

OMAN NATIONAL SPATIAL STRATEGY 2040

National Planning Standards
August 2023



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SPATIAL STRATEGY

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In August 2020, a significant change in the structure of Ministries and the governance of the country was announced by His Majesty, Sultan Haitham bin Tariq al Said. This was an outcome of the Vision 2040 National Priorities and the strategic direction prepared for the Governance of the country. This change has had far reaching implications for the organisation and operation of the majority of Ministries.

The manner in which planning decision making is undertaken at a National and Governorate level has changed. The change in Government structure has been welcomed to increase efficiency in decision making and the delivery of public services. However, these Ministerial and Government structural changes have not been captured within this ONSS and RSS documents, as they coincided with the finalisation of the strategies.

The implementation of the ONSS and RSSs will need to be aligned to these changes when taken forward by the newly formed Ministry of Housing and Urban Planning.

In a very challenging and ever - changing global environment, Oman is moving to the future stepping on two main pillars: capitalizing the previous development efforts and achievements that took place over half a century all over the country and, at the same time, envisioning a sustainable future where resilient and adaptive planning will occur, as identified within the priority areas of VISION 2040.

Oman National Spatial Strategy (ONSS) is the “roadmap” to drive the country to its future achievements, in a bold, ambitious but also realistic and achievable manner, where the “spatial development” is given a clear definition and description and is “translated” in comprehensive plans at a National level and for all Governorates.

The Strategy was developed as a 20-year planning framework aiming to deliver a better balance between social, economic, environmental and physical development at a strategic scale. It ensures that cities are future-proofed against climate change and competitive in nature. It provides clear answers to the residents of Oman, on where they should live, where they should work, what kind of employment opportunities they will have, how they will travel and what kind of environment they will be living in, as basis, for the generations to come.

The process undertaken to develop the Strategies was a rigorous and interactive one. Key decisions were taken through stakeholders’ and community participation, during all phases of the project. Stakeholders such as the government, the private sector, academic institutions and the civil society were engaged, and given a platform to debate, discuss and decide.

The result of this process emerged into multi-faceted Strategies. Policies were introduced to cover the various dimensions needed to develop sustainable cities. The Strategies also identify appropriate mechanisms and tools necessary to ensure implementation and guide the detailed levels of planning. Nevertheless, the Oman National Spatial Strategy needs strong allies for its next steps, who understand the requirements and the challenges of the era and support its success. The Strategies need commitment to ensure our future generations are provided with better place to live, work and recreate.

HE Dr Khalfan Al Shueili

Minister of Housing and Urban Planning



01

INTRODUCTION

1. INTRODUCTION

The Oman National Spatial Strategy (ONSS) provides a framework for future spatial development across Oman. The ONSS sets a direction for where and how investment in infrastructure and development should occur so that Oman becomes a better place to live, work and visit. It makes clear the importance of planning new infrastructure and development in such a way they are complementary rather than competing priorities, ensuring opportunities are maximised and multiple benefits are achieved.

Following the direction of Vision 2040, the country is seeking to reinvigorate itself, developing its capital Muscat as a significant regional attraction, with higher levels of international trade, foreign investment and visitors who arrive to experience the country's rich natural assets and its traditional hospitality. Oman intends to develop its research and innovation capabilities, underpinned by high-quality academic institutions as well as investing in strengthening existing, and creating new, employment locations so that all parts of the country are able to contribute to, and benefit from the envisioned growth in national GDP.

Developing integrated and thriving urban communities are critical to the strategy's success and work will be required to improve all settlements so that they become desirable and dynamic places to live and work. It is the Government's desire that Oman becomes synonymous for the quality of its overall environment, as for its economic success. New national policies aimed at enhancing the country's natural and cultural environments will play a key role in this, but there will be important contributions for the country's urban communities through improved provision of a comprehensive range of community facilities and introduction of a range of public open spaces.

The ONSS is an important contributor to, and is informed by, Vision 2040 and its proposals are fully aligned with key priority areas as identified above. Proposals on wide-ranging matters such as housing, transport, energy, natural resources, food and water security and environmental protection have implications for all parts of Oman and can be better delivered if the planning system is aligned to deliver their aims.

Although there are a number of Royal Decrees and Ministerial Decisions that relate to the development of the country, there is no comprehensive Planning Law that covers all aspects of development. Planning is undertaken predominantly by the Ministry of Housing and Urban Planning (MoHUP) at a strategic level and prepare detailed subdivision plans and who are responsible for the delivery of residential plots to eligible citizens.

The Planning Standards used by these organisations were developed some time ago and collated to form what is commonly known as The Green Book (1991). It is considered that many of the standards used before are no longer relevant in the 21st century or have been superseded by more modern practices. Given the preparation of the ONSS and similar Regional Spatial Strategies (RSS) for each of the 11 Governorates, it is an appropriate time to review and refocus the Planning Standards that need to be used to guide future development across Oman for the coming decades.

1.1. Planning Standards – What Are They and How Do They Work?

1.1.1. Purpose of the Standards

The ONSS Planning Standards have been developed to support the future Vision of Oman and to provide regulations and guidelines to ensure the development of high-quality places and communities which encompasses the ONSS Vision and Objectives. The ONSS defines ‘development’ as the carrying out of any building, engineering, mining or other operations in, on, over or under land, or the making of any material change in the use of any buildings or other land.

With this in mind, the ONSS Planning Standards intend to:

- Classify, designate, and regulate the use of structures and land for residential, commercial, civic, institutional, recreational and other purposes in accordance with sound planning practices and to provide the regulatory tools and for future development.
- Provide regulation and control over the use of land, environment and water to ensure the public health, safety, and general welfare of the residents and visitors of Oman.
- Protect the property values and quality of life throughout Oman.
- Achieve mutual compatibility between different land uses.
- Regulate and limit the height and size of buildings and other structures.
- Provide guidelines influencing the design and appearance of development, especially in regard to elements of the public realm or affecting the public realm.
- Regulate the design and appearance of development, such as scale, typology, context.
- Facilitate adequate provisions of public facilities and services.
- Promote interconnected communities, access to public transport and convenient and safe movement.
- Promote sound and sustainable development practice based on social, economic and environmental requirements and in accordance with international best practice.

1.1.2. Application of the Standards

The ONSS Planning Standards shall apply to all land uses and development of land, water and structures in Oman. The Planning Standards provided in this document are to be referred to for all future land use planning and development and be consulted throughout the master planning and development permitting process. The ONSS Planning Standards provide the basis for all future development at a national level, and therefore it is the responsibility of the relevant Planning Authority (national, regional, local) to take on-board these Planning Standards and develop more local level standards in which to implement within their jurisdiction. This will ensure a certain level of planning and development quality is applied and implemented at a national level. For example, maximum building heights have been provided for Primary Land Uses at a national level, however, regional or local variations of this standard may choose to impose lower maximum building height standards, based on the urban form and context of the local area, where taller buildings may not be considered appropriate or be a desired built form.

Application of the ONSS Planning Standards will help to protect and improve environmental quality in Oman, with respect to both the built environment (settlements, industry and infrastructure) and the natural environment, by respecting the sensitivity of the land, coast and sea that may be subject to development. For this reason, the ONSS Planning Standards are recognised as an essential tool in helping to deliver the Environmental Management Strategies that have been prepared for the ONSS and the Regional Spatial Strategies (RSSs).

Challenges to the success of the Planning Standards provided in this document will largely arise due to a lack of diligence and disposition to implement such standards at a local level, as Regional and Local Authorities need to ensure they are the implementer and promotor of these Planning Standards and carry forward the 2040 Vision of Oman.

1.1.3. Conflict Resolution

Land Use and Activity Conflicts

The role of an Urban Planner is to identify, manage, resolve and mitigate against land use conflicts, assessing and determining a fair resolution between conflicting activities and their local and wider impacts. Such resolution should consider and provide a balance between the three Pillars of sustainable development: economic, environmental and

social. Although it is not always possible to provide a resolution which caters for each Pillar equally, none of the Pillars should be undermined significantly or be subject to extreme negative impact.

Conflict resolution is a key role in the Urban Planning profession and a Planner's involvement and input is essential when the interests of two (or more) parties clash. National level Planning Standards can only go so far in promoting good development and reducing potential conflicts, for example by providing setback and buffer zone standards, defining permitted and non-permitted land use activities. However, conflicts which cannot be resolved with these ONSS Planning Standards, or other relevant Ministry or Authority Standards which regulate planning and development, are still likely to arise in the future.

For example, the interests of the mining sector may conflict with environmental interests within Terrestrial Special Planning Zones (TSPZs), with mining activities, which support Oman's economic growth, having the potential to cause adverse environmental impacts to the local and possibly wider area. Again, in the TSPZs conflicts may arise between hotel/ resort developments, which support Oman's growing tourism industry offering and local vulnerable species habitats or nesting sites. Similarly, a proposed highway development, aimed at reducing vehicle travel times, may conflict with a designated Cultural Conservation Area (CCA)/ Cultural Landscape which have been recognised as areas of high cultural and historical value, with the road development undermining the local development context and historical urban form.

There is no way to predict where such spatial conflicts will arise in the future, and therefore a structured process which defines some basic steps to handle such conflicts is required and an outline of this is provided below, in order to guide Urban Planners in their attempts to identify, assess and resolve future land use conflicts. It is recommended that this process should be facilitated by a member of the SCP, whereby a designated Urban Planner leads the conflict resolution process, gathers information from relevant Ministries and Authorities, facilitates discussions, and ultimately formulate the resolution(s).

This process proposed is as follows:

Recommended Conflict Resolution Process	
1 – Conflict Definition	Clearly define the conflict and identify the affected parties/ stakeholders.
2 – Information Gathering and Assessment	Request and evaluate both conflicting parties/ stakeholders' requirements/ objectives/ needs. Assessment to include: • Location Assessment – Consider the location of the conflict and the overarching role of that area/ land use. • Economic Assessment – Consider the economic implications of the conflict. • Environmental Assessment – Consider the environmental implication of the conflict. Social Assessment – Consider the social implications of the conflict.
3 – Consultation	Provide an opportunity for both affected parties/ stakeholders to discuss the conflict, taking on board the role as mediator to guide the discussions proactively.
4 – Decision	If no resolution can be agreed between the parties/ stakeholders, provide a decision on behalf of the SCP.

ONSS Planning Standards and Authority Standards Conflicts

Should there be any question arising concerning discrepancies, inconsistencies or ambiguities within these Standards, the Ministry of Housing and Urban Planning (MoHUP) retains authority to interpret these Standards and shall render a decision to clarify the question. The use and development of land, water, and structures shall comply with the requirements established in these Standard, as well as:

- All other applicable rules, technical codes and standards subsequently adopted by government Ministries or Authorities having jurisdiction.
- All other applicable rules, technical codes, design guides and regulations for Oman.

1.2. Existing Standards, Guidelines and Manuals

1.2.1. Relevant Ministries and Authorities for Planning and Development

The ONSS Planning Standards do not supersede or replace any existing relevant Ministry/ Authority Standards, Guidelines or Regulations. On the contrary, the ONSS Planning Standards (this document) wholly supports Ministry and Authority standards and guidance and requires the adherence and application of these to all existing and future planning and development.

For all future master planning, development, redevelopment or regeneration projects, it is the responsibility of the Landowner, Master Planner, Developer or relevant Authority to ensure that all Ministry and Authority Standards and Guidelines are applied and adhered to throughout the planning, development, construction and post-construction stages.

The ONSS Planning Standards do not explicitly state the specific Ministry/ Authority Standards in this document. These are likely to change over time, and therefore providing explicit references in this document, would likely render it outdated whenever any Ministry/ Authority published modifications or updates to their own standards. However, this document does provide guidance regarding the relevant Ministry/ Authority who should be engaged with in order to determine the most current and up-to-date standards that should be applied to a given development. Such Ministry/ Authority engagement is also an important element to promote participatory planning.

Relevant Oman Ministries and Authorities who may require engagement during master planning and development review and construction processes are listed below alongside their identified current available Planning /Development Standards. Further detail regarding each Ministry / Authority role, responsibility and remit is provided in ANNEX A. Reference is made to relevant Ministries and Authorities throughout this document, where relevant.

Supreme Council for Planning (Formerly) *

Current available Planning/ Development Standards:

- Physical Planning Standards, March 1991 – SCTP, Physical Planning Standards
- The Green Book (limited implementation)
- SCP Planning Guidelines, 2014 (limited implementation)
- ONSS Planning Standards and Guidelines

* *Currently the Ministry of Housing and Urban Planning*

Ministry of Housing and Urban Planning

Current available Planning/ Development Standards:

- Urban Planning Guide (Green Book)

Ministry of Transport, Communications and Information Technology

Current available Planning/ Development Standards:

- Highway Design Standards, 2017 (Vol 1 and 2)

Ministry of Heritage and Tourism

Current available Planning/ Development Standards:

- Development Control Framework for Tourism Development Projects (2010)
- Regional Tourism Development Plans – Planning Guidelines

Oman Tourism Development Company (Omran)

Current available Planning/ Development Standards:

- Design Management Permits
- Project specific guidelines – Madinat al Irfan Guidelines/ Al Mouj Guidelines

Governors' Office, Ministry of Interior (Former Ministry of Regional Municipalities and Water Resources)

Current available Planning/ Development Standards:

- Regional Municipalities Development Control Guidelines

Muscat Municipality

Current available Planning/ Development Standards:

- Building Regulations for Muscat, administered by Muscat Municipal Council

Environment Authority

Current available Planning/ Development Standards:

- At present, the Environment Authority does not have any specific active planning standards or guidelines available. It does occasionally issue Guidance Notes on specific subjects, including recently on Buffer Zones around sensitive land uses and on Coastal Areas, (water) Wellfield Protection Zones, as well as mining activities buffer zones which should be referred to when relevant.
- 'Guidelines for Obtaining Environmental Permits' published by the previous Ministry of Regional Municipalities and Environment (now EA), circa 2001, have not been updated and therefore remain the latest guidance for environmental permits.

Ministry of Culture and Heritage (Formerly)

Current available Planning/ Development Standards:

- At present, the Ministry of Culture and Heritage does not have any published planning standards or guidelines

Royal Oman Police

Current available Planning/ Development Standards:

- At present, the Royal Oman Police does not have any specific published planning standards or guidelines other than the Road Safety Manual which seeks to improve road safety across the country

Ministry of Agriculture, Fisheries and Water Resources

Current available Planning/ Development Standards:

At present, the Ministry of Agriculture, Fisheries and Water Resources does not have any specific published planning standards or guidelines. Their most recent sector guiding documents are:

- Sustainable Agriculture and Rural Development (SARDS)
- Fisheries Development Strategy (World Bank)
- Water Resources Master Plan 2000-2020
- Oman Salinity Study, 2009

Public Establishment for Industrial Estates

Current available Planning/ Development Standards:

- PEIE Strategy and Implementation Plan; 9th 5-year Plan (2017-2020)

Ministry of Energy and Minerals

Current available Planning/ Development Standards:

- At present, the Ministry of Energy and Minerals does not have any specific active planning standards or guidelines available, although has recently published its Oil and Gas Regulations 2020.
- At present, the Ministry of Energy and Minerals does not have any published planning standards or guidelines, although it has recently published its Mining Strategy (2019), which does provide some guidance on mine buffer zones etc.

Ministry of Defence

Current available Planning/ Development Standards:

- At present, the Ministry of Defence does not have any published planning standards or guidelines

Ministry of Health

Current available Planning/ Development Standards:

- The Oman Health Vision (OHV) 2050

Ministry of Education

Current available Planning/ Development Standards:

- Ministry of Education 2018 Standards

Public Authority for Civil Defence and Ambulance

Current available Planning/ Development Standards:

- At present, the Public Authority for Civil Defence and Ambulance does not have any specific published planning standards or guidelines

Ministry of Endowments and Religious Affairs

Current available Planning/ Development Standards:

- The most recent Mosque Planning Standards are included in the Interim Mechanism of Urban Planning Document, developed by the General Secretariat of the Supreme Council for Planning, and approved by the Supreme Council for Planning in 2014

Be'ah

Current available Planning/ Development Standards:

- At present, Be'ah does not have any specific published planning standards or guidelines, although it has published its Waste Management Strategy

Nama Water Services

Current available Planning/ Development Standards:

- Diam Master Plan (2040)
- Diam Business Plans are rolled out every 5-years to align with the government's budget spend
- National Water Sector Master Plan
- Wastewater Master Plan

1.2.2. Recommended Standards, Guidelines and Manuals

Based on the identification of current available planning, design and development Standards and Guidelines from relevant Oman Ministries and Authorities, the following provides recommendations for the development of additional or supplementary Manuals that can contribute to improving urban development across Oman. Preparing these documents will further guide master planning and development design at the national level as part of a national development framework and therefore ensure a more consistently high-quality approach to planning, design and development in the country.

The identified Planning and Design Manuals should be utilised and applied to all future master plans and development proposals, and therefore be accessible to developers, landowners, master planners, as well as Ministries and Authorities.

It is recommended that the SCP or designated Authority lead the preparation of the recommended Planning and Design Manuals, however, they will need to adopt an integrated and collaborative approach with all relevant Ministries and Authorities. This will ensure such Standards are consistent and can take on-board all other interrelated or applicable Ministry or Authority standards and requirements. This will help avoid issues with mismatched standards between Authorities and ensure that cross-communication between the key development regulators of Oman is maintained and enhanced.

1. **Right of Way and Street Design Manual** – *promoting compact, efficient and flexible streets which prioritise pedestrians and cyclists, reduce land take, promote user safety and reduce congestion.*

The development of this Manual should be led by the Ministry of Transport, Communications and Information Technology in close collaboration of the Ministry of Housing and Urban Planning (with the support of Regional Municipalities). This Manual should consider but not be limited to:

- RoW Configurations (Utility Infrastructure Provision and Placement)
- Street Hierarchy and Context
- Street Layout and Connectivity (Design Principles)
- Smart Streets (Design and Implementation)
- Design for Cyclists, Pedestrians, Public Transport
- Parking Provision (Design, Provision and Placement)
- Traffic Calming
- Traffic Signs and Markings
- Street Safety
- Street Furniture and Street Lighting
- Street Materials and Maintenance
- Street Flexibility (Design and Implementation)

2. **Landscape and Public Realm Manual** – *promoting climate sensitive, quality and user-friendly public spaces which are accessible, diverse, and sensitively programmed.*

The development of this Manual should be led by the Ministry of Housing and Urban Planning, with support from the Governors' Office and the Municipalities of Muscat, Salalah and Sohar (including input from relevant Ministries and Authorities). This Manual should consider but not be limited to:

- Public Realm Hierarchy and Context (based on/ mirroring the Hierarchy provided in this document to ensure consistency with Community Facility Planning and access to parks and open space)
- Public Realm Connectivity and Accessibility
- Public Realm Detailed Typology and Programming
- Public Realm Design Elements – including but not limited to: Surface Materials, Footways and Footpaths, Carriageways, Slopes, Ramps and Steps, Street Furniture, Seating, Boundary Treatment, Litter Bins, Cycle Racks, Signage and Wayfinding, Tree Pits, Planters, Play Spaces, Play Equipment, Public Art, Lighting, Tree Planting and Spacing)
- Recommended Softscape and Hardscape Palette (Planting, Surface Materials etc.)
- Shading and Climate Attenuation Standards
- Public Realm Irrigation Standards
- Green Infrastructure Design and Retrofitting.

3. **Green Buildings and Communities Manual** – *promoting sustainable development, efficient buildings and inclusive community design; providing quality places to live and thrive that are environmentally, socially and economically responsible.*

The development of this Manual should be led by the Environment Authority and the Ministry of Housing and Urban Planning, (including input from relevant Ministries and Authorities). This Manual should consider but not be limited to:

- Natural Environment and Habitats (e.g. reuse of land, remediation of land, existing and future habitats, environmental assessment and protection, food systems)

- Community Spaces, Design and Inclusivity (e.g. walkability, outdoor thermal comfort, community facilities, open space networks, safety and security)
- Water Demand, Efficiencies and Alternative Sources (e.g. landscaping, water features, water leak detection, monitoring)
- Energy Demand, Efficiency and Renewable Sources (e.g. passive outside cooling, smart grid technology, energy efficient appliances, peak load reduction)
- Material Use and Responsible Sources (e.g. recycled materials, regional materials, construction and operational waste management, hazardous waste management)
- Outdoor Liveability – Communities and Buildings (e.g. accessibility and quality of outside spaces, public transport, community facilities)
- Indoor Liveability – Communities and Buildings (e.g. materials emissions, thermal comfort, air quality, ventilations)

It is important to note that there are many existing Green Building Codes, Regulations, Strategies/ Sustainability Rating Systems currently utilised and operational internationally (LEED, BREEAM, Estidama, GSAS etc.). As with many other countries, existing Sustainability Rating Systems or Green Building Codes can be adopted within Oman, retrofitting existing standards (if required) to suit the unique context of Oman and its specific requirements.

4. **Neighbourhood Planning and Design Guidelines** – *providing defined and detailed guidance for the planning and development of neighbourhoods in Oman, highlighting best practice urban design principles to be considered and included in master plan development.*

The development of this Manual should be led by the Ministry of Housing and Urban Planning (including input from relevant Ministries and Authorities) and should follow a similar structure to Section 2.2 of this document, but provide additional detail, guidance and standards to be a standalone Manual. This Manual should consider but not be limited to:

- Omani Urban Design Key Elements and Features
- Omani Urban Character
- Housing Typologies
- Compact Urban Design (regeneration, redevelopment and reuse)
- Urban Density
- Urban Legibility
- Integrated Street Planning/ Complete Streets
- Transit Orientated Development
- Mix of Uses and Land Use Compatibility
- Green Infrastructure
- Regional Distinctiveness

5. **Chapter 8 - Nationally Significant Planning and Development Guidelines** *provides a number of recommendations for the development of Standards/ Guidelines/ Manuals in order guide the development of unique and specially zoned areas across Oman. The outcomes of Chapter 8 include recommendations to develop the following Manuals and Guidelines:*

- Terrestrial Special Planning Zone (SPZ) Management Plan - MECA with SCP
- Coastal Zone Management Plan (CZMP) – MECA
- Cultural Conservation Area – Planning Process and Standards (Identification Guidance, Appraisal Document Guidance, Planning Standards) – Ministry of Heritage and Tourism
- Tourism Development Planning Manual - Ministry of Heritage and Tourism
- Coast and Wadi Buffer Zones and Setbacks Standards– MECA with SCP, Ministry of Transport, Communications and Information Technology, Be'ah, MRMWR

1.3. Master Planning Submission Process and Structure

In the future, it is likely that the Oman Planning Authorities will receive requests for the development of large areas of land to house a variety of land uses, with the proposals being set within the framework of a Master Plan. To enable the efficient and effective review and adjudication of these proposals, it is proposed to introduce a more formal Master Planning Submission and Development Review Process, which will need to be undertaken by the SCP in order to provide clear and defined guidance for future development, redevelopment, and regeneration projects throughout Oman.

By having a defined submission process, alongside adopted Planning Standards, Building Codes and other relevant Authority Standards and Guidelines, ensures that each Master Plan provides comparable detail and definitions, in order for relevant Ministries and Authorities to adequately review and determine the merits and suitability of each Plan. This will promote uniformity of the information and data submitted to the Authority and allow for ease of review by ensuring quality and complete data is provided for each Master Plan/ Development Proposal. Furthermore, having a defined Master Plan/ Development Submission Process which is transparent, uniform and clear, also provides private sector confidence which can support an attractive investment market.

To create sustainable patterns of urban growth, the basic development unit – the individual plot – is not suitable for an integrated planning approach and will need to be reviewed under the normal development control process. Master planning should be undertaken for complete areas – say at a City, District or Neighbourhood level – so as to create a built environment that is resource-efficient, with integrated public transit, a connected network of green areas, shaded public space, energy efficient buildings and ‘complete’ streets that balance the needs of pedestrians as well as vehicles.

It is recommended, therefore, that greater focus is placed on the master planning and urban design process in order to achieve more sustainable urban form and well-designed places.

A best practice approach to Master Plan submissions is to provide a two-tiered approach, typically referred to as Concept Master Planning and Detailed Master Planning stages. A recommended process for each of these defined stages is provided below.

Concept and Detailed Master Planning – Recommended Submission Process (Outline)

Concept Master Planning

As the term suggests, the Concept Master Plan submission is intended to provide the Approving Authorities with a high-level overview of the proposed concept for the development area. Concept Master Plan submissions will, therefore, provide high-level Master Plan information and data that provides a clear overview of a) the type of development being proposed; b) the development concept that binds the development together, and c) the main ingredients of the development and how they fit together – so that the Approving Authorities can gain a clear understanding of the overall intent of the Project. Furthermore, any Ministry or Authority requirements and comments received from a review at this stage can be included more easily on conceptual works and updated as part of the following Detailed Master Plan stage.

Best practice recommends that prior to Concept Master Plan submission, the land owner, developer, or master planner approaches the relevant Approving Authority, as well as other relevant Ministries and Authorities to undertake a ‘Introductory Meeting’, whereby the key aspects of the Master Plan can be discussed, and any issues, data requirements, or standards clarification can be undertaken. This provides an opportunity, prior to commencement of Master Planning works, for the key site parameters to be agreed upon, therefore reducing the risk of inappropriate Master Plan proposals and rejections. Typically, the proposed master plan/ development should be in accordance with the relevant Urban Change Plan / Local Area Plans etc., land use designations and zoning, however, deviation may occur in accordance relevant Authority approval.

Once prepared, it is recommended that the Concept Master Plan documentation is submitted to the Approving Authority, who then distributes the documentation to the relevant Ministries/ Authorities – such as the Ministry of Transport, Communications and Information Technology, Utilities Authorities, MECA etc. – for review, commentary, approval, or rejection (as applicable). It is recommended that such Ministry/ Authority review process is undertaken **within 4 weeks**, to promote efficiency in the system for both master planners, developers and investors.

Detailed Master Planning

Following review of the Concept Master Plan and receipt of Ministry/ Authority comments, best practice recommends that any comments, which are unclear or require further clarification, are addressed through direct consultation with the relevant Authority, in order to agree resolution and an appropriate way forward, prior to commencement of more Detailed Master Planning works.

Detailed Master Plan submissions typically follow the same structure as the Concept Master Plans but should address all relevant Ministry/ Authority standards, guidelines and Concept Master Plan comments, as well as providing

additional, more detailed information, as highlighted in **bold** within the Recommended Documentation Structure shown below.

Once developed, it is recommended that the full set of the Detailed Master Plan documentation is submitted to the Approving Authority, who then distributes the documentation to the relevant Ministry/ Authority – such as the Ministry of Transport, Communications and Information Technology, Utilities Authorities, MECA etc. – for review, commentary, approval, or rejection (as applicable). It is recommended that such Ministry or Authority review process is undertaken **within 6 weeks**, to promote efficiency in the system for both master planners, developers and investors.

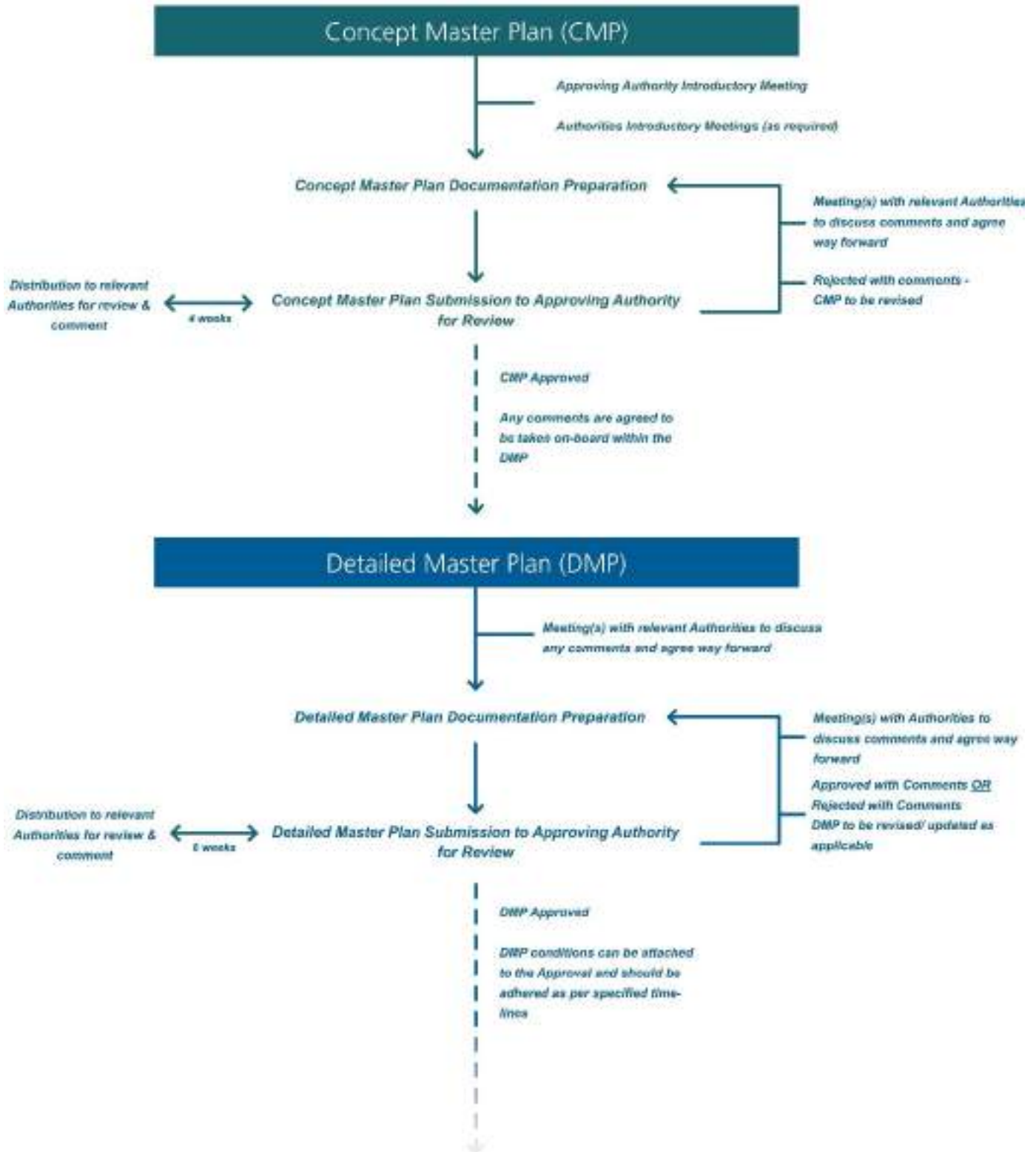
Once the Detailed Master Plan has been approved by the Approving Authority and notification provided to the developer, Building Permit applications etc. can commence.

Concept and Detailed Master Planning – Recommended Documentation Structure

It is recommended that the structure indicated below is used as a guide for the preparation of submission documentation for Master Plan proposals. The outline provided refers to both Concept Master Plans and Detailed Master Plans, with information applicable to Detailed Master Plans only, shown in **bold**.

1. Site Context and Analysis (Narrative and Plans)
 - a. Introduction to the Proposal/ Development
 - b. Regional Context – location, positioning, relevant governing ministries/ authorities
 - c. Local Context/ Site Assessment – including character area analysis, existing land uses, current activities, neighbouring (external) land uses and activities.
 - d. Existing and Proposed Site Plan Levels.
 - e. Existing Access and Connectivity – roads, public transport, airports, ports, pedestrian networks, etc.
2. Development Concept (Narrative, Plans and Tables)
 - a. Land Use
 - i. Land Use Plan – showing all land uses to be included within the master plan/ development proposal
 - ii. Urban Design Concept/ Proposals
 - iii. Master Plan Development Statistics – corresponding to the Land Use Plan
 - iv. Site Sections
 - v. **Axonometric Drawings**
 - vi. **Renderings, Imagery, Architectural Vision, etc.**
 - b. Phasing
 - i. Phasing Plan
 - ii. Phasing Development Statistics – data per phase of the development
 - iii. Ownership/ Development Management Plan – private vs. public land ownership and maintenance.
 - c. Landscape and Open Space
 - i. Landscape and Open Space Hierarchy/ Typology Plan – reference to the ONSS Planning Standards
 - ii. Landscape and Open Space Hierarchy Plan
 - iii. Landscape (hard and soft) and Open Space Character and Features (street furniture, street art, etc.)
 - iv. Pedestrian and Cycle Network Landscape
 - v. **Plant Palette, Imagery, References**
 - d. Community Facilities
 - i. Community Facilities Analysis – reference to the ONSS Community Facility Planning Standards for accessibility, capacity, density, distance for all required community facilities.
 - ii. Community Facilities Plan – all community facilities
3. Transportation (as per relevant Ministry of Transport, Communications and Information Technology Standards)
 - a. Transportation/ Mobility Strategy
 - b. TIS or TMP Methodology/ Approval
 - c. Road Hierarchy Network and Layout Plan – Roads, U-turns, Roundabouts, Ramps, Bridges, Tunnels etc.
 - d. Public Transport Network (BRT, LRT, Taxi, Train – as relevant) – connectivity both within and from outside the development, including stops, lay-bys, drop offs etc.
 - e. Pedestrian and Cyclist Network – Paths, Networks, Connectivity, Crossings, Facilities, etc.
 - f. Water Transportation (as appropriate) – Marinas, Ports, Harbours, Water Taxi etc.
 - g. **Proposed Road Levels**

4. Utilities Infrastructure (as per the relevant Utilities Authority Standards)
 - a. Utilities Layouts, Demand Programmes (by plot and by phase) for:
 - i. Power
 - ii. Water
 - iii. Irrigation
 - iv. Sewerage
 - v. Telecommunication
 - vi. Solid Waste Management and Recycling
 - vii. District Cooling
 - b. Right of Way Cross Sections – relating to Road Hierarchy Plan
5. Environment and Heritage
 - a. Environmental Impact Assessment (EIA) – Concept Methodology (in coordination with MECA)
 - b. Environmental Impact Assessment (EIA) – Detailed Assessment (approved by MECA)**
 - c. Archaeological Impact Assessment (AIA) – if required (in coordination with MECA and MoHC)
6. Sustainability Assessment (SA)
 - a. Sustainability Assessment Methodology (Objectives definition)
 - b. Sustainability Assessment Targets and Goals (UN SDGs; Economic, Environmental, Transport, Utilities Infrastructure, Social, Spatial Assessments – as applicable)
 - c. Sustainability Assessment Outcomes (design, interventions, specifications, strategy etc.)**
 - d. Sustainability Management Plan**
7. Development Control Regulations (DCRs)
 - a. **Master Plan Design Regulations and Guidelines – land use, plots, architecture, landscape (hard and soft), palettes, character areas, walls and fencing, openings and arcades, lighting, signage and wayfinding, pedestrian and cyclists, public transport infrastructure.**
 - b. **Building Typology Plan – location and guidelines for each building type.**
 - c. **View Corridor Protection Regulations – natural, built views and corridors which require protection.**
 - d. **Individual Plot Development Control Regulation Sheets– plot information such as permitted land use, envelope, heights, setbacks, open space, utilities connections, access, egress, parking (as appropriate), etc.**



Concept Master Plan and Detailed Master Plan Process Summary Diagram

1.4. Document Structure

The ONSS Planning Standards comprise a number of 'Parts', which play a specific role in the regulating of future development and lands. Following this PART 1 – INTRODUCTION, the below details the structure of this document.

PART 2 – NATIONAL PLANNING STANDARDS

The planning standards and principles provided in this section should underpin all future development. PART 2 starts with an overview of key design principles that will form the basis of the planning of future urban areas, such as climate responsive planning, Urban Form, Master Planning & Urban Design, Integrated Street Planning & Design, Green Buildings and Smart City Initiatives.

This section then provides planning standards and supporting guidance for key Primary Land Uses (Residential, Commercial, Industrial, and Tourism), Community Facilities, Parks and Open Space, Streets and Utilities Infrastructure. These standards and supporting guidelines are to be applied to all development at a national level, in order to guide and benchmark development proposals and master plans against these best practice standards. The ONSS Planning Standards have been developed with a similar structure for each land use throughout the document. The following provides a summary of the typical information provided:

- **Intent:** The role of the land use and its overall character.
- **Goals:** The key outcomes expected for the land use.
- **Permitted Uses:** Development and activities which are allowed by the land use.
- **Primary Uses:** The key development or activity which underpins the land use.
- **Secondary Uses:** Subsidiary development or activity that help the primary uses meet the purpose and outcomes of the land use.
- **Not Permitted:** Development of activity not allowed as part of the land use.
- **General Planning and Development Guidelines:** Development standards/ regulations which are applicable to one or more land uses (as specified). These are provided as part of the introductory section for each land use.
- **Supplementary Planning Guidelines:** Additional relevant development standards/ regulations, as well as design guidelines which are applicable to the specific land use. These are provided following the Planning Standards table for each land use (where relevant).

PART 3 –NATIONALLY SIGNIFICANT PROJECTS AND DEVELOPMENT GUIDELINES

Nationally Significant Planning and Development Guidelines refers to development which cannot be controlled by typical planning standards and guidelines, and therefore are required to be assessed on a case-by-case basis. These are usually large, unique areas, developments or sites which are of a national importance relating to large-scale infrastructure, master plans, services and economies. Development, review and approval of any such development or project will require a range of national level relevant Ministry/ Authority inputs, as well as coordination with the Governate(s) in which the project is sited.

Nationally Significant Planning and Development Guidelines has been defined as follows:

A) National Level Zonal Guidelines

National Level Zones refer to a way of grouping areas with similar characteristics such as land use, character, designation together and setting outcomes for the area through policy, standards and guidelines.

National Level Zonal Guidelines therefore provides key information in which to guide the development of relevant standards and codes in the future for key zoning elements of the ONSS, making reference to key relevant Ministries and Authorities which require consultation and coordination. The specific development standards will vary and will be determined by the governing Authority/ department/ project owner. National Level Zonal Guidelines referred to in this document include:

- Special Planning Zones (TSPZs) – Terrestrial and Coastal
- Coastal Zone Management Plans (CZMP)
- Cultural Conservation Areas (CCAs)

- Tourism Development Plans (TDPs)
- Flood Control Management Strategies – Wadis and Coast
- Buffer Zones and Setbacks
- Transit Orientated Development (TOD)

B) National Level Project Guidelines

National Level Projects refer to specific developments of a unified type and designation which require specific planning standards, regulation and codes to initiate and approve its development.

National Level Project Guidelines signposts the responsible Ministry or Authority in which such project must adhere to and be regulated by, as well as key information and considerations which are required, at minimum, if such development opportunities arise in the future. The specific development standards will vary and will be determined by the governing Ministry/ Authority/ department/ project owner etc. National Level Project Guidelines provided in this document include:

- Transportation Projects
- Special Economic Zones and Free Zones
- Universities Projects
- Healthcare Projects
- Theme Park Projects
- Defence Installations Projects
- Oil Refineries and Gas Field Projects
- Mining and Extraction Projects
- Energy Projects
- Utility Infrastructure Projects
- Agriculture, Fisheries and Livestock Projects

PART 4 – REGIONAL SPECIFIC PLANNING STANDARDS

Oman is a country of varying settlements, urban context and natural environments. The ONSS recognises and records the variance across the regions and the associated natural and cultural environments and provides supplementary planning guidance for the development of each Regional/ Governate specific character area, recognising their regional distinctiveness, cultural influences, traditional lifestyles, settlement patterns, and architecture, alongside appropriate climatic responses based on the locality. The Planning Standards provided in PART 2 of this document provide the initial guidance; however, regional influences and exceptions are identified in order to ensure regionally appropriate development, which is responsive to the local urban and natural environment. In addition, in order to recognise the distinctiveness of certain areas of the country, standards are also considered for Special Planning Zones (SPZs) designated as part of the ONSS. The Regional Standards, developed and included within various Regional Spatial Strategy documentation, are provided for the following Governates:

- Muscat Governorate
- Dhofar Governorate
- Al Buraymi Governorate
- Ad Dakhiliyah Governorate
- Al-Batinah North Governorate
- Al-Batinah South Governorate
- Ash Sharqiyah North Governorate
- Ash Sharqiyah South Governorate
- Adh-Dhahirah Governorate
- Al Wusta Governorate



02

NATIONAL URBAN
DESIGN GUIDELINES

2. NATIONAL URBAN DESIGN GUIDELINES

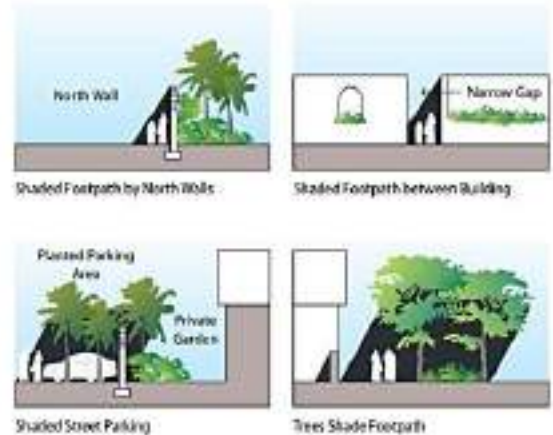
2.1. Introduction

The ONSS Planning Standards encompass 10 Key Community Design Principles, which underpin the vision and overall goals of the Standards, in order to create socially, economically, environmentally and culturally attractive and viable places to live, now and in the future. These 10 Principles should be considered for all development, redevelopment, regeneration and master planning, as follows:

Climate Responsive

The need to provide shelter, shade and protection to address a range and variety of weather conditions, such as extreme temperatures and solar exposure during the summer months, as well as khareef, and flooding.

- ✓ Reduce Urban Heat Island Effect through building orientation, urban shade, shade structures and vegetation.
- ✓ Develop urban areas which consider solar orientation and prevailing winds to create comfortable and useable streets and open spaces throughout the year.
- ✓ Ensure quality infrastructure and protection is provided in all urban areas, to reduce issues with urban flooding and unique weather conditions to protect people and the places which they live and work.



Cultural Inspiration

Designs that enhance and enforce Oman's unique cultural identity, emphasise family and hospitality and provide a blend of tradition and modernity.

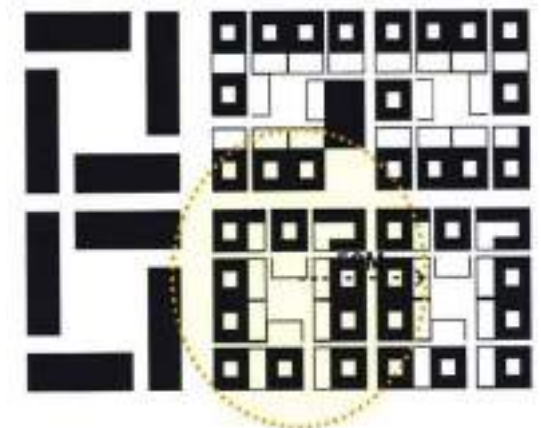
- ✓ Encourage contemporary and authentic Omani architecture and built form to reinforce a sense of place and identity.
- ✓ Support emerging modern Omani architectural trends which underpins local cultural heritage but fosters creativity, innovation and uniqueness.
- ✓ Encourage the restoration and regeneration of communities, which respects the traditional architecture and urban form, but provides places which cater to modern daily life and needs.



Character

Creating distinct places of character with a strong sense of identity, responding to local environmental and cultural factors, as well as built form, local economies and existing urban areas.

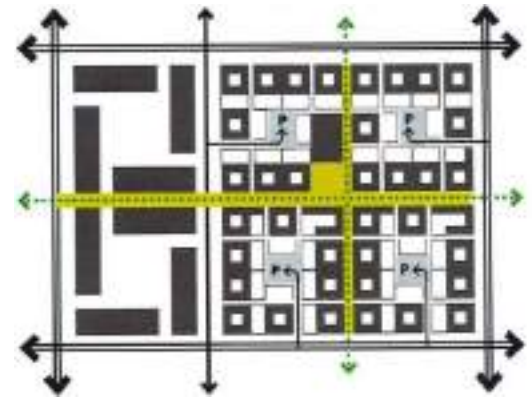
- ✓ Ensure all development responds directly to the local urban context, character and history and reinforces local identity.
- ✓ Ensure development respects and embraces Oman's natural environment, and development does not impose or diminish the environments uniqueness.
- ✓ Encourage, revitalise and showcase settlements history; be that built form, economy, agriculture, tradesmanship, celebrations – to retain local identity and character.
- ✓ Ensure development is located within existing urban areas where possible, to reinforce existing communities and promote community development.



Ease of Movement

Providing an accessible, well connected, pedestrian friendly environment that prioritises pedestrians, cyclists and transit users before motor vehicle traffic.

- ✓ Development must put sustainable modes of travel and movement as a priority in all cases.
- ✓ Ensure the pedestrian and cyclist movement is put at the heart of urban development through the provision of high-quality public realm through the encouragement of a walking and cycling strategy.
- ✓ Promote urban legibility, transit orientated development and multi-modal transport hubs to create ease of movement between walking, cycling and public transport which is convenient and accessible to all – overall increasing take-up of alternative transport options and sustainable modes of transport.



Liveability

Ensuring that streets and public spaces are valued places where people enjoy spending time, not just places to be rushed through or avoided, by making them clean, safe and attractive environments.

- ✓ Emphasise and consider the human experience of places, by considering the user at the heart of urban design and place making.
- ✓ Create spaces of interest at all scales, be that City level or Neighbourhood level, by providing multi-user spaces and streetscapes which consider all aspects of daily life and people.
- ✓ Ensure everyone has access to community services and facilities, in walkable and accessible locations, to create a sense of place and connectivity to the communities in which people live.



Places of Quality

Creating places of quality that people will take pride in and enjoy observing and using in their own right.

- ✓ Avoid isolated development by ensuring development is considered at a community or district level, to create a consistent level of built quality which benefits existing and future residents and users.
- ✓ Include the local community in developing or redeveloping places, to ensure development responds to local needs, but also encourages a sense of ownership to promote longevity of communities.
- ✓ Ensure new development or regeneration prioritises the development of the public realm, and not as an afterthought, so that places are liveable and desirable from the outset.



Sustainability

Ensuring that planning and design promotes 'greener' transport modes, such as walking, cycling and public transport, reduces carbon emissions, supports the local economy, and maintains cultural heritage and traditions.

- ✓ The principles of sustainability: people, environment, economy and culture should be a key consideration at the outset of any project or proposal and be clearly demonstrated prior to design and development.
- ✓ Emerging and innovative approaches to sustainable development principles or concepts should be explored and considered for future development.
- ✓ Ensure development enables people to live, work and play utilising sustainable principles, such as walking and cycling, mixed use compact development, green infrastructure and utilities, and best use of resources – to integrate such mechanisms into everyday life, in a convenient and accessible way.



Social Inclusion

Ensuring that streets are physically and culturally accessible to all, that the varying needs of different user groups are acknowledged and catered, for example, the safety and security of women and children.

- ✓ Promote development which considers all genders, ages, levels of mobility and cultures, to create multi-user spaces which embraces, supports and encourages a diverse population.
- ✓ Ensure public and private spaces consider the needs and cultures of people, such as women and children, young and older people, people with disabilities, and vulnerable members of society.
- ✓ Provide a range of employment, housing, recreational, and leisure opportunities for a range of people, to create communities in which people can live in harmony and promote a sense of local ownership and place.



Legibility

Creating legible sequence of places that are readily understandable and link up in a logical way to form an easily navigable environment defined by landmarks, nodes and gateways.

- ✓ Ensure development provides a series of logical, multi-use spaces, services and facilities, that are connected by a defined hierarchy of streets and walkways, which provide direct routes to key nodes and destinations.
- ✓ Utilise urban centre hierarchy classifications to define the level and type of services and facilities required to serve the local, wider and city level population.
- ✓ Provide distinctive and consistent public realm character areas, utilising a consistent planting and hardscape palette, along with the application of the open space hierarchy, to create defined places for defined users.



Vitality & Viability

Promoting lively and economically successful places through the location, format and design of streets and spaces which encourage local economic activity and attract investment.

- ✓ Consider local employment opportunities at the heart of new development, to promote Omani employment, which is accessible and convenient, and located according to local needs.
- ✓ Promote businesses which enhance and support the vision for Oman's economy and local employment opportunities.
- ✓ Promote mixed use centres, which provide a combination of residential, office, retail and F&B, to create active hubs which promote a range of uses and are therefore diverse and utilised throughout the day and night.



In order to achieve these 10 Key Community Design Principles, the following sections provide more detailed information and signposting relating to National Level Urban Design Guidelines which deliver a basis for future urban design manual and guidance to be developed. These National Level Urban Design Guidelines are categorised as follows:

- The Challenge of Climate Change
- Sustainable Urban Form
- The Importance of Master Planning and Urban Design
- Integrated Street Planning and Design
- Green Buildings
- Smart City Initiatives

2.2. The Challenge of Climate Change

The Government of the Sultanate of Oman adopted in October 2019 a comprehensive National Strategy for Adaptation and Mitigation to Climate Change, 2020-2040. The strategy aims to contribute towards UN Sustainable Development Goal 13 on Climate Action, which includes five targets related to resilience, policies and planning, building the capacity of institutions and climate finance.

Climate Action is any activity that helps people cope with a changing climate, or that results in a decline in climate gas emissions. It includes mitigation, adaptation and promoting an economic transition to a low carbon society through actions by government, businesses, communities and individuals.

Oman became a signatory to the 2015 Paris Agreement and has submitted its Intended Nationally Determined Contributions (INDC) report, however, further work is needed to implement mitigation and adaptation activities. The most recent IPCC reports on climate change reinforce the message and indicate increasing rates of change. It is, therefore, essential that the ONSS accounts for climate change and plans necessary adaptations so that the people can continue to thrive even in the face of such change.

ONSS Climate Change Objectives and Policies

The key objectives which have been identified in the ONSS are as follows:

- To transition Oman to a **low carbon** and **climate resilient** economy.
- To anticipate the potential impacts of climate change, develop national/ regional adaptation plans and include **climate action** in all sector policies to contribute to SDG13.
- To include **climate adaptation** and **climate mitigation** measures in new developments and to implement appropriate measures in climate vulnerable areas, such as in wadis, floodplains and along the coastline.

The ONSS sets out three Climate Change policies:

- **CC1 – Mitigation measures** to combat climate change through energy transition leading to reduced dependence on hydrocarbon fuelled energy and increased utilization of renewable energy.
- **CC2 – Climate adaptation measures** to be included in all new developments and existing areas susceptible to sea-level rise and other natural hazards.
- **CC3 – An adaptive planning approach** to ensure flexibility, based on monitoring current and future risks and timely implementation of adaptation measures that contribute to sustainable development.

Impact on Water Resources

Oman is a water-stressed country, ensuring water supply and demand are in a sustainable equilibrium remains a constant challenge. By the late-21st Century, average annual rainfall is predicted to have changed substantially across Oman. In the best case average annual rainfall is expected to further decrease by up to an additional 10 mm/year in interior areas south of the Al Hajar mountains. In the worst case average annual rainfall decreases in most areas by up to an additional 10 mm/year below mid-21st Century levels.

The water sector is especially vulnerable to the effects of climate change and the country is predicted to experience adverse impacts on its precious water resources, both surface water, and groundwater. The frequency of destructive flash flooding is already evidenced by an increased frequency of extreme wadi flows while future sea-level rise is projected to impose serious adverse impacts on groundwater quality in some of Oman's most important aquifers.

Climate change poses enormous risks to the future sustainability of Oman's agricultural sector. As agricultural productivity depends entirely on groundwater, rising sea levels will lead to seawater intrusion into aquifers, thereby degrading the quality of water extracted for irrigation. Sea level rise also implies a steady decline in cropland available for cultivation as cultivatable land becomes inundated. As temperatures rise the water requirements of crops increases significantly. Total water supply capacity will need to increase through greater provision of desalinated water.

Impact of Increased Temperatures

In the best-case maximum temperatures are expected to rise by at least 2°C along southern coastal areas. In the worst-case maximum temperatures are expected to reach 4°C above historical levels in the interior and north, including Musandam.

Higher temperatures and intense weather will affect conditions in urban centres, require adaption in urban layout and building specifications and in rural areas will lead to changes in the natural biosphere, agriculture and water needs.

About 95% of Oman's land area is characterized as a desert or having more than moderate desertification. Land degradation from desertification is most acute in the Al-Batinah, Ash Sharqiyah and Dhofar governorates. The increase in temperatures is expected to accelerate the process of desertification.

Policy CC3 identifies the need to increase the knowledge base in Oman of the potential human health risks associated with climate change, particularly extreme temperatures, vector diseases such as malaria or dengue and air quality with development of appropriate adaptation strategies.

Transitioning to a Low Carbon Future

Oman is facing significant and increasing changes in its climate because of global greenhouse gas emissions. The combustion of fossil fuels and energy-related activities account for the dominant portion of emissions in Oman. The economy is based on fossil fuel extraction and export and energy intensive industrial production as well as energy intensive consumption.

The country is in the process of transitioning to a low carbon future. This involves the promotion of clean energy initiatives, new low-carbon technologies, and developing long-term partnerships to exploit sustainable energy opportunities. Close cooperation will be required between developers, utility companies, energy service providers and regulators to ensure barriers to implementation are overcome.

Oman has potential to access vast solar and other renewable energy. The electrical generation sector needs to transition to these renewable sources; this will take time and will require the transformation of the energy distribution and storage systems. Transition to more renewables on the supply side and more electrical systems on the demand side will require the development of a more flexible grid that allows demand from industrial processes, buildings and transport systems to vary in response to pricing signals.

Combustion transition has implications for all sectors of spatial planning, not just energy but transport and urban design. It can work in combination with other technological advances such as the introduction of electric vehicles, increased public transport and SMART data systems permitting easy access to mobility without having to own a vehicle. Transit Oriented Development, a reduction in parking spaces, increased road use efficiency, reduced noise and pollution from transport arteries can allow for the design of much more liveable and efficient urban spaces.

The Role of Planning in Climate Change

Planning can make an important contribution to both mitigating and adapting to climate change through decision-making on the location, mix, density and form of development and considering the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes. It can put in place appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts.

Planning policy and guidance should set testing environmental objectives and targets for development in order to plan and design for the predicted effects of climate change over the next several decades. Key environmental themes are summarised below:

- **Sustainable Transport:** Integration of land use and transport planning and application of Transit Oriented Development (TOD) principles to maximise low/zero carbon movement. Delivery of public transit in Greater Muscat, Sohar and Salalah. Introduction of Smart Mobility and the provision of walking and cycling networks. Measures to encourage zero/ultra-low carbon vehicles, introduction of electric vehicle charging points.
- **Climate Responsive Urban Design:** Moving away from the single-family low-density villa typology to higher density, energy efficient residential typologies. Contemporary re-interpretation of courtyard housing and the introduction of low-rise high-density neighbourhoods.
- **Clean Energy:** Government initiatives to reduce the energy consumption of buildings. Home efficiency upgrades and retrofit of inefficient buildings. Use of planning policy to usher in widespread adoption of renewable energy. Maximise decentralised zero/low carbon energy generation. All public buildings to be solar powered. Use of innovative Smart City technologies to match energy supply and demand. Introduction of district cooling systems to reduce carbon emissions.
- **Water:** Maximise efficient use of water and widespread introduction of Smart metering. Alternative sources for non-potable water. Minimise surface water run-off and wastewater discharge. Protecting well field zones and aquifers.
- **Flood Risk:** Protect and preserve natural drainage patterns and consider climate change and rising sea levels within the planning and development of coastal areas. Restriction upon developments within and adjacent to wadis. Application of sustainable drainage (SuDS) principles. Flood risk assessments required for development and infrastructure projects.
- **Landscape and Biodiversity:** Maximise multi-function, multi-benefit green infrastructure. Restore natural habitats and enhance biodiversity. Promote high quality, comfortable and liveable public realm. Adopting a

sustainable approach to planting using native or adapted species. Major city greening projects using recycled water to sequester carbon and improve micro-climate.

- **Waste:** Spur behaviour change to divert waste from landfill, reducing emissions from waste disposal and maximising recycling and composting. Waste to energy and converting food waste to compost. Promote Circular Economy principles by which the waste products or heat and energy from one process are treated to become the raw materials and inputs for another process.
- **Materials:** Optimise use of low carbon, sustainably sourced, healthy materials. Use of green building technologies and recycled materials.

Adaptation Plans and Assessments

Targeted risk assessments and plans can make cities and urban development more resilient and adaptable for future climate changes, such as extreme weather, sea level rise and increased temperatures, while at the same time increasing recreational opportunities and providing significant social benefits to residents.

ONSS Policy CC3 requires the development of planning guidelines for including climate change adaptation in new developments and master plans and the revision of national building codes to enhance climate adaptation (and mitigation) in new building stock and ensure resiliency of communities. It is recommended that all urban development projects greater than 30 hectares in area incorporate **Climate Change Risk Assessments**. Proposed national infrastructure projects should also incorporate climate change risks into their project design and undertake carbon accounting to estimate the embedded and operational carbon.

Coastal Urban Development

Urban areas, tourism facilities and infrastructure along coastal areas in Oman are particularly vulnerable to climate change impacts due to sea level rise, tropical cyclones and storm surge associated with extreme weather events. In addition, flash flooding magnitude and frequency could increase in the future from heavy rainfall events. No better warning of the need for preparing for such extreme weather events was Gonu in 2007 which led to 50 deaths in Oman, plus over US\$ 4 billion in property damage.



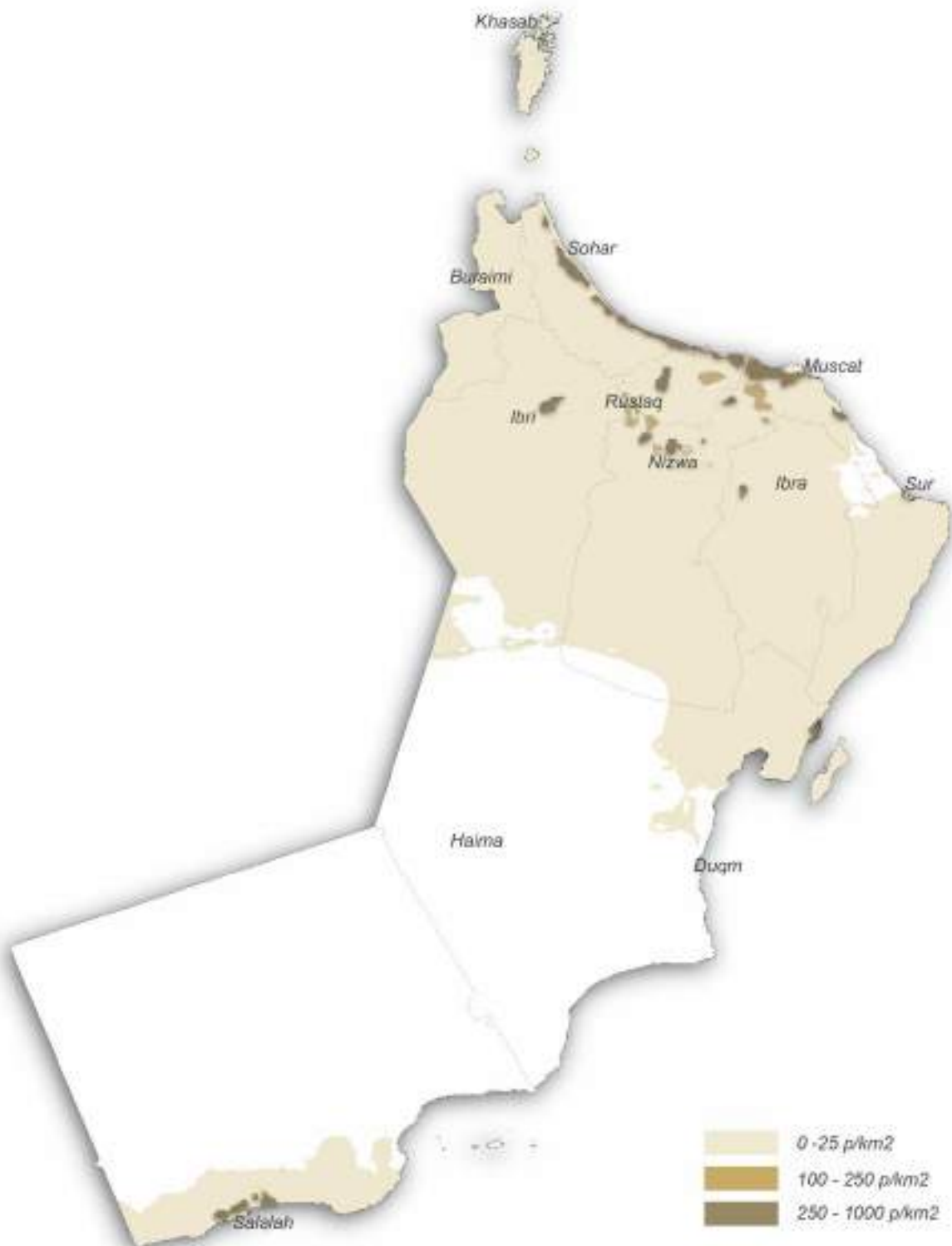
Images highlighting the magnitude of the damage to infrastructure resulting from Gonu

Urban development in Oman has largely focused on the coast during the past five decades, a trend that seems certain to continue through the 21st century. Coastal population growth in Oman has led to widespread conversion of natural coastal landscapes to industrial and residential uses. According to the census of 2010, 80% of the Omani population lives in low-lying areas such as coastal plains which are considered high risk flood-prone zones. Nearly 60% of the population is concentrated in Muscat and in the Al Batinah coastal plain.

There are substantial amounts of vulnerable urban infrastructure located in or near flood-prone areas, or subject to coastal inundation and storm surge associated with sea-level rise. With climate change, these risks are projected to increase still further, especially if current patterns of development in high-risk flood-prone zones continue. Marine infrastructure, such as ports, marinas and sea front developments will need to take account of sea level rise and storm resilience in designs.

Policy CC3 requires the development of a **Coastal Vulnerability Index** for the entire coastline this will: quantify the magnitude of land inundated by sea level rise; characterize storm surge risks from tropical cyclones; and establish a priority list of strategic actions to build resilience. The preparation of **Coastal Zone Management Plans (CZMP)** will need to address the incorporation of climate resilience in coastal development and the integrated management of marine resources, refer to Chapter 8.

The map below shows the concentration of the urban population along the Al Batinah coastal plain between Muscat and Sohar.



Oman Population Density

Source: p.253 of Muscat and Oman-Engineered Land, A Territorial Research (ETH Studio Basel)

2.3. Sustainable Urban Form

Sustainable urban form is an essential pillar in achieving **sustainable urban development** and the long-term viability of cities by reducing consumption, waste and harmful impacts on people while enhancing the overall wellbeing of both people and place. In literature, common criteria of sustainable urban form have been identified, including compactness, increased density, efficient public transit, mixing uses, and the provision of connected green spaces.

Many of these principles were achieved in the traditional forms of settlements which evolved in response to the different climatic and ecological constraints across the regions of Oman. Sustainable development should learn from these regionally distinctive, vernacular examples of architecture and urbanism.

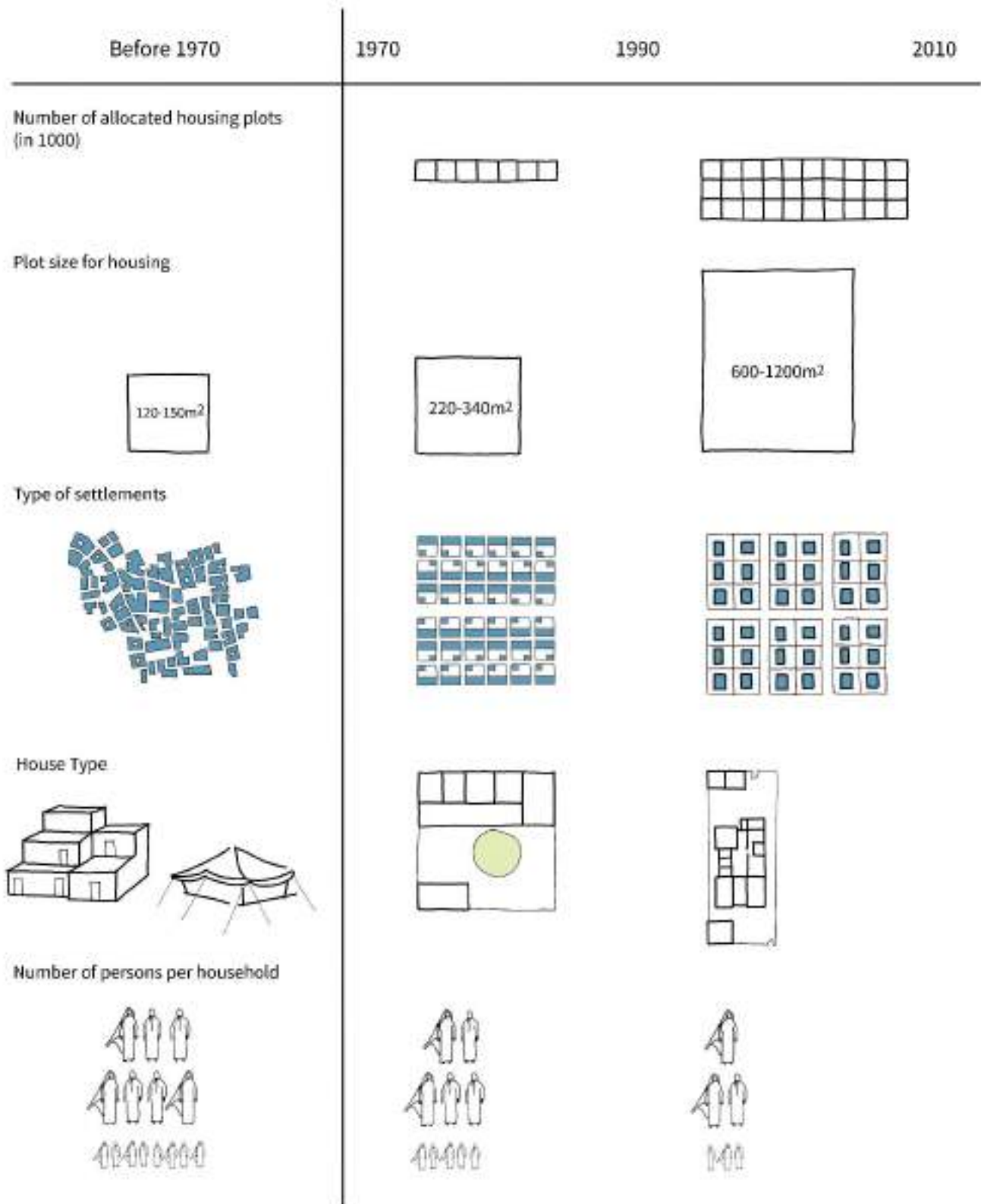
Achieving sustainable urban form in Oman in the context of rapid urbanisation and the transition to a low carbon future will be challenging and require new planning tools and guidance to control the form and layout of urban development, including greater focus on the importance of **sustainable urban design** (refer to Section 2.3) and **integrated street planning and design** (refer to Section 2.4).

Current Patterns of Urban Growth

Traditional Omani settlements were a cultural and climatic response to the harsh desert environment. Courtyard homes huddled together to present minimum surface exposure to intense solar radiation, thus creating organic, compact, walkable settlements with small shaded urban spaces. The rapid growth of modern Omani towns and cities, however, typically results in a very different urban form that can be characterised by:

- Separation of uses into distinct residential, civic, commercial and industrial zones.
- Residential zoning dominated by low density villa-based subdivision.
- Orthogonal grid based residential layouts.
- Low densities resulting in urban sprawl and excessive land consumption.
- Fragmented low-rise urban form provides poor legibility and sense of place.
- Piecemeal delivery of infrastructure and patchwork of vacant subdivision plots.
- Dependency on private cars with absence of viable public transport.
- Wide highway rights of way with large utility corridors.
- Shopping malls located at highway intersections surrounded by large areas of surface parking.
- Schools and public sector buildings set in large walled compounds.
- Poorly defined and connected public spaces with wide gaps between developments.
- Development often close to or within wadis.
- Expansion of development into traditional agricultural areas and palm groves.

The following table shows the evolution of settlements from the 1970's, with an increase in plot size, a move away from traditional courtyard housing to free-standing villas and a decrease in persons per household.



Omani Settlement Evolution from 1970's

Source: p.540/541 of Muscat and Oman-Engineered Land, A Territorial Research (ETH Studio Basel)

Compactness

House types in Oman have undergone remarkable changes over the last four decades. The long-standing advantage of compactness, stemming from courtyard housing, has been largely abandoned since the 1970's in favour of the imported free-standing villa. The size and shape of the building have been transformed from clustered courtyard houses to free-standing villas in a large walled plot. The very low density of development that results is not resource efficient and reinforces the need for the private car to travel to school, shopping and work.

The current process of urbanisation fosters low-rise and low-density neighbourhoods irreversibly converting undeveloped land or agriculture. Natural resources including ecological habitats, wadis and coastal land are at risk as the balance between environment and urban development is disturbed.

Recycling land by means of urban regeneration, the redevelopment or reuse of abandoned, derelict or unused land must be a key strategy for the reduction of land consumption and therefore combating urban sprawl. If sustainable forms of development are to be achieved, strategies to re-densify and transform neighbourhoods to become multifunctional and diverse, resilient and sustainable must be prepared.



*Old Settlement of Harat Al Hawashim in Adam & current development in AlKhuwair
Source: Google Earth 2020*

The pair of aerial photographs above are at the same scale and illustrate the contrast between a traditional oasis settlement and a typical grid subdivision.

Density

Low physical density is connected to high consumption of land and high infrastructure costs (roads, water, electricity, waste). This in turn provides little incentive for private sector businesses to invest in commercial activity and jobs due to low demand. The low population density can also not support a full range of social facilities (schools, medical services, cultural and leisure). If low density is combined with the functional segregation of land uses, residents must rely on commuting by private car between their homes and places of work, shopping, leisure, health care and education. This creates traffic jams, polluting the environment, further downgrading the quality of life and reducing sustainability.

Sustainable urbanism is simply not achievable at the low densities of villa development in Oman, typically at 10-15 dwellings per hectare (dph). Sustainable development requires minimum development densities roughly four times higher (40-50 dph). These densities thresholds are achievable in neighbourhood-scale projects within urban areas. This can be achieved by offering a mix of housing types and tenures, apartments, townhouses, duplexes (twin villas) and larger single-family homes, all in the same neighbourhood.

Sustainable urbanism also provides opportunities to integrate infrastructure design increase with density. At high enough densities, concentrated mixed-use development can support district energy and cooling systems, reducing carbon generation and energy consumption. The per capita pipe and trench lengths required for district systems shorten as density rises, increasing their viability.

Low-rise, High-density (LRHD) Neighbourhoods

The opportunity to introduce low-rise, high-density (LRHD) neighbourhoods based on courtyard housing is encouraged. The use of inward-looking courtyard housing creates many possibilities for the contemporary urban design of housing areas which do not exist when open-plan principles are used. Compact grouping of houses around semi-private, communal courtyards promotes domestic security and privacy, and reinforces family ties and relationships. Compact layouts enable the strict requirements of climatic control to be met, whereas open-plan layouts create problems of wind, sand deposition and exposure to sun and glare.

The example below of a LRHD Neighbourhood for Oman was developed as part of the **Urban Oman** research project carried out between 2010 and 2014 at the German University of Technology (GUTech) in co-operation with Sultan Qaboos University in Oman. The planning model for a sustainable neighbourhood is based on a courtyard rather than villa type house. This basic building unit is also half the size (300 sq/m) than the typical plot currently allocated by the government lottery system to all adult Omanis. The reduced plot size still achieves, however, the same floor area by using a more efficient and climatically appropriate courtyard typology. Section 2.5 provides further guidance on the use and benefits of courtyard housing.



Courtyard Housing Model Plan

Source: Nebel, Sonja, and Aurel von Richthofen, eds. 2016. *Urban Oman - Trends and Perspectives of Urbanisation in Muscat Capital Area*. Vol. 21. HABITAT - INTERNATIONAL: Schriften Zur Internationalen Stadtentwicklung. Berlin: LIT Verlag

Transit Oriented Development

Planning must consider from the outset how new neighbourhoods will be served by public transport. Investment in an affordable, convenient, public transport system is central to the creation of sustainable communities. It will provide an attractive alternative to private car-based commuting and offer mobility for all. Increasing neighbourhood population density supports improved public transit service. Concentrating higher density housing in and around centres and transit stops maximises the potential catchment population within easy walking distance. This can reduce car ownership and transfer car trips to walking trips.

Sustainable urban developments around the world are increasingly based on the principles of Transit Oriented Development (TOD). This transit led approach should be followed for the future urban expansion of the Greater Muscat conurbation with higher density mixed-use development at new transit stops and the regeneration of existing low-density areas.

The adjacent plan shows a sustainable TOD corridor based on public transit, with a mixed-use centre and green infrastructure network.



Transit Orientated Development Concept

Mix of Uses

Modern urban areas in Oman are typically planned based on a clear separation of land uses with residential areas often some distance from employment and social activities. This segregation and the lack of public transport requires frequent trips by private car. The community facility standards set out in Section ... promote the provision of a hierarchy of mixed-use centres with a range of catchments.

The district, neighbourhood and local centres will be positioned at points of maximum accessibility which will also be optimum locations for higher density housing and a mix of other supporting economic and social activities. Housing can provide customers for shops, make use of empty space above them and generate activity when they are closed. In residential areas, workplaces, shops and other facilities can make the place more than just a dormitory.

A mix of uses may be appropriate at a variety of scales: within a village, town or city; within a neighbourhood or a street or even a building. Larger city scale mixed-use development can make the most of opportunities for higher densities and intensive activity at locations with good access to public transport. The key nodes along the new public transit corridors proposed in the Muscat Capital Area will be appropriate locations for clusters of taller buildings with a vibrant mix of uses.

Green Infrastructure

A key consideration in planning Oman's cities is the need to strategically plan and deliver high quality, connected green spaces capable of delivering a wide range of environmental and quality of life benefits for local communities. This green infrastructure (GI) includes parks, open spaces and connecting green corridors.

A GI approach enables landscapes to deliver social, economic and environmental benefits close to where people live and work including responding to the effects of climate change; encouraging exercise by providing local, safe and inspiring places for recreation; enhancing biodiversity; delivering a sustainable approach to water management; and creating attractive settings for development.

Wadis within urban expansion zones will have an important role to play in the hierarchy of the open space. These threads of desert can extend into the urban fabric as linear parks. They can create a connected network of multi-functional open space which supports the hydrological processes, enhance biodiversity and provide a recreational resource for future residents. Degraded wadi corridors in existing urban areas can also be transformed into linear parks.

Chapter 5 of this document provides further guidance on landscape, green infrastructure and the proposed hierarchy of parks and open space.

The photo adjacent shows Wadi Al Azaiba and illustrates the potential to retrofit green infrastructure in urban areas.



Wadi Al Azaiba

Source: <https://www.pinterest.co.uk/pin/691232242785572992/>

Regional Distinctiveness

The rich cultural heritage and dramatic natural landscapes of Oman are an important asset for sustainable development. Traditional cultivation of land, preservation of water and land resources in the past, have created a culture in alignment with the climatic and ecological constraints of the different regions of Oman. The built environment should be planned in harmony with the landscape surrounding it, learning from regionally distinctive, vernacular examples of architecture and urbanism. The unique natural landscape and scenic views also form the fundamental resource for eco-tourism and cultural tourism.

Oman possesses a variety of regionally distinct landscapes, for example: the fjords of the Musandam Peninsula, the spectacular Hajar Mountains, the vast dunes of the Rub al-Khali, lush green Dhofar and the fertile Batinah coast. It is essential that planning guidance reflects this rich regional variation and identity. Part Four of the Planning Standards provides specific regional planning guidance for each of the governorates based on an understanding of the climate, physical and human geography, the morphology of traditional settlements and the natural landscape.

The following montage of photographs illustrate the rich variety of regionally distinctive landscapes across Oman.







2.4. The Importance of Master Planning and Urban Design

Master planning and urban design is about making connections between people and places, movement and urban form, nature and the built fabric, with the goal of making urban areas functional, attractive, and sustainable. It places emphasis on the design and management of the public realm and the way public places are experienced and used.

Public realm includes streets, squares and parks, which together provide the setting for a diverse range of social activities. Well-designed places influence the quality of our experience as we spend time in them and move around them. A humane city with carefully designed streets, squares and parks creates pleasure for those who live, work and play there, as well as visitors and tourists.

Successful Places

Certain characteristics are common to successful places:

- **Context:** The location of the development and the attributes of its local and regional surroundings. A thorough appreciation of the overall site context is the starting point for designing a distinct place. This requires an understanding of the site and the surrounding context. Baseline studies covering a range of topics are likely to be required for a larger scale development, including: its history and heritage; landform and drainage; landscape and ecology; access and movement; and the communities living in or near the area.
- **Character and Identity:** Understanding what makes a place distinctive in terms of its character and identity is essential in designing for that place or appraising a development proposal. To promote character in townscape requires responding to and reinforcing local and regionally distinctive patterns of development, landscape and culture. This requires consideration of the way that buildings, streets and spaces, landscape and infrastructure combine and how people experience them. This may include, drawing inspiration from traditional local architecture and materials; or introducing built form and appearance that adds new character and difference to places.
- **Urban Structure:** The three-dimensional pattern or arrangement of blocks, streets, buildings and open spaces. The framework of routes and spaces provides the key organising urban structure and basis for the design of individual developments within a place. A fine urban grain creates a sense of place, generating vibrancy and unity in the neighbourhood. The grain and pattern of streets form a key component of urban character. The urban structure provides the framework for detailed design of the constituent elements.
- **Ease of Movement:** How people get around and how development is connected to the surrounding area is a major influence on how a place works and what it feels like. A well-defined urban structure has a network of connected spaces and routes, for pedestrians, cyclists and vehicles. Permeability refers to the ease with which people, not cars, can move through an urban area by a choice of routes. Streets are more than just traffic channels for vehicles and should offer a safe, attractive and enjoyable environment for all.
- **Legibility:** A clear urban structure organised into distinctive districts, nodes, paths with landmarks and gateways will help create a legible city image. Paths are key movement corridors which are used by people to move between neighbourhoods and districts. They can be formalised as civic boulevards or avenues, defined by gateways and aligned along vistas framing key views. Nodes are often highlighted by a higher density of development, civic, retail and mixed-use buildings. Landmarks, such as the minarets of mosques, are important elements for providing visual orientation.
- **Adaptability:** Well-designed places are adaptable over time and prosper in changing circumstances. Places need to be adaptable at every scale. A household makes different demands on a house as children are born and grow up. Towns and cities must adapt as the demand for housing and the nature of workplaces changes, and buildings and infrastructure age. Building to last means thinking about future uses, expansion and changing needs for access.
- **Resources:** Well-designed places and buildings conserve natural resources including land, water, energy and materials. Their design responds to the impacts of climate change, reducing greenhouse gas emissions and minimising embodied energy. They adapt to anticipated events, such as rising temperatures and the increasing risk of flooding; they use materials and adopt technologies to minimise their environmental impact. The compact-city approach minimises unnecessarily car use by creating relatively dense development enabling people to walk to prayer, school or shopping, reducing the need to drive.

Master Planning Process

It is recommended that greater focus is placed on the master planning and urban design process in order to achieve more sustainable urban form and well-designed places. It is recommended that master plans and the sequence of approvals set out in the Introduction (Chapter 1) are adopted for all major urban developments in Oman. This includes:

- Special Economic Zones (SEZ)
- Ministry of Housing land allocation subdivision plans
- Urban regeneration, infill and densification schemes
- Mixed use development
- Transit Oriented Development (TOD)
- Urban expansion projects
- Cultural Conservation Areas (CCAs)
- Areas of Special Interest

Neighbourhood Planning

One of the greatest challenges facing urban planning in Oman is the need to provide a sustainable alternative to the low density, car based, villa subdivision which is generated by the current land allocation system. This process has resulted in scattered, incomplete urban areas which require extensive infrastructure. This current approach does not place enough emphasis on the proper master planning of these new communities. Greater focus needs to be placed on the context and location of new development, the integration of land use and transportation, and optimising residential densities so that land is developed efficiently.

Types of Neighbourhood

The approach to neighbourhood planning will vary depending on the context, location, density and type of neighbourhood, three broad categories can be identified:

- **Low density villa neighbourhoods** based on Ministry of Housing land allocation, typically with 600 sq/m plots, on the outskirts of existing settlements or in remote locations. These planned areas of subdivision are exclusively for Omani citizens.
- **Medium density suburbs** with a mix of housing types; compact villas, townhouses and low-rise apartments. These have typically developed since the 1980's and have a mix of Omani citizens and expatriates.
- **Higher density, inner city areas**, often identified by a name. Established small-scale mixed uses - workshops and local shopping streets. Housing often more varied in size and age than the categories above, including accommodation above retail and commercial. These neighbourhoods are typically occupied by expatriates.

Low Density Villa Neighbourhood

A main criticism of so much of the villa subdivision in Oman is that it ignores its context. The standard plots are designed to a standard orthogonal layout in CAD which results in a development that are placeless and could be anywhere. In order to achieve neighbourhoods which, have a sense of place and local identity it is essential that features of the site it's; views, orientation, topography and drainage are fully analysed. The biodiversity and cultural importance of the locality must also be considered. These factors should have a major influence on the layout of the site and the character of the built form.

It is not possible to achieve compact, walkable neighbourhoods with low density villa subdivision, but many improvements can be made to improve their sustainability and residential amenity. For example:

- Development should be located so that it respects the existing context, and ensures key environmental, heritage and cultural assets are protected and enhanced.
- Layouts should respond to the site topography and drainage and not just impose a standard grid-based street network that has been used elsewhere.
- Essential transport and utilities infrastructure should be provided at the outset.
- New housing typologies should be introduced to increase densities and make more efficient use of land. This includes compact villas, twin villas and townhouses.
- Convenient access is required to existing or planned education, commercial and community facilities by sustainable modes of transport.
- Provide local work opportunities to minimise the need to travel.
- Courtyard oriented homes and layouts are more climate and culturally responsive than the free-standing villa.
- Neighbourhoods should be completed before further land allocation to prevent urban sprawl.

The following diagram shows a low-density villa neighbourhood with courtyard typologies in standard 600 sq/m plots grouped in small clusters.



Low Density Villa Neighbourhood Illustrative Plan

Medium Density Neighbourhoods

These fall into two main categories- existing and proposed. Existing medium density neighbourhoods are typically around the historic core of towns and cities and form part of the first waves of development in the 1980's and 1990's. They are characterised by smaller development parcels and plots, less grid-based layouts and a mix of housing typologies. Measures to enhance these existing neighbourhoods include:

- Engaging the local community on what new facilities are required such as health centres, children's play and sports facilities.
- Retrofitting the street network to provide 'Complete Streets' this will include integrated traffic calming, tree planting and public realm enhancement.
- Establishing a connected network of greenspaces, these can be based on natural features such as wadis.
- Providing local job opportunities, for example, start up space for small, medium enterprises (SMEs).
- Infill development on brownfield land.

New medium density neighbourhoods with a mix of housing typologies are appropriate as part of a gradient of residential densities extending out from new growth nodes in cities. They provide the opportunity to provide more sustainable urban forms than low density villa subdivision with a mix of land uses so that they are self-sufficient and provide opportunities to live, work and socialise locally.

High Density Neighbourhoods

The historic cores of cities in Oman, such as Mutrah in the capital, often have a mix of higher density accommodation interspersed with commercial uses. These traditional neighbourhoods (hara) typically still retain their original winding streets, souks and courtyard housing. They are compact, with a mix of uses within comfortable walking distance, minimising the need to travel by car. These urban neighbourhoods would often benefit from conservation, restoration and enhancement. Regeneration strategies need to be developed in conjunction with the local communities.

New low rise, high density neighbourhoods (LRHD) are an appropriate response to the problems of urban sprawl and are recommended in new urban expansion areas close to public transport routes and nodes. Section 2.2 illustrates a prototype LRHD neighbourhood model developed by the Urban Oman initiative. The Madinat Al Irfan project commissioned by Omran (see below) demonstrates how new development can provide a visionary and implementable alternative to car dominated development. It will be compact and walkable, place-specific and climate appropriate,

taking inspiration from historic Omani settlements. New high-density neighbourhoods will form a key component of the future urban expansion of Greater Muscat based on the principles of **Transit Oriented Development (TOD)**. This approach achieves sustainable corridors of development with land use and transport integrated in order to reduce the need to travel. This can be achieved by locating residential development close to places of employment, schools, shops and services, providing activity throughout the day.

The following objectives should be considered when integrating higher density residential development with new public transit:

- Create a mix of uses in new urban areas.
- Concentrate higher density development close to public transport routes and nodes.
- Locate land uses so that those that generate the greatest number of trips are closest to public transport.
- Provide a shaded and attractive network of walking and cycling routes to connect homes with transit nodes.
- Existing natural features and wadis should form part of a connected network of greenspaces.
- The urban design should consider the legibility of the new urban area and the placement of taller buildings.
- Outward expansion should be limited by setting clear urban development boundaries.

Neighbourhood Planning and Design Manual

The development of a Neighbourhood Planning and Design Manual (refer to Chapter 1) will provide defined and detailed guidance for the planning and development of neighbourhoods in Oman, highlighting best practice urban design principles to be considered and included in master plan development. It should be led by the Ministry of Housing and Urban Planning.

Design Codes

A design code is a set of illustrated design rules and requirements for the physical development of a site or area. The graphic and written components of the code are detailed and precise and build upon a design vision established by a master plan. Codes maintain design quality by identifying the elements of the master plan that are fundamental in creating a sense of place and translating these into a detailed set of design instructions. They ensure that development achieves the aspirations of the master plan.

Design codes are particularly important on large developments which are phased over time, involving different developers and design teams. They provide certainty on design requirements at the outset and help create a coherent sense of place. They ensure high design quality across development parcels and that later phases will be of similar design quality.

Codes are usually prepared by an urban design team on behalf of the landowner or master developer. This will require working closely with the planning authority and technical stakeholders to develop consensus on what is required. The agreed design codes are then provided to developers for each parcel, often with an accompanying brief identifying specific constraints and requirements. To ensure that the required design quality set out in the codes is delivered on site careful consideration needs to be given to how they are implemented and enforced.

Madinat Al Irfan is the Sultanate's largest urban development project, led by Omran – the country's master developer of tourism, heritage and urban developments. The master plan responds to a series of ambitious guiding principles laid out by Omran in their brief. These included 'learning from the past to inform the future'. The master plan is accompanied by a sophisticated set of design codes detailing the character of the streets and places.



Madinat Al Irfan Illustrative Plan

Source: https://worldarchitecture.org/article-links/epeme/madinat_al_irfan_catalyst_for_urban_innovation_in_muscat.html

2.5. Integrated Street Planning and Design

Since the start of the rapid growth in motorisation in Oman in the 1970's, the planning and design of urban streets has concentrated primarily on meeting the needs of motor vehicles, using a roads-based street classification. This has led to vehicle-dominated designs that have generally neglected the other functions of streets, as places of economic and social activity, and as important parts of the urban public realm.

Collaborative Approach

A more collaborative approach to the design of the highway network is proposed which moves away from hierarchies of standard road types based on traffic flows towards developing street character types which achieve a balance between place and movement. The principal changes proposed, are set out below:

- Applying a user hierarchy to the design process which considers pedestrians first when designing streets.
- Emphasising a collaborative approach to the delivery of streets.
- Recognising the importance of the community function of streets as spaces for social interaction.
- Promoting an inclusive environment that recognises the needs of people of all ages and abilities.
- Achieving an appropriate balance between the needs of different user groups. Traffic capacity and utility corridors should not be the primary consideration in designing streets and networks.
- Encouraging innovation with a flexible approach to street layouts and the use of locally distinctive, durable and maintainable materials.

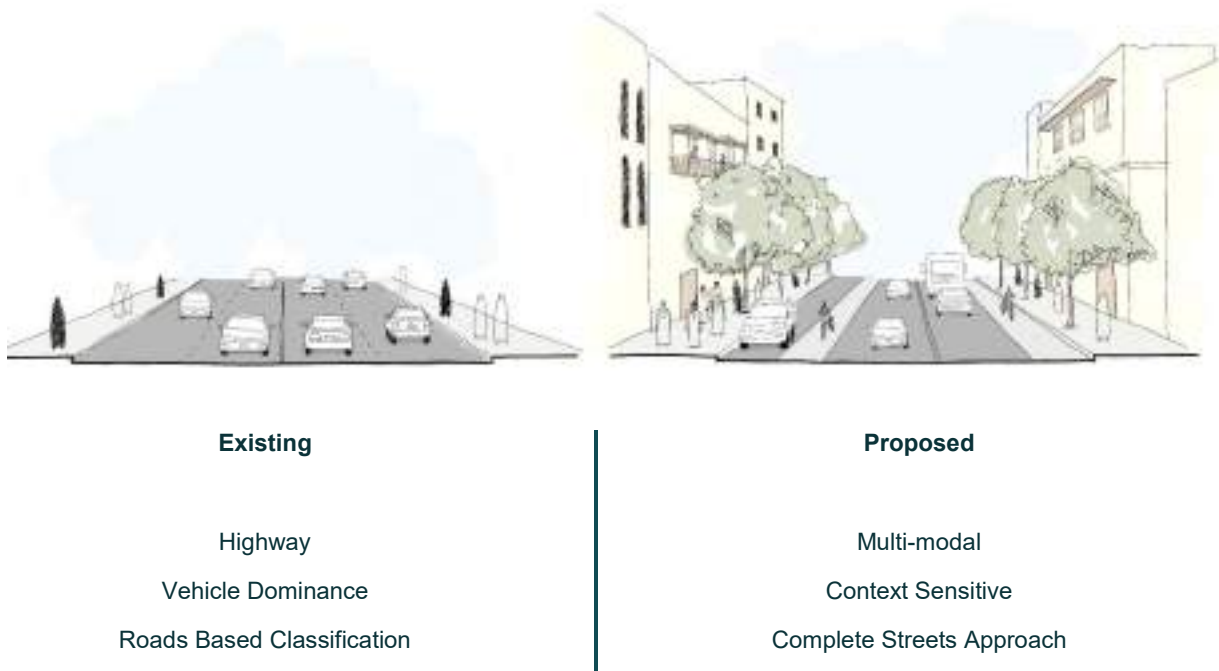
The current approach for utility networks based on the approvals from Royal Oman Police, Utility providers, Highways/Roads Authorities and Municipalities departments prevents the placement of utilities beneath travel lanes. This has a significant impact on the width of the highway corridor, resulting in large areas of unused land which do not create inviting public spaces and a comfortable, shaded public realm.

Complete Streets

Cities around the world increasingly focus on creating Complete Streets and treating land for urban rights of way as a limited resource. This requires designing public streets as three-dimensional corridors which enhance the liveability of our communities.

A Complete Streets approach ensures that transportation planners, highway engineers and urban designers collaborate and work together to design the street corridor with all users in mind. This integrated approach addresses the following key areas:

- **Context:** The land use context dictates the type of activities taking place along a street and will strongly influence the pedestrian realm design. Vehicle trips can be reduced by providing a mix of uses and amenities within easy walking distance from people's homes.
- **Safety:** Creating safe streets requires the prioritisation of vulnerable users to minimise conflicts between motor vehicles, cyclists and pedestrians. Slowing vehicle speeds will increase safety.
- **Public Health:** Good street design will promote higher rates of walking and lead to a decrease in obesity, heart disease, diabetes and mental health issues. Reduced vehicle use improves air quality and, as a result, respiratory health.
- **Vitality and Viability:** Creating a strong relationship between urban streets and adjacent land uses transforms streets into places. Good street design that encourages social interaction will enhance property values along them and support retail success.
- **Sustainability:** A well-designed street network results in increased environmental, economic and health benefits by creating compact and denser developments which promote sustainable modes of travel and help reduce per capita carbon emissions from transport.



Existing and Proposed Complete Streets Approach

Street Typologies

The existing MoTCIT Oman Highway Design Standards June 2017 are based on a traditional functional classification system with a hierarchy of roads: It is proposed that this hierarchy is evolved within urban areas to consider the land use context and character, for example: City, Town, Commercial, Neighbourhood and Industrial. These context names are then placed in front of the street family names: Boulevard, Avenue, Street and Lane. The following Table shows the main street typology naming combinations. This approach has been successfully adopted in the GCC region and other world class cities.

Recommended standard typologies for the urban road networks:

S/N	Maximum RoW width	Nr of travel lanes	Name and Description
1	50m	3x3 + parking and BRT options	Boulevard (Higher Density) – a main road through with commercial building frontages/activity either side of the road lanes. Parking can be provided or the space future-proofed for a BRT lane option.
2	50m	2x2 + parking and BRT options	Boulevard (Lower Density) – a main road that could be a dual carriageway, has with no side roads but substantial width of land either side for parking or the space future-proofed for a BRT lane option. (similar to November 18 th Street). Also incorporating walkways, cycleways surfacing over the top of utility networks.
3	50m	2x2 + side access/ parking lanes	Avenue (Higher Density) – a main road that could be a dual carriageway and with side roads and parking either side of the travel lanes to allow for access to the adjacent plots. There will also be space for a future BRT lane option. Also incorporating walkways, cycleways surfacing over the top of utility networks.
4	50m	2X2 + parking lane options	Avenue (Lower Density) – a main road through a Ministry of Housing sub-division with designated parking lanes either side of the travel lanes. Also incorporating walkways, cycleways surfacing over the top of utility networks.

5	30m	1x1 + parking lane options	Street – a single carriageway road with designated parking lanes either side of the travel lanes. Also incorporating walkways, cycleways surfacing over the top of utility networks.
6	20m	1x1 + parking option	Lane – a single carriageway road with alternate parking in the landscaped areas on one side of the travel lanes.
7	15m	Footpath/ cycleways/ wadi routes	Alleyway / Greenway – a public access corridor for walkways, jogging tracks, cycle routes, and aligns with flood alleviation requirements or wadi channels through these green corridors.

Street based codes have been prepared (refer to Chapter 6 and 7), these define the dimensional requirement for the street design, such as width and number of travel lanes, allocation and width of on-street parking, the width of the pedestrian realm and the location of planting. The street section also provides guidance on how buildings should address the street, both in height, frontage type and setback.

The above urban road types are provided for guidance on opportunities where it is possible to utilise some of the space underneath the travel or parking lanes of the road networks, which allows the offset land areas to be used for landscaping verges, cycle paths, footpath and other more compact arrangements of urban realm uses.

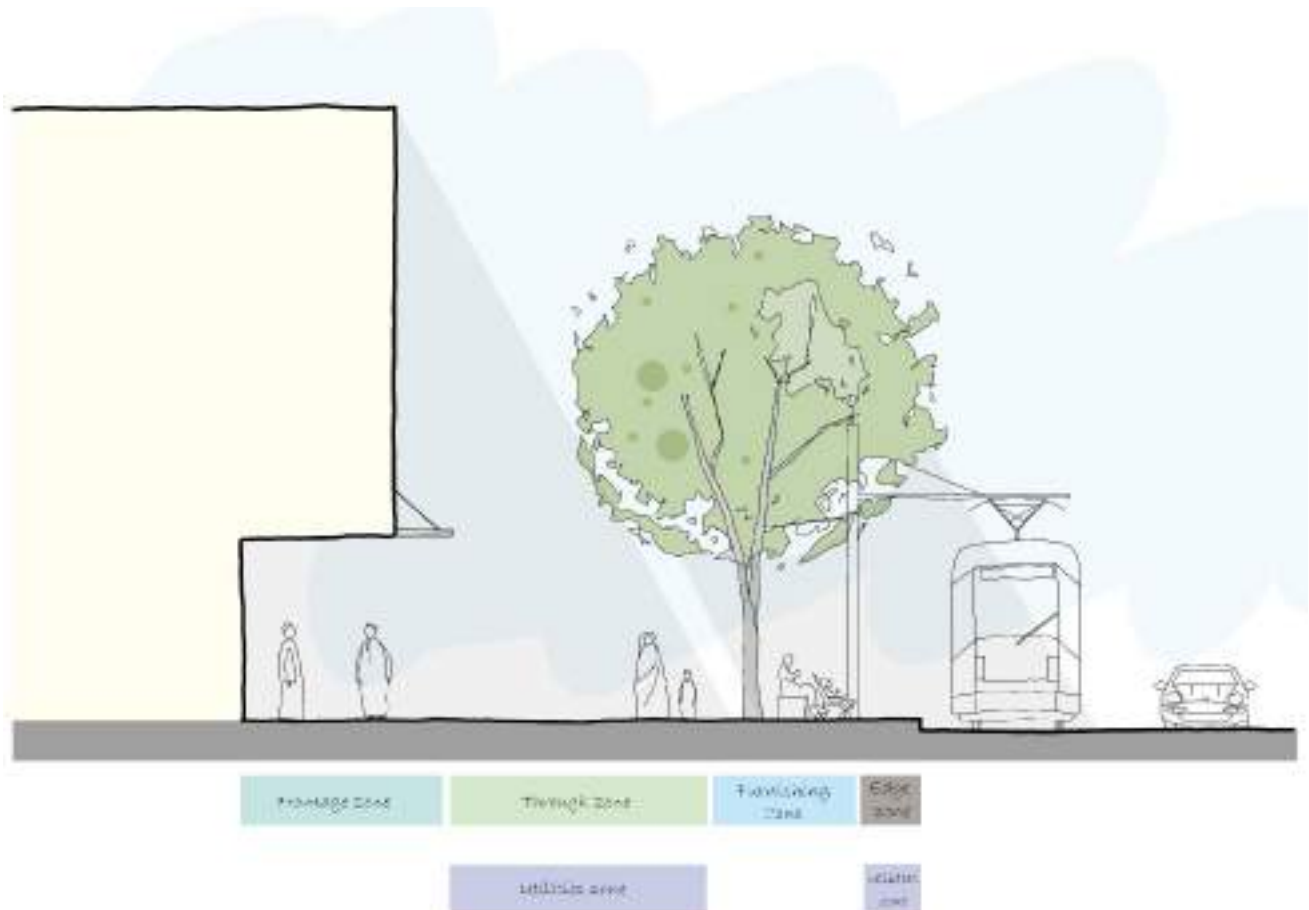
It is noted that these solutions align with best international practices and also with other GCC countries practices for multi-purpose uses of the RoWs in the built-up environment.

The intention of the following standard typologies is to urge better co-ordination between the various designers, and authorities and find better solutions that are more economical, sustainable and habitable for the built-up environments. It is expected this will remain in a case-by-case basis until the Oman Highways Design Standards and the other standards for utility infrastructure are updated to ensure the best fit solutions recommended by these urban road types solution.

The Pedestrian Realm

Urban street design will need to attenuate the hot desert climate and provide comfortable thermal conditions for walking and cycling. Shade and shelter from the sun can be achieved by the buildings enclosing the street, integrated architectural elements such as colonnades and arcades, free-standing shade structures and climate adaptive trees. The cross-section below shows shading elements and the role of the different functional zones in the pedestrian realm:

- **The Frontage Zone** – is immediately next to the building or property line and provides space for door openings, changes in level, shaded window shopping and café tables.
- **The Through Zone** – is an obstacle free space for pedestrian movement. It must remain clear and provide a firm smooth, slip-resistant surface.
- **The Furnishing Zone** – is where street furniture, trees, transit stops, and shelters are positioned to maximise public use and benefit.
- **The Edge Zone** – is the interface with the travel lane or on-street parking. This zone contains traffic related furniture such as traffic signs, signals and streetlights.



Pedestrian Realm Diagram

- **Surface materials:** Visual continuity will be developed through a common palette of paving materials that should be used across the whole of a city. An Urban Street Manual should be developed specifying areas where certain material usage should be applied and their ratio of use. Material usage and application will also relate to the future anticipated use of the site. Paving patterns and colours should vary and provide a means to create an individual sense of place and identity. Special treatment should be given to promenades, plazas, squares and key nodal points within a city. Where possible the use of local materials is encouraged.
- **Street furniture:** Can be categorised into three main areas, each of these areas housing a different suite of furniture:
 - o City wide street furniture.
 - o Key nodal and feature areas
 - o High use and high-profile areas.
- Much of the public realm space will be categorised as site wide street furniture whereby these are standard off the shelf furniture items but with minor customising. Key nodal and feature areas will comprise of furniture that is unique and interesting yet is readily available and affordable. High use and high-profile areas such as waterfronts, city centre and civic districts will contain bespoke furniture items, developed specifically for the local context.
- **Street trees:** Make cities more liveable, providing shade and shelter from the sun and filtering airborne sand and dust. Resilience to the hot temperatures during the summer months and irrigation water requirements will dictate the choice of species. The suitability of a species root structure for planting close to buildings and underground utilities are also important considerations.

Retrofit of Existing Streets

The opportunity exists to retrofit existing streets in towns and cities as part of the comprehensive regeneration of an area. This could be linked to the introduction of public transit or major utility relocations. The degree of intervention could range from simple decluttering and the removal of unnecessary signs and furniture to a major transformation of the street. Vibrant, active streets can attract investors, retailers, hoteliers and residents and act as the catalyst for economic development.

The following diagram illustrates the public realm upgrade explaining the Public space development study undertaken by MCTspaceLab along with the community of Hay al Marifa in the neighbourhood of Al Khoudh 6.



Public Realm Upgrade within Hay Al Marifa in the neighbourhood of Al Khoudh 6

Source: MCTspaceLab

Urban Street Manual

It is recommended that an Urban Street Design Manual is produced to guide the transition of Oman's streets towards a more sustainable, multi-modal, low carbon future. The manual would provide more detail on the design principles, the specific urban considerations to be addressed in Oman and new street typologies based on the Complete Streets approach.

2.6. Green Buildings

What is Green Building?

The World Green Building Council defines a 'green' building as a building that, in its design, construction or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment. Green buildings preserve precious natural resources and improve our quality of life.

There are several features which can make a building 'green'. These include:

- Efficient use of energy, water and other resources.
- Use of renewable energy, such as solar energy.
- Pollution and waste reduction measures, and the enabling of re-use and recycling.
- Good indoor environmental air quality.
- Use of materials that are non-toxic, ethical and sustainable.
- Consideration of the environment in design, construction and operation.
- Consideration of the quality of life of occupants in design, construction and operation.
- A design that enables adaptation to a changing environment.

Any building can be a green building, whether it's a home, an office a school, a hospital, a community centre, or any other type of structure, provided it includes features listed above.

The Benefits of Green Buildings

- **Environmental:** Green buildings can help mitigate the negative impact of climate change by using less energy, water or natural resources. They can also have a positive impact on the built environment by generating their own energy.
- **Economic:** Financial and economic benefits include cost savings on utility bills through reduced energy and water consumption; lower operating costs for building owners; and job creation.
- **Social:** Green buildings have been shown to bring positive social impacts, in terms of health and wellbeing of people who work in green offices or live in green homes.

Energy Conservation

Energy conservation and efforts to reduce building energy consumption must be a key consideration within any new development. Energy conservation can be achieved through increased efficiency in energy use, in conjunction with reduced consumption from fossil fuel sources. The integration of renewable energy sources within buildings and the wider fabric of cities will be an important component of the transition to low carbon, green buildings in Oman.

Residential buildings are the major consumer of energy in Oman, generating 55% of the total demand. Up to 80% of this residential energy is to power mechanical cooling units. The freestanding villa is only habitable with powerful air-conditioning and in most parts of the country air conditioners work 24 hours a day, 365 days a year.

Since the 1980's the detached villa has become the most common residential typology and now represents over 90% of homes in Oman. The size of villa plots allocated to Omani's by the Ministry of Housing (MoH) when they reach 21 have nearly doubled in size over the last two decades. The typical MoH villa plot is now 600 square metres in size (20m by 30m). The current planning standards require setbacks from the plot boundaries which have resulted in narrow unused spaces between the building and the 2m high perimeter wall.

The exterior façade typically reflects western buildings with few Arabic characteristics. Unlike traditional courtyard buildings with small openings to limit solar penetration modern villas often have large windows which allow the sun to easily reach the inner spaces.

The constant use of air conditioning increases the urban heat island effect and the generation of greenhouse gas emissions. The resulting rise in temperature causes many environmental problems such as drought, desertification, and water scarcity.

The unsustainable building design is further compromised by the lack of thermal insulation and the very low-density layout of dwellings which minimises the amount of shade and shelter from the sun.

It is important to raise public awareness in Oman of the climatic and environmental impacts of unsustainable building design and the high levels of energy consumption in the home. This can be achieved by events and programmes

highlighting the environmental importance of reducing domestic energy consumption as well as the financial benefit to individual household budgets.

The following photograph shows typical villa housing in an incomplete, fragmented neighbourhood:



Typical Villa Housing Image

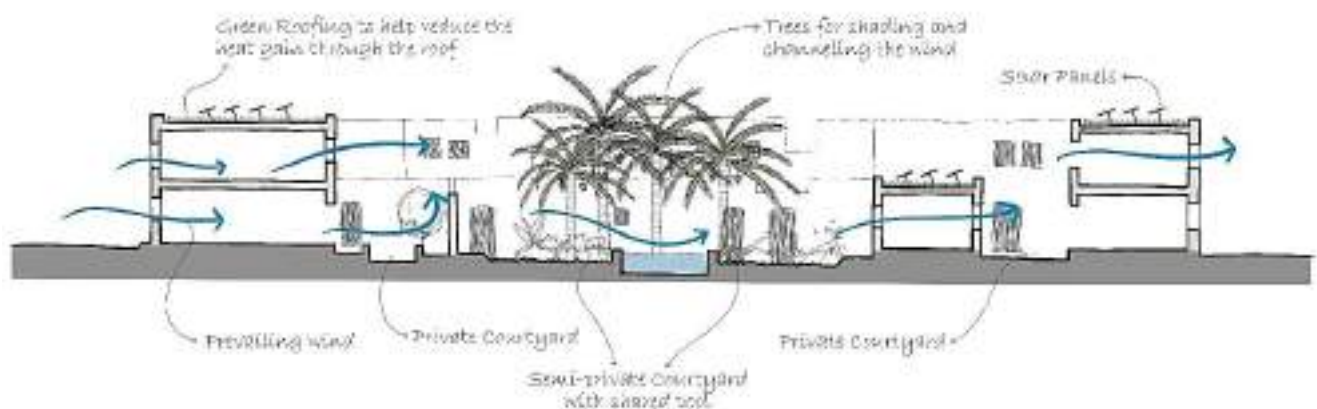
To Design the Future Look to the Past

The courtyard house is an ancient Arab form that works well in this region because it responds to the cultural requirements and the climatic challenges. The long-standing advantage of compactness, stemming from the courtyard principle, has been largely abandoned since the 1970's in favour of the imported free-standing villa.

The courtyard provides a sustainable response to the harsh climate by providing shade and shelter from the sun and a filter to airborne sand and dust. Privacy from overlooking by adjacent plots is still retained and because homes are orientated inwards onto a central court surrounding private open space is not needed. This allows denser planning of neighbourhoods more suited to the extreme climate than the imported villa form.

This climate responsive design approach can modify the microclimate, improve thermal comfort and help reduce the amount of air conditioning required to combat the blistering heat and humidity. Compact, inward facing, courtyard layouts enable the strict requirements of climatic control to be met, whereas open-plan layouts create problems of wind, sand deposition and exposure to sun and glare.

The following diagram shows a schematic section through a courtyard house.



Courtyard House Schematic Section

The National Eco House Competition

The Research Council (TRC) of Oman sponsored a national competition in 2011 between universities in Oman to design, construct and operate an energy-efficient 'eco house'. The competition aimed to enhance public awareness of sustainability issues and improve collaboration between academia, government and the construction industry. Five universities participated:

1. The Higher College of Technology (HCT)
2. The German University of Technology in Oman (GUtech)
3. University of Nizwa
4. Dhofar University
5. Sultan Qaboos University

The GREEN NEST of the Higher College of Technology



The ECO HAUS of the German University of Technology in Oman



The BUSTAN OMAN of the Nizwa University



Lessons Learnt from the Projects

- **Orientation:** The importance of studying the sun path and orientating the building to the direction of less solar gain. In Oman, the sun path is east-south-west, larger openings should therefore be towards the north and smaller openings towards the east, south and west. The siting of buildings can also assist with other passive strategies such as capturing cooling breezes and natural ventilation.
- **Solar Energy:** Is a natural renewable energy source that is available throughout the year in Oman. Buildings should be used as energy generators; solar energy can provide for most domestic needs. Photovoltaic (PV) panels are used in all the eco-house projects. Roof top solar-thermal collectors can also be used to provide hot water.
- **Sustainable Materials:** The use of highly processed materials should be avoided in favour of those with a high recycled content or low carbon constituents. Embodied energy can be reduced by designing long-life, durable, adaptable and low-energy-use buildings. Energy-intensive materials like concrete, steel and glass should be used sparingly. Using local construction materials encourages the local economy and reduces the carbon emissions used in transportation.
- **Building Envelope:** Improving the thermal insulation of the building envelope (walls, roof and floor) will reduce heat gain from all sides. Using a double wall system will slow down heat transfer and create a buffer between the core and the shell. The window/wall ratio should be reduced to between 15-25% and multilayer window glazing used to minimise unwanted direct solar radiation. Integrating architectural elements (canopies, screens) will provide further solar shading, dust and sand protection.
- **Building Automation:** Installing an automated building management system utilising smart technologies will enable room air temperatures and humidity to be carefully monitored and controlled minimising the waste of energy. Improving the efficiency of air conditioning and home appliances is a key priority. Refer to Section 2.6. for further information on smart technologies such as automation.
- **Water Conservation:** Reduce consumption by installing low or ultra-low flow fixtures and water-saving devices. Grey domestic wastewater can be naturally treated and re-used for irrigation. Landscaping should use drought resistant plant species and drip rather than sprinkler irrigation.
- **Native Plants:** Planting can be used to shield roofs and walls from direct sunlight, cool the surrounding environment and filter airborne sand and dust. Native plants require less water, and no pesticides or fertilizers. They also enhance biodiversity and provide a habitat for local fauna.
- **Adaptability:** Built in at the outset, will enable future users to extend the building's life, take advantage of new technologies and modify its spaces, environments and structures to respond to changing requirements.

Without adaptability, a building soon outlives its usefulness. Buildings should be designed so that they can be easily dismantled and recycled at the end of their life.

The competition and the projects have served as a platform to extend and share knowledge of energy-efficient and eco-friendly architecture and construction in Oman.

A New National Building Code

The development of a new performance based National Building Code (NBC) is among a range of important strategic initiatives being considered by the SCP to reduce carbon emissions, diversify the energy sector and accelerate the adoption of renewable energy sources. It would form part of a programme of activity being undertaken to strengthen resilience to climate change and help Oman deliver its commitment to the UNCC 2016 Paris Agreement.

Updating the NBC will improve building performance in terms of energy efficiency, construction quality, health and wellbeing of occupants, building management and sustainability of the building stock. It will also encourage integration with Smart City technologies, including metering of energy and water (see Section 2.6).

The construction sector in Oman remains highly labour intensive and updating the NBC will encourage innovation and stimulate modern methods of construction such as offsite prefabrication. It will help build capacity and develop the skills necessary to improve the sustainability and energy efficiency of the nation's building stock.

The new NBC will provide the framework within which a series of constituent codes can be developed, for example a Buildings Energy Efficiency Code and a Sustainable Buildings Code to align with the UN Sustainable Development Goals and COP 21 commitments.

The Alila Jabal Akhdar Resort, designed by ATKINS, was the first building in Oman to achieve LEED Silver Certification. A key feature is the reuse of on-site materials and water efficiency.



Alila Jabal Akhdar Resort

2.7. Smart City Initiatives

A Smart City uses **information and communication technologies (ICT)** to enhance quality, performance and interactivity of urban services, in order to reduce costs and resource consumption and increase contact between citizens and government for an improved quality of life – all supporting innovation and the transition to a low-carbon economy. Technology-based solutions are key to building the resilience of cities, particularly concerning the pressures placed on urban infrastructure by population growth, rapid urbanisation and climate change.

Internet of Things (IoT)

The Smart City framework involves the use of IoT sensors and technology to connect components across a city to derive data, and in turn use such insights to manage assets, resources and services efficiently. Data collected from citizens, devices, and assets is analysed to manage traffic systems, power plants, utilities, water supply networks, waste management, crime detection, information systems, hospitals, and other community services.

Smart City initiatives range from small scale to large scale interventions, from smart parking up to integrated operation centres, and can consist of:

- **Smart Government Initiatives**, e.g. Oman National Eco House Competition (see Section 2.5).
- **Smart City Platforms**, e.g. Oman Smart City Platform.
- **Smart Streets and Places**, e.g. smart street lighting and intelligent traffic light management.
- **Smart Living**, e.g. adoption of water saving devices and security monitoring.
- **Smart Health**, e.g. telehealth, telemedicine and unified health databases.
- **Smart Infrastructure**, e.g. smart power grids and water supply monitoring.
- **Smart Mobility**, e.g. Connected and Autonomous Vehicles and smart parking.

Oman and the Smart City Platform

The introduction of a Smart City approach has the potential to accelerate the economic development of Oman in a sustainable and resilient manner which improves quality of life for its citizens. Major technological, economic and environmental changes across the globe have generated increased interest in Smart Cities, including the Covid-19 pandemic and the associated shift towards online retail and entertainment.

A **Smart City Platform** has been developed by a consortium including the Supreme Council for Planning, Muscat Municipality and The Research Council. This collaborative and knowledge-sharing hub was formed to provide the leadership and vision required to facilitate and enable Smart City innovations. The consortium are funding research projects, capacity building, policy discussions and networking events to create awareness on the importance of Smart City solutions and best practices.

Oman's Smart Cities are beginning to move from theory to reality, as **Vision 2040** aims to achieve digital transformation by deploying ICT and other enablers of technological progress into urban life. The **Duqm Special Economic Zone (SEZ)** is set to be developed as a Smart City in areas such as public utility services, tourism, security and safety, port solutions, transport and building management.

Smart Energy

Energy underpins urban life, impacting all aspects of a city's infrastructure. Water distribution, public transport, communications and urban services rely on a resilient and reliable energy supply. Energy can be made more intelligent by integrating smart interventions across the supply chain to establish supplies that are reliable, cost-efficient, safe and flexible. Two major global trends driving the transformation of the energy world are digitalisation and the shift from centralised unidirectional to locally generated and distributed energy systems.

Smart energy solutions which have the potential to enhance the performance, sustainability and resilience of cities in Oman include:

- **Microgrids:** Small, independent electricity or heat grids distribute locally generated energy to nearby customers. Microgrid infrastructure can ensure a constant power supply even if the main power grid is under stress.
- **Smarter Power Grids:** Energy network performance can be increased with intelligent controls. This has the potential to reduce technical and non-technical grid losses in distribution, limiting related energy emissions.
- **Smart Metering:** Implementing smart meter devices and a meter data management system provides detailed information about how much energy is consumed and where, allowing demand response and reduction.



Smart City Integration

Smart Water

A key sustainability challenge facing Oman is the provision of a stable supply of fresh water, both for human consumption and basic sanitation. Most of urban Oman's potable water relies on desalinated seawater. Through smart decentralised approaches, redundant infrastructure, automation and asset monitoring, cities can ensure safe and continuous water supplies – even in cases of extreme weather or water shortages.

Smart water solutions which have the potential to enhance the performance, sustainability and resilience of cities in Oman include:

- **Smart Irrigation:** Deploys both weather and soil sensors among crops, lawns and gardens which connect to a central management system and IoT devices to notify irrigation systems exactly where, how much and when to water. Optimises water consumption by tracking water usage and detecting leakages.
- **Waste Reduction:** Smart water systems are designed to gather data about the flow, pressure and distribution of water to reduce waste. Smart technologies allow providers to minimise non-revenue water by identifying leaks quickly, as well as comparing real-time data to model network simulations.

Smart Buildings

Buildings represent a major lever in the pursuit for sustainability, as they are responsible for some 40% of global energy consumption and where people spend up to 90% of their time. A range of smart interventions exist which can support the resilience of Oman's building systems and ensure their ongoing functionality.

- **Residential:** Includes smart metering of electricity consumption and communication to users, providing incentives to save energy. Home automation allows the automatic adjustment of heating, cooling, ventilation and lighting depending on environmental conditions and room occupancy.
- **Non-Residential:** Building remote monitoring allows individual building performances to be measured and compared against benchmark values for similar building types/sizes. Energy-efficient building automation and control functions save building operating costs and minimise electrical usage.



Al Bahar Tower Abu Dhabi Highlighting Responsive Façade

Smart Transport

Mobility is the backbone of social and economic activity in urban areas, unobstructed and resilient infrastructure is central to the performance of modern cities. Smart transport can help municipalities save costs, provide better service to passengers, and better manage safety and security. Smart transport solutions which have the potential to enhance the performance, sustainability and resilience of cities in Oman include:

- **Public Transport:** Introduction of battery electric vehicles into the vehicle fleet, resulting in significant reductions in local emissions. Provision of passenger transport through E-BRT; a faster and more efficient public transport combining bus lanes with high-quality stations and electric vehicles.
- **Private Transport:** Replacement of conventional combustion vehicles by battery electric vehicles, resulting in significant reductions in noxious emissions. Planning for the future introduction of Connected and Autonomous Vehicles (CAVs). Connected vehicles receive warnings on speed limits, hazardous conditions, and other information to improve safety.
- **Traffic Management:** Traffic lights coordinated with green wave algorithms. Intelligent management systems to control traffic speeds and volumes, and coordinate traffic lights to maintain the flow. Real Time Traffic and Travel Information (RTTI) promoting a change in mobility behaviours from individual to public transport.
- **Smart and LED Street Lighting:** Street lighting can comprise up to 40% of a municipality's electricity bill. Smart lighting can reduce this cost by replacing lamps with more efficient LED lighting, motion sensors and wireless communication. Lights dimmed when there are no cars, cyclists or pedestrians in the vicinity to save energy.
- **Digital Signage and Integrated Navigation:** Sensors can provide a better understanding of street conditions by generating real-time feedback on parking availability, congestion and lane closures. Information communicated to travellers through digital signage or navigation apps.
- **Monitoring Air Quality:** Deployment of sensors and digital technologies to monitor and forecast air quality and identify actions to avert breaches of air quality standards and limit respiratory stress on vulnerable citizens.



E-BRT Examples



03

PRIMARY
LAND USES

3. PRIMARY LAND USES

3.1. Introduction

This Chapter provides Planning Standards for Primary Land Uses at a national level, meaning the standards provided in this document should not be considered exhaustive.

Secondary or Tertiary Land Use Standards will be the responsibility of relevant Regional and Local Planning efforts, whereby national level Standards should be taken on-board, however, developed based on specific local context, form, character and other requirements.

This should encourage more bespoke Regional and Local Planning Standards which consider the influence of regional distinctiveness on development, such as topography, climate, location and cultural heritage of the local area, and adapt these Primary Land Use Planning Standards to suit such regional variances. Regional influences and therefore variances on the National Level Planning Standards are further detailed in Chapter 9 Regionally Specific Planning Standards.

At a national level, Planning Standards for Primary Land Use include:

RESIDENTIAL

- Low Density
 - o Villas
 - o Townhouses
- Medium Density
 - o Apartments
- High Density
 - o Apartments
- Mixed Use
- Labour Accommodation
- Nomadic Communities Lands

COMMERCIAL

- Office
- Mall Retail
- Showrooms
- Office and Business Parks

INDUSTRIAL

- Light and Medium Impact Industrial
- Heavy Impact Industrial

TOURISM

- Hotel Resort
- Business Hotel
- Serviced Apartments

UTILITIES

AGRICULTURE

For Community Facilities and Parks and Open Space Planning Standards, refer to Chapters 4 and 5 respectively.

3.2. Residential

The key aims of Residential Planning Standards are to provide high-quality residential developments for all residential land use types, which serve the existing and future diverse population and provide accessible and convenient community facilities and open space to create liveable and sustainable residential communities; as well as prioritise infill development of residential units within existing urban areas with similar land use character.

Residential land uses refer to areas dedicated to purpose built residential accommodation and units, and includes the following:

Low Density – Villa



Low Density – Townhouse



Medium Density – Apartment



High Density – Apartment



Residential Mixed Use



Labour Accommodation



Nomadic / Community Lands

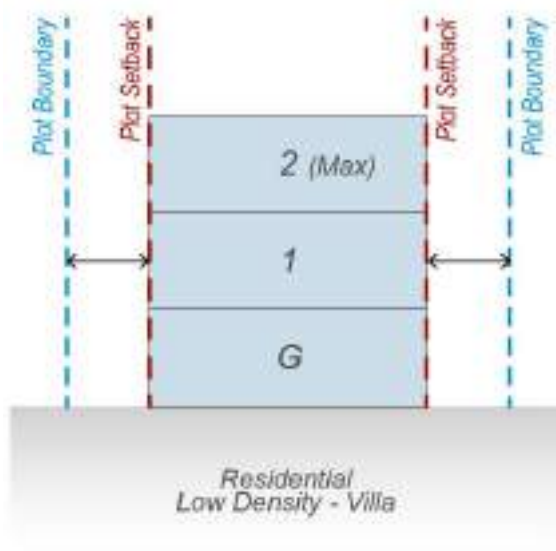


Residential – Supplementary Planning Guidance

- Provide residential development within appropriately zoned areas – ensuring the site is appropriate for residential development.
- Residential development should not be located in inappropriate locations, such as wadis, flood plains etc., and any allocated residential land within inappropriate locations should be deleted and reallocated.
- Infill development should be encouraged to enhance and reinforce existing residential communities.
- Ensure residential development is provided as part of complete communities, and therefore either delivered within existing residential communities, or within master communities whereby development is delivered in a phased approach alongside accessible open space, community facilities, and convenience retail to encourage sustainable living.
- Ensure residential development is situated amongst convenient and walkable neighbourhoods which encourage walking and cycling, as well as public transport stops.
- Provide residential apartments as part of mixed-use, diverse neighbourhoods, to ensure good accessibility to community services and facilities, as well as to create vibrant urban areas and to activate streets and frontages.
- Residential apartments should encourage active frontages toward a public street, public pedestrian corridors and open space, where relevant
- Ensure adequate residential parking is provided on-plot or in convenient and accessible locations, as per relevant authority standards.

3.2.1. Low Density Residential – Villa

Intent The purpose of Low-Density Residential - Villa is to provide single dwelling, detached units supported by community uses and small-scale services and facilities that cater for both Omani and Expatriate family living.		
Goals • Ensure the provision of high-quality villa residential units across Oman in order to serve the existing and future population, meeting housing needs across the spectrum of household incomes. • Ensure villa residential units in both rural and urban areas are of a high standard and adhere to the specified standards and guidelines. • Prioritise infill development to enhance and reinforce existing residential communities. • Maintain existing Ministry of Housing (MoH) plot subdivision where these are appropriately located and can be incorporated into existing settlements, whilst allowing for relocation, redevelopment and regeneration of MoH plots where required. • Provide accessible and convenient community facilities and open space to create liveable and sustainable residential communities in order to create mixed, inclusive and sustainable communities. • Prioritise development of sites within, adjacent to or in close proximity to existing urban areas, in accordance with the land use zoning set out in the Regional Spatial Strategy.		
Permitted Uses		
<i>Primary Uses</i>	<i>Secondary Uses</i>	<i>Not Permitted</i>
Single Family Residential Detached Units (Villa) Single Family Detached Residential Units (MoH Villa)	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Gym and swimming pools • Tennis and basketball courts • Guard/gate house	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Typical Building Height	Maximum G+2	
Typical Floor Height	3.5m	
Typical Plot Size	Range in size from 200-1200m ² with average of 600m ² Smaller plot sizes are preferred in major urban areas to promote compact urban form. Larger plot sizes can be provided in more rural areas/ outside of designated urban areas.	
Plot Coverage	Maximum 65%	
Plot Setbacks	To be determined by Oman Building Code.	
Resident Parking (on-plot)	To be determined by MoTCIT/ relevant Authority Standards.	
Visitor Parking (on-street)	To be determined by MoTCIT/ relevant Authority Standards.	



Low Density Residential Villas – Diagram



Low Density Residential Villas – Reference Images

Intent

The purpose of Low Density Residential - Townhouses is to provide single dwelling, attached/ semi-detached units in a more compact urban form, supported by community uses and small-scale services and facilities that cater for both Omani and Expatriate family living.

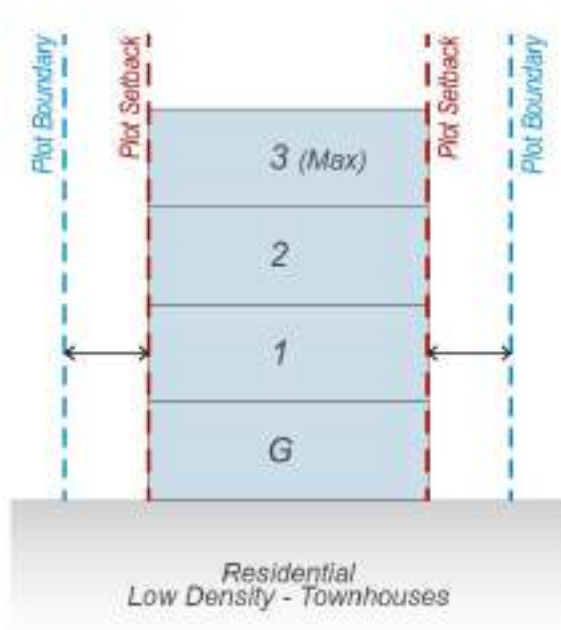
Goals

- Ensure the provision of high-quality residential units across Oman in order to serve the existing and future population, meeting housing needs across the spectrum of household incomes.
- Ensure residential units in both rural and urban areas are of a high standard and adhere to the specified standards and guidelines.
- Prioritise infill development to enhance and reinforce existing residential communities.
- Provide accessible and convenient community facilities and open space to create liveable and sustainable residential communities in order to create mixed, inclusive and sustainable communities.
- Prioritise development of sites within, adjacent to or in close proximity to existing urban areas, in accordance with the land use zoning set out in the Regional Spatial Strategy.

Permitted Uses

<i>Primary Uses</i>	<i>Secondary Uses</i>	<i>Not Permitted</i>
Single Family Residential Attached/ Semi-Detached Units	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Gym and swimming pools • Tennis and basketball courts • Guard/gate house	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Typical Building Height	Maximum G+3	
Typical Floor Height	3.5m	
Typical Plot Size	Minimum 200m ² Maximum 350m ² Typical 10m x 25m Smaller plot sizes are preferred in major urban areas to promote compact urban form. Larger plot sizes can be provided in more rural areas/ outside of designated urban areas.	
Plot Coverage	65%	
Plot Setbacks	To be determined by Oman Building Code.	
Resident Parking (on-plot)	To be determined by MoTCIT/ relevant Authority Standards.	
Visitor Parking (on-street)	To be determined by MoTCIT/ relevant Authority Standards.	

3.2.2. Low Density Residential – Townhouses



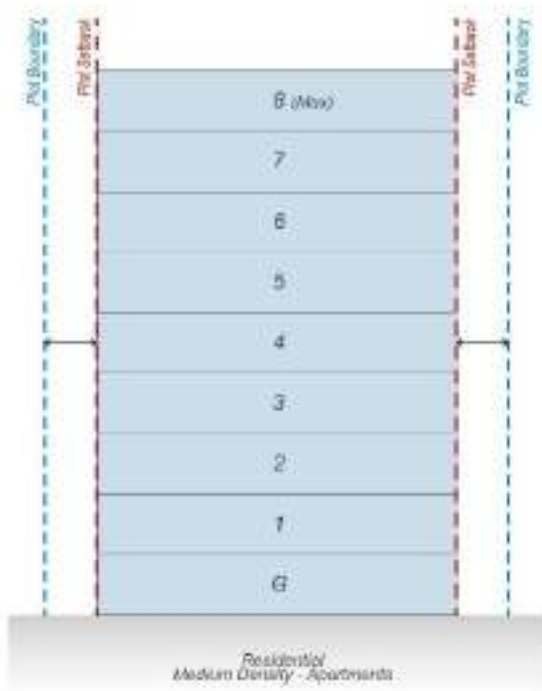
Low Density Residential Townhouses – Typical Diagram



Medium Density Residential Townhouses – Reference Images

3.2.3. Medium Density Residential – Apartments

Intent The purpose of the Medium Density Residential - Apartments is to provide multi-family accommodation within a high quality, mid-rise apartment setting to promote compact urban form, supported by community uses and small-scale services and facilities that cater for both Omani and Expatriate family living.		
Goals • Ensure the provision of high-quality residential units across Oman in order to serve the existing and future population, meeting housing needs across the spectrum of household incomes. • Prioritise infill development to enhance and reinforce existing residential communities. • Provide accessible and convenient community facilities and open space to create liveable and sustainable residential communities in order to create mixed, inclusive and sustainable communities. • Prioritise development of sites within, adjacent to or in close proximity to existing urban areas, in accordance with the land use zoning set out in the Regional Spatial Strategy. • Provide development in an efficient land-use pattern and designed to provide safe and walkable neighbourhood.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Multi-Unit Residential: • Apartments • Condominiums • Terraced Apartments	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Convenience Retail (GF only) • Open Space • Public Utility and Community Facilities • Supporting amenities (Gym, Pool etc.) • Car parking	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Typical Building Height	Maximum G+8 Utilities such as HVAC units or lift rooms on roof may exceed maximum height of building and shall be appropriately screened.	
Typical Floor Height	3.5m	
Typical Plot Size	Minimum 1,500m ²	
Plot Coverage	60%	
Plot Setbacks	To be determined by Oman Building Code.	
Resident Parking (on-plot)	To be determined by MoTCIT/ relevant Authority Standards. Basement Parking should be encouraged, where possible. Parking should be preferred on-plot.	
Commercial Parking	To be determined by MoTCIT/ relevant Authority Standards.	
Open Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. To be determined by Oman Building Code.	



