



REPUBLIC OF THE MARSHALL ISLANDS
URBAN RESILIENCE PROJECT

# MAJURO MASTER PLAN (STAGE 1) - RESILIENT VILLAGE PLANS

Revision: 2026 Edition



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Cover Photo: Aerial view looking over Djarrit/Rita towards Uliga

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- Attorney General
- National Disaster Management Office
- Economic Policy, Planning and Statistics Office
- RMI Ports Authority Office
- National Energy Office
- Majuro Water and Sewer Company
- Women United Together Marshall Islands
- Republic of Marshall Islands Public School System
- Office of Commerce, Investment & Tourism

# DEFINITION OF TERMS AND ABBREVIATIONS

## Terms

| | |
|---|---|
| Senior land interest holders (referenced as landowners in the Master Plan) | Senior land interest holders means the individuals currently holding the traditional title and interest of Iroijlaplap, Iroijerik where necessary, Alab, and Senior Dri Jerbal, respectively, whose approval is necessary to create a valid conveyance of land interests pursuant to Article X, Section 1(2) of the Constitution. Reference to Iroijlaplap includes Leroij where applicable. In cases where no Iroij interests exist, those rights are deemed to be exercised by the Alab and the Senior Dri Jerbal acting together (Land Recording and Registration Act 2003). |
| Weto | Weto means a parcel of land in accordance with Marshallese custom and tradition (Land Recording and Registration Act 2003). |
| Land use | A description of the typical use of land across an area. |
| Zone | An area of land with rules or characteristics under a planning or zoning framework. |
| Village | For the purpose of the Master Plan each village area is aligned with the GoRMI electoral wards. |

## Abbreviation Definition

| Abbreviation | Definition |
|---|---|
| ADB | Asian Development Bank |
| BICL | Beca International Consultants Limited (Beca) |
| CHPO | Cultural and Historic Preservation Office |
| CIU | Centralized Implementation Unit |
| DIDA | The Division of International Development Assistance |
| DUD | Delap-Uliga-Djarrit |
| ECC | Educational Cultural Center |
| ENSO | El Nino Southern Oscillation |
| EPA | Environmental Protection Agency |
| EPPSO | Economic Policy, Planning & Statistics Office |
| ERO | Energy Resource Office |
| FAA | Federal Aviation Administration |
| GoRMI | Government of the Republic of Marshall Islands |
| GIS | Geographical Information System |
| ICDF | International Cooperation and Development Fund |
| KBEGov | Kili-Bikini-Ejit Local Government |
| MALGov | Majuro Atoll Local Government |
| MEC | Marshalls Energy Company |
| MICS | Marshall Islands Conservation Society |
| MIHS | Marshall Islands High School |
| MNRC | Ministry of Natural Resources and Commerce |
| MoCIA | Ministry of Culture and Internal Affairs |
| MPWIU | Ministry of Public Works, Infrastructure & Utilities |
| MWSC | Majuro Water & Sewer Company |
| NAP | National Adaptation Plan |
| NBS | Nature Based Solutions |
| NDMO | National Disaster Management Office |
| NEO | National Energy Office |
| NIIP | National Infrastructure Investment Plan |
| NOAA | National Oceanic Atmospheric Administration |
| NSP | National Strategic Plan |
| OCIT | Office of Commerce, Investment and Tourism |
| PIU | Project Implementation Unit |
| PMU | Project Management Unit |
| PSS | Public School System |
| REGAIN | Renewable Energy Generation and Assess INcrease Project |
| RMI | Republic of Marshall Islands |
| RMIPA | Republic of the Marshall Islands Ports Authority |
| SLR | Sea-Level Rise |
| SSP | Shared Socio-economic Pathway |
| SWOT | Strengths, Weaknesses, Opportunities and Threats |
| URP | Urban Resilience Project |
| WAM | Waan Aelõñ in Majel |
| WB | World Bank |
| WUTMI | Women United Together Marshall Islands |

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Appendix G - Village Hazard Maps - SLR, rainfall-based flooding, typhoon flooding

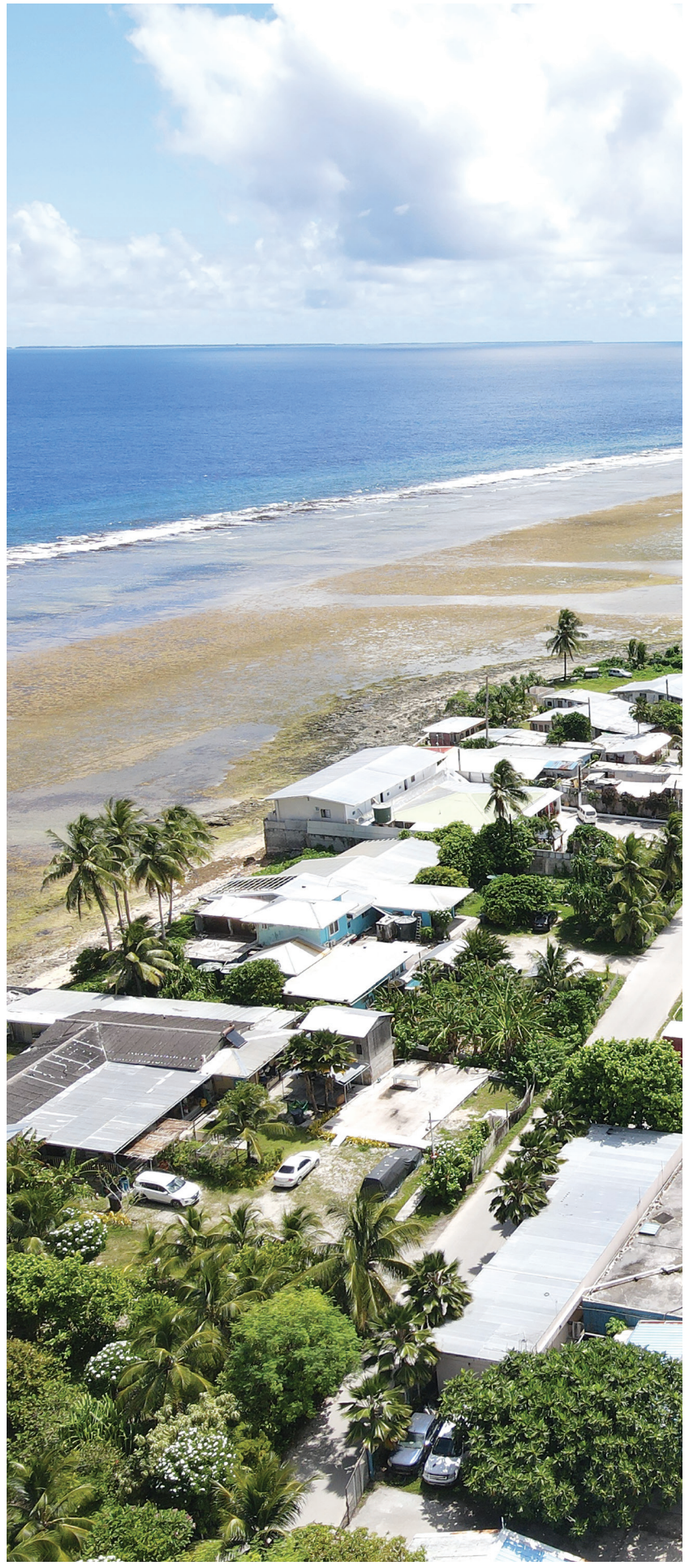



***Photo 1*** - View over the coastal ocean edge in Majuro




***Map 1*** - Majuro Master Plan villages

# EXECUTIVE SUMMARY

The Majuro Master Plan (Stage 1) - The Development of Resilient Majuro Precinct Plans (the Master Plan) has been developed as part of the Urban Resilience Project (URP) for the Republic of the Marshall Islands (RMI). The Master Plan sets out resilient, community-informed plans for eleven villages from Laura to Ejit, collectively referred to as the Resilient Village Plans.

The Master Plan also establishes a spatial and land use framework, with prioritized actions and policy directions to guide coordinated government and donor investment over the next 20 years. The Master Plan directly responds to accelerating climate risks, demographic change, and the need for a more strategic, long-term planning approach across Majuro Atoll.

## Context of a changing climate and population

Majuro is experiencing the combined pressures of sea-level rise, extreme weather, coastal erosion, population decline, and aging infrastructure. With most land under customary ownership and historically limited planning application, development has become dense, fragmented, and highly exposed to hazards. Communities are already experiencing frequent flooding, water scarcity, wastewater contamination, and loss of critical services during extreme events.

The Master Plan describes how land use can adapt to changes like climate impacts and population changes, and it outlines steps to improve livability across the villages. By showing land use at the village level, the Master Plan helps coordinate development, build resilience and prepare for future needs and challenges. Engagement with landowners, government stakeholders, and the wider community has been central to its development, so that local knowledge and priorities have shaped the actions. The scale of the village plans enabled detailed feedback to be provided and these village plans provide a central resource for ongoing engagement.

## Strategic context

The Master Plan is informed by the RMI National Adaptation Plan (Pāpjelmae, adopted 2023) and is referenced as a spatial tool in the proposed update of the Planning and Zoning Act. Other national policy and legislative frameworks that have informed the development of the Master Plan include the National Strategic Plan, the National Building Code, the Disaster Risk Management Act, and the RMI National Infrastructure and Investment Plan.

## Purpose of the Master Plan

The Master Plan aims to establish resilient land use frameworks for each village with land use strategies that:

- Reflect the increasing challenges associated with climate and population changes.
- Improve daily livability, safety and community wellbeing; support economic sustainability, and protect the environment, guided by cultural and local knowledge.
- Deliver actionable plans with short (5-year), medium (10-year), and long-term (20 year) horizons that can direct government and donor funding.

Three objectives structure the Master Plan which are supported by guiding principles and actions that can be taken.

- **Healthy Adaptive Environments -** Enhance the Majuro Atoll environment and the health and well-being for all people.
- **Resilient Future Focused Communities -** Building resilience that puts community wellbeing first.
- **Safe Connected Villages -** Maintain and enhance transport and movement connections.

## The Core Strategic Shift: The Consolidated Centers Approach

A key feature of the Master Plan is the move from dispersed linear settlement patterns to compact, walkable, consolidated village centers. This approach is fundamental to building long-term resilience.

This matters as it:

- Reduces exposure to climate hazards by encouraging development to the most resilient land.
- Enables economies of scale for essential infrastructure, including water, drainage, coastal protection, energy, and transport.
- Improves access to schools, health facilities, markets, emergency shelters, and cultural spaces.
- Strengthens local economies by concentrating people, services, and small enterprises.

Each consolidated center becomes the focal point for future development, policy reform, and infrastructure investment.

## Role of the Resilient Village Plans

The second half of the report contains **Section 3: Resilient Village Plans** with eleven Resilient Village Plans that are the backbone of the Master Plan.

For each village they provide descriptions and mapping of:

- **Existing State** – current land uses, services, hazards, cultural landmarks, and infrastructure summary.
- **Anticipated Change** – mapped climate hazards (SLR, rainfall flooding, typhoon flooding), population change, constraints.
- **Future State** – resilient land use, priorities and local project opportunities.

These Resilient Village Plans offer village-specific pathways, allowing communities and landowners to see how resilience measures apply to their location, while aligning with the broader atoll-wide strategy.

They also provide the granularity donors expect; clear project locations, prioritization, informed by climate maps and assessment, and evidence of community support.

## Implementation and Action Plan

**The Action Plan in Section 4** describes a range of potential actions that can be taken to deliver the outcomes sought within the Master Plan. They reflect the collective input of residents, stakeholders, and technical experts and are practical, actionable steps designed to respond to the unique challenges and opportunities facing Majuro. Each action is supported by a clear rationale, suggested timeframe and the identification of how they align with the broader Master Plan objectives.

The actions are grouped into the following categories and time frames:

- Actions to update and implement the Master Plan
- Further work/studies.

**Short-term actions** focus on health, safety, essential services, and enabling policy frameworks.

**Medium - and long-term actions** focus on investment, consolidation, and climate adaptation.

## Conclusion

The Majuro Master Plan provides:

- A coherent, risk-informed spatial framework for the next 20 years.
- Clear priorities, actions, and policy directions needed to address climate threats and demographic shifts.
- Resilient Village Plans providing for equitable, practical, community-supported outcomes.
- A resource to identify the land use zones would occur through a designated responsible government authority who will oversee the Master Plan and the Planning and Zoning Act once it is enabled.
- An important foundation for donor investment by helping identify spatial priorities and support more coordinated, climate-smart development.

Together, these elements create a practical pathway for a safer, more resilient, and more livable Majuro.



***Photo 2*** **-** View of the lifeline corridor looking towards Uliga

*Photo 3 -* Aerial view of Bejan looking north

# 1.

## 1.1 PURPOSE

Beca International Consultants Limited (Beca) has been engaged to develop Resilient Village Precinct Plans (Resilient Village Plans) for communities across Majuro Atoll, from Laura to Ejit. These plans, which are aligned to the RMI National Government electoral wards, will help Majuro prepare for the future by analysing hazards, exposure and vulnerability, combined with urban design, while incorporating feedback from residents and stakeholders.

The Resilient Village Plans form the basis of this Master Plan for Majuro. The purpose of a Master Plan is to provide a long-term strategic framework for guiding development and investment across Majuro. It establishes a clear vision and integrates land use and infrastructure planning, to achieve sustainable, resilient growth. By outlining phased implementation and aligning with community needs, a Master Plan helps prevent fragmented development, supports efficient resource allocation, and creates a roadmap for achieving economic, social, and environmental objectives in line with national strategies.

Under the overarching Master Plan, each of the eleven electoral wards has a Resilient Village Plan prepared to guide sustainable development, address climate change and sea-level rise (SLR), and promote social, economic, and environmental well-being. The Resilient Village Plans set out land use strategies for the next 5, 10, and 20 years, so that development is resilient, community-focused, and aligned with national goals.

## 1.2 REPORT STRUCTURE

This Master Plan is organized into four main sections, each designed to guide the reader through the context, the approach to developing the Master Plan and Resilient Village Plans.

### Section 1: Introduction - Environmental, Social, and Cultural Context of Majuro

Section 1 provides an overview of Majuro's context, including its environmental characteristics, social dynamics, cultural heritage, land ownership systems, population trends, climate change risks, existing infrastructure, and legislative environment. It establishes the foundation for understanding the constraints and opportunities that shape the planning of resilient villages in Majuro.

### Section 2: Approach to the Resilient Village Plans

Section 2 details the methodology used to develop the Resilient Village Plans, including the planning analysis, scenario development, SWOT analysis, stakeholder engagement process, and the objectives and principles that underpin the Master Plan. It explains how community feedback, hazard mapping, and population projections were integrated to create actionable strategies for the Resilient Village Plans.

### Section 3: Resilient Village Plans

Section 3 presents the eleven individual Resilient Village Plans, each supported by maps and analysis of the current state, anticipated changes, and future land use scenarios. Each Resilient Village Plan can be read as a standalone document and includes specific information on opportunities and projects identified through consultation. The resilient village profiles are supported by visual mapping and population projection information.

### Section 4: Action Plan

An Action Plan is provided outlining Majuro-wide and village specific actions across short-term (0–5 years), medium-term (6–10 years), and long-term (11–20 years) timeframes, extending to 2045, which is the planning horizon for the Master Plan.

### Supporting Appendices (online version only)

The online version of the report also includes appendices containing the background planning analysis, population projections, detailed SWOT tables, community consultation reports, and village specific hazard maps that supported the development of the Master Plan.

## 1.3 BACKGROUND

### Project Context

The Master Plan is part of the Marshall Islands Urban Resilience Project (URP) which aims to strengthen the Republic of the Marshall Islands' ability to adapt to climate change and natural hazards. The Government of the Republic of the Marshall Islands (GoRMI) has received financial assistance from the World Bank (WB) to undertake the URP. The project comprises four components, with this Master Plan sitting within **Component 1: Risk-Informed Adaptation Planning.** This component focuses on resilience, risk-informed planning, improved building standards, and sustainable land use strategies over a 20 year horizon, aligned with national policies including the National Adaptation Plan (NAP), the RMI Building Code, and those in development that include the Planning and Zoning Act.

### Majuro Context

Majuro is the capital and main urban center of the RMI. The atoll is an elliptical shaped reef approximately 25 miles (40km) long east-west and 6.4 miles (10km) across north-south. It has a total land area of approximately 4 square miles (10 square kilometers). With a population of 23,156 (2021 Census), Majuro is home to just over half of the RMI population. Urbanization has brought opportunities but has also increased community exposure to flooding, erosion, and other climate risks. Limited building controls and unplanned development have made communities more vulnerable to risks and exposed to natural hazards, highlighting the need for integrated and risk-informed land use planning.

### Master Plan Scope

To address these challenges, the Resilient Village Plans have been developed and collectively form the Master Plan covering the area from Laura to Ejit (known as Stage 1 of the Master Plan). These area based plans align with GoRMI electoral wards, also referred to as villages. The plans consider population and demographic trends and establish an approach to managing land use and development over the short-term (0-5 years), medium-term (6-10 years) and long-term (11-20 years). These plans form the foundation of the Master Plan and align with broader resilience initiatives, emphasizing "focused development" rather than uncontrolled growth. This approach considers future population scenarios and links them to essential community needs, such as education facilities for all ages, health services for an aging population, housing options with varied densities, and measures to address gender-based violence (movement safety through lighting and common open spaces). This approach also integrates strategies for economic opportunities, household income, sustainable construction trends, and environmental health, while respecting cultural practices.

The Master Plan recognizes the critical role it will play in the economic future of Majuro, not only in creating the spaces and opportunities where economic activity can happen but reducing uncontrolled development and urbanization vulnerable to climate changes that have significant economic implications.

The Master Plan does not create economic growth or jobs on its own. Instead, it provides **a framework that guides where development should occur and how land use and infrastructure can support economic activity,** with employment largely generated through construction of proposed projects. For further commentary, please refer to Section 2.1.3 Economic Outcomes Enabled by the Master Plan.

### Governance and Engagement

The project has been led by the Ministry of Public Works, Infrastructure and Utilities (MPWIU) through a dedicated Project Implementation Unit (PIU). Support for Fiduciary and Environmental and Social Risk Management has been provided by the Centralized Implementation Unit (CIU) which is housed within the Division of International Development Assistance (DIDA) in the Ministry of Finance, Banking and Postal Service.

The governance structure set up for the project has enabled coordination between government agencies, stakeholders, and communities throughout the planning process.

Community, landowner, and stakeholder engagement was critical to the development of Stage 1 of the Master Plan. Engagement was undertaken in two structured phases during July to August 2025 and November to December 2025 and included village-level workshops, landowner meetings, and stakeholder sessions. The consultation process was designed to understand existing conditions, identify anticipated change, and assess community risk tolerance in relation to climate change and population change. Feedback from this engagement directly informed the identification of opportunities and constraints, the development of resilient village principles, and the refinement of land use and infrastructure strategies. While this Master Plan provides a community-informed framework for the villages from Laura to Ejit (Stage 1), it does not represent a complete Master Plan for the entire Majuro Atoll. Additional villages and future stages will be incorporated as the planning and zoning framework is finalized and further engagement is undertaken.

Concurrent with the development of the Master Plan, other projects in Component 1 are being progressed. Given the interdependencies between these projects, and to ensure alignment between them, project teams have communicated throughout the development of this Master Plan. In the future a designated responsible government authority will oversee the Master Plan and the Planning and Zoning Act once this act is enabled.

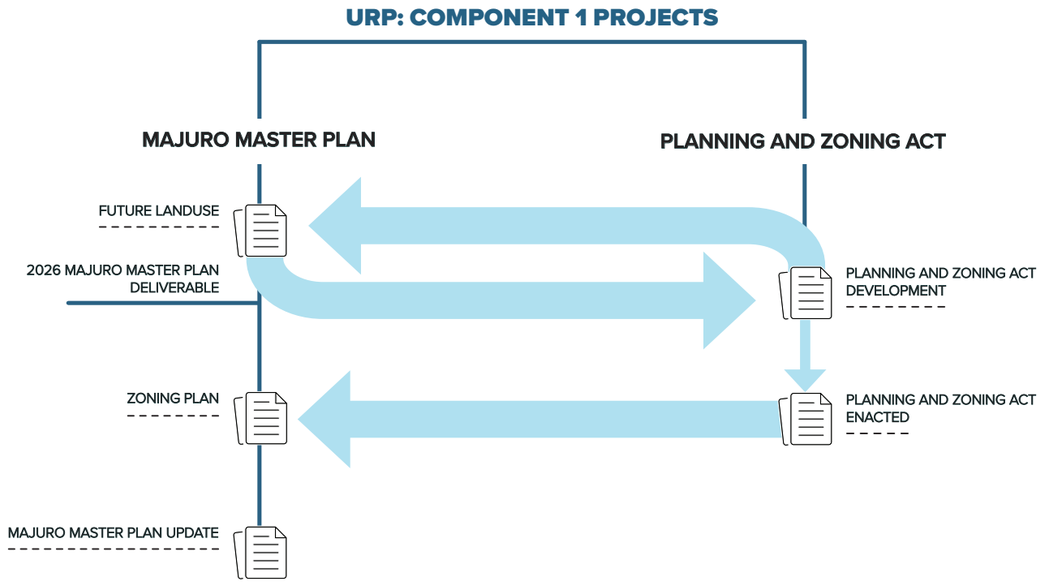



*Figure 1* - Diagram showing the relationship and development of the Majuro Master Plan (Stage 1) alongside the RMI Planning and Zoning Act.

## 1.4 DEFINING RESILIENCE IN MAJURO

Resilience is defined broadly in the RMI National Strategic Plan 2020-2030 as the empowerment of individuals to make the most of opportunities and resources available, so that communities can adapt to changing circumstances. To understand how resilience is experienced across Majuro, villages have been categorized into four typologies that share common strengths, weaknesses, opportunities and threats. These typologies being rural, connector, urban and island are described in more detail in the **SWOT Analysis (refer to Appendix C).**

### Village Strengths and Attributes

Table 1 provides a visual summary of the known strengths and attributes of each village, organized into the village typologies and assessed across three categories being environmental, social and infrastructure. By default, the table also highlights the gaps in provision identified between Ejit and Laura.

### Village Typologies

Each of the village typologies (Rural, Connectors, Urban, Island) experience the impacts of changing circumstances (i.e. population and climate change) differently, as the level of exposure and vulnerability to impacts, varies depending on the community characteristics. For this reason, resilience varies from village to village. For example, coastal inundation as a result of sea-level rise (SLR), will pose a major issue for the connectivity of low-lying urban and connector typologies like Woja, Ajeltake, Djarrit/Rita, and Delap. In comparison, population decline due to migration will have a larger impact on villages that already have lower population bases such as Lomar, Lobat, Iolap, Jeirok, Woja and Ejit as businesses and social services (health, education) become more difficult to sustain.

### The Role of Planning in Building Resilience

Without land use planning that considers environmental, economic and social factors - supported by appropriate building codes, regulations and other technical measures - the long-term impacts of these changing circumstances will be detrimental to the continued way of life of villages and the livelihoods of their residents.

Resilience for Majuro requires measures to be taken that mitigate the increasing challenges and threats of environmental risks and population decline. These measures need to increase adaptive capacity within each of the village centers in order to not only recover from a shock but also be better prepared for future shocks. Resilience is the ability to adapt successfully when faced with challenges, uncertainty, or change.

*The RMI National Strategic Plan 2020-2030 offers the following on the importance of planning for resilience:*

*Building resilience to the effects of climate change and managing and mitigating disasters from natural hazard risks are imperatives for RMI. In the short to medium-term, this requires far more investment in several areas including coastal protection, climate-proofing critical infrastructure; food, water, and health security; early warning systems and disaster risk-reduction measures. Additionally, a focus on fiscal and financial resilience, innovative financing instruments; and the resilience of the private sector must be implemented.*

Considering the above, the Master Plan process has iteratively developed principles and actions that will help to achieve resilience across Majuro. The principles respond to the project vision and objectives and influence the Action Plan which prioritizes projects for investment and funding consideration.

| Strengths and Attributes that Contribute to Resilience | Rural (Laura) | | | | Connectors | | Urban | | | | Island |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lomar | Lobat | Iolap | Jeirok | Woja | Ajeltake | Rairok | Delap | Uliga | Djarrit/Rita | Ejit |
| **Environmental Strengths** | | | | | | | | | | | |
| Areas of Higher Ground | ✓ | ✓ | | ✓ | | | | | ✓ | | |
| Fresh Groundwater Aquifer | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | | |
| Arable Soil - For Growing Food | ✓ | ✓ | ✓ | ✓ | | | | | | ✓ | |
| Significant Vegetation Cover (Heat protection) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| **Social Cultural and Economic Strengths** | | | | | | | | | | | |
| Main Hospital | | | | | | | | ✓ | | | |
| Medical Clinic/Dispensary | | | ✓ | | | ✓ | | ✓ | | | ✓ |
| Employment Center (Industrial/Commercial landuse) | | | | | | | ✓ | ✓ | ✓ | | |
| Local Shops | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Village Community Buildings (i.e. Community Center) | ✓ | | | ✓ | ✓ | ✓ | | | | | |
| Productive Land/Community Gardens | | | | | | | | | | | |
| Public Spaces (Outdoor Play/Recreation/Event Spaces etc) | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Sports and Recreation Facilities (Buildings) | | | | | | | | ✓ | ✓ | | |
| Cultural Sites (Churches/Cemeteries) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Elementary School | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| College (Secondary) | | | | ✓ | | | | ✓ | ✓ | ✓ | |
| College (Tertiary) | | | | | ✓ | | ✓ | | ✓ | | |
| Police Station | | | ✓ | | | ✓ | | | ✓ | | ✓ |
| **Existing Infrastructure** | | | | | | | | | | | |
| Significant Coastal Protection | | | | | | | ✓ | ✓ | ✓ | ✓ | |
| Moderate Localised Coastal Protection | | | | | ✓ | ✓ | | | | | ✓ |
| Evacuation Shelters (public schools) | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Stormwater/Drainage Systems | | | | | | | | | | | |
| Connection to Wastewater Treatment Facilities | | | | | | | ✓ | | | | |
| Solid Waste Management | | | | | | | ✓ | ✓ | ✓ | ✓ | |
| Some Climate Resilient Buildings (specifically designed) | | | | | | | | ✓ | | | |
| Resilient Connections to Power System | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Access to Potable Public Water Supply | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Large Rainwater Catchment System | | | | | | | ✓ | | | | |
| Community Rainwater Tanks | | | | | | | | | | | |
| Groundwater Wells | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | ✓ | |
| Road Transport/Bridges | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Footpaths along Lifeline Corridor | | | | | | | ✓ | ✓ | ✓ | ✓ | |
| Jetty/Wharves | | | | | | | ✓ | ✓ | ✓ | | ✓ |
| Public Boat Ramps | ✓ | | | | | | | | ✓ | ✓ | |
| Airport | | | | | | | ✓ | | | | |
| Telecommunications/NTA Antennae | | | | ✓ | | | | ✓ | | ✓ | |
| Solar panels and Battery Bank | | | | | | | | | | | |

Legend

- ✓ Existing
- ✓ Has some availability/partially meets this
- More information needed

***Table 1 -*** Strengths and attributes that contribute to resilience

## 1.5 MAJURO

Majuro plays a central and strategic role in the national urban structure of the RMI; it is the political and economic capital of the country, an infrastructure hub and gateway to the country, as well as the most populous district. It hosts the RMI's primary civilian international airport and the main seaport, providing key lifelines for trade, aid, and international travel. This central and strategic role is projected to expand and intensify, as communities continue to migrate from rural areas or outer islands to more urbanized centers within the Marshall Islands.

Within Majuro, the urban Delap, Uliga and Djarrit (DUD) area is the current economic and administrative center of the RMI. The co-location of Government agencies, healthcare services, and higher education opportunities make this area a magnet for further growth and economic development. The value of this location is further reinforced by critical nearby industrial land uses, including the Delap Dock, Uliga Wharf, fuel storage, and other boat ramps, as well as the nearby Amata Kabua International Airport. Key opportunities to capitalize on and boost the role and the economic strength of Majuro are outlined in **Section 2.3** of the **Planning Analysis (refer to Appendix A)** and the **SWOT Analysis (refer to Appendix C).**

While pressure for competing land uses is already very tight for this area, intensification is anticipated to continue in the DUD area as these economic and social anchors draw more people to this area. Dispersing growth outside of this area is unlikely to occur as it means greater travel distances for residents. It will also impact on Majuro's limited productive soils and agricultural assets and require additional infrastructure investment from services to transportation. Focusing investment on improving or maintaining existing assets where key services are already centered is likely to deliver cost efficiencies as long as this infrastructure, particularly essential services is resilient to future climate change impacts.

### 1.5.1 PLACE/LAND OWNERSHIP AND CULTURE

#### Urbanization of Majuro

Majuro Atoll was historically a series of separate islets, with Laura (Lomar, Lobat, Iolap and Jeirok) representing the longest established area of continuous occupation. Archaeological evidence of taro agriculture dating from around 100 to 700 AD in Laura illustrates how early communities lived in extended family groups along the lagoon edge, with access across the weto strip to the ocean. This settlement pattern reflects a longstanding relationship between people, land, and marine environments that continues to shape village life today.

Majuro's connection to the rest of the atoll and the wider world was traditionally by boat, with the sheltered lagoon area near DUD valued for its deep water access suitable for large vessels. This natural advantage led to the early development of port facilities and associated activities which was a focal point during and after the war in the mid 1940s.

From the 1950s, the construction of a central road linking Laura to Djarrit/Rita fundamentally changed settlement patterns across the atoll. This road connection enabled urban development to extend westward from the DUD area, a trend that continued with the opening of Amata Kabua International Airport in the 1970s. As connectivity improved, development increasingly concentrated around transport and port infrastructure.

Today, Delap and Uliga remain the most urbanized parts of Majuro Atoll, hosting key civic and national facilities including government offices, courts, museums, and the hospital (Leroij Atama Zedkeia Medical Center). While proximity to deepwater ports continues to be a strategic asset for trade and connectivity, the narrow landform and low elevation of the DUD area also make it particularly vulnerable to coastal inundation- an exposure that has historically resulted in significant impacts, such as during the 1905 typhoon, and which continues to pose challenges under future sea-level rise.

#### Land ownership

Land ownership in the Marshall Islands is complex and forms the basis of Marshallese culture and society.[1] Traditionally every person had certain rights and obligations to the land which they acquired at birth by virtue of lineage. In this system of customary land tenure, land is traditionally passed down matrilineally, so land remains within the extended family. These rights and obligations have been mostly preserved within the RMI constitution. As a result most land is privately owned, and is under customary tenure.

Land is divided into wetos, which are parcels that may stretch from lagoon to ocean side, ranging in size from one to five acres (0.4 to two hectares). These are often demarcated by natural boundaries, though urbanization and reclamation since the 1950s have complicated boundaries. In the context of spatial planning, this land ownership structure needs to be taken into consideration when approaching any potential changes in land use.

#### Culture

Strong ties to family, traditional connection to land and the church define Majuro culture and connects people with their wider community. Marshallese social structure is intensely communal, and extended family typically live together or in close clusters of homes on family land. Today, culture is also expressed through formal relationships and social structures in Majuro society with the Leroij, Iroij and chiefly authorities along with landowners being part of decision-making. The protocols within villages are not overtly visible, however, there are different rules as seen in the signs outlining the expected behaviour in some villages.

The Marshall Islands have two official languages, Marshallese and English, but Marshallese is the language of daily life and identity. It is an Austronesian language rich in navigational and familial terms, reflecting the seafaring heritage of the Marshallese. In Majuro, Marshallese is spoken in homes, government meetings, and community events, with English used mainly in formal education and external commerce.

Other cultural aspects can be seen and are supported today through various groups across Majuro, some include:

- MoCIA bringing a group of women together weekly to meet at the University of the South Pacific for handicrafts.
- Women United Together Marshall Islands (WUTMI) works to advance the causes and improve the lives of Marshallese women and their families. Serving as the voice of women in the Marshall Islands, the primary goal of WUTMI is to support and strengthen Marshallese women, and in so doing, to strengthen Marshallese families.
- Waan Aelõñ in Majel (WAM) located in Delap uses traditional Marshallese skills for men and women as a medium to transfer needed life skills and capacity building to the youth of the Marshall Islands.
- Jo-Jikum at its core, this program is about giving hope and creating impact, powered by youth ideas, energy, and leadership.

All of these groups along with others require spaces to meet and operate. The Master Plan provides the opportunity to identify spaces within each village for facilities that are essential to supporting social connections, maintaining cultural practices—including significant places such as cemeteries—and strengthening the resilience of Majuro's existing and future communities.

Finally, it is worth noting that the Marshallese people have a proud history and a legacy of resilience that deeply inform their culture today. Having survived colonialism, war, nuclear upheaval, and now facing climate change, Marshallese continue to balance change and tradition.



***Photo 4*** - Example of signage in village outlining restrictions



***Photo 5*** - Aerial view of Uliga with the Majuro Track and Field in the foreground



***Photo 6*** - View of the Bridge looking towards Delap



***Photo 7*** - View of Delap with the ECC gymnasium in the foreground

1 *Gregg de Bie, Private lands conservation in the Republic of the Marshall Islands (Report). Natural Resources Law Center, University of Colorado School of Law, September 2004.*

| Sea-Level Rise[2] | | | | |
|---|---|---|---|---|
| Climate Scenario | | | | |
| Year | SSP5-8.5 (m) | SSP3-7.0 (m) | SSP2-4.5 (m) | SSP1-2.6 (m) |
| 2045 | 0.15 | 0.13 | 0.12 | 0.12 |
| 2055 | 0.24 | 0.22 | 0.20 | 0.18 |
| 2120 | 1.11 | 0.98 | 0.80 | 0.66 |

Note: Sea-level rise values are relative to a 2025 baseline, that considers -1 mm/year of vertical land movement.

***Table 2*** - Sea-level rise

| Tropical Cyclones[3] (Median change at 2°C of global warming) | |
|---|---|
| Tropical Cyclone Frequency | ↓ 10% |
| Intensity of Tropical Cyclones | ↑ 5% |
| Rain Rate | ↑ 17% |

***Table 3*** - Tropical cyclones

**Increasing Air Temperature[4]**

**(Avg. annual mean surface air temp., 10th to 90th percentile)**

*Avg annual mean surface air temp from 1950-2014: 26.7˚C

| Climate Scenario | | | |
|---|---|---|---|
| Year | SSP5-8.5 | SSP3-7.0 | SSP2-4.5 |
| 2045 | 27.7 to 28.6˚C | 27.7 to 28.3˚C | 27.5 to 28.3˚C |
| 2055 | 28.0 to 29.0˚C | 27.9 to 28.8˚C | 27.7 to 28.6˚C |
| 2100 | 29.5 to 31.7˚C | 29.0 to 30.9˚C | 28.0 to 29.4˚C |

***Table 4*** - Climate scenario

| Coastal Changes by Mid-Century[5] | |
|---|---|
| Coastal Flooding | ↑ |
| Coastal Erosion | ↑ |
| Storm Surge Intensity | ↑ |
| Saltwater Intrusion into Groundwater | ↑ |

***Table 5*** - Coastal changes by mid-Century

**Changes in Rainfall[6]**

**(Avg. annual rainfall, 10th to 90th percentile)**

*Avg annual rainfall from 1950-2014: 2510 mm

| Climate Scenario | | | |
|---|---|---|---|
| Year | SSP5-8.5 | SSP3-7.0 | SSP2-4.5 |
| 2045 | 1913 to 3116 mm | 1981 to 3163 mm | 1997 to 3054 mm |
| 2055 | 2077 to 2970 mm | 2028 to 3228 mm | 2019 to 3030 mm |
| 2100 | 1810 to 3370 mm | 1762 to 3212 mm | 1950 to 3163 mm |

***Table 6*** - Changes in rainfall




***Map 2*** - Majuro Master Plan villages

2 *Tonkin & Taylor International Ltd. (2025). RMI-URP-C2_D7-Eletutu detailed design report. Ministry of Public Works, Infrastructure and Utilities, Republic of the Marshall Islands.*
3 *Knutson, T., Camargo, S., Chan, J., Emanuel, K., Ho, C.-H., Kossin, J., ... Wu, L. (2020). Tropical cyclones and climate change assessment: Part II: Projected response to anthropogenic warming.*
4 *World Bank Group. (2026) Climate Change Knowledge Portal – Marshall Islands. https://climateknowledgeportal.worldbank.org/country/marshall-islands/climate-data-projections*
5 *Beca International Consultants Ltd. (2023). Final output 3: Community vulnerability and adaptation planning report. Republic of the Marshall Islands.*
6 *World Bank Group. (2026) Climate Change Knowledge Portal – Marshall Islands. https://climateknowledgeportal.worldbank.org/country/marshall-islands/climate-data-projections*

## 1.5.2 POPULATION/DEMOGRAPHICS

### Demographic Change and Urban Pressures

Majuro is home to 23,156 people (2021 Census), representing more than half of the RMI's population. While Majuro remains the country's largest urban center, its population has declined by 17% since 2011, driven by out-migration. Despite this decline, urbanization is intensifying, with Majuro absorbing most internal migration due to better access to services and employment opportunities. Population is projected to decline to approximately 16,400 by 2045, even as Majuro's share of the national population rises to 64%, reinforcing its role as the primary urban center.

Key demographic and social characteristics (source 2021 census):

- **Youthful population:** Median age is 23 years, with 34% under the age of 15. Projections show a gradual aging trend, increasing demand for healthcare and social support.
- **Community health challenges:** Non-communicable diseases such as heart disease and diabetes are prevalent, placing pressure on health services and requiring integrated planning for prevention and treatment.
- **Gender-based violence (GBV):** This remains a critical social issue, impacting safety and wellbeing. Safe public spaces, social support networks, and gender-responsive services are required to address this.
- **Household change:** Average household size has fallen from 8.6 (1988) to 5.7 (2021), reflecting smaller family units and evolving social structures.
- **Economic profile:** Majuro is the economic hub of the RMI, yet unemployment remains at 8.7%, and women and youth face higher joblessness than men.
- **Migration pressures:** Climate change and SLR are accelerating relocation from outer islands, adding stress to Majuro's limited land and infrastructure.

### Planning Response and Investment Implications

When considering the declining population, coupled with combined health and social challenges, the need for a resilient and balanced planning response that will enable Majuro residents to thrive is evident. In some areas, particularly those facing high climate risk or where service delivery is costly and difficult to sustain, planning may need to allow for managed decline or reduced new development. However, other parts of Majuro will continue to require investment to maintain minimum levels of essential services, social amenities and public spaces for existing residents. This reflects not only service needs but also commitments to cultural continuity, community cohesion and the preservation of Marshallese traditions, which remain strong drivers of settlement patterns.

Declining population does not negate the case for targeted investment. Improving livability, safety, infrastructure reliability and public amenities can help retain population, support young people, and strengthen Majuro's role as the RMI's key urban center. Clear articulation of how these improvements contribute to population retention, community wellbeing and long-term resilience will strengthen the socio-economic justification for investment and help demonstrate why the Master Plan remains essential in a context of demographic change. For further commentary on this, refer to Section 4 (Action Plan).

## 1.5.3 CLIMATE CHANGE/DISASTER RISK MANAGEMENT

### Climate Vulnerability and Key Hazards

Majuro is among the most climate-vulnerable urban centers in the world. High exposure to impacts from SLR and other climate hazards, coupled with the atoll's low elevation, narrow landmass, and high population density make Majuro highly vulnerable to climate hazards and disaster risks that threaten habitability and infrastructure.

The exposure to and impacts from four key climate change hazards have been considered for this Master Plan:

- SLR and associated coastal inundation and erosion.
- Increasing air temperatures and extreme heat days.
- Changes in typhoons.
- Changes in rainfall (drought/flooding).

### Climate Projections and Hazard Impacts

Projected changes for these climate hazards are provided in Table 2 to 6, with data sources indicated. As SLR poses one of the most serious threats to livability, Majuro-scale data based upon the IPCC's updated climate projections using Shared Socioeconomic Pathways (SSPs) from the CMIP6 model have been used as analyzed by Tonkin + Taylor for the atoll using a 2025 baseline. The most robust projections available at the time of this plan for air temperature and rainfall are at the RMI-scale from the CMIP6 model. Projections for typhoons are the most uncertain of the hazard data, where the most recent information on anticipated change is based on a global analysis at 2˚C of global warming and has not been specifically downscaled for the RMI.

Recent SLR projections (SSP5-8.5, very high emissions/rapid climate change) indicate approximately 6 inches (0.15 m) of SLR by 2045 and approximately 10 inches (0.24 m) of SLR by 2055, based upon 2025 sea-levels. Both the SSP3-7.0 and SSP5-8.5 scenarios anticipate 40 inches (1.0 m) or more of SLR by 2120.[7] (See SLR Table 2) Even modest rises in the sea will amplify coastal flooding, erosion, and saltwater intrusion of freshwater aquifers, reducing land availability and affecting roads, housing, water supplies, and utilities.