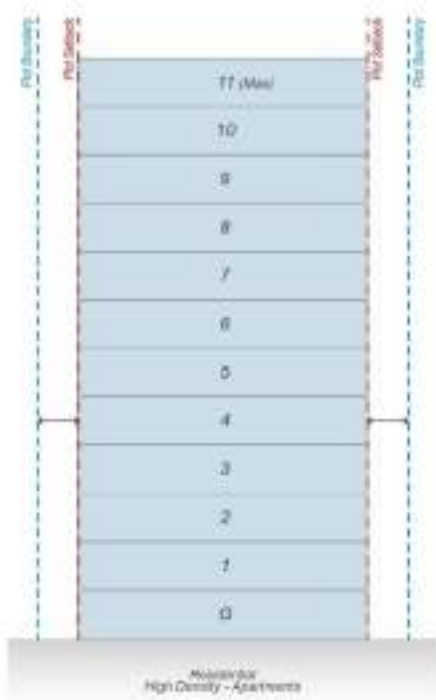
Medium Density Residential Apartments – Typical Diagram



Medium Density Residential Apartments – Reference Images

3.2.4. High Density Residential – Apartments

Intent The purpose of High Density Residential - Apartments is to provide multi-family accommodation within a high quality, higher density apartment setting to promote compact urban form, supported by community uses and small-scale services and facilities that cater for both Omani and Expatriate family living.		
Goals • Ensure the provision of high-quality residential units across Oman in order to serve the existing and future population, meeting housing needs across the spectrum of household incomes. • Prioritise infill development to enhance and reinforce existing residential communities. • Provide accessible and convenient community facilities and open space to create liveable and sustainable residential communities in order to create mixed, inclusive and sustainable communities. • Prioritise development of sites within, adjacent to or in close proximity to existing urban areas, in accordance with the land use zoning set out in the Regional Spatial Strategy. • Provide development in an efficient land-use pattern and is designed to provide safe and walkable neighbourhood.		
Permitted Uses		
<i>Primary Uses</i>	<i>Secondary Uses</i>	<i>Not Permitted</i>
Multi-Unit Residential: • Apartments	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Convenience Retail (GF only) • Open Space (incl. recreation courts – tennis, basketball etc.) • Public Utility and Community Facilities • Supporting amenities (Gym, Pool etc.) • Car parking	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Typical Building Height	Maximum G+11 A variety of building heights can occur within a block. Utilities such as HVAC units or lift rooms on roof may exceed maximum height of building and shall be appropriately screened.	
Typical Floor Height	3.5m	
Typical Plot Size	Minimum 1,500m ²	
Plot Coverage	60%	
Plot Setbacks	To be determined by Oman Building Code.	
Resident Parking (on-plot)	To be determined by MoTCIT / relevant Authority Standards. Basement Parking should be encouraged, where possible. Parking should be preferred on-plot.	
Commercial Parking	To be determined by MoTCIT/ relevant Authority Standards.	
Open Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. To be determined by Oman Building Code.	



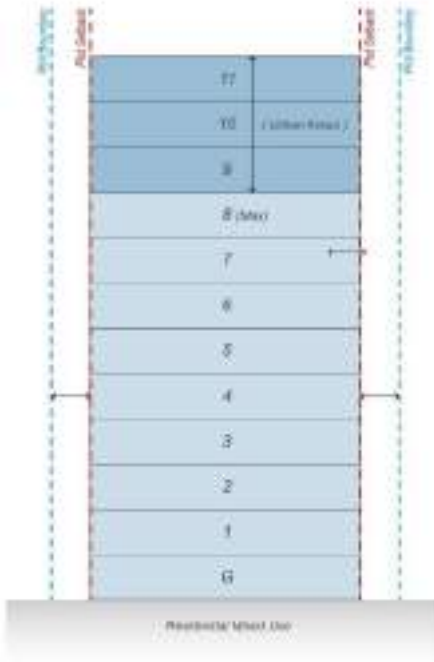
High Density Residential Apartments – Typical Diagram



High Density Residential Apartments – Reference Images

3.2.5. Residential Mixed Use

Intent Residential Mixed Use identifies areas for development which consists of both residential and commercial (office, retail) uses, providing accommodation for both Expatriate and Omanis. These are generally located along primary roads and in key commercial areas where the intention is to create pedestrian friendly, multi-use Centres and defined corridors.		
Goals • Ensure the provision of high-quality residential units across Oman in order to serve the existing and future population, meeting housing needs across the spectrum of household incomes. • Create urban areas which provide a range and variety of land use and activities in order to promote vibrant and multi-functional urban areas. • Prioritise infill development to enhance and reinforce existing residential communities. • Provide accessible and convenient community facilities and open space to create liveable and sustainable residential communities in order to create mixed, inclusive and sustainable communities. • Prioritise development of sites within, adjacent to or in close proximity to existing urban areas, in accordance with the land use zoning set out in the Regional Spatial Strategy. • Provide development in an efficient land-use pattern and is designed to provide safe and walkable neighbourhood.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Residential Apartment (excluding GF) • Commercial – Office • Commercial – Retail (GF Only)	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Commercial Retail (GF only) • Open Space (incl. recreation courts – tennis, basketball etc.) • Public Utility and Community Facilities (Clinic, Nursery etc.) • Supporting amenities (Gym, Pool etc.) • Car parking	All Industrial activity. <i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Typical Building Height	Maximum G+8 Up to G+11 in urban centres (although potential for higher in special circumstances) Utilities such as HVAC units or lift rooms on roof may exceed maximum height of building and shall be appropriately screened.	
Typical Floor Height	3.5m	
Typical Plot Size	Minimum 1,500m ²	
Plot Coverage	60%	
Plot Setbacks	To be determined by Oman Building Code.	
Resident Parking (on-plot)	To be determined by MoTCIT/ relevant Authority Standards. Basement Parking should be encouraged, where possible. Parking should be preferred on-plot.	
Commercial Parking	To be determined by MoTCIT/ relevant Authority Standards.	
Open Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. To be determined by Oman Building Code.	



Mixed Use Residential – Typical Diagram



Mixed Use Residential – Reference Images

3.2.6. Nomadic Community Lands

Intent Nomadic Community Lands refers to specific plots set aside to cater for Oman's nomadic communities, something which is typical of Oman's traditional cultural heritage and history. Land is to be provided where required, to ensure such communities are served with the required infrastructure, facilities and services in order to maintain their traditional way of life. Areas/ regions which typically see nomadic communities recurrently should ensure that these groups are considered as parts of the local communities in which they frequent.		
Goals - To support and cater for Oman's nomadic communities by providing and allocating appropriate lands with supporting utilities infrastructure. - To support and cater for Oman's nomadic communities by providing key services and facilities in suitable locations. - To facilitate and support nomadic communities by creating flexible service support and development to provide a high-quality way of life and maintain this cultural heritage practice.		
Permitted Uses		
<i>Primary Uses</i>	<i>Secondary Uses</i>	<i>Not Permitted</i>
- Allocated land/ site of sufficient size in order to accommodate nomadic communities throughout the year. - Relevant utility infrastructure services: water, power, sewerage, waste points within the plot etc.	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: - Small Parks/ Open Space - Toilets/ Showers/ Bathroom facilities - Mosque - Temporary Shade Structures/ Pavilions - Livestock enclosures and structures	<i>All other uses that do not meet the purpose and outcomes of the land use.</i> <i>Any permanent development structures.</i>
Typical Building Height	G (Temporary structures only)	
Typical Floor Height	N/A	
Typical Plot Size	Minimum 20,000m² Must be of sufficient size to accommodate residents and livestock.	
Plot Coverage	40%	
Plot Setbacks	To be determined by Oman Building Code.	
Parking	To be determined by MoTCIT relevant Authority Standards. Parking should be preferred on-plot.	



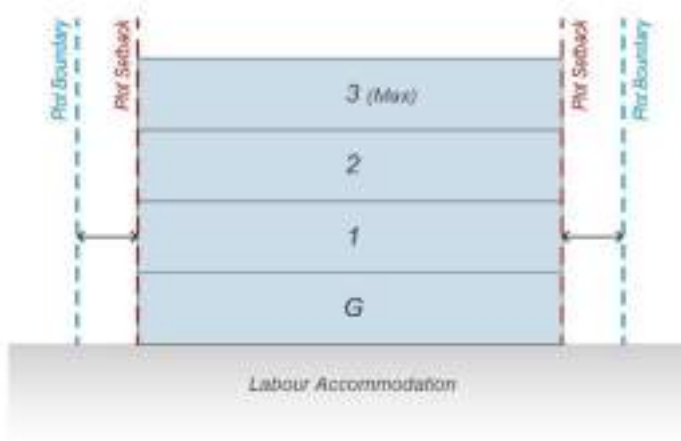
Nomadic Community Lands – Typical Diagram



Nomadic Community Lands – Reference Images

3.2.7. Labour Accommodation

Intent The purpose of Labour Accommodation is to provide high-quality purpose-built residence for group worker living, which includes adequate provision of community facilities, social services, open space within a quality and highly functional community setting. These Standards are for both Permanent Labour Accommodation and Temporary Labour Accommodation, located both on-site and off-site. If Labour Accommodation is provided temporarily, it will be the responsibility of the developer or operator to ensure adequate remediation measures are initiated following construction completion as part of the Master Plan/ Development.		
Goals • Provide a high-quality living environment for workers. • Provide community facilities which provide for the daily needs of residence and promote quality of life. • Provide development which is designed to provide safe and walkable neighbourhood. • Ensure development maintains a high level of residential amenity with regards to traffic, noise, dust, odour, lighting and other locally specific impacts. • Ensure Labour Accommodation does not become isolated and maintains a high quality and sanitary environment throughout its use and occupancy.		
Permitted Uses		
<i>Primary Uses</i>	<i>Secondary Uses</i>	<i>Not Permitted</i>
• Labour accommodation units • Management offices	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Ancillary retail/commercial uses such as pharmacy, barbers, convenience retail etc. • Canteen Facilities • Health centre/clinic • Mosque/ Religious buildings • Supporting recreational and leisure facilities (e.g. sports courts, gym) • Open Space	All Industrial activity. <i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Population Capacity	Up to 5,000	
Sqm. Per Person	6m ²	
Max. No People per Room	8 to 10 (recommended)	
Building Height	Max. G+3	
Minimum Building Setbacks	To be determined by Oman Building Code.	
Building Separation	Minimum 6m (recommended).	
Site Coverage	Max. 50%	
Car Parking/ Bus Parking	1 car parking space per 50 residents (recommended). To be determined by the MoTCIT/ relevant Authority Standards.	
Open Space	15% of total site area should be provided as functional open space. Any Open Space provision should be no less than 10sqm.	



Labour Accommodation – Typical Diagram



Labour Accommodation – Reference Images

3.3. Commercial

Commercial land uses refer to office, business and retail uses along with other complementary services. This can include financial services, banks, offices, retail, food and beverage and restaurants as well as local and major shops and other support services.

Commercial land uses refer to:

Commercial Office



Commercial Mall Retail



Commercial Showrooms



Commercial Office and Business Parks

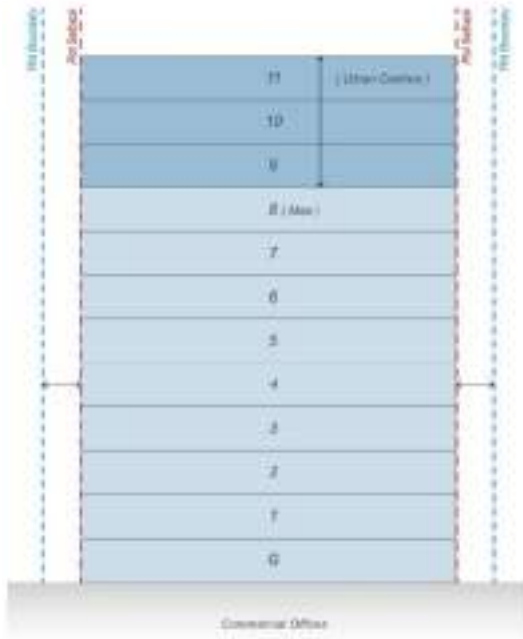


Commercial - Supplementary Planning Guidance

- Ensure retail facilities are provided at appropriate locations, providing convenient retail within neighbourhoods and communities as part of neighbourhood centres.
- Ensure commercial facilities are developed to consider convenient accessibility to public transport facilities, such as walking, cycling, and buses, overall reducing the reliance on private vehicle uses.
- Provide the majority of new retail land use as part of mixed-use development, to create vibrant urban areas and to activate streets and frontages.
- Locate appropriate retail uses depending on the character of the area, whether it is predominantly residential, business, or serves as a tourist/ cultural heritage hub.
- Develop new offices as part of Mixed-Use development, to create vibrant and multi-functional urban areas.
- Discourage office development within predominantly residential areas, or away from existing employment centres and uses.
- Encourage office development within mixed-use developments, in order to support the local population and encourage a live-work environment for residents
- Provide office development to support planned real estate development and provide a live/work area which serves local residents.

3.3.1. Commercial Offices

Intent Commercial Office intends to provide development to accommodate a broad range of business activities (administrative, financial, business, professional, medical and public office uses) to support Oman's economic growth and ensure these are located within suitable locations to support the development of urban centres.		
Goals • Provide Commercial Office land uses to create defined business areas, supporting Oman's economy. • Provide Commercial Office land uses to create physical buffers between industrial and residential land uses. • Encourage the integration of Commercial Office with retail/ F&B and community facilities as appropriate, to create active and multi-functional areas. • Ensure that Commercial Uses respect the density of surrounding development and discourage the development of high-density Commercial Uses in locations where such development would alter the established urban form. • Prioritise development of sites within, adjacent to or in close proximity to existing urban areas, in accordance with the land use zoning set out in the Regional Spatial Strategy.		
Permitted Uses		
Primary Uses • Commercial offices • Finance and professional sales and services • Business services • Personal services • Education and training services • Car parking	Secondary Uses • Retail shops including convenience and/or comparison retail, grocery stores • Hairdresser's beauty parlours and barbers • Post office • Laundry • Restaurants, café/food and beverage outlets or similar (GF only)	Not Permitted <i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Typical Building Height	Maximum: G+8 - Up to G+11 in urban centres. Utilities such as HVAC units or lift rooms on roof may exceed maximum height of building and shall be appropriately screened.	
Typical Floor Height	3.5m	
Typical Plot Size	Minimum 2,500m ²	
Plot Coverage	60%	
Plot Setbacks	To be determined by Oman Building Code. Distance from other buildings with windows and habitable rooms to be determined by local standards.	
Parking	Parking spaces to be provided on-plot, as well as taxi ranks and drop-off where appropriate. Basement Parking should be encouraged, where possible. To be determined by MoTCIT/ relevant Authority Standards.	
Open Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. To be determined by Oman Building Code.	



Commercial Office – Typical Diagram



Commercial Office – Reference Images

3.3.2. Commercial Retail Mall

Intent Commercial Retail Mall intends to provide shopping facilities and services in convenient and accessible locations. The scale and size of Retail Malls will require variation depending on their location: local, neighbourhood, city, regional, and should respect the local urban form and requirement for such development.		
Goals • Provide Commercial Retail Mall as per the local urban context and as part of defined Centres. • Integrate community facilities within Malls to create multi-use nodes. • Provide Commercial Retail Mall as per the projected demand. • Prioritise development of sites within, adjacent to or in close proximity to existing urban areas, in accordance with the land use zoning set out in the Regional Spatial Strategy.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Retail Shopping Mall • Convenience retail • Grocery stores	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Medical clinic or dental clinic • Restaurant, café, food and beverage outlets, and food courts • Mosque/ Musalla • Entertainment and recreational uses such as cinemas	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Typical Building Height	Small Scale Community Mall: G only District Mall: Maximum: G+2 Utilities such as HVAC units or lift rooms on roof may exceed maximum height of building and shall be appropriately screened.	
Typical Floor Height	3.5m	
Typical Plot Size	Varies depending on urban context. Must be in-keeping with the Mall context.	
Plot Coverage	60%	
Plot Setbacks	To be determined by Oman Building Code. A continuous active frontage is encouraged. No front setback preferred to enable active frontage with Retail/ F&B at the ground floor.	
Parking	Parking spaces to be provided on-plot, as well as taxi ranks and drop-off where appropriate. Plot servicing from dedicated access. Basement Parking should be encouraged, where possible. To be determined by Ministry of Transport/ relevant Authority Standards.	
Public Space	A green belt is recommended along the street side frontage of the plot. To be determined by Oman Building Code.	



Commercial Retail Mall – Typical Diagram



Commercial Retail Mall – Reference Images

3.3.3. Commercial Showrooms

Intent Commercial Showrooms intends land for larger scale commercial uses and provides an alternative retail offering of 'big box' retail uses and functions.		
Goals • Provide Commercial Showroom retail in appropriate locations, depending on the local urban context and scale. • Ensure good accessibility on key road corridors, away from predominantly residential communities. • Provide Commercial Showroom as per projected demand. • Prioritise development of sites within, adjacent to or in close proximity to existing urban character areas, in accordance with the land use zoning set out in the Regional Spatial Strategy.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Car showroom/ new and used vehicle sales • Vehicle leasing and rentals • Vehicle storage/ forecourt • Furniture stores • General hardware • Sports and lifestyle • Textiles	• Car workshop/associated maintenance and repair shops • Supporting commercial offices • Walk in office/ business services • Car wash • Mosque • Entertainment and recreational uses such as cinemas	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Typical Building Height	Maximum G+3 Utilities such as HVAC units or lift rooms on roof may exceed maximum height of building and shall be appropriately screened.	
Typical Floor Height	4 to 7m	
Typical Plot Size	Minimum 2,500m² - 20,000m² To be determined on a plot by plot basis.	
Plot Coverage	50%	
Plot Setbacks	To be determined by Oman Building Code. A continuous active frontage is encouraged.	
Parking	Parking spaces to be provided on-plot, as well as taxi ranks and drop-off where appropriate. Basement Parking should be encouraged, where possible. To be determined by MoTCIT/ relevant Authority Standards.	
OpenSpace	A green belt is recommended along the street side frontage of the plot. To be determined by Oman Building Code.	



Commercial Showroom – Typical Diagram



Commercial Showroom – Reference Images

3.3.4. Commercial – Office and Business Parks

Intent Commercial Office and Business Parks should be designed to encourage complementary operators and tenants to locate in one area in order to facilitate collaboration and innovation.		
Goals • Provide Office and Business Parks to create defined business areas, supporting Oman's economy. • Provide Office and Business Parks to create physical buffers between industrial and residential land uses. • Encourage the integration of Office and Business Parks with retail/ F&B and community facilities as appropriate, to create active and multi-functional areas. • Ensure that Office and Business Parks respect the density of surrounding development and discourage the development of high-density Commercial Uses in locations where such development would alter the established urban form. • Prioritise development of sites within, adjacent to or in close proximity to existing urban areas of similar context, in accordance with the land use zoning set out in the Regional Spatial Strategy.		
Permitted Uses		
Primary Uses • Commercial offices • Finance and professional sales and services • Banking and finance, walk in office • Business services • Personal services • Education and training enterprises and services • Technology • E-commerce • Research and development	Secondary Uses • Medical clinic, pharmacy, day-care/ nursery or dental clinic • Gym • Associated restaurants, café, food and beverage outlets, for the benefit of the employees and/or consumption on the premises	Not Permitted <i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Typical Building Height	Maximum: G+5 Utilities such as HVAC units or lift rooms on roof may exceed maximum height of building and shall be appropriately screened.	
Typical Floor Height	3.5m	
Typical Plot Size	Varies	
Plot Coverage	50%	
Plot Setbacks	To be determined by Oman Building Code. Distance from other buildings with windows and habitable rooms to be determined by local standards. A continuous active frontage is encouraged. No front setback preferred to enable active frontage with Retail/ F&B at the ground floor.	
Parking	Parking spaces to be provided on-plot, as well as taxi ranks and drop-off where appropriate. Plot servicing from dedicated access. To be determined by MoTCIT/ relevant Authority Standards.	
Open Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. A minimum of 30% open space will be provided. This excludes vehicular access. To be determined by Oman Building Code.	



Commercial Office and Business Park – Typical Diagram



Commercial Office and Business Park – Reference Images

3.4. Industrial

Industrial Land Use is the use of a piece of land for industrial purposes, e.g. manufacturing. Industrial uses typically require larger pieces of land and are located away from residential communities, centres, tourism areas etc., to mitigate against pollutions such as air, sound and visual pollution.

Industrial land uses refer to:

Light and Medium Impact Industry

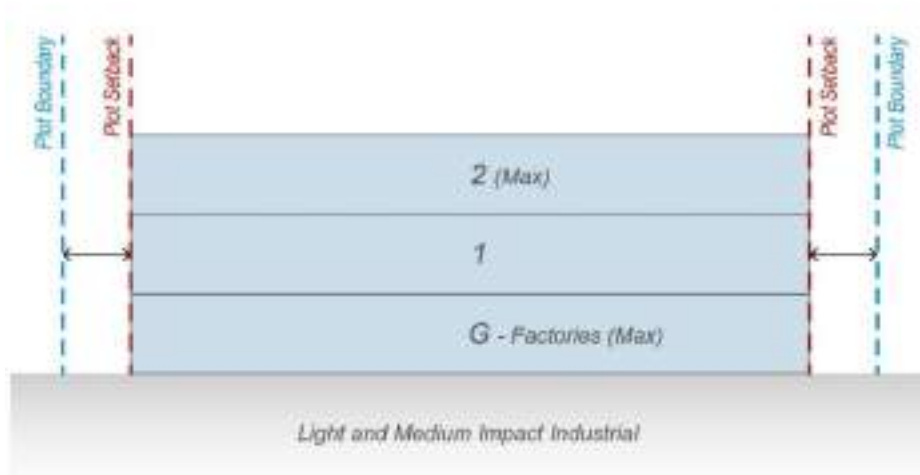


Heavy Impact Industry



Industrial - Supplementary Planning Guidance

- Industrial activities should be located in defined Industrial Zones whereby no visual, noise, or air pollution can affect residential, tourist, environmentally sensitive areas and Centres.
- Industrial uses should not be permitted where such a use would result in odours, fumes, dust and/or noise, which would negatively impact upon residential amenity of the local area.
- Industrial uses should not be detrimental to public health, safety, morals or general welfare and shall take all measures possible to minimise any adverse impacts on their surroundings.
- If the Authority identifies industrial activity which would lead to detrimental effects on amenity, the Authority is encouraged to impose conditions, safeguards and restrictions upon Development or Master Plan Approvals as necessary to reduce or minimise any potential effect of such uses upon other properties, their environs, or the local area as a whole.
- All parking, loading and manoeuvring of trucks should be conducted off-street on private property.
- Required vehicle parking should not be allowed within the truck dock apron space.
- Boundary fences and other security treatments should not create visual barriers above a height of 0.9m.
- Controlling entry and access via security gates and fencing should be considered where industrial goods and equipment storage and manoeuvring is envisaged to coincide with public access.



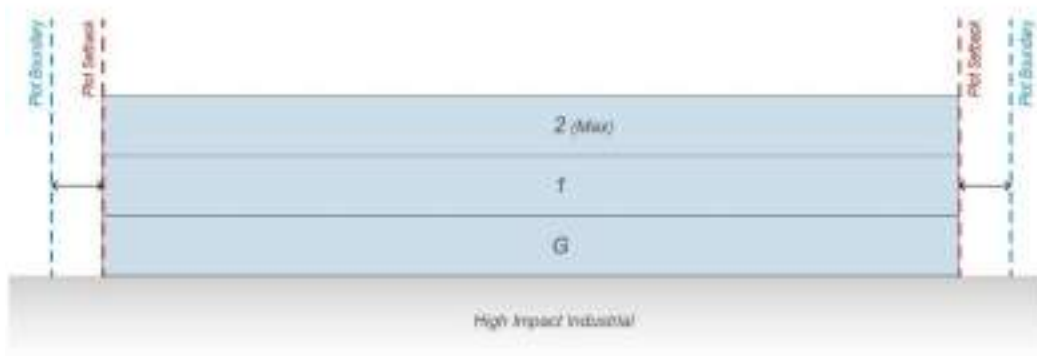
Light and Medium Impact Industrial – Typical Diagram



Light and Medium Impact Industrial – Reference Images

3.4.2. Heavy Impact Industrial

Intent Heavy impact industry land use is to provide land for heavy impact industrial activities, which includes uses which by reason of scale or process, require large inputs of natural resources and which may have an adverse impact on air or water quality, may create noise, or generate toxic by-products/wastes or involve the storage or handling of hazardous materials potentially injurious to human health and safety, or any other activity that might cause a risk or nuisance to the public.		
Goals • Provide Heavy Impact Industrial Uses in appropriately located industrial areas, away from residential communities, tourism areas, and centres. • Ensure adjacent uses are not conflicting in terms of safety and security, and that such industries are located in non-environmentally sensitive areas. • Provide high quality public realm and enforce planning standards to ensure the integrity of industrial areas. • Provide quality and accessible public transport for employees and workers in industrial areas. • Prioritise development of sites within, adjacent to or in close proximity to existing heavy industrial areas, in accordance with the land use zoning set out in the Regional Spatial Strategy. • Ensure Cumulative Environmental Impact Assessments (EIAs) are conducted as per MECA requirements.		
Permitted Uses		
<i>Primary Uses</i>	<i>Secondary Uses</i>	<i>Not Permitted</i>
<i>Including but not limited to:</i> • Heavy manufacturing and assembly • Storage of large volumes of highly flammable, chemical or toxic materials • Intensive industrial activities • Highly pollutive industrial activities • Visually intrusive industrial activities	• Retail • Mosque • Office uses • Heavy Vehicle Temporary Parking • Supporting Office Use • Truck Service centre and resting area • Primary use related logistics	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Typical Building Height	Maximum: G+2 Chimneys and emission stacks may be included, based on the process used (not in conflict with environmental requirements or regulations).	
Typical Floor Height	As per industry requirements/ Oman Building Code.	
Typical Plot Size	Minimum 1,500m ²	
Plot Coverage	40%	
Plot Setbacks	Highly pollutive or toxic industries should consider a 25m to 30m setback on all sides. To be determined by Oman Building Code/ MECA Environmental Requirements.	
Parking and Access	All parking to be provided on-site. To be determined by MoTCIT/ relevant Authority Standards.	
Open Space	To be determined by Oman Building Code.	



Heavy Impact Industrial – Typical Plot Regulations Diagram



Heavy Impact Industrial – Reference Images

3.5. Tourism

Tourism land uses refer to areas dedicated to hospitality, including accommodation such as resorts and hotels, serviced apartments, and complementary land uses – including both permanent residential homes and ‘second homes’ for rent and for sale, and supporting facilities such as beach clubs, restaurants, recreational facilities and meeting or conference centres.

Tourism land uses refer to:

Hotel Resort



Business Hotel



Serviced Apartments



Tourism - Supplementary Planning Guidance

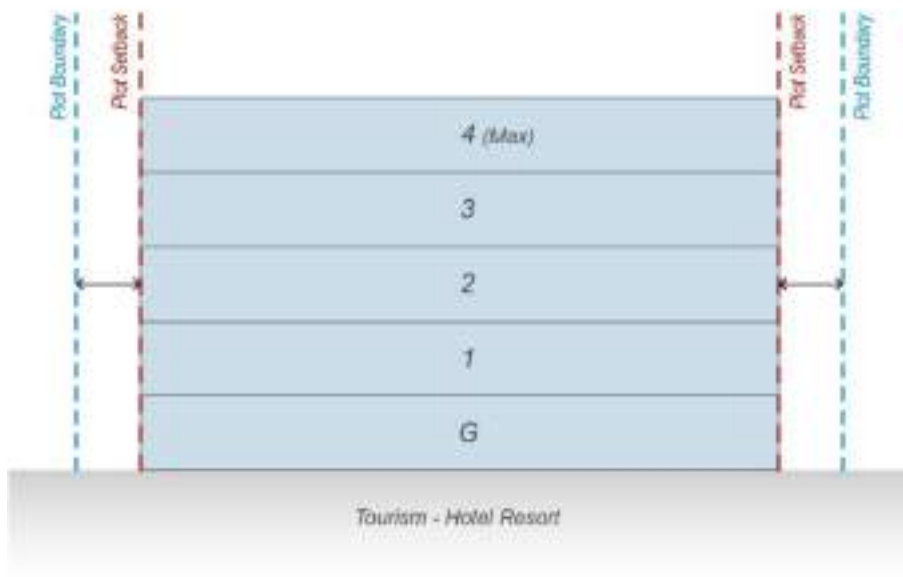
- Ministry of Heritage and Tourism (MoHT) standards and guidelines should be referred to and adhered to for all tourism development related activities (refer to MoHT Development Control Plan Framework “DCPF” for Tourism Development Projects).
- As per the MoHT DCPF, several other government agencies have additional legal roles along the development life cycle, and must be consulted where required for Tourism projects, including but not limited to: Ministry of Housing and Urban Planning (MoHUP), Governors' Office, Ministry of Environment and Climate Affairs (MECA), Supreme Committee for Town Planning (SCP).
- EIAs for all tourism projects must adhere to the requirements and guidance of MoHT and MECA (2001 Guidelines for Obtaining Environmental Permits, Group Six (Marine and Coastal Projects) and Group Seven (Tourism Projects) and updates of these). Tourism land uses should be provided in designated Tourism areas and should complement existing and planned tourism developments and attractions.
- Tourism development should be of a high quality, catering specifically to the market intended for the site.
- Business Hotel development should cater to business tourism users, and be provided in areas where demand is projected, such as business centres and employment areas.
- Hotel Resort development should specifically focus on family and leisure type developments, including family hotel resorts and/or ‘splash hotels’, ecohotels or boutique hotels, parks and recreation and other beachfront activities. Such developments should aim to be of a high standard at either a 4-star or 5-star rating.
- Leisure, sports and entertainment components should complement the hospitality offering and will be ancillary to any hotel or resorts development. Such facilities shall not harm residential amenity for guests of the hotels/resorts or residents within the local area.
- Tourism development should respect the existing urban area and characteristics and should not exceed the local building heights and densities.
- Any residential development within tourism areas should complement the proposed hotel and resort development and may comprise second homes/holiday homes or permanent residential accommodation.
- Local environmental aspects such as wadis, green areas, coastal areas etc. should be a key consideration for hotel development, and development should be set back appropriately and not intrude on sensitive environmental areas and should ensure the retention of the ecological value.
- No development should be located within deep incised wadis, which should be kept clear from built development in order to allow them to continue to fulfil their current drainage function and prevent flood risk. No built development should be located within the 50m buffer to the edge of the wadi.



- Tourism development in the Coastal Zone should maintain setbacks from the high tide line, as per MoHT DCPF requirements, based on Ministerial Decisions by SCP (see Part 3 Section 8.2.2 on Coastal Zone Management Plans, especially the Guidance item entitled “Shoreline Management: Coastal Setbacks and Design Levels”). No permanent built development should be located on the seaward side of the specified setback; however temporary structures such as beach huts, pop-up stalls and food trucks may be located here. The following Coastal Setbacks are stipulated, though exceptions in Part 3 Section 8.2.2 and Regional Variations in Part 4 of this document should be noted:
 - Natural coasts with natural landscapes and seascapes, such as rocky headlands and cliffs (development within these areas is not permitted unless approvals are provided by the Ministry of Environment and the Ministry of Housing) – 300m setback from the highest tidal mark.
 - Ministry of Environment and the Ministry of Housing) – 300m setback from the highest tidal mark.
 - Sandy coasts and around khawrs – 150m setback from the highest tidal mark.
 - Stable coasts where urban development may not cause serious impacts on the receiving environment – 50m setback from the highest tidal mark.
- Hotels may be developed in accordance with the Omani Standards set out within Decision No (45/2017) relating to ‘Integrated Tourism Complexes’ (ITC) which set out the requirements for ITC development. Should these plots be developed as ITC developments, the area of land shall not be less than one hundred (100) thousand square meters (equivalent to 10 hectares) in accordance with Decision No (45/2017).

3.5.1. Hotel Resort

Intent Hotel Resort is low density development for family hotels and resorts, typically located in key Integrated Tourism Zones and in defined coastal/ natural environmental areas expanding the local tourism economy. A Hotel Resort is typically a full-service lodging facility, intended primarily for vacationers and usually located in places frequented for relaxation or recreation, such as beaches, seashores, scenic or historic areas etc. Goals • Provide quality hotel resort development, including multi-functional spaces and activities, in order to support Oman's growing tourism industry. • Provide Hotel Resorts in appropriate locations, taking advantage of existing tourism hotspots. • Ensure Hotel Resorts respect the local natural and built environment. • Ensure development focuses on family and leisure type developments, including family hotel resorts and/or 'splash hotels', ecohotels or boutique hotels, parks and recreation etc. • Hotel Resort developments should aim to be of a high standard at either a 4-star or 5-star rating. Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Hotels and resorts • Entertainment complexes • Sports and leisure facilities • Water parks or larger recreation facilities	• Commercial uses including restaurants, cafes, retail and other supporting facilities • Hotel 'back of house' facilities e.g. administrative offices, kitchen, laundry housekeeping and maintenance facilities • Child Care Facilities • Mosques • Bars and nightclubs • Leisure facilities e.g. swimming pool, tennis courts, spa and gym	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Typical Building Height	Maximum: G+4, although dependent upon environmental sensitivity of surrounding area and urban context. To be determined based on Ministry of Heritage and Tourism/ Oman Building Code Standards – as relevant.	
Typical Floor Height	3.5m	
Typical Plot Size	Minimum 1,500m ²	
Plot Coverage	30%	
Plot Setbacks	To be determined based on Ministry of Heritage and Tourism/ Oman Building Code Standards – as relevant.	
Parking and Access	To be determined by Ministry of Heritage and Tourism/ MoTCIT/ relevant Authority Standards. Parking should be provided on-plot. Basement Parking should be encouraged, where possible.	
Open Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. To be determined based on Ministry of Heritage and Tourism/ Oman Building Code Standards – as relevant.	



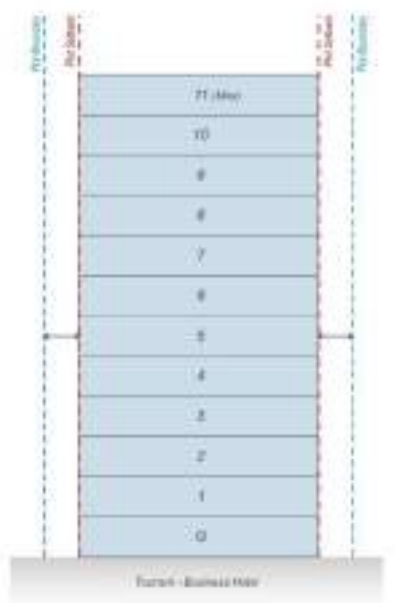
Tourism Hotel Resort – Typical Diagram



Tourism Hotel Resort – Reference Images

3.5.2. Business Hotel

Intent Business Hotels refers to the development hotels to cater for business visitors and should include associated facilities such as conference and meeting centres which may also include some Serviced Apartments.		
Goals • Provide quality Business Hotel development, including multi-functional spaces and activities, in order to support Oman's growing business tourism industry. • Provide Business Hotels in appropriate locations, taking advantage of business/ economic hubs in which, such accommodation is required. • Ensure Business Hotels respect the local urban context.		
Permitted Uses		
<i>Primary Uses</i>	<i>Secondary Uses</i>	<i>Not Permitted</i>
• Business hotels • Serviced apartments • Restaurants • Exhibition halls • Conference and meeting facilities ('MICE')	• Commercial uses including restaurants, cafes, retail and other supporting facilities • Hotel 'back of house' facilities e.g. administrative offices, kitchen, laundry housekeeping and maintenance facilities • Mosques • Leisure facilities e.g. swimming pool, tennis courts, spa and gym	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Typical Building Height	Maximum G+11 – dependent upon urban context. To be determined based on Ministry of Heritage and Tourism/ Oman Building Code Standards – as relevant.	
Typical Floor Height	3.5m	
Typical Plot Size	Varies	
Plot Coverage	60%	
Plot Setbacks	To be determined based on Ministry of Heritage and Tourism/ Oman Building Code Standards – as relevant.	
Parking and Access	To be determined by Ministry of Heritage and Tourism/ MoTCIT/ relevant Authority Standards. Parking should be provided on-plot. Basement Parking should be encouraged, where possible.	
Open Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. To be determined based on Ministry of Heritage and Tourism/ Oman Building Code Standards – as relevant.	



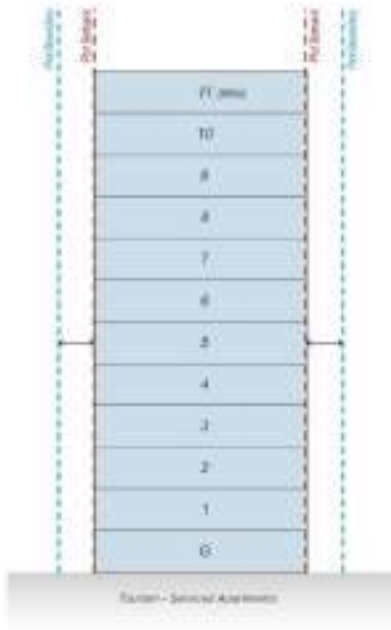
Tourism Business Hotel – Typical Diagram



Tourism Business Hotel – Reference Images

3.5.3. Serviced Apartments

Intent Serviced Apartments refers to the development of a fully furnished apartment available for short-term or long-term stay, providing hotel-like amenities.		
Goals • Provide quality hotel development, including multi-functional spaces and activities, in order to support Oman's growing tourism industry. • Provide Serviced Apartments in appropriate locations, typically in urban areas where longer term visitors will require residence. • Ensure Serviced Apartments respect the local urban context.		
Permitted Uses		
<i>Primary Uses</i>	<i>Secondary Uses</i>	<i>Not Permitted</i>
• Serviced apartments • Residential apartments	• Commercial/retail at ground floor • Restaurants and cafes • Supporting office use • Guard/gate house • Gym and swimming pools • Mosques • Leisure facilities e.g. swimming pool, basketball courts, tennis courts and spa	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Typical Building Height	Maximum: G+11 - dependent upon urban context. To be determined based on Ministry of Heritage and Tourism/ Oman Building Code Standards – as relevant.	
Typical Floor Height	3.5m	
Typical Plot Size	Varies	
Plot Coverage	60%	
Plot Setbacks	To be determined based on Ministry of Heritage and Tourism/ Oman Building Code Standards – as relevant.	
Parking and Access	To be determined by Ministry of Heritage and Tourism/ MoTCIT/ relevant Authority Standards. Parking should be provided on-plot. Basement Parking should be encouraged, where possible.	
Open Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. To be determined based on Ministry of Heritage and Tourism/ Oman Building Code Standards – as relevant.	



Tourism Serviced Apartments – Typical Diagram



Tourism Serviced Apartments – Reference Images

3.6. Utilities

Utilities land uses refer to plots dedicated to utilities infrastructure, such as substations, GSM towers, TSE, STPs etc. Utilities planning standards in this section cover all required lands/ plot regulations for utilities infrastructure. Refer to Chapter 7 Utilities Infrastructure for planning standards and guidance for specific utilities typologies.

Utilities – Supplementary Planning Guidance

- RoW and Utilities Infrastructure planning standards are provided in Chapter 6 and 7 respectfully.
- Ensure that the provision of utilities and infrastructure does not impact upon the pedestrian realm within public open space.
- Ensure space is provided for adequate pedestrian access and associated landscape treatments adjacent to infrastructure and utility plots.
- Ensure space is provided for adequate pedestrian access and associated landscape treatments adjacent to infrastructure and utility plots.
- Visually integrate infrastructure and utility plots into the wider urban fabric.
- Wherever possible site infrastructure and utilities below ground and provide a landscape treatment above which integrates the infrastructure plot with the surrounding landscape.
- Where a physical barrier is required around the plot boundary, any such treatment should be integrated with the surrounding built form in terms of materiality, form and height.
- Vegetative screening should be incorporated around infrastructure and utility plots.
- Dedicated vehicular access should be avoided to infrastructure plots, and access requirements should be incorporated within other landscape elements.
- All utilities within the development plot should be coordinated with the utility connections to the plot by the developer. It should be the developer's responsibility to survey all utilities and levels upon possession.
- All utilities should be screened and be designed to blend as part of the local built form/ urban environment.
- No utilities or service rooms should be permitted on the primary (active) or retail frontage.
- Ensure that transmission and distribution projects are initiated, planned and implemented in a timely manner to ensure continuity of service to all residents.
- Sewerage Plants and Solid Waste Plants should refer to MECA requirements.
- EIAs for all utilities projects must adhere to the requirements and guidance of MECA.

Intent

The purpose of the Utilities land use is to provide for public uses that are owned or operated by a public Agency/ Authority in the course of a public utility undertaking. Utilities are provided efficiently, and access provided conveniently.

Goals

- Public uses that are owned or operated by a public Agency/Authority in the course of a public utility undertaking are accommodated and provided for all developments. This may include the provision of water supply, sewerage, electricity/ power, gas, telecommunications, transport, drainage or other like services.
- Utility Facility plots are to follow relevant Authority design guidelines.
- Accessibility and access for operations and maintenance purposes is considered in the selection of the plot location.
- No development may occur within the designated service corridors and plots unless approved by a relevant Ministry or Authority.
- The location of the utility facility is appropriate to the nature of the special purpose and is generally consistent in scale, height and bulk with that of the surrounding development.

Permitted Uses

Primary Uses	Secondary Uses	Not Permitted
• Power • Water • Sewerage • Solid Waste • Irrigation • Drainage and Flood • Telecommunications • Gas • District Cooling	N/A	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Typical Building Height	As per relevant Authority requirements. Buildings should be sensitive to the local urban context and surrounding building heights.	
Typical Floor Height	N/A	
Typical Plot Size	As per relevant Authority requirements.	
Plot Coverage	As per relevant Authority requirements.	
Plot Setbacks	As per relevant Authority requirements. A 1m internal plot setback for screening is advisable.	
Parking and Access	To be determined by Ministry of Transport/ relevant Authority Standards. Access should be provided from the front.	
Public Realm	Utilities plots should incorporate planting and screening, so as to reduce visual impact, especially within residential communities.	

3.7. Agriculture

Agriculture refers to land used for agricultural purposes, such as crops or livestock grazing, either existing or proposed. Agricultural land can include low density residential, outbuildings, agricultural facilities, etc. all of which support the overall functions and operations.

Agriculture – Supplementary Planning Guidance

- Agriculture lands and development should follow Ministerial Decision 46/2017 for the Ministry of Housing land use regulations relating to animal husbandry and grazing – this includes but is not limited to health, safety, location, land use, size, design and maintenance. Any updates to the Ministerial Decision shall take precedent.
- Agricultural lands must be developed in appropriate areas, as designated within Regional/ Local Plans, and consider proximity to distribution areas to reduce travel.
- Agricultural land development must consider The Sustainable Agriculture and Rural Development Strategy – towards 2040 (SARDS 2040) which provides strategic and programmatic guidance to policy and investment in agriculture and the rural sector. It consists of a comprehensive set of measures needed to ensure that future agricultural and rural development are economically viable and environmentally sustainable.
- Prioritisation should be provided to existing agricultural areas and intensification of existing plots.
- The restoration of Harats should be utilised as a mechanism to support agricultural restoration, retainment and enhancement.
- Renewable energy sources should be encouraged for existing and future Agricultural Land.
- Optimise, collection, storage and use of all water resources for Agricultural Lands should be promoted.
- Avoid use of non-renewable groundwater extraction for Agricultural Lands.
- Increase food production through intensification of agriculture within existing properties using better crop and water management technology.
- Encourage the intensification of agriculture within existing properties by adoption of better crop and water management technology.
- Encourage the controlled expansion of agriculture where suitable soil and groundwater resources permit.

Intent

The purpose of Agricultural Land is to safeguard adequate areas to support existing and future agricultural industries and activities, and to ensure development does not negatively impact the land and its functionality.

Goals

- Ensure existing Agricultural Land is safeguarded to allow for continuance and growth of existing agricultural activities.
- Allocate Agricultural Land of sufficient size and within appropriate locations to allow for successful farming and agricultural activities and facilities.
- Ensure any physical development does not impact the overall aesthetics of the surrounding landscapes and is developed to serve the intended function of the agricultural land in which it is located.

Permitted Uses

Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Detached Units (Villa) Appropriate Agricultural Units	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Gym and swimming pools • Tennis and basketball courts • Guard/gate house • Outbuildings and relevant agricultural facilities • Water bodies for agricultural use	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Typical Building Height	Maximum G+2	
Typical Floor Height	3.5m residential and commercial 4m to 7m for agricultural buildings As per industry requirements based on building typology and function.	
Typical Plot Size	Agricultural Plot - Varies – depending on the type of agricultural activity - Minimum 1,500m ² Residential plot within Agricultural Plot – max 1,200m ² (Refer to Low Density Residential – Villa).	
Plot Coverage	Maximum 20%	
Plot Setbacks	To be determined by Oman Building Code.	
Parking and Access	To be determined by MoTCIT/ relevant Authority Standards. Parking recommended on-plot.	



04

COMMUNITY
FACILITIES

4. COMMUNITY FACILITIES

4.1. Introduction

Successful, healthy and sustainable communities are well served by a full range of Community Facilities that are appropriate to resident's needs and are accessible to all. The approach to the provision of Community Facilities developed as part of the ONSS should be adopted across Oman at a national level, ultimately being taken forward and rationalised for each Regional Spatial Strategy (RSS). This Chapter provides an overview of the ONSS Community Facility Standards, alongside guidance for the application of such facilities.

These ONSS Community Facility Standards are intended to provide guidance at a National level, delivering best practice standards and rates for key Community Facilities. The Standards provided act as a national benchmark and are required to be applied for each region or Governorate in relation to the specific urban and rural context of the jurisdiction, taking into account specific governorate differences and variations, for the planning of new and regeneration of existing communities.

The Standards have been designed for communities over 6,000 residents. Any settlements which fall below this threshold should be considered on a bespoke basis, depending on the specific needs of the communities themselves.

The ONSS Community Facility Standards take on-board available existing standards from relevant Authorities, and provide revised standards as per best practice, as well as regional and international benchmarks. Overall, the Community Facility Planning Standards aim to:

- Ensure that appropriate Community Facilities are designed and provided for all, regardless of location in the country or status within the Settlement Hierarchy;
- Provide Community Facilities that make the best use of land, offer ease of access for users and allow flexibility for possible future demographic change;
- Plan for appropriate Community Facilities which are appropriately sizes and located; and
- Ensure that Community Facilities are given an equal weighting with other spatial and land use requirements when planning for sustainable communities across the country.

The ONSS Community Facilities Standards include:

- **Educational Facilities** – Kindergartens, Schools, Colleges and Universities;
- **Municipal, Institutional and Government Services** – Government Services, Administration and Civil Defence Stations;
- **Healthcare Facilities** – Clinics and Hospitals;
- **Parks and Open Space Facilities** - District, Neighbourhood and Local programmed open spaces;
- **Social, Cultural and Recreational Facilities** – Cinemas, Libraries, Cemetery, Community and Youth Centres.
- **Religious Facilities** – Mosques.

4.2. Community Facilities Centre Hierarchy

4.2.1. Approach to Community Facilities Provision

Best practice Community Facility planning uses a defined hierarchy, whereby certain public facilities and services are provided at accompanying spatial scales and population densities. This is done to ensure that appropriate Community Facilities are provided in suitable locations to promote liveability and create successful and highly functional urban areas. When Community Facilities are provided successfully, this promotes sustainable living - by encouraging walking and cycling for daily services, reducing unnecessary vehicle travel, increasing the viability of public transport, and creating active 'Centres' which also encourage social interaction, cohesion and stability.

Based on established best practice, the future community facilities required across Oman will be provided based on a hierarchy of 'Centres' at Local, Neighbourhood, District and City Level. All Centres should be designed to actively encourage Community Facilities to form positive synergies with other land uses within the Centre, such as Commercial and Retail uses. Furthermore:

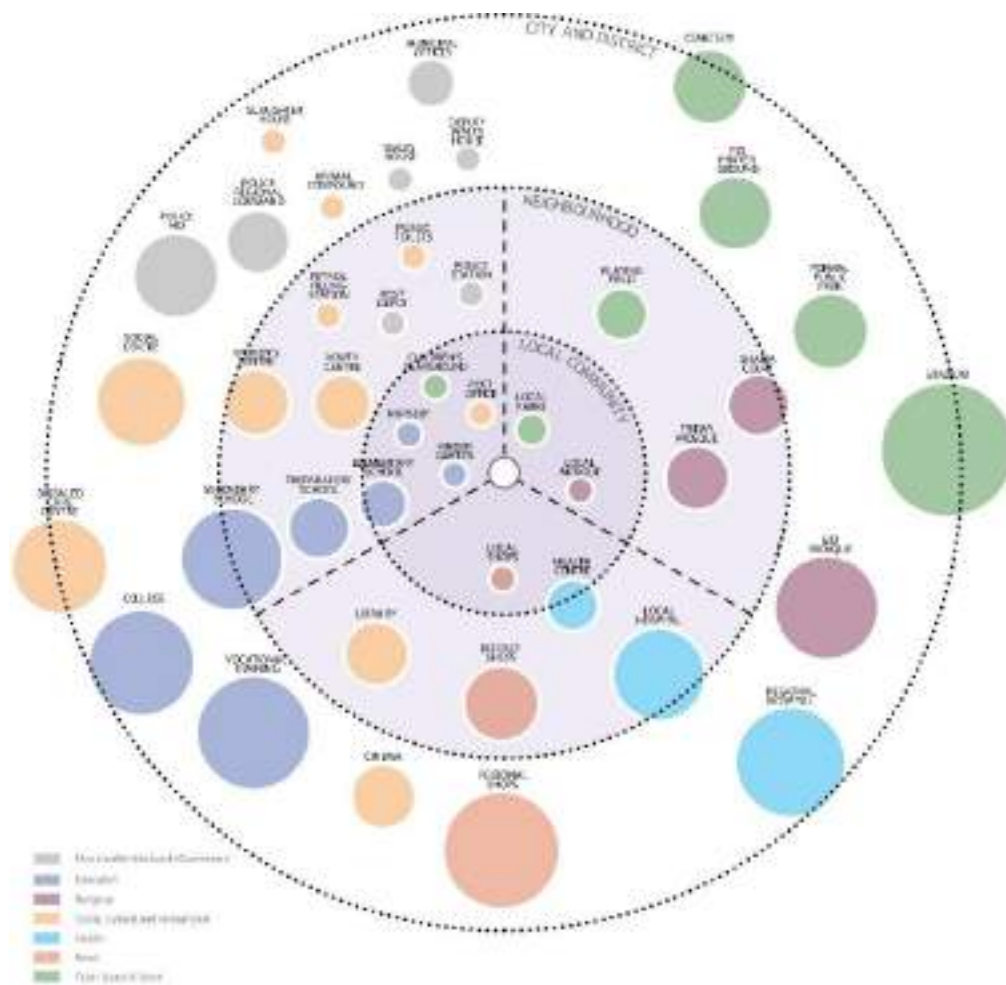
- Centres should be planned as compact and pedestrian oriented systems that respect the scales of the planned urban form;
- Community Facilities to be clustered with, or framing spaces which encourage social gathering such as plazas, or generate pedestrian footfall such as retail and food and beverage uses;
- Centres are to create high streets that mix community and commercial uses, with climate-controlled spaces within this context where possible;
- Where possible, shared parking is to be provided to maximise utilisation of parking spaces and minimise use of land for parking.

4.2.2. ONSS Community Facilities Centre Hierarchy

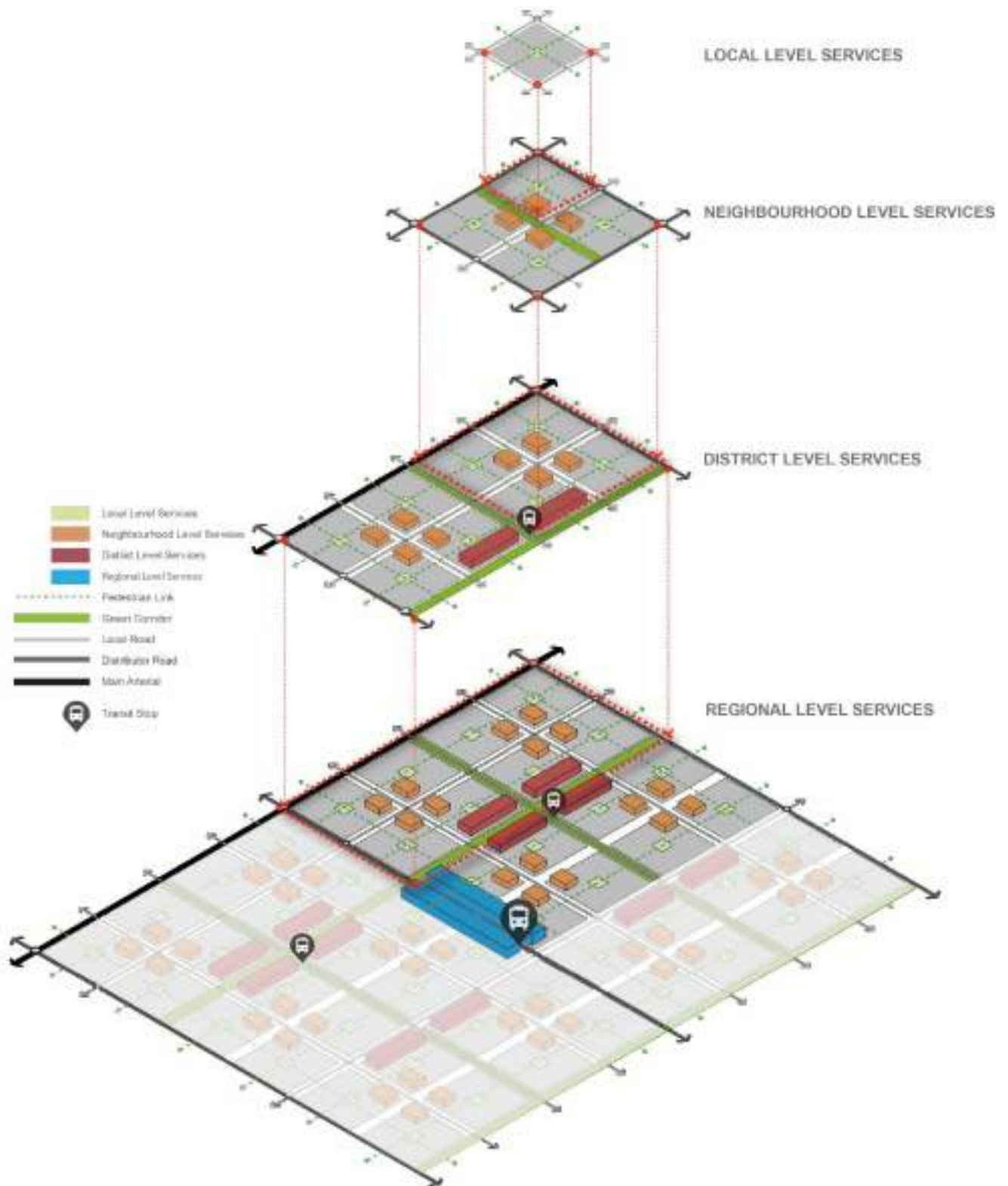
It is important to note that the classification 'Community Facilities Centre Hierarchy' is different from a 'Settlement Hierarchy', however there may be similarities. For the purposes of the ONSS, the Settlement Hierarchy defines existing urban areas and their limits to aide and guide future development, planning and function.

However, the Community Facility Centre Hierarchy provides an order in which the type, size and functionality of specific facilities relating to the needs of the community are provided, based on a defined population catchment size, which may be different to that of the ONSS Settlement Hierarchy definitions.

There may be cases where the Settlement Hierarchy and Community Facility Centre Hierarchy correlate. It is considered best planning practice to ensure Community Facility Centre Hierarchy largely corresponds to the Settlement Hierarchy (e.g. District Centre facilities located within a defined District Centre) in order to create defined hubs and activity centres.

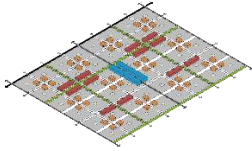


Community Facilities Centre Hierarchy



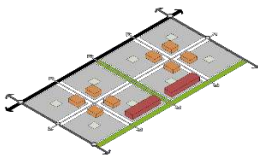
Community Facility Centre Hierarchy Diagram

Based on the underlying principles of accessibility, convenience and sustainability, the location standards for Community Facilities is based on a Centre Hierarchy approach, further detailed throughout this Chapter. As an overview, the ONSS Community Facilities Centre Hierarchy is as follows:



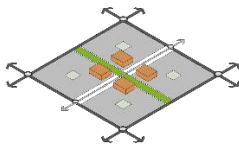
Regional Centre Services

Regional Centre Services include facilities which serve the City as a whole, 200,000 +, and each of the multiple Local, Neighbourhood, and District Centres, providing services which require a large population base to warrant their viability. Due to the larger population and Regional Centre catchment area, a multi-modal public transport hub can be considered viable by co-locating these services on main arterial roads, to ensure accessibility for all residents, some of which may be located at longer distances. Regional Centre Services include, amongst others, Police Headquarters, Hospitals, Care Centres (Disabled, Elderly), Social Centres, Parks and Open Space.



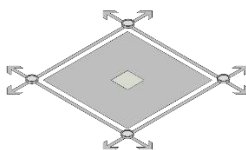
District Centre Services

District Level Services include facilities which require a larger population and catchment to warrant their viability. District Centres serve a catchment of communities, typically 40,000 to 60,000, and offer a broad range of services which cannot be provided at a smaller scale. By serving a wider population base and collocating District Level Services on Boulevards, Avenues or at intersections, increase the viability and necessity of public transport such as bus services, to maintain accessibility alongside encouraging walking and cycling. District Level Services include Cinemas, Libraries, Police Stations, Major Post Offices, Deputy Wali's House, Wali's House, Wali's Office, Parks and Open Space, and Hospitals.



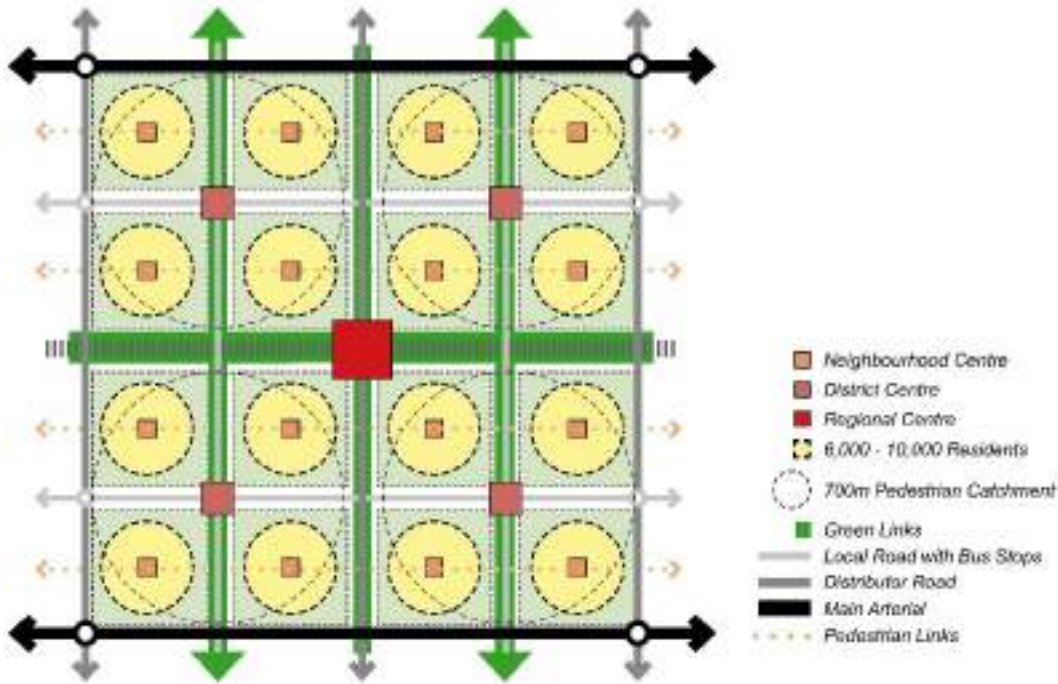
Neighbourhood Centre Services

Neighbourhood Level Services serve a larger population and catchment area, typically 10,000 to 20,000, meaning the types of services provided require a larger population to warrant their viability. Neighbourhood Centres serve a catchment of neighbourhoods by co-locating services in a convenient location, such as on local roads or intersections, as well as main pedestrian routes to encourage everyday walking and cycling, as well as local public transport. Neighbourhood Level Services include Sport and Youth Centres, Clinics, Playing Fields, Local Post Offices Parks and Open Space.



Local Centre Services

Local Level Services are the lowest level of community facility provision, delivering basic services and facilities to a population of around 6,000 to 10,000 within a 5-minute walk. Local Centres provide an area for the co-location of services, to satisfy the day-to-day needs of the immediate population and local residents in accessible locations which encourage walking and cycling. Local Level Services include local convenience, Community Police Points, Early Learning Centres/ Nursery's, Community Centres and Parks and Open Space.



Community Facility Settlement Hierarchy Diagram

Centred Facilities

Centred Community Facilities should be located in a Centre, recommended to be located in close proximity, in order to best serve the population, to ensure their accessibility and catchment radius. There are four broad types of Community Facility that fall within this category:

- Healthcare
- Municipal, Institutional and Governance (Police, Government Facilities)
- Social, Cultural and Recreational
- Parks and Open Space

These Community Facilities should be located according to the functional needs of the facility and be sensitively placed with respect to residential neighbourhoods.

Community Facility Centre Hierarchy - Key Location Criteria and Catchments

	Key Location Criteria	Catchment	Key Community Facilities
Regional Level	• Located in major urban centres; • High profile location / gateway location; • Within a dedicated central core of the City.	200,000+ residents	Police Headquarters Regional Hospital Disabled Rehabilitation and Elderly Care Centre Social Centre Regional Park/ Open Space
District Centre	• Located along Boulevards or Avenues; • Walkability to be encouraged throughout the Centre through a coherent use of open space and pathway linkages; • Integrated with or adjacent to higher order transit stops / station (tram, metro or express bus) where these services are provided; • Provide community facilities within the Centre in a mixed / clustered integrated manner;	Serve 40,000 - 60,000 residents Catchment of 2km or 25-minute walk	Cinema Library Community Support Centre Sports Centre District Police Station Major Post Office Wali's House Wali's Office Municipal/ Government

	Key Location Criteria	Catchment	Key Community Facilities
	- Be located adjacent to District or City Parks/ Plazas and District Mosques; - Provide higher density residential uses to frame the District Centre, to buffer lower density residential areas from the centre and to provide a critical population mass to support the centre; and - Reflect the scale necessary to support the intended commercial function of the centre.		Offices District Hospital (150 bed) District Park/ Open Space
Neighbourhood Centre	- Located along Avenues, Streets or Boulevards; - Good pedestrian connectivity with the surrounding residential area using a coherent system of open space and pathway linkages; - Integrated with or adjacent to local transit stops / stations (such as local bus or tram) where these services are provided; - Provide integrated, mixed community facilities where possible; - Include or be adjacent to Neighbourhood Parks / Plaza and Friday mosques; - Act as a buffer between lower density residential and higher density residential uses; and - Reflect the scale of the neighbourhood they serve.	Serve 10,000 - 20,000 residents Catchment of 800m or 10-minute walk	Youth Centre + Sports Centre Playing Fields Local Hospital (50 bed) Clinic (PHC A) Local Post Office Neighbourhood Park/ Open Space
Local Centre	- Highly accessible, being walkable within 5 minutes; - Include local mosques, nurseries, local shops and playgrounds and a local square.	Serve approximately 6,000 - 10,000 residents Catchment of 350m or 5-minute walk	Community Police Point Clinic (PHC B) Nursery/ Early Learning Centre Community Centre Local Park/ Open Space Cemetery

Non-Centred Facilities

Non-Centred Community Facilities do not necessarily need to be located in a Centre in order to best serve the population. Their location should be determined based on their service radius and local need. There are three broad types of Community Facility that fall within this category:

- Education;
- Municipal, Institutional and Governance (Civil Defence);
- Social, Cultural and Recreational (Petrol Stations and Sports Stadiums).

These Community Facilities should be located according to the functional needs of the facility and be sensitively placed with respect to residential neighbourhoods.

ONSS Community Facility Centre Hierarchy - Non-Centre Facilities

	Key Location Criteria	Catchment	Key Community Facilities
Non-Centre Facilities	- Located based upon the nature and scale of the facility and its compatibility with other surrounding uses; 'Bad neighbour' uses such as animal compounds, slaughterhouses, bus garage and vehicle compound are to be located distant from residential areas and buffered by other uses; - Other uses such as bus terminus sites, bus garage, Eid prayer ground and vocational training centres should be located to provide good levels of connectivity to the City and the primary road network.	<i>Varies – See ONSS Community Facility Standards</i>	Kindergarten – Mixed Cycle 1 School (Public School) – Mixed Cycle 2 School (Public School) – Male/ Female Post-Basic/ Cycle 3 School (Public School) – Male/ Female University College Vocational Training Centre Civil Defence Station (Small/ med/ large) Police Vehicle Compound Sharia Court Cemetery Sports Stadium Slaughterhouse Animal Compound Petrol Filling Station (Local) Highway Petrol Station/ Rest Area

Mosque Facility Standards

Mosque Planning Standards are provided separately to the ONSS Community Facility Planning Standards, as these have taken on-board the latest Standards from the Interim Mechanism of Urban Planning Document, developed by the General Secretariat of the Supreme Council for Planning, and approved by the Supreme Council for Planning in 2014. The Standards provided by this document include Masjids (Local Mosques), Mosques (Friday Mosques), and Sultani Mosques (Grand Mosques). Musalla Standards have been included as part of the ONSS Community Facility Planning Standards.

These Standards have been taken forward as part of the ONSS, as they are considered up-to-date based on the assessment of the SCP and therefore relevant for application for future application.

- **Local Mosque (Masjid)** - serves a single catchment and is typically within walking distance. Serves all Daily prayer times. Required to serve a small worshipper population. To include Majlis, where required.
- **Friday Mosque** - serves multiple catchments within a given area. Typically located along a transit route to provide better access. Serves all daily prayer times and Friday prayers. Required to serve a larger worshipper population than a Masjid to accommodate the number of worshippers from multiple catchments who will attend Friday prayers. To include Majlis, where required.
- **Sultani (Grand/ Eid) Mosque** - similar catchment to a Friday Mosque and serves Daily, Friday and Eid prayers. Adjacent open space requirement to accommodate Eid prayers.
- **Musalla (Prayer Room)** - In non-residential buildings (Hotels, Offices, Shopping Centres etc.), Musalla's will be required within the built form of the building. Musalla's will not replace the requirement for a Mosque in given Neighbourhood or District but will provide additional prayer facilities over and above the provision of all required Mosques.

4.3. Community Facilities – Needs Assessment

Based on the Community Facility Centre Hierarchy set out previously, the determination of required Community Facilities as per defined 'Centres' can be undertaken – for either assessing the adequacy of existing Community Facilities provision within a defined locality or determining the required number of Community Facilities for proposed developments.

The key steps in determining the *type* and *number* of Centres are set out in the following Sections for both 'Existing Localities' and 'New Developments', both of which following a similar structure. Once the Centre Hierarchy has been established, the application of ONSS Community Facilities Planning Standards can be applied based on the identified requirement of the Centre.

4.3.1. Minimum/ Maximum Population Catchment Classification

The ONSS Community Facility Planning Standards provide a 'Minimum' and 'Maximum' population catchment for the majority of Community Facilities which represents a range to consider the diversity of urban context and density of settlements, since in many more sparse areas of Oman there may be a need for facilities even where the typical 'Urban' population threshold may not be met.

Therefore, a two-tier approach to Community Facility provision has been established, defining the population catchment for both Urban and Suburban communities through the provision of 'Minimum' and 'Maximum' population catchments, to ensure facilities are accessible to a more dispersed urban context. It will be the responsibility of the designated Urban Planner/ Authority to decide the appropriate range/ value to be utilised based on the settlement context in question.

As per the ONSS Settlement Hierarchy, 'Rural Support Centres' are classified as those below 5,000 residents, and therefore will require bespoke Community Facilities assessment based on the specific needs of the local communities. The ONSS Community Facilities Standards provide guidance for settlements at 6,000 residents and above.

4.3.2. Centre Facilities: Urban Settlement Context

Existing Localities

For existing localities, it is important to assess whether the existing Community Facilities are adequate to be able to serve the communities in which they sit. To do this, an assessment based on a defined settlement boundary must be undertaken, in which the population can be utilised to determine the optimum number of Community Facilities required to serve the community according to the ONSS Community Facility Planning Standards.

As set out previously, these Centres are classified as per the following hierarchy:

- Regional Centre: Community Facilities at this level are required for every 200,000+ people. Facilities should be provided with good accessibility to public transport to ensure accessibility.
- District Centre: Community Facilities at this level are required for every 40,000 to 60,000 people. Facilities should be provided within a catchment of 2km or 25-minute walk, with good accessibility to public transport to ensure accessibility.
- Neighbourhood Centre: Community Facilities at this level are required for every 10,000 to 20,000 people. Facilities should be provided within a catchment of 800m or 10-minute walk with good accessibility to public transport.
- Local Centre: Community Facilities at this level are required for every 6,000 to 10,000 people. Facilities should be provided within a catchment of 350m or 5-minute walk to ensure accessibility.

Based on the known or estimated population of an existing defined settlement area, the Centre Hierarchy (number and type) can be assessed.

To calculate the Community Facility requirement, the total known or estimated population is divided by each Community Facility Centre Hierarchy population catchment, and any outcome over No. 1.0 value will require all the Community Facilities which the population requires. Any value of (x).5 and above should be rounded up and included within the provision.

$$\text{No. of Centres} = \text{Total Population} / \text{Centre Hierarchy Population Catchment}$$

The above calculation is considered a broad approach to Community Facility Centre Hierarchy definition, and it is understood that settlement boundaries and urban areas are not independent or mutually exclusive.

An assessment of the actual required Community Facility needs, based on settlement and internal community boundaries, will be required for such a retrofit approach to community facilities provision. 'Community Boundaries' are a lower level of classification to Settlement Boundaries and will be for the relevant Local Authority or designated Urban Planning Department to determine, based on the local context of the Settlement under assessment. For community facilities analysis, 'Community Boundaries' need to be identified, in order to assess local level community facility provision. Therefore, the designated Urban Planning Department will be required to:

1. Delineate community and settlement boundaries based on a subjective understanding of the local and unique urban context;
2. Determine the known or estimated population;
3. Determine their context and interdependencies with neighbouring Centres and group based on these outcomes; and
4. Undertake the Community Facility Centre Hierarchy assessment as a final step.

Example:

1. Undertake urban analysis to determine a Settlement/ Urban Boundary in which to conduct the Community Facility Centre Hierarchy Assessment.
2. Estimated/ known population within defined Settlement/ Urban Boundary:
 - 210,000 people
3. Apply the Centres Assessment:
 - 1 Regional Centre (200,000+ population threshold)
 - 4 / 5 District Centres (40,000 to 60,000 population threshold)
 - 11 / 21 Neighbourhood Centres (10,000 to 20,000 population threshold)
 - 35 / 21 Local Centres (6,000 to 10,000 population threshold)

Due to the application of population catchment *ranges*, the outcome of the Community Facilities Centres Hierarchy Assessment produces a *range* of the number of required Centres. It is therefore the responsibility of the designated Urban Planning Department to determine the actual requirement within this range, based on a local urban context analysis. This should include, but not limited to, consideration of the following key parameters:

1. Physical Barriers: Major roadways, highways, transportation corridors, utility corridors, water bodies, protected areas etc.
2. Geographical Physiognomies: Distance to community facilities/ Centres which provide similar functions.
3. Accessibility: Distance to Centres for residents, as per the Standards, to encourage convenience (e.g. 400m Neighbourhood Centre, 700m District Centre etc).

Based on the Community Facility Centre Assessment Outcomes, and the Urban Context Analysis Assessment by the designated Urban Planning Department, the optimum number of Community Facilities can be determined for the defined settlement.

Proposed Developments

Similar to the above process for existing urban areas, for all future development proposals, the Community Facilities Centres Hierarchy can be determined at the outset of the Planning Approvals Process, in order to ensure adequate Community Facilities are provided for future residents.

As part of future Master Planning projects, Developers/ Consultants should determine the number of Centres and their hierarchy based on the projected total population. Adjacency of existing Community Facilities can be considered; however, walkability and accessibility catchment areas should be the key determination for the appropriateness of provision to serve future residents.

As before, to calculate the Community Facility requirement, the total projected population is divided by each Community Facilities Centre Hierarchy population catchment, and any outcome over No. 1.0 value will require all the Community Facilities which the settlement area requires. Any value of (x).5 and above should be rounded up and included within the provision.

$$\text{No. of Centres} = \text{Total Projected Population} / \text{Centre Hierarchy Population Catchment}$$

Example:

1. Projected population within the proposed development:
 - 42,000 people
2. Apply the Community Facilities Centres Assessment:
 - 0 Regional Centre (200,000+ population threshold)
 - 1 District Centre (40,000 to 60,000 population threshold)
 - 2 / 4 Neighbourhood Centres (10,000 to 20,000 population threshold)
 - 4 / 7 Local Centres (6,000 to 10,000 population threshold)

Due to the application of population catchment *ranges*, the outcome of the Community Facilities Centres Hierarchy Assessment produces a *range* of the number of required Centres. It is therefore the responsibility of the Developer/ Consultant to determine the appropriate number of District/ Neighbourhood/ Local Centres, which is appropriate to the proposed development, based on a local urban context assessment. This should include, but not limited to, consideration of the following key parameters:

1. Physical Barriers: Major roadways, highways, transportation corridors, utility corridors, water bodies, protected areas etc.
2. Geographical Physiognomies: Distance to community facilities/ Centres which provide similar functions.
3. Accessibility: Distance to Centres for residents, as per the Standards, to encourage convenience (e.g. 400m Neighbourhood Centre, 700m District Centre etc).

Based on the above Community Facilities Centres Hierarchy Assessment and Urban Context Analysis, the appropriate number of Centres, and therefore Community Facilities can be determined, which will require approval from the relevant designated Urban Planning Department.

4.3.3. Community Facilities Centre Hierarchy relationship with ONSS Settlement Hierarchy

The below table provides a high-level assessment of the community facility centres required as per the ONSS Settlement Hierarchy, highlighting the relationship between the two definitions. As mentioned previously, it will be the responsibility of a designated urban planner to determine actual settlement boundaries and catchment requirements based on the locality/ governate in question, to ensure all settlements are adequately provided with the required community facilities to support the community across all spatial scales.

Example of Link between ONSS Settlement Hierarchy and Community Facilities Centre Assessment

Title	Code	Link to Community Facility Centre Assessment (<i>indicative</i>)	ONSS Settlement Hierarchy Population Assumption (Max.)
Capital City (Greater Muscat)	A	✓ 10 (+/-) Regional Centres (200,000+ population threshold) ✓ 50 / 33 District Centres (40,000 to 60,000 population threshold) ✓ 200 / 100 Neighbourhood Centres (10,000 to 20,000 population threshold) ✓ 333 / 200 Local Centres (6,000 to 10,000 population threshold)	2,000,000
National Gateways (Greater Salalah, Great Sohar, Duqm)	B1	✓ 1 (+/-) Regional Centres (200,000+ population threshold) ✓ 8 / 5 District Centres (40,000 to 60,000 population threshold) ✓ 30 / 15 Neighbourhood Centres (10,000 to 20,000 population threshold) ✓ 50 / 30 Local Centres (6,000 to 10,000 population threshold)	300,000
National Hub (Greater Nizwa)	B2	✓ 1 (+/-) Regional Centres (200,000+ population threshold) ✓ 8 / 5 District Centres (40,000 to 60,000 population threshold) ✓ 30 / 15 Neighbourhood Centres (10,000 to 20,000 population threshold) ✓ 50 / 30 Local Centres (6,000 to 10,000 population threshold)	300,000
Regional Hubs (Governance) (Al Buraymi, Ar Rustaq, Haima, Ibra, Ibri, Khasab, Sur)	C1	✓ 1 Regional Centre (200,000+ population threshold) ✓ 5 / 3 District Centres (40,000 to 60,000 population threshold) ✓ 20 / 10 Neighbourhood Centres (10,000 to 20,000 population threshold) ✓ 33 / 20 Local Centres (6,000 to 10,000 population threshold)	200,000
Regional Hubs (Economic) (Barka, As Suwayq)	C2	✓ 1 Regional Centre (200,000+ population threshold) ✓ 5 / 3 District Centres (40,000 to 60,000 population threshold) ✓ 20 / 10 Neighbourhood Centres (10,000 to 20,000 population threshold) ✓ 33 / 20 Local Centres (6,000 to 10,000 population threshold)	200,000
Primary Service Centres	D1	✓ 1 Regional Centre (200,000+ population threshold) <i>if required</i> ✓ 4 / 3 District Centres (40,000 to 60,000 population threshold) ✓ 15 / 8 Neighbourhood Centres (10,000 to 20,000 population threshold) ✓ 25 / 15 Local Centres (6,000 to 10,000 population threshold)	150,000
Major Rural Villages	E1	✓ 0 Regional Centre (200,000+ population threshold) ✓ 1 (+/-) District Centres (40,000 to 60,000 population threshold) ✓ 2 / 1 Neighbourhood Centres (10,000 to 20,000 population threshold) ✓ 3 / 2 Local Centres (6,000 to 10,000 population threshold)	20,000
Rural Support Centres	E2	<i>As required – dependent on proximity to other service centres and facilities.</i>	5,000
Rural Villages	E2	<i>As required – dependent on proximity to other service centres and facilities.</i>	100+

4.4. Community Facilities – Location Standards

The ONSS Community Facility Standards identifies facilities which are recommended to be co-located with supporting or complimentary facilities – either benefiting the community in terms of accessibility or needs requirements or benefiting the operational requirements. Co-location can refer to the ‘integration’ or ‘adjacency’ of facilities. There are a number of benefits for the co-location of facilities:

- Land take reduction (parking, circulation, infrastructure);
- Centre definition/ sense of place;
- Increased accessibility;
- Reduced trip generation;
- Lower development, operation and maintenance costs.

The ONSS Community Facility Planning Standards provides recommendations for the co-location of facilities as part of the standards Planning Guidance:

4.4.1. Co-Location: Adjacent Facilities

Adjacent facilities are operated as separate facilities but assembled together on one plot or site. Entrances, GFA calculations and supporting functions are kept separate. External spaces can be shared such as parking, internal facilities (e.g. schools’ outdoor fields) and can also encourage reduced trip generation.

Example:

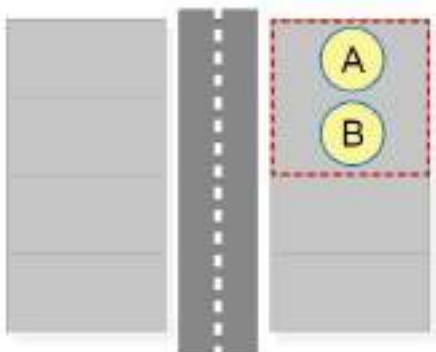
- A municipality building and a post office.
- A police station and civil defence unit.
- School campuses e.g. primary and intermediate schools; intermediate and secondary schools; or in some cases all three school types together; primary, intermediate and secondary.

4.4.2. Co-location: Integrated Facilities

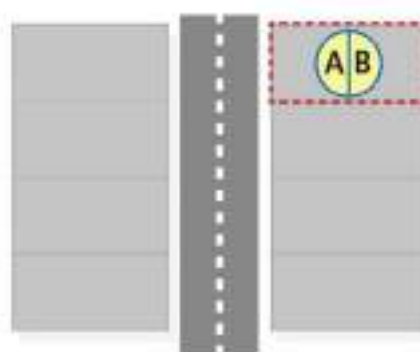
Integrated facilities are operated as separate facilities but assembled together on one complex or building with shared entrances, central services and some common spaces within. GFA calculations can be kept separate, if required. Integrated facilities can be managed in a way to serve different functions at different times during the day, week or month, therefore requiring the need for one space which serves a number of community functions.

Example:

- Community Centres: These can be flexible spaces such as meeting spaces and activity spaces by schoolchildren and then by the wider community and social groups (such as youth clubs) at different times of the day, therefore reducing the need for three separate spaces.
- Swimming pools in schools can be used by the wider community in the evenings and weekends when the school is not operating. Swimming pools in municipal or centre settings can be timetabled to allow for dedicated school use at specific times of the school day.



Co-Location Adjacent Facilities



Co-Location Integrated Facilities

Colocation – Adjacency and Integration Example Diagram

4.4.3. Community Facilities and Retail/ Commercial Integration

To create defined 'Centres', be that at a Regional or Local scale, it is important to create defined activity hubs, which provide a range of services and facilities to serve the local and wider population. Such 'hubs' support community cohesion, social well-being, as well as providing defined sense of place which is important in creating and maintaining quality communities where people want to live, work and thrive.

To do this, the integration and co-location of commercial and retail activities with Community Facilities is important for every Centre and should be provided as per the specific requirements of the local communities. In general, the following commercial and retail uses should be provided at each Centre:

- **Regional Centre:** To provide primarily commercial uses such as office and retail together with Government/Institutional services and select community facilities. Regional Centres typically provide significant employment, retail, cultural, entertainment and specialist services opportunities in a higher density format than found in Neighbourhood and District Centres.
- **District Centre:** To balance community facility provision with supporting commercial services such as office, larger scale or specialist retail and entertainment floorspace. District Centres provide higher order services than can be found in Neighbourhood Centres and Local Centres, as they serve as a focal point for proximate neighbourhoods.
- **Neighbourhood Centre:** To provide specific retail and commercial uses such as larger supermarkets, Food and Beverage outlets, and some specialist retail. Neighbourhood Centres provide higher order services than can be found in Local Centres, as they serve as a focal point for proximate communities.
- **Local Centre:** To serve the basic day-to-day needs of a community for religious, community, convenience retail and recreational services. They act as the focal point for the local community, as meeting places and places of interaction, and given the day-to-day nature of the services they provide, they attract frequent trips from within their catchments. Where possible, Local Centres should be within a 350-700m (5-10 minute) walk of residents.

4.5. Community Facility Planning Standards

Based on the above Community Facilities Centre Hierarchy approach, the following Standards have been developed for Community Facilities in Oman.

An overview of the ONSS Community Facility Planning Standards is provided below, determining the Standards set out for all significant community facilities considered essential to maintain a high quality of life for residents in Oman. Community Facility Standards are provided for both 'Centre' and 'Non-Centre' facilities, as described previously.

Mosque Planning Standards for the ONSS are provided as separate Standards, as these do not necessarily adhere to the Community Facility Centre Hierarchy, and are provided on a more concentrated scale, such as Masjid Mosques which are not required in Centres, moreover, integrated within residential communities.

KEY

Education	
Healthcare	
Municipal, Institutional and Governance	
Social, Cultural and Recreational	
Religious	
Parks and Open Space	

ONSS Community Facilities Standards – Centre Facilities

CENTRE FACILITIES				
	Maximum Population Catchment	Minimum Population Catchment	Indicative Site Area (sqm)	Supplementary Guidance
Regional Centres (200,000+)				
Police Headquarters/ Police Regional Command Centre	250,000	200,000	36,000	Central location recommended. Location and response times to be in accordance with RoP Standards.
Regional Hospital (300 Bed)	100,000	100,000	200,000	Based on OHV 2050. MoH Standards and Guidelines must be followed. MoH approval required. Emergency Response time: 15 Minutes.
Disabled Rehabilitation and Elderly Care Centre	100,000	100,000	60,000	Needs assessment required per facility. MoH Standards and Guidelines must be adhered to. MoH approval required.
Social Centre	100,000	75,000	7,000	Standalone Facility, with flexible uses recommended.
Regional Park/ Open Space	200,000+	200,000+	0.2ha/ 1,000 pop	Spacious land areas of Regional significance, including natural, undeveloped landscapes. Preservation of important natural features and regional-wide important civic spaces. Significant public art, as well as Areas for Omani Day Celebrations and passive Use.

CENTRE FACILITIES				
	Maximum Population Catchment	Minimum Population Catchment	Indicative Site Area (sqm)	Supplementary Guidance
				Dictated by natural landscapes, major historical landmarks and monumental central spaces within developed areas.
District Centre (40 – 60,000)				
Cinema	50,000	40,000	5,000	Located within Centre.
Library	50,000	40,000	3,000	Adjacency or Integration with Community Support Centre encouraged.
Community Support Centre	60,000	50,000	8,000	Adjacency or Integration with Sports Centre encouraged.
Sports Centre	40,000	40,000	20,000*	Adjacency or Integration with Community Support Centre encouraged.
District Police Station	50,000	40,000	7,000	Central location recommended. As per RoP standards and guidelines. Location and response times to be in accordance with RoP Standards.
Major Post Office	50,000	40,000	2,500	Co-location with Community Centre recommended.
Wali's House	60,000	60,000	1,200	Facility provided as required.
Wali's Office	60,000	60,000	5,000	Facility provided as required.
Municipal/ Government Offices	50,000	40,000	5,000	As per relevant Authority requirements.
District Hospital (150 bed)	50,000	40,000	200,000	Based on OHV 2050. MoH Standards and Guidelines must be followed. MoH approval required. Emergency Response time: 15 Minutes.
District Park/ Open Space	60,000	40,000	0.2ha/ 1,000 pop	District level important public spaces with historic and civic landmarks, historic and civic landmarks monumental public art. Major cultural events but generally passive use, which are suitable for District-wide activities and gatherings. Dictated by major civic entities, landmarks or historic landscapes of District-wide significance.
Neighbourhood Centre (10-20,000)				
Youth Centre + Sports Centre	20,000	10,000	15,000*	Adjacency with Education Facilities recommended.
Playing Fields	15,000	10,000	15,000*	Adjacency with Education Facilities and Community Centre/ Youth Centre recommended.
Local Hospital (50 bed)	20,000	15,000	150,000	Based on OHV 2050. MoH Standards and Guidelines must be followed. MoH approval required. Emergency Response time: 15 Minutes.
Clinic (PHC A)	10,000	10,000	50,000	Based on OHV 2050. MoH Standards and Guidelines to be followed. MoH approval required.

CENTRE FACILITIES				
	Maximum Population Catchment	Minimum Population Catchment	Indicative Site Area (sqm)	Supplementary Guidance
				All patients/consumers should be able to reach the PHC institute within 20 minutes (Oman Health Strategy 2050). Integration with Community Centres recommended.
Local Post Office	20,000	10,000	4,000	Located close to residential community development.
Neighbourhood Park/ Open Space	20,000	10,000	0.4ha/ 1,000 pop	Important civic spaces which preserve unique and historic assets. Specialised destination sports facilities with public art and performance space. Specialised sports facilities (active/ passive uses). Locations of major civic spaces should be central within more densely populated areas. Additional Parks should be located around civic facilities and assets (museums, institutions, governmental buildings, historic landmarks, etc.). Larger parks designed for specific uses are located adjacent and accessible to population centres.
Local Centre (6-10,000)				
Community Police Point	10,000	6,000	150	Avg. 8 to 15-minute response time recommended. Location and response times to be in accordance with RoP Standards. Integration with Community Centres / Community Ambulance Point recommended.
Clinic (PHC B)	10,000	7,000	30,000	Based on OHV 2050. MoH Standards and Guidelines must be followed. MoH approval required. All patients/consumers should be able to reach the PHC institute within 20 minutes (Oman Health Strategy 2050). Integration with Community Centres recommended.
Community Ambulance Point	10,000	6,000	150	Avg. 8 to 15-minute response time recommended. Location and response times to be in accordance with RoP Standards. Integration with Community Centres / Community Police Point recommended.
Nursery/ Early Learning Centre	8,000	6,000	1,200	Colocation with Community Centres recommended.
Community Centre	8,000	6,000	1,250	Colocation with Clinic (PHC B), ELC, Community Police Point recommended.
Cemetery	10,000	6,000	7,000	As per Ministry of Endowments and Religious Affairs standards and guidelines.
Local Park/ Open Space	10,000	1,000	0.4ha/ 1,000 pop	Serves multiple communities with a mix of daily use and important district-wide public functions. Smaller scale public art with active and passive use and large athletic fields for organised and informal activities. Locations of major civic spaces should be central within more densely populated areas. Additional

CENTRE FACILITIES				
	Maximum Population Catchment	Minimum Population Catchment	Indicative Site Area (sqm)	Supplementary Guidance
				Parks should be located around civic facilities and assets (museums, institutions, governmental buildings, historic landmarks, etc.). Larger parks designed for specific uses are located adjacent and accessible to population centres.
Community Park/ Open Space	1,000	150	0.3ha/ 1,000 pop	Integrated with daily life and activities to provide users with a variety of play areas and gathering areas. Features designated areas design for outdoor children's play, as well as equipped playgrounds with Smaller sport pitches/courts. Abundant seating and abundant shade for active and passive use. Locations are within a maximum of 350m of residents. Smaller typologies such as the Baraha/ Meyadeen have a general distribution of 1/developed residential block.

**In line with Interim Mechanism of Urban Planning Document, 2014 (General Secretariat of the Supreme Council for Planning)*

ONSS Community Facilities Standards – Non-Centre Facilities

NON-CENTRE FACILITIES				
	Maximum Population Catchment	Minimum Population Catchment	Indicative Site Area (sqm)	Planning Guidelines
Kindergarten - Mixed) *	5,000	500	5,000 – 8,000	Refer to latest MoE Standards for Education Facilities Planning Guide.
Cycle 1 School (Public School) – Mixed*	8,000	2,500	15,000 – 25,000	Refer to latest MoE Standards for Education Facilities Planning Guide.
Cycle 2 School (Public School) – Male/ Female *	19,000	3,000	25,000 – 35,000	Refer to latest MoE Standards for Education Facilities Planning Guide.
Post-Basic/ Cycle 3 School (Public School) – Male/ Female*	60,000	20,000	30,000	Refer to latest MoE Standards for Education Facilities Planning Guide.
University*	200,000	100,000	60,000	As per MoHE latest Standards.
College*	120,000	80,000	60,000	As per MoHE latest Standards.
Vocational Training Centre*	100,000	75,000	60,000	As per MoHE latest Standards.
Civil Defence Station (Small)	N/A	3km Catchment Radius	5,000	Location and response times to be in accordance with RoP and Public Authority for Civil Defence and Ambulance.

NON-CENTRE FACILITIES					
	Maximum Population Catchment	Minimum Population Catchment	Indicative Site Area (sqm)	Planning Guidelines	
Civil Defence Station (Med)	2.5km Catchment Radius	3.5km Catchment Radius	6,500		
Civil Defence Station (Large)	12km Catchment Radius	N/A	8,000		
Police Vehicle Compound	200,000	200,000	18,000	As per RoP standards and guidelines. Location away from residential areas recommended.	
Sharia Court	50,000	20,000	20,000	As per Ministry of Endowments and Religious Affairs standards and guidelines.	
Sports Stadium	200,000	100,000	200,000	Location to be in accordance with relevant TIS and Authority Approvals.	
Slaughterhouse	100,000	50,000	2,000	Location away from residential areas recommended.	
Animal Compound	100,000	50,000	3,000	Location away from residential areas recommended.	
Petrol Filling Station (Local) Recommended)	15,000	10,000	2,500	- Fuelling island - NGV facilities - LPG store - Carwash	- Oil change - Tyre repair - Car parking - Off-loading for fuel
Highway Petrol Station and Rest Area (Recommended)	N/A	N/A	20,000	- Fuelling island - NGV facilities - LPG store - Carwash	- Oil change - Tyre repair - Car parking - Off-loading for fuel

* Source: Ministry of Education

Typical Population Density – Villas – Approx. 40 people/ hectare					
	Population Catchment	Worshipper Population	Total Area (m2)	Parking	Planning Guidelines
Masjid*	1,000	400	1,826	20 spaces	300m Catchment Radius. As per Ministry of Endowments and Religious Affairs standards and guidelines.
Friday Mosque*	4,500	2,000	7,135	100 spaces	600m Catchment Radius. Provide Eid Prayer Ground (as required). As per Ministry of Endowments and Religious Affairs standards and guidelines.
Higher Population Density – Multi-Story Buildings – Approx. 70 people/ hectare					
	Population Catchment	Worshipper Population	Total Area (m2)	Parking	Planning Guidelines
Masjid*	2,000	800	2,801	32 spaces	300m Catchment Radius.

					As per Ministry of Endowments and Religious Affairs standards and guidelines.
Friday Mosque*	7,900	3,000	9,900	150 spaces	600m Catchment Radius. Provide Eid Prayer Ground (as required). As per Ministry of Endowments and Religious Affairs standards and guidelines.
Sultani Mosque					
	Worshipper Population	Total Area (m2)	Parking	Planning Guidelines	
Sultani Mosque*	5,000	20,000	335 spaces	Provide Eid Prayer Ground (where required). As per Ministry of Endowments and Religious Affairs standards and guidelines.	
Musalla (non-residential multi-story buildings)					
	Worshipper Population		Male vs. Female		GFA
Musalla	35% total non-residential vehicle parking spaces		50% worshipper population		Worshipper population x 0.9 sqm. As per Ministry of Endowments and Religious Affairs standards and guidelines.

*Source: Interim Mechanism of Urban Planning Document, General Secretariat of the Supreme Council for Planning (2014)

Other Religious Facilities			
	Worshipper Population	Male vs. Female	GFA
Churches/ Temples / Other	<i>To be determined by Ministry of Endowment and Religious Affairs on a case-by-case basis.</i>	<i>To be determined by Ministry of Endowment and Religious Affairs on a case-by-case basis.</i>	<i>To be determined by Ministry of Endowment and Religious Affairs on a case-by-case basis.</i>

4.5.1. Community Facilities - Supplementary Planning Guidance

- Community facilities should be provided within defined centres, across a defined hierarchy of centres at Local, Neighbourhood, District and City level to promote liveability and create successful and highly functional residential areas.
- The Community Facility Hierarchy should be utilised in order to inform the requirement and location standards of community facilities. The community facilities standards set out in this chapter shall be adopted to ensure facilities are provided in accessible and appropriate locations.
- Centres shall be planned as compact and pedestrian oriented systems that respect the scales of the planned urban form. Pedestrian access should be safe and comfortable, with non-obstructive shade ways.
- Community facilities within defined centres should be clustered with, or framing spaces which encourage social gathering such as plazas or generate pedestrian footfall such as retail and food and beverage uses, to create activity centre and places of social interaction.
- All community facilities should be easily accessible by defined pedestrian and cyclist routes to encourage walking and cycling.
- All community facilities should be conveniently located and in close proximity to public transport stops and interchanges, such as buses and taxis, to ensure high levels of accessibility.
- Mosques should be the focal point of any given centre, although they are to be designed to integrate with the connections to the surrounding public realm.
- Mosques should be located where they are easily accessible by worshippers travelling on foot or by public transport.
- Community facilities shall promote equality and social inclusion through the design and development of community facilities, services and spaces, catering for both Omanis and Expats and the elderly and disabled.
- Where possible, shared parking should be provided to maximise utilisation of parking spaces and minimise use of land for parking. Basement parking should be encouraged for relevant community facilities, where feasible.
- Community facilities shall be delivered in a phased manner and in accordance with a defined taking phasing strategy and growth projections.
- Non-centre facilities shall be in highly accessible locations with suitable access and egress from the road network, with suitable parking to be provided within the plot.
- It is preferential for schools to be in centres where possible, although it is not essential. Schools should be located throughout the residential communities that they serve rather than being clustered in central locations.
- Where schools are not located in centres, they should be located in accessible urban areas, close to community centres to encourage students to walk to school on foot, reducing vehicular movements and allowing residents to take advantage of local facilities.

4.6. Education

Intent The purpose of the Educational Facilities is to provide for education related activities and institutions that will be under private or public ownership, which adequately serve the local school-age population and contribute to the educational goals of Oman.		
Goals • Provide appropriate balance of educational uses and facilities and are provided to meet the identified needs of the community. • Ensure Education facilities are located in publicly accessible and convenient locations and is generally consistent in scale, height and bulk with that of surrounding development. • Ensure the form of development is specific to the facility in recognition of particular operational, functional and locational criteria of Educational facilities. • Provide Schools in accordance with the requirements of the Ministry of Education (MoE).		
Permitted Uses		
<i>Primary Uses</i>	<i>Secondary Uses</i>	<i>Not Permitted</i>
• Kindergarten • Cycle 1 School (Public School) • Cycle 2 School (Public School) • Post-Basic/ Cycle 3 School (Public School) • University • College • Vocational Training Centre	• Open Space • Car and Bus Parking • Swimming Pool and Sports Facilities	<i>All except Primary and Secondary Uses</i>
Typical Max Building Height	Kindergarten Cycle 1 School (Public School) Cycle 2 School (Public School) Post-Basic/ Cycle 3 School (Public School) University College Vocational Training Centre	G+1 G+2 G+2 G+2 G+3 G+3 G+1
Typical Floor Height	4.5m	
Indicative Plot Size	Varies depending on location/ site and school size. To be determined by Ministry of Education/ Oman Building Code.	
Plot Coverage	40%	
Plot Setbacks	To be determined by Ministry of Education/ Oman Building Code.	
Parking and Access	To be determined by MoTCIT/ Ministry of Education/ or relevant Authority standards.	
Open Space	To be determined by Ministry of Education/ Oman Building Code.	

Education – Definitions				
	Grade	Age	Separate/ Mixed	Max children per classroom
Kindergarten	-	3-5	Mixed	20
Cycle 1 Schools	Grades 1-4	6-9	Mixed	30
Cycle 2 Schools	Grades 5-10	10-15	Male/female	30
Post - Basic Education	Grades 11-12	16-17	Male/female	30

Private Schools	Kindergarten – Grade 12	3-17	Determined by the school	30
Vocational Training Centre	N/A	18+	Mixed	N/A
Technical College	N/A	18+	Mixed	N/A
University	N/A	18+	Mixed	N/A

Education – Supplementary Planning Guidance

- The Ministry of Education 2018 Standards have been taken forward and included in the ONSS Community Facilities Standards – Education, as they are deemed up-to-date and therefore appropriate in order for the MoE to regulate the future provision of education facilities across Oman. *Any revisions by MoE will take precedent over the Standards provided in this document.*
- As it has been identified that there are no rates for Private Schools by the MoE, recommended rates for such facilities are provided and should be used as a guide.
- The Standards for Education Facilities are provided as 'Non-Centred Facilities, as Schools should be provided as per the needs of residential communities and may not be appropriate to be located within Centres with regards to traffic and safety.
- Higher Education Facilities should be determined on a case-by-case basis, as per the requirements of the Ministry of Higher Education (MoHE).
- Higher Education Facilities have been included as Non-Centre Facilities, as it is not necessary to include such facilities within Centres, or every Centre. If located outside urban areas, such as in purpose built educational complexes or 'Cities'.
- Higher Education Facilities should be well served by public transport systems, encourage walking and cycling, provide a range of accessible ancillary community facilities such as Mosques, Clinic, Retail and Open Space, and be fully integrated into the wider urban framework.
- As there are no defined Private versus Public school definition or standards by the Ministry of Education, Private versus Public school is provided as an indicative percentage breakdown. It will be the responsibility of the relevant Authority to define the Private versus Public School Breakdown Assumptions based on the population context of the local area/ catchment. The standards provided in this document should be used at a National level as a guide.
- Ministry of Education consultation should be sought for any Private School development at the onset.



Education - Typical Diagram



Education – Reference Images

4.7. Healthcare

Intent														
The purpose of Healthcare Facilities is to provide for medical facilities to serve the population, to a high standard, which are accessible to all, as well as support the Oman Health Vision 2050.														
Goals														
• Ensure Healthcare facilities are located in convenient, publicly accessible locations, and promote accessibility through walking and cycling • Public Transport stops are provided in coordination with Healthcare facilities to promote accessibility. • Ensure Healthcare facilities provide the level of medical care required for every community, be that day-to-day or emergency care. • Provide Healthcare in accordance with the requirements of the Ministry of Health (MoH). • Support the implementation and execution of the Oman Health Vision 2050.														
Permitted Uses														
<i>Primary Uses</i>	<i>Secondary Uses</i>	<i>Not Permitted</i>												
• Hospital (300 bed) • Hospital (150 bed) • Hospital (50 bed) • PHC Clinic Type A • PHC Clinic Type B • Disabled Rehabilitation and Elderly Care Centre	• Open Space • Car Parking	<i>All except Primary and Secondary Uses</i>												
Typical Building Height	Varies (dependent upon facility type, location and size)													
Typical Floor Height	To be determined by Ministry of Health/ Oman Building Code.													
Indicative Plot Size	<table><tr><td>Hospital (300 bed);</td><td>200,000m²</td></tr><tr><td>Hospital (150 bed);</td><td>200,000m²</td></tr><tr><td>Hospital (50 bed);</td><td>150,000m²</td></tr><tr><td>PHC Clinic Type A:</td><td>50,000m²</td></tr><tr><td>PHC Clinic Type B:</td><td>30,000m²</td></tr><tr><td>Disabled Rehabilitation and Elderly Care Centre:</td><td>60,000m²</td></tr></table>		Hospital (300 bed);	200,000m ²	Hospital (150 bed);	200,000m ²	Hospital (50 bed);	150,000m ²	PHC Clinic Type A:	50,000m ²	PHC Clinic Type B:	30,000m ²	Disabled Rehabilitation and Elderly Care Centre:	60,000m ²
Hospital (300 bed);	200,000m ²													
Hospital (150 bed);	200,000m ²													
Hospital (50 bed);	150,000m ²													
PHC Clinic Type A:	50,000m ²													
PHC Clinic Type B:	30,000m ²													
Disabled Rehabilitation and Elderly Care Centre:	60,000m ²													
Plot Coverage	60%													
Plot Setbacks	To be determined by Ministry of Health/ Oman Building Code.													
Parking and Access	Parking should be provided on-plot. To be determined by Ministry of Health/ MoTCIT/ relevant Authority Standards.													
Public Space	Minimum 30% of the total plot area. To be determined by Ministry of Health/ Oman Building Code.													

Healthcare – Supplementary Planning Guidance

- The OHV 2050 Standards for Primary Health Care (PHC) 'Clinics' and 'Hospitals' have been utilised and categorised within the Community Facility Centre Hierarchy, in order to maintain a consistent hierarchy for the purpose of the ONSS according to defined population catchments. Any revisions to the OHV will take precedent over the Standards provided in this document.
- PHC (A) and (B) Clinics, as defined by the OHV 2050 should include: 20 Clinics, Pharmacy, Dental Clinic, Medical Store of sufficient size, Diagnostic Medical Laboratory, X-Rays Facilities and Treatment Room with Treatment Beds, 50-person Multi-Purpose Hall, and 10-person Meeting Room.
- PHC (A) are to also include Maternity services including 2 delivery suites and recovery beds according to the OHV 2050.
- PHC A and B Clinics should be provided to treat the day-to-day health needs of local communities, and therefore located within District and Local Centres to ensure convenient accessibility.
- Following consultation with the Ministry of Health, the exact services provided by PHC Clinics is to be determined based on an assessment of the local area and identified needs.
- Indicative Site Area (sqm) is based on consultation with the Ministry of Health, however, exact sizes are to be determined based on an assessment of local needs and required treatment facilities.
- The provision of Disabled Rehabilitation and Elderly Care Centre is recommended to conduct a Needs Assessment prior to land/ facility allocation, in order to ensure its suitability as per the population requirements. This can be based on census data regarding recorded disability, as well as age profile. Overall, such facilities should be located within Regional Centres in order to ensure accessibility to a larger population catchment.
- Community Ambulance Points are to be provided to ensure good accessibility to emergency services for the whole population. Such facilities should include parking bays (approx. 2) and small holding area. Such facilities are recommended to be co-located with Community Police Point / Community Centres at a Local level.

Taken from the Oman Health Vision 2050, the following provides additional supplementary guidance from the Ministry of Health:

- Hospitals should be provided as "General Hospitals" with specialties based on the needs and epidemiology of the catchment population.
- 300-bed (and more) hospitals should include subspecialties according to projected local needs.
- Hospitals should be constructed as multi-story hospitals (2, 3, 4 or more floors) in 50-bed blocks and should be expandable to accommodate services for a growing population;
- All hospitals should include "Day Care", the number of day-care beds will depend on the specialties that will provide day-care and advances in technology.
- All hospitals should provide rehabilitation services.
- All hospitals should have a "Renal Dialysis Unit" (20, 30 beds or more).
- The number of beds in critical care units (Intensive Care Units (ICU), Coronary Care Units (CCU), Special Care Baby Units (SCABU)) should be at least 20% of the total number of hospital beds.
- All hospitals should have sufficient outpatient department (35, 50 clinics or more as needed during planning of specific hospital) together with treatment rooms, ECG and other diagnostic rooms.
- All hospitals should have isolation rooms and special rooms to accommodate at least 10% of the beds.
- All hospitals should have private rooms to accommodate 20-50% of beds (to increase hospital revenues).
- For 300-bed (and more) hospitals, there should be accommodation for patients' companions (to increase hospital revenues).



Healthcare - Typical Diagram



Healthcare – Reference Images

4.8. Social, Cultural and Recreational

Intent The purpose of the Social, Cultural and Recreational Services is to provide for a range of organised services which support local residents. Social, Cultural and Recreational Services should be integrated where possible within Centres to enhance the urban fabric and communities in which they sit. Goals • Ensure adequate Social, Cultural and Recreational services are provided to meet the identified needs of the community. • Provides services in accordance with the ONSS Community Facility Planning Standards. • Ensure development is designed to maximise energy efficiency, water conservation and public/active transport use. • Ensure Social, Cultural and Recreational are located in convenient and accessible locations. • Promote accessibility through defined pedestrian and cycle routes, as well as conveniently accessible and coordinated public transport stops, such as defined bus stops and taxi ranks. • Provide for a mixture of compatible land uses that may be co-located or integrated. • Provide Social, Cultural and Recreational in accordance with the requirements of the relevant Authority. Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Social Centre • Cinema • Library • Community Support Centre • Sports Centre • Youth Centre + Sports Centre • Playing Fields • Nursery/ Early Learning Centre • Community Centre	• Open Space • Car Parking • Public Utility	<i>All except Primary and Secondary Uses</i>

Social, Cultural and Recreational – Supplementary Planning Guidance

- Social Centres, Community Support Centre and Community Centres should be considered an important feature of any community and should provide a focal point to communities and therefore have convenient and adequate accessibility to all.
- Co-location of other community facilities, such as healthcare, ELC, Library, Police Points etc. is recommended, to define community hubs, and encourage shared facilities such as parking and infrastructure.
- Sports Centres as part of District Centres should be provided as standalone facilities, to serve a wider population catchment, and therefore provide a range and breath of sports facilities in a defined and purpose-built plot.
- As per standards in the Interim Mechanism of Urban Planning Document (2014), such Sports Centres should be located adjacent to Schools, where possible, and encourage school and public shared usage, which is 'coordinated between the School Administration, the Municipal Council and the Municipal Committee of the Wilayat [settlement]'.
- Sports Centres at a Neighbourhood level should be co-located with Youth Centre facilities, to increase the functionality of the facility itself for a smaller population catchment. Again, such facilities are encouraged to be adjacent to Schools, in order to increase the viability of the facility.
- Sharia Court provision is dependent on local needs and requirements, however, not essential to be located within Centres, unless sufficient land area is available.
- Highway Petrol Stations and Rest Areas Standards are not provided, as these should be located along Highways and not within communities, according to current standards as required by the relevant Operator (Oman Oil etc.).

- Sports Stadiums have been included as part of Non-Centred Facilities as it may not be appropriate to locate such facilities within Centres and urban areas. However, if the site permits, such facility can be located in-centre, as per the appropriate traffic capacity studies and approvals.



Social, Cultural and Recreational – Reference Images

4.9. Municipal, Institutional and Governance

Intent The purpose of the Municipal, Institutional and Governance facilities is to provide for civic related activities and facilities under public ownership. Municipal, Institutional and Governance facilities are to serve the day-to-day needs of residents, workers and visitors. Goals • Ensure adequate facilities are provided to meet the identified needs of the community. • Provide a development that meets all Government regulatory requirements. • Ensure plots are located in publicly accessible locations which provide efficient coverage and access to the development and is generally consistent in scale, height and bulk with that of surrounding development. • Ensure facilities are provided in highly accessible locations, are supplied with appropriate infrastructure and are well integrated with surrounding land uses. • Promote accessibility through defined pedestrian and cycle routes, as well as conveniently accessible and coordinated public transport stops, such as defined bus stops and taxi ranks. Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Police Headquarters/ Police Regional Command Centre • District Police Station • Major Post Office • Wali's House • Wali's Office • Municipal/ Government Offices • Local Post Office • Community Police Point • Non-Centre Facilities • Civil Defence Station (Small) • Civil Defence Station (Med) • Civil Defence Station (Large) • Police Vehicle Compound	• Open Space • Car Parking • Public Utility	<i>All except Primary and Secondary Uses</i>

Municipal, Institutional and Governance – Supplementary Planning Guidance

- Any revisions to Royal Omani Police (ROP) and Public Authority for Civil Defence and Ambulance planning standards take precedent over the standards provided in this document.
- Co-location of Police and Civil Defence facilities is encouraged, however, segregation in terms of provision is recommended.
- Community Police Points are to be provided to ensure good accessibility to emergency services for the whole population. Such facilities should include parking bays (approx. 2) and small holding area. Such facilities are recommended to be co-located with Community Ambulance Point / Community Centres at a Local level.



Municipal, Institutional and Governance – Reference Images

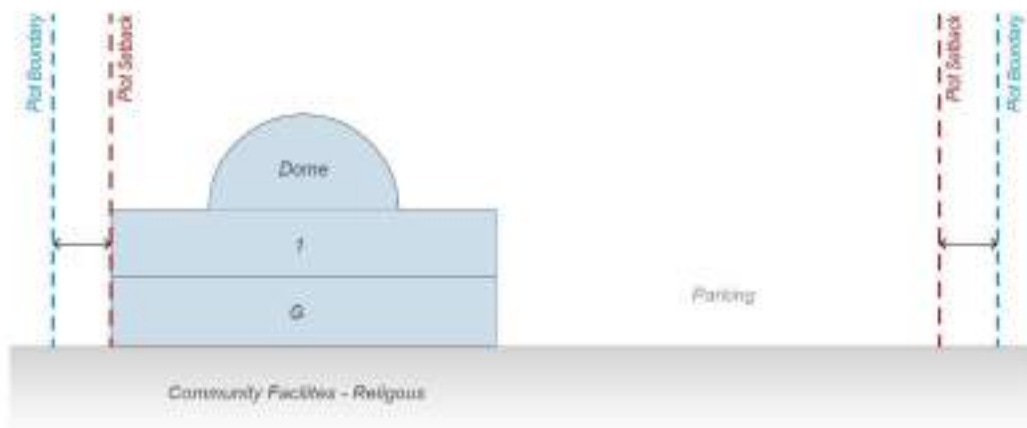
4.10. Religious

Intent The purpose of the Religious Facilities is to provide for religious related activities and facilities under public ownership in convenient and accessible locations. Goals • Ensure adequate religious facilities are provided to meet the identified needs of the community. • Provide religious facilities in accordance with the relevant Standards, in terms of number, location and catchment. • Ensure religious facilities are in highly accessible locations, are supplied with appropriate infrastructure and are well integrated with surrounding land uses. • Ensure religious facility development provides mosques in accordance with the requirements of the Ministry of Endowments and Religious Affairs. • Promote accessibility through defined pedestrian and cycle routes, as well as conveniently accessible and coordinated public transport stops, such as defined bus stops and taxi ranks. • Development is located in publicly accessible locations and is generally consistent in scale, height and bulk with that of surrounding development. • Local Mosque (Masjid) - serves a single catchment and is typically within walking distance. Serves all Daily prayer times. Required to serve a small worshipper population. • Friday Mosque - serves multiple catchments within a given area. Typically located along a transit route to provide better access. Serves all daily prayer times and Friday prayers. Required to serve a larger worshipper population than a Masjid to accommodate the number of worshippers from multiple catchments who will attend Friday prayers. • Sultani (Grand/ Eid) Mosque - similar catchment to a Friday Mosque and serves Daily, Friday and Eid prayers. Adjacent open space requirement to accommodate Eid prayers. Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Masjid (Mosque) • Jame'e (Friday Mosque) • Sultani Mosque • Musalla	• Majlis • Open Space/ Eid Prayer Ground • Car Parking • Imam/ Staff Residence • Service Facilities • Women's Prayer Space, Including Services • General Council • Quran Memorization School and Library	<i>All except Primary and Secondary Uses</i>

Religious – Supplementary Planning Guidance

- The most recent Mosque Planning Standards are taken from the Interim Mechanism of Urban Planning Document, developed by the General Secretariat of the Supreme Council for Planning, and approved by the Supreme Council for Planning in 2014. The Standards provided by this document include Masjids (Local Mosques), Mosques (Friday Mosques), and Sultani Mosques (Grand Mosques). *Any revisions to the Mosque Planning Standards or revision of standards by the SCP will take precedent over the Standards provided in this document.*
- Sufficient mosques are to be provided to ensure there is appropriate provision for all worshippers regardless of location and settlement context.
- Mosques are to be placed in prominent, localised places that promote and reinforce the important religious and social roles they play in their respective communities.
- Mosques are to be located to ensure they are easily accessible by worshippers travelling on foot or by public transport.

- Mosques are to provide opportunities for community support facilities, such as crèches and Qur'anic education, and spaces for community interaction.
- Mosques are to be planned to create activity centres and places of social interaction through co-location with other community facilities.
- Jame'e and Sultani Mosques (when required) should include flexible open space for Eid Prayer Ground facilitation within the plot. If such area cannot be facilitated within the plot, the Mosque should be located adjacent to park/open space to accommodate an increase in the number of worshippers during Eid prayers.
- Appropriate space is to be provided to accommodate the requirements of male and female worshippers.
- Comfortable prayer spaces, ancillary facilities and recognisable access points are to be provided to accommodate the requirements of the elderly and mobility impaired.
- Musalla's should be provided in non-residential buildings (Hotels, Offices, Malls etc.) and should be provided within the built form of the building.
- Musalla's should not replace the requirement for a Mosque in given Neighbourhood or District but should provide additional prayer facilities over and above the provision of all required Mosques.



Religious - Typical Diagram (Masjid and Jame'e)



Mosque – Reference Images

4.11. Parks and Open Space

Intent

The purpose of Parks and Open Space is to provide areas which serve the recreational needs of a wide range of residents and visitors. Where required to meet community needs, development may include shelters, amenity facilities, picnic tables, and playgrounds that support safe environment and allow access for essential management and maintenance.

Goals

- Provide programmed public open space to meet the needs of the local community, and the wider area.
- Provide an important contribution to the liveability communities through providing visual relief from the built environment.
- Provide open space to serve the recreational needs of the community and enhance liveability.
- Provide a legible open space network that is easy to navigate and understand, while being diverse enough to host a range of active and passive activities for a variety of users.
- Promote accessibility to Parks and Open Space facilities through defined pedestrian and cycle routes, as well as conveniently accessible and coordinated public transport stops, such as defined bus stops and taxi ranks.
- Provide links to Centres via pedestrian and cycle routes through the provision of a green open space/ park network.
- Protect and enhance existing natural features and integrate as part of wider open space provision.

Permitted Uses

Primary Uses	Secondary Uses	Not Permitted
• Regional Park • District Park • Neighbourhood Park • Local Park • Community Park	• Car Parking • Sheltered Areas • Small Pavilions • Children's Playgrounds • Sports Pitches and Ancillary Buildings • Small F&B outlets • Public Toilets	All except Primary and Secondary Uses

Parks and Open Space – Supplementary Planning Guidance

- Regional, District, Neighbourhood, Local and Community Parks should be developed in accordance with the Parks and Open Space Planning Standards provided in Chapter 5 of this document.



05

PARKS AND OPEN
SPACE

5. PARKS AND OPEN SPACE

5.1. Introduction

Based on the ONSS Community Facility Planning Standards (refer to Chapter 4), Parks and Open Space have been defined using the following hierarchy:

- Regional Parks
- District Parks
- Neighbourhood Parks
- Local Parks
- Community Parks
- Alleyways/ Greenways

Level of Service (LoS) Standards are used to quantify the number of Parks and/or Open Space which must be provided to meet a community's basic needs and expectations both now and in the future. The Standards also provide a benchmark for evaluating service deficiencies in existing communities and for monitoring progress towards meeting growth management and park provision goals.

The Community Facility Planning Standards provided in Chapter 4 for Parks and Open Space forms the basis for identifying LoS, summarised in the table below, and should be calculated as per the methodology provided in Chapter 4 in order to determine any existing or future deficiencies. Each Park and Open Space category is further detailed throughout this Chapter.

Parks and Open Space Hierarchy and Level of Service (LoS)

	Maximum Population Catchment	Minimum Population Catchment	Indicative Site Area (sqm)
Regional Park/ Open Space	200,000+	200,000+	0.2ha/ 1,000 pop
District Park/ Open Space	60,000	40,000	0.2ha/ 1,000 pop
Neighbourhood Park/ Open Space	20,000	10,000	0.4ha/ 1,000 pop
Local Park/ Open Space	10,000	1,000	0.4ha/ 1,000 pop
Community Park/ Open Space	1,000	150	0.3ha/ 1,000 pop

For each Hierarchy classification, a number of Parks and Open Space Typologies can be applied. Such Typologies range from Natural Parks, typically larger areas or corridors, to Greenways, typically small, narrow shaded pedestrian and cycle routes throughout neighbourhoods and communities. However, a Typology is not bound by size, moreover, Typology relates to the programming and characteristics of a Park or Open Space, irrelevant of its size and LoS, and therefore hierarchy. It will be the responsibility of the master planner, developer, or Ministry/ Authority in determining the Park or Open Space typology.

The following section explores Parks and Open Space Typologies further, as well as planning guidance for key Parks and Open Space elements such as for planting, irrigation, thermal comfort etc.

5.2. Parks and Open Space Planning Guidance

A key consideration in planning Oman's towns and cities is the need to establish a strategically planned and delivered network of high-quality green spaces and other environmental features. This **Green Infrastructure (GI)** should be designed and managed as a multi-functional resource capable of delivering a wide range of environmental and quality of life benefits for local communities. Green infrastructure includes parks, open spaces and connecting green corridors such as Wadis.

A GI approach enables landscapes to deliver social, economic and environmental benefits close to where people live and work including:

- **Climate Change Adaptation:** Responding to the effects of climate change will require assessing the most appropriate locations for development avoiding areas at potential risk of environmental hazards. Climate change mitigation can include planting trees to fix carbon and reduce the energy used for cooling buildings by shading them in summer. Connected green spaces can attenuate surface water run-off and reduce the risk of flooding.
- **Recreation and Health:** The green network can increase the pleasure and choice of routes for non-motorised forms of transport, offering shaded green connections to schools, neighbourhood centres and urban activities. A GI approach can help to lower stress levels and encourage exercise by providing local, safe and inspiring places for recreation.
- **Social Benefits:** Natural environments that are connected to local communities can provide a range of educational opportunities and assist in reconnecting society with the natural environment. GI can be a focus for community participation through public involvement in the design, delivery and management of new GI assets.
- **Enhancing Biodiversity:** Taking a landscape-scale approach to the planning, design and management of connected GI assets provides a natural green framework which can more readily respond to environmental pressures and climate change. The use of indigenous plant species will enhance biodiversity and repair natural habitats.
- **Water Management:** A sustainable urban drainage system (SUDs) approach to water management can reduce the number of properties at risk of flooding during intense storms. Rather than taking space from water, it makes space for water and in doing so enhances biodiversity, recreation and local character.
- **Economic Benefits:** Quality green space can have a major positive impact on land and property markets, creating attractive settings for investment and acting as a catalyst for wider regeneration. High quality connected environments attract skilled and mobile workers, that, in turn, encourage business investment. Major city greening initiatives can provide 'green' jobs.
- **Regional Distinctiveness:** Oman possesses a variety of regionally distinct landscapes, for example: the fjords of the Musandam Peninsula, the spectacular Hajar Mountains, the vast dunes of the Rub Al-Khali, lush green Dhofar Mountains, the fertile Batinah coast and the modern capital of Muscat. It is essential that the approach to landscape and green infrastructure reflects this rich regional variation and identity. Part Four of these standards contains more detailed landscape and urban design guidelines for the regions and include climatic response, cultural influences, traditional lifestyles.

Parks and Open Space Typologies

Set within the connected green space network will be a range of parks and open spaces. The starting point in establishing the Park and Open Space should be an appreciation of the natural landscape. Wadis, Beaches and even Dunes can be integrated into the network of open space complementing the more formal parks planned in communities and urban areas. These different Typologies will provide opportunities for both active and passive recreation. The Parks and Open Spaces should be easily accessible to all residents and fully integrated with pedestrian and cycle routes.

The Tourism Development Master Plan for Muscat identifies 33 key investment projects. These include imaginative examples of new forms of park and open space, for example, a Sand Dunes Urban Park in the Boshar Neighbourhood. The conventional hierarchy-based approach to the provision of parks and open spaces needs to be expanded to include new typologies similar to the Tourism Development Master Plan.

It is important that the requirement for new open spaces is combined with the provision of green infrastructure and together form an essential part of the overall master planning of new urban areas. Improvements to existing open spaces can also play an important role in the regeneration of existing neighbourhoods, for example, better provision for children's play and teenagers.

Parks and Open Spaces can be categorised by function, size and catchment. It is important to recognise the importance of multi-functional open spaces. They can provide a range of social, environmental and health benefits, as well as making neighbourhoods more attractive places to live.

- **Natural Parks:** are typically larger areas, corridors or networks of natural or semi-natural open space; within, or on the edge of, urban areas. Most of the area will be publicly accessible and provide a range of facilities and features offering recreational, ecological, landscape, cultural or green infrastructure benefits. Natural Parks could be based along wadis, sections of coastline, palm groves, hills and escarpments. They can incorporate geological features, viewpoints and cultural heritage assets. The Parks can have circular walks, self-guided nature trails, adventure sports, children's play and family picnic areas. These public open spaces can host environmental research programmes, including the restoration of habitats and a more sustainable approach to landscape design using indigenous plant species.
- **Urban Parks:** the hierarchy of Parks and Open Space provides a major focus for cultural activity and active, structured recreation within zones planned for urban expansion. This will include District, Neighbourhood, Local and Community level parks with play areas for different age groups; family picnic areas and multi-use games areas etc. The larger parks can host temporary events such as sport competitions, concerts and markets.
- **Outdoor Sports Facilities:** sport and active recreation is being increasingly recognised for its physical and mental health benefits. To promote an active lifestyle a varied range of public and privately-owned outdoor sports are needed for the community, including - tennis courts, football pitches, athletic tracks, golf courses, school and institutional playing fields. Artificial, floodlit pitches minimise the need for intensive irrigation and can be used during the cooler evenings.
- **Beach Parks:** involve the creation of a high quality, well designed, publicly accessible open space along selected beaches in coastal cities such as Muscat, Sohar and Salalah. They can include a wide range of recreational facilities: event space, cycle and skate parks, public plazas, cafes, basketball/volleyball courts, all connected by a boardwalk or promenade.
- **Wadi Parks:** Wadis within urban expansion zones will have an important role to play in delivering accessible open space. These threads of desert can extend into the urban fabric and can create a connected network of multi-functional open space which supports the hydrological processes, enhance biodiversity and provide a recreational resource for future residents. Degraded wadi corridors in existing urban areas can also be transformed into linear parks.
- **Greenways (Alleyways):** can provide a connected network of shaded pedestrian and cycle routes and alleyways. They thread through Districts and Neighbourhoods, linking together to provide safe routes to school and community facilities. Local and Neighbourhood Centres are typically located at the intersection of greenways with pocket parks providing shaded seating and play areas for young children.
- **Shaded Streets:** street trees can form an attractive and functional element of urban streets, from boulevards to home zones. The Complete Streets approach advocated in Section 2.4 will make town and cities more liveable, providing shade from the sun and shelter from wind borne sand and dust.
- **Public Squares:** it is important that local and regional culture is reflected in the design of urban public squares. Al Fereej is the Arabic term given to traditional housing organised around a public space and saha means a place for people to gather and socialise. It is important that these traditional forms of urban space are researched and used as a model for places for social gathering in new neighbourhoods.

Planting

Planting in the hot, dry environment of Oman can make a dramatic impact, but its use must be carefully considered in relation to the availability of water for irrigation, environmental constraints and the resources available for management and maintenance. Planting can be used to create a more favourable outdoor environment for people modifying local micro-climates by:

- Producing shade, regulating high temperatures and reducing glare and reflected radiation
- Countering the 'heat island' effect
- Providing shelter against strong desert winds and filtering airborne sand and dust
- Stabilising areas of loose sand and controlling surface erosion

Planting also has an important role to play by:

- Acting as a sink for carbon
- Restoring and enhancing natural habitats

- Providing a visual and physical framework for development
- Creating local identity and a sense of place

Two different approaches to landscape design are appropriate for use in urban areas, these are termed natural and intensive landscapes.



Natural Landscape Imagery



Extensive Landscape Imagery

Intensive Landscapes

Intensive Landscapes are in complete contrast to the natural landscapes. The key word here is “oasis”. Design must create shade and shelter from the harshness of the environment. To achieve this both buildings and planting are used. They protect each other and in turn create the necessary favourable outdoor environment for people.

This type of planting is very costly in terms of water demand and should therefore be concentrated to maximise its effect. The traditional Islamic garden provides a valuable model demonstrating how to use formal planting within gardens enclosed and protected by walls, arcades or buildings. Their design and symmetry are rooted in the deep religious tenets of Islam and the culture of the Arab people, they are gardens of hospitality and privacy. They are inward looking focussing beauty on the interior rather than the exterior. Walls that are undecorated on the outside may enclose a delightfully lush, shaded paradise garden on the inside.



Intensive planting from the grounds of The Sultan Qaboos Grand Mosque

Natural Landscapes

Oman is blessed with attractive natural landscapes - with mountains and wadis coming close and extending into even the largest settlements, for example, Muscat, Sohar, Nizwa and Salalah. There are many opportunities across the Sultanate to take a more sustainable approach to landscape design that reflects these regionally distinctive landscapes and works with nature.

Oman has an incredibly diverse flora, for a pre-dominantly arid to semi-arid country, with over 1400 species being recorded, many unique to the country. The value of Oman's native plants was recognised by His Majesty, the late Sultan Qaboos, in the establishment of the Oman Botanic Garden (OBG). Valuable research on the propagation of Oman's native plants has been carried out at the OBG plant nursery on how to adopt innovative approaches to naturalistic, water-efficient planting using native species. Within urban areas indigenous plant species can be used in the following contexts:

- Natural parks
- Within Linear Wadi Parks bringing natural habitat threading through the urban fabric
- Parks and public spaces along the coastline retaining a 'wilderness' quality
- Shelterbelts and windbreaks around settlements
- Restoring natural habitats
- Natural areas within larger parks
- School grounds providing access to nature
- Road medians and verges
- Sand stabilisation using pioneer species

Many native species are xerophytic and have shown adaptation to urban settings, and after establishment can survive with little, or no, irrigation. It is important that the plant species selected are within the context of their preferred habitat, i.e. sand desert, rock desert, wadi, stony plains, mountains or coastal. Using these habitats as a framework will help achieve regional distinctiveness. Native planting can be successfully combined with ground modelling and the use of natural hard landscape materials such as rocks, boulders and blankets of gravel mulch.



Wadi Al Azaiba Park
Source: Landezine

Irrigation

Potable water is a precious resource in the desert, and its use for irrigating amenity planting must be carefully considered and justified. Enough quantities of Treated Sewage Effluent (TSE) are potentially available for all landscape use, provided it is treated to a sufficiently high level. Its availability is in direct correlation to the population of a given area. If not safely treated and properly recycled TSE can be a threat to public health and its disposal can contaminate groundwater aquifers.

TSE provides a good source of the regular nutrients needed to sustain formal landscape planting in urban areas, obviating the need for artificial fertilizers and additional maintenance which would otherwise be required for this type of planting.

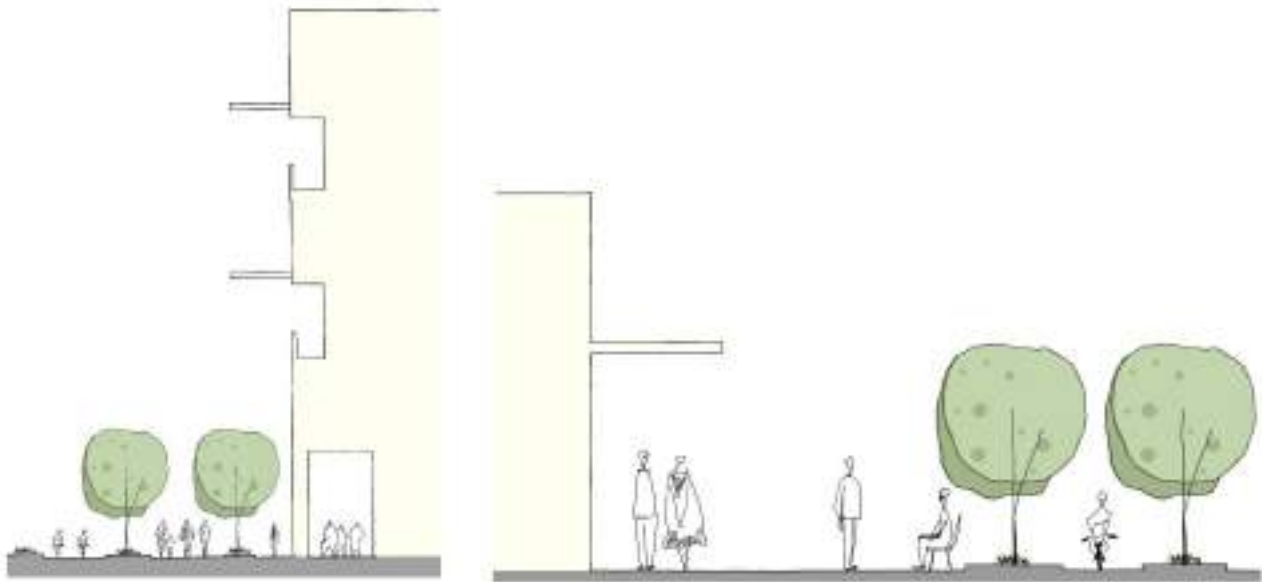
Grass areas should be limited to key areas of parks and sheltered gardens where it can be best appreciated and not used for roadside 'greening'. Short mown grass is not drought tolerant and requires large quantities of regular irrigation in order to survive. Where excessive amounts of irrigation water are needed for sports turf and golf courses, the drainage water should be recovered and reused for other adjacent planting.

Thermal Comfort and Shade

The design of the public realm and selection of street-scene elements will need to attenuate the extreme temperatures and humidity during the summer months. Thermal comfort and shade and shelter from the sun will be critical in creating a comfortable public realm that encourages multi-modal travel.

Thermal comfort is influenced also by the additional heating effects caused by direct and reflected sunlight and heat radiating back from warm surfaces. This urban heat gain should be reduced by passive shading measures that lessen the exposure of pavement and wall surfaces and the selection of materials that retain and radiate less heat.

Shading can be provided by colonnades and building overhangs; freestanding shade structures and sculptures; shade trees planted in bosques or tight groupings. A fine network of shaded paths (greenways and alleyways) and pedestrian friendly streets will enhance connectivity and encourage walking and cycling within neighbourhoods.



Sections illustrating shading methods: arcades, colonnades, planting

Landscape and Public Realm Manual

It is recommended that a Landscape and Public Realm Manual is produced to raise the quality of the landscape, open space and public realm in towns and cities across Oman. The development of this Manual should be led by the Ministry of Housing and Urban Planning, with support from Ministry of Interior and the Municipalities of Muscat, Salalah and Sohar (including input from relevant Ministries and Authorities).

The guidance would cover a range of scales from large scale strategic green infrastructure, structure planting and opportunities for habitat creation to the more detailed consideration of the public realm and the design and furnishing of urban spaces, including hard landscape, street furniture, signage and lighting. The manual would also provide guidance on sustainable drainage techniques such as the incorporation of natural bio-swales.

Palettes of native and adapted plants for the different regions of Oman would be provided. It should be noted that there are only a limited number of plant species suitable for shade within the indigenous flora, and while these species can be prioritised, most urban trees will be arid-adapted types from other parts of the world such as the Indian sub-continent.

The manual would guide all the professions involved in the planning, design, approval, construction and operation of landscape, green infrastructure and public realm projects. It would define principles and policies, set aspirational targets and set out clearly the planning, design, review and approval process. It would include examples of national and international best practice.

5.3. Regional Park

Intent Regional Parks are intended to provide a national and iconic feature to the Region. The Regional Park could retain some working areas of agriculture or natural conservation areas (where relevant), opening up to publicly accessible walking and cycling trails. There should be opportunities to promote resources for education, leisure and sport. Regional Parks should consider the internal and surrounding natural elements to determine its typology. A range of typologies, zones, activities and uses should be provided and flexibility should be promoted to host events and activities. The Regional Park should provide both local, national and international visitors to the Park with an increased desire and ability to respect, enjoy and look after the Omani natural environment and its natural flora and fauna. These three key values should therefore underpin the development and design of the Regional Park. Regional Parks should be developed in significantly important regional areas, where existing open space, natural features and facilities exist and can be expanded on, however, in proximity to residential communities to promote daily use of key facilities.		
Goals • Provide open space of regional significance, with a diverse range of activities and programs. • Promote activity and active use of natural landscapes and features. • Provide regionally significant ceremonial and gathering places for annual events. • Provide opportunities for educational spaces/ centres/ events, relating to a variety of elements such as science, art and culture, historical etc. • Provide defined sports pitches to host a range of sporting activities. • Act as a key destination point and sense of place for the region, with flexibility for one-time visitors as well as regular, daily use by residents. • Promote accessibility to facilities through defined and continuous pedestrian and cycle routes, as well as conveniently accessible and coordinated public transport stops, such as bus stops and taxi ranks directly serving the park entrances.		
Permitted Uses		
<i>Primary Uses</i>	<i>Secondary Uses</i>	<i>Not Permitted</i>
Including but not limited to: • Gathering areas • Educational spaces/ centres (such as historical, science, art and culture) • Informal play areas • Touristic park areas • Active play/exercise areas • Desert trails • Multi-use game areas • Sports Pitches • Natural Areas • Agricultural Areas	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Picnic / BBQ facilities • Drinking fountains, bike racks, recycling/ trash receptacles • Changing rooms, restrooms, shower facilities • Parking • Bus Stops/ Taxi Ranks	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Location	Regional Parks should be developed in significantly important regional areas, where existing open space, natural features and facilities exist and can be expanded on, however, in proximity to residential communities to promote daily use of key facilities.	
Minimum Area	300ha+	
Recommended Catchment	n/a (Regional – 100km +)	
Parking	To be determined by MoTCIT / relevant Authority standards.	

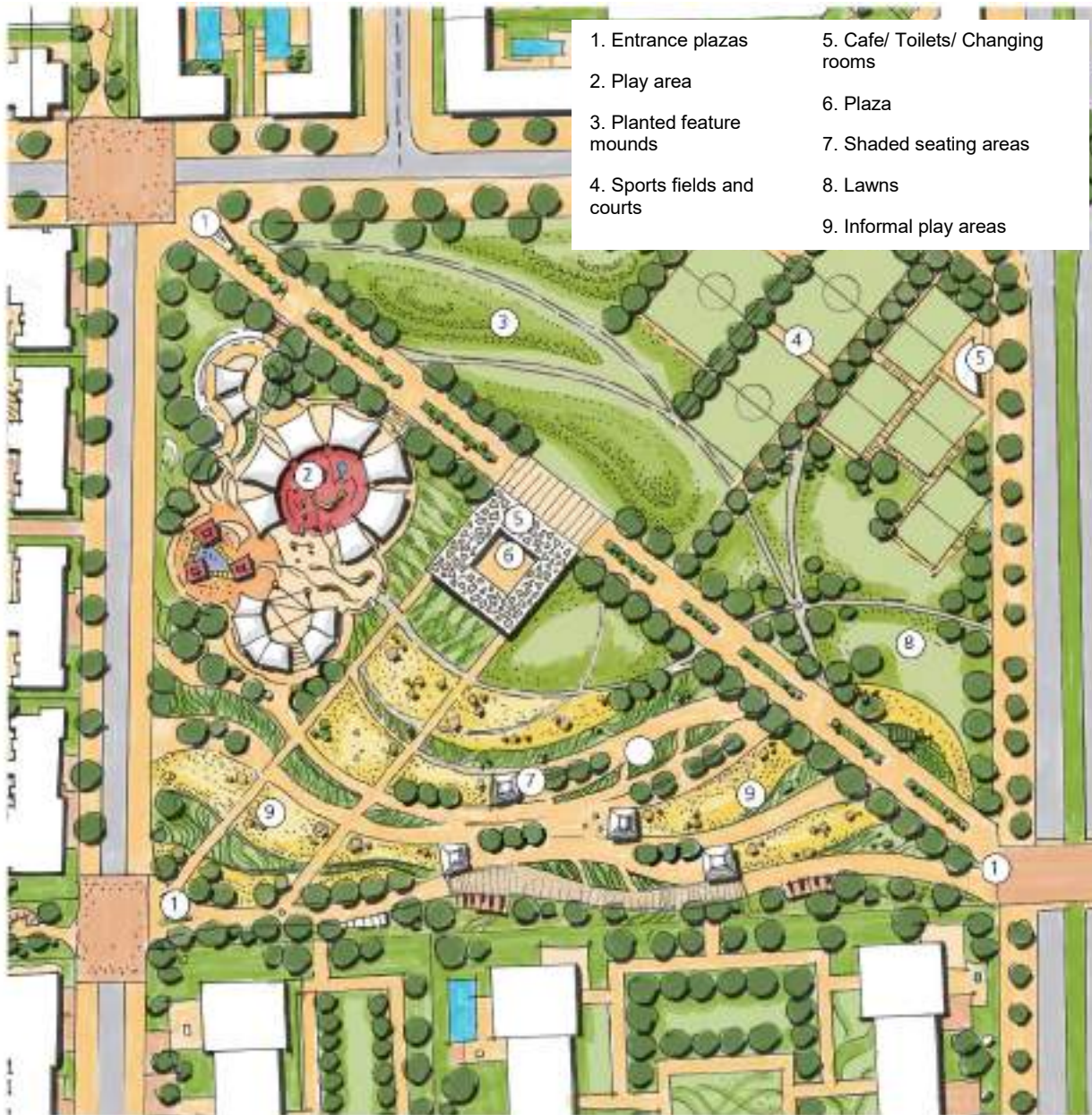


1. Gathering area
2. Play area
3. Dry gardens
4. Linear connection and walking trails
5. Cafe and toilets/ changing rooms
6. Educational areas/ Multi-use games areas/ Informational areas

Indicative Conceptual Diagram of a Regional Park

5.4. District Park

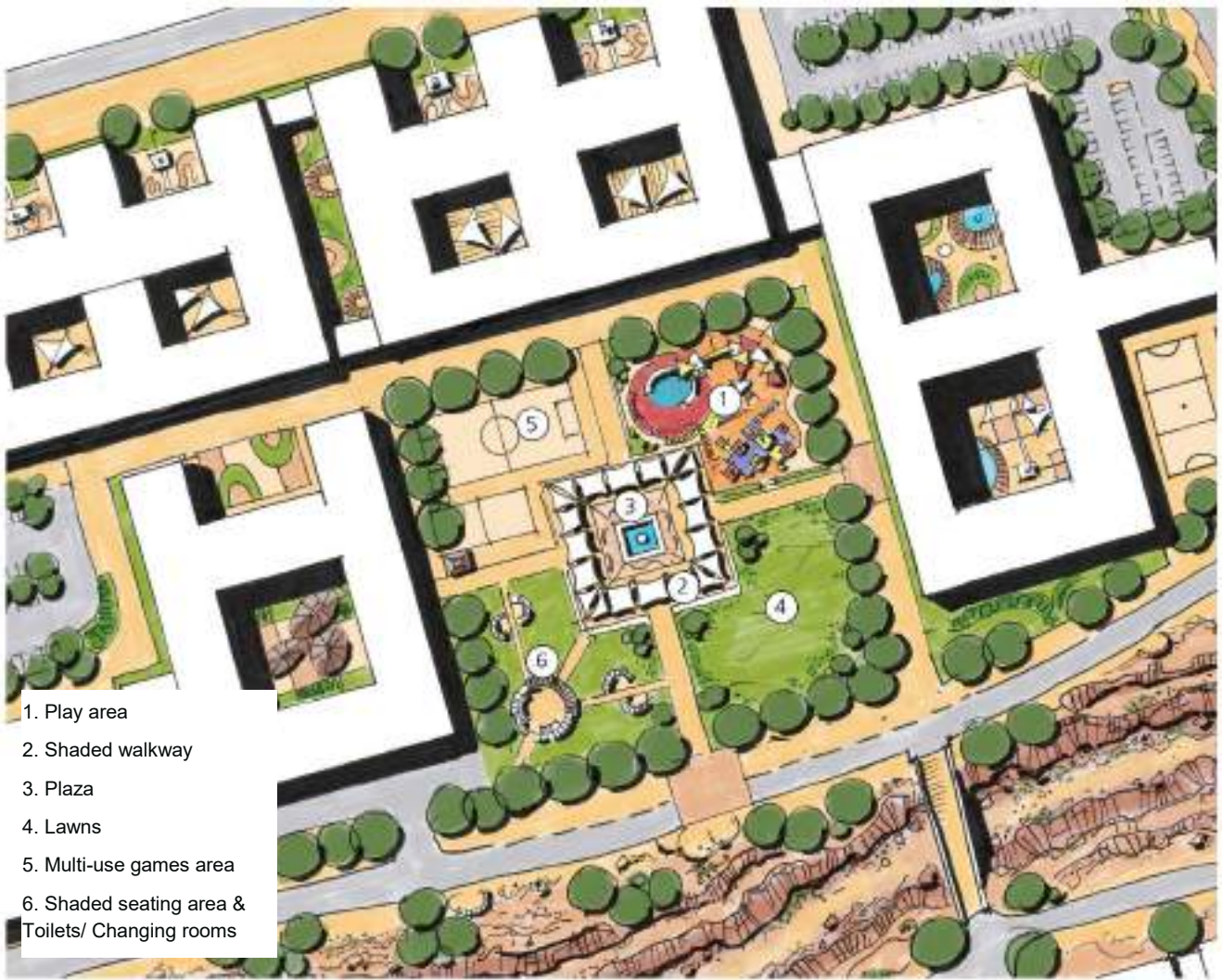
Intent District Parks are intended to provide large area programmed open space primarily for sport and active uses, as well as ceremonial and events, providing the recreational facilities for a variety of activities. District Parks should be the focal point of the wider community, and will support the identity of the place, providing a facility for community-wide events and commemoration. District Parks should provide a range of sporting infrastructure to host larger scale events that occur over a number of days in a single location. District Parks should accommodate more informal activities such as walking trails, picnic facilities and play areas for children. They should be developed as part of a main District Centre and located next to District level community facilities, Jame'e Mosques and commercial district areas. They should provide good accessibility to the wider District, and therefore a number of communities and neighbourhoods, and be a key landmark for the wider area. Goals • Provide a focal point of the District, for District-wide events for public celebrations and commemorations. • Be accessible and convenient to the wider District, which provides a range of functions and serves a number of communities. • Provide programmed open space for active and passive recreation, with multi-purpose spaces. • Provide defined sports pitches to host a range of sporting activities. • Promote accessibility to facilities through defined and continuous pedestrian and cycle routes, as well as conveniently accessible and coordinated public transport stops, such as bus stops and taxi ranks directly serving the park entrances. Permitted Uses <table> <tr> <th>Primary Uses</th><th>Secondary Uses</th><th>Not Permitted</th></tr> <tr> <td> Including but not limited to: • Sports fields and courts with shade structures • Plaza with shade structure • Play structures that accommodate all ages and abilities • Gathering/meeting spaces • Public event space • Performance space/ Amphitheatre • Active play/exercise areas and equipment • Informal play areas • Shaded seating/ event seating • Public toilets / changing rooms • Drinking fountains, bike racks, recycling/ trash receptacles </td><td> All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Picnic / BBQ facilities • Parking (on-site) • Bus Stop/ Taxi Rank • Cafe / kiosk </td><td> <i>All other uses that do not meet the purpose and outcomes of the land use.</i> </td></tr> </table>			Primary Uses	Secondary Uses	Not Permitted	Including but not limited to: • Sports fields and courts with shade structures • Plaza with shade structure • Play structures that accommodate all ages and abilities • Gathering/meeting spaces • Public event space • Performance space/ Amphitheatre • Active play/exercise areas and equipment • Informal play areas • Shaded seating/ event seating • Public toilets / changing rooms • Drinking fountains, bike racks, recycling/ trash receptacles	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Picnic / BBQ facilities • Parking (on-site) • Bus Stop/ Taxi Rank • Cafe / kiosk	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Primary Uses	Secondary Uses	Not Permitted						
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Location	District Parks should be developed as part of a main District Centre and located next to District level community facilities, Jame'e Mosques and commercial district areas. It should provide good accessibility to the wider District, and therefore a number of communities and neighbourhoods, and be a key landmark for the wider area.							
Minimum Area	100ha (recommended)							
Recommended Catchment Area	10-25km							
Parking	To be determined by MoTCIT / relevant Authority standards. .							



Indicative Conceptual Diagram of a District Park

5.5. Neighbourhood Park

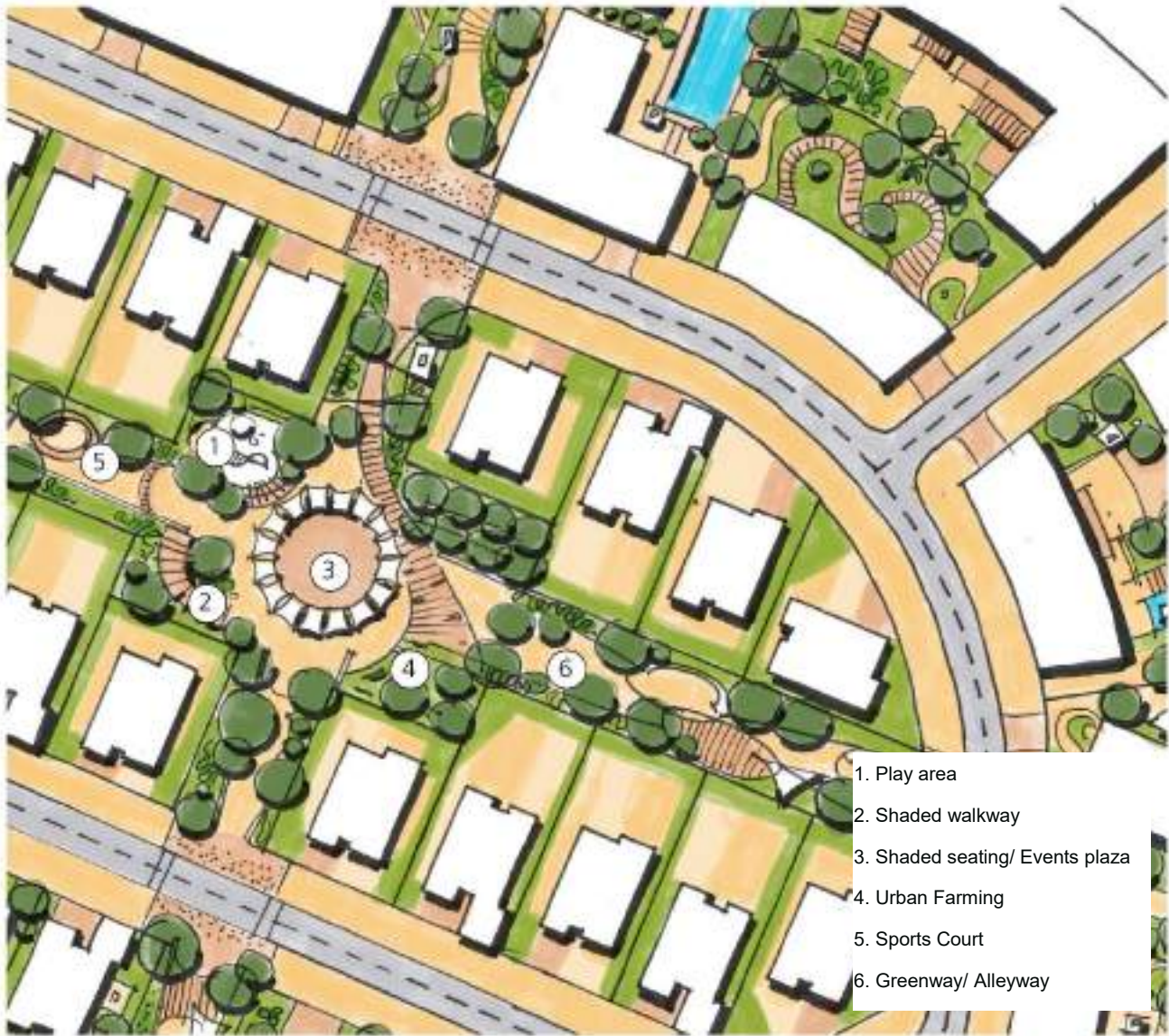
Intent Neighbourhood Parks should accommodate active and passive uses and community events. It should provide essential park amenities for residents and visitors, a meeting place in the community and a space for local sports activities. Neighbourhood Parks should be equipped to host local community events and its design should focus on creating spaces for community experiences. They can also include specialised sports facilities and active and passive uses for sporting activities. Locations of major civic spaces should be central within more densely populated areas. Neighbourhood Parks should be located in convenient locations to intentionally serve a number of surrounding neighbourhoods, including the provision of parking to encourage wider community use and accessibility. Neighbourhood Parks should be developed as part of a main Neighbourhood Centre and located next to Local Mosques, local shops and other Neighbourhood Centre level facilities. Neighbourhood Parks will be connected to surrounding residential areas by shaded pedestrian and cycle-routes and have linkages to the planned public transport network.		
Goals • Provide accessible and convenient public open space, which provides a range of functions and serves a cluster of communities. • Provide programmed open space for active and passive recreation, with multi-purpose spaces for daily use. • Create a defined place to host local community events and focus on creating spaces for family experiences. • Be located regularly throughout communities with good accessibility through pedestrian and cycle routes, as well as proximal public transport.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Including but not limited to: • Plazas • Shaded seating areas • Internal pathways • Play structures • Picnic / BBQ facilities • Urban Farming Areas • Multi-use game areas / fitness equipment • Public toilets / changing rooms • Women's / children's area • Drinking fountains, bike racks, recycling/ trash receptacles	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Food trucks and stalls (non-permanent structures) • Parking (on-site)	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Location	Neighbourhood Parks should be developed as part of a main Neighbourhood Centre and located next to Local Mosques, local shops and other Neighbourhood Centre level facilities. Neighbourhood Parks will be connected to surrounding residential areas by shaded pedestrian and cycle-routes and have linkages to the planned public transport network.	
Minimum Site Area	20ha (recommended) Minimum 5ha/ Maximum 50ha	
Recommended Catchment Area	2 – 10 km	
Parking	To be determined by MoTCIT / relevant Authority standards. .	



Indicative Conceptual Diagram of a Neighbourhood Park

5.6. Local Park

Intent Local Parks are to serve smaller communities with a mix of daily use and important district-wide public functions. They should be located within or near residential neighbourhoods and be an area programmed for active and passive recreation to provide the local population with typical park amenities. Local Parks should be a place for local meeting places for residents and activity centres for children; that can host local community events and focuses on creating spaces for every-day family experiences. Local Parks should be developed as part of a main Local Centre and located next to Local Mosques, local shops and other Local Centre facilities. They should be connected to surrounding residential areas by shaded pedestrian and cycle-routes and have linkages to the planned public transport network. Goals • Provide accessible and convenient public open space for local communities and residents. • Provide multi-use games areas to promote active lifestyles within the adjacent community. • Provide programmed open space for active and passive recreation. • Create a defined place to host local community events and focus on creating spaces for family experiences. • Located regularly throughout communities within convenient walking/ cycling distance of maximum 750m. Permitted Uses <table> <tr> <th>Primary Uses</th><th>Secondary Uses</th><th>Not Permitted</th></tr> <tr> <td> Including but not limited to: • Central plaza • Picnic areas • Public event spaces • Multi-use game areas • Informal play areas • Areas for rest and respite • Active play areas • Formal sport areas • Interactive public art aimed at children • Informal and active play areas • Interactive children's water play area • Public art • Trail / pathway for walking and cycling • Urban Farming Area </td><td> All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Amphitheatre • Small public facilities: toilets, BBQ areas, changing areas • Food trucks and stalls (non-permanent structures) • Drinking fountains, bike racks, recycling • Recycling areas </td><td> <i>All other uses that do not meet the purpose and outcomes of the land use.</i> </td></tr> </table>			Primary Uses	Secondary Uses	Not Permitted	Including but not limited to: • Central plaza • Picnic areas • Public event spaces • Multi-use game areas • Informal play areas • Areas for rest and respite • Active play areas • Formal sport areas • Interactive public art aimed at children • Informal and active play areas • Interactive children's water play area • Public art • Trail / pathway for walking and cycling • Urban Farming Area	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Amphitheatre • Small public facilities: toilets, BBQ areas, changing areas • Food trucks and stalls (non-permanent structures) • Drinking fountains, bike racks, recycling • Recycling areas	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Primary Uses	Secondary Uses	Not Permitted						
Including but not limited to: • Central plaza • Picnic areas • Public event spaces • Multi-use game areas • Informal play areas • Areas for rest and respite • Active play areas • Formal sport areas • Interactive public art aimed at children • Informal and active play areas • Interactive children's water play area • Public art • Trail / pathway for walking and cycling • Urban Farming Area	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Amphitheatre • Small public facilities: toilets, BBQ areas, changing areas • Food trucks and stalls (non-permanent structures) • Drinking fountains, bike racks, recycling • Recycling areas	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>						
Location	Local Parks should be developed as part of a main Local Centre and located next to Local Mosques, local shops and other Local Centre facilities. They will be connected to surrounding residential areas by shaded pedestrian and cycle-routes and have linkages to the planned public transport network.							
Minimum Area	2ha (recommended) Minimum: 1ha Maximum: 5ha							
Recommended Catchment Area	0.75- 2km							
Parking	To be determined by MoTCIT/ relevant Authority standards. Parking should not be provided on-plot. On-street parking is preferred.							



Indicative Conceptual Diagram of a Local Park

5.7. Community Park

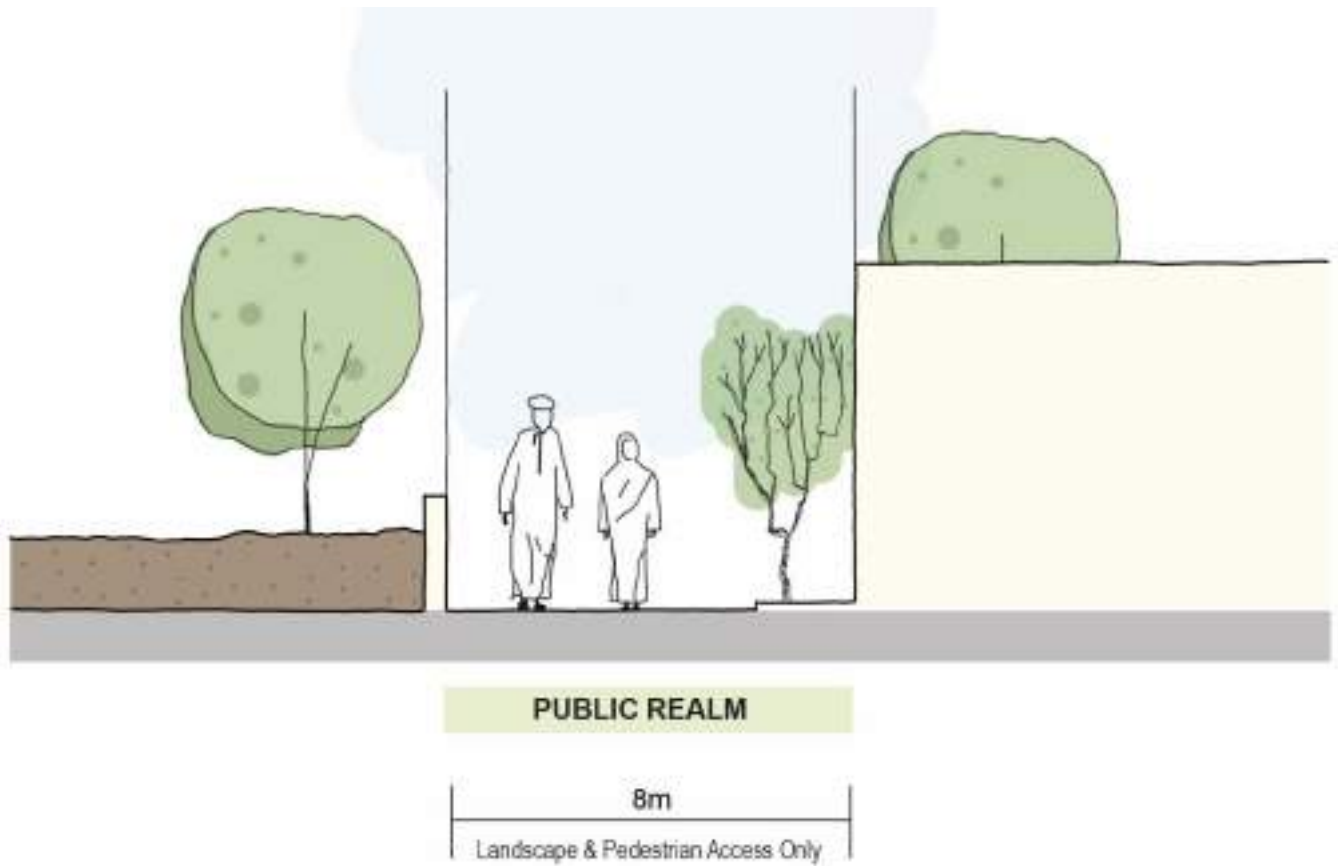
Intent Community Parks are intended as small-scaled community courtyards located at the end of alleyways and should include small seating areas and/or water features with trees that shade the space. They should be located in the centre of residential neighbourhoods and will be used for family and community gatherings; they will be areas where residents come and interact with one another. Community Parks should include hard-paved areas, suitable for open markets, community festivals, and other events that require flexible open paved areas. In addition, the design of the Park should incorporate the opportunity to enable spill-out activities for adjacent buildings, such as gathering areas associated with mosques and other civic and community buildings, or cafés and retail facilities. Community Parks should be flexible to change during the course of the day, week, and year due to daily activities, the age group using the space, seasonal weather conditions and different events and occasions. To respond to these natural fluctuations, flexibility should be built-in, in addition to shade and shelter to ensure a comfortable microclimate. Community Parks should be developed as part of neighbourhoods, and be integrated within the neighbourhood fabric itself, connected through alleyways and convenient for local access. They will be connected to surrounding residential areas by shaded pedestrian and cycle-routes and have linkages to the planned public transport network. They should be highly accessible for daily use. Goals • Provide accessible and convenient public open space for local communities and residents. • Provide programmed open space for active and passive recreation. • Create a defined place for local resident interaction and focus on creating spaces for family experiences. • Located regularly throughout communities within convenient walking/ cycling distance of maximum 350m. Permitted Uses <table> <tr> <th>Primary Uses</th><th>Secondary Uses</th><th>Not Permitted</th></tr> <tr> <td> • Public event spaces • Small seating areas • Playing areas • Areas for rest and respite • Informal and active play areas • Interactive children's water play area • Public art to enhance the public realm • Urban Farming Area </td><td> All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Small public facilities: toilets, BBQ areas • Food trucks and stalls (non-permanent structures) • Drinking fountains • Refuse recycling areas </td><td> <i>All other uses that do not meet the purpose and outcomes of the land use.</i> </td></tr> </table>			Primary Uses	Secondary Uses	Not Permitted	• Public event spaces • Small seating areas • Playing areas • Areas for rest and respite • Informal and active play areas • Interactive children's water play area • Public art to enhance the public realm • Urban Farming Area	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Small public facilities: toilets, BBQ areas • Food trucks and stalls (non-permanent structures) • Drinking fountains • Refuse recycling areas	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Primary Uses	Secondary Uses	Not Permitted						
• Public event spaces • Small seating areas • Playing areas • Areas for rest and respite • Informal and active play areas • Interactive children's water play area • Public art to enhance the public realm • Urban Farming Area	All other uses that help the primary uses meet the purpose and outcomes of the land use e.g.: • Small public facilities: toilets, BBQ areas • Food trucks and stalls (non-permanent structures) • Drinking fountains • Refuse recycling areas	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>						
Location	Community Parks should be developed as part of neighbourhoods, and be integrated within the neighbourhood fabric itself, connected through alleyways and convenient for local access. They should be connected to surrounding residential areas by shaded pedestrian and cycle-routes and have linkages to the planned public transport network and should be highly accessible for daily use.							
Minimum Area	0.5ha (recommended) Maximum: 1ha							
Recommended Catchment Area	0.35 to 0.5km							
Parking	To be determined by MoTCIT/ relevant Authority standards. Parking should not be provided on-plot. On-street parking is preferred.							



Indicative Conceptual Diagram of a Community Park

5.8. Alleyway/ Greenway

Intent Alleyways/ Greenways provide pedestrian only linkages from homes to both neighbours and community facilities. Alleyways/ Greenways are uncluttered pedestrian streets which intersect communities. Alleyways are typically between buildings and defined by the urban form, whereas Greenways typically align to wadi channels and therefore determined by the natural form. They both contain elements used to define entrances into the neighbourhood and adjacent trees/ buildings to passively cool the pathways.		
Goals • Provide interconnected and accessible pedestrian routes throughout neighbourhoods, connecting to local community facilities, community parks, and mosques. • Provide safe and uninterrupted internal access and linkages. • Provide shaded routes which promote walking and cycling.		
Permitted Uses		
<i>Primary Uses</i>	<i>Secondary Uses</i>	<i>Not Permitted</i>
• Pedestrian routes • Shading • Low maintenance plant materials (if necessary) • Low level pedestrian lighting	Seating (where possible)	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Description	The smallest elements of public space, Alleyways / Greenways are narrow streets that link the neighbourhood together, separated from street edge. In residential neighbourhoods, Alleyways provide a network of pedestrian priority routes to community services with traffic calming, safe crossings, and shade. Greenways will typically follow wadi channels and edges, but also providing pedestrian only connections. Alleyways / Greenways should directly link to Community and Local Parks, other residential units, as well as local surrounding community facilities.	
Location	Alleyways/ Greenways should be located throughout neighbourhoods, as secondary pedestrian routes between buildings, and provide direct connections to community facilities, open space and mosques.	
Minimum Area	Minimum 3m width. Maximum 5m width.	
Parking	n/a	



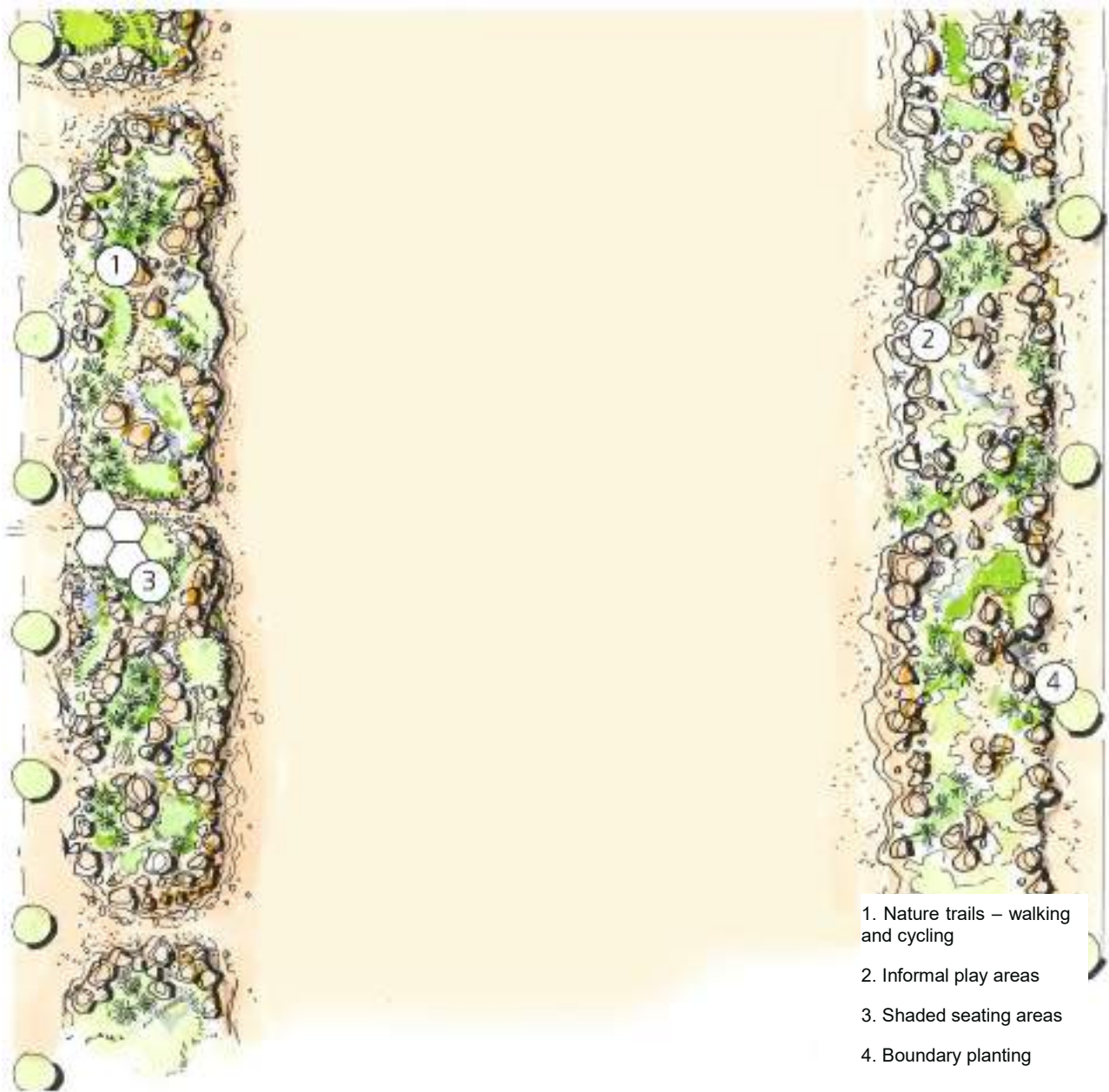
Alleyway Section Diagram



Greenway Section Diagram

5.9. Green/ Sand Belt

Intent Green/ Sand Belts can have a number of functions. They are typically implemented to create a natural land buffer between land uses and activities (such as industrial and residential etc.) to reduce any negative impacts from noise, air, ground, sound pollution or the like. Belts can also be implemented to protect natural lands from development, and therefore protect local flora and fauna. However traditionally, Green/ Sand Belts are also implemented to contain urban sprawl, being accompanied by strict development regulations, limiting any type of permanent building structure or urban expansion, encouraging urban infill development.		
Goals • Provide natural land buffers between conflicting land uses, or to create a safeguard from any polluting activities. • Protect national land areas from development encroachment, in order to protect landscapes, flora, fauna, sites of special interest etc. • Provide a limitation to urban development, surrounding villages, towns, and cities in order to contain urban development, and encourage urban infill development – promoting sustainable development.		
Permitted Uses		
<i>Primary Uses</i>	<i>Secondary Uses</i>	<i>Not Permitted</i>
• Natural Landscape Buffer • Nature Trails • Informal play areas • Trail / pathway for walking and cycling	Temporary building structures	<i>All other uses that do not meet the purpose and outcomes of the land use.</i>
Description	Acting as a protective landscape buffer, Green/Sand Belts are intended as areas with strict building regulations, and do not typically allow for permanent building structures. Green/ Sand belts can incorporate walking and cycling trails, informal play areas, or similar, however, should be predominantly natural landscape and used as a physical buffer between land use activities, or to contain urban sprawl.	
Location	Dependent on the role of the Green/ Sand Belt, typically at the fringe of villages and towns, or between conflicting land uses.	
Minimum Area	Approx. 1km	
Parking	n/a	



Indicative Conceptual Diagram of a Green/ Sand Belt



06

URBAN STREETS

6. URBAN STREETS

6.1. Introduction

Chapter 2 details the importance of integrated street planning and design and advocates a 'Complete Streets' approach which provides for all travel modes when a street is designed or rebuilt. This process of sustainable street design supports compact, walkable neighbourhoods and integrates the street with the form and function of the surrounding land uses. The design approach uses a framework that pairs a street family typology (Boulevard, Avenue, Street, Lane) with a place typology of urban context (City, Town, District, Neighbourhood). This context-based guidance is intended primarily for the hierarchy of streets in urban areas.

The conventional approach to utility corridor design in Oman typically places less emphasis on the direct impact on RoW land take and the resulting land costs. The current approach prevents the placement of utilities beneath travel lanes. This has a significant impact on the width of RoW, resulting in large areas of unused land which do not create inviting public spaces and a comfortable, shaded public realm.

It is recognised that utilities are an integral part of the urban street and well-designed utility networks help create sustainable cities. Cities around the world increasingly focus on creating Complete Streets and treating land for urban RoWs as a limited resource. This requires designing public as three-dimensional corridors. The Urban Street Planning Standards set out on the following pages are based on the current Oman Highway Standards, but strongly advocate that narrower RoWs are considered by the highway authorities and utility providers.

The Urban Streets Planning Standards consist of five (5) typical streets which can be used as a basis for street hierarchy classification and implementation:

- Boulevard
- Avenue
- Street
- Lane
- Alleyway

Urban Street Family Classifications

The traditional Oman Functional Classification system refers to a hierarchy of street types such as Urban Arterial, Urban Secondary and Urban Distributor, based on the vehicle movement and property access roles in the network.

However, this system makes no reference to adjacent land uses, surrounding context and environment, which is the basis for context sensitive street design. The table below shows the relationship between Street Design and existing Functional Classification systems:

Functional Classification vs. Street Family Characters

Street Family Classification	Oman Functional Classification			
	Urban Arterial	Urban Secondary	Urban Distributor	Local Street
Boulevard	X			
Avenue		X		
Street			X	X
Lane				X

The Street Family Classification is further detailed as follows:

- **Boulevards:** A high vehicle capacity 3+3 street (three lanes in each direction). This is the highest order of street serving key commercial, public and institutional buildings. It will need to accommodate high volumes of workers and shoppers particularly at lunchtimes and early evenings. A dedicated lane for public transit should be provided with a high frequency BRT service connecting key urban areas and centres. Continuous formal tree planting should be provided for shade and shelter for active frontage uses.
- **Avenues:** A medium vehicle capacity 2+2 street (two lanes in each direction). Avenues may have frontage lanes. These link roads should form a web of major routes across the urban area. They must be able to carry the high frequency bus routes and link residential neighbourhoods with retail and community facilities. Frontage access will generally not be allowed but where they pass through district centres and mixed-use areas parallel frontage parking would be provided.
- **Streets:** A low vehicle capacity 1+1 street (one lane in each direction). Anticipated low traffic volumes and low speeds. These provide a secondary grid of streets, they provide links between residential areas and should be served by local feeder buses, as well as direct access to housing within residential areas. Local streets must connect frequent intervals. Frontage access allowed with on-street parking in defined bays.
- **Lanes:** A very low vehicle capacity 1+1 street (one lane in each direction). Anticipated very low traffic volumes and very low speeds. These provide direct access to housing within residential areas. They typically take the form of a loop providing access to residences. They are not served by bus services and are intended to be slow speed with traffic calming features.
- **Alleyways/ Greenways:** Alleyways/ Greenways provide a network of shaded pedestrian and cycle routes extending throughout defined areas. They thread through residential areas, linking together to provide safe routes to school and community facilities.

6.2. Urban Streets – Planning Guidance

The Urban Streets Planning Standards include a section drawing that defines the dimensional requirement for the street design, such as width and number of travel lanes, allocation and width of on-street parking, the width of the pedestrian realm and the location of planting etc.

Furthermore, the specific way that a building is required to address the street, both in height, frontage type and setback is included in the regulating Urban Street section. The allocation of the different Urban Street types and their preferred locations are to be determined as per the appropriateness of their typology within certain urban contexts as described.

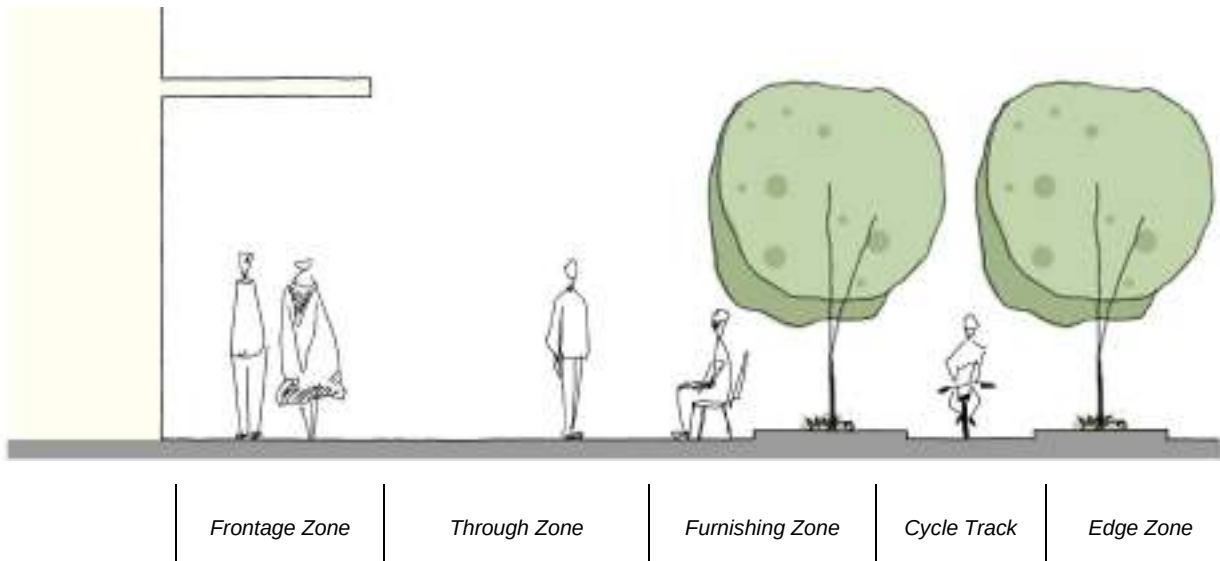
A key recommendation is the need to produce an Urban Street Design Manual to guide the transition of Oman's streets towards a more sustainable, multi-modal, low carbon future. The manual should provide more detail on the design principles, the specific urban considerations to be addressed in Oman and new street typologies based on the Complete Streets approach. The following provides an overview of key planning guidance and key terms of references for Urban Streets:

Right of Way (RoW)

- The measurement across a thoroughfare of the area the municipality controls or owns which includes the travel lanes as well as parking and pedestrian realm and together with the building setbacks and the frontage types, effectively defines the width of the public space. Paired with the minimum and maximum height of buildings, this defines the proportion of the public space. All of these should be considered together and regulated accordingly to prescribe the desired place.

Pedestrian Realm

- There are five primary Zones in the pedestrian realm: Frontage, Through, Furnishing, Cycle and Edge. Because interaction occurs between these Zones, development of a cohesive design for the pedestrian realm is important. These Zones are defined as follows:
 - o **Frontage Zone:** Space between the building façade, wall or fence and the through zone of the pedestrian realm.
 - o **Through Zone:** Obstacle free space for clear pedestrian through travel. This is the primary walking area of the pedestrian realm.
 - o **Furnishing Zone:** Primary buffer space between the active pedestrian walking area of the through zone and adjacent thoroughfares.
 - o **Cycle Track:** Designated track for cyclists, which may not be present on some streets.
 - o **Edge Zone:** Interface between the on-street parking or travel lane.
- Design must consider the unique conditions associated with each Zone as well as how the pedestrian realm interacts with other elements of the street, such as cycle and transit facilities and junctions. Maintaining clear sight lines between pedestrians, cyclists and motorists in these areas of interaction is critical.
- Pedestrian Through Zone should be no less than 1.5m width with no obstructions.
- Cycle Track should be no less than 1.5m width (1-way) and 3m width (2-way).



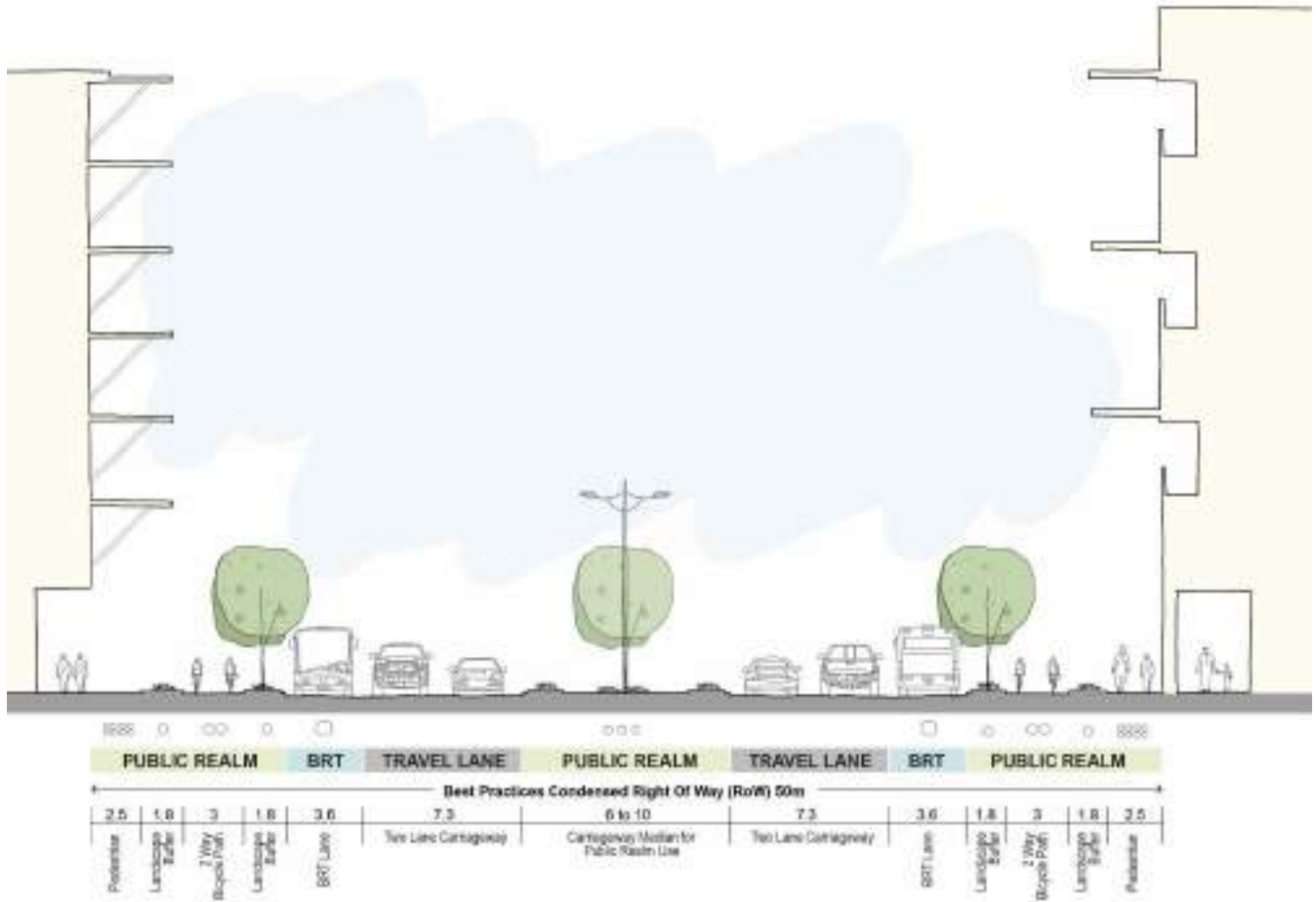
Pedestrian Realm Reference Diagram

Parking

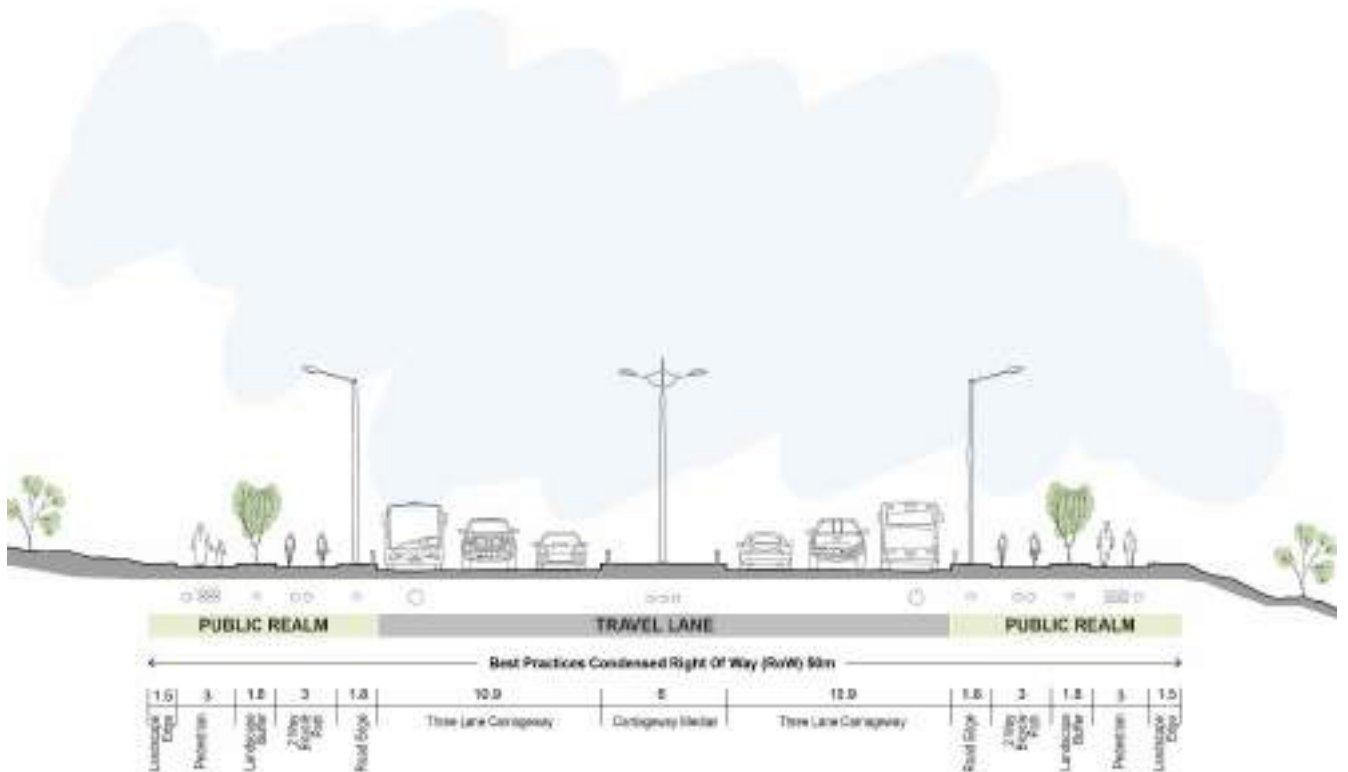
- All parking should be in accordance with Ministry of Transport, Communications and Information Technology, as well as relevant Ministries / Authorities.
- Different parking types affect a development in different ways. Based on the location and building type, certain parking types may not be acceptable for creating the urban and building form desired. Possible parking types include:
 - Underground garage
 - Multi-storey
 - Surface parking
 - Integrated garage (e.g. Town Houses)
 - Detached garage (e.g. Villas)
 - On-street parking
- Smaller pockets of parking (no more than 10-15 spaces) should be encouraged as they are more easily absorbed into an attractive outdoor space than large, dominating areas of parking.
- Parking areas should be well overlooked, with clear and safe pedestrian routes between parking areas and the entrances to homes provided.
- Consideration of decking over parking between buildings inside a block where appropriate to provide parking shade, creation of residents' amenity space on the deck and ensure parking does not dominate. The success of this will rely on the design of the parking, ensuring good lighting, security and access to dwellings.
- Basement parking should be preferred as, although generally more expensive, it clears the space between buildings for residents' amenity.
- Garages that are designed as an integral part of town houses have to be carefully designed so that they do not dominate the façade, which can be achieved by lowering the level of the garage or by placing the garage at the rear of the property accessed by an Alleyway.

6.3. Boulevard

Boulevard	
Typology	The Boulevard should act as the civic, ceremonial and commercial spine of urban areas and should attract priority treatment in terms of hard materials and planting. It is characterised by a more generous pedestrian realm that accommodates higher volumes of pedestrians. These will help facilitate Transit Oriented Development (TOD) in the form of high density, mixed use urban corridors. All RoW should be in accordance with the MoTCIT.
Right of Way (RoW)	50m
Travel Lanes	Two (2) Travel Lanes in each direction – 3.6m width separated by central median. One (1) BRT Lane in each direction – 3.65m width.
Cycle Lanes	Minimum 3m width (2-way direction).
Parking and Servicing	No frontage parking should be provided. Parking and servicing accessed via proximal Streets. Parking to be accommodated within development plots or multi-storey public car parks. Parking should as per MoTCIT/ relevant Authority standards.
Pedestrian Realm	Double row of closely spaced shade trees to be provided on each side of Boulevard. Pedestrian amenities on sidewalks: Transit Stops, Benches, Waiting Areas, Flexible Spaces. The Pedestrian Realm should encourage activity and enhance the vitality/ viability of the adjacent shops and businesses. Regularly spaced (average every 50m recommended) signalised step free pedestrian crossings should provide safe and accessible pedestrian crossing movements across the Boulevard. Pedestrian Crossings should be provided at every junction and middle of the blocks. Transit stops should be local landmarks and feature sculptural canopies that provide shade. Step free access for pedestrians should be provided throughout to cater for people with mobility difficulties. High quality street furniture, hardscape and softscape, alongside shaded and extended pedestrian walkways should be provided, with good accessibility between both sides of the street.
Frontage Type (Urban)	A combination of building colonnades, shade canopy trees and free-standing structures should be used to provide shade near key nodes and community facilities. Design corner buildings – exposure to multiple street frontages and high public visibility. Incorporate elements such as increased height, fenestration and roof features, and well-articulated entrances. Front setback to be 0m, where appropriate, to maintain urban townscape character.



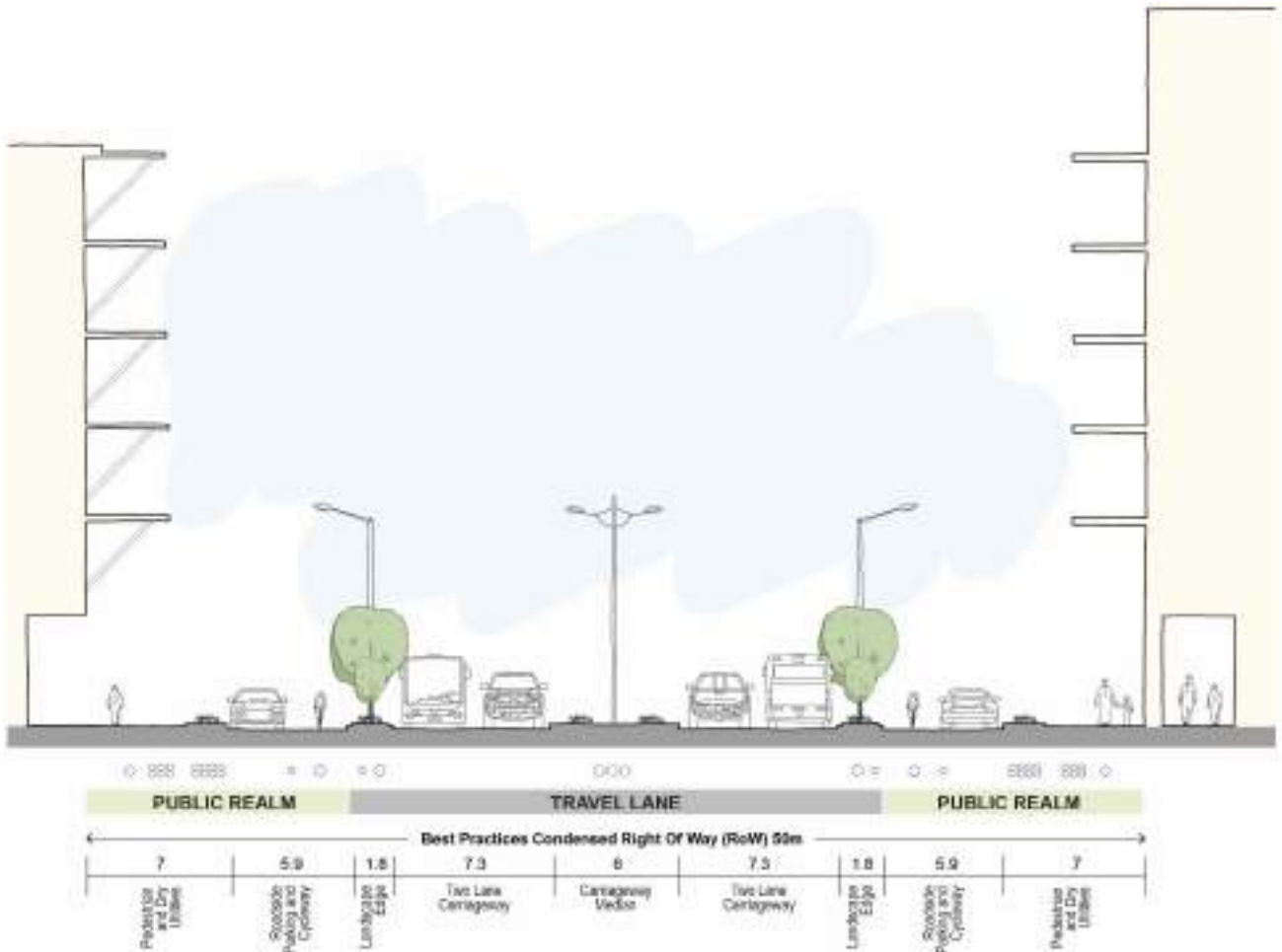
Boulevard Typical RoW Section Diagram – Higher Density



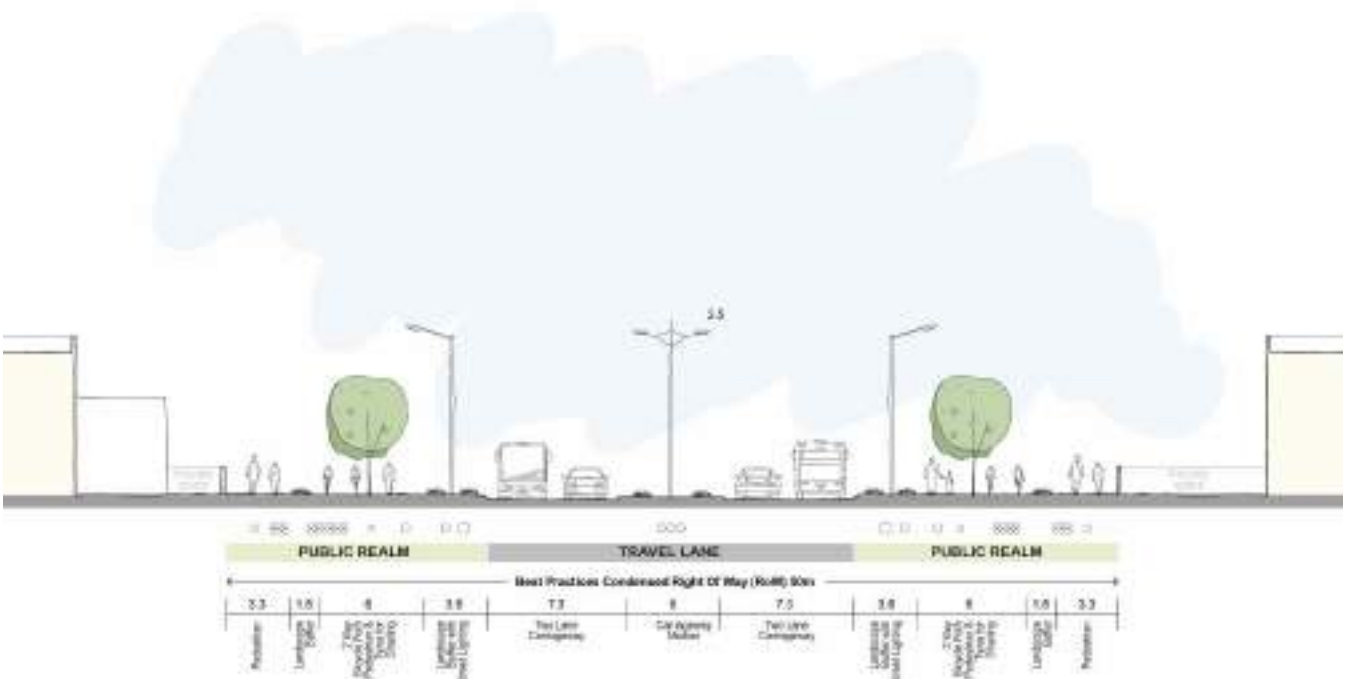
Boulevard Typical RoW Section Diagram – Lower Density

6.4. Avenue

Avenue	
Typology	Avenues should provide the spine to the new residential districts and are the main transport corridors. Lower Density: A loose grid of Avenues provides the main circulation within a residential district, linking District and Neighbourhood Centres to the existing arterial roads. Two 3.65m travel lanes are provided in each direction, with limited on-street parking and a median for left turns. Sidewalks and cycle tracks are also provided on both sides of this roadway. Higher Density: Where Avenues pass through District Centres and mixed-use areas, it is important to create an active frontage. This will be achieved by shops and commercial activities on the ground floor of buildings fronting onto the street and a high-quality public realm. Shade should be achieved by colonnades and tree planting. All RoW should be in accordance with MoHT.
Right of Way (RoW)	50m
Travel Lanes	Two (2) Lanes in each direction. Two (2) 3.65m travel lanes provided in each direction separated by a 6m central median. All cross-sections/ travel lanes to be in accordance with Ministry of Transport, Communications and Information Technology guidelines/ regulations.
Cycle Lanes	Minimum 1.8m width (1-way direction). Minimum 3m width (2-way direction).
Parking and Servicing	Lower Density: No frontage parking provided. Higher Density: Parallel frontage parking provided. Parking should be provided as per MoTCIT / relevant Authority standards.
Pedestrian Realm	Provide safe and accessible pedestrian crossing movements across the Avenues as a priority which should be achieved through regular signalised step free pedestrian crossings. Shade canopy trees should be incorporated to enhance pedestrian comfort. Step free access for pedestrians should be provided throughout to cater for people with mobility difficulties. High quality street furniture, hardscape and softscape, alongside shaded and extended pedestrian walkways should be provided, with good accessibility between both sides of the street.
Frontage Type	A combination of building colonnades, shade canopy trees and free-standing structures should be used to provide shade near key nodes and land uses, particularly in Centres. Retail and commercial activity should be encouraged to spill out into the public realm in higher density areas, creating a diverse and active pedestrian walkway which encourages walking and cycling.



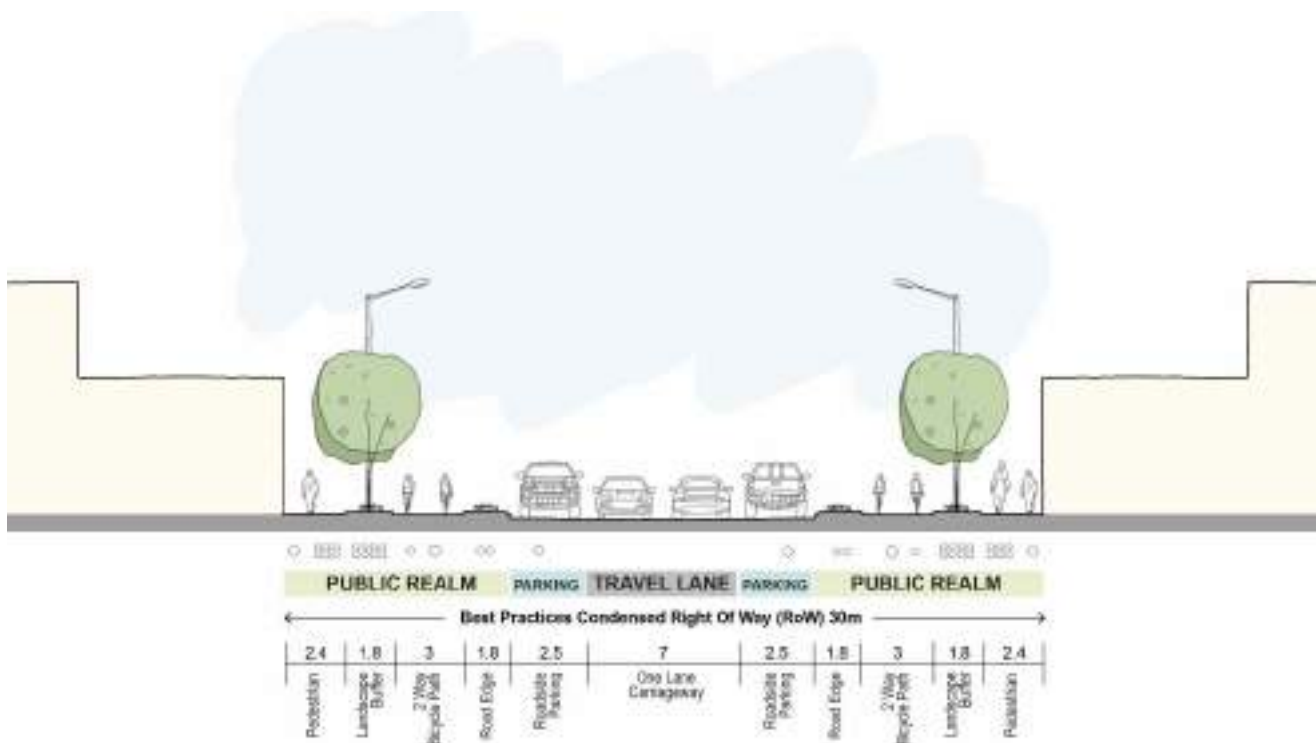
Avenue Typical RoW Section Diagram – Higher Density



Avenue Typical RoW Section Diagram – Lower Density

6.5. Street

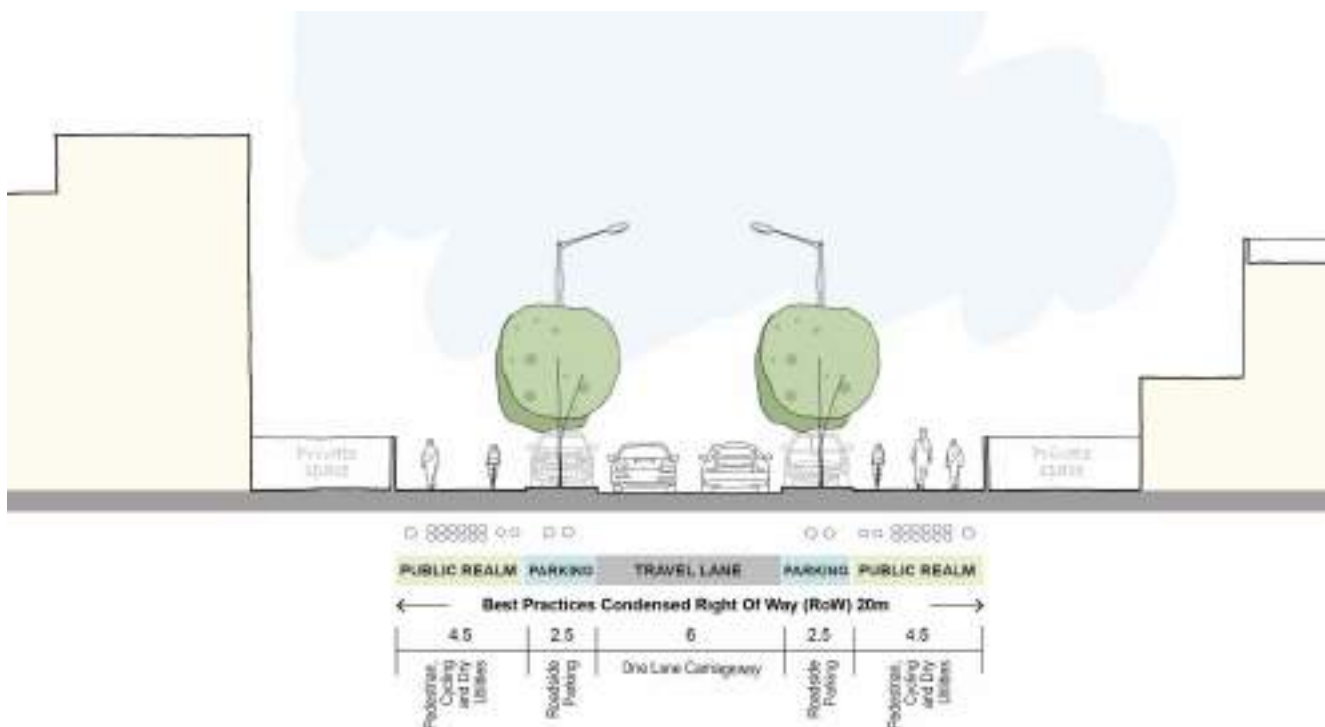
Street	
Typology	Streets should provide the main vehicular circulation within and between residential neighbourhoods. They typically take the form of a secondary grid between Avenues with access points to residences. Pedestrian safety is of paramount importance. They should be designed for slower speeds and incorporate traffic calming measures. All RoW should be in accordance with MoHT.
Right of Way (RoW)	30m
Travel Lanes	One (1) Lane in each direction – 3.5m width. Traffic calming measures should be used to limit traffic speeds and deter through-traffic.
Cycle Lanes	Minimum 3m width (2-way direction). Pedestrian sidewalks and shared surface cycle tracks (minimum 5m as required) can be provided on both sides of this roadway.
Parking and Servicing	Parallel on-street parking provided at key locations. Parallel parking on one side of the street should be preferred. Parking for residents to be provided within the large or compact residential plots. Areas for visitor parking are defined to prevent driveways being obstructed. Parking should be provided as per MoTCIT / relevant Authority standards.
Pedestrian Realm	Allowing safe and accessible pedestrian crossing movements across the street should be a priority and this should be achieved through regular signalised step free pedestrian crossings. Trees to be located along both sides of the street to offer visual interest and shade. Step free access for pedestrians should be provided throughout to cater for people with mobility difficulties.
Frontage Type	Entrances to residential plots. Typically fronted by low density residential uses, such as Villas with boundary walls or Townhouses with semi-private setback.



Street Typical RoW Section Diagram

6.6. Lane

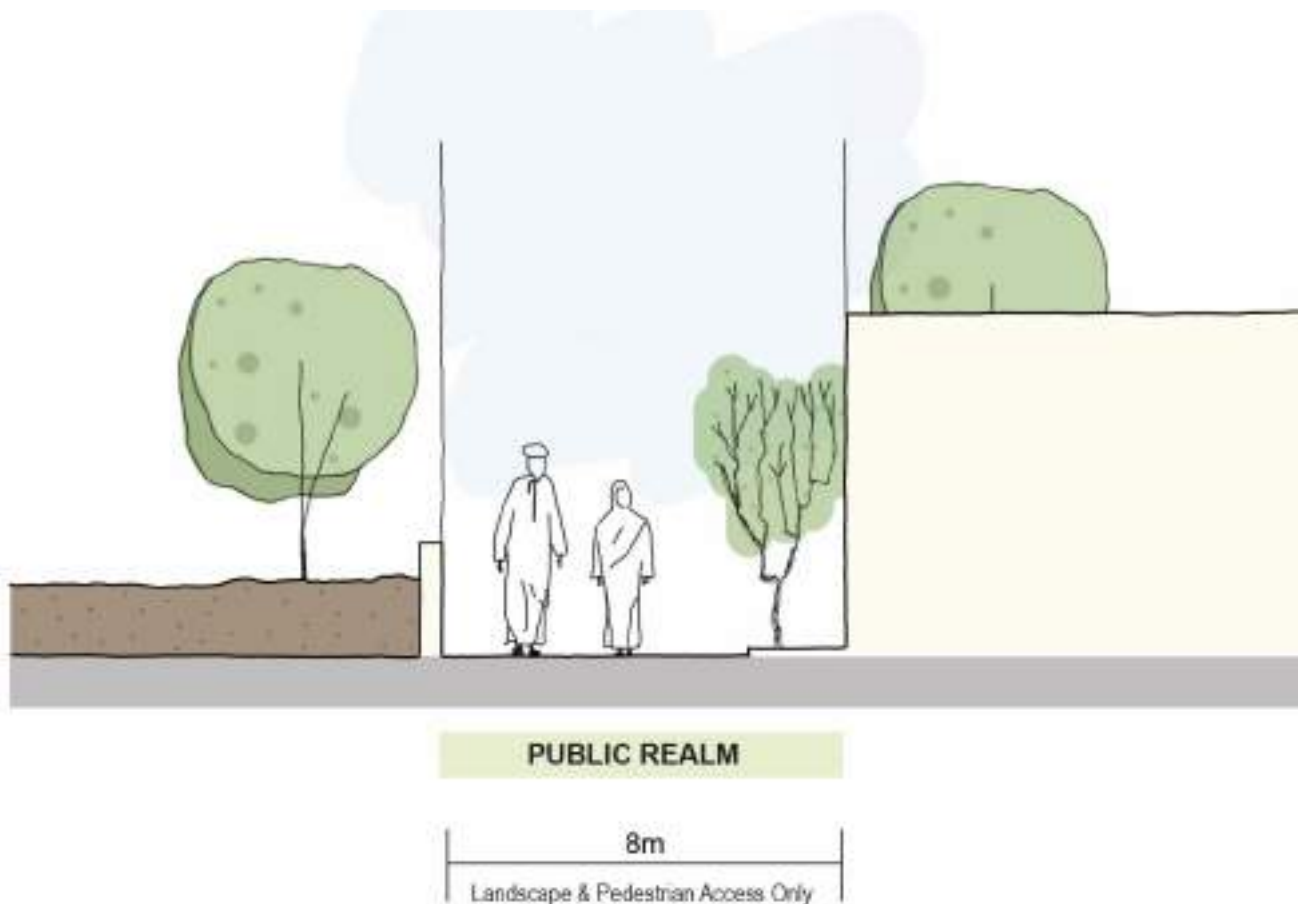
Lane	
Typology	Lanes should provide access to residential plots, or cul-de-sac within residential areas they typically take the form of a loop and are not to be used as through-ways. Pedestrian safety is of paramount importance and they are designed for slower speeds and incorporate traffic calming measures. All RoW should be in accordance with MTCIT.
Right of Way (RoW)	20m
Travel Lanes	One (1) lane in each direction – 3.5m width. Traffic calming measures should be used to limit traffic speeds and deter through-traffic.
Cycle Lanes	Dedicated Cycle Lane not provided. Cycling can be accommodated on-street due to reduced traffic speeds through traffic calming measures.
Parking and Servicing	Parallel parking provided on-street – recommended to be provided on one side of the street only, intersected with trees. Parking for residents to be provided within the residential plot. Areas for visitor parking are defined to prevent driveways being obstructed. Parking should as per MoTCIT / relevant Authority standards..
Pedestrian Realm	Recommended to be partly paved to define pedestrian priority with raised tables and pinch points. Connects to Greenways and Alleyways to provide wider movement through residential areas. Trees to be located along both sides of the street, intermittently within the Parking lane, to offer visual interest and shade.
Frontage Type	Entrances to residential plots. Typically fronted by low density residential uses, such as Villas with boundary walls or Townhouses with semi-private setback. Plot entrances should be staggered to ensure privacy.



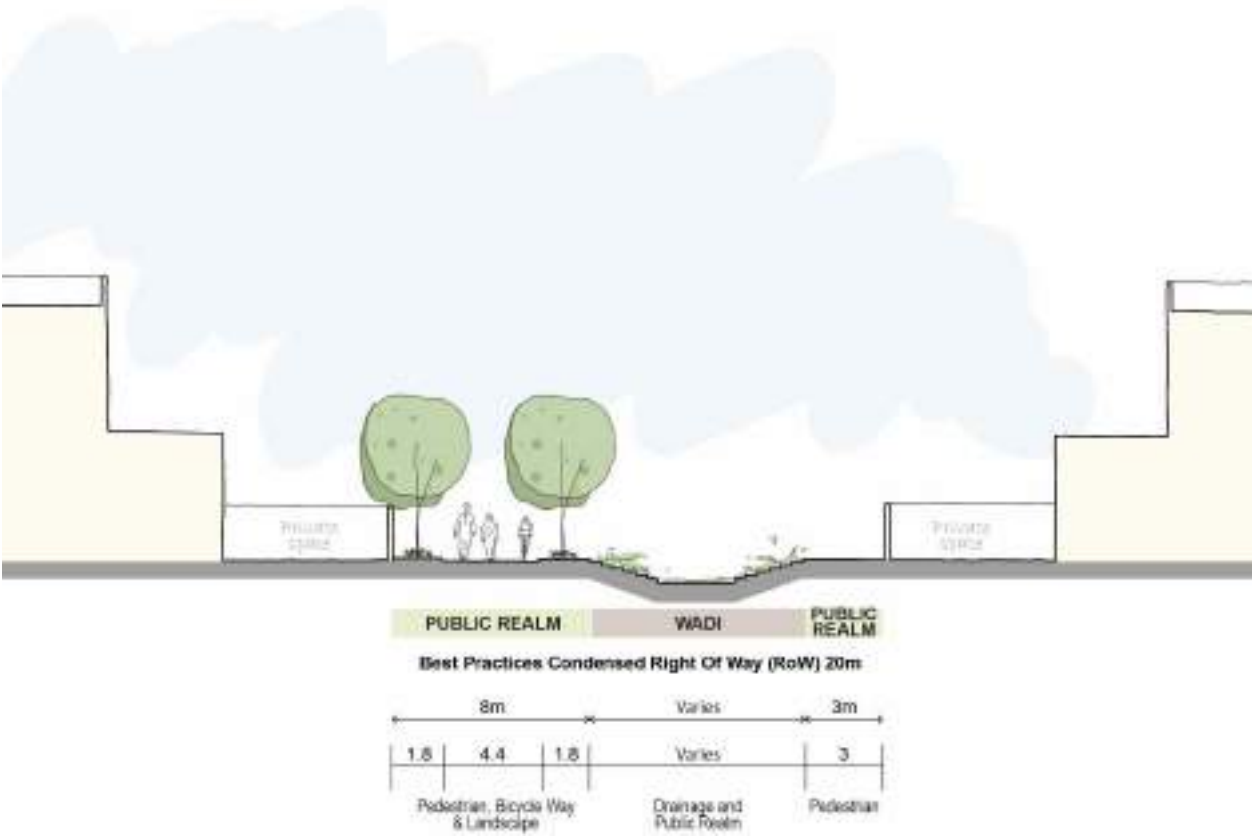
Lane Typical RoW Section Diagram

6.7. Alleyway / Greenway

Alleyway/ Greenway	
Typology	Alleyways provide narrow passageways between buildings are traditionally used as a shaded, comfortable way for pedestrians to move within and through a neighbourhood and offer 'shortcuts' and enhanced pedestrian permeability. Alleyways should be used to increase connectivity within neighbourhoods, providing passageways between residential plots and through blocks to pocket parks, open spaces, schools or other public amenities.
Right of Way (RoW)	3.5m minimum. 5m with hardscape/ softscape.
Travel Lanes	Motor vehicles are not accommodated.
Cycle Lanes	Dedicated cycle lane not provided but cyclists may share the space.
Parking and Servicing	Motor vehicles are not accommodated. Alleyways can be developed to accommodate emergency vehicles, if required for the specific master plan.
Pedestrian Realm	Alleyways should be well-designed spaces with good quality surfaces, furniture and lighting. Avoid clutter and utilities that obstruct pedestrian movement. The hardscape treatment should provide the main points of interest through ground patterns and use of colour. Potential for climbing plants to walls that form the framework of the Alleyway.
Frontage Type	Alleyways are defined by the walls of adjacent buildings and should be shaded by these walls as well as by any adjacent built form.



Alleyway Typical RoW Section Diagram



Greenway Typical RoW Section Diagram



07

UTILITIES
INFRASTRUCTURE

7. UTILITIES INFRASTRUCTURE

7.1. Introduction

This Chapter provides general spatial planning requirements for various Utility Infrastructure networks and provides information on typical demand values and other general information related to the following Utilities:

- Standard Road Typologies and Right of Ways (RoW)
- Potable Water Supply Networks
- Irrigation (TSE) Networks
- Electricity / Power Networks
- Gas Networks
- District Cooling Networks
- Telecommunications Networks
- Sewerage Networks
- Solid Waste Management
- Surface Water Drainage Networks
- Solar Power - PV Solutions/Applications

7.1.1. Utilities Infrastructure – Supplementary Planning Guidance

Overall, the conventional approach to utility corridor design in Oman typically places less emphasis on the direct impact on Right of Way (RoW) land uptake and the resulting land costs. The current approach for network approvals from Royal Oman Police, Utility providers, Highways/Roads Authorities and Municipalities departments prevents the placement of utilities beneath travel lanes. This has a significant impact on the width of RoW, resulting in large areas of unused land which do not create inviting public spaces and a comfortable, shaded public realm. Current practices have attempted to landscape such barren areas, which result in requiring significant cost for landscaping materials and also where grass or foliage has been planted means substantial amounts of irrigation water.

Chapter 2 of this document introduces future opportunities for an Integrated Street Planning and Design requirements including SMART-City layouts and concepts in road hierarchy and efficient use of the Right of Way corridor for multiple infrastructure networks.

Chapter 6 Urban Streets, seeks to address this spatial issue and provides recommended solutions as based on international best practice and other practices within the GCC region for the integrated placement of the multiple urban networks

The planning information set out in this Chapter is based on the current practices for relevant Authority and Utility providers requirements and is also aligned with Oman Highway Design Standards 2017. However, it is advocated that narrower RoWs should be considered within the built-up environment by the Highway/Roads Authorities and Utility Providers and they should be approached with complementary design proposals to optimise the amount of actual land designated for the overall RoW corridor for each utility or multi-infrastructure network solutions.

Presented in a separate section of this report, is the recommended integrated urban street and the positioning of the multi-utility infrastructure that feeds the urban and built-up environment.

The following are list of planning objectives to guide RoW spatial requirements for various utility infrastructure networks:

- General Utilities Plot planning guidance is provided in Chapter 3 Primary Land Uses.
- Ensure that the provision of utilities and infrastructure does not impact upon the pedestrian realm within public open space.
- Ensure space is provided for adequate pedestrian access and associated cost-effective landscape treatments adjacent to infrastructure and utility plots.
- Visually integrate utility infrastructure e.g. electricity feeder pillars into the wider urban fabric, and telecoms masts disguised as palm trees, etc.

- Wherever possible the below ground site infrastructure and utilities are providing with a surface landscape treatment above the assets, integrates the infrastructure plot with the surrounding landscape.
- Where a physical barrier is required around the plot boundary, any such treatment should be integrated with the surrounding built form in terms of materiality, form and height.
- Vegetative screening should be incorporated around infrastructure and utility plots.
- Dedicated vehicular access should be avoided to infrastructure plots, and access requirements should be incorporated within other landscape solutions.
- All utilities within a development plot should be coordinated with the utility connections to the plot by the developer. It should be the developer's responsibility to survey all utilities and terrain levels upon possession.
- Ensure that utilities apparatus, walls or buildings is screened from view and/or integrates with the built form.
- All utilities should be screened and be designed to blend as part of the local built form / urban environment.
- No utilities or service rooms should be permitted on the primary (active) or retail frontage.
- Ensure that transmission and distribution projects are initiated, planned and implemented in a timely manner to ensure continuity of services and uninterrupted accessibility to all residencies.
- Educate the population on water saving/conservation measures in order to support reductions of the per capita consumption for all water resources types, whether they are from desalination or ground water sources.
- Introduce smart water metering and appropriate water tariffs for residential, commercial, industrial and agricultural users in order to encourage consumer's self-awareness of water uses and self-management of their own water demand, and thus supporting a reduction of the per capita consumption for all water resources types.
- Implement non-revenue water and leakage control measures in order to target where Economic Level of Leakage can be obtained and thus reduce water losses.
- Consider the use of alternative water sources, like TSE or the re-use of grey water, for flushing toilets, private irrigation or street cleaning, to minimise the consumption and to reduce the impact on the corridors and additional piping.
- Consider groundwater storage of TSE surplus, to be recovered and treated for potable water uses.
- Consider groundwater storage of Potable Water, to be re-recovered and re-treated for potable uses. (NB: The locations of TSE and Potable Water ground storage locations need to be carefully planned to prevent cross contamination within the aquifer strata/lenses).
- Extend and enhance TSE networks within all settlements in order to promote increased TSE utilisation.
- Upgrade and extend the irrigation networks to enable full use of available TSE.
- Reduce the reliance on ground water and potable water for irrigation by maximizing the use of TSE from STPs.
- Ensure landscape design and irrigation quantities are limited to sustainable rates.
- Explore the storage of TSE surplus by promoting groundwater recharge projects to enhance reserves for future emergency use.
- Ensure space provision for each utility provider to incorporate a minimum of one spare duct in the same utility trench when laying their networks, for own Fibre Optical Cable (FOC) use or for future use/rental of the underground space for other FOC providers.
- Ensure road providers of junctions provide adequate spare underground ducting to allow other future utility service crossings to be installed within the ducting after the road is build, thus preventing lift and relay costs of roads.
- Allow for adequate underground ducting conduits/space for future Smart-City technologies or IoT connectivity opportunities.

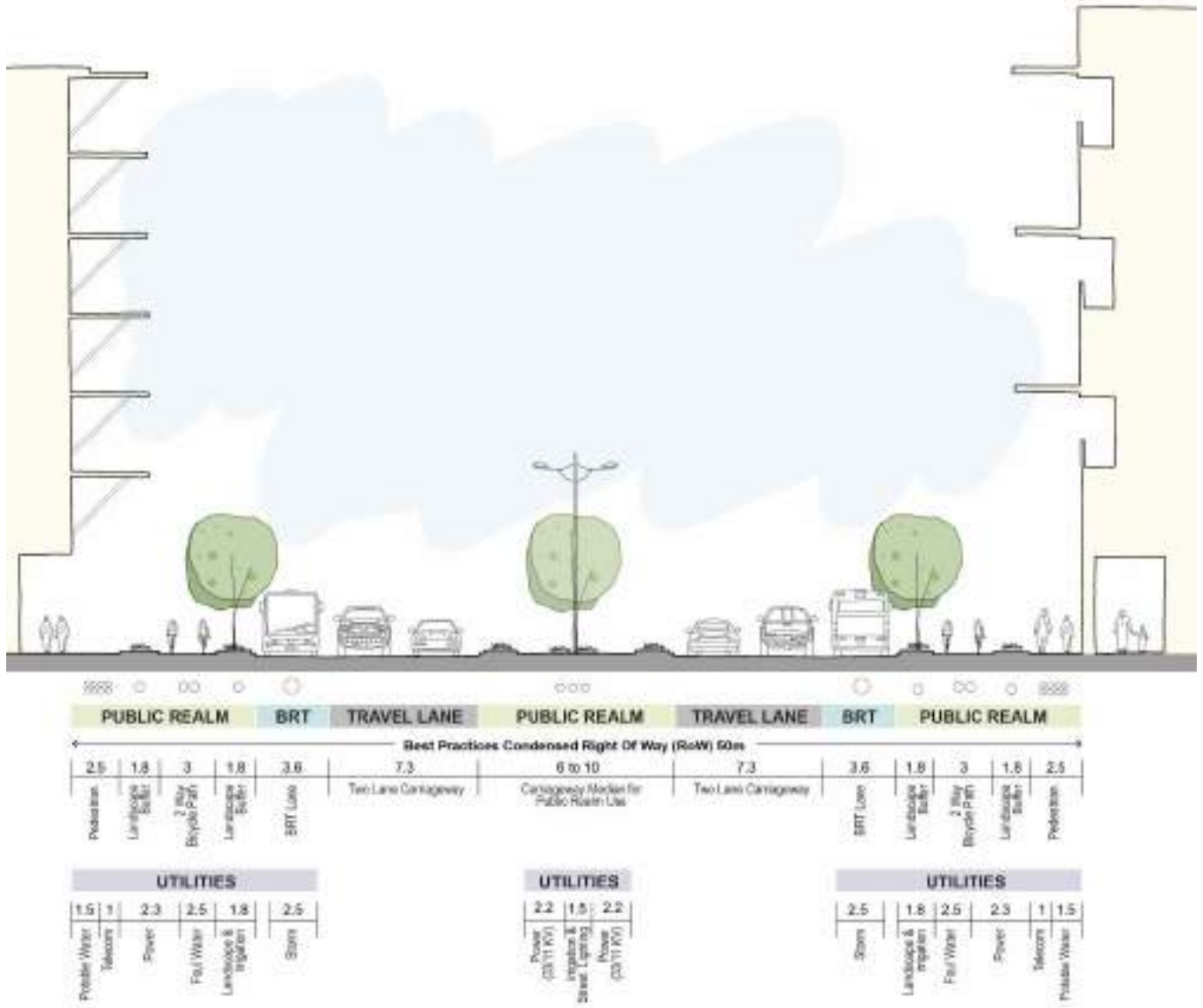
7.1.2. Utilities Infrastructure – Relevant Authorities

Utility Discipline	Ministry/ Authority	Operators
Roads/ Highways	Ministry of Transport, Communications and Information Technology Local Municipalities Departments Of Roads And Lighting	Ministry of Transport, Communications and Information Technology, Municipalities. Developers (for inside compounds or ITCs)
Street Lighting	Ministry of Transport, Communications and Information Technology Local Municipalities Departments Of Roads And Lighting	Ministry of Transport, Communications and Information Technology, Municipalities Developers (for inside compounds or ITCs)
Public Footpaths / Alleyways/ Access-Ways/ Walkways And Cycle-Paths	Local Municipalities Departments Of Roads And Lighting	Municipalities Developers (for inside compounds or ITCs)
Public Landscaping And Irrigation	Local Municipalities	Municipalities Developers (for inside compounds or ITCs)
Water	Nama Water Services	Nama Water Services Developers (for inside compounds or ITCs)
Irrigation Water and Networks	Nama Water Services	Nama Water Services Municipalities Developers (for inside compounds or ITCs)
Sewerage	Nama Water Services	Nama Water Services Developers (for inside compounds or ITCs)
Storm Water / Drainage Management	Ministry of Regional Municipalities and Water Resources Muscat Municipality	Municipalities
Power	AER OETC OPWP Nama Water Services Distribution Service Providers (MEDCo, Majan, Mazoon, RAECO)	MEDCo Majan Mazoon RAECO Developers (for inside compounds or ITCs)
Telecommunication	Oman Telecommunications Regulatory Authority Oman Towers Company Service Providers (Omantel, Ooreedo, future 3 rd operator) ROP/ISS security towers	Omantel Ooreedo Future 3 rd operator
Gas	Oman Gas Company (OGC) Petroleum Development Oman (PDO)	Oman Gas Company (OGC) Petroleum Development Oman (PDO)
District Cooling	Tabreed Oman Other District Cooling providers	Tabreed Oman Developers (for inside compounds or ITCs)

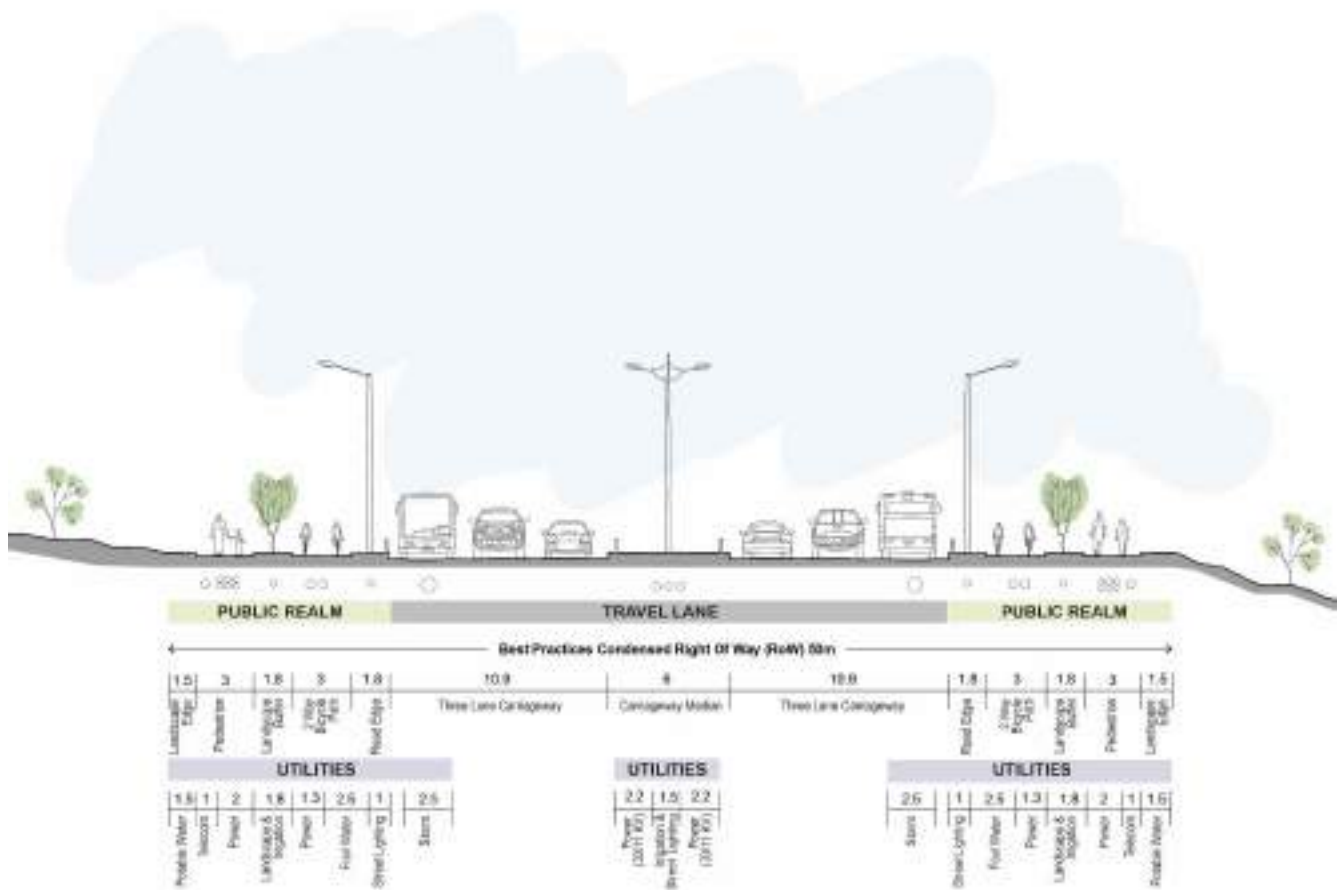
7.2. Standard Road Typologies and RoW

Typologies for Road Right of Ways (RoW)				
Description	The purpose of providing road typologies and the standard Right of Way (RoW) widths and solutions is to provide information on the typical RoW corridor requirements of the multi-infrastructure networks that may be required within the fabric of the urban built-up area.			
	It is noted that Oman Highways design Standards June 2017 already provide substantial and considerable detailed designs, guidelines and solutions on this matter, however the current practices in Oman today place all utilities outside of the travel lanes of the road networks.			
	In addition, the approach for utility network approvals through Royal Oman Police, Utility providers, Highways/Roads Authorities and Municipalities departments prevents the placement of utilities beneath travel lanes and this has a significant impact on the width of resulting RoW being required. As such large areas of unused land are required to contain the utilities, when left as wide-open areas, do not create inviting public spaces and a comfortable, shaded public realm.			
	The following are provided for guidance on opportunities to utilise some of the space underneath the travel or parking lanes of the road networks, which allows the offset land areas to be used for landscaping verges, cycle paths, footpath and other more compact arrangements of urban realm uses.			
	It is noted that these solutions align with best international practices and also with other GCC countries practices for multi-purpose uses of the RoWs in the built-up environment.			
Governing Authority	The intention of the following standard typologies is to urge better co-ordination between the various designers and authorities to find better solutions that are more economical, sustainable and habitable for the built-up environments. It is expected this will remain on a case-by-case basis until the Oman Highways Design Standards and the other standards for utility infrastructure are updated to ensure the best fit solutions recommended in this Chapter.			
	Royal Oman Police (ROP- Roads Planning Department)			
	Utility Providers (Design and Planning Departments)			
	Highways/ Roads Authorities			
	Municipalities (Roads and Planning) Departments			
ROW Width	Standard typologies for the urban road networks are as follows:			
	S/N	Maximum RoW width	Nr of travel lanes	Name and Description
	1	50m	3x3 + parking and BRT options	Boulevard (Higher Density) – a main road through with commercial building frontages/activity either side of the road lanes. Parking can be provided or the space future-proofed for a BRT lane option.
	2	50m	2x2 + parking and BRT options	Boulevard (Lower Density) – a main road that could be a dual carriageway, has with no side roads but substantial width of land either side for parking or the space future-proofed for a BRT lane option. (similar to November 18 th Street). Also incorporating walkways, cycleways surfacing over the top of utility networks.
	3	50m	2x2 + side access/	Avenue (Higher Density) – a main road that could be a dual carriageway and with side roads and parking either side of the travel lanes to allow for access to the adjacent plots. There will also be space for a future BRT lane option. Also

			parking lanes	incorporating walkways, cycleways surfacing over the top of utility networks.
	4	50m	2X2 + parking lane options	Avenue (Lower Density) – a main road through a Ministry of Housing sub-division with designated parking lanes either side of the travel lanes. Also incorporating walkways, cycleways surfacing over the top of utility networks.
	5	30m	1x1 + parking lane options	Street – a single carriageway road with designated parking lanes either side of the travel lanes. Also incorporating walkways, cycleways surfacing over the top of utility networks.
	6	20m	1x1 + parking option	Lane – a single carriageway road with alternate parking in the landscaped areas on one side of the travel lanes.
	7	15m	Footpath/ cycleways/ wadi routes	Alleyway / Greenway – a public access corridor for walkways, jogging tracks, cycle routes, and aligns with flood alleviation requirements or wadi channels through these green corridors.
Other national and arterial type road networks that exist outside urbanised areas will remain as per current OHDS design practices but recommended to be reviewed on a case-by-case basis to determine where similar opportunities exist for reducing the RoW width.				
Typical Sections of Condensed RoWs Examples (for future use)		As noted, the current practices in Oman mean that Right of Ways (RoW) are wider than they really need to be. The following are examples of the standard roadway typologies in the previous Table. The following images show that RoW widths are able to contain all of the urban type multi-utilities and multi-surface uses. It is also noted that the utilities have the same space provisions on both sides of the carriageway to allow for the worst-case scenario. However, when the actual utility network designs are undertaken then this may not be case and some of the space provided for each utility are not required. This would then free up some of the space provided to allow for moving the utility arrangement to suit. During the design of the RoW it is recommended the utility arrangement and types on either side of the carriageway be reviewed on a case-by-case basis.		



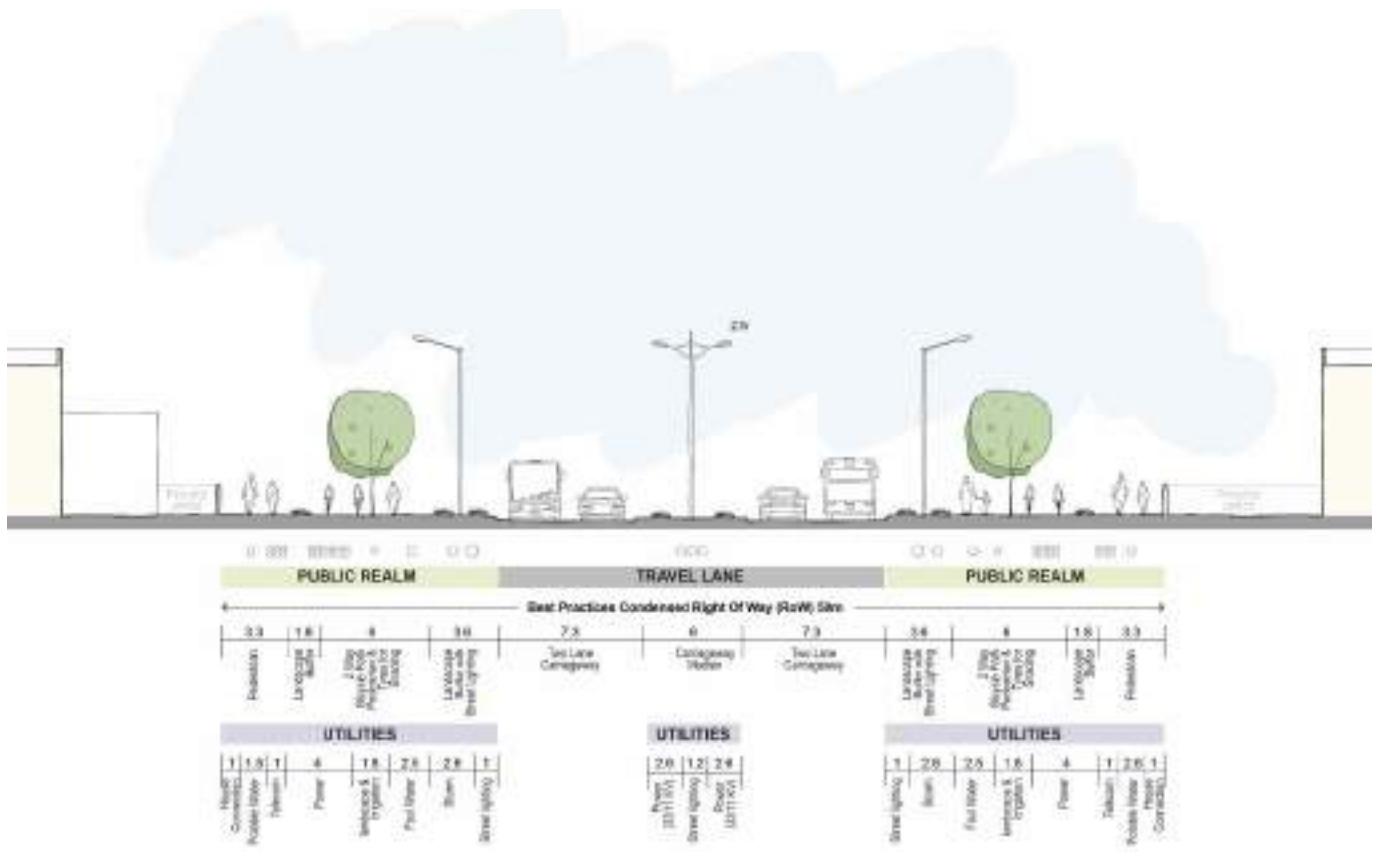
Boulevard Typical RoW Section Diagram – Higher Density



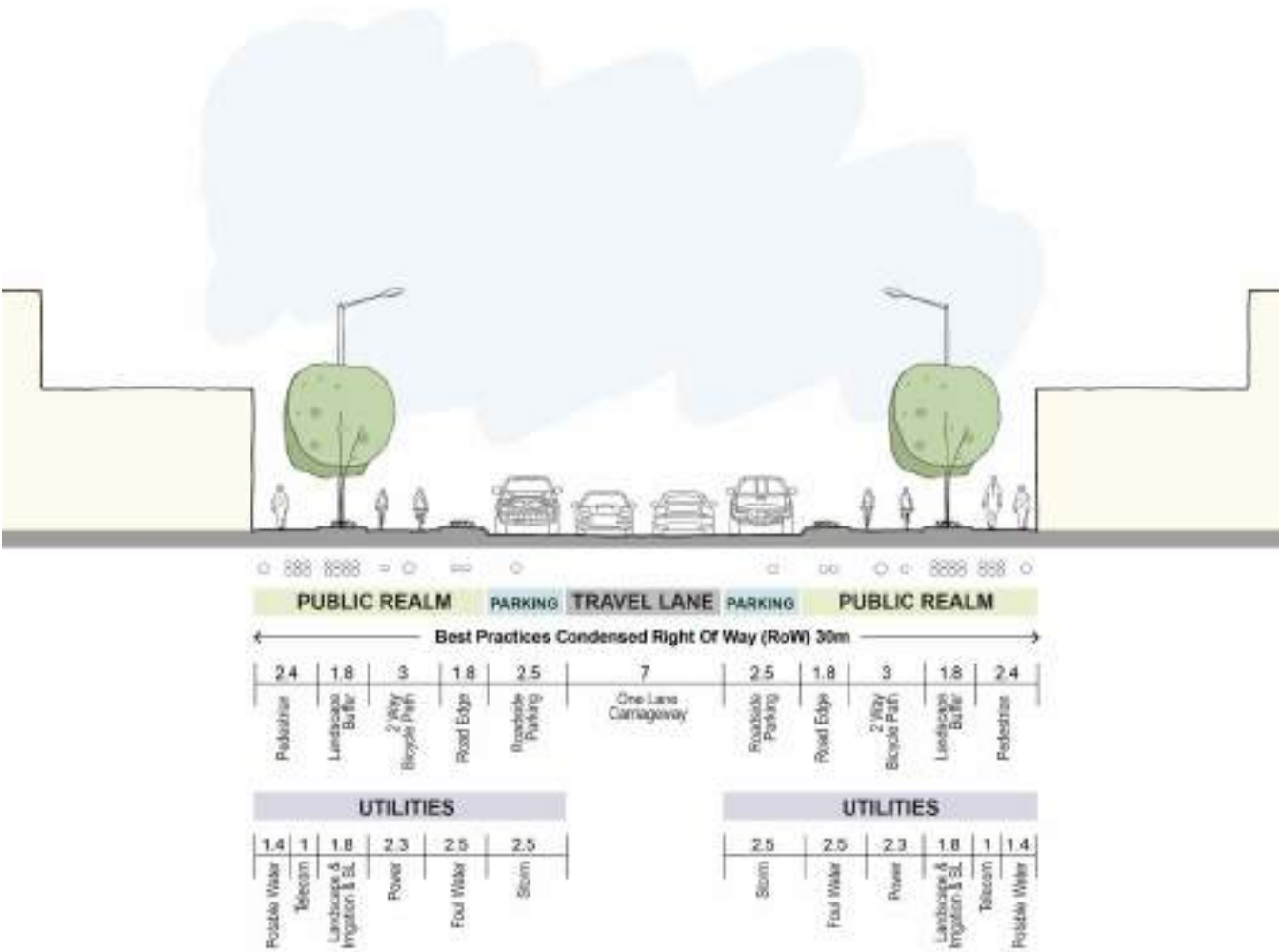
Boulevard Typical RoW Section Diagram – Lower Density



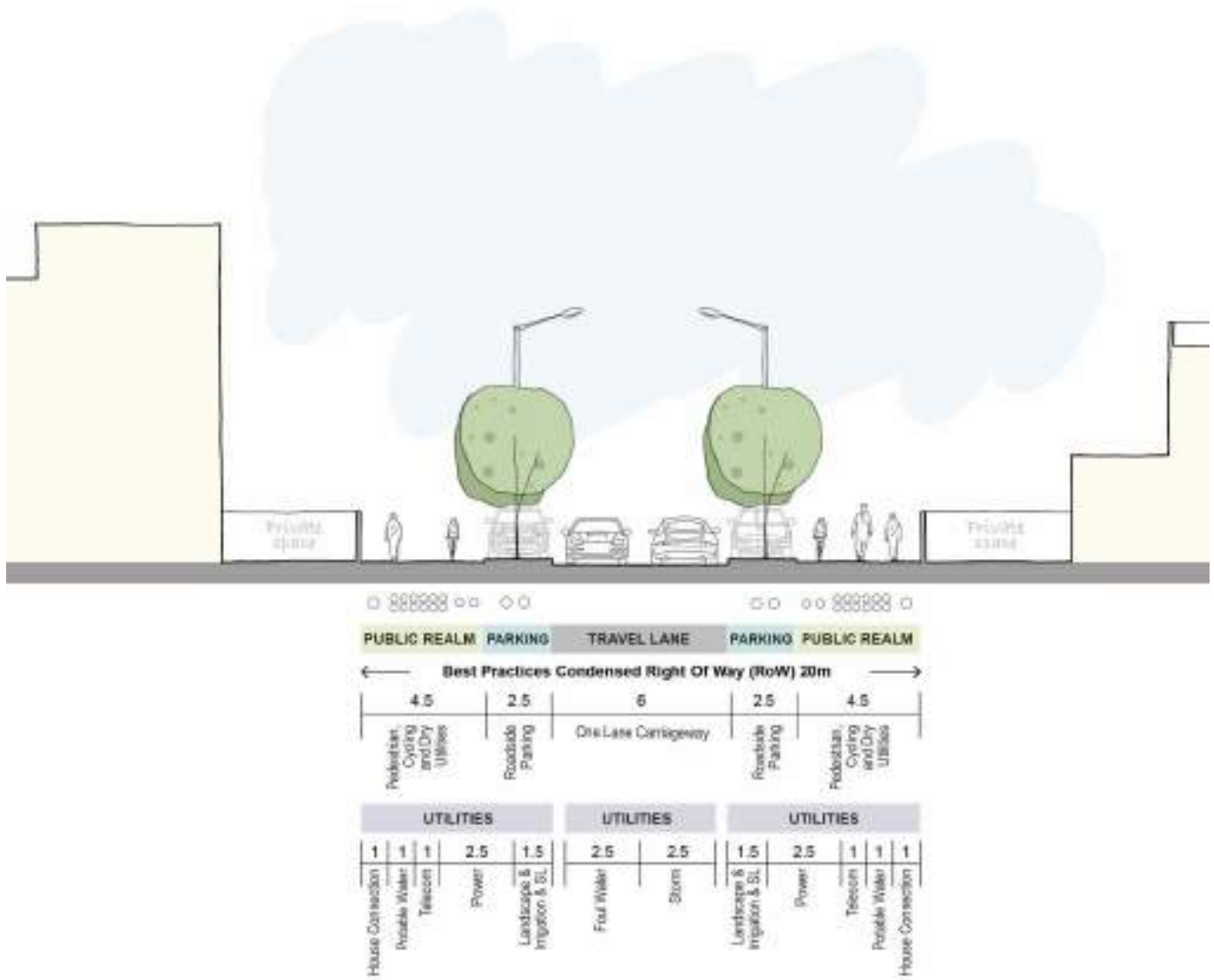
Avenue Typical RoW Section Diagram – Higher Density



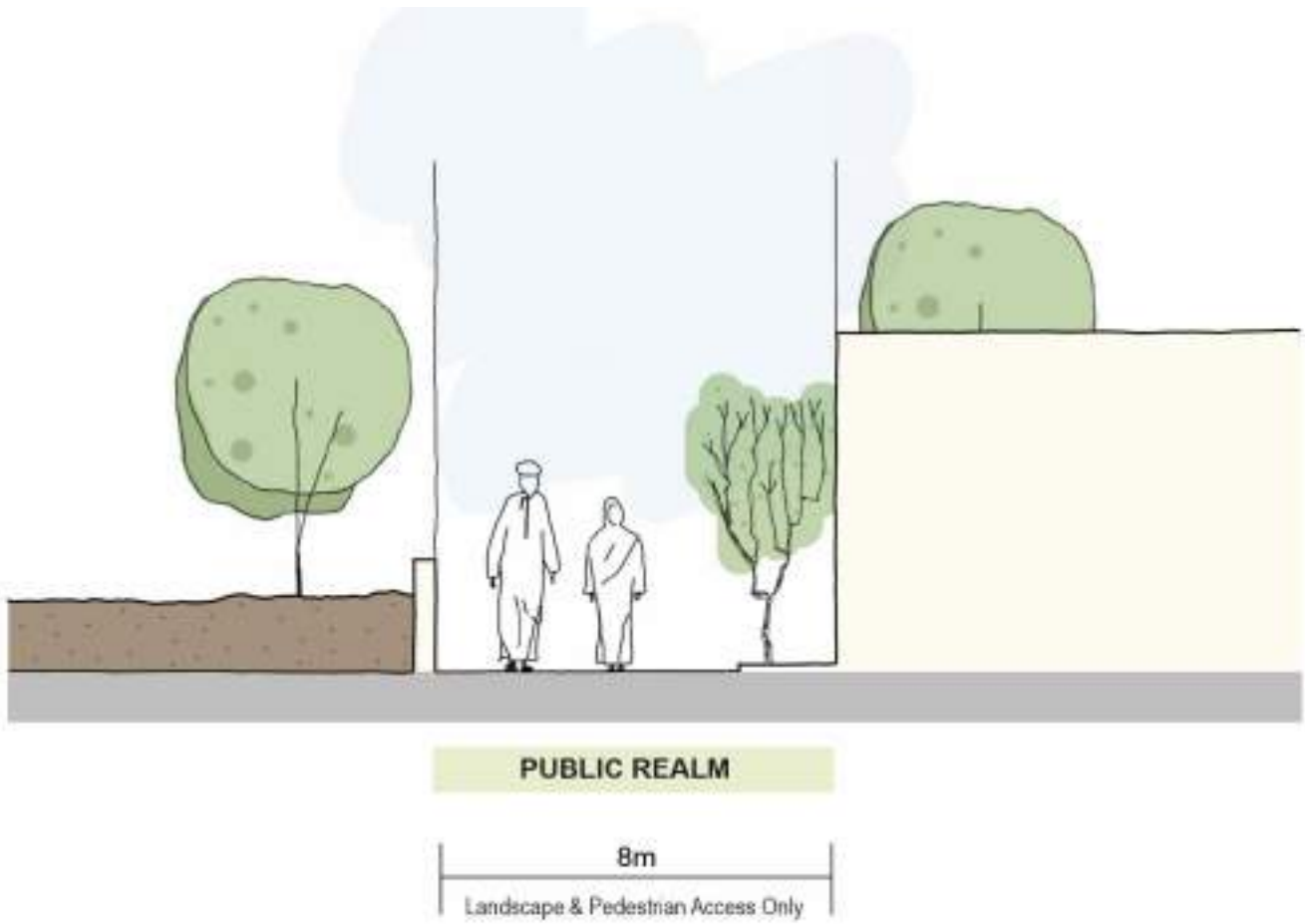
Avenue Typical RoW Section Diagram – Lower Density



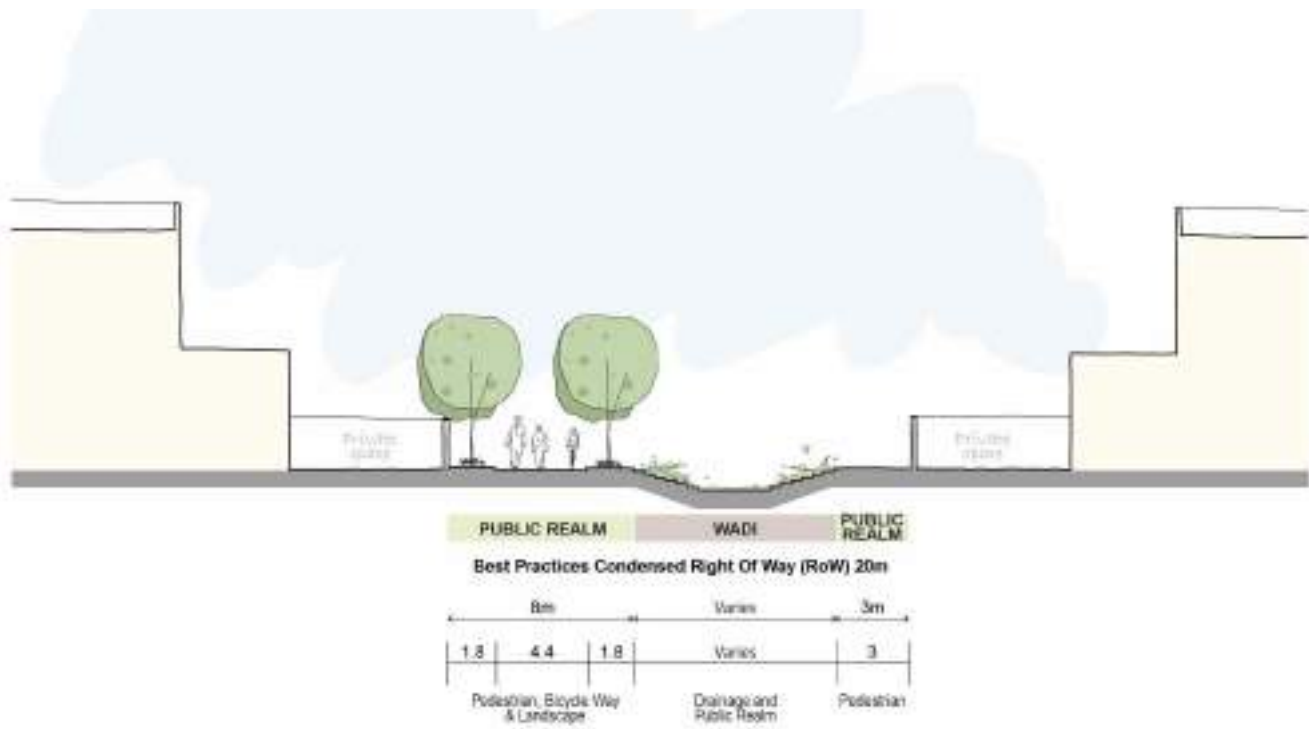
Street Typical RoW Section Diagram



Lane Typical RoW Section Diagram



Alleyway Typical RoW Section Diagram



Greenway Typical RoW Section Diagram

7.3. Potable Water Supply Networks

Water Supply							
Description	The purpose of the Water Supply Guideline is to provide information on typical RoW corridor requirements of the particular network type, plot sizes (where applicable) and typical water demand rates for assessment of schemes.						
Governing Authority	The Governing Authority, Diam, have their own planning and design standards and codes.						
Plot Size	No standard plot sizes are available as dimensions for generation facilities, pumping stations and reservoirs are dependent on the capacity and plot size required as based on the population and volume demand to catered for by the new facility. Typical ground-based storage reservoirs, pumping stations, tanker filling locations or other apparatus, will require particular design definition for the plot size requirements by the governing authority. Elevated Storage Reservoirs can typically be assumed as 50m x 50m but shall also need confirmation by the governing authority on specific plot needs.						
ROW Width	Urban Secondary Route 1.00m (0 to 300mm diameter) Urban Distributor Route 1.00m (0 to 300mm diameter), Urban Distributor Route trunk mains 1.50m (300 to 600mm diameter) Transmission pipelines >600mm (to be confirmed due to high pressure and security of supply risk)						
ROW Placement	The current practice for potable water distribution networks is a preferred location adjacent to plot boundary line.  Consideration required to align larger mains or trunk networks within one of the travel lanes where suitable and aligned with approving authorities' requirements.						
ROW Depth	Preferred depth of 1.00m to pipe crown (0-600mm diameters). Depth of larger Transmission pipelines greater than 600mm (to be confirmed by approving authorities due to high pressure and security of supply risk).						
Demand Rates	Typical demand per capita or demand per area rates for Potable Water Distribution Networks are shown as follows: <table border="1"> <thead> <tr> <th>Land Use Type</th><th>Planning Demand</th></tr> </thead> <tbody> <tr> <td>Residential (domestic demand)</td><td> 180 - 200 l / c / d NB: incentivisation and enforcement solution required by governing authority to reduce demand and align with WHO figures of <150 l / c / d. </td></tr> <tr> <td>Retail</td><td>7.0 l / m² / d</td></tr> </tbody> </table>	Land Use Type	Planning Demand	Residential (domestic demand)	180 - 200 l / c / d NB: incentivisation and enforcement solution required by governing authority to reduce demand and align with WHO figures of <150 l / c / d.	Retail	7.0 l / m ² / d
Land Use Type	Planning Demand						
Residential (domestic demand)	180 - 200 l / c / d NB: incentivisation and enforcement solution required by governing authority to reduce demand and align with WHO figures of <150 l / c / d.						
Retail	7.0 l / m ² / d						

	Commercial	7.0 l / m ² / d
	Renewables and Utilities Hub Areas	1.5 m ³ / hec / d
	Cattle/Livestock Facilities	10.0 litres / animal / d
	Mixed Use – Residential / Retail	7.0 l / m ² / d + 180 l / c / d
	Mixed Use – Residential / Commercial	7.0 l / m ² / d + 180 l / c / d
	Proportion of Mixed-use demand per person for Domestic/residency setting versus Non-domestic/workplace demand	60% domestic/residency, 40% non-domestic/workplace demand
	Hospitals	200-500 l / bed / day
	Logistics	25.0 m ³ / hec / day
	Light Industry	15.0 - 25.0 m ³ / hec / day
	Medium Industry	25.0 - 40.0 m ³ / hec / day
	Heavy Industry	User specific
	Mixed-use multi-demand type (Domestic + Non-Domestic)	300 l / c / d (NB: A general rule-of-thumb planning parameter only)
	Non-Domestic %age of domestic demands. (NB specific land uses above will define exact balance)	20% (NB: A general rule-of-thumb planning parameter only)
	Large Super Distribution storage facilities as a minimum of 1.0 days storage provision in separate plot. Smaller Localised Distribution storage facilities as a minimum of 2.0 days storage provision in separate plot. Residency storage facilities as a minimum of 1.0-day storage provision on-plot. Peaking factors (ADD, PHD, PMD), pressure regimes, fire-fighting provisions, etc. are dependent upon the design criteria by the governing authority. [ADD = Average Daily Demand, PHD = Peak Hourly Demand, PMD = Peak Monthly Demand] General Level of Leakage (GLL) to be maximum of 15% allowance, therefore targeted Economic Level of Leakage (ELL) reductions for necessary to attain less than 15%.	
Additional Guidelines	Additional ROW corridor widths will be required to suit the location of chambers for valves and flow meters, PRVs, Air Valves, Washouts, hydrants, etc. The additional space is to be overlapped with adjacent utility corridors where possible to ensure that no chambers are located within the adjacent corridors to cause obstruction for installation or repair/maintenance access. Typical trench and chamber widths are shown as follows:	
	Utility Providers' Requirements	

	Pipe Diameter (mm)	Trench Width (mm)	Service Corridor Width (mm)	Chamber Corridor Width (mm)
	150	700	1000	1500
	200	800		
	300	900		
	400	1000	1300	2200
	500	1200		
	600	1300		
	700	1400	1800	2700
	800	1500		
	900	1600		
	1000	1800		

7.4. Irrigation (TSE) Networks

Irrigation													
Description	The purpose of the Irrigation (TSE) Network Guideline is to provide information on typical RoW corridor requirements of the particular network type, plot sizes (where applicable) and typical demand rates for assessment of schemes.												
Governing Authority	The Governing Authority is Nama Water Services who have their own planning and design standards and codes.												
Plot Size	No standard plot sizes are available as dimensions for pumping stations and storage reservoirs or valving/distribution assets as these are dependent on dimensions/size as required for the quantity/capacity required for the supply area.												
ROW Width	Urban Secondary Route 1.00m (0 to 300mm diameter) Urban Distributor Route 1.00m (0 to 300mm diameter) Urban Distributor Route trunk mains 1.50m (300 to 600mm diameter) Transmission pipelines >600mm (to be confirmed due to high pressure and security of supply risk)												
ROW Placement	The current practice for the distribution network is a location, is adjacent to landscaped areas and medians. Consideration is required to align larger mains or trunk networks within one of the travel lanes where suitable and aligned with approving authorities' requirements.												
ROW Depth	Preferred depth of 1.00m to pipe crown (0-600mm diameters) Depth of larger Transmission pipelines greater than 600mm (to be confirmed by approving authorities due to high pressure and security of supply risk)												
Production Rates	TSE production to consider between 90 – 95% of the collected and treated wastewater volumes at the Sewerage Treatment Plant facility. Collected wastewater is to be considered as between 80-85% of the total potable water demand to all catchment plots, which will likely return the wastewater to the sewer systems and onwards to the STP facility.												
Demand Rates	Typical demand rates for Irrigation are shown as follows:												
	Plant Category		Irrigation Demand							Unit			
	Lawn / Grass		20							Litres / m ² / day			
	Shrubs		10							Litres / m ² / day			
	Ground Cover		10							Litres / m ² / day			
	Trees		80							Litres / day			
	Large Trees / Palms		129							Litres / day			
	Average mixed-use type development to be considered for plot-side irrigation needs and maximum of 20% of the plot area		3.0 - 10.0							Litres/m2			
Specific irrigation demand rates will require a mass balance design check for available TSE/irrigation water, with the density coverage area of plant types and their related demands.													
Monthly Variation	Typical annual demand profile for irrigation (assuming peak summer sweat factor at 100% of total demand) is shown as follows:												
	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	%	50	50	75	75	75	100	100	100	75	75	75	50

Additional Guidelines

Additional ROW corridor width will be required to suit the location of chambers for valves and flow meters, PRVs, Air Valves, Washouts, etc.

The additional space is to be overlapped with adjacent utility corridors where possible to ensure that no chambers are located within the adjacent corridors to cause obstruction for installation or repair/maintenance access.