The available Deltares' flood modelling for Majuro, which was used to identify flood exposure for this Master Plan, produced results based on SLR increments of 0.25m, 0.5m, and 1.0m.[8] Based on analysis with the latest SSP projections for SLR, the lowest increment of 10 inches (0.25m) of SLR is indicative of a rapid climate change scenario (SSP5-8.5) in the year 2055. By 2045, 6 inches (0.15m) of SLR is projected (SSP5-8.5), but Deltares has not included this increment of SLR in their modelling, so exposure to flooding under this scenario could not be assessed.

The frequency of typhoons is less certain but anticipated to decline. However, typhoon intensity (and their associated rains, swell waves, and winds) is anticipated to increase by up to 10% as the climate changes. High winds and intense rainfall during these weather events can cause significant flooding across the atoll, disrupt land transport, damage critical assets, and increase recovery costs.

Changes in rainfall may result in high intensity rainfall events or drought, driven by climate variability and El Nino Southern Oscillation (ENSO) patterns. Past droughts have disrupted water supply and food security for the atoll, and future climate scenarios indicate that prolonged dry periods could coincide with rising air temperatures, increasing demand on freshwater supplies. Increasing intensity in rainfall events can result in flooding across the atoll, particularly in areas with poor natural drainage or inadequate stormwater controls, impacting residences, businesses, and critical services. Rising air temperatures and shifting rainfall patterns can also strain sanitation and health systems, increasing risks of waterborne disease and heat stress. These compound hazards are exacerbated by uncontrolled development and limited building code compliance.

### Other Natural Hazards

Other natural hazards with the potential to cause acute disasters also require consideration when planning for resilience. Earthquakes and tsunamis are low-probability but high-impact natural hazards. Work by the National Oceanic Atmospheric Administration (NOAA) has estimated that the maximum tsunami heights for the atoll vary between approximately 60 to 80 inches, where the low-lying Rairok and the DUD would be significantly inundated[9]. In producing flood modelling for Majuro, Deltares' research considered a historical tsunami event that had a 0.33% chance of occurring in any given year. Even if it had occurred during the highest tide, they estimated that flood extents would be comparable to annual swell wave flood events. Thus, Deltares' flood modelling did not include tsunami hazards, as they were deemed on par with swell waves[10].

## 1.5.4 EXISTING INFRASTRUCTURE

Majuro's infrastructure provides essential services but faces significant challenges from aging and degraded assets, uneven coverage, issues with maintenance, and climate vulnerability. Core systems, including transport, water, sanitation, energy, communications, and waste, are concentrated in the DUD urban corridor, which typically leaves outer areas under-serviced.

The main arterial road corridor spans the length of the atoll, connecting Laura to Djarrit/Rita. It forms the backbone of the transport system, connecting key socio-economic nodes including the airport, government offices, industrial areas, and residential zones. However, the network lacks redundancy and is highly exposed to flooding and erosion due to its linear nature. Water supply relies on a mix of centralized systems (airport catchment, hospital roof runoff, and the Laura freshwater lens) and household rainwater harvesting. These systems are fragile, with limited storage and frequent service interruptions.

Within the DUD catchment approximately 80% of households are connected to a reticulated sewer network with saltwater flushing. Wastewater is discharged untreated to an ocean outfall. The majority of other unconnected properties utilize pit latrines and septic tanks or direct discharge. Areas outside the DUD including Laura through to the Airport are not serviced by public sewer infrastructure and rely on onsite septic tank disposal systems, pit latrines, or direct discharge which are contributing to the increased risk of groundwater contamination. Stormwater drainage is fragmented and where in place often blocked, causing localized flooding and health risks. Recent maintenance interventions through the Urban Resilience Project have significantly improved stormwater drainage infrastructure performance.

Energy supply is largely diesel-based with an aging grid which is vulnerable to climate change hazards. There is growing solar integration and a number of resilience and renewables projects in early implementation. Communications have improved with the submarine cable, but redundancy is low, and service gaps persist in informal settlements. Solid waste management is significantly constrained by a single landfill which is over capacity and environmentally vulnerable. Improvements to recycling, and hazardous waste handling are in progress but are still significant factors impacting solid waste management.

Combined with climate risks, these vulnerabilities underscore the need for resilient infrastructure planning. Future strategies should upgrade critical assets and provide for equitable access to services across all villages, integrating nature-based solutions where possible.

| Critical services across Majuro Atoll | Village Location |
|---|---|
| Fire station | Next to police station in Uliga |
| Fuel storage tanks and fuel stations | Fuel tank storage is centralized in DUD close to docks and there are a number of fuel stations spread across Majuro. |
| Schools | Public schools are located across Majuro with public high schools in Jeirok, and Djarrit/Rita |
| Hospital | Delap |
| Medical center | Iolap, Ajeltake (clinic) |
| Antenna | Jeirok, Delap and Includes antenna in Djarrit/Rita, Bokiur Island east of Ejit |
| National telecommunication | Delap |
| Pump stations | Across Majuro including Djarrit/Rita, Rairok, Jeirok (buildings are painted blue) |
| Power plant | Delap |
| Airport zone | Rairok |
| Ports | Uliga, Delap and Rairok and Kramer Dock |
| Solid waste | Rairok - Jable Landfill |
| Emergency shelters | Primarily public schools and then churches. |
| Government disaster store/ NDMO | Delap – Multipurpose building next to the National Telecommunication Center |

***Table 7*** - Location of critical services across Majuro Atoll mapped in Section 3: Resilient Village Plans

7 *Tonkin & Taylor International Ltd. (2025). RMI-URP-C2_D7-Eletutu detailed design report. Ministry of Public Works, Infrastructure and Utilities, Republic of the Marshall Islands.*

8 *The Deltares hazard models do not connect the various sea-level rise scenarios to any particular timeframe*

9 *NOAA Center for Tsunami Research/Pacific Marine Environmental Laboratory (PMEL). (2022). Modelling Tsunami Inundation for Hazard Assessment of Majuro, Republic of the Marshall Islands. https://www.pmel.noaa.gov/sites/default/files/atoms/files/SANNIKOVA_Majuro_PosterV2_508press.pdf*

10 *Deltares. (2022). Coastal Vulnerability Assessment for Majuro Atoll (CVA) Technical Report.*

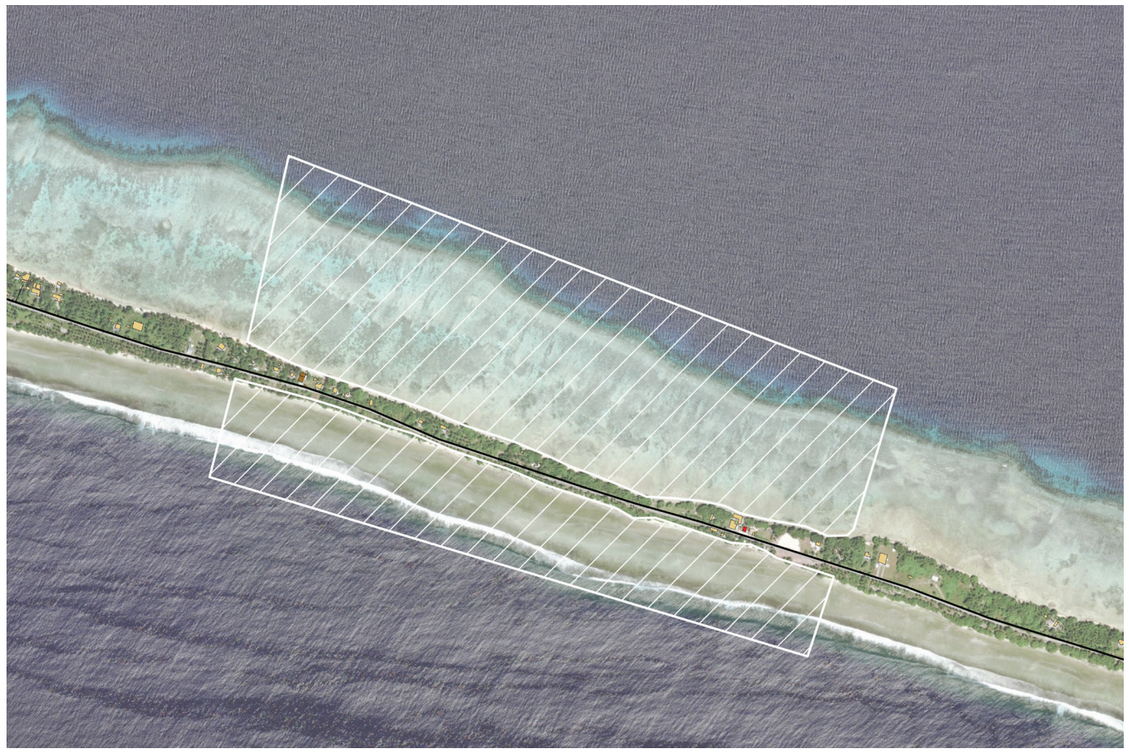
### 1.5.5 ENVIRONMENTAL ASPECTS

Majuro's environment is defined by its fragile atoll ecosystem, which is highly sensitive to human activity and climate change. The atoll comprises a narrow land strip surrounded by lagoon and ocean, creating unique ecological challenges.

Marine and coastal ecosystems are under pressure from land reclamation, shoreline development, and pollution. Water quality in the lagoon has deteriorated due to wastewater discharge, stormwater runoff, and poor solid waste management, with elevated contaminants and bacterial levels recorded in recent surveys. Coral reefs, vital for coastal protection and biodiversity, are threatened by warming seas, ocean acidification, reef mining and sedimentation.

There are five protected marine areas across the Majuro Atoll, with only one of these in the Master Plan area, the Woja Marine Protected Area, which safeguards lagoon and ocean habitats. Coastal vegetation buffers, are limited and fragmented, reducing natural resilience against erosion and storm surge.

Environmental health is closely linked to community well-being. Poor waste disposal, inadequate sanitation, and uncontrolled development increase risks of disease and degrade natural resources. Climate change compounds these pressures, with sea-level rise and saltwater intrusion affecting soil quality and freshwater lenses.



***Map 3*** - Woja Marine Protection Area

## 1.6 LEGISLATIVE ENVIRONMENT

Majuro's planning and development framework operates within a complex legislative and customary land tenure system. Traditional land ownership dominates, with rights protected under the Constitution of the Republic of the Marshall Islands. Land is divided into wetos and managed by landowners, which significantly influences land use and development decisions.

Formal planning legislation exists but has been ineffectively enforced. The Planning and Zoning Act 1987 has not been consistently implemented, resulting in limited development control and unregulated urban growth. This has contributed to overcrowding, poor housing quality, and increased exposure to climate hazards. It has also resulted in ad-hoc development and incompatible uses occasionally being placed next to one another such as industrial and education facilities.

Recent reforms aim to strengthen governance and resilience. The NAP and RMI SLR Adaptation Policy set out strategies for long-term climate-responsive planning, including protection measures and potential relocation. The Disaster Risk Management Act mandates integration of risk reduction into development processes. A revision to the Planning and Zoning Act is in progress as well as a rollout of the RMI National Building Code (2022), which introduces standards for safer, climate-resilient construction along with compliance requirements.

As noted above, the Master Plan will align with these frameworks, supporting a transition from ad-hoc development to risk-informed, regulated land use planning that respects cultural practices while addressing climate and disaster risks.

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*Photo 8* - Photo credit: Urban Resilience Project

# 2.

## 2.1 MASTER PLAN APPROACH

### 2.1.1 PROCESS

The development of the final spatial plans for the eleven villages followed a structured process. It began with an understanding of the context, followed by the identification and communication of key opportunities and challenges. This process culminated in the creation of Resilient Village Plans, each supported by detailed mapping. Stakeholder, landowner, and community engagement during the development of these plans validated base information, provided input, and enabled community testing of draft maps. A critical component was the analysis of trends, including population and climate change projections. These insights informed the second round of consultation, which focused on understanding community risk tolerance. The feedback from this engagement led to modifications of the plans and the development of an initial Action Plan which was finalized through a prioritization workshop with stakeholders.

### 2.1.2 DEVELOPMENT STAGES

The following sequence outlines the key inputs and engagement activities undertaken in the development of the Master Plan. References to selected outputs are provided in the Appendices of the digital version of the Majuro Master Plan.

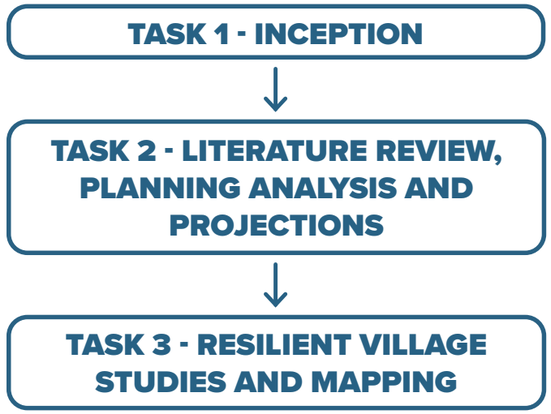



*Figure 2* - Majuro Master Plan Development steps

#### Task 1: Inception

Inception Report including a Communications Strategy and Engagement Plan

#### Task 2: Literature Review, Planning Analysis and Projections

To establish a baseline for the Master Plan, a review was undertaken of existing information relevant to resilient land use management and development in response to climate change.

##### Planning Analysis (refer to Appendix A)

A planning analysis report outlined the opportunities and constraints, including climate change and disaster risks that should be considered in the development of the Master Plan.

##### First Community and Stakeholder Consultation sessions (refer to Appendix D)

Individual hazard maps were prepared at the village-level for the first engagement in July and August 2025 based on existing mapping from Deltares that was provided showing SLR, rainfall-based flooding, typhoon flooding.

These maps were accompanied by an identification of Strengths, Weaknesses, Opportunities and Threats (SWOT) that formed the material for engagement with communities. The naming and identification of existing village features formed part of the existing state review provided by the community.

##### SWOT analysis (refer to Appendix C)

The consultation engagement material was grouped under the following lenses or system layers that contribute to land use planning:

- Environment, Topography, and Natural Resources
- Land Use, Economic, and Social Services
- Transportation and connectivity
- Infrastructure.

##### Population projection note (refer to Appendix B)

This note provides population projections and insights to support informed, forward-looking decisions that assists in the creation of village plans that are not only responsive to current realities but also resilient to future challenges.

#### Task 3: Resilient Village Studies and Mapping

##### Scenario development

Following the confirmation of the population modelling and projections, population projection and climate change variables were combined to challenge and develop spatial scenarios that would meet the project objectives, these included:

- Status quo (do minimum)
- A consolidated centers approach
- A dispersed settlement pattern (do maximum).

##### Objectives and Principles

The project objective is to prepare ‘a series of resilient village plans for Majuro that guide the physical and sustainable development of Majuro in line with existing land uses, and existing government priorities and policies…to achieve significant urban transformation that enhances livability, supports economic growth and protect the environment.’

The Master Plan objectives and principles were developed in response to the project’s Terms of Reference and from the community-informed SWOT analysis and consultation sessions, where discussion was categorized into Environment, Land Use, Transport and Access and Infrastructure. With Infrastructure inherent across all, the objectives were refined to reference:

- **Environment** (Healthy Adaptive Environments)
- **Land Use** (Resilient Future Focused Communities)
- **Transport and Access** (Safe Connected Villages).

Each objective is supported by specific principles that clarify the intended outcomes and recommended actions. The Objectives were shared in the November/December consultation along with the Resilient Village approaches that are applied at a more focused scale.

##### Second community and stakeholder engagement sessions (refer to Appendix E)

Maps were developed for engagement in November and December 2025 and supporting opportunities and constraints outlined for each village for engagement with landowners and communities. Maps included:

- **A current state map** showing existing building and land use at a village-level
- **An anticipated change map** with a multi-hazard flood map (showing high tide at 0.25m SLR, swell waves at 0.25m SLR, non-typhoon rainfall flooding, and typhoon rainfall flooding on one map) and the population projection for 2030, 2035 and 2045 at a village-level
- **Possible future state map** showing a consolidated centers approach, resilient village strategies and a future land use approach.

Feedback from this engagement informed the resilient village profiles and high priority projects for each village (refer to Section 3 - Resilient Village Plans).

##### Action Plan (refer to Section 4)

This section describes the range of potential actions that can be taken to deliver the outcomes sought within the Master Plan. They reflect the collective input of residents, stakeholders, and technical experts and are practical, actionable steps designed to respond to the unique challenges and opportunities facing Majuro. Each action is underpinned by a clear rationale, an indicative timeframe, and an explanation of how it aligns with the broader Master Plan objectives.:

- Actions to update and implement the Master Plan
- Further work/studies.

The Action Plan table groups projects, actions, and tasks as either short (0 to 5 years), medium (5 to 10 years) or long-term (11 to 20 years). Those identified as short-term are given higher priority because they have been identified as those that need to be completed promptly as they are essential for the health, wellbeing, and safety of residents. On the other hand, medium-to-long-term tasks, while necessary to meet the Master Plan objectives, do not require immediate action and thus hold a lower priority. This preliminary prioritization will be reviewed on a regular cycle by the Chief Planner, as part of their role.

Existing and proposed Sector Strategies as well as those covered by Ministries and Agencies have been factored into this list.

Community and Landowner Consultation – Village-Specific Actions (refer to Appendix F) contains a consolidated list of opportunities and projects that were suggested through the community consultation. Community consultations were held in two primary stages, a first and second round of stakeholder engagement. The first round of community consultation was undertaken through July and August 2025 with the second round of engagement including landowners completed during November and December 2025. These actions should be reviewed and investigated by the Chief Planner, as part of their role and incorporated into the broader action list.

### 2.1.3 ECONOMIC OUTCOMES ENABLED BY THE MASTER PLAN

The Master Plan allocates land and space for future housing, services, protective infrastructure, enterprise areas, circulation networks, and nature-based buffers. It provides a single integrated spatial reference for all development on Majuro. Through the implementation of the Master Plan and the actions proposed below, there are several ways that economic development outcomes can be enabled:

- **Direct employment during construction:** Infrastructure and housing investments generate on site construction and installation jobs.
- **Ongoing jobs from operation and services:** Completed assets such as water systems, clinics, markets, utilities and tourism facilities create permanent operational roles and increase productivity.
- **Growth opportunities for local businesses:** Investments stimulate local procurement and supply chain participation for construction materials, maintenance, food, transport, tourism services and crafts.
- **Indirect and induced economic effects:** Supplier spending generates indirect effects and workers’ wage spending generates induced effects. These multipliers increase total economic activity beyond the initial investment.
- **Attraction of foreign investment:** A clear spatial framework reduces risk for international investors and climate finance.
- **Connectivity and resilience benefits:** Resilient transport and coastal infrastructure maintain economic continuity, safeguarding access to markets, services, and livelihoods.

It is noted that whilst the Master Plan can enable economic development outcomes, realizing these requires specific and targeted interventions that are beyond scope of the Master Plan. These may include:

- Employment placement and jobs brokerage connecting local labor to construction and operational roles, supported by workforce initiatives.
- Workforce training and skills development in construction trades, operation and maintenance, hospitality, and digital skills linked to NIIP and tourism sector needs.
- Local procurement and supplier development using unbundled contracts, local content policies, and business capability training.
- Access to finance for medium and small to medium enterprises through secured transactions reform and enterprise support mechanisms.
- Tourism product development and branding for village-level experiences aligned with the Office of Commerce, Investment and Tourism (OCIT’s) strategy.
- Investment promotion using plan ready sites packaged with tenure clarity and design guidance for external investors.

As part of implementation of the Master Plan, the Chief Planner can review these interventions as part of their role.

### 2.1.4 RESILIENT VILLAGE PLANS

Section 3 of the Master Plan is structured with the following maps for each of the eleven villages:

Map 1: A current state map showing existing building and land use at a village-level.

Map 2: An anticipated change map with a multi-hazard flood map (showing high tide at 0.25m SLR, swell waves at 0.25m SLR, non-typhoon rainfall flooding, and typhoon rainfall flooding on one map), critical services and the population projection for 2030, 2035 and 2045 at a village-level.

Map 3: Possible 2045 future state map showing a consolidated centers approach, resilient village strategies and a future land use approach.

2025

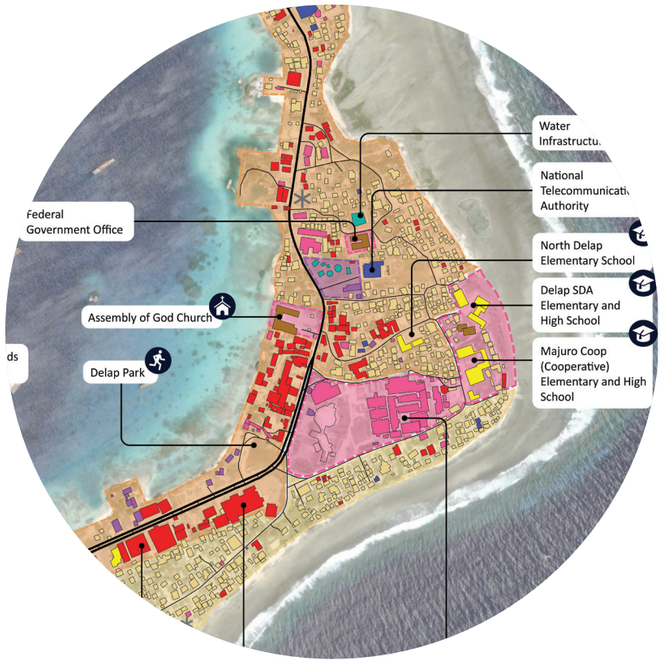
CURRENT

POPULATION CHANGE

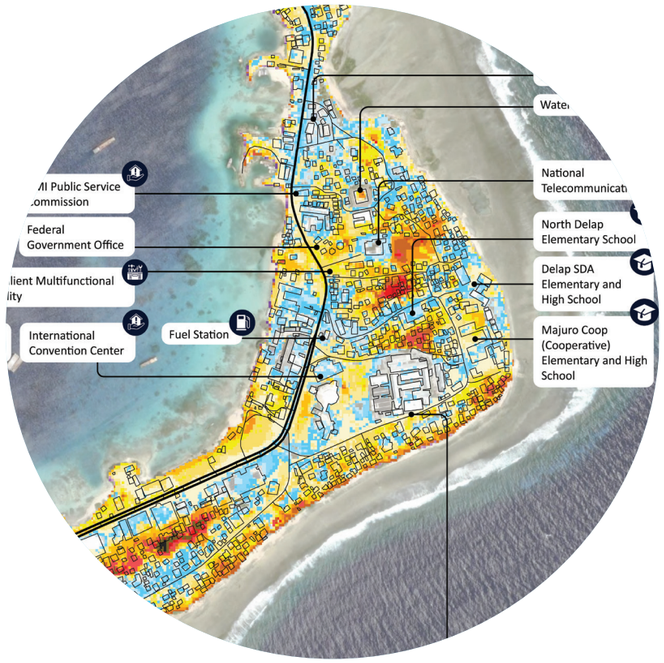
CLIMATE CHANGE

2045

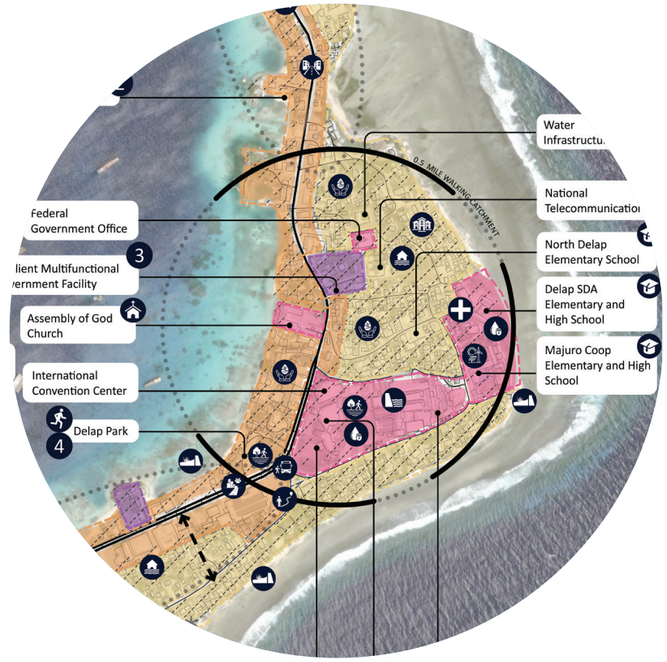
FUTURE




MAP 1 - CURRENT STATE
(EXISTING BUILDING AND LAND USE)




MAP 2 - ANTICIPATED CHANGE




MAP 3 - POSSIBLE FUTURE STATE
(RESILIENT VILLAGE STRATEGIES)

*Figure 3* - Resilient Village Plan Framework

## 2.2 VISION AND OBJECTIVES

The Master Plan vision and overall objectives that have been developed are summarized in Figure 4. Further detail is provided in **Section 2.3 Objectives and Principles** and **Section 2.4 Resilient Village Design Approach**. The vision articulates the long-term aspirations for Majuro and describes what success looks like in the future. The objectives break down the vision into measurable, actionable goals, and have helped to guide the approach to the development of resilient villages across Majuro.

### VISION

To create resilient, inclusive, and sustainable village plans from Laura to Ejit that address climate change, protect the environment, and enhance community well-being.

### OBJECTIVES AND PRINCIPLES

**1.** HEALTHY ADAPTIVE ENVIRONMENTS

- **1.1** Protect and enhance the life-sustaining ecosystems of Majuro
- **1.2** Provide multi-purpose and adaptive open spaces within consolidated centers
- **1.3** Build on the strengths and identity of each village to support their way of life into the future

**2.** RESILIENT FUTURE FOCUSED COMMUNITIES

- **2.1** Infrastructure and development able to avoid, adapt, or respond to climate change
- **2.2** Land use planning that supports healthy communities and economic resilience
- **2.3** Contributing to a positive legacy for future generations
- **2.4** To provide and enable housing upgrades that are resilient to future change

**3.** SAFE CONNECTED VILLAGES

- **3.1** Adapt the lifeline corridor to anticipated climate change hazards
- **3.2** Maintain and enhance connectivity
- **3.3** Safe and inclusive lifeline corridor
- **3.4** Promote walkable communities and proximity to community facilities

### APPROACH




*Figure 4* - Master Plan Objectives and Principles Framework

## 2.3 OBJECTIVES AND PRINCIPLES

### OBJECTIVE 1: HEALTHY ADAPTIVE ENVIRONMENTS

ENHANCE THE HEALTH OF MAJURO'S ATOLL ENVIRONMENT AND THE WELL-BEING FOR ALL PEOPLE



#### 1.1 PROTECT AND ENHANCE THE LIFE-SUSTAINING ECOSYSTEMS OF MAJURO (ATOLL, OCEAN REEF AND LAGOON)

**Outcomes**

- Developments should mitigate impacts on the natural environment of Majuro and where possible enhance them.
- All ecological areas of significance are identified and mapped on a publicly accessible GIS viewer.
- Food growing and freshwater sources are protected and enabled.
- Increased resilience to climate change hazards e.g. flooding, drought, rising air temperatures and erosion.
- Reduced waste contaminating marine and freshwater sources.
- Improved livability i.e. shade and urban cooling.
- Healthier ecosystems support sustainable livelihoods, including small scale agriculture, tourism, fisheries, and nature-based enterprises.

**Actions**

- Protect the health of marine areas through waste and water quality improvement projects
- Protect aquifer recharge areas (limit or avoid development), promote water storage areas as part of green spaces/buffer water storage areas.
- Protect mature trees to support shade and erosion control and identify areas for new tree and vegetation planting to protect coastlines, aid in flood mitigation, and provide windbreaks.
- Protect and utilize fertile soils for sustainable food production.
- Develop a waste management plan for each village that contributes to an overarching waste strategy for the Atoll.
- Utilize nature-based solutions that are adaptive and increase village resilience.



#### 1.2 PROVIDE MULTI-PURPOSE AND ADAPTIVE OPEN SPACES WITHIN CONSOLIDATED CENTERS

**Outcomes**

- Proximity to community open spaces promotes inclusivity and accessibility.
- Improved living conditions in urbanized areas that are flexible to the changing environment.
- Opportunities for flood resilience and ground water recharge.
- Shared community open spaces that facilitate a range of events to support stronger social bonds and connection such as community markets and local enterprise activity.

**Actions**

- Identify open spaces that can be developed to complement community facilities.
- Community open spaces to include universal design where possible.
- Identify low-lying flood prone land that could be developed into passive green buffers to attenuate flooding or act as water storage and support the development of adjacent land.
- Identify open spaces that can also serve as evacuation routes or spaces.



#### 1.3 BUILD ON THE STRENGTHS AND IDENTITY OF EACH VILLAGE (AS IDENTIFIED BY THE COMMUNITY) TO SUPPORT THEIR WAY OF LIFE INTO THE FUTURE

**Outcomes**

- Cultural sites of significance continue to be protected through land use and resilience planning change
- An appropriate level of infrastructure and amenity is provided to support community needs.
- The cultural and community values of each village are acknowledged and supported through land use and resilience planning changes.
- Cultural sites are protected to enhance opportunities for heritage-based tourism and cultural enterprise development.
- A sense of belonging and pride in each village through clear connection to history and identity of each village is supported.
- Local land ownership and cultural values are supported.
- Community-led tourism, creative industries, and local enterprises are supported.
- Development that is appropriate to the character and identity of each village.

**Actions**

- All cultural sites held special by the community are identified and mapped on a publicly accessible GIS viewer. These can include sites of cultural and historical significance, including tangible and intangible heritage relating to history, traditions and stories, archaeological sites, cultural landscapes, views, sacred places, traditional architecture and villages.
- Continue to recognize and reflect Marshallese culture and tradition in future developments including infrastructure, placemaking and community facilities. Identify the unique features and character of each village and the value they provide.
- Placemaking initiatives to support the unique character and destinations of each village.

## OBJECTIVE 2: RESILIENT FUTURE FOCUSED COMMUNITIES

BUILDING RESILIENCE THAT PUTS COMMUNITY WELLBEING FIRST



### 2.1 INFRASTRUCTURE AND DEVELOPMENT ABLE TO AVOID, ADAPT, OR RESPOND TO THREATS CAUSED BY CLIMATE CHANGE.

#### Outcomes

- More resilient communities that are less at risk of physical harm from climate change hazards.
- Existing infrastructure that better adapts to climate change hazards and new infrastructure designed with climate hazards in mind.
- Right sized infrastructure investment to support future population centers.
- Reduced climate-related disruptions help maintain access to markets, jobs, and essential services, strengthening long-term economic continuity.
- More resilient development and infrastructure lowers investor risk, supporting future public and private investment.
- Reduced long-term operational and maintenance risks and expenditure.

#### Actions

- Identify and prioritize land for future development that is least susceptible to anticipated climate hazards and population decline. Government investment and development to support the consolidated centers approach.
- Identify gaps in emergency shelter provision and proximity to communities and assess how these existing facilities meet the required standard. Existing churches, schools and community centers have been identified as potential emergency shelters. Once assessed shelters are to be improved with regard to resilience and preparedness.
- Post disaster reconstruction of existing infrastructure and housing to incorporates resilience design.
- A publicly accessible GIS map identifying the location of emergency shelters.
- Future infrastructure and development to consider prioritization of climate change upgrades.



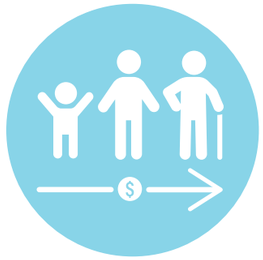
### 2.2 LAND USE PLANNING THAT SUPPORTS HEALTHY COMMUNITIES AND ECONOMIC RESILIENCE

#### Outcomes

- Resilient land is identified for future development and intensification.
- Consolidated village centers that encourage proximity of community to facilities and infrastructure within each village.
- Providing land use certainty and provision through landowner engagement to support the government's economic development priorities and strategies.
- Land use that supports and maximises the linear development and transport patterns of Majuro.
- Clear zoning and land-use certainty improve investor confidence, supporting local procurement, small business growth, and future enterprise development.

#### Actions

- Introduce a mixed-use zoning along the lifeline corridor where population supports this.
- Introduce a 'go carefully' land use area that applies to buildings and activities in areas vulnerable to natural hazards. It signals that any future redevelopment or new construction should consider the impacts of climate change.



### 2.3 CONTRIBUTING TO A POSITIVE LEGACY FOR FUTURE GENERATIONS

#### Outcomes

- Economic growth and productivity enables physical development, land use, infrastructure, and zoning, i.e. support development efficiencies and spaces where economic activity can happen.
- Coordinated land-use planning and targeted infrastructure upgrades strengthening Majuro's role as the national gateway for trade, services, and travel, creating the foundation for healthy communities and long-term economic resilience.
- Climate resilient infrastructure strengthens connectivity (digital and physical) and supports employment across construction, marine resource value-adding, renewable energy and services.
- More resilient infrastructure and improved connectivity supporting employment opportunities and encouraging private sector participation to enable diversified local economies.

#### Actions

- An economic development strategy that focuses on growing industries, attracting investment, and building workforce skills to enhance local employment.
- Identify the capacity for each village to contribute to the economic resilience of Majuro (e.g. service sector, fishing, construction, tourism and domestic consumption).



### 2.4 TO PROVIDE AND ENABLE HOUSING UPGRADES THAT ARE RESILIENT TO FUTURE CHANGE

#### Outcomes

- Improved living conditions and resilience to anticipated change.
- Improved condition, security, energy efficiency and suitability of homes. This will be assisted by providing a framework to facilitate good quality development standards.
- Improved building structures and design by providing a variety of design templates for future housing development within Majuro.
- A stronger sense of community within each village and groupings of homes by providing for communal amenities, enhancing safety and wellbeing.
- Upgraded, energy-efficient housing with reduced household energy costs, improving disposable income and economic stability.

#### Actions

- Maximize the use of existing resources. This may include the reduction of the number of long-term empty properties that both private and public sectors are responsible for, to meet housing needs.
- A housing strategy that guides resilience upgrades to existing housing and new housing development that is appropriate to Majuro supported by the National Building Code.

### 2.3.1 OBJECTIVE 3: SAFE CONNECTED VILLAGES

ACCESS TO CRITICAL INFRASTRUCTURE THROUGH INCREASED RESILIENCE



#### 3.1 ADAPT THE LIFELINE CORRIDOR TO ANTICIPATED CLIMATE CHANGE HAZARDS

**Outcomes**

- A resilient and safer road connection for villages to critical infrastructure, education and employment.
- Increased resilience of critical utilities and infrastructure within the Lifeline Corridor. Enhanced access to utilities within the lifeline corridor.
- Increased economic resilience for the Atoll.

**Actions**

- Identify and prioritize investment into resilience upgrades including coastal protection measures to support the lifeline corridor.
- Identify how the consolidated centers and lifeline corridor support each other.



#### 3.2 MAINTAIN AND ENHANCE CONNECTIVITY

**Outcomes**

- Improved road and sea infrastructure (road, wharf, jetty, boat ramps).
- More reliable transport routes reducing costs for goods movement and supporting local business activity.
- Increased transport connections and choices between each village (e.g. shared transport, private vehicle, boat, bus, walking and cycling).
- Transport resiliency upgrades that improve livability and economic outcomes of each village.
- Enhanced transport efficiency supporting supply chain reliability for fisheries, agriculture, construction materials, and tourism services.

**Actions**

- Identify transport needs for each village including the supporting infrastructure (e.g. shelters, sidewalks, lighting, drainage etc).
- Prioritize investment in new and existing transport connections for each village.
- Identify shared transport options to support regular and reliable access to employment, health and education.
- Identify improvements to road structure and circulation to reduce traffic congestion.



#### 3.3 SAFE AND INCLUSIVE LIFELINE CORRIDOR

**Outcomes**

- Reduction of deaths and injuries by improving safety along the lifeline corridor.
- Supports shared and active transport options, while reducing private vehicles use/congestion.
- Users will feel safe using the corridor and its connecting streets during the day and night.
- Safer transport corridors that reduce economic losses from accidents and improve day-to-day mobility for workers and students.

**Actions**

- Define and enforce safer speed environments within each village and surrounding schools.
- Increase sidewalks, lighting and shade provision along the lifeline corridor.
- Improve coastal protection and flood resilience of the lifeline corridor.



#### 3.4 PROMOTE WALKABLE COMMUNITIES AND PROXIMITY TO COMMUNITY FACILITIES

**Outcomes**

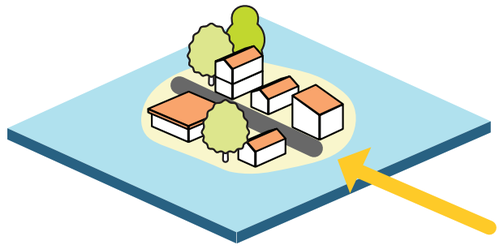
- Increased accessibility and use of community facilities.
- Support for shared and active transport choices.
- Support of a consolidated centers approach where investment is encouraged and can be focused to benefit a higher number of people.
- Consolidated centers approach enables focused investment into resilience measures.
- Walkable communities that reduce household transport costs and strengthen retail activity within village centers.

**Actions**

- Promote residential development within the consolidated centers.
- Identify opportunities for new or improved sidewalks connecting to community facilities.
- Consolidate and encourage future development with proximity to existing community facilities (e.g. emergency shelters, community centers, public schools and/or churches).
- Provide targeted resilience measures to consolidated centers as a priority.

## 2.4 RESILIENT VILLAGE DESIGN APPROACH

The six key approaches outlined below are the foundation for any actions aimed at making the Villages more resilient or implementing changes within each Village. These approaches for the development of resilient villages were informed by the Master Plan objectives and principles and support the consolidated centers strategy for Majuro. When applied together, these approaches support the long-term well-being and resilience of communities in Majuro.



### COMPACT AND WALKABLE

#### Linear Development Pattern:

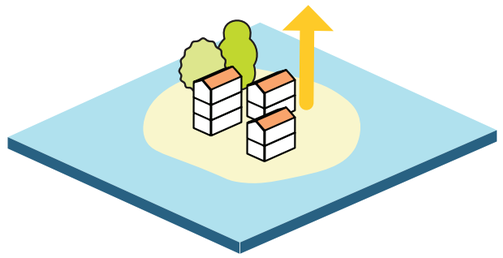
Majuro's declining population and geography supports a consolidated centers layout along the Lifeline Corridor. The Master Plan should:

- Consolidate and cluster future village growth around existing community facilities and where relevant along the Lifeline Corridor (with the exception of Ejit).
- Concentrate infrastructure and services along the main road corridor.

#### Encourage Compact and Mixed-Use Nodes:

Introduce small mixed-use clusters (housing + community facilities + micro-enterprises) to reduce travel distances and improve walkability.

- Future housing within the consolidated centers i.e. walkable catchments 0.25 miles from a community hub and school.
- Introduce Mixed Use zoning within the walkable catchments, where population supports this.
- Promote employment in each village.
- Provide tree lining/shading along main routes to encourage walking (including the Lifeline Corridor).



### RESILIENT HOUSING

#### Existing Housing:

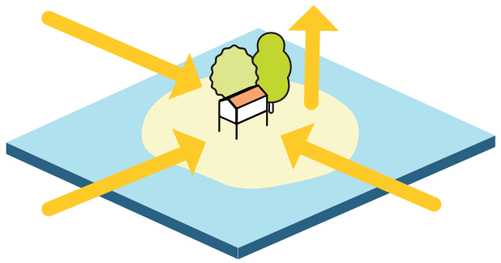
- Existing development in areas where flood depth is anticipated to be greater than 10 inches (0.25m) at daily high tide by 2055 (Climate Scenario SSP5-8.5) should either have flood management measures to reduce flood depth/frequency, be raised, or relocated.
- Use raising/regrading and local defenses only if it avoids displacing risk onto neighbors.

#### New Housing:

- No new residential development in areas where flood depth is anticipated to be greater than 10 inches (0.25m) at daily high tide by 2055 (Climate Scenario SSP5-8.5) without coastal protection or flood-adaptable building design.

#### Density Strategy:

- Encourage vertical development (2–3 stories) in consolidated centers to optimize land use and infrastructure including transportation.
- Apply clustered housing to share infrastructure, provide for wider family groupings and enable wind to pass through areas for cooling purposes.
- As more people live in multi-storey buildings, decide whether to use local or central systems for water and wastewater, and design the infrastructure to match.
- Upgrade water and sanitation systems to support clustered housing and higher population density to manage waste and resources better.



### HAZARD-INFORMED SITING

#### Climate Change-Informed Future Development:

Incorporate flood, storm surge, coastal erosion, and SLR projections and modelling into site selection and design of any future development.

#### High-tide and Erosion Prone Areas:

Avoid building new permanent structures or concentrating development within proximity of the high-tide zone or in erosion-prone areas unless coastal defences are proposed as part of growth consolidation or new structures are designed to accommodate flooding (i.e. a floodable first floor or raised structures).