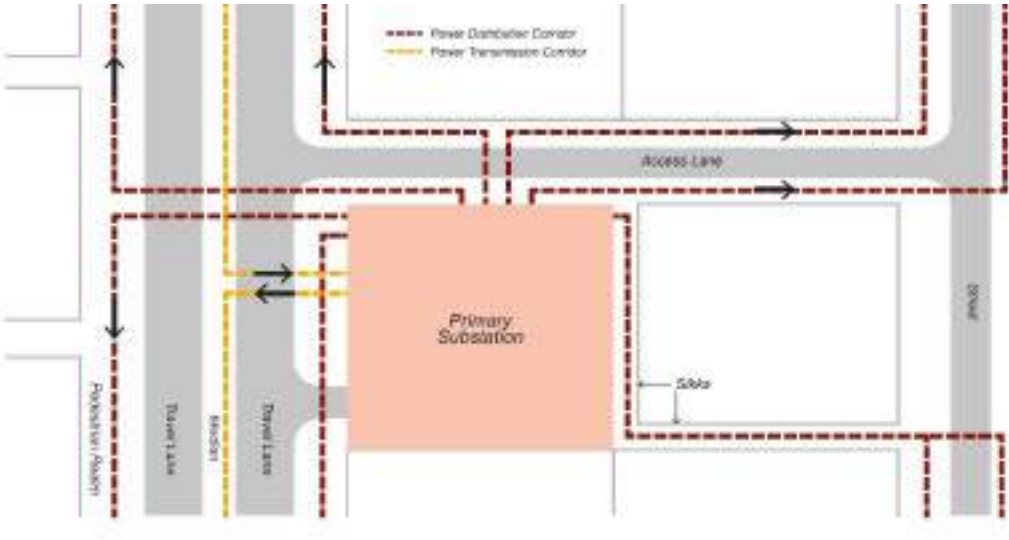
Typical trench and chamber widths are shown as follows:

Utility Providers' Requirements		Service Corridor Width (mm)	Chamber Corridor Width (mm)
Pipe Diameter (mm)	Trench Width (mm)		
150	500	700 / 900	700 / 900
200	550		
300	680		
400	1000	1100	2000
500	1200	1300	2200
600	1300		
700	1400	Exceptional Cases	
800	1500		
900	1600		
1000	1800		

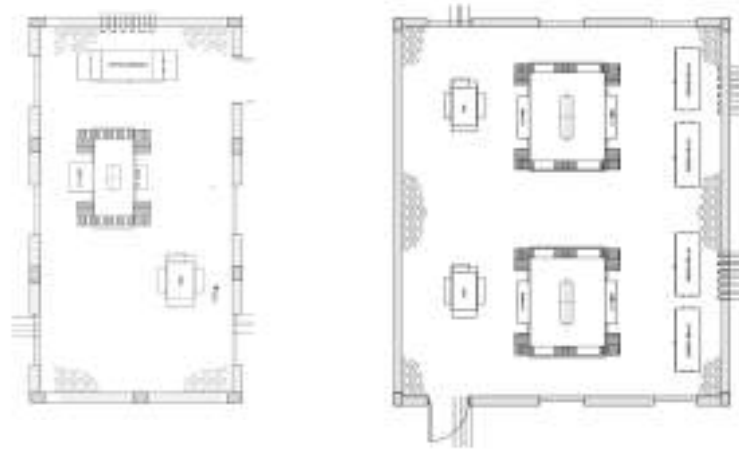
7.5. Electricity / Power Networks

Electricity/ Power	
Description	The purpose of the Electricity/ Power Network Guideline is to provide information on typical RoW corridor requirements of the particular network type, plot sizes (where applicable) and typical demand rates for assessment of schemes.
Governing Authority	The Governing Authority is Nama, the Electricity regulator (AER), electricity Distribution Companies, and OETC for Transmission power networks. The Ministry of Energy and Minerals will also be required for input to networks. Planning parameters are also incorporated into the Oman Electricity Standards for the specific utility apparatus. OETC have their own planning guidelines for the larger transmission grid networks.
Average Plot Sizes	Typical plot size for Grid Station is 25,000 to 90,000m² depending on capacity and number of spare/back-up transformer requirements Typical plot size for Primary Substation is 2,500 to 3,600m² depending on capacity and number of spare/back-up transformer requirement. Typical is for 3 nr transformer units to allow resilience back-up. Typically plot dimensions are in the order of 50x50m, 50x70m etc. Typical plot size for Secondary Substation is 80 to 100m² depending on capacity and number of spare/back-up transformer requirement. The arrangement is typically 8x10m or 10x10m for 1-2 MVA substations or 14x15m for larger 3-4 MVA substations with surrounding footpaths. In tight congested development areas it may be possible to reduce to 5x8m for 1-2 MVA substation however this requires special discussion and approval with local Utility/Distribution company/ provider.
ROW Width	Urban Secondary Route 1.50m both sides for LV / MV, 4.00m for HV Urban Distributor Route 1.50m both sides for LV / MV General rule-of-thumb for Transmission overheads is 25m either side of the overhead line, however confirmation is required with OETC to confirm actual width requirements as based on voltage type, height, line sag, tower spacing and the height of the adjacent built up environment near to the overhead. OES provided some information on the general and typical setbacks for other lower voltage distribution overhead lines and the setbacks vary regarding height, sag, pole spacing, and voltages of overheads. OES allows for double layering of networks to reduce overall width of the multiple number of cables/spacings, however offset of layers is required to allow repair/maintenance access between the cabling. Such double layering is accepted in congested built up areas. Refer to utility provider for approvals for such practices on a case by case basis.
ROW Placement	The current practice for the electrical networks is a generally located near the centre of the utility corridor next to the plots and near to where street lighting is required or within the median. Substations will be in plots near to junctions or road edges in order to accommodate incoming and outgoing cabling/ducting network connectivity. Consideration required to align LV and MV networks within one of the travel lanes either side closest to the plots where suitable and aligned with approving authorities' requirements. HV or transmission networks to be separated from LV or MV systems and consideration for the HV networks to be located one of the travel lanes either side closest to the median where suitable and aligned with approving authorities' requirements.

ROW Depth	Preferred depth of 0.6m to crown of cables for Low Voltage (LV) networks, 0.6m for up to 11KV Medium Voltage (MV) networks and 1.00m to crown of cables for 33KV High Voltage (HV) network cables. Oman Electricity Standards provides supporting rules and regulations.																																		
Cable Spacing	Generally normal spacings are: • 33KV 60cm for each circuit • 11KV 50cm for each circuit • LV 40cm for each circuit Minimum spacings to be considered for when in built-up environments with congestion of multi-networks or multi-utilities. The minimum spacing will require approval with the local authorities / providers. <u>Cable Spacing (mm)</u> <table><tr><th></th><th>LV</th><th>11KV</th><th>33KV</th></tr><tr><th>LV</th><td>400 preferred 200 min</td><td>450 preferred 200 min</td><td>500 preferred 200 min</td></tr><tr><th>11KV</th><td>450 preferred 200 min</td><td>500 preferred 200 min</td><td>550 preferred 200 min</td></tr><tr><th>33KV</th><td>500 preferred 200 min</td><td>550 preferred 200 min</td><td>600 preferred 200 min</td></tr></table>		LV	11KV	33KV	LV	400 preferred 200 min	450 preferred 200 min	500 preferred 200 min	11KV	450 preferred 200 min	500 preferred 200 min	550 preferred 200 min	33KV	500 preferred 200 min	550 preferred 200 min	600 preferred 200 min																		
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Demand Typical Rates	Typical Electrical demand rates for a variety of typical land use types are as follows: <table><tr><th>Land Use Type</th><th>W/m²</th></tr><tr><td>Residential</td><td>90-100</td></tr><tr><td>Retail</td><td>120</td></tr><tr><td>Commercial</td><td>120</td></tr><tr><td>Mixed Use – Residential / Retail</td><td>120</td></tr><tr><td>Mixed Use – Residential / Commercial</td><td>120</td></tr><tr><td>Logistics</td><td>90</td></tr><tr><td>Light Industry</td><td>100</td></tr><tr><td>Medium Industry</td><td>120-150</td></tr><tr><td>Heavy Industry</td><td>User specific</td></tr></table> However specific demand rates will require full detailed design to define exact requirements and obtain approval from the utility provider. Diversity Factors to be considered depend upon the connectivity, but a general rule-of-thumb can be used for early high-level planning considerations. However, these will require full detailed design to define exact requirements and obtain approval from the utility provider. <u>At the Individual Sub-Divided Plot</u> <table><tr><th>Land Use Type</th><th>Diversity at the Plot</th></tr><tr><td>Domestic Plot</td><td>0.6</td></tr><tr><td>Retail Plot</td><td>0.6</td></tr><tr><td>Commercial Plot</td><td>0.6</td></tr><tr><td>Mixed Use – Residential / Retail Plot</td><td>0.5</td></tr><tr><td>Mixed Use – Residential / Commercial Plot</td><td>0.5</td></tr><tr><td>Logistics Plot</td><td>0.6</td></tr></table>	Land Use Type	W/m ²	Residential	90-100	Retail	120	Commercial	120	Mixed Use – Residential / Retail	120	Mixed Use – Residential / Commercial	120	Logistics	90	Light Industry	100	Medium Industry	120-150	Heavy Industry	User specific	Land Use Type	Diversity at the Plot	Domestic Plot	0.6	Retail Plot	0.6	Commercial Plot	0.6	Mixed Use – Residential / Retail Plot	0.5	Mixed Use – Residential / Commercial Plot	0.5	Logistics Plot	0.6
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	<u>At the Secondary Substation</u> <table><tr><th>Land Use Type</th><th>Diversity at the Secondary Substation for Compound or of Multiple Plots</th></tr><tr><td>Domestic Plots</td><td>0.6</td></tr><tr><td>Retail Plots</td><td>0.6</td></tr><tr><td>Commercial Plots</td><td>0.6</td></tr><tr><td>Mixed Use – Residential / Retail Plots</td><td>0.5</td></tr><tr><td>Mixed Use – Residential / Commercial Plots</td><td>0.5</td></tr><tr><td>Logistics Plots</td><td>0.6</td></tr><tr><td>Light Industry Plots</td><td>0.4</td></tr><tr><td>Medium Industry Plots</td><td>0.5</td></tr><tr><td>Heavy Industry Plots</td><td>User specific</td></tr></table>	Land Use Type	Diversity at the Secondary Substation for Compound or of Multiple Plots	Domestic Plots	0.6	Retail Plots	0.6	Commercial Plots	0.6	Mixed Use – Residential / Retail Plots	0.5	Mixed Use – Residential / Commercial Plots	0.5	Logistics Plots	0.6	Light Industry Plots	0.4	Medium Industry Plots	0.5	Heavy Industry Plots	User specific
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<u>At the Primary Substation</u>, the loads and dimensions of the apparatus shall require specific discussion with the local Utility or Distribution company/ provider, and they shall confirm the details to be adopted for each instance.																					
<u>At the Grid Station</u>, the loads and dimensions of the apparatus shall require specific discussion with the Utility/Distribution company/ provider and OETC transmission power provider and they shall confirm the details to be adopted for each instance.																					
Plot Location																					
Primary Substation plots are preferred to be located at the corner of roads/junctions to allow for varied routes of incomer and distribution of supply networks. A typical arrangement is shown as follows:																					
																					

Secondary Substations plots are preferred to be long side of the plot, to be facing the roads or open areas to allow for repair/maintenance access and attendance vehicle to park adjacent to the substation.

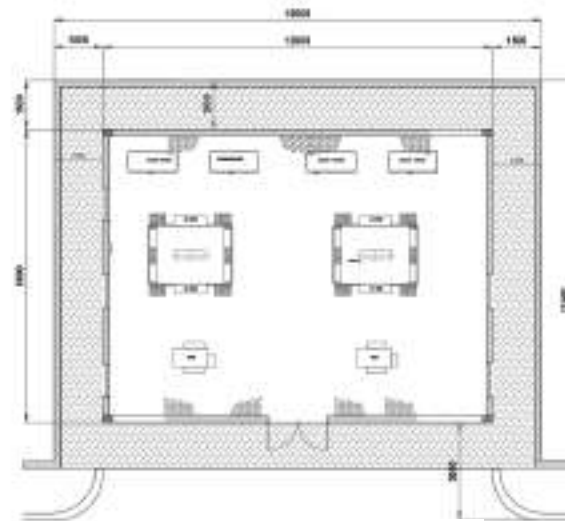


1-2 MVA (5m x 8m)

3-4 MVA (10m x 8m)

Where possible then Secondary Substations to be located in public areas, alleyways/ alleyways other landscaping areas.

Where Secondary Substations are required within or adjacent to plots and are shared between multiple plots, then positioning to be arranged in between plots such as they each plot will equally share some loss of space for the Secondary Substation.



3-4 MVA (14m x 15m) with Surrounding Footpath

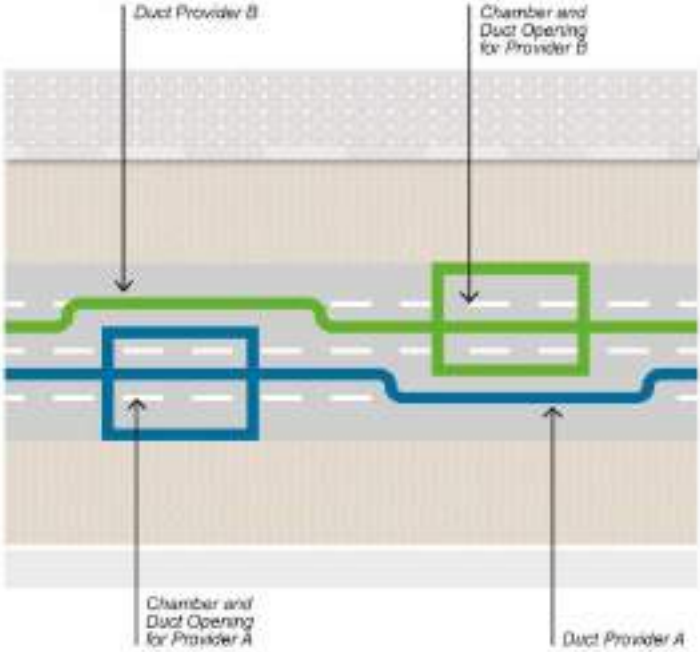
7.6. Gas Networks

Gas	
Description	Gas transmission and distribution networks are limited to mainly large economic sectors, localised networks and where there is an ability to extract from sources/sites and feed processing facilities and to major plant. A local Gas network for distribution for domestic and commercial uses in general is not being planned due to the high risk of operational maintenance and repair/inspection regimes required to ensure the operational safety of such networks. Where there are any specific gas network requirements then Oman Gas Company (OGC) is the gas transportation company who is delivering natural gas to those main economic sectors and major consumers comprising of Domestic, Power and Desalination plants, Fertilizer, Methanol, Petrochemical, Refinery, Steel and Cement plants. OGC is involved in the transmission and distribution of natural gas, through a large network of gas pipelines, compressor stations and gas supply stations. Any Gas networks will require their own specific planning rules and RoW to suit the development type and network requirements.
Governing Authority	The Governing Authority is Oman Gas Company, Ministry of Energy and Minerals (MoEM) and Petroleum Development Oman (PDO) for such networks and transmission pipelines.
ROW Placement	In general Gas pipelines should be located a minimum of 10m from buildings. Larger high volume and high-pressure transmission networks have a minimum of 25m offset either side of the pipelines. Specific details required OGC and PDO approval for any work near or in the vicinity of Gas pipelines. Distribution networks are generally to be located near the centre of the RoW corridor away from other distribution networks, near the central median, or under one travel lane. Compressor stations and gas supply stations will generally be in plots near to junctions or road edges in order to accommodate incoming and outgoing pipeline network connectivity. The plot position, location and safe setbacks of such Gas apparatus/facilities - and the network loads and RoW dimensions for installation of the network apparatus - will require specific consultation with the OGC or other local Distribution provider, and they shall confirm the details to be adopted for each instance.
Spacing to Power Cables	A minimum of 2m should be maintained between the gas service corridor and buried power cables.

7.7. District Cooling Networks

District Cooling																									
Description																									
Governing Authority	There is no national governing authority for District Cooling, only potential localised providers such as Tabreed Oman. There are development authorities who have utilised District Cooling within their schemes such as Madayn (previous PEIE), Al Mouj Muscat (part of Majid Al Futaim), and various shopping malls within the Muscat area.																								
Typical Plot Size	The typical plot size for a 40,000 RT district cooling plant would be in the order of 1,600m ² .																								
Pipe Sizes	To be confirmed with specific designs solutions. However longer routes and certain diameters require considerable expansion loops and chambers, including large diameter insulation wrapping to the pipelines.																								
ROW Placement	Distribution networks are generally to be located near the centre of the RoW corridor away from other distribution networks, near the central median, or under one travel lane, however this will depend on the scale and size of the development and the RoW road and all other multi-utility networks and the utility corridor available within the development.																								
RoW Width	Typical RoW widths for District Cooling pipelines range from 2.0m in minor roads up to 4.0m for main transmission lines in major roads. Additional ROW corridor width will be required and the location of expansion loops and chambers for valves and flow meters and manifolds etc. The additional space to be overlapped with adjacent utility corridors to ensure that no chambers or expansion loops are located at the same position or within the adjacent corridors to cause obstruction for installation or repair and maintenance access. Typical trench and chamber widths are shown as follows: <table> <tr> <th colspan="2">Utility Providers' Requirements</th><th rowspan="2">Service Corridor Width (mm)</th><th rowspan="2">Chamber Corridor Width (mm)</th></tr> <tr> <th>Pipe Diameter (mm)</th><th>Trench Width (mm)</th></tr> <tr> <td>up to 10 (up to 250 mm)</td><td>1500</td><td>1500</td><td>2300</td></tr> <tr> <td>12 - 18 (300mm - 450mm)</td><td>2000</td><td>2000</td><td>3100</td></tr> <tr> <td>20 - 30 (500mm - 750mm)</td><td>2600</td><td>2600</td><td>3500</td></tr> <tr> <td>32 - 36 (800mm - 900mm)</td><td>3100</td><td>3100</td><td>4100</td></tr> </table>			Utility Providers' Requirements		Service Corridor Width (mm)	Chamber Corridor Width (mm)	Pipe Diameter (mm)	Trench Width (mm)	up to 10 (up to 250 mm)	1500	1500	2300	12 - 18 (300mm - 450mm)	2000	2000	3100	20 - 30 (500mm - 750mm)	2600	2600	3500	32 - 36 (800mm - 900mm)	3100	3100	4100
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7.8. Telecommunications Networks

Telecommunications	
Description	The purpose of the Telecommunication Network Guideline is to provide information on typical RoW corridor requirements of the particular network type and typical plot sizes (where applicable).
Governing Authority	The Governing Authority is Oman Telecommunications Regulatory Authority, however Oman Towers Company, Oman Broadband Company, Omantel, Ooreedo, and Awasr also have input to their specific apparatus requirements. Oman Broadband Company, Omantel and Ooreedo have similar design standards and codes for the networks of route widths and chamber sizes. Awasr typically rents the infrastructure or space in the utility ducting for their customer connections.
Plot Sizes	A typical GSM tower requires a 5 x 5m plot. Larger 5G Oman Tower Company plots requires 15x15m plots. Other telecoms hubs and data transfer sites, have specific plot needs and rely on discussions with Oman Broadband Company, and the telecoms providers (Omantel and Ooreedo, other) to confirm their apparatus needs.
ROW Width	A 1.0m corridor is allocated on both sides of roads for both Urban Distributors and Urban Secondary roads as defined within OHDS 2017.
ROW Placement	The current practice for the electrical networks is a preferred location adjacent to the potable water corridor at the edge of the RoW corridor to allow for ease of connection to the plots.
ROW Depth	Minimum depth of 0.6m to crown of ducting. Multiple ducting solutions are available for multi-number layering or multi-cell conduits.
Additional Guidelines	There are numerous telecommunications providers in the market in Oman and it is important that utility corridor space is shared whilst also minimising land uptake. An example of minimising the corridor width whilst allowing separate duct infrastructure for each provider is shown as follows:  Having separate networks for multiple providers is to be avoided where possible and therefore multi-cell options shall be adopted to allow all providers to utilise the same conduit.

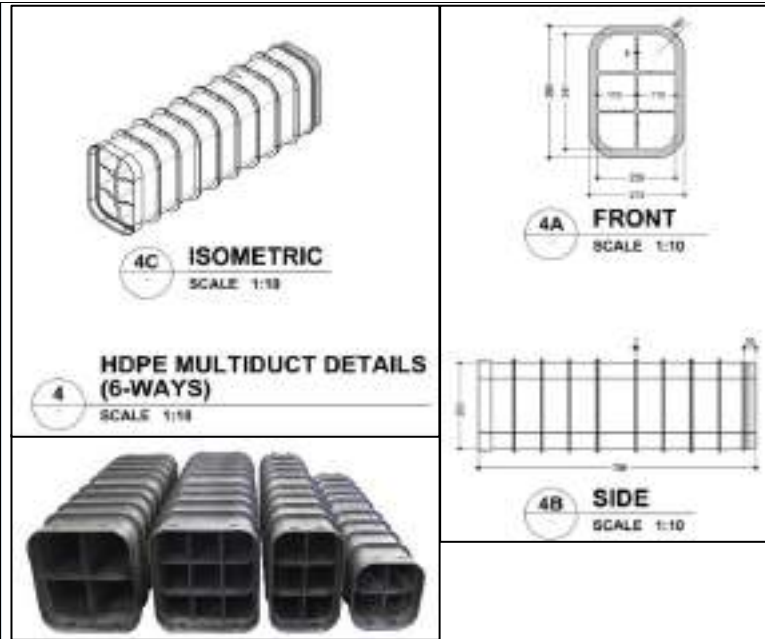
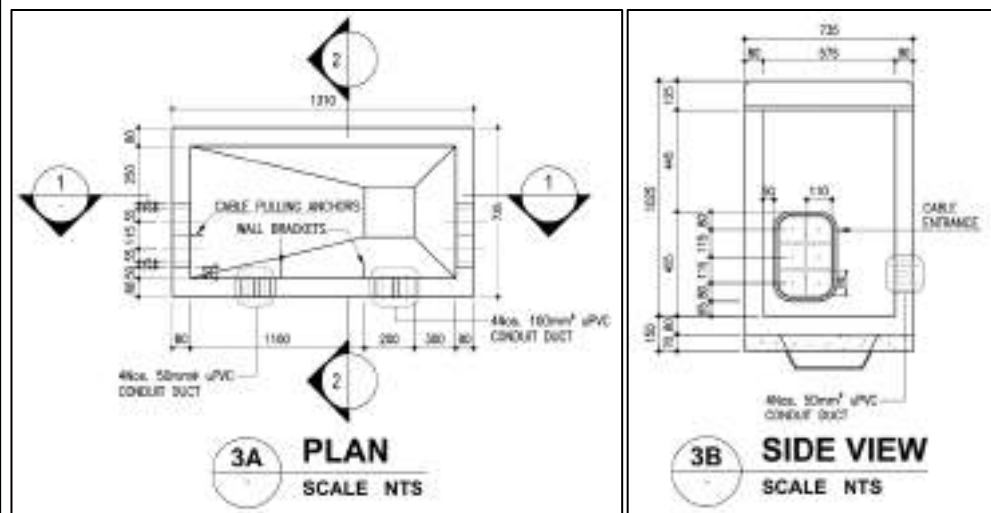
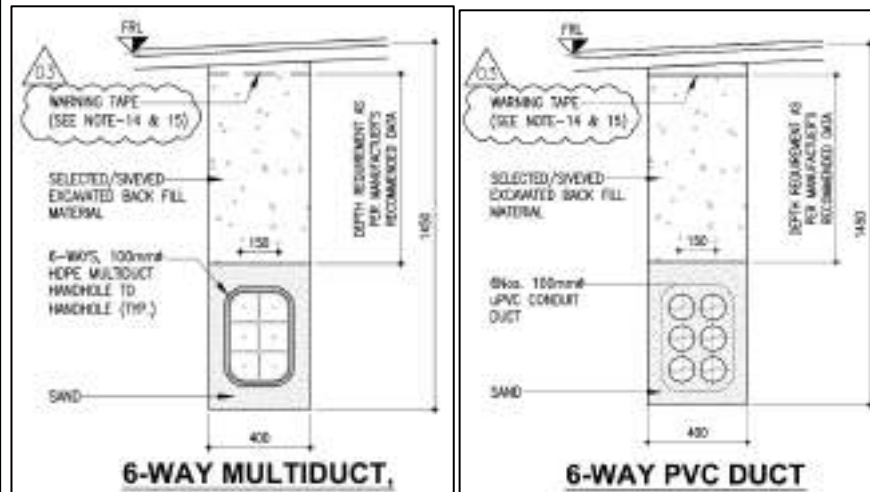


Image of multi-cell ducting. And cross sections of where and how these can be applied into the trench and connections to duct chambers.



7.9. Sewerage Networks

Sewerage																									
Description	The purpose of the Sewerage Network Guideline is to provide information on typical RoW corridor requirements of the particular network type, plot sizes if applicable and typical wastewater production rates for assessment of schemes.																								
Governing Authority	The Governing Authority is Nama Water Services who have their own planning and design standards and codes.																								
Plot Size	No standard plot sizes are available as dimensions for pumping/lifting stations and sewerage treatment plant/facilities because they are dependent on the capacity and plot size required as based on the catchment area or of the volume collected and dealt with by the new apparatus or facility.																								
ROW Width	Urban Routes 1.20m (0 to 600mm diameter) Urban Route 1.60m (600mm to 1000mm diameter) Rising mains to be minimum 1.2m (0 to 600mm diameter) Urban main interceptor mains 2.3m (1000mm to 1600mm diameter) Other interceptors >1600mm diameter (to be confirmed due to depth of network, accessibility security of supply risk, and size/diameter of manifold or chambers)																								
ROW Placement	The current practice for the electrical networks is a location adjacent to the centre of the ROW corridor to allow for short-sided connections from plots on both sides of the RoW. Location in travel lane is to be planned in order to avoid the manhole cover being on direct path of the vehicles wheelbase as this can cause damage/rocking noise on the manhole cover.																								
ROW Depth	Minimum depth of collection network 1.2m. Maximum depth to be as per the design, but rule-of-thumb to consider 5.0m-6.0m depth before introducing pump/lifting station. Manhole spacing to be confirmed with the relevant Authority.																								
Production Rates	To consider between 80 – 85% of the potable water demand to plots is returned to sewer and transferred onwards as the total volume connected at the Sewerage Treatment Plant facility.																								
Additional Guidelines	Additional ROW corridor width will be required to suit the location of manholes, for plot connections, manned access cleaning/maintenance, pumping/lifting stations, etc. The additional space is to be overlapped with adjacent utility corridors where possible to ensure that no chambers are located within the adjacent corridors to cause obstruction for installation or repair/maintenance access. Typical trench and chamber widths are shown as follows: <table border="1"> <thead> <tr> <th colspan="2">Utility Providers' Requirements</th><th rowspan="2">Service Corridor Width (mm)</th><th rowspan="2">Chamber Corridor Width (mm)</th></tr> <tr> <th>Pipe Diameter (mm)</th><th>Trench Width (mm)</th></tr> </thead> <tbody> <tr> <td>200</td><td>500</td><td rowspan="5">1050</td><td rowspan="5">2000</td></tr> <tr> <td>300</td><td>600</td></tr> <tr> <td>400</td><td>800</td></tr> <tr> <td>500</td><td>930</td></tr> <tr> <td>600</td><td>1050</td></tr> <tr> <td>700</td><td>1180</td><td>1550</td><td>2800</td></tr> </tbody> </table>			Utility Providers' Requirements		Service Corridor Width (mm)	Chamber Corridor Width (mm)	Pipe Diameter (mm)	Trench Width (mm)	200	500	1050	2000	300	600	400	800	500	930	600	1050	700	1180	1550	2800
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	900	1400		
	1000	1550		
	1200	1800	1800	3200
	1400	2050	2300	4000
	1600	2300		

Sewerage lines should not pass over a Potable Water line and should have at least 1.0m separation between the pipelines to allow clear access for maintenance.

7.10. Solid Waste Management

Solid Waste Management	
Description	The purpose of Solid Waste Management Guideline is to provide information on typical urban sizing of waste collection areas in urban built up areas (where applicable).
Governing Authority	The Governing Authority is the relevant Municipality.
Average Plot Size	No standard number of plots per location or plot sizes are available as the number of waste refuse collection areas will be determined to suit the built up area, population density, location and accessibility of the waste refuse collection areas to properties, and of the number of possible storage bins or facilities to be contained in the solid waste collection area. However, guidelines are provided for indication of how these shall be provided.
Placement Requirements	Located in the verge or landscaped areas adjacent to the road edge or in treated landscaped areas near to driveways, where there is access for refuse collection trucks.
Additional Guidelines	<u>Private Collection Areas</u> The overall Solid Waste Management System and process is covered under the environmental section and developers shall comply with Be'ah environmental standards and requirements. However, for locations of on-plot and roadside of Waste Management Collection Areas, Local Authority/Developers will provide designated garbage collection areas to house and store garbage collection bins. The areas shall be hardscaped flat platforms with designated enclosed collection bays. The enclosures shall be walled and of adequate height to conceal the garbage bins. The hardscaping/landscaping around the enclosure areas shall be of asphalt, interlock or slab/paved surfaces to allow the wheeled bins to be manoeuvred from the enclosure and into to the roadway for collection by the Garbage Trucks and lift/tip the Garbage Bins into the compactor trucks. The following images are examples of where Municipality and Private Refuse Collection Bins have been placed at street corners without any control or designation. There are no enclosures and the bins, and stockpiled garbage has been placed next to the bins at street corners and in an uncontrolled manner.      

Other example images are provided to show where there are controlled designated collection areas, located in carparks or landscaped areas. The space made available is 3m x 5m and enclosed with a wall structure to contain 3 Bins. The Local Authority/Developers shall include for similar enclosed and designated areas within their plot landscaping and the enclosure sized to allow for the number of refuse bins to be contained within.

Public Collection Areas

Example images of waste dumping sites within uncontrolled and undesigned areas are shown below.

Good examples are shown of underground waste collection systems and of recycling solutions for segregation at source. The same segregated recycling bins can also be located in the plot-side enclosures.



For other public garbage collection areas, there are now more recent underground/sub-surface solutions as introduced in Muscat by Muscat Municipality and Be'ah. These are good examples provided within landscaped or carparking areas.

Furthermore, Be'ah has developed a recycling campaign to provide better recycling solutions at waste sources and therefore allow the separate collection of waste.

Detailed designs of such structures will be undertaken by the Local Authority/Developer to ensure the number of collection bins, and the type of enclosure or underground structure, is adequate for collection access and also safely located to allow public to place their waste into the designated recycle collection bin type.

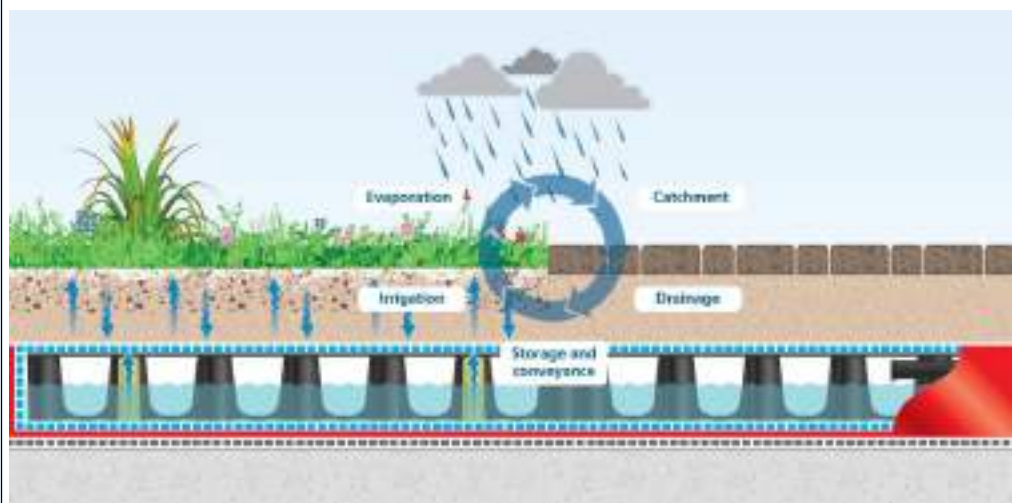
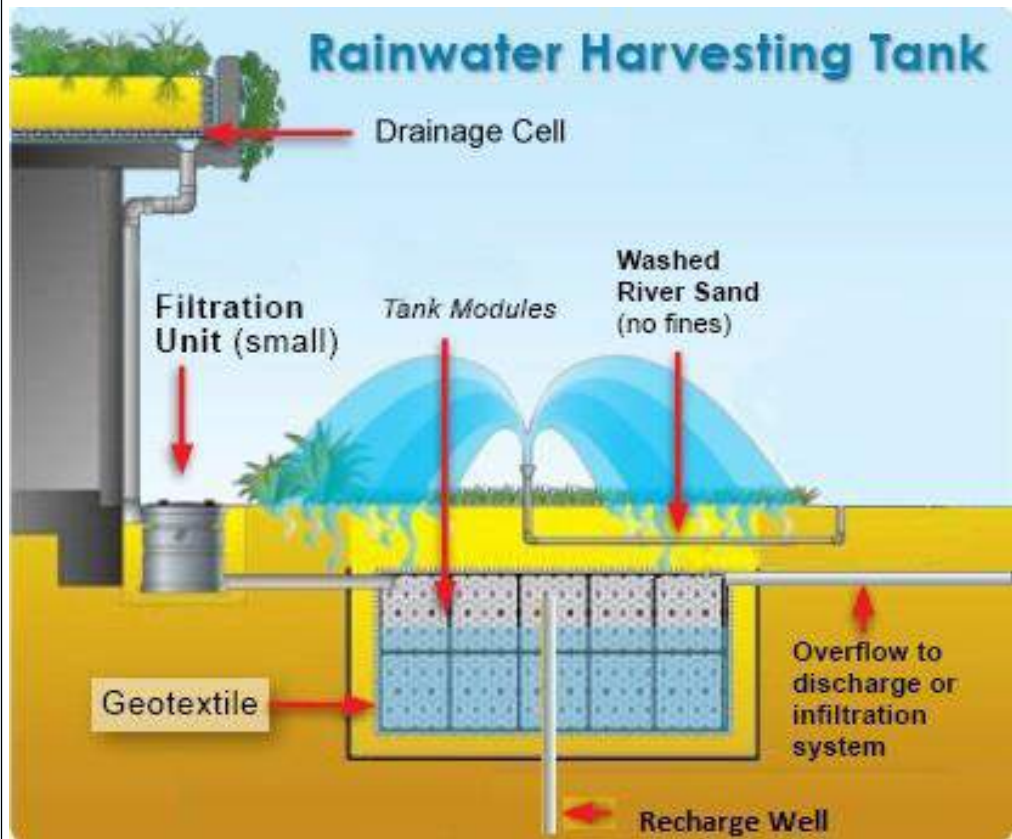
7.11. Surface Water Drainage Networks

Surface Water Drainage	
Description	The purpose of the Surface Water Guideline is to provide information on typical RoW corridor requirements of the particular network type, and any typical plot sizes (where applicable).
Governing Authority	The Governing Authority is the Ministry of Regional Municipalities and Water Resources. Further reference to surface water drainage channels, crossings, and edge protections/lining is contained within Oman Highways Design Standards (OHDS) 2017, Volume 2 section 12.0 and are applicable for surface water drainage and drainage collection and transportation channels.
Plot Size	No standard plot sizes are available as dimensions for any possible storage facilities, pumping stations, attenuation apparatus, off-line storage, overspill floodplains are dependent on volume, flow rates, storm conditions and hydrology studies that will define the sizes required based for the specific site requirements accordingly.
ROW Width	A 1.2m corridor is allocated on both sides of roads as defined within OHDS 2017. Other storm open drainage channel widths (at surface or just below surfaces) will require to be designed to suit specific drainage requirements.
ROW Placement	The current practice for the drainage networks is located adjacent to the road edge. However, for dual carriageways with a central median, then there is opportunity for additional drainage within the median. Where open channels are required these will be located in road edge/verge areas or within the median and comply with Oman Highways Design Standards June 2017. Where below ground, sub-surface box/culvert or pipe conduits are to be provided then these can also be located in the road edge areas or median. Consideration is required to align larger drainage networks within the parking lane or underneath one of the travel lanes of the RoW corridor and where suitably aligned with approving authorities' requirements. Location in the travel lane is to be planned in order to avoid any manhole/access covers being on direct path of the vehicles wheelbase as this can cause damage/rocking noise on the manhole cover.
ROW Depth	Minimum depth of 1.0m. Open channels near built-up areas to be fenced or provided with safety measures to protect persons falling in. where there is a risk of people in channels, then battered slopes require access steps for access/egress. Closed channels (using cover slab solutions) is suitable in walkways and allowing shared/dual purpose of use. Maximum depth will need assessed in relation to its position and location near built-up area and allowing accessibility.
Additional Guidelines	Additional ROW corridor width will be required and the location of manholes, culverts, sharp change of direction solutions, infusion of multiple drainage flows, and flow transition points etc. The additional space to be overlapped with adjacent corridors ensuring that no chambers are located in the adjacent corridors. Typical details and design guidelines for open drainage channels are contained in Oman Highways Design Standards (OHDS) 2017 and are applicable for surface drainage and drainage channels for collection and transporting drainage water Typical trench and chamber widths are shown as follows:

	Utility Providers' Requirements		Service Corridor Width (mm)	Chamber Corridor Width (mm)
	Pipe Diameter (mm)	Trench Width (mm)		
	200	500	1050	2000
	300	600		
	400	800		
	500	930		
	600	1050		
	700	1180	1500	2300
	800	1300		
	900	1400		
	1000	1550	2500	2500
	1200	1800		
	1400	2050		
	1600	2300		
	1800	2550	3000	3000
	2000	2800		

7.11.1. Sustainable Urban Drainage (SUDs)

SUDs	
Description	Consideration to be given to SUDs applications when developing storm water systems due to the following reasons: • In natural environments, rain falls on permeable surfaces and soaks into the ground; through a process called infiltration. • In urban areas where many surfaces are sealed by buildings and paving, natural infiltration is limited. Instead, drainage networks consisting of pipes and culverts, divert surface water to local watercourses. In some cases, this has resulted in downstream flooding. • Sustainable drainage systems aim to alleviate these problems by storing or re-using surface water at source, by decreasing flow rates to watercourses and by improving water quality. • Sustainable drainage systems use a sequence of techniques that together form a management train. • retention systems delay the discharge of surface water to watercourses by providing storage within ponds, and wetlands for example. • Water harvesting or storage attenuation solutions to be considered to harness as much natural water for possible irrigation uses elsewhere. • infiltration systems, such as infiltration trenches and soakaways mimic natural recharge, allowing water to soak into the ground.
Application	Source control methods should be applied to decrease the volume of water entering the drainage / wadi network by intercepting run-off water on roofs for subsequent re-use (e.g. for irrigation) or for storage and subsequent evapotranspiration (e.g. green roofs). Pre-treatment steps are required, such as vegetated swales (ditches) or filter trenches, remove pollutants from surface water prior to discharge to watercourses or aquifers.
Examples	For surface water drainage and irrigation systems there are many initiatives that can be undertaken two options for built up urban areas are: • Sustainable Urban Drainage Systems (SUDs), where-by the rights of ways have utilised naturalised channels (instead of concrete lined channels) and thus allows the rainwater to be collected in these channels, where the collected water dissipates into the sub-soils and to aquifers. Other SUDs solutions provide lined channels in areas where irrigation is required and can collect / pond the rainwater which can then be re-used for localised irrigation needs (instead of dissipating to sub-soils and aquifer). • Water harvesting of rainwater or irrigation water, where-by collecting buildings or roof run-off system and returning the water to underground storage solutions, Alternatively there is option for whereby the excess or run-off irrigation water is also collected in the underground storage solutions and prevented from running away into sub-soils. Therefore, the irrigation water being fully reusable to the plants.



7.12. Solar Power - PV Solutions/Applications

Solar Power Solutions	
Description	To support SMART City initiatives, smart solutions such as the use of Photo Voltaic (PV) systems should be considered wherever possible to providing lighting and power to the urban infrastructure and or provide trickle feed systems back to the energy grid.
Governing Authority	The Governing Authority is the AER and local distribution companies.
ROW Placement	It is possible to have LED street-lighting powered by Solar PV canopies or PV cells which feed storage batteries by day and then the batteries supply the lighting at night. Other street furniture, bus-stops, shelters, information apparatus or walkway canopies to be utilised for PV cell installations.
	PV technology is good clean option for free electricity. Sizing a PV installation for a property is expected to service only part of the buildings total electrical demand because full load demand, especially with air conditioning and other rotary equipment (freezers, fridges, washing machines, dryers) that require a high initial current, would results in a PV system significantly overly large for the space available. Therefore, viable PV installation shall apply to the lighting and small power (excluding, washing machine, fridges and freezers). MEDCo are currently encouraging PV installations in Muscat and there are connection applications in place for PV installers. The Authority for Electricity Regulation (AER), Oman has also published guidelines for small scale PV installations. There is a recognition by the government on Renewable technology and there are methods in place for installation. The electricity guidelines do not allow the use of battery systems, and the PV system is an online type, with double conversion (DC to AC). This means that utilisation of the system is only during daytime. The regulations might change soon to allow for batteries which store electricity for night-time usage.
Power Saving Initiatives: Street Lighting PV	PV for Electrical Lighting Systems are a prime candidate for energy conservation. It is noted that the primary roads networks already have cabled street lighting, however, many of the secondary road routes, pathways are yet to be built and therefore there is an opportunity to consider low power demand (LED), or low lux solutions for the streetscape and accessway lighting requirements. Such energy conservation, or self-powering solutions exist within the market today. There is for example low power demand LED lighting that can either be powered by solar LEDs self-powered PV/battery cells or fed from the lighting network. Notwithstanding the solar energy opportunities, there are already solutions for low Lux LED lighting that also have self-contained PV cells located on the lighting pillars or on an overhead canopy to the lighting mast. An example today in PDOs Ras Al-Hamra estate in Muscat, the street lighting is provided via PV cells and batteries and the street lighting is lower lux but within a speed-controlled area. The image below highlights the existing technology within Oman.

	  
Power Saving Initiatives: Carpark/ Walkway Shading with PV Cells	During the last 5 years, PV cells and innovations to their application have undertaken significant technological advancement, with shading structures that would typically have been canopy shading, alternatively using PV cells. This provides a dual-purpose opportunity for carpark or walk-way shading where the canopy structure is replaced by multiple Solar PV cells and these also connected to the grid or other central power bank/battery facilities to provide supportive power to the buildings of these carparking and walkway areas.   
Power Saving Initiatives: Bus-Stops and Public Information	For bus stops, other street furniture or public information/signage, solar panels should be adopted where possible to power internal lighting or signboards communications or even support power chargers.

**Systems/Signage
with PV Cells**



08

NATIONALLY SIGNIFICANT
PLANNING AND DEVELOPMENT
GUIDELINES

8. NATIONALLY SIGNIFICANT PLANNING AND DEVELOPMENT GUIDELINES

8.1. Introduction

Nationally Significant Planning and Development Guidelines refers to development which cannot be controlled by typical planning standards and guidelines, and therefore are required to be assessed on a case-by-case basis. These are usually large, unique areas, developments or sites which are of a national importance relating to large-scale infrastructure, master plans, services and economies. Development, review and approval of any such development or project will require a range of national level relevant Ministry/ Authority inputs, as well as coordination with the Governate(s) in which the project is sited.

Nationally Significant Planning and Development Guidelines has been defined as follows:

A) National Level Zonal Guidelines

National Level Zones refer to a way of grouping areas with similar characteristics such as land use, character, designation together and setting outcomes for the area through policy, standards and guidelines.

National Level Zonal Guidelines therefore provides key information in which to guide the development of relevant standards and codes in the future for key zoning elements of the ONSS, making reference to key relevant Ministries and Authorities which require consultation and coordination. The specific development standards will vary and will be determined by the governing Authority/ department/ project owner. National Level Zonal Guidelines referred to in this document include:

- Special Planning Zones (TSPZs) – Terrestrial and Coastal
- Coastal Zone Management Plans (CZMP)
- Cultural Conservation Areas (CCAs)
- Tourism Development Plans (TDPs)
- Flood Control Management Strategies – Wadis and Coast
- Buffer Zones and Setbacks
- Transit Orientated Development (TOD)

B) National Level Project Guidelines

National Level Projects refer to specific developments of a unified type and designation which require specific planning standards, regulation and codes to initiate and approve its development.

National Level Project Guidelines signposts the responsible Ministry or Authority in which such project must adhere to and be regulated by, as well as key information and considerations which are required, at minimum, if such development opportunities arise in the future. The specific development standards will vary and will be determined by the governing Ministry/ Authority/ department/ project owner etc. National Level Project Guidelines provided in this document include:

- Transportation Projects
- Special Economic Zones and Free Zones
- Universities Projects
- Healthcare Projects
- Theme Park Projects
- Defence Installations Projects
- Oil Refineries and Gas Field Projects
- Mining and Extraction Projects
- Energy Projects
- Utility Infrastructure Projects
- Agriculture, Fisheries and Livestock Projects

8.2. National Level Zonal Guidelines

8.2.1. Special Planning Zones (SPZs) – Terrestrial and Coastal

Introduction

A Special Planning Zone (SPZ) is a new planning designation which provides greater protection to areas where the interaction of people and nature over time has produced an area of distinct character, with a combination of significant ecological, geological, marine, cultural and scenic values. An SPZ can be both Terrestrial (linked predominantly to the land) or Coastal with significant interest in the coastal habitats - beaches, inter-tidal areas and inshore marine environment (up to the edge of Oman's Territorial Waters, which extend 12 nautical miles from the shoreline).

An SPZ does not prevent development; rather it provides a more stringent framework to guide development to ensure the unique assets contained within its boundaries are well managed – now and for future generations. Under the SPZ system proposed for Oman, large areas with rich environmental assets (whether they are high value terrestrial or high value coastal assets) and which may be sensitive to particular projects, activities or changes in land use, will be designated SPZs. Therefore, SPZs provide an opportunity to plan and select better locations for potentially harmful projects that factor in key criteria (including environmental) which should help to reduce and resolve land conflicts.

For areas nominated in Oman, the SPZs relate closely to the International Union for the Conservation of Nature (IUCN) **Protected Area Categories System, in particular 'Category V – Protected Landscape/ Seascape'**. However, there may be specific areas or sites within these large SPZs, where increased protection is warranted and a Nature Conservation Area designation, with a "higher" IUCN Category (I to IV) is more appropriate. These areas will need to be identified and their future role outlined in any management plan prepared for the wider area. The intention of the SPZs is to include as many as possible of the high environmental value sites within either a Terrestrial or Coastal SPZ.

Nature Conservation Areas (NCAs) can be designated inside and outside SPZs by MECA/ OCE in accordance with existing nature conservation legislation and procedures; these NCAs may have specific management or protection requirements that are stipulated by the Royal Decree by which they are declared. Many NCAs will be "nested" within the larger SPZs, which should provide a layer of "planning protection" over and above the more specific conservation management measures that MECA/ OCE will apply. There should be close and regular co-ordination between the SPZA and the NCA managers (MECA/ OCE) on activities and developments that may affect the NCAs. A draft NCA Management Plan, prepared by the responsible authority, should be ready at the time of the declarations for new NCAs and finalised soon afterwards. This will set out the management objectives of the NCA, internal zoning with permitted activities etc and should recognise the role of the SPZs within which they are located. Outline Management Recommendations for each of the NCAs being proposed by the ONSS/RSSs are included in the Regional Spatial Strategies.

Descriptions of all the IUCN Categories are presented below, for information and guidance.

IUCN Guidelines for Applying Protected Area Management Categories

IUCN Reserve Category	Description
Ia Strict Nature Reserve	Category Ia are strictly protected areas set aside to protect biodiversity and also possibly geological/ geomorphic features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring. <i>Primary Objective:</i> - To conserve regionally, nationally or globally outstanding ecosystems, species (occurrences or aggregations) and/or geodiversity features: these attributes will have been formed mostly or entirely by non-human forces and will be degraded or destroyed when subjected to all but very light human impact. <i>Other Objectives:</i> - To preserve ecosystems, species and geodiversity features in a state as undisturbed by recent human activity as possible; - To secure examples of the natural environment for scientific studies, environmental monitoring and education, including baseline areas from which all avoidable access is excluded; - To minimize disturbance through careful planning and implementation of research and other approved activities; - To conserve cultural and spiritual values associated with nature.

Ib Wilderness Area	Category Ib protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition. <i>Primary Objective:</i> - To protect the long-term ecological integrity of natural areas that are undisturbed by significant human activity, free of modern infrastructure and where natural forces and processes predominate, so that current and future generations have the opportunity to experience such areas. <i>Other Objectives:</i> - To provide for public access at levels and of a type which will maintain the wilderness qualities of the area for present and future generations; - To enable indigenous communities to maintain their traditional wilderness-based lifestyle and customs, living at low density and using the available resources in ways compatible with the conservation objectives; - To protect the relevant cultural and spiritual values and non-material benefits to indigenous or non-indigenous populations, such as solitude, respect for sacred sites, respect for ancestors etc.; - To allow for low-impact minimally invasive educational and scientific research activities, when such activities cannot be conducted outside the wilderness area.
II National Park	Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities. <i>Primary Objective:</i> - To protect natural biodiversity along with its underlying ecological structure and supporting environmental processes, and to promote education and recreation. <i>Other Objectives:</i> - To manage the area in order to perpetuate, in as natural a state as possible, representative examples of physiographic regions, biotic communities, genetic resources and unimpaired natural processes; - To maintain viable and ecologically functional populations and assemblages of native species at densities sufficient to conserve ecosystem integrity and resilience in the long term; - To contribute in particular to conservation of wide-ranging species, regional ecological processes and migration routes; - To manage visitors' use for inspirational, educational, cultural and recreational purposes at a level which will not cause significant biological or ecological degradation to the natural resources; - To take into account the needs of indigenous people and local communities, including subsistence resource use, in so far as these will not adversely affect the primary management objective; - To contribute to local economies through tourism.
III National Monument or Feature	Category III protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value. <i>Primary Objective:</i> - To protect specific outstanding natural features and their associated biodiversity and habitats. <i>Other Objectives:</i> - To provide biodiversity protection in landscapes or seascapes that have otherwise undergone major changes; - To protect specific natural sites with spiritual and/or cultural values where these also have biodiversity values; - To conserve traditional spiritual and cultural values of the site.

IV Habitat/ Species Management Area	Category IV protected areas aim to protect particular species or habitats and management reflects this priority. Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category. <i>Primary Objective:</i> - To maintain, conserve and restore species and habitats. <i>Other Objectives:</i> - To protect vegetation patterns or other biological features through traditional management approaches; - To protect fragments of habitats as components of landscape or seascape-scale conservation strategies; - To develop public education and appreciation of the species and/or habitats concerned; - To provide a means by which the urban residents may obtain regular contact with nature.
V Protected Landscape/ Seascape <i>(Equivalent to Oman's SPZ)</i>	Category V protected areas are those where the interaction of people and nature over time has produced an area of distinct character with significant, ecological, biological, cultural and scenic value: and where safe guarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values. <i>Primary Objective:</i> - To protect and sustain important landscapes/seascapes and the associated nature conservation and other values created by interactions with humans through traditional management practices. <i>Other Objectives:</i> - To maintain a balanced interaction of nature and culture through the protection of landscape and/or seascape and associated traditional management approaches, societies, cultures and spiritual values; - To contribute to broad-scale conservation by maintaining species associated with cultural landscapes and/or by providing conservation opportunities in heavily used landscapes; - To provide opportunities for enjoyment, well-being and socio-economic activity through recreation and tourism; - To provide natural products and environmental services; - To provide a framework to underpin active involvement by the community in the management of valued landscapes or seascapes and the natural and cultural heritage that they contain; - To encourage the conservation of agrobiodiversity and aquatic biodiversity; - To act as models of sustainability so that lessons can be learnt for wider application.
VI Protected Area with sustainable use of natural resources	Category VI protected areas conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area. <i>Primary Objective:</i> - To protect natural ecosystems and use natural resources sustainably, when conservation and sustainable use can be mutually beneficial. <i>Other Objectives:</i> - To promote sustainable use of natural resources, considering ecological, economic and social dimensions; - To promote social and economic benefits to local communities where relevant; - To facilitate inter-generational security for local communities' livelihoods – therefore ensuring that such livelihoods are sustainable; - To integrate other cultural approaches, belief systems and world views within a range of social and economic approaches to nature conservation;

	• To contribute to developing and/or maintaining a more balanced relationship between humans and the rest of nature; • To contribute to sustainable development at national, regional and local level (in the last case mainly to local communities and/or indigenous peoples depending on the protected natural resources); • To facilitate scientific research and environmental monitoring, mainly related to the conservation and sustainable use of natural resources; • To collaborate in the delivery of benefits to people, mostly local communities, living in or near to the designated protected area; • To facilitate recreation and appropriate small-scale tourism.

Purpose of the Special Planning Zones

The following three items together set out the main purpose of SPZs in Oman:

1. Conserve and enhance the natural beauty, wildlife, marine life and cultural heritage located within the boundaries of each SPZ.
2. Promote opportunities for the understanding and enjoyment of these special SPZ qualities by the public.
3. Seek to enhance the social and economic well-being of the local communities within the SPZ.

The following provides national level guidance for SPZs:

- SPZs may not be confined to one particular region or Governorate; therefore, alignment and liaison between different Governorates is required, with this being facilitated at the national level to ensure a coordinated and holistic approach to “national park” enhancement and conservation in both terrestrial and coastal locations.
- A fully serviced SPZ Authority (SPZA) will need to be created for each SPZ. This Authority will need to develop, with the participation of the national SPZ Authority, a Management Plan, whether terrestrial or coastal, covering all areas, aspects and activities within each SPZ.
- Based on the Management Plan, the SPZA will manage activities within the SPZ boundary and handle all development applications and permits ensuring all proposals are in harmony with the principles of the SPZ and have adequately taken account of and considered all relevant environmental and social aspects. MECA (and/or OCE) will be directly responsible for the planning and management of Nature Conservation Areas (NCAs) within an SPZ and will work with the SPZA on the permitting of development applications that may affect NCAs.
- The SPZA (in collaboration with MECA and OCE) will ensure that development proposals will not be allowed to have significant negative impact upon the inhabitants, natural environment (landscape, biodiversity, geology, water resources) and cultural heritage of an SPZ - and, in coastal locations, significant negative impacts on the equivalent coastal features and sensitive marine habitats of a CSPZ.
- Where necessary and appropriate, identify ecological corridors between major areas within an SPZ, where (larger) mammal species are believed to roam and include these corridors as part of SPZ conservation and protection protocols.
- Ensure any settlements, industries, activities within SPZs are regularly monitored and controlled to ensure that there is no negative impact to the natural environment. Any development within SPZs should be sensitive to the natural environment and be in-keeping with local traditional architectural character and built form. Settlement expansion outside limits set by the Management Plan will not be permitted.
- Develop and implement SPZ controls as part of the Management Plan, which respond directly to the natural and built environment to preserve the overall integrity of the area.
- Promote nature-based tourism activities within SPZs, ensuring where developed that these are of low impact and do not impose on the natural environment. Projects in coastal SPZs will need to be especially sensitive to the habitats of marine life and ensure that water-based activities are within non-sensitive zones.
- The definition of the SPZs and of other environmental designations within them should be based on:
 - o National level information provided by national Ministries/ Authorities (MECA, OCE, MHC, ESO, GSO etc) and specialists.
 - o The outputs of specialist studies commissioned by the SCP, MECA, MoHC and others to identify features such as Important Bird Areas of Oman, Important Plant Areas, Geological Sites etc and

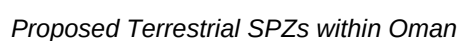
also ecologically important Coastal and Marine Resources (turtle nesting beaches and feeding grounds, mangroves, coral habitats etc).

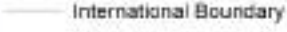
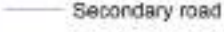
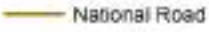
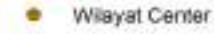
- o Regional-specific data, studies and consultations.
- o Consultations with national level stakeholders (e.g. Public Authority for Mining, Ministry of Heritage and Tourism, Ministry Culture, Ministry of Environment and Climate Affairs) on sector-specific strategies and plans and how these are relevant, at regional/governorate level.
- o Further consultations with stakeholders at Governorate level.
- o IUCN's Guidelines for Applying Protected Area Management Categories (see table above).

The intention is that SPZs are **large areas** encompassing a range of rich and diverse natural and cultural heritage features, which require special attention by a planning regime that gives high priority to the responsible and sustainable management of the features for which each has been designated – and which should attract investment in tourism and other rural activities. The planning controls in the broader SPZ will facilitate stronger protection of the specific high value features within the SPZ – NCAs, Cultural Landscapes, (Cultural) Heritage Conservation Areas, Geological and Archaeological Sites.

The ONSS / RSS preparation process has involved detailed review of the Sultanate's areas of high environmental / heritage value and has resulted in comprehensive SPZ proposals. It is believed that the study team, with the help of stakeholders consulted, has identified the five major Terrestrial SPZs and five major Coastal SPZs that should be taken forward over the next 20 years. Minor adjustments to their boundaries will be needed to incorporate "new" features of interest, but new SPZs are not envisaged. One exception is the Rub' Al Khali which has been proposed as an IUCN 1b Wilderness Area; this could be made an SPZ at a later date but, since it is not under immediate threat, the recommendation is to prioritise the other SPZs.

The location of the five (5) Terrestrial and five (5) Coastal SPZs, that have been proposed as part of the development of the ONSS, is shown in the following two Figures.





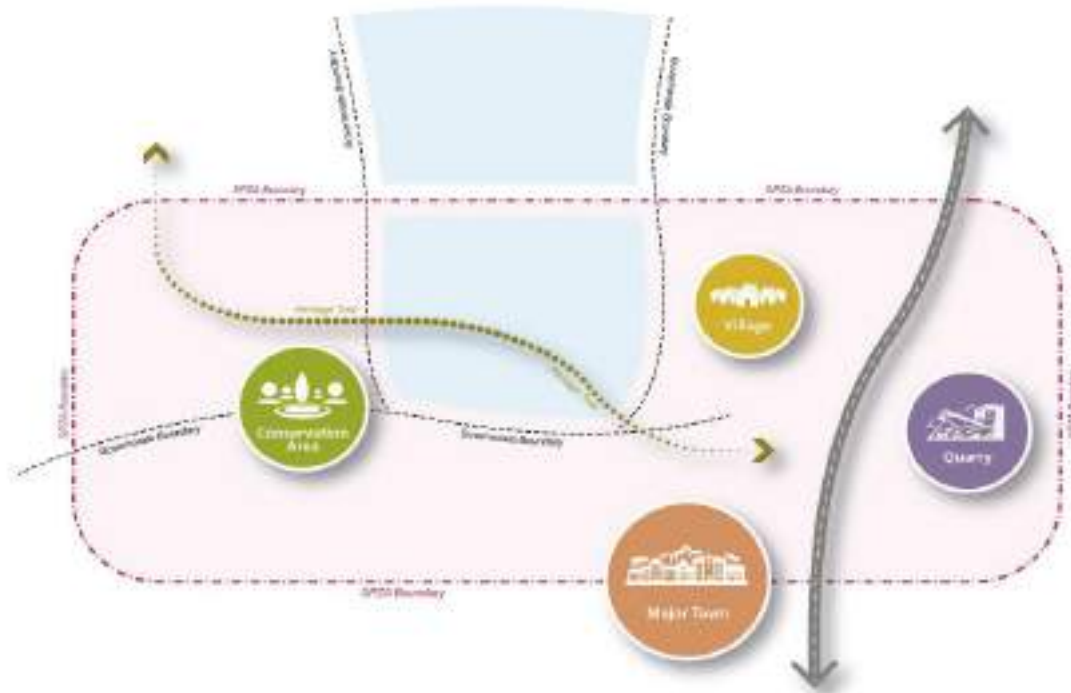
Proposed Coastal SPZs within Oman

SPZ Selection Criteria Guidance

The initial step is to define the boundaries of individual SPZs, adhering to methodology adapted from international 'best practice' including various UK organisations of a similar nature. Each region should take on board the SPZs boundaries proposed at a national level and refine these further according to local circumstances. A cross-Governorate approach will be required in most cases – the proposed Hajar Mountains SPZ, for example, crosses 8 Governorates.

Criteria for SPZ boundary selection is as follows:

1. **Types of boundary:** Wherever possible, an easily distinguishable permanent physical boundary should be chosen. Boundaries should not, if possible, be overly complex or convoluted. Where a boundary follows a road, the road verges and embankments may be included in the designation where they blend into the wider landscape. For coastal areas, where no seaward boundary can be identified, use of the 12 nautical mile limit to territorial waters (as defined in the United Nations Convention on the Law of the Sea (UNCLOS)). The landward boundary should extend at least one kilometre in areas where there are no settlements or other terrestrial designation; where there are settlements the boundary will need to be identified in liaison with the city planning authorities.
2. **Other administrative boundaries:** Where Governorate or Wilayat boundaries follow suitable lines, it may be administratively convenient to adopt them. In the majority of cases, however, they will be unsuitable. Similarly, land ownership is not itself a reason for including or excluding land from designation – there will often be instances where part of a landholding sits within the designated area and part sits outside.
3. **Transition areas:** The boundary should not be expected to be a 'sharp' barrier between areas of differing quality. Often there will be a transition of natural beauty and opportunities for open-air recreation across a sweep of land: in those cases, the boundary chosen should be an easily identifiable feature within this transition. The boundary should be drawn towards the high-quality end of the transition in a manner that includes areas of high-quality land and excludes areas of lesser quality land i.e. it should be drawn conservatively. Visual associations may also be used to help define the extent of land for inclusion in these circumstances.
4. **Inclusion of settlements:** A settlement should only be included if it lies within a wider tract of qualifying land (whether or not this is part of the same designation), having regard to the influence of the settlement on the land in question. Settlements should be assessed on their individual merits and particularly on their character, qualities and relationship to adjoining countryside. The extent to which countryside penetrates the built-up area may also be relevant.



SPZ Boundary Example Diagram

5. **Integrity of settlements:** Towns or villages should not normally be cut in two by SPZ formation. The ability of a settlement to act as a gateway to a designated area is not dependent on its inclusion within a designation.
6. **Incongruous development:** Unsightly development on the edge of a SPZ should generally be excluded unless it is of a temporary or transient nature.
7. **Land allocated for development:** Land on the margins of a SPZ identified in development plans (both adopted and emerging), or having the benefit of planning permission, for major built developments (including the extraction of minerals and other deposits) should normally be excluded from the SPZ, unless the land will be developed or restored to a land use and quality which contributes to SPZ purposes. Land should not be included merely to seek to protect it from specific development proposals.
8. **Features of interest:** Areas and features of wildlife, geological, geomorphological, historic, cultural or architectural value which are situated on the margins of a SPZ should be included where practicable providing that they are situated within a tract that meets the statutory criteria.

Isolated sites / features of high heritage value (natural and cultural), distant from an SPZ, would not be given SPZ status but should still be given a separate designation (e.g. Nature Conservation Area, Cultural Conservation Area), in their own right, and given the necessary protection.

Special Planning Zone Management Plan Guidance

This guidance is for SPZ Authorities (SPZAs) and for all who have involvement in the future of Oman's SPZs. The guidance provides key 'steps' which should be undertaken by any Authority when developing a SPZ Management Plan (SPZMP), whereby all elements should be reflected within the final regulatory document. This has been provided to ensure a consistent approach to SPZMP development in all SPZs (terrestrial and coastal) throughout the country.

Although preparation of the Management Plan is the prime responsibility of the SPZA, its preparation needs actively to engage and gain the support of all key stakeholders who will assist in its delivery.

Overall, the key principles of the SPZMP are:

- SPZMPs are for the geographic area of the SPZ in question, and not for any single regional entity. As a strategic over-arching document, it must coordinate and integrate other plans, strategies and actions that in any format impact upon the SPZ; as well as coordinating the actions of local authorities, stakeholders, residents and visitors.
- SPZMPs are for all those who have an involvement in the future of each SPZ;
- No major decisions should be taken affecting the future of a SPZ without reference to its Management Plan;
- Given the central importance of the SPZMP, it should be up to date and regularly reviewed, recommended at least every five years;
- Ultimately, SPZMPs must produce outputs and shared outcomes. Much of the success of the SPZMP and its delivery depends on good working relationships between organisations and individuals.

For the SPZMP itself, the following guidelines for its preparation should be followed:

- **Clear and accessible:** easy to read, 'jargon' free and well presented.
- **Concise and comprehensive:** no longer than is necessary, but with enough information to fulfil its purpose.
- **Accurate and objective:** without major errors or statements likely to date quickly and with the criteria for all judgements clearly explained.
- **Systematic and logical:** with management policies derived from an assessment of the area and with a clear rationale given for all proposals.
- **Acceptable and motivating:** to all those with interests in and emotional attachment to the area.
- **Precise and practical:** with clear objectives, realistic methods for achieving them, resulting in desired outcomes which can be monitored.
- **Focused and effective:** fulfilling its purpose as a tool for site management, meeting the needs of its users and satisfying any legal or other obligations.
- **Specific but flexible:** must be based on relevant data and provide clear legislation and regulation, however, it should also be sufficiently flexible to allow for change through its working life.

SPZMP Development Guidance

The following provides a defined process for the development and implementation of a SPZMP, which must form the basis for all future SPZMP preparation, to ensure a nationally consistent approach. The following approach has been based upon official guidance issued by World Commission for Protected Areas (WCPA) and the IUCN.

Step 1	• SPZMP Pre-Planning
Step 2	• Data Collection, Background Research and Initial Fieldwork
Step 3	• Data Evaluation
Step 4	• Identifying Constraints, Opportunities and Threats
Step 5	• Development of the SPZ Vision and Objectives
Step 6	• SPZ Planning Options, Evaluation and Zoning
Step 7	• Preparation of a Draft SPZMP
Step 8	• Stakeholder and Public Consultation, Including Public Exhibition of the Draft SPZMP
Step 9	• Revision of Draft and Production of Final SPZMP
Step 10	• Implementation of the SPZMP
Step 11	• Monitoring, Review and SPZMP Update

SPZMP Process

1. SPZMP Pre-Planning

This includes the initial decision to prepare a SPZMP, appointment of planning team (or Authority), scoping of the task, defining the process to be used, as follows:

1a	Identify a 'planning team' or 'Authority' who will be responsible for developing and producing the SPZMP, and define their authority, roles and responsibilities at the outset.
1b	Clearly identify the purpose (Vision) objectives and goals of the SPZ, including comprehensive definitions
1c	Define the planning process which will be administered within the SPZ
1d	Define the boundaries, inclusions and exclusions of the SPZ – all areas included will assessed based on their individual issues and merits, however, under the complete view of the SPZ wider system.
1e	Establish an interdisciplinary approach – identifying and engaging with all disciplines and interested parties, as well as establishing their involvement and interaction.
1f	Develop a Stakeholder Management Plan, as well as Public Consultation Plan (as required).
1g	Develop a SPZMP project programme, specifying key tasks and delivery dates, as well as responsible parties.
1h	Establish a defined and agreed SPZMP approval process with the relevant authorities and stakeholders, in order to gain approval for each stage of works.

2. Data Collection, Background Research and Initial Fieldwork

A SPZ needs to be established based on a robust data set which is used to determine management objectives (e.g. protect rare habitat and species). The stages involved are to:

2a	Gather available background information
2b	Carry out a field inventory to check the information (and to acquire additional data if required);
2c	Identify data gaps and prepare a plan to mitigate against such gaps;
2d	Document the above in the form of a description of the SPZ – this should be concise, utilising maps and Annex, not include value judgements, and utilise only relevant data.

The information collected in this way should include both information about the area as it is, and about trends affecting it. The data should relate to both the physical aspects of the area, and to its social/cultural and economic significance.

The following is a checklist of general types of information that may need to be collected:

- Ecological resources (terrestrial/ marine) and their condition;
- Cultural resources and their condition;
- Aesthetic aspects;
- Physical facilities (e.g. settlement, roads, buildings, easements, mountains/ sea-cliffs, power and water supply);
- Key features of the socio-economic environment;
- The capability of facilities in the SPZ and its region to support existing and projected uses;
- Visitor characteristics and influence on the SPZ;
- Predictions of the future condition of each of the above factors; and
- Land uses and planning provisions of surrounding lands and any in-holdings or leases

3. Data Evaluation

The purpose of this step is to identify and understand why the SPZ is important. It should describe the 'values' associated with the SPZ, explain why it was designated and identify its benefits to society.

The evaluation of values is a two-part process:

3a	The identification of the 'key features' or 'exceptional values'. These are the features or values that must be protected and preserved to maintain the significance of the SPZ. They may not be limited to those within the SPZ boundary.
3b	The development of a succinct 'Statement of Significance' (as per UNESCO) which explains the SPZ's importance to society or particular interest groups. The Statement of Significance expands upon the identification of values by adding unique qualifiers and placing SPZs within their context at a regional, national and international level. Along with the SPZ's broad purposes, this Statement should provide an important framework upon which the Management Plan is based.

In assessing the significance of a SPZ, the planner should ask if the area contains:

- Outstanding examples of natural, scenic, geological, marine, scientific, ecological, floral, faunal and recreational values (and if so, why);
- Unique biological attributes, vegetation types landforms, marine features or marine life (and if so, why);
- Areas essential for protecting the ecological integrity of the SPZ as a whole, (including areas critical for maintaining water flow and quality and the reasons why);
- Areas and resources that are vital (economically, culturally or in other ways) to local communities;
- Areas and resources which provide essential services to people outside the park, especially where these have significant economic or political values;
- Rare and endemic plants and animals/ marine life;
- Sensitive, threatened or endangered plants and animals and habitats;
- Resources which are unusually sensitive to human use, including beaches known for turtle nesting;
- Outstanding examples of modified landscapes and evidence of sustainable use of natural resources;
- Major archaeological or historical sites; and

- Major cultural heritage sites including sites/ features with world-wide recognition (e.g. as World Heritage Sites).

4. Identifying Constraints, Opportunities and Threats

Before defining the specific management objectives for the SPZ, the constraints on its management should be identified, as should any major threats to the area's values.

4a	Constraints: Some 'constraints' are a function of the natural environment. Examples are the ecological processes which exist in the area, the presence of unique and vulnerable features, the relative rarity of the resource and any other aspects which may be identified.
4b	Threats: 'Threats' to, or pressures on the SPZ may be human-induced or natural and may originate from within the SPZ or from beyond its boundaries. Often, they will manifest themselves in the form of social or economic demands upon the SPZ.
4c	Opportunities: 'Opportunities' will look into the future regarding any predicted impacts to the SPZ, so that they can be considered as part of the SPZMP development, as well as future reviews and updates.

Once identified, the constraints, opportunities and threats should be clearly included in the SPZMP.

5. Development of the SPZ Vision and Objectives

The SPZ management planning process should develop and articulate an ideal condition, state or appearance for the future of the SPZ. Vision statements describe the desired or envisaged result of the policies for the conservation of the SPZ. Objectives follow from the Vision and are more specific statements of intentions, setting out the conditions that SPZMP aims to achieve. They are thus statements of 'outcomes' rather than how to achieve them.

5a	The long-term Vision should: • Describe the kind of SPZ that the plan is seeking to achieve in the long term. This will help people to understand what it is hoped the area will be like in the future, the reasons for this, and the action needed to achieve the Vision; • Be a long-term statement which is unlikely to change significantly over time. It should therefore provide continuity in the process of managing the SPZ in a sustainable way; and • Include environmental, recreational, cultural and social and economic aspects of the SPZ.
5b	The objectives should be: • Precise/specific - written so they are difficult to misinterpret. • Achievable and realistic - the aspirations expressed in the vision will need to be translated into more practical terms and address the prevailing practical realities. • Time-related - accountability should be measured by the timeliness of the actions undertaken to implement the plan. • Measurable - must be able to tell whether management activities are achieving the desired results as this is an important measure of success. • Reflect SPZ purpose, significance and exceptional values - should not restate the purposes of the SPZ but set out important aspects that will accomplish this purpose. • Spell out the ends desired, but not the means to those ends - should not describe the programmes, actions and support facilities needed to achieve these desired conditions, which are tasks that should be addressed later in the process. • Adequately address the issues - respond to the issues that have been identified in previous steps of the planning process. • Accompanied by a rationale - the reasoning behind the choice of objectives should be explained to help communicate the significance of the Management Plan and its objectives. • Written in priority order - to ensure there is a clear understanding about the most important aspects to be included and accomplished.

According to the IUCN, typical objectives would be formulated to cover the following:

- Habitat and species management;
- Research, survey and monitoring;
- Infrastructure including communications;
- Visitor use and facilities;
- Education and training;

- Social and cultural features;
- Income generation;
- SPZ services; and
- Administration.

6. SPZ Planning Options, Evaluation and Zoning

Following the majority of data collection and data gaps evaluation, as well as developing the overall vision and objectives for the SPZ, planning options, evaluations and land use zoning can commence:

6a	SPZ Options Development and Evaluation: With objectives in place, the next step is to work out how the SPZMP Vision and Objectives will be achieved. As there are often several ways in which this can be done, the range of options should be identified, and the appropriate ones chosen according to their achievement of the local constraints, threats and opportunities.
6b	SPZ Zoning: Once a SPZMP option(s) has been selected (or options have been refined), SPZs may identify different 'management zones' – that is geographical areas within which similar management emphases are applied and similar levels of use permitted, and different uses segregated. Typically, zoning will be used to (<i>refer to IUCN Protected Areas Categories Table provided previously</i>): • Provide protection for critical or representative habitats, ecosystems and ecological processes; • Separate conflicting human activities; • Protect the natural and/or cultural qualities while allowing a spectrum of reasonable human uses; and • Enable damaged areas to be set aside to recover or be restored.

Zoning may also be invoked on a temporal basis where an area is managed according to the time of day, days of the week or months of the year, to allow for cultural events, acknowledge seasonal changes or by reference to some other trigger or causal event (e.g. breeding seasons).

There is no set formula for identifying internal zones. The planner and the planning team should start with the relevant objectives. Then criteria for zoning designations should be agreed, based on the objectives for the area and within the scope of the options developed. The zones are identified using the best information available and the professional judgement of the interdisciplinary planning team.

Factors to consider may include:

- Protection of exceptional resource values;
- Constraints imposed by the landscape and other ecological determinants e.g. slope, soil type and hydrology, landscape values;
- Provision of a diverse range of appropriate visitor use experiences;
- Elimination or minimisation of uses and activities that either damage SPZ resources or create an undue burden on SPZ management;
- The capability of the SPZ to support different types of desired uses and development;
- The results of public participation or consultation – prior to the preparation of the plan;
- Government policy and decisions regarding land use; and
- Established uses by local people and communities.

7. Preparation of a Draft SPZMP

The integration of all of the above planning elements into a single document will result in a 'Draft SPZMP'. Even though there is no such thing as a standard format for a Management Plan, they tend to contain certain standard elements. These are not necessarily 'chapter headings' within a plan, although they may be. They may occur as headings in the plan, be 'lumped together' or be split into smaller sections, depending on the complexities and characteristics of the area. Some of these elements may be absent, or additional ones added. They closely mirror the steps in the process used, as follows:

7a	Executive summary: This summarises essential issues within the plan and relevant decisions. This is important as many of the final decision-makers will not have time to read and digest supporting detail.
7b	Introduction: This states the purpose and scope of the plan and provides an explanation of the purpose for which the SPZ was established (including any legislative basis) and the

	authority for plan development. It may also contain some summary information about the SPZ, such as its location, size, primary resources and values.
7c	Description of the SPZ: This summarises relevant descriptive information about the SPZ. It normally includes a summary account of the resources (features) of the area (natural, cultural, coastal, historical and socio-economic), how it is used, and its legal and management framework. It can be equally important to state what the plan does not cover.
7d	Evaluation of the SPZ: This identifies why the SPZ is important, and explains the values associated with it. It frequently takes the form of a 'Statement of Significance' or Key Features of the area.
7e	Analysis of issues and problems: This section contains an analysis of the constraints and opportunities affecting the area and a statement of the principal threats to its conservation, management and maintenance. Any impacts (internal or external) on the important features of the area should be stated, along with any other management considerations.
7f	Vision and objectives: This entails the development of a broad, long-term vision for the SPZ, which may take the form of goals, and a 'vision statement'. Any guiding policies for management can be included here. A set of objectives is provided. These are specific statements outlining what is to be achieved by management in the timeframe of the plan. A rationale for the objectives is often included and provides valuable justification of the decisions made during the planning process. Limits of Acceptable Change (LACs) may be provided for objectives.
7g	Zoning plan: If different management sub-zones are required, a zoning plan can be prepared to illustrate the boundaries, classification and management and other activities allowed or prohibited for each zone. Sub-objectives for each zone can also be provided. The zoning scheme can be included in the Management Plan or presented separately. In many cases, the zoning plan will be prepared to inform the Management Plan. Its findings are then summarised within the Management Plan. Specific constraints and conditions applying in each zone must be clearly described.
7h	Management actions (prescriptions): This contains the specific actions to be carried out in order to achieve the objectives. It commonly includes: • List of management actions/activities required (often called prescriptions); • Schedule or work plan identifying when each action will be carried out and by whom (this may be a separate document); • Priority activities identified; and • Staff and finances required to carry them out (costings).
7i	If this section of the plan is to be very detailed, it can further break prescriptions down into 'projects', each of which is a detailed action. An explanation as to how these should be carried out can also be given. More commonly, the information in this section may not be detailed, but will be supplemented by separate annual operational or work plans, which will contain detailed costings and instructions.
7j	Monitoring and review: This section outlines how implementation of the SPZMP will be monitored, and when and how a review of the plan will be carried out. It will include the indicators against which the performance of the SPZ will be measured.

8. Stakeholder and Public Consultation, Including Public Exhibition of the Draft SPZMP

It is essential that the consultation processes create confidence among all stakeholders. The Draft SPZMP should be provided to and presented to all stakeholders, as well as local community meetings where possible. This requires the SPZMP to:

- Identify all the stakeholders;
- Approach all of them on the basis of equality and transparency;
- Produce materials that are informative, clear and user-friendly;
- Use a variety of culturally appropriate means to seek views;
- Emphasise the draft nature of proposals;
- Be ready to revisit any proposal;
- Keep a complete and documented record of all comments, and log all contacts;
- Ensure that all requests for meetings, materials etc. are responded to promptly;
- Make sure that every view has been considered, whether it is adopted or not;
- Allow time so that people do not feel rushed by the process, but not so much that they lose interest;

- Engage in further consultation if changes in the SPZMP are envisaged that will affect other stakeholders than those seeking these changes;
- Feedback the results of consultation to all who commented; and
- Above all treat the stakeholders as essential partners in the conservation of the SPZs, not as obstacles.

9. Revision of Draft and Production of Final SPZMP

This step in the process involves revision of the draft, taking into account the comments received from stakeholders and the public, gaining relevant approvals and sign-off.

9a	Final SPZMP Preparation: Good practice requires that all written comments received, and those noted at public meetings etc., should be recorded and considered. Even if not incorporated into the final version, it would be appropriate for the SPZMP team to summarise each comment received and include these as an annex to the published SPZMP, or to make it a separate document. The planning team will be required to exercise judgment of the highest order in considering which comments to accept. Comments from user groups and stakeholders will tend to focus on single issues rather than the plan as a whole. The views of a particular group, however strongly advocated, should not be allowed to put at risk other elements of the plan.
9b	Final SPZMP Approval: This is a procedural step involving submission of the final plan for approval by the competent authority, as identified and decided as part of Step 1 at the outset of the project. There should be a formal process of adoption or approval to give authority to the SPZMP, often laid down in legislation and clearly documented.

10. Implementation of the SPZMP

The SPZMP 'actions' need to be implemented and should include detailed resource and financial information for the year. This information should be in the form of a work plan which should cover the activities to be carried out with an estimate of costs over the entire period of the Management Plan. This can be set out as a summary in spread sheet format. It should include: the timescale involved; the resources of staff and money required; the priority to be accorded to the work; and criteria for success and failure to be used to measure progress. Depending on how financial/ resource planning is carried out, it may be useful to split the work plan into two parts:

10a	Repeated and on-going tasks (maintenance programme)
10b	Developmental or capital projects, or "one off" actions. Detailed annual operational plans for the SPZ should also be prepared on a rolling basis. These should be linked to annual budgets and provide an accurate projection of the work to be carried out in a SPZ each year derived from the SPZMP

Implementation can also be presented as follows, where relevant:

10c	By Zone: If management zones have been identified, the actions, times and costs for the SPZ may be grouped together thus: • Actions which are required for each zone; • Actions which are wide in their application, affecting more than one zone; and • Actions that extend outside the SPZ.
10d	By Objective: In some cases, actions – along with associated timelines and costings – are grouped into 'management strategies' for each objective.
10e	Division into Projects: In other cases, management actions (sometimes called prescriptions) are broken down into units of work called "projects". This can facilitate implementation as each project can be clearly described, individually costed and timetabled. Within this approach, each project is assigned a priority. The priority order is used to guide an annual allocation of resources.

11. Monitoring, Review and SPZMP Update

When the SPZMP has been prepared and approved, and the operational plans are in place to guide its implementation, the SPZA is then able to put the plan into practice. With implementation under way, monitoring and review will provide the feedback loop. The purposes of this step are:

- To identify whether the plan is being implemented effectively and the objectives are being met;
- To learn from observation of the impacts of management; and

- To adapt the management actions accordingly.

Where implementation runs into problems, monitoring and review can be used to re-deploy resources and effort to improve implementation. IUCN identifies six main elements of the management process which can be evaluated to identify the level and location of success or failure within the management cycle:

11a	Where are we now? (context)
11b	Where do we want to be? (planning)
11c	What do we need? (input)
11d	How do we go about it? (process)
11e	What were the results? (outputs – i.e. the activities carried out or services provided)
11f	What did we achieve? (outcomes – i.e. the actual achievements of management)

The final step in the planning process is to decide on either review or update of the SPZMP. The decision to undertake a revision needs to be made in sufficient time to allow the new plan to be in place before the expiry of the old one. In cases of a complex plan with extensive public consultation process, it may be necessary to consider embarking on the review two years prior to the new plan coming into effect.

In less complicated situations, the process should commence at least 12 months before the new plan takes effect. An integral part of this final step is to ensure that feedback from the monitoring cycle is available to guide drafting of the new document. It may be appropriate to commission an evaluation study to collect monitoring information where this is not available, or to commission further studies to provide in-depth information on issues that have not been well covered by monitoring.

8.2.2. Coastal Zone Management Plans (CZMPs)

Introduction

The Coastal Zone is recognised as being a special area because of the diverse competing and complementary land uses that occur at the interface of land and the sea. Access to the sea is essential for fishing, maritime trade and transport and some tourism activities. Developing and maintaining offshore activities such as oil and gas development and coastal industries may also require the transfer of goods and materials from land to sea or vice versa. However, not all activities require access to the sea or benefit from it, so in order to reach full development potential such activities should not be allowed to compete for space in the Coastal Zone with activities that do depend on such access, so called 'coastal dependent activities'. Minimising land use and resource access conflicts and maximising development potential lies at the heart of the spatial aspects of Coastal Zone Management.

The natural environment at the coast is also potentially a difficult environment in which to develop without inducing significant impacts because of the complex processes that occur there and the sensitive ecological communities that can exist. The interaction between the physical and biological aspects of the coast and their response to development activities make the coast a special area, and therefore it is important to provide guiding principles to planners and developers.

In the 1980's and early 1990's, Coastal Zone Management Plans (CZMPs) were prepared for sections of Oman's coast by IUCN (International Union for Conservation of Nature) for the Ministry of Commerce Industry. The Government is intending to prepare a new National Coastal Zone Management Plan (NCZMP) for the Sultanate. Pending completion and approval of the new NCZMP, these guidelines are to assist Planners, Environmental Authorities, Developers and others in the planning and management of the coast.

The concerned Government Authority will develop and maintain the National Coastal Zone Management Plan (NCZMP) in coordination with concerned stakeholders. Until the NCZMP process is complete, the guidelines presented in this section are to be treated as an interim mechanism, for informed decision-making, and therefore will be subject to change. The NCZMP plan will build on previous coastal management studies and plans to fill gaps and integrate and update them to reflect the present conditions and the development intentions of the Sultanate of Oman. It is anticipated that the NCZMP will contain the following elements (sub-plans and systems) for managing of the Coastal Zone:

- **Shoreline Management** to include coastal risks (erosion and flooding), interfacing with watershed management efforts, coastal engineering aspects and beach management.
- **Natural Resource Management**, including important and sensitive habitats (coral reefs, seagrasses, mangroves, important coastal bird areas, turtle nesting areas, interfacing with the management of marine protected areas, and relevant aspects of inshore fisheries management.
- **Planning**, including access, emergency response and pollution control, inputs into spatial and urban planning, designation of future protected areas and special use areas, interface and coordination regarding approvals and permits
- **Public Relations**, both outward-looking, such as external stakeholder coordination and public awareness campaigns, and with an inward focus such as coordination with MECA, MoAFWR and MoHT, capacity building and legal affairs.

Defining the Coastal Zone

For Planners, the first step is to identify the extent of the Coastal Zone. The definition of Oman's Coastal Zone has been developed with reference to that of the California Coastal Commission, according to which all areas of land affected by their proximity to the sea should be included (i.e. land that is influenced by marine processes and which influence coastal processes such as sediment transport).

In Oman the boundaries of the coastal zone have previously not been defined. However, under the ONSS, as a general rule, a landward boundary has been set at 1000 m inland from the mean high tide line. However, in areas of significant coastal landscape, khawrs, coastal wetlands and recreational areas it extends inland to the first major ridgeline or five kilometres from the mean high tide line, whichever is less. In urban areas, the boundary may be set at less than 1,000 meters, where topography (elevation and drainage) and existing urban development mean that it is not essential for coastal zone regulations to apply to all urban modifications. In such areas, the future CZMP and Shoreline Management Plans (see later section) will refine the boundaries to capture, and enable resolution of, all the major coastal issues.

The full seaward extent of the Coastal Zone lies 12 Nautical Miles from the mean high tide line, to the edge of Oman's Territorial Waters in order to consider developments and planning in the maritime zone; this generally encompasses most relevant shallow water habitats and also accords with national and international legal definitions. However; for

the purpose of these Guidelines, which considers land based development only, the seaward extent of the Coastal Zone is 5km from the mean high tide line (the 'zone of influence from land based development').

Proposed development or activities related to or potentially impacting the marine environment beyond 5 km (the 'zone of influence from marine based development'), such as offshore windfarms, shipping lanes, deep sea mining concessions etc., will be subject to a different regulatory process for which specific Guidelines will need to be prepared in future.

Any natural process or human activity that affects the Coastal Zone, regardless of its location, is to be considered when developing Coastal Zone Management Plans and when making planning decisions.

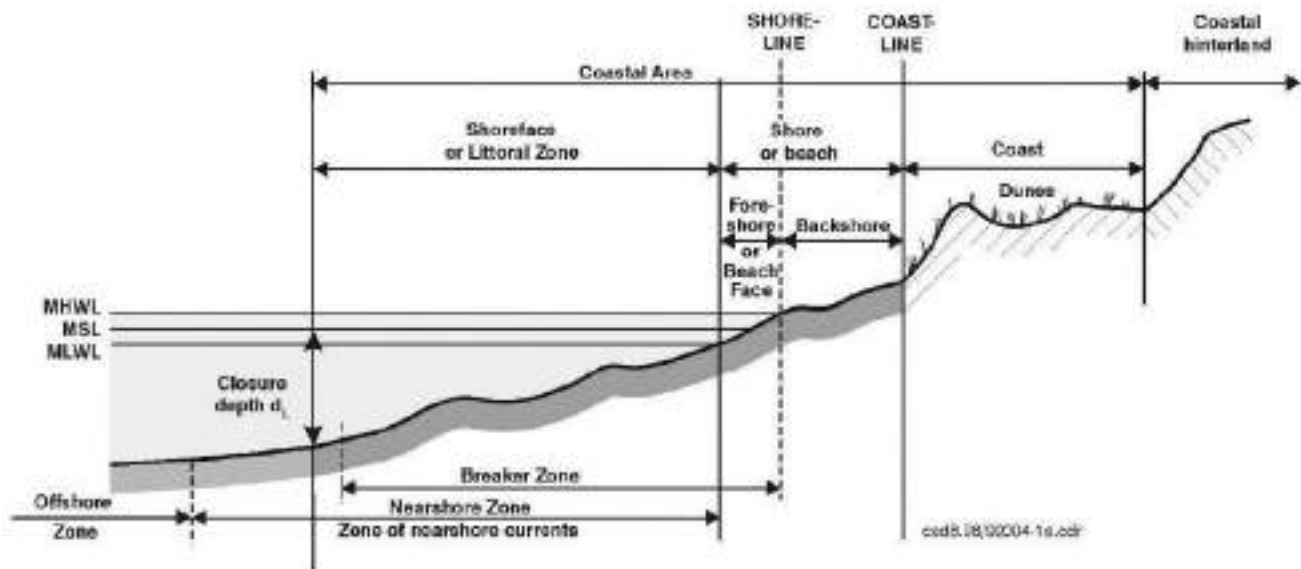


Illustration of different terms used in coastal and shoreline management – Source: DHI, 2018

Coastal Zone Management Planning Guidance

Coastal management is a highly interdisciplinary field since it must integrate a myriad of human activities while respecting and accommodating complex physical processes and biodiversity. Since the purpose of this document is to provide spatial planning guidelines, the sections below are focused on aspects of coastal management that concern such aspects for planners and developers.

1. The Role and Responsibilities of Coastal Zone Planners and Managers

The role of Planners, at the highest level, is to develop and administer the National CZMP and regulatory and administrative framework for the Coastal Zone in which it is based. This requires the Planners to adopt a range of responsibilities, such as:

- Integrating the needs and interests of the Public and other Stakeholders, including Authorities and Landowners, into the Plan. In particular, the regulator must decide whether a development in the Coastal Zone is in the public interest, particularly if it interferes with coastal processes and natural assets.
- Ensuring that responsibility for managing coastal risks is clearly delegated to the participating Stakeholders including Developers.
- Directing Government spending towards coastal protection that is prioritised, effective and sustainable.
- Managing and maintaining coastal protection assets in the public domain.
- Collecting, managing, analysing and visualising data from the Coastal Zone relating to natural resources, ecosystem services, land use, status and condition of built and natural assets, and specific management units (such as Special Planning Zones, set back areas, protected areas, etc.) that will serve as evidence for planning and adaptive management of the Coastal Zone.
- Updating and developing appropriate legislation and standards, including appropriate design storm parameters and the planning horizon over which to incorporate sea level rise for different categories of development (including critical infrastructure).
- Resolving disputes.

- Monitoring compliance with regulations and standards, managing the monitoring of geomorphological changes to the shoreline by either conducting monitoring itself or delegating the responsibility for monitoring to developers and coastal users, and assessing the effectiveness of coastal management interventions.
- Dissemination of findings and decisions, facilitating engagement and communication amongst stakeholders.

2. The Responsibilities of Coastal Zone Developers

It is the responsibility of Developers to comply with the regulatory framework for the Coastal Zone and address site specific coastal risks with due care, which will entail the following steps:

- Assessing coastal risks diligently during site selection and site assessment processes.
- Should any deviation from the requirements given in MD 20/1990 (amended by MD 23/1997) regarding coastal setbacks be considered necessary, the developer will prepare his case and consult with the concerned authority, considering sustainability principles and climate change.
- Apply appropriate design standards that respect risks and sensitivity of the site including ecological and visual features.
- Comply with the requirements of environmental legislation and guidelines, in particular with respect to Environmental Impact Assessment (EIA). Developers should identify and address coastal issues that may arise as a result of their project. EIA studies should include appropriate mitigation measures for impacts and risks attributable to the proposed Project. The studies should also address the management of the construction and operational phases, in accordance with all legal and permit conditions, and any requirements arising from the National Coastal Zone Management Plan (NCZMP).
- Protect, maintain and restore shorelines to a condition that allows them to respond to natural processes and provide protection to lives, property, infrastructure and the public realm.
- Protect, maintain and restore sensitive aspects of the Coastal Zone (see below) to a condition where such areas continue to provide services (ecosystem services, shoreline protection and visual amenity) as they would if they were in their original natural condition.
- Monitor the condition of shorelines and coastal assets (built and natural) and submit data and reports to the concerned authorities.

3. Shoreline Management: Coastal Setbacks and Design Levels

Coastal setbacks are intended to protect property from coastal flooding and coastal erosion risks. These risks will be significantly exacerbated by climate change, so regulations must be conservative to accommodate future potential increases in risk. The current law on coastal setbacks (MD 20/1990 amended by MD 23/1997) provides linear distance from the mean high-water mark according to three basic types of coastline:

- Open sandy beaches that are vulnerable to erosion and or flooding including khawrs (150m)
- Scenic coast lines and cliffs (300m).
- Coastlines that are not susceptible to erosion or flooding (50m), etc.

When formulated over 30 years ago this approach was designed to be simple to apply. In 2012, the Supreme Council for Planning took steps to introduce measures for addressing various urban planning issues (a team was established, by Decision No. 9.3.2012, to develop an "Interim Mechanism for Urban Planning"). The interim mechanism itself was approved by SCP Decision no. 63-2014 dated April 6th, 2014, and this decision was given interim status until the findings of the ONSS, and stated that planners should apply a setback of 300 m from all beaches in the country for all new developments (existing buildings and infrastructure are excluded) with the following exceptions:

- Fins to Dhaghmar (Muscat Governorate): as per the land use plan developed by SCP for this area.
- The city of Quriyat (Muscat Governorate): as per the study prepared by the competent authority
- Ras Abu Daoud to Harmool (Muscat Governorate): to be subjected to a technical study and approved by a technical committee comprising SCP, MECA, MoH, MoAFWR, MoTransport and MoTourism.
- Sidah to Al Ghubrah North (Muscat Governorate): Only fishermen's temporary shade structures are permitted in the setback zone.
- Azaibah (Muscat Governorate) to Al Khurais (Al Batinah South): to be subjected to a technical study and guidelines given in the Development Control Plan Framework for ITCs (Ministry of Tourism, 2010).

- Al Khurais to Manumah, Seeb (Muscat Governate): up to the existing coastal road. Only fishermen's temporary shade structures are permitted in the setback zone.
- North and South Al Batinah: 100m setback, subject to the results of coastal erosion monitoring by MECA.
- Masirah Island (Sharqiyah South): 300m setback except Hilf where recommendations on setbacks given in current Masirah Island Master Plan shall be adopted.

However, following three decades of significant development along Oman's coast and the emergence of climate change as a major multiplier of coastal risk, a more sophisticated set of guideline development is recommended to ensure that a clear and transparent decision-making mechanism is implemented that takes into account:

- The above-mentioned factors (types of coastline based on their vulnerability and sensitivity to coastal erosion and flooding, and the setbacks given in SCP's Interim Urban Planning Guidelines);
- The most recent, readily available climate change projections with respect to sea-level rise and storm-surge, and the corresponding wave run up etc. along with the design parameters set by the concerned authority for coastal developments;
- Variations in physical conditions at Governorate level (orientation and exposure to extreme weather events and tsunamis); and
- Site specific conditions, such as the elevation of natural ground at the site and sensitivities such as turtle nesting beaches, dune systems, important bird areas, khawrs etc.

When prepared, the NCZMP and more detailed regional-level CZMPs, will incorporate a series of Shoreline Management Plans (SMPs) to manage erosion and coastal flooding risks. SMPs will be prepared by the concerned national Authority following a technical review of the available body of information concerning coastal setbacks as summarised above¹, and, with inputs from regional institutions and in consultation with appropriate stakeholders including local residents. The plans will take into consideration the specific conditions and risks faced by each segment of shoreline, sub-divided into littoral cells² where practical.

In case a developer wishes to apply for a waiver to the applicable coastal setbacks given in the SMP, a process for presenting and determining the case shall also be defined in the NCZMP. Any deviation from the limits set out in the applicable legislation (currently (MD 20/1990 amended by MD 23/1997) or other legally binding standards (such as the SCP Interim Urban Planning Mechanism) must be requested in writing from the concerned Authority (or Authorities) for determination, as per the specifications to be provided in the national SMP. The waiver application must be prepared by a competent coastal engineering consultant registered with the CZMP Authority, be consistent with the objectives and definitions of the applicable SMP and must be accompanied by all necessary supporting evidence for the Authorities to be able to make an informed decision.

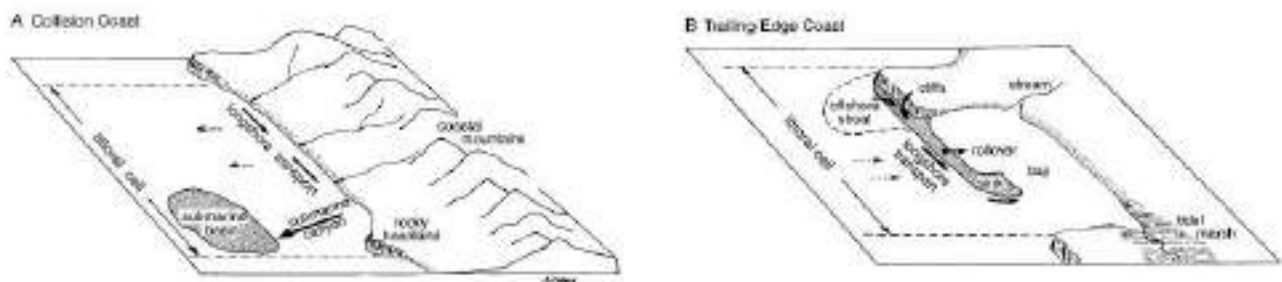


Illustration of a Littoral Cell – Source: Inman, 2005. Littoral cells are the functional management units of the shoreline with respect to coastal erosion

¹ To include PACA (2015) Mitigation Handbook. Assessment of Coastal Hazards, Vulnerability and Risk for the Coastal of Oman. IH Cantabria, Pp 149 and any specific guidance relating to the coastal zone that MECA may issue from time to time (e.g. MECA Guidance Note on Sustainable Development on Coastlines issued to SCP on 19 April 2020).

² Inman D.L. (2005) Littoral Cells. In: Schwartz M.L. (eds) Encyclopedia of Coastal Science. Encyclopedia of Earth Science Series. Springer, Dordrecht

Site specific setbacks may be proposed on a case-by-case basis that take into account the characteristics of the coastal erosion and flood hazard, the vulnerability and sensitivity of the site and the associated risk.

Principles of disaster management should be incorporated into decision-making with respect to the location of critical infrastructure and other facilities/ assets at safer elevations and sites. In consultation with the concerned Authority a risk assessment will be made considering the following factors:

- Degree of exposure to the hazards (erosion, flooding, geological risk etc.) based on a design storm with a return period of 1 in 50 or greater, with critical infrastructure requiring the application of longer return periods to embed resilience).
- Vulnerability of human lives and infrastructure, considering the latter's capacity to cope and to recover.
- Risk i.e. potential impact to human lives and infrastructure.
- Mechanisms to mitigate the risk by reducing the hazard, reducing exposure, reducing sensitivity.
- Any site-specific environmental sensitivities.
- Strategies to design resilience into the project for example by providing an allowance for managed retreat to be implemented.

In order to calculate safe design levels, and pending the development of coastal design standards by the national CZMP Authority, the following factors must be included in design calculations:

- The elevation of the Highest Astronomical Tide (HAT), as determined by the National Hydrographic Office.
- Predictions of sea level rise published in the most up to date IFCC Report.
- Allowance for Storm Surge (based on as design storm with a return period of 1 in 50 or greater, with critical infrastructure requiring greater resilience).
- Allowance for wind and wave set up (using design storm with a return period of not less than 1 in 50).
- Allowance for future sea level rise over the design life of the structure, but not less than 50 years.

Permissible development within the setback zone in tourism development areas may include shade structures and food and beverage outlets with complementary and appropriate landscaping. Proper waste management facilities must be installed, together with appropriate lighting (but see restrictions for ecologically sensitive areas).

4. Land Reclamation

The policy of the Government of Oman is to prohibit land reclamation unless it is deemed to be in the public interest.

5. Access

The Coastal Zone Management Plan must provide and maintain access to the shoreline for the following purposes:

- To maintain beaches as public spaces for the use and enjoyment to the public, except where it is decided not to be in the public interest (e.g. military installations; where health, safety and security concerns arise from industrial activity and port operations, and for the management of biodiversity such as in protected areas or other ecology sensitive areas).
- Respect for all legal traditional and customary uses.
- Equitable development of low and medium cost housing with access to the shoreline.
- Delivery of emergency response services including but not limited to civil defence response to extreme weather events, tsunamis, industrial or transport accidents, major pollution events such as oil spills etc.

6. Ecologically and Visually Sensitive Areas

Ecologically and visually sensitive areas are special areas within the Coastal Zone that provide ecological services and amenity value for the well-being of communities, recreation and tourism (for local, regional and international tourists), provisioning through fishing and collecting wild animals and plants, environmental services such as shoreline protection and improvement of water quality.

Ecologically Sensitive Areas include:

- Mangrove stands.
- Seagrass beds and coral communities.

- Turtle nesting beaches (currently active and those which have been active in the past).
- Important bird habitats on mudflats, sandflats and sabkhas.
- Any other area deemed to be important biologically or ecologically.
- Areas that are functional in terms of maintaining coastal processes, including beaches, primary dune systems, tidal inlets and *khawrs*, wadis, offshore sand and mud banks.

Visually Sensitive Landscapes include:

- Headlands.
- Cliffs.
- Less developed scenic coastlines.

The identification of sections of Oman's coastline that are ecologically sensitive, geo-morphologically functional and visually sensitive is an objective of the National Coastal Zone Management Plan. Such areas should remain less developed, unless it is deemed by the concerned authority to be in the public interest in which case an assessment shall be prepared to demonstrate the cost and benefit in terms of social, environmental and financial capital.

Development restrictions in sensitive coastal environments include:

- Conservative setback limits around sensitive coastal environments. In the case of mangroves, all forms of development must be at least 20m from the nearest aerial roots of mangrove plants and, if development within mangroves stands is deemed to be in the public interest (e.g. eco-tourism or visitor centres), then a habitat restoration and offsetting plan shall be implemented.
- Impacts to shallow water sensitive habitats (seagrass and coral communities) shall be avoided, minimised, mitigated and offset according to the mitigation hierarchy. Should unavoidable impact to such habitats occur, a restoration and offsetting plan shall be implemented.
- Any development or activity that has potential to introduce light pollution to historic or current turtle nesting beaches shall implement a light pollution management plan that minimises light spilling on to the beach through a combination of turtle friendly luminaries, shielding at source, light barriers (e.g. landscape features) at the receptor and design, operational and behavioural interventions to minimise light use.
- Development of fishing harbours and enhancement of fish landing sites shall be prohibited within 5 km of active turtle nesting sites, and fishing activities shall be prohibited within 2.5 km of active turtle nesting sites. Building on the marine and coastal resource atlas developed by SCP (2019), the NCZMP will be responsible for surveying, assessing and clearly mapping all turtle nesting beaches, including those that have been active in the past (based on IUCN data).
- The mitigation hierarchy³ shall be rigorously applied to Important Bird Areas of Oman (IBAOs).
- Primary dune systems will be incorporated into coastal setback zones to keep the dune system and its ecology intact. Where necessary access to the beach will be provided using appropriate methods such as board walks, or permeable surfaces.

³ The mitigation hierarchy refers to the preferred order of action to minimize environmental and social impact and risk arising from a project: avoid, minimize, mitigate and offset, as required by International Finance Corporation (IFC) Environmental and Social Performance Standards.



An example of one of Oman's scenic coastlines, the cliffs at Fizayah west of Salalah, Dhofar

7. Governorate / Region Specific Guidelines

Planning Standards for each Governorate within this document provides information regarding Coastal Zone Management. This provides further guidance on development (and protection) specific to the conditions and issues prevailing in those Governorates, pending completion of the full NCZMP with its SMPs, including in particular:

- A map showing the categories of coastline given in MD 20/1990, so there is a spatial definition of these categories for each Governorate. The boundaries of the Coastal Zone, Nature Conservation Areas and Coastal SPZs would also be shown. This will help with the interpretation of the applicable regulations promulgating these standards and guidelines.
- Guidance on the suitability of a 300 m setback for each category of coast in the Governorate, taking into account the erosion risk, environmental resources and sensitivities, vulnerability to storm surge and tsunamis etc. The guidance makes reference to and should be interpreted in the light of the PACA (2015) Mitigation Handbook report, and the current status of coastal erosion. If sufficient evidence on which to base such guidance is not available, such gaps are highlighted in order to inform the full extent of data gathering that is required by the future NCZMP process.

8.2.3. Cultural Conservation Areas (CCAs)

Introduction

A Cultural Conservation Area (CCA) is an area of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance. This could be a place, locality, natural landscape, settlement area, architectural complex, archaeological site, or standing structure that is recognized and often legally protected as a specific place/ area of historical and cultural significance.”

A CCA can comprise a significant cultural heritage building, single site, or a cluster of sites. CCAs can also be included within cultural landscapes, defined by the World Heritage Committee, as the "cultural properties [that] represent the combined works of nature and of man". A cultural landscape is a significant area in terms of scale, composed of a number of cultural and natural heritage assets – both tangible and intangible. It may comprise several CCAs along with other elements, such as settlements and infrastructure and is reflective of man's interaction with its natural setting. A cultural landscape may be considered as part of a Special Planning Zone (SPZ).

The guidance provided in this section relates to the identification and appraisal of CCAs, as well the guidance relating to planning regulation development for CCAs.

Cultural Conservation Area – Identification Guidance

The first step is to identify CCAs from Regional Spatial Strategies, alongside additional works undertaken by the Ministry of Cultural Heritage, as well as the relevant Planning Authority (be that existing or proposed).

A series of designated CCAs, both inside and outside of SPZ's, is proposed to protect Oman's significant cultural heritage areas and assets that might otherwise come under pressure from development. CCAs should be identified by the following categories:

- Archaeological sites or clusters thereof.
- The urban heritage of Omani Towns, comprising any of the following:
 - o Settlement Quarters/ Harats
 - o Mosques
 - o Markets
 - o Souks
 - o Fortifications
 - o Gardens, open spaces, public spaces, agricultural land and falaj irrigation systems
 - o Traditional Architectural Features

Alongside the above, the following key questions should also be considered in order to determine a CCA:

1. Is there sufficient architectural or historic interest for the area to be considered 'special'?
2. Is this is experienced through its character or appearance?
3. Is it desirable for that character or appearance to be preserved or enhanced, and what problems designation could help to solve?

Cultural Conservation Area – Appraisal Document Guidance

Once a CCA has been identified, an 'Appraisal Document' should be developed in which to formally assess the special historic or architectural interest it may have and whether it is desirable to preserve or enhance its character or appearance. This should include the following:

1. Local Context and Character Description (Narrative and Plans)

Describing the general identity and character of the CCA (whether it is a village, town or city centre, for example), its townscape and its place within the wider settlement or surrounding landscape.

2. Historic Interest (Narrative and Plans)

Describing what makes the area special and the impact of its history on its current character and appearance. This should include all heritage assets, archaeological sites and potentially archeologically sensitive areas.

3. Architectural interest and built form (Narrative and Plans)

Sets out the features of the area that contribute to its special interest. A general statement regarding the nature of this interest, whether as a collection of buildings representing a range of uses that document the area's history, or with materials and features that are special because of their contribution to local distinctiveness and identity. Surviving or former uses within the area might also have influenced plan form, urban grain and building types should also be considered.

To guide decisions on new development a more detailed examination of buildings and other structures should be provided, identifying the characteristics (including scale, form, materials, and the characteristic architectural detailing or styles found in the area, as well as the position of buildings in relation to highways and plot boundaries) that are desirable to preserve or enhance. Surviving historic surfaces and historic or unusual street furniture are likely to contribute to character and special interest. Buildings representing different periods of development are also likely to exhibit variation. It should be considered whether there are sub-areas within the CCA that have a distinct architectural character.

4. Spatial Analysis (Narrative and Plans)

Spatial character and plan form need to be described, e.g. whether the area follows a linear, compact, dense or dispersed pattern of settlement. Open Space hierarchy and relationship between spaces needs to be examined (marketplaces, streets, squares etc.) to determine their current or traditional cultural use. Similarly, streetscapes require examination to determine their current and traditional function.

5. Settings and Views (Narrative and Plans)

Identify how the landscape or townscape that the area is located within contributes to its special interest, by providing approaches along historic routes or visual connections between different areas that illustrate an important historic relationship, such as between a Harat and its surrounding agricultural landscape, or a formal design, such as a designed view from a park or garden to a feature in the landscape beyond. Types of views should be explained, (such as views out to the setting, views of street frontages and groups of buildings or views of key landmarks) that are distinctive of the area's character and contribute to its historic or architectural interest.

6. Character Areas and Zones (Narrative and Plans)

Character areas should be identified and illustrated on a plan to provide a detailed description of the physical constituents but also an evaluation of the significance of the sub-area concerned and a summary of its special interest. This should be in the context of the area as a whole, or of the wider settlement, if the CCA covers only a part of it.

7. Asset Audit and Condition Assessment (Narrative and Plans)

An audit of heritage, cultural and traditional assets will be helpful in larger, more complex areas, where there is a wide range of historic structures, and/or in areas with an industrial heritage, importantly including a description of condition. The results should be tabulated and included an Annex to the appraisal, and/or on a map. Where significant change to public space is proposed, an audit of the public realm may be appropriate, noting in the appraisal if such an audit needs to be undertaken.

An appraisal should be undertaken to record the general condition of the area, both its economic vitality and the physical condition of the historic buildings, other heritage assets and the public realm, identifying:

- Buildings at risk or in a serious state of disrepair
- Buildings where in rare cases matters of deliberate neglect may arise
- Lost architectural features and fenestration
- Gap sites eroding special character
- Areas of degraded public realm or poorly maintained green space
- Areas where traffic, noise or odour impacts affect the ability to use or appreciate the historic or architectural interest of the area.

8. Boundary Definition (Narrative and Plans)

An important aspect of the appraisal (and review) process is considering where the boundaries should be drawn (and whether the boundaries of an existing CCA should be re-drawn). An explanation of why the boundary is drawn where it is (or extensions are suggested, in the case of existing CCA), and what is included and what is excluded, should be provided.

9. CCA Appraisal Summary (Narrative and Plans)

Present an overview and summarise the main problems and pressures identified in the appraisal that will be addressed through a CCA Local Plan and Planning Regulations.

Cultural Conservation Area - Planning Standards

Following the identification of a CCA, be that a single building, site, or multiple sites, it will be the responsibility of the Ministry of Cultural Heritage and relevant planning Authority to develop location specific planning regulations in order maintain the integrity of the identified CCA.

The role of the CCA Planning Standards will be to positively manage change within the CCA. The need to make changes should be considered carefully on a case-by-case basis. Change can enhance character or amend past created harm, but standardised solutions are not always appropriate. The following key considerations should be applied to all CCAs:

- All works should be conceived with specific regard to the character and appearance of the CCA as set out in the 'Appraisal Document' (refer to previous section).
- Any intervention should echo and reinforce those characteristics of the buildings, townscape and public realm which make a positive contribution to the CCA and its local distinctiveness.
- Works of alteration, repair or maintenance should be executed to a high standard, with the aim of preserving or enhancing the special characteristics of the CCA.
- If the immediate context displays no special characteristics, the works should be devised to enhance the location, or at least have a neutral impact.
- Where there are opportunities to achieve positive improvements to a building or townscape, they should be integrated into development proposals.

In order to guide the development of CCA Planning Standards, the following should be considered at minimum:

1. Setting

The identified CCA must be considered and defined by its surroundings, as well as its capacity for change. The Planning Standards must consider this local context, and how this will be reflected through the management of the CCA so as to reinforce the local area.

Principle: CCA Planning Standards must consider the setting of the CCA and its contribution and significance to the local area. This identified contribution must be maintained and be at the core of the Standard.

2. Development Pattern

The CCA Planning Standards must consider the local historical development pattern which demonstrates and determines the local special historic and architectural interest of the area. This may include: the hierarchy of spaces; urban grain/built layout; open spaces; enclosure; plots; gaps; uses; building form and details; materials; boundary treatments and the public right of way network. All of these relate to the origins and historic pattern of development of the area.

Principle: CCA Planning Standards must respond to the local historic pattern of development, which contributes positively to the special historic and architectural interest of the CCA and its significance.

3. Built Environment

The CCA, whether it is a single building, a single site, or cluster of sites, should all contribute harmoniously to the overall character of the built environment in which they sit. Therefore, efforts must be made through CCA Planning Standards to maintain and upgrade existing buildings, and new development should ensure it is in keeping with the local development context.

Principle: Structures which contribute positively to the character and appearance of the CCA, must be retained where possible, and new development carefully designed, to preserve or enhance the special character and appearance of the CCA. Where structures of particular interest or value are lost or altered, development proposals must make a positive contribution to the CCA to make up for the loss.

4. Materials and Finishes

New works, especially when filling gaps between historical buildings, do not necessarily have to mimic traditional materials, as aesthetically pleasing solutions may, for example involve steel, glass or fair-faced-

concrete. However, generally new works, repair and maintenance should utilise the traditional common palette of materials and finishes used in the local area, or specific to the type of CCA in question, and be specified in the CCA Planning Standards. If original materials are now unavailable, materials should be used which are sympathetic in character and appearance. The use of inappropriate materials should be resisted. Preference should be given to materials sourced locally or regionally.

Principle: New works, repair and maintenance must use the traditional common palette of materials and finishes used in the CCA. This common palette of materials and finishes is a key positive contributor to the special historic and/or the architectural interest of the CCA.

5. Views and Vistas

Views and vistas into, out of and within the CCA are important and should be regulated, as they contribute positively to the character of the area. Care needs to be taken to identify these view corridors to ensure that where views and vistas contribute positively to the CCA, they are not lost or compromised. Such views and vistas can include:

- Views of rivers, the sea and surrounding hills and glimpses of landscape from urban streets.
- Open spaces and prominent public buildings that provide landmarks in views or views that illustrate a particular element of the area's historic development.
- Groups of buildings, both those with a degree of conscious design or with recognised fortuitous beauty and the consequent visual harmony or congruity of development.
- Townscape attributes such as enclosure, definition of streets and spaces and spatial qualities as well as lighting, trees, and verges, or the treatments of boundaries or street surfaces.
- A uniform building height resulting either from past influences or planning restrictions that contribute to the character of views.
- Distant views of the settlement and those in the approach to it
- Adjacent or nearby heritage assets that gain or contribute significance through views to or from the CCA.

Principle: Views, into, out of and within the CCA, which contribute positively to the character, appearance, or significance of the CCA must be preserved or enhanced.

6. Open Spaces

Important Open Spaces (IOS) need to be identified at the outset of the CCA. Some of these are public open spaces, some are private open spaces. All make a positive contribution to the character, appearance, special interest and significance of the CCA and should be specified within the CCA Planning Standards.

Principle: Open spaces which contribute positively to the character, appearance, historic and/or the architectural interest of the CCA must be preserved or enhanced.

7. Landscape

The landscape of the CCA may be made up of a network of natural watercourses and falaj irrigation systems, open spaces, trees, as well as built structures. These features make an important contribution to the character of the CCA and should be regulated by the CCA Planning Standards. This contribution can be adversely affected through:

- Loss of green spaces.
- Loss of trees.
- Loss of traditional boundary treatments.
- Planting of non-native species.
- Subdivision of open spaces with inappropriate fencing.
- Large out-of-scale buildings.
- Light pollution and use of external lighting.
- New access drives over previously undeveloped land.
- Parking on road verges.

Principle: The landscape features and boundary treatments which make a positive contribution to the CCA must be preserved and enhanced. New landscape features, boundary treatments which are considered out of keeping with the CCA must be resisted.

8. Signage and Advertising

Oversized or poorly designed signage and advertisements, using poor quality, non-traditional materials and finishes can have a negative impact on a CCAs special character. Advertisement consent should be often required for these works in CCAs. Related works should typically require planning permission and the type and style defined by the CCA Planning Standards.

Principle: Signage and advertising must be regulated to ensure it is in keeping with the traditional and cultural aesthetics of the local area and should not detract from the overall character of the CCA.

9. Shop Fronts

In the CCA, shop fronts and frontages to other commercial premises should be of a high-quality design which aims to bring vitality and interest to the street. Planning permission should be generally required for alterations to shopfronts. When shop fronts are to be painted the paint colour should be sympathetic to CCA.

Principle: Shop front maintenance, improvement or replacement must preserve or enhance the character and appearance of the CCA.

10. Street Furniture

Street furniture including bollards, bins and seating make an important contribution to the character of the CCA. CCA Planning Standards should guide where new or replacement street furniture is needed, design and materials should reflect the character and appearance of the CCA and take into account the surrounding buildings, their functions and features. Where possible, existing traditional street furniture should be retained and maintained.

Principle: New and replacement street furniture must be in keeping with the character of the CCA.

11. Roads and Road Signage

If CCA is served by a network of roads and lanes, responsibility for the maintenance of public highways and the provision of road signs within the CCA rests with the local authority. Road safety in Oman is regulated by legislation, however, highway works, and the location and number of signs can have a significant impact on the character of the CCA, as well as signage, traffic calming measures, parking issues and highway maintenance. Duplication of signage leads to visual clutter, harmful to the character and appearance of the CCA and should be avoided.

Principle: Highway works, signage improvements and maintenance must be in keeping with the character of the CCA. The retention of historic fabric must be maximised, and the negative impacts of interventions minimised.

12. Utilities

Works carried out by utility suppliers (such as electricity, water, gas, telecommunications, street lighting etc.) can have an impact on the character of the CCA, such as the position and type of street lights, the siting of electricity sub-stations, overhead lines and poles, the use of non-traditional fencing, maintenance including tree cutting, digging of trenches near to trees, etc. Duplication of plant, equipment and street lighting leads to visual clutter, harmful to the character and appearance of the CCA and should be avoided.

Principle: Works undertaken by utility authorities or suppliers must preserve or enhance the character and appearance of the CCA. Burying power and service lines and associated equipment, underground must be encouraged.

13. Pre-Application Consultation

Since planning considerations are often complex in CCAs and can require a number of various specialists and stakeholder consultations; pre-application advice is important. There are many benefits to seeking advice from the Ministry of Culture and Heritage, and the relevant Planning Authority through the provision of a 'pre-application stage' prior to the initiation of planning or development proposals:

- Specialist input can be sought at an early stage, for example regarding listed buildings, trees, landscape, noise, transport, contaminated land, ecology or archaeology issues.
- It will assist applicants in preparing proposals for formal submission which - provided advice is taken fully into account - will be handled more quickly, with the likelihood of a more positive outcome.
- It may lead to a reduction in time spent by professional advisors in working up proposals.

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- It will indicate how CCA policies will be applied to proposals.
 - It may indicate that a proposal is completely unacceptable, saving the cost and time of pursuing a formal application by the applicant.

Principle: Pre-application advice should be sought for all development proposals which affect the CCA and its local setting.

8.2.4. Tourism Development Plans (TDPs)

Introduction

Tourism Development Plans (TDPs) should be developed for each Governate or sub-areas of Governates who intend to grow their tourism offering, in order to provide a roadmap for tourism development, activities, and points of interest (POIs) in relation to the unique characteristics of the Governate or region itself. TDPs should be developed in accordance within the Ministry of Heritage and Tourism (MoHT) and should adhere to specific requirements, guidelines and regulations of the Authority. All TDPs should be reviewed and approved by MoHT and any other relevant or associated Authorities. MoHT standards and guidelines should be referred to and adhered to for all tourism development related activities (refer to MoHT Development Control Plan Framework "DCPF" for Tourism Development Projects). TDPs should take into account SPZs and CCAs and work with the relevant associated Authorities in order to ensure a comprehensive approach to tourism development, whilst ensuring the protection, conservation and management of cultural and environmentally sensitive areas across Oman.

Tourism Development Plan Structure

TDPs should be tailored to accommodate each Governates individual needs but should include the following items and implementation strategies in order to provide a comprehensive document in which key actions, services, attractions, strategies, and urban design codes are provided in a clear and implementable way. The following is recommended to be included within TDPs:

1. Tourism Vision and Objectives

Describes the overall end-goal for tourism in the area, and the main principles which support this vision (e.g. tourism diversification, environmental management, investment requirements etc.). The Vision statement and associated objectives must be clear, concise, and set a defined message for the future tourism offering of the area as a whole.

2. Tourism Offerings/ Competitive Advantages

Present the key points of interest, attractors and unique features of the Governate which currently, or have the potential to increase tourism. These offerings/ advantages should be described, mapped where relevant, and linkages between offerings should be identified where possible. A differentiation analysis should be undertaken to identify local and regional offerings and potential competitiveness which may undermine the TDP, and this should be considered during the tourism offering and competitive advantages analysis.

3. Tourism Cluster Identification

Based on the identified offerings and advantages, the linkages should be further explored to create 'Tourism Cluster Areas'. This should provide a defined and legible tourism route in which visitors can combine and follow to explore the local area, and therefore extend the general tourism market and offerings. This Cluster identification should also form the basis for tourism diversification and creation, to build upon the current attractions.

4. Key Projects and Phasing

Once a defined tourism offering and associated Clusters have been identified, future projects should be identified and developed which respect the overall Vision and Objectives of the Tourism Development Area and correspond to a clear tourism offering. The integration and consideration of SPZs and CCAs is important, to ensure such defined areas are not undermined in any way. Each identified project should include:

- A clear strategy for implementation, including short term and long-term goals.
- Identification and strategy for relevant authority and stakeholder interaction such as MoH, MECA, Governate Authorities, Developers, Landowners, SPZAs etc.
- Land use evaluations and land use plans which clearly convey the intention and spatial impact of the project.
- Sustainable development analysis, which identifies and defines the social, environmental, heritage, and economic impact of the project. This can include an array of analysis such as visual impacts, migratory animal impacts, infrastructure challenges, agricultural impacts, investment issues etc.
- Defined phasing strategy based on projected visitor numbers and projected growth in line with development to ensure a pragmatic and realistic approach to implementation.
- A clear strategy for the consideration and integration of SPZs and CCAs within the Tourism Development Area, and relevant consultation with the SPZA, MECA or similar as relevant.

- Initial 'Quick Wins' which can be implemented quickly to increase the tourism offering of the area in the immediate/ short term.
- Identification of tourism routes and itineraries, festival/ events schedules, tourism operator collaborations etc. which can support the TDP as a whole.
- Urban design codes and standards which convey and ensure the implementation of the overall tourism offering and in-line with the overall specific tourism vision. This should include architectural guidelines, signage and wayfinding guidelines, safety and security strategy, visitor interaction strategy, environmental protection and conservation guidelines etc.
- A sustainable development strategy which identifies key opportunities to implement sustainable measures into the projects, such as waste/ recycling strategies, light pollution control, renewable energies, low impact fixtures and fittings.
- Investment strategies, identifying key investors/ contributors to enable or support the project. Large/ medium investors such as developers, investment funds, public sectors; and SMEs both local and international to support on smaller scale elements of the project.

5. Authority Consultation and Approval

Following the development of the TDP, a comprehensive review should be undertaken by MoHT in order to gain approval, alongside any other relevant Authorities. Following approval, the TDP should be legislated and begin implementation as per the strategy within the document. It is recommended that the TDP is made available on the public domain, in order to support tourism growth and ensure transparency for other associated plans (SPZs, Local Plan developments, Developer interests etc.). Yearly reviews of the TDP should be undertaken to ensure projects are being executed and implemented as per the plan, and any adjustments are updated to reflect the current situation.

8.2.5. Flood Control Management Strategies – Wadis and Coast

Introduction

The Public Authority for Civil Aviation (PACA) oversaw the production of an “Assessment of Coastal Hazards; Vulnerability and Risk for the Coast of Oman”, including preparation of a Mitigation Manual and a set of national and main city risk maps (IH Cantabria, Feb 2015). Any standards, guidelines or strategies provided in this document should be adhered to.

Wadis are very individual in character and any setback will be dependent upon specific circumstances. A “one-size fits all” approach will not work. Defining the flood risk for individual wadis is the primary objective of ONSS Policy WR4, and therefore should be carried out on a case-by-case basis.

When updated flood risk maps are available buffer zones can be determined to meet specific circumstances. Proposed buffer zones can then be reviewed in accordance with MECA’s recent documentation ‘Sustainable Development on Coastlines’ and its guidance on buffer zones and setbacks. Refer to Section 8.2.6 for further guidance on buffers and setbacks.

The following provides an overview of Flood Control Management Strategies which should be considered for the active mitigation against Wadi and Coastal flooding, as well as applied to development located within these high-risk areas.

STRATEGY 1: Modify Human Susceptibility to Flood Damage

Reduce disruption by avoiding hazardous, uneconomic or unwise use of floodplains.

Tools include:

- Regulating floodplain use by using zoning codes to steer development away from hazardous areas or natural areas deserving preservation, establishing rules for developing subdivisions, and rigorously following building, health and sanitary codes.
- Establishing development and redevelopment policies on the design and location of public services, utilities and critical facilities.
- Allocating land in a floodplain in order to preserve open space and permanently relocate buildings.
- Elevating or floodproofing new buildings and retrofitting existing ones.
- Preparing people and property for flooding through forecasting, warning systems and emergency plans.
- Restoring and preserving the natural resources and functions of flood-plains.

STRATEGY 2: Modify the Impact of Flooding

Assist individuals and communities to prepare for, respond to and re-cover from a flood.

Tools include:

- Providing information and education to assist self-help and protection measures.
- Following flood emergency measures during a flood to protect people and property.
- Reducing the financial impact of flooding through disaster assistance, flood insurance and tax adjustments.
- Preparing post-flood recovery plans and programs to help people rebuild and implement mitigation measures to protect against future floods.

STRATEGY 3: Modify Flooding Itself

Develop projects that control floodwater.

Tools include:

- Building dams and reservoirs that store excess water upstream from developed areas.
- Building dikes, levees and floodwalls to keep water away from developed areas.
- Altering channels to make them more efficient, so overbank flooding will be less frequent.
- Diverting high flows around developed areas.
- Treating land to hold as much rain as possible where it falls, so it can infiltrate the soil instead of running off.

- Storing excess runoff with on-site detention measures.
- Protecting inland development with shoreline protection measures that account for the natural movement of shoreline features.
- Controlling runoff from areas under development outside the floodplain.

STRATEGY 4: Preserve and Restore Natural Resources

Renew the vitality and purpose of floodplains by reestablishing and maintaining floodplain environments in their natural state.

Tools include:

- Floodplain, wetlands and coastal barrier resources or land use regulations, such as zoning, can be used to steer development away from sensitive or natural areas.
- Development and redevelopment policies on the design and location of public services, utilities and critical facilities.
- Land acquisition; open space preservation; permanent relocation of buildings; restoration of floodplains and wetlands, and preservation of natural functions and habitats.
- Information and education to make people aware of natural floodplain resources and functions and how to protect them.
- Tax adjustments to provide a financial initiative for preserving lands or restoring lands to their natural state.
- Beach nourishment and dune building to protect inland development by maintaining the natural flood protection features.

8.2.6. Buffer Zones and Setbacks

Buffer Zones

The recommended Buffer Zones standards, as set out by MECA (refer to Proposed Guidelines to Create Buffer Zones for All Types of Projects - Version 5 - 2019), have been reviewed and are currently considered appropriate to be taken forward as Buffer Zone standards at a national level, recognising that additional work will be required by MECA to verify and update these over time, in consultation with SCP and specialist entities (public and private sector). The table below (MECA, 2019) provides a description of the Buffer Zone criteria that should be met when evaluating different types of Projects.

However, it is important to note that the application of Buffer Zones cannot be standardised or be considered 'catch-all'; this means every project/ development will need to be considered on a case-by-case basis (see example with reference to wastewater treatment lagoons and vector-borne diseases at the end of this section).

According to MECA (2019), determining the scale of the Buffer Zone shall be subject to the project's type and size, as well as the technology used. The Ministry shall consider the distance of the Buffer Zone in light of the project information as submitted and the full verification of the project's environmental impact (type of pollution, prevailing wind, topography etc.) as part of an initial environmental impact assessment.

MECA Standards for Buffer Zones shall be adhered to, with the current standards being shown in the table below.