#### Critical Infrastructure and Essential Services:

- Protection should be developed to maintain continuity of service during climate hazard or disaster events (for example, protected from present and future flood hazards greater than 10 inches (0.25m) of modelled flood depth).
- Room to adapt should be provided through creation of setbacks from the shoreline, coastal buffers and green spaces.
- Monitor for signals such as those based on community-determined unacceptable flood depths and frequency to understand when to upgrade or relocate to reduce risk.

#### High Flood Hazard Areas (modelled flood depth greater than 8 inches, or 0.2m):

Reserve these areas for low consequence uses or green space. These areas are favored for water retention as part of diverting waters away from adjacent developed areas.

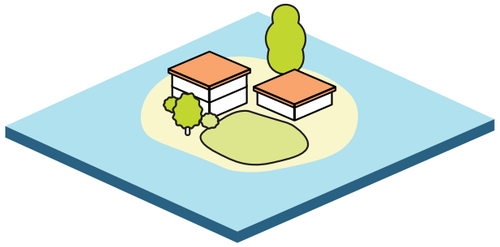
- Maintain appropriate setback zones from the shoreline to act as a coastal buffer and utilize nature-based solutions in preference to hard protection.
- New community facilities or existing critical infrastructure (i.e. schools, clinics, emergency shelters) located on highest available ground or elevated platforms, away from flooding and coastal erosion. No new critical infrastructure unless long-term risks can be avoided.

#### Mixed Use/Industrial/Commercial Zones:

- Protection should be developed against flood hazard areas of 10 inches (0.25m) or less (modelled flood depth).
- Areas with flood hazards greater than 10 inches (0.25m) should feature raised buildings or platforms, unless there is coastal protection in place.

#### Residential Zones:

See Resilient Housing section for residential guidance.



## MULTI-FUNCTIONAL SPACES

### Community Hubs:

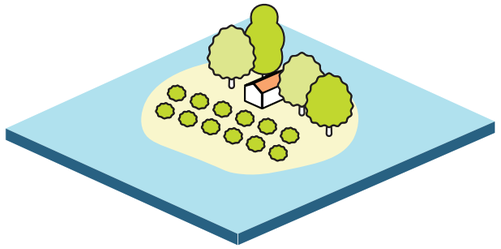
- Schools, churches and clinics designed to double as emergency shelters.
- Provision of humanitarian supplies and renewable power systems form part of the design and operation of these facilities.
- Repurpose vacant buildings where appropriate into a community use.
- Provide backup freshwater storage tanks at community hubs.

### Open Spaces:

- Outdoor gathering spaces/recreational areas to be provided with shading/tree canopy.

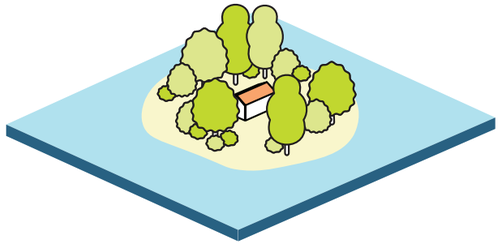
### Inclusive Design:

- Provide accessible community facilities for all ages and abilities
- Ramps, wide doorways, and accessible sanitation facilities in all public buildings.
- Improve access for people with disabilities and the elderly by incorporating universal design aspects, such as level or ramped entrances and paths, inclusive wayfinding and amenity, and adequate lighting, tactile cues, shelter, and rest areas.



## PROTECT AND ENHANCE THE ENVIRONMENT:

- Food growing and freshwater sources are managed, protected and enabled at a community level.
- Prevent waste, solid waste, and agricultural runoff from contaminating marine and fresh water sources.
- Provide more shade tree planting in urban areas and protect existing mature vegetation for shoreline protection, shade and urban cooling.
- Protect aquifer recharge areas (limit or avoid development), promote water storage areas as part of green spaces/buffer water storage areas.



## SUSTAINABLE INFRASTRUCTURE & UTILITIES

### Green Infrastructure:

- Green buffers and passive open spaces for stormwater absorption should be promoted in areas with flood depth greater than 0.67 feet (0.2m) and where water storage is required as part of diverting waters away from adjacent developed areas. These areas can be designed to flood as part of their intended function; designed to store and attenuate water and to protect adjacent sensitive uses. Align overland flow paths to these areas; design outlets and operations to protect adjacent sensitive uses and meet the zone standards
- Protect all mature trees to promote shade and erosion resilience. Plant salt and drought tolerant species that will provide shade, soil stabilization and shelter.
- Provide rain gardens and tree-lined streets for cooling and stormwater absorption within the consolidated centers.
- Identify appropriate locations for vegetated buffers along vulnerable shorelines.
- Provide permeable pavements and retention basins in green buffers/open spaces.
- Provide continuous drainage channels along the lifeline corridor.

### Water Security:

- Rainwater harvesting systems with appropriate treatment are integrated into future housing clusters, as feasible.
- Provide protection of the Laura groundwater aquifer from contaminants and agricultural runoff through effective environmental management.
- Effective, easy to maintain treatment, such as reverse osmosis or package units, for treating increasingly brackish groundwater in the Laura region and Ejit.
- Provide backup water storage tanks at community hubs.
- Provide enhanced protection and treatment of the large-scale rainwater catchment system in Rairok.

### Energy Resilience:

- Provide solar microgrids with battery storage for critical facilities.

### Resilient Lifeline Corridor:

- All-weather road with raised or bridged sections in flood-prone areas ensuring that neighboring land is not impacted by reduced access or by increased flooding.
- Enhancement of coastal protection methods to prevent wave overtopping of the lifeline corridor.
- Provide continuous drainage channels along the lifeline corridor.

### Shared Transport Nodes:

- Provide shared mobility stops at community hubs and employment zones.

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## 2.5 SCENARIO PLANNING

Three future scenarios for 2045 were developed through the Master Plan process to support the development of a spatial planning response. The development of the scenarios used variables of projected population decline along with the anticipated impacts of climate change.

### Scenario 1

Population decline based on current trends (30% population decline). Moderate climate change (SLR at **4.7in (0.12m) (SSP2-4.5),** rainfall changes and associated drought, increasing air temperature, and typhoon hazards)

| Climate Hazard | Anticipated Climate Parameter in 2045 |
|---|---|
| SLR[11] | 4.7 inches (0.12m), based on 2025 baseline |
| Increasing air temperatures[12] | Average mean surface air temperature:<br>27.5 to 28.3˚C (p10 to p90 certainty)<br>(average annual mean surface air temperature from 1950-2014: 26.7 ˚C) |
| Change in rainfall[13] | Average annual rainfall:<br>1,997 to 3054mm (p10 to p90 certainty)<br>(average annual rainfall from 1950-2014: 2,510mm) |
| Typhoons[14] | Median 5% increase in intensity, and median 17% increase in rainfall, based on global trend analysis |

***Table 8*** - Projected changes in climate parameters under a moderate climate change scenario

### Scenario 2

Population declines at a slower rate due to government interventions and incentives (15% population decline)

- Moderate climate change (SLR at **4.7in (0.12m) (SSP2-4.5),** rainfall changes and associated drought, increasing air temperature, and typhoon hazards) (see table above)

### Scenario 3

Population declines at a slower rate due to government interventions and incentives (15% population decline)

- Rapid climate change impacts (SLR at **6in (0.15m) (SSP5-8.5),** rainfall changes (SSP5-8.5), increasing air temperature (SSP5-8.5), and typhoon hazards)

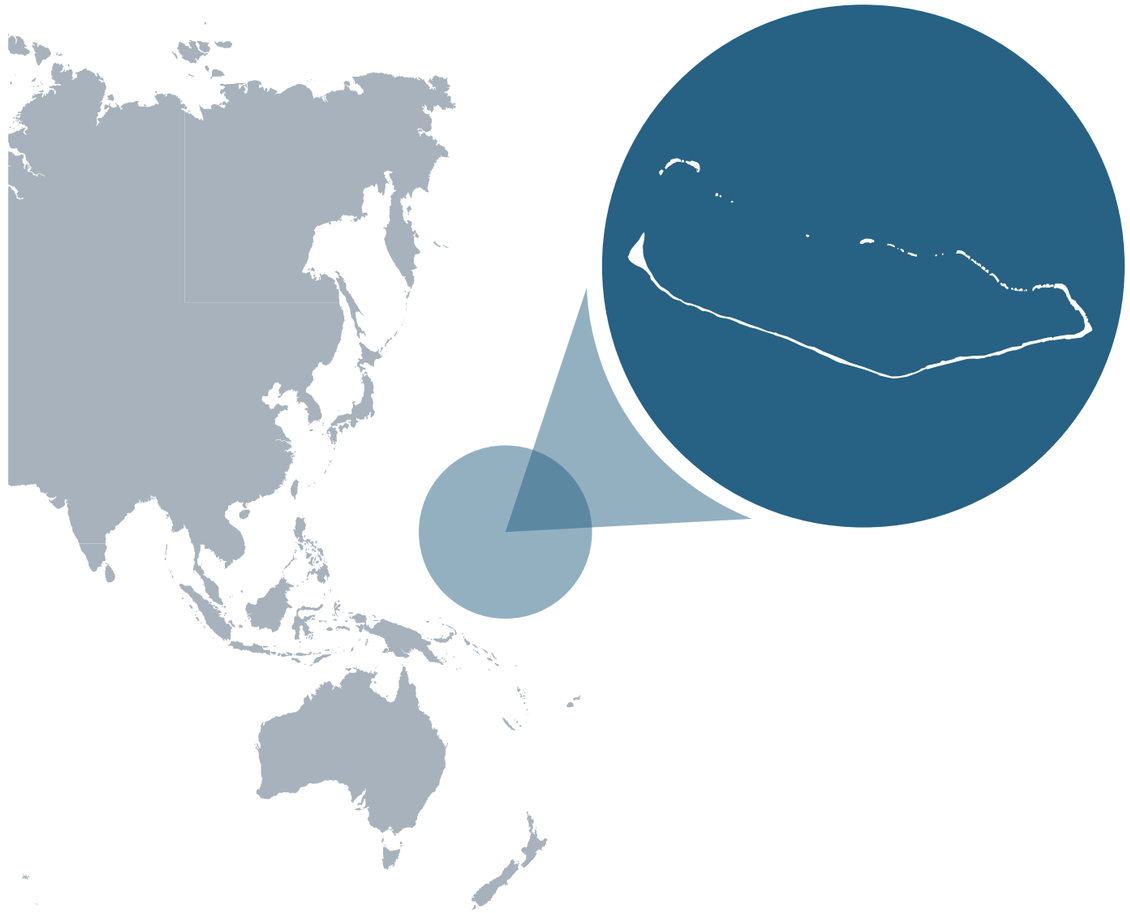
| Climate Hazard | Anticipated Climate Parameter in 2045 |
|---|---|
| SLR[15] | 6 inches (0.15m), based on 2025 baseline by 2045 |
| Increasing air temperatures[16] | Average mean surface air temperature:<br>27.7 to 28.6˚C (p10 to p90 certainty)<br>(average annual mean surface air temperature from 1950-2014: 26.7 ˚C) |
| Change in rainfall[17] | Average annual rainfall:<br>1,913 to 3,116mm (p10 to p90 certainty)<br>(average annual rainfall from 1950-2014: 2,510mm) |
| Tropical cyclones[18] | Median 5% increase in intensity, and median 17% increase in rainfall, based on global trend analysis |

*Deltares' flood model evaluates SLR at 10 inches (0.25m), which aligns with 2055 SLR based on 2025 baseline*

***Table 9*** - Projected changes in climate parameters under a rapid climate change scenario

**The Master Plan is based on Scenario 3**, which is the most conservative (or worst case) of the three climate variables explored and results in the most amount of land constrained by climate change. Scenario 3 combines a lower population decline than Scenario 1, which is based on the assumption that future Government interventions (public sector investment and funding) supports economic growth and improved quality of life outcomes (housing, health and education etc.) reducing outward migration. Scenario 3 has in turn shaped the spatial planning approach of 'consolidated centers' which addresses the declining population and the investment into villages and critical infrastructure such as the Lifeline Corridor signaled by the Government.

Scenario 3 is mapped in Section 3 of this report under the anticipated change plan, noting that the mapping is based on the Deltares' flood model of SLR at 0.25m as opposed to 0.15m used in Scenario 3.



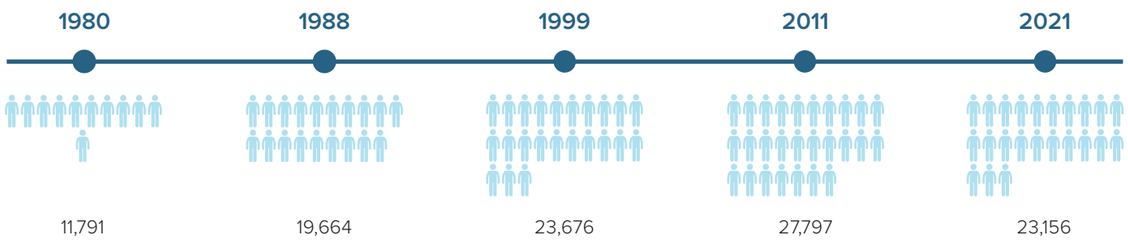



***Figure 5*** - Majuro population since 1980

11 *Tonkin & Taylor International Ltd. (2025b). RMI-URP-C2_D7-Eletutu detailed design report. Ministry of Public Works, Infrastructure and Utilities, Republic of the Marshall Islands*

12 *World Bank Group. (2026) Climate Change Knowledge Portal – Marshall Islands. https://climateknowledgeportal.worldbank.org/country/marshall-islands/climate-data-projections*

13 *World Bank Group. (2026) Climate Change Knowledge Portal – Marshall Islands. https://climateknowledgeportal.worldbank.org/country/marshall-islands/climate-data-projections*

14 *Knutson, T., Camargo, S., Chan, J., Emanuel, K., Ho, C.-H., Kossin, J., ... Wu, L. (2020). Tropical cyclones and climate change assessment: Part II: Projected response to anthropogenic warming.*

15 *Tonkin & Taylor International Ltd. (2025b). RMI-URP-C2_D7-Eletutu detailed design report. Ministry of Public Works, Infrastructure and Utilities, Republic of the Marshall Islands*

16 *World Bank Group. (2026) Climate Change Knowledge Portal. https://climateknowledgeportal.worldbank.org/country/marshall-islands/climate-data-projections*

17 *World Bank Group. (2026) Climate Change Knowledge Portal. https://climateknowledgeportal.worldbank.org/country/marshall-islands/climate-data-projections*

18 *Knutson, T., Camargo, S., Chan, J., Emanuel, K., Ho, C.-H., Kossin, J., ... Wu, L. (2020). Tropical cyclones and climate change assessment: Part II: Projected response to anthropogenic warming.*

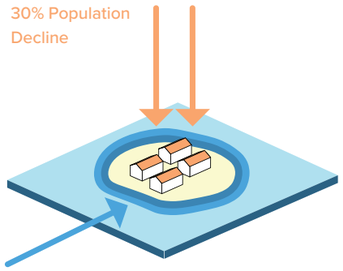
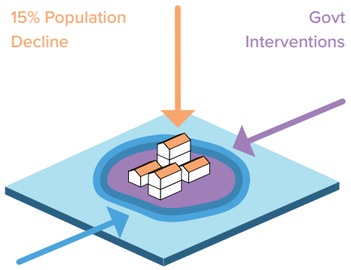
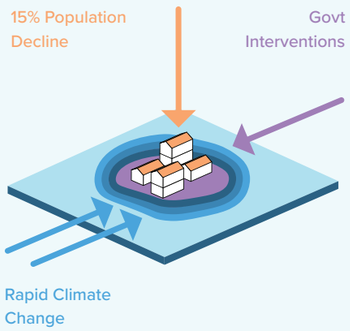
| Scenarios 2045 | Description | Outcome | Response |
|---|---|---|---|
| **Scenario 1 - Population Decline (-30%) and Moderate Climate Change (SSP2-4.5)**<br> | Population decline based on current trends (-30%) Moderate climate change (SLR ≤4.7in (0.12m)), rainfall changes, increasing air temperature, and typhoon hazards).<br><br>This scenario is the middle of the road climate change pathway, where global, social, and economic trends related to climate change mitigation are similar to historical trends. CO2 emissions remain around current levels until the middle of the century. | Significantly less population across Majuro and challenges with viable village population (for example 272 residents across the 4 villages in Laura).<br><br>Internal migration and consolidation to more resilient urban centers such as DUD for community structure and longer-term infrastructure resilience.<br><br>Increased amount of land constrained by flood hazards (from SLR, rainfall events, coastal events like king tides, swell waves, storm surge, and typhoons) in comparison to 2025. | Support development and infrastructure around viable village populations (urban centers) to increase resilience of supporting infrastructure (for e.g. lifeline corridor).<br><br>Assumes coastal protection and Nature Based Solution interventions (vegetated buffers). |
| **Scenario 2 - Population Decline (-15%) and Moderate Climate Change (SSP2-4.5)**<br> | Population declines at a slower rate due to government interventions and incentives (-15%) Moderate climate change (SLR ≤4.7in (0.12m)), rainfall changes, increasing air temperature, and typhoon hazards)<br><br>Government interventions (public sector investment) that support economic growth and improved quality of life outcomes (housing, health and education etc.) reducing outward migration.<br><br>This scenario is the middle of the road climate change pathway, where global, social, and economic trends related to climate change mitigation are similar to historical trends. CO2 emissions remain around current levels until the middle of the century. | Internal population redistribution (outer islands and less resilient areas of Majuro). Localized populations increase in resilient centers such as DUD.<br><br>Villages are more viable from a population perspective so more investment to improve resilience in existing villages where it makes sense.<br><br>Less change for landowners/current village structure.<br><br>Increased amount of land constrained by flood hazards (from SLR, rainfall events, coastal events like king tides, swell waves, storm surge, and typhoons) in comparison to 2025. | Consolidate and promote growth in villages that can be resilient to future changes across Majuro.<br><br>Assumes coastal protection and Nature Based Solution interventions (vegetated buffers). |
| **Scenario 3 - Population Decline (-15%) + Rapid Climate Change, (SSP5-8.5)**<br> | Population declines at a slower rate due to government interventions and incentives (-15%) combined with rapid climate change impacts (SLR ≥6in (0.15m)), rainfall changes, increasing air temperature, and typhoon hazards)<br><br>This scenario is characterized by fossil-fueled development where the desire for economic and social development is tied to the use of excessive fossil fuels and worldwide energy-intensive lifestyles. CO2 emissions roughly double from current levels by 2050, and other emissions are exceedingly high. | Increased number and severity of hazards compromising land to accommodate the same population.<br><br>Results in the most amount of land constrained by flood hazards (from SLR, rainfall events, coastal events like king tides, swell waves, storm surge, and typhoons) in comparison to 2025. | Assumes some land and dwellings will need to be raised or land reclamation may be required to meet project objectives.<br><br>Increase levels of resilience for supporting infrastructure (e.g. lifeline corridor, coastal protection). |

***Table 10*** - Scenario Table




*Map 4* - Majuro Master Plan typologies

## 2.6 SWOT ANALYSIS

A Strengths, Weaknesses, Opportunities, Threats (SWOT) analysis was prepared with insights from engagement with stakeholders, including communities and landowners. This informed the opportunities and constraints that were shared with the spatial maps and strategies as part of the engagement for the draft Resilient Village Plans. The full SWOT analysis is provided in **SWOT Analysis - Strengths, Weaknesses, Opportunities, Threats (refer to Appendix C)**, and a description of what is considered in a SWOT analysis is noted in Table 11 - SWOT Category Table.

The SWOT analysis has been grouped by the village typology (rural, connectors, urban and island) as shown in Map 4 and a summary of each typology identifying the key constraints for future planning is provided in the following sections. Many of the SWOT characteristics are consistent across all villages in a typology. Where differences exist, these are called out for the specific village within the SWOT table in the - SWOT Analysis (refer to Appendix C).

### SWOT Lenses and Components

The SWOT categories were assessed through four lenses and their associated components. The lenses consist of; 1. environment, topography, and natural resources; 2. land use, economics, and social services; 3. transportation and connectivity; and 4. infrastructure. These align with the project objectives to enhance livability, support economic growth and protect the environment. The SWOT categories are defined in Table 12, which is followed, overleaf by a summary of the key findings for each village typology.

| SWOT Category | Definition | Timeframe and Conditions |
|---|---|---|
| Strengths | Components of the village that have the capacity to adapt to uncertain future changes, such as climate change impacts, population changes, or economic changes, or components that strengthen the community's ability to adapt or prevent negative consequences. It also includes those aspects of a village that contribute to livability and day-to-day functions of the village. | Present-day |
| Weaknesses | Sensitivities within the village that either limit the ability to adapt to uncertain future changes or aspects that increase vulnerability to negative impacts from uncertain changes. It also includes those aspects that may take away from livability and day-to-day functions of the village. | |
| Opportunities | Emerging trends, funding/financing programs, or investments in resilient infrastructure that offer capability to meet or exceed the Majuro Resilient Villages Master Plan objectives. | Present-day to 2045, where a high degree of change has occurred (rapid climate change, population changes, economic changes, etc.):<br>Approximately 0.15 m SLR plus coastal flooding in 2045 or 0.25m in 2055.[19] |
| Threats | The climate change hazards, economic threats, population shifts, and other factors and the consequences posed by them between now and 2045. | |

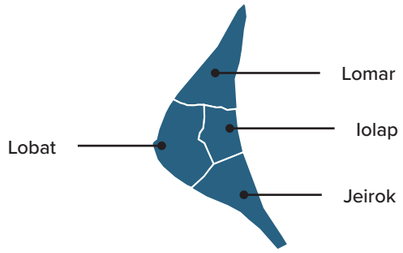
***Table 11*** - SWOT category table

| Lens | Component | Description |
|---|---|---|
| 1. Environment, Topography, and Natural Resources | Elevation/Topography | Elevation refers to the height of the land above sea-level, while topography refers to physical land features. |
| | Water/Soil Resources | Water resources include surface water, groundwater (aquifers), and rainwater. Soil resources refer to soil for agriculture, forestry, and biodiversity. These elements are critical to sustaining the village's way of life by providing drinking water and arable land for food production. |
| | Vegetation | Refers to the collective plant life or plant cover in an area, critical for shade, green space, and coastal protection. |
| 2. Land Use, Economic, and Social Services | Land Use | Land use types, such as residential areas, agriculture/food production, commercial/industrial use, recreational use, religious or traditional use, and government use. This component also considers the implications of Majuro's land ownership system. |
| | Economy/Employment | Economic and employment factors for the village, such as infrastructure funding capabilities, employment and income generating activities, changes resulting from migration patterns, and economic growth, which have the ability to impact land use and spatial planning. |
| | Social Services (including access) | Public or private programs and activities designed to support individuals, families, and communities in meeting basic needs and improving well-being, such as education systems and facilities, healthcare systems and facilities, religious facilities, community centers, sports grounds, and other recreational or community-based aspects of village life. |
| 3. Transportation and Connectivity | Road Transport/Bridges | Road transport/bridges refer to the aspects of these assets, as well as the ability for movement of people, goods and services using vehicles and roads. |
| 4. Infrastructure | Coastal Protection | Coastal protection structures include seawalls, groynes, breakwaters, revetments, other informal structures, and nature-based protection. |
| | Buildings | Buildings include residential, commercial and public buildings. |
| | Water Systems | Water systems include drinking water supply networks (pipes), community and private rainwater catchment and storage, large-scale rainwater catchment, and groundwater wells (boreholes). |
| | Stormwater/Drainage | Stormwater/drainage infrastructure refers to the conveyance systems that collect and divert excess stormwater to prevent flooding. |
| | Wastewater Systems and Solid Waste Management | Wastewater systems involve the collection, treatment and disposal of water used in homes, industries and businesses. Solid waste management involves collection and disposal of municipal, industrial, agricultural or hazardous waste. |

***Table 12*** - SWOT lens table

19 *Tonkin & Taylor International Ltd. (2025). RMI-URP-C2_D7-Eletutu Detailed Design Report. Ministry of Public Works, Infrastructure and Utilities, Republic of the Marshall Islands*

## 2.6.1 SUMMARY OF KEY CONSTRAINTS FOR FUTURE PLANNING OF RURAL TYPOLOGY (LAURA)




### Cutting off Laura from Rairok, the airport, port, hospital, and DUD area:

If parts of the Woja Causeway become impassable, the Laura region will lose access via land transport to Rairok, the airport, the port (and food and fuel imports), the hospital, other critical services, and the DUD area, which is important for access to services and employment. Additionally, long travel distances along a linear road network to the DUD region already challenges access to critical services in the DUD, while local services within Laura are at risk from SLR.

### Transportation disruptions around Laura during extreme weather events:

Laura's road network is in poor condition, lacks drainage, and is highly vulnerable to flooding, creating transportation disruptions during extreme events. Alternative transport options are limited, and sea connectivity is constrained by limited public docks and wharves.

### Limited coastal protection leaves land more vulnerable to coastal inundation:

Coastal protection is minimal, leaving most of the shoreline exposed to erosion, SLR, and wave overtopping during coastal events, which means that significant portions of the villages are at risk of flooding, particularly in low lying areas where taro agriculture occurred.

### Water security is threatened by seawater intrusion and increasing drought:

The Laura groundwater lens faces challenges associated with seawater intrusion, contamination, and drought depletion. Household rainwater catchment systems often overflow and lack treatment, while reduced rainfall limits capture during dry periods.

### Existing infrastructure is challenged and needs enhancement to improve resilience:

Many buildings are flood-prone, stormwater systems are absent, and wastewater reliance on septic tanks threatens groundwater quality and marine environments.

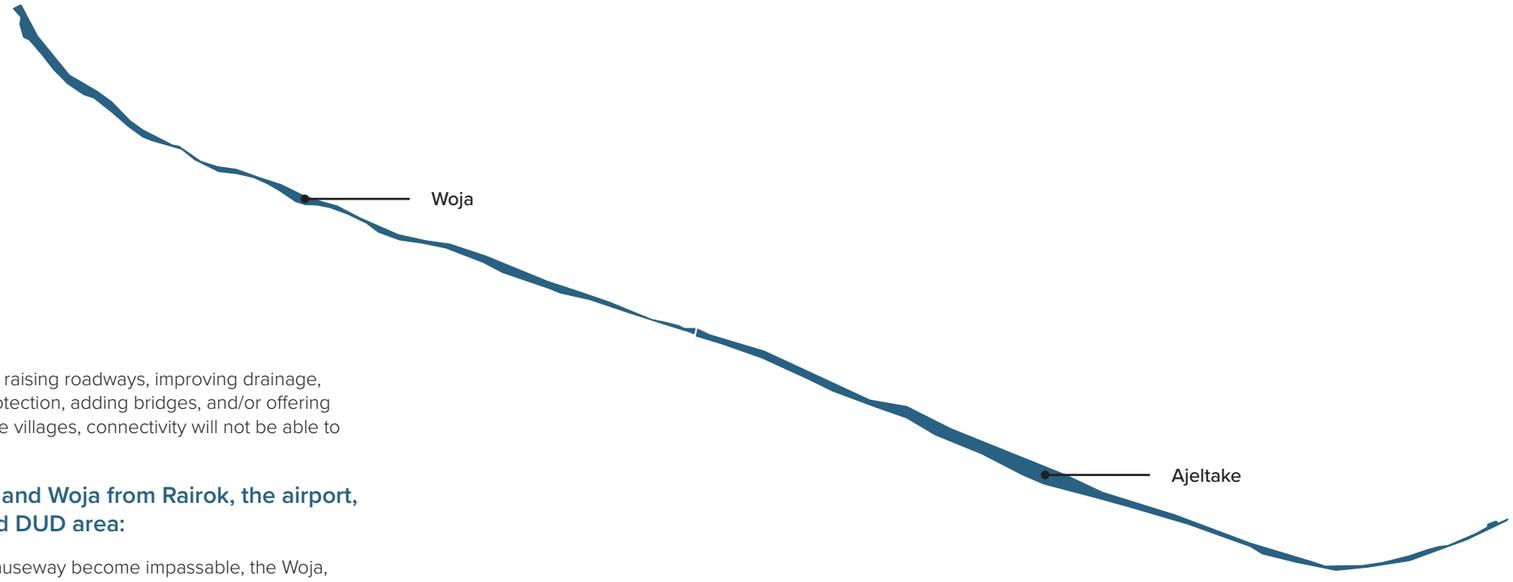
### An economy dependent upon agriculture with much employment located in distant DUD:

Laura's economy depends heavily on agriculture, making it vulnerable to climate impacts like drought and salinization. Its distance from the main economic hub limits employment and access to services.

## 2.6.2 SUMMARY OF KEY CONSTRAINTS FOR FUTURE PLANNING OF CONNECTOR TYPOLOGY - WOJA AND AJELTAKE

### Reliance on road transport only, with no known boat docks for Woja and Ajeltake. These villages are likely to be segmented into multiple small islets periodically due to flooding and inundation by 2055:

With future SLR (10 inches (0.25m) in 2055) and coastal flooding, as well as rising groundwater levels that impact road pavement and stability, there are multiple segments of the road that will be inundated and very likely impassable, segmenting these villages into multiple small islands. Without carefully considering interventions, such as raising roadways, improving drainage, enhancing coastal protection, adding bridges, and/or offering boat transport to these villages, connectivity will not be able to be maintained.




### Cutting off Laura and Woja from Rairok, the airport, port, hospital, and DUD area:

If parts of the Woja Causeway become impassable, the Woja, Ajeltake and Laura areas of Majuro will be cut off from Rairok, the airport, the port (and food and fuel imports), the hospital, other critical services, and the DUD area, which is important for access to services, employment and higher education.

### There are no medical facilities in Woja or Ajeltake apart from a medical clinic at the Ajeltake Community Center:

For hospital care this means residents must travel to DUD or Laura, which will be problematic if the road becomes impassable.

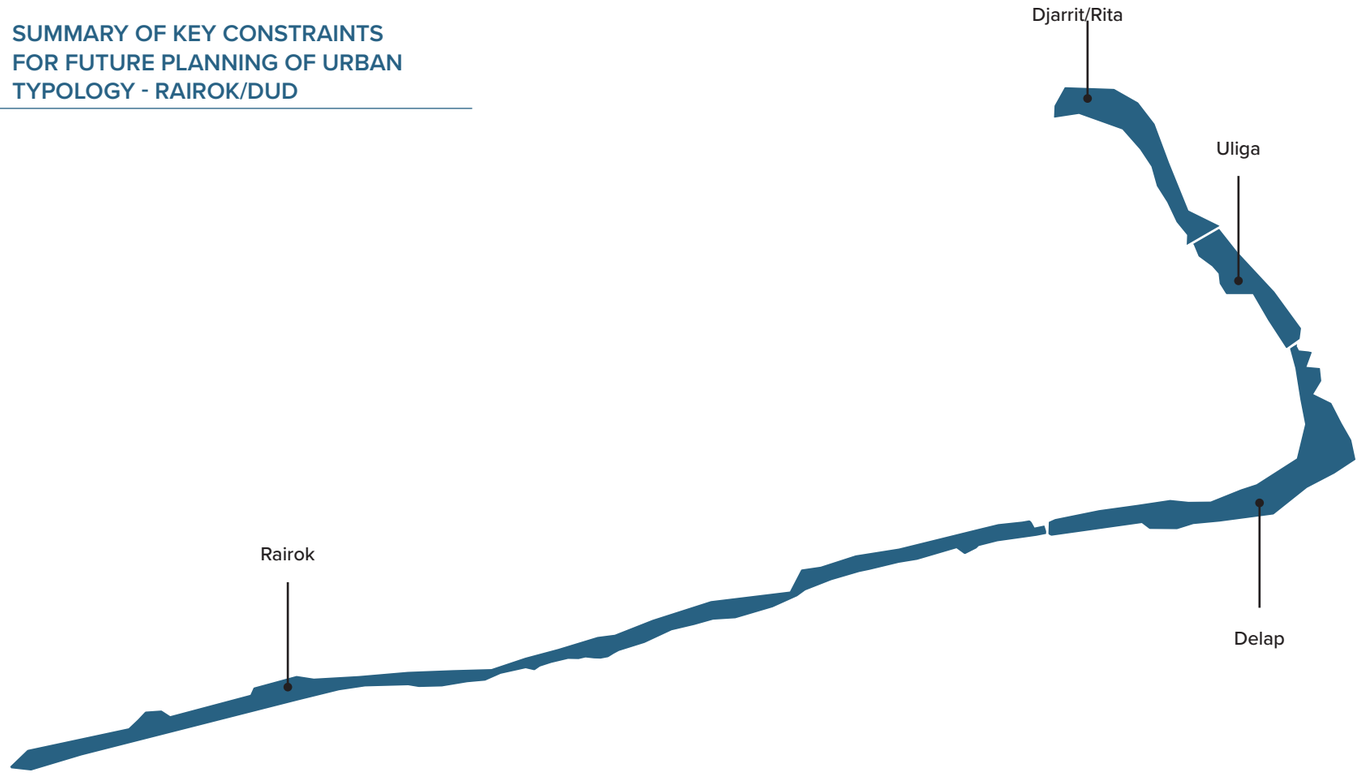
### Long, narrow, and limited amount of land not in a flood zone with few areas to move buildings:

Because Woja and Ajeltake are quite long and very narrow (about 800 feet (250 meters) at the widest section), all buildings are set close to the coast, and many are already subject to flooding. There is limited space to move them to higher ground or non-flood zone areas, so other alternative, resilient design methods would need to be considered.

### Limited drinking water supply:

For both Woja and Ajeltake, increased drought levels will further reduce rainwater available for drinking water supply. There are limited connections to the groundwater supply currently, except for the LiModrel well in Woja. The possibility for future connection to diversify the water supply may be limited due to difficulties with connecting pipes across a segmented atoll due to SLR and coastal flooding.

## 2.6.3 SUMMARY OF KEY CONSTRAINTS FOR FUTURE PLANNING OF URBAN TYPOLOGY - RAIROK/DUD




### Significant flooding of buildings, houses, and key services:

Most (approx. 60-90%) buildings in Uliga and almost all (approx. 90-100%) buildings in Djarrit/Rita, Delap, and Rairok are at risk from flooding due to 10 inches (0.25m) SLR with coastal flooding (anticipated by 2055 under SSP5-8.5), taking into consideration the coastal protection measures already in place during the time of modelling by Deltares. This is exacerbated by gaps in coastal protection or areas that need design/construction improvements to avoid damage and overtopping.

### Coastal flooding impacts on regionally critical infrastructure (Airport and Wharves):

The airport, Uliga Wharf and Delap Dock are already subject to coastal flooding and damage, with more impacts expected due to SLR/climate change. Tidal flooding is also already experienced due to backflow through drains during high tides, particularly in the area of Lojkar. This has the potential to impact travel regionally and internationally and to complicate the distribution of food, fuel, and other goods for all of Majuro.

### Limited Drinking Water Supply and Possible Contamination of Supply:

The drinking water supply has been limited during droughts due to decreased volumes of water in rainwater catchments, especially in areas with high development and population. Based upon Deltares' flood modelling, which did not include recently installed (2025) coastal protection measures, the centralized rainwater catchment near the airport is subject to coastal flooding/overtopping, putting it at risk of seawater contamination. The recent (2025) construction of an additional reservoir and associated protection should reduce this risk; however, improvements to the existing reservoir's coastal protection is required. There are some private groundwater wells in DUD which present an opportunity for water supply diversification, but they may be subject to seawater intrusion as the sea-level rises.

### Land for development and change is limited and challenging:

Land is at a premium in this area. Changing building arrangements and types will require the cooperation and the agreement of landowners.

### Disruptions for Road Transport:

Coastal flooding will continue to threaten and impact roads across Rairok and the DUD. SLR could result in the roads flooding with greater frequency, decreasing accessibility as well as worsening the condition of the roads (i.e., increase of potholes).

SLR and coastal flooding may periodically sever access from DUD to the airport along the central road connector.

Traffic concerns already exist, so further consolidation of population in this area will exacerbate this issue. Additionally, as there are no alternative modes of transport (for example ferries or buses) or contiguous footpaths across the atoll, impacts on travel are felt acutely.

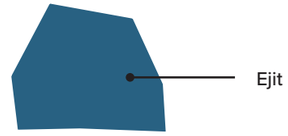
### The Jable Landfill presents a major environmental hazard:

The Jable Landfill is nearing capacity and is vulnerable to SLR and coastal inundation, leachate leakage, and erosion during storm surges, which presents a major environmental hazard. The possibility for landfill relocation has been discussed (Solid Waste Management Plan for Majuro – 2019-2028, but a location for a new site not yet known).

### Reliance on "The Bridge":

The bridge connects Delap to Rairok. If it is damaged (due to typhoon or other reasons), land access between the DUD and the western part of the atoll (including the airport and communities in Rairok, Woja, Ajeltake and Laura area) would be impossible. This would limit the access to goods and fuel for the western villages of the atoll. Additionally, provision of services which utilize or are in the vicinity of the bridge could be impacted notably the provision of water from the airport catchments to the DUD area.

## 2.6.4 SUMMARY OF KEY CONSTRAINTS FOR FUTURE PLANNING OF ISLAND TYPOLOGY - EJIT




### Significant, potentially catastrophic flooding of the islet:

10 inches (0.25m) of SLR with coastal flooding (indicative of rapid climate scenario by 2055) projects that approximately 80-90% of Ejit will be flooded. Currently, there is limited coastal protection in place for Ejit, with existing concrete wall protecting about 30% of the coastline, predominantly on the eastern side of the island. Even when a coastal/storm event is not occurring, 10 inches (0.25m) of SLR alone has a significant impact on land and the wharf. There is little land for relocation of buildings.

### Limited drinking water supply:

Ejit relies either on rainwater catchment, a shallow (10-12 meters) groundwater source, or water imports from other parts of the atoll. Rainwater catchment faces shortages during droughts, while the reverse osmosis unit used to treat brackish groundwater is also frequently inoperable and in need of repairs, leaving well water undrinkable. Importing water is not a resilient practice and potentially a problematic solution due to reliance on limited fuel supplies for boat transport which is challenged during extreme weather events and particularly if the existing wharf becomes inaccessible.

### Reliance on boat transport and infrastructure that is not fit for purpose to access services and jobs:

The boat wharf is already damaged and at risk of flooding/inundation. It is the only means of transporting goods and is the primary means of access as there are no roads or bridges connecting Ejit to the rest of the atoll.

## 2.6.5 CONSTRAINTS MAPPED IN SECTION 3 OF THE MASTER PLAN

Resilient village profiles and plans are provided for each village in **Section 3 of the Master Plan**. Alongside a multi-hazard map commentary for each village on the climate hazards and risk is provided. The multi-hazard flood map shows high tide at 10 inches (0.25m) SLR, swell waves at 10 inches (0.25m) SLR, non-typhoon rainfall flooding, and typhoon rainfall flooding. The information on this map has informed the land use mapping and strategies in the last of the series of three maps, the future state maps, that are included in Section 3 of the Master Plan.

Individual hazard maps showing the extent of the physical hazard were prepared at the village-level for the first stakeholder engagement in July and August 2025. These maps contained in the **Village hazards maps (refer to Appendix G)** show SLR, rainfall-based flooding and typhoon flooding. Wind was not mapped due to the lack of data however it is acknowledged that strong winds pose a real climate risk.

## 2.7 LAND USE AND TRANSITIONAL AREAS

The Resilient Village Plans identify the possible future land use scenarios that could apply across the atoll. They will inform the plans that will be required under the Planning and Zoning Act, which is presently under development. The Planning and Zoning Act is intended to provide a framework for the future planning, zoning and Master Planning of the Republic of the Marshall Islands and will require plans that map the geographic extent of different zones. The Resilient Village Plans therefore provide the foundation for these future plans by setting out the broad land use categories and areas that will then be translated into zones in the future.

Land use is a term that describes the functional intent of land. It is meant to be broad in scope, capturing the general use or purpose of an area, rather than capturing all the specific activities that are located within it. Importantly, land use is highly dependent on context. In determining the land use classifications on Majuro, aerial surveys and site visits were conducted to understand how land was used. Factors considered were the distribution of homes, the location of commercial and industrial activities, and whether these uses were in combination with others or were isolated/on their own. As a result of this analysis, five different types of land uses were identified across the atoll. These are outlined in Table 13.

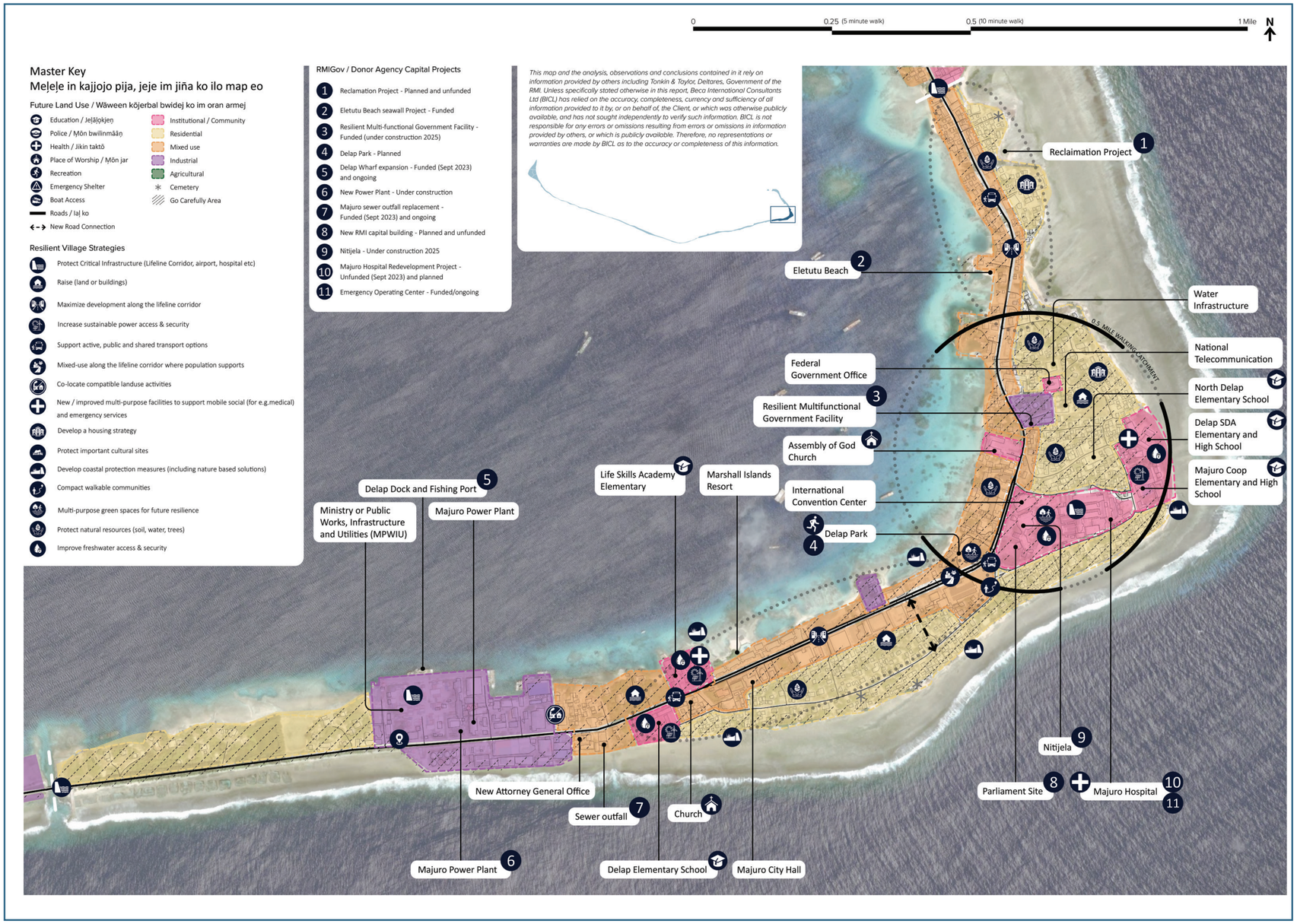
| Land use | Description |
|---|---|
| Institutional/ Community | This consists of land used for social or public purposes, including religious buildings, charitable organizations, and educational facilities. In some areas, it also include parks, sports fields, and community spaces for activities and recreation, for example areas set aside for public enjoyment that are accessible to the public. |
| Residential | It consists predominantly of land used for homes/dwellings. In Majuro, residential land also includes small shops, churches and cemeteries interspersed throughout. |
| Agricultural | Large areas of contiguous (connected) land that is used to produce crops or grow natural resources for consumption and use. |
| Industrial | Land used for manufacturing, processing, warehousing, storage of fuel and other industrial operations. |
| Mixed Use | As the name implies, this comprises areas of land that contain a mix of land use types that are in close proximity to one another. This is typically a mix of residential and commercial. In Majuro, some mixed land use also includes land that is used for industrial purposes. |

***Table 13*** - Land use category table

In addition to the above land uses, a "go carefully" area has been applied on land across parts of the atoll. This transitional area recognizes that parts of the atoll are subject to several natural hazard risks. The purpose of this overlay is to:

*apply to buildings and activities in areas vulnerable to natural hazards. It signals that any future redevelopment or new construction should be designed to manage risks like SLR and adapt to the impacts of climate change. Consideration should be given to the appropriateness of any new development in these areas.*

The "go carefully" area in this Master Plan shown with a diagonal hatch applies to areas identified as being at moderate, major, or extreme risk of flooding from multiple hazards, based on 50-year return period events such as swell waves, typhoon-related rainfall combined with storm surge, and non-typhoon rainfall.




***Map 5*** - Example of land use catagories shown on the future state resilient village plans

## 2.8 STAKEHOLDER ENGAGEMENT

Community insight and feedback is central to the development of the Resilient Village Plans.

Community consultations were held in two primary stages, a first and second round of stakeholder engagement. The first round of community consultation was undertaken through July and August 2025 with the second round of engagement completed during November and December 2025.

**July and August 2025 engagement (refer to Appendix D)**

The purpose of this round of consultation was to:

- Distribute project information.
- Gather environmental, social, cultural and land use information to shape the Master Plan.
- Listen to what the community and stakeholders shared and develop an understanding of the issues and aspirations of stakeholders for the development of the Resilient Village Plans.

| Date | Community | Attendees | Males | Females |
|---|---|---|---|---|
| 14 July 2025 | Laura | 37 | 25 | 12 |
| 19 July 2025 | Rairok-DUD | 48 | 19 | 29 |
| 26 July 2025 | Ajeltake and Woja | 20 | 14 | 6 |
| 8 Aug 2025 | Ejit | 22 | 17 | 5 |
| Total | | 127 | 75 | 52 |

*Table 14* - July/August community engagement attendance

During the consultation, four key questions were posed to the communities:

1. What is important to you for daily life in your village. What needs to be kept? What are important places beyond your village area that are part of your daily life?
2. What is an issue that makes living in your village harder now?
3. What climate issue worries you most about the future and why? What issues are you willing to live with – certain amounts of SLR? Over topping from storm surges? When is this not tolerable?
4. What do you want for the future of your village for your children and grandchildren? What positive changes do you want to see that would maintain you and your family's wellbeing?

When asked what was important in their daily life in their village and beyond, and what was important to be retained, most participants commented on the importance of clean and safe drinking water and the social services that existed with their communities, although improved access to social services was noted. Participants also commented on the importance of trees and vegetation within their areas, which they valued for the shade they provided, and areas with stormwater drainage were also highly valued. Due to the narrow and low-lying characteristics of their villages, participants from Ajeltake and Woja highlighted the need to protect community assets (churches, schools, etc.) which were at risk during storm surge events. Participants highlighted that, not only do these assets provide important social services, but they are also places of refuge during emergency events. Additionally, these participants commented on the lack of wharves and jetties meaning increased reliance on the road network which they stated was vulnerable to flooding, at times isolating these communities from important services and infrastructure. The community from Ejit noted concerns related to the physical separation from the rest of Majuro, which created a sense of isolation from infrastructure and services that were provided on the wider atoll.

Most participants commented on the limited economic and social opportunities, their experiences of flooding and inundation plus concerns regarding coastal erosion and degradation. Participants also expressed significant concern around the impact of these changes on economic and social vulnerability leading to further movement away from Majuro. Participants also commented on connection into and with the DUD area, especially the lack of suitable public transportation options, traffic congestion, delays and safety. Participants also voiced concerns over contamination and environmental degradation, particularly wastewater systems and discharges.

For the future changes, participants across all communities expressed a desire for younger generations to have the opportunity to live safely through improved transport options and roading, enhancing economic and social opportunities, and the implementation of nature-based solutions to protect the coastline alongside their villages.

**November and December engagement 2025 (refer to Appendix E)**

The purpose of this engagement was to:

- Discuss the anticipated changes and impact with the landowners based on the development of the Resilient Village Plans and the scenarios provided within these plans.
- For the design team to present the land use options that can be taken that will maintain the livability and wellbeing of the residents of these villages (infrastructure, economics, health).
- Based on the above, for the landowners and communities to provide their feedback and support on the proposed approaches.
- Provide the project team with feedback and information to validate the plans, and/or make updates to these plans. The November/December round of project engagement was important for the project team as it was the first opportunity for them to engage directly with landowners. Table 15 lists the dates of landowner engagement sessions and numbers of attendees.

The consultation with communities within each village area is provided in Table 16, outlining the number of males and female attendees. The attendee numbers that have an asterisk beside them are estimated based on attendance sign in sheets, and photographs, as not all attendees signed into the meeting.

| Bukwon/ District | Date | Landowners Present | Wetos Represented |
|---|---|---|---|
| Rita | 1 December 2025 | 7 | Lokonmok, Utrikkan, Tiete, Alwal, Ioonmaaj, Teron, Tur |
| Uliga | 2 December 2025 | 5 | Barkan, Toeak, Binbin |
| Delap | 4 December 2025 | 15 | Delap, Mokeo, Mejelok, Lomar, Monbon Wotje, Lokjbra, Mwejelok, MonKotom, Lukon Jein, Ututwe, Eonmaaj, Jebel, Mon worwor |
| Rairok | 4 December 2025 | 3 | Jejeikik, Raen, Enedrel |
| Ajeltake | 4 December 2025 | 15 | Barkan, Bijeje, Monbat, Rekrekan, Ekjaben, Monbukor, Kejen, Monomij, Aeleineo, Endretdret, Kejen, Kemejen |
| Woja | 4 December 2025 | 6 | Lonamnke, Kemejen, Monejo, Limar |
| Arrak | 4 December 2025 | 0 | Tolmnile, Kolomie, Jerre |
| Laura | 4 December 2025 | 28 | Lomar-Okok, Jeriok-Jepel, Jeirok-Didmej Ean, Kapilal, Iolap, Likin Atbwa, Aronan, Ajunun, Eklur, Tetelon rak, Likilobat, Uttjobonwor, Likkilalin mak, Metartar, Mwirikwut, Monwaju, Jeirok-Newa, Botin e, Didmejrak, Likinmawon, Mwetartar mwa, Mon Bok |
| Kalalen | 4 December 2025 | 3 | Monaktel, Monakete |

*Table 15* - November/December landowner engagement

| Date | Village/Community or Group | Attendees | Males | Females |
|---|---|---|---|---|
| 11 November 2025 | Ejit/Community | 12* | 8 | 4 |
| 12 November 2025 | Ajeltake/Community | 9* | 2 | 7 |
| 13 November 2025 | Djarrit/Rita Community | 26 | Not recorded | |
| 14 November 2025 | Rairok/Community | 13 | 0 | 13 |
| 15 November 2025 | Ejit Councilmen and community member (on Ejit) | 3 | 3 | 0 |
| 2 December 2025 | Lomar, Lobat, Iolap and Jeirok/Community | 27 | 17 | 10 |
| 3 December 2025 | Uliga/Community | 13* | 9 | 4 |
| 4 December 2025 | Delap/Community | 7* | 0 | 7 |
| 9 December 2025 | Woja/Community | 19 | 12 | 7 |
| | **Total** | **129** | **51** | **52** |

*Table 16* - November/December community engagement attendance

Stakeholder consultation provided an important opportunity to share with landowners and the community the Resilient Village Plans, to obtain feedback on their contents, identify the need for any changes or additions to the plans, and validate the contents of the plans.

The information obtained allowed the plan designers to update the Resilient Village Plans as necessary, reflecting the feedback and information obtained. These plans now better reflect the needs and aspirations of landowners and communities as a result of the round of engagement.

Going forward, the client will post the Majuro Master Plan (Stage 1) - Resilient Village Plans on their social media pages to allow these stakeholders to see the final plans.

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# 3.

*Photo 9* - Aerial view of Delap looking towards Rairok Photo credit: Urban Resilience Project

## CONSOLIDATED CENTERS PLAN




*Map 6* - Consolidated centers plan

## 3.1 INTRODUCTION

This section describes the resilience profile for each village, including population changes, infrastructure capacity and natural hazards. The resilient village profile for each village includes analysis of the following:

An **existing state** summary of each village supported by a plan of the village extents and the existing building uses and names of places in each village. Groups of 'similar' building uses form the existing land uses.

An **anticipated change** summary of the anticipated changes (climate hazards, population changes) supported by a constraint map based on the current day environment and infrastructure (not allowing for more seawalls or other changes to the ocean and coastal edge).

A **future state** summary of the future land use and infrastructure needs and opportunities that respond to the anticipated changes for each village. The future state is based on the consolidated centers approach which proposes the clustering of development within Majuro's linear settlement pattern to increase the resilience and quality of life for each village.

The following three strategies inform the approach to the eleven Resilient Village Plans:

- 3.2 Consolidated Centers
- 3.3 Infrastructure
- 3.4 Housing

## 3.2 CONSOLIDATED CENTERS

The generally narrow and low-lying atoll landscape of Majuro connected for many decades by the Lifeline Corridor (Main Island Road) has created a linear settlement pattern which stretches from Djarrit/Rita to Lomar (Laura) approximately 30-mile (50km) distance. The Lifeline Corridor is recognized under the National Adaptation Plan as both the symbolic lifeblood of these communities and a critical infrastructure asset needing protection to ensure its ongoing viability.

With a declining population and increasing risks from climate change, including SLR, storm surges, and coastal erosion, the dispersed linear settlements and infrastructure of Majuro are and will continue to be vulnerable to climate change without resilience planning and investment.

In response to the challenges identified above, the consolidated centers approach, i.e. clustering development into compact, walkable villages - offers a strategic solution aligned with resilience and sustainability principles to meet the Master Plan objectives. This approach is defined and translated spatially within the village plans as walkable nodes of 0.25-mile radius that promote clustering around existing community facilities and population. It is also intended that the centers will consolidate viable village populations and future development that government investment and funding can support more efficiently and with more confidence.

For the purposes of the Master Plan the consolidated centers are categorized across three scales; urban, intermediate and local. These classifications are based on existing population, community facilities and critical infrastructure identified during the SWOT analysis (refer to Appendix C) which informed the Master Plan.

As shown on **Map 6 - The Consolidated Centers Plan** outlines nine centers proposed across the 11 villages of the Master Plan, with Lomar and Lobat supporting a center in the nearby village of Iolap. The Master Plan proposes two centers for Woja due to its length and groupings of existing infrastructure. The aim of this approach is to provide a resilient land-use strategy that meets the project's livability, economic and environmental objectives.

The three types of centers are defined as:

### Urban Center

- Delap is the primary urban center of Majuro with a higher population density and urbanized environment supported by much of the critical lifeline infrastructure for Majuro (and the wider RMI).

### Intermediate Centers

- Djarrit/Rita, Uliga, Rairok and Iolap are defined as intermediate centers, owing to existing population, and infrastructure provision. Intermediate centers typically act as employment hubs, featuring some national infrastructure such as the Airport. The exception to this being Iolap, which has been identified as a future intermediate center for Laura, supporting the surrounding villages, through consolidated community facilities and infrastructure with higher levels of resilience.

### Local Centers

- Jeirok, Woja 1, Woja 2, and Ajeltake are defined as local centers typically featuring more limited community infrastructure.

These centers have been identified based upon location of existing facilities and population; tested against multi-hazard flood mapping (SSP5-8.5) for 2055, when 10 inches (0.25m) of SLR is anticipated. Further investigations for each village should be conducted to understand the longer-term vulnerabilities and impacts of flooding and other climate hazards, to derisk and inform the future development of each of the proposed centers.

### 3.2.1 HOW CONSOLIDATED CENTERS SUPPORT PROJECT OBJECTIVES

Risk-informed siting and clustering of future development offers a number of advantages to improve the livability of each village. Beyond the proximity and increased access to community facilities, clustering residential housing within walkable catchments will support community cohesion and inclusion.

The consolidation of future development is likely to attract funding for improved infrastructure and community facilities. This will result in improved community services and infrastructure within walkable catchments that are more resilient and accessible to a greater number of the population improving daily convenience, health, and safety.

Environmentally, the concentration of development will reduce impacts on sensitive environments such as mature vegetation or freshwater aquifers recharge zones. The consolidated centers approach will include nature-based solutions to improve environmental outcomes for each center that increases resilience such as green buffers to mitigate flooding and increasing air temperature.

Economically, consolidating population and development creates economies of scale for utilities and services, reducing costs and improving the potential for local businesses through higher concentrations of population and shared infrastructure.

The consolidation of future development also provides the opportunity to increase community resilience to climate shocks and hazards through the co-location of community facilities and population to emergency infrastructure and shelters. Prioritized investment within village centers will support infrastructure and services to continue operating during disruptions, while improved access to education and health services strengthens workforce capacity and reduces out-migration. Infrastructure benefits include phased upgrades for water, power, sanitation, and provision of evacuation facilities near where people live.

The aim of the consolidated centers approach is to increase the resilience of Majuro's vulnerable linear settlement form into a network of healthy, resilient and well serviced communities. It improves livability, environmental protection, economic efficiency, and infrastructure resilience, while addressing social equity, population decline, and climate change.

To strengthen urban resilience within the consolidated centers, the Resilient Village Design Approach (refer to Section 2.4) is integrated into planning and implementation. This approach informed by the Master Plan Objectives and Principles (refer to Section 2.3) results in development that is risk-informed, culturally appropriate, and environmentally sustainable while enhancing community capacity and preparedness.



***Photo 10*** - View looking over Delap towards the ocean

## 3.3 INFRASTRUCTURE

Infrastructure is fundamental to achieving resilient, well-connected communities across Majuro. The consolidated centers approach provides a framework to enable prioritization of infrastructure investments where it will deliver the greatest benefit to communities within walkable catchments that cluster housing, community facilities, and services. This approach ensures that infrastructure upgrades are not dispersed but concentrated in areas that support daily life and future resilience.

### Supporting the Consolidated Centers Approach

By directing investment to consolidated centers, infrastructure improvements can be scaled appropriately to meet community needs while reducing duplication and long-term maintenance costs. Concentrating services such as water, sanitation, energy, and drainage within these centers strengthens reliability and accessibility, particularly during climate-related disruptions. This approach also creates opportunities for integrated planning, where housing, transport, and utilities work together to improve livability and reduce vulnerability.

### Existing Standards and Required Improvements

Current infrastructure across Majuro varies significantly in quality and coverage. Many systems operate below what would be considered a minimum acceptable level of service for urban and rural communities. To achieve minimum acceptable standards, provision for access and improvements to critical infrastructure is required. Beyond these baseline improvements, further improvements are required to provide for required resilience and enhanced levels of service that will support livability and socio-economic development of the resilient villages, the wider Majuro Atoll and Marshall Islands.

### Benefits of Targeted Infrastructure Investment

Targeted investment within consolidated centers offers multiple benefits:

- **Resilience:** Infrastructure can be designed to withstand flooding, storm surge, and SLR, ensuring continuity of essential services.
- **Efficiency:** Focused upgrades reduce per capita costs and enable economies of scale for utilities and services.
- **Social and Economic Outcomes:** Improved access and reliability of utilities, education, health, and employment within resilient hubs will support community well-being and is expected to reduce out-migration.

### Lifeline Corridor and Critical Infrastructure

The Lifeline Corridor, the main road connecting Laura to Djarrit/Rita, remains the most critical infrastructure asset for Majuro, enabling movement of people, goods, and services. This corridor includes key network infrastructure supply and distribution networks which are critical to social and economic development. However, its linear form and exposure to flooding, erosion and other climate related hazards make it highly vulnerable. Future-proofing this corridor is an essential element of providing for connected and resilient communities and will include:

- Raised sections and improved drainage to reduce the extent and temporal nature of flood risk.
- Coastal protection measures such as seawalls and vegetated buffers to prevent overtopping and erosion improving resilience and serviceability.
- Alternative transport options, including shared mobility hubs and marine access, to maintain connectivity and access to essential services, during disruptions.
- Improvements and targeted intervention to provide a resilient utility corridor.
- Interventions which raise or provide bridging in this case for the road would need to be considered in conjunction with the wider area and impacts. It is anticipated that a requirement to raise the road would also require adjacent houses as an example to be raised or some other form of adaptation to be undertaken to avoid the potential of road raising to exacerbate the SLR/flooding impacts. All interventions will need to be considered in the wider context as they have significant potential for negative effects.

### Current and Planned Investments

A number of projects have already been identified and funded at the time of the Master Plan development, many of which align with the consolidated centers approach. These are shown on the Resilient Village Future State Plans in this section and detailed in Table 17 – RMI Government and Donor Agency Capital Projects, which includes:

- URP Component Projects that are planned/funded or under construction.
- Infrastructure improvements identified in the National Infrastructure Investment Plan (NIIP) 2023.
- MPWIU projects being implemented under other components of the Urban Resilience Project.
- Marshalls Energy Company (MEC) projects that area planned and/or funded.
- Projects listed on the Division of International Development Assistance (DIDA) Grant Writing Spreadsheet.

Additional donor and agency projects can be added to provide a full picture of the investment and gaps across each village area in addition to those identified through stakeholder engagement.



***Photo 11*** - View of the Bridge connecting Delap and Rairok. Photo credit: Lee Arkhie Perez




***Photo 12*** - Power plant to the east of Delap dock. Photo credit: Lee Arkhie Perez



***Photo 13*** - Fuel storage tank on the lagoon edge in Uliga



***Photo 14*** - Uliga Dock. Photo credit: Lee Arkhie Perez



***Photo 15*** - View of the reservoir upgrade in Rairok near the Amata Kabua International Airport

| Project (RMIGov owner/Funder)<br>*Project located on the Section 3 Future state village map | Funding status/project status** | Reference |
|---|---|---|
| Lomar | | |
| *Laura Ball field Additional shelters with solar panels | Funded REGAIN 2027-30 | MEC |
| Lobat | | |
| Power Distribution upgrades | Unfunded | MEC |
| Iolap | | |
| Jeirok | | |
| Laura Sewerage Scheme (MWSC/-) | Unfunded (Sept 2023) and planned | NIIP Table A1.15 |
| *Laura School Project (PMU/PSS/Compact) | Funded (Sept 2023)/ongoing | NIIP Table A1.24 |
| Laura Power upgrades to switchyard | Funded underway | MEC |
| Power Distribution upgrades | Funded REGAIN/ADB 2026-28 | MEC |
| *Laura High School Shelters with solar panels | Funded REGAIN 2027-30 | MEC |
| Various Basketball court shelters with solar panels | Funded REGAIN 2027-30 | MEC |
| Woja | | |
| *CMI Arrak Campus Vocational classrooms | Under construction 2025 | |
| *CMI Arrak Campus Dormitory | Planned | |
| Power Distribution upgrades | Funded REGAIN/ADB 2026-28 | MEC |
| *CMI Arrak Ocean Thermal Energy Conversion (OTEC) Pilot project | Planned/Funded OTA 2026 | MEC |
| *Woja school shelter with solar panels | Funded REGAIN 2027-30 | MEC |
| Ajeltake | | |
| Power Distribution upgrades | Funded REGAIN/ADB 2026-28 | MEC |
| Rairok | | |
| *Majuro Reservoir Project (MWSC/Official Development Assistance – Japan) | -/Ongoing | NIIP Table A5.1 |
| *Runway 25-7 rehabilitation (RMIPA/FAA) | -/Ongoing | NIIP Table A5.1 |
| *Interim Passenger Terminal Bldg and Reclamation | Funded | MPWIU |
| *JICA Funded New AKIA Passenger Terminal Bldg | Funded | MPWIU |
| Power Distribution upgrades | Funded REGAIN/ADB 2026-28 | MEC |
| *Rairok Elementary School Building (PSS/Compact) – 4 classrooms | Funded (Sept 2023) and planned | NIIP Table A1.24 |
| *Katoj Park | Planned | URP |
| Delap | | |
| *Reclamation Project - northern area ocean side | Planned and unfunded | |
| *Eletutu Beach seawall Project | Funded | URP |
| *Delap Park | Planned | URP |
| *Resilient Multi-functional Government Facility (RMGF) | Funded (under construction 2025) | URP |
| Majuro Streetscaping Program | Planned | URP |
| *Delap Wharf expansion (RMIPA/GRMI) | Funded (Sept 2023) and ongoing | NIIP Table A1.5 |
| *Majuro sewer outfall replacement (MWSC/ADB) | Funded (Sept 2023) and ongoing | NIIP Table A1.15 |
| *Majuro Hospital Redevelopment Project | Unfunded (Sept 2023) and planned | NIIP Table A.29 |
| *Nitijela | Under construction 2025 | |
| *New RMI capital building | Planned and unfunded | |
| *New Power Plant PS1 (MEC/World Bank) | Under Construction | NIIP Table A5.1/ MEC |
| Emergency Operating Center (OCS) | Funded/ongoing | NIIP Table A1.36 |
| Women and Youth Skills, Empowerment and Resilience Project | Planned | MPWIU |
| Uliga | | |
| *Alele Park | Planned | URP |
| Majuro Streetscaping Program | Planned | URP |
| *Track & Field – Carpark & spectator shelter with solar panels | Funded REGAIN (2027-30) | MEC |
| Power Distribution upgrades | Funded REGAIN/ADB 2026-28 | MEC |
| *Majuro Track and Field (PMU, MPWIU/ICDF, Taipei) | Funded (Sept 2023) and ongoing | NIIP Table A1.25 |
| *New Majuro MIPD Building and Jail Repair | Partially funded and planned | MPWIU |
| Women and Youth Skills, Empowerment and Resilience Project | Planned | MPWIU |
| Djarrit/Rita | | |
| *MIHS student center (PMU/PSS//Compact) | Funded (Sept 2023)/and planned | NIIP Table A1.24 |
| *MIHS Seawall - 400m long | Funded | URP |
| Majuro Streetscaping Program | Planned | URP |
| *Rita Water Supply Upgrade (MWSC/ADB) | Ongoing | NIIP Table A5.1 |
| *Rita Health Center | Unfunded (Sept 2023) and planned | NIIP Table A1.28 |
| Lagoon Floating Solar | Unfunded | MEC |
| Power Distribution upgrades | Funded REGAIN/ADB 2026-28 | MEC |
| *Rita Elementary School - 4 classrooms (MPWIU/Compact) | Funded (Sept 2023) and planned | NIIP Table A1.24 |
| Ejit | | |
| Rita to Ejit onwards Power cable upgrades | Unfunded | MEC |
| *New Community Center | Funded and planned | MPWIU |

**Information compiled from the National Infrastructure Investment Plan 2023, DIDA and information provided by MPWIU, MEC.

***Table 17*** - RMI Government and Donor Agency Capital Projects Table

## 3.4 HOUSING

A housing strategy should be developed to guide future housing development across Majuro. In the more urbanized villages of DUD and Rairok, the primary challenge is to improve livability through housing standards within already developed areas. In the remaining villages, there is greater potential to facilitate higher quality housing development as growth occurs on undeveloped land. The Master Plan, together with the guidance provided in the housing typology section, outlines a future housing response that aligns with different land use environments and incorporates resilience measures within the 'go carefully' areas to address climate change impacts.

### 3.4.1 KEY HOUSING CHALLENGES

- **Inundation risk:** Housing is vulnerable to inundation and coastal flooding, and this is likely to increase in the future.
- **Limited land availability:** The larger population in Delap, Uliga and Djarrit/Rita and Rairok villages with smaller housing footprints has resulted in dense living conditions for people and the land ownership means there can be a lack of space to construct new dwellings where communities from outer islands are clustered. This lack of space leads to limited opportunities to address longer term resilience issues such as flooding and increasing air temperature. Freeing up land for resilient green buffers that can also accommodate recreational and communal activities is important for community vitality and amenity.
- **Spatial constraints:** Limited space also leads to infrastructure issues associated with stormwater drainage and soakage areas, lack of areas for water catchments and lack of other services.
- **Existing housing form:** In urban areas the density of building to open space as seen in Delap and Uliga with single level dwellings means that 'making space' for shade trees, setbacks and communal facilities would require a smaller ground floor. This can be achieved by building on two levels but this has a higher cost and also accessibility considerations.
- **Vegetation:** A lack of vegetation within the village of Delap and Uliga primarily also results in a reduction of shading and cooling benefits.
- **Laneways and shared surface with vehicles:** The laneways off the main roads are generally unpaved and when it has rained there is water that ponds and restricts access for pedestrians. Some laneways make emergency service access difficult due to their width.
- **Lack of services:** In order for the village centers to provide efficient and comfortable housing, basic services such as additional water catchments, waste collection and power must also be provided.

### 3.4.2 HOUSING OPPORTUNITIES

- Improving housing so that it is resilient to the impacts of climate change.
- Working with landowners to identify opportunities where improvements or developments could occur.
- Improve the condition, security, energy efficiency and suitability of homes. This will be assisted by providing a framework to facilitate good quality development standards including how they are sited on land alongside open areas.
- Foster and enhance a strong sense of community within each housing area by providing for communal amenities, enhancing safety and wellbeing.
- Maximize the use of existing resources. This may include the reduction of the number of long-term empty properties that both private and public sectors are responsible for, to meet housing needs.
- Promote other types of housing that are efficient with space such as mixed use (housing above shops on main road) or apartments in urban areas.

### 3.4.3 DESIGN PRINCIPLES

The following key principles are aimed at increasing residential amenity and providing safer and more accessible homes and open spaces, and generally a better quality of life for residents. The housing typology sections illustrates/how these principles may be applied to different housing types across Majuro. Further development of these principles is anticipated through the development of a housing strategy illustrating the design principles with relatable Majuro based examples. The housing strategy will also need to be supported by a 'housing agency' to manage development and assist in facilitating appropriate outcomes (i.e. quality control).

#### Housing should be designed to maximise resilience to climate change

New houses should be designed and constructed to withstand more intensive weather events, include sufficiently raised floor levels to provide resilience to inundation and coastal flooding, and include design measures to provide for passive cooling. They should be located a sufficient distance from the coastal edge to enable any future investment in coastal protection to be made and maintained.

#### Enable residents to see onto streets and laneways enhancing safety

Fences greater than eye level height of 5 feet (1.5 meters) should be avoided alongside all public roads and access lanes. This is to encourage visibility between the public and private realm enhancing passive surveillance and preventing crime. By limiting the height of fences within access lanes, the lanes are perceived to be wider as there is more natural light.

#### Provide appropriate access lane widths

Look at setting a minimum width for access lanes of 10 to 13 feet wide (3 to 4 meters) to provide space for vehicles, people who are walking and emergency access.

Lanes should be wide enough for emergency vehicles to pass through and should also enable greater natural ventilation and lighting.

#### Require new dwellings to be set back from a shared access lane and neighboring properties

Dwellings should be setback from the street/access lane by at least 6 feet (2 meters) to widen the access lane to natural light, ventilation and provide space for an entry zone to the dwelling. Dwellings should also be setback from neighboring properties by at least 6 feet (2 meters). Note: Minimum Fire resistance separation distance is less than this in the RMI Building Code (Table A301.1) for One, Two and Three – Family Dwellings at 5 foot or more when walls are not fire rated (Wall of dwelling to center line of street, alley or public way, imaginary property line.)[20] This set back should be tested and confirmed in the Housing Strategy.

#### Encourage multi-level residential dwellings and encourage no more than 50% maximum dwelling site for a comprehensive housing area or grouping of houses

Providing a maximum site coverage will encourage homeowners to build two levels with the same floor area as a single level house. As a result more space will be freed up for open spaces that are multipurpose and can, depending on the location, provide for flood resilience, green buffers to attenuate flooding, space for trees that reduce heat island effect, gardens for sustainable land use, space for services such as water tanks, and in some situations additional housing opportunities in the future.

In addition, consideration should also be given to the following matters as part of a proposed housing strategy:

- Designing residential areas to prevent crime and promote a safe environment. For example, doors, windows and openings overlook and actively connect with public and communal spaces. Well-designed treatments such as low fences, walls, railings and hedges can also maintain enclosure and contribute to the quality of the environment.
- New residential proposals should seek to improve housing quality. For example, residential proposals provide good residential amenity including internal space standards, storage, universal access and in-dwelling and on-site amenities. Providing equity of access via ramps is important if houses have raised floor levels to provide resilience to inundation and coastal flooding.
- Private outdoor space. For example, all residents should have unobstructed access to useable outdoor spaces for private, common and communal use that are fit for purpose. This may be in the form of balconies, terraces and gardens and directly accessible from residents' main living areas and are not compromised by vehicular parking (noting not all dwellings have vehicles).

20 *Tonkin & Taylor International Ltd. (2025). RMI-URP-C2_D7-Eletutu Detailed Design Report. Ministry of Public Works, Infrastructure and Utilities, Republic of the Marshall Islands*



***Photo 16*** - Aerial view of the lifeline corridor from Djarrit/Rita looking towards Uliga

## 3.4.4 HOUSING TYPES AND LAND USE AREAS

Majuro has the opportunity to develop a broader range of housing types as land use evolves. This section illustrates the different types of housing for various land use areas.

The Master Plan encourages higher-density housing - such as mixed-use developments and apartments - especially in consolidated centers and proposed mixed-use areas along the lifeline corridor, where infrastructure upgrades are prioritized. By focusing future higher density housing investment in these areas, investment will be located in the vicinity of resilient infrastructure.

The main housing types and their typical locations are:

- **Residential Land Use Area:** Stand-alone houses, terrace houses, and duplexes.
- **Mixed use land use area:** Mixed use with residential above and higher density apartments

This section outlines the design considerations for housing in 'Go carefully' areas, with examples from Majuro, to guide development in locations that may face environmental challenges.

## 3.4.5 STAND ALONE HOUSING IN A RESIDENTIAL LAND USE AREA

Generally located in the residential land use area these houses are surrounded by open space either in rural or urban areas. They offer privacy and space for occupants and enable increased living area to be added if the number of people living in them increases. Stand Alone Housing uses more land and may cost more to maintain compared to higher-density options such as terraces or duplexes.

### What does this look like in Majuro

Stand alone/detached houses are located on individual sites either on their own or clustered with other dwellings. This residential type offers the greatest flexibility in size and layout, often providing private outdoor living spaces and ability to use outdoor spaces for fires, small scale agriculture and raising of livestock depending on the size of the surrounding area the house is sited on.

In urban areas there needs to be consideration of space for gardens and small-scale agriculture i.e. vegetable gardens, housing of livestock. Housing that has two levels can provide more space - an ideal being 50% open space for a housing site. This does have the drawback that building on two levels has a higher cost and also accessibility considerations to access the upper floor.

### Majuro Built-Form Examples

The following examples illustrate the typical built form and density pattern of housing typologies within Majuro.



***Photo 17*** - Stand alone housing with space for sizeable shade trees, small-scale, agriculture, vehicle access and parking.



***Photo 18*** - Stand alone housing alongside laneway with courtyard areas fronting onto the street



***Photo 19*** - 150m x150m area in Iolap (3 dwellings a hectare)



***Photo 20*** - 150x150m area in Rairok to the east of the reservoir (8 -10 dwellings a hectare)



***Photo 21*** - 150x 150m area in Delap north of the Hospital (25-30 dwellings a hectare)

## 3.4.6 RESIDENTIAL IN A MIXED USE AREA

The Master Plan proposes mixed land use areas to be located along the Lifeline Corridor within Villages of higher population with a mix of land use types that are in close proximity to one another. Generally, these are buildings that combine homes with shops, offices, or community spaces - sometimes all in one place. This can create lively neighborhoods where people can live, work, and shop nearby. Mixed use and higher density residential will also support active and shared transport opportunities.

### What does this look like in Majuro

Mixed-use developments can increase land-use efficiency and foster a sense of community but require careful design to manage privacy and amenity, in particular noise and access. Access for vehicles and parking is best located at the rear of the building.

### Majuro Built-Form Examples




***Photo 22*** - Mixed use in Uliga with a shopfront and other uses on the levels above



***Photo 23*** - Fronting onto a main road this form can be commercial or retail with housing on levels above



***Photo 24*** - AI generated image of a mixed use streetscape supporting, active and shared transport opportunities.

## 3.4.7 HIGHER DENSITY RESIDENTIAL AREA

Apartments, townhouses, or duplexes are a type of housing where several homes are built close together, often in multi-level buildings. These homes make the best use of limited land and provide for the loss of space in the house with greater amenity if they are close to shops, open spaces and main roads with transport.

### What does this look like in Majuro

Multi-unit dwellings such as terraced houses, duplexes, or low-rise apartments, are a type of housing best suited for consolidated centers. They are designed to maximize land efficiency in urban or town center locations. Design considerations include privacy, acoustic separation, and quality shared spaces. An example of apartments is Lojkar in Rairok, which could be encouraged in areas that have single land ownership and can be planned with a layout that is more resilient to future climate change impacts. i.e. orientation of buildings to funnel the prevailing wind for cooling, placement of shade trees and structures.

### Majuro Built-Form Examples



***Photo 25*** - At Lojkar parking is provided as part of the central vehicle access area reducing paved areas



***Photo 26*** - Lojkar as an example has three levels of apartments that look out onto common open space with large shade trees



***Photo 27*** - Lojkar apartments - approximately 200 apartments in a 150 x150m area (80 - 100 dwellings a hectare)

## 3.4.8 'GO CAREFULLY' AREAS - RESIDENTIAL

In the Master Plan the 'Go carefully' area is applied to buildings and activities in areas vulnerable to natural hazards. It signals that any future redevelopment or new construction should be designed to manage risks like sea-level rise and adapt to the impacts of climate change.

Future residential housing in a 'Go carefully' area should consider the form, location and surrounding site area for any housing is designed with future environmental changes in mind, especially those related to climate and site conditions. This approach can be cost effective as future changes have been considered such as flooding, wind and heat so housing is safe and livable in the future.

### What does this look like in Majuro

- **Site Selection:** Position buildings away from vulnerable coastal edges and areas prone to storm surges.
- **Elevation:** Raise the house above projected flood levels to reduce risk from rising waters. This will support views and ventilation.
- **Climate-responsive Design:** Arrange groups of houses to allow wind to flow through, improving ventilation and comfort.
- **Orientation and Roof Shape:** Face the narrow side of the house toward prevailing winds and use hip-shaped roofs to better withstand strong gusts
- **Tree cover:** Consider placement and type of trees to provide natural shade, reducing heat inside homes and outdoor spaces. Placement of trees can also act as wind breaks helping to shield homes from strong winds. Tree roots help absorb rainwater, reducing surface run off and effects of flooding.
- **Fire zone:** Clear fire separation around the house as required by the RMI National Building Code and access to fire hydrant or fire truck access in urban areas.

### Majuro Built-Form Examples



***Photo 28*** - Housing in Majuro built up off the ground. Universal accessibility needs to be considered as ramps required for disabled access is an issue if all amenities are on the top level. However, it is noted that RMI National Building Code Section A315 Accessibility does not require the accessibility requirements of the code to apply to one-, two-, and three-family dwelling units.



***Photo 29*** - AI generated Image of a resilient house in the Northern Pacific

## 3.4.9 VERNACULAR REFERENCES

Aspects to consider in the form and layout of new housing that consider vernacular/traditional housing elements include:

- Rectangular plan form with narrow side facing prevailing wind.
- Raised area for living and sleeping space.
- Pitched hipped roof.
- Small number of openings.

### Built Form Majuro Examples



***Photo 30*** - Image of a traditional house - Majuro Atoll from Alele Museum display



***Photo 31*** - Historic image of traditional housing



***Photo 32*** - Replica of traditional housing in Majuro

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*Photo 33* - Aerial photo of Lomar looking toward Lobat and Iolap with Laura Beach in the foreground

# LOMAR

## 3.5 LOMAR

### 3.5.1 CURRENT STATE/CURRENT LAND USE PLAN

Lomar is predominantly a mix of low density residential, and agriculture uses, with some community and commercial (small shops) interspersed throughout the area. Laura Beach, located at the northern extent of the village, is a privately owned Majuro destination known for its swimmable beach and barbeque facilities.

#### Environment

Many parts of Lomar, particularly the oceanside, are at roughly 10 feet (3m) above sea-level and feature higher levels of vegetation cover than other areas of Majuro. Lomar was home to an estimated 517 people in 2025 and is around 173 acres (70 hectares). The community of Lomar includes housing, recreation and community facilities (church, community center and baseball field). Lomar is a 65 to 70 minute vehicle trip from Delap or can be accessed by boat from the boat ramp on the western side.

The groundwater lens (aka Laura Aquifer) located across the Laura region including Lomar, is a significant water supply source for the Laura villages and is also used in other areas of the atoll as a backup during times of water scarcity. Laura has Majuro's most arable land (most appropriate soil type) with pit agriculture having occurred in Laura for many centuries (since 100 to 700 AD).

#### Land use

Lomar like much of the Laura region is predominantly made up of rural land use. The rural character means there are large areas of undeveloped land. These areas are characterized by lower population density, larger undeveloped land areas, and more agricultural activity compared the rest of Majuro. The area lacks formal education and health facilities but includes a community center and access to recreational spaces such as Laura Beach, a baseball field, and basketball courts. Religious institutions serve as both places of worship and emergency shelters. Lomar has arable soil suitable for food production. Laura Beach at the most northern point of Lomar is a regional destination.