Buffer Zone Standards - MECA (2019)			
TYPE	DESCRIPTION (Revised for this document)	STANDARD	
		No Natural Buffer	With Natural Buffer
Heavy Industrial	Heavy impact industrial activities, which includes uses which by reason of scale or process may have an adverse impact on the environment.	5,000m	2,500m
Medium Industrial	Medium industrial activities include those with potential harmful environmental impact including light production and manufacturing.	3,000m	1,500m
Light Industrial	Light industrial activities include those with a light environmental impact including warehouses, and/or storage, light production and manufacturing.	1,000m	500m
Industrial Projects	Industrial activities that may cause an environmental impact such as petrochemical, fertilizers or other plants.	500m – 3,000m	250m - 1,500m
Landfills and Waste Processing Plants	(Hazardous or non-hazardous) waste management projects and waste collection plants.	*As per Be'ah Standards on a case by case basis.	
Mining	All mining activities, such as quarries, crushers, metal and non-metal exploration, etc.	300m – 3,000m	150m – 1,500m
Agriculture	Poultry or cattle farms or any kind of animal husbandry and slaughterhouses.	500m -3,000m	250m – 1,500m
Food	Various food processing activities, such as dairy and cheese production, cookies, sweets, etc.	500m – 1,000m	250m – 500m
Services	Regional development or service projects, such as roads, water networks, supply and groundwater dams, etc.	250m – 1,000m	125m – 500m
Tourism	Projects that help develop the country's tourism sector, such as hotels, resorts, tourism camps, etc.	Varies - Depending on the size of the project, technology used, distance to the beach or any other protected or sensitive area. *Refer to MoHT Development Control Plan Framework for ITCs (2010).	
Coastal and Marine	Projects located on the coast or offshore, such as industrial ports, fishing ports, fisheries, etc.	Varies - Depending on the size of the project, technology used, distance to the beach or any other protected or sensitive area.	

		<i>*Coastal Zone Buffer Zone standards should be developed and included as part of future Coastal Zone Management Plan (CZMP) development – refer to Section 8.2.2.</i>

Furthermore, as per the Private Office input to this document (August 2020), the following buffer zone standards should also be considered:

- All palaces should accommodate a 1000 m buffer around them from all sides
- All Security and Civil Defence institutions should accommodate a 500 m buffer around them from all sides

Wastewater Treatment Lagoon Buffers and Vector-Borne Diseases

Open wastewater treatment lagoons can provide a breeding habitat for mosquitos that are vectors of diseases such as dengue fever/dengue haemorrhagic fever (DHF) i.e. the lagoons can be linked to Vector-Borne Diseases (VBDs). People living close to such lagoons in Muscat have complained about increasing mosquito bites (with similar complaints coming from other urban and rural areas). Buffer Zones between wastewater lagoons (and other potential breeding habitats) and human settlements are therefore desirable. The issue of buffer zones for VBD vectors is complicated by the fact that each vector has its own flight range (which can be further complicated by the vector's behaviour and feeding dynamics). Therefore, setting specific buffer distances may not be effective, but instead a planning guideline is required to indicate that human settlements should not be located close to potential vector habitats. Further detailed "Buffer Zone" guidance will be required on how to develop acceptable buffer distances that are scientific but flexible according to circumstances – along with public health policies regarding human travel to and from high risk areas.

Coastal Setbacks

The recommended Setback standards in coastal areas, as developed by the SCP (refer to Interim Mechanism for Urban Planning (2012) and associated SCP decisions in 2012 and 2014), have been reviewed and are considered appropriate to be taken forward at a national level. The three principal Coastal Setback standards are the same as those presented by the Ministry of Tourism in their document, "Development Control Plan Framework for ITCs (2010)". (For further details of Coastal Setbacks, see Part 3 Section 8.2.2 on Coastal Zone Management Plans, especially the Guidance item entitled "Shoreline Management: Coastal Setbacks and Design Levels").

It is recommended that the SCP Interim Mechanism for Urban Planning (2012) and the follow-up SCP decision (2014) are enforced at a national level until more detailed or revised standards are developed by the relevant Ministry or Authority (e.g. MECA, SCP). Coastal Zone Setback standards will be developed and included as part of future Coastal Zone Management Plans (CZMP) that, as indicated in the table above, will be prepared for all sections of Oman's coast – refer to Section 8.2.2.

Overall, development in the Coastal Zone should maintain setbacks from the High Tide Line (HTL). No permanent structure should be located within this area; however temporary structures such as beach huts, pop-up stalls and food trucks may be located here.

The following table provides a summary of the Setback Standards presented in the Ministry of Tourism DCPF (2010) and referred to in SCP decision (2014), which should be adhered to until further notice or until these national level standards are updated locally. Both publications should be consulted for detailed Setback standards information – the table below provides an overview only and should not be considered comprehensive.

Coastal Setback Standards – SCP (2012)		
TYPE	DESCRIPTION	STANDARD
Natural Coasts	Natural coasts with natural landscapes and seascapes, such as rocky headlands and cliffs (development within these areas is not permitted unless approvals are provided by the Ministry of Environment and the relevant Planning Authority).	300m setback from the highest tidal mark.
Sandy Coasts	Sandy coasts and around khawrs.	150m setback from the highest tidal mark.
Stable Coasts	Stable coasts where urban development may not cause serious impacts on the receiving environment.	50m setback from the highest tidal mark.

The SCP should be referred to for all specific Setback Standards for the following localities (as per SCP 2014 decision on the Interim Mechanism for Urban Planning): Muscat Governate

- North and South Al Batinah Governorates
- Wilayat Masirah

Wadi Setbacks

There are no existing national level Wadi development setback standards. It is recommended that the below setback standards are enforced until more detailed or revised standards are developed by the relevant Ministry or Authority (e.g. MECA, SCP).

Each Wadi should be assessed on a case-by-case basis, undertaking an appropriate Flood Risk Protection Assessment which is defined by a detailed Hydrological Analysis. Site investigation and hydrology studies are required to confirm the flow and velocity expected through the Wadi. This will also require geotechnical analysis of the Wadi and adjacent land materials in order to understand the risk of scour and edge damage. Where there is a risk then edge protection should be provided, and Wadi Edge facing/lining solutions must be studied to deal with any hydrological issues.

Wadi Setback Standards		
TYPE	DESCRIPTION	STANDARD
Wadis	A valley, ravine, or channel that is dry except in the rainy season, common in desert areas such as in Oman.	50m to 100m from all Wadi banks is recommended. The actual setback will depend on site specific geotechnical conditions but should not be less than 50m.

8.2.7. Transit Orientated Development (TOD)

Introduction

Transit Oriented Development (TOD), according to the Transit Orientated Development Institute (TODI) is the “exciting fast-growing trend in creating vibrant, liveable, sustainable communities ... it's the creation of compact, walkable, pedestrian-oriented, mixed-use communities centred around high quality [public transport] systems”.

For many of Oman's larger urban areas, specifically Muscat and Sohar, TOD can be a key enabler in:

- Reducing traffic congestion hot-spots, encouraging sustainable modes of transportation and in-turn encouraging healthier lifestyles, and enable ease of movement and general mobility within urban areas;
- Creating defined and active urban centres which are highly desirable places for people to live, work and play in-turn increasing the viability of the local economy; and
- Creating infrastructure efficient urban areas, reducing infrastructure costs through more compact urban form, development and regeneration, and reducing urban sprawl.

TOD typically centres upon train/ metro station hubs, however, for Oman, due to the lack of immediate provision of public train or metro development, TOD sites should be considered for Regional/ City-wide Bus Rapid Transport (BRT) hubs, in which local/ feeder BRT networks can be considered as the multi-modal option for users, alongside pedestrian, cyclist or similar. As part of the Regional Spatial Strategies developed for each Governate, the following TOD potential sites have been identified as:

- Muscat (Muscat Governorate);
- Salalah (Dhofar Governorate); and
- Sohar (Al Batinah North Governorate)
- Smaller-scale TOD sites in As Suwayq - Al Batinah North; Barka - Al Batinah South; and Nizwa - Ad Dakhiliyah

Transit Orientated Development Site Selection Criteria

For these sites, in order to fully identify and confirm such urban areas in which TOD should be a key focus, eight (8) criteria have been developed which encompass the key principles of TOD and will allow for an assessment of potential sites, as well as any additional in the future.

1. Location

TOD should be located within current or future designated key destination nodes – such as employment hubs, commercial centres, leisure destinations, key residential neighbourhoods (preferably a mix of all), in which large amounts of people are likely to reside, work or visit, or where there is potential to increase visitor numbers in these areas through development (refer to No.4 Local Development Potential).

Criteria: Does the potential TOD site have current, or future potential/ planned high resident, worker and visitor numbers, which required quality public transport to enable ease of movement and accessibility to the site?

2. Catchment

TOD should be within a defined radius of a public transport hub, with best practice suggesting 800m, as this is considered optimum for walking, cycling and therefore accessibility to the surrounding area. With this focused catchment radius, various uses, densities, and interconnections can be established in order to take advantage and serve as TOD.

Criteria: Is the potential TOD site located so that it is within a desirable location for existing development, hubs, activities which will attract users within an 800m radius?

3. Densities

Surrounding the public transport hub, development/ population density should be at its highest in the immediate vicinity, which tapers towards the boundary of the TOD catchment. Higher densities allow for a mix of land uses, activities and economies, creating a diverse urban area, a variety of users, and generates and attracts activity.

Criteria: Does the potential TOD site have current, or future potential/ planned high density development which can be maximised upon to validate TOD implementation?

4. Local Development Potential

The TOD area should be an existing node or be utilised as a catalyst for redevelopment or regeneration, which would benefit from increased densities, development of a variety of land use activities and overall increase of visitors, users and footfall.

5. Public Space

In close proximity (ideally adjacent or fronted) to the public transport hub, there should be an area of active public space or plaza allowing pedestrians to move freely and legibly within the TOD wider area. This immediate pedestrian focused open space should also encourage continued pedestrian movement and accessibility from this area to the wider TOD area (Refer to Criteria 7).

Criteria: Does the potential TOD site have land available to incorporate a public plaza/ open space in which pedestrians can access immediately, and therefore continue pedestrian movement legibly through the wider TOD area?

6. Commercial Provision

The TOD catchment area should have existing or planned continuous commercial retail and F&B at the ground floor of streets, encouraging spill out, with ample pedestrian pathways and routes – overall creating an attractive and interactive streetscape. Mixed use development, e.g. Office, Residential, Commercial, Hotel, as well as Institutional and Civic uses within one plot or in close proximity should be encouraged. This enhances or creates active urban areas throughout the day and night; increases the viability of regular/ high frequency public transport; creates complete communities; and encourages pedestrian movement through the TOD area.

Criteria: Does the potential TOD site have existing or potential for ground floor retail and F&B, as well as range of commercial offerings within the TOD wider area, to serve both residential, employees and visitors?

7. Pedestrian Accessibility

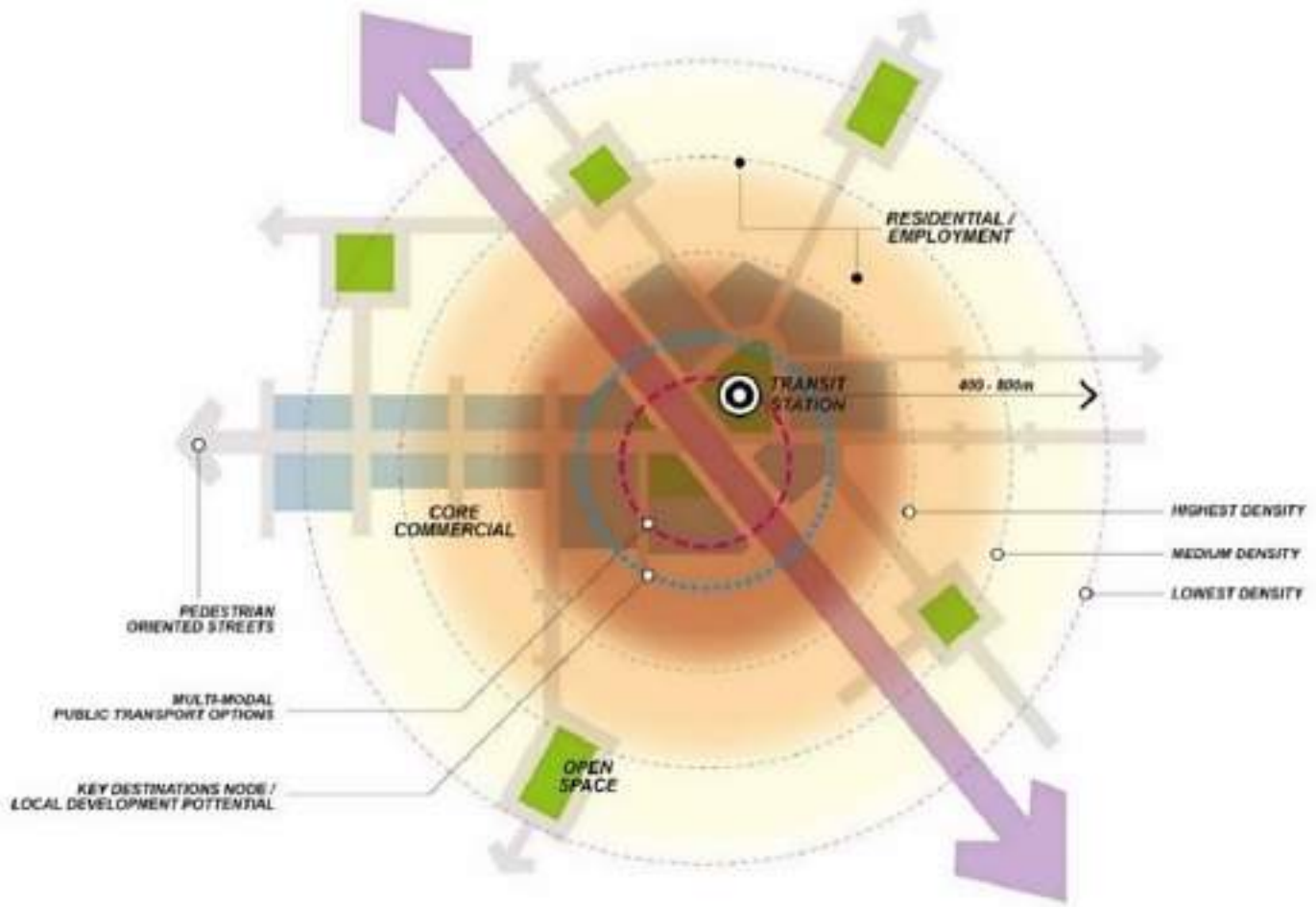
The TOD site should have existing or potential for future pedestrian accessibility, whereby pedestrians and cyclists are always prioritised over vehicles, through the creation of pedestrian only streets or wider dedicated pedestrian and cycle lanes, heavy traffic calming, especially within the immediate 500m radius of the Public Transport hub. Parking and vehicle access to the TOD site should be limited and reduce desirability of the private car through the prioritisation of pedestrians and public transport.

Criteria: Does the potential TOD site currently have, or the ability to incorporate, dedicated and continuous pedestrian and cycling lanes, reduce vehicle access and parking provision, as well as the potential to designate key streets for pedestrians only use?

8. Multimodal Public Transport

The TOD site should have existing or potential for future multi-modal public transport options, to allow users to transition seamlessly between transport modes to access their final destination. This is referred to as 'Last Mile' connectivity, whereby initiatives such as local/ feeder buses, public bike sharing, bikeways, ride-in bike parking, electric scooters etc. should be incorporated to increase the sustainable modes of transport for TOD.

Criteria: Is there currently, or is there potential to incorporate a variety of public transport options within the Public Transport Hub (or within proximity to the Hub) in order to provide a number of options to TOD visitors?



Transit Orientated Development – Best Practice Criteria Diagram

8.3. National Level Project Guidelines

8.3.1. Transportation Projects

Airports

Any future airport development or expansion in Oman is considered as a nationally significant project and will require cross-coordination of many disciplines and be influenced by many socio-economic factors such as population growth, tourism industry growth and business development. Future Airport development and expansion should:

- Be in accordance and adhere to international standards (ICAO/ IATA/ CASA) including all relevant codes and regulations to ensure the highest standard and safety of airport development in Oman.
- Develop a master plan and full supporting studies, including but not limited to:
 - o Airport Land Use Plan
 - o Facilities (aviation and landside) Design and Development Plan (runways, taxiways, aprons, terminals, hangar, fuel, utility, navigation, emergency services, ground access and parking etc.)
 - o Terminal Master Plan
 - o Ground Transportation Plan
 - o Environmental Impact Assessment
 - o Traffic Impact Assessment Study (for freight and passengers)
 - o Environment Management Plan
 - o Airport Safeguarding Plan
 - o Airspace Protection Surfaces (Obstacle Limitation Surface (OLS) and Procedures for Air Navigational Services – Aircraft Operations surface (PANS-OPS))

For all points listed above and, in all cases, development of Airports must be in accordance with the latest standards, regulations, guidelines and approvals of the relevant Ministries and Airport related Authority.

Ports

Port infrastructure and development is a key aspect of Oman's national economy, and future expansion of this sector is deemed a nationally significant project. Future Port development and expansion should consider the following issues:

- Undertake relevant feasibility studies and market assessment to ensure complimentary Port activities in relation to Oman's current and future economic vision.
- Undertake a complete Port Master Planning process, as required by the relevant Port Authority, including but not limited to:
 - o Geophysical, Geotechnical, Topographical and Subsurface Surveys and Investigations
 - o Bathymetric Studies
 - o Coastal and Navigation Studies (e.g. Wave Climate Modelling; Tidal Analysis; Hydrology, Hydraulics and Sedimentation Studies)
 - o Navigational Channel, Berth Dredging and Land Reclamation Plan
 - o Breakwater Design
 - o Environmental Impact Assessment (including hazardous materials, landfill mitigation, wildlife habitat mitigation, coastal erosion, sediment, water quality, storm water management).
 - o Utility Infrastructure
 - o Traffic Impact Assessment Study (for freight and passengers, if applicable)
 - o Facility Planning based on operations

For all points listed above and, in all cases, development of Port or Harbours must be in accordance with the latest standards, regulations, guidelines and approvals of the relevant Ministry and Port related Authority.

Bus Rapid Transport (BRT)

Bus Rapid Transport (BRT) is a key component of Oman's public transport provision and is a key element in the growth and development and interconnectivity of urban and rural areas. The following key elements should be considered during the planning and implementation of BRT services across Oman:

- All BRT related master planning, development proposals, infrastructure, stops, terminals, routes, schedules, services, capacity, design, fares and ticketing, operation and maintenance shall be in accordance with the Ministry of Transport standards, regulations, guidelines and approvals. If specific guidance is not available, direct consultation with the Ministry of Transport, Communications and Information Technology must be undertaken.
- Bus services should be operated under suitable enabling legislation by Ministry of Transport setting out the conditions and terms under and by which bus services shall be provided.
- It shall be the responsibility of the Ministry of Transport to ensure that public transport services by the various modes of transport across Oman are properly coordinated to ensure the provision of a coherent, integrated and comprehensive network for the benefit of the travelling public.
- Buses should provide public transport along main corridors and should provide feeder services to and from BRT, tram, metro, railway, and water ferry services, as relevant, now and in the future. Appropriate interchanges should be provided to enable easy and accessible transfer between buses and other public transport services including walking, cycling and taxis.
- Buses should be located in accessible and convenient locations to provide high levels of connectivity to, at minimum; community facilities, leisure and recreation facilities, parks and open space, residential communities, employment hubs, retail hubs, industrial areas, tourism areas.
- The Ministry of Transport should be consulted, and approval obtained for any BRT services or infrastructure as part of plot or site master planning and development.
- Applications by developers, promoters and bus operators for additional bus routes should be submitted to the Ministry of Transport. It is recommended that for large developments, developers be responsible for the costs associated with introducing new bus services at “day 1” to limit the likelihood of new residents/employees developing the “car habit”.
- BRT services should be provided in accordance with the Oman National Transport Strategy (ONTS) or any subsequent *Bus Master Plan* and such Action Area Plans or Local Area/ City Plans and other initiatives as may be issued from time to time.
- An operator, if not wholly owned by Government, should seek Government’s assistance in locating and reserving land for (a) depot(s) and that Government should use its best endeavours to assist the operator in such regard.

For all points listed above and, in all cases, development of Bus Rapid Transport related infrastructure must be in accordance with the latest standards, regulations, guidelines and approvals of the Ministry of Transport, as well as any relevant associated Ministries and Authorities.

Light Rapid Transport (LRT)

Light Rapid Transport, such as a Metro or Tram may be a key component of Muscat’s public transport provision and be a key public transport provision for all residents and visitors across the City. The following key elements should be considered during the planning and implementation of LRT services:

- All LRT related master planning, development proposals, infrastructure, stops, terminals, routes, schedules, services, capacity, design, fares and ticketing, operation and maintenance shall be in accordance with the Ministry of Transport standards, regulations, guidelines and approvals. If specific guidance is not available, direct consultation with the Ministry of Transport must be undertaken.
- LRT services should be operated under suitable enabling legislation by Ministry of Transport setting out the conditions and terms under and by which LRT services shall be provided.
- It shall be the responsibility of the Ministry of Transport to ensure that public transport services by the various modes of transport across Muscat and to the wider Oman are properly coordinated to ensure the provision of a coherent, integrated and comprehensive network for the benefit of the travelling public.
- LRT should provide public transport along main corridors and should provide feeder services to and from BRT, railway, and water ferry services, as relevant. Appropriate interchanges should be provided to enable easy and accessible transfer between LRT and other public transport services including BRT, taxis, walking, and cycling.
- LRT stops should be located in accessible and convenient locations to provide high levels of connectivity to, at minimum; higher density residential and employment hubs, community facilities, leisure and recreation facilities, retail hubs, industrial areas, tourism areas.
- The Ministry of Transport should be consulted, and approval obtained for any LRT services or infrastructure as part of plot or site master planning and development.

- LRT services should be provided in accordance with the Oman National Transport Strategy (ONTS) or any subsequent *LRT/ Metro/ Tram Master Plan* and such Action Area Plans or Local Area/ City Plans and other initiatives as may be issued from time to time.

For all points listed above and, in all cases, development of Light Rapid Transport related infrastructure must be in accordance with the latest standards, regulations, guidelines and approvals of the Ministry of Transport, as well as any relevant associated Ministries and Authorities.

Taxis

Taxi related planning standards, such as number of spaces for buildings or in site specific locations should be regulated by the Ministry of Transport, Communications and Information Technology and the Oman Development Code, as relevant. The following should be considered in the location and provision of Taxi laybys, stopping areas, and ranks during planning and development:

- All taxi related planning, infrastructure, stops, terminals, routes, schedules, services, capacity, design, fares and ticketing, operation and maintenance shall be in accordance with the Ministry of Transport, Communications and Information Technology standards, regulations, guidelines and approvals. If specific guidance is not available, direct consultation with the Ministry of Transport, Communications and Information Technology must be undertaken.
- Taxi ranks and laybys should be in close proximity to key trip generators/ locations – recommended within 400m (or a five-minute walking journey) of the entrance and/or exit of the key location. Note that areas with high potential population growth are likely to generate new passenger demands. Key locations, and major trip generators, include, but are not limited to:
 - o Airports, Ports, Metro/LRT and other transport interchanges (e.g. Bus)
 - o Major shopping/ retail destinations
 - o Hospitals, key Health Centres
 - o Community Facilities (e.g. Mosques, Community Centres, Large Open Space)
 - o Sporting Venues and Museums
 - o Major Parks and Open Space Areas
 - o Entertainment precincts (e.g. stadiums, late-night venues)
 - o Tourism districts, Major Hotels, Hospitality Districts
 - o Major Office/ Commercial Centres
 - o Educational Centres
- Taxi ranks and laybys should be located in accessible and convenient locations:
 - o A continuous accessible path of travel should be provided to the taxi rank and taxi boarding point.
 - o The route to the rank should be as direct as possible and clearly signed for the convenience of all, but particularly to reduce fatigue experienced by people with disabilities. Identify barriers such as railways, freeways, rivers or busy roads which may increase access times and distances.
 - o Locate the taxi rank in a clearly visible location where there are clear sightlines for oncoming vehicles, taxi drivers and pedestrians.
 - o Taxi ranks should be located with safety in mind, considering optimal street lighting; safe distances to and from stations, interchanges and stops; passive surveillance can occur and avoid isolated, derelict or underused locations.
- Taxi ranks and laybys should consider the potential impact on surrounding land use:
 - o Some land uses are more compatible with taxi ranks than other types, such as hotels, offices, residential apartments, cinemas, stadiums and leisure facilities, tourist attractions, hospitals etc.
 - o Taxi ranks and laybys can negatively impact on adjacent landowners due to extended noise, fumes etc., and on the operation of intersections. Where possible, taxi ranks used for taxi layovers should be located away from residential areas, alfresco dining areas, and other sensitive frontages where ongoing noise and disturbance are undesirable.
 - o Some sites may be undesirable for taxi rank locations due to potential use by other conflicting users, e.g. adjacent to areas that generate large amounts of short-term high-turnover parking.

For all points listed above and, in all cases, development of Taxi related infrastructure must be in accordance with the latest standards, regulations, guidelines and approvals of the Ministry of Transport, as well as any relevant associated Ministries and Authorities.

Electric Vehicles

Electric Vehicles (EV) are becoming increasingly popular both internationally and across the region. In order to support this more sustainable form of private transportation and ensure its feasibility for the user, infrastructure provision and operation is required throughout Oman, specifically EV charging points. This will be the responsibility of the Ministry of Transport, Communications and Information Technology standards and guidelines, as well as the relevant planning authority and applicable utility authorities.

Future EV charging points should consider the following:

- Feasibility Study for EV Charge Point Types/Locations General Siting (considering at minimum: demand, location/ placement strategy, visibility, road obstructions/ impacts, footpath obstructions/ impacts, power supply and infrastructure)
- Traffic Impacts and Management (considering availability of charging as demand increases, home connections, charge point capacity).
- Pedestrians and Public Realm infrastructure considerations to ensure safety and visibility from the public, as well as any negative impacts to the public realm aesthetics (including signage and information points, CCTV, electric hazards etc.).
- Development of Detailed Siting Guidelines for each site, including but not limited to:
 - o Physical space requirements.
 - o Potential impacts on adjacent land / business owners or other stakeholders.
 - o Existing parking controls and tariff.
 - o Availability of footpath space (if on-street parking).
 - o Availability and / or ease of electricity supply connection within public right of way (nearby street lighting columns or traffic signals can indicate this).
 - o Presence of nearby underground utilities.
 - o Consideration of access for ongoing maintenance and operations.
 - o The outcome of Traffic Impact Studies (wherever required as per relevant standards) for charging stations which are located outside the ROW but affect it. EV charge point location must consider building entry ways, pathways, street crossings and meeting points so as not to impede pedestrians.

For all points listed above and, in all cases, Electric Vehicle infrastructure must be in accordance with the latest standards, regulations, guidelines and approvals of the Ministry of Transport, Communications and Information Technology, as well as relevant associated planning and utilities Ministries and Authorities.

Electric Scooters

The use of Electric Scooters is a relatively new mode of transport and movement, however, as popularity grows, their consideration into movement strategies and local planning needs to be considered. The following key points require consideration for Electric Scooter planning:

- Infrastructure and Space - People using scooters for transportation need space to ride. These places should be separated from both pedestrians and motor vehicles or shared only in low-volume corridors. The colocation of cycle paths and electric scooter paths should be considered, ensuring appropriate speed limits. Consideration should be to combine cycle and electric scooter paths.
- Codes and Ordinances - For Electric Scooters and other devices, consideration is required regarding speed limit regulations on shared public spaces such as pedestrian footpaths and cycle paths. Consider including scooters in bicycle ordinances, while establishing parking regulations, and addressing yield requirements between different modes of transportation.
- Regulation of Scooter Businesses – Application of business operations and permitting requirements that would apply to such a business to ensure Electric Scooters do not become a nuisance on roads, footpaths, cycle paths or public realm areas.
- Public Education - Incorporate the operation of scooters into footpath and cycle path rules and etiquette signage, education programs, and with driver's education classes. Share information about the benefits of scooters and how they support equitable mobility.

For all points listed above and, in all cases, Electric Scooter infrastructure must be in accordance with the latest standards, regulations, guidelines and approvals of the Ministry of Transport, Communications and Information Technology, as well as relevant associated planning and utilities Ministries and Authorities.

Cycling

Increasing cycle facilities, such as routes, parking, and services will encourage the uptake of cycling as a practical mode of transport within Oman. The following key points require consideration for Cycle planning:

- All cycle related master planning, design and development, infrastructure, lanes (routes, dimensions, lengths etc.) stops, terminals/ interchanges, parking, crossings design, signage and wayfinding operation and maintenance shall be in accordance with the latest Ministry of Transport, Communications and Information Technology standards, regulations, guidelines and approvals. If specific guidance is not available, direct consultation with the Ministry of Transport, Communications and Information Technology must be undertaken.

- All key destinations should be served by defined cycle routes and parking that can accommodate employees, customers, residents and visitors. Key destinations include:
 - o Residential areas.
 - o Shopping centres and high streets.
 - o Workplaces.
 - o Services, e.g. Hospitals, Health Centres, Government Buildings.
 - o Education establishments including schools, colleges and universities.
 - o Community facilities and services e.g. Community Centres, Mosques.
 - o Entertainment and leisure venues.
 - o Tourism districts, Major Hotels, Hospitality Districts.
 - o Public transport interchanges.
- Cycle parking should be provided as close as possible to the final destination, and in convenient locations for entrances to and exits from the destination. Cycle parking should not obstruct any movement, access, egress, or utilities and should be in accordance with the Ministry of Transport, Communications and Information Technology standards and guidelines.
- Cycle sharing schemes should be encouraged throughout Oman, through coordination between the Ministry of Housing and Urban Planning, the Ministry of Transport, Communications and Information Technology and any relevant Ministries or Authorities. The Ministry of Transport, Communications and Information Technology should develop a cost-effective, high-performance, integrated bike-sharing system which is:
 - o Integrated with Multi-Modal Transport Hubs - ideally adjacent or in close proximity to bus stops, transport hubs, key tourist and commercial destinations etc. in order to encourage their usage and promote sustainable 'last mile connectivity'.
 - o Provides guidance on optimal density in which a cycle share system can be deemed viable
 - o Provides guidance on the number of bicycles per residents, and coverage area – considering variables such as commuters and high-volume destinations.
 - o Provides guidance on the coverage area of the cycle sharing scheme to ensure a diverse network of origins and destinations;
 - o Provides regulations on the quality, type, operation, maintenance, safety requirements of bicycles themselves.
 - o Provides guidance on the station interfaces, to ensure easy-to-use systems, payment authorisation technology, locking systems, monitoring and occupancy tracking at minimum.

8.3.2. Economic Zones and Free Zones

Economic Zones and Free Zones are enabled by the Free Zones Law (Royal Decree 56/02) (the "FZ Law"), 2002 which supports the diversification of national revenues to serve as a catalyst to economic growth. Zones currently include:

- Knowledge Oasis Muscat – KOM
- Al Mazyunah Free Trade Zone
- Salalah Free Trade Zone
- Sohar Free Trade Zone
- Al Duqm Free Trade Zone
- Khazeen Economic City

Future establishment of Free Zones or Special Economic Zones, should:

- Be established by Omani Royal Decree.
- Establish a FZ or SEZ Regulatory Authority.
- Develop independent master planning and approvals process for the development and allocation of lands.
- Develop a defined process for review and approvals of Master Plans and Building Permit Applications.
- Regulate, manage and maintain all services, facilities, operations and economies within the FZ or SEZ.

8.3.3. University Projects

The creation of a new public university is considered as a nationally significant project, due to the specialisation and the scale of development required to implement and then operate and manage such a multi-faceted project.

At present, the proposed University of Oman (to be located at the 'Oman University City' complex near Barka) is the only higher education project envisaged within Oman over the next 20 years, with this being promoted and delivered by the Ministry of Higher Education (MoHE). This is an extensive, multi-phased project that includes the educational facilities, as well as RandD complexes, mixed use residential, commercial outlets and a wide range of community facilities.

Future national-level university/ higher education development should:

- Be in accordance with the Oman Ministry of Higher Education (MoHE), including all requirements, standards, codes and land allocation.
- Be in accordance with all relevant Ministry and Authority standards, regulations, guidelines and approvals, including but not limited to planning and development, transportation, utilities infrastructure, public realm, environment, sustainability.
- For higher education development such as colleges, training institutes, vocational training education (excluding large-scale universities), the location, standards, and needs assessment should be in accordance with the standards provided in Chapter 5 Community Facilities of this document.

8.3.4. Healthcare Projects

Medical City is a new public sector health project that is considered as a nationally significant project, due to the specialisation and the scale of development required to implement and then operate and manage such a multi-faceted development.

At present, the proposed Medical City (to be located near the Khazaen Economic City complex near Barka) is the only nationally important medical facility envisaged within Oman over the next 20 years, with this being promoted and delivered by the Ministry of Health. The project is an extensive, multi-phased project that includes the development of different medical facilities, as well as medical R&D complexes, mixed use residential, commercial outlets and a wide range of community facilities.

Future national-level medical development should:

- Be in accordance with the Oman Ministry of Health, including all requirements, standards, codes and land allocation.
- Apply and adhere to all relevant Ministry and Authority standards, regulations, guidelines and approvals, including but not limited to planning and development, transportation, utilities infrastructure, public realm, environment, sustainability.
- For other healthcare development such individual Hospitals and Clinics the location, standards, and needs assessment should be in accordance with the standards provided in Chapter 5 Community Facilities of this document.

8.3.5. Theme Park Projects

Theme Park development (of various descriptions, including but not limited to Water Parks, Adventure Parks, or Tourism Parks) may be deemed appropriate to support Oman's growing tourism market, and encourage visitors to certain, dedicated, tourism zones across the country. Future Theme Park development, should:

- Be in accordance with the Ministry of Heritage and Tourism (MoHT), including all requirements, standards, codes and land allocation.
- Be in accordance with all relevant Ministry and Authority standards, regulations, guidelines and approvals, including but not limited to planning and development, transportation, utilities infrastructure, public realm, environment, sustainability.
- In general, be developed in conjunction within defined tourism areas and be sensitive to the local built and natural environment. Development in close conjunction with Hotel Resorts, as well as in proximity to a large population catchment is recommended for such uses, however, the exact type, scale and function of Theme Parks will be the determination of the developer based on applicable feasibility studies and due diligence.

8.3.6. Agriculture, Fisheries and Livestock Projects

Ministries of Agriculture, Fisheries and Water Resources (MoAFWR) is the key regulator of Agriculture, Fisheries and Livestock Projects in Oman, with any associated standards, legislation or codes to be adhered to for all current and future projects.

Proposed agriculture projects identified by the ONSS include, development of Nadj and Al Mazrat Area, rationalisation or agricultural lands along the Batinah Plain, and the need for reintroduce / restore traditional areas of agriculture across the country. Key national level fisheries projects include commercialisation of fisheries in Duqm, support for artisanal fishing (harbour infrastructure, processing facilities etc.), and overall development and enhancement of the aquaculture sector. For livestock, national level focus is on Dairy and Poultry in Al Buraymi Governate.

Future national-level Agriculture, Fisheries and Livestock development should:

- Be in accordance with Ministries of Agriculture, Fisheries and Water Resources (MoAFWR) including all requirements, standards, codes and land allocation.
- Be in accordance with all relevant Ministry and Authority standards, regulations, guidelines and approvals, including but not limited to planning and development, transportation, utilities infrastructure, public realm, environment, sustainability.
- Refer and adhere directly to the latest SARDS document - Sustainable Agriculture and Rural Development Strategy (2018), where relevant.
- Balance Oman's economic, social and environmental needs, to ensure protection of the environment and sustainable economic growth for the people.

8.3.7. Defence Installation Projects

Defence installations across Oman are considered of significant national importance, in order to ensure the safety and security of the country, its people and its assets.

The Oman Ministry of Defence (MoD) regulates and develops these national services, including a range of forces and departments including: Office of MRDA, Office of Secretary General, Office of COSSAF, Royal Army of Oman, Royal Air Force of Oman, Royal Navy of Oman, National Defence College, National Survey Authority, and Engineering Services.

Future Defence Installation development should:

- Be in accordance with the requirements, standards, codes, regulations and approvals of the Ministry of Defence.
- Be in accordance with the latest standards, regulations, guidelines and approvals of relevant Ministries and Authorities.
- Be located away from residential/ commercial areas in order to carry out safe and secure operations.

8.3.8. Oil Refinery and Gas Field Projects

The Ministry of Energy and Minerals coordinates the government's role in Oman's hydrocarbon sectors. Final approval on policy and investment, however, rests with the Sultan of Oman. The state-owned Petroleum Development Oman (PDO) holds most of Oman's oil reserves and is responsible for more than 70% of the country's crude oil production and nearly all of Oman's natural gas supply. Currently, Oman has two refineries, at Mina al Fahal and in Sohar.

The Oman Gas Company (OGC) directs the country's natural gas transmission and distribution systems. The OGC is a joint venture between the **Omani Ministry of Oil and Gas** (80%) and OOC (20%). Oman Liquefied Natural Gas (Oman LNG) – owned by a consortium including the government, Shell, and Total – operates all liquefied natural gas (LNG) activities in Oman through its three liquefaction trains in Qalhat near Sur.

Future Oil and Gas related projects and development should:

- Be in accordance with the requirements, standards, codes, regulations and approvals of the Oman Ministry of Energy and Minerals, as well as the relevant operator.
- Be in accordance with the latest standards, regulations, guidelines and approvals of relevant Ministries and Authorities.
- Be located away from urban areas and maintain sensitivity to Oman's natural environment.

8.3.9. Energy Projects

The Ministry of Energy and Minerals oversees national level energy projects and is the key coordinator for large-scale projects whereby a number of authorities and ministries require input, with any associated standards, legislation or codes to be

adhered to for all current and future projects. At present, the 400kV North/ South Interconnector project is a major upcoming national energy project for Oman.

Future Energy related projects and development should:

- Be in accordance with the requirements, standards, codes, regulations and approvals of the Oman Ministry of Energy and Minerals, as well as the relevant operator.
- Be in accordance with the latest standards, regulations, guidelines and approvals of relevant Ministries and Authorities, including but not limited to OPWP Oman Power and Water Procurement, OETC Oman Electrical Transmission Company.
- Be located away from urban areas and maintain sensitivity to Oman's natural environment.

8.3.10. Utility Infrastructure Projects

There are a number of different entities that oversee the provision of utility infrastructure. These include, for example:

- Diam – Water distribution;
- MEDC, Mazoon, RAEC – Electrical distribution;
- Nama Water Services – Wastewater services;
- Be'ah – Solid Waste and environmental management services;
- Omantal and Ooredoo – Telephone/ mobile phone/ internet services;
- MRMWR - Flood protection and Dams.

Each of these entities should be referred to and involved in any future development projects and adherence to individual standards, legislation or codes will be required in all current and future projects.

Future projects and development in urban and rural environments should:

- Be in accordance with the site selection, execution, requirements, standards, codes, regulations and approvals of the utility providers, as well as the relevant operator, if different.
- Be in accordance with the latest standards, regulations, guidelines and approvals of relevant Ministries and Authorities, including but not limited to Oman Power and Water Procurement (OPWP), Oman Electrical Transmission Company (OETC) for major connecting transmission schemes.
- Wherever located, utility infrastructure will need to maintain sensitivity to Oman's natural environment.

8.3.11. Mining and Extraction Projects

The Public Authority for Mining (Formerly), established by Royal Decree in 2014, regulates and manages mining across the country, as well as exploration, research, operations and investment. Mining is a key component of the Omani economy, and therefore, careful planning and management in order to ensure continued growth, as well as ensuring no loss of environmental integrity, will be required as the sector continues to grow.

Future Mining and Extraction related projects and development should:

- Be in accordance with the requirements, standards, codes, regulations and approvals of the Public Authority for Mining, as well as the relevant operator.
- Be in accordance with the latest standards, regulations, guidelines and approvals of relevant Ministries and Authorities.
- Be considered holistically through defined coordination between the Environment Authority, as well as the Ministry of Heritage and Tourism, Ministry of Culture, Sports, and Youth to ensure sensitive mining and remediation in relation to the natural environment and cultural heritage, as well as Oman's growing tourism industry.



09

REGIONALLY SPECIFIC PLANNING STANDARDS

9. REGIONALLY SPECIFIC PLANNING STANDARDS

9.1. Introduction

Oman is a country of varying settlements, urban context and natural environments. The ONSS recognises and records the variance across the regions and the associated natural and cultural environments and provides supplementary planning guidance for the development of each Regional/ Governate, recognising their regional distinctiveness, cultural influences, traditional lifestyles, settlement patterns, and architecture, alongside appropriate climatic responses based on the locality. The National level Planning Standards provided in PART 2 of this document provide the initial guidance; however, regional influences and exceptions are identified in order to ensure regionally appropriate development, which is responsive to the local urban and natural environment. In addition, in order to recognise the distinctiveness of certain areas of the country, standards are also considered for Special Planning Zones (SPZs) designated as part of the ONSS. The Regional Standards, developed and included within various Regional Spatial Strategy documentation, are provided for the following Governates:

- Muscat Governorate
- Dhofar Governorate
- Al Buraymi Governorate
- Ad Dakhiliyah Governorate
- Al-Batinah North Governorate
- Al-Batinah South Governorate
- Ash Sharqiyah North Governorate
- Ash Sharqiyah South Governorate
- Adh-Dhahirah Governorate
- Al Wusta Governorate

9.2. Muscat Governorate

Region Specific Standards

The national planning standards are applicable to the entire Muscat Governorate. However, considering the character of the governorate, the following region-specific standards are proposed for the Muscat Governorate:

- Climatic Response
- Wadi Setbacks
- Cultural Influences
- Traditional Lifestyles
- Settlement Pattern
- Vernacular Architecture
- SPZ Characteristics

Climatic Response

Specific issues of climatic response in the Muscat Governorate include protecting coastal development from sea-level rise (SLR), risks to coastal development coastal storm surges and flooding, and wadi flooding. Governorate specific standards are proposed for coastal areas and development adjacent to wadis.

Coastal Setbacks

Urban development has taken place along many parts of the coastline of Muscat, and the coastal area is now home to a significant population. Nearly 60% of the governorate population resides within 3 km of the coast. Storm surges are a major threat to the population and infrastructure in these areas, especially in the western parts of the governorate such as Bawshar and As Seeb; parts of Qurayyat are also particularly susceptible to storm surges.

Due to these extreme weather events, along with the sea-level rise occurring against the backdrop of climate change, inundation in low-lying coastal areas will become an increasingly serious issue. This problem is partly the result of the poor implementation of existing coastal setback regulations, which has led to inappropriate development in high-risk areas. Inland flooding, particularly near wadis after intensive rainfall in adjacent mountains, is also a major issue in parts of the Governorate, including the coastal zone. Existing coastal setbacks in various locations of the Muscat Governorate are presented in Volume 3 - Appendix K.1.

The government has issued regulations controlling development along the coast, but enforcement has been limited or ineffective. Following three decades of significant development along the governorate's coastline and the emergence of climate change as a major multiplier of coastal risk, a more sophisticated set of guidelines is recommended to ensure that a clear and transparent decision-making mechanism is implemented that takes into account:

- The above-mentioned factors (types of coastline based on their vulnerability and sensitivity to coastal erosion and flooding, and the setbacks given in the SCP's Interim Urban Planning Guidelines);
- Recent climate change projections with respect to sea-level rise and storm surges, and the corresponding wave run-up etc. Along with the design parameters set by the concerned authority for coastal developments;
- Variations in physical conditions at the governorate level (orientation and exposure to extreme weather events and tsunamis); and
- Site-specific conditions, such as the elevation of the natural ground at the site and sensitivities such as turtle nesting beaches, dune systems, important bird areas, khawrs etc.

Coastal Zone

The Government intends to prepare a new Coastal Zone Management Plan (CZMP) that will encompass coastal areas in the Muscat Governorate. Pending completion and approval of the new CZMP, these guidelines have been provided to assist planners, environmental authorities, developers and others in the planning and management of the governorate's coastline.

The concerned Government Authority will develop and maintain the Coastal Zone Management Plan (CZMP) in coordination with concerned stakeholders. Until the CZMP process is complete, the guidelines presented below are to be treated as an interim mechanism for informed decision-making, and therefore will be subject to change.

Definition of the Coastal Zone

The development of the CZMP first requires defining its area of influence, namely the "Coastal Zone". The seaward extent of coastal zones is normally bounded by the 12 nautical mile (NM) limit, which generally encompasses most of the relevant shallow-water habitats. This accords with national and international legal definitions of the coastal zone.

The landward extent of the coastal zone is more difficult to define. Basic definitions include, at a minimum, all areas of land affected by its proximity to the sea (i.e. land that is influenced by marine processes and that influence coastal processes such as sediment transport). In the Muscat Governorate, the coastal zone is rather varied in terms of landforms. Based on the above considerations, especially with respect to the issues regarding the landward extent, along with existing coastal regulations and studies (for details see Volume 3- Appendix K.1), the following zones are identified along the coast of the Muscat Governorate.

- Ecologically sensitive areas
- Muscat city and Qurayyat urban areas
- Visually sensitive landscapes

Protected Areas

Protected areas are environmentally sensitive areas along the coast identified under the environmental strategy of the RSS, which include mangroves, khawrs, turtle nesting grounds, seagrass beds, important bird areas, important plant areas, and declared nature conservation areas etc. The following are the major environmentally sensitive areas along the coast of the Muscat Governorate.

- Al Mouj IBAO
- Qurum Nature Reserve
- Yiti IPA
- Bandar Al Khiyran Reserve
- Jabal Abu Dawud IPA
- Qurayyat IBAO

No construction shall be permitted within the protected area. A 150m buffer needs to be provided along with the environmentally sensitive areas along the coast. Eco-tourism activities such as mangrove walks, tree huts, nature trails, etc., will be allowed as per the coastal management plan. The laying of pipelines, transmission lines, conveyance systems etc. will also be allowed in the buffer zones of the environmentally sensitive areas.

A detailed environment management plan will need to be prepared, and potential developments need to be approved on a case-by-case basis by the concerned authority.

Muscat City and Qurayyat Urban Area

The Muscat city and Qurayyat urban areas are existing developed areas that lie within their respective settlement boundaries.

- i. Coastal Setback: The area up to 50 meters from the high tide line (HTL) on the landward side will be earmarked as the 'No Development Zone (NDZ)'. No construction shall be permitted within the NDZ except to repair or reconstruct existing authorized structures. In addition, no flattening of sand dunes will be carried out. Any development within this area will be subject to approval from the concerned authority. The following activities will be allowed in the NDZ, subject to maintaining a minimum 10m distance from the HTL:
 - Facilities for the local fishing community
 - Temporary tourism facilities
 - Parks and open space
 - Necessary infrastructure facilities (as approved by the CZMP)
- ii. Development of vacant plots between 50 and 300m from the high tide line will be permitted, subject to an assessment of their cumulative impact on local conditions including the hydrological aspects of erosion and ecological sensitivity.
- iii. In the developed areas, the proposed setback is based on existing structures. Construction activities outside of the existing urban boundaries are not allowed, except for fishing umbrellas made of non-fixed materials.
- iv. Roads along the coastline will act as a development setback. No construction activities will be allowed towards the seaside of the road, except for fishermen umbrellas made of non-fixed materials.
- v. Construction of buildings for residential purposes, schools, hospitals, institutions, offices, public places, etc. will be permitted only on the landward side of the existing road, or on the landward side of existing authorised fixed structures:

- vi. Reconstruction of non-compliant buildings may be permitted, subject to the existing zoning regulations and planning standards.
- vii. The design and scale of buildings needs to be consistent with the surrounding landscape and local architecture style.
- viii. Any existing uses/activities will be allowed to continue.
- ix. Inappropriate existing land uses will be relocated to ensure public safety.
- x. Buildings need to ensure that access to the beach is maintained.

Visually Sensitive Landscapes

- i. No Development Zone: Area up to 300 meters from the HTL on the landward side shall be earmarked as the 'No Development Zone (NDZ). No construction shall be permitted within the NDZ except to repair or reconstruct existing authorized structures. In addition, no flattening of sand dunes will be carried out. Any development within this area will be subject to approval from the concerned authority. The following activities will be allowed in the NDZ, subject to maintaining a minimum 10m distance from the HTL:
 - Facilities for the local fishing community
 - Temporary tourism facilities
 - Parks and open space
 - Necessary infrastructure facilities (as approved by the CZMP)
- ii. Development of vacant plots between 300m – 1km of the HTL is permitted for construction of a detached dwelling and hotels/beach resorts for the temporary occupation of tourists/visitors, subject to an assessment of their cumulative impact on local conditions including the hydrological aspects of erosion and ecological sensitivity.
- iii. Development must confirm the standards laid down by the competent Authority, including MECA and SCP.
- iv. Appropriate arrangements for the treatment of effluents and collection/disposal of solid waste must be provided. No untreated effluents and/or solid waste can be discharged into the water or beach areas.
- v. Public access to the beach must be maintained, and a minimum gap of 20m width for public accessways shall be provided between hotels/beach resorts. The front width (or extent) of the development facing the beach should not exceed more than 1km in order to minimise interruptions in beach access for the public.
- vi. Reconstruction/alterations of an existing authorised building are permitted without a change in the existing use, its scale or intensity of development.

Prohibited Activities in the Coastal Zone

The following activities will not be permitted within the coastal zone:

- i. New industries or the expansion of existing industries
- ii. Fish processing units
- iii. Land reclamation, building or distributing the natural course of seawater
- iv. Discharge of untreated waste and effluents
- v. Waste dumping
- vi. Ports and harbours in high erosion segments
- vii. Disposal of plastic
- viii. Damage and/or removal of corals other than for research purposes.
- ix. Removal of sand
- x. Mining of sand, rocks and other substrata materials, except those rare minerals not available outside the coastal zone areas.
- xi. Land reclamation, filling by sand and other materials or disturbing the natural course of seawater with similar obstructions, except those required for:
 - control of coastal erosion
 - maintenance or clearing of waterways, channels and ports
 - prevention of sandbars (except for tidal regulators)
- xii. No permanent structure for sports facilities shall be permitted except the construction of temporary goal posts, net posts and lamp posts.
- xiii. Withdrawal of ground within 200m of the HTL



- xiv. Any construction activity between the LTL and HTL
- xv. Dressing or altering of sand dunes, hills, or natural features including landscape changes for beautification, recreational and other such purposes.
- xvi. Any development activity that will significantly degrade the quality of any area designated as being of exceptional value or beauty.



Coastal Setbacks for the Muscat Governorate
Source: RSS

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Wadi Setbacks

No perennial flows occur in Muscat Governorate except in Wadi Dayqah, many wadis originating in the mountains may flow for an extended period post rainfall reaching the downstream. Combination of high, steep slopes, bare mountains and surface runoff gives flash floods in wadi Rusail, wadi al Ansab, wadi Udhaiba, wadi Adai, and wadi Mayh, wadi Mijlas and wadi Dayqah. Flash-flooding has been highly variable, both temporally and spatially, and typically lasts for few hours to days after a storm. Wadi flows disperse into numerous distributaries and often there is no channelization in the inter-fan areas. Developments within flood plains were not effectively monitored and controlled due to lack of proper technical studies.

It has to be noted that measures to mitigate flood risk are in different stages of implementation by MRMWR. Furthermore, RSS Policy WR4.1 proposed regional flood mapping, Wadi channelization and construction of flood protection dams, they shall identify the Wadi banks and recommended buffer zones for each wadi on case to case basis for mitigating the impact of flooding in Muscat Governorate. These mitigation measures will be implemented in a phased manner. For the time being to mitigate the impact of flooding on new developments it is recommended that no building of permanent occupation shall be allowed within 30 m in Muscat City and 50m in settlements outside Muscat City from the edge of wadis or wadi channels as stipulated by the concerned authorities (Muscat Municipality/ MRMWR).

The following are development control regulations for wadi setbacks:

- **Permitted Uses:** agriculture, parks, utility networks, transportation infrastructure. low-density tourism and recreational infrastructure, depending on the width of the channel.
- **Conditional Uses:** Nil
- **Prohibited Uses:** industries, fuel bunkering and retailing, waste and wastewater management facilities, and other uses/activities as specified under any applicable rules, regulations, policies, etc.
- **Existing Uses:** existing uses/activities, which adversely affect the wadi flows or the alignment of wadi channels, will be relocated to their appropriate land use zone/s through coordination among the concerned authorities, unless protection measures are provided to avoid damage to structures or loss of human life.
- **Temporary Uses:** Quarrying for borrow materials are permissible under applicable rules, regulations, policies, etc. and after prior permissions from the concerned authorities.

Cultural Influences

Muscat city is one of the oldest cities in Oman and throughout its history a number of cross-cultural influences have impacted its lifestyle and built environment. Many of these influences have assimilated over time into the distinctive identities of the governorate and these influences can still be experienced in the older settlement areas. Important influences that have been assimilated here originate from regions that used to form part of the Omani empire, most notably east Africa, along with parts of Asia that had developed trading links with Oman and Muscat. Other cultural influences that can be experienced in the governorate were developed indigenously in Oman and Muscat, including the water system (Falaj system), fishermen and their settlements, folk cultures, its seafaring history and port settlements. It is important to retain the urban and cultural artifacts of these cultural influences, as they are part of the historical civilization and cultural identity of the governorate. Recent urban lifestyles, especially in the modern Muscat area, are heavily influenced by post- industrial and western culture, which has arrived in the form of shopping places, means of mobility, and the villa housing system.

Traditional Lifestyles

The traditional lifestyles in the governorate can be experienced in the historic settlements of the governorate or in areas which have a pre-industrial settlement history. Some of the distinctive features that represent the traditional lifestyles are as follows:

- Joint family and community associations;
- Traditional dressing styles;
- Idea of privacy in traditional neighbourhoods;
- Association with seafronts for fishing-related activities and as a public space;
- Concept of Haman for young men as a bathing space; and
- Community and city events and festivals.



Mutrah Corniche and Muscat Festival

Iconic waterfront public and festival spaces form part of the distinctive character and urban identity of the Muscat Governorate.

Settlement Pattern

A variety of settlement patterns can be experienced in the Muscat Governorate. There is a distinctive difference in the settlement form between the traditional urban settlement areas and newer urban areas. Newer urban areas are dominated by villas, commercial buildings along major roads, and institutional complexes enclosed by compound walls, whereas traditional urban and village settlement areas are typically low-rise, street oriented and pedestrian friendly because of their human scale. Traditional urban settlements, such as the old settlement of Mutrah, are low-rise and higher density, with mixed use buildings along main streets and a compact character. Many historical settlements in the governorate possess a similar settlement pattern. To protect areas and settlements having a unique cultural heritage character, the concept of cultural conservation areas has been proposed in the Muscat Governorate.

The traditional settlements characteristics of the Muscat Governorate should serve as a source of inspiration for the creation of region-specific planning and design practices, including the following elements:

- Compact and low-rise urban or settlement form;
- Commercial activity centred in a souq/bazaar;
- Mixed use along main streets;
- Pedestrian-friendly environment and human scale streets;
- Provision of privacy in traditional neighbourhoods;
- The use of waterfronts as a public space and centre for economic activities;
- Forts, defence towers, and mountains forming the skyline of the settlement;
- Locating community buildings at important junctions of public importance;
- Oasis-based traditional settlements located along the wadis;
- 2-3 storied buildings directly abutting the street; and
- Water systems (falaj and Hamams), especially in traditional and older settlements.



Mutrah Souq and Fort - The Mutrah Souq and mixed use streets, historic forts and the Al Hajar Mountain skyline are part of the unique identity of the Muscat, hence these components are to be protected as part of the RSS.

Vernacular Architecture

Vernacular architecture is another important part of the identity of the Muscat Governorate. The architecture of traditional houses and neighbourhoods, forts and castles, defence towers, streets architectural treatment is quite distinctive in older urban and village settlements. Many of these historically important areas and buildings with vernacular architecture are protected by MoHC as Harats and historic buildings. The distinctive vernacular architecture that can be experienced in Muscat and the other historical settlements of the governorate include:

- Hilltop forts and castles with a distinctive scale and architectural elements;
- Traditional souqs with a human scale;
- Mixed use buildings located directly on main streets with commercial or public uses on the ground floor and residential uses on upper levels;
- Neighbourhoods with narrow entrances and fenestrations;
- Use of white or lighter colours on the outer skin of buildings to combat the harsh solar radiation; and
- Incorporation of Islamic architectural elements.



Fort, Street and Aerial View of Mutrah - Forts, traditional neighbourhoods, and urban form with lighter colour outer skins are distinctive of Muscat's built environment.

Terrestrial SPZ Characteristics

The environmental character of the Muscat Governorate is one of its greatest assets, ranging from the rugged mountain ranges of the Al Hajar to the coastal beaches of the Sea of Oman, intrinsically linked together through a vast network of wadis. Within natural areas, the governorate is home to mangrove vegetation, sand dunes, mammal areas, important plant and bird areas, and wellfields, along with the shallow marine biodiversity along its coastline. In addition, important archaeological and cultural heritage assets often co-exist in these locations, enhanced by their natural surroundings.

The Muscat Governorate comprises only 1.2% of the total area of Oman but it will accommodate 33% of its population by 2040, illustrating the pressing need to preserve its natural and cultural environment from the pressures of urban expansion and industrial development. Recognising the existing regulatory deficiencies that limit the protection of the Sultanate's natural assets, the ONSS has created a new planning oversight authority that will be tasked with protecting, conserving, and better managing the environmental features within the delineated boundaries of Special Planning Zones (SPZ).

Under the SPZ framework, areas possessing high-value landscapes, such as the Al Hajar Mountains, along with environmentally sensitive locations, have been designated and will be protected from incompatible projects,

activities, or changes in land use. Two types of SPZ are proposed: a terrestrial SPZ (e.g. Al Hajar) and a coastal SPZ.

The following characteristics of terrestrial SPZ of Muscat Governorate are explained below:

- Social Characteristics
- Economic Characteristics
- Mining Areas
- Cultural Characteristics
- Environmental Characteristics
- Architecture and Built form of Settlements in SPZ
- Agricultural Practices and Systems

Social Characteristics

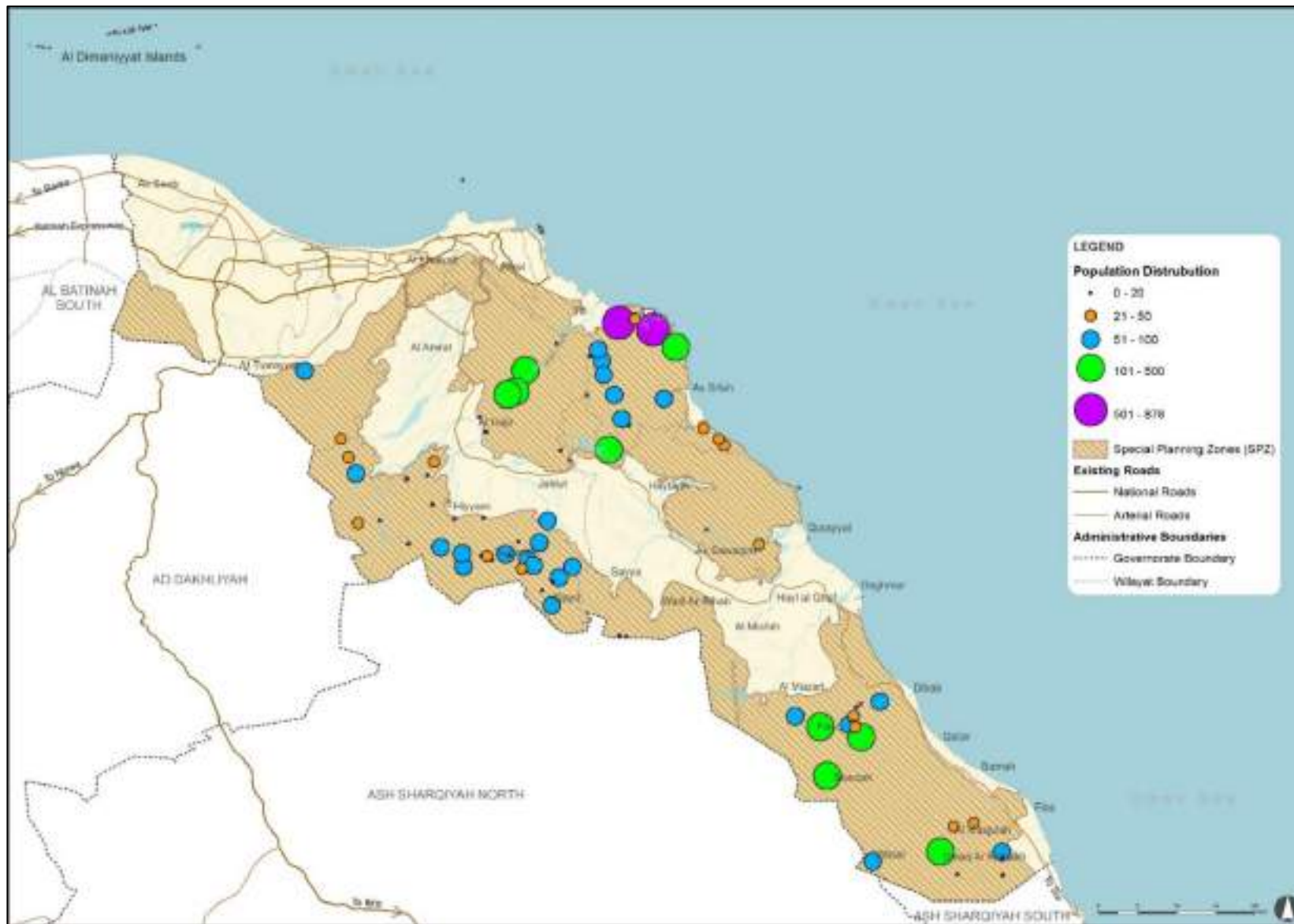
Within the Muscat Governorate, the Al Hajar Mountains terrestrial SPZ will cover 2,200 sq. km, comprising 58% of the governorate area. As per the 2010 census, a total population of 5,357 resides within the SPZ, of which 97% are Omanis and 3% are Non-Omanis. 769 housing units and 1051 households are located in the SPZ, and the average household size is 5.09 people.

There are 78 settlements in the SPZ, the largest being Al Khiran with a total population of 878. The following Tables present the distribution of settlements within the SPZ.

Settlements within the Terrestrial SPZ

S. No.	Population Range	No of Settlements	Population	% of Population
1	0	20	0	0
2	0-20	10	93	2
3	21-50	13	456	9
4	51-100	23	1675	31
5	101-500	10	1678	31
6	501-878	2	1455	27
	Total	78	5357	100

Source: RSS analysis and Existing Land use Survey (2017)



Distribution of Settlements within the Terrestrial SPZ

Source: RSS

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Economic Characteristics

The major economic sectors in the SPZ are agriculture and tourism. The total agriculture area in the SPZ is 2.5 sq. km, and most of this area is located along wadis. Many residents also travel to nearby settlements for employment or discretionary purposes.

Mining Areas

80% of the high-value mining blocks proposed by PAM are within the SPZ boundary. The exploitation of mining in the Al Hajar Mountains has the potential to negatively impact its flora and fauna, including endangered mammals. Mining of minerals also has the potential to cause severe localised environmental and visual impacts that can be detrimental to the well-being and existence of local communities, their potential for sustainable tourism development, as well as adversely impacting their cultural heritage assets and landscapes. However, 92% of the mining blocks within the SPZ area do not conflict with the other conservation areas or settlements and can proceed subject to strict environmental monitoring and mitigation measures.

Cultural Characteristics

A total of 22 historical and cultural assets are located within SPZ, including one castle, six forts, two mosques and thirteen towers. In addition, two cultural landscapes (Sayya and Wadi Dayqah) are located in its boundaries.

Environment Characteristics

Major environment features located within the SPZ area include declared conservation areas, geoparks, SSIs, important bird areas, important plant areas, Arabian Tahr area and proposed IUCN areas, many of which have significant overlap.

The following Table and Figure presents the environment designations within SPZ.

S. No	Environment Designation	Name of the Area	Area in Ha
1	Declared Conservation Areas	Bandar Al Khiyran Nature Reserve, Ras Al Shajar, Wadi Sareen Reserve	22,213
2	Geoparks	As Sifah Eclogite, Majlis al-Jin cave, Wadi Mayh Sheath Fold	897
3	SSI	Al Khoud Conglomerate, Bandar Khuyran, Wadi Qahza ripple marks	148
4	IBA	Al Multaqa Waste Site	171
5	IPA	Bandar Al Khairan Reserve, Coastal Vegetation, Eastern Hajar, Jabal Abu Dawud, Oman Botanic Garden, Ras Al Shajar, Wadi Al Khod, Wadi Sareen-Aswad	118,140
6	Arabian Tahr		163,082
7	IUCN Area		116,173
	Total		420,825

Environment Designations within the Terrestrial SPZ

Source: RSS analysis and Existing Land use Survey (2017)



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Environment Designations within the Terrestrial SPZ

Source: RSS

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Architecture and Built Form

The total built-up area in the SPZ is 9.3 sq. km, which represents 9% of the total SPZ area. Nearly 93% of the SPZ area consists of mountainous terrain (above 5% slope). 11 sq.km area of MoH planned areas are located within the SPZ. The Table below presents the existing land uses in the SPZ area.

S. No	Land use	Area in Sq.Km	%
1	Residential	2.0	0.1%
2	Commercial	0.0	0.0%
3	Industrial	0.3	0.0%
4	Public and Semi Public	0.6	0.0%
5	Recreational	0.2	0.0%
6	Infrastructure	6.2	0.3%
7	Planned Areas	10.8	0.5%
8	Agriculture	2.5	0.1%
9	Wadis	45.8	2.1%
10	Vacant Areas	85.3	3.9%
11	Mountains	2046.6	93.0%
	Total	2200	100%

Terrestrial SPZ Existing Land Uses

Source: RSS analysis and Existing Land use Survey (2017)



Terrestrial SPZ Existing Land Uses

Source: RSS

The settlements in the SPZ mostly consist of oasis villages near wadis or in hilly terrain. The fertility of the land and availability of water for agriculture, especially date plantations, play a significant role in the location and visual aesthetic of these settlements. The following figure shows a conceptual plan of a typical settlement in the SPZ.



Conceptual Plan of a Typical Settlement in the Terrestrial SPZ

Source: ArCHIAM Centre: Architecture and Cultural Heritage of India, Arabia and the Maghreb (2019)

Important building materials utilised in traditional buildings in the SPZ consist of stones, baked bricks, mud bricks, palm trees, mangrove poles and lime (mainly for plaster and mortar). Though modern buildings in these settlements consist of contemporary materials, the stepped built form still remains due to the constraints imposed by the hilly terrain (see Figure below).



Settlements near Wadi Dayqah in the Al Hajar SPZ

Agricultural Practice and Systems

As a practice to overcome the prevalence of steep slopes, flat areas are often cut into the terrain to allow for crops and plantations. This practice, widely known as terrace farming, is prevalent in the rural settlements within the SPZ. These farms are supported by the falaj systems, drawing water from nearby wadis or mountain springs (see Figure below).



Terrace Farming and Falaj Systems

Source: RSS

Coastal SPZ Characteristics

The 266 km long coastline of the Muscat Governorate, which is located on the Gulf of Oman (Also known as the Sea of Oman), extends from the sandy bay near As Seeb to the sandy bay at Fins in Wilayat Qurayyat. These two sandy coastlines, which front a wide continental shelf, are separated by the largely rocky coastline between Qurum and As Sifah where the shelf is very narrow and the seabed rapidly descends into deep water. Significant stands of mangroves occur at the permanently open khawrs at Qurum and Qurayyat. There are also other less significant ephemeral or seasonal khawrs along both sandy coasts. A third major stand of mangroves is found in the Bandar Khairan inlet.

The Daymaniyat archipelago, consisting of nine islets, is located 16 to 18 km offshore and was created by the re-emergence of Paleogene limestone. The As Sawadi islands located in Al Batinah South have the same geological composition. Whereas the monsoon periods have a substantial impact on marine life in the Arabian Sea, their effect in the Gulf of Oman is much less, a fact that is reflected in the seasonal appearance of larger marine wildlife.

Phytoplankton

Requiring specialist collection and identification, the number of identified phytoplankton taxa in the Muscat Governorate is difficult to estimate. For example, Sariji et al. (2014) identified 186 taxa from sampling in the Strait of Hormuz and Oman Sea while (Polikarpov et al., 2016) reported 376 phytoplankton taxa when sampling also extended into the Arabian Gulf. In total, 287 species were identified by Al-Hasmi et al. (2015) from the coast of Oman and reflecting the relative abundance of the different groups of phytoplankton, an identification guide of 137 taxa found in Oman, includes 64 diatoms (Bacillariophyceae), 71 dinoflagellates (Dinophyceae), one silicoflagellate and one cyanobacterium, was prepared (Al Hashmi, 2017).

The winter (north-east) and summer (south-west) monsoon periods have profound effects on the marine ecosystems of Oman. The Gulf of Oman is more strongly influenced by the winter NE monsoon to such an extent that satellite remote-sensing studies show that phytoplankton populations, as measured by chlorophyll-a, are at a maximum during the winter monsoon (February–March) (Piontkovski et al., 2011). As the basis for the marine food chain, the importance of phytoplankton cannot be overstated. For Oman, this is especially true given the

increase in harmful algal blooms (HABs) that have occurred in the Oman Sea over the past 40 years (Al-Gheilani et al. 2011). The potentially harmful algae included 10 diatoms and 14 dinoflagellates such as *Ceratium* spp., *Karenia* spp. and *Noctiluca scintillans* (Al Azri et al., 2015; Al Hasmi et al., 2015). The annual blooms of most of the diatoms and some dinoflagellates are irregular, but those caused by green *N. scintillans* are regular and of great concern (also refer to Section 3.2.4). They occur during both monsoon seasons and have replaced diatoms as the basis of the food web (Goes and Gomes, 2016). This replacement is likely linked to the expansion of the oxygen-depleted "dead zone" of the Arabian Sea into the Oman Sea (Queste et al., 2018), and which is now the biggest such dead zone in the world (CBS News 2 May 2018). Green *Noctiluca* have a photosynthetic symbiont *Pedinomonas noctilucae* (Subrahmanyam) that gives it a competitive edge over dinoflagellates that can only graze on plankton.

Between 1988 and 2011, 91 harmful algal blooms accompanied by fish kills occurred in the Oman Sea. The fish kill incidents were mainly driven by oxygen depletion (Piontkovski et al. 2012). Not all kills are caused by *Noctiluca*. In 2017 thousands of sardines suffocated at Sidab as the result of a bloom of *Prorocentrum* (6 May 2017, Gulf News), a dinoflagellate that is always present in Oman's waters (Al Hasmi et al., 2015). The latest incident of a large quantity of dead fish, including the Flapnose Ray (*Rhinoptera javanica*, Arabic-Gharabi), being washed ashore occurred at As Seeb (20 November 2018, Oman Observer).

The increased frequency and intensity of bloom events are posing serious threats to fisheries, tourism and a host of other coastal industries such as desalination plants on which these coastal communities depend (Goes et al., 2018). The impact of HABs, monitoring and management on desalination plants is of international concern (Anderson et al., 2017), and forecasting of *Noctiluca* events in Oman is one of several similar projects around the world (Tollefson, 2018).

Marine plants

Macroalgae are photosynthetic non-flowering plants that grow in shallow sea waters. The Sultanate of Oman has 435 species of macroalgae, including 69 taxa of Chlorophyta (green algae), 50 taxa of Phaeophyta (brown algae) and 205 taxa of Rhodophyta (red algae). Algae populations are severely threatened by oil pollution, construction and coastal development.

435 marine macroalgae or seaweeds are listed as occurring in Oman in the international Algae Base database. The Table below summarizes their distribution among the three plant divisions together with the genera with the largest numbers of species.

Seaweeds	No. of Genera	No. of Species	Genera	No. of Species
Green - Chlorophyta	25	91	Caulerpa	23
			Codium	14
			Bryopsis	7
Brown -Phaeophyta	26	77	Sargassum	12
			Padina	10
			Dictyota	9
Red -Rhodophyta	116	267	Gracilaria	13
			Hypnea	13
			Laurencia	10

Macroalgae or Seaweeds

Source: <http://www.algaebase.org>

As mainly benthic primary producers, seaweeds are restricted to relatively shallow waters on the margins of the ocean. With very different seasonal oceanographic conditions, the seaweeds of the Oman Sea are different in terms of species composition and are lower in terms of species number when compared to those of the Arabian Sea. Wynne and Jupp (1998) and Jupp (2002) only recorded eight green, eleven brown and 19 red genera of algae from the Oman Sea.

Some red and brown seaweeds are of commercial importance⁴. In the Oman Sea, the red algae *Gracilaria* are used to produce agar (Gharanjik, 2002).

Seaweed farming is an expanding industry worldwide, and an FAO technical document (De San, 2012) provides an Indian Ocean perspective on seaweed farming. Oman has proposed a number of initiatives for mariculture (e.g. 17 August 2014 Muscat Daily; 15 February 2015; 30 April 2016, Oman Observer), which, however, do not seem to have progressed. In any case, such activities would be more suited to the Arabian Sea coastline.

Seagrasses are found on sandy silty shallow water sediments and were reported from Bandar Jissah (*Halodule univervis* and *H. ovalis*: Jupp et al. 1996). Seagrass (*Halodule* sp.) was previously recorded in 1990 (report for the then Department of Tourism) as occurring in the small khawrs between Qurayyat and Daghamar where salt mining occurs. However, as these khawrs are largely seasonal or ephemeral, the populations of seagrasses are unlikely to be of any great significance.

Zooplankton

Winters in the Oman Sea coincide with the north-east monsoon season bringing a fall in water temperature that significantly influences primary and therefore secondary, zooplankton production. The outflow of enriched Arabian Gulf waters into the Oman Sea and the presence of cyclonic eddies in general makes these waters nutrient-rich throughout the year. It is therefore not surprising that the overall zooplankton biomass of the Oman Sea is 1.35 times greater than that of the Arabian Sea. Further, the Oman Sea winter zooplankton biomass was 2.27 times more than the summer biomass (Thangaraja et al., 2011).

Zooplankton exhibits a vertical migration in the water column both on a daily and seasonal basis. In total, the biomass of nocturnal surface waters was 1.6 times greater than during the day (Thangaraja et al., 2011). Because of their ability to switch between different phytoplankton and zooplankton prey, copepods are the commonest types of zooplankton.

This preponderance is reflected in the plankton hauls from Bandar Khairan (Pointovski et al., 2014), where copepods comprised 79% of the total zooplankton abundance. Cladocera (9%), Oikopleuridae (7%), Chaetognatha (3%) and Decapoda (~2%) accounted for the remaining amount.

With the exception of the decapods, all these groups are holoplankton spending their entire lives in the plankton. Meroplankton, on the other hand, are only present in the plankton as larvae. As adults, some groups such as the decapods become benthic or, like fish, pelagic. There are two peaks of fish larval abundance: during the north-east monsoon and spring inter-monsoon periods. The larvae were represented by 39 families, 50 genera and 55 species. The top five most abundant families were Clupeidae (4 spp.; 21.5%), Pomacentridae (5 spp.; 12.01%), Sparidae (1 sp.; 10.38%), Carangidae (6 spp.; 6.57%) and Blenniidae (3 spp.; 4.84%) (Al Abri et al, 2017).

Invertebrates

Corals

Coral distribution is dictated by the necessity for the correct illumination for their photosynthetic symbionts- the zooanthellae, sedimentation and wave action. The Muscat Governorate coast and Damaniyat Islands is one of the four principle areas along the Sultanate's coast that provide a suitable environment for them.

The hard, fringing-reef corals of Oman Sea belong to fifteen families in 39 genera for an ongoing total of 110 species (Claereboudt, 2006). The most abundant coral genera include the hard corals *Acropora*, *Pocillopora*, *Porites*, *Goniopora*, *Platygyra*, *Favia* or *Favites* and the soft corals *Sarcophyton* and *Sinularia*. Corals are found at Ras Abu Daud off Qurayyat and at Qalhat and the capital area sites of Damaniyat and Fahal Islands and Bandar Khiran. These sites have been known for a long time (Salm, 1993) as has the anthropomorphic impacts on these fragile systems (Al Jufaili, 1999). Impacts caused by fishing activities were more severe than those caused by coastal construction, recreational activities, oil pollution and eutrophication. These same threats to the coral reefs remain an issue (Burt et al., 2016).

Additional threats to the reefs come from the recurring outbreaks of predation by *Acanthaster planci* the Crown of Thorns Starfish (Glynn, 1993; Mendonca et al, 2010).

⁴ See www.fao.org/docrep, Introduction to Commercial Seaweeds

Cyclone Gonu in 2007 had a devastating effect on the corals of Oman, leading to a significant loss of coral cover on the Damaniyat and Capital area reefs. Re-growth (of branching *Acropora* and *Pocillopora*) occurred rapidly in the Damaniyat, but by contrast recovery, of coral cover and composition has remained depressed at mainland sites around Muscat Burt et al. 2016).

Initial attempts to provide artificial refuging reefs in the capital area using discarded vehicle tyres were unsuccessful, but the concrete reef ball initiative by PDO in 2012 was more successful. The sinking of the Al Munassir ship off the coast of Bandar Khairan by the Oman Royal Navy in 2003 has created an additional attraction for diving tourists.

Molluscs

Molluscs are one of the most successful and diverse groups of invertebrates and are found in all marine environments. The gastropod (snail) specimens of the Oman Natural History Museum have 1,480 gastropod (snail) specimens representing 386 species in 197 genera. The genera with the greatest number of species are listed in the Table below.

Gastropod genera		No. species	General Habitat	Feeding
Nassarius	Mud snails	20	sediments	carnivorous scavenger
Conus	Cone shells	18	reefs and sediments	carnivorous predator
Cypraea	Cowries	14	rocks and coral	omnivorous
Cymatium	Trumpet shells	9	off-shore rocks	omnivorous
Ancilla	Olive shells	8	intertidal sand	carnivorous predator
Siphonaria	False Limpet	7	rocks and coral	rock grazer

Gastropod (snail)

Source: The Oman Natural History museum

Similarly, the holdings for the bivalve molluscs include 322 specimens representing 122 species in 87 genera: those with the most species are listed in the Table below.

Bivalve genera		No. species	General Habitat	Feeding
Barbatia	Arc shells	6	rocks and coral	carnivorous scavenger
Anadara	Arc shells	4	reefs and sediments	carnivorous predator
Arca	Arc shells	4	rocks and coral	omnivorous
Chama	Jewel boxes	4	Off shore rocks	omnivorous
Chlamys	Scallops	4	intertidal sand	carnivorous predator

Bivalve

Source: The Oman Natural History museum

While this gives an idea of the diversity of these groups other genera are numerically dominant as for example the presence of around 1.6 million *Cerithidea cingulata* snails per kilometre in Khawr Milh at Qurayyat (circa 1980: Qurayyat report for the then Department of Tourism).

Twelve species of chiton have been identified from Oman (Bosch et al 1995), but with only broad general location data, only six of them may be potentially found in the Muscat Governorate area. The largest chiton *Acanthopleura vaillanti* however was listed by Smythe (1983: as *A. haddoni*) from the Qurum nature reserve as one of three species. With taxonomic revisions and name changes, the identity of the listed 53 gastropods and 24 bivalves (Smythe 1983) needs to be updated.

The Sultanate of Oman has a large artisanal fishery for squid and cuttlefish. The 2015 Fisheries Statistics book reports that 109 tonnes of Cuttlefish (mainly *Sepia pharaonis*, the Pharaoh cuttlefish) were landed from five harbors (As Seeb, Bawshar, Muttrah, Muscat and Qurayyat) throughout the year with the largest catches being made between October and March. While Octopus (*Octopus aegina*) appears in the markets they do not have a special fishery (Abdessalaam 1995).

Crustaceans

In the Oman Sea, 258 species of crabs and shrimps have been listed, of which 134 are found in Oman. Concerning those of commercial importance Oman has two of the three lobsters (Palinuridae), seven of the reported 14 shrimps (Penaeidae) and nine of the 34 species of swimming crab (Portunidae) (Naderloo et al., 2015).

Lobsters (*Panulirus homarus* and *Panulirus versicolor*) occur along the entire coastline of Oman with the major fisheries in the south of the country. Nevertheless, in Muscat there is an irregular annual catch, but which has declined dramatically from the nine metric tons landed during 2002 (refer to the Table below).

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
3	1	-	-	-	-	-	4	-	3	1	1	1

Lobster Catch in Muscat Governorate

Source: <https://data.gov.om/OMFSRS2016/fisheries>

The Table below shows the seven species of shrimp reported from Oman.

Oman Penaeidae
<i>Metapenaeus monoceros</i>
<i>Penaeus canaliculatus</i>
<i>Penaeus japonicus</i>
<i>Penaeus latisulcatus</i>
<i>Penaeus semisulcatus</i>
<i>Parapenaeopsis acclivirostris</i>
<i>Trachysalambria curvirostris</i>

Species of Shrimp in Oman

Source: Naderloo et al. (2015)

As for the lobsters, the major shrimp fisheries are in the south of the country and in the governorate during the last 17 years only one metric ton in 2016 was reported.

The Table below shows the nine species of swimming crab listed from Oman.

Oman Portunidae
<i>Charybdis (Goniohellenus) longicollis</i>
<i>Charybdis (Goniohellenus) omanensis</i>
<i>Charybdis (Goniohellenus) smithii</i>
<i>Portunus pulchricristatus</i>
<i>Portunus (Portunus) segnis</i>
<i>Portunus (Portunus) guinotae</i>
<i>Portunus (Xiphonectes) tuberculatus</i>
<i>Thalamita bandusia</i>
<i>Thalamita quadrilobata</i>

Species of Swimming Crabs in Oman

Source: Naderloo et al (2015)

Despite a survey that showed the swimming crab market in Muscat city achieves at least 200,000 OR per year (Mehanna et al., 2013), there are no statistics available on either volume of landing or of the species concerned. Mehanna et al. (2013) identified *Portunus pelagicus* as the most commercially important species in Oman coastal waters and which was already being over-exploited.

Other invertebrate groups

The benthic microfauna of Oman's extensive beaches exhibit exceptionally high species diversity and also demonstrate the regional differences in the fauna of the Oman Sea and the Arabian Sea. (McLachlan et al., 1998).

The Oman Sea in general has only 60 species of polychaetes (Wehe and Fienge, 2002) and the Muscat Governorate in particular only has seven of the 14 polychaetes found in the Sultanate, the dominant general being *Glycera* and *Magelona*.

Similarly, there were only 18 of the 23 species of non-decapod crustaceans in the beaches, the commonest being amphipods of the genera *Urothoe*, *Periculoides* and *Microprotopus*, the mysid *Gastrosaccus* and isopod *Eurydice*.

There are a few distributional records of echinoderms in the Sultanate. In Muscat, two brittle stars (*Ophiothrix savignyi* and *Macrophiothrix elongata*) and four sea urchins (*Diadema setosum*, *Echinothrix calamaris* and *Toxopneustes pileoleus*) have been reported (Price and Rowe, 1996). The sea urchin *Echinometra mathaei* also occurs at As Sawadi together with sand dollars (*Clypeaster humilis* and *Echinodiscus auritus*), starfish (*Asterina burtoni* and *Astropectin polyacanthus*) and the sea cucumber *Holothuraria arenicola*. Given that all these echinoderms have preferred habitats, it is likely that they can be found throughout the governorate wherever the appropriate sedimentary conditions are met. For example, *Clypeaster humilis* prefer clay and sandy sediments while *Diadema setosum* prefers sand gravel and rocky ones.

In support of the sea cucumber fishery (Al Rashdi et al., 2007), a nationwide survey (Claerboudt and Al Rashdi, 2011) identified 12 species in the Oman Sea from collection sites in Muscat and the Dimaniyat. The species included *Holothuraria arenicola* but the most abundant species are shown in the Table below.

Sea cucumbers
<i>Stichopus variegatus</i>
<i>Holothuria atra</i>
<i>Holothuria edulis</i>
<i>Holothuria leucospilota</i>
<i>Actinopyga mauritiana</i>

Sea Cucumber Species in the Governorate

Source: Claerboudt and Al Rashdi (2011)

For all marine animal and plant groups in general and invertebrates in particular, the Sultanate's coastline along the Oman Sea is poorly studied in comparison with that of neighboring countries. The situation is exacerbated by the constant updating of the taxonomic status of species and even existing species listings may be inaccurate. A major effort is required to revise and complete the inventory of the flora and fauna of the Muscat Governorate.

Vertebrates

Sharks and Rays

Before the 1990s there were about 70 species of sharks and rays reported in Omani waters (Randall, 1995), but extensive sampling during 2002 and 2003 found only 47 species including 31 sharks, 10 rays and 6 guitarfish (Henderson et al 2007). Collections were made from artisanal catches landed at As Seeb and Muttrah. With 16 species, Muscat was the most species rich governorate in Oman and where catches in winter were the lowest and those in autumn the highest.

The Table below shows the frequency of occurrence of the commonest species in Muscat during 2015. The red highlighted species are among the eight species that dominate the elasmobranch landings throughout Oman in which the milk shark is the predominant species elsewhere.

Species	Common name	Frequency
<i>Iago omanensis</i>	Bigeye hound shark	405
<i>Rhizoprionodon acutus</i>	Milk Shark	149
<i>Carcharhinus sorrah</i>	Spot-tail shark	86
<i>C. melopterus</i>	Blacktip reef shark	41
<i>Loxodon macrorhinus</i>	Slit-eye shark	34

Mustelus mosos	Arabian houndshark	33
Guitarfish	Unknown species	17
Others		97

Common Sharks Found in Muscat Governorate Marine Environment

Source: Henderson et al 2007

Informal interviews with fishermen revealed a general trend of declining shark catches over the last number of years, particularly large pelagic species as is true worldwide. This trade may have fuelled the decline in the number of species of elasmobranch found in the more recent study. Nevertheless, despite a strong local demand for shark fins and meat, refrigerated trucks take sharks from Muscat to the UAE for world-wide distribution (2 July 2015 Muscat Daily). These landings and exports are of minor concern as far as the IUCN Red Lists are concerned as the Milk and Slit-eye sharks are of 'Least Concern' and the Spot-tailed and Blacktip reef sharks have only 'Near Threatened' status (Jabado et al. 2015). However, one of the eight dominant sharks landed in Oman, *Sphyrna lewini*, the scalloped hammerhead shark is considered as 'Endangered' and may be included in the 'others' category for Muscat.

In the 2015-2025 global priorities for conserving sharks and rays (Bräutigam et al 2015), Oman has been identified as a country that could maintain a sustainable fishery.

Rhincodon typus, the filter-feeding Whale shark often appear in small groups usually in deep water at the edge of the continental shelf. The waters around Bandar Khiran, Fahal Island and the Dimaniyat archipelago mainly in July to September are some of the 'hot spots'.

As the largest fish in the world the Whale Shark has become a great tourist attraction wherever it occurs. In Oman tourist operators offer the opportunity to see them as a diving attraction. On the IUCN Red Data lists the whale shark is 'Endangered'. Sawfish (Narrow sawfish, *Anoxypristis cuspidate* and Olive Sawfish *Pristis zijsron*) are critically endangered reflecting the fact that once commonly found in the Sultanate of Oman, they are now absent (Moore 2014).

Bony Fish

The List of Marine Osteichthyes (bony fish) reported from Oman held in the Fish database currently has 957 species in 29 orders and 135 families, over half of which (569 species) are associated with coral reefs⁵. All species can be found throughout the Indo-Pacific Governorate and some have a world-wide distribution.

Commercially these fish can be divided into small epipelagics such the Indian Oil (*Sardinella longiceps*) and the Gold striped (*Sardinella gibbosa*) sardines that are numerically dominant in the shallow waters. In deeper waters the two scads, the Indian (*Decapterus russelli*) and the Arabian (*Trachurus indicus*) are the dominant small epipelagic fish. As fish that form large schools comprised of many thousands of individuals these species are easily harvested. Although records for individual species are not available, statistics for sardines (*Clupeidae*, Arabic -Abed) accounted for over 33% of the 2015 annual catch from the governorate. The Indian Mackerel, (*Scombridae*: *Rastrelliger kanagurt*: Qarfa), Anchovies (*Engraulidae*: Barriya) and small jacks (*Carangidae*: Sal, Habsa, Khayat and others) accounted for almost all the remainder (63%) of the small pelagics landed by the artisanal fisheries in the Muscat Governorate (Fisheries Statistics Book, 2015).

Large epipelagics include tuna (longtail, *Thunnus tonggol* and yellowfin, *Thunnus albacares*), sailfish (*Istiophorus platypterus*) and marlin (*Istiompax indica*), the latter three being of interest to recreational as well as commercial fishermen. The two tunas contributed 27% and 20% respectively towards the annual catch followed by barracuda (13.3%; *Sphyrnaenidae*: Qad), Kingfish (6.2%; *Scomberomorus commerson*; Kana'ad) and Large Jacks (5.5%; *Carangidae*).

The total catches of these large pelagics have probably been underestimated as they do not include those caught by recreational fishermen (Al Abdessalaam, 1995). Although there are no reliable statistics, recreational fishing has probably increased in the Sultanate (Khalfallah et al 2016) and it targets the *Scombridae* and *dolphinfishes* (*Coryphaenidae*: Anfalus).

⁵ See <http://www.fishbase.us>

Lantern fish (*Benthosema pterotum*) predominate in the mesopelagic and are a significant source of food for many marine fish and mammalian species and of fish meal (FAO Fisheries Report 2001, Catul et al 2011). Their ability to survive in oxygen depleted zones may be of immense significance to the fisheries sector in the future.

The fourth division is demersal stocks with many commercial species including, in order of catch size, Ribbonfish (Trichiuridae: Arabic-Khardawil), Emperors (Lethrinidae: Sha'ari), Seabream (Sparidae: Subaiti, Kowfar), Groupers (Serranidae: Hamour), Sweetlips (Haemulidae: Kannai), Jobfish (Lutjanidae: Andaq) and Snapper (Lutjanidae: Hamrah). These six groups constituted 69% of the annual catch in 2017 with the ribbon fish being the most important of the demersal fish (Al-Abdessaalam, 1995) accounting for about 20% of the 2015 catch (Fisheries Statistics Book, 2015)

The IUCN Red data list rates some members of the Serranidae, Pomatomidae and Scombridae families as Vulnerable and in 2011 the Muscat fish stocks were assessed as being within normal levels and not overexploited (Al Habsi and Mustopha, 2011). There is no place for complacency as in 2015 a World Bank report in collaboration with Ministries of Agriculture, Fisheries (Formely) provided a breakdown of the country's marine wealth as per the Table below.

Category	% exploited	
	Fully	over
Small Pelagics		9
Large Pelagics	20	36
Demersal	8	60

Oman's Marine Wealth (2015)

Source: World Bank report, in collaboration with the Ministry of Agriculture and Fisheries (Formely), 2015

Initiatives like that concerning the dwindling of Kingfish stocks (Al Busaidi et al. 2015) need to be extended and repeated. Stakeholders (fishers from the Muscat Governorate, fishery managers and scientists) came to the consensus that the stock condition was not biologically sustainable. Remedies including control of fishing effort and technical measures were agreed as the best way to make the industry sustainable.

Reptiles

There are ten species of sea snakes recorded in the Oman Sea including two *Microcephalophis* and eight *Hydrophis* spp (Raeie-Alagholipour 2016) but little is known of their distribution except in so far as that sea snakes feed on shallow waters benthic fish that usually hide in crevices as for example in coral reefs. Breeding may occur during the cooler months.

All species in the Table below are of 'Least Concern' (IUCN 2016) except for Gunther's Sea Snake which has a 'Deficient Data' status and which is not listed from Oman (Gallagher 1990).

Species	Common Name
<i>Hydrophis schistosus</i>	Beaked Sea Snake
<i>Hydrophis viperinus</i>	Viperine Sea Snake
<i>Hydrophis curtus</i>	Shaw's Sea Snake
<i>Hydrophis platurus</i>	Yellow-bellied Sea Snake
<i>Hydrophis spiralis</i>	Yellow Sea Snake
<i>Hydrophis ornatus</i>	Ornate Reef Sea Snake
<i>Hydrophis cyanocinctus</i>	Blue banded Sea Snake
<i>Hydrophis lapemoides</i>	Arabian Gulf Sea Snake
<i>Microcephalophis gracilis</i>	Graceful Small-headed Sea Snake
<i>Microcephalophis cantoris</i>	Gunther's Sea Snake

Sea Snakes in Oman Sea

Source: Gallagher 1990

As it feeds on the surface, the Yellow-bellied is the most likely to be seen. While the Yellow is considered to be aggressive, the Beaked and Blue banded sea snakes are considered to be the most dangerous (Gallagher 1990). The snakes' fangs are not long enough to penetrate most wet suits and snake bites usually occur when fishermen retrieve their nets. However, snake bites in Oman appear to be rare and many of the so-called bites can be attributed to stings from stonefish or lacerations from stingrays (Scrimgeour et al., 2001)

The Dimaniyat islands are a major nesting ground for two of the five species of turtle found in Oman. There is a major colony of Hawksbills (*Eretmochelys imbricate*) and a smaller one of Greens (*Chelonia mydas*). Additionally, a small number of Hawksbills (*Eretmochelys imbricate*) and Greens (*Chelonia mydas*) breed on the beaches of the Shangri-La Bar Al Jissah resort where a turtle ranger protects the nests and hatchlings as they enter the sea (Barr Al Jissah Press release April 2017).

The egg laying activity of turtles is considered a tourist attraction for visitors but even in the larger populations elsewhere in the Sultanate this is currently not a sustainable enterprise (Al Busaidi et al 2018).

Like all breeding turtle populations some of the females remain close to their nesting ground for feeding while others travel long distances. Some Hawksbills from the Dimaniyat for example migrate down to Masirah where their beaked jaws enable them to explore crevices for sponges, anemones squid and shrimps. Conversely, some individuals of species that breed on Masirah (Greens, Hawksbills and Loggerheads, *Caretta caretta* and Olive Ridley, *Lepidochelys olivacea* (Rees et al 2012)-migrate north to feed in the Oman Sea and to Arabian Gulf.

The visibility of these turtle species depends on the size of the populations, the timing of their breeding and their diet. Green turtles will be the species most often seen having a large population, the longest breeding season and are herbivorous with a predominant diet of seagrass and algae requiring it to forage in shallow water. The absence of a breeding population and its open water pelagic existence and diet of jellyfish make the Leatherback the least likely species to be seen.

Birds

Seabirds rely on the ocean for food and land for reproduction. While the quality of the former is important for foraging, the availability of suitable nesting sites is crucial (Mannocci, 2013). The Dimaniyat provide one such location. Three species of terns, the Bridled (*Onychoprion anaethetus*), Greater Crested (*Thalasseus bergii*) and White-cheeked tern (*Sterna repressa*) and the Sooty gull (*Ichthyaelus hemprichii*) nest on Al Jabal al Kabeer island (Al-Fazari & Victor, 2014). These are four of the seven species of seabirds (Gallagher & Woodcock, 1980) in which breeding in the Muscat Governorate has been confirmed (Eriksen & Victor 2013) as shown in the Table below.

Breeding Seabirds	
Species	Common Name
<i>Phaethon aethurus</i>	Red-billed tropic Bird
<i>Anous stolidus</i>	Brown Noddy
<i>Ichthyaelus hemprichii</i>	Sooty Gull
<i>Thalasseus bergii</i>	Greater Crested Tern
<i>Onychoprion anaethetus</i>	Bridled Tern
<i>Sterna dougallii</i>	Roseate Tern
<i>Sterna repressa</i>	White-cheeked Tern

Breeding Seabirds

Source: Gallagher & Woodcock, 1980; Eriksen & Victor 2013

Another seven species with a confirmed breeding status that predominantly rely on coastal lagoon or open water marine food sources are shown below in the Table below.

Breeding Birds relying on marine food sources	
<i>Butorides striata</i>	Striated Heron
<i>Egretta gularis</i>	Western Reef Heron
<i>Pandion haliaetus</i>	Western Ospray

Gallinula chloropus	Common Moorhen
Charadrius alexandrinus	Kentish Plover
Charadrius dubius	Little Ringed Plover
Vanellus indicus	Red-wattled Lapwing

Breeding Birds Relying on Marine Food Sources

Source: Gallagher & Woodcock, 1980; Eriksen & Victor 2013

Oman also hosts large numbers of species of winter migrants from some of the same families as the breeding species. These include the Ardeidae (Herons and Bitterns), Charadriidae (Plovers and Lapwings), Laridae (gulls) and Sternidae (Terns) as well as from the Scolopacidae (Sandpipers and stints). As an example of the latter group more than 400 overwintering Red-necked Phalaropes (*Phalaropus lobatus*) were seen on a tourist dolphin watching cruise off the coast of the Muscat Governorate (Flood, 2016). These small birds ride out at sea feeding on planktonic invertebrates.

Reports of similar experiences from other bird watching tourists are common such as that of Bird quest's tenth trip to Oman in November 2017 where the ducks Garganey (*Spatula querquedula*), Gadwall (*Mareca strepera*), Eurasian Wigeon (*Mareca penelope*), Common Teal (*Anas crecca*) and Northern Pintail (*Anas crecca*) were recorded from the Qurum Mangroves⁶. Small groups of *Phoenicopterus roseus*, the Greater Flamingo also overwinter in the Governorate (Gallagher & Woodcock 1980; Eriksen et al, 2001).

Mammals

In waters off the Arabian Peninsula Baldwin et al (1999) identified 23 cetaceans (six whales and 17 dolphin species) that might occur in the inshore and offshore waters of Oman. These cetaceans vary greatly in size from the huge filter-feeding baleen blue and sperm whales (>20 m in length) to the small fish and squid eating spinner dolphins (<2 m in length).

In Oman in general, Bryde's, minke and humpback whales seem to be the most common of the baleen whales while the sperms and false killer whales are the most common toothed whales. Among the dolphins the humpbacks, the common, spinner, spotted dolphin and Bottlenose are the most common. The preferred habitat varies for each species such that humpbacks prefer shallow water and the bottlenoses sheltered in coves and bays. In open waters the common dolphins are seen in groups of 10 to 20 individuals or mixed with others, chasing fishes (Baldwin and Salm, 1994).

The Table below represents the twenty species that can be found in the Muscat area through observations made at sea and of records of stranding on the shore. The latter data is provided from the Oman Cetacean stranding data held at the Noman Natural History Museum and from Collins et al (2004). The species in red represent sightings by Minton et al (2010) while those of Baldwin et al (1999a) are shown as a set of symbols. Some sightings required confirmation while others were of solitary sightings ("i"), as for example the March and April sighting of Bryde's whale and the November and December sighting of the blue whale; other species were repeatedly observed ("y"). That sperm whales are common in Oman is also confirmed by the occasional finds of their highly unpleasant smelling vomit- ambergris (a). Khalid Al Sinani found a lump at Qurayyat (5 November 2016 Gulf News) that was worth a million riyals to the perfume industry.

Scientific Name		Common Name	Muscat		IUCN
Sub Order Mysticeti		baleen whales	sighting	stranding	Red Data listing
Family Balaenopteridae		the rorquals		7	
1	Balaenoptera physalus	fin whale	?		Endangered
2	Balaenoptera borealis	sei whale	?		Endangered
3	Balaenoptera edeni	Bryde's whale			Deficient Data
4	Balaenoptera musculus	blue whale	i		Endangered

⁶ See <http://www.birdquest-tours.com/pdfs/report/OMAN%20REP%2017-0-.pdf>

5	Balaenoptera acutorostrata	Minke whale	i		Vulnerable
6	Megaptera novaeangliae	Humpback whale	y		Endangered
Sub Order Odontoceti		dolphins and porpoises			
Family Delphinidae					
1	Delphinus sp.	common dolphin	y	7	Lower Risk
2	Grampus griseus	Risso's dolphin	y	1	Deficient Data
3	Neophocaena phocaenoides	finless porpoise	y		Deficient Data
4	Stenella attenuata	spotted dolphin	y		Lower Risk
5	Stenella longirostris	spinner dolphin	y	19	Lower Risk
6	Steno bredanensis	rough-toothed dolphin	i		Deficient Data
7	Tursiops truncatus	bottlenose dolphin	y	4	Deficient Data
Family Globicephalidae		toothed whales			

Dolphins and Whales Found in Muscat Governorate Area

Variations from the National Standards

Urban design guidelines will be prepared for Muscat city covering built form aspects not mentioned in the ONSS Planning Standards, with a particular emphasis on taller buildings given the focus of higher density mixed use development in the Muscat city urban area. The guidelines will discuss view corridors to the Al Hajar Mountains that will need to be maintained by buildings above a certain height. In addition, the guidelines will offer guidance on specific architectural and built form elements that can be included to reflect the traditional character of Muscat while allowing for new building forms that fit harmoniously in their surrounding context.

Key variations which are an important part of the RSS are described below:

- Primary Land Uses
- Community Facilities
- Parks and Open Spaces
- Urban Streets

Primary Land Uses

Variations to the built form parameters are recommended for the following land use categories:

- High Density Residential – Apartments
- Residential Mixed Use
- Commercial Offices

These variations are area-specific, as outlined below:

- **TOD Districts:** Development within the four TOD districts in Muscat city should be allowed to exceed the typical building height of G+10 (along with other building criteria, if deemed necessary) on a case-by-case basis, provided that the proposed development constitutes good planning and is consistent with the vision of the RSS. A reduced parking rate should also be outlined in the area action plan of each TOD district to encourage a shift towards public transport usage.
- **Ghala CBD:** Typical building criteria from the national planning standards will not be applicable within the Ghala CBD, as this district will be the site of landmark buildings that help redefine the skyline and built form of Muscat city. The “Muscat Grand Avenue” in Ghala will be the focus of high density mixed use and office development along its entire length, while preserving a view corridor to the Sultan Qaboos Grand Mosque. Landmark buildings in the district should retain architectural influences from the traditional built form of the historic settlements in the governorate, emphasizing white/lighter colour schemes and angular patterns. The master plan for Ghala and Muscat city urban design guidelines will outline specific guidance for new development in the Ghala CBD.

Community Facilities

The location of community facilities should be considered in relation to the public transport and NMT network in Muscat city as part of the structure plan for Greater Muscat. To the greatest extent possible, district and regional facilities should be located within the TOD influence area or less than 200m from an urban bus route. For neighbourhood and local centres, direct linkages to the climate protected active transportation network should be considered and implemented as part of their development to ensure that walking and cycling are the primary travel modes used to access these facilities. For local and neighbourhood centres, a limited supply of parking should be provided, recognizing that not all residents are able bodied and that driving will remain a requirement for a certain segment of the population.



TOD and Mixed-Use Areas - Transit oriented development and mixed-use area will form future urban language of Muscat city.

Parks and Open Space

While wadis and beachfront recreation areas are the focus of the park space strategy for the Muscat Governorate, additional parks will also need to be considered as part of the provision of community facilities. These parks, particularly larger regional parks, should abide by the same principles outlined for wadis and beachfronts areas, including an emphasis on linking them together through an integrated network of multi-use pathways or protected walking/cycling infrastructure. In addition, parks will need to be designed to serve both recreational and ecological functions, including serving dual purposes such as storm water management and connections to the urban drainage system, along with climate control to combat the urban heat island effect.

Urban Streets

The RSS recommends the preparation of active transportation guidelines alongside the develop of an NMT network for Muscat city as part of the structure plan for Greater Muscat. These guidelines will build upon the cross-sections provided in the ONSS Planning Standards to provide specific guidance on the appropriateness of difference NMT infrastructure (eg. multi-use pathway, cycle track, painted bike lane, sidewalks) depending on the road hierarchy and its relationship to the surrounding active transportation network. The guidelines will be tailor to the specific road cross-sections of major road corridors in the governorate that could benefit from active transportation infrastructure (eg. Sultan Qaboos Street, Muscat Grand Avenue in the Ghala CBD, 18th November Street, 23rd July Street).

Road safety improvements will also be achieved through the infrastructure audit and related safety study to identify recommended changes to existing roads and intersections in the governorate and consider changes, which should be reflected, in the next update of the MoTCIT Highway Design Standards. The existing design of many urban streets in the governorate privileges vehicle speed and uninterrupted movement at the expense of the safety and comfort of other road users, a systematic issue which will need to be addressed through design modifications, regulation and enforcement, and awareness campaigns.



Public Spaces and NMT Infrastructure

Iconic public spaces and streets defined through promotion of public transport and NMT modes are part of the distinctive strategies for transforming existing areas in Muscat city.

Development Control Regulations

Developing specific planning guidelines and development control regulations for the governorate is needed in order to realize the RSS objectives. The Muscat RSS is a broad strategy which needs to be taken forward through more detailed planning documents and development control regulations to enable national and local governments to regulate urban and rural development in a transparent manner which can facilitate social equity and private sector investment. The following development control regulations needs to be further illustrated through detailed studies.

- **Urban Form Controls:** Development control regulations are designed to guide a settlement's future urban form. In the context of Muscat City, the following urban form control regulations will structure its future built environment:
 - Residential area densities ranging between 125 to 225 pph;
 - A floor area ratio (FAR) between 100 – 300;
 - Maximum building height of 50m in commercial and mixed use areas, and a max height of 30m in residential area, unless subject to area-specific regulations;
 - Building footprint regulations (to be developed).
 - Skyline/ view corridors regulated through height restrictions to achieve a desired visual form in unique areas of the city.
 - Min. 10-15% allocation of urban area towards allocation of open and greenspaces.
- **Cultural Conservation Areas and Other Heritage Areas:** Cultural conservation areas and landscapes will need specific development controls and guidelines to control development within their boundaries in order to retain their cultural heritage significance. Development control regulations for these areas will include:
 - Permission before changing or demolishing existing structures and buildings.
 - Specific building height, footprint, street elevation, and building use controls.
 - Special Permission from MoHC before altering any of listed heritage structure.
 - Prepare enhancement plans for the conservation areas.
 - Building and development controls for the surrounding precincts of heritage buildings, areas of national importance, and Scheduled Monuments.
- **Special Planning Zone (SPZ):** A Special Planning Zone is delineated in the Al Hajar mountains to provide protection for areas where interaction between natural environment and human activities creates a distinct character. The SPZ is a combination of ecological, geological, and cultural processes and requires development control regulations in order to protect its ecological, geological, and cultural features. The SPZ will be given the *IUCN Category V Protected Landscape* and some of the more environmentally sensitive landscapes within the SPZ may be given higher order of protection as per the *IUCN Categories I-IV*. The Authority for the SPZ in the Muscat Governorate need to focus on the following areas.
 - Development of settlements, industry, and infrastructure projects are carefully monitored through detail control regulations and monitoring process.
 - The SPZ Authority (SPZA) will need to legally demarcate the SPZ boundary and, if need be, carryout modifications to the boundary to protect areas of environmental significance.
 - Identify additional buffer zones/transitional areas to monitor development activities at the boundaries of the SPZ.
 - Carryout out extensive mapping of natural, geological, human settlements, and natural habitat systems on a regular basis.
 - Prepare a Management Plan (SPZMP) tailored to the unique characteristics of each governorate.
 - Promote eco-tourism within the SPZ that will have minimum impact on the natural, environment. Prepare an eco-tourism plan for the SPZ, including restrictions on the number of visitors, the development of ecotourism infrastructure, and restricted areas with highly sensitive environmental or geological conditions.
 - Control and regulate mining activities to ensure the minimum possible impact on the SPZ. Carryout environment rehabilitation of abandoned mining areas located within the SPZ.
- **Protecting Environment Sensitive Areas:** Development control regulations for SPZs will be in accordance with the ONSS and managed by the SPZ authority. With respect to other areas of environmental importance:

- The Al Hajar mountains area above 5% slope outside of the SPZ have been designated as Inappropriate Development Areas.
- Wadis, which are important part of the resilience to climate, change issues in the governorate.
- Regulations on sand dunes and other natural features of special importance.
- **Development Control Regulations for Vernacular Settlements:** There are number of smaller village settlements, which are less than 5,000 population, for which Urban Change Plans (UCPs) have not been prepared as part of the RSS. These settlements will also require development control regulations, including:
 - Settlement growth boundaries;
 - Building use and height controls; and
 - Building materiality and design controls etc.

Development Guidelines for Urban Districts

Development guidelines are needed to better articulate the vision for urban areas in Muscat City. The government will carry out further studies to realise the potential of these area through Project Feasibility Studies and Area Action Plans. The focus of these districts should be on the following planning elements:

- **Mixed Use Development:** Promoting mixed use has several advantages that make cities and urban areas more liveable and sustainable. Mixed Use districts in Muscat City include Madinat Al Irfan, Ruwi, Qurum, Ghubra, and Al Khuwair. Special development control regulations may be necessary for these areas.
- **Transit Oriented Development (TOD):** To promote a transit-supportive built form in the four TOD zones of Muscat City, along with the TOD influence area, will require the following urban interventions:
 - A fully developed non-motorised transport (walking and cycling) network in the 400m radius surrounding rapid transit stations;
 - Last mile connectivity through public and para transit solutions;
 - Higher density development (225+ pph);
 - Mixed use development; and
 - High quality intermodal facilities (e.g. park-n-ride, bike storage).
- **Neighbourhoods Development:** To improve existing residential areas in Muscat city the following guidelines are recommended.
 - Improve the quality of public parks, children parks, and gardens;
 - Bridge the social infrastructure gap in neighbourhoods;
 - Provide NMT infrastructure, including traffic calming wherever feasible; and
 - Improve neighbourhood centres and markets.
- **Wadi Parks:** Several major wadis cross through the Muscat city area, originating in the Al Hajar mountain range and terminating in the Sea of Oman. Wadis are unique assets that can help further the resilience of the city with respect to climate change and flooding events. It is recommended that detailed project reports be carried out for each wadi park with respect to the following aspects:
 - Retain the hydrological “sponge” capacity of wadis to help manage flooding and general drainage;
 - Connect wadis with their surrounding neighbourhoods and the city’s system of public spaces with improved accessibility through NMT and public transport;
 - Remove or reorient high volume roads that restrict connectivity between neighbourhoods and wadis parks; and
 - Remove any encroachments in wadis, which restrict their hydrological capacity.
- **Areas of Special Interest:** There are several areas of special interest/importance which fall outside the Cultural Conservation Areas in the Muscat city area, but which possess high architectural, community, tourism, and/or public space potential. It is recommended that special projects be carried out in the city to improve its urban image through their development:
 - **Sultan Qaboos Grand Mosque and Surrounding Precinct:** traffic calming measures on surrounding streets, the development of additional public spaces, improved linkages to surrounding neighbourhoods and the Ghala CBD.

- **Beachfronts:** There are five major beachfront areas in Muscat city, which will be developed as public spaces for recreational, and tourism purposes: Mutrah, Qurum, Al Khuwair, Azaiba, and As Seeb. Potential improvements include NMT infrastructure, improved public transport access, landscaping and urban greenery, visitor facilities, and parking facilities.
- **Hilltops:** Muscat has a unique geographic setting due its location on the coast alongside the backdrop of the Al Hajar mountains. Select hilltops should be identified which can enable views of the city without requiring significant physical alterations to the surrounding landscape.

Tools and Regulatory Instruments

The Governorate needs to take forward the planning process by developing a series of legal documents which help regulate development:

- **Structure Plan for Greater Muscat:** Preparing a structure plan for Greater Muscat is necessary in order to properly regulate future development, including zoning overlays and a land use map.
- **Urban Master Plans:** There are number of smaller settlements in the Muscat Governorate for which Urban Master Plans, including associated urban zoning plans and a land use map, can be prepared to guide and regulate their growth.
- **Urban Transformation Areas:** Area Action Plans are required for the following urban transformation areas:
 - Redevelopment of Ghala;
 - Regeneration of Ruwi, Ghubra, and Al Khuwair;
 - Enhancement of Qurum, Rusail, and the Mabailah Industrial Area; and
 - Cultural Conservation Area Plans for Mutrah and old Muscat.

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9.3. Dhofar Governorate

Introduction

This section provides background information about Dhofar's regional distinctiveness that helps to interpret and apply the National Planning Standards and will recommend, where appropriate, specific Regional variations. This section includes the following sub-sections:

- Climatic Response
- Cultural Influences/ Traditional Lifestyles
- Settlement Pattern
- Vernacular Architecture
- Regional variations

Administratively, Dhofar is one entity, but the region is usually divided in three distinctive areas, with each a different interplay between climate, geomorphology, biodiversity and history of human settlement and occupation that could result in a slightly different approach towards applying Planning Standards:

- The coastal zone south of the mountains (and including the Greater Salalah conurbation).
- The hilly and mountainous landscapes of the Dhofar Mountains chains.
- The interior desert including the stony plains of the Najd and the sand desert of the Rub' al Khali.

If relevant, each of these distinct areas will be mentioned separately in the next sections.

Climatic Response

Dhofar's climate coincides with the three geographic areas mentioned above, clearly divided by differences in annual rainfall and average temperatures. Precipitation is highest in parts of the Dhofar Mountains, while average temperatures are highest in the northern Najd.

In the coastal zone, including the city of Salalah, there is a significant drop in temperatures around July and August when the Khareef starts with coastal winds bringing moisture from the sea at night. Although the Khareef brings precipitation from fog or rain in the coastal areas, it is less than in the Dhofar Mountains range.

Human occupation had used several strategies in response to climate challenges, with annual migration being one of the most obvious strategies both for interior groups as for the ones in the mountains, each in a different pattern, while coastal villages were more or less sedentary and traditionally built in informal patterns making optimal use of coastal winds and to reduce solar irradiation. More recently, interesting new experiments have been done with climate adaptive housing that is energy neutral, as is shown in the Figure below.



Pilot Project of Climate Neutral Houses in Ash Shuwaymiyah

Cultural Influences/ Traditional Lifestyles

Cultural influences in Dhofar derive from many different sources. The region has a long history evidencing a plethora of groups that left its traces across the region. Various groups occupied the lands, were concurred and replaced by others, or sometimes merged with their enemies. Today's dominant Arab culture is richly infused with regional distinctive elements from proto-Arabic and other cultures.

Of all the different cultural influences and lifestyles, the Jebali groups, inhabiting the Dhofar mountain chain, are widely seen as the most prominent and distinct element in Dhofar's cultural landscape, because of the use of their own language, and the traditional herding of camels as an important part of their identity. The "transhumance", the annual vertical migration of camels from the mountains to the Salalah plains, described in detail elsewhere in this report, is another important element of cultural importance, which is being threatened by ongoing sprawl in the foothills north of Salalah.

Less recognizable but still distinct are the various groups of Bedou, who more or less have settled permanently in the major villages across the Najd. Today, most Bedou hold to relatively traditional culture of keeping livestock, often supplemented by other sources of income. Because of the mobile lifestyle, housing traditionally consisted of simple structures produced from natural materials that could be easily transported to other locations if the need arose, for example in search of better grazing.

Salalah is an ethnically and culturally mixed city thanks to migration from other parts of Oman as well as (temporary) immigration by expats. Influenced by a general Arabic culture, the city has grown to become an average Omani city. The lifestyle in the city is still somewhat more traditional than compared to Muscat, for example witnessed by the more traditional role of women in society, larger and extended families and a certain level of resistance to modern influences.

Bedouin fishermen have lived a rather isolated life in the harsh, barren coastal plains, away from Salalah and from inhabited land and nearby the nutritious fishing grounds at sea. Life in these villages was and is about fish: fishing, processing, trading, net repair, boat building etc. Besides a secure base of income, fishing was a way of life.

Settlement Pattern

Settlement patterns in Dhofar vary between the coast, the mountains and the Najd.

The coast is dominated by Salalah's modern urban grid structure, with a traceable historic core around the horticulture belt and a layer of modern urban extensions around it. The agricultural past is still being sensed inside the city, with coconut palm trees and banana groves near the sea and camels rooming around in the

foothills and open spaces in and around the city. The older parts of the city have deteriorated over recent years and need attention.

The modern areas of Salalah have a settlement pattern similar to other major cities in Oman:

- A somewhat fragmented urban area with a historic downtown area from the second half of the 20th century and newer subcentres in other parts of the city, often around malls.
- Historic villages of which the location was based on the proximity to agricultural areas or the coast for fisheries or trade. This is case for the villages of Al Husn, Hasilah, Al Hafa, Dahariz and Al Zahra.
- New residential suburbs with standard plots in rectangular grid patterns in both the central parts of Sahalnout and Salalah al Wusta, with the western suburb of Awqad having a slightly more imaginative urban plan.
- A system of oversized main roads / highways connecting the disjointed parts of the urban area, as well as a port and an airport.
- Functional zoning with large industrial areas separated out in industrial areas in the Raysut area of the city.

The mountains have a more or less organically grown settlement pattern with small villages still growing organically and threatening the pastures surrounding it. The settlement pattern of the mountains is described in more detail under SPZ section in this report.

The landscape of the Najd is open with long distance views, villages are visible from a large distance and make a mark on the horizon. Settlements in the Najd hardly have any historic traces and mainly consist of modern designed blocks in an orthogonal pattern around a central square with community facilities. The mosque is usually a visually dominant feature, other buildings are lower or modest. A general lack of trees generates a somewhat harsh and windswept townscape.

Vernacular Architecture

To define a distinct vernacular architecture for Dhofar is not easy. Although archaeological findings in Sumhuram and in Ubar have disclosed stone structures, they have not left specific architectural details such as forms of rooftops, internal structures, decorations, paint colours or ornamentation. Other, still visible traces are the few historic buildings and castles in Mirbat, Taqah and Al Husn in the centre of Salalah. These are mostly stone rendered buildings. Some buildings have modest decorations, with a specific type of roof molding, not found elsewhere in Oman, that could be used as part of a vernacular architecture (see Figure below)

As stated before, other areas in Dhofar were mainly inhabited by migrating groups and have not left strong architectural marks because of their mobile lifestyle. Their housing traditionally consisted of simple structures produced from natural materials that could be easily transported to other locations. The most significant are the round “houses” derived from the original dome roofed tents in the Dhofar Mountains (see Figure below).



A Traditional House in Al Husn



Traditional Round Houses in the Jabal al Qara (RHDHV)

Variations from the National Standards

The general descriptions in the previous sections have provided the background to which the following Variations to the Planning Standards have been formulated.

Since the Dhofar Mountains are fully covered by an SPZ, variations from the Planning Standards for this particular area are covered under **Section 4.1.2** regarding Regional Standards for the Special Planning Zones and are therefore not included in this section.

Primary Land Uses

- Create a multi-layered and site-specific grid that allows exceptions such as diagonals, open spaces, curved lines and design the grid edges.

- Preserve and enhance the views to the sea and mountains from Salalah (by using optimal use of the grid).
- The grid lines should be open to the north-south direction for wind and for mountain/ sea views. Adapt the profitable characteristics from north/ south wind and sun power and protection/shadow in patterns.
- Consider and reuse organic street patterns in (re)development areas.
- Add a “rural house” to the housing typology to prevent urban structures to become dominant in rural areas. A planning standard for a rural house should consist of a single storey house with a minor second storey on a plot with less than 20% build up area.
- Also, create the “farmhouse” as a variation, for farm plots with less than 40% of the plot being built-up area. The buildings should be forming a harmonic ensemble together to enhance the Dhofar contextual architectural character.
- Design buildings with contextual architecture, create more difference from the current MOH typology and involve architects.
- Create a new more differentiated MOH typology on the plots (aspire the openness of the original Dhofar culture in detached plots, no closed walls, windows in houses, green on the plot, not fully 100 % but 50% built-up plot, different shapes for the buildings on a plot.
- Strive to achieve a contemporary local vernacular in appearance, with pitched or dome shaped roof shapes, elevation colours fitting the landscape, local stone in the facade, modest decoration.
- Integrate high quality contemporary building techniques. To be used to create high energy performance (U value less than 0.25), sustainable building designs with a low carbon footprint.
- In Salalah, allow the unique climatological circumstances to be visible in the architecture, by using planted elements such as veranda’s and overhanging structures, to bridge indoor and outdoor, and to provide shade in sunnier months.

Community Facilities

- Create more variation in the look and scale of School buildings and make them fit for the local context, use the subtropical and moisture aspects of the climate in creating shadow by planting trees or large overhanging canopies.
- Design facades with natural ventilation for use in the appropriate season.
- Create outward looking open buildings with inside and outside spaces.
- Health centres, Hospitals and other government buildings should be using the same principles: fit for purpose and contextual architecture.

Parks and Open Space

- Parks and open spaces should form a network between the sea and the mountains.
- The north-south wadis provide a park framework that can be used as a base for an accessible park system to accommodate water, nature, and recreation.
- Preserve the akhwar and restore the mangroves that have been closed from seawater.
- The beach should be public and always be accessible for pedestrians. Cars to be banned from beaches in the towns.
- The unique climate provides the opportunity for sub-tropical planting. Parks could experiment with the botanical richness of Dhofar.
- Enhance and revitalize the agricultural belt in towns and villages; food providing green is a great asset to a liveable build environment.
- Keep large open spaces between the new developments in the Jarbeeb and keep the urban fabric from Salalah and Taqah separated with a landscape park and the palace and Royal Gardens and the 100,000-coconut palm tree project.
- Create and add small communal green areas in the urban fabric. For example, for every 500 houses a plot of 50 x 50 metres. With larger trees to provide shade and with some grass or to sit and play, ornamented with indigenous plants.

Urban Streets

- The special climate in Dhofar is a great opportunity to provide liveable, enjoyable and walkable spaces for pedestrians and cyclists, and should be regarded as an opportunity to create something specific in a predominantly car-orientated urban environment.
- “Greenification” of the urban grid-pattern structures (Greening the grid), allow the Khareef to provide a more tropical character to the variation of streets. Integrate major streets, such as Ar Rubat and As Salam Street in this green network.
- All major urban streets should have dedicated cycle lanes.

- Create shade where possible; wider streets and avenues should be treelined, narrow streets use buildings to provide shadow.
- In the urban areas, create every 300 metres a resting point in the street with a small green shadowed area with seating.
- Rediscover and revalue the original mostly organic patterns. Create a new and careful balance in street patterns for each village/hamlet with orthogonal and organic patterns.
- Make or allocate an existing village focal point; close to the mosque or shop and create a green lush space with indigenous trees; this can be sized to fit the scale of the village.

Utilities Infrastructure

- Visual and environmental impact of overhead transmission lines and other utilities to be researched before implementation and construction. Consider the special status of the Dhofar Mountains and the visual impact of such transmission lines in and around Salalah.
- Sewage plants, cement plants, desalination plants, oil and gas installations to be as much as possible visually integrated in the landscape.
- Self-sufficiency is a viable option in several areas of the Dhofar region: energy, solar power, water wells, sewage in modern septic tanks, internet connection.

Dhofar Mountains SPZ

Introduction

While the Regional Variations to the National Planning Standards as described in **Section 4.1.1** are more generic and applicable to the entire Governorate of Dhofar, the Variations for the Dhofar Mountains SPZ focus on this unique area with its special features and traditions.

These specific Standards for the Dhofar Mountains SPZ should be understood from a holistic perspective and in the context of the overall strategy and management for the Dhofar Mountains, its ecosystem and its grazing traditions as described in the **Policies SD11** and **FS4 (Volume 1)**.

Geography and Climate

The Dhofar Mountains are the mountain chain running in an east-west direction parallel to the coast of Dhofar. The range consists of the western Jabal Qamar near Yemen, the central Jabal Qamar close to Salalah and the eastern Jabal Samhan north-east of Mirbat. The Jabal al Qara, located closest to Salalah, is the most densely populated area, followed by the Jabal Qamar in the west. The eastern Jabal Samhan is (nearly) uninhabited.

During the annual Khareef, an upwelling of cold seawater in the Arabian Sea cools the moist winds coming from the sea to dew point, causing a dense fog to form against the seaward-facing escarpments of the Dhofar Mountains. As the low cloudbank moves inland, it cannot rise because of a temperature inversion created by the flow of warm dry air from the desert inland, so the fogs are trapped against the escarpment. The Khareef results in much higher precipitation levels (rain / fog) in the Dhofar Mountains than other parts of Dhofar.

Cultural Traditions / Lifestyles

Historically, the area is inhabited by Jebali, who live on the southern (sea facing) slopes of the Dhofar Mountains. They benefit from a favourable climate to make a living from livestock and camel keeping, for which the environmental conditions are suitable throughout most of the year. Camel herders adapt to the climate by migrating to the coastal plain during Khareef, when the weather is wet and humid in the mountains.

Although it is widely recognized that keeping cattle, goats and camels is an essential aspect of the traditional way of life for the Jebali, animal numbers have however grown far beyond what the area can sustain. **Policy FS4** in **Volume 1** therefore calls for government intervention to introduce measures reducing numbers of animals and improving rangeland management.

Settlement Pattern

Most Jebali families had no permanent housing. Temporary structures were made from materials available in the natural surroundings that could be easily transported to other locations if the need arose, for example in search of better grazing. Permanent settlements started to develop only in the 20th century in response to increased standards of living.

The resulting settlement structure of the Dhofar Mountains has over time grown into a dispersed pattern of habitation with a rural sprawl of farms that are located individually or in small groups or hamlets. While many settlements seem to be mostly inhabited by members of the same tribe, some more random houses and enclosures are found throughout the area.

Some settlements have developed into larger villages with some commercial services, schools and healthcare facilities. These key settlements are assigned to further grow and help to contain sprawl over other parts of the mountains:

In the Jabal Al Qara: Tawi Atayr, Jibjat, Titam, Qayroon Hayriti, Madinat al Haqq and Zayk.

In the Jabal Qamar: Sarfayt, Ajdarawt, Shahb Asayb, Dalkut and Rakhyut.

Jebel Samhan is uninhabited and should remain so.

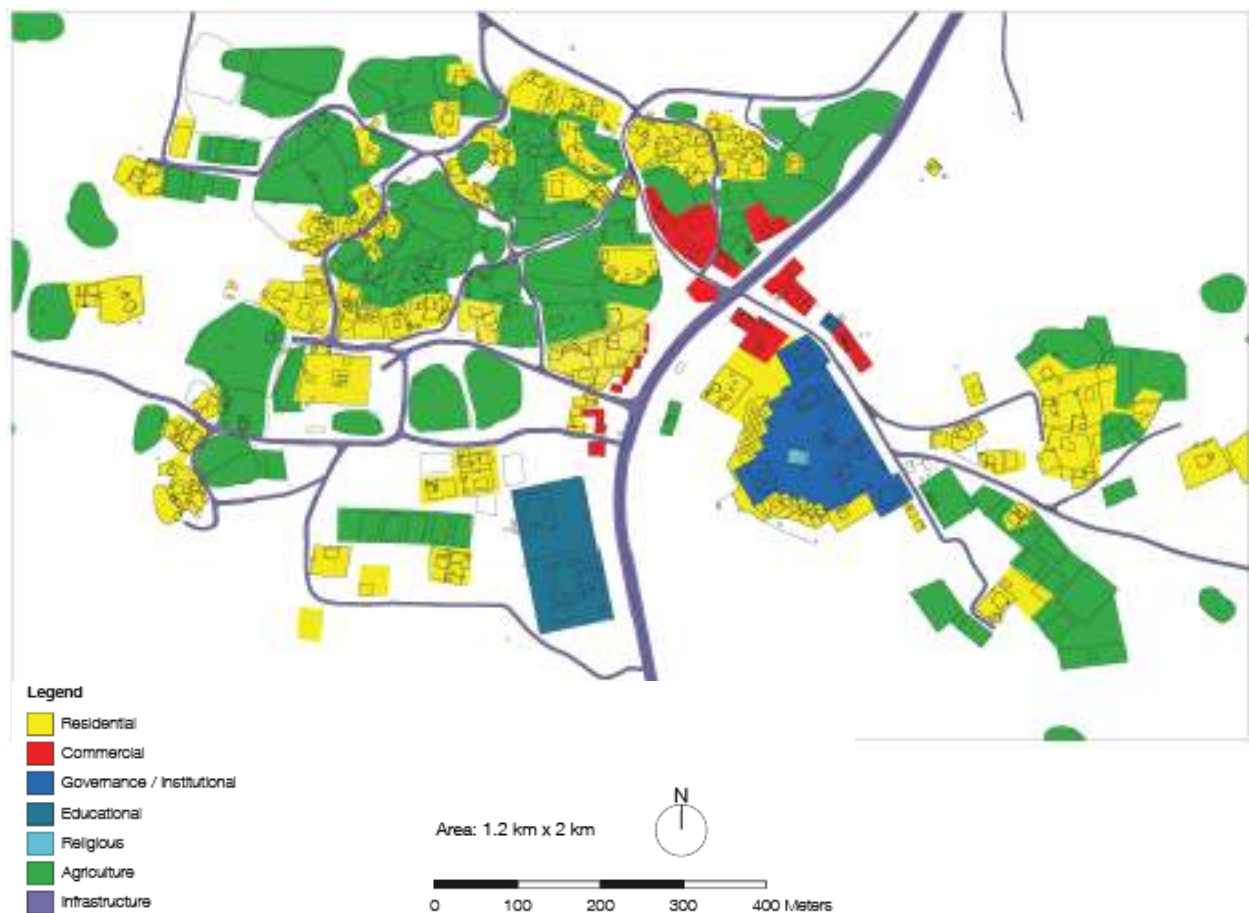
An increased residential sprawl is witnessed in parts of the mountains that are more easily accessible from Salalah, evidencing the fact that city residents are building second homes in the cooler mountains. Stakeholders have voiced concern about such urban sprawl, demanding a stop of housing construction except for mountain residents.

Furthermore, the RSS delineates settlement boundaries as per **Policy SD2** showing boundaries within which new housing should be concentrated, as to prevent rural sprawl in random locations (**Policy SD8**). This requires greater clarity on the current land ownership situation (**Project 02.SD8.1.1-1**). New houses are added on random

locations and in effect enlarging the town extend. This process of sprawl will now be contained by adhering to the new settlement boundaries. Construction of individual houses outside of these settlement boundaries must be prevented.

Village Structure

Villages have grown organically, and houses are some distance apart, with stone walls around the plots for keeping livestock inside the enclosure. Most villages have a lot of open, green spaces without a specific use. Shops and commercial services are generally located around the main intersections of towns, while community facilities such as schools and health centre are situated along the main roads. Overall, buildings in the village are spread out in a seemingly random informal pattern. The example of Madinat al Haqq is shown in the Figure below.



Land Uses in Madinat al Haqq in the eastern Jabal al Qara

Mountain Housing

At the level of the individual home, housing traditionally consists of modest structures made of wood, with animal enclosures near the house, creating a decidedly rural atmosphere. Plots are large, in the range of 1,000 to 2,000 square meters. Traditional 'round houses' were used, which are made of tree branches and grass, though only a few examples have survived, and these are no longer used for habitation.

Currently, almost all housing is built in concrete, mostly modest in size, but increasingly quite similar to typical villas common in cities. Houses are now built in a wide range of sizes and shapes, making use of a variety of (modern) construction materials.

Variations from the National Standards

The following suggested variations from the National Planning for the Dhofar Mountains SPZ may need adjustment with further details for specific locations, once an integrated Management Plan for the SPZ has been approved and implemented (**Project 02.SD11.1.1-1**).

Primary Land Uses

Regarding settlement structures and villages:

- Compact development is essential to prevent further urban sprawl from impacting the productive rangelands or the scenic qualities of the landscape. All development should be within the 2040 settlement boundaries, within which there is sufficient room for infill development (**Volume 1; Policy SD2**).
- Villages have grown organically, and houses are some distance apart, with stone walls around the plots for keeping livestock inside the enclosure. New developments should fit this organic pattern.
- Villages should keep their rural character with open patterns and sometimes plots are detached from each other; by no means should grid-like or other serial structures appear.
- Additional built structures for agricultural activities, e.g. for livestock keeping such as stables or enclosures, are allowed in proximity (500 meter) to existing settlements
- The landscape must always dominate villages, not vice versa.
- Buildings on hill tops and ridges are not permitted.
- Hierarchy in village contour; mosque is dominant, other buildings are lower.
- Large scale commercial activities, industrial development, major urban expansion areas, large utilities or major infrastructure are not allowed.

Regarding residential functions:

- Construction of new houses is only permitted in response to demonstrated demand and economic necessity by a local household and within the 2040 settlement boundaries. No second homes for people that own a primary house in Salalah.
- Additional built structures for agricultural activities, e.g. for livestock keeping such as stables or enclosures, are allowed in proximity (500 meter) to existing settlements (refer to policy FS4 for further details on this requirement).
- New houses in urban typologies such as villas and town houses are not permitted. All housing should be either of the "rural house" or "farmhouse" type. Variations within the typology, e.g. with subtypes is encouraged.
- Create a new and more differentiated typology in the mountains, aspire the openness of the original Dhofar culture in detached plots, no closed walls, windows in houses, green on the plot, plots not fully built-up, different shapes for buildings on a plot.
- Strive to achieve a contemporary local Jebali vernacular in appearance, with for example pitched or dome shaped roof shapes, elevation colours fitting the landscape, rooftops with green turf (eco rooftops), local stone facades and modest decorations.
- Three seasons architecture: extra attention for the climatological aspects of the three dominant seasons. In the Khareef: openable windows and shutters for natural ventilation. To prevent staining with algae and other fungi, use only materials with a natural look and colour that fits the landscape. In the cold period the north elevation should be closed against the cold wind. In the hot period the roofs should have a U value less than 0,16 W/m2 and the walls should be able to absorb the heat and have a U value of less than 0,25 W/m2. These seasonal aspects give a challenging possibility for a specific contemporary Dhofar Jebali aesthetical characteristic.
- Preserve the historical round houses and find a new use for those structures.

Community Facilities

- Given communities are dispersed across all parts of the mountain areas, particularly in the Jabal Qara. Over time, facilities should be concentrated in the main rural villages.
- Buildings of community facilities require a site-specific design that fits the local context, make use of elevation in the landscape and fit the local context for size and the use of materials.
- If appropriate, multiple uses should be combined in one building (Integrated Facilities).

Parks and Open Space

- Given the open landscape of the mountain areas, the open settlement structures which are interspersed with open spaces, the need for specifically designated parks and open spaces is less pronounced than in regular urbanised areas.

- Make or allocate an existing village focal point; close to the mosque or shop and create a lush green space with indigenous trees, some benches or flat area to sit, this can be sized to fit the scale of the village.

Streets

- No new roads are allowed to connect to remote settlements. Roads are known to attract urban development, may have strong negative impacts on local eco-systems by causing habitat fragmentation, and open up previously inaccessible areas for grazing.
- Minor upgrades of local roads (e.g. traffic safety measures) are allowed.
- New streets within the settlement boundaries should follow the original organic curved and mountain contour as a leading development principle.
- New streets within settlements boundaries should be designed by using trees to provide shade and to encourage walking.

Utilities Infrastructure

- There is a presumption against the alignment of new utility corridors through the SPZ. Such development is only allowed if alternative options are not reasonably available (considering economic, social and environmental aspects). In this case, corridors must be carefully integrated in the natural landscape.
- For reasons of cost-efficiency, the construction of centralised utility systems (water, sewage) to all parts of the Dhofar Mountains is not advisable.
- The main settlements of the Jabal al Qara should be connected to a centralised drinking water system, while existing dispersed buildings may continue to use trucked water
- Decentralised wastewater treatment systems for the larger settlements could be considered. Individual homes may use eco-friendly septic tanks.
- Solar power on rooftops is encouraged to provide electricity for local demand. Wind turbines are not allowed.

Coastal SPZs

Introduction

A substantial part of Dhofar's rich coastal waters are being assigned as Coastal SPZ and divided over two distinct areas. One coastal SPZ is located in the west, adjacent to the Dhofar Mountains SPZ stretching over the wilayah of Dalkut and Rakhyut and up to Raysut. The second coastal SPZ is in the east, stretching from Mirbat to Ash Shawaymiyah, including the Hallaniyat islands. The Planning Standards described in this section are applicable to both Coastal SPZs.

Planning Standards for the Coastal SPZs should be understood in the context of the overall strategy and management for Dhofar's unique environment, its coastal and marine ecosystems and its rich biodiversity (**EMS** in **Chapter 5**), a Coastal Zone Management Plan (**Policy CE1**) and Marine Spatial Planning (**Policy CE3**) of the RSS documentation.

Planning Standards for Coastal SPZs are to be applied for the purpose of controlling building activities in and near ports and for port-related constructions as well as for potential building activities on islands, beaches and coastal areas under the SPZ authority.

Planning Standards for Coastal SPZs also include the ocean-facing parts of coastal villages, near ports and beaches. Planning Standards focus on a better integration of those built environments within its coastal context.

Variations from the National Standards

Primary Land Uses

- Any new development along the coast will need to adhere to the general setback of a minimum of 300 meter. In cases where 300 meter is not feasible, additional measures should not require out-of-scale engineered solutions (such as large break waters, dams and dikes) but rather look at nature-based mitigation.
- No high buildings (more than 3 storey) on the SPZ coastline are allowed and so to keep the natural coastline "readable" from a distance with only minor landmarks such as lighthouses and mosques. No building on clifftops are allowed.
- No building activities allowed on the Hallaniyat Islands other than for the purpose of nature conservation and / or defence. Should buildings be required, they are to merge with the natural landscape, are modest in scale and use natural colours and materials.

Community Facilities

- Not applicable

Parks and Open Spaces

- Keep beaches public as much as possible, and apply litter control with heavy-duty sealed garbage bins that are emptied and maintained regularly.
- No facilities such as restaurants, coffeshops and parking are allowed on beaches and on cliffs. Cars are generally banned from those places but are allowed at specifically designed and maintained picnic spots.

Streets

- Not applicable

Utilities and infrastructure

- The development of large ports, break waters, port buildings and the development of high capacity roads and cranes is not allowed, since this scale and type of such developments does not match the character of these coastal areas.
- New ports and port related activities and constructions should fit and adapt to the natural coastal landscape and should adhere to strict environmental regulations.
- New break waters should not block sea views from villages.
- No wind turbines are allowed inside Coastal SPZs.

Rub'Al Khali Wilderness Area

Introduction

The Rub al Khali is the northern sand dune desert that extends into Saudi Arabia. It is a striking landscape largely untouched by human influences and the presence of very few permanent settlements. Traditionally, the area is used by Bedouin tribes who used to roam freely through the areas that are today in Oman, Saudi Arabia and the UAE.

Planning Standards for the Rub'Al Khali Wilderness Area should be understood in the context of the overall strategy and management for Dhofar's unique environment, its ecosystems and its rich biodiversity (EMS in **Chapter 5**) and the proposed designation of this area as IUCN category IB area (**Policy TE1 in Volume 3**) of the RSS documentation.

Building activities in the Rub'Al Khali Wilderness Area are mainly tourism related. Several tourism related developments are currently being planned near Mitán and Al Hashman. A resort near Muqshin will mostly benefit from the natural scenery of Wadi Muqshin but is also situated in close proximity to the Rub al Khali sand dunes area.

More developments may be considered in the future, for instance as part of the initiative by the Ministry of Heritage and Tourism to promote tourism activities in the Rub al Khali wilderness cluster. Future (tourism) activities proposed in the area should be regulated through one or more area specific management plans. Buildings and constructions to support activities related to the military, border patrol and national security are exempted from the Variations below.

Variations from the National Standards

Primary Land Uses

- While allowing for enough distance between resorts and tented camps, developments should be concentrated in areas that are well accessible e.g. near Muqshin, Al Hashman and Mitán.
- Within those areas, new resorts can be developed and may include temporary as well as permanent structures but have to be sensitive to the natural landscape and use appropriate zoning.
- Buildings should be modest in size and have a maximum height of one storey. If by exception, there is a necessity for a minor second storey then this must be integrated in the view of the surrounding landscape.
- All buildings, common areas, maintenance and staff facilities, as well as any associated structures should be designed as a whole and well-integrated in harmony with the landscape.
- Consider the climatic conditions – with large differences between high daytime temperatures and cold nights – in the design of the area and individual buildings. Apply energy saving and green building principles as much as possible.
- Camps should use “low lumen” lights in the evenings and there should be no visibility of the use of lights between the darkness of the night approximately 10 pm and 4 am.
- Camps should consider avoiding excessive off-road driving inside the sensitive desert ecosystem.
- Camps should not leave any traces (no septic tanks etc) and should use a minimum of light and electricity.

Community Facilities

- Not applicable

Parks and Open Spaces

- Not applicable

Streets

- Not applicable

Utilities and Infrastructure

- No overhead transmission lines
- No wind turbines and solar parks are allowed inside dunes

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9.4. Al Buraymi Governorate

This section presents the Regional Planning Standards for Al Buraymi Governorate. The regional standards complement the national standards and illustrate the regional specificities. The regional planning standards take into consideration Al Buraymi Governorate's specific physical environment and built character.

Relationship with the National Planning Standards

At the national level, the ONSS Planning Standards have been developed to support the future Vision of Oman and to provide development regulations and guidelines to ensure the development of high-quality places and communities which encompasses the ONSS Vision and Objectives.

The National Standards will apply to each governorate and will be supplemented by any regional specific standards. As well as aiming to achieve the national ONSS Vision and Objectives, the Regional Standards will also aim to achieve the Regional Spatial Strategy Vision and Objectives, and support the planning policies, which were outlined in Volume I.

National Urban Design Guidelines

The National Planning Standards set out 10 Key Community Design Principles, which underpin the vision and overall goals of the Standards, in order to create socially, economically, environmentally and culturally attractive and viable places to live, now and in the future. The 10 principles are listed below (page 23 of the National Planning Standards) for reference as each Regional Planning Standard for the Governorate shows which principles it will enable.

- Climate Responsive
- Cultural Inspiration
- Character
- Ease of Movement
- Liveability
- Places of Quality
- Sustainability
- Social Inclusion
- Legibility
- Vitality and Viability

Sustainable Development

The objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs. The ONSS and RSS 20-year spatial planning frameworks set out a way of delivering a better balance between social, economic and environmental dimensions, either directly or indirectly. Spatial development in Oman should aim to minimise impacts, maximise benefits and actively seek opportunities to secure gains for the country's citizens across the economic, social and environmental dimensions. At a regional level, in Al Buraymi, this might involve the following:

- Protecting and mitigating the population against extreme weather conditions, such as drought and prolonged periods of extremely high temperatures (social and environmental);
- Protecting and supporting cultural influences and traditional lifestyles, such as agriculture (social and environmental);
- Reinforcing cultural tourism around the unique opportunities within the Al Hajar Mountains (social and economic); and
- The importance of the Special Planning Zone in providing extra guidelines for sensitive areas that provide special character to the governorate (social and environmental).

Adherence to the National and Regional Planning Standards will contribute to a more sustainable future for Oman.

Climatic Response

At the national level, the Standards propose to address issues through design, helping to mitigate the urban heat island effect, solar orientation of buildings and spaces and ensuring quality infrastructure and protection is provided in all urban areas. These approaches should be carried through at a regional level in Al Buraymi. Climatic response issues that are specific to the governorate include the risk of prolonged extreme weather events, such as high temperatures, drought and flood risk. The governorate is most susceptible to drought in the north, and flooding in the south.

Risk of Drought in the Governorate

Al Buraymi has high temperatures most of the year. It's inland location – with no cooling sea-breezes – mean that inland towns with a lot of unshaded asphalt will face increasingly severe heatwaves. The mean air temperature in Al Buraymi town is 29.4°C and the annual mean rainfall is 75.6mm. Temperatures are mainly affected by continental air masses, which bring hot and very dry air. In 2015, the World Health Organisation (WHO) prepared a Climate and Health Country Profile for Oman. It ran two scenarios for annual temperature change under different climate change projections. Under a high emissions scenario, mean annual temperature is projected to rise by about 5°C on average from 1990 to 2100, while under a low emissions scenario, the mean annual temperature is expected to rise by about 1.5°C. Also, the number of heatwaves is expected to increase from less than 15 days in 1990 to about 280 days in 2100 under a high emissions scenario and under a low emissions scenario, the increase is limited to some 85 days.

The effect of drought would have a profound impact on agriculture and the quality of lives in the governorate. Strategies such as implementing climate responsive design and adaptive planning to minimise the effect of extreme weather events as a result of climate change.

Flood Risk

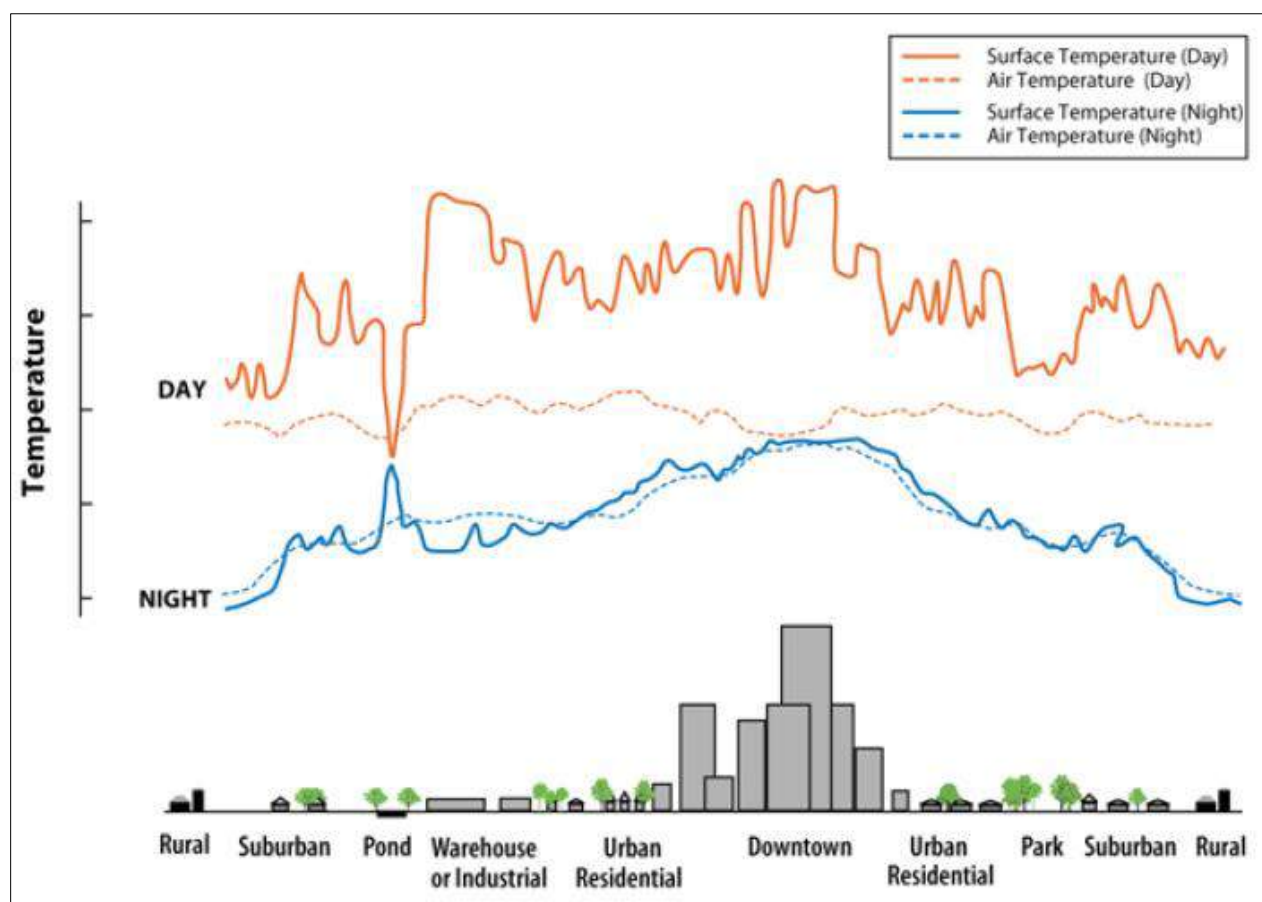
The surface runoff in Al Buraymi flows from the Al Hajar Mountains in the east towards the plains in the west. Given the relatively high rainfall in the mountainous area and steep topography, there is significant surface water flowing into the wadis. Flows disperse into numerous tributaries. Part of the flood volume flowing out of the mountains may actually continue towards UAE. The remaining volume contributes to recharging the groundwater aquifers. Due to the frequent dry ground conditions, flash flooding often occurs downstream where the ground does not absorb the large volume of water quickly enough. This is a particular problem for developments within in the wadi flood plain, or within the shallow channel itself. Part of the Regional Planning Standards will be to ensure that new development within the rural settlement boundary is not within the wadi channel and appropriate studies are undertaken to determine the flood risk.

Intent		
To ensure that new developments reduce the Heat Island Effect as much as possible by implementing the following supplementary to national measures, as outlined by the Leadership in Environmental Efficient Design (LEED): • Minimise development footprint, where possible; • Consider underground or undercover parking; • Installing green roofs; • Shading (as described in the National Standards); • Using hardscape materials with high reflectance; • Installing surfaces that have high solar reflectance (SR) or solar reflectivity index (SRI); • Using open-grid paving. • New development should be constructed within defined settlement boundaries and not within wadi floodplains.		
Goals		
• To reduce the effects of rising temperatures by designing efficient buildings that take advantage of traditional building techniques and materials, where possible and the use of modern building technology. • To ensure that new developments are within defined settlement boundaries and not within wadi flood plains, as the risk of flooding will become greater future due to more extreme weather events as a result of climate change.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted

All uses with building efficient design considered	N/A	N/A
Key Urban Design Principles Enabled		
• Climate Responsive • Sustainability • Vitality and Viability		

Building Typology	Various, where development is permitted
Typical Building Height	Height should respect exiting context
Typical Floor Height	3 - 4m
Typical Plot Size	Where development is permitted, 300 - 600m ² for a single villa unit
Plot Coverage	When development is permitted, up to 60%
Setback and Entrances	To be determined based on MoTCIT/ relevant Authority standards.
Resident Parking (on plot)	To be determined based on MoTCIT/ relevant Authority standards.
Visitor Parking (on street)	Where ROW permit, to be determined based on MoTCIT / relevant Authority standards.
Public Space	Quality public realm should be prioritised, typically provided.
Special Design Guidelines	• Building renders finished with muted colour palette. • Energy efficient design to be considered for all new development.

The following Figure shows the day and night heat island effect across different densities within an urban area. These would be increased as the effects of climate change occur. Therefore, new development should follow the Planning Standards outlined at national level and above for Al Buraymi Governorate.



Heat island effect across different urban densities.

Source: LEED v4 Edition, GBES, 2018

Settlement Pattern

The RSS for Al Buraymi promotes the densification and regeneration of urban settlements, rather than continuing urban sprawl over valuable agricultural land. The Regional Planning Standards reinforce this approach but notes that new, denser development should not detract from the historic core.

Rural Settlements

Many of the rural settlements within Al Buraymi are ribbon developments that have evolved along a wadi or movement corridor. This is particularly clear within the mountainous rural settlements, where water courses and aflaj are used for agriculture. The ribbon development is a distinct settlement pattern for the rural settlements in the governorate, particularly within the Hajar Mountains and forms part of the character of these settlements.

The Figure below shows a typical mountainous urban settlement that follows the wadi and main road through the settlement. This forms a vital part of the settlements character. The Regional Planning Standards therefore state that for rural settlement development:

- Development should continue in the ribbon pattern with a focus on a densification of the central core;
- Densification that is proportionate to the existing settlement should be within the central core of existing rural settlements; and
- Development should not be permitted outside of the rural settlement boundary.



Ribbon development is typical within the Hajar Mountains

Intent		
The intent of the Rural Settlements regional planning standard is to preserve and enhance the character and local identity of rural settlements whilst also limiting sprawl through well-designed densification and infill development. Development proposals should enhance their surroundings and the settlement layout, by providing the following: • Greater ease of movement between key areas, such as the fort, mosque and souq and other community facilities, through sikkas and other pedestrian routes; • Providing a greater sense of enclosure around key public spaces and greater shading to promote walkability; • Providing the correct land uses in the historic core, such as mixed uses and different types of residential typologies, such as apartments and townhouses as a variation to villas; and • Promoting views and vistas of key landmarks, such as the settlements fort or mosques, to help wayfinding and reinforce a sense of place.		
Goals		
• To preserve and enhance the settlement pattern of historic towns and neighbourhoods; and • To encourage new development to be contextual and responsive to local character.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Residential; • Community Facilities; • Parks and Open Space; • Commercial; • Tourism.	• Industrial; and • Utilities and Infrastructure.	Agriculture (unless demonstrably characteristic of the settlement)
Key Urban Design Principles Enabled		
• Cultural Inspiration • Character • Places of Quality • Social Inclusion • Legibility • Vitality and Viability		

Building Typology	Various
Typical Building Height	Height should respect existing building heights.
Typical Floor Height	3.5m
Typical Plot Size	400m ²
Plot Coverage	up to 80%
Setback and Entrances	To be determined based on MoTCIT/ relevant Authority standards.
Resident Parking (on plot)	To be determined based on MoTCIT/ relevant Authority standards.
Visitor Parking (on street)	Where ROW permit, to be determined based on MoTCIT / relevant Authority standards.
Public Space	Quality public realm should be prioritised, typically provided
Special Design Guidelines	Building renders finished with muted colour palette.

Cultural Influences and Traditional Lifestyles

Omani culture is part of the country's identity. At a national level, the Standards will encourage traditional Omani architecture and built form, supporting new and emerging Omani architectural trends and encourage the restoration and regeneration of communities. At the regional level, there are a number of cultural assets that help give the governorate its character and identity. These assets should be respected and given special planning consideration in order to help conserve and build upon the cultural influences in the governorate, such as:

- The governorates traditional hill forts; and
- Agriculture in the mountains.

Traditional Forts

The Al Buraymi Fort is a distinguishable characteristic of the town. Traditional forts have been constructed over centuries and form a key part of the built landscape. Therefore, regionally specific standards should apply to safeguarding the setting and future of these heritage assets.

The standards that should apply will vary between each fort and its setting, however, the following points should be considered when development is proposed within 250m of a key historic asset:

- Consideration of heights;
- Consideration of view corridors and vistas being obscured by new development
- Consideration of material selection (colour, tones and types of material should not detract from historic forts if in vicinity);
- Consideration of parking requirement and demand in vicinity of a fort; and
- Consideration of road improvements and alterations which may have an adverse impact on the fort and its setting.

Intent		
In general, the following points should be considered when development is proposed within 250m of a high-value historic asset: • Consideration of building heights, scale, mass, construction materials and finishes (colour, tones and types of material should not detract from historic forts if in vicinity); • Consideration of view corridors and vistas being obscured by new development (see Figure on the following page); • Consideration of parking requirement and demand in vicinity of a fort; • Consideration of the adverse impact caused by inappropriate siting of utility infrastructure such as mobile telephone masts and substations; and Consideration of road improvements and alterations which may have an adverse impact on the fort and its setting.		
Goals		
• To improve the siting and design of buildings located within close proximity to buildings of cultural importance; and • To require public and private-sector developers to consider the potential impact of development on buildings of cultural or historical importance.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Residential; • Tourism; • Commercial; • Light industrial; • Community Facilities; • Parks and Open Space	• Utilities; • Infrastructure;	N/A
Key Urban Design Principles Enabled		
• Cultural Inspiration • Character • Liveability • Places of Quality		

Building Typology	Various
Typical Building Height	G+2, total height should not exceed that of nearby fort.
Typical Floor Height	3.5m
Typical Plot Size	400m ²
Plot Coverage	up to 80%
Setback and Entrances	To be determined based on MoTCIT/ relevant Authority standards.
Resident Parking (on plot)	To be determined based on MoTCIT/ relevant Authority standards.
Visitor Parking (on street)	Where ROW permit, to be determined based on MoTCIT / relevant Authority standards.
Public Space	Quality public realm should be prioritised, typically provided
Special Design Guidelines	- Residential houses traditionally occupied smaller plots in dense configurations adjacent to forts, many characterised by largely enclosed plots with central courtyard(s). - Building renders finished with muted colour palette.



Consideration of view corridors and vistas being obscured by new development

The three scenarios shown in the previous Figure show how the setting of Buraymi Fort could be degraded from improper consideration of view corridors and vistas, which in turn would detract from the unique character and identity it creates for Al Buraymi Town.

- Scenario 1 – large building where the scale is disproportionate to its context, particularly Buraymi Fort, which makes it inappropriate;
- Scenario 2 – The proximity and massing of the development adjacent to the Fort detract from its setting, which makes it inappropriate;
- Scenario 3 – Massing and scale is more considered to the existing context meaning views and vistas of the Fort are more likely to be maintained. In consideration of the Key Urban Design Principles, this would aid the preservation of character and promote places of quality.

Vernacular Architecture

The vernacular architecture of the Governorate is most widely represented in the historic buildings such as old Forts. The preservation, enhancement and utilization of cultural heritage resources within Al Buraymi Governorate is a strategic priority, alongside spatial and economic development, provision of high-quality infrastructure and wide-ranging environmental concerns.

The distinctive heritage of the governorate is widely distributed and comprises a range of asset types including archaeology sites, historic buildings and towns, landscapes and cultural traditions. Collectively, this 'historic environment' reflect the history and settlement of the governorate. Whilst even minor attributes of the historic environment contribute to Oman's heritage, and are finite resources worthy of conservation, not all cultural heritage assets have equal importance or sensitivity to change.

A range of management approaches, based on a combination of local specifics and international best practice, have been outlined in the emerging cultural heritage policies in volume 1 of this report (CH1.1 to CH5.1).

Cultural Heritage and Conservation

A Cultural Conservation Area (CCA) is an area of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance. This could be a place, locality, natural landscape, settlement area, architectural complex, archaeological site, or standing structure that is recognized and often legally protected as a specific place/ area of historical and cultural significance. Within Al Buraymi, proposed CCAs are located in two broad areas:

- Oases settlements, including Buraymi Town, with developed areas well integrated with their agricultural areas, located at the desert edge. These incorporate distinctive forts and fortified houses, historic commercial areas and open space that enable close connection with the surrounding landscape;
- Rural settlements located in the foothills of the Hajar Mountains, with linear wadi settlements, often including defensive features, located close to a network of terraces for agriculture.
- National planning standards have set out a range of topics to be considered when guiding development within CCAs, including: setting; development pattern, materials and finishes, views and vantage points; and landscape

A specific issue relevant to Al Buraymi concerns the impact of development on the setting of historic areas and individual features. New roads, telecommunication masts and other infrastructure should be designed and sited sympathetically so as to reduce as far as possible the negative impact on the historic environment.

Another important consideration is the impact of advertisement and commercial unit shuttering within CCAs. If not properly controlled, both of these can have a disproportionately negative impact on the quality of public realm and historic character of a place.

Intent		
The intent of the Cultural Heritage and Conservation regional planning standards is to support the preservation and enhancement of the distinctive character of designated Cultural Conservation Areas. Proposed development applications should include justified design statements informed by the adopted character appraisals and management plans relevant to the CCA in question.		
The basis of this approach is set out in regional policy CH1.1, supported by the sustainable management of the historic built environment set out in regional policy CH4.1.		
Goals		
• Ensure that planning decisions are based upon an appraisal of local character; • To preserve or enhance local character; • To enable developers to bring forward opportunities for enhancement, based on the improvement of features which are acknowledged to detract from local character.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Residential; • Light industrial; • Commercial;	Various	N/A

Mixed use – residential / commercial.		
Key Urban Design Principles Enabled		
- Cultural Inspiration - Character - Liveability - Places of Quality		

Building Typology	Various
Typical Building Height	G+2
Typical Floor Height	3.5m
Typical Plot Size	400m ²
Plot Coverage	Up to 80%
Setback and Entrances	Determined by detailed CCA characterisation assessment.
Resident Parking (on plot)	To be determined based on MoTCIT/ relevant Authority standards.
Visitor Parking (on street)	If ROW permit, to be determined based on MoTCIT/ relevant Authority standards.
Public Space	Determined by detailed CCA characterisation assessment.
Special Design Guidelines	To ensure that new development is contextual and preserves or enhances the distinctive character of CCAs, special consideration should be given to the following features: - Special attention to the location, scale, massing of new developments, to protect important views and vistas; - Protection of important trees and vegetation which contributes to local character; - Limiting visual influence of aerials and satellite dishes; - Special controls on advertisements and billboards; - Limiting or prohibiting use of metal shuttering in commercial areas; - Close attention to use and design of high-quality hardscape materials; - Ensuring boundary features preserve or enhance local character; - Special attention to the siting of utility infrastructure, to avoid or minimise adverse impacts on the setting of historic buildings and CCAs; and - Special attention to the siting of telecommunication masts, to minimise the adverse impacts on the setting of historic buildings and CCAs, bearing in mind that these impacts occur over longer distances.

Al Buraymi town centre displays many attributes of oases settlements and CCAs, including the combination of the old fort, surrounding residential and commercial quarters and agricultural fieldscape.



Buaymi Town Centre

Terrestrial Special Planning Zone

The Al Hajar Mountains are a distinctive topographical feature of Al Buraymi that also cover parts of neighbouring governorates. The mountains possess exceptional environmental quality and visual aesthetic with regard to their scenery, geology, biodiversity, archaeology and built heritage so have been designated as a Special Planning Zone, which means they require special consideration for development due to their significance in the landscape and identity of the governorate and of Oman.

Terrestrial Special Planning Zone

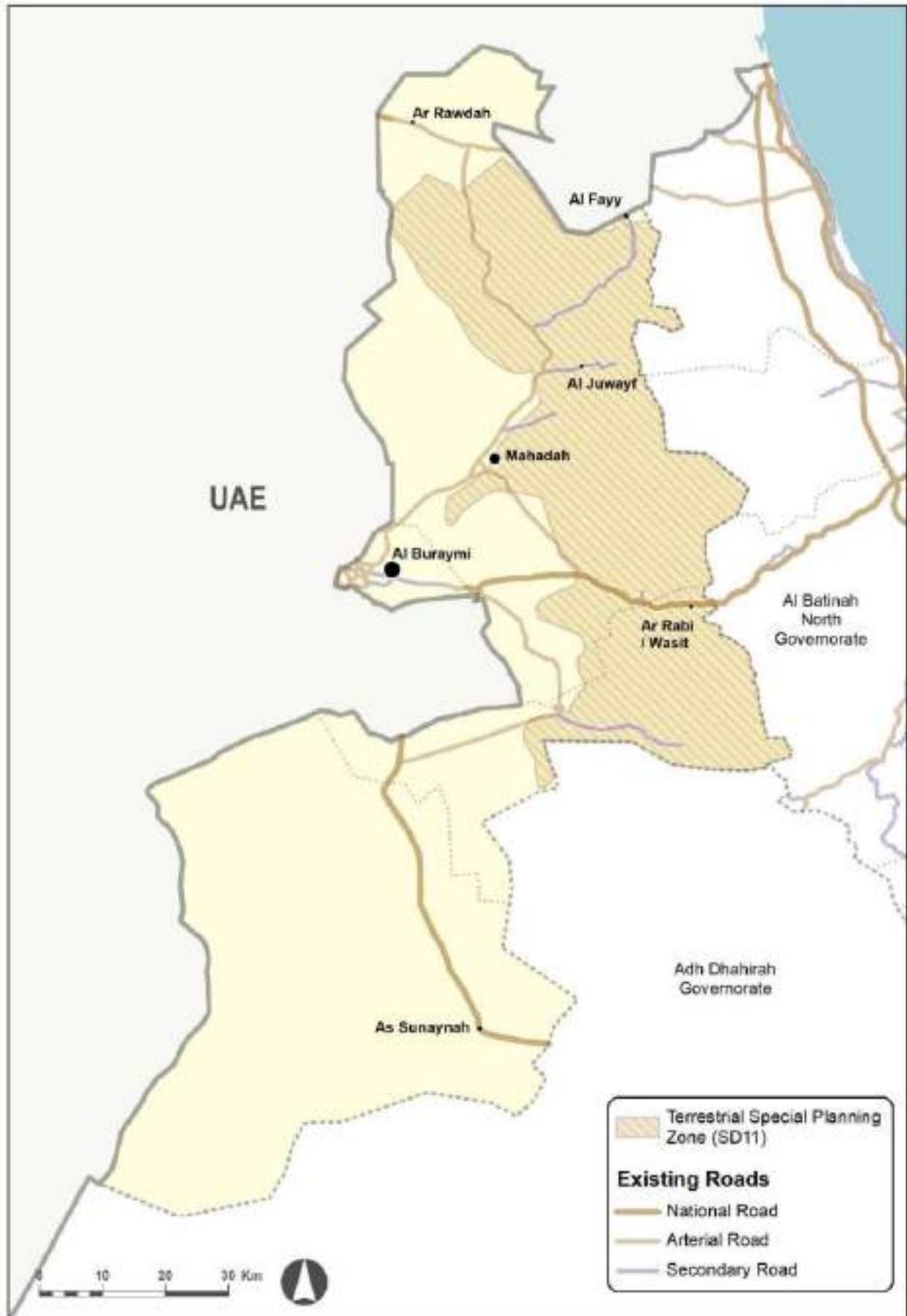
The Special Planning Zone is set out within the emerging policy SD11.1 Hajar Mountains Special Planning Zone. Given the beauty of the area's aesthetic, environmental, ecological and cultural assets, an opportunity exists to leverage this area as a recreational zone, similar to that of a national park, whereby people can explore and be at one with the natural and cultural assets that the area exhibits. As well as providing a healthy environment for its citizens, and meeting international biodiversity obligations, the Hajar Mountains SPZ supports the economic strategy for the governorate of Al Buraymi by providing criteria which ensures development balances the integrity of the natural and cultural heritage of the Hajar Mountains, with the economic development needs of the Governorate, including the promotions of ecosystem goods and services.

Under policies TE1.1 and TE1.2, the designation will adhere to IUCN Category V and IV management practices. Nature Conservation Areas are proposed to highlight specific areas of high importance for natural heritage. In particular, the SPZ within Al Buraymi is an important habitat for Arabian Tahr and Mountain Gazelle populations, the protection of which must be prioritised in any development proposal.

Intent		
The intent of the Terrestrial Special Planning Zone regional planning standard is to preserve and enhance the special character within the designated SPZ by ensuring future development is carefully considered. Policy SD11.1 states the conditions upon which the SPZ Authority should allow future development proposals. This Planning Standard supplements the policy by outlining permitted land uses and further standards for development. Proposed development applications concerning the construction or adaptation of single residential properties shall be dealt with in the normal way. However, proposed development applications deemed by the planning directorate to be of more than local impact shall be required to demonstrate how they have considered the opinions of local residents and other stakeholders in a process of community consultation. The type of development permitted within the SPZ should be: • Appropriately scaled so as not to detract from the aesthetic quality of the surroundings; • Sustainably located and designed; and • Provide sensitively designed parking requirements for tourist and leisure attractions.		
Goals		
• To ensure that development within the SPZ is carefully considered so that it does not detract from the natural and cultural heritage in the area; • Ensure that local communities are consulted about developments in their areas which may affect them and their livelihoods; and • Development that creates jobs and a sustainable use of the land such as tourism should be promoted in the SPZ.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Tourism; • Residential; • Commercial; • Community Facilities; • Parks and Open Spaces.	• Agriculture; • Utilities (see Standards on Utility Corridors)	Heavy Industrial, except within reserved mining concession areas;
Key Urban Design Principles Enabled		
• Climate Responsive • Cultural Inspiration • Character • Liveability • Places of Quality		

- Sustainability
- Social Inclusion
- Vitality and Viability

Building Typology	Various
Typical Building Height	Respond to existing context
Typical Floor Height	3.5m
Typical Plot Size	Varies
Plot Coverage	Up to 50%
Setback and Entrances	To be determined based on MoTCIT/ relevant Authority standards.
Resident Parking (on plot)	To be determined based on MoTCIT/ relevant Authority standards.
Visitor Parking (on street)	To be determined based on MoTCIT/ relevant Authority standards.
Public Space	To be determined based on MoTCIT/ relevant Authority standards.
Special Design Guidelines	Developers who wish to build within the designated SPZ area should consult with local authorities to gain necessary approvals. Special consideration should be given to the material palette.



Al Hajar Mountains Special Planning Zone

Other Variations from the National Standards

This section outlines key regionally specific differences for Al Buraymi that are not outlined or differ to those outlined in the National Standards.

Primary Land Uses: Residential - Low Density Residential Villas Re-Use

The re-use of low-density residential villas for other uses should be considered to help increase density. Villa plots could also be subdivided to increase density.

Intent		
Future development should be targeted within the newly delineated Urban Change Plan Areas and / or revised settlement boundaries, as set out in policy SD2.1 Where there are existing large residential serviced plots exceeding 1,200m² coverage, subdivision into two 600m², or four 300m² residential plots, is permitted. If supported by appropriate demand and subject to planning application, the land use category of existing residential plots may be changed to secondary uses which will support SMEs and community services without greatly altering the existing character of the plot.		
Goals		
- Promote the sustainable re-use and adaption of existing buildings; and - Allow the redevelopment of existing villas to provide for ongoing residential and supporting adjacent uses.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Low-Density Residential – Single Family Villas.	- Community centre; - Community health clinic; - Small hotel / guesthouse; - Community park; - Community tourism; - Mixed use commercial / residential; - Agriculture, fisheries and livestock husbandry.	All other uses that do not meet the purpose and outcomes of the land use, including: - Schools; - Offices; - Religious; - Commercial; - Industrial.
Key Urban Design Principles Enabled		
- Liveability - Places of Quality - Sustainability - Vitality and Viability		

Building Typology	Single Family Villas/Dwellings
Typical Building Height	Maximum G+3
Typical Floor Height	3.5m
Typical Plot Size	300 - 600m ² Smaller plot sizes are preferred in urban areas (Al Buraymi) to introduce new residential typologies and promote a compact urban form.
Plot Coverage	60%
Setback and Entrances	To be determined based on local context and local planning/ building code.

Resident Parking (on plot)	To be determined based on MoTCIT/ relevant Authority standards.
Visitor Parking (on street)	To be determined based on MoTCIT/ relevant Authority standards.
Public Space	To be determined based on MoTCIT/ relevant Authority standards.
Special Design Guidelines	In general, development or adaptive reuse should be sensitive to local context. Design should adopt the local character, especially in terms of scale, mass and colour.

The Figure below shows existing low-density villas developed in Al Buraymi town. Future development should be located within the designated boundaries and must respect standards to prevent urban sprawl. Alternative, more compact typologies should be considered for new urban development. The re-use and adaption of existing vacant low-density villas is encouraged.



Existing low-density villas developed in Al Buraymi

Primary Land Uses: Mixed Use - Commercial

The Al Buraymi RSS proposes that Al Buraymi Town accommodate most of the future population growth in the region. As a Regional Hub of Oman, Al Buraymi Town will benefit from IMPROVED infrastructure provision and connectivity making it attractive to many national and potentially international investors. Mixed-Use Commercial development in Al Buraymi Town will also support transport-orientated densification (see policy SD6.1) and allow employment opportunities and key services to be brought closer to people, reducing the need to travel

Intent		
The purpose of the Mixed Use – Commercial category is to allow development areas to provide a mix of land uses within a plot or in several plots designated under this use, as opposed to mono-use land zoning ordinances.		
Goals		
- Create defined business areas, supporting Al Buraymi's economy. - Create physical buffers between industrial and residential land uses. - Encourage the integration of Commercial Office with retail/ F&B and community facilities as appropriate, to create active and multi-functional areas. - Ensure that Commercial Uses respect the density of surrounding development and discourage the development of high-density Commercial Uses in locations where such development would alter the established urban form. - Prioritise development of sites within, adjacent to or in close proximity to existing urban areas, in accordance with the land use zoning set out in the Regional Spatial Strategy.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Commercial – Offices Retail – Ground Floor only - Commercial offices; - Finance and professional sales and services; - Business services; - Personal services; - Education and training services; - Car parking.	- Retail shops including convenience and/or comparison retail, grocery stores; - Hairdresser's beauty parlours and barbers; - Post office; - Laundry; - Restaurants, café/food & beverage outlets or similar (GF only).	All except for primary and secondary uses.
Key Urban Design Principles Enabled		
- Places of Quality - Sustainability - Social Inclusion - Vitality and Viability		

Building Typology	Multi-storey block with retail
Typical Building Height	G+5 maximum in service centre settlements (Mahadah). In Al Buraymi Town along the main roads within the commercial mixed-use areas G+8 is permitted.
Typical Floor Height	Ground: 5m, higher floors 4m
Typical Plot Size	800 – 1500m ²
Plot Coverage	80%
Setback and Entrances	To be determined based on local context and local planning/ building code, bearing in mind the requirement for principal and service entrances.
Parking	Disabled parking, taxi-ranks and drop-off to be located to the front of the building, as appropriate. Residential parking provision to be provided in basement areas, or to side and rear of the plot.

	Quantum to be determined based on MoTCIT/ relevant Authority standards.
Public Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. To be determined based on local context and local planning/ building code.
Special Design Guidelines	Utilities such as HVAC units or lift rooms on roof may exceed maximum height of building and shall be appropriately screened, and emphasis placed on integrating the HVAC into the design of the building – not an add-on.



Example of mixed-use development (commercial with residential above)
 Source: Google Images, 2020.

Primary Land Uses: Mixed Use – Higher Education

Competitiveness of local firms within Al Buraymi is critical for sustainable long-term economic growth and prosperity. The RSS sets out an innovation strategy, to identify and enable communications, networking and coordination between different relevant stakeholders.

The purpose of this planning standard is to permit suitable uses to co-locate (both within the primary land use parcel and / or up to 250m distance of the primary land use boundary) that complement the development of Higher Education facilities. Proposals to expand Buraymi University will consider the provision of supporting and complimentary facilities in order to benefit the student community and create a conducive environment for learning and innovation.

Intent		
In certain cases, it is recommended that facilities are co-located with supporting or complimentary facilities – either benefiting the community in terms of accessibility or needs requirements or factors benefiting the operational requirements. Co-location can refer to the ‘integration’ or ‘adjacency’ of facilities and can bring the following benefits: • Land take reduction; • Centre definition / sense of place; • Increased accessibility; • Reduced trip generation; • Lower development, operation and maintenance costs; and • Proximity to the adequate training and upskilling / R&D facilities.		
Goals		
• Allow the development of certain supporting uses to coincide with higher education uses and support the needs of the surrounding community. • Ensure education facilities or associated permitted uses are located in publicly accessible and convenient locations and is generally consistent in scale, height and bulk with that of surrounding development. • Ensure the form of development is specific to the facility in recognition of particular operational, functional and locational criteria of higher-educational facilities.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Higher Education – University Campus;	• Restaurants, café/food & beverage outlets or similar; • Retail shops including convenience, bookshops • Library; • Printing / Publishing Services; • Banks and ATMs; • Hotel; • Convention centres; • Light industry; • Research and development; • Transport/	• Other industrial uses; • Military; • Tourism.
Key Urban Design Principles Enabled		
• Sustainability • Social Inclusion • Vitality and Viability		

Building Typology	Mixed Use Blocks

Typical Building Height	G+4 Maximum
Typical Floor Height	Minimum 4.5 metres, though this may vary across different buildings.
Typical Plot Size	Variable
Plot Coverage	Up to 90%
Setback and Entrances	Variable
Resident Parking (on plot)	N/A
Visitor Parking (on street)	To be determined based on MoTCIT/ relevant Authority standards.
Public Space	Higher education facilities should encompass diverse open spaces to satisfy different purposes. Landscapes should be stimulating and play an important role in the health and wellbeing of users.
Special Design Guidelines	When this planning standard is applied within higher education campuses, the design approach should be highly contextual, such that a coherent and complimentary designs are proposed. Design principles should consider the following: • Buildings that promote intellectual and social exchange; • Heights of structures; • Benefits of high-quality designs that use either consistent and predominant materials or the introduction of contemporary juxtapositions; • Landscape, streetscape, signage; • Commitment to accessibility • Respect for cultural resources; • Integration of art in buildings; and • Responsible use of energy and natural resources.



Example of Open Space Design - Kuwait University

Open Space: Wadi Parks

Wadis are important functional elements of natural and water system within Al Buraymi. They contribute ecological and environmental services and are therefore considered an ecologically sensitive area. In addition, wadis also have the potential to provide significant amenity value for the well-being of communities, supporting recreation and tourism (serving local, regional and international users). To support this, Al Buraymi RSS supports the sympathetic development of wadi parks in appropriate locations, to encourage development of public realm around wadis.

Policy SD12.1 supports actions that contribute to the greening of the Built Environment. This includes converting appropriate wadis to parks and actions to reduce the urban heat island effect. It also calls for homes to be constructed according to sustainable building codes and for the allocation of 10% of plot land for green space and green infrastructure.

Intent
The intent of the Wadi Parks regional planning standard is to protect and enhance the natural, ecological and amenity value of wadis and their immediate surroundings. This aims to provide a solution to land that may no longer be viable for agriculture, increase opportunities for healthy lifestyles and recreation, and as an alternative to damaging over-development. Within wadi parks, appropriately designed single storey ancillary buildings would only be permitted to support the function of the park and, where appropriate, to provide services such as visitor information or toilets.
Goals
• Provision of increased public, recreational and community-serving land; • Maintain public access to natural areas and the coastline; • Improved preservation of natural, ecological and environmental sensitive land; and • Conversion of windfall agricultural land into public, recreational and community-serving land.

Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
- Public open space; - Parks; - Public / pedestrian paths; - Sport; - Preserved.	- Tourism; - Private open space; - Community facilities.	- Residential; - Industrial; - Mixed use.
Key Urban Design Principles Enabled		
- Climate Responsive - Cultural Inspiration - Character - Ease of Movement - Liveability - Places of Quality - Sustainability - Social Inclusion - Vitality and Viability		



Example of a Wadi Park that can occur within wadi flood plains in urban and rural areas
 Dar image of Wadi Sulai Wadi Park, Riyadh, Saudi Arabia



*Example of Wadi Parks that can occur within wadi flood plains in urban and rural areas
Google Images, Wadi Hanifah Wadi Park, Riyadh, Saudi Arabia*

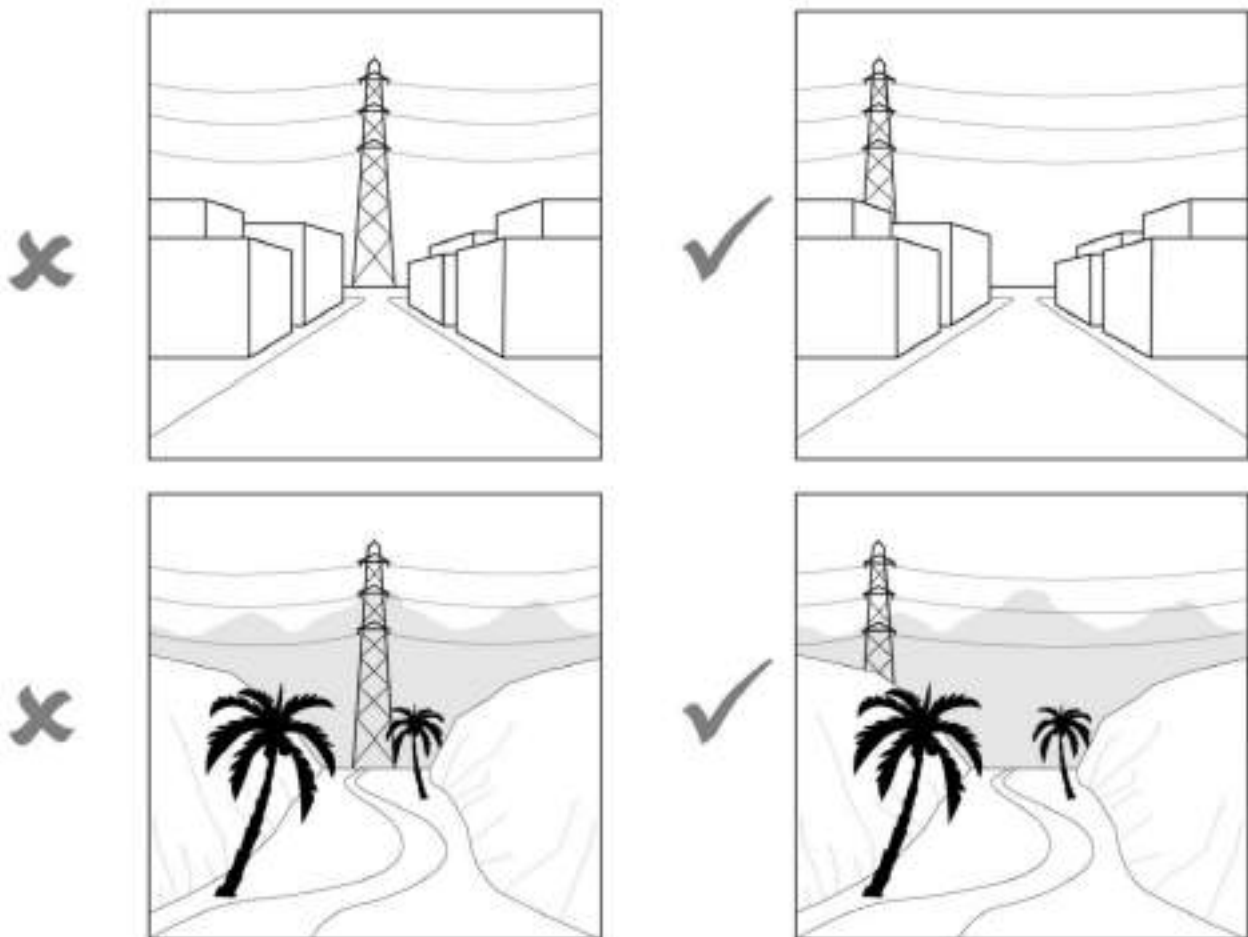
Utility Infrastructure: Utility Corridors

Utilities corridors are a requirement in order to ensure a reliable and secure utilities network across Oman and within the Governorate. However, areas such as the Special Planning Zone have designations due to their ecological or historic value and the placement of future large-scale utilities corridors through such areas should be considered carefully.

Future utilities corridors within the SPZ and / or Nature Conservation Areas within the Governorate should prioritise undergrounding to preserve the natural beauty of the landscape. A recent UK example of a National Grid high voltage line connecting the new Hinkley Point C power station to the National Grid in southwest England provides a benchmark for undergrounding parts of nationally significant utility corridors where they may otherwise significantly detract from sensitive locations such as National Parks and other areas of natural beauty.

If undergrounding isn't possible, a sufficient buffer should be implemented for future development near utility corridors, or if a new utility corridor is proposed near existing development. This is for ease of access for utility providers to maintain utility assets, but also to provide a safe distance for surrounding land uses from electromagnetic fields from overhead transmission lines, or a safe distance from gas pipelines.

Furthermore, if undergrounding is not possible, the location of utility assets should be considered. The National Grid Sense of Place Guidance Document in the UK provides good practice information on the placement of transmission line towers and how to minimise their visual impact (refer to Figure below). It also provides recommended buffer distances to transmission lines. These have been incorporated into the Regional Planning Standards as best practice.



Offsetting high voltage transmission lines to reduce visual impact

Within the SPZ, mining and quarrying can be permitted in certain locations. However, mining related activities and sites need to be strictly regulated to ensure the adverse impact is minimized where possible. Green mining should be encouraged, and priority should be given to higher value priority mines sites as identified by PAM. Utilities provision should also be undertaken in a sensitive way, avoiding truncation of sensitive environments including those related to natural and cultural heritage.

Intent		
<u>Selective undergrounding of utility corridors within SPZ</u> To protect and preserve designated areas from large-scale utility corridors that would detract from the value of that area. Future utility corridor development should consider undergrounding or other alternatives to protect view corridors and the character of designated areas within the Governorate. <u>Buffers for utility corridors</u> If undergrounding of the utility corridor is not viable, then an alternative would be to provide sufficient buffer zone between the corridor and surrounding sensitive land use or environmental attribute: • Recreational open space - 30m buffer between overhead high-voltage transmission line should be provided (access should be restricted if the open space is unsupervised / open access); • Buffers for other land uses should exceed 30m • High-value built heritage assets – 250m buffer between transmission utility infrastructure (for distribution infrastructure this can be decreased but a minimum of 150m should be maintained). <u>Location of Utility Assets to reduce Visual Impact</u> The location of transmission power line towers or other utility assets must be considered in relation to the visual impact they create, particularly within sensitive areas, such as the SPZ. The placement of towers should be considered by conducting a Visual Impact Assessment and modelling the most suitable location of assets to minimise their impact.		
Goals		
• Alignment with the aims of the Special Planning Zone; • Preservation of natural and cultural landscapes; and • Modernisation of distribution networks.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Special uses – utilities; • Heavy industry; and • Power generation and distribution.	N/A	Any other use
Key Urban Design Principles Enabled		
• Climate Responsive • Places of Quality • Sustainability • Vitality and Viability		

Building Typology	Utility infrastructure including substations, pylons, cabling, ducts etc.
Typical Building Height	N/A
Typical Floor Height	N/A
Typical Plot Size	N/A
Plot Coverage	N/A
Setback and Entrances	N/A
Resident Parking (on plot)	N/A
Visitor Parking (on street)	N/A
Public Space	N/A

Special Design Guidelines

The design and construction of utility corridors and networks must comply with relevant international, national and regional standards. In particular, sustainable development is that which delivers increased supply to meet current and future demand in such a way that sustains the environment for future generations.

During utility works, special consideration should be given to avoiding truncation of archaeology. Within Archaeology Priority Areas, the Directorate of Heritage and Culture may require the preparation of desk-based assessments and other specialist studies to manage risk to archaeological resources.



The appreciation of the natural and cultural environment can be adversely affected by utilities, in this case, electricity pylons

9.5. Ad Dakhiliyah Governorate

Introduction (Regional Distinctiveness)

This section outlines the Regional Planning Standards for Ad Dakhiliyah. It is intended that the regional standards complement the national ones and set out any key regional variations that are applicable instead or over and above the National Standards. This section presents these differences and assumes that all other standards are covered nationally and apply to the region.

The National and Regional Standards, combined, aim to achieve the Vision and Objectives of the ONSS and Regional Spatial Strategy, which for Ad Dakhiliyah are outlined in RSS D11 Volume I.

The objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs. The ONSS and RSS 20-year spatial planning frameworks set out a way of delivering local prosperity with a better balance between social, economic and environmental dimensions, either directly or indirectly. Specifically, within the Ad Dakhiliyah region this might involve the following

- Accelerating the development and expansion of urban economies, particularly around knowledge and creative industries in Nizwa, within a framework of organised compact urban development in all major settlements in the region;
- Enabling progressive restructuring and densification of settlements and reverse sprawling trends;
- Protecting and supporting cultural influences and traditional urban forms, such as oasis settlements and traditional crafts and produce;
- Reinforcing forms of cultural and natural tourism which are respectful of local assets and understanding of local culture; and
- Introducing a Special Planning Zone for the Hajar Mountain as a way to take into consideration environmental issues in guiding future development in the sensitive areas of the mountain that provide special character to the governorate

Compliance with the National and Regional Planning Standards will therefore contribute to a more sustainable future for Oman and to the distinctiveness of Ad Dakhiliyah.

Climatic Response

Climate change in the interior of Oman is likely to manifest itself primarily through more extreme periods of heat and sudden and dangerous flash flooding, with occasional frost and ice in the mountain.

As the majority of the population will live in urban settlements, it will be imperative to:

- Strictly adhere to the development zones, identified by the boundaries of Policy SD2, which take into account the protection of floodplains.
- Address flood risk and prioritise the policy and Priority Flood Management Areas identified in Policy WR4. It will be important to address flood risk issues particularly in Nizwa, Samail and Al Hamra before progressing development.
- Ensure the survival of the oasis and terraced agriculture not only for production and protection of local lifestyles, but also, very importantly as a way to retain a form of climatic control and reduction of urban heat in the settlements.
- Application of the principles of green buildings contained in the National Planning Standards for all new construction (taking account of orientation, sustainable material, water and energy conservation, use of climate adapted and naturally occurring planting, etc).
- Application of street National Planning Standards to encourage active modes of travel and shaded streets, to reduce energy consumption and air pollution and mitigate urban heat

In addition, a 50m minimum setback should be applied to all development along wadis.

Cultural Influences and Traditional Lifestyles

Ad Dakhiliyah has a long history, with its own traditions and culture: from scholarly studies in Nizwa to pottery crafts in Bahla and production of rose water in the mountains. The Standards encourage respect for traditional Omani architecture and built form and the restoration and regeneration of communities by promoting an approach to streets and public realm that supports social life and the formation of more attractive neighbourhood centres. At the regional level, Conservation Areas (Policy CH1) have been established to identify areas where cultural

assets that help give the governorate its character and identity should be respected and given special planning consideration in order to help conserve cultural influences in the governorate. Typical assets include

- The governorates numerous castles and forts, typically located at the centre of the older parts of the settlement;
- Fortifications and observation towers;
- The compact earthen architecture harats at the edge or immersed within the oases;
- The traditional souk and markets;
- The local family mosques and the ancient grand mosque of Nizwa;
- The system of terraces, aflaj and patterns of fields which has sustained life in the region for centuries.

The main settlements of the governorate mainly developed around a traditional nucleus with a fort, harat and plantations. It is a distinguishable characteristic of each of the settlements and contributes to the sense of place and identity. The impact of car use (and parking requirements) and the construction of houses using contemporary standards and setbacks within the oases has introduced a new development language that has compromised the appreciation of cultural and historic assets and viability of cultural traditions.

The standards that apply within the identified Conservation areas and within 250m of a key historic asset include:

- Limitation of heights to a level so that the fort and lookout towers retain their dominant profile over the surrounding areas.
- Protection of all view corridors and vistas towards the forts and main mosques from being obscured by new development and retention of lower heights around the forts for that open views over the surrounding areas from the top of the forts are preserved.
- Selection of materials and details that are similar to that of local traditional features: colour, tones, types of material and built form should not detract from historic assets; garish colours, overly decorated features and built forms that are not inspired from local context should not be allowed.
- Identification of appropriate reuse and alterations to the harats through a collective agreement with the local community.
- Adoption of specific standards for new residential and tourism development (see sub-section on Residential Typologies and Tourism Development respectively).
- Retention of the narrow lanes and alleyways and streets as informal, slow speed, local access routes used by all (pedestrian, cyclists, cars and small trucks), with limited lighting and minimal engineering.
- Provision of parking in vicinity of visitor attractions, large mosques and markets in a way that does not occupy prominent positions or result in structures or areas that compromise the views and appreciation of the historic area and its functions

Settlement Pattern

The Ad Dakhliyah region is characterised by three main spatial areas, each with distinctive character

- The Hajar Mountain area, characterised by tall mountains with steep slopes and very rugged terrain, traditionally inhabited by very compact isolated settlements, often nestled within the slopes using terraced form of housing development and reached from the foot of the mountain through steep mountain roads with a multitude of switchbacks. Many of these villages located at water sources and were sustained by a specialised agriculture of aflaj-fed terraces. Unusual in this region is the Sayq plateau, a vast limestone plain at 2000m above sea level, where a variety of orchards and specialist crops were in cultivation. This area, reachable by road since 2006, is now under intense pressure for development putting local character and sustainability of development at risk.
- The Oasis Belt at the foot of the Hajar Mountain where most of the local settlements developed along the main trade routes (Muscat-Samail-Nizwa-Ibri and then towards the Gulf region or from Nizwa towards the south of Oman and Salalah or towards Sur and the coast). Aflaj and wadi-fed oasis with palms and mixed crops were at the origin of the older cities, which were typically made of a nucleus of earthen buildings around a fort and souk. Most of the cities have now sprawled into vast and faceless areas of half complete villa neighbourhoods and linear strips of commercial and administrative buildings. Isolated subdivisions of the same type of villa development are dotted along most road connections and many of the villages have become the location of expansive low density characterless housing subdivisions. Development in the oasis has created a new form: that of the Palm Garden Villa type, where a large villa (not dissimilar to the villas elsewhere) is built within many of the plantation plots, turning agricultural fields into gardens. This type of development is attractive, but could risk the loss of the oasis if not specifically regulated.
- The Desertic South, an area of sparsely inhabited gravel plains, now occupied by oil & gas infrastructure and settlements. The main settlement in this area is Adam, an oasis city not dissimilar to the ones of the Oasis Belt but linked to north-south trading routes, rather than east-west, and therefore relatively

isolated. Oil towns are functional and organised around a regular grid which differentiates permanent managerial level habitation (in apartments or small houses with facilities) and rows of temporary workers cabins served by a minimal commercial core. Sprawling development is rarer, as the area is mainly controlled by oil operations and pipelines cross the land freely.

Vernacular Architecture

Until the 1970s, local building construction was essentially made of earthen structures, which constrained the room sizes and created a variety of mainly square buildings. Traditional settlements were more typically formed of compact groups of small houses, separated from the oasis plantations. Family mosques were located within the settlement or in the fields.

Forts and towers, still made of earthen structures, display impressive proportions and fortifications as well as a great variety of forms.

More recent buildings follow standard national construction typologies and fail to create a distinctive vernacular style, apart from a few exceptions:

- Residential Palm Garden Villas – a particular villa typology emerging within many oases: not particularly distinctive in architectural terms (fairly common villa building type), but with a unique relationship with the green area of the palm plantations. It is normally accessed through narrow dirt plantation lanes and alleyways and surrounded by stone walls. The plantation remains productive, with layered palms and lower crops, but often decorative and unusual plants are also introduced.
- The mixed commercial area north of Nizwa Fort, which has introduced mid-rise apartments or small office units with commercial ground floor with great overall unity and earthen colours complementing the restored fort and mosque. This built form is not replicated in other centres, and it is respectful of the character of the area, rather than ‘vernacular’ itself.
- The first group of new houses in Misfat al Abreeyin, perched on the slope opposite the original village, has created a new more recent form of housing adapted to the contours of the slope, displaying a range of pastel colours and complemented by planting. This is a fresh and attractive version of slope-adapted housing which combined standard villa formats with traditional sensitivities.



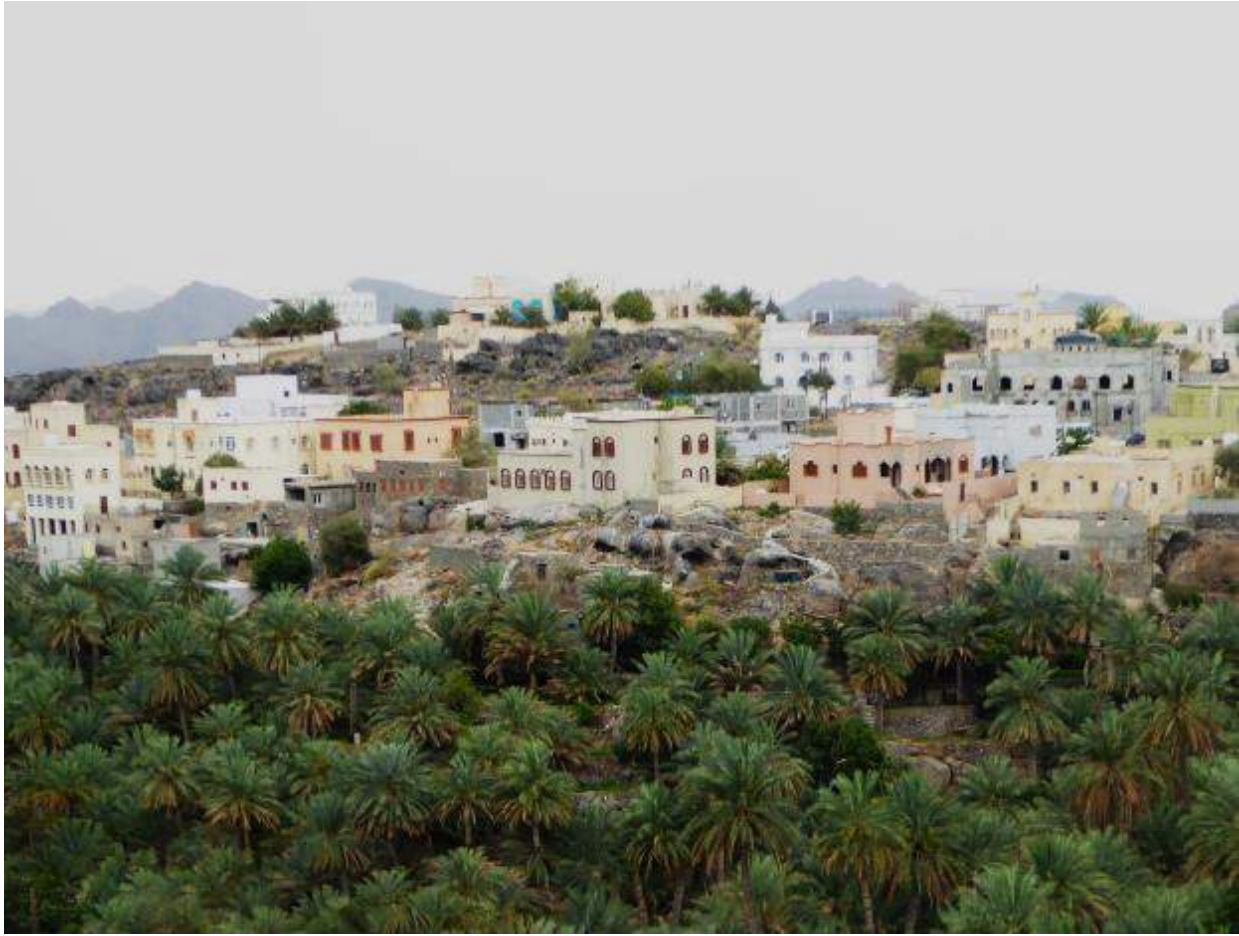
Palm Garden Villa Residential Typologies



Mixed Commercial Area Near the Older Part of Nizwa (1)



Mixed Commercial Area Near the Older Part of Nizwa (2)



Recent housing on the slopes of Misfat Al Abreeyin

Variations from the National Standards

Primary Land Uses – Assessment-based Land Release

Sprawling development and indiscriminate land consumption are one of the main problems of development in Ad Dakhliyah, leading to unattractive neighbourhoods, excessive costs of infrastructure and unsustainable patterns of development.

Through the National and Regional Spatial Planning Strategies it will be important to adopt a better organised form of development through the systematic and progressive release of land and planning of employment and community facilities. Where a Local Plan is to be prepared, this should include the identification of progressive directions of growth and more detailed sequencing of assessment.

In the interim, and where a Local Plan is absent, it is imperative to constrain sprawl and strongly encourage densification of already urbanised areas. Therefore, land for development should be identified strictly within the settlement boundaries identified in Policy SD2 and as follows:

- **Residential Land in Main Settlements** – identified and only released for subdivision, distribution and development every 2 years following an assessment of actual need and confirmation of 80% substantial completion of the residential land released in the period before the last one (released 4 years before) for each major settlement: Nizwa, all Service Centres and Major Rural Villages. This process will need to be carried out in conjunction with new national guidance for allocating residential land.
- **Residential Land in Rural Villages** – identified and only released for subdivision, distribution and development every 2 years following a Governorate-wide assessment of localised need of the existing communities and confirmation of 80% substantial completion of any residential land previously released. Land release in smaller order settlements (Other Rural Centres – category E3) should not be for more than 30 residential units at the time and allocated to families living or working within a 50km radius from the settlement. Land allocated remaining unbuilt should be returned and reallocated on the basis of actual need. This process will be carried out in conjunction with new national guidance for allocating residential land.
- **Employment Land** – released progressively on the basis of assessment studies undertaken at governorate wide level every 5 years to inform allocation of employment land in local plans/master plans and in local areas where no detailed planning is anticipated to take place. Employment land assessments should consider local employment growth rate including identification of areas for major or inward investment and allocation of employment land to serve the local population (commercial uses, city-serving industrial uses, local crafts etc).
- **Community Facilities** – identification of land and delivery of community facilities will be on the basis of an estimate of actual permanent population within main settlements (on the basis of residential completions and land release described above) and assessment of capacity of existing community facilities across the Governorate: for example actual availability of school places or hospital beds. The assessment, to be repeated every 5 years, will establish the requirement for, timing and cost of additional facilities to serve the planned level of growth set out in the RSS.
- **Revision of Settlement Boundaries** – expansion of the settlement boundaries identified in Policy SD2 will only be allowed when 80% of the land within the boundaries is expected to be completed and occupied within the forthcoming 5 years period. Settlement boundary expansion will follow the criteria set out in the ONSS and follow the methodology set out in the Technical Appendix section of the RSS

Residential Typologies

National Planning Standards provide a range of appropriate residential typologies, typically suited to larger urban settlements, where the majority of housing will be built. Appropriate National Residential Typologies include:

- Low density residential – Villas: appropriate to all settlements in Ad Dakhliyah
- Low density residential – Townhouses: appropriate to all settlements in Ad Dakhliyah
- Medium density residential – Apartments: limited to 4 floors in Sayq, 5 floors in other Service Centres and 8 floors in Nizwa
- Residential Mixed Use: limited to 4 floors in Sayq, 5 floors in other Service Centres and 8 floors in Nizwa
- Labour accommodation to be provided as part of the typologies above

Within the region, however, there are distinctive urban fabrics driven by local traditions and suited to specific situations, where national planning guidance is not appropriate and should not be applied. In Ad Dakhliyah, regionally specific Residential Planning guidance is applicable in

- Any development within the plantation oasis in Residential Palm Garden zones
- Mid Density Compact Courtyard Townhouses within larger and medium-sized settlements
- Low and mid density development within the SPZ and the Hajar Mountains, in the form of Mountain Villas and Compact Clusters

Low Density Residential - Residential Palm Gardens

Intent		
The purpose of a Low-Density Residential – Residential Palm Gardens typology is to recognise the value and attractiveness of residential living within the traditional palm plantations of the oasis within some settlements and to avoid over-development and loss of the oasis altogether. This typology is clearly identified in the land use zoning set out in the Regional Spatial Strategy, which should be refined in Local Plans. It does not apply to zones indicated as Agricultural Enhancement or to oasis areas in general. Goals Ensure the continuation of traditional living within designated oasis where agricultural functions have become secondary to residential. Promote locally appropriate development formats, which replicate traditional patterns. Protect the plantations from over-development and support retention of the green cover (with micro-climatic, cultural and biodiversity benefits) even where agricultural outputs are not commercially viable, and the plantation becomes ancillary to the house (garden). Allow co-existence of agricultural and traditional functions alongside residential use.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units (Palm Garden Villa) Mixed purpose Farming and Residential Units.	Restricted to traditional functions only: • Family farming • Local mosque • Small shops	<i>All other uses that do not meet the purpose and outcomes of the land use, including:</i> Schools (which should be located outside the plantations) Markets Hotels/ tourist accommodation Any use requiring large car parking

Low Density Residential - Residential Palm Gardens	
Building Typology	Residential Palm Gardens identify areas where the agricultural gardens / plantations remain prevailing, while accommodating small-medium dwelling units typically for Omani family living with occasional Expatriate living.
Typical Building Height	Maximum G+2 Parapet cannot exceed 1m beyond maximum height of the building.
Typical Floor Height	3.5m G; 3m above
Typical Plot Size	Minimum 1500 m2
Plot Coverage	Maximum 25% of plot to be paved or built area up to 750m2 built or paved footprint in total.

Setbacks & Entrances	Front setback – 0m Side setback – 0m, with the built side against a single lateral property boundary only for a maximum length of 22m Rear setback – min. 25m Perimeter property walls to be 2m maximum and limited to dwelling area.
Resident Parking (on plot)	2 car parking spaces per unit – enclosed behind gates or within ground floor of the building.
Visitor Parking (on street)	Allowed outside the plantation and agricultural area only.
Public Space	Publicly accessible roads following the traditional plantation patterns, maximum 6m wide, with permeable surface and low bounding walls adjacent to the plantations. No street lighting. Seating and resting places to be provided where appropriate.
Design Requirements	Materials limited to traditional-looking finishes and equivalent contemporary alternatives. Use of traditional forms and development patterns encouraged. Use of bright artificial colours forbidden. No A/C units or other technical equipment to be visible from access roads and public spaces. Plantation and agricultural gardens to be retained and enhanced with modern irrigation techniques where possible.



Example of Residential Palm Gardens from Manah

Mid Density Residential - Compact Courtyard Townhouses

Intent		
The purpose of a Mid Density Residential – Compact Courtyard Townhouses typology is to take inspiration from older housing developed in the region, which created clusters of compact single-family units, built around a central private open space. Gaps in the grid create communal spaces, additional visitor parking areas and focal points for local services. Dwellings within the grid can evolve with time, using traditional methods of expansion. This approach is suitable for medium density areas of all main settlements. Goals • Adoption of traditional construction methods and development patterns promoting locally appropriate development formats. • Affordable construction, spread over time. • Medium density with individual family units		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units	Restricted to small scale functions only: • Local mosque • Local shops • Primary schools • Local community facilities • Local recreational open space • Small scale visitor / tourist accommodation	<i>All other uses that do not meet the purpose and outcomes of the land use, including:</i> • Any large format buildings • Any use requiring large car parking

Mid Density Residential – Compact Courtyard Townhouses	
Building Typology	Compact Courtyard Townhouses are single family units arranged a small central opening within a tight regular grid. They suit both Omani and non-Omani family living. They are typically clustered in groups of 100-200 units of single buildings served by lanes on all sides.
Typical Building Height	Maximum G+1 Accessible roof terrace only above ground floor level to protect neighbour's privacy.
Typical Floor Height	3.5m G; 3m above
Typical Plot Size	400m ² to 700m ²
Plot Coverage	Maximum 65%
Setbacks & Entrances	All setbacks – 0m, with built mass against the property boundaries up to 60% of its perimeter maximum Perimeter property walls to be 2m maximum.
Resident Parking (on plot)	Minimum 2 car parking spaces per unit – enclosed behind gates or within ground floor of the building.
Visitor Parking (on street)	Within small parking yards in between properties.

Public Space	All properties to be served by at least one access road of 6m width. Public space / widening and garden every cluster of 25 units. Limited street lighting, mounted on buildings. Seating and resting places to be provided where appropriate.
Design Requirements	Natural-looking finishes and use of traditional forms and details (gates, window screens, etc) encouraged. Use of bright artificial colours forbidden. No A/C units or other technical equipment to be visible from access roads and public spaces. Courtyard planting.



Example of Compact Courtyard Townhouses from Lizugh

Low Density Residential – Hajar Mountain Villas

Intent		
As buildable land in the mountains is scarce and construction expensive, any form of development in the mountain should be compact and efficient. Protection of views and appreciation of the mountain scenery should be prioritised, and development remain discreet, respectful and located away from prominent positions. The purpose of Low Density Residential – Hajar Mountain Villas is to build distinctive residential areas appropriate to the context of the mountain, forming a compact group, prioritising shared open spaces and viewpoints over the creation of private open spaces. Parcel layouts should adapt to the topography and land formation, rather than imposing an urban grid over the landscape. To preserve the dominance of the mountain setting, height is restricted, and appropriate greenery is required. Suitable for Omani as primary residence or for second / holiday homes. Goals • Adoption of compact villa formats that respond organically to the local landscape and topography. • Limitation of private gardens or private open space in favour of shared public spaces to optimise the mountain setting. • Distinctive architecture allowed to emerge by unique planning standards.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units in small clusters of 50-60 units	Restricted to small scale functions only: • Local mosque • Local shops • Visitor / tourist accommodation adopting the same formats	<i>All other uses that do not meet the purpose and outcomes of the land use, including:</i> • Any large format buildings • Any buildings over G+2 • Any use requiring large car parking

Low Density Residential – Hajar Mountain Villas	
Building Typology	Hajar Mountain Villas are clusters of up to 60 single family units enclosed by low perimeter walls with no or small private open space. They are typically arranged within a grid of 10m streets laid out to follow the natural ground and topography and, depending on the situation, built on split levels to suit the slope. Gaps and open spaces in between the houses serve as semi-private communal gardens or viewing spaces. They suit both Omani and non Omani family living.
Typical Building Height	Maximum G+2 Accessible roof terrace only above ground floor level to protect neighbour's privacy.
Typical Floor Height	3.5m
Typical Plot Size	Ranging from 400m ² to 600m ²
Plot Coverage	Maximum 50%
Setbacks & Entrances	No setbacks from streets and semi-private spaces. 1.5m setback from other properties. Perimeter property walls to be 1.7m maximum.
Resident Parking (on plot)	Maximum 1 car parking space per unit enclosed behind gates or within ground floor of the building. 1 additional space within a shared parking area at the edge of each cluster.
Visitor Parking (on street)	Within parking yards at the edge of each cluster.
Public Space	Mountain cuts and flattening not permitted. Exposed retaining walls for private plots or roads limited to 2m high terraces and naturalised.

	Access roads of approx. 10m width including sidewalks, creating a low speed and pedestrian-friendly environment. Overall land-take of road infrastructure and parking to be less than 20% of development area. Limited street lighting, mounted on buildings.
Design Requirements	Natural colour finishes and use of traditional materials, forms and details (gates, window screens, etc) only. Tree planting within the property and green terraces encouraged. No A/C units or other technical equipment to be visible from access roads and public spaces.



Example of Recent Housing on the Slopes of Misfat Al Abreeyin

Mid Density Residential – Hajar Mountain Compact Clusters

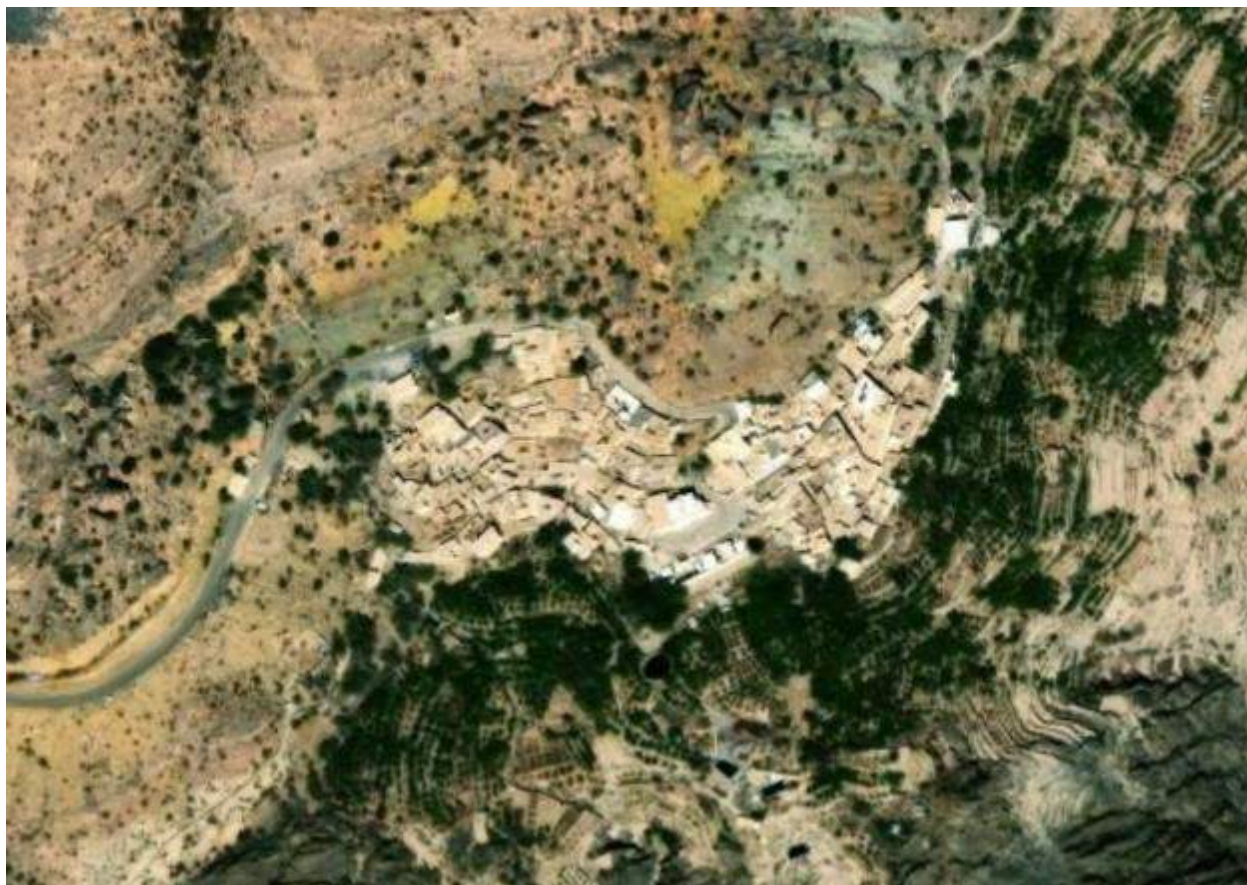
Intent		
As buildable land in the mountains is scarce and construction expensive, any form of development in the mountain should be compact and efficient. Traditional villages are often tightly clustered and with limited road access. This pattern is intended to protect the mountain and maximise the land for sustenance and agriculture, by keeping the built-up areas to a minimum. Most of these traditional villages are now of heritage value. The purpose of Mid Density Residential – Hajar Mountain Compact Clusters is to build distinctive residential areas appropriate to the context of the mountain, prioritising shared open spaces and viewpoints over the creation of private open spaces. Parcel layouts and buildings should adapt to the topography and land formation, rather than imposing an urban grid over the landscape. To preserve the dominance of the mountain setting, height and car access are restricted. Suitable for Omani as primary residence or for second / holiday homes. Goals • Adoption of compact residential formats that adopt traditional forms suited to the local landscape and topography. • Limitation of land take to optimise the mountain setting. • Distinctive architecture allowed to emerge by unique planning standards.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units in small clusters of 50-60 units	Restricted to small scale functions only: • Local mosque • Local shops • Visitor / tourist accommodation adopting the same formats	<i>All other uses that do not meet the purpose and outcomes of the land use, including:</i> • Any large format buildings • Any buildings over G+2 • Any use requiring large car parking •

Mid Density Residential – Hajar Mountain Compact Clusters	
Building Typology	Hajar Mountain Compact Clusters are formed of up to 60 single family units attached at the side walls and separated by yards and patios at the back. They are typically formed by narrow plots, served by a single vehicular street / lane and multiple pedestrian passageways laid out to follow the natural ground and topography and, depending on the situation, built on split levels to suit the slope. Gaps and open spaces in between the houses serve as semi-private communal gardens or viewing spaces. They suit both Omani and non-Omani family living.
Typical Building Height	Maximum G+2 Accessible roof terrace only above ground floor level to protect neighbour's privacy.
Typical Floor Height	3m
Typical Plot Size	Ranging from 300m ² to 500m ²
Plot Coverage	Maximum 70%
Setbacks & Entrances	No setbacks from streets and semi-private spaces. No lateral set-back. 2-4m setback from the back. Property walls to be 1.7m maximum.
Resident Parking (on plot)	none
Resident and Visitor Parking (on street)	2 resident car park spaces and 0.5 visitor space within a shared parking area at the edge of each cluster.

Public Space	Mountain cuts and flattening not permitted. Exposed retaining walls for private plots or roads limited to 2m high terraces and naturalised. Access roads of approx. 10m width without separate sidewalks, creating a low speed and pedestrian-friendly environment. Overall land-take of road infrastructure and parking to be less than 15% of development area. Limited street lighting, mounted on buildings.
Design Requirements	Natural colour finishes and use of traditional materials, forms and details (gates, window screens, etc) only. Tree planting within the property and green terraces encouraged. No A/C units or other technical equipment to be visible from access roads and public spaces.



Example of Clustered Houses in Birkat Al Mawz



Example of Traditional Clustered Houses on Steep Slopes near Sayq

Tourism Development

Tourism development in Ad Dakhliyah will follow the ONSS National Standards and the policies set out in the Regional Spatial Strategy Policy GP1. In addition, the following regional specific guidance will be applied:

- **Business Hotel, Serviced Apartments and relative complexes** will have a height limit of 5 floors and only be allowed within the settlement boundaries of Nizwa, Samail/Lizugh, Bahla and Fanja. They will be well integrated in the fabric of the city as part of a local masterplan designed to encourage pedestrian access to all main local destination. Isolated hotel compounds will be discouraged.
- **Tourism Resorts and complexes**, including a wide range from luxury resorts to camping facilities and theme parks, should only be allowed within the designated sites and subject to the approval of a masterplan, business strategy and viability assessment. The design proposals should be clearly adapted to local context and climate:
 - Maximising Green Building methodologies and techniques, maximising recycled water and low energy technology.
 - Adoption of layouts adapted to the local terrain and situation and inspired from traditional patterns of development.
 - Use of locally inspired materials, colours and finishes.
 - Containment of light pollution and no street / open space lighting in the mountain except for essential safety
- **Shared Transport** - Larger tourism operators, whether mountain resorts, leisure facilities or hotels will be required to provide shared taxi and/or minibus services to and from their location to local public transport nodes to ensure that tourists and visitors to the Governorate and employees who live and work in the Governorate have a sustainable alternative to private vehicles where no coach or local bus routes exist. These services can be provided by the operator or contracted out to shared transport services provider. The following threshold should apply:
 - Any hotel with more than 50 beds
 - Mountain resort/hotel with more than 20 beds
 - Any leisure facility attracting more than 100 visitors per day
 - Any tourism employer with more than 100 employees

Employment

Employment development in Ad Dakhliyah will follow the ONSS National Standards and the policies set out in the Regional Spatial Strategy Policy GP1. In addition, the following regional specific guidance will be applied:

- **Shared Transport** - Operators of large commercial, retail and/or industrial premises that have no direct access to local bus services will provide company transport to ensure employees have sustainable alternative to private vehicles. This should apply to government and local government offices. These services can be provided by the operator or contracted out to shared transport services providers, such as taxi and minibus operators. These services can utilize existing transport provision or future demand responsive transport services, using the technologies utilized by smartphone ride hailing applications. The following threshold will apply:
 - Any commercial, industrial or retail with more 100 employees
 - Any government office or agency with more 100 employees

Parks and Open Space

The purpose of Parks and Open Space is to provide areas which serve the recreational needs of a wide range of residents and visitors. Where required to meet community needs, development may include shelters, amenity facilities, picnic tables, and playgrounds that support safe environment and allow access for essential management and maintenance.

The National Planning Standards identify a range of Parks and Open Spaces suitable to the recreational needs of the local population.

Within Ad Dakhliyah, in addition, the following regional guidance will be applied:

- **Access to Oasis and Plantation Areas** – customary informal recreational access (walking, picnics and small gatherings) will be retained within the oasis, by allowing pedestrian and cycle public access. No specific provision for visitors will be made: no permanent lighting, benches or waste collection will be located unless requested by the local community. No retail / food vans will be allowed. Where necessary an information panel setting out the behaviours and rules of visitors and recycling bins will be installed at the edges of the entrance route to the oasis.
- **Formation of Regional / District Natural Open Space** – Policy SD12 sets the framework for projects including the formation of large areas of natural open space within the settlement boundaries of the larger settlements. Often these areas correspond to attractive and distinctive local features, such as main wadis, hillocks and rock formations. These areas are to be retained as natural undeveloped spaces in perpetuity, providing natural wildlife corridors and supporting human appreciation of the natural environment. Within these areas:
 - Any planting should be comprised of naturally occurring or locally frequent species adapted to the climate and suitable to support local wildlife habitats.
 - Paths and walks should provide access to no more than 20% of the area and strictly built with natural and permeable surface finishes, without lighting or other formal equipment.
 - Seats and shelters should be natural and informal, such as boulders and groups of trees.
 - Any visitor or commercial use should be limited to small temporary facilities at the interface of the natural and built areas.

Urban Streets

A major change is necessary within Ad Dakhliyah to transform roads and main highways into urban streets as they enter the urban boundaries of a settlement. This will require the identification of a better balance between road / vehicular functions, pedestrian movement and permeability and provision of attractive public realm with trees and shaded areas. This will be very important in the main commercial areas, where safe pedestrian movement and frequent crossings should be the norm.

National Planning Standards provide a range of appropriate urban street typologies, typically suited to larger urban settlements, where the majority of development will take place. Appropriate National Urban Street Typologies to be applied within the settlement boundaries include:

- Lower Density Urban Boulevard and Avenue layouts – suitable only for the main national roads of Nizwa and Samail / Lizugh.
- Streets typologies - appropriate to the main highway corridors and urban distributor roads of all key settlements in Ad Dakhliyah
- Lanes – appropriate to all mixed use, commercial and residential districts
- Alleyways – appropriate to residential areas and historic districts.

Other Road and Access Corridors

In Ad Dakhliyah , regionally, new access is likely to be necessary to enable tourism development or other activities within sensitive environmental areas, including within the boundaries of the Hajar Mountains SPZ (Policy SD11), UNESCO World Heritage sites (Policy CH2), Heritage Conservation Areas (Policy CH1), Nature Conservation Areas and Geoparks (Policy TE1). However, the design standards as set out in Oman Highway Design Manual are not suitable in areas of significant ecological, geological, cultural and scenic value. The design guidance is focused on improving the alignment of the road and the increasing the design speed of the new or upgraded routes, without due consideration to the adverse impacts of construction and new alignment on environmentally sensitive areas.

Ministry of Transport, Communications and Information Technology will work with the Planning Authorities to design and deliver rural highway or transport schemes (including parking and other forms of transport such as cable cars) that are appropriate within the context of the specially designated areas.

Any highway scheme located in a protected/designated area as defined by Policies SD11, TE1, CH1, CH2, CH3, CH4 and CH5, will be subject to a full feasibility, design, and environmental and social impact (ESIA) assessments, to determine if the scheme is appropriate and that the adverse environmental, cultural, ecological and social impacts of highway scheme can be minimised:

- No construction works will proceed until such assessments have been undertaken by Ministry of Transport, Communications and Information Technology and approved by the Relevant Planning Authority. If it is determined that the adverse environmental impacts are significant, the relevant committed projects should be cancelled.
- Significant impact includes light pollution, need for extensive retaining structures, major alteration of the contours and of the natural mountain slope

Interim Development Safeguards in the SPZ and Protected Natural Areas

The parameters for development within the Special Planning Zone and in other protected areas (Policy TE1) will become clearer once the institutional arrangements will be further developed. It will be important to safeguard these important areas in the interim period through a series of safeguards and restrictions, which can be softened at a later stage by the authority in charge of the SPZ. These include:

- No development above 5ha will be allowed in the interim period. Development below 5ha will be allowed to proceed subject to a masterplan proving how the proposals are adapted to the site, its topography and cultural traditions.
- All development along wadis will need to adhere to a general setback of a minimum of 50 metres.
- Buildings will be limited to 2 storeys to keep the natural landscape “readable” from a distance with only minor landmarks such as a local mosque. Buildings and structures should avoid ridges and clifftops. Use of natural colours and materials is encouraged.
- No building activities (including visitors community facilities) are allowed in the interim period in designated Nature Conservation Areas.
- No facilities such as restaurants, coffeeshops, food vans and parking are allowed in Nature Conservation Areas and in prominent locations on ridges, cliff tops and vista-points.
- Cars access will be restricted to designated roads, with small parking facilities allowed at specifically designed and maintained picnic spots.
- No street and open space lighting are allowed in Nature Conservation Areas and in prominent locations.
- The development of large technical infrastructure, including dams and energy plants will be not allowed in the interim period.
- Strict measure and fines should be imposed so that visitors take all their waste with them when leaving the area, pending the setting up and organisation of waste collection systems in the area.



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9.6. Al Batinah North Governate

This section presents the Regional Planning Standards for Al Batinah North Governorate. The regional standards complement the national standards and illustrate the regional specificities. The regional planning standards take into consideration Al Batinah North Governorate's specific physical environment and built character.

Al Batinah North has a coastline that stretches roughly 180 km along the eastern edge. Greater Sohar is the largest port in the region and functions as the northern gateway of Oman. Along the coastline there are many smaller ports and harbours. The majority of urban development in the Governorate is concentrated within this eastern coastal strip, where many coastal communities are located and where fishing and the majority of agricultural activities take place. In the western part of the governorate, the Al Hajar mountains are home to many dispersed rural communities, typically strategically located along seasonal wadis and principal communication routes.

Relationship with the National Planning Standards

At the national level, the ONSS Planning Standards have been developed to support the future Vision of Oman and to provide development regulations and guidelines to ensure the development of high-quality places and communities which encompasses the ONSS Vision and Objectives.

The National Standards will apply to each governorate and will be supplemented by any regional specific standards. As well as aiming to achieve the national ONSS Vision and Objectives, the Regional Standards will also aim to achieve the Regional Spatial Strategy Vision and Objectives, and support the planning policies, which were outlined in Volume I.

National Urban Design Guidelines

The National Planning Standards set out 10 Key Community Design Principles, which underpin the vision and overall goals of the Standards, in order to create socially, economically, environmentally and culturally attractive and viable places to live, now and in the future. The 10 principles are listed below (page 23 of the National Planning Standards) for reference as each Regional Planning Standard for the Governorate shows which principles it will enable.

- Climate Responsive
- Cultural Inspiration
- Character
- Ease of Movement
- Liveability
- Places of Quality
- Sustainability
- Social Inclusion
- Legibility
- Vitality and Viability

Sustainable Development

The objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs. The ONSS and RSS 20-year spatial planning frameworks set out a way of delivering a better balance between social, economic and environmental dimensions, either directly or indirectly. Spatial development in Oman should aim to minimise impacts, maximise benefits and actively seek opportunities to secure gains for the country's citizens across the economic, social and environmental dimensions. At a regional level, in Al Batinah North, this might involve the following:

- Protecting and mitigating coastal development against the risk of sea level rise (SLR), storm surges and flooding (environmental);
- Enhancing the structure and efficiency of urban areas located along the coastline, by limiting sprawl and encouraging future development to be concentrated within defined areas with better access to infrastructure and public transport (economic and environmental);
- Protecting and supporting cultural influences and traditional lifestyles, such as marine related industries, fishing and agriculture (social and environmental);
- Reinforcing cultural tourism around the unique coastal forts, beaches and corniches and opportunities within the Al Hajar Mountains (social and economic); and
- The importance of the Special Planning Zone in providing extra guidelines for sensitive areas that provide special character to the governorate (social and environmental).
- Adherence to the Regional Planning Standards will contribute to a more sustainable future for Oman.

Climatic Response

At the national level, the Standards propose to address issues through design, helping to mitigate the urban heat island effect, solar orientation of buildings and spaces and ensuring quality infrastructure and protection is provided in all urban areas. These approaches should be carried through at a regional level in Al Batinah North. Climatic response issues that are specific to the governorate include the risk to coastal development from sea level rise (SLR), coastal erosion and the risk to coastal development from coastal storm surges and flooding.

The governorate has significant development along its coastline, which stems from its historic evolution around fishing settlements. This development was often uncontrolled and has come at the expense of the coastal environment. The coastline was previously more protected from storm surges and tsunami by naturally occurring mangroves. The majority of mangroves have been stripped bare to permit ribbon development along the coast, offering sea views.

Currently, 92% of the governorate's population is forecast to live within the urban coastal zone. As a result of climate change, many areas are at risk from ongoing SLR and extreme weather events. Future development should be subject to specific Standards for coastal development in the governorate.

The coastal zone for Al Batinah North has been defined as 12 nautical miles seaward and 1km inland from the mean high-tide line (MHTL). This has been defined with reference to the California Coastal Commission, according to which all areas of land affected by their proximity to the sea should be included.

In 2015, the Public Authority for Civil Aviation (PACA) published an Assessment of Coastal Hazards, Vulnerability and Risk. In respect to tsunamis, for the majority of the Al Batinah North coast the height above the natural coastline that a tsunami wave might reach was found to be 2 m to 10 m. The length of inundation from such waves would potentially be 1,000 m to 4,000 m inland, due to Al Batinah's flat coastal plain. Given the density of development along the coast of Al Batinah North a tsunami could severely impact a large proportion of developments and infrastructure across the coastline. Correspondingly, the vulnerability of humans to a tsunami event was put at high, and the vulnerability of infrastructure high to very high.

Therefore, the inland extent of the coastal zone shall be reviewed by authorities responsible for implementing coastal zone management within Al Batinah North in conjunction with relevant stakeholders as part of the ICZMP (Policy CE1.1). It may be necessary to extend the coastal zone in some areas to 4000 m inland to cover the possible inland extent of a tsunami. Policy CE1.2 requires the undertaking of hazard, vulnerability and risk assessment studies for Tsunamis and Storm Surge across Al Batinah North. Such studies will verify and update the PACA Assessment of Coastal Hazards, Vulnerability and Risk for Oman completed in 2015.

Wadis are also included within the coastal zone of Al Batinah North as they provide a direct link from the Al-Hajar Mountains to the sea and have historically supplied sediment to the coastline. Wadi sediment would discharge into the sea replenishing material moved by erosive waves and longshore drift. However, inland recharge dams constructed several kilometres from the coastline, capture as much as 48% of wadi sediment that previously would have made its way to the coastline. The most significant impacts of the interruption of the natural sediment supply to the coastline are increasing coastal erosion and increased risk from coastal hazards such as storm

surge and tsunami. Consequently, the coastal zone includes all wadis within the Al Batinah North as they are directly linked to management issues on the coastline. As with the inland extent of the coastal zone requiring validation, the extent of the wadis that are included within the coastal zone will also require validation and review by authorities as part of the ICZMP (Policy CE1.1).

In respect of storm surge, the expected water levels were 4 to 5 m above normal, little different from that for much of the Omani coast, but because of the intense development and population along the coast of Al Batinah North, and the flatness of the coastal plain, both human and infrastructure vulnerability was considered high to very high.

Development within the coastal zone shall be permitted but it should be managed in an integrated fashion (refer to policy CE1.1) so that all stakeholders are considered within management plans for human activities and / or natural resources within the coastal zone.

Coastal Development Setback

At a national level, an interim mechanism for coastal setbacks was approved by SCP Decision No 62-2014 that stated planners should apply a setback of 300 m from the point of the Highest Astronomical Tide (HAT) for all new developments across Oman (existing buildings and infrastructure were excluded). The current law on coastal setbacks (MD 20/1990 amended by MD 23/1997) states that setbacks for open sandy beaches vulnerable to erosion shall be 150 m. These existing Standards were reviewed and incorporated into the National Planning Standards (page 251).

The Coastal Development Setback within Al Batinah North contains much existing infrastructure and development which mean that the National Standards cannot always be implemented. For example, the partly constructed coastal road often falls within the nationally defined 300 m setback. For future development in the coastal zone, the Coastal Setback Development Management Regional Planning Standard should also be used.

The setbacks for Wadi's to prevent risk from flooding should follow the nationally prescribed Planning Standards.

Intent		
The intent of the Coastal Development Setback regional planning standard is to severely limit development within the setback areas. Coastal development in Al Batinah North must be subject to National Planning Standards for coastal setbacks, unless existing development prevents this. In accordance with Policy CE1.2, coastal setbacks for future developments are: - Where the coastal road runs through developed urban areas, the road shall be used as the basis for the coastal setback. The road runs at 100 – 150 m from the coastline. - For developed urban areas where the coastal road is not present or runs inland beyond the 150 m the setback shall be 150 m from the level of the Highest Astronomical Tide (HAT) to the building line; and - For undeveloped areas the setback shall be 300 m from the HAT to the building line (in accordance with National Standards). Within the coastal setback, new development will not generally be permitted unless specifically approved by the local authority as the result of a well-justified and detailed planning application. Where new developments are permitted, additional flood protection and / or coastal defences may be required to mitigate against the threat of coastal flooding and erosion in order to gain such approval. The Regional Planning Standards for Al Batinah North should apply until authorities in charge of planning shall utilise the Integrated Coastal Zone Management Plan, outlined in Policy CE1.1.		
Goals		
- To ensure that development is at a reasonably safe distance from the coastline to promote climate responsive design and reduce the risk of coastal erosion, sea level rise and storm surges; - To ensure that any new development permitted does not remove excessive open permeable land; and - To prevent urban sprawl, in accordance with policies SD2.1 and SD3.1.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
- Existing land uses - Existing infrastructure - Agriculture; and - Parks and Open Space.	All other uses specifically permitted following detailed planning applications.	N/A

Key Urban Design Principles Enabled		
- Climate Responsive - Sustainability - Vitality and Viability		
Building Typology	Various, where development is permitted	
Typical Building Height	Height should respect exiting context	
Typical Floor Height	3 - 4m (depending on building use)	
Typical Plot Size	Where development is permitted, 300 - 600m ² for a single villa unit	
Plot Coverage	When development is permitted, up to 60%	
Setback and Entrances	To be determined based on MoTCIT/ relevant Authority standards.	
Resident Parking (on plot)	To be determined based on MoTCIT/ relevant Authority standards.	
Visitor Parking (on street)	Where ROW permit, to be determined based on MoTCIT / relevant Authority standards.	
Public Space	Quality public realm should be prioritised, typically provided.	
Special Design Guidelines	- Public access to the coast / beachfront must be considered where a development would restrict or block usual access; - Additional flood protection and / or coastal defences may be required to mitigate risks; - Buildings and sikka orientated to benefit from coastal breezes; - Building renders finished with muted colour palette.	



Coastal Zone Management – Coastal Development Setbacks

The green line shows the 300m setback which should be used for all new development in accordance with National Policies and Standards. However, due to the partly constructed coastal road in Al Batinah North,

Regional Standards and Policy (CE1.2) state that development can occur up to the boundary of the coastal road, if it falls closer to the HAT (blue line) than the 300m and 150m setbacks. The dotted black line represents the regionally defined coastal setback for Al Batinah North Governorate. Supporting information on coastal setbacks is provided in Volume III, Appendix E and the EMS.

Settlement Pattern

Many of the urban coastal settlements originated around smaller fishing settlements and agricultural areas. The larger settlements and wilayat centres often expanded around forts and central mosques, which can now be characterised, in part, by a relatively dense network of low-rise streets, lanes and sikka located around key landmarks of coastal fort, souqs and mosque. In order to retain the character and identity of these settlements, this traditional settlement pattern should be maintained where it is evident. Future development should not remove the key link between the fort, souq and mosque, but rather enhance it, where possible.

Traditional lifestyles have influenced the built environment, whether it be the traditional souq and sikka street layouts or workshops supporting local industries including those related to the sea and seafaring. Within the National Standards, sikka are set as having a minimum width of 3m. Traditional souqs and markets should be protected from future development as they form part of the character of many of the coastal settlements in Al Batinah North.

Coastal and Inland Settlements

The RSS for Al Batinah North promotes the densification and regeneration of urban settlements, rather than continuing urban sprawl over valuable agricultural land. The Regional Planning Standards reinforce this approach but notes that new, denser development in the historic core should not detract from the existing historic character of these settlements

Intent		
The intent of the Coastal and Inland Settlements regional planning standard is to preserve and enhance the character and local identity of coastal and inland settlements whilst also limiting sprawl through well-designed densification and infill development. Development proposals should enhance their surroundings and the settlement layout, by providing the following: - Greater ease of movement between key areas, such as the fort, mosque and souq and other community facilities, through sikkas and other pedestrian routes; - Providing a greater sense of enclosure around key public spaces and greater shading to promote walkability; - Providing the correct land uses in the historic core, such as mixed uses and different types of residential typologies, such as apartments and townhouses as a variation to villas; and - Promoting views and vistas of key landmarks, such as the settlements fort or mosques, to help wayfinding and reinforce a sense of place.		
Goals		
- To preserve and enhance the settlement pattern of historic towns and neighbourhoods; and - To encourage new development to be contextual and responsive to local character.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
- Residential; - Community Facilities; - Parks and Open Space; - Commercial; - Tourism.	- Industrial; and - Utilities and Infrastructure.	Agriculture (unless demonstrably characteristic of the settlement)
Key Urban Design Principles Enabled		
- Cultural Inspiration - Character - Places of Quality - Social Inclusion - Legibility - Vitality and Viability		

Building Typology	Various



Typical Building Height	Height should respect existing building heights.
Typical Floor Height	3.5m
Typical Plot Size	400m ²
Plot Coverage	up to 80%
Setback and Entrances	To be determined based on MoTCIT/ relevant Authority standards.
Resident Parking (on plot)	To be determined based on MoTCIT/ relevant Authority standards.
Visitor Parking (on street)	Where ROW permit, to be determined based on MoTCIT / relevant Authority standards.
Public Space	Quality public realm should be prioritised, typically provided
Special Design Guidelines	Building renders finished with muted colour palette.



Historic core example of Sohar



Ribbon development is typical within the Hajar Mountains

Cultural Influences and Traditional Lifestyles

Omani culture is part of the country's identity. At a national level, the Standards will encourage traditional Omani architecture and built form, support new and emerging Omani architectural trends and encourage the restoration and regeneration of communities. At the regional level, there are a number of distinctive cultural assets that help reinforce the character and identity of the governorate. These features should be respected and given special planning consideration in order to help conserve and build upon the cultural influences in the governorate, such as:

- The governorates numerous coastal forts and their setting, including adjacent historic urban areas;
- The relationship of coastal communities with the sea and coastline.

The following Regional Planning Standards contain specific details in relation to the protection and preservation of the unique components of the built environment that define the character of Al Batinah North.

Coastal Communities

The main coastal settlements of the governorate have typically developed around a traditional coastal fort. The main coastal settlements of Sohar, As Suwayq, Al Khabourah, Liwa and Saham all have a fort from which development of the settlements formed around. It is a distinguishable characteristic of each of the settlements and contributes to the sense of place and identity. Therefore, regionally specific standards should apply, to protect the immediate setting of these historic and cultural assets.

The standards that should apply will vary between each fort and its setting. Developers are required to demonstrate that proposed designs have taken into consideration local heritage features, respecting the character of these features in terms of scale, mass and appearance.

Sea fishing has historically been a major part of the Al Batinah lifestyle. This includes the fish souqs in the coastal settlements, harbours and the traditional dhow boat-building and maintenance. In many cases, these traditional lifestyles have influenced the built environment. In particular it is beneficial to preserve viable sea fishing and their associated infrastructure such as harbours, boat maintenance and fish souqs.

The heritage of coastal forts is reinforced by the survival of historic residential communities in adjacent areas. The historic character of these areas often makes a positive contribution to the setting of coastal forts, supporting local businesses and cottage industries related to the sea.

Intent

The intent of the Coastal Communities regional planning standard is twofold: regarding coastal forts and their setting, to ensure that new development does not adversely affect the setting of coastal forts; and, regarding the relationship between coastal communities and the sea, to maximise positive relationships between coastal heritage, historic and contemporary built up areas, and the foreshore.

Neither of these aims should preclude good contemporary design where it is demonstrated that it does not detract from the ability to appreciate heritage values.

Development proposals should neither disproportionately restrict coastal communities' access to the coastline, nor adversely affect the value and appreciation of distinctive seascapes.

In general, the following points should be considered when development is proposed within 250m of a high-value historic asset:

- Consideration of building heights, scale, mass, construction materials and finishes (colour, tones and types of material should not detract from historic forts if in vicinity);
- Consideration of view corridors and vistas being obscured by new development (see Figure on the following page);
- Consideration of parking requirement and demand in vicinity of a fort;
- Consideration of the adverse impact caused by inappropriate siting of utility infrastructure such as mobile telephone masts and substations; and
- Consideration of road improvements and alterations which may have an adverse impact on the fort and its setting.

Goals

- To improve the siting and design of buildings located within close proximity to buildings of cultural importance;
- To promote public access and use of coastal open space and to enhance the quality of this space; and
- To require public and private-sector developers to consider the potential impact of development on buildings of cultural or historical importance.

Permitted Uses

Primary Uses	Secondary Uses	Not Permitted
• Residential; • Tourism; • Commercial; • Light industrial; • Community Facilities; • Parks and Open Space.	• Utilities; • Infrastructure;	N/A

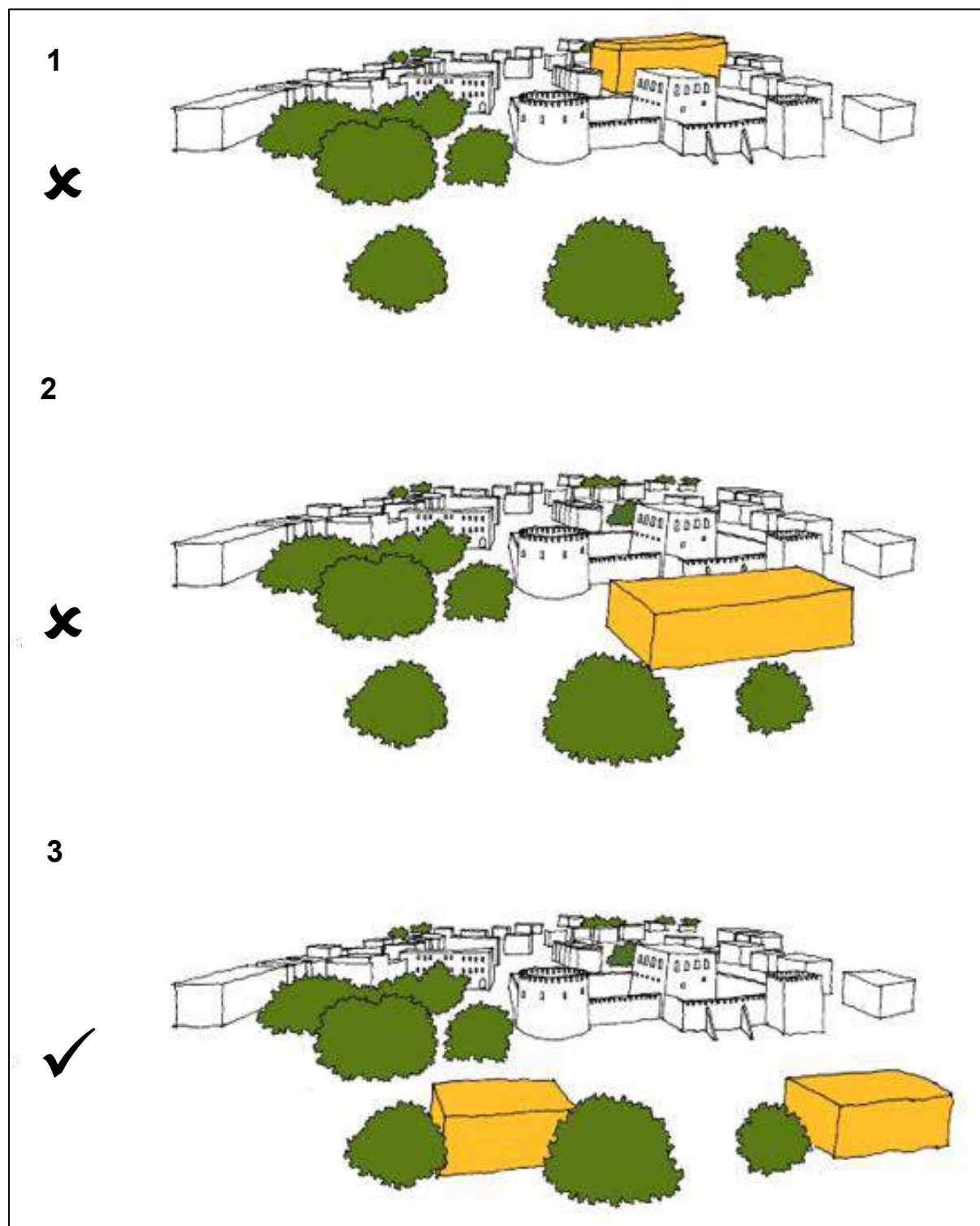
Key Urban Design Principles Enabled

- Cultural Inspiration
- Character
- Liveability
- Places of Quality

Building Typology	Various
Typical Building Height	G+2, total height should not exceed that of nearby coastal fort.
Typical Floor Height	3.5m
Typical Plot Size	400m ²
Plot Coverage	up to 80%
Setback and Entrances	To be determined based on MoTCIT/ relevant Authority standards.
Resident Parking (on plot)	To be determined based on MoTCIT/ relevant Authority standards.
Visitor Parking (on street)	Where ROW permit, to be determined based on MoTCIT / relevant Authority standards.
Public Space	Quality public realm should be prioritised, typically provided

Special Design Guidelines

- Residential houses traditionally occupied smaller plots in dense configurations adjacent to the coastal forts, many characterised by largely enclosed plots with central courtyard(s).
- Buildings and sikka orientated to benefit from coastal breezes.
- Building renders finished with muted colour palette.



Consideration of view corridors and vistas being obscured by new development

The three scenarios in the above figure show how the setting of Sohar Fort could be degraded from improper consideration of view corridors and vistas, which in turn would detract from the unique character and identity it creates for Sohar.

- Scenario 1 – large building where the scale is disproportionate to its context, particularly Sohar Fort, which makes it inappropriate;
- Scenario 2 – The proximity and massing of the development adjacent to the Fort detract from its setting, which makes it inappropriate;
- Scenario 3 – Massing and scale is more considered to the existing context meaning views and vistas of the Fort are more likely to be maintained. In consideration of the Key Urban Design Principles, this would aid the preservation of character and promote places of quality.

Rural Communities

Many rural settlements within the Hajar Mountains of Al Batinah North are ribbon developments, their form being strongly influenced by topography and having evolved adjacent to a wadi or movement corridor. This is particularly clear within the mountainous rural settlements, where various forms of falaj are used for agricultural irrigation.

Ribbon development is a distinct settlement pattern for the rural settlements in the governorate, particularly within the Hajar Mountains and forms part of the character of these settlements. The following figure shows a typical mountainous urban settlement in Al Batinah North that follows the wadi and main road through the settlement

Intent		
The intent of the Rural Communities regional planning standard is to reinforce existing settlement character. Settlement character is strongly influenced by overall form, density, building scale and design aesthetics. Development proposals should demonstrate their contextual basis so that future development proceeds in a sympathetic way: • Development must be located within revised rural settlement boundaries, as per policy SD2.1 • Development should respect the historic ribbon pattern but focus on densification of the central core; and • Densification that is proportionate to the existing settlement should be within the central core of existing rural settlements.		
Goals		
• To respect traditional lifestyles of existing rural communities that evolved around a wadi channel or movement corridor but to promote densification in the centre of these settlements with the provision of co-located services, where necessary; and • To prevent urban sprawl outside of defined settlement boundaries.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Residential; • Community Facilities; • Parks and Open Space; • Commercial; • Tourism.	• Agriculture; • Industrial; • Utilities and Infrastructure;	Agriculture (in the core of the settlement)
Key Urban Design Principles Enabled		
• Character • Ease of Movement • Liveability • Places of Quality • Legibility • Vitality and Viability		

Building Typology	Various
Typical Building Height	G+2, total height should respect existing building heights.
Typical Floor Height	3.5m
Typical Plot Size	400m ²

Plot Coverage	up to 80%
Setback and Entrances	To be determined based on MoTCIT/ relevant Authority standards.
Resident Parking (on plot)	To be determined based on MoTCIT/ relevant Authority standards.
Visitor Parking (on street)	Where ROW permit, to be determined based on MoTCIT / relevant Authority standards.
Public Space	Quality public realm should be prioritised, typically provided
Special Design Guidelines	Building renders finished with muted colour palette.



Typical mountainous rural community developed along linear wadi and movement corridor

Agriculture in the Batinah Plain

Agriculture has always been a big part of life within the Al Batinah region. The rich soils in the Al Batinah Plain below the Hajar Mountains have presented many opportunities for different types of agriculture. Often agricultural land is completely integrated within the settlement, reinforcing the need to limit the loss of this land to residential or other uses.

Traditional methods such as collecting water in the aflaj water channels to provide irrigation and natural water supply from the mountains should be preserved, as they form part of the identity of the place. This also extends across the governorate boundary into Al Batinah South. Soil that is suitable for agriculture should be preserved and protected from urban sprawl. The growth area of rural settlements will be controlled by a settlement boundary.

Although new development will not be permitted on viable and productive agricultural land, single buildings and structures of ancillary use to the primary use may be permitted upon application. Examples include:

- Singular single-storey dwellings to support agricultural activities;
- Culverts and other structures related to falaj systems and their maintenance;
- Boundary structures to delineate field systems; and
- Mosques, Musalla and other religious buildings for daily worship of farm workers.

Intent		
The intent of the Agriculture in the Batinah Plain regional planning standard is to protect viable agriculture land which is typically integrated within existing settlements, whilst also allowing for appropriate development of ancillary structures that support irrigation and communities who are working on the land.		
The distinctive character of many historic settlements within the Batinah Plain, which is in large part related to the relationship between their integrated built-up and agricultural areas, are also protected when falling within designated Cultural Conservation Areas under policy CH1.1.		
Goals		
• To preserve scarce agricultural land that may otherwise be developed; • To support and reinforce traditional approaches to agriculture; and • To support the retention and regeneration of traditional features such as falaj channels and boundary features.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Agricultural land	Ancillary structures and single buildings	Any other use
Key Urban Design Principles Enabled		
• Climate Responsive • Cultural Inspiration • Sustainability • Vitality and Viability		

Building Typology	Isolated single-storey buildings and structures constructed using traditional forms and materials.
Typical Building Height	5m
Typical Floor Height	3.5m
Typical Plot Size	100m ²
Plot Coverage	80%
Setback and Entrances	To principal façade only
Resident Parking (on plot)	N/A
Visitor Parking (on street)	N/A
Public Space	N/A

Special Design Guidelines

Where historically employed, the use of traditional falaj systems should be prioritised above water abstraction using motorised pumped wells. Maintenance of falaj systems should use traditional methods and materials. Well ventilated buildings constructed with rendered natural masonry under flat roofs, with parapets. Deep verandas allow for cool shaded space. Render should be finished using muted colours. Field boundary structures should also be constructed using a range of traditional natural materials including masonry or adobe blocks.

The Figure below illustrates the traditional form and integration of agricultural areas with surrounding settlements.



Falaj Rabi Bani'ah in Wilayat Al Khaburah

Vernacular Architecture

The vernacular architecture of the Governorate is most widely represented in the historic buildings such as old Forts. The preservation, enhancement and utilization of cultural heritage resources within Al Batinah North Governorate is a strategic priority, alongside spatial and economic development, provision of high-quality infrastructure and wide-ranging environmental concerns.

The distinctive heritage of the governorate is widely distributed and comprises a range of asset types including archaeology sites, historic buildings and towns, landscapes and cultural traditions. Collectively, this 'historic environment' reflect the history and settlement of the governorate. Whilst even minor attributes of the historic environment contribute to Oman's heritage, and are finite resources worthy of conservation, not all cultural heritage assets have equal importance or sensitivity to change.

A range of management approaches, based on a combination of local specifics and international best practice, have been outlined in the emerging cultural heritage policies in volume 1 of this report (CH1.1 to CH5.1).

Cultural Heritage and Conservation

A Cultural Conservation Area (CCA) is an area of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance. This could be a place, locality, natural landscape, settlement area, architectural complex, archaeological site, or standing structure that is recognized and often legally protected as a specific place/ area of historical and cultural significance. Within Al Batinah North, many proposed CCAs are located in three broad areas:

- Coastal communities, with dense historic settlements clustered around distinctive coastal forts, often incorporating important connections to the sea and seascapes;
- Batinah Plain, with rural settlements with traditional agricultural fieldscapes irrigated by aflaj; and
- Hajar Mountains, with linear wadi settlements, often including defensive features, located close to a network of terraces for agriculture.

National planning standards have set out a range of topics to be considered when guiding development within CCAs, including: setting; development pattern, materials and finishes, views and vantage points; and landscape

A specific issue relevant to Al Batinah North concerns the impact of development on the setting of historic areas and individual features. New roads, telecommunication masts and other infrastructure should be designed and sited sympathetically so as to reduce as far as possible the negative impact on the historic environment. This is particularly important in coastal areas which are generally flat and open, meaning that features that detract from setting or views can be affected over large distances.

Another important consideration is the impact of advertisement and commercial unit shuttering within CCAs. If not properly controlled, both of these can have a disproportionately negative impact on the quality of public realm and historic character of a place.

Intent		
The intent of the Cultural Heritage and Conservation regional planning standards is to support the preservation and enhancement of the distinctive character of designated Cultural Conservation Areas. Proposed development applications should include justified design statements informed by the adopted character appraisals and management plans relevant to the CCA in question. The basis of this approach is set out in regional policy CH1.1, supported by the sustainable management of the historic built environment set out in regional policy CH4.1.		
Goals		
• Ensure that planning decisions are based upon an appraisal of local character; • To preserve or enhance local character; • To enable developers to bring forward opportunities for enhancement, based on the improvement of features which are acknowledged to detract from local character.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Residential; • Light industrial; • Commercial; • Mixed use – residential / commercial.	Various	N/A

Key Urban Design Principles Enabled	
• Cultural Inspiration • Character • Liveability • Places of Quality	
Building Typology	Various
Typical Building Height	G+2
Typical Floor Height	3.5m
Typical Plot Size	400m ²
Plot Coverage	Up to 80%
Setback and Entrances	Determined by detailed CCA characterisation assessment.
Resident Parking (on plot)	To be determined based on MoTCIT/ relevant Authority standards.
Visitor Parking (on street)	If ROW permit, to be determined based on MoTCIT/ relevant Authority standards.
Public Space	Determined by detailed CCA characterisation assessment.
Special Design Guidelines	To ensure that new development is contextual and preserves or enhances the distinctive character of CCAs, special consideration should be given to the following features: • Special attention to the location, scale, massing of new developments, to protect important views and vistas; • Protection of important trees and vegetation which contributes to local character; • Limiting visual influence of aerials and satellite dishes; • Special controls on advertisements and billboards; • Limiting or prohibiting use of metal shuttering in commercial areas; • Close attention to use and design of high-quality hardscape materials; • Ensuring boundary features preserve or enhance local character; • Special attention to the siting of utility infrastructure, to avoid or minimise adverse impacts on the setting of historic buildings and CCAs; and • Special attention to the siting of telecommunication masts, to minimise the adverse impacts on the setting of historic buildings and CCAs, bearing in mind that these impacts occur over longer distances.



As Suwayq town centre

Terrestrial Special Planning Zone

The Al Hajar Mountains are a distinctive topographical feature of Al Batinah North that also cover parts of neighbouring governorates. The mountains possess exceptional environmental quality and visual aesthetic with regard to their scenery, geology, biodiversity, archaeology and built heritage so have been designated as a Special Planning Zone, which means they require special consideration for development due to their significance in the landscape and identity of the governorate and of Oman.

Terrestrial Special Planning Zone

The Special Planning Zone is set out within the emerging policy SD11.1 Hajar Mountains Special Planning Zone. Given the beauty of the area's aesthetic, environmental, ecological and cultural assets, an opportunity exists to leverage this area as a recreational zone, similar to that of a national park, whereby people can explore and be at one with the natural and cultural assets that the area exhibits. As well as providing a healthy environment for its citizens, and meeting international biodiversity obligations, the Hajar Mountains SPZ supports the economic strategy for the governorate of Al Batinah North by providing criteria which ensures development balances the integrity of the natural and cultural heritage of the Hajar Mountains, with the economic development needs of the Governorate, including the promotions of ecosystem goods and services.

Under policies TE1.1 and TE1.2, the designation will adhere to IUCN Category V and IV management practices. Nature Conservation Areas are proposed to highlight specific areas of high importance for natural heritage. In particular, the SPZ within Al Batinah North is an important habitat for Arabian Tahr and Mountain Gazelle populations, the protection of which must be prioritised in any development proposal.

Intent		
The intent of the Terrestrial Special Planning Zone regional planning standard is to preserve and enhance the special character within the designated SPZ by ensuring future development is carefully considered. Policy SD11.1 states the conditions upon which the SPZ Authority should allow future development proposals. This Planning Standard supplements the policy by outlining permitted land uses and further standards for development. Proposed development applications concerning the construction or adaptation of single residential properties shall be dealt with in the normal way. However, proposed development applications deemed by the planning directorate to be of more than local impact shall be required to demonstrate how they have considered the opinions of local residents and other stakeholders in a process of community consultation. The type of development permitted within the SPZ should be: • Appropriately scaled so as not to detract from the aesthetic quality of the surroundings; • Sustainably located and designed; and • Provide sensitively designed parking requirements for tourist and leisure attractions.		
Goals		
• To ensure that development within the SPZ is carefully considered so that it does not detract from the natural and cultural heritage in the area; • Ensure that local communities are consulted about developments in their areas which may affect them and their livelihoods; and • Development that creates jobs and a sustainable use of the land such as tourism should be promoted in the SPZ.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Agriculture; • Parks and Open Spaces; • Other uses (must be small scale and occur within delimited areas): • Tourism; • Residential; • Commercial; • Community Facilities.	Utilities (see Standards on Utility Corridors)	Heavy Industrial, except within reserved mining concession areas;
Key Urban Design Principles Enabled		
• Climate Responsive • Cultural Inspiration		

- Character
- Liveability
- Places of Quality
- Sustainability
- Social Inclusion
- Vitality and Viability



Al Hajar Mountains Special Planning Zone

Other Variations from the National Standards

This section outlines key regionally specific differences for Al Batinah North that are not outlined or differ to those outlined in the National Standards.

Highly confidential document for the sole use of the Ministry of Housing and Urban Planning. Obtaining permitting is required from the Ministry to

share.

The governorate has significant development along its coastline, which stems from its historic evolution around fishing settlements. This development was often uncontrolled and has come at the expense of the coastal environment. The coastline was once protected from the storms coming in from the Indian Ocean and tsunami hazard by naturally occurring mangroves, which have been stripped bare to permit ribbon development along the coast, offering sea views. Currently, 92% of the governorate's population is forecast to live within the urban coastal zone.

The RSS highlights a coastal management zone that extends approximately 1km inland. Any future development in this zone, will be subject to special planning standards and guidelines, as set out in the Coastal Setback Regional Planning Standard and policy CE1.2.

Generally, new development is permitted within the coastal zone only where it is located outside of these stipulated setbacks. However, development is not completely prohibited within the stipulated setback areas. Instead, development proposals will be considered on a case-by-case basis and will be subject to enhanced scrutiny with regards to environmental standards.

Primary Land Uses: Residential - Low Density Coastal Residential Villas

Generally, new development is permitted within the coastal zone where it is located outside of stipulated setbacks. Within this developable zone, it is considered beneficial to both regenerate low-density residential plots (primary land use) or to consider integrating secondary uses that can be demonstrated would meet the demand of local communities, as set out below. The Coastal Setback Planning Standard and Policy CE1.2 must be considered when developing within the coastal zone.