#### Infrastructure

Lomar has limited public infrastructure common for the rural topology but is connected to the Lifeline Corridor, providing access to other parts of the atoll and critical infrastructure and services. A community level boat ramp on the ocean side supports small craft and artisanal fishing activities. The area lacks formal solid waste collection and public sewerage systems, relying on household disposal and personal septic systems, increasing the risk of contamination of groundwater. Potable water is sourced from groundwater wells and rainwater tanks. Electricity is provided from the grid and is supplemented by small solar systems and generators. Telecommunications connectivity is available but as with electricity is vulnerable, due to deteriorating network infrastructure.

#### Map explanation

Map 7 illustrates the building uses and names of key buildings. Each building activity has a different color. A dashed line is shown around groups of 'like' building uses – these are the land uses.



***Photo 34*** - Aerial view of Lomar. Photo credit: Lee Arkhie Perez



***Photo 35*** - Laura Baseball field




***Photo 36*** - Access to Laura Beach at the northern end of Laura



***Photo 37*** - Laura Full Gospel Church




***Photo 38*** - St Francis Xavier Church on the lagoon side of Lomar

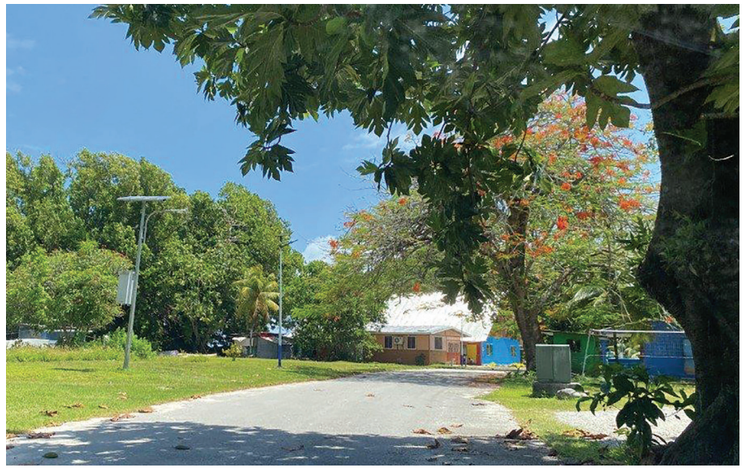
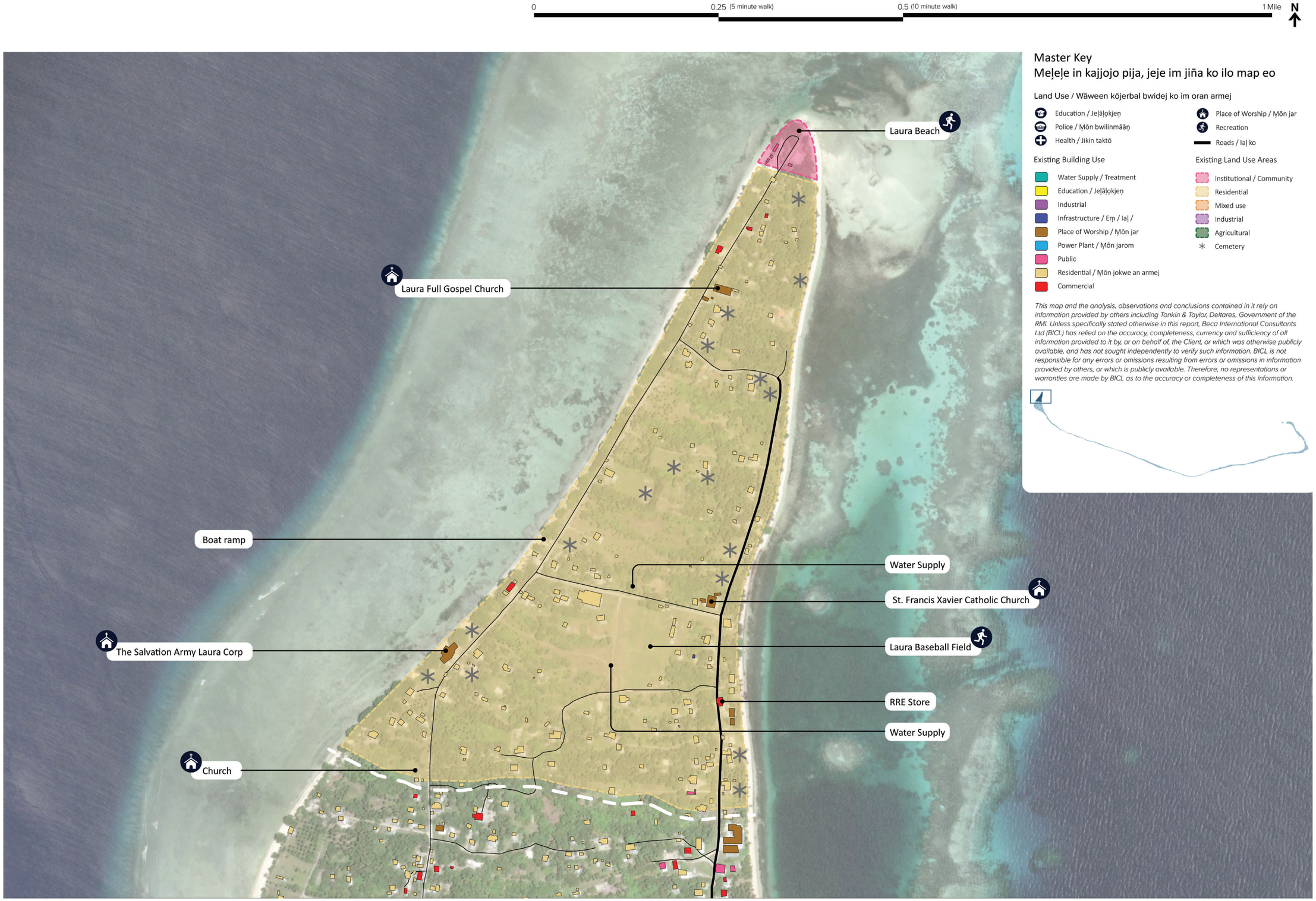


***Photo 39*** - Laura Salvation Army Corp




***Map 7*** - Current state

## 3.5.2 ANTICIPATED CHANGE

### Projected Population

Lomar's estimated population in 2025 was 517. Projections indicate a significant decline, with forecasts of 406 to 410 by 2030, 285 to 289 by 2035, and 118 to 122 by 2045. This downward trend highlights the need for future planning so that infrastructure and services are appropriately scaled for a smaller community.

### Climate Hazards

Flood modelling completed by Deltares shows 0.82 feet (0.25 meters) of sea-level rise and increased intensity of rainfall events, which are anticipated to occur by 2055 under a rapid climate change scenario. Flood models indicate that the village will experience higher incidence of flooding than today, resulting from daily higher sea-levels and high tide events, and periodic rainfall from storm events such as typhoons or other heavy rains, and/or wave-drive overwash from storm surges or swell waves.

Flooding is likely to be most problematic in the following areas of the village by 2055 if no interventions or additional coastal protection measures are implemented*:

- The lagoon coastline of Lomar is expected to experience major flooding, especially at the northern tip of the village.
- The ocean coastline will also experience flooding, but likely to a lesser extent than the lagoon coastline.
- A pocket of more severe flooding could cause access issues for the existing community center and other areas in the southern portion of Lomar.

*Flood severity was determined by evaluating the modelled potential flood depths, with flooding increasing in severity from minor ➔ moderate ➔ major ➔ extreme.

### Map explanation

Map 8 illustrates what could change at a village-level over the next 20 years because of a decrease in population and impacts from climate change. Note that there are other climate impacts – heat, drought, flooding from tsunamis that are not illustrated on the map.

The population bar chart shows two ways the population could change - the lower line shows the population projection of this village over the next 5, 10 and 20 years and the line above shows the population with potential interventions signaled by the RMI government.

The map shows 0.82 feet (0.25m) of sea-level rise, daily high tide, and flooding from rainstorms, typhoons, and swell wave events.

Critical services and infrastructure are shown as icons on the map. These support daily life, community resilience and disaster preparedness now and in the future and are to be retained and potentially moved if they are located in vulnerable areas.

Map 8 has different colors to show the possible extent of flooding from typhoons, rainstorms, and swell waves in 2055 with 0.82 feet of sea-level rise (SLR):

- No color - these areas show where there is minimal flood risk.
- Blue shows where there would be minor flooding (less risk of flooding, lower levels of flooding expected).
- Light yellow shows where there would be moderate flooding (higher risk of flooding, possible deep flood waters).
- Bright yellow and orange show where there would be major flooding (even higher risk of flooding, area susceptible to multiple flood hazards, possible deep flood waters).
- Red, brown, black show where there would be extreme flooding (worst flooding for Majuro, area susceptible to multiple flood hazards, possible very deep flood waters).

The high tide map has different colors to show possible water depths from daily high tide in 2055 with 0.82 feet of SLR.

- Light purple shows where there will likely be 0.33-1.64 feet of water every day at high tide.
- Purple shows where there will likely be more than 1.65 feet of water every day at high tide.

NOTE – these flood maps are modelled based on current day environment and coastal edge (not allowing for more seawalls or other changes to the ocean and coastal edge).

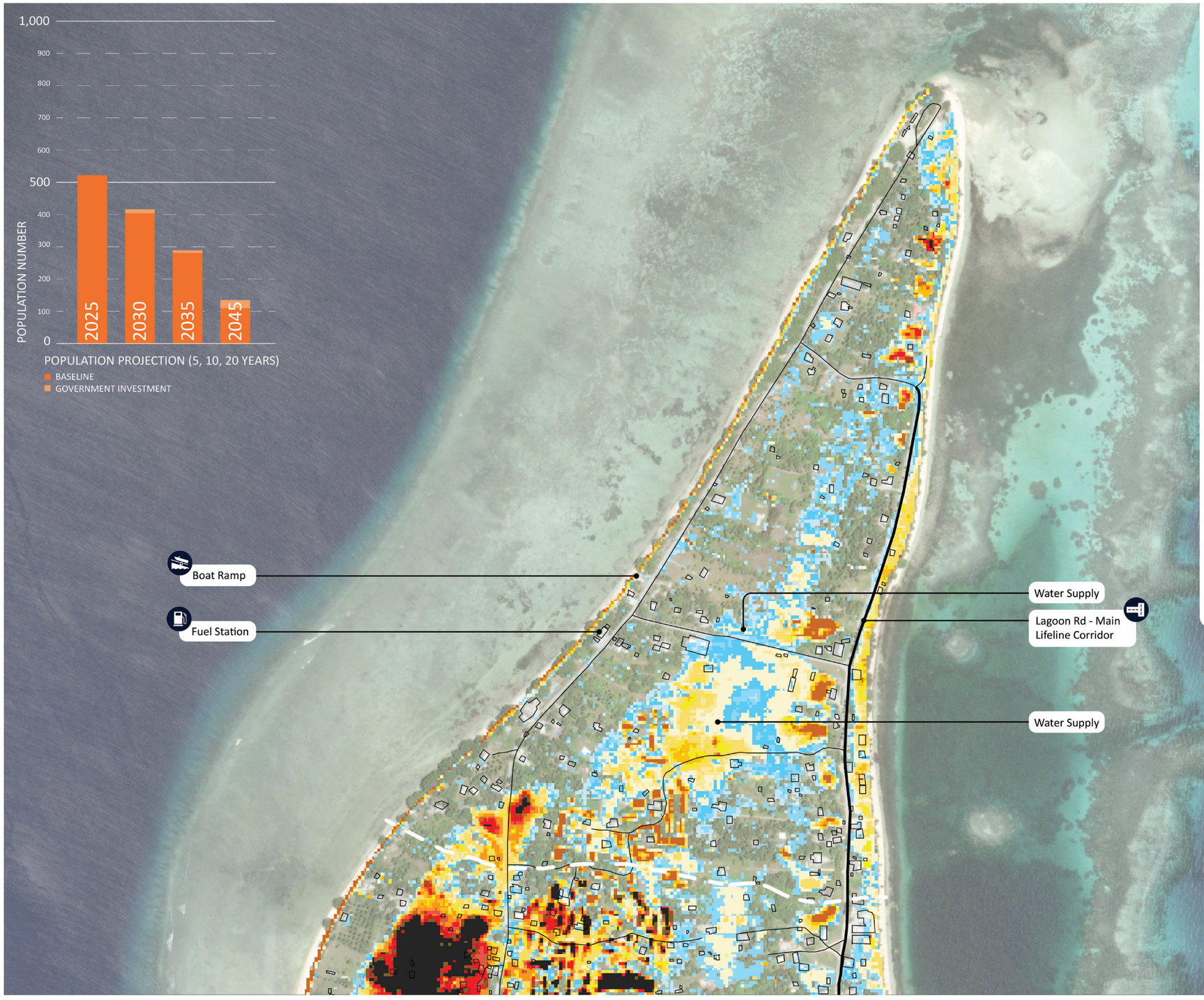


***Photo 40*** - Ocean side road



***Photo 41*** - Cross atoll road

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N




## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

- Buildings
- Roads / laḷ ko

**Critical Services**

- Education / Jeḷāḷoḳjeṇ
- Police / Ṃōn bwilinmāāṇ
- Fire Station
- Health / Jikin taktō
- Hospital
- Fuel Station
- Antenna
- National Telecommunication
- Pump Station
- Power Plant
- Airport
- Port / Wharves
- Boat Ramp / Access
- Disaster Equipment Storage
- Emergency Shelter
- Main Lifeline Corridor

**Multi - Hazard* Flooding**
at 10 inches of Sea Level Rise by 2055

- Minor Flooding
- Moderate Flooding
- Major Flooding
- Extreme Flooding (Multiple potential flood hazards)

**High Tide**
at 10 inches of Sea Level Rise by 2055

- 0.33 - 0.82ft
- 0.83 - 1.64ft
- 1.65 - 2.46ft
- 2.47 - 3.28ft
- 3.29ft- and above

** 50-year return period events: swell waves, typhoon rainfall with storm surge, and non-typhoon rainfall.*
** SLR and high-tide based on Deltares' modelling of the extreme climate scenario, SSP5-8.5*

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***Map 8*** - Anticipated change

### 3.5.3 FUTURE LAND USE PLAN AND INFRASTRUCTURE NEEDS

In the future, Lomar is proposed to retain its rural character, reflecting both the physical landscape and the deep agricultural history of this area. The transition from residential land use (as shown in the maps above) to agricultural land use reinforces the agricultural heritage of Lomar and signals a deliberate approach to avoid intensification. This shift will enable productive land to be prioritized.

The only exception to this approach is along the main road on the lagoon side, where a mixed-use zone is proposed near Iolap. This location has been identified as suitable for limited commercial and residential activity to support local services and provide a small hub of activity without detracting from the broader rural setting. This targeted mixed-use development will enhance connectivity and economic opportunities while maintaining the overall vision of Lomar as a predominantly agricultural and low-density area.

#### Opportunities

Opportunities raised in the July engagement session that formed the basis of discussion at the November stakeholder engagement:

- Build on the recreation and tourism potential of Lomar Beach as a destination.
- Improve the boat ramp in Lomar for future climate resilience and provide a safe alternative to road-based connections to the wider Atoll.
- Develop a public transport or ride share strategy for Lomar to improve connectivity to employment and critical infrastructure in Rairok and DUD.
- Identify and invest in new or existing multi-purpose community facilities including a recreation hall, that could accommodate mobile social services (medical, education etc).
- Identify locations for a multi-purpose recreation space within Lomar that could be utilized for events such as a weekly farmers market to sell fish and produce.
- Protect the water lens and arable soil from inappropriate development and utilize undeveloped land for water collection and food production.
- Protect the existing vegetation and tree cover for future climate resilience.
- Increase food growing capacity and efficiency within Lomar to support the wider Atoll.
- Water storage tanks within Lomar to increase drought resilience locally and across the Atoll.
- Develop nature-based solutions to reduce coastal erosion.

#### Priorities and Projects:

Looking to the future, the Lomar community is focused on advancing projects that will strengthen resilience and improve quality of life. Following engagement sessions in July and November 2025 as part of the Master Plan engagement, community and landowners identified the following key priorities:

| Projects and Priorities (high priority in bold) | Master Plan Objectives: Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages |
|---|---|---|---|
| **Seawalls both ocean and lagoon sides** | ✓ | ✓ | |
| **Control pumping of the lens water for it affects the household wells** | ✓ | | |
| **Improve road surface by paving smaller residential roads** | | | ✓ |
| **Install streetlight, road signage, speed bumps** | | | ✓ |
| **Agricultural projects and support community gardens with tools and supplies** | ✓ | ✓ | |
| **Community facilities – A Lomar Community Center** | ✓ | ✓ | |
| Sports and recreation facilities | ✓ | ✓ | |
| Upgrade schools and churches to be climate and weather proof | | ✓ | |
| Fishing vessels for the community | ✓ | ✓ | |

#### Map explanation

Map 9 illustrates the recommended land use changes and actions that should be taken to address the impacts of anticipated changes over the next 20 years. It also shows the priority projects identified by the community and includes those that will support daily life, community resilience and disaster preparedness.



***Photo 42*** - Japanese cemetery on hill north of St Francis Xavier Church



***Photo 43*** - Shop on southern end of Lomar lagoon side

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N




## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeļāļokjeņ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / Iaļ ko
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

### RMIGov / Donor Agency Capital Projects

1. Laura Baseball Field additional shelters and solar panels- Funded

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Raise (land or buildings)
- Develop coastal protection measures (including nature based solutions)
- Maximise resilient land for development
- Maximize development along the lifeline corridor
- Increase sustainable power access & security
- Improve boat access and connectivity (ramp, dock etc.)
- Improve roads and access to critical infrastructure
- Support active, public and shared transport options
- Develop local employment opportunities
- New / improved multi-purpose facilities to support mobile social (for e.g.medical) and emergency services
- Potential to re-purpose available buildings for community use
- Improve access to new or existing community facilities
- Protect important cultural sites
- Compact walkable communities
- Increase food growing capacity
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security
- Multi-purpose green spaces for future resilience

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***Map 9*** - Future state

# LOBAT

# 3.6 LOBAT

## 3.6.1 CURRENT STATE/CURRENT LAND USE PLAN

Lobat is mainly low density residential, and agricultural in nature, supported by local scale community and recreation uses including a recreation field, basketball court, cemetery, and church. Lobat is a 65 minute vehicle trip from Delap.

### Environment

Lobat's topography rises from the west (ocean side) towards the village of Iolap which borders in the east. Like the surrounding villages of Laura, Lobat typically has higher elevation and features higher levels of vegetation cover than other areas of Majuro. Lobat was home to an estimated 226 people in 2025 and is around 174 acres in area (70 hectares).

The groundwater lens (aka Laura Aquifer) located across the Laura region including Lobat, is a significant water supply source for the Laura villages and is also used in other areas of the atoll as a backup during times of water scarcity. Laura has Majuro's most arable land (most appropriate soil type) and Lobat features historic taro agriculture having occurred in Laura for many centuries (since 100 to 700 AD).

### Land use

Lobat is predominantly rural, with large areas of undeveloped land that contributes to its low population density and strong agricultural character relative to other parts of Majuro. The area lacks formal education and health facilities but includes access to recreational spaces and a basketball court. Religious institutions serve as both places of worship and potential emergency shelters. Lobat has arable soil suitable for food production.

### Infrastructure

Lobat has limited public infrastructure and is one of few villages not connected directly to the Lifeline Corridor along the lagoon edge. Lobat's primary road connection is elevated and connects a cluster of community facilities and small roadside shops.

There is no waste collection service in Lobat with households responsible for disposing waste.

### Map explanation

Map 10 illustrates the building uses and names of key buildings. Each building activity has a different color. A dashed line is shown around groups of 'like' building uses – these are the land uses.



***Photo 44*** - Basketball court with the mobile library



***Photo 45*** - Kingdom Hall of Jehovah's Witness



***Photo 46*** - Road out to the ocean side

0 0.25 (5 minute walk) 0.5 (10 minute walk) 1 Mile N

## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

### Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeļāļokjeņ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Roads / laļ ko

### Existing Building Use

- Water Supply / Treatment
- Education / Jeļāļokjeņ
- Industrial
- Infrastructure / Eṃ / laļ /
- Place of Worship / Ṃōn jar
- Power Plant / Ṃōn jarom
- Public
- Residential / Ṃōn jokwe an armej
- Commercial

### Existing Land Use Areas

- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery

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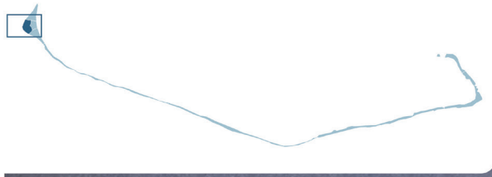

R & H Shop

Kingdom Hall of Jehovah's Witness

New Life Church

BNJ Church

Basketball Court and Recreation Field

***Map 10*** - Current state

## 3.6.2 ANTICIPATED CHANGE

### Projected Population

Lobat's estimated population in 2025 was 226. Projections indicate a substantial decline, with forecasts of 139 to 140 by 2030, 50 to 51 by 2035, and 57 to 59 by 2045. This downward trend underscores the importance of adapting infrastructure and services to meet the needs of a much smaller future community. Note that the population estimate based on available data has led to an assumption of an even population split across Lobat and Iolap.

### Climate Hazards

Flood modelling completed by Deltares shows 0.25 meters (0.82 feet) of sea-level rise and increased intensity of rainfall events, which are anticipated to occur by 2055 under a rapid climate change scenario. Flood models indicate that the village will experience higher incidence of flooding than today, resulting from daily higher sea-levels and high tide events, and periodic rainfall from storm events such as typhoons or other heavy rains, and/or wave-drive overwash from storm surges or swell waves.

Flooding is most likely to be most problematic in the following areas of the village by 2055 if no interventions or additional coastal protection measures are implemented*:

- Though one of the widest parts of the atoll, Lobat is expected to experience extreme flooding, particularly in the central region of the village, where deep pooling of flood water is anticipated in and around the areas of pit agriculture.
- Major to extreme pooling of water is also anticipated throughout the eastern side of the village, limiting the land available for resilient development.
- The ocean coastline, particularly along the southwest side, will be subject to major to extreme flooding.

*Flood severity was determined by evaluating the modelled potential flood depths, with flooding increasing in severity from minor ➔ moderate ➔ major ➔ extreme.

### Map explanation

Map 11 illustrates what could change at a village-level over the next 20 years because of a decrease in population and impacts from climate change. Note that there are other climate impacts – heat, drought, flooding from tsunamis that are not illustrated on the map.

The population bar chart shows two ways the population could change - the lower line shows the population projection of this village over the next 5, 10 and 20 years and the line above shows the population with potential interventions signaled by the RMI government.

The map shows 0.82 feet (0.25m) of sea-level rise, daily high tide, and flooding from rainstorms, typhoons, and swell wave events.

Critical services and infrastructure are shown as icons on the map.  These support daily life, community resilience and disaster preparedness now and in the future and are to be retained and potentially moved if they are located in vulnerable areas.

Map 11 has different colors to show the possible extent of flooding from typhoons, rainstorms, and swell waves in 2055 with 0.82 feet of sea-level rise (SLR):

- No color  - these areas show where there is minimal flood risk.
- Blue shows where there would be minor flooding (less risk of flooding, lower levels of flooding expected).
- Light yellow shows where there would be moderate flooding (higher risk of flooding, possible deep flood waters).
- Bright yellow and orange show where there would be major flooding (even higher risk of flooding, area susceptible to multiple flood hazards, possible deep flood waters).
- Red, brown, black show where there would be extreme flooding (worst flooding for Majuro, area susceptible to multiple flood hazards, possible very deep flood waters).

The high tide map has different colors to show possible water depths from daily high tide in 2055 with 0.82 feet of SLR.

- Light purple shows where there will likely be 0.33-1.64 feet of water every day at high tide.
- Purple shows where there will likely be more than 1.65 feet of water every day at high tide.

NOTE – these flood maps are modelled based on current day environment and coastal edge (not allowing for more seawalls or other changes to the ocean and coastal edge).

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

- Buildings
- Roads / laḷ ko

### Critical Services

- Education / Jeḷāḷokjeṇ
- Police / Mōn bwilinmāāṇ
- Fire Station
- Health / Jikin taktō
- Hospital
- Fuel Station
- Antenna
- National Telecommunication
- Pump Station
- Power Plant
- Airport
- Port / Wharves
- Boat Ramp / Access
- Disaster Equipment Storage
- Emergency Shelter
- Main Lifeline Corridor

### Multi - Hazard* Flooding
at 10 inches of Sea Level Rise by 2055

- Minor Flooding
- Moderate Flooding
- Major Flooding
- Extreme Flooding (Multiple potential flood hazards)

### High Tide
at 10 inches of Sea Level Rise by 2055

- 0.33 - 0.82ft
- 0.83 - 1.64ft
- 1.65 - 2.46ft
- 2.47 - 3.28ft
- 3.29ft- and above

** 50-year return period events: swell waves, typhoon rainfall with storm surge, and non-typhoon rainfall.*
** SLR and high-tide based on Deltares' modelling of the extreme climate scenario, SSP5-8.5*

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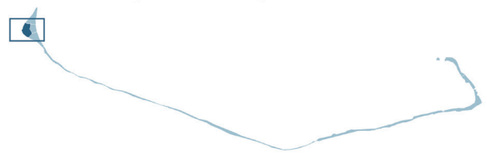

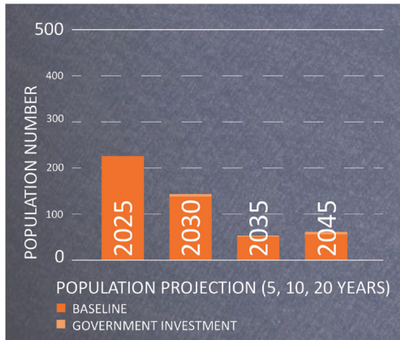


Lagoon Rd - Main Lifeline Corridor

***Map 11*** - Anticipated change

### 3.6.3 FUTURE LAND USE PLAN AND INFRASTRUCTURE NEEDS

In the future, land use in Lobat remains agricultural reinforcing the agricultural heritage of the area and signaling a deliberate approach to avoid intensification.

#### Opportunities

Opportunities raised in the July engagement session that formed the basis of discussion at the November stakeholder engagement:

- Identify and invest in new or existing multi-purpose community facility and recreation space, that could accommodate mobile social services (medical, education etc).
- Protect the water lens and arable soil from inappropriate development and utilize undeveloped land for water collection and food production.
- Protect the existing vegetation and tree cover for future climate resilience.
- Increase food growing capacity and efficiencies within Lobat to support the wider Atoll.
- Develop a public transport or ride share strategy for Lobat to improve connectivity to employment and critical infrastructure in Rairok and DUD.
- Water storage tanks within Lobat to increase drought resilience locally and across the Atoll.
- A multi-purpose recreation space that could also be utilized for events such as a weekly farmers market to encourage local commercial activity and income generation.
- Increase the resilience of the local roading connections to the local community services in Iolap and wider Atoll via the Lifeline Corridor.

#### Priorities and Projects

Looking to the future, the Lobat community is focused on advancing projects that will strengthen resilience and improve quality of life. Following engagement sessions in July and November 2025 as part of the Master Plan engagement, community and landowners identified the following key priorities:

| Projects and Priorities (high priority in bold) | Master Plan Objectives | | |
|---|---|---|---|
| | Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages |
| **Employment opportunities for the community** | | ✓ | |
| **Agriculture and husbandry projects for food security** | ✓ | ✓ | |
| **Improve the quality of road system, specifically the small roads.** | | | ✓ |
| **Provide public transportation - low cost for community** | | | ✓ |
| **Seawalls to protect key infrastructure** | ✓ | ✓ | |
| Waste disposal and management system | ✓ | ✓ | |
| Lobat community center (new build) | ✓ | ✓ | |
| Evacuation center | | ✓ | |
| Provision of more and maintenance of existing solar lights - roading and housing | | | ✓ |

#### Map explanation

Map 12 illustrates the recommended land use changes and actions that should be taken to address the impacts of anticipated changes over the next 20 years. It also shows the priority projects identified by the community and includes those that will support daily life, community resilience and disaster preparedness.

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Ieļāļokjeņ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / Iaļ ko
- New Road Connection
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

### Resilient Village Strategies

- Develop coastal protection measures (including nature based solutions)
- Increase sustainable power access & security
- Improve roads and access to critical infrastructure
- Support active, public and shared transport options
- Develop local employment opportunities
- New / improved multi-purpose facilities to support mobile social (for e.g.medical) and emergency services
- Improve access to new or existing community facilities
- Compact walkable communities
- Multi-purpose green spaces for future resilience
- Increase food growing capacity
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security

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Kingdom Hall of Jehovah's Witness

New Life Church

BNJ Church

Basketball Court and Recreation Field

0.5 MILE WALKABLE CATCHMENT

***Map 12*** - Future state

# IOLAP

## 3.7 IOLAP

### 3.7.1 CURRENT STATE/CURRENT LAND USE PLAN

Iolap contains largely low density residential and agricultural land uses, with a clear cluster of community services around the village center, including the medical center, police, multiple churches and a school. Scattered convenience retail (stores) and a basketball court are located along/near the main corridor. Iolap is a 60 to 65 minute vehicle trip from Delap or can be accessed by boat from the local boat ramp.

#### Environment and Topography

Many parts of Iolap are at higher elevation and feature higher levels of vegetation cover than other areas of Majuro. Greater vegetation coverage can aid in improved stormwater management, thereby reducing flooding, while areas of higher elevation are less susceptible to pooling flood waters. While areas of previous taro agriculture along the border with Lobat are likely to see extreme pooling of flood water by mid-century, most of the existing community services are currently in areas that are not expected to see worsening flooding conditions by mid-century. Iolap was home to an estimated 226 people in 2025 and is around 91 acres in area (37 hectares). The groundwater lens (the Laura Aquifer) located across the Laura region including Iolap, is a significant water supply source for the Laura villages and is also used in other areas of the atoll as a backup during times of water scarcity. The Laura area that includes Iolap area has Majuro's most arable land for food growing.

#### Land use

The community of Iolap is centrally located within the Laura region and includes low density residential and agricultural land uses, with a clear cluster of shops and community services along the Lifeline Corridor, including the medical center, police, multiple churches and a school. Scattered convenience retail (stores) and a basketball court are located near and along the Lifeline Corridor. The clustering of existing shops and community facilities results in a relatively walkable catchment for those living close to the Lifeline Corridor.

#### Infrastructure

Higher levels of infrastructure and public facilities are located within the village of Iolap than the surrounding villages of Laura. Iolap is well connected by road to the wider atoll via the Lifeline Corridor. Infrastructure within Iolap includes:

- Lifeline corridor
- Boat ramp
- Water supply and storage
- Police station
- Medical centre
- Evacuation centre (school)
- Schools

There is no waste collection service in Iolap and households are responsible for disposing waste.

#### Map explanation

Map 13 illustrates the building uses and names of key buildings. Each building activity has a different color. A dashed line is shown around groups of 'like' building uses – these are the land uses.



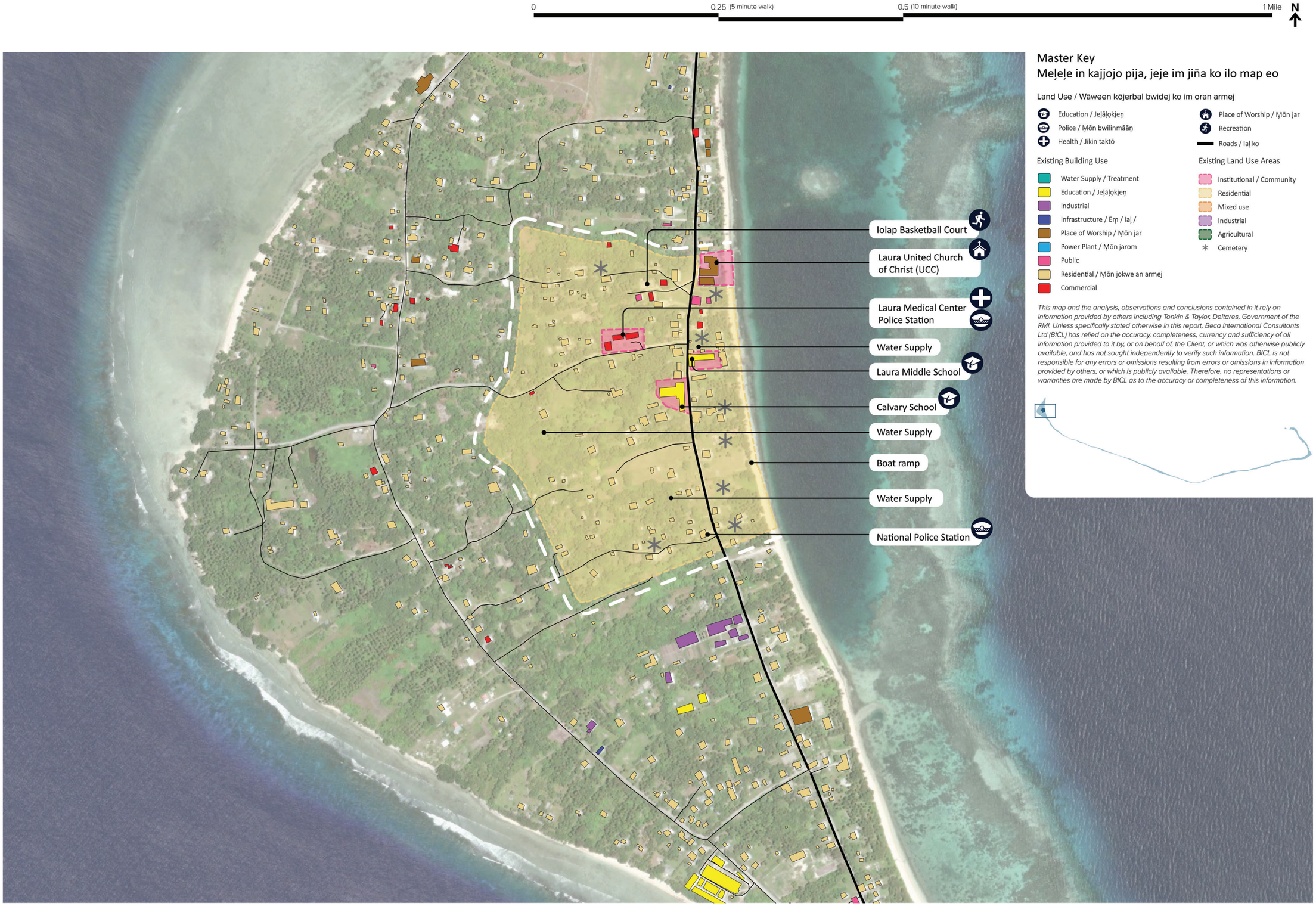
***Photo 47*** - Laura United Church of Christ



***Photo 48*** - Laura Police Station next to the Laura Medical Center



***Photo 49*** - Access to the basketball court on the lagoon side




***Map 13*** - Current state

## 3.7.2 ANTICIPATED CHANGE

### Projected Population

Iolap's estimated population in 2025 was 226. Projections indicate a substantial decline, with forecasts of 139 to140 by 2030, 50 to 51 by 2035, and 57 to 59 by 2045. This downward trend underscores the importance of adapting infrastructure and services to meet the needs of a much smaller future community. Note that the population estimate based on available data has led to an assumption of an even population split across Iolap and Lobat.

### Climate Hazards

Flood modelling completed by Deltares shows 0.82 feet (0.25 meters) of sea-level rise and increased intensity of rainfall events, which are anticipated to occur by 2055 under a rapid climate change scenario. Flood models indicate that the village will experience higher incidence of flooding than today, resulting from daily higher sea-levels and high tide events, and periodic rainfall from storm events such as typhoons or other heavy rains, and/or wave-drive overwash from storm surges or swell waves.

Flooding is most likely to be most problematic in the following areas of the village by 2055 if no interventions or additional coastal protection measures are implemented*:

- There is an area along the western boundary with Lobat where major to extreme pooling of flood water is anticipated to occur, predominantly in agricultural areas.
- Iolap has only lagoon coastline, and is therefore less vulnerable to king tides and sea-level rise when compared to other villages, but some moderate flooded is expected along the coastline.

Most of the existing community services are currently in areas that are not expected to see worsening of flooding conditions.

*Flood severity was determined by evaluating the modelled potential flood depths, with flooding increasing in severity from minor ➔ moderate ➔ major ➔ extreme.

### Map explanation

Map 14 illustrates what could change at a village-level over the next 20 years because of a decrease in population and impacts from climate change. Note that there are other climate impacts – heat, drought, flooding from tsunamis that are not illustrated on the map.

The population bar chart shows two ways the population could change - the lower line shows the population projection of this village over the next 5, 10 and 20 years and the line above shows the population with potential interventions signaled by the RMI government.

The map shows 0.82 feet (0.25m) of sea-level rise, daily high tide, and flooding from rainstorms, typhoons, and swell wave events.

Critical services and infrastructure are shown as icons on the map.  These support daily life, community resilience and disaster preparedness now and in the future and are to be retained and potentially moved if they are located in vulnerable areas.

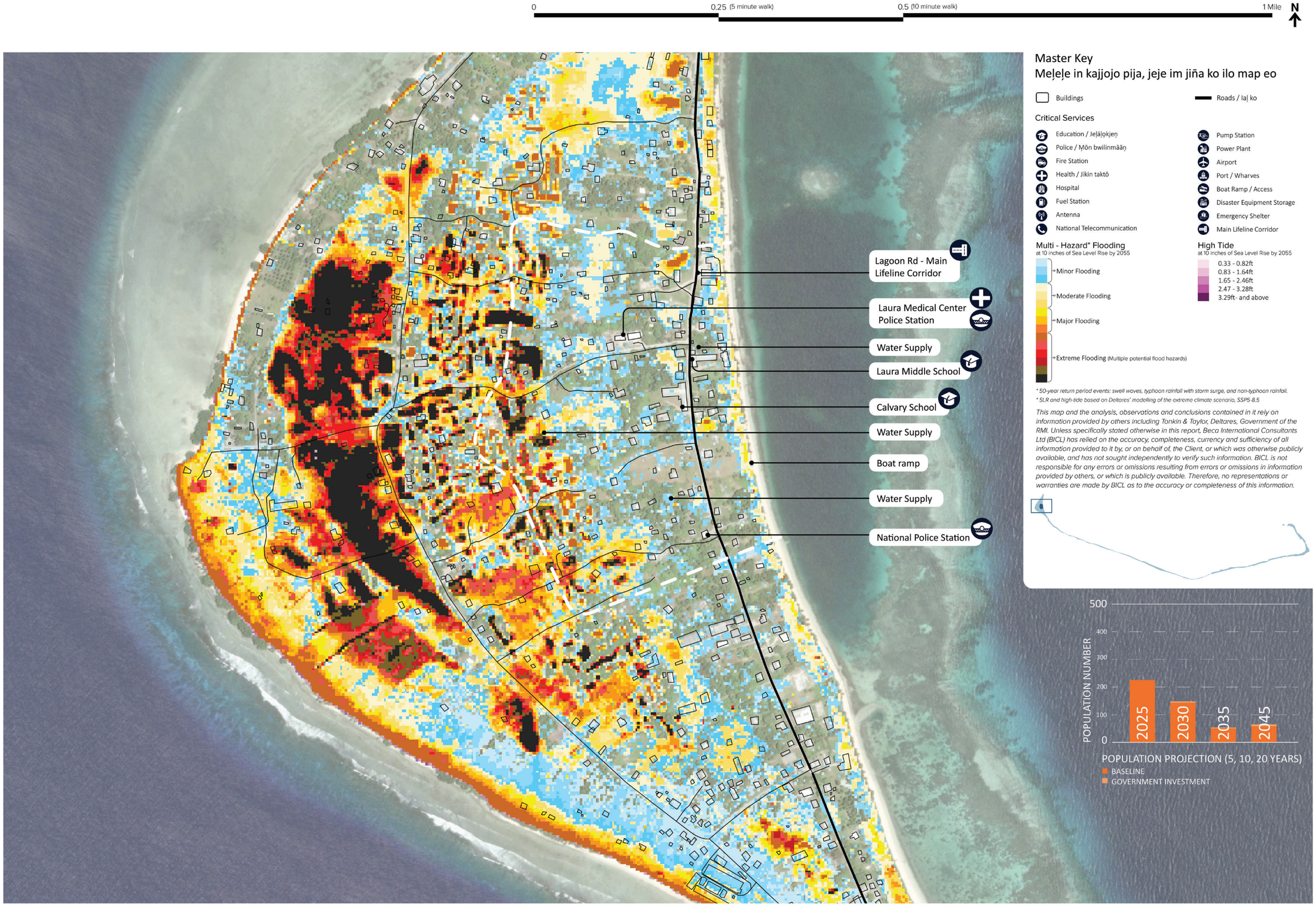
Map 14 has different colors to show the possible extent of flooding from typhoons, rainstorms, and swell waves in 2055 with 0.82 feet of sea-level rise (SLR):

- No color  - these areas show where there is minimal flood risk.
- Blue shows where there would be minor flooding (less risk of flooding, lower levels of flooding expected).
- Light yellow shows where there would be moderate flooding (higher risk of flooding, possible deep flood waters).
- Bright yellow and orange show where there would be major flooding (even higher risk of flooding, area susceptible to multiple flood hazards, possible deep flood waters).
- Red, brown, black show where there would be extreme flooding (worst flooding for Majuro, area susceptible to multiple flood hazards, possible very deep flood waters).

The high tide map has different colors to show possible water depths from daily high tide in 2055 with 0.82 feet of SLR.

- Light purple shows where there will likely be 0.33-1.64 feet of water every day at high tide.
- Purple shows where there will likely be more than 1.65 feet of water every day at high tide.

NOTE – these flood maps are modelled based on current day environment and coastal edge (not allowing for more seawalls or other changes to the ocean and coastal edge).




***Map 14*** - Anticipated change

### 3.7.3 FUTURE LAND USE PLAN AND INFRASTRUCTURE NEEDS

Iolap will continue as a rural community hub with low-density homes and extensive agricultural land preserved, while strengthening its small village center. The plan calls for limited mixed-use development along the main lifeline road (lagoon side) to support local services, creating a modest activity node without losing Iolap's open, rural character. Overall, Iolap's future land use prioritizes productive land and resilient housing, consolidating community facilities (medical center, police, churches, school) in a compact, walkable core.

## Opportunities

Opportunities raised in the July engagement session that formed the basis of discussion at the November stakeholder engagement:

- The development of Iolap as an intermediate center of Laura, through the consolidation of future infrastructure and development around existing community facilities in Iolap.
- Identify and invest in new or existing multi-purpose community facilities including a recreation hall that could accommodate mobile social services (medical, education etc)
- Develop an emergency system for Iolap with satellite services, emergency resources i.e. food, clean water, fuel source for heat.
- Protect the water lens and arable soil from inappropriate development and utilize undeveloped land for water collection and food production.
- Protect the existing vegetation and tree cover for future climate resilience.
- Increase food growing capacity and efficiencies within Iolap to support the wider Atoll.
- Investigate potential locations for a boat ramp in Iolap to increase future resilience and provide a safe alternative to road-based connections between Laura and the wider Atoll.
- Develop a public transport or ride share strategy for Iolap to improve connectivity to employment and critical infrastructure in Rairok and DUD.
- Improve safety of corridor through improved lighting, sidewalks and speed reduction measures through more populated areas.
- Water storage tanks within Iolap to increase drought resilience locally and across the Atoll.

## Priorities and Projects

Looking to the future, the Iolap community is focused on advancing projects that will strengthen resilience and improve quality of life. Following engagement sessions in July and November 2025 as part of the Master Plan engagement, community and landowners identified the following key priorities:

| Projects and Priorities (high priority in bold) | Master Plan Objectives: Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages |
|---|---|---|---|
| **Community Center for Iolap** | ✓ | ✓ | |
| **Boat Ramp** | | ✓ | ✓ |
| **Sewer system** | ✓ | ✓ | |
| **Provision of more and maintenance of existing solar lights - roading and housing** | | ✓ | ✓ |
| **Provide sidewalks and better road drainage system** | ✓ | ✓ | |
| **Improve roads and road signage** | | | ✓ |
| **Introduce nature based approaches for coastal protection** | ✓ | ✓ | |
| Agricultural fencing/pig pens and Poultry netting | ✓ | ✓ | |
| Support for community gardens | ✓ | ✓ | |

## Map explanation

Map 15 illustrates the recommended land use changes and actions that should be taken to address the impacts of anticipated changes over the next 20 years. It also shows the priority projects identified by the community and includes those that will support daily life, community resilience and disaster preparedness.




## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷọkjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / Iaḷ ko
- New Road Connection
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Develop coastal protection measures (including nature based solutions)
- Maximise resilient land for development
- Maximize development along the lifeline corridor
- Increase sustainable power access & security
- Improve boat access and connectivity (ramp, dock etc.)
- Improve roads and access to critical infrastructure
- Support active, public and shared transport options
- Develop local employment opportunities
- Mixed-use along the lifeline corridor where population supports
- Protect important cultural sites
- Compact walkable communities
- Multi-purpose green spaces for future resilience
- Increase food growing capacity
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security

*This map and the analysis, observations and conclusions contained in it rely on information provided by others including Tonkin & Taylor, Deltares, Government of the RMI. Unless specifically stated otherwise in this report, Beca International Consultants Ltd (BICL) has relied on the accuracy, completeness, currency and sufficiency of all information provided to it by, or on behalf of, the Client, or which was otherwise publicly available, and has not sought independently to verify such information. BICL is not responsible for any errors or omissions resulting from errors or omissions in information provided by others, or which is publicly available. Therefore, no representations or warranties are made by BICL as to the accuracy or completeness of this information.*



***Map 15*** - Future state



*Photo 50* - Aerial view of the western end of Majuro Atoll with Laura area in the distance

# JEIROK

# 3.8 JEIROK

## 3.8.1 CURRENT STATE/CURRENT LAND USE PLAN

Jeirok is the gateway into the Laura region and contains a mixture of residential and public uses alongside several churches. Land use also includes agriculture, where farming/planting is identified within the village extent. Jeirok is a 50 to 60 minute vehicle trip from Delap or can be accessed by boat from the local boat ramp.

### Environment

The village of Jeirok transitions from a low lying narrow atoll corridor to a wider and well vegetated landscape. Jeirok was home to an estimated 379 people in 2025 and is around 162 acres in area (66 hectares). The groundwater lens (the Laura Aquifer) located across the Laura region including parts of Jeirok is a significant water supply source for the Laura villages and is also used in other areas of the atoll as a backup during times of water scarcity. Jeirok also has high levels of arable land for food growing.

### Land use

Like much of the surrounding region, Jeirok is predominantly made up of rural land use with smaller areas of education and residential. The community of Jeirok is centrally located within the Laura region and includes low density residential and agricultural land uses, with a cluster of shops and community services along the Lifeline Corridor, including the community center, multiple churches and schools. Scattered convenience retail (stores) and a basketball court are located along/near the main corridor. The wider Laura area is considered a hub for cropping/agriculture activity on Majuro, highlighted by the Agricultural Nursery and Farm in Jeirok.

Jeirok can be considered the educational precinct for Laura given the number of educational facilities, including Laura Public Elementary and High School and the Laura Seventh Day Adventist Elementary School. Jeirok is also home to the Taiwan Technical Mission (TTM) Gardens a local agricultural based employer.

### Infrastructure

Jeirok features higher levels of infrastructure and public facilities than the surrounding villages of Laura. Jeirok is well connected by road to the wider atoll via the Lifeline Corridor. Infrastructure within Jeirok includes:

- Lifeline corridor
- Boat ramp
- Water supply and storage
- Power
- NTA Communications Antenna
- Medical center
- Schools which also have a function as an evacuation center

There is no waste collection service in Jeirok and households are responsible for disposing waste.

### Map explanation

Map 16 illustrates the building uses and names of key buildings. Each building activity has a different color. A dashed line is shown around groups of ‘like’ building uses – these are the land uses.



***Photo 51*** - Technical Mission - Taiwan providing - providing horticulture

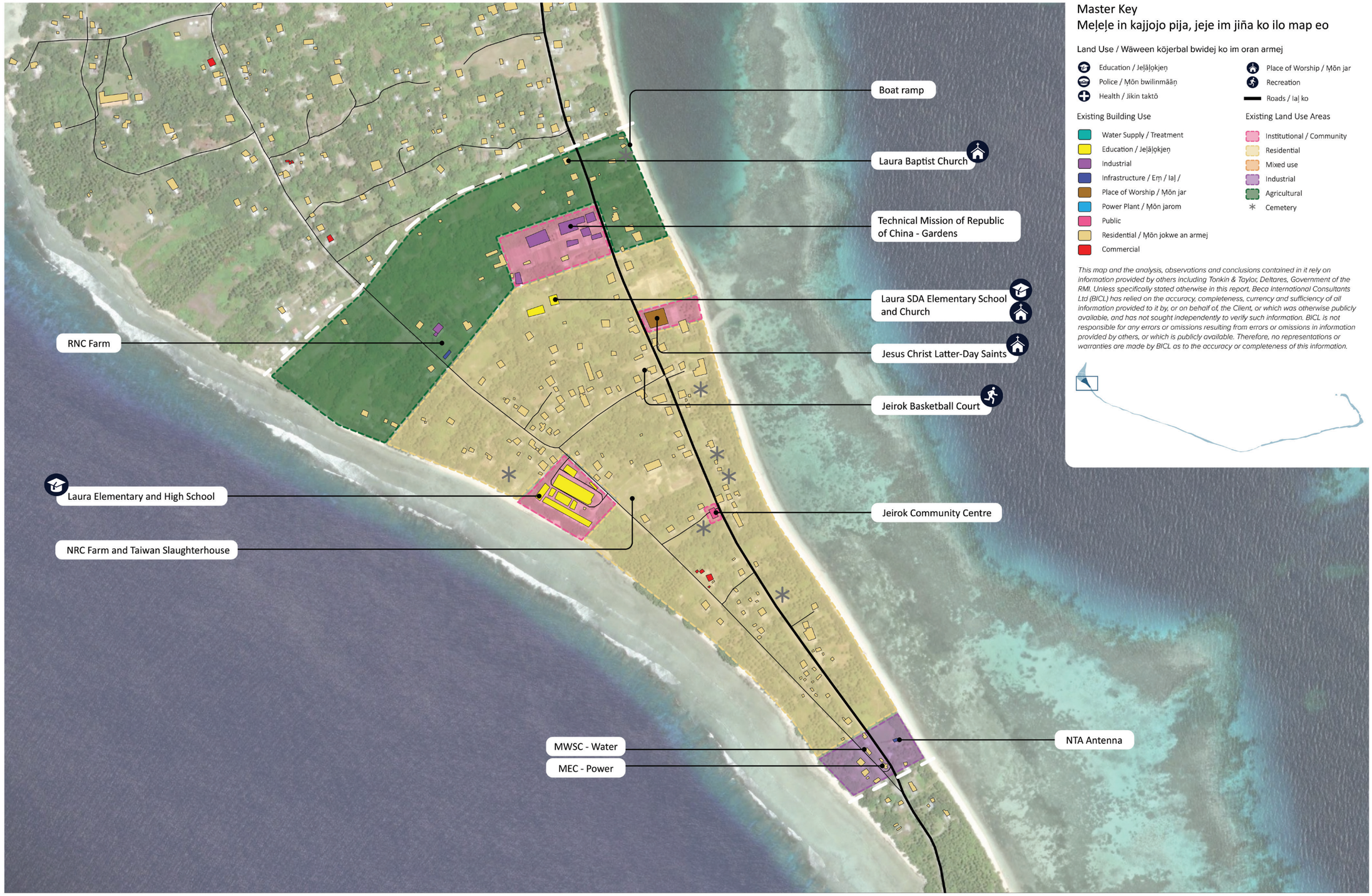


***Photo 52*** - Jeirok Community Center




***Photo 53*** - Laura Elementary and High School on the ocean side

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N




## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

### Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷọkjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Roads / Iaḷ ko

### Existing Building Use

- Water Supply / Treatment
- Education / Jeḷāḷọkjeṇ
- Industrial
- Infrastructure / Eṃ / Iaḷ /
- Place of Worship / Ṃōn jar
- Power Plant / Ṃōn jarom
- Public
- Residential / Ṃōn jokwe an armej
- Commercial

### Existing Land Use Areas

- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery

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***Map 16*** - Current state

### 3.8.2 ANTICIPATED CHANGE

#### Projected Population:

Jeirok's estimated population in 2025 was 379. Projections indicate a decline, with forecasts of 307 to 310 by 2030, 229 to 233 by 2035, and 122 to 126 by 2045. This downward trend highlights the importance of planning for future infrastructure and services to support a smaller community.

#### Climate Hazards

Flood modelling completed by Deltares shows 0.82 feet (0.25 meters) of sea-level rise and increased intensity of rainfall events, which are anticipated to occur by 2055 under a rapid climate change scenario. Flood models indicate that the village will experience higher incidence of flooding than today, resulting from daily higher sea-levels and high tide events, and periodic rainfall from storm events such as typhoons or other heavy rains, and/or wave-drive overwash from storm surges or swell waves.

Flooding is most likely to be most problematic in the following areas of the village by 2055 if no interventions or additional coastal protection measures are implemented*:

- The ocean coastline is expected to see major to extreme flooding, with minor flooding just inland from the coastline.
- Extreme flooding in expected in the northwest of the village along the border with Lobat, as well as the southern tip of the village on the border with Woja.
- Laura School is of particular concern due to the increase in flooding and erosion likely to occur, exacerbating the risks already experienced by community.

*Flood severity was determined by evaluating the modelled potential flood depths, with flooding increasing in severity from minor ➔ moderate ➔ major ➔ extreme.

#### Map explanation

Map 17 illustrates what could change at a village-level over the next 20 years because of a decrease in population and impacts from climate change. Note that there are other climate impacts – heat, drought, flooding from tsunamis that are not illustrated on the map.

The population bar chart shows two ways the population could change - the lower line shows the population projection of this village over the next 5, 10 and 20 years and the line above shows the population with potential interventions signaled by the RMI government.

The map shows 0.82 feet (0.25m) of sea-level rise, daily high tide, and flooding from rainstorms, typhoons, and swell wave events.

Critical services and infrastructure are shown as icons on the map. These support daily life, community resilience and disaster preparedness now and in the future and are to be retained and potentially moved if they are located in vulnerable areas.

Map 17 has different colors to show the possible extent of flooding from typhoons, rainstorms, and swell waves in 2055 with 0.82 feet of sea-level rise (SLR):

- No color - these areas show where there is minimal flood risk.
- Blue shows where there would be minor flooding (less risk of flooding, lower levels of flooding expected).
- Light yellow shows where there would be moderate flooding (higher risk of flooding, possible deep flood waters).
- Bright yellow and orange show where there would be major flooding (even higher risk of flooding, area susceptible to multiple flood hazards, possible deep flood waters).
- Red, brown, black show where there would be extreme flooding (worst flooding for Majuro, area susceptible to multiple flood hazards, possible very deep flood waters).

The high tide map has different colors to show possible water depths from daily high tide in 2055 with 0.82 feet of SLR.

- Light purple shows where there will likely be 0.33-1.64 feet of water every day at high tide.
- Purple shows where there will likely be more than 1.65 feet of water every day at high tide.

NOTE – these flood maps are modelled based on current day environment and coastal edge (not allowing for more seawalls or other changes to the ocean and coastal edge).



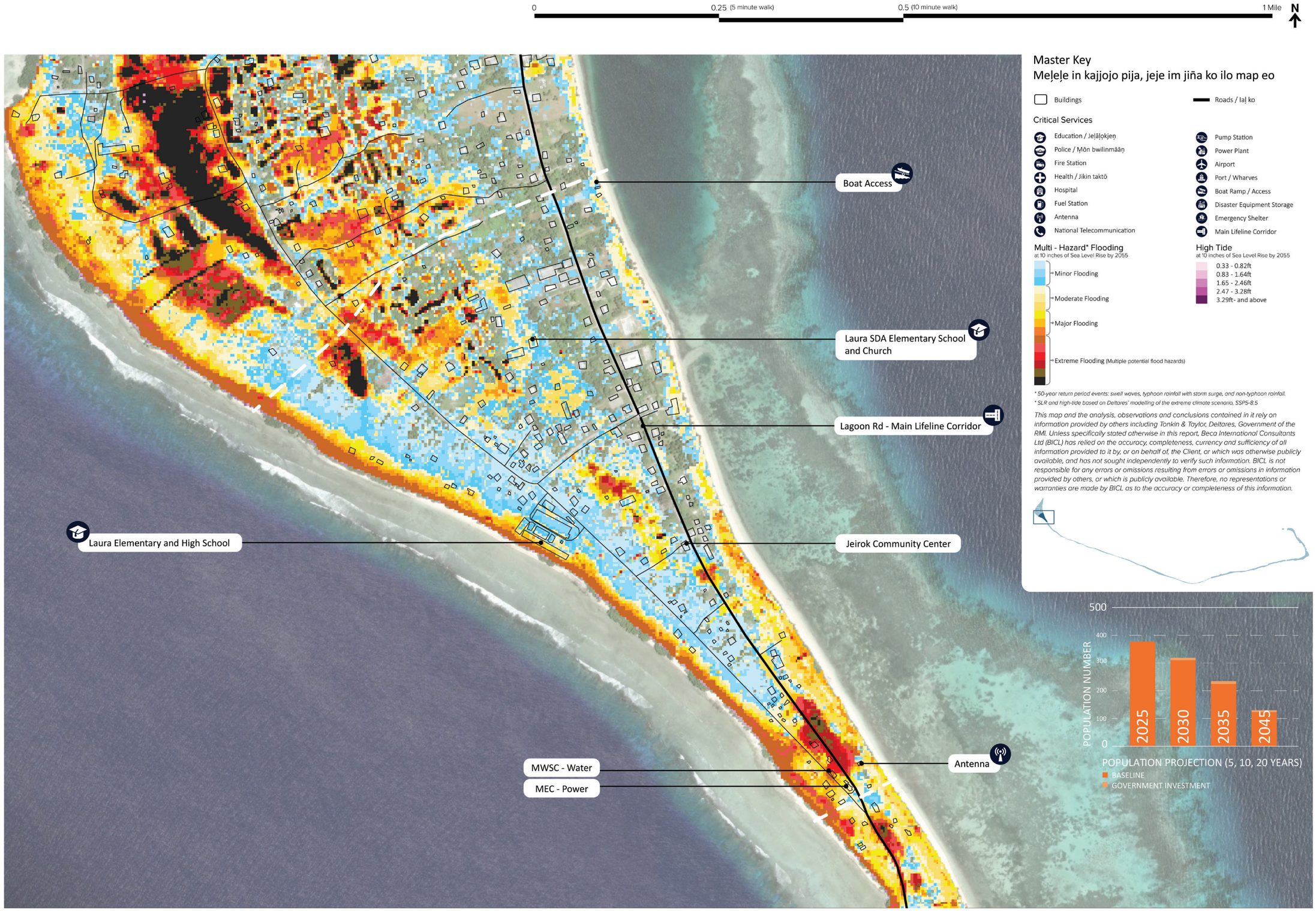
***Photo 54*** - Water and power infrastructure at the road junction entering Laura



***Photo 55*** - Antenna at the entry to Laura on the lagoon side



***Photo 56*** - Solar power poles along the roads in Laura provide lighting




***Map 17*** - Anticipated change

### 3.8.3 FUTURE LAND USE PLAN AND INFRASTRUCTURE NEEDS

Jeirok's future land use remains predominantly rural and community-focused. It will retain its mix of low-density residential and rural areas, with key public facilities (schools, community center, churches) continuing to form an educational and civic cluster. No major intensification is planned, instead Jeirok's agricultural heritage is preserved, and any development aligns with resilience measures (e.g. protecting the Laura water lens).

## Opportunities

Opportunities raised in the July engagement session that formed the basis of discussion at the November stakeholder engagement:

- Clustering any future development along the Lifeline Corridor (Lagoon side), around existing community facilities to support a walkable catchment for Jeirok.
- Identify and invest in new or existing multi-purpose community facilities including a recreation hall, that could accommodate mobile social services (medical, education etc).
- Protect the water lens and arable soil from inappropriate development and utilize undeveloped land for water collection and food production.
- Protect the existing vegetation and tree cover for future climate resilience.
- Increase food growing capacity and efficiencies to support the wider Atoll.
- Develop a public transport or ride share strategy for Laura to improve connectivity to employment and critical infrastructure
- Water storage tanks to increase drought resilience locally and across the Atoll
- Protect or consider relocation of Laura Elementary and High School from coastal flooding and erosion.

## Priorities and Projects

Looking to the future, the Jeirok community is focused on advancing projects that will strengthen resilience and improve quality of life. Following engagement sessions in July and November 2025 as part of the Master Plan engagement, community and landowners identified the following key priorities:

| Projects and Priorities (high priority in bold) | Master Plan Objectives: Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages |
|---|---|---|---|
| **A better water supply source for Laura High School** | ✓ | ✓ | |
| **Merging room for community exercise and recreational activities at the community center.** | ✓ | ✓ | |
| **Increase land height in high risk areas** | ✓ | ✓ | |
| **Seawalls both ocean and lagoon side particularly near schools** | ✓ | ✓ | |
| Possible relocation or protection of NTA tower, MEC transformers and as well as MWSC operations due to sea-level rise in the area. | | ✓ | |
| Public restroom facilities | ✓ | ✓ | |
| Fencing for livestock | ✓ | ✓ | |
| Maintenance and provision of more solar streetlights | | | ✓ |

## Map explanation

Map 18 illustrates the recommended land use changes and actions that should be taken to address the impacts of anticipated changes over the next 20 years. It also shows the priority projects identified by the community and includes those that will support daily life, community resilience and disaster preparedness.




## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeļāļokjeņ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / Iaļ ko
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

### RMIGov / Donor Agency Capital Projects

1. Laura School Project - Funded (Sept 2023)/ongoing
2. Laura High School Shelters and solar panels - Funded

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Raise (land or buildings)
- Develop coastal protection measures (including nature based solutions)
- Maximise resilient land for development
- Maximize development along the lifeline corridor
- Increase sustainable power access & security
- Improve roads and access to critical infrastructure
- Support active, public and shared transport options
- Develop local employment opportunities
- New / improved multi-purpose facilities to support mobile social (for e.g.medical) and emergency services
- Protect important cultural sites
- Improve boat access and connectivity (ramp, dock etc.)
- Compact walkable communities
- Increase food growing capacity
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security
- Multi-purpose green spaces for future resilience

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***Map 18*** - Future state

# WOJA

## 3.9 WOJA

### 3.9.1 CURRENT STATE/CURRENT LAND USE PLAN

The villages of Woja/Arrak along with Ajetake are described as ‘connectors’ characterized by a narrow low lying atoll landscape defined by the Lifeline Corridor connecting Laura to the wider Atoll. There are two clusters of community facilities located within the Woja village boundaries. The northern western cluster includes a community center, the Arrak Public Park and the CMI Arrak Campus. The smaller eastern cluster is centered around a community center and church.

#### Environment

Woja was home to an estimated 842 people in 2025 and is around 369 acres in area (149 hectares). Given Woja and Ajeltake are quite long and very narrow (about 800 feet (250 meters at the widest section), all buildings are set close to the coast and many are already subject to flooding. There is limited space to move to higher ground.

The Woja Marine Protected area is a feature located in the midpoint of Woja.

#### Land use

Land use in Woja is predominantly residential mixed with pockets of agriculture across its length with higher vegetation cover in wider areas of the Atoll. Interspersed throughout are schools, places of worship and a community center. There is one public recreation space (Arrak Public Park) at the western extent of Woja.

#### Infrastructure

Woja has limited levels of infrastructure and is reliant on road transport, with no known boat access infrastructure. Woja and Ajeltake are connected to the public water supply from Laura however there are limited connections to the groundwater system currently. There is no waste collection service with households responsible for disposing waste.

#### Map explanation

Maps 19-22 illustrate the building uses and names of key buildings. Each building activity has a different color. A dashed line is shown around groups of ‘like’ building uses – these are the land uses.



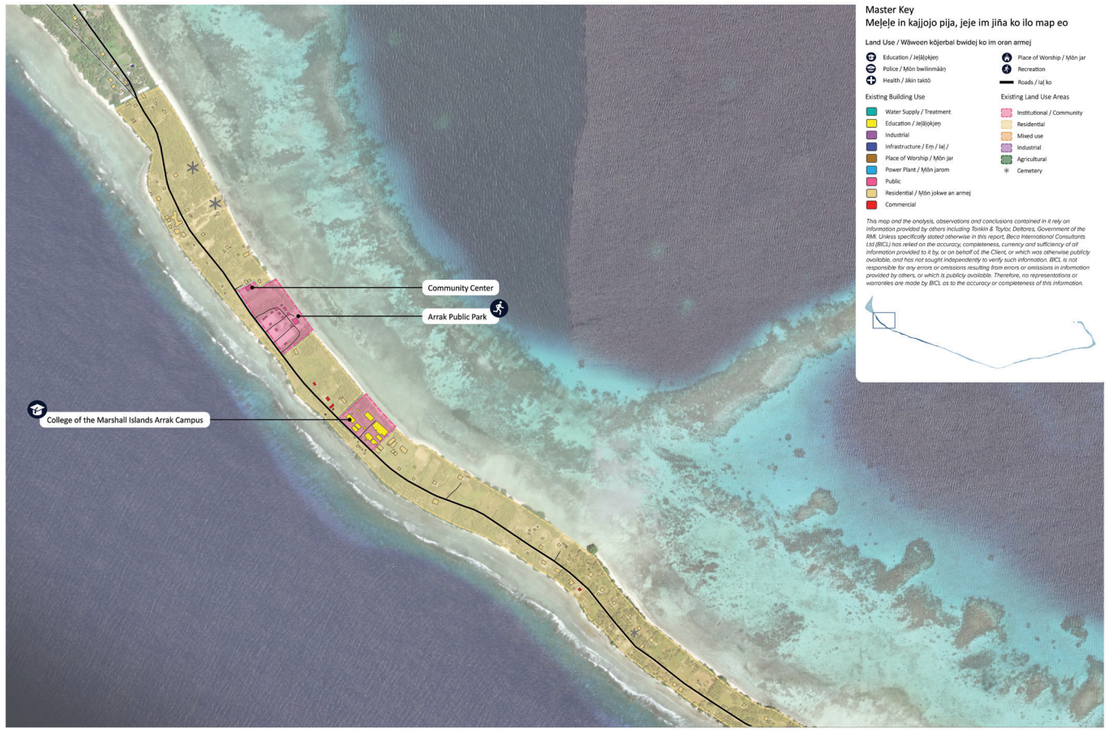

***Photo 57*** - Arrak Public Park



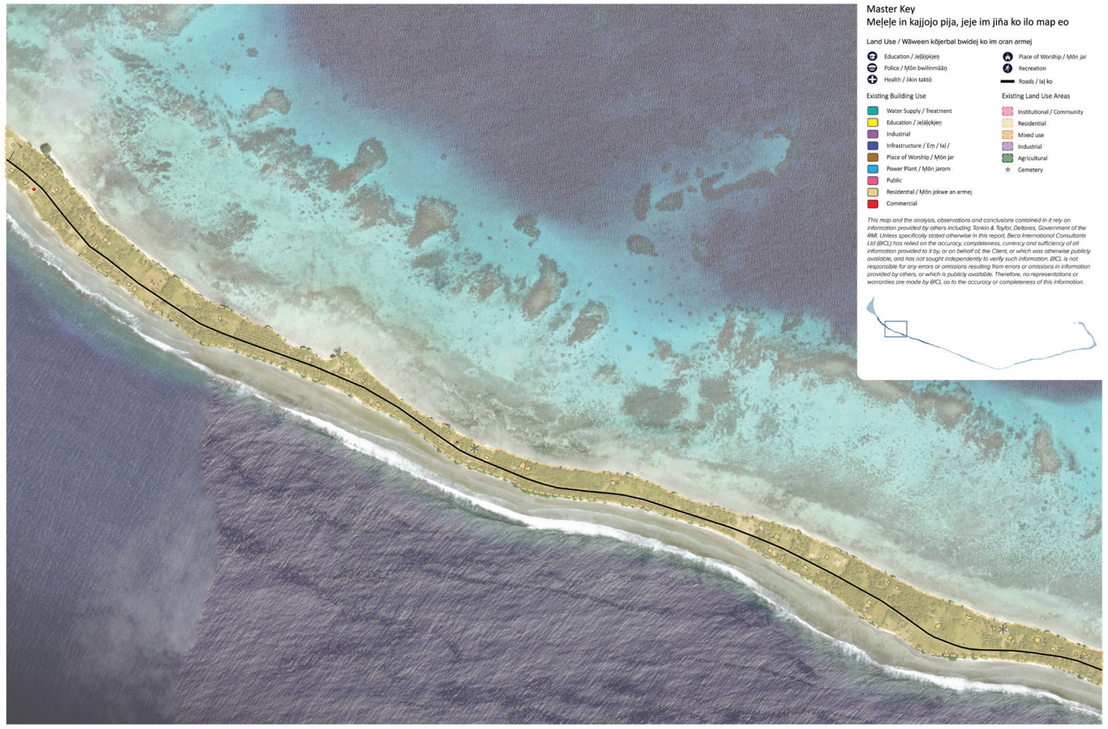
***Photo 58*** - Woja United Church of Christ



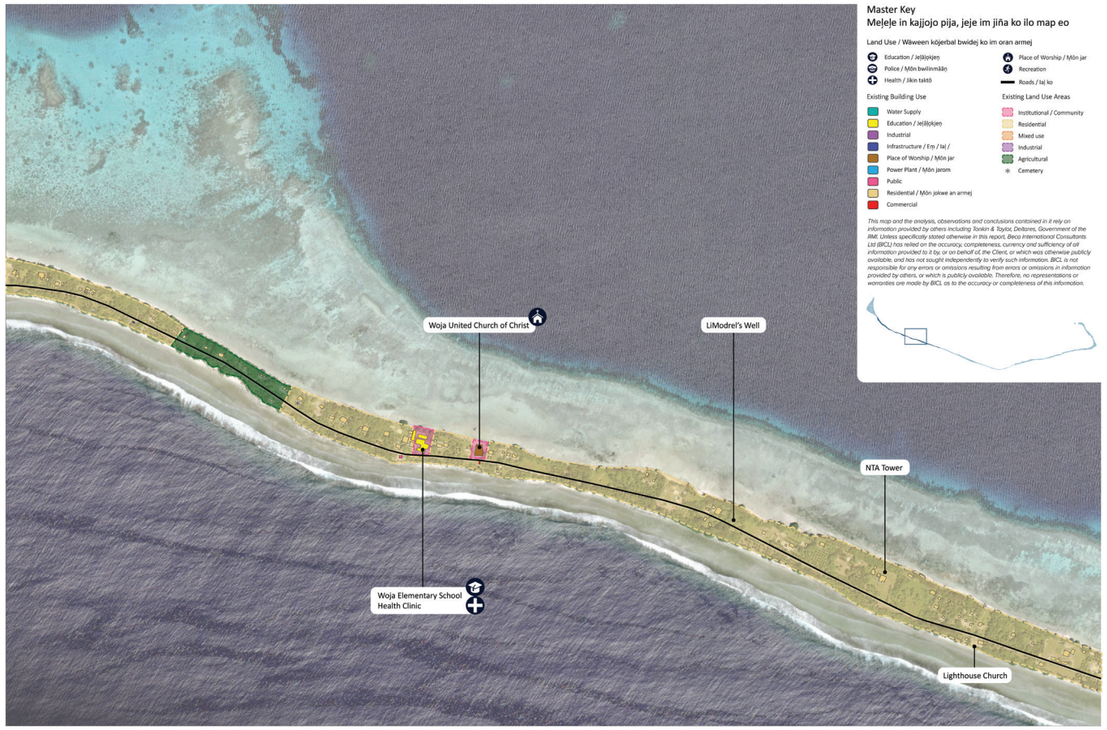
***Photo 59*** - Woja Elementary School



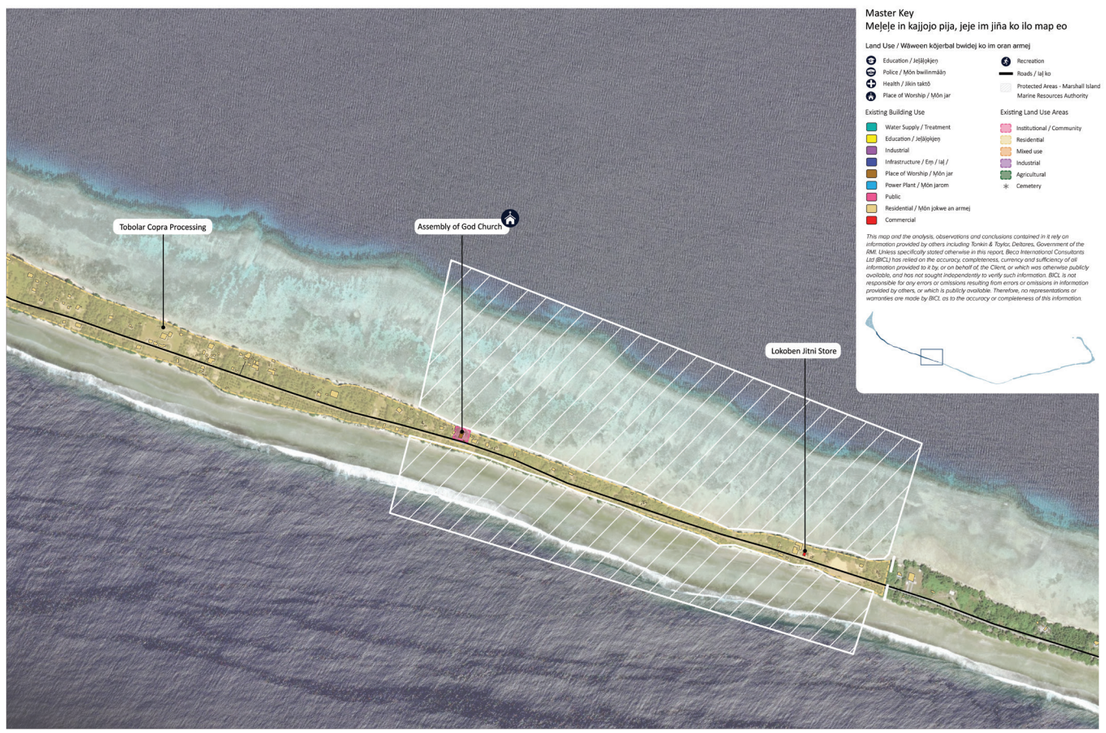

***Map 19*** - Current state



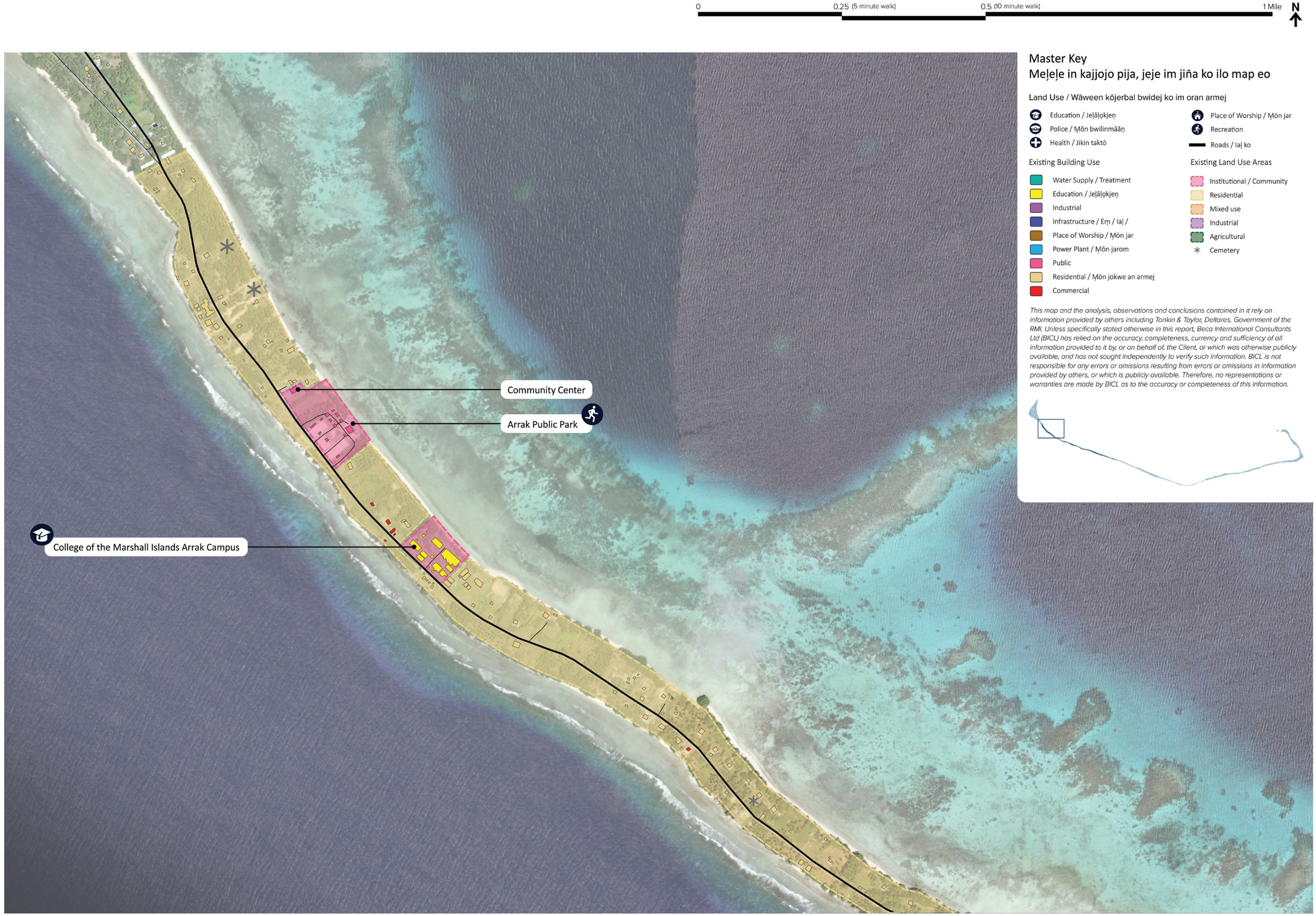

***Map 20*** - Current state




***Map 21*** - Current state

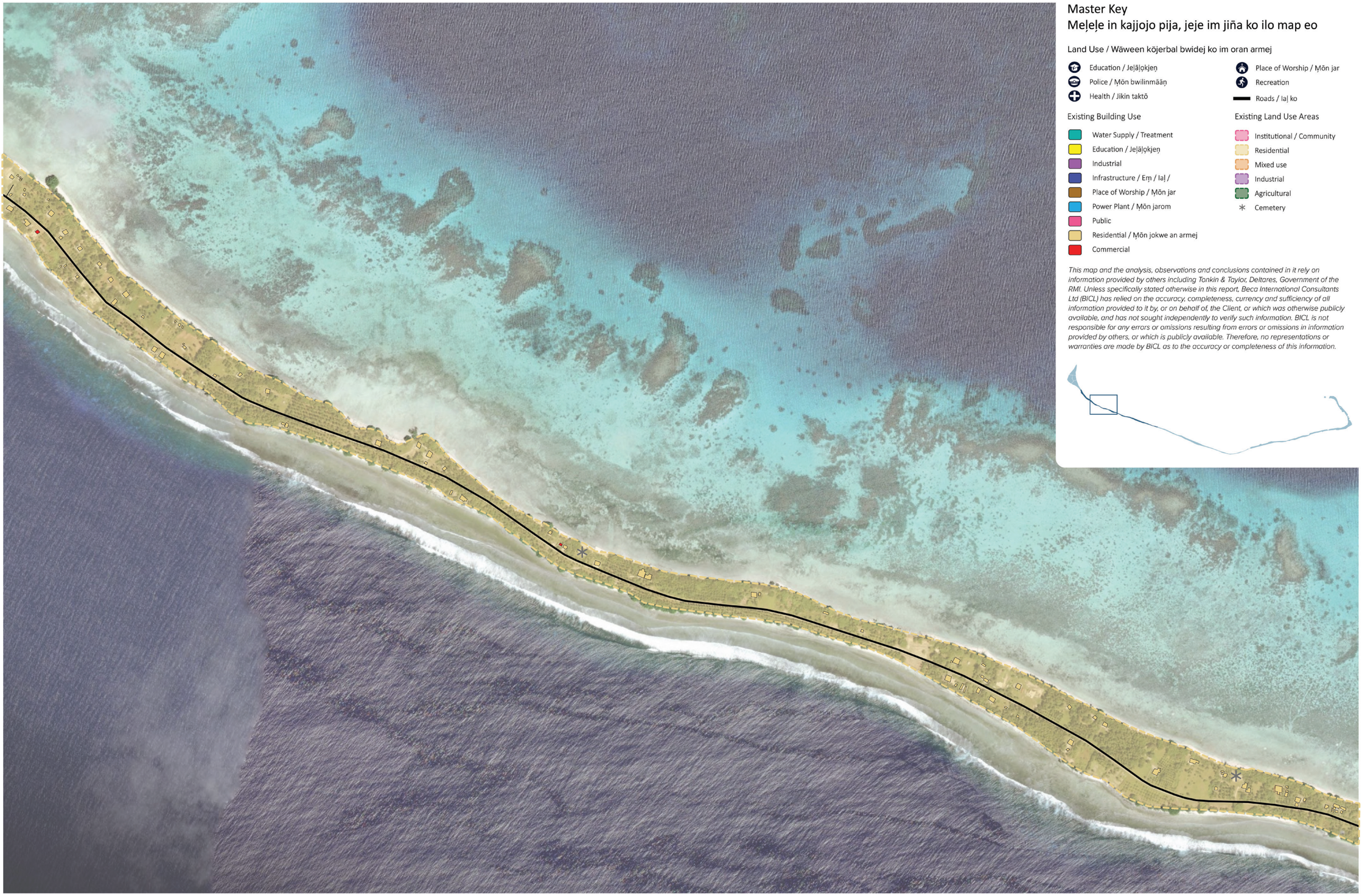



***Map 22*** - Current state




***Map 23*** - Current state

0 0.25 (5 minute walk) 0.5 (10 minute walk) 1 Mile N



## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

### Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷọkjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Roads / Iaḷ ko