Intent		
The purpose of the coastal communities' category is to recognise the value of the coastal environment and at the same time manage the desire to develop there in a sustainable way. Future development should be targeted within the newly delineated Urban Change Plan Areas and / or revised settlement boundaries, as set out in policy SD2.1 Where there are existing large residential serviced plots exceeding 1,200m² coverage, subdivision into two 600m², or four 300m² residential plots, is permitted. If supported by appropriate demand and subject to planning application, the land use category of existing residential plots may be changed to secondary uses which will support SMEs and community services without greatly altering the existing character of the plot.		
Goals		
• Ensure the future residential development proposed in the coastal areas does not encroach upon the foreshore and are developed in a sensitive and sustainable manner; • Promote coastal villas that are respectful of their existing settings; and • Allow the redevelopment of existing villas to provide for ongoing residential and supporting adjacent uses.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Low-Density Residential – Single Family Villas.	• Community centre; • Community health clinic; • Small hotel / guesthouse; • Community park; • Community tourism; • Mixed use commercial / residential; • Agriculture, fisheries and livestock husbandry.	All other uses that do not meet the purpose and outcomes of the land use, including: • Schools; • Offices; • Religious; • Commercial; • Industrial.
Key Urban Design Principles Enabled		
• Liveability • Places of Quality • Sustainability • Vitality and Viability		
Building Typology	Single Family Villas/Dwellings	

Typical Building Height	Maximum G+3
Typical Floor Height	3.5m
Typical Plot Size	300 - 600m ² Smaller plot sizes are preferred in urban areas (Greater Sohar, As Suwayq) to introduce new residential typologies and promote a compact urban form.
Plot Coverage	Ranging from 60% for the 600m ² and 75% for the 300m ² plots
Setback and Entrances	To be determined based on local context and local planning/ building code.
Resident Parking (on plot)	To be determined based on MoTCIT/ relevant Authority standards.
Visitor Parking (on street)	To be determined based on MoTCIT/ relevant Authority standards.
Public Space	To be determined based on MoTCIT/ relevant Authority standards.
Special Design Guidelines	In general, development or adaptive reuse of coastal communities should be sensitive to local context. Design should adopt the local character, especially in terms of scale, mass and colour.

The Figure below shows existing low-density villas developed along the coast. Future development should be located within the designated boundaries and must respect standards on coastal setbacks to prevent urban sprawl and protect land still suitable for agriculture.



Existing low-density villas development along the coast and settlement boundaries

Primary Land Uses: Mixed Use - Commercial

The Al Batinah North RSS proposes Greater Sohar to accommodate most of the future population growth in the region. As a national gateway of Oman, Greater Sohar will benefit from improved infrastructure provision and connectivity making it attractive to many national and potentially international investors. Mixed-Use Commercial development in Greater Sohar will also support transport-orientated densification (see policy SD6.1) and allow employment opportunities and key services to be brought closer to people, reducing the need to travel.

Intent		
The purpose of the Mixed Use – Commercial category is to allow development areas to provide a mix of land uses within a plot or in several plots designated under this use, as opposed to mono-use land zoning ordinances.		
Goals		
- Create defined business areas, supporting Al Batinah North's economy. - Create physical buffers between industrial and residential land uses. - Encourage the integration of Commercial Office with retail/ F&B and community facilities as appropriate, to create active and multi-functional areas. - Ensure that Commercial Uses respect the density of surrounding development and discourage the development of high-density Commercial Uses in locations where such development would alter the established urban form. - Prioritise development of sites within, adjacent to or in close proximity to existing urban areas, in accordance with the land use zoning set out in the Regional Spatial Strategy.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Commercial – Offices Retail – Ground Floor only - Commercial offices; - Finance and professional sales and services; - Business services; - Personal services; - Education and training services; - Car parking.	- Retail shops including convenience and/or comparison retail, grocery stores; - Hairdresser's beauty parlours and barbers; - Post office; - Laundry; - Restaurants, café/food & beverage outlets or similar (GF only).	All except for primary and secondary uses.
Key Urban Design Principles Enabled		
- Places of Quality - Sustainability - Social Inclusion - Vitality and Viability		

Building Typology	Multi-storey block with retail
Typical Building Height	G+5 maximum in the coastal main settlements. In Greater Sohar along the main roads within the commercial mixed-use areas G+8 is permitted.
Typical Floor Height	Ground: 5m, higher floors 4m
Typical Plot Size	800 – 1,500m ²
Plot Coverage	60% to 80% maximum. Based on parcel location and size. To be determined at the local planning regulation level.
Setback and Entrances	To be determined based on local context and local planning/ building code, bearing in mind the requirement for principal and service entrances.
Parking	Disabled parking, taxi-ranks and drop-off to be located to the front of the building, as appropriate. Residential parking provision to be provided in basement areas, or to side and rear of the plot. Quantum to be determined based on MoTCIT/ relevant Authority standards.
Public Space	Designated semi-private spaces should be provided, subject to space availability and appropriateness. To be determined based on local context and local planning/ building code.

Special Design Guidelines

Utilities such as HVAC units or lift rooms on roof may exceed maximum height of building and shall be appropriately screened, and emphasis placed on integrating the HVAC into the design of the building – not an add-on.



Example of mixed-use development (commercial with residential above)
 Source: Google Images, 2020

Primary Land Uses: Mixed Use – Higher Education

Competitiveness of local firms within Al Batinah North is critical for sustainable long-term economic growth and prosperity. The RSS sets out an innovation strategy, to identify and enable communications, networking and coordination between different relevant stakeholders.

A key stakeholder relevant to the delivery of this strategy is the higher education sector. It is recognised that to cater for projected growth within Greater Sohar, up to 2 universities could be provided over the period to 2040. The purpose of this planning standard is to permit suitable uses to co-locate (both within the primary land use parcel and / or up to 250m distance of the primary land use boundary) that complement the development of Higher Education facilities. Proposals to expand Sohar University will consider the provision of supporting and complimentary facilities in order to benefit the student community and create a conducive environment for learning and innovation.

Intent		
In certain cases, it is recommended that facilities are co-located with supporting or complimentary facilities – either benefiting the community in terms of accessibility or needs requirements or factors benefiting the operational requirements. Co-location can refer to the ‘integration’ or ‘adjacency’ of facilities and can bring the following benefits: • Land take reduction; • Centre definition / sense of place; • Increased accessibility; • Reduced trip generation; • Lower development, operation and maintenance costs; and • Proximity to the adequate training and upskilling / R&D facilities.		
Goals		
• Allow the development of certain supporting uses to coincide with higher education uses and support the needs of the surrounding community. • Ensure education facilities or associated permitted uses are located in publicly accessible and convenient locations and is generally consistent in scale, height and bulk with that of surrounding development. • Ensure the form of development is specific to the facility in recognition of particular operational, functional and locational criteria of higher-educational facilities.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Higher Education – University Campus;	• Restaurants, café/food & beverage outlets or similar; • Retail shops including convenience, bookshops • Library; • Printing / Publishing Services; • Banks and ATMs; • Hotel; • Convention centres; • Light industry; • Research and development; • Transport/	• Other industrial uses; • Military; • Tourism.
Key Urban Design Principles Enabled		
• Sustainability • Social Inclusion • Vitality and Viability		

Building Typology	Mixed Use Blocks
Typical Building Height	G+4 Maximum
Typical Floor Height	Minimum 4.5 metres, though this may vary across different buildings.

Typical Plot Size	Variable
Plot Coverage	Up to 90%
Setback and Entrances	Variable
Resident Parking (on plot)	N/A
Visitor Parking (on street)	To be determined based on MoTCIT/ relevant Authority standards.
Public Space	Higher education facilities should encompass diverse open spaces to satisfy different purposes. Landscapes should be stimulating and play an important role in the health and wellbeing of users.
Special Design Guidelines	When this planning standard is applied within higher education campuses, the design approach should be highly contextual, such that a coherent and complimentary designs are proposed. Design principles should consider the following: • Buildings that promote intellectual and social exchange; • Heights of structures; • Benefits of high-quality designs that use either consistent and predominant materials or the introduction of contemporary juxtapositions; • Landscape, streetscape, signage; • Commitment to accessibility • Respect for cultural resources; • Integration of art in buildings; and • Responsible use of energy and natural resources.



Example of Open Space Design - Kuwait University

Open Space: Wadi Parks

Wadis are important functional elements of natural and water system within Al Batinah North. They contribute ecological and environmental services and are therefore considered an ecologically sensitive area. It is important to note that wadis form one part of a wider system of functional attributes, including mangroves, seagrass beds, turtle nesting beaches, important bird habitats, beaches, dune systems, tidal inlets and khawrs. Wadi parks can also serve a dual role as Sustainable Urban Drainage Systems (SUDs) within urban areas.

In addition, wadis also have the potential to provide significant amenity value for the well-being of communities, supporting recreation and tourism (serving local, regional and international users). To support this, Al Batinah North RSS supports the sympathetic development of wadi parks in appropriate locations, to encourage development of public realm around wadis.

Policy SD12.1 supports actions that contribute to the greening of the Built Environment. This includes converting appropriate wadis to parks and actions to reduce the urban heat island effect. It also calls for homes to be constructed according to sustainable building codes and for the allocation of 10% of plot land for green space and green infrastructure.

Intent		
The intent of the Wadi Parks regional planning standard is to protect and enhance the natural, ecological and amenity value of wadis and their immediate surroundings. This aims to provide a solution to land that may no longer be viable for agriculture, increase opportunities for healthy lifestyles and recreation, and as an alternative to damaging over-development.		
Goals		
- Provision of increased public, recreational and community-serving land; - Maintain public access to natural areas and the coastline; - Improved preservation of natural, ecological and environmental sensitive land; and - Conversion of windfall agricultural land into public, recreational and community-serving land.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
- Public open space; - Parks; - Public / pedestrian paths; - Sport.	- Tourism; - Private open space; - Community facilities.	- Residential; - Industrial; - Mixed use.
Key Urban Design Principles Enabled		
- Climate Responsive - Cultural Inspiration - Character - Ease of Movement - Liveability - Places of Quality - Sustainability - Social Inclusion - Vitality and Viability		



Example of a Wadi Park that can occur in an urban area
Source: Dar image of Wadi Sulai Wadi Park, Riyadh, Saudi Arabia



Example of a Wadi Park that can occur within wadi flood plains in a rural area.
Source: Google Images, Wadi Hanifah Wadi Park, Riyadh, Saudi Arabia

Open Space: Coastal Parks and Recreational Spaces

Al Batinah North has many beaches along its coastline. With a population that is expected to grow in the governorate, these beaches are a great form of accessible open space. The National Planning Standards outline the different categories of open spaces including the following:

- Regional Parks;
- District Parks;
- Neighbourhood Parks;
- Local Parks;
- Community Parks; and
- Alleyways

Intent		
In addition to the above forms of open space, the Regional Standards recommend that beaches can be utilised as public open space. Beaches should be promoted as public open spaces and made accessible through individual projects and Municipal schemes. An example is shown in the figure on the following page.		
Goals		
• Provision of increased public, recreational and community-serving land; • Maintain public access the coastline; • Conversion of windfall agricultural land into public, recreational and community-serving land.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
• Public open space • Parks • Public / pedestrian paths • Beaches / sand • Sport • Playground • Preserved	• Transportation infrastructure • Utilities • Parking • Entertainment • Tourism • Health	• Residential • Industrial • Mixed use
Key Urban Design Principles Enabled		
• Climate Responsive • Cultural Inspiration • Character • Liveability • Places of Quality • Sustainability • Social Inclusion • Vitality and Viability		

Building Typology	Single storey and temporary structures (in exceptional circumstances)
Typical Building Height	5m
Typical Floor Height	3.5m
Typical Plot Size	Parks: 10,000m ² – 20,000m ² ; ancillary buildings / playgrounds: 2,000m ²
Plot Coverage	50%
Setback and Entrances	Variable
Resident Parking (on plot)	N/A
Visitor Parking (on street)	To be determined based on MoTCIT/ relevant Authority standards.
Public Space	Public parks, recreational spaces and public realm adjacent to corniche roads are by definition public space. Their purpose is to ensure and increase public access to open areas.

Special Design Guidelines

Design of public parks, recreational spaces and public realm must be fit-for-purpose and take into consideration accessibility, disability and public safety requirements.



Example of using beaches for public open space
 Source : Google Images, Abu Dhabi Corniche

Public Realm: Coastal Road

The National Planning Standards cover a range of urban streets including boulevards, avenues, streets and lanes. Another type of urban street that is applicable to Al Batinah North is the corniche, or urban waterfront streets which occur along its coastline. These roads should be designed to standards that ensure that ease of movement for pedestrians and cyclists, as well as the traffic are considered. This should ensure that the coastal road is not a barrier for pedestrians to access the coast from the urban settlements along the coast.

Intent		
To ensure that the coastal road does not become a barrier between the coastline and urban areas. Ease of movement across the road should be promoted through pedestrian access and the provision of quality public open space.		
Goals		
- Provision of increased public, recreational and community-serving land; - Maintain public access the coastline; - Conversion of windfall agricultural land into public, recreational and community-serving land.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
- Public open space - Parks - Public / pedestrian paths - Beaches / sand - Sport - Playground - Preserved	- Transportation infrastructure - Utilities - Parking - Entertainment - Tourism - Health	- Residential - Industrial - Mixed use
Key Urban Design Principles Enabled		
- Climate Responsive - Cultural Inspiration - Character - Liveability - Places of Quality - Sustainability - Social Inclusion - Vitality and Viability		



Al Batinah Coastal Road - opportunity for public spaces along the coastline

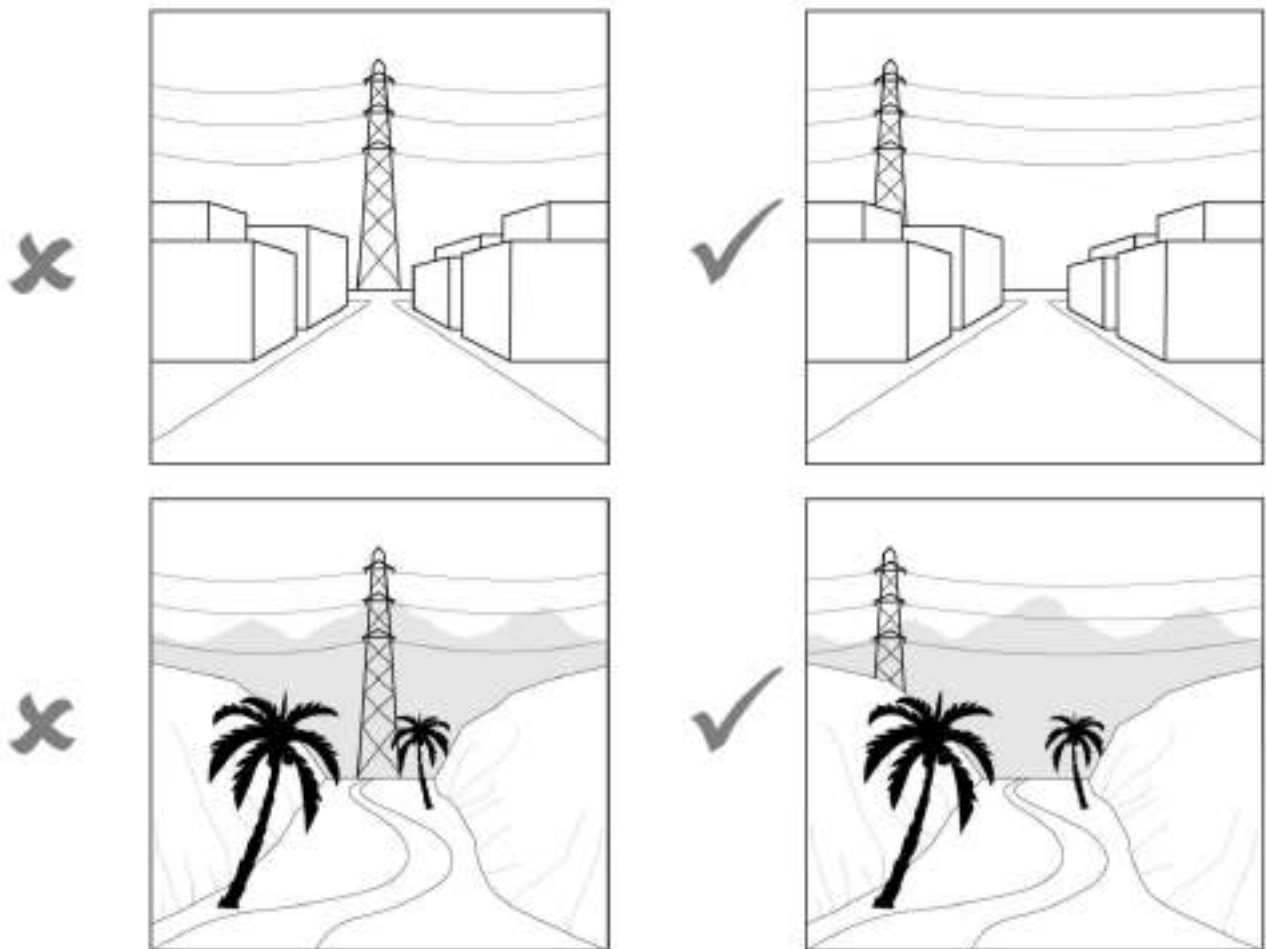
Utility Infrastructure: Utility Corridors

Utilities corridors are a requirement in order to ensure a reliable and secure utilities network across Oman and within the Governorate. However, areas such as the Special Planning Zone have designations due to their ecological or historic value and the placement of future large-scale utilities corridors through such areas should be considered carefully.

Future utilities corridors within the SPZ and / or Nature Conservation Areas within the Governorate should prioritise undergrounding to preserve the natural beauty of the landscape. A recent UK example of a National Grid high voltage line connecting the new Hinkley Point C power station to the National Grid in southwest England provides a benchmark for undergrounding parts of nationally significant utility corridors where they may otherwise significantly detract from sensitive locations such as National Parks and other areas of natural beauty.

If undergrounding isn't possible, a sufficient buffer should be implemented for future development near utility corridors, or if a new utility corridor is proposed near existing development. This is for ease of access for utility providers to maintain utility assets, but also to provide a safe distance for surrounding land uses from electromagnetic fields from overhead transmission lines, or a safe distance from gas pipelines.

Furthermore, if undergrounding is not possible, the location of utility assets should be considered. The National Grid Sense of Place Guidance Document in the UK provides good practice information on the placement of transmission line towers and how to minimise their visual impact (See Figure below). It also provides recommended buffer distances to transmission lines. These have been incorporated into the Regional Planning Standards as best practice



Offsetting high voltage transmission lines to reduce visual impact

Within the SPZ, mining and quarrying can be permitted in certain locations. However, mining related activities and sites need to be strictly regulated to ensure the adverse impact is minimized where possible. Green mining should be encouraged, and priority should be given to higher value priority mines sites as identified by PAM. Utilities provision should also be undertaken in a sensitive way, avoiding truncation of sensitive environments including those related to natural and cultural heritage.

Intent		
<u>Selective undergrounding of utility corridors within SPZ</u> To protect and preserve designated areas from large-scale utility corridors that would detract from the value of that area. Future utility corridor development should consider undergrounding or other alternatives to protect view corridors and the character of designated areas within the Governorate. <u>Buffers for utility corridors</u> If undergrounding of the utility corridor is not viable, then an alternative would be to provide sufficient buffer zone between the corridor and surrounding sensitive land use or environmental attribute: • Recreational open space - 30m buffer between overhead high-voltage transmission line should be provided (access should be restricted if the open space is unsupervised / open access); • Buffers for other land uses should exceed 30m • High-value built heritage assets – 250m buffer between transmission utility infrastructure (for distribution infrastructure this can be decreased but a minimum of 150m should be maintained). <u>Location of Utility Assets to reduce Visual Impact</u> The location of transmission power line towers or other utility assets must be considered in relation to the visual impact they create, particularly within sensitive areas, such as the SPZ. The placement of towers should be considered by conducting a Visual Impact Assessment and modelling the most suitable location of assets to minimise their impact (see Figure on the following page).		
Goals		
• Alignment with the aims of the Special Planning Zone; • Preservation of natural and cultural landscapes; and • Modernisation of distribution networks.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Special uses – utilities; Heavy industry; and Power generation and distribution.	N/A	Any other use
Key Urban Design Principles Enabled		
• Climate Responsive • Places of Quality • Sustainability • Vitality and Viability		

Building Typology	Utility infrastructure including substations, pylons, cabling, ducts etc.
Typical Building Height	N/A
Typical Floor Height	N/A
Typical Plot Size	N/A
Plot Coverage	N/A
Setback and Entrances	N/A
Resident Parking (on plot)	N/A
Visitor Parking (on street)	N/A
Public Space	N/A
Special Design Guidelines	The design and construction of utility corridors and networks must comply with relevant international, national and regional standards. In particular, sustainable development is that which delivers increased supply to meet current and future demand in such a way that sustains the environment for future generations. During utility works, special consideration should be given to avoiding truncation of archaeology. Within Archaeology Priority Areas, the Directorate of Heritage and Culture may require the preparation of desk-based assessments and other specialist studies to manage risk to archaeological resources.



The appreciation of the natural and cultural environment can be adversely affected by utilities, in this case, electricity pylons

Sohar Port Free Zone : Buffer Zone

Economic Zones and Free Zones are enabled by the Free Zones Law (Royal Decree 56/02) which supports the diversification of national revenues to serve as a catalyst to economic growth. The Sohar Port Free Zone (SPFZ) was established in 2001 as a result of this law.

SPFZ has since become a nationally important production / heavy industrial and trading hub attracting high volumes of domestic and foreign direct investments. As set out in policy SD2.1, the priority of strengthening Sohar's role as the primary industrial gateway through SPFZ extensions should be balanced by improved environmental mitigation of land contamination and air pollution risks to surrounding urban areas, as well as the measures to protect the remaining mangrove forest at Liwa and avoid coastal erosion.

A c.1.5km wide buffer zone is therefore delineated adjacent to the southern boundary of the SPFZ. Comprising predominately green open space, the buffer zone will separate the industrial activities of the SPFZ from the existing agricultural areas and urban development further south.

It is important to note that the SPFZ may be expanded in the future, and that the related buffer zone would also be amended at that time, subject to agreement with various stakeholders and related planning applications.

Intent		
The intent of the Sohar Port Free Zone: Buffer Zone regional planning standard is to provide a suitable buffer between the industrial activities in the SPFZ and adjacent urban areas. The buffer zone will help provide separation between different land uses that are not compatible, such as heavy industrial activity and residential areas. Land within the buffer zone will be considered important open space, and policy SD12.1 shall be applied to support the greening of the existing built environment.		
Goals		
• Provide a suitable buffer between the Port and Free Zone and surrounding uses; • To improve the quality of place in the areas directly adjacent to the Port and Free Zone.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Agriculture; Buffer planting; Parks and Open Space;	Light Industrial (if Free Zone extended); Transportation infrastructure; and Utilities infrastructure.	All other land uses.
Key Urban Design Principles Enabled		
• Climate Responsive • Places of Quality • Sustainability • Liveability • Vitality and Viability		

Building Typology	Existing residential villas and service land uses
Typical Building Height	G+2
Typical Floor Height	3.5m
Typical Plot Size	600m ²
Plot Coverage	80% (10% of plot land to be allocated to green space / green infrastructure)
Setback and Entrances	To be determined based on MoTCIT/ relevant Authority standards.
Resident Parking (on plot)	To be determined based on MoTCIT/ relevant Authority standards.
Visitor Parking (on street)	To be determined based on MoTCIT/ relevant Authority standards.
Public Space	The buffer zone is predominately open space but remains largely privately-owned land (either existing residential areas or agricultural land). Development proposals should look for opportunities to provide increasing areas of high-quality public and recreational spaces, occasionally through the implementation of landscape improvements.
Special Design Guidelines	• Converting redundant agricultural land to parks and open space; • Design interventions to reduce the urban heat island effect; • Implement sustainable building codes; and • Maximise permeable surfaces and SUDS.

The figure below shows part of the design for Capital Park in Cairo. The 1.5 km wide buffer zone could be used as public open space which would also act as a buffer between the Free Zone industrial area and Port, and other land uses nearby, such as residential.



Image of useable public open space as buffer zone

9.7. Al Batinah South Governorate

Region Specific Standards

The national planning standards are applicable to the entire Al Batinah South Governorate. However, considering the character of the governorate, the following region-specific standards are proposed for the Al Batinah South Governorate:

- Climatic Response
- Wadi Setbacks
- Cultural Influences
- Traditional Lifestyles
- Settlement Pattern
- Vernacular Architecture
- SPZ Characteristics

Climatic Response

Specific issues of climatic response in the Al Batinah South Governorate include protecting coastal development from sea-level rise (SLR), risks to coastal development coastal storm surges and flooding, and wadi flooding. Governorate specific standards are proposed for coastal areas and development adjacent to wadis.

Coastal Setbacks

Urban development has taken place along many parts of the coastline of the Al Batinah South Governorate. The coastal zone is now home to a significant number of residents, with a ribbon of urban development extending parallel to the coastline from east to west. Storm surges are a major threat to the people and infrastructure in these areas, especially the coastal areas from Al Musanaah to Ar Rumays. Due to these extreme weather events, along with the sea-level rise occurring against the backdrop of climate change, inundation in low-lying coastal areas will become an increasingly serious issue. This problem is partly the result of the poor implementation of existing coastal setback regulations, which has led to inappropriate development in high-risk areas. Existing coastal setbacks are provided in Volume 3 – Appendix K.1.

Seawater intrusion and soil salinisation, together with their resulting negative impacts on the natural and socio-economic environment, are considered a major problem in the governorate due to the over-abstraction of groundwater. Coastal erosion is already considered a pressing issue, and with the impacts of climate change likely to manifest themselves more strongly in the future, the situation will become even more challenging.

Due to these extreme weather events, along with the sea-level rise occurring against the backdrop of climate change, inundation in low-lying coastal areas will become an increasingly serious issue. This problem is partly the result of the poor implementation of existing coastal setback regulations, which has led to inappropriate development in high-risk areas. Inland flooding, particularly near wadis after intensive rainfall in adjacent mountains, is also a major issue in parts of the governorate, including the coastal zone.

The government has issued regulations controlling development along the coast, but enforcement has been limited or ineffective. Following three decades of significant development along the governorate's coastline and the emergence of climate change as a major multiplier of coastal risk, a more sophisticated set of guidelines is recommended to ensure that a clear and transparent decision-making mechanism is implemented that takes into account:

- The above-mentioned factors (types of coastline based on their vulnerability and sensitivity to coastal erosion and flooding, and the setbacks given in the SCP's Interim Urban Planning Guidelines);
- Recent climate change projections with respect to sea-level rise and storm surges, and the corresponding wave run-up etc. Along with the design parameters set by the concerned authority for coastal developments;
- Variations in physical conditions at the governorate level (orientation and exposure to extreme weather events and tsunamis); and
- Site-specific conditions, such as the elevation of the natural ground at the site and sensitivities such as turtle nesting beaches, dune systems, important bird areas, khawrs etc.

Coastal Zone

The Government intends to prepare a new Coastal Zone Management Plan (CZMP) that will encompass coastal areas in the Muscat Governorate. Pending completion and approval of the new CZMP, these guidelines have

been provided to assist planners, environmental authorities, developers and others in the planning and management of the governorate's coastline.

The concerned Government Authority will develop and maintain the Coastal Zone Management Plan (CZMP) in coordination with concerned stakeholders. Until the CZMP process is complete, the guidelines presented below are to be treated as an interim mechanism for informed decision-making, and therefore will be subject to change.

Definition of the Coastal Zone

The development of the CZMP first requires defining its area of influence, namely the "Coastal Zone". The seaward extent of coastal zones is normally bounded by the 12 nautical mile (NM) limit, which generally encompasses most of the relevant shallow-water habitats. This accords with national and international legal definitions of the coastal zone.

The landward extent of the coastal zone is more difficult to define. Basic definitions include, at a minimum, all areas of land affected by its proximity to the sea (i.e. land that is influenced by marine processes and that influence coastal processes such as sediment transport). In the Al Batinah South Governorate, the coastal zone is rather varied in terms of landforms. Based on the above considerations, especially with respect to the issues regarding the landward extent, the following zones are identified along the coast of the Al Batinah South Governorate.

- Ecologically Sensitive Areas
- Barka and Al Musanaah Coastal Area

Ecologically Sensitive Area

Ecologically sensitive areas identified along the coast under the environment strategy include the Ras Al Sawadi Important Bird Area, Ras Al Sawadi Lagoon and Backwaters. The following regulations have been proposed to protect these areas:

- No construction shall be permitted within 150m of ecologically sensitive areas.
- Eco-tourism activities such as mangrove walks, tree huts, nature trails, etc., are allowed as per the coastal zone management plan.
- The laying of pipelines, transmission lines, conveyance systems etc. are allowed in the buffer zones of environmentally sensitive areas.
- A detailed environment management plan shall be formulated by the concerned agency.
- Potential developments need to be approved on a case-by-case basis by the concerned authority.

Barka and Al Musanaah Coastal Area

For most of the coastal areas in Wilayat Barka and Al Musanaah, the coastal road will act as a natural setback for development. However, in a few locations, the coastal road is located further away from the coast. Considering this, the following guidelines have been suggested for these locations:

- i. No Development Zone: The area up to 100 meters from the high tide line (HTL) on the landward side, or up to the coastal road if it is a lesser distance, will be earmarked as the 'No Development Zone (NDZ). No construction shall be permitted within the NDZ except to repair or reconstruct existing authorized structures. In addition, no flattening of sand dunes will be carried out. Any development within this area will be subject to approval from the concerned authority. The following activities will be allowed in the NDZ, subject to maintaining a minimum 10m distance from the HTL:
 - Facilities for the local fishing community
 - Temporary tourism facilities
 - Parks and open space
 - Necessary infrastructure facilities (as approved by the CZMP)
- ii. Development of vacant plots between 100 and 300m from the high tide line will be permitted, subject to an assessment of their cumulative impact on local conditions including the hydrological aspects of erosion and ecological sensitivity.
- iii. In the developed areas, the proposed setback is based on existing structures. Construction activities outside of the existing urban boundaries are not allowed, except for fishing umbrellas made of non-fixed materials.
- iv. Roads along the coastline will act as a development setback. No construction activities will be allowed towards the seaside of the road, except for fishermen umbrellas made of non-fixed materials.

- v. Construction of buildings for residential purposes, schools, hospitals, institutions, offices, public places, etc. will be permitted only on the landward side of the existing road, or on the landward side of existing authorised fixed structures:
- vi. Reconstruction of non-compliant buildings may be permitted, subject to the existing zoning regulations and planning standards.
- vii. The design and scale of buildings needs to be consistent with the surrounding landscape and local architecture style.
- viii. Any existing uses/activities will be allowed to continue.
- ix. Inappropriate existing land uses will be relocated to ensure public safety.
- x. Buildings need to ensure that access to the beach is maintained.

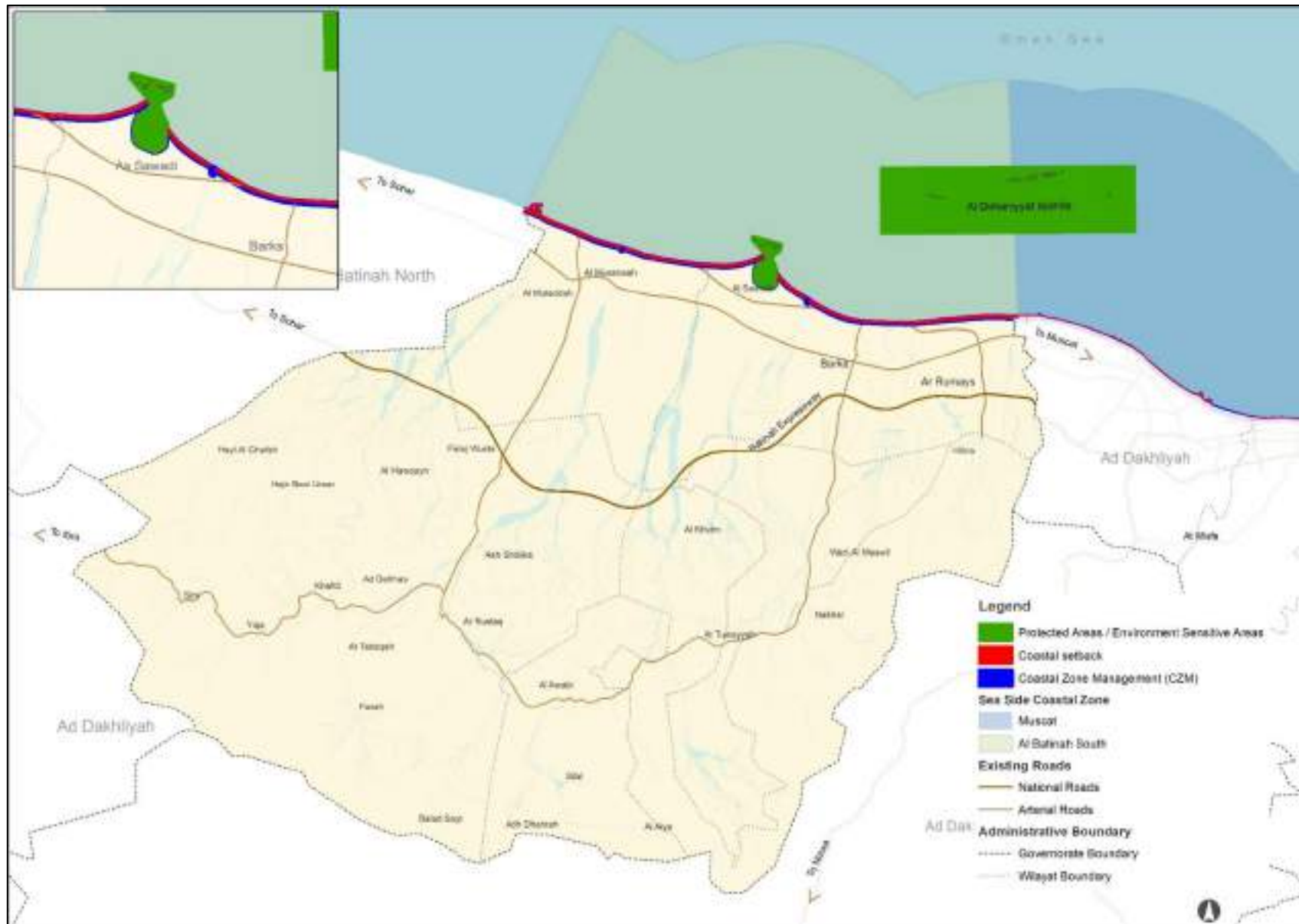
Prohibited activities in the Coastal Zone

The following activities will not be permitted within the coastal zone:

- i. New industries or the expansion of existing industries
- ii. Fish processing units
- iii. Land reclamation, building or distributing the natural course of seawater
- iv. Discharge of untreated waste and effluents
- v. Waste dumping
- vi. Ports and harbours in high erosion segments
- vii. Disposal of plastic
- viii. Damage and/or removal of corals other than for research purposes.
- ix. Removal of sand
- x. Mining of sand, rocks and other substrata materials, except those rare minerals not available outside the coastal zone areas.
- xi. Land reclamation, filling by sand and other materials or disturbing the natural course of seawater with similar obstructions, except those required for:
 - control of coastal erosion
 - maintenance or clearing of waterways, channels and ports
 - prevention of sandbars (except for tidal regulators)
- xii. No permanent structure for sports facilities shall be permitted except the construction of temporary goal posts, net posts and lamp posts.
- xiii. Withdrawal of ground within 200m of the HTL
- xiv. Any construction activity between the LTL and HTL
- xv. Dressing or altering of sand dunes, hills, or natural features including landscape changes for beautification, recreational and other such purposes.
- xvi. Any development activity that will significantly degrade the quality of any area designated as being of exceptional value or beauty.



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Coastal Setbacks for the Al Batinah South Governorate
Source: RSS

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Wadi Setbacks

Many settlements are also at risk of flash floods emanating through the wadi channels that traverse urban and rural areas. Wadis and associated inundation areas should be kept from development and appropriate setbacks need to be maintained to protect the settlements from the intermittent wadi flows.

The following are development control regulations for wadi setbacks:

- **Permitted Uses:** agriculture, parks, utility networks, transportation infrastructure, low-density tourism and recreational infrastructure, depending on the width of the channel.
- **Conditional Uses:** Nil
- **Prohibited Uses:** industries, fuel bunkering and retailing, waste and wastewater management facilities, and other uses/activities as specified under any applicable rules, regulations, policies, etc.
- **Existing Uses:** existing uses/activities, which adversely affect the wadi flows or the alignment of wadi channels, will be relocated to their appropriate land use zone/s through coordination among the concerned authorities. No building of permanent occupation shall be allowed within 30 m from the edge of wadis or wadi channels unless protection measures are provided as stipulated by the concerned authorities (eg. MRMWR) to avoid damage to structures or loss of human life.
- **Temporary Uses:** Quarrying for borrow materials are permissible under applicable rules, regulations, policies, etc. and after prior permissions from the concerned authorities.
- **Other Guidelines:** Develop a hydrological model using 100 years of rainfall data to determine the wadi channel area.

Cultural Influences

Al Batinah South has its own distinctive identity, which forms part of the cultural diversity in Oman. It is important to retain and further nourish the cultural diversity in the Al Batinah South governorate, particularly the traditional and cultural practices related to agriculture that defines the Batinah coastal plain. Another important cultural influence in the region are the fort-based settlements with surrounding plantations and agriculture precincts. Ar Rustaq was one of the former capitals of Oman, and still retains important historical and architectural artifacts which are an important part of the political and cultural history of the region.

Within the governorate, a number of oasis settlements have developed along the wadis, emerging from the Al Hajar Mountains. Many archaeological sites exist in the governorate, representing its ancient cultural history and settlements systems located in the valleys and lower hill slopes of the Al Hajar Mountains. Falaj-based traditional irrigation systems are also an important part of the cultural and agricultural history of the governorate. One of the World Heritage Sites (WHS) inscribed by UNESCO, Falaj Al Mayassar, is located in Ar Rustaq and is representative of the water systems and agriculture practices in the governorate.

The Al Batinah South Governorate has experienced significant urbanization and settlement expansion during the modern era of Oman. The new residential development in the governorate represents a significant departure from its traditional settlement forms.

Traditional Lifestyles

Al Batinah South has numerous traditional and cultural practices of significance to its people and history. These traditional practices predominantly belong to the Batinah coastal plain, where bull fighting, horse racing, camel racing, and fishing activities are popular cultural events. Other traditional practices, which can be experienced in the governorate, are related to agricultural practices, jewellery crafts, pottery, dance forms etc. Some of the distinctive features that represent traditional lifestyles are as follows.

- Bull fighting and camel racing cultural events
- The concept of Haman for young men as a bathing space,
- The concept of privacy in residential neighbourhoods,
- Oasis settlements with agriculture practices
- Crafts and dance forms



Traditional Lifestyles of Al Batinah South - Aspects of traditional lifestyles include agricultural practices, community cultural events, and crafts which are still practiced in the governorate.

Settlement Pattern

In principle, three to four main variations can be experienced in the settlement patterns of the governorate. Semi urban sprawl along the coastline, interspersed with agricultural precincts, is one of the dominant settlement patterns. Other settlement typologies that can be experienced in the governorate include fort-based compact settlements with attached agricultural precincts, oasis settlements along wadis and in valleys, and hillside settlements along with terraced farming. The fort settlements of Al Batinah South are connected through a cultural corridor that connect the important settlements of Barka, Nakhal, Al Awabi, Ar Rustaq, Al Hazm, and Musanaah. These settlements have historical forts located in their historic centre, traditional neighbourhoods, and street-oriented movement patterns especially in the older quarters. Modern expansion around these old settlements has generally been in the form of urban sprawl. To protect older parts of the settlements and harats, cultural conservation areas will be introduced to ensure the protection and enhancement of heritage areas in the governorate.

The traditional settlements characteristics of the Al Batinah South Governorate should serve as a source of inspiration for the creation of region-specific planning and design practices, including the following elements:

- Fort and precincts surrounding traditional living quarters (harats);
- Compact and low rise urban form;
- Commercial activity centred in a souq/bazaar;
- Pedestrian-friendly environment and human scale streets;
- Provision of privacy in traditional neighbourhoods;
- Forts, defence towers, and mountains in and near settlements.
- Oasis-based traditional settlements located in valleys and along wadis.
- Two to three storied buildings directly abutting the street.
- Water system (falaj), especially in oasis settlements.



Inland Traditional Settlements in Al Batinah South - Inland traditional settlements in Al Batinah South are comparatively compact, low rise, and have unique features such as a fort/castle, falaj, traditional neighbourhoods (harats), and human scale streets.

Vernacular Architecture

Vernacular architecture generally refers to architecture, which has evolved indigenously in the region. Vernacular architecture, in the context of Al Batinah South, can be experienced in the traditional settlements possessing a fort/castle, traditional living quarters (harats), and oasis settlements. Hillside settlements with terraced farming are another unique aspect of the region, with small houses located in a terraced pattern. Historic areas and harats generally have low rise buildings abutting directly to the street with a human scale. The location of forts and castles on hilltops and in the midst of settlements are another unique identifiable feature in the governorate. Many of the historically important areas and buildings with vernacular architecture are protected by the MoHC as Harats or historic buildings. The distinctive vernacular architecture that can be experienced in Al Batinah South and the other historical settlements of the governorate include:

- Majestic and iconic forts and castles with a distinctive scale and architectural elements,
- Small defence towers located on hilltops,
- Neighbourhoods with narrow entrances and fenestrations,
- The use of white/lighter colours on the outer skin of buildings to combat the harsh solar radiation.
- The incorporation of Islamic architectural elements.



Forts of Al Batinah South - The presence of forts amidst traditional settlements, hillside villages in the Al Hajar mountains, and oasis villages along wadis are important vernacular architectural and settlement features in Al Batinah South.

SPZ Characteristics

The environmental character of the Al Batinah South Governorate is one of its greatest assets, ranging from the rugged mountain ranges of the Al Hajar to the coastal beaches of the Sea of Oman, intrinsically linked together through a vast network of wadis. Within natural areas, the governorate is home to mangrove vegetation, sand dunes, mammal areas, important plant and bird areas, and well fields, along with the shallow marine biodiversity along its coastline. In addition, important archaeological and cultural heritage assets often co-exist in these locations, enhanced by their natural surroundings.

The Al Batinah South Governorate comprises only 1.7% of the total area of Oman, but will accommodate 13% of its population by 2040, illustrating the pressing need to preserve its natural and cultural environment from the pressures of urban expansion and industrial development. Recognizing the existing regulatory deficiencies that limit protection of the Sultanate's natural assets, the ONSS has created a new planning oversight authority that will be tasked with protecting, conserving, and better managing the environmental features within the delineated boundaries of Special Planning Zones (SPZ).

Under the SPZ framework, areas possessing high value landscapes, such as the Al Hajar Mountains, along with environmental sensitive locations, have been designated and will be protected from incompatible projects, activities, or changes in land use. Additional environmental protection will be provided through the Nature Conservation Area (NCA) designation.

The following characteristics of terrestrial SPZ of Al Batinah South Governorate are explained below:

- Social Characteristics
- Economic Characteristics
- Mining Areas
- Cultural Characteristics
- Environmental Characteristics
- Architecture and Built form of Settlements in the SPZ
- Agricultural Practice and Systems

Social Characteristics

Within the Al Batinah South Governorate, the Al Hajar Mountains terrestrial SPZ will cover 3,154 sq. km, 59% of the governorate area. As per the 2010 census, a total population of 43,29 resides within the SPZ, of which 92 % are Omanis and 8 % are Non-Omanis. A total of 7,955 housing units and 5,101 households are located in the SPZ. The average household size of residents in the SPZ is 5.4 individuals.

The total number of settlements within SPZ is 291. The largest settlement is Al Hawqayn, with a total population of 2,344, followed by Al Sita with a population of 2050. The Table below presents the distribution of settlements in the SPZ.

Distribution of Settlements within the SPZ

S.No	Population Range	No of Settlements	Population	% of Population
1	0	36	0	0
2	0-20	54	505	1
3	21-50	55	2,045	5
4	51-100	49	3,541	8
5	101-500	76	16,444	38
6	501-1000	13	8,555	20
	1001-2000	6	7,810	18
	2001-2344	2	4,394	10
	Total	291	43,294	100

Source: RSS analysis and Land use Survey (2017)

Source: RSS



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Economic Characteristics

The major economic sectors in the SPZ are agriculture and tourism. The total agriculture area in the SPZ is 15.2 sq. km, and most of this area is located along wadis. Many residents also travel to nearby settlements for employment or discretionary purposes.

Mining Areas

97% of the high-value mining blocks proposed by PAM are within the SPZ boundary. The exploitation of mining in the Al Hajar Mountains has the potential to negatively impact its flora and fauna, including endangered mammals. Mining of minerals also has the potential to cause severe localised environmental and visual impacts that can be detrimental to the well-being and existence of local communities, their potential for sustainable tourism development, as well as adversely impacting their cultural heritage assets and landscapes. However, 97% of the mining blocks within the SPZ area do not conflict with the other conservation areas or settlements, with the exception of the Chromite Block in Wilayat Nakhal and Wadi Al Maawil, and can proceed subject to strict environmental monitoring and mitigation measures.

Cultural Characteristics

Many historical and cultural assets are located within SPZ. A total of 108 heritage assets are located within SPZ including 4 castles, 24 forts, 3 mosques, 76 towers and 1 wall.

Environment Characteristics

Major environment features located within the SPZ area include declared conservation areas, geoparks, SSIs, important bird areas, important plant areas, Arabian Tahr area and proposed IUCN areas, many of which have significant overlap.

The Table below presents the environment designations within SPZ.

S.No	Environment Designation	Name of the Area	Area in Ha
1	Declared Conservation Areas	Jebel Akhdar Scenic Reserve, Dark Sky Area, Rustaq Wildlife Reserve	50,618
2	SSI	Wadi Abiad ophiolite sciton	4,228
3	IBA	Al Ghubrah Bowl, Jabal Shams Area, Sayq Plateau	38,976
4	IPA	Hayl Al Juwari, Jabal Nakhal, Jebal Shams, Wadi Bani Awf, Wadi Bani Kharous, Wadi Mistal	35,602
5	Arabina Tahar		247,711
6	IUCN Area		44,128
		Total	421,263

Environment Designations within the SPZ

Source: RSS analysis and Land use Survey (2017)



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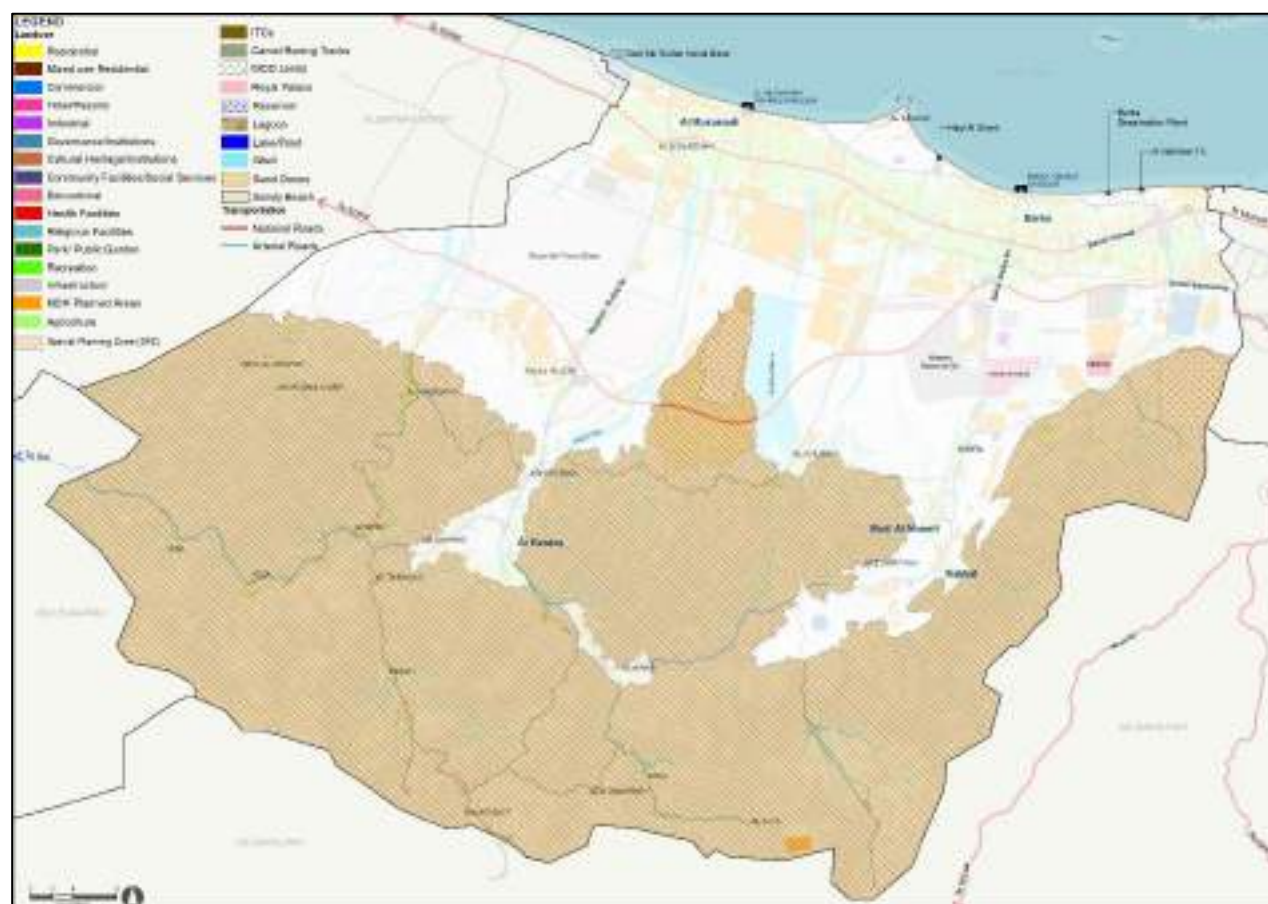
Architecture and Built Form

The total built-up area in the SPZ is 19 sq.km, which is 0.6% of its total area. Nearly 85% of the SPZ area consists of mountainous terrain (above 5% slope). 77 sq.km area of MoH planned areas are located within the SPZ. The Table below presents the existing land uses of the SPZ area.

S.No	Land use	Area in Sq.Km	%
1	Residential	7.9	0.2%
2	Commercial	0.1	0.0%
3	Industrial	0.1	0.0%
4	Public and Semi Public	1.1	0.0%
5	Recreational	0.7	0.0%
6	Infrastructure	8.7	0.3%
7	Planned Areas	77.2	2.4%
8	Agriculture	15.2	0.5%
9	Wadis	130.5	4.1%
10	Vacant Areas	242.8	7.7%
11	Mountains	2669.7	84.6%
	Total	3154	100%

SPZ Existing Land Use

Source: RSS analysis and Land use Survey (2017)



Economic Designations within SPZ

Source: RSS

The settlements in the SPZ mostly consist of oasis villages near wadis or in hilly terrain. The fertility of the land and availability of water for agriculture, especially date plantations, play a significant role in the location and visual aesthetic of these settlements, particularly the date plantations in villages in Wadi Bani Kharus and Wadi Hawqayn. The Figure below shows a conceptual site plan for a typical settlement in the SPZ.



Conceptual Site Plan for Settlements in the SPZ

Source: ArCHIAM Centre: Architecture and Cultural Heritage of India, Arabia and the Maghreb (2019)

Important building materials utilised in historic buildings consist of stones, baked bricks, mud bricks, palm trees, mangrove poles and lime (mainly for plaster and mortar). Though modern buildings consist of contemporary materials, the stepped built form of these settlements still remains due to the constraints of the terrain (see Figure below).



Settlements in Wadi Bani Kharus and Wadi Mistal (Wakan Village) in the SPZ

Agricultural Practice and Systems

As a practice to overcome the prevalence of steep slopes, flat areas are often cut into the terrain to allow for crops and plantations. This practice, widely known as terrace farming, is prevalent in the rural settlements within the SPZ. These farms are supported by the falaj systems, drawing water from nearby wadis or mountain springs (see Figure below).



Terrace Farming and Falaj Systems

Source: RSS

Variations from the National Standards

While the ONSS National Planning Standards offer a broad blueprint for future development in the Sultanate, it is anticipated that deviations from the planning parameters will be required to suit the local governorate-context, particularly in the eastern settlements that comprise the Greater Muscat region. Specific guidance for the Barka economic cluster is discussed below.

Urban design guidelines will be prepared for Muscat city and it is recommended that this guidance be applicable to the Greater Muscat region once the boundaries and institutional structure have been finalized. In particular, it is important that new development draw upon the traditional architectural elements that characterize its historic settlements to retain a distinctive governorate identity, including the elements discussed above.

The other key variations which are important part of the RSS for the governorate are described below for the following:

- Primary Land Uses
- Community Facilities
- Parks and Open Spaces
- Urban Streets

Primary Land Uses

The Barka economic cluster, comprising KEC, Oman University, Medicity, and a mixed use district, will be a unique master planned area that requires special consideration. In particular, it is recommended that a flexible land use strategy be promoted within its boundaries, as the typical separation of permitted uses (eg. residential, commercial, industrial) would be antithetical to the mixed use principles employed in its design. All types of land uses will be permitted and can co-locate where appropriate, although health and safety considerations will still need to be evaluated (eg. buffer zones between heavy industry and residential). Other building performance standards (eg. building height, plot size, plot coverage) should be viewed as a baseline criterion while permitting deviations provided that the development is still consistent with their respective master plans and the general principles of the ONSS/RSS.

Within the urban regeneration areas and cultural conservation areas, specific planning guidance will be provided as part of their local planning documents to reflect standards for the adaptive reuse and context-appropriate regeneration of culturally significant buildings and precincts in the Al Batinah South Governorate. These standards may deviate from the ONSS Planning Standards where appropriate.

Community Facilities

The location of community facilities should be considered in relation to the public transport and NMT network as part of the structure plan for Greater Muscat (for the settlements in Al Batinah South) and the urban masters plans for other settlements. To the greatest extent possible, district and regional facilities should be located less than 200m from an urban bus route. For neighbourhood and local centres, direct linkages to the climate protected active transportation network should be considered and implemented as part of their development to ensure that walking and cycling are the primary travel modes used to access these facilities.



Compact Neighbourhoods and Public Spaces - Promote compact neighbourhoods having public open spaces and other community facilities connected with NMT modes and walkways

Parks and Open Space

While wadis and beachfront recreation areas are the focus of the park space strategy for the Al Batinah South Governorate, additional parks will also need to be considered as part of the provision of community facilities. These parks, particularly larger regional parks, should abide by the same principles outlined for wadis and beachfronts areas, including an emphasis on linking them together through an integrated network of multi-use pathways or protected walking/cycling infrastructure. In addition, parks will need to be designed to serve both recreational and ecological functions, including serving dual purposes such as stormwater management and connections to the urban drainage system, along with climate control to combat the urban heat island effect.

Urban Streets

The RSS recommends the preparation of active transportation guidelines alongside the develop of an NMT network as part of the structure plan for Greater Muscat, along with the urban master plans for other settlements in the governorate. These guidelines will build upon the cross-sections provided in the ONSS Planning Standards to provide specific guidance on the appropriateness of difference NMT infrastructure (eg. multi-use pathway, cycle track, painted bike lane, sidewalks) depending on the road hierarchy and its relationship to the surrounding active transportation network. The guidelines will be tailor to the specific road cross-sections of major road corridors in the governorate that could benefit from active transportation infrastructure (eg. Batinah Highway, Barka-KEC road, coastal road).

Road safety improvements will also be achieved through the infrastructure audit and related safety study to identify recommended changes to existing roads and intersections in the governorate and consider changes, which should be reflected, in the next update of the MoTCIT Highway Design Standards. The existing design of many urban streets in the governorate privileges vehicle speed and uninterrupted movement at the expense of the safety and comfort of other road users, a systematic issue which will need to be addressed through design modifications, regulation and enforcement, and awareness campaigns.



Compact Neighbourhoods and Public Spaces - Seafront walks and redesigning streets for public transport use, pedestrian friendliness, and mixed use which help achieve more sustainable development in the Al Batinah South Governorate.

Development Control Regulations

Developing specific planning guidelines and development control regulations for the governorate is needed in order to realize the RSS objectives. The Al Batinah South RSS is a broad strategy which needs to be taken forward through more detailed planning documents and development control regulations to enable national and local governments to regulate urban and rural development in a transparent manner which can facilitate social equity and private sector investment. The following development control regulations needs to be further illustrated through detailed studies.

Urban Form Controls: Development control regulations are designed to guide a settlement's future urban form. In the context of Al Batinah South, the following urban form control regulations will structure its future built environment:

- Residential area densities ranging between 100 to 200 ppha;
- A floor area ratio (FAR) between 100 – 200;
- Maximum building height of 30m in commercial and mixed use areas, and a max height of 20m in residential area, unless subject to area-specific regulations;
- Building footprint regulations (to be developed).
- Skyline/view corridors regulated through height restrictions to achieve a desired visual form in unique areas of the city.
- Min. 10-15% allocation of urban area towards allocation of open and greenspaces.
- The promotion of urban agricultural practices within settlement boundaries.

Cultural Conservation Areas and Other Heritage Areas: Cultural conservation areas and landscapes will need specific development controls and guidelines to control development within their boundaries in order to retain their cultural heritage significance. There are three main CCAs in the governorate: Rustaq, Al Hazm, and Nakhal, along with several harat-based conservation areas. In addition, four cultural landscapes have been delineated. Development control regulations for these areas will include:

- Permission before changing or demolishing existing structures and buildings.
- Specific building height, footprint, street elevation, and building use controls.
- Special Permission from MoHC before altering any of listed heritage structure.
- Prepare enhancement plans for the conservation areas.
- Retain visual corridors surrounding key heritage structures.
- Building and development controls for the surrounding precincts of heritage buildings, areas of national importance, and Scheduled Monuments.

Special Planning Zone (SPZ): A Special Planning Zone is delineated in the Al Hajar Mountains to provide protection for areas where interaction between natural environment and human activities creates a distinct character. The SPZ is a combination of ecological, geological, and cultural processes and requires development control regulations in order to protect its ecological, geological, and cultural features. The SPZ will be given the IUCN Category V Protected Landscape and some of the more environmentally sensitive landscapes within the SPZ may be given higher order of protection as per the IUCN Categories I-IV. The SPZ Authority will need to focus on the following areas:

- Carefully monitor the development of settlements, industry, and infrastructure projects through detail control regulations and monitoring process.
- Legally demarcate the SPZ boundary and, if need be, carryout modifications to the boundary to protect areas of environmental significance.
- Identify additional buffer zones/transitional areas to monitor development activities at the boundaries of the SPZ.
- Delineate Cultural Landscapes within the SPZ.
- Carryout out extensive mapping of natural, geological, human settlements, and natural habitat systems on a regular basis.
- Prepare a Management Plan (SPZMP) tailored to the unique characteristics of each governorate.
- Promote eco-tourism within the SPZ that will have minimum impact on the natural, environment. Prepare an eco-tourism plan for the SPZ, including restrictions on the number of visitors, the development of ecotourism infrastructure, and restricted areas with highly sensitive environmental or geological conditions.
- Control and regulate mining activities to ensure the minimum possible impact on the SPZ. Carryout environment rehabilitation of abandoned mining areas located within the SPZ.

Protecting Environment Sensitive Areas: Development control regulations for SPZs will be in accordance with the ONSS and managed by the SPZ Authority. With respect to other areas of environmental importance:

- The Al Hajar Mountains area above 5% slope outside of the SPZ will be designated as Inappropriate Development Areas.
- Wadis, which are important part of the resilience to climate, change issues in the governorate.
- Regulations on sand dunes and other natural features of special importance.

Development Control Regulations for Vernacular Settlements: There are number of smaller village settlements, which are less than 5,000 population, for which Urban Change Plans (UCPs) have not been prepared as part of the RSS. These settlements will also require development control regulations, including:

- Settlement growth boundaries;
- Building use and height controls; and
- Building materiality and design controls etc.

Development Guidelines for Urban Districts

Development guidelines are needed to better articulate the vision for urban areas in Al Batinah South. The government will carry out further studies to realise the potential of these area through Project Feasibility Studies and Area Action Plans. The focus of these districts should be on the following planning elements:

Neighbourhoods Development: To improve existing residential areas in Al Batinah South the following guidelines are recommended.

- Improve the quality of public parks, children parks, and gardens;
- Bridge the social infrastructure gap in neighbourhoods;
- Provide NMT infrastructure, including traffic calming wherever feasible; and
- Improve neighbourhood centres and markets.

Areas of Special Interest: There are several areas of special interest/importance which fall outside the Cultural Conservation Areas in the governorate, but which possess high architectural, community, tourism, and/or public space potential. It is recommended that special projects be carried out in the city to improve its urban image through their development:

Beachfronts: There are three major beachfront areas in Al Batinah South which will be developed as public spaces for recreational and tourism purposes: Al Sawadi, Barka, and Musanaah. Potential improvements include NMT infrastructure, improved public transport access, landscaping and urban greenery, visitor facilities, and parking facilities.



Tools and Regulatory Instruments

The Al Batinah South Governorate needs to take forward the planning process by developing a series of legal documents which help regulate development:

- **Structure Plan for Greater Muscat:** Preparing a structure plan for Greater Muscat (including settlements in Al Batinah South is necessary in order to properly regulate future development, including zoning overlays and a land use map.
- **Urban Master Plans:** There are number of settlements in the Al Batinah South Governorate outside of Greater Muscat for which Urban Master Plans, including associated urban zoning plans and a land use map, can be prepared to guide and regulate their growth.
- **Urban Transformation Areas:** Area Action Plans are required for urban transformation and cultural conservation areas.

9.8. Ash Sharqiyah North Governorate

Introduction (Regional Distinctiveness)

This section outlines the Regional Planning Standards for Ash Sharqiyah North. It is intended that the regional standards complement the national ones and set out any key regional variations that are applicable instead or over and above the National Standards. This section presents these differences and assumes that all other standards are covered nationally and apply to the region.

The National and Regional Standards, combined, aim to achieve the Vision and Objectives of the National ONSS and Regional Spatial Strategy, which for Ash Sharqiyah North are outlined in RSS D11 Volume I.

The objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs. The ONSS and RSS 20-year spatial planning frameworks set out a way of delivering local prosperity with a better balance between social, economic and environmental dimensions, either directly or indirectly. Specifically, within the Ash Sharqiyah North region this might involve the following:

- Promoting the role of Ibra as a city of technology and innovation, attractive for young entrepreneurs and for the technology businesses that Oman requires to modernise its agriculture, engineering and production in general; this will require the development of a significant tech-innovation cluster around Ash Sharqiyah University and Ibra-Tech, together with a new young and dynamic commercial district.
- Safeguarding and strengthening the role of Sinaw as a regional / interregional scale market for food and food related activities – with investment in food related tourism and visitor activities and expansion of food processing capabilities.
- Supporting appropriate and distinctive tourism activities in Bidiyah and in the Hajar Mountains (Wadi Bani Khalid and Dima Wa At Tayin).
- Encouraging compact settlements and good quality urban development, including the regeneration of heritage areas.
- Protecting natural assets by introducing a Special Planning Zone for the Hajar Mountain and one for the Sharqiyah Sands as a way to take into consideration environmental issues in guiding future development in the sensitive areas that provide special character to the governorate.

Compliance with the National and Regional Planning Standards will make an essential contribution to a more sustainable future for Oman and to the distinctiveness of Ash Sharqiyah North

Climatic Response

Climate change in the interior of Oman is likely to manifest itself primarily through more extreme periods of heat and sudden and dangerous flash flooding.

As the majority of the population will live in urban settlements, it will be imperative to:

- Strictly adhere to the development zones, identified by the boundaries of Policy SD2, which take into account the protection of floodplains.
- Address flood risk and prioritise the policy and Priority Flood Management Areas identified in Policy WR4. It will be important to address flood risk issues in all main settlements before progressing development.
- Ensure the survival of oasis and wadi agriculture not only for production and protection of local lifestyles, but also, very importantly as a way to retain a form of climatic control and reduction of urban heat in the settlements and the region.
- Application of the principles of green buildings contained in the National Planning Standards for all new construction (taking account of orientation, sustainable material, water and energy conservation, use of climate adapted and naturally occurring planting, etc).
- Application of street National Planning Standards to encourage active modes of travel and shaded streets, to reduce energy consumption and air pollution and mitigate urban heat.

In addition, a 50m minimum setback should be applied to all development along wadis

Cultural Influences and Traditional Lifestyles

Ash Sharqiyah North has diverse traditions linked to its different geographic areas: the areas around the Sharqiyah Sands in the past had only small settlements around a fort and a dominance of nomadic population with strong links to camel rearing, races and camel-related artifacts that survive today. The mountain regions had

developed specialised agriculture and fruit and vegetable production only possible in cooler areas. The water-fed plain from Ar Rawdah to Sinaw and the rural villages along Highway 32 to Duqm and Salalah had rural traditions, with Sinaw emerging as one of the largest market of Oman. Decorated stone houses near Ibra are evidence of a flourishing past.

At the regional level, Conservation Areas (Policy CH1) have been established to identify areas where cultural assets that help give the governorate its character and identity should be respected and given special planning consideration in order to help conserve cultural influences in the governorate. Typical assets include:

- The governorates castles and forts, typically located at the centre of the older parts of the settlement;
- Fortifications and observation towers;
- The compact earthen and stone architecture of the harats at the edge of the oases, sometimes taking the form of multi-storey decorated buildings (Ibra) or forming an attractive mixed commercial centre (Al Mundaybi);
- The traditional souk and markets, with the one of Sinaw forming a vast commercial centre;
- The mountain villages along the wadis in Dima Wa At Tayin and Wadi Bani Khaled set in colourful rock formations.

The main settlements of the governorate are no longer centred around a fort or older harat, as development since the 1980s has moved away from them and new subdivisions emerged in all directions within the plains. Safeguarding the heritage and reinforcing local identity will require protection of the setting of historic artefacts and regeneration and reuse of abandoned or underutilised areas. The standards that apply within the identified Conservation areas and within 250m of a key historic asset include:

- Limitation of heights to a level so that the fort and lookout towers retain, where it has not been lost, their dominant profile over the surrounding areas.
- Protection of all view corridors and vistas towards the forts and main mosques from being obscured by new development and retention of lower heights around the forts for that open views over the surrounding areas from the top of the forts are preserved.
- Safeguard of natural clifftops surrounding villages in the wadi areas.
- Selection of materials and details that are similar to that of local traditional features: colour, tones, types of material and built form should not detract from historic assets; garish colours, overly decorated features and built forms that are not inspired from local context should not be allowed.
- Facilitation and encouragement of appropriate reuse and alterations to the harats, in preference through a collective agreement with the local community.
- Adoption of specific standards for new residential and tourism development (see Section below).
- Retention of the narrow lanes and alleyways and streets as informal, slow speed, local access routes used by all (pedestrian, cyclists, cars and small trucks), with limited lighting and minimal engineering, especially outside of Ibra.

Provision of parking in vicinity of visitor attractions, large mosques and markets in a way that does not occupy prominent positions or result in structures or areas that compromise the views and appreciation of the historic area and its functions.

Settlement Pattern

The Ash Sharqiyah North region is characterised by three main geographic areas, each with distinctive character, in addition to the city of Ibra:

- The Hajar Mountain area, characterised by tall mountains with steep slopes and very rugged terrain, streaked by multi-coloured rock minerals, traditionally inhabited by sequences of small villages nestled within the slopes along a single mountain road and the wadi-fed plantations. This is the case of the villages along Wadi Bani Khalid and Highway 25 in Dima Wa At Tayin. These villages are located in the Special Planning Zone, in some cases within areas, which, because of the geology and particular micro-climate, are of importance for nature conservation.
- The area of the Sharqiyah Sands, famous for its reddish dunes and contrasting palm plantations along the eastern edge at Bidiyah, where camel farming is a prominent activity and camel and desert tourism an emerging one. The settlements are rapidly sprawling in very low density, non-distinctive villa areas partially built and, when built, partially occupied as employment and attractive lifestyles are limited. Unique for their setting and contrasting colour are the villages set within the red sands of the desert, such as Ar Rakkah, which have a central nucleus of bright green young palm plantations surrounded by villas and camel farms. The Regional Strategy's priorities include protecting the integrity of the desert, containing and densifying the settlements and promoting the quality and effectiveness of camel-related industries and tourism.

- The Agricultural Gravel Plain to the west of the Sharqiyah Sands where the main settlements of Sinaw, Al Mudaybi, Samad Ash Shan and numerous other smaller rural villages are located within a short distance to each other. These settlements have a predominantly rural and agricultural function, with a semi-compact settlement around a central space with services and a mosque. Sinaw, with its large and famous markets and the mixed commercial centre of Al Mudayibi, however, have a much more pronounced urban centrality, despite their small size, probably as they serve a larger region and passing trade. The Regional Spatial Strategy proposes significant expansion of economic activities in Sinaw: it will be important to utilise the impetus of growth to regenerate and restructure the main settlements to form viable cities for the future.
- The city of Ibra is still emerging and at present it has a poor urban form, with most of its destinations scattered across a large and only partly developed area. Its markets and commercial areas were built in the 90s towards the south east of the city, the College of Technology opened in 2001 and the University in 2009 and still partly in construction in the north west; the hospital and main regional facilities are detached from the main urban area towards the south. Ibra, therefore, is more a city with potential than actual beauty.

Vernacular Architecture

Until the 1980s, settlements in Ash Sharqiyah North were very small, with local building construction essentially made of earth and stone agricultural buildings at the edge of a cluster of agricultural plantations and temporary residences for the traditionally nomadic population. Settlements were marked by the larger houses of the leading families, a fort, souk and mosque. Animal pens are still present within the residential areas or at the back of the houses towards the desert in Bidiyah. Only Al Mudaybi and Sinaw (now small settlements compared to Ibra) had a more developed urban structure around a market and public services.

In the mountain, traditional clustered village forms are now accompanied by large villa subdivisions wherever there is available land, with unattractive commercial buildings along the main road.

Elsewhere growth has been more recent and driven by the construction of new roads and public buildings. Today the main cities of the Governorate are still expanding with large scale, partly occupied, subdivisions on flat land in all direction, leading to expensive sprawl and weak character. Buildings follow standard national construction typologies and fail to create a distinctive vernacular style. Nevertheless, there are distinctive aspects of the Governorate that are worth highlighting:

- The heritage districts partly refurbished and in use.
- Large and busy market spaces, which function as urban centres, trading and meeting points for the wider population of the region.
- A strong contrast with the palm plantations both in the mountain and by the Sharqiyah Sands



The Refurbished Heritage in Old Ibra (Al Minzifah)



The Commercial Area of Al Mudaybi (1)



The Commercial Area of Al Mudaybi (2)



The Busy Market Area of Sinaw



The Young Palms of Ar Rakkah by the Sharqiyah Sands



The Water Pools of Wadi Bani Khalid, Where Buildings are Hidden within the Landscape



Traditional Houses in a Village of Dima Wa At Tayin

Variations from the National Standards

Primary Land Uses – Assessment-based Land Release

Sprawling development, lack of urban structure and non-distinctive architecture are one of the main problems of development in Ash Sharqiyah North, leading to unattractive neighbourhoods, excessive costs of infrastructure and unsustainable patterns of development.

Through the National and Regional Spatial Planning Strategies it will be important to adopt a better organised form of development through the systematic and progressive release of land and planning of employment and community facilities. Where a Local Plan is to be prepared, this should include the identification of progressive directions of growth and more detailed sequencing of assessment.

In the interim, and where a Local Plan is absent, it is imperative to constrain sprawl and strongly encourage densification of already urbanised areas. Therefore, land for development should be identified strictly within the settlement boundaries identified in Policy SD2 and as follows:

- **Residential Land in Main Settlements** – identified and only released for subdivision, distribution and development every 2 years following an assessment of actual need and confirmation of 80% substantial completion of the residential land released in the period before the last one (released 4 years before) for each major settlement: Ibra, Sinaw / Al Mudaybi and Bidiyah. This process will need to be carried out in conjunction with new national guidance for allocating residential land.
- **Residential Land in Rural Villages** – identified and only released for subdivision, distribution and development every 2 years following a Governorate-wide assessment of localised need of the existing communities and confirmation of 80% substantial completion of any residential land previously released. Land release in smaller order settlements (Other Rural Centres – category E3) should not be for more than 30 residential units at the time and allocated to families living or working within a 50km radius from the settlement. Land allocated remaining unbuilt should be returned and reallocated on the basis of actual need. This process will be carried out in conjunction with new national guidance for allocating residential land.
- **Employment Land** – released progressively on the basis of assessment studies undertaken at governorate wide level every 5 years to inform allocation of employment land in local plans/master plans and in local areas where no detailed planning is anticipated to take place. Employment land assessments should consider local employment growth rate including identification of areas for major or

inward investment and allocation of employment land to serve the local population (commercial uses, city-serving industrial uses, local crafts etc). This will be very important for the technology cluster planned for Ibra and for the new industrial area of Sinaw, intended for food processing.

- **Community Facilities** – identification of land and delivery of community facilities will be on the basis of an estimate of actual permanent population within main settlements (on the basis of residential completions and land release described above) and assessment of capacity of existing community facilities across the Governorate: for example actual availability of school places or hospital beds. The assessment, to be repeated every 5 years, will establish the requirement for, timing and cost of additional facilities to serve the planned level of growth set out in the RSS.
- **Revision of Settlement Boundaries** – expansion of the settlement boundaries identified in Policy SD2 will only be allowed when 80% of the land within the boundaries is expected to be completed and occupied within the forthcoming 5 years period. Settlement boundary expansion will follow the criteria set out in the ONSS and follow the methodology set out in the Technical Appendix section of the RSS.

Residential Typologies

National Planning Standards provide a range of appropriate residential typologies, typically suited to larger urban settlements, where the majority of housing will be built. Appropriate National Residential Typologies include:

- Low density residential – Villas: appropriate to all settlements in Ash Sharqiyah North, except for the mountain zones of Dima Wa At Tayin, adopting average national plot sizes
- Low density residential – Townhouses: appropriate to all main settlements in Ash Sharqiyah North
- Medium density residential – Apartments: limited to 4 floors in Sinaw, 5 floors in Ibra
- Residential Mixed Use: limited to 4 floors in Sinaw, 5 floors in Ibra
- Labour accommodation to be provided as part of the typologies above.

Within the region, however, there are distinctive urban fabrics driven by local traditions and suited to specific situations, where national planning guidance is not appropriate and should not be applied. In Ash Sharqiyah North, regionally specific Residential Planning guidance is applicable in:

- Any development within the plantation in designated Residential Palm Garden zones
- Mid Density Courtyard Townhouses within the secondary settlements of the sandy plains by the Sharqiyah Sands
- Low and mid density development within the SPZ and the Hajar Mountains, in the form of Mountain Villas and Compact Clusters

Low Density Residential - Residential Palm Gardens

Intent		
The purpose of Low-Density Residential – Residential Palm Gardens is to recognise the value and attractiveness of residential living within the traditional palm plantations of the oasis within some settlements but also avoid over-development and loss of the oasis altogether. This typology is clearly identified in the land use zoning set out in the Regional Spatial Strategy, which should be refined in Local Plans. It does not apply to zones indicated as Agricultural Enhancement or to oasis areas in general. Goals • Ensure the continuation of traditional living within designated oasis where agricultural functions have become secondary to residential. • Promote locally appropriate development formats, which replicate traditional patterns. • Protect the plantations from over-development and support retention of the green cover (with micro-climatic, cultural and biodiversity benefits) even where agricultural outputs are not commercially viable and the plantation becomes ancillary to the house (garden). • Allow co-existence of agricultural and traditional functions alongside residential use.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units (Palm Garden Villa) Mixed purpose Farming and Residential Units.	Restricted to traditional functions only: • Family farming • Local mosque • Small shops	<i>All other uses that do not meet the purpose and outcomes of the land use, including:</i> • Schools (which should be located outside the plantations) • Markets • Hotels/ tourist accommodation • Any use requiring large car parking

Low Density Residential - Residential Palm Gardens	
Building Typology	Residential Palm Gardens identify areas where the agricultural gardens / plantations remain prevailing, while accommodating small-medium dwelling units typically for Omani family living with occasional non-Omani living.
Typical Building Height	Maximum G+2 Parapet cannot exceed 1m beyond maximum height of the building.
Typical Floor Height	3.5m G; 3m above
Typical Plot Size	Minimum 2,000m ²
Plot Coverage	Maximum 25% of plot to be paved or built area up to 750m ² built or paved footprint in total.
Setbacks & Entrances	Front setback – 0m Side setback – 0m, with the built side against a single lateral property boundary only for a maximum length of 22m Rear setback – min. 25m Perimeter property walls to be 2m maximum and limited to dwelling area.
Resident Parking (on plot)	Maximum 2 car parking spaces per unit – enclosed behind gates or within ground floor of the building.
Visitor Parking (on street)	Allowed outside the plantation and agricultural area only.

Low Density Residential - Residential Palm Gardens	
Public Space	Publicly accessible roads following the traditional plantation patterns, maximum 6m wide, with permeable surface and low bounding walls adjacent to the plantations. No street lighting. Seating and resting places to be provided where appropriate.
Design Requirements	Materials limited to traditional-looking finishes and equivalent contemporary alternatives. Use of traditional forms and development patterns encouraged. Use of bright artificial colours forbidden. No A/C units or other technical equipment to be visible from access roads and public spaces. Plantation and agricultural gardens to be retained and enhanced with modern irrigation techniques where possible.



Samad Ash Shan Residential Palm Gardens

Mid Density Residential - Courtyard Townhouses

Intent		
The purpose of a Mid Density Residential – Courtyard Townhouses typology is to enable the use of traditional construction methods which allow houses to be built over time by successive addition of rooms and habitable space around a private courtyard. This method allows construction cost to be spread in time and paced with need. It also creates communal private social space in the courtyards and a progressively denser urban environment, which may encourage densification in secondary settlements, where higher density development from the outset of the RSS would be inappropriate. Goals • Adoption of traditional construction methods and development patterns promoting locally appropriate development formats. • Affordable construction, spread over time. • Progressive densification of the urban fabric.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units	Restricted to small scale functions only: • Local mosque • Local shops • Primary schools • Local community facilities • Local recreational open space • Small scale visitor / tourist accommodation	<i>All other uses that do not meet the purpose and outcomes of the land use, including:</i> • Any large format buildings • Any use requiring large car parking

Mid Density Residential – Courtyard Townhouses	
Building Typology	Courtyard Townhouses are single family units arranged around a central courtyard and built over time to suit the needs of a changing family. They suit both Omani and non-Omani family living. They are typically arranged within an irregular grid of lanes originating from local natural features, with individual properties attached at the boundaries.
Typical Building Height	Maximum G+2 Accessible roof terrace only above ground floor level to protect neighbour's privacy.
Typical Floor Height	3.5m G; 3m above
Typical Plot Size	600m ² to 1500m ²
Plot Coverage	Maximum 70%
Setbacks & Entrances	All setbacks – 0m, with built mass against the property boundaries up to 60% of its perimeter maximum Perimeter property walls to be 2m maximum.
Resident Parking (on plot)	Minimum 2 car parking spaces per unit – enclosed behind gates or within ground floor of the building.
Visitor Parking (on street)	Within small parking yards in between properties.
Public Space	All properties to be served by at least one access road of 6m width. A slow and irregular two-way road to serve groups of 100 units. Public space / widening and garden every cluster of 25 units.

	Limited street lighting, mounted on buildings. Seating and resting places to be provided where appropriate.
Design Requirements	Natural-looking finishes and use of traditional forms and details (gates, window screens, etc) encouraged. Use of bright artificial colours forbidden. No A/C units or other technical equipment to be visible from access roads and public spaces. Courtyard planting.



Bidiyah Courtyard Townhouses

Low Density Residential – Hajar Mountain Villas

Intent		
As buildable land in the mountains is scarce and construction expensive, any form of development in the mountain should be compact and efficient. Protection of views and appreciation of the mountain scenery should be prioritised, and development remain discreet, respectful and located away from prominent positions. The purpose of Low Density Residential – Hajar Mountain Villas is to build distinctive residential areas appropriate to the context of the mountain, forming a compact group, prioritising shared open spaces and viewpoints over the creation of private open spaces. Parcel layouts should adapt to the topography and land formation, rather than imposing an urban grid over the landscape. To preserve the dominance of the mountain setting, height is restricted, and appropriate greenery is required. Suitable for Omani as primary residence or for second / holiday homes. Goals • Adoption of compact villa formats that respond organically to the local landscape and topography. • Limitation of private gardens or private open space in favour of shared public spaces to optimise the mountain setting. • Distinctive architecture allowed to emerge by unique planning standards.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units in small clusters of 50-60 units	Restricted to small scale functions only: • Local mosque • Local shops • Visitor / tourist accommodation adopting the same formats	<i>All other uses that do not meet the purpose and outcomes of the land use, including:</i> • Any large format buildings • Any buildings over G+2 • Any use requiring large car parking

Low Density Residential – Hajar Mountain Villas	
Building Typology	Hajar Mountain Villas are clusters of up to 60 single family units enclosed by low perimeter walls with no or small private open space. They are typically arranged within a grid of 10m streets laid out to follow the natural ground and topography and, depending on the situation, built on split levels to suit the slope. Gaps and open spaces in between the houses serve as semi-private communal gardens or viewing spaces. They suit both Omani and non-Omani family living.
Typical Building Height	Maximum G+2 Accessible roof terrace only above ground floor level to protect neighbour's privacy.
Typical Floor Height	3.5m
Typical Plot Size	Ranging from 400m ² to 600m ²
Plot Coverage	Maximum 65%
Setbacks & Entrances	No setbacks from streets and semi-private spaces. 1.5m setback from other properties. Perimeter property walls to be 1.7m maximum.
Resident Parking (on plot)	Maximum 1 car parking space per unit enclosed behind gates or within ground floor of the building. 1 additional space within a shared parking area at the edge of each cluster.
Visitor Parking (on street)	Within parking yards at the edge of each cluster.
Public Space	Mountain cuts and flattening not permitted. Exposed retaining walls for private plots or roads limited to 2m high terraces and naturalised.

	Access roads of approx. 10m width including sidewalks, creating a low speed and pedestrian-friendly environment. Overall land-take of road infrastructure and parking to be less than 20% of development area. Limited street lighting, mounted on buildings.
Design Requirements	Natural colour finishes and use of traditional materials, forms and details (gates, window screens, etc) only. Tree planting within the property and green terraces encouraged. No A/C units or other technical equipment to be visible from access roads and public spaces.



Traditional Pattern in a Village of Dima Wa At Tayin

Mid Density Residential – Hajar Mountain Compact Clusters

Intent		
As buildable land in the mountains is scarce and construction expensive, any form of development in the mountain should be compact and efficient. Traditional villages are often tightly clustered and with limited road access. This pattern is intended to protect the mountain and maximise the land for sustenance and agriculture, by keeping the built-up areas to a minimum. Most of these traditional villages are now of heritage value. The purpose of Mid Density Residential – Hajar Mountain Compact Clusters is to build distinctive residential areas appropriate to the context of the mountain, prioritising shared open spaces and viewpoints over the creation of private open spaces. Parcel layouts and buildings should adapt to the topography and land formation, rather than imposing an urban grid over the landscape. To preserve the dominance of the mountain setting, height and car access are restricted. Suitable for Omani as primary residence or for second / holiday homes. Goals • Adoption of compact residential formats that adopt traditional forms suited to the local landscape and topography. • Limitation of land take to optimise the mountain setting. • Distinctive architecture allowed to emerge by unique planning standards.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units in small clusters of 50-60 units	Restricted to small scale functions only: • Local mosque • Local shops • Visitor / tourist accommodation adopting the same formats	All other uses that do not meet the purpose and outcomes of the land use, including: • Any large format buildings • Any buildings over G+2 • Any use requiring large car parking

Mid Density Residential – Hajar Mountain Compact Clusters	
Building Typology	Hajar Mountain Compact Clusters are formed of up to 60 single family units attached at the side walls and separated by yards and patios at the back. They are typically formed by narrow plots, served by a single vehicular street / lane and multiple pedestrian passageways laid out to follow the natural ground and topography and, depending on the situation, built on split levels to suit the slope. Gaps and open spaces in between the houses serve as semi-private communal gardens or viewing spaces. They suit both Omani and non-Omani family living.
Typical Building Height	Maximum G+2 Accessible roof terrace only above ground floor level to protect neighbour's privacy.
Typical Floor Height	3m
Typical Plot Size	Ranging from 300m ² to 500m ²
Plot Coverage	Maximum 80%
Setbacks & Entrances	No setbacks from streets and semi-private spaces. No lateral set-back. 2-4m setback from the back. Property walls to be 1.7m maximum.
Resident Parking (on plot)	none
Resident and Visitor Parking (on street)	2 resident car park spaces and 0.5 visitor space within a shared parking area at the edge of each cluster.

Mid Density Residential – Hajar Mountain Compact Clusters	
Public Space	Mountain cuts and flattening not permitted. Exposed retaining walls for private plots or roads limited to 2m high terraces and naturalised. Access roads of approx. 10m width without separate sidewalks, creating a low speed and pedestrian-friendly environment. Overall land-take of road infrastructure and parking to be less than 15% of development area. Limited street lighting, mounted on buildings.
Design Requirements	Natural colour finishes and use of traditional materials, forms and details (gates, window screens, etc) only. Tree planting within the property and green terraces encouraged. No A/C units or other technical equipment to be visible from access roads and public spaces.



Traditional Cluster in a Village of Dima Wa At Tayin

Tourism Development

Tourism development in Ash Sharqiyah North will follow the ONSS National Standards and the policies set out in the Regional Spatial Strategy Policy GP1. In addition, the following regional specific guidance will be applied:

- **Business Hotel, Serviced Apartments and relative complexes** will have a height limit of 5 floors and only be allowed within the CBD area of Ibra or as part of the Technology Cluster around the university and college of technology. They will be well integrated in the fabric of the area as part of a local masterplan designed to encourage pedestrian access to all main local destination. Isolated hotel compounds will be discouraged.
- **Tourism Resorts and complexes**, including a wide range from resorts to camping facilities, should only be allowed within the sites identified and designated as part of a tourism development masterplan and subject to the approval of an environmental study, business strategy and viability assessment. The design proposals should be clearly adapted to local context and climate:
 - Maximising Green Building methodologies and techniques, maximising recycled water and low energy technology.
 - Adoption of layouts adapted to the local terrain and situation and inspired from traditional patterns of development.
 - Use of locally inspired materials, colours and finishes.
 - Containment of light pollution and no street / open space lighting in the mountain except for essential safety.
- **Shared Transport** - Larger tourism operators, whether mountain resorts, leisure facilities or hotels will be required to provide shared taxi and/or minibus services to and from their location to local public transport nodes to ensure that tourists and visitors to the Governorate and employees who live and work in the Governorate have a sustainable alternative to private vehicles where no coach or local bus routes exist. These services can be provided by the operator or contracted out to shared transport services provider. The following threshold should apply:
 - Any hotel with more than 50 beds
 - Mountain resort/hotel with more than 20 beds
 - Any leisure facility attracting more than 100 visitors per day
 - Any tourism employer with more than 100 employees.

Employment

Employment development in Ash Sharqiyah North will follow the ONSS National Standards and the policies set out in the Regional Spatial Strategy Policy GP1. In addition, the following regional specific guidance will be applied:

- **Shared Transport** - Operators of large commercial, retail and/or industrial premises that have no direct access to local bus services will provide company transport to ensure employees have sustainable alternative to private vehicles. This should apply to government and local government offices. These services can be provided by the operator or contracted out to shared transport services providers, such as taxi and minibus operators. These services can utilize existing transport provision or future demand responsive transport services, using the technologies utilized by smartphone ride hailing applications. The following threshold will apply:
 - Any commercial, industrial or retail with more 100 employees
 - Any government office or agency with more 100 employees.

Parks and Open Space

The purpose of Parks and Open Space is to provide areas which serve the recreational needs of a wide range of residents and visitors. Where required to meet community needs, development may include shelters, amenity facilities, picnic tables, and playgrounds that support safe environment and allow access for essential management and maintenance.

In Ash Sharqiyah North it will also be important to retain natural open spaces within the urban areas to preserve the views and relationship of settlements and nature (mountains and geological formations) that is characteristic of the area.

The National Planning Standards identify a range of Parks and Open Spaces suitable to the recreational needs of the local population.

Within Ash Sharqiyah North, in addition, the following regional guidance will be applied:

- **Access to Wadi Plantation Areas** – customary informal recreational access (walking, picnics and small gatherings) will be retained within the plantations, by allowing pedestrian and cycle public access. No specific provision for visitors will be made: no permanent lighting, benches or waste collection will be located unless requested by the local community. No retail / food vans will be allowed. Where necessary an information panel setting out the behaviours and rules of visitors and recycling bins will be installed at the edges of the entrance route to the oasis.
- **Formation of Regional / District Natural Open Space** – Policy SD12 sets the framework for projects including the formation of large areas of natural open space within the settlement boundaries of the larger settlements. Often these areas correspond to attractive and distinctive local features, such as main wadis, hillocks and rock formations. These areas are to be retained as natural undeveloped spaces in perpetuity, providing natural wildlife corridors and supporting human appreciation of the natural environment. Within these areas:
 - Any planting should be comprised of naturally occurring or locally frequent species adapted to the climate and suitable to support local wildlife habitats.
 - Paths and walks should provide access to no more than 20% of the area and strictly built with natural and permeable surface finishes, without lighting or other formal equipment.
 - Seats and shelters should be natural and informal, such as boulders and groups of trees.
 - Any visitor or commercial use should be limited to small temporary facilities at the interface of the natural and built areas.

Urban Streets

A major change is necessary within Ash Sharqiyah North to transform roads and main highways into urban streets as they enter the urban boundaries of a settlement. This will require the identification of a better balance between road / vehicular functions, pedestrian movement and permeability and provision of attractive public realm with trees and shaded areas. This will be very important in the main commercial areas, where safe pedestrian movement and frequent crossings should be the norm.

National Planning Standards provide a range of appropriate urban street typologies, typically suited to larger urban settlements, where the majority of development will take place. Appropriate National Urban Street Typologies to be applied within the settlement boundaries include:

- Lower Density Urban Boulevard and Avenue layouts – suitable only for the main national roads and bypasses of Ibra and Sinaw.
- Streets typologies - appropriate to the main highway corridors and urban distributor roads of all key settlements in Ash Sharqiyah North
- Lanes – appropriate to all mixed use, commercial and residential districts
- Alleyways – appropriate to residential areas and historic districts.

Other Road and Access Corridors

In Ash Sharqiyah North , regionally, new access could become necessary to enable tourism development or other activities within sensitive environmental areas, including within the boundaries of the Hajar Mountains SPZ (Policy SD11), UNESCO World Heritage sites (Policy CH2), Heritage Conservation Areas (Policy CH1), Nature Conservation Areas and Geoparks (Policy TE1). However, the design standards as set out in Oman Highway Design Manual are not suitable in areas of significant ecological, geological, cultural and scenic value. The design guidance is focused on improving the alignment of the road and the increasing the design speed of the new or upgraded routes, without due consideration to the adverse impacts of construction and new alignment on environmentally sensitive areas.

Ministry of Transport, Communications and Information Technology will work with the Planning Authorities to design and deliver rural highway or transport schemes (including parking and other forms of transport such as cable cars) that are appropriate within the context of the specially designated areas.

Any highway scheme located in a protected/designated area as defined by Policies SD11, TE1, CH1, CH2, CH3, CH4 and CH5, will be subject to a full feasibility, design, and environmental and social impact (ESIA) assessments, to determine if the scheme is appropriate and that the adverse environmental, cultural, ecological and social impacts of highway scheme can be minimised:

- No construction works will proceed until such assessments have been undertaken by Ministry of Transport, Communications and Information Technology and approved by the Planning Authority. If it is determined that the adverse environmental impacts are significant, the relevant committed projects should be cancelled.
- Significant impact includes light pollution, need for extensive retaining structures, major alteration of the contours and of the natural mountain slope.

Interim Development Safeguards in the SPZ and Protected Natural Areas

The parameters for development within the Special Planning Zone and in other protected areas (Policy TE1) will become clearer once the institutional arrangements will be further developed. It will be important to safeguard these important areas in the interim period through a series of safeguards and restrictions, which can be softened at a later stage by the authority in charge of the SPZ. These include:

- No development above 5ha will be allowed in the interim period. Development below 5ha will be allowed to proceed subject to a masterplan proving how the proposals are adapted to the site, its topography and cultural traditions.
- All development along wadis will need to adhere to a general setback of a minimum of 50 metres.
- Buildings will be limited to 2 storeys to keep the natural landscape “readable” from a distance with only minor landmarks such as a local mosque. Buildings and structures should avoid ridges and clifftops. Use of natural colours and materials is encouraged.
- No building, tourism or industrial activities (including visitors community facilities) are allowed in the interim period in designated Nature Conservation Areas and the Sharqiyah Sands.
- No facilities such as restaurants, coffeeshops, food vans and parking are allowed in Nature Conservation Areas and in prominent locations on ridges, cliff tops and vista-points.
- Cars access will be restricted to designated roads, with small parking facilities allowed at specifically designed and maintained picnic spots.
- No street and open space lighting are allowed in Nature Conservation Areas and in prominent locations.
- The development of large technical infrastructure, including dams and energy plants will be not allowed in the interim period.
- Strict measure and fines should be imposed so that visitors take all their waste with them when leaving the area, pending the setting up and organisation of waste collection systems in the area.



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9.9. Ash Sharqiyah South Governorate

Introduction (Regional Distinctiveness)

This section outlines the Regional Planning Standards for Ash Sharqiyah South. It is intended that the regional standards complement the national ones and set out any key regional variations that are applicable instead or over and above the National Standards. This section presents these differences and assumes that all other standards are covered nationally and apply to the region.

The National and Regional Standards, combined, aim to achieve the Vision and Objectives of the national ONSS and Regional Spatial Strategy, which for Ash Sharqiyah South are outlined in RSS D11 Volume I.

The objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs. The ONSS and RSS 20-year spatial planning frameworks set out a way of delivering local prosperity with a better balance between social, economic and environmental dimensions, either directly or indirectly. Specifically, within the Ash Sharqiyah South region the balance between environmental assets and growth needs to guide any development in the region, as around ¾ of the land and most of the coastline is of high value for Oman and for the world. This might involve the following:

- Restructuring, modernising and diversifying the urban economy of Sur, particularly through regeneration, advanced marine research (aimed at marine production and industry as well as conservation) and a range of tourism development opportunities;
- Enabling progressive densification of inland settlements (Kamil Wa Al Wafi, Jaalan Bani Bu Hassan and Jaalan Bani Bu Ali), improve their commercial centres and strengthen community services, while consolidating sprawling trends and protecting agricultural land;
- Protecting and supporting regional cultural influences and traditional urban forms, such as compact coastal settlements and traditional crafts and produce;
- Expand and encourage excellence in practices related to the blue economy: fisheries, water activities and nature conservation.
- Enabling coordinated, respectful and locally beneficial blue and green tourism which supports understanding of local culture, traditions, environment and crafts.
- Introducing a Special Planning Zone for the Hajar Mountain range and one for the Sharqiyah Sands as a way to take into consideration environmental issues in guiding future development in the delicate areas of mountain and desert that provide special character to the governorate; and
- Support sensitive tourism development in Masirah Island, while protecting its unique environmental assets, as part of a joint Special Planning Zone with the area of Barr Al Hikman in Al Wusta.
- Protect turtle nesting grounds for the long term.

It is intended that compliance with the National and Regional Planning Standards will contribute to a more sustainable future for Oman and to local distinctiveness

Climatic Response

Climate change along the coast of Ash Sharqiyah South is likely to manifest itself primarily through coastal risk due to erratic weather patterns and storm surge combined with coastal erosion. It is also likely that there will be more extreme periods of heat and sudden and dangerous flash terrestrial flooding, with occasional frost and ice high in the mountain.

Protecting coastal development and mitigating against the risk of sea level rise, storm surges and flooding will be as important as preventing development in areas at risk.

Historically, devastating tsunamis destroyed flourishing cities such as Qalhat and Sur. The coastline was once protected from the storms coming in from the Indian Ocean and tsunami hazard by naturally occurring mangroves and deep beaches; development has been traditionally set back from the coast and wadi estuaries by several hundred meters. More recently, public buildings (schools, government offices and fishing infrastructure) have been built along the coastline and a multitude of tourism proposals are proposed directly on the seafront.

In 2015, the Public Authority for Civil Aviation (PACA) published an Assessment of Coastal Hazards, Vulnerability and Risk. In respect to tsunamis and storm surge, the length of inundation could potentially range from 1,000m to 4,000m inland in places, as indicated in the coastal flood risk mapped as part of Policy WR4. Given the density of developments particularly in the older parts of Sur and emerging development in Ras Al Hadd, coastal flooding could severely impact a large proportion of the urbanised areas and infrastructure across the coastline.

Future development within the Coastal Management Zone (Policy CE1) must be subject to specific Standards for governorate. The National Planning Standards state that developments in coastal zones should maintain setbacks from the high tide line, as per MoHT regulations and no permanent built development should be located within this area. MoHT regulations stipulate:

- Natural coasts with natural landscapes and seascapes, such as rocky headlands and cliffs – 300m setback from the highest tidal mark.
- Sandy coasts and around khawrs – 150m setback from the highest tidal mark.
- Stable coasts where urban development may not cause serious impacts on the receiving environment – 50m setback from the highest tidal mark.
- A 50m minimum setback should be applied to all development from Wadis.

In Ash Sharqiyah South, the majority of the population will live in the main urban settlements of Sur and the combined area of Jaalan, but smaller coastal settlements will also develop in response to expansion of the blue economy. It will be imperative to:

- Strictly adhere to the development zones, identified by the boundaries of Policy SD2, which take into account the protection of terrestrial floodplains.
- Avoid any development in the coastal setback zone identified in Policy CE1 or within the setback areas stipulated by MoHT, whichever it is greater.
- Apply a standard 50m setback for any development along wadis.
- Retain public access to all coastal area and wadi frontages.
- Address flood and coastal risk and prioritise the policy and Priority Flood Management Areas identified in Policy WR4 and refine the coastal setback zone of Policy CE1. It will be important to address flood risk issues particularly in Sur before progressing development.
- Implement coastal protection projects before development and choose natural / semi-natural approaches in preference to engineered solution. This will be very important to secure the future prosperity of any settlement, but in particular of Sur, through expansion of mangroves and semi natural beaches, which should be designed to become an attraction as well.
- Ensure the survival of the oasis and terraced agriculture not only for production and protection of local lifestyles, but also, very importantly as a way to retain a form of climatic control and reduction of urban heat in the inland and mountain settlements.
- Apply the principles of green buildings contained in the National Planning Standards for all new construction (taking account of orientation, sustainable material, water and energy conservation, use of climate adapted and naturally occurring planting, etc).
- Apply street National Planning Standards to encourage active modes of travel and improve the shade in streets and urban places, to reduce energy consumption, air pollution and mitigate urban heat.

Cultural Influences and Traditional Lifestyles

Ash Sharqiyah South has dual tradition of coastal seafaring activities and inland agriculture. Seafaring brought influences from various parts of the South Ocean regions, with cosmopolitan cultural traditions linked to travel: trade was vast and varied in the souk of Sur, boating and fishing industries were flourishing, including the construction of dhows, sails and nets, and so was the commerce of silver craft. Inland tighter-knit communities had a more restrained family life, linked to agriculture and camel rearing, with crafts linked to textiles, jewellery and camel racing artefacts.

With the exception of Sur, coastal settlements are typically small and very compact, set back from the beach, which still is the main area for fishing activities and fish markets. Most had little recent development and therefore maintained their original urban fabric. Exceptions are Ras al Hadd and Hilf, which have recent areas of standard housing subdivisions.

The Standards encourage respect for traditional Omani architecture and built form and the restoration and regeneration of communities, by promoting an approach to streets and public realm that supports social life and the formation of more attractive neighbourhood centres. At the regional level, Conservation Areas (Policy CH1) and Cultural Landscapes (policy CH3) have been established to identify areas where cultural assets that help give the governorate its character should be respected and given special planning consideration in order to conserve and provide inspiration for distinctive environments. Typical assets protected by these policies include:

- The governorates forts and towers, typically located at the centre of the older parts of the settlement;
- Traditional fabrics such as the area around the Al Ayjah bay of Sur;
- Ancient mosques and remains of ancient earthen and stone settlements;
- The wadi gorges, agriculture and compact micro settlements of Wadi Tiwi and Wadi Shab.

Besides these recognised heritage assets, most settlements have a distinctive urban form, which should be used as inspiration for future development and retained, even if not identified as Conservation Areas:

- In coastal villages, traditional stone and earthen courtyard houses remained in use over the decades, adapted and altered giving rise to the current compact areas of Al Ashkharah, Asilah, Tiwi, etc. where traditional and recent buildings are mixed within the pattern of the historic fabric.
- In Jaalan Bani Bu Hassan and Jaalan Bani Bu Ali recent courtyard houses developed informally over the past 20-30 years and progressively densified as each unit gets expanded within the area of each courtyard, near but without encroaching in the plantation and agricultural areas, which are preserved for agriculture in the fertile sliver of land at the edge of the Sharqiyah Desert.
- The old souk area of Sur retains the traditional fabric and urban function of an ancient souk, despite many of its buildings have been rebuilt or expanded using common concrete blocks.

The impact of car use (and parking requirements) and the construction of houses using contemporary standards and setbacks has introduced a new development language that has compromised the appreciation of cultural and historic assets, distinctive local areas and the viability of cultural traditions.

The standards that apply within the identified Conservation areas and within 250m of a key historic asset include:

- Limitation of heights to a level so that the fort and lookout towers retain their dominant profile over the surrounding areas.
- Protection of all view corridors and vistas towards the forts and main mosques from being obscured by new development; retention of lower heights around the forts so that open views over the surrounding areas from the top of the forts are preserved.
- Selection of materials and details that are similar to that of local traditional features: colour (mainly white along the coast and pale tones inland), types of material and built form should reflect both historic and more recent traditional assets. Garish colours, overly decorated features and built forms that are not inspired from local context should not be allowed.
- Identification of appropriate reuse and alterations to the villages or older parts of the settlements through a collective agreement with the local community.
- Adoption of specific standards for new residential and tourism development (see Section below).
- Retention of the narrow lanes and alleyways and streets as informal, slow speed, local access routes used by all (pedestrian, cyclists, cars and small trucks), with limited lighting and minimal engineering.
- Provision of parking in vicinity of visitor attractions, large mosques and markets in a way that does not occupy prominent positions or result in structures or areas that compromise the views and appreciation of the historic area and its functions

Settlement Pattern

The Ash Sharqiyah South region is characterised by two main spatial areas, each with distinctive character, and the unique city of Sur:

- The Coastal Area, typically a narrow strip of inhabited land with at the back either tall mountains or the desert, traditionally dotted by very compact isolated fishing settlements located at semi-regular distance along the coastal road. These villages are typically formed by a very compact cluster of 1-2 storey courtyard houses, with an inland street with community facilities (shops, mosque and few more) and a beachfront dedicated to fishing activities: boats, nets and markets. In recent times additional facilities have been built along the beachfront: sometimes a paved cornice with seats and children play areas, schools, government buildings or more developed fishing facilities. Some of these are located in an area of coastal risk. In Tiwi and Al Ashkharah formal breakwaters now protect the fishing boats.
- The Edge of Desert Belt at the north eastern fringe of the Sharqiyah Sands where most of the local population settled along the aquifer and the corridor of Wadi Bani Khaled forming the oasis settlements of Kamil Wa Al Wafi, Jaalan bani Bu Hassan and Jaalan Bani Bu Ali. These were linked to trade routes and sea-front outlets in Sur, Al Ashkharah and Asilah. Wadi-fed oasis with palms and mixed crops were at the origin of the older settlements, which were typically made of a nucleus of earthen buildings around a tower, mosque and souk. In recent decades, these settlements grew through development of courtyard houses, larger than the traditional ones but adopting similar built forms and patterns. Over the years many of these areas have densified with additional buildings progressively expanding into the courtyards. In addition, new standard villa subdivisions have been planned in all directions and linear strips of commercial and administrative buildings have been built along the main road (Highway 35), leading to considerable sprawl but saving the agricultural areas of the oasis, which remain in agricultural use.
- Sur is unique in the Governorate for its dense centre and city features: a compact and extensive souk, multi-level commercial and administrative buildings, a large fishing port and a seafront with distinctive

maritime-city buildings. It also hosts a large national industrial area partly occupied by heavy industry. The city has attractive beach promenades and sea views in need of regeneration and protection. Recent villa development has initiated a process of sprawling along all main roads which needs consolidation and containment. Public spaces within the city itself are poor and car dominated

Vernacular Architecture

Until the 1970s, local inland building construction was essentially made of earthen structures which constrained the room sizes and created a variety of mainly small courtyard houses, separated from the oasis plantations. Small mosques were located in between the houses to serve a family group. Forts and towers, still made of earthen structures, emerged within the settlements to identify the most important families.

Coastal settlements adopted a mix of earth and stone buildings, typically forming small courtyards clustered together. Sometimes a porch embellished the most important houses.

More recent buildings follow standard national construction typologies and fail to create a distinctive vernacular style. However, there are many examples of attractive urban development which should form the inspiration for the future and an alternative to the standard national typologies.

In inland setting:

- Courtyard townhouses, forming attractive organic neighbourhoods served by narrow alleyways. These are typically large but flexible, as the buildings inside the courtyard change and evolve following the needs of the family. This system provides variety within a consistent system and affordability, as the house is built as and when required.
- Palm Garden Villas – a particular villa typology rarely present in Ash Sharqiyah South where wadi-fed agricultural land is precious, but nevertheless attractive in some areas of Sur and Al Kamil: not particularly distinctive in architectural terms (fairly common villa building type), but with a unique relationship with the green area of the palm plantations. It is normally accessed through narrow dirt plantation lanes and alleyways and surrounded by stone walls. The plantation remains productive, with layered palms and lower crops, but often decorative and unusual plants are also introduced.

In coastal setting:

- The mid-rise house blocks of Al Ayjah Bay, without courtyards or setbacks from the narrow streets and arranged following the topography of the bay, form a very attractive and varied frontage, unified by the white colour finish and scale, but otherwise enriched by porches, loggias and other features.
- The mixed traditional fabrics of Tiwi, Asilah and Al Ashkharah, where traditional courtyard houses have been changed and altered with time to respond to more recent needs and are also interspersed with more recent villa-types yet following the traditional fabric of lanes and alleyways.
- The adapted / renovated houses in the small clustered villages in the Hajar Mountains or along the wadis (for example Wadi Tiwi), perched on the slope and adapted to the contours, displaying a range of pale colours and complemented by planting.
- The compact buildings of Hilf, low rise and low density along spacious roads but built directly at the edge of the road along a semi-organic grid



Traditional Courtyard Residential Typologies



Palm Garden Villa Residential Typologies



Mid rise compact development around Al Ayjah Bay



Mixed traditional fabric in Tiwi



Clustered houses in Al Hosn (Wadi Tiwi)



Built frontages in Hilf

Variations from the National Standards

Primary Land Uses – Assessment-based Land Release

Sprawling standardised development forms and indiscriminate land consumption is one of the recent problems of development in Ash Sharqiyah South, leading to loss of local character, excessive costs of infrastructure and unsustainable patterns of development.

Through the National and Regional Spatial Planning Strategies it will be important to adopt a better organised form of development through the systematic and progressive release of land and planning of employment and community facilities. Where a Local Plan is to be prepared, this should include the identification of progressive directions of growth and more detailed sequencing of assessment.

In the interim, and where a Local Plan is absent, it is imperative to constrain sprawl and strongly encourage densification of already urbanised areas. Therefore, land for development should be identified strictly within the settlement boundaries identified in Policy SD2 and as follows:

- **Residential Land in Main Settlements** – identified and only released for subdivision, distribution and development every 2 years following an assessment of actual need and confirmation of 80% substantial completion of the residential land released in the period before the last one (released 4 years before) for each major settlement: Sur, Al Kamil Wa Al Wafi, Jaalan Bani Bu Hassan, Jaalan Bani Bu Ali, Al Ashkharah and Hilf. This process will need to be carried out in conjunction with new national guidance for allocating residential land.
- **Residential Land in Rural Villages** – identified and only released for subdivision, distribution and development every 2 years following a Governorate-wide assessment of localised need of the existing communities and confirmation of 80% substantial completion of any residential land previously released. Land release in smaller order settlements (Other Rural Centres – category E3) should not be for more than 30 residential units at the time and allocated to families living or working within a 50km radius from the settlement. Land allocated remaining unbuilt should be returned and reallocated on the basis of actual need. This process will be carried out in conjunction with new national guidance for allocating residential land.
- **Employment and Tourism Development Land** – released progressively on the basis of assessment studies undertaken at governorate wide level every 5 years to inform allocation of employment and tourism land in local plans/master plans and in local areas where no detailed planning is anticipated to take place. Employment land assessments should consider local employment growth rate including identification of areas for major or inward investment and allocation of employment land to serve the local population (commercial uses, city-serving industrial uses, local crafts etc). Tourism development should follow objective assessment of demand.
- **Community Facilities** – identification of land and delivery of community facilities will be on the basis of an estimate of actual permanent population within main settlements (on the basis of residential completions and land release described above) and assessment of capacity of existing community facilities across the Governorate: for example actual availability of school places or hospital beds. The assessment, to be repeated every 5 years, will establish the requirement for, timing and cost of additional facilities to serve the planned level of growth set out in the RSS.
- **Revision of Settlement Boundaries** – expansion of the settlement boundaries identified in Policy SD2 will only be allowed when 80% of the land within the boundaries is expected to be completed and occupied within the forthcoming 5 years period. Settlement boundary expansion will follow the criteria set out in the ONSS and follow the methodology set out in the Technical Appendix section of the RSS

Residential Typologies

National Planning Standards provide a range of appropriate residential typologies, typically suited to larger urban settlements, where the majority of housing will be built. Appropriate National Residential Typologies include:

- Low density residential – Villas: appropriate to main settlements in Ash Sharqiyah South
- Low density residential – Townhouses: appropriate to main settlements in Ash Sharqiyah South
- Medium density residential – Apartments: limited to 4 floors in Jaalan Bani Bu Hassan and Jaalan Bani Bu Ali, 5 floors in Sur more generally, and 8 floors in Sur CBD area.
- Residential Mixed Use: limited to 4 floors in Jaalan Bani Bu Hassan and Jaalan Bani Bu Ali, 5 floors in Sur more generally, and 8 floors in Sur CBD area.
- Labour accommodation to be provided as part of the typologies above.

Within the region, however, there are distinctive urban fabrics driven by local traditions and suited to specific situations, where national planning guidance is not appropriate and should not be applied. In Ash Sharqiyah South, regionally specific Residential Planning guidance is applicable in:



- Any development within the plantation oasis in Residential Palm Garden designated zones
- Mid Density Courtyard Townhouses within the secondary settlements of the sandy plains by the Sharqiyah Sands
- Coastal Townhouses for the compact settlements along the coast
- Villas and clusters specifically for Masirah Island
- Low and mid density development within the SPZ and the Hajar Mountains, in the form of Mountain Villas and Compact Clusters

Low Density Residential - Residential Palm Gardens

Intent		
The purpose of Low-Density Residential – Residential Palm Gardens is to recognise the value and attractiveness of residential living within the traditional palm plantations of the oasis within some settlements but also avoid over-development and loss of the oasis altogether. This typology is clearly identified in the land use zoning set out in the Regional Spatial Strategy, which should be refined in Local Plans. It does not apply to zones indicated as Agricultural Enhancement or to oasis areas in general. Goals • Ensure the continuation of traditional living within designated oasis where agricultural functions have become secondary to residential. • Promote locally appropriate development formats, which replicate traditional patterns. • Protect the plantations from over-development and support retention of the green cover (with micro-climatic, cultural and biodiversity benefits) even where agricultural outputs are not commercially viable and the plantation becomes ancillary to the house (garden). • Allow co-existence of agricultural and traditional functions alongside residential use		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units (Palm Garden Villa) Mixed purpose Farming and Residential Units.	Restricted to traditional functions only: • Family farming • Local mosque • Small shops	All other uses that do not meet the purpose and outcomes of the land use, including: • Schools (which should be located outside the plantations) • Markets • Hotels/ tourist accommodation • Any use requiring large car parking

Low Density Residential - Residential Palm Gardens	
Building Typology	Residential Palm Gardens identify areas where the agricultural gardens / plantations remain prevailing, while accommodating small-medium dwelling units typically for Omani family living with occasional Expatriate living.
Typical Building Height	Maximum G+2 Parapet cannot exceed 1m beyond maximum height of the building.
Typical Floor Height	3.5m G; 3m above
Typical Plot Size	Minimum 2,000m ²
Plot Coverage	Maximum 25% of plot to be paved or built area up to 750m ² built or paved footprint in total.
Setbacks & Entrances	Front setback – 0m Side setback – 0m, with the built side against a single lateral property boundary only for a maximum length of 22m Rear setback – min. 25m Perimeter property walls to be 2m maximum and limited to dwelling area.
Resident Parking (on plot)	Maximum 2 car parking spaces per unit – enclosed behind gates or within ground floor of the building.
Visitor Parking (on street)	Allowed outside the plantation and agricultural area only.

Low Density Residential - Residential Palm Gardens	
Public Space	Publicly accessible roads following the traditional plantation patterns, maximum 6m wide, with permeable surface and low bounding walls adjacent to the plantations. No street lighting. Seating and resting places to be provided where appropriate.
Design Requirements	Materials limited to traditional-looking finishes and equivalent contemporary alternatives. Use of traditional forms and development patterns encouraged. Use of bright artificial colours forbidden. No A/C units or other technical equipment to be visible from access roads and public spaces. Plantation and agricultural gardens to be retained and enhanced with modern irrigation techniques where possible.



Al Kamil Wa Al Wafi Residential Palm Gardens

Mid Density Residential - Courtyard Townhouses

Intent		
The purpose of Mid Density Residential – Courtyard Townhouses is to enable the use of traditional construction methods which allow houses to be built over time by successive addition of rooms and habitable space around a private courtyard. This method allows construction cost to be spread in time and paced with need. It also creates communal private social space in the courtyards and a progressively denser urban environment, which may encourage densification in secondary settlements, where higher density development from the outset of the RSS would be inappropriate. Goals • Adoption of traditional construction methods and development patterns promoting locally appropriate development formats. • Affordable construction, spread over time. • Progressive densification of the urban fabric.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units	Restricted to small scale functions only: • Local mosque • Local shops • Primary schools • Local community facilities • Local recreational open space • Small scale visitor / tourist accommodation	<i>All other uses that do not meet the purpose and outcomes of the land use, including:</i> • Any large format buildings • Any use requiring large car parking

Mid Density Residential – Courtyard Townhouses	
Building Typology	Courtyard Townhouses are single family units arranged around a central courtyard and built over time to suit the needs of a changing family. They suit both Omani and non-Omani family living. They are typically arranged within an irregular grid of lanes originating from local natural features, with individual properties attached at the boundaries.
Typical Building Height	Maximum G+2 Accessible roof terrace only above ground floor level to protect neighbour's privacy.
Typical Floor Height	3.5m G; 3m above
Typical Plot Size	600m ² to 1500m ²
Plot Coverage	Maximum 70%
Setbacks & Entrances	All setbacks – 0m, with built mass against the property boundaries up to 60% of its perimeter maximum Perimeter property walls to be 2m maximum.
Resident Parking (on plot)	Minimum 2 car parking spaces per unit – enclosed behind gates or within ground floor of the building.
Visitor Parking (on street)	Within small parking yards in between properties.
Public Space	All properties to be served by at least one access road of 6m width. A slow and irregular two way road to serve groups of 100 units. Public space / widening and garden every cluster of 25 units.

Mid Density Residential – Courtyard Townhouses

	Limited street lighting, mounted on buildings. Seating and resting places to be provided where appropriate.
Design Requirements	Natural-looking finishes and use of traditional forms and details (gates, window screens, etc) encouraged. Use of bright artificial colours forbidden. No A/C units or other technical equipment to be visible from access roads and public spaces. Courtyard planting.



Jalaan Bani Bu Ali Courtyard Townhouses

Mid Density Residential – Coastal Courtyard Townhouses

Intent		
The purpose of Mid Density Residential – Coastal Courtyard Townhouses is to enable the use of traditional construction methods which allow compact development of houses to be built over time by successive addition of rooms and habitable space around a private courtyard. This method allows construction cost to be spread in time and paced with need. It also creates shaded lanes and weather protection by aligning the main roads and lanes parallel and well inland from the coast. Goals • Adoption of traditional construction methods and development patterns promoting locally appropriate development formats. • Affordable construction, spread over time. • Progressive densification of the urban fabric.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units	Restricted to small scale functions only: • Local mosque • Local shops • Primary schools • Local community facilities • Local recreational open space • Small scale visitor / tourist accommodation	<i>All other uses that do not meet the purpose and outcomes of the land use, including:</i> • Any large format buildings • Any use requiring large car parking

Mid Density Residential – Courtyard Townhouses	
Building Typology	Coastal Courtyard Townhouses are single family units built around a small central opening and built over time to suit the needs of a changing family. They suit both Omani and non-Omani family living. They are typically arranged within an irregular grid of lanes arranged to maximise protection from the weather and the sea.
Typical Building Height	Maximum G+2 Accessible roof terrace only above ground floor level to protect neighbour's privacy.
Typical Floor Height	3.5m G; 3m above
Typical Plot Size	Ranging from 400m ² to 600m ² (G+1 max) and 600m ² to 1200m ² (G+2 max)
Plot Coverage	Maximum 70% (G+1 max); maximum 60% (G+2 max)
Setbacks & Entrances	All setbacks – 0m Perimeter property walls to be 2m maximum.
Resident Parking (on plot)	Minimum 2 car parking spaces per unit – enclosed behind gates or within ground floor of the building.
Visitor Parking (on street)	Within small parking yards in between properties.
Public Space	All properties to be served by at least one access road of 6m width and separated by lanes of 4m width minimum. A slow and irregular two-way road to serve groups of 250 units. Public space / widening and garden every cluster of 40 units.

Mid Density Residential – Courtyard Townhouses

	Limited street lighting, mounted on buildings. Seating and resting places to be provided where appropriate.
Design Requirements	Natural-looking finishes of the colour prevailing in the settlement (white, pale cream, etc) and use of traditional forms and details (gates, window screens, etc) encouraged. Use of bright artificial colours forbidden. Plants and shading devices (trellis, trees, etc) in courtyard, lanes and public spaces. No A/C units or other technical equipment to be visible from access roads and public spaces.



Al Ashkara Coastal Courtyard Townhouses



Al Ayjah Bay, Sur Coastal Courtyard Townhouses

Mid Density Residential – Hilf Townhouses

Intent		
The purpose of a Mid Density Residential – Hilf Townhouses typology is to build compact residential areas and minimise the footprint of urbanisation on this environmentally sensitive island, while avoiding urban models of apartment blocks. This model, similar to that adopted in the more established area of Hilf, is significantly denser than normal villas and yet suitable for Omani and non-Omani households. Goals • Adoption of compact development formats to reduce the footprint of urbanisation. • Avoid urban architectural models extraneous to the location. • Distinctive island architecture allowed to emerge by unique planning standards.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units	Restricted to small scale functions only: • Local mosque • Local shops • Primary schools • Local community facilities • Small scale visitor / tourist accommodation	<i>All other uses that do not meet the purpose and outcomes of the land use, including:</i> • Any large format buildings • Any use requiring large car parking

Mid Density Residential – Hilf Townhouses	
Building Typology	Hilf Townhouses are terraced / attached family units with minimal private open space at the back. They suit both Omani and non-Omani family living. They are typically arranged within a regular grid of 12m streets alternate to 6m lanes with narrow pedestrian cut through passages.
Typical Building Height	Maximum G+2 Accessible roof terrace only above ground floor level to protect neighbour's privacy.
Typical Floor Height	3.5m
Typical Plot Size	Ranging from 400m ² to 600m ²
Plot Coverage	Maximum 70%
Setbacks & Entrances	Front setbacks – 1m No lateral setbacks. Back setback - 6m Perimeter property walls to be 2m maximum.
Resident Parking (on plot)	Maximum 2 car parking spaces per unit (electric cars only) – enclosed behind gates or within ground floor of the building.
Visitor Parking (on street)	Shared and public electric cars parking provided with parking yards in between properties.
Public Space	All properties fronting an access road of 12m or 6m width. Public space / widening and garden every cluster of 40 units. Limited street lighting, mounted on buildings. Seating and resting places to be provided where appropriate.

Mid Density Residential – Hilf Townhouses**Design Requirements**

Natural-looking finishes of the colour prevailing in the settlement (white, pale cream, etc) and use of traditional forms and details (gates, window screens, etc) encouraged.

Tree planting within the property and green terraces encouraged.

No A/C units or other technical equipment to be visible from access roads and public spaces.



Hilf Townhouses

Low Density Residential – Masirah Villas

Intent		
The purpose of Low Density Residential – Masirah Villas is to build distinctive and pedestrian friendly residential areas suitable for Omani as primary residence or for second / holiday homes. This model is appropriate at the edges of Hilf or within the residential component of tourism clusters. The street layout should respond to the local topography and landscape and adapt to the specific situation, without imposing geometric grids. Height is restricted and appropriate greenery is required. Goals • Adoption of compact villa formats that respond organically to the local landscape and topography. • Recognise the specific electric-vehicle only situation of Masirah Island. • Distinctive island architecture allowed to emerge by unique planning standards.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units in small clusters of 50-60 units	Restricted to small scale functions only: • Local mosque • Local shops • Small scale visitor / tourist accommodation	All other uses that do not meet the purpose and outcomes of the land use, including: • Any large format buildings • Any buildings over G+2 • Any use requiring large car parking

Low Density Residential – Masirah Villas	
Building Typology	Masirah Villas are clusters of up to 60 single family units enclosed by low perimeter walls with small private open space at the back or within a central courtyard. They are typically arranged within an irregular grid of 10m streets laid out to follow the natural ground and landscape and grouped so that most front doors are served by a semi-private distribution space. They suit both Omani and non-Omani family living.
Typical Building Height	Maximum G+2 Accessible roof terrace only above ground floor level to protect neighbour's privacy.
Typical Floor Height	3.5m
Typical Plot Size	Ranging from 400m ² to 600m ²
Plot Coverage	Maximum 60%
Setbacks & Entrances	No setbacks from streets and semi-private spaces. 1.5m setback from other properties. Perimeter property walls to be 1.7m maximum.
Resident Parking (on plot)	Maximum 2 car parking spaces (electric cars only) per unit – enclosed behind gates or within ground floor of the building.
Visitor Parking (on street)	Within parking yards at the edge of each cluster.
Public Space	All properties served by an access road of approx. 10m width, creating a low speed and pedestrian-friendly environment. Semi-private entry space every group of 5-8 units. Limited street lighting, mounted on buildings. Appropriate street landscape and shading.
Design Requirements	White finishes and use of traditional forms and details (gates, window screens, etc) only. Tree planting within the property and green terraces encouraged.

Low Density Residential – Masirah Villas

No A/C units or other technical equipment to be visible from access roads and public spaces.



Traditional Pattern in Qalhat to be used as Inspiration for Masirah Villas

Low Density Residential – Hajar Mountain Villas

Intent		
As buildable land in the mountains is scarce and construction expensive, any form of development in the mountain should be compact and efficient. Protection of views and appreciation of the mountain scenery should be prioritised, and development remain discreet, respectful and located away from prominent positions. The purpose of Low Density Residential – Hajar Mountain Villas is to build distinctive residential areas appropriate to the context of the mountain, forming a compact group, prioritising shared open spaces and viewpoints over the creation of private open spaces. Parcel layouts should adapt to the topography and land formation, rather than imposing an urban grid over the landscape. To preserve the dominance of the mountain setting, height is restricted, and appropriate greenery is required. Suitable for Omani as primary residence or for second / holiday homes. Goals - Adoption of compact villa formats that respond organically to the local landscape and topography. - Limitation of private gardens or private open space in favour of shared public spaces to optimise the mountain setting. - Distinctive architecture allowed to emerge by unique planning standards.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units in small clusters of 50-60 units	Restricted to small scale functions only: - Local mosque - Local shops - Visitor / tourist accommodation adopting the same formats	All other uses that do not meet the purpose and outcomes of the land use, including: - Any large format buildings - Any buildings over G+2 - Any use requiring large car parking

Low Density Residential – Hajar Mountain Villas	
Building Typology	Hajar Mountain Villas are clusters of up to 60 single family units enclosed by low perimeter walls with no or small private open space. They are typically arranged within a grid of 10m streets laid out to follow the natural ground and topography and, depending on the situation, built on split levels to suit the slope. Gaps and open spaces in between the houses serve as semi-private communal gardens or viewing spaces. They suit both Omani and non-Omani family living.
Typical Building Height	Maximum G+2 Accessible roof terrace only above ground floor level to protect neighbour's privacy.
Typical Floor Height	3.5m
Typical Plot Size	Ranging from 400m ² to 600m ²
Plot Coverage	Maximum 65%
Setbacks & Entrances	No setbacks from streets and semi-private spaces. 1.5m setback from other properties. Perimeter property walls to be 1.7m maximum.
Resident Parking (on plot)	Maximum 1 car parking space per unit enclosed behind gates or within ground floor of the building. 1 additional space within a shared parking area at the edge of each cluster.
Visitor Parking (on street)	Within parking yards at the edge of each cluster.
Public Space	Mountain cuts and flattening not permitted. Exposed retaining walls for private plots or roads limited to 2m high terraces and naturalised.

Low Density Residential – Hajar Mountain Villas	
	Access roads of approx. 10m width including sidewalks, creating a low speed and pedestrian-friendly environment. Overall land-take of road infrastructure and parking to be less than 20% of development area. Limited street lighting, mounted on buildings.
Design Requirements	Natural colour finishes and use of traditional materials, forms and details (gates, window screens, etc) only. Tree planting within the property and green terraces encouraged. No A/C units or other technical equipment to be visible from access roads and public spaces.



Traditional Pattern in a Mountain Village North-West of Sur

Mid Density Residential – Hajar Mountain Compact Clusters

Intent		
As buildable land in the mountains is scarce and construction expensive, any form of development in the mountain should be compact and efficient. Traditional villages are often tightly clustered and with limited road access. This pattern is intended to protect the mountain and maximise the land for sustenance and agriculture, by keeping the built-up areas to a minimum. Most of these traditional villages are now of heritage value. The purpose of Mid Density Residential – Hajar Mountain Compact Clusters is to build distinctive residential areas appropriate to the context of the mountain, prioritising shared open spaces and viewpoints over the creation of private open spaces. Parcel layouts and buildings should adapt to the topography and land formation, rather than imposing an urban grid over the landscape. To preserve the dominance of the mountain setting, height and car access are restricted. Suitable for Omani as primary residence or for second / holiday homes. Goals • Adoption of compact residential formats that adopt traditional forms suited to the local landscape and topography. • Limitation of land take to optimise the mountain setting. • Distinctive architecture allowed to emerge by unique planning standards.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units in small clusters of 50-60 units	Restricted to small scale functions only: • Local mosque • Local shops • Visitor / tourist accommodation adopting the same formats	All other uses that do not meet the purpose and outcomes of the land use, including: • Any large format buildings • Any buildings over G+2 • Any use requiring large car parking

Low Density Residential – Hajar Mountain Compact Clusters	
Building Typology	Hajar Mountain Compact Clusters are formed of up to 60 single family units attached at the side walls and separated by yards and patios at the back. They are typically formed by narrow plots, served by a single vehicular street / lane and multiple pedestrian passageways laid out to follow the natural ground and topography and, depending on the situation, built on split levels to suit the slope. Gaps and open spaces in between the houses serve as semi-private communal gardens or viewing spaces. They suit both Omani and non-Omani family living.
Typical Building Height	Maximum G+2 Accessible roof terrace only above ground floor level to protect neighbour's privacy.
Typical Floor Height	3m
Typical Plot Size	Ranging from 300m ² to 500m ²
Plot Coverage	Maximum 80%
Setbacks & Entrances	No setbacks from streets and semi-private spaces. No lateral set-back. 2-4m setback from the back. Property walls to be 1.7m maximum.
Resident Parking (on plot)	none
Resident and Visitor Parking (on street)	2 resident car park spaces and 0.5 visitor space within a shared parking area at the edge of each cluster.

Low Density Residential – Hajar Mountain Compact Clusters	
Public Space	Mountain cuts and flattening not permitted. Exposed retaining walls for private plots or roads limited to 2m high terraces and naturalised. Access roads of approx. 10m width without separate sidewalks, creating a low speed and pedestrian-friendly environment. Overall land-take of road infrastructure and parking to be less than 15% of development area. Limited street lighting, mounted on buildings.
Design Requirements	Natural colour finishes and use of traditional materials, forms and details (gates, window screens, etc) only. Tree planting within the property and green terraces encouraged. No A/C units or other technical equipment to be visible from access roads and public spaces.