### Existing Building Use

- Water Supply / Treatment
- Education / Jeḷāḷọkjeṇ
- Industrial
- Infrastructure / Eṃ / Iaḷ /
- Place of Worship / Ṃōn jar
- Power Plant / Ṃōn jarom
- Public
- Residential / Ṃōn jokwe an armej
- Commercial

### Existing Land Use Areas

- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery

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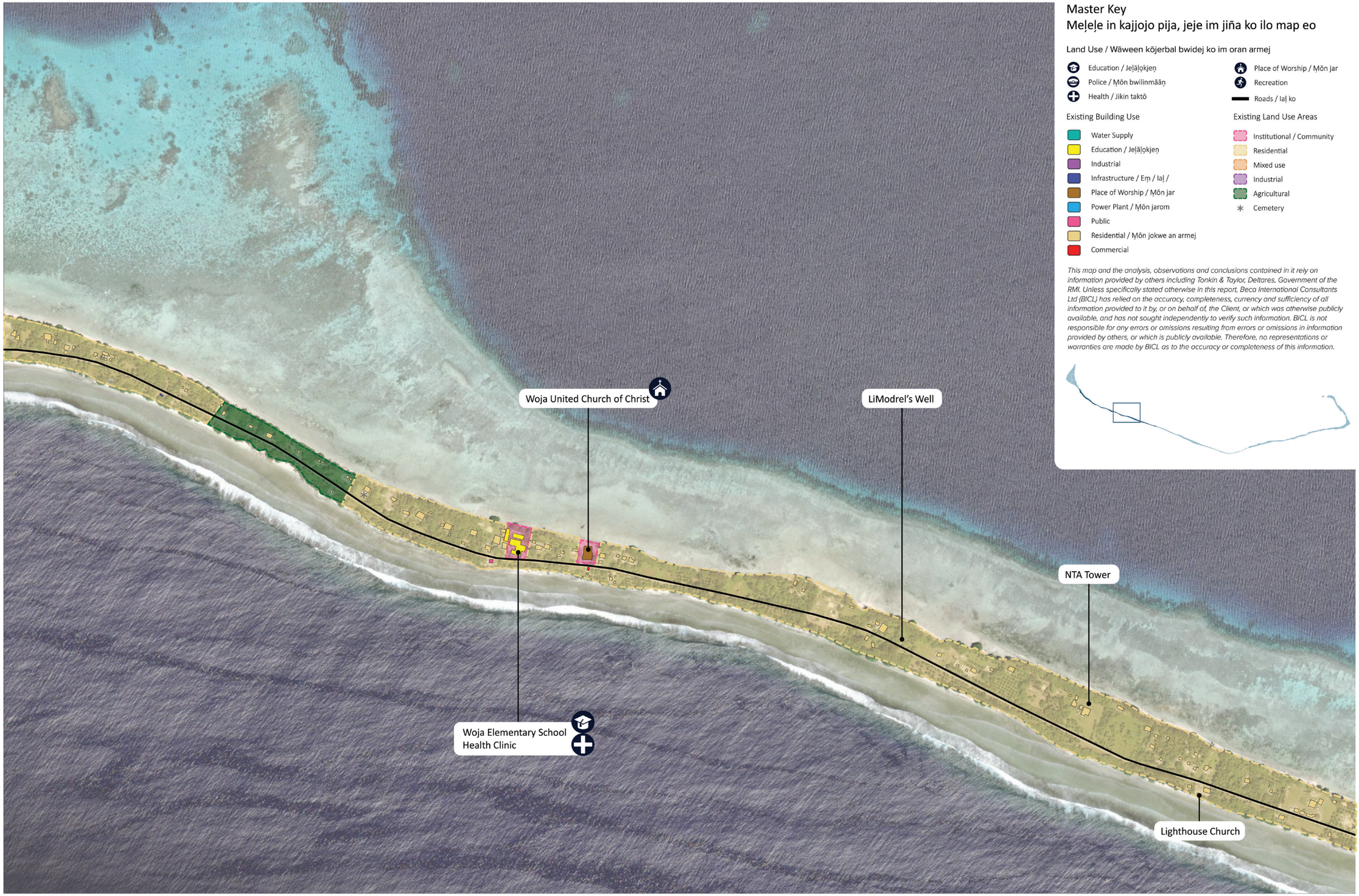
***Map 24*** - Current state

0 0.25 (5 minute walk) 0.5 (10 minute walk) 1 Mile N




## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

### Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeļāļokjeņ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Roads / Iaļ ko

### Existing Building Use

- Water Supply
- Education / Jeļāļokjeņ
- Industrial
- Infrastructure / Eṃ / Iaļ /
- Place of Worship / Ṃōn jar
- Power Plant / Ṃōn jarom
- Public
- Residential / Ṃōn jokwe an armej
- Commercial

### Existing Land Use Areas

- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery

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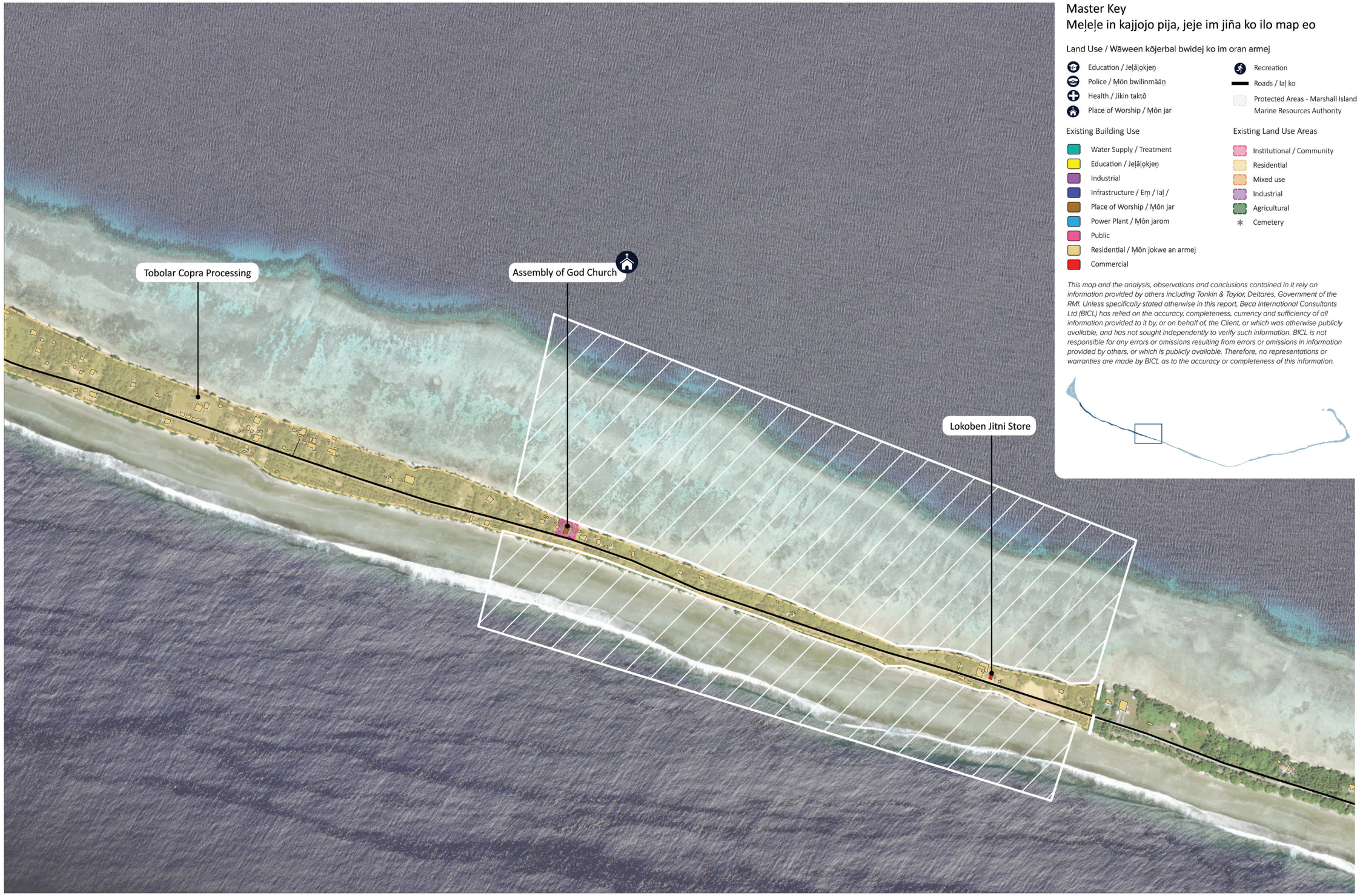
***Map 25*** - Current state

0 0.25 (5 minute walk) 0.5 (10 minute walk) 1 Mile N




## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

### Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷọkjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Roads / Laḷ ko
- Protected Areas - Marshall Island Marine Resources Authority

### Existing Building Use

- Water Supply / Treatment
- Education / Jeḷāḷọkjeṇ
- Industrial
- Infrastructure / Eṃ / Laḷ /
- Place of Worship / Ṃōn jar
- Power Plant / Ṃōn jarom
- Public
- Residential / Ṃōn jokwe an armej
- Commercial

### Existing Land Use Areas

- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery

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***Map 26*** - Current state

## 3.9.2 ANTICIPATED CHANGE

### Projected Population

Woja's estimated population in 2025 was 842. Projections indicate a gradual decline, with forecasts of 783 to 790 by 2030, 722 to 733 by 2035, and 573 to 591 by 2045. This trend highlights the importance of planning for future infrastructure and services to support a sustainable community size.

### Climate Hazards

Flood modelling completed by Deltares shows 0.25 meters (0.82 feet) of sea-level rise and increased intensity of rainfall events, which are anticipated to occur by 2055 under a rapid climate change scenario. Flood models indicate that the village will experience higher incidence of flooding than today, resulting from daily higher sea-levels and high tide events, and periodic rainfall from storm events such as typhoons or other heavy rains, and/or wave-drive overwash from storm surges or swell waves.

Flooding is most likely to be most problematic in the following areas of the village by 2055 if no interventions or additional coastal protection measures are implemented*:

- Due to the narrow width of Woja, it is exposed to flooding along the ocean and lagoon coastlines with little land left unexposed.
- The ocean coastline is anticipated to experience extreme flooding across the entire length of Woja.
- While the lagoon coastline will experience patchy moderate to extreme flooding, there are some areas on the lagoon side of the road and small areas of land between the coastlines that are anticipated to remain relatively similar to the present-day conditions.

*Flood severity was determined by evaluating the modelled potential flood depths, with flooding increasing in severity from minor ➔ moderate ➔ major ➔ extreme.

### Map explanation

Maps 27-30 illustrate what could change at a village-level over the next 20 years because of a decrease in population and impacts from climate change. Note that there are other climate impacts – heat, drought, flooding from tsunamis that are not illustrated on the map.

The population bar chart shows two ways the population could change - the lower line shows the population projection of this village over the next 5, 10 and 20 years and the line above shows the population with potential interventions signaled by the RMI government.

The maps show 0.82 feet (0.25m) of sea-level rise, daily high tide, and flooding from rainstorms, typhoons, and swell wave events.

Critical services and infrastructure are shown as icons on the map.  These support daily life, community resilience and disaster preparedness now and in the future and are to be retained and potentially moved if they are located in vulnerable areas.

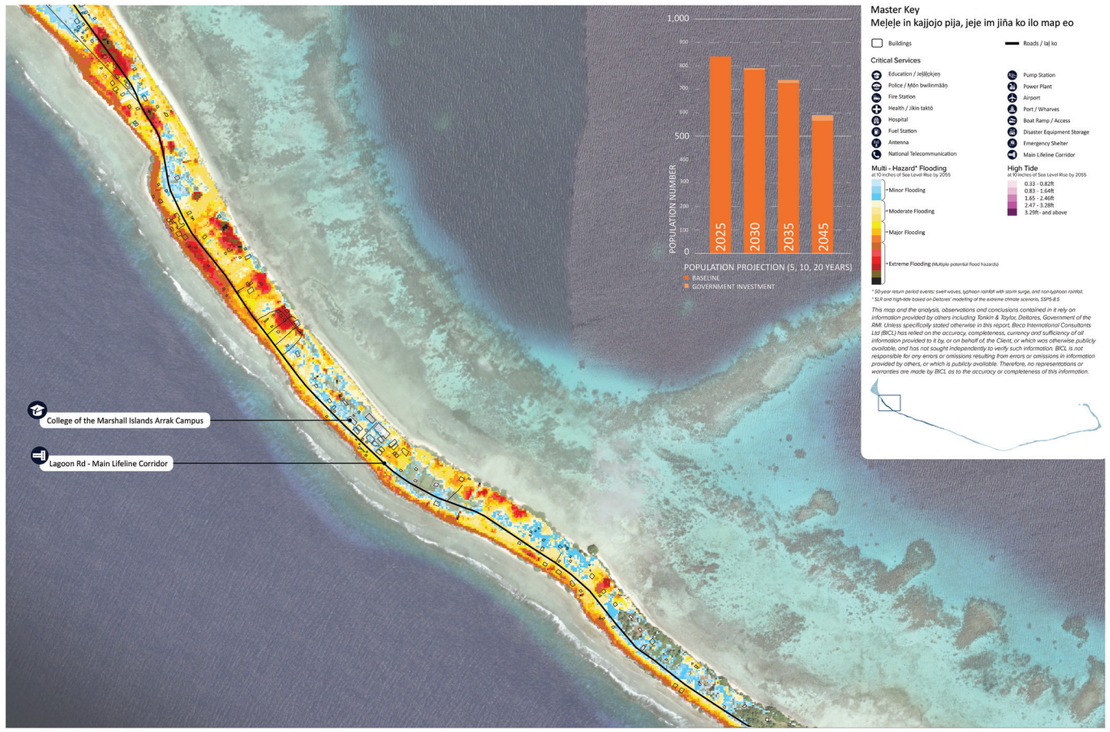
Maps 27-30 have different colors to show the possible extent of flooding from typhoons, rainstorms, and swell waves in 2055 with 0.82 feet of sea-level rise (SLR):

- No color - these areas show where there is minimal flood risk.
- Blue shows where there would be minor flooding (less risk of flooding, lower levels of flooding expected).
- Light yellow shows where there would be moderate flooding (higher risk of flooding, possible deep flood waters).
- Bright yellow and orange show where there would be major flooding (even higher risk of flooding, area susceptible to multiple flood hazards, possible deep flood waters).
- Red, brown, black show where there would be extreme flooding (worst flooding for Majuro, area susceptible to multiple flood hazards, possible very deep flood waters).

The high tide map has different colors to show possible water depths from daily high tide in 2055 with 0.82 feet of SLR.

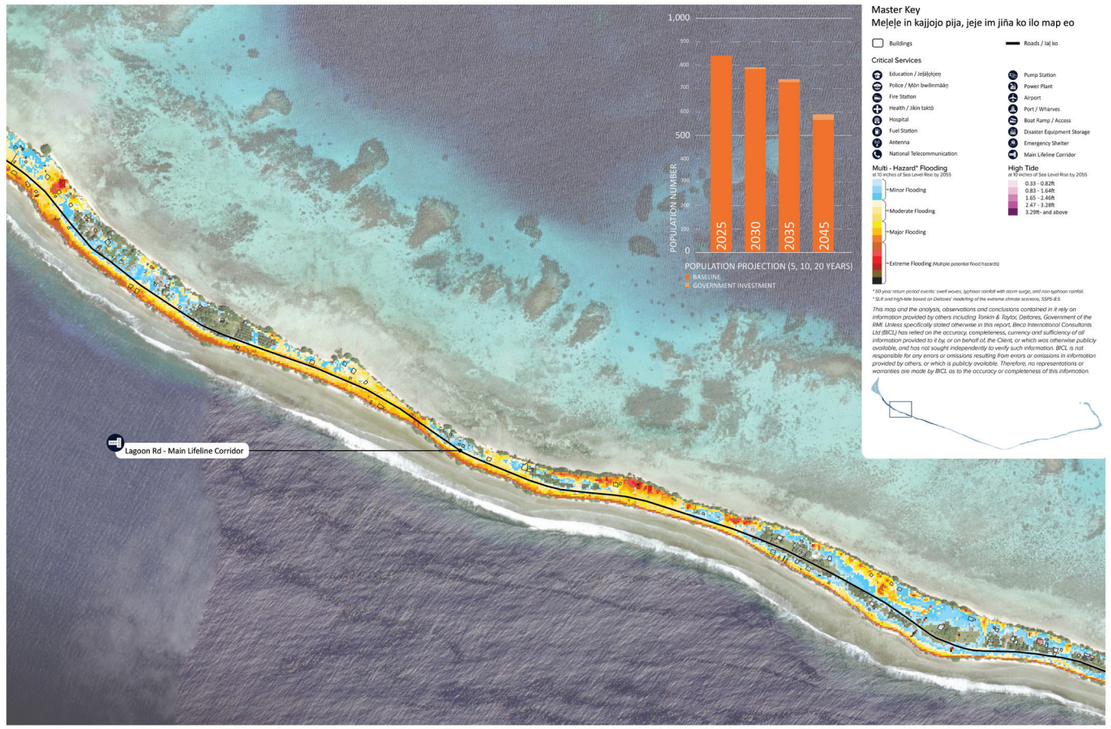
- Light purple shows where there will likely be 0.33-1.64 feet of water every day at high tide.
- Purple shows where there will likely be more than 1.65 feet of water every day at high tide.

NOTE – these flood maps are modelled based on current day environment and coastal edge (not allowing for more seawalls or other changes to the ocean and coastal edge).

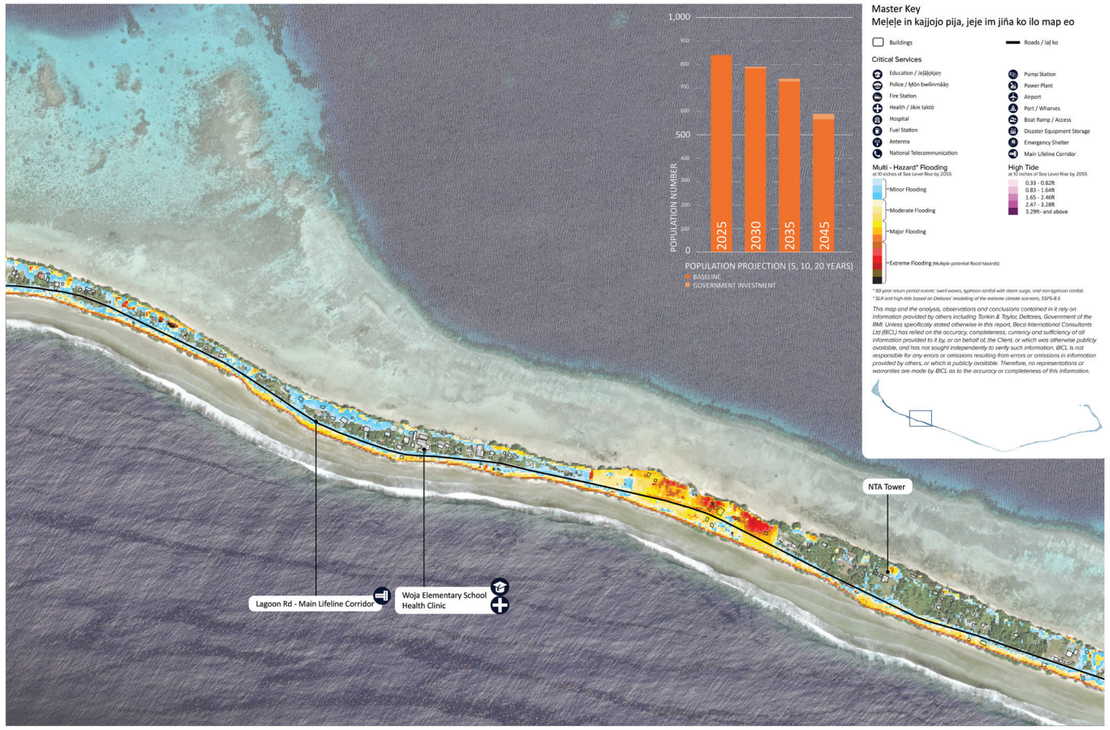



*Map 27* - Anticipated change

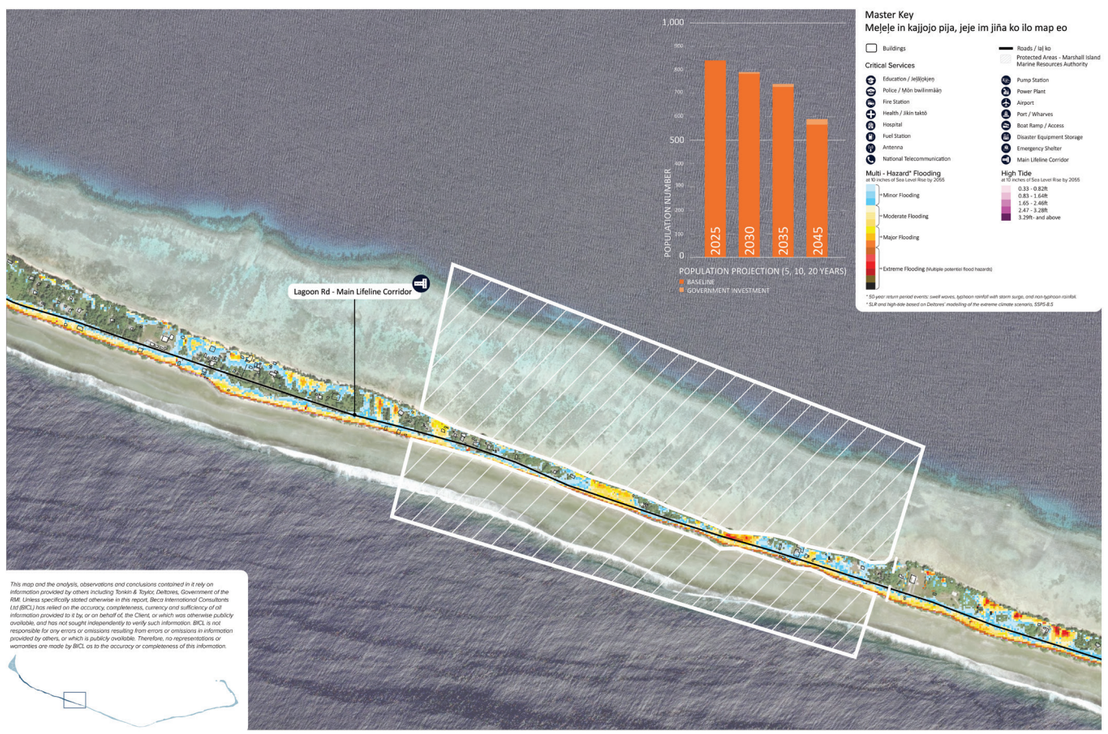
0 0.25 (5 minute walk) 0.5 (10 minute walk) 1 Mile N




*Map 28* - Anticipated change

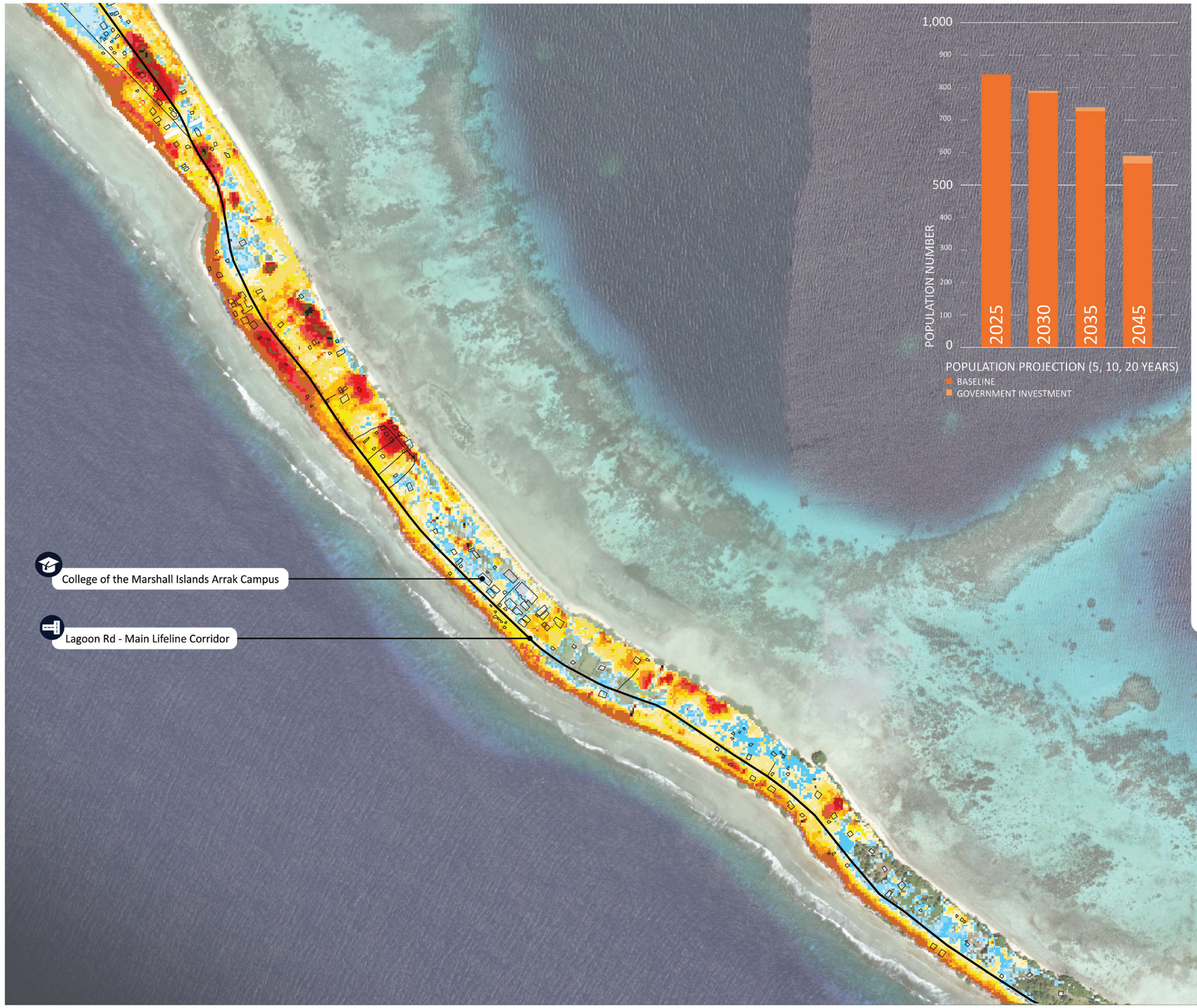



*Map 29* - Anticipated change




*Map 30* - Anticipated change

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N







## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

- Buildings
- Roads / laḷ ko

**Critical Services**

- Education / Jeḷāḷọkjeṇ
- Police / Ṃọn bwilinmāāṇ
- Fire Station
- Health / Jikin taktō
- Hospital
- Fuel Station
- Antenna
- National Telecommunication
- Pump Station
- Power Plant
- Airport
- Port / Wharves
- Boat Ramp / Access
- Disaster Equipment Storage
- Emergency Shelter
- Main Lifeline Corridor

**Multi - Hazard* Flooding**
at 10 inches of Sea Level Rise by 2055

- Minor Flooding
- Moderate Flooding
- Major Flooding
- Extreme Flooding (Multiple potential flood hazards)

**High Tide**
at 10 inches of Sea Level Rise by 2055

- 0.33 - 0.82ft
- 0.83 - 1.64ft
- 1.65 - 2.46ft
- 2.47 - 3.28ft
- 3.29ft- and above

** 50-year return period events: swell waves, typhoon rainfall with storm surge, and non-typhoon rainfall.*
** SLR and high-tide based on Deltares' modelling of the extreme climate scenario, SSP5-8.5*

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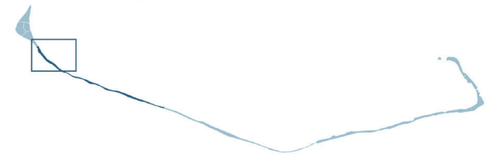
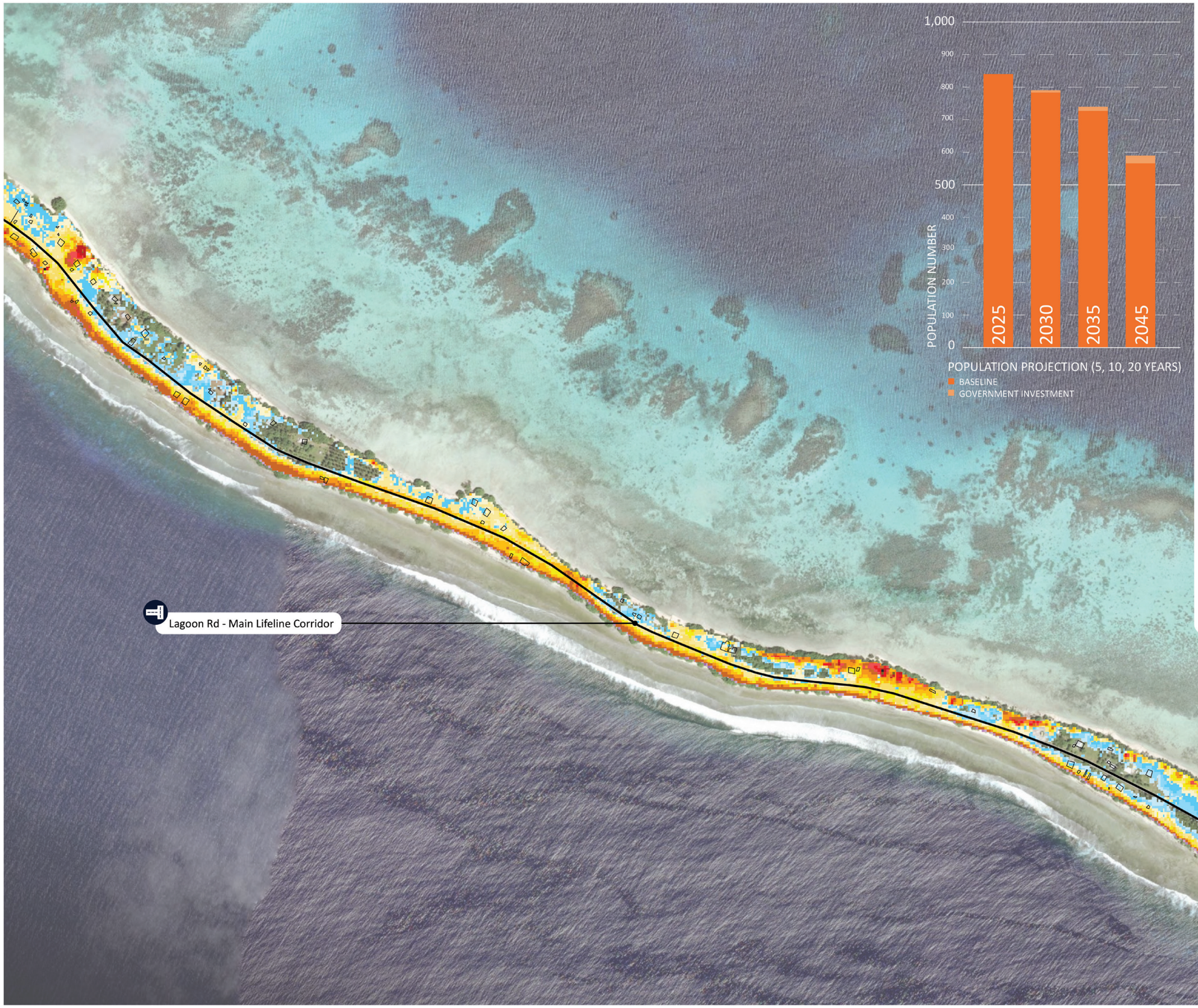


***Map 31*** - Anticipated change

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N







## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

- Buildings
- Roads / laḷ ko

**Critical Services**

- Education / Jeḷāḷokjeṇ
- Police / Mōn bwilinmāāṇ
- Fire Station
- Health / Jikin taktō
- Hospital
- Fuel Station
- Antenna
- National Telecommunication
- Pump Station
- Power Plant
- Airport
- Port / Wharves
- Boat Ramp / Access
- Disaster Equipment Storage
- Emergency Shelter
- Main Lifeline Corridor

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at 10 inches of Sea Level Rise by 2055

- 0.33 - 0.82ft
- 0.83 - 1.64ft
- 1.65 - 2.46ft
- 2.47 - 3.28ft
- 3.29ft- and above

** 50-year return period events: swell waves, typhoon rainfall with storm surge, and non-typhoon rainfall.*
** SLR and high-tide based on Deltares' modelling of the extreme climate scenario, SSP5-8.5*

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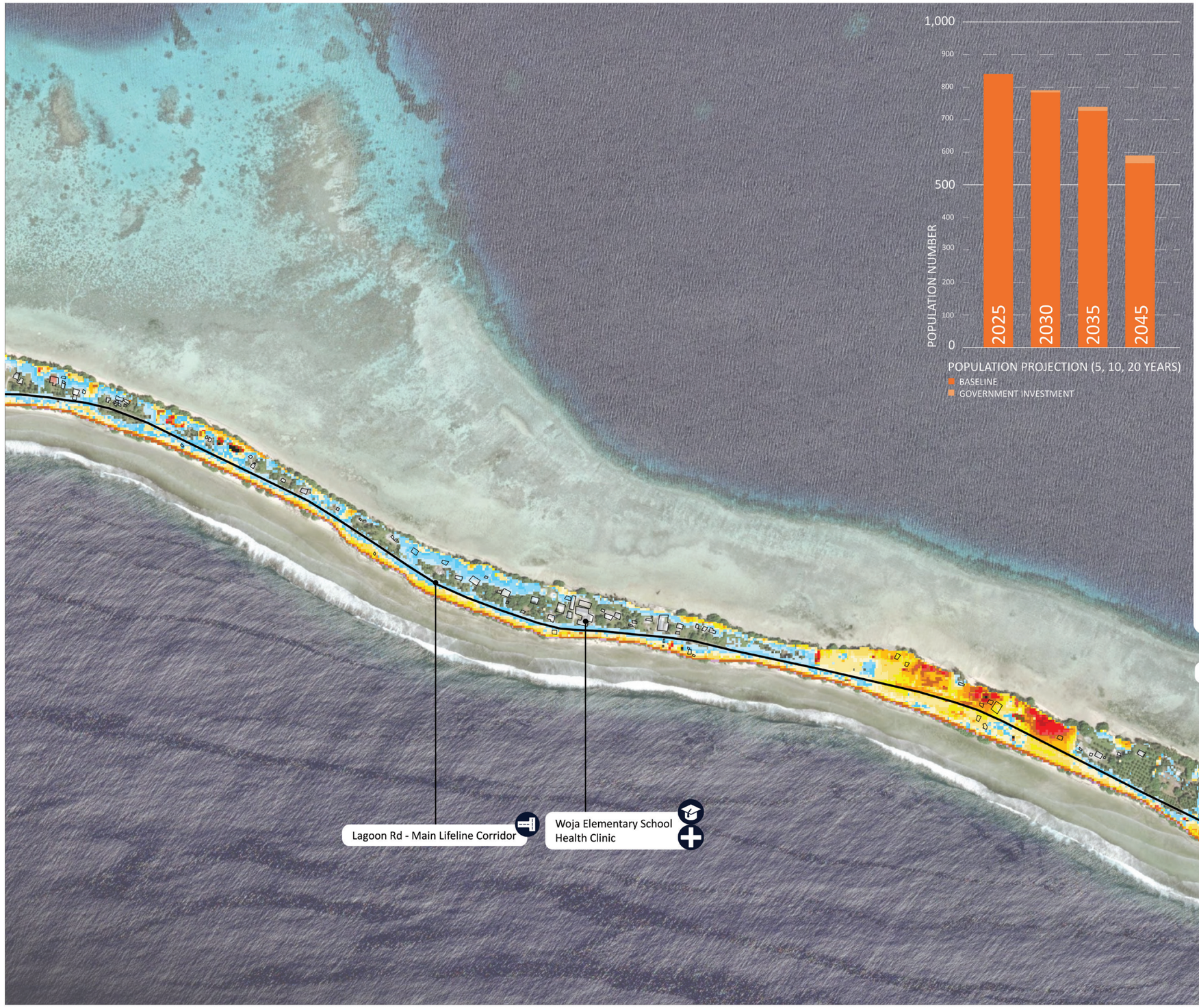
***Map 32*** - Anticipated change

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N







## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

- Buildings
- Roads / laḷ ko

**Critical Services**

- Education / Jeḷāḷokjeṇ
- Police / Ṃōn bwilinmāāṇ
- Fire Station
- Health / Jikin taktō
- Hospital
- Fuel Station
- Antenna
- National Telecommunication
- Pump Station
- Power Plant
- Airport
- Port / Wharves
- Boat Ramp / Access
- Disaster Equipment Storage
- Emergency Shelter
- Main Lifeline Corridor

**Multi - Hazard* Flooding**
at 10 inches of Sea Level Rise by 2055

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**High Tide**
at 10 inches of Sea Level Rise by 2055

- 0.33 - 0.82ft
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- 2.47 - 3.28ft
- 3.29ft- and above

** 50-year return period events: swell waves, typhoon rainfall with storm surge, and non-typhoon rainfall.*
** SLR and high-tide based on Deltares' modelling of the extreme climate scenario, SSP5-8.5*

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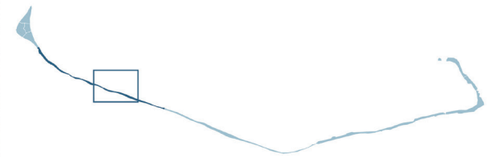
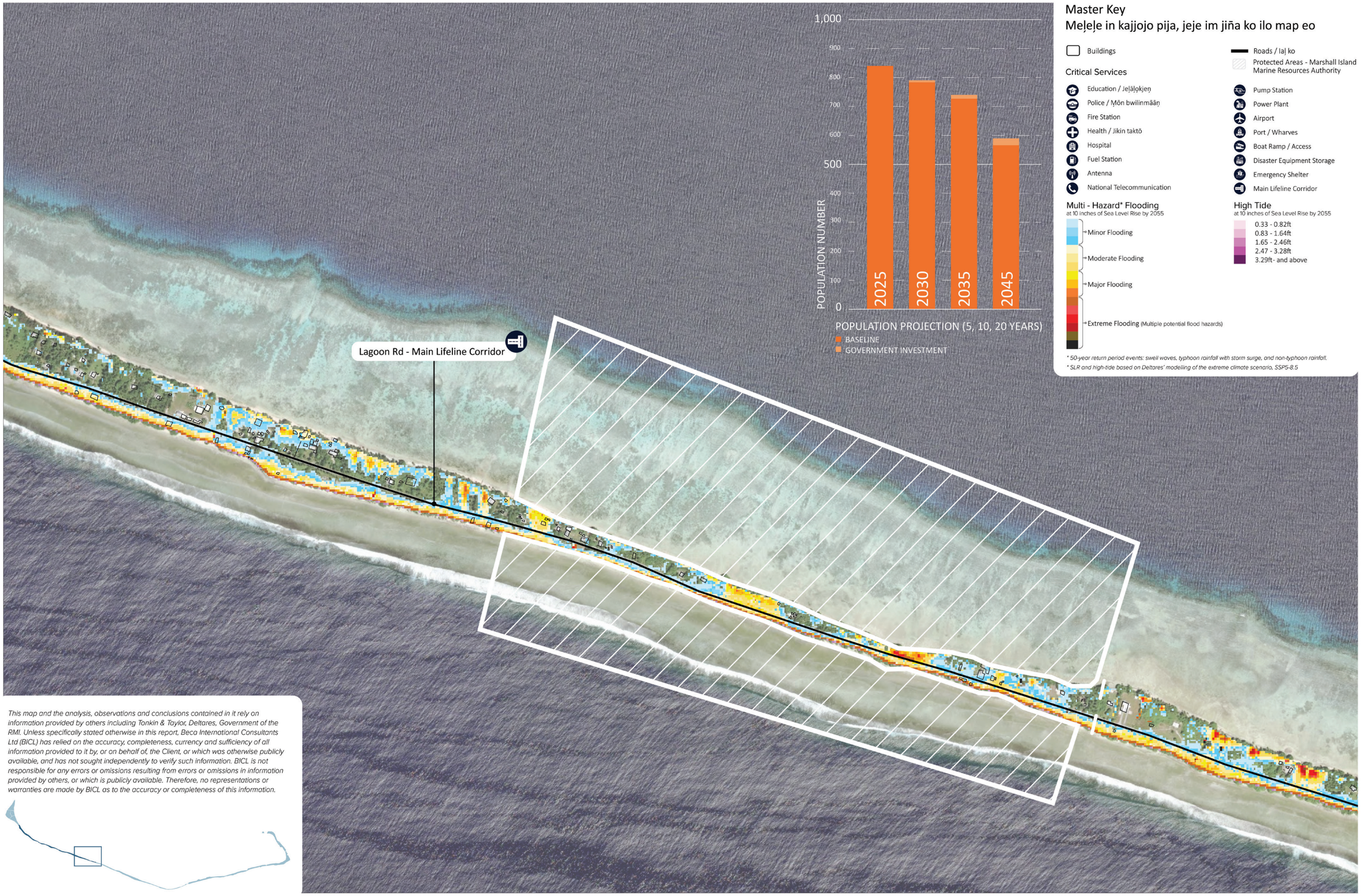


***Map 33*** - Anticipated change

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

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***Map 34*** **-** Anticipated change

### 3.9.3 FUTURE LAND USE PLAN AND INFRASTRUCTURE NEEDS

In Woja (Arrak), which serves as a narrow “connector” village, future land use remains largely residential along the linear corridor with small community nodes at its ends. The plan reinforces existing assets like Arrak Public Park and the College campus as community focal points, while ensuring any land use changes (e.g. minor infill or amenities along the road) support a more compact, walkable settlement.