Cluster Village of Al Hosn, Wadi

Tourism Development

Tourism development in Ash Sharqiyah South will follow the ONSS National Standards and the policies set out in the Regional Spatial Strategy Policy GP1. In addition, the following regional specific guidance will be applied:

- **Business Hotel, Serviced Apartments and relative complexes** will have a height limit of 5 floors and only be allowed within the CBD area of Sur. They will be well integrated in the fabric of the city as part of a local masterplan designed to encourage pedestrian access to all main local destination. Isolated hotel compounds will be discouraged.
- **Tourism Resorts and complexes**, including a wide range from luxury resorts to camping facilities and theme parks, should only be allowed within the designated sites and subject to the approval of a masterplan, business strategy and viability assessment. The design proposals should be clearly adapted to local context and climate:
 - Maximising Green Building methodologies and techniques, maximising recycled water and low energy technology.
 - No prominent clifftop location and no development within the coastal setback zone or in areas designated as Nature Conservation Area.
 - No tourism development requiring extensive access road construction or widenings. All access roads must be in conformity with the standards set out below in Other Road and Access Corridors.
 - Adoption of layouts adapted to the local terrain and situation and inspired from traditional patterns of development.
 - Use of locally inspired materials, colours and finishes.
 - Containment of light pollution and no street / open space lighting in the mountain except for essential safety
- **Shared Transport** - Larger tourism operators, whether mountain resorts, leisure facilities or hotels will be required to provide shared taxi and/or minibus services to and from their location to local public transport nodes to ensure that tourists and visitors to the Governorate and employees who live and work in the Governorate have a sustainable alternative to private vehicles where no coach or local bus routes exist. These services can be provided by the operator or contracted out to shared transport services provider. The following threshold should apply:
 - Any hotel with more than 50 beds
 - Mountain resort/hotel with more than 20 beds
 - Any leisure facility attracting more than 100 visitors per day
 - Any tourism employer with more than 100 employees.

Employment

Employment development in Ash Sharqiyah South will follow the ONSS National Standards and the policies set out in the Regional Spatial Strategy Policy GP1. In addition, the following regional specific guidance will be applied:

- **Shared Transport** - Operators of large commercial, retail and/or industrial premises that have no direct access to local bus services will provide company transport to ensure employees have sustainable alternative to private vehicles. This should apply to government and local government offices. These services can be provided by the operator or contracted out to shared transport services providers, such as taxi and minibus operators. These services can utilize existing transport provision or future demand responsive transport services, using the technologies utilized by smartphone ride hailing applications. The following threshold will apply:
 - Any commercial, industrial or retail with more 100 employees
 - Any government office or agency with more 100 employees.

Parks and Open Space

The purpose of Parks and Open Space is to provide areas which serve the recreational needs of a wide range of residents and visitors. Where required to meet community needs, development may include shelters, amenity facilities, picnic tables, and playgrounds that support safe environment and allow access for essential management and maintenance.

The National Planning Standards identify a range of Parks and Open Spaces suitable to the recreational needs of the local population.

Within Ash Sharqiyah South, in addition, the following regional guidance will be applied:

- **Access to Oasis and Plantation Areas** – customary informal recreational access (walking, picnics and small gatherings) will be retained within the oasis, by allowing pedestrian and cycle public access. No specific provision for visitors will be made: no permanent lighting, benches or waste collection will be located unless requested by the local community. No retail / food vans will be allowed. Where necessary an information panel setting out the behaviours and rules of visitors and recycling bins will be installed at the edges of the entrance route to the oasis.
- **Formation of Regional / District Natural Open Space** – Policy SD12 sets the framework for projects including the formation of large areas of natural open space within the settlement boundaries of the larger settlements. Often these areas correspond to attractive and distinctive local features, such as main wadis, hillocks and rock formations. These areas are to be retained as natural undeveloped spaces in perpetuity, providing natural wildlife corridors and supporting human appreciation of the natural environment. Within these areas:
 - Any planting should be comprised of naturally occurring or locally frequent species adapted to the climate and suitable to support local wildlife habitats.
 - Mangrove in coastal and khawr locations where appropriate.
 - Paths and walks should provide access to no more than 20% of the area and strictly built with natural and permeable surface finishes, without lighting or other formal equipment.
 - Seats and shelters should be natural and informal, such as boulders and groups of trees.
 - Any visitor or commercial use should be limited to small temporary facilities at the interface of the natural and built areas.

Urban Streets

A major change is necessary within Ash Sharqiyah South to transform roads and main highways into urban streets as they enter the urban boundaries of a settlement. This will require the identification of a better balance between road / vehicular functions, pedestrian movement and permeability and provision of attractive public realm with trees and shaded areas. This will be very important in the main commercial areas, where safe pedestrian movement and frequent crossings should be the norm.

National Planning Standards provide a range of appropriate urban street typologies, typically suited to larger urban settlements, where the majority of development will take place. Appropriate National Urban Street Typologies to be applied within the settlement boundaries include:

- Lower Density Urban Boulevard and Avenue layouts – suitable only for the main national roads and Bypass of Sur and Jaalan.
- Streets typologies - appropriate to the main highway corridors and urban distributor roads of all key settlements in Ash Sharqiyah South
- Lanes – appropriate to all mixed use, commercial and residential districts
- Alleyways – appropriate to residential areas and historic districts.

Coastal Scenic Routes

All routes along the coast and with sea views should be improved to accommodate tourism use:

- Provision of welfare and local retail facilities (convenience shops / food outlets / toilets) and access to fuel.
- Provision of viewpoints with parking, picnic facilities, information boards and toilets.
- For all facilities, locally appropriate landscaping with trees and shade should be provided.

Other Road and Access Corridors

In Ash Sharqiyah South, new access is likely to be necessary to enable tourism development or other activities within sensitive environmental areas, including within the boundaries of the Hajar Mountains SPZ (Policy SD11),

UNESCO World Heritage sites (Policy CH2), Heritage Conservation Areas (Policy CH1), Nature Conservation Areas and Geoparks (Policy TE1) and along the coast (Policy CE1). However, the design standards as set out in Oman Highway Design Manual are not suitable in areas of significant ecological, geological, cultural and scenic value. The design guidance is focused on improving the alignment of the road and the increasing the design speed of the new or upgraded routes, without due consideration to the adverse impacts of construction and new alignment on environmentally sensitive areas.

MoTCIT will work with the Planning Authorities to design and deliver rural highway or transport schemes (including parking and other forms of transport such as cable cars) that are appropriate within the context of the designated areas.

Any highway scheme located in a protected/designated area as defined by Policies SD11, TE1, CE1, CH1, CH2, CH3, CH4 and CH5, will be subject to a full feasibility, design, and environmental and social impact (ESIA) assessments, to determine if the scheme is appropriate and that the adverse environmental, cultural, ecological and social impacts of highway scheme can be minimised:

- No construction works will proceed until such assessments have been undertaken by MoHT and approved by the Planning Authority or SPZ authorities. If it is determined that the adverse environmental impacts are significant, the relevant projects, even where committed, should be cancelled.
- Significant impact includes light pollution, need for extensive retaining structures, major alteration of the contours and of the natural mountain slope.

Protection of Turtle Nesting Sites

Temporary and permanent activities will be restricted at turtle nesting locations unless specific surveys and management plans are put in place. Locations include:

- Masirah turtle nesting beaches: north, east and south coasts – nesting season January-October
- Ras al Hadd and turtle nesting protected areas to the south (east coast) – nesting season February to October
- Sur– nesting season February to March

Year-round restrictions include:

- No permanent development or temporary development (such as sunshades, beach huts, pop-up stalls, food trucks, etc.) inside the setback area related to the turtle nesting protected beaches.
- Minimisation of light pollution through a combination of turtle-friendly luminaries (e.g. longer wavelength), shielding at source, light barriers (e.g. landscape features) and design, operational and behavioural interventions to minimise light use including for intermittent sources such as cars.
- No fishing harbours, enhancement of fish landing sites and marine aquaculture installations to be allowed within 10 km of active turtle nesting sites.

Fishing activities that occur in coastal shelf waters of the SPZs shall be subject to mitigation measures and record keeping with respect to turtle bycatch. Gill netting activities will require mitigation measures including being oriented perpendicular to the shore, soak time kept as short as possible, portions of the net to be illuminated and shark silhouettes placed adjacent the net. For all fishing gear types turtle bycatch recording shall take place (and best practice to be followed for release), which shall be reported to the Ministry of Agriculture, Fisheries and Water Resources and appropriate mitigation measures employed.

Seasonal restrictions will apply to breeding sites during the nesting seasons indicates above. This will include prohibition of access by walking, driving and all fishing activities within 10km of the sites. No animal access to the beach will be allowed at this time.

Interim Development Safeguards in the SPZ and Protected Natural Areas

The parameters for development within the Special Planning Zones and in other protected areas (Policy TE1 and CE1) will become clearer once the institutional arrangements will be further developed. It will be important to safeguard these important areas in the interim period through a series of safeguards and restrictions, which can be softened at a later stage by the authority in charge of the SPZ. These include:

- No development above 5ha will be allowed in the interim period. Development below 5ha will be allowed to proceed subject to a masterplan proving how the proposals are adapted to the site, its topography and cultural traditions.
- All development along wadis will need to adhere to a general setback of a minimum of 50 metres. Development along the coast should respect the coastal setback identified in Policy CE1.

- Buildings will be limited to 2 storeys to keep the natural landscape “readable” from a distance with only minor landmarks such as a local mosque. Buildings and structures should avoid ridges and clifftops. Use of natural colours and materials is encouraged.
- No building activities (including visitors community facilities) are allowed in the interim period in designated Nature Conservation Areas.
- No facilities such as restaurants, coffeeshops, food vans and parking are allowed in Nature Conservation Areas, on beaches and in prominent locations on ridges, cliff tops and vista-points.
- Cars access will be restricted to designated roads, with small parking facilities allowed at specifically designed and maintained picnic spots.
- No street and open space permanent or temporary lighting are allowed in Nature Conservation Areas, beaches and in prominent locations.
- The development of large technical infrastructure, including dams and energy plants will be not allowed in the interim period.
- Strict measure and fines should be imposed so that visitors take all their waste with them when leaving the area, pending the setting up and organisation of waste collection systems in the area.



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9.10. Adh Dhahirah Governorate

Introduction (Regional Distinctiveness)

This section outlines the Regional Planning Standards for Adh Dhahirah. It is intended that the regional standards complement the national ones and set out any key regional variations that are applicable instead or over and above the National Standards. This section presents these differences and assumes that all other standards are covered nationally and apply to the region.

The National and Regional Standards, combined, aim to achieve the Vision and Objectives of the National ONSS and Regional Spatial Strategy, which for Adh Dhahirah are outlined in RSS D11 Volume I.

The objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs. The ONSS and RSS 20-year spatial planning frameworks set out a way of delivering local prosperity with a better balance between social, economic and environmental dimensions, either directly or indirectly. Specifically, within the Adh Dhahirah region this might involve the following

- Accelerating the development and expansion of production-based economies, particularly around advanced manufacturing, engineering and logistics industries in Ibri, advanced agriculture and food processing in and around Dank and high value mining and processing at Yanqul, within a framework of organised compact urban development in all major settlements in the region;
- Safeguarding and encouraging development of oil&gas related activities within the main cities and Ibri in particular;
- Enabling progressive restructuring and intensification of the centre of Ibri to form a new mixed use and mixed typology CBD;
- Encourage compact settlements and reverse sprawling trends;
- Protecting and supporting cultural influences and a positive relationship between built areas and natural ones; and
- Introducing a Special Planning Zone for the Hajar Mountain as a way to take into consideration environmental issues in guiding future development in the sensitive areas of the mountain that provide special character to the governorate.

Compliance with the National and Regional Planning Standards will make an essential contribution to a more sustainable future for Oman and to the distinctiveness of Adh Dhahirah

Climatic Response

Climate change in the interior of Oman is likely to manifest itself primarily through more extreme periods of heat and sudden and dangerous flash flooding, with occasional frost and ice in the mountain.

As the majority of the population will live in urban settlements, it will be imperative to:

- Strictly adhere to the development zones, identified by the boundaries of Policy SD2, which take into account the protection of floodplains.
- Address flood risk and prioritise the policy and Priority Flood Management Areas identified in Policy WR4. It will be important to address flood risk issues in all main settlements before progressing development.
- Ensure the survival of oasis and wadi agriculture not only for production and protection of local lifestyles, but also, very importantly as a way to retain a form of climatic control and reduction of urban heat in the settlements and the region.
- Application of the principles of green buildings contained in the National Planning Standards for all new construction (taking account of orientation, sustainable material, water and energy conservation, use of climate adapted and naturally occurring planting, etc).
- Application of street National Planning Standards to encourage active modes of travel and shaded streets, to reduce energy consumption and air pollution and mitigate urban heat.

In addition, a 50m minimum setback should be applied to all development along wadis

Cultural Influences and Traditional Lifestyles

Adh Dhahirah has a long history of urban settlements related to passing trade caravans, agriculture and livestock. The Standards encourage respect for traditional Omani architecture and built form and the restoration and regeneration of communities by promoting an approach to streets and public realm that supports social life and

the formation of more attractive neighbourhood centres. At the regional level, Conservation Areas (Policy CH1) have been established to identify areas where cultural assets that help give the governorate its character and identity should be respected and given special planning consideration in order to help conserve cultural influences in the governorate. Typical assets include:

- The prehistoric tombs, set in spectacular landscape setting;
- The governorates castles and forts, typically located at the centre of the older parts of the settlement;
- Fortifications and observation towers;
- The compact earthen architecture harats at the edge or immersed within the oases;
- The traditional souk and markets;
- The patterns of fields and villages along wadis (such as the attractive Wadi Fida valley and villages) which has sustained life in the region for centuries.

The main settlements of the governorate mainly developed around a traditional nucleus with a fort, harat and market. In some cases, such as Ibri and Dank, the old nucleus is neglected or even at risk of being lost, with immediate consequences in loss of local identity and character. The impact of car use (and parking requirements) and the construction of houses using contemporary standards and setbacks has introduced a new development language that has compromised the appreciation of cultural and historic assets and viability of cultural traditions.

The standards that apply within the identified Conservation areas and within 250m of a key historic asset include:

- Limitation of heights to a level so that the fort and lookout towers retain their dominant profile over the surrounding areas.
- Protection of all view corridors and vistas towards the forts and main mosques from being obscured by new development and retention of lower heights around the forts for that open views over the surrounding areas from the top of the forts are preserved.
- Selection of materials and details that are similar to that of local traditional features: colour, tones, types of material and built form should not detract from historic assets; garish colours, overly decorated features and built forms that are not inspired from local context should not be allowed.
- Identification of appropriate reuse and alterations to the harats through a collective agreement with the local community.
- Adoption of specific standards for new residential and tourism development (see Section below).
- Retention of the narrow lanes and alleyways and streets as informal, slow speed, local access routes used by all (pedestrian, cyclists, cars and small trucks), with limited lighting and minimal engineering, especially outside of Ibri.

Provision of parking in vicinity of visitor attractions, large mosques and markets in a way that does not occupy prominent positions or result in structures or areas that compromise the views and appreciation of the historic area and its functions

Settlement Pattern

The Adh Dhahirah region is characterised by three main spatial areas, each with distinctive character:

- The Hajar Mountain area, characterised by tall mountains with steep slopes and very rugged terrain, traditionally inhabited by small isolated settlements, often nestled within the slopes and reached through long distance steep mountain roads (such as Highway 8 linking Yanqul-Al Wuqbah to Sohar) or foot of the mountain roads such as Highway 21 from the area of Dank towards Al Buraimi. Many of these villages located along wadis or aquifer sources and were sustained by local agriculture and livestock activities. One of the largest of these villages is Al Wuqbah, which enjoys passing trade as well as local agriculture.
- The Urban Triangle at the foot of the Hajar Mountain where the three main settlements of Ibri, Dank and Yanqul are located within a short distance to each other. Of the three, only Ibri has an emerging urban form, although dispersed along several corridors and scattered uses. Its two market areas still attract trade from all surrounding areas. Dank and Yanqul still have the form of overgrown villages and are at risk of faceless sprawl. The Regional Spatial Strategy proposes significant expansion of economic activities within the three cities, supported by expansion of national advanced agriculture south of Dank: it will be important to utilise the impetus of growth to regenerate and restructure the main settlements to form viable cities for the future.
- The Desertic South, an area of sparsely inhabited gravel plains, occupied by oil & gas infrastructure and settlements. The area is mainly controlled by oil operations and pipelines cross the land freely. The main settlement in this area is Fuhud, the largest oil city in the area and potentially the first to evolve into a permanent settlement. Other oil settlements are small and functional, organised around a regular grid

which differentiates permanent managerial level habitation (in apartments or small houses with facilities) and rows of temporary workers cabins served by a minimal commercial core.

Vernacular Architecture

Until the 1970s, settlements in Adh Dhahirah were very small, with local building construction essentially made of earthen agricultural buildings, with small rooms for people and animals within the same courtyards or groups of farms and fields forming the settlement. Ibri experienced a period of growth in the 80s and 90s with urban courtyard townhouses built not far from the main market and souk of the time. Elsewhere growth has been more recent and driven by the construction of new roads and public buildings.

Forts and other ancient artefacts, made of earth and stone structures, display impressive proportions and commanding positions upon the landscape: for example, the fort of Al Sulaif or the Bat Tombs of Al Ayn.

Today the main cities of the Governorate are still expanding with large scale, partly occupied, subdivisions with the largest plot sizes of the interior regions (1500m² or more), leading to expensive sprawl and weak character. Buildings follow standard national construction typologies and fail to create a distinctive vernacular style. Nevertheless, the cities of the Governorate are characterised by a distinctive urban form, even if not linked to building architecture

- A strong relationship with the surrounding landscape and open views towards the mountains from within the urban area, which in future will be preserved through natural open space corridors within the settlements.
- Lively market spaces, which function as trading and meeting points for the wider population of the region.
- The plantation villages, such as those along Wadi Fida or Al Ayn: compact groups of buildings surrounded by lush agricultural vegetation.



The Open Views Towards the Mountains from within Yanqul



The Busy Markets of Ibri (1)



The Busy Markets of Ibri (2)



The Plantation Village of Al Ayn

Variations from the National Standards

Primary Land Uses – Assessment-based Land Release

Sprawling development, land consumption and non-distinctive architecture are one of the main problems of development in Adh Dhahirah, leading to unattractive neighbourhoods, excessive costs of infrastructure and unsustainable patterns of development.

Through the National and Regional Spatial Planning Strategies it will be important to adopt a better organised form of development through the systematic and progressive release of land and planning of employment and community facilities. Where a Local Plan is to be prepared, this should include the identification of progressive directions of growth and more detailed sequencing of assessment.

In the interim, and where a Local Plan is absent, it is imperative to constrain sprawl and strongly encourage densification of already urbanised areas. Therefore, land for development should be identified strictly within the settlement boundaries identified in Policy SD2 and as follows:

- **Residential Land in Main Settlements** – identified and only released for subdivision, distribution and development every 2 years following an assessment of actual need and confirmation of 80% substantial completion of the residential land released in the period before the last one (released 4 years before) for each major settlement: Ibri, Dank and Yanqul. This process will need to be carried out in conjunction with new national guidance for allocating residential land.
- **Residential Land in Rural Villages** – identified and only released for subdivision, distribution and development every 2 years following a Governorate-wide assessment of localised need of the existing communities and confirmation of 80% substantial completion of any residential land previously released. Land release in smaller order settlements (Other Rural Centres – category E3) should not be for more than 30 residential units at the time and allocated to families living or working within a 50km radius from the settlement. Land allocated remaining unbuilt should be returned and reallocated on the basis of actual need. This process will be carried out in conjunction with new national guidance for allocating residential land.
- **Employment Land** – released progressively on the basis of assessment studies undertaken at governorate wide level every 5 years to inform allocation of employment land in local plans/master plans and in local areas where no detailed planning is anticipated to take place. Employment land assessments should consider local employment growth rate including identification of areas for major or inward investment and allocation of employment land to serve the local population (commercial uses, city-serving industrial uses, local crafts etc). This will be very important for the major industrial areas of Ibri and Dank.
- **Community Facilities** – identification of land and delivery of community facilities will be on the basis of an estimate of actual permanent population within main settlements (on the basis of residential completions and land release described above) and assessment of capacity of existing community facilities across the Governorate: for example actual availability of school places or hospital beds. The assessment, to be repeated every 5 years, will establish the requirement for, timing and cost of additional facilities to serve the planned level of growth set out in the RSS.
- **Revision of Settlement Boundaries** – expansion of the settlement boundaries identified in Policy SD2 will only be allowed when 80% of the land within the boundaries is expected to be completed and occupied within the forthcoming 5 years period. Settlement boundary expansion will follow the criteria set out in the ONSS and follow the methodology set out in the Technical Appendix section of the RSS

Residential Typologies

National Planning Standards provide a range of appropriate residential typologies, typically suited to larger urban settlements, where the majority of housing will be built. Appropriate National Residential Typologies include:

- Low density residential – Villas: appropriate to all settlements in Adh Dhahirah, adopting average national plot sizes
- Low density residential – Townhouses: appropriate to all main settlements in Adh Dhahirah
- Medium density residential – Apartments: limited to 4 floors in Dank and Yanqul, 5 floors in Ibri
- Residential Mixed Use: limited to 4 floors in Dank and Yanqul, 5 floors in Ibri
- Labour accommodation to be provided as part of the typologies above.

Within the region, however, there are distinctive urban fabrics driven by local traditions and suited to specific situations, where national planning guidance is not appropriate and should not be applied. In Adh Dhahirah, regionally specific Residential Planning guidance is applicable in:

-
- Any development within the plantation oasis in Residential Palm Garden zones
 - Mid Density Compact Courtyard Townhouses within larger and medium-sized settlements
 - Low and mid density development within the SPZ and the Hajar Mountains, in the form of Mountain Villas and Compact Clusters

Low Density Residential - Residential Palm Gardens

Intent		
The purpose of Low-Density Residential – Residential Palm Gardens is to recognise the value and attractiveness of residential living within the traditional palm plantations of the oasis within some settlements but also avoid over-development and loss of the oasis altogether. This typology is clearly identified in the land use zoning set out in the Regional Spatial Strategy, which should be refined in Local Plans. It does not apply to zones indicated as Agricultural Enhancement or to oasis areas in general. Goals • Ensure the continuation of traditional living within designated oasis where agricultural functions have become secondary to residential. • Promote locally appropriate development formats, which replicate traditional patterns. • Protect the plantations from over-development and support retention of the green cover (with micro-climatic, cultural and biodiversity benefits) even where agricultural outputs are not commercially viable and the plantation becomes ancillary to the house (garden). • Allow co-existence of agricultural and traditional functions alongside residential use.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units (Palm Garden Villa) Mixed purpose Farming and Residential Units.	Restricted to traditional functions only: • Family farming • Local mosque • Small shops	All other uses that do not meet the purpose and outcomes of the land use, including: • Schools (which should be located outside the plantations) • Markets • Hotels/ tourist accommodation • Any use requiring large car parking

Low Density Residential - Residential Palm Gardens	
Building Typology	Residential Palm Gardens identify areas where the agricultural gardens / plantations remain prevailing, while accommodating small-medium dwelling units typically for Omani family living with occasional Expatriate living.
Typical Building Height	Maximum G+2 Parapet cannot exceed 1m beyond maximum height of the building.
Typical Floor Height	3.5m G; 3m above
Typical Plot Size	Minimum 2,000m ²
Plot Coverage	Maximum 25% of plot to be paved or built area up to 750m ² built or paved footprint in total.
Setbacks & Entrances	Front setback – 0m Side setback – 0m, with the built side against a single lateral property boundary only for a maximum length of 22m Rear setback – min. 25m Perimeter property walls to be 2m maximum and limited to dwelling area.
Resident Parking (on plot)	Maximum 2 car parking spaces per unit – enclosed behind gates or within ground floor of the building.

Low Density Residential - Residential Palm Gardens	
Visitor Parking (on street)	Allowed outside the plantation and agricultural area only.
Public Space	Publicly accessible roads following the traditional plantation patterns, maximum 6m wide, with permeable surface and low bounding walls adjacent to the plantations. No street lighting. Seating and resting places to be provided where appropriate.
Design Requirements	Materials limited to traditional-looking finishes and equivalent contemporary alternatives. Use of traditional forms and development patterns encouraged. Use of bright artificial colours forbidden. No A/C units or other technical equipment to be visible from access roads and public spaces. Plantation and agricultural gardens to be retained and enhanced with modern irrigation techniques where possible.



Dank Residential Palm Gardens

Mid Density Residential - Compact Courtyard Townhouses

Intent		
The purpose of a Mid Density Residential – Compact Courtyard Townhouses typology is to take inspiration from older housing developed in the region, which created clusters of compact single family units, built around a central private open space. Gaps in the grid create communal spaces, additional visitor parking areas and focal points for local services. Dwellings within the grid can evolve with time, using traditional methods of expansion. This approach is suitable for medium density areas of all main settlements. Goals • Adoption of traditional construction methods and development patterns promoting locally appropriate development formats. • Affordable construction spread over time. • Medium density with individual family units		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units	Restricted to small scale functions only: • Local mosque • Local shops • Primary schools • Local community facilities • Local recreational open space • Small scale visitor / tourist accommodation	<i>All other uses that do not meet the purpose and outcomes of the land use, including:</i> • Any large format buildings • Any use requiring large car parking

Mid Density Residential – Compact Courtyard Townhouses	
Building Typology	Compact Courtyard Townhouses are single family units arranged a small central opening within a tight regular grid. They suit both Omani and non Omani family living. They are typically clustered in groups of 100-200 units of single buildings served by lanes on all sides.
Typical Building Height	Maximum G+1 Accessible roof terrace only above ground floor level to protect neighbour's privacy.
Typical Floor Height	3.5m G; 3m above
Typical Plot Size	400m ² to 700m ²
Plot Coverage	Maximum 70%
Setbacks & Entrances	All setbacks – 0m, with built mass against the property boundaries up to 60% of its perimeter maximum Perimeter property walls to be 2m maximum.
Resident Parking (on plot)	Minimum 2 car parking spaces per unit – enclosed behind gates or within ground floor of the building.
Visitor Parking (on street)	Within small parking yards in between properties.
Public Space	All properties to be served by at least one access road of 6m width. Public space / widening and garden every cluster of 25 units. Limited street lighting, mounted on buildings. Seating and resting places to be provided where appropriate.

Mid Density Residential – Compact Courtyard Townhouses

Design Requirements

Natural-looking finishes and use of traditional forms and details (gates, window screens, etc) encouraged.

Use of bright artificial colours forbidden.

No A/C units or other technical equipment to be visible from access roads and public spaces.

Courtyard planting.



Ibri Compact Courtyard Townhouses

Low Density Residential – Hajar Mountain Villas

Intent		
As buildable land in the mountains is scarce and construction expensive, any form of development in the mountain should be compact and efficient. Protection of views and appreciation of the mountain scenery should be prioritised, and development remain discreet, respectful and located away from prominent positions. The purpose of Low Density Residential – Hajar Mountain Villas is to build distinctive residential areas appropriate to the context of the mountain, forming a compact group, prioritising shared open spaces and viewpoints over the creation of private open spaces. Parcel layouts should adapt to the topography and land formation, rather than imposing an urban grid over the landscape. To preserve the dominance of the mountain setting, height is restricted, and appropriate greenery is required. Suitable for Omani as primary residence or for second / holiday homes. Goals • Adoption of compact villa formats that respond organically to the local landscape and topography. • Limitation of private gardens or private open space in favour of shared public spaces to optimise the mountain setting. • Distinctive architecture allowed to emerge by unique planning standards.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units in small clusters of 50-60 units	Restricted to small scale functions only: • Local mosque • Local shops • Visitor / tourist accommodation adopting the same formats	<i>All other uses that do not meet the purpose and outcomes of the land use, including:</i> • Any large format buildings • Any buildings over G+2 • Any use requiring large car parking

Low Density Residential – Hajar Mountain Villas	
Building Typology	Hajar Mountain Villas are clusters of up to 60 single family units enclosed by low perimeter walls with no or small private open space. They are typically arranged within a grid of 10m streets laid out to follow the natural ground and topography and, depending on the situation, built on split levels to suit the slope. Gaps and open spaces in between the houses serve as semi-private communal gardens or viewing spaces. They suit both Omani and non Omani family living.
Typical Building Height	Maximum G+2 Accessible roof terrace only above ground floor level to protect neighbour's privacy.
Typical Floor Height	3.5m
Typical Plot Size	Ranging from 400m ² to 600m ²
Plot Coverage	Maximum 65%
Setbacks & Entrances	No setbacks from streets and semi-private spaces. 1.5m setback from other properties. Perimeter property walls to be 1.7m maximum.
Resident Parking (on plot)	Maximum 1 car parking space per unit enclosed behind gates or within ground floor of the building. 1 additional space within a shared parking area at the edge of each cluster.
Visitor Parking (on street)	Within parking yards at the edge of each cluster.
Public Space	Mountain cuts and flattening not permitted. Exposed retaining walls for private plots or roads limited to 2m high terraces and naturalised.

Low Density Residential – Hajar Mountain Villas	
	Access roads of approx. 10m width including sidewalks, creating a low speed and pedestrian-friendly environment. Overall land-take of road infrastructure and parking to be less than 20% of development area. Limited street lighting, mounted on buildings.
Design Requirements	Natural colour finishes and use of traditional materials, forms and details (gates, window screens, etc) only. Tree planting within the property and green terraces encouraged. No A/C units or other technical equipment to be visible from access roads and public spaces.



Traditional Pattern in Maqniyat

Mid Density Residential – Hajar Mountain Compact Clusters

Intent		
As buildable land in the mountains is scarce and construction expensive, any form of development in the mountain should be compact and efficient. Traditional villages are often tightly clustered and with limited road access. This pattern is intended to protect the mountain and maximise the land for sustenance and agriculture, by keeping the built-up areas to a minimum. Most of these traditional villages are now of heritage value. The purpose of Mid Density Residential – Hajar Mountain Compact Clusters is to build distinctive residential areas appropriate to the context of the mountain, prioritising shared open spaces and viewpoints over the creation of private open spaces. Parcel layouts and buildings should adapt to the topography and land formation, rather than imposing an urban grid over the landscape. To preserve the dominance of the mountain setting, height and car access are restricted. Suitable for Omani as primary residence or for second / holiday homes. Goals • Adoption of compact residential formats that adopt traditional forms suited to the local landscape and topography. • Limitation of land take to optimise the mountain setting. • Distinctive architecture allowed to emerge by unique planning standards.		
Permitted Uses		
Primary Uses	Secondary Uses	Not Permitted
Single Family Residential Units in small clusters of 50-60 units	Restricted to small scale functions only: • Local mosque • Local shops • Visitor / tourist accommodation adopting the same formats	<i>All other uses that do not meet the purpose and outcomes of the land use, including:</i> • Any large format buildings • Any buildings over G+2 • Any use requiring large car parking

Mid Density Residential – Hajar Mountain Compact Clusters	
Building Typology	Hajar Mountain Compact Clusters are formed of up to 60 single family units attached at the side walls and separated by yards and patios at the back. They are typically formed by narrow plots, served by a single vehicular street / lane and multiple pedestrian passageways laid out to follow the natural ground and topography and, depending on the situation, built on split levels to suit the slope. Gaps and open spaces in between the houses serve as semi-private communal gardens or viewing spaces. They suit both Omani and non-Omani family living.
Typical Building Height	Maximum G+2 Accessible roof terrace only above ground floor level to protect neighbour's privacy.
Typical Floor Height	3m
Typical Plot Size	Ranging from 300m ² to 500m ²
Plot Coverage	Maximum 80%
Setbacks & Entrances	No setbacks from streets and semi-private spaces. No lateral set-back. 2-4m setback from the back. Property walls to be 1.7m maximum.
Resident Parking (on plot)	none
Resident and Visitor Parking (on street)	2 resident car park spaces and 0.5 visitor space within a shared parking area at the edge of each cluster.

Mid Density Residential – Hajar Mountain Compact Clusters	
Public Space	Mountain cuts and flattening not permitted. Exposed retaining walls for private plots or roads limited to 2m high terraces and naturalised. Access roads of approximately 10m width without separate sidewalks, creating a low speed and pedestrian-friendly environment. Overall land-take of road infrastructure and parking to be less than 15% of development area. Limited street lighting, mounted on buildings.
Design Requirements	Natural colour finishes and use of traditional materials, forms and details (gates, window screens, etc) only. Tree planting within the property and green terraces encouraged. No A/C units or other technical equipment to be visible from access roads and public spaces.



Hajar Village Cluster in Al Wuqbah

Tourism Development

Tourism development in Adh Dhahirah will follow the ONSS National Standards and the policies set out in the Regional Spatial Strategy Policy GP1. In addition, the following regional specific guidance will be applied:

- **Business Hotel, Serviced Apartments and relative complexes** will have a height limit of 5 floors and only be allowed within the CBD area of Ibri or as part of the Technology Cluster around the College of Technology. They will be well integrated in the fabric of the area as part of a local masterplan designed to encourage pedestrian access to all main local destination. Isolated hotel compounds will be discouraged.
- **Tourism Resorts and complexes**, including a wide range from resorts to camping facilities, should only be allowed within the sites identified and designated as part of a tourism development masterplan and subject to the approval of an environmental study, business strategy and viability assessment. The design proposals should be clearly adapted to local context and climate:
 - Maximising Green Building methodologies and techniques, maximising recycled water and low energy technology.
 - Adoption of layouts adapted to the local terrain and situation and inspired from traditional patterns of development.
 - Use of locally inspired materials, colours and finishes.
 - Containment of light pollution and no street / open space lighting in the mountain except for essential safety.
- **Shared Transport** - Larger tourism operators, whether mountain resorts, leisure facilities or hotels will be required to provide shared taxi and/or minibus services to and from their location to local public transport nodes to ensure that tourists and visitors to the Governorate and employees who live and work in the Governorate have a sustainable alternative to private vehicles where no coach or local bus routes exist. These services can be provided by the operator or contracted out to shared transport services provider. The following threshold should apply:
 - Any hotel with more than 50 beds
 - Mountain resort/hotel with more than 20 beds
 - Any leisure facility attracting more than 100 visitors per day
 - Any tourism employer with more than 100 employees

Employment

Employment development in Adh Dhahirah will follow the ONSS National Standards and the policies set out in the Regional Spatial Strategy Policy GP1. In addition, the following regional specific guidance will be applied:

- **Shared Transport** - Operators of large commercial, retail and/or industrial premises that have no direct access to local bus services will provide company transport to ensure employees have sustainable alternative to private vehicles. This should apply to government and local government offices. These services can be provided by the operator or contracted out to shared transport services providers, such as taxi and minibus operators. These services can utilize existing transport provision or future demand responsive transport services, using the technologies utilized by smartphone ride hailing applications. The following threshold will apply:
 - Any commercial, industrial or retail with more 100 employees
 - Any government office or agency with more 100 employees.

Parks and Open Space

The purpose of Parks and Open Space is to provide areas which serve the recreational needs of a wide range of residents and visitors. Where required to meet community needs, development may include shelters, amenity facilities, picnic tables, and playgrounds that support safe environment and allow access for essential management and maintenance.

In Adh Dhahirah it will also be important to retain natural open spaces within the urban areas to preserve the views and relationship of settlements and nature (mountains and geological formations) that is characteristic of the area.

The National Planning Standards identify a range of Parks and Open Spaces suitable to the recreational needs of the local population.

Within Adh Dhahirah, in addition, the following regional guidance will be applied:

- **Access to Wadi Plantation Areas** – customary informal recreational access (walking, picnics and small gatherings) will be retained within the plantations, by allowing pedestrian and cycle public access. No specific provision for visitors will be made: no permanent lighting, benches or waste collection will be located unless requested by the local community. No retail / food vans will be allowed. Where necessary an information panel

setting out the behaviours and rules of visitors and recycling bins will be installed at the edges of the entrance route to the oasis.

- **Formation of Regional / District Natural Open Space** – Policy SD12 sets the framework for projects including the formation of large areas of natural open space within the settlement boundaries of the larger settlements. Often these areas correspond to attractive and distinctive local features, such as main wadis, hillocks and rock formations. These areas are to be retained as natural undeveloped spaces in perpetuity, providing natural wildlife corridors and supporting human appreciation of the natural environment. Within these areas:
 - Any planting should be comprised of naturally occurring or locally frequent species adapted to the climate and suitable to support local wildlife habitats.
 - Paths and walks should provide access to no more than 20% of the area and strictly built with natural and permeable surface finishes, without lighting or other formal equipment.
 - Seats and shelters should be natural and informal, such as boulders and groups of trees.
 - Any visitor or commercial use should be limited to small temporary facilities at the interface of the natural and built areas.

Urban Streets

A major change is necessary within Adh Dhahirah to transform roads and main highways into urban streets as they enter the urban boundaries of a settlement. This will require the identification of a better balance between road / vehicular functions, pedestrian movement and permeability and provision of attractive public realm with trees and shaded areas. This will be very important in the main commercial areas, where safe pedestrian movement and frequent crossings should be the norm.

National Planning Standards provide a range of appropriate urban street typologies, typically suited to larger urban settlements, where the majority of development will take place. Appropriate National Urban Street Typologies to be applied within the settlement boundaries include:

- Lower Density Urban Boulevard and Avenue layouts – suitable only for the main national roads and bypasses of Ibri and Yanqul.
- Streets typologies - appropriate to the main highway corridors and urban distributor roads of all key settlements in Adh Dhahirah
- Lanes – appropriate to all mixed use, commercial and residential districts
- Alleyways – appropriate to residential areas and historic districts.

Other Road and Access Corridors

In Adh Dhahirah , regionally, new access could become necessary to enable tourism development or other activities within sensitive environmental areas, including within the boundaries of the Hajar Mountains SPZ (Policy SD11), UNESCO World Heritage sites (Policy CH2), Heritage Conservation Areas (Policy CH1), Nature Conservation Areas and Geoparks (Policy TE1). However, the design standards as set out in Oman Highway Design Manual are not suitable in areas of significant ecological, geological, cultural and scenic value. The design guidance is focused on improving the alignment of the road and the increasing the design speed of the new or upgraded routes, without due consideration to the adverse impacts of construction and new alignment on environmentally sensitive areas.

Ministry of Transport, Communications and Information Technology will work with the Planning Authorities to design and deliver rural highway or transport schemes (including parking and other forms of transport such as cable cars) that are appropriate within the context of the specially designated areas.

Any highway scheme located in a protected/designated area as defined by Policies SD11, TE1, CH1, CH2, CH3, CH4 and CH5, will be subject to a full feasibility, design, and environmental and social impact (ESIA) assessments, to determine if the scheme is appropriate and that the adverse environmental, cultural, ecological and social impacts of highway scheme can be minimised:

- No construction works will proceed until such assessments have been undertaken by Ministry of Transport, Communications and Information Technology and approved by the Planning Authority. If it is determined that the adverse environmental impacts are significant, the relevant committed projects should be cancelled.
- Significant impact includes light pollution, need for extensive retaining structures, major alteration of the contours and of the natural mountain slope.
- Interim Development Safeguards in the SPZ and Protected Natural Areas
- The parameters for development within the Special Planning Zone and in other protected areas (Policy TE1) will become clearer once the institutional arrangements will be further developed. It will be important to safeguard these important areas in the interim period through a series of safeguards and restrictions, which can be softened at a later stage by the authority in charge of the SPZ. These include:

- No development above 5ha will be allowed in the interim period. Development below 5ha will be allowed to proceed subject to a masterplan proving how the proposals are adapted to the site, its topography and cultural traditions.
- All development along wadis will need to adhere to a general setback of a minimum of 50 metres.
- Buildings will be limited to 2 storeys to keep the natural landscape “readable” from a distance with only minor landmarks such as a local mosque. Buildings and structures should avoid ridges and clifftops. Use of natural colours and materials is encouraged.
- No building, mining or industrial activities (including visitors community facilities) are allowed in the interim period in designated Nature Conservation Areas.
- No facilities such as restaurants, coffeeshops, food vans and parking are allowed in Nature Conservation Areas and in prominent locations on ridges, cliff tops and vista-points.
- Cars access will be restricted to designated roads, with small parking facilities allowed at specifically designed and maintained picnic spots.
- No street and open space lighting are allowed in Nature Conservation Areas and in prominent locations.
- The development of large technical infrastructure, including dams and energy plants will be not allowed in the interim period.

Strict measure and fines should be imposed so that visitors take all their waste with them when leaving the area, pending the setting up and organisation of waste collection systems in the area.

9.11. Al Wusta Governorate

Introduction (Regional Distinctiveness)

This section is to be read in conjunction with the revised Oman National Planning Standards (SCP, 2020) and the Master Plan for Duqm Town (SEZAD, 2019). This section provides background information about Al Wusta's regional distinctiveness that helps to interpret and apply the National Planning Standards and will recommend, where appropriate, specific Regional variations. This section includes the following sub-sections:

- Climatic Response
- Cultural Influences/ Traditional Lifestyles
- Settlement Pattern
- Vernacular Architecture
- Regional variations

Duqm is a special case. The Duqm City Detailed Master Plan includes Urban Planning Standards and Guidelines, Development Control Regulations and planning procedures for obtaining permits. SEZAD is the government authority processing all planning applications as part of its "one-stop-shop" approach in order to speed up the permitting process. The Duqm development is thus explicitly excluded from the regulations discussed here.

Climatic Response

Al Wusta has a typical desert climate with year-round high temperatures and limited precipitation. The highest temperatures are recorded in the inland, while the coastal areas are slightly more moderate. The southern coastal areas receive somewhat more precipitation from occasional fogs setting over the area as a result of cool winds caused by the summer monsoon. This phenomenon also causes temperatures to decline in late summer afternoons.

Human occupation has used several strategies in response to climate challenges, with temporary or permanent migration being one of the most obvious strategies for the Bedouin traditionally living in Al Wusta.

Cultural Influences/ Traditional Lifestyles

Al Wusta has a distinctive Bedouin history. The Harassis tribe have historically lived in the Jiddat al-Harassis; a desert covering most of Al Wusta and named after the tribe. They traditionally engaged in goat and camel breeding. During summer months, a coastwards drift of groups was found to be common to benefit from lower temperatures and to provide their livestock with additional protein-rich food from fish.

Building houses consisted of simple structures produced from natural materials that could be easily transported to other locations if the need arose, for example in search of better grazing. Today, most Bedou have supplemented the traditional culture of keeping livestock with other sources of income and live a more or less sedentary life in concrete structures common in other parts of Oman.

Bedouin fishermen have lived a rather isolated life in the coastal areas that offer rich fishing grounds. Life in these villages was and is about fish, fishing, processing, trading, net repair, boat building etc. Besides a secure base of income, fishing is a way of life.

Settlement Pattern

Settlement patterns in Al Wusta vary between the different type of settlements:

- Larger settlements, such as Hayma and Mahawt, are modern towns, built after 1970, and are built in a car-dominated grid structure near a main road or road crossing with some shops, a petrol station, government offices and some community facilities. Residential buildings consist mostly of modern single-family villas or small 2- or 3-storey apartment blocks. The main mosque is usually a visually dominant feature, other buildings are lower or modest. A general lack of trees or other vegetation causes a somewhat harsh and windswept townscape.
- Smaller settlements have an informal structure, sometimes just a few houses in random locations and are very rural in character, usually surrounded by informal structures of wood, palm leaves and branches or other materials for livestock keeping. In some cases, a small neighbourhood built in an MoH grid pattern has been added, usually as a form of social housing to provide decent shelter for low income families.
- Duqm SEZ is a recently planned area in a functional, modern city structure with distinctive districts and neighbourhoods and integrates landscaped elements in its design such as the natural topography, elevations, wadis, and the coastline. Duqm promises to become a modern city with its own particular character.



A newly constructed building using vernacular elements (Ras Al Hadd)

Vernacular Architecture

As a result of the constant mobility of the Bedouin, housing was traditionally simple as it was constantly being dismantled to be rebuilt in another location. Homes were often tent-like structures made of tree branches and covered by palm fronds and textures made of goat hair. The home was often situated in the shadow of some trees or rocky outcrops.

A vernacular architecture in Al Wusta could be developed based on such elements but would need a thorough translation and interpretation in modern standards (See image above). This could be inspired by its heritage and contribute to the multi faces and characters that are found across Oman. Building could use differences in roof shares (domed, pitched or flat,) elevation colour and material that fits the landscape, expression through decoration based on culture, religion or economy.

Variations from the National Standards

Primary Land Uses

- New development in urban and rural areas should be designed with a vernacular architecture to give the cities and villages their distinct identity and to realise more variety in Oman. This is applicable for residential, commercial and tourism land use and less for industrial.
- To create more variations away from the current MOH typology (based on a 1980's concept) and involve architects for new villas and other structures. Differences across Al Wusta should be accentuated:
 - Hayma as a government city and transport hub in a green "enclaved" setting
 - Towns along the coastline could express the sea, fisheries, and tourism in buildings to create a more attractive atmosphere
 - Duqm's architecture is inspired by the concept of a modern Smart City (Master Plan SEZAD)
- New developments should aim to be more compact and promote mixed-use in order to reduce car dependency
- Add a "rural house" to the housing typology to prevent urban structures (villas, townhouses) to become dominant in rural areas. A planning standard for a rural house should consist of a single storey house with a minor second storey on a plot with less than 20% built-up area.

- Also, create the “farmhouse” as a variation, for farm plots with less than 40% of the plot being built-up area. Buildings should be grouped together to form a harmonic ensemble to enhance the Al Wusta contextual architectural character.
- Integrate high quality contemporary building techniques. To be used to create high energy performance (U value less than 0.25), sustainable building designs with a low carbon footprint. Insulate the buildings and create possibilities for natural ventilation.

Community Facilities

- Create more variation in the look and scale of community facility buildings and purposely design them for the local context, e.g. with greenery providing shade and a liveable entrance area.

Parks and Open Space

- Create a focal point in village or city; close to the mosque or shop and create a lush green space with indigenous trees; this can be sized to fit the scale of the development.
- Given the open landscapes of Al Wusta and the open settlement structures which are interspersed with open spaces, the need for specifically designated parks and open spaces is less pronounced in the villages than in urban areas.
- In the urban areas for instance in Duqm the wadis and parks including the Rock garden provide necessary open spaces in the city and this should be integrated in the green/ open space structure plan for the city.

Urban Streets

- In cities and villages, make maximum use of natural winds for cooling and provide protection from solar irradiation / shadow.
- Create shade everywhere to its maximum as possible; wider streets and avenues should be treelined, narrow streets use buildings to provide shadow.
- The Master plan of Duqm provides opportunity to provide liveable, enjoyable and walkable spaces for pedestrians and cyclists in a predominantly car-orientated urban environment.
- “Greenification” of the urban grid-pattern structures (Greening the grid). Find indigenous planting that can live in salty soil with minimum need for irrigation.
- Create informal “resting points” inside residential, commercial and tourism districts, for instance after every 300 meters, with a small green shadowed area with seating.
- Rediscover and revalue the scarce original mostly organic settlement patterns. Create a new and careful balance in street patterns for each village/hamlet with orthogonal and organic patterns.

Utilities Infrastructure

- Visual and environmental impact of overhead transmission lines and other utilities to be researched before implementation and construction.
- Sewage plants, cement plants, desalination plants, oil and gas installations to be as much as possible visually integrated in the landscape.
- Self-sufficiency is a viable option in several areas of Al Wusta: energy, solar power, water wells, sewage in modern septic tanks, internet connection.
- For reasons of cost-efficiency, the construction of centralised utility systems (water, sewage) to all remote parts of Al Wusta is not advisable.
 - o The main towns of Duqm and Hayma are connected to a centralised drinking water system.
 - o Connecting all individual homes to a central drinking water system is not suggested given the dispersed settlement pattern.
 - o For wastewater, decentralised treatment systems are in place for the larger towns.
 - o Environmentally responsible septic tanks should be used for dispersed housing.
 - o Project for local solar energy production are encouraged, e.g. either through a centralised utility with back-up power and / or rooftop systems for individual buildings.

Al Wusta Wildlife & Huqf SPZ

Introduction

Al Wusta's Wildlife Reserve, together with the Huqf Geopark has been assigned as an SPZ. The area is largely uninhabited and includes the RD protected habitat of the Arabian Oryx. Historically the area was used by several Bedouin groups who intermittently passed through this area and found a livelihood in herding camels and goats. At Jalouni, a more permanent encampment has been established to function as an entrance to the area, with accommodation for rangers and to host the future information centre. This SPZ is further described in more detail under **Policy SD11** and in **Section C6 of the Al Wusta RSS documentation**.

Planning Standards for this SPZ should be understood in the context of the overall strategy and management for Al Wusta's environment, its remote wilderness and its rich biodiversity (**EMS in Chapter 5**).

Planning Standards for this SPZ are to be applied for the purpose of controlling building activities for large scale infrastructure that might cross this area and for future tourism related structures.

Variations from the National Standards

Primary Land Uses

- Due to the vast and open spaces, with long unobstructed views, no high buildings (not more than 1 storey) inside the SPZ are allowed and so to keep the area free from "urban" developments.
- No building on clifftops are allowed.
- The new information centre at Jalouni is able to house one or a few small hotels or refuges for wildlife observers, and should adhere to the following:
 - o Buildings should be modest in size and have a maximum height of one storey. If by exception, there is a necessity for a minor second storey then this must be integrated in the view of the surrounding landscape.
 - o All buildings, common areas, maintenance, and staff facilities as well as any associated structures should be designed as a whole and well-integrated in harmony with the landscape.
 - o Consider the climatic conditions – with large differences between high daytime temperatures and cold nights – in the design of the area and individual buildings. Apply energy saving and green building principles as much as possible.
 - o Camps should use "low lumen" lights in the evenings and there should be no visibility of the use of lights between the darkness of the night approximately 10 pm and 4 am.
 - o Camps should consider avoiding excessive off-road driving inside the sensitive ecosystem.
 - o Camps should not leave any traces (no septic tanks etc) and should use a minimum of light and electricity.

Community Facilities

- Not applicable

Parks and Open Spaces

- Not applicable

Streets

- New tarmac/ roads are not allowed because roads tend to attract urban development and other undesired encroachments.

Utilities and infrastructure

- No wind turbines are allowed inside the SPZ.
- No large-scale solar power plants are allowed inside the SPZ.
- Overhead transmission lines should be avoided, and if unavoidable, they should be well integrated with the surrounding landscape (so no cutting of hilltops).
- Pipelines and other oil & gas related infrastructure should avoid blocking passage of wildlife.

Gulf of Masirah & Barr Al Hikman Coastal SPZ

Introduction

A large part of Al Wusta's northern coastal waters is designated as a Coastal SPZ together with the bird-rich, tidal lands of the Barr al Hikman peninsula and the desert-like rock formation of Masirah Island. This Coastal SPZs is described in more detail in **Volume 1; Policy CE2**.

Planning Standards for this Coastal SPZ should be understood in the context of the overall strategy and management for Al Wusta's environment, its coastal and marine ecosystems and its rich biodiversity (**EMS in Chapter 5**), a Coastal Zone Management Plan (**Policy CE1**) and Marine Spatial Planning (**Policy CE3**) of the **Al Wusta RSS documentation**.

Planning Standards for Coastal SPZs are to be applied for the purpose of controlling building activities in and near ports and for port-related constructions as well as for potential building activities on islands, beaches and coastal areas under the SPZ authority.

Planning Standards for Coastal SPZs also include the ocean-facing parts of coastal villages, near ports and beaches. Planning Standards focus on a better integration of those built environments within its coastal context.

Variations from the National Standards

Primary Land Uses

- Any new development along the coast will need to adhere to the general setback of a minimum of 300 meter. In cases where 300 meter is not feasible, additional measures should not require out-of-scale engineered solutions (such as large break waters, dams and dykes) but rather look at nature-based mitigation
- No high buildings (maximum 2 storeys) on the SPZ coastline are allowed and so to keep the natural coastline "readable" from a distance with only minor landmarks such as lighthouses and mosques. No building on clifftops are allowed.
- No building activities allowed on Mahawt Island than for the purpose of nature conservation and / or defence. Should buildings be required, they are to merge with the natural landscape, are modest in scale and use natural colours and materials.
- Masirah Island is a prime tourist destination in Oman and requires a built environment that complies with a higher international ambiance in terms of architecture and urban design.

Community Facilities

- Not applicable

Parks and Open Spaces

- Keep beaches public as much as possible, and apply litter control with heavy-duty sealed garbage bins that are emptied and maintained regularly
- No facilities such as restaurants, coffeeshops and parking are allowed on beaches and on cliffs. Cars are generally banned from those places but are allowed at specifically designed and maintained picknick spots.

Streets

- Not applicable

Utilities and Infrastructure

- The development of large ports, break waters, port buildings and the development of high capacity roads and cranes is not allowed, since this scale and type of such developments does not match the character of these coastal areas.
- New ports and port related activities and constructions should fit and adapt to the natural coastal landscape and should adhere to strict environmental regulations
- No wind turbines are allowed inside Coastal SPZ
- No largescale aquaculture and related infrastructure is allowed inside the SPZ

Rub'Al Khali Wilderness Area

Introduction

The Rub al Khali is the sand dune desert on Al Wusta's north-western side that stretches over Dhofar and Al Wusta and extends into Saudi Arabia. It is a striking landscape largely untouched by human influences and the presence of very few permanent settlements. Traditionally, the area is used by Bedouin tribes who used to roam freely through the areas that are today in Oman, Saudi Arabia and the UAE.

Planning Standards for the Rub'Al Khali Wilderness Area should be understood in the context of the overall strategy and management for Al Wusta's unique environment, its ecosystems and its rich biodiversity (**EMS in Volume 2, Chapter 5**) and the proposed designation of this area as IUCN category V area (**Volume 1; Policy TE1**) of the **Al Wusta RSS documentation**.

Building activities in Al Wusta's part of the Rub'Al Khali Wilderness Area are mainly oil & gas exploration related being undertaken near the sand desert perimeter.

More developments may be considered in the future, for instance as part of the initiative by the Ministry of Heritage and Tourism to promote tourism activities in the Rub al Khali wilderness cluster. Future (tourism) activities proposed in the area should be regulated through one or more area specific management plans.

Buildings and constructions to support activities related to the military, border patrol and national security are exempted from the Variations as described below.

Variations from the National Standards

Primary Land Uses (tourism related)

- While allowing for enough distance between resorts and tented camps, developments should be concentrated in areas that are well accessible.
- Within those areas, new resorts can be developed and may include temporary as well as permanent structures but have to be sensitive to the natural landscape and use appropriate zoning.
- Buildings should be modest in size and have a maximum height of one storey. If by exception, there is a necessity for a minor second storey then this must be integrated in the view of the surrounding landscape.
- All buildings, common areas, maintenance, and staff facilities as well as any associated structures should be designed as a whole and well-integrated in harmony with the landscape.
- Consider the climatic conditions – with large differences between high daytime temperatures and cold nights – in the design of the area and individual buildings. Apply energy saving and green building principles as much as possible.
- Camps should use “low lumen” lights in the evenings and there should be no visibility of the use of lights between the darkness of the night approximately 10 pm and 4 am.
- Camps should consider avoiding excessive off-road driving inside the sensitive desert ecosystem.
- Camps should not leave any traces (no septic tanks etc) and should use a minimum of light and electricity.

Community Facilities

- Not applicable

Parks and Open Spaces

- Not applicable

Streets

- Not applicable

Utilities and Infrastructure

- No overhead transmission lines
- No wind turbines and solar parks are allowed inside dunes

ANNEX





A1

Associated Ministries and
Authorities for Planning and
Development

A.1. Associated Ministries and Authorities for Planning and Development

Key information regarding relevant Oman Ministries and Authorities who may require engagement during master planning and development review and construction processes is provided below, in order to determine the most up-to-date Standards and Guidelines based on the context of the site and development. Reference is made to relevant Ministries and Authorities throughout this document, where relevant.

Supreme Council for Planning (Formely) *

The Supreme Council for Planning is responsible for formulating national development strategies, policies and mechanisms of implementation and the provision of a national framework for achieving sustainable development across the country (ONSS). It seeks to identify and develop an institutional framework to implement its development responsibilities and looks for active participation of Oman's wider society to support its agenda for national development.

As well as overseeing the preparation of the ONSS and the associated plans and strategies at regional level, (the Regional Spatial Strategies), the Supreme Council for Planning is also currently leading the development of Vision 2040 for the future economic, social and environmental development of Oman and the capabilities, relationships and guiding principles between the public and private sectors necessary to achieve this.

Current available Planning/ Development Standards:

- Physical Planning Standards, March 1991 – SCTP, Physical Planning Standards;
- The Green Book (limited implementation);
- SCP Planning Guidelines, 2014 (limited implementation);
- ONSS Planning Standards and Guidelines (under preparation)

* *Currently the Ministry of Housing and Urban Planning*

Ministry of Housing and Urban Planning

The Ministry of Housing is currently the main competent authority in relation to land issues in Oman. The Ministry of Housing's remit is to seek to provide social and economic stability through implementation of sustainable urban planning procedures for the establishment of integrated modern cities across the country, based on controlled real estate organization. The Ministry of Housing is also responsible for preparing and implementing plans and schemes for social housing, housing related loans and provides residential assistance for lower-income citizens.

The majority of the Ministry of Housing statutory functions relates to land ownership, disposal and registration of real property rights, such as:

- Granting ownership of lands for different uses to citizens pursuant to Oman's Land Entitlement System of Government lands;
- Allocating lands needed by various units of the administrative apparatus of the state, public establishments and authorities and other public officials in connection with the performance of their statutory functions;
- Granting usufruct over lands in accordance with the applicable prescribed regulation;
- Considering applications for ownership of lands which are unregistered in accordance with the Land Law; and
- Registering all dispositions, original and collateral real estate lands on properties, document instruments and legal dispositions pertaining thereto as per the system of Documents Registration and issue ownership deeds.

The Ministry plays a key role in zoning and determining land uses and is an important stakeholder in land planning matters, as well as coordinating various committees at the national and local level. This includes formation and leadership of the Land Affairs Committee and the Integrated Technical Committee, to assist it in carrying out its duties.

Following the abolition of Supreme Committee for Town Planning (SCTP) in 2012, the remit of the Ministry of Housing was expanded to include more powers for direct involvement in urban development across the country. Article 2 of Royal Decree 32/2012, reassigned many of the responsibilities previously held by the SCTP to the Ministry of Housing, including:

- Jurisdiction to propose legislation related to urban planning;
- Developing the controls that regulates and guides urban planning activities throughout the Sultanate and;
- To prepare a manual which includes basic criteria for urban planning and the spatial (or urban) strategy for the Sultanate, as developed by the Supreme Council for Planning.

Current available Planning/ Development Standards:

- Urban Planning Guide (Green Book).

Ministry of Transport, Communications and Information Technology

Ministry of Transport, Communications and Information Technology plays a pivotal and essential role in laying the foundations of the country's infrastructure. The Ministry of Transport's key role relates to the opening, paving, and maintenance of roads, in addition to constructing ports and airports to meet the needs of the Sultanate, according to the plans and strategies that the government adopts. The Ministry of Transport, Communications and Information Technology is responsible for developing and updating the level of services for facilities and sectors which fall under its supervision in order to activate their role in serving the national economy.

The construction, paving and maintenance of roads are the key priorities for the Ministry of Transport, as well the development of land transport sector. Currently, the Ministry of Transport, Communications and Information Technology has no legal framework for planning and development, it is responsible for all land transport and infrastructure with different authorities such as airports under PACA and municipal roads under MRMWR or Muscat/ Sohar/Dhofar Municipalities.

Current available Planning/ Development Standards:

- Highway Design Standards, 2017 (Vol 1 and 2)

Ministry of Heritage and Tourism

Together with other concerned parties and local communities, the Ministry of Heritage and Tourism is responsible for developing the tourism sector, increasing investment and promoting Oman as a tourist destination through orchestrating its comparative and competitive advantages. In addition, the Ministry of Heritage and Tourism enhances the sector's contribution to the GDP within the framework of the policy of diversifying sources of national income and creating jobs while preserving the natural environment and social and cultural rights.

As well as identifying potential tourist sites, the Ministry of Heritage and Tourism is also the statutory regulator of tourism projects and activities in Oman by means of a licensing system. One of the Ministry's main statutory functions is to regulate and oversee the development of Integrated Tourism Complexes (ITCs), which are mixed use commercial, residential and tourism projects.

In terms of planning, the Ministry of Heritage and Tourism allocates land for tourism development, and developers are required to follow the Ministry's procedures to obtain the necessary approvals. The official approvals for tourism development are granted on stages commensurate with the planning phases and government requirements for each phase. The administrative cycle, relevant requirements and their timeframes are broadly as follows:

1. Conceptual Master Plan;
2. Preliminary Master Plan;
3. Final/ Detailed Master Plan;
4. Plans of Development.

All plans submitted to the Ministry of Heritage and Tourism must follow the Planning Guidelines as set out in the Development Control Framework for Tourism Development Projects (2010), relating to setbacks, heights, building design, utilities, roads and streets, landscaping, social and environmental planning aspects, controls for 'Special Areas' (beaches, marinas, waterways, mountains), surface water drainage and flood control.

Current work is updating the standards and guidelines that should be applied to tourism development/ tourism projects. A number of Governorate-wide plans have been or under preparation (including Muscat, Ad Dakhiliyah, Salalah and Musandam) and as part of the final submissions, updated planning guidelines are to be included. Although these Tourism Development Plans have been prepared for individual Governorates, the standards and guidelines identified will assist in forming the basis for new consolidated standards and guidelines.

Current available Planning/ Development Standards:

- Development Control Framework for Tourism Development Projects (2010).
- Regional Tourism Development Plans – Planning Guidelines

Oman Tourism Development Company (Omran)

Working closely with the Ministry of Heritage and Tourism is the Oman Tourism Development Company (Omran), which has been created to drive the investment, growth and development of the rapidly growing tourism sector in Oman. Omran are the master developer of major tourism, heritage and urban developments, delivering some of the nation's most iconic projects, whilst creating new destinations and unique experiences that benefit the social and economic growth of Oman.

Omran was established by Government mandate in 2005 in line with Vision 2020 to strengthen and diversify the economy, and achieve this by growing the capacity, scope and potential of the tourism sector in Oman.

Current available Planning/ Development Standards:

- Design Management Permits;
- Project specific guidelines – Madinat al Irfan Guidelines/ Al Mouj Guidelines.

Governors' Office, Ministry of Interior (Former Ministry of Regional Municipalities and Water Resources)

Governors' Office (Former Ministry of Regional Municipalities and Water Resources) is responsible for ensuring sound and balanced construction, as well as providing infrastructure, services and facilities in different regions and towns across Oman. The ministry is in charge of protecting public health and ensuring environmental sanitation.

In respect of Regional Municipalities, MRMWR has key roles in:

- Protecting public health and ensuring the safety of food and water;
- Combating ground water pollution;
- Keeping up with urban development, ensuring a sound town planning and develop monitoring and inspection mechanisms and; ensuring that there is a balance in providing and distributing infrastructure and other facilities services.

In total, there are 43 Municipalities in Oman which the Ministry is responsible for supervising. Some municipalities – Muscat, Sohar and Salalah for instance (see below for the example of Muscat Municipality) – have their own separate arrangements due to their political significance, with these entities being established under a specific law.

The Ministry also has responsibility for nature reserves and wildlife conservation. The Law on Nature Reserves and Wildlife Conservation, promulgated by Royal Decree 6/2003, establishes the legal framework for the protection and development of natural reserves and wildlife in Oman. According to this law, certain areas may be designated as protected areas by a special governmental committee established by the law for this purpose. This designation, however, is subject to the approval of the Council of Ministers. In these protected areas, all forms of commercial, industrial, or building activities are prohibited without a permit from the ministry. Lands within the protected area may be expropriated in accordance with applicable law.

Current available Planning/ Development Standards:

- Regional Municipalities Development Control Guidelines

Muscat Municipality

Muscat Municipality is a service entity that serves the residents of the Governorate of Muscat in several sectors including health, technical, administration and finance. Muscat Municipality is responsible for:

- Construction of water drainage networks;
- Issuing and renewing the building permits for new buildings, repair or demolition of old buildings and register tenancy agreement;
- Construction of roads, streets, parks and public squares as well as taking care of their maintenance in co-ordination with the concerned authorities;
- Lighting of roads, streets, public squares, public parks and markets;
- Implementing a system of naming roads and numbering buildings;
- Establishing and maintaining markets;
- Organising markets and commercial shops, crafts, simple professions storage of hazardous materials, in co-ordination with the concerned authorities;
- Establishing car parks, bus stops and passenger shelters, and traffic signs in coordination with the concerned authorities;
- Approve all signboards and regulate their installations in the city; and
- Establishing gardens and parks and children playgrounds, public toilets and general landscaping of public areas.

Current available Planning/ Development Standards:

- Building Regulations for Muscat, administered by Muscat Municipal Council.

Environment Authority

The Environment Authority is responsible for formulating plans and programs for the protection of the environment and the conservation of the country's natural resources. This includes combatting pollution, maintaining ecosystems and wildlife and integrating environmental protection within national development plans. The Environment Authority regulates activities that could have an adverse environmental impact including several types of waste management, noise abatement, chemicals use and storage and handling hazardous materials and activities under its functions under Royal Decree 18/08. It issues secondary legislation by Ministerial Decisions regulating these activities that typically instigate a specific licensing regime.

The Environment Authority also seeks to regulate and bring within acceptable limits the potentially adverse environmental impact of development projects in both their construction and operational stages. For this purpose, the Environment Authority operates an environmental permitting system which aims to control the development aspect of a project in terms of its design and construction, as well as to control the project's environmental impact during operation. The project permit is subject to project specific conditions that must be complied with to ensure an acceptable limit to any environmental impact.

The Environment Authority' planning role is two-fold:

- Planning and strategies; and
- Project level input.

By law, all government bodies that have development plans must coordinate with the Environment Authority and the priority should be given to conservation of the environment.

Current available Planning/ Development Standards:

- Currently, the Environment Authority does not have any specific active planning standards or guidelines available. It does occasionally issue Guidance Notes on specific subjects, including recently on Buffer Zones around sensitive land uses and on Coastal Areas.
- 'Guidelines for Obtaining Environmental Permits' published by the previous Ministry of Municipalities and Environment (now MECA), circa 2001, have not been updated and therefore remain the latest guidance for environmental permits.

Ministry of Culture and Heritage (Formerly)

The Ministry of Heritage and Culture (MHC) is the governmental body responsible for promoting and preserving Omani heritage and culture, therefore developing culture and heritage sector for generations to come and reinforcing its enrichment and diversity. The Ministry has defined objectives to preserve the genuine identity of Oman and to protect the correlation of its structure and has supported the importance of Omani identity.

The Ministry of Heritage and Culture's main roles include:

- Discovering and restoring archaeological sites and finds, as well as supervising archaeological expeditions.
- Establishing historic museums that showcase the past of Oman's civilization and its cultural role throughout history.
- Enforcing relevant laws to protect archaeological materials.
- Listing, restoring, preserving and using historical castles, forts and buildings to emphasize their significance in the cultural history of Oman.
- Establishing historic museums that showcase the past of Oman's civilization and its cultural role throughout history.
- Preserving elements of Oman's heritage to protect them from loss or damage since they are considered as a cultural inheritance that can be used to serve the national economy in general and the tourism sector in particular.
- Activating and enhancing the participation of the private sector in maintaining cultural heritage so that it can be utilised in developing the economy of the country without affecting its essence and historical value.

Recently, the Ministry has been charged with the protect and enhancement of the country's various Geoparks.

Current available Planning/ Development Standards:

- Currently, the Ministry of Heritage and Culture does not have any published planning standards or guidelines.

Royal Oman Police

The role of the Royal Oman Police is to maintain law, order and regulation throughout Oman. Article (11) of the Police Law stipulates that the mission of Royal Oman Police is the maintenance of public order and security and monitoring public behaviour together with the protection of lives, possessions, properties and honour. It also assumes any other assignments and responsibilities stipulated by the applicable laws and decrees and all other duties enforced by relevant and applicable law and regulation.

The role of the Royal Oman Police – Traffic Division is to ensure road safety reducing the number and impact of road traffic collisions, ensuring that road users understand their role in making roads safer and working with key partners to identify and implement ways of making roads safer. A major function of the Traffic Division is coordination, planning and logistics of events, as well as construction activities. The Traffic Division contributes input at logistical and pre-planning meetings and monitors roadway obstruction permits and street closures. The Traffic Division is also responsible for the management of school crossings and those part time personnel employed to provide safe passage of students.

Current available Planning/ Development Standards:

- Currently, the Royal Oman Police does not have any specific published planning standards or guidelines other than the Road Safety Manual which seeks to improve road safety across the country

Ministries of Agriculture, Fisheries and Water Resources

Ministries of Agriculture, Fisheries and Water Resources (MoAFWR) is responsible for the development and planning of Oman's agriculture and fisheries sectors. The Ministry was established by Royal Decree 83/2010 with functions including preparing and implementing agriculture and fisheries resources development plans, programs and projects in accordance with the approved policies and coordination with the competent governmental bodies.

Ministries of Agriculture, Fisheries and Water Resources also has an important role in developing agricultural lands to maintain their sustainability and developing investment in the agricultural and fisheries sectors and related services in coordination with the competent governmental bodies.

Current available Planning/ Development Standards:

Currently, Ministries of Agriculture, Fisheries and Water Resources does not have any specific published planning standards or guidelines. Their most recent sector guiding documents are:

- Sustainable Agriculture and Rural Development (SARDS)
- Fisheries Development Strategy (World Bank)

Public Establishment for Industrial Estates

The first industrial estate in the Sultanate of Oman was established at Al Rusayl in the 1983. As new industrial estates were set up, the Public Establishment for Industrial Estates was formed a decade later to give considerable incentive to industrial development in the country.

Since then, the Public Establishment for Industrial Estates has transformed into an organisation with a vision to enhance Oman's position as a leading regional centre of manufacturing, ICT, innovation and entrepreneurship excellence. Its mission is to attract a wide variety of investments, introduce advanced technologies, human resources development, productivity enhancement, develop international trade, and boost exports.

As part of its planning process, the Public Establishment for Industrial Estates assesses the intensity of industrial activities and interest in an area. It then coordinates with the Ministry of Housing on the subject and a joint site visit is conducted. The Ministry of Housing also communicates with several other parties to gauge consensus, if there is no such consensus then PEIE would look to attain the closest area nearby. Once the area is delineated, the request is submitted to the Secretariat General of the Cabinet.

Current available Planning/ Development Standards:

- PEIE Strategy and Implementation Plan; 9th 5-year Plan (2017-2020).

Ministry of Oil and Gas (Formerly)

The Ministry of Oil and Gas (MOG) is statutorily authority charged, pursuant to Royal Decree 2/08, with formulating and executing the plans, policies and studies to ensure the optimum exploration of Oman's oil and gas resources.

The Ministry of Oil and Gas statutory functions include:

- Obtaining surveys and technical studies with respect to oil and gas resources, and carrying out the

necessary economic studies for any projects related to the exploration of these resources, in coordination with the relevant government authorities;

- Supervising all relevant activities related to the exploration and production of oil and gas carried out by concession holders; and
- Executing agreements with specialist companies operating in the field of the oil and gas industry.

To carry out these functions, the Ministry of Oil and Gas is involved in determining and planning land use with respect to oil fields, concession areas, and pipelines, including setbacks and no-build-zones.

Current available Planning/ Development Standards:

- Currently, the Ministry of Oil and Gas does not have any specific active planning standards or guidelines available, although has recently published its Oil and Gas Regulations 2020

Ministry of Defence

The Ministry of Defence (MoD) is the governmental body in the Sultanate of Oman responsible for all matters relating to the defence of the state. The Ministry of Defence carries out the defence policy of the Sultan's Armed Forces and royal directives of His Majesty as well as the Supreme Commander of the Armed Forces. The Ministry deals many agreements to update weapons and equipment, and signs armament deals, according to well-prepared plans and conscious planning that meet the needs of the Sultan's Armed Forces and enables it to perform, its role in the overall development process in the country, and in accordance with the functions of protecting the homeland and its achievements.

The Ministry of Defence regulates and controls all lands, activities and operations relating to state defence operations.

Current available Planning/ Development Standards:

- Currently, the Ministry of Defence does not have any published planning standards or guidelines.

Public Authority for Mining (formerly) *

Public Authority for Mining develops the mining sector to achieve optimal exploitation of mineral resources in a manner that will best serve the development goals in the Sultanate. The Ministry of Commerce and Industry issued Royal Decree 49/2014 which established a Public Authority for Mining in Oman (formerly). The Ministry has several functions, duties and obligations including: preparing strategies and policies of the basic geological structure of the Sultanate; reviewing and drafting laws and regulations with the aim of providing organisational structure that encourages the development of the mining sector; preparing studies and creating research teams to obtain the needed information for the feasibility of projects; as well as studying the prospect for mineral exploitation and supervising and overseeing any activities related to the mining sector with the aim of achieving optimal exploitation of mining resources in the country as well as striving to preserve the geological heritage.

Current available Planning/ Development Standards:

- Public Authority for Mining (formerly) does not have any published planning standards or guidelines, although it has recently published its Mining Strategy (2019), which does provide some guidance on mine buffer zones and the like.

* *Currently the Ministry of Energy and Minerals*

Ministry of Health

The Ministry of Health (MoH) is the Sultanate's main agency responsible for provision, coordination and stewardship of the health sector. The Ministry of Health is required to ensure the overall development of the health sector in relation to key social sectors. In keeping with this role, the Ministry of Health acts as the principal architect of health system design and takes responsibility for ensuring proper coordination. It develops policies and programs for the health sector and implements these in coordination with all other related ministries, health service institutions under the government, as well as in the private sector. The Ministry of Health also advocates to all other public systems to make policies favourable to the health sector, and to refrain from making policies, which may adversely affect the health of the people.

The Ministry of Health runs hospitals and health centres at national, regional, sub-regional and local levels, which are integrated in a referral chain. The curative care services provided in Ministry of Health hospitals is supplemented by other government hospitals/ clinics such as those run by the Sultan Qaboos University, Ministry of Defence, Royal Oman Police and the Petroleum Development Oman. There are also several private hospitals/clinics which play an increasingly important role in providing care. All these establishments are linked with the Ministry of Health system through a referral chain.

Current available Planning/ Development Standards:

- The Oman Health Vision (OHV) 2050.

Ministry of Education

The Ministry of Education (MoE) is the responsible entity that develops and manages education across the Sultanate. The Ministry of Education is responsible for establishing schools throughout the country, providing periodic maintenance and all furniture requirements and other accessories; ensuring high levels of staffing and curriculum; contributing to the Oman digital society.

The Ministry of Education contributes to education planning through the Ministry of Education 2018 Standards, which provides guidance as to how to calculate the number of children estimated in any given settlement based on population catchments and provides standards for school sizes (both number of students (population) and site area).

Current available Planning/ Development Standards:

- Ministry of Education 2018 Standards

Public Authority for Civil Defence and Ambulance

The Public Authority for Civil Defence and Ambulance was established according to Royal Decree No. (3/2013) which stated merging the General Directorate of Civil Defence with Ambulance Division. The Authority is responsible for the following tasks:

- Fire Fighting
- Ambulance Services
- Fire Prevention
- Search and Rescue Operations in Wild and Urban Areas (implemented by the National Team for Search and Rescue)
- Rescue Services (both terrestrial and aquatic).
- Awareness

The Authority's main objective is to reach to all the areas in the Sultanate to provide the emergency services.

Current available Planning/ Development Standards:

- Currently, the Public Authority for Civil Defence and Ambulance does not have any specific published planning standards or guidelines.

Ministry of Endowments and Religious Affairs

The Ministry of Endowments and Religious Affairs is responsible for the spiritual and religious values based on the Islamic law in order to develop citizens on the understanding of believing of Allah and right religion. It also organises all things with regard to the religious matters inside the Sultanate.

The Ministry of Endowments and Religious Affairs specialises identifying land and in constructing mosques, as well as establishing other Mosques inside and outside Oman. In the field of Endowments, General Directorate of Endowments manages the Endowments funds such as providing assistance to imams, muezzins and teachers of holy Qur'an, as well as investing funds.

Current available Planning/ Development Standards:

- The most recent Mosque Planning Standards are included in the Interim Mechanism of Urban Planning Document, developed by the General Secretariat of the Supreme Council for Planning, and approved by the Supreme Council for Planning in 2014.

Be'ah

Oman Environmental Service Holding Company S.A.O.C (Be'ah) was established in 2007 and in 2009, a Royal Decree No. 46/2009 granted Be'ah the mandate and the legal status as the entity responsible for solid waste management in Sultanate of Oman. Be'ah works on moving towards sustainable waste management practices as per international standards by establishing the required infrastructure, restructure the municipal waste collection services, and improve public awareness of waste management. Be'ah works to develop the waste management sector in Oman by providing safe, efficient and the most economically and environmentally sustainable services in innovative ways thereby contributing to the overall economy.

In terms of municipal waste, Be'ah is involved in setting up facilities in all governorates across the country. This includes outsourcing 10 contracts to cover all governorates, establishing over 12 landfills and up to 25 transfer stations. As the transition requires Municipality handovers, Be'ah is committed towards streamlining processes and aims to address rising challenges in a systematic and structured approach.

Be'ah is also involved and responsible for industrial and hazardous waste, including to date, hazardous waste facility in Sohar, as well as planned development for an industrial waste centre in Duqm.

Current available Planning/ Development Standards:

- Currently, Be'ah does not have any specific published planning standards or guidelines, although it has published its Waste Management Strategy.

Diam

Diam, the new name for the former Public Authority for Electricity and Water, is the regulator for the power and water distribution sector in Oman, completing water networks and provide related services, and administration. It regulates and supervises electricity and water for: policy development and establishment, privatization laws, sector development and statistical studies and data. Diam's main objective is to ensure the provision of high quality, sustainable and reliable power and potable water services to the people of Oman (excluding Dhofar Governate).

Planning is done centrally within Diam, who deals with operational issues only. Diam's planning procedures is listed below in the following order:

1. Initiation of project
2. Pre-concept (study)
3. Project (Detail Design)
4. Execute
5. Operations

Current available Planning/ Development Standards:

- Diam Master Plan (2040).
- Diam Business Plans are rolled out every 5-years to align with the government's budget spend.

Nama Water Services

Nama Water Services is responsible for developing, designing, implementing, operating and maintaining the wastewater facilities in Muscat Governorate. Nama Water Services's main objective is planning a modern wastewater system to serve all the Governorate of Oman, excluding Dhofar Governorate and supervising, operating, maintaining and managing of all wastewater components and the network of treated water distribution.

Current available Planning/ Development Standards:

- National Water Sector Master Plan,
- Wastewater Master Plan.

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A2

Abbreviations and Glossary

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A.2. Abbreviations and Glossary

Abbreviations

AAV	:	Autonomous Aerial Vehicles
AER	:	Authority for Electricity Regulation
AI	:	Artificial Intelligence
AMF	:	Arab Monetary Fund
AOS	:	Arabian Oryx Sanctuary
BAME	:	Black, Asian, or Minority Ethnicities
BCR	:	Benefit Cost Ratio
BIT	:	Bilateral Investment Treaty
BRT	:	Bus Rapid Transit
BTMP	:	Long Term Bus Transport Master Plan
CAGR	:	Compounded Annual Growth Rate
CAV	:	Connected and Autonomous Vehicles
CBA	:	Cost Benefit Analysis
CBD	:	Central Business District
CBD	:	Convention on Biological Diversity
CC	:	Climate Change
CCA	:	Cultural Conservation Area
CCEPP	:	Council for the Conservation of the Environment and Prevention
CandD	:	Construction and Demolition
CEA	:	Cost Effectiveness Analysis
CES	:	Coastal Erosion Strategy
CESAR	:	Centre for Environmental Studies and Research
CI	:	Critical Infrastructure
CIS	:	Commonwealth of Independent States
CVI	:	Coastal Vulnerability Index
CZMP	:	Coastal Zone Management Plan
DAR	:	Dar Al Handasah
DC	:	District Cooling
DCPF	:	Development Control Plan Framework (for Tourism Development Projects)
DCR	:	Development Control Regulations
DDI	:	Domestic Direct Investment
DG	:	Directorate General
DRT	:	Demand Responsive Transport

DSM	:	Demand Side Management
EIA	:	Environmental Impact Assessment
EIS	:	Environmental Impact Statement
EMP	:	Emergency Management Plan
EPM	:	Existing Policies Map
EA	:	Environmental Authority
ESO	:	Environmental Society of Oman
EV	:	Electric Vehicle
FAO	:	Food and Agriculture Organisation
FAR	:	Floor Area Ratio
FDI	:	Foreign Direct Investment
FSS	:	Food Self-Sufficiency
FTE	:	Full Time Equivalent
G+x	:	Ground Floor Plus x Floors
GCC	:	Gulf Cooperation Council
GDP	:	Gross Domestic Product
GEF	:	Global Environment Facility
GF	:	Ground Floor
GHG	:	Greenhouse Gases
GIS	:	Geographic Information System
GJT	:	Generalised Journey Time
GMM	:	Global Macroeconomic Model
GSO	:	Geological Society of Oman
GW	:	Ground water
GO	:	Governors' Office
HEI	:	Higher Education Institutes
HI	:	Highway Interventions
HQ	:	Headquarter
HVAC	:	Heating, Ventilation and Air Conditioning
IBA	:	Important Bird and Biodiversity Area Important
IBAO	:	Bird Areas of Oman
ICBD	:	International Convention on Biological Diversity
ICT	:	Information and Communications Technology
ICV	:	In-country Value
ICZM	:	Integrated Coastal Zone Management
IEA	:	International Energy Agency
IMF	:	International Monetary Fund

INDC	:	Intended Nationally Determined Contribution
IoT	:	Internet of Things
IPA	:	Important Plant Areas
IPCC	:	International Panel on Climate Change
IPP	:	Independent Power Producer
IRENA	:	International Renewable Energy Agency
IT	:	Information Technology
ITC	:	Integrated Tourism Complex
ITS	:	Intelligent Transport Systems
IUCN	:	International Union for the Conservation of Nature
IWP	:	Independent Water Plant
JICA	:	Japanese International Cooperation Agency
KandA	:	Khatib and Alami
KBA	:	Key Biodiversity Area
KPI	:	Key Performance Indicators
KSA	:	Kingdom of Saudi Arabia
LASA	:	LEA Associates South Asia
LCU	:	Local Currency Unit
LGV	:	Large Goods Vehicle
LNG	:	Liquified Natural Gas
LOS	:	Level of Service
LPG	:	Liquefied Petroleum Gas
LRT	:	Light Rapid Transit
LUPTK	:	Land Use Planning Toolkit
MaaS	:	Mobility as a Service
MoAFWR	:	Ministry of Agriculture, Fisheries and Water Resources
MATS	:	Muscat Area Transportation Study
MBT	:	Mechanical Biological Treatment
MCA	:	Multi Criteria Assessment
MCAF	:	Multi Criteria Assessment Framework
MCE	:	Main Consulting Engineer
MD	:	Ministerial Decision
MECA	:	Ministry of Environment and Climate Affairs
MENA	:	Middle East and North Africa
MERA	:	Ministry of Endowment and Religious Affairs
MH	:	Ministry of Health

MIA	:	Muscat International Airport
MIS	:	Main Interconnected System
MIT	:	Massachusetts Institute of Technology
MLD	:	Million Litres per Day
MM	:	Muscat Municipality
MoCI	:	Ministry of Commerce and Industry
MoCSY	:	Ministry of Culture, Sports, and Youth
MoD	:	Ministry of Defence
MoE	:	Ministry of Education
MoG	:	Ministry of Oil and Gas
MoH	:	Ministry of Housing
MoHC	:	Ministry of Heritage and Culture
MoHE	:	Ministry of Higher Education
Mol	:	Ministry of Interior
MoSD	:	Ministry of Social Development
MoHT	:	Ministry of Heritage and Tourism
MoTCIT	:	Ministry of Transport, Communications and Information
MoU	:	Technology Memorandum of Understanding
MRF	:	Material Recovery Facility
MRMWR	:	Ministry of Regional Municipalities and Water Resources Municipal
MSW	:	Solid Waste
MoTC	:	Ministry of Technology and Communications
MW	:	Megawatt
NBSAP	:	National Biodiversity Strategy and Action Plan
NCA	:	Nature Conservation Area
NCCD	:	National Centre for Civil Defence
NCS	:	National Conservation Strategy
NCSI	:	National Centre for Statistics and Information
NFC	:	National Ferries Company
NGDB	:	National Geodatabase
NGO	:	Non-Governmental Organisation
NHPL	:	National Heritage Protection Law
NMT	:	Non-motorised Transport
NNR	:	National Nature Reserve
NPV	:	Net Present Value
NRR	:	National Resource Reserve
NSA	:	National Survey Authority

NSD	:	National Spatial Dialogue
NSR	:	National Scenic Reserve
NTDS	:	National Tourism Development Strategy
NTM	:	National Transport Model
NTS	:	National Transport Surveys
NUA	:	New Urban Agenda
NWRMP	:	National Water Resources Master Plan
OACE	:	Office for the Advisor for Conservation of the Environment
OBG	:	Oman Botanical Garden
OCCI	:	Oman Chamber of Commerce and Industry
OCE	:	Office for the Conservation of the Environment
OE	:	Oxford Economics
OECD	:	Organisation for Economic Cooperation and Development
OETC	:	Oman Electricity Transmission Company
OFIC	:	Oman Finance Investment Company
OFIHC	:	Oman Food Investment Holding Company
OFSSMP	:	Oman Food Security Strategy and Master Plan 2010-2020
OGL	:	Oman Global Logistics
OMEM	:	Oman Macro Economic Model
OMR	:	Omani Rial
OMRAN	:	Oman Tourism Development Company
ONSS	:	Oman National Spatial Strategy
ONTM	:	Oman National Transport Model
OPEC	:	Organization of the Petroleum Exporting Countries
OPIS	:	Oman Planning Information System
OPSM	:	Oman Population Study Model
OPWP	:	Oman Power and Water Procurement Company
ORC	:	Oman Research Council
OTC	:	Oman Tower Company
OTF	:	Oman Technology Fund
OWA	:	Oman Women's Association
OWSS	:	Oman Water Salinity Strategy
PA	:	Protected Areas
PACA	:	Public Authority for Civil Aviation
PACDA	:	Public Authority for Civil Defence and Ambulance
PAEW	:	Public Authority for Electricity and Water

PAM	:	Public Authority for Mining
PAPP	:	Public Authority for Privatisation and Partnership
PAW	:	Public Authority for Water
PDO	:	Petroleum Development Oman
PEIE	:	Public Establishment for Industrial Estates
PHC	:	Primary Health Centre
PMT	:	Project Management Team
PPA	:	Power Purchase Agreement
PPP	:	Public Private Partnership
PRS	:	Preferred Regional Strategy
PRT	:	Personal Rapid Transit PSM - Population Study Model
PSQ	:	Port Sultan Qaboos
PT	:	Public Transport
PTA	:	Public Transport Authority
PTI	:	Public Transport Interventions
PV	:	Photovoltaic
PVB	:	Present Value of Benefits
PVC	:	Present Value of Costs
QA/ QC	:	Quality Assurance/ Quality Control
RAECo	:	Rural Areas Electricity Company
RCP	:	Representative Concentration Pathways
RD	:	Royal Decree
RDF	:	Refuse Derived Fuel
RHDHV	:	Royal Haskoning DHV
RO	:	Reverse Osmosis
ROP	:	Royal Oman Police
RoW	:	Right-of-Way
RSD	:	Regional Spatial Dialogues
RSS	:	Regional Spatial Strategy
RTA	:	Regional Trade Agreement
RTI	:	Regional Transport Intervention
SA	:	Sustainability Assessment
SARDS	:	Sustainable Agriculture and Rural Development Strategy
SBIZ	:	Special Botanical Interest Zone
SCP	:	Supreme Council for Planning
SCTP	:	Supreme Committee for Town Planning

SDG	:	Sustainable Development Goal
SDT	:	Self-Driving Transport
SEA	:	Strategic Environmental Assessment
SED	:	Special Economic Designation
SEP	:	Stakeholder Engagement Plan
SEZ	:	Special Economic Zone
SEZAD	:	Special Economic Zone Authority at Al Duqm
SFP	:	Strategic Framework Plan
SGRF	:	State General Reserve Fund
SIA	:	Sustainability Impact Assessment
SME	:	Small and Medium Enterprises
SOLS	:	Sultanate of Oman Logistics Strategy
SPZ	:	Special Planning Zones
SQU	:	Sultan Qaboos University
SSDC	:	Salalah Sanitary Drainage Company
SSSI	:	Sites of Special Scientific Interest
STP	:	Sewage Treatment Plant
TAZ	:	Traffic Analysis Zone
TDM	:	Travel Demand Management
TDP	:	Tourism Development Plan
TI	:	Transport Intervention
TIA	:	Traffic Impact Assessment
TIA	:	Territorial Impact Assessment
TOD	:	Transit Oriented Development
TRA	:	Telecommunications Regulatory Authority
TSE	:	Treated Sewage Effluent
TUBA	:	Transport User Benefits Appraisal
TW	:	Treated Wastewater
UAE	:	United Arab Emirates
UAV	:	Unmanned Aircraft Vehicles
UK	:	United Kingdom
UN	:	United Nations
UNCLOS	:	United Nations Convention on the Law of the Sea
UNDP	:	United Nations Development Programme
UNECE	:	United Nations Economic Commission for Europe
UNESCO	:	United Nations Educational, Scientific and Cultural Organisation

UNESCWA	:	United Nations Economic and Social Commission for Western Asia
UNFCCC	:	United Nations Framework Convention on Climate Change
UNWTO	:	United Nations World Tourism Organisation
USGS	:	United States Geological Survey
VAT	:	Value-added Tax
VDM	:	Variable Demand Model
VMS	:	Variable Messaging Signage
VOC	:	Volume over Capacity
WAA	:	Water Assessment Areas
WAUA	:	Water Assessment Unit Areas
WHS	:	World Heritage Site
WPZ	:	Wellfield Protection Zone
W2W (WtE)	:	Waste to Energy
W2E2W	:	Waste to Energy to Water
WTTC	:	World Travel and Tourism Council

Glossary (by Theme)

Delivering Strategic Spatial Growth

Administrative Hierarchy	The established hierarchy of administrative boundaries based on size in Oman: • Sultanate • Governorate (<i>Muhafadhat</i>) • Wilayat • Hila
Agricultural Settlement	Small rural settlement which is linked to a sizeable area of natural or planted agricultural area.
Bottom-up/ Top-down	Bottom-up – Ideas originating from ordinary people/ non-professionals or lower layers of an organisation that can proactively influence decision-making in an urban context. Top-down – The reverse. Ideas and decisions from high-ranking/ government officials that influence/ impact the lives/ context of ordinary people.
Brownfield Land	Land (or a defined site) that has been previously developed.
Building Code	The term 'building codes' refers to rules/ regulations that set out the standards to which all buildings and other structures must conform so as to obtain planning permission, usually from a local council. The codes cover design, construction, alteration, repair and maintenance and specify the minimum requirements necessary to safeguard the health, safety and welfare of building occupants and the public as well as other impacts on the environment, efficiency, community, etc. In some countries, building codes are referred to as 'building regulations'.
Building Regulations	Building regulations are a set of standards for design and construction that apply to alterations of existing buildings and most new builds. The standards are very in-depth and include consideration of materials and workmanship requirements, structural matters, fire safety, sound insulation, energy conservation, provision of infrastructure and access to and use of buildings.
Capacity Building	Programmes to develop/ improve the capabilities of the personnel working within the country's planning/ development system.
Census 2010	Government survey to identify population figures and population mix within the country. Usually undertaken every 10 years.
Central Business District	The main business or commercial area of a town or city – area of high economic activity.
Committed land (or commitments)	All land which is allocated for development (particularly residential development as part of the Ministry of Housing's subdivision plans).
Conurbation	A conurbation is a region comprising a number of cities, large towns, and other urban areas that, through population growth and physical expansion, have merged to form one continuous urban or industrially developed area. In most cases, a conurbation is a polycentric urbanised area, in which transportation has developed to link areas to create a single urban labour market or travel to work area.
Cottage Industry	A cottage industry is a small-scale, decentralized manufacturing business often operated out of a home rather than a purpose-built facility . Cottage industries are defined by the amount of investment required to start, as well as the number of people employed. Examples of common cottage industry products include candles, handmade body care products including perfumes and honey products , as well as textiles, some wooden furniture items, and items for the tourist sector . A home-based business in textiles is a good example of a cottage industry that can raise or grow its own material, process it and sell it.
Densification	A development strategy used to increase the capacity of an existing urban area to house more people/ dwelling units and the development of support economic and social

	infrastructure. The process improves land utilisation and infrastructure provision, contributes to the achievement of sustainability targets and counters urban sprawl.
Density	In the case of residential development, a measurement of either the number of habitable rooms per hectare, or more commonly, the number of dwellings per hectare.
Development Control	Development control is the process by which planning authorities manage the extent and nature of growth in local areas and the standards/ building codes/ regulations that must be followed in order to construct a building or other structure. Landowners/ developers wishing to develop are typically required to apply to a planning authority for permission to build prior to commencing any development work. Such development control – regulating and managing what is built where, when and how – allows authorities to manage land across a large area. It allows authorities to balance competing needs – such as allocating land for farming, while accommodating the growth of cities and towns – and to protect areas with particular values. The implementation of relevant standards and regulations ensures that all buildings safeguard the intended users of the building or structure.
Development Regulations	Development control regulations are the Policies and Regulations that can regulate and control the standard of development as well as the projected physical growth in an area to ensure that development is sustainable, and that best practice is integrated into the planning of an area to ensure that it is developed as an attractive place to live, work and visit.
District Centre	Usually comprising groups of shops and some services, separate from the town centre, but with more variety than local centres. Can include suburban centres.
Gap Analysis	The difference between ‘what there currently is’ against ‘what there should be’ to implement the planning system
Governorates (<i>Muhafadhat</i>)	Administrative sub-area made up of Wilayats; at roughly the same scale as a region.
Green Belt	Areas of open land surrounding existing built up areas, the purpose of which is to check the unrestricted sprawl of the built-up area to safeguard the surrounding countryside against encroachment. There is a presumption against inappropriate development with the Green Belt.
Greenfield Land	Land (or a defined site) which has not been previously developed.
Hila	Smallest administrative boundary currently in Oman – used by the NCSI when undertaking national census surveys.
Land Use	How land is used by humans for economic, residential, recreational, conservational and governmental purposes. Land use is closely associated with human community development.
Minority Groups and Vulnerable Groups	A minority group refers to a category of people who experience relative disadvantage as compared to members of a dominant social group. Minority group membership is typically based on differences in observable characteristics or practices, such as: ethnicity, race, religion, disability. Vulnerable groups include the elderly and young people with mental health issues and disabilities
Mixed Use	Provision of a mix of complementary uses such as residential, community and leisure land uses, on a given site or within a particular area. Where a building is mixed use, this refers to more than one land use within the building. There is usually a prominent use such as several storeys/ floors of residential development above a smaller number of commercial or retail floors.
Non-agricultural Settlement	Rural settlement with no sizeable area of natural or planted areas associated with it.
Open Space	Open space covers all open space of public value, including not just land, but also inland bodies of water such as rivers, canals, lakes and reservoirs which offer important opportunities for sport and outdoor recreation and can also act as a visual amenity. The following list illustrates the range of open spaces that are of public value:

	• Parks and gardens – including Regional Parks, District Parks, Neighbourhood Parks, Natural Parks, Tourist Parks; • Outdoor sports facilities (with natural or artificial surfaces and either publicly or privately owned) – including tennis courts, sport pitches, golf courses, athletic tracks, school and other institutional playing fields, and other outdoor sports areas; • Amenity green space (most commonly, but not exclusively in housing areas) – including Local Parks with informal recreation spaces, community parks in and around housing; • Provision for children and teenagers – including play areas, kickabout areas, skateboard parks and outdoor basketball hoops; • Green corridors – including wadi channels, alleyways, green/ sand belts, amenity footpaths and cycleways; • Natural and semi-natural urban green spaces – including sand dunes, wadis etc.); • Cemeteries; and • Civic spaces, including civic and market squares and other hard surface areas designed for pedestrians.
Peri-urban	Formerly rural areas, typically on the fringe, which have been urbanised, both in a qualitative and quantitative sense.
Place-making	<i>Placemaking</i> is a multi-faceted approach to the planning, design and management of public spaces. Placemaking capitalises on a local community's assets, inspiration, and potential, with the intention of creating public spaces that promote people's health, happiness, and well-being. <i>Placemaking</i> refers to a collaborative process of shaping the public realm to maximize shared value. More than promoting better urban design, placemaking facilitates use, paying particular attention to the physical, cultural, and social identities that define a place.
Planning Standards	Planning standards are requirements approved by laws to guide physical development in a particular area at a particular time. Planning standards are set to prevent the development of poor-quality urban areas but rather to ensure and maintain a minimum standard as to the quality of new development. These are national planning standards and ensure conformity of planning throughout the country, although recognising that there will be variations to reflect regional distinctiveness.
Protected Landscape/ Seascape	Based on IUCN Protected Area Management Category V. A protected area where the interaction of people and nature over time has produced an area of distinct character with significant, ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values
Public Access	The ability for public or open spaces to be easily accessed by the general public.
Public Space	Public space refers to all places publicly owned or of public use. It is accessible and enjoyable by all for free and without profit motive. This includes streets, open spaces and public facilities. (see also Open Space above).
Regulatory Framework	A regulatory framework is a model people can use for reforming and enacting regulations in an effective and logical way. Policymakers may develop a framework with a specific area of interest, such as improving development in urban areas, or could use an existing model to work on a regulatory project. Many governments rely on such frameworks for handling regulatory matters and developing flexible and useful networks of regulations, laws, and rules. A regulatory framework usually consists of different elements such as: • Regulatory requirements • Codes of practice • Regulatory guidance
Regulatory Instruments	Regulatory Instruments or tools that have been developed as part of a regulatory framework used to achieve policy goals.

Resilience	Measurable ability of any urban system, with its inhabitants, to maintain continuity through all shocks and stresses, while positively adapting and transforming towards sustainability". A resilient city is one that assesses, plans and acts to prepare for and respond to hazards - natural and human-made, sudden and slow-onset, expected and unexpected. Resilient Cities are better positioned to protect and enhance people's lives, secure development gains, foster an investible environment, and drive positive change.
Rural Diversification	The expansion, enlargement or variation of rural businesses to branch out from traditional farming activities.
Rural Settlement	Smaller settlements, ranging from individual, more isolated housing units/ small hamlets, to small villages with a population generally less than 5,000 residents, although in Oman, these can sometimes be larger. Rural settlements/ areas are characterised by their location; usually set within the natural environment (in open countryside/ in mountain locations/ in coastal settings) where there is a dominance of natural vegetation and extensive open unpopulated spaces. Employment in rural areas is dominated by traditional sectors – agriculture/ fisheries; cottage industries and animal husbandry – although new sectors for example tourism and mining are emerging. Residential densities in rural areas will continue to be low; small-scale expansion will be allowed to ensure settlement survival within set boundaries.
Settlements	Places, which are typically previously uninhabited, where people establish a community. Settlements are typically smaller than a town in size and may also constitute a village. They may be urban or rural in nature (see also Rural Settlement and Urban Settlement/ Area).
Settlement Boundary (Urban Boundary)	A 'settlement boundary' is a dividing line, or boundary between areas of built/ urban development (the settlement) and non-urban or rural development. Although a settlement boundary does not necessarily preclude all development beyond the boundary, it does give clarity as to where new development (particularly housing) is likely to be acceptable in planning terms. Inclusion of land within a settlement boundary does not mean that it is automatically suitable for new development, as there may be areas within the settlement boundaries that are not suitable due to other constraints, for example land protected as local green space (wadi channels, etc.); mountainous terrain; areas of special townscape character; Cultural Conservation Areas and the like. The benefits of establishing settlement boundaries are: • Ensure development is directed to more sustainable locations, both in terms of accessibility to and support of existing services and transport, and in terms of landscape. • Protect the special character of the rural or cultural landscapes from encroachment of land uses more characteristic of built up areas. • In conjunction with other policies, to sustain the individual identity of each of the communities and maintain the distinctiveness of each settlement. • Provide greater certainty to communities, landowners and developers over where certain types of development could be acceptable in principle.
Settlement Hierarchy	The system of ordering settlements by character (i.e. inherently urban/ rural) dependent on size, location and spacing. Each level of the hierarchy is characterised by places with a particular set of facilities and services and a similar amount of complexity. Positioning within the hierarchy, therefore, is usually based on a number of different criteria, namely: • Proposed population range; • Defined economic/ administrative function; and • Locational criteria related to a settlement's spatial setting – within the country; within the Governorate; or in relation to settlements in neighbouring Governorates.

	Settlements within the hierarchy can also be defined by the political and/ or economic roles that they may play within a country's spatial development regardless of size or relative location.
Spatial Development	Changes in the distribution of activities in space and the linkages between them in terms of the use and development of land.
Spatial Options	Geographical representation of the potential for change in a given area.
Spatial Planning	Spatial planning goes beyond traditional land use planning to bring together and integrate policies for the development and use of land with other policies and programmes which influence the nature of places and how they function.
Spatial-Economic Strategies	Combination of spatial options and economic development scenarios to form a combined strategy.
Special Planning Zones	A Special Planning Zone (SPZ) is a proposed new planning designation which provides greater protection of areas where the interaction of people and nature over time has produced an area of distinct character with a combination of significant ecological, geological, cultural and scenic values. An SPZ does not prevent development, rather it provides a more stringent framework to guide development to ensure the unique assets contained within its boundaries are well managed – now and for future generations. Under the SPZ system proposed for Oman, areas with rich environmental assets (especially high value landscapes) and which may be sensitive to particular projects, activities or changes in land use, will be designated SPZs.
Sultanate	A state or country governed by a sultan, a king, or a sovereign especially of a Muslim state. In this case, the country of Oman, a strategically located monarchy on the southern and eastern coasts of the Arabian Peninsula, which traditionally has been governed by Sultan Qaboos bin Said al Said who has ruled since 1970.
Sustainable Communities	Places where people want to live and work, now and in the future.
Sustainable Development	Development capable of maintain a balance between short term human need and interests with the preservation of natural resources and ecosystems and the protection of the long-term interests of future generations.
Temporary Settlement	Residential areas/ developments that are only used on a temporary or perhaps seasonal basis – worker camps; nomadic camps; temporary pastoral farming; etc.
Town Extents	Settlement Boundaries linked to the Census.
Transit Oriented Development	Transit-oriented development (TOD) seeks to maximize the amount of residential, business and leisure space that falls within walking distance of public transport hubs/ interchanges. In doing so, TOD aims to increase public transport ridership by reducing the use of private cars and by promoting sustainable urban growth.
Urban Settlement/ Area	Although this does vary between different countries, for the purposes of the ONSS urban areas are considered to be those settlements with a population in excess of 5,000 inhabitants who live in a predominantly 'man-made environment or surroundings. There is no upper limit to the population size of an urban settlement. Residents are usually engaged in trade, commerce and services within the settlement and the level of concentrated development will result in better employment opportunities, easier access to education, health and recreational facilities and usually greater choice in local transportation. As a result of the ONSS, residential densities in urban areas will increase, with there being more people to house on less land available for residential purposes; densities will become medium to high, due to the restrictions placed on land availability within the settlements. Urban areas will be allowed to grow as prescribed by the regional strategies, although growth will only be permitted within urban boundaries that are set by those strategies.
Urbanisation	The process of population movement away from rural areas to urban areas, for residential and employment purposes. The process expands urban land-take and the services needed to serve the increasing population.

Urban Agriculture	Urban agriculture, urban farming, or urban gardening is the practice of cultivating, processing and distributing food in or around urban areas. Urban agriculture can also involve animal husbandry, aquaculture, agroforestry, urban beekeeping, and horticulture. These activities occur in peri-urban areas as well, and peri-urban agriculture may have different characteristics.
Urban Enhancement	'Urban Enhancement' refers to improving the quality of public spaces within urban areas, through various methods such as improving pedestrian connectivity; introducing traffic calming measures in residential neighbourhoods; landscaping, shading and general public beautification and the creation of quality public open spaces; the provision of missing amenities; and upgrading social infrastructure based on local needs. Urban Enhancement relates to improving the overall aesthetics of urban areas, as well as its social functions and support – creating places where people want to live, work and play and take pride in their local areas.
Urban Fringe	The urban-rural fringe, also known as the outskirts, peri-urban or the urban hinterland, can be described as the "landscape interface between town and country", or as the transition zone where urban and rural uses mix and often clash. Alternatively, it can be viewed as a landscape type in its own right, one forged from an interaction of urban and rural land uses.
Urban Heat Island	An urban heat island is an urban/ metropolitan area that is significantly warmer than its surrounding rural areas due to human activities. The temperature difference is usually larger at night than during the day and is most apparent when winds are weak. The main cause of the urban heat island effect is from the modification of land surfaces. Waste heat generated by energy usage is a secondary contributor. As a population centre grows, it tends to expand its area and increase its average temperature.
Urban Redevelopment	'Urban Redevelopment' refers to the demolition, remediation or development of existing developed sites inside a defined urban area that are either unused or under-utilised; beyond its built life-span; includes inappropriate uses based on the needs of the current and future population or its specific locality; or is beyond the potential of regeneration. Urban Redevelopment can be achieved through the full or partial demolition of the existing buildings and based on a site-specific master plan, the complete reconstruction of the area to create a new and more functional neighbourhood for the city. Urban Redevelopment promotes the revitalisation/ redevelopment of brownfield sites.
Urban Regeneration/ Renewal	'Urban Regeneration' refers to the revival of existing urban areas that are currently facing physical, economic or social decline such as population out-migration; closure or reduced viability of businesses; degradation or the physical/ built environment; and the presence of unused or under-utilised sites and plots. The process typically takes on a larger urban area, in which a number of combined strategies and projects can achieve transformation through upgrading old or run-down buildings or complexes; constructing new or updating housing; upgrading community buildings such as sports and community centres; revitalising commercial areas; and improving streetscapes and public spaces.
Urban Resilience	Urban resilience has conventionally been defined as the "measurable ability of any urban system, with its inhabitants, to maintain continuity through all shocks and stresses, while positively adapting and transforming towards sustainability". Additionally, it is the ability to respond, absorb, and adapt to, as well as recover in a disruptive event. A resilient structure/ system/ community is expected to be able to resist an extreme event with minimal damages and functionality disruptions during the event; after the event, it should be able to rapidly recovery its functionality similar to or even better than the pre-event level.
Urban Sprawl	The uncontrolled expansion of urban areas leading to the injudicious use of land and problems with infrastructure provision.
Village	A group of houses and associated buildings, larger than a hamlet and smaller than a town, situated in a rural area.
Wali	The senior official within the administrative district known as a Wilayat. Appointed by the Ministry of the Interior.

Walkability	<i>Walkability</i> measures the extent to which the built environment is friendly to people moving on foot in an area. Factors affecting walkability include but are not limited to: street connectivity; land-use mix; residential density; presence of trees and vegetation; and the frequency and variety of buildings and entrances along street frontages.
Wilayat	Important administrative area within Oman, which deals with local issues. Currently there are 61 Wilayats across Oman. The head of each Wilayat is the Wali.
Windfall Sites	Sites, usually within urban areas, which have not been specifically identified as available for future development in the local planning process. They normally comprise previously developed sites that have unexpectedly become available.
Zoning	Legislative regulations by which a municipal government can control the use and characteristics of buildings and land within its boundaries.
Zoning Guidelines	The Zoning Guidelines provide clear definitions for land use activities within each land use zone, indicating the uses that are permitted and prohibited in each zone. They spell out the considerations that must be taken into account if the land use zone is to be changed, either for an individual plot or parcel of land within a Local Plan or a broad land use zoning classification in the Structure Plan. Zoning guidelines are statutorily enforceable guidelines used in the preparation of spatial plans such as Structure Plans and Local Plans as well as permitting of development.

Delivering Growth and Prosperity

Clusters	Networks of specialised creative, industrial or high-tech businesses concentrated within a particular location or particular area.
Economic Development Scenarios	Change parameters that cover the potential distribution of population and economic activity/ employment.
Fourth Industrial Revolution	The Fourth Industrial Revolution (4IR) is the fourth major industrial era since the first Industrial Revolution of the 18th century. It is characterized by a fusion of technologies that blur the lines between the physical, digital, and biological spheres, collectively referred to as cyber-physical systems. It is marked by emerging technology breakthroughs in several fields, including robotics, artificial intelligence, nanotechnology, quantum computing, biotechnology, the Internet of Things, the Industrial Internet of Things (IIoT), fifth-generation wireless technologies (5G), additive manufacturing/3D printing and fully autonomous vehicles.
Free Zone	Free economic zones (FEZ), free economic territories (FETs) or free zones (FZ) are a class of special economic zone (SEZ) designated by the trade and commerce administrations of various countries. The term is used to designate areas in which companies are taxed very lightly or not at all to encourage economic activity.
Gulf Cooperation Council (GCC)	The Gulf Cooperation Council (GCC) is a political and economic alliance of six countries in the Arabian Peninsula: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates.
Inward Investment	New business investment or expansion of an existing investment into a Region or Country from a source outside of the Region or Country.
Mineral	Rock or other material that has a commercial value when extracted.
Mineral Resources	A potential mineral deposit where the quality and quantity of material present has not been tested.
National Labour Force	The National Labour Force in Oman are the section of the working population in the age group of 16-64 in the economy currently employed or seeking employment. People who are in education, housewives and persons above the age of 64 are not included in the labour force.
Productivity	A measure of the efficiency of a person, machine, factory, system, etc., in converting inputs into useful outputs. Productivity is computed by dividing average output per

	period by the total costs incurred or resources (capital, energy, material, personnel) consumed in that period.
Socio-Economic Growth	The process of social and economic development of a society based on a basket of growth indicators.
Special Economic Designation	A special economic designation is a spatial area which has a set of preferential policy arrangements in place to attract investors. This includes the concept of special economic zones, free zones, bonded warehouses which serve many types of markets and investors to the integrated tourism complexes which specifically target tourist activities or urban regeneration corporations/areas which seek to use preferential policy arrangements to transform previously development land in urban areas.
Special Economic Zones (SEZ)	A special economic zone is an area in a country that is subject to unique economic regulations that differ from other regions of the same country. The SEZ regulations tend to be conducive to <u>foreign direct investment</u> (FDI). Conducting business in an SEZ typically implies that the company will receive tax incentives and the opportunity to pay <u>lower tariffs</u> .
Sustainable Economic Development	Development which promotes a strong, stable and productive economy and aims to bring jobs and prosperity for all, recognising that economic development can also deliver social and environmental benefits.
Vision 2040	Vision 2040, which will replace the existing Vision 2020, is the overarching strategy which aims to guide the Sultanate towards a sustainable and diversified economy. The vision will follow three key pillars: people and society, economy and development, and governance and institutional performance.

Managing the Environment and Responses to Climate Change

Adaptation (Climate Change)	Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (IPCC Definition).
Aquifers	An area of permeable rock or underground geological formation containing or conducting ground water, especially one that supplies the water for wells, springs, etc.
Biodiversity	Biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems (Convention on Biological Diversity 1992)
Buffer Zone	A buffer zone is generally an area that lies between two or more areas (often, but not necessarily, countries). Common types of buffer zones are <u>demilitarized zones</u>, <u>border zones</u> and certain restrictive easement zones and <u>green belts</u>. They can be established to prevent violence, protect the environment, or shield residential and commercial zones from industrial accidents or natural disasters. Buffer zones often result in large uninhabited areas that are themselves noteworthy in many increasingly developed or crowded parts of the world. In nature conservation, a buffer zone is often created to enhance the protection of areas under management for their biodiversity importance. This buffer zone may be situated around the periphery of the region or may be a connecting zone within it, linking two or more protected areas. The term gained prominence in the conservation of natural and cultural heritage through its usage in the establishment of UNESCO's World Heritage Convention, where it is considered as a 'Best Management Practice'. For UNESCO, a buffer zone is intended to avert the effect of negative environmental or human influences, whether or not it embodies great natural or cultural value itself. The importance and function of a buffer zone and the necessary protective measures derived thereof can differ greatly for each site.
Climate Action	Is any activity that helps people cope with a changing climate, or that results in a decline in climate gas emissions. It includes mitigation, adaptation and promoting an

	economic transition to a low carbon society through actions by government, businesses, communities and individuals.
Climate Change	Changes in climatic conditions, largely brought about through the increase in human emissions. Consequences of climate change for Oman could include more extreme weather events, an increase in average temperatures, flooding, sea-level rise and risk of coastal erosion.
Coastal Special Planning Zones (CSPZ)	Areas with rich coastal assets and marine habitats, which may be sensitive to particular projects or activities, may be designated as 'Coastal Special Planning Zones'. These Areas may be under intense development pressure and therefore shall have special institutional arrangements where rigorous and environmentally sensitive planning is a priority in order to protect Oman's most important coastal and marine assets.
Coastal Zone	The coast, also known as the coastline or seashore, is the area where land meets the sea or ocean, or a line that forms the boundary between the land and the sea/ ocean. The coastal zone is considered as the interface area between land and sea; defined as the part of the land affected by its proximity to the sea (influence of marine processes), and the part of the sea affected by its proximity to the land (influence of terrestrial processes).
Coastal Zone Management	Coastal zone management involves managing coastal areas to balance different environmental, economic, human health, and human activities ensuring that coastal communities are equipped to better address continued economic development of the coastal zone while accounting for natural resource management.
Cultural Conservation Area	An area of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance. This could be a place, locality, natural landscape, settlement area, architectural complex, archaeological site, or standing structure that is recognized and often legally protected as a specific place/ area of historical and cultural significance." A Cultural Conservation Area can comprise a significant cultural heritage site or a cluster of sites.
Cultural Heritage	The term cultural heritage encompasses: • <i>Tangible cultural heritage:</i> • Movable cultural heritage (paintings, sculptures, coins, manuscripts) • Immovable cultural heritage (monuments, archaeological sites, and so on) • Underwater cultural heritage (shipwrecks, underwater ruins and cities) • <i>Intangible cultural heritage: oral traditions, performing arts, rituals</i> • <i>Natural heritage:</i> • See definitions for Cultural Landscapes and Natural Heritage • <i>Heritage in the event of armed conflict</i> • Sites which are defined by previous conflicts and now are considered of important historical and cultural importance, both locally and nationally.
Cultural Landscape	A cultural landscape, as defined by the World Heritage Committee, is the "cultural properties [that] represent the combined works of nature and of man". A cultural landscape is a significant area in terms of scale, composed of a number of cultural and natural heritage assets – both tangible and intangible. It may comprise several cultural conservation areas along with other elements, such as settlements and infrastructure and is reflective of man's interaction with its natural setting. Cultural landscapes in Oman should, where possible, be incorporated within an SPZ.
Ecosystem	A habitat or a group of related habitats can be considered an ecosystem. Ecosystems are dynamic complexes of plant, animal and micro-organism communities and their non-living environment, which interact to form functional units.
Environmental Management	Environmental Management can be understood as those administrative functions that are associated with development, implementation, and monitoring of the environmental policy of an organization/ country. It is a systematic approach to minimize the ill-effects of different actions on the environment. Environmental Monitoring (at the national and project level) and Environmental Impact Assessment

and Construction and Operational Environmental Management Plans (at the project level) are amongst the tools that have been developed to understand the state of the environment and to influence development actions and thus help to improve Environmental Management. The establishment of conservation areas and of conservation area networks can be regarded as another tool for improving environmental management.

Exclusive Economic Zone	An exclusive economic zone (EEZ) is a sea zone prescribed by the 1982 United Nations Convention on the Law of the Sea (UNCLOS) over which a sovereign state has special rights regarding the exploration and use of marine resources, including energy production from water and wind. It stretches from the baseline out to 200 nautical miles (nmi) from its coast. In colloquial usage, the term may include the continental shelf. The term does not include either the territorial sea or the continental shelf beyond the 200 nmi limit. The difference between the territorial sea and the exclusive economic zone is that the first confers full sovereignty over the waters, whereas the second is merely a "sovereign right" which refers to the coastal state's rights below the surface of the sea.
Falaj	The falaj is an original Omani irrigation system, deep-rooted in the country's land and history. The Falaj Irrigation System relies on water stored underground. It is extracted in a simple manner without the use of machines, flows through a variety of underground and aboveground channels, before being used in agriculture and all other essential uses.
Food Security	The condition in which all people, at all times, have physical, social and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.
Food Self-Sufficiency	The ability of a country to be able to provide through its own resources and without external assistance, an adequate food supply for its residents.
Greenhouse Gases	Gases which when emitted to the atmosphere can increase the likelihood of global warming. Naturally occurring examples include water vapour, carbon dioxide, methane, nitrous oxide and ozone. Some human activities increase these gases, including fossil fuel combustion within motor vehicles and some power stations.
Groundwater	An important part of the natural water cycle present underground, with strata known as aquifers.
Habitat	The term "habitat" has several meanings. In ecology it means either (i) the area and resources used by a particular species (<u>the habitat of a species</u>) or (ii) an assemblage of animals and plants together with their abiotic environment. In the ONSS and RSS project it is the latter definition which is most often applicable and can be expanded as follows: "a place where plants or animals normally live, characterized primarily by its physical features (topography, plant or animal physiognomy, soil characteristics, climate, water quality etc.) and secondarily by the species of plants and animals that live there". This definition is from EUNIS (the European Nature Information System) which is the most comprehensive hierarchical approach for describing and classifying habitats in European ecosystems. https://www.eea.europa.eu/themes/biodiversity/an-introduction-to-habitats/an-introduction-to-habitats As well as "natural" habitats, man-made habitats can be recognised. These refer to an environment designed and created by human beings, which contains the elements, sometimes synthetic, which would otherwise be found in a natural habitat, and are necessary to support a species. Agricultural areas can be described as man-made habitats.
Hazard	A physical situation with a potential for human injury, damage to property, damage to the environment or some combination of these.
Important Bird Areas of Oman (IBAO)	A compilation of the most important areas in the Sultanate of Oman for breeding birds, resident as well as migratory, and for birds that visit the country on passage or in winter. The compilation is made in a report Prepared by Dr Jens Eriksen for the Supreme Council for Planning (February 2019), based on more than three decades of studies throughout Oman by Jens Eriksen and studies by thousands of other

	observers. BirdLife has defined a number of categories for selecting a site as an IBA (BirdLife 2019) and the relevant categories have been used in this report http://datazone.birdlife.org/site/ibacriteria. The report has not been reviewed and verified by Birdlife International and hence the term Important Bird Areas of Oman has been used to distinguish this list from lists of sites which have been agreed by BirdLife International and can be found on their website – and noting that the information on Oman areas, as currently posted on the Birdlife International website, is 25 years out of date, going back to Evans, M. I. (ed) (1994) Important Bird Areas in the Middle East. Cambridge, UK: BirdLife International.
Important Bird and Biodiversity Areas (IBAs)	Important Bird and Biodiversity Areas are key sites for the conservation of bird species, identified through the BirdLife International IBA programme. (https://www.birdlife.org/worldwide/programme-additional-info/important-bird-and-biodiversity-areas-ibas) In 2013 IBAs were renamed from "Important Bird Areas" to "Important Bird and Biodiversity Areas", to reflect their importance for other species.
Important Mammal Area	In the context of the ONSS/RSS project refers to key areas used by or determined to be suitable for four flagship species of large mammal in Oman: the Arabian Tahr (endangered), the Arabian Gazelle (vulnerable), the Nubian Ibex (vulnerable) and the Arabian leopard (critically endangered) – making reference to the global conservation status of these mammals, according to the IUCN Red List of Threatened Species.
Important Plant Area	A natural or semi-natural site exhibiting exceptional botanical richness and/or supporting an outstanding assemblage of rare, threatened and/or endemic plant species and/or vegetation of high botanic value.
Integrated Coastal Zone Management	Integrated Coastal Zone Management is a strategy for an integrated approach to the planning and management of coastal areas, in which all policies, sectors and, to the highest possible extent, individual interests are properly taken into account, with the proper consideration given to the full range of temporal and spatial scales and involving stakeholders in a participative way. It demands good communication among governing authorities (local, regional and national), and promises to address all three dimensions of sustainability: socio/ cultural, economic and environmental. It thus provides management instruments that are not per se included or foreseen in the different policies and directives in such comprehensiveness."
Key Biodiversity Area (KBA)	Whilst widely recognised (including by the International Finance Corporation), KBAs and their subsets (IBAs and IPAs) are a non-statutory designation. There is no government requirement to identify KBAs and they are not necessarily recognised by local or national authorities. They are however the most high-profile designation for areas of importance for biodiversity and can be used by governments to support protected area designations. Fletcher, R., Tolley, M., Jones, M., Brauner, K. (2014) Protected Areas in IFC Performance Standard 6, UNEP-WCMC, Cambridge, UK.
Land Cover	Physical surface of the earth. Includes various combinations of natural land categories such as vegetation types, soils, exposed rocks and water bodies. Can also include man-made uses such as agriculture and built environment.
Mitigation (Climate Change)	An anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases (IPCC Definition).
Nature Conservation Area	A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values. (Same as PA).
Natural Heritage	Natural features, geological and physiographical formations, biodiversity (flora and fauna), ecosystems (including delineated areas that constitute the habitat of threatened species of animals and plants) and natural sites of value from the point of view of science, conservation or natural beauty.
Nature Reserve	A protected area of importance for wildlife, flora, fauna or features of geological or other special interest.
Protected Area	A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with

associated ecosystem services and cultural values. (IUCN Definition 2008). Protected areas – national parks, wilderness areas, community conserved areas, nature reserves and so on – are a mainstay of biodiversity conservation, while also contributing to people's livelihoods, particularly at the local level.

Risk	The likelihood of a specified undesired event occurring within a specified period or in specified circumstances. It may be either a <i>frequency</i> (the number of specified events occurring in unit time) or a <i>probability</i> (the probability of a specified event following a prior event), depending on the circumstances.
Valorisation	Valorisation refers to the productive use of a resource, and more specifically the use or application of that resource so that it makes money or generates value. 'Heritage valorisation' is, therefore, seen as 'the value-generating revival of heritage assets, such as Oman's harats, that have the potential to provide financial/ commercial benefit for the host community.'
Wadi	A valley, ravine, or channel that is dry except in the rainy season, common in desert areas such as in Oman.

An Efficient Transport System

Accessibility	The ability to conveniently reach key services at reasonable cost, in reasonable time and with reasonable ease.
Bus Rapid Transit	Bus rapid transit (BRT) is a bus-based public transport system designed to improve capacity and reliability relative to a conventional bus system. Typically, a BRT system includes roadways that are dedicated to buses and gives priority to buses at intersections where buses may interact with other traffic; alongside design features to reduce delays caused by passengers boarding or leaving buses or purchasing fares. BRT aims to combine the capacity and speed of a metro with the flexibility, lower cost and simplicity of a bus system.
Intelligent Transport Systems	An intelligent transportation system (ITS) is an advanced application which aims to provide innovative services relating to different modes of transport and traffic management and enable users to be better informed and make safer, more coordinated, and 'smarter' use of transport networks.
Light Rail Transit	Light rail transit (LRT) is a form of passenger urban rail transit characterized by a combination of tram and metro features. While its rolling stock is more similar to a traditional tram, it operates at a higher capacity and speed, and often on an exclusive right-of-way. A local railway or tram system designated direct, accessible and sometimes capable of sharing roads with traffic and heavy railways.
Means of Transport	The means of transport refers to the (motorized) vehicles necessary for transport according to the chosen mode (bicycle, car, airplane, ship, truck and rail). Each mode of transport (see below) has a fundamentally different technological solution, and some require a separate environment. Each mode has its own infrastructure , vehicles, and operations .
Mode of Transport	Mode of transport is a term used to distinguish between different ways of transportation or transporting people or goods. The different modes of transport are air , water , and land transport , which includes rail/ railway , road and off-road transport , although other modes also exist. Human-powered transport and animal-powered transport are sometimes regarded as their own mode.
Public Transport	Transport services provided for the public on a regular basis by vehicles such as bus, trams or rail that use specific routes and schedules and usually on a fare paying basis.
Sustainable Transport	Walking, cycling and public transport; modes which are less damaging to the environment and which contributes less to traffic congestion than other modes such as the car.
Transport Infrastructure	The physical features (for example highways, fixed rail, cycle routes, stations, interchanges and bus stops) that facilitate the overall transport network.

Transport Interventions	Range of transport-related activities including for example demand management, public transport, highway development to enable improved transport systems planning.
Travel Demand Management	A package of measures which reduce the demand to travel by private vehicles.
Visitor Accessibility	Ensuring that venues open for public exhibition are accessible by different means of transport and that the accessibility needs of disadvantaged groups – the disabled and those with limited mobility, wheelchair users, guide dog owners and those who are visually impaired, young children in prams, those who are hearing impaired – are taken into account when developing visitor attractions.
Visum	Modelling software providing traffic analyses, forecasts and GIS-based data management, utilised for developing the Oman National Transport Model.

An Efficient Infrastructure System

Critical (National) Infrastructure	Critical infrastructure (or critical national infrastructure) is a term used by Governments to describe <u>assets</u> that are essential for the functioning of a society and economy in terms of physical <u>infrastructure</u>. In its broadest sense, the term is most commonly associated with facilities for: • Shelter – heating (e.g. natural gas, fuel oil, district heating); • Agriculture – food production and distribution; • Water supply – drinking water, wastewater/ sewage, stemming of surface water (e.g. dikes and sluices); • Public health – hospitals, ambulances; • Transportation systems – fuel supply, railway network, airports, harbours, inland shipping; • Security services – police, military. • Electricity generation, transmission and distribution – natural gas, fuel oil, coal, nuclear power; • Renewable energy sites – solar, wind, rain, tides, waves, and geothermal heat. • Telecommunication – coordination for successful operations • Economic sector – goods and services and financial services (banking, clearing).
Desalination	Desalination is a process that takes away mineral components from saline water, commonly used to remove salt from seawater.
Incineration	The controlled burning of waste. Energy may also be recovered in the form of heat (see Energy from Waste).
Landfill	The permanent disposal of waste into the ground, by the filling of man-made voids or similar features, or the construction of landforms above ground level (land-raising).
Material Recovery Facilities	A materials recovery facility, materials reclamation facility, materials recycling facility or Multi re-use facility (MRF) is a specialized plant that receives, separates and prepares recyclable materials for marketing to end-user manufacturers. Generally, there are two different types: clean and dirty materials recovery facilities.
Mechanical Biological Treatment	A mechanical biological treatment (MBT) system is a type of waste processing facility that combines a sorting facility with a form of biological treatment such as composting or anaerobic digestion. MBT plants are designed to process mixed household waste as well as commercial and industrial wastes.
Municipal Solid Waste	Household waste and any other waste collected by a Waste Collection Authority such as municipal parks and gardens waste, beach cleansing waste and waste resulting from the clearance of fly-tipped materials.
Renewable Energy	Energy from a source that is not depleted when used, such as wind or solar power.
Residual Waste	Waste remaining after materials for re-use, recycling and composting have been removed.

Treated Sewerage Effluent	Sewage treatment is the process of removing contaminants from municipal wastewater, containing mainly household sewage plus some industrial wastewater. Physical, chemical, and biological processes are used to remove contaminants and produce treated wastewater (or treated effluent) that is safe enough for release into the environment. A by-product of sewage treatment is a semi-solid waste or slurry, called sewage sludge. The sludge has to undergo further treatment before being suitable for disposal or application to land.
Waste	Waste is any material or object that is no longer wanted, and which requires disposal. If a material or object is re-usable, it is still classed as waste if it has first been discarded.
Waste Hierarchy	A framework for securing a sustainable approach to waste management. Wherever possible, waste should be minimised. If waste cannot be avoided, then it should be re-used; after this value recovered by recycling or composting; or waste to energy; and finally landfill disposal.
Waste-to-Energy (Energy-from-Waste)	Waste-to-energy (WtE) or energy-from-waste (EfW) is the process of generating energy in the form of electricity and/or heat from the primary treatment of waste, or the processing of waste into a fuel source. WtE is a form of energy recovery. Most WtE processes generate electricity and/or heat directly through combustion, or produce a combustible fuel commodity, such as methane, methanol, ethanol or synthetic fuels.

Other

Components	Common elements of each alternative scenario, including: land use, environment, agriculture & water, economy, population, transport and infrastructure, allowing a comparison of each alternative scenario to be made.
Data Capture	Scale at which data should be captured during area surveys.
Data Viewing	Scale at which surveyed material should be shown.
Key Drivers	The most important catalysts for growth and/or change in Oman. Clustered together for the purposes of ONSS as socio-economic dynamic drivers and Urbanisation drivers. These clusters of key drivers form the basis of the two-axis model.
Institutional Assessment	A detailed assessment of the government's structures/ machinery responsible for planning and development in Oman.
Stakeholders	Individuals, groups of individuals or organisations who have an interest in/ can influence the work being undertaken.
Stakeholder Engagement	Process of involving key stakeholders in the planning and decision-making process
Strategic Goals	The agreed objectives or desired outcomes of the ONSS project, which have been agreed by MCE, PMT and RSS consultants. The strategic goals are: • adaptation to climate change; • liveable communities and preservation of Omani cultural identity; • economic diversification; • protection/ enhancement of Oman's natural and cultural heritage • responsible use of water resources and the optimum level of food self-sufficiency; • sustainable transport including a range of mobility options • sustainable use of resources – energy transition and green and resilient infrastructure.
Thematic Areas	Layers or themes, developed through consultation with stakeholders, which guide the review and form a structure under which assessments can be made.
Two-axis Model	A tool used to characterise outcomes on two dimensions – taking the form a horizontal and vertical axis – providing four quadrants or four alternatives outcomes.
Windshield Survey	A technique used when undertaking land use surveys. Areas viewed through driving through areas rather than more detailed on-site surveys. Often used for verification of desk surveys.



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