## Opportunities

Opportunities raised in the July engagement session that formed the basis of discussion at the November stakeholder engagement:

- Clustering and elevating future development around existing community facilities to support walkable catchments and resilient communities.
- Identify and invest in a multi-purpose community facility that could accommodate mobile social services (medical, education etc) in Woja and Ajeltake.
- Develop a strategy for protecting the Lifeline Corridor through the low-lying areas of Woja/Ajeltake, with focused interventions such as elevated roadways and bridges to maintain future connectivity across the atoll.
- A new boat ramp for safe lagoon access and an alternative to road-based connectivity to the wider Atoll.
- Protect the existing vegetation and tree cover for future climate resilience.
- A strategy for upgrading or re-purposing existing public buildings such as schools and churches for use as community evacuation facilities.
- Develop a public transport or ride share strategy to improve connectivity to employment and critical infrastructure.
- Improve safety of corridor through improved lighting and speed reduction measures, in particular through more populated areas.
- Take advantage of traffic passing through villages to stimulate the local economy, such as farmers market events.

## Priorities and Projects

Looking to the future, the Woja community is focused on advancing projects that will strengthen resilience and improve quality of life. Following engagement sessions in July and November 2025 as part of the Master Plan engagement, community and landowners identified the following key priorities:

| Projects and Priorities (high priority in bold) | Master Plan Objectives: Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages |
|---|---|---|---|
| **Build a safe public drinking water sanitation facility.** | ✓ | ✓ | |
| **Build seawalls both ocean and lagoon side** | ✓ | ✓ | |
| **Improve road infrastructure with side walk and street lights** | | ✓ | ✓ |
| **Affordable public transportation** | | | ✓ |
| **Multi-purpose center facility** | ✓ | ✓ | |
| **Need area large area for agriculture** | ✓ | ✓ | |
| Need boat ramp oceanside for easy accessibility for fishing | | ✓ | ✓ |
| Need to replant big trees near shoreline areas | ✓ | ✓ | |

## Map explanation

Maps 35-38 illustrate the recommended land use changes and actions that should be taken to address the impacts of anticipated changes over the next 20 years. It also shows the priority projects identified by the community and includes those that will support daily life, community resilience and disaster preparedness.



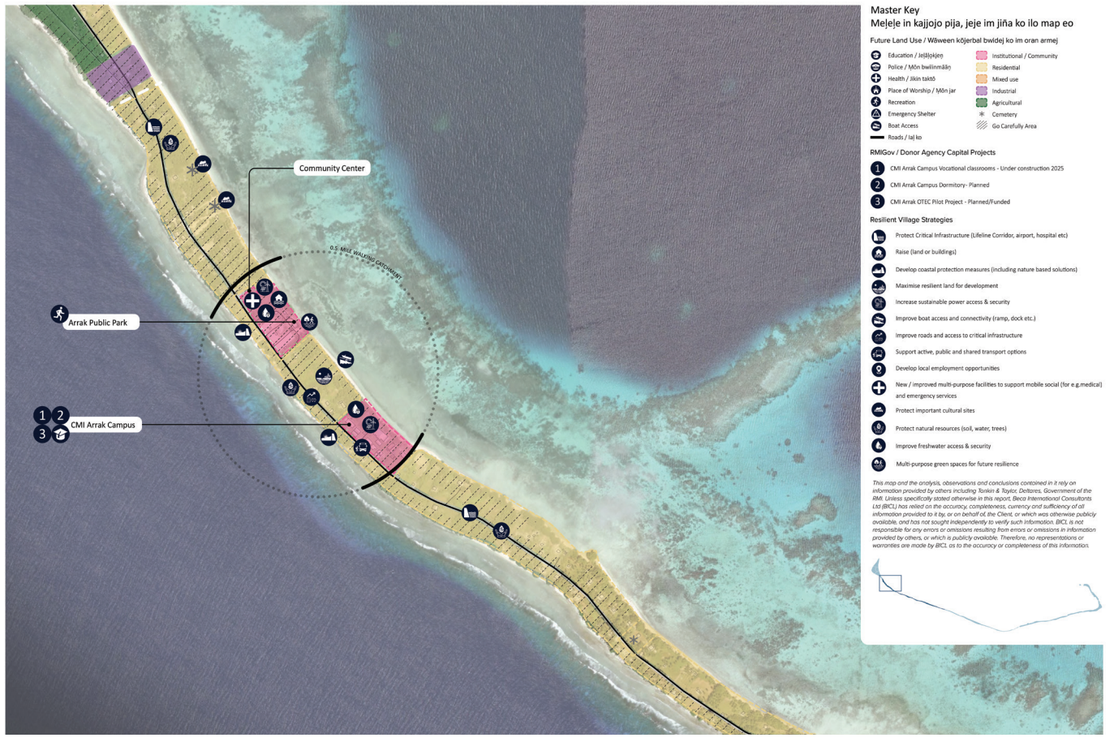
***Photo 60*** - Solar panels above covered recreational spaces



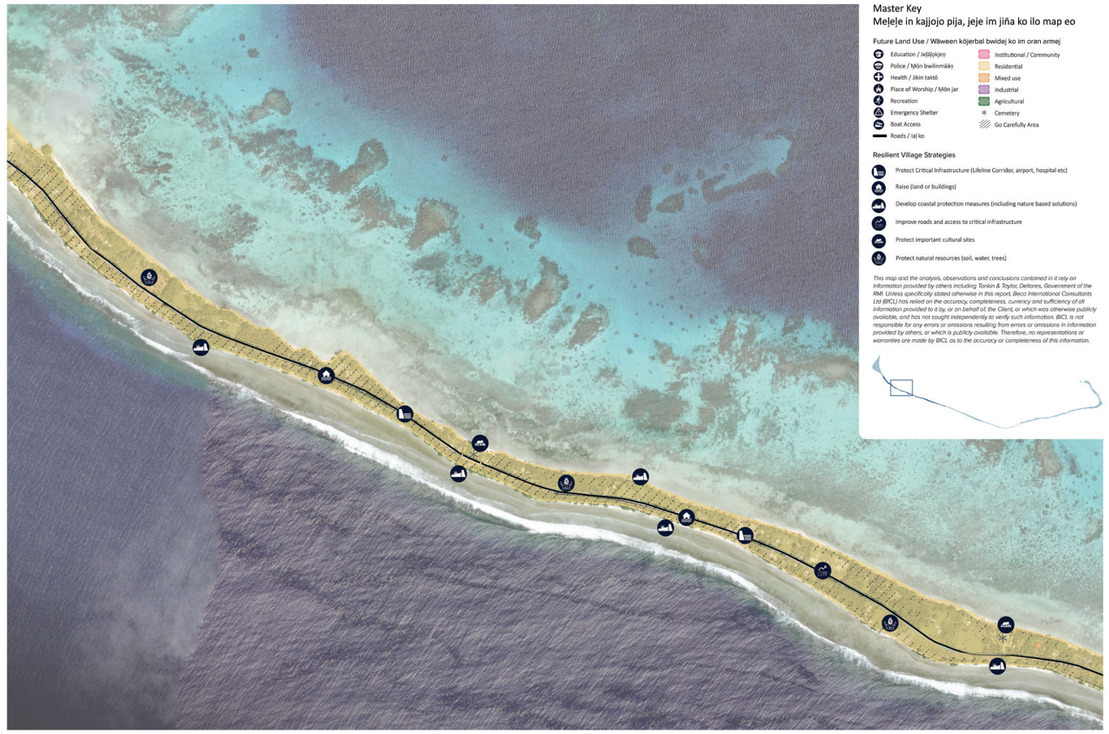
***Photo 61*** - Shop along the main road in Woja



***Photo 62*** - Arrak Campus provides a community water station



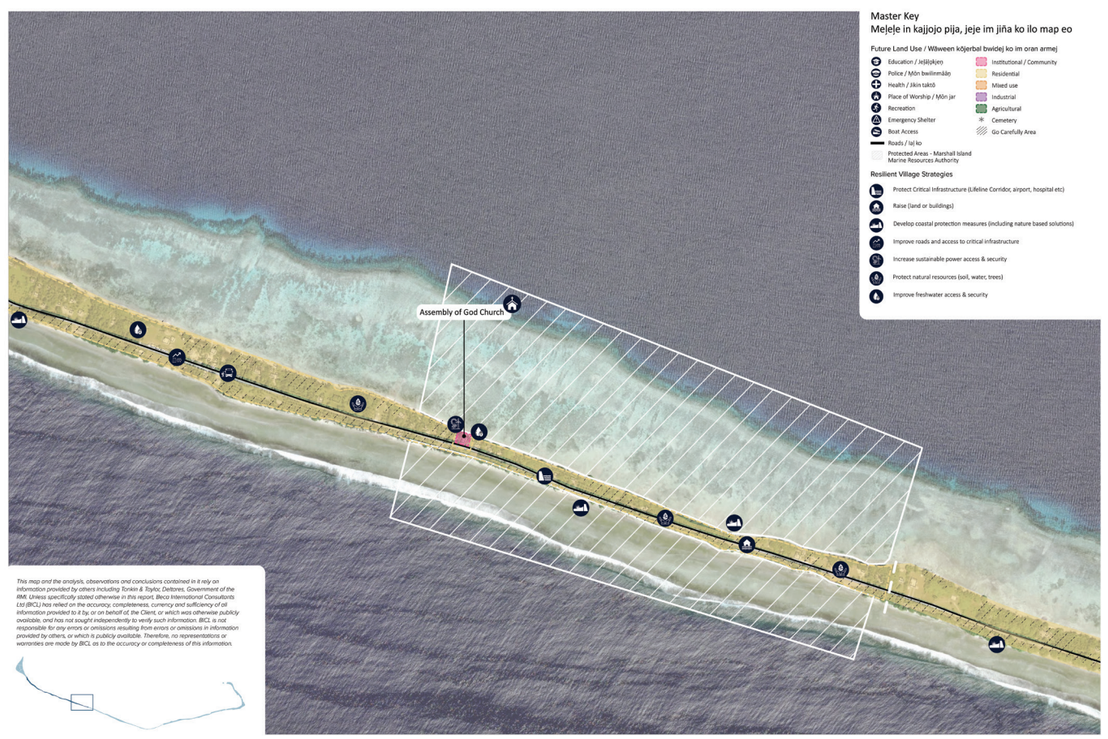

*Map 35* - Future state




*Map 36* - Future state




*Map 37* - Future state




*Map 38* - Future state

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N




## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷọkjeṇ
- Police / Mọn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Mọn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / Iaḷ ko
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

### RMIGov / Donor Agency Capital Projects

1. CMI Arrak Campus Vocational classrooms - Under construction 2025
2. CMI Arrak Campus Dormitory- Planned
3. CMI Arrak OTEC Pilot Project - Planned/Funded

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Raise (land or buildings)
- Develop coastal protection measures (including nature based solutions)
- Maximise resilient land for development
- Increase sustainable power access & security
- Improve boat access and connectivity (ramp, dock etc.)
- Improve roads and access to critical infrastructure
- Support active, public and shared transport options
- Develop local employment opportunities
- New / improved multi-purpose facilities to support mobile social (for e.g.medical) and emergency services
- Protect important cultural sites
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security
- Multi-purpose green spaces for future resilience

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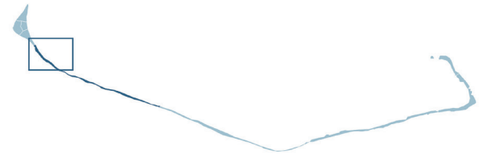
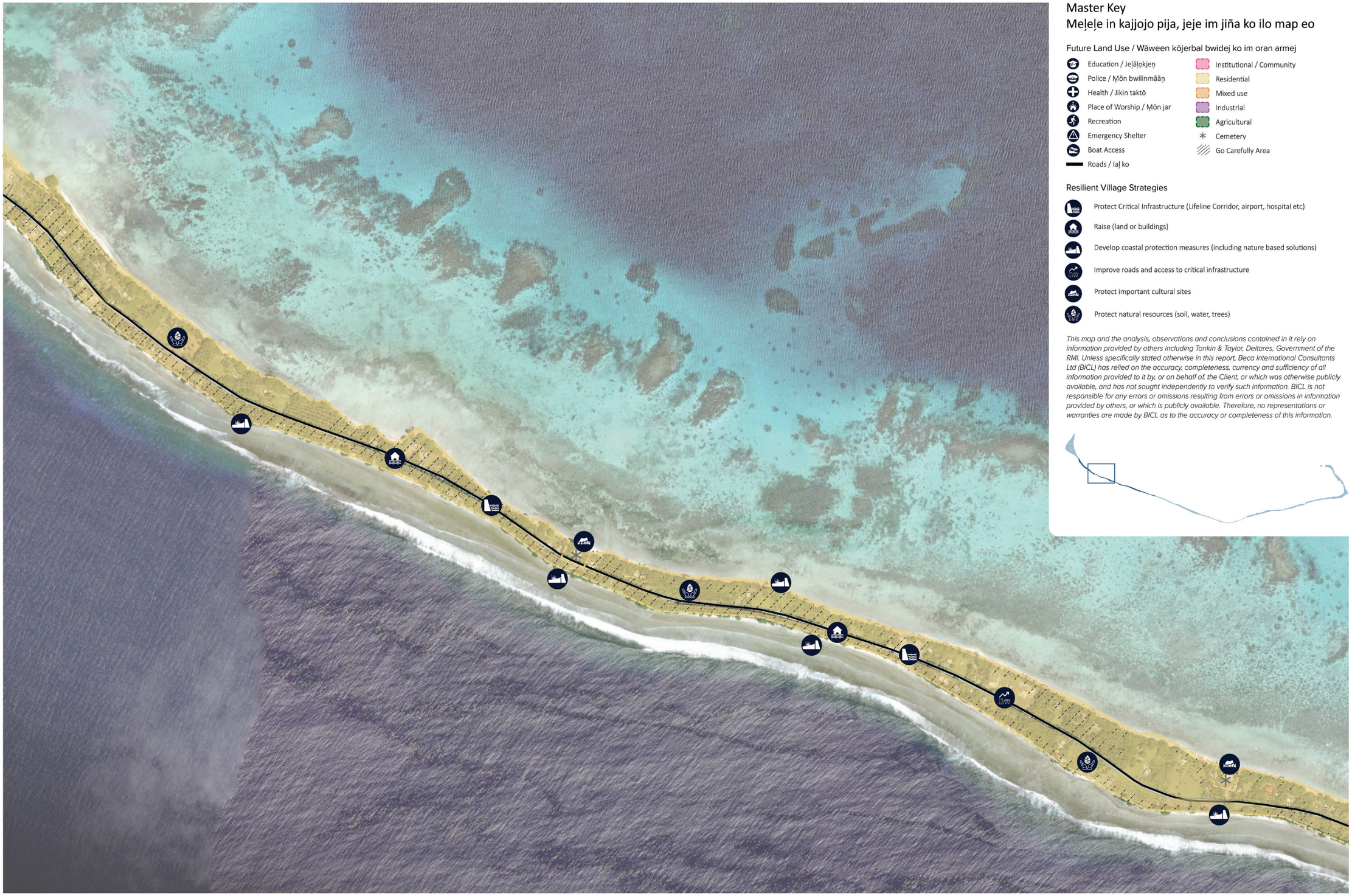


***Map 39*** - Future state

0 0.25 (5 minute walk) 0.5 (10 minute walk) 1 Mile N



## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷokjeṇ
- Police / Mṃn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Mṃn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / Iaḷ ko
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Raise (land or buildings)
- Develop coastal protection measures (including nature based solutions)
- Improve roads and access to critical infrastructure
- Protect important cultural sites
- Protect natural resources (soil, water, trees)

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***Map 40*** - Future state

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N




## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷokjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / Iaḷ ko
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

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### RMIGov / Donor Agency Capital Projects

1 Woja School shelters with solar panels - Funded

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Raise (land or buildings)
- Develop coastal protection measures (including nature based solutions)
- Increase sustainable power access & security
- Improve roads and access to critical infrastructure
- Support active, public and shared transport options
- Develop local employment opportunities
- New / improved multi-purpose facilities to support mobile social (for e.g.medical) and emergency services
- Protect important cultural sites
- Increase food growing capacity
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security

***Map 41*** - Future state

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N




## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷokjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / laḷ ko
- Protected Areas - Marshall Island Marine Resources Authority
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Raise (land or buildings)
- Develop coastal protection measures (including nature based solutions)
- Improve roads and access to critical infrastructure
- Increase sustainable power access & security
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security

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***Map 42*** - Future state

# AJELTAKE

## 3.10 AJELTAKE

### 3.10.1 CURRENT STATE/CURRENT LAND USE PLAN

The village of Ajetake is described as a 'connector' characterized by a narrow low lying atoll landscape defined by the Lifeline Corridor connecting Laura to the wider Atoll. There is one cluster of community facilities located within the Ajeltake village boundaries. The northern western cluster includes a school, police station and church.

#### Environment

Ajeltake was home to an estimated 1440 people in 2025 and is around 495 acres in area (200 hectares). Given Woja and Ajeltake are long and very narrow (about 800 feet (250 meters at the widest section), all buildings are close to the coast, and many are already subject to flooding. There is limited space to move to higher ground.

#### Land use

The land use in Ajeltake is predominantly residential mixed with pockets of agriculture across its length with higher levels of vegetation cover in wider sections of the Atoll. Interspersed throughout are schools and places of worship. There is sole public space (Majuro Peace Park) at the eastern extent of Ajeltake which has potential with its location on the lagoon edge. Land use begins to shift to industrial at the very eastern extent, in proximity to the Amata Kabua International Airport.

#### Infrastructure

Ajeltake has limited levels of infrastructure and is reliant on road transport, with no known boat access infrastructure. Ajeltake is connected to the public water supply from Laura however there are limited connections to the groundwater system currently. There is no waste collection service in Ajeltake with households responsible for disposing waste.

#### Map explanation

Maps 43-46 illustrate the building uses and names of key buildings. Each building activity has a different color. A dashed line is shown around groups of 'like' building uses – these are the land uses.



***Photo 63*** - Ajeltake Christians Academy



***Photo 64*** - Majuro Peace Park



***Photo 65*** - Assembly of God Church




***Photo 66*** - Lokoben Jitni store along the main road



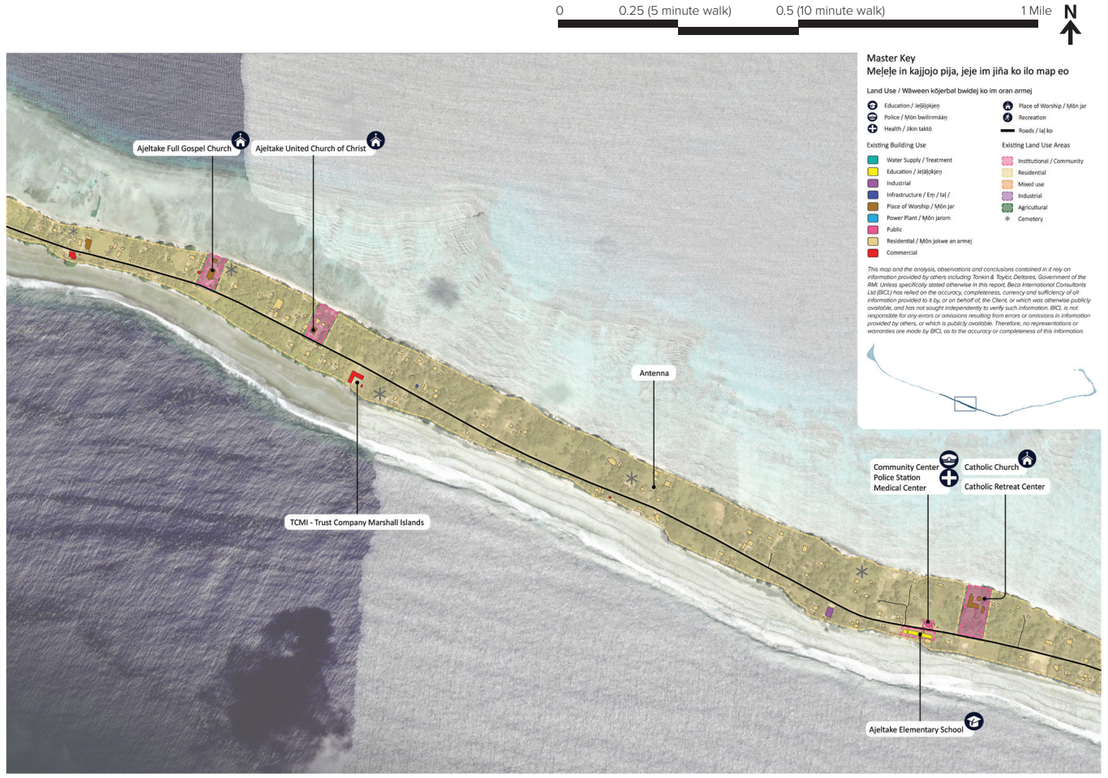
***Photo 67*** - Ajeltake Community Center and Health check



***Photo 68*** - TCMI – Trust Company Marshall Islands



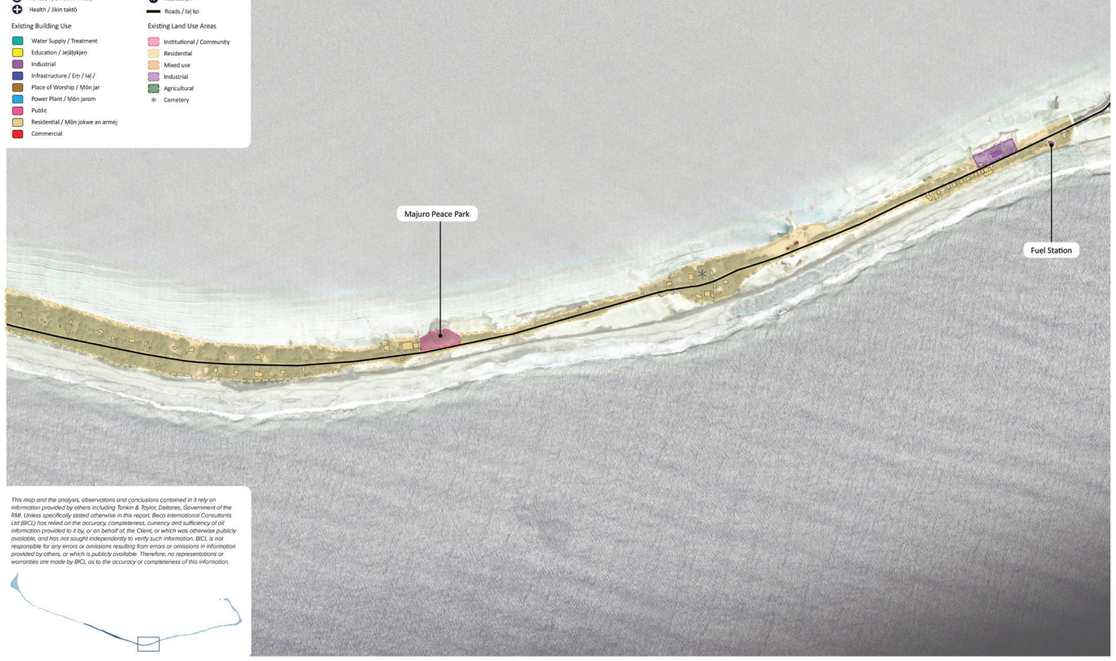

***Map 43*** - Current state



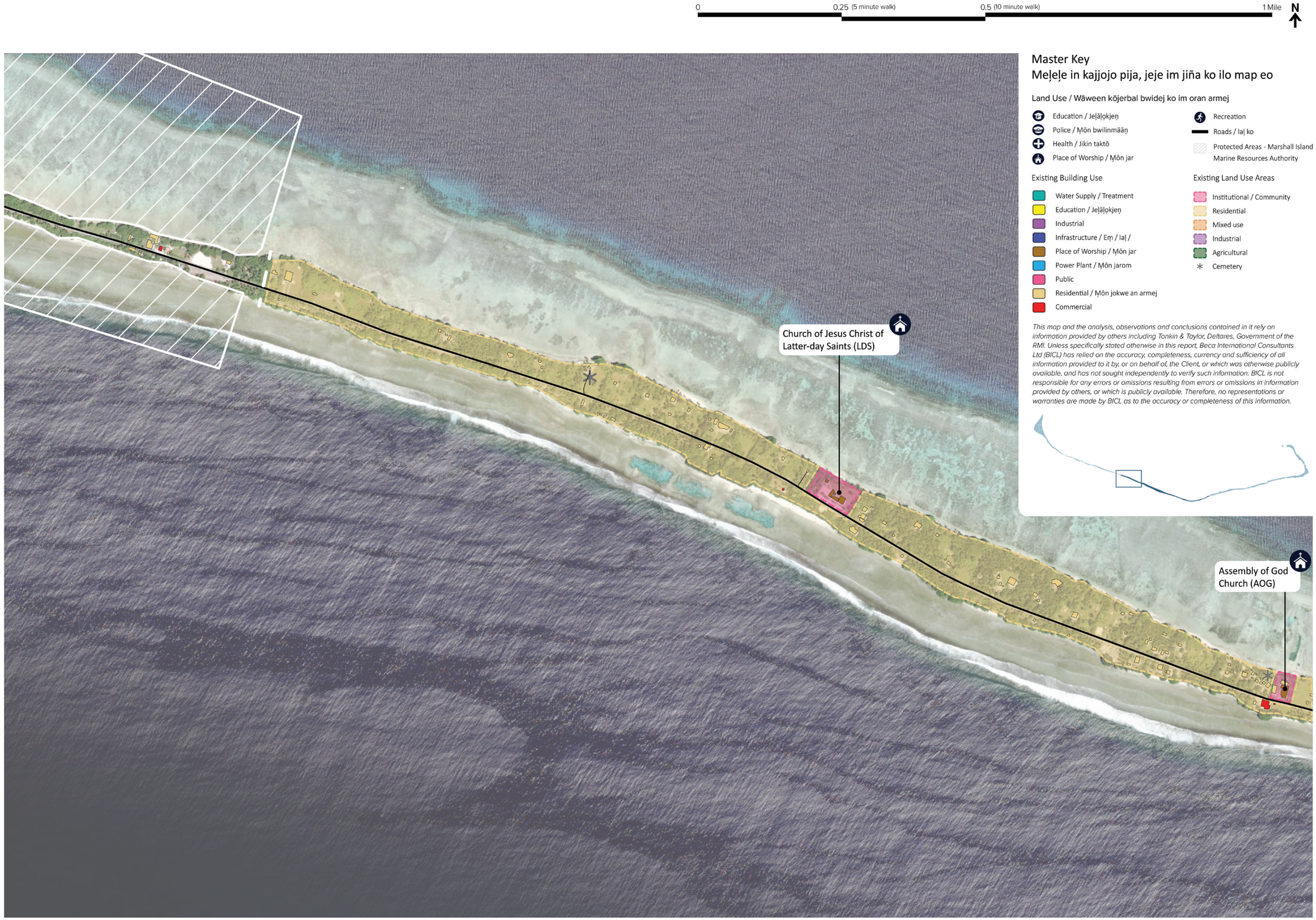

***Map 44*** - Current state




***Map 45*** - Current state

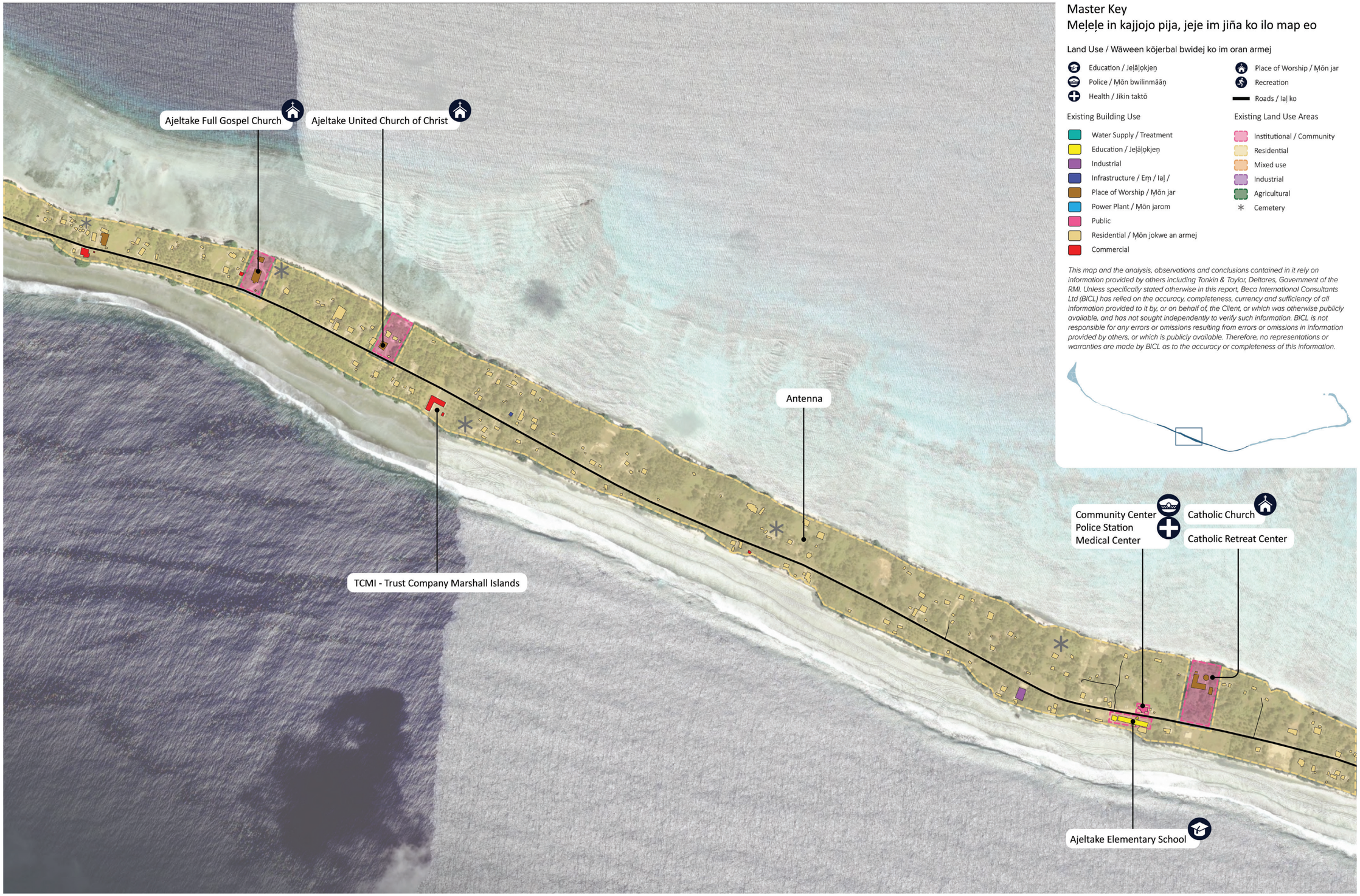



***Map 46*** - Current state




***Map 47*** - Current state

0 0.25 (5 minute walk) 0.5 (10 minute walk) 1 Mile N




## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

### Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeļāļọkjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Roads / Iaļ ko

### Existing Building Use

- Water Supply / Treatment
- Education / Jeļāļọkjeṇ
- Industrial
- Infrastructure / Eṃ / Iaļ /
- Place of Worship / Ṃōn jar
- Power Plant / Ṃōn jarom
- Public
- Residential / Ṃōn jokwe an armej
- Commercial

### Existing Land Use Areas

- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery

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***Map 48*** - Current state




***Map 49*** - Current state

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

### Land Use / Wāween kōjerbal bwidej ko im oran armej

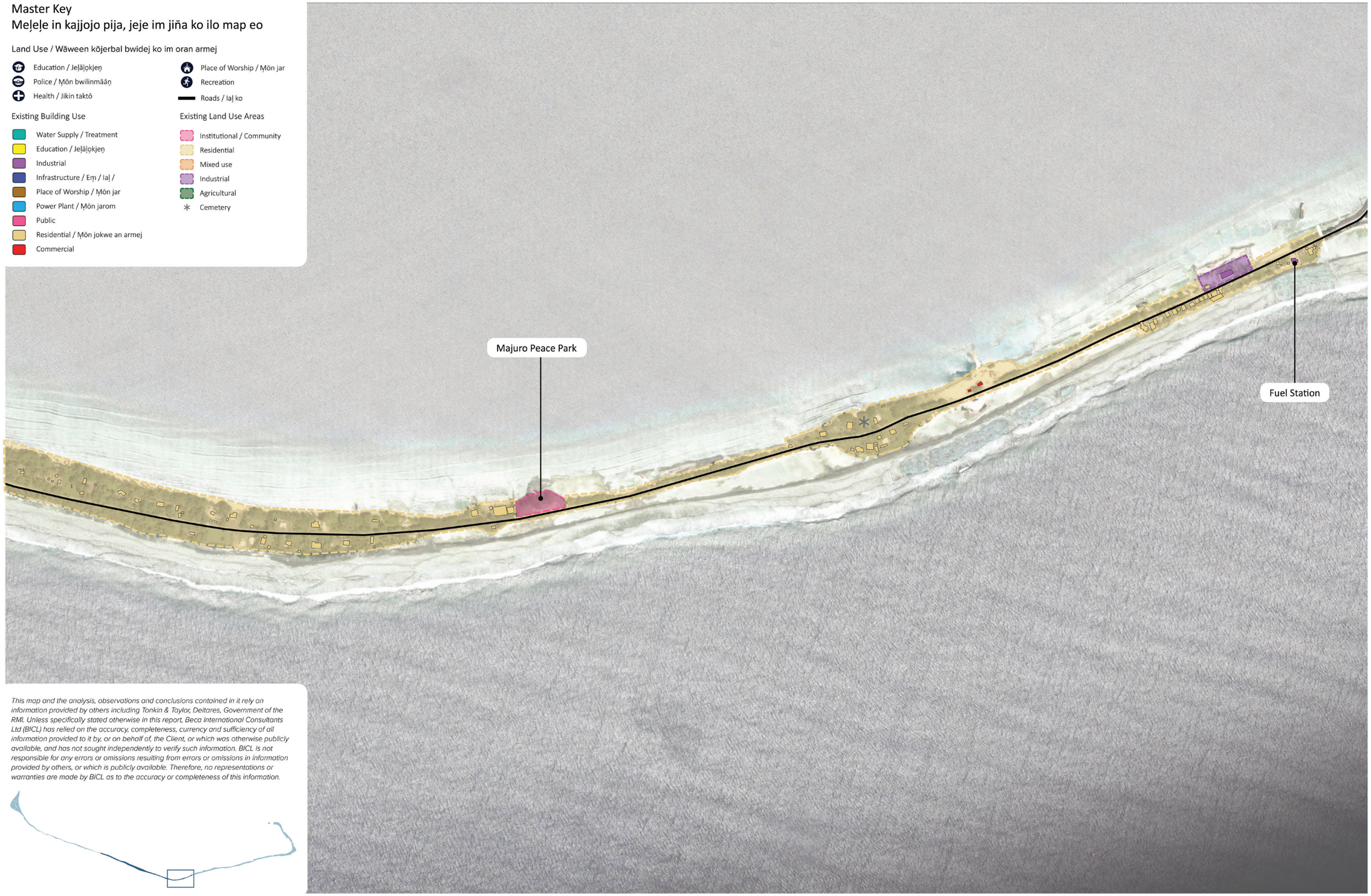
- Education / Jeḷāḷọkjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Roads / laḷ ko

### Existing Building Use

- Water Supply / Treatment
- Education / Jeḷāḷọkjeṇ
- Industrial
- Infrastructure / Eṃ / laḷ /
- Place of Worship / Ṃōn jar
- Power Plant / Ṃōn jarom
- Public
- Residential / Ṃōn jokwe an armej
- Commercial

### Existing Land Use Areas

- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery

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***Map 50*** - Current state

## 3.10.2 ANTICIPATED CHANGE

### Projected Population

Ajeltake's estimated population in 2025 was 1,440. Projections indicate a gradual decline, with forecasts of 1,381 to 1,393 by 2030, 1,324 to 1,345 by 2035, and 1,183 to 1,220 by 2045. This trend highlights the importance of planning for future infrastructure and services to support a sustainable community size.

### Climate Hazards

Flood modelling completed by Deltares shows 0.25 meters (0.82 feet) of sea-level rise and increased intensity of rainfall events, which are anticipated to occur by 2055 under a rapid climate change scenario. Flood models indicate that the village will experience higher incidence of flooding than today, resulting from daily higher sea-levels and high tide events, and periodic rainfall from storm events such as typhoons or other heavy rains, and/or wave-drive overwash from storm surges or swell waves.

Flooding is most likely to be most problematic in the following areas of the village by 2055 if no interventions or additional coastal protection measures are implemented*:

- Due to the narrow width of Ajeltake, it is exposed to flooding along the ocean and lagoon coastlines, but it is anticipated to experience less severe flooding than Woja.
- The ocean coastline is anticipated to experience major to extreme flooding across the entire length of Ajeltake.
- There are patchy areas of minor to major flooding in the areas of land between coastlines, across the length of Ajeltake, worsening to extreme flooding in areas where the land is more narrow, particularly as the village approaches the border with Rairok, with the potential for frequent inundation of the lifeline corridor.
- While the lagoon coastline will experience patchy minor flooding, there are some areas on the lagoon side of the road and small areas of land between the coastlines that are anticipated to remain relatively similar to the present-day conditions.

*Flood severity was determined by evaluating the modelled potential flood depths, with flooding increasing in severity from minor ➔ moderate ➔ major ➔ extreme.

### Map explanation

Maps 51-54 illustrate what could change at a village-level over the next 20 years because of a decrease in population and impacts from climate change. Note that there are other climate impacts – heat, drought, flooding from tsunamis that are not illustrated on the map.

The population bar chart shows two ways the population could change - the lower line shows the population projection of this village over the next 5, 10 and 20 years and the line above shows the population with potential interventions signaled by the RMI government.

The maps shows 0.82 feet (0.25m) of sea-level rise, daily high tide, and flooding from rainstorms, typhoons, and swell wave events.

Critical services and infrastructure are shown as icons on the map. These support daily life, community resilience and disaster preparedness now and in the future and are to be retained and potentially moved if they are located in vulnerable areas.

Maps 51-54 have different colors to show the possible extent of flooding from typhoons, rainstorms, and swell waves in 2055 with 0.82 feet of sea-level rise (SLR):

- No color - these areas show where there is minimal flood risk.
- Blue shows where there would be minor flooding (less risk of flooding, lower levels of flooding expected).
- Light yellow shows where there would be moderate flooding (higher risk of flooding, possible deep flood waters).
- Bright yellow and orange show where there would be major flooding (even higher risk of flooding, area susceptible to multiple flood hazards, possible deep flood waters).
- Red, brown, black show where there would be extreme flooding (worst flooding for Majuro, area susceptible to multiple flood hazards, possible very deep flood waters).

The high tide map has different colors to show possible water depths from daily high tide in 2055 with 0.82 feet of SLR.

- Light purple shows where there will likely be 0.33-1.64 feet of water every day at high tide.
- Purple shows where there will likely be more than 1.65 feet of water every day at high tide.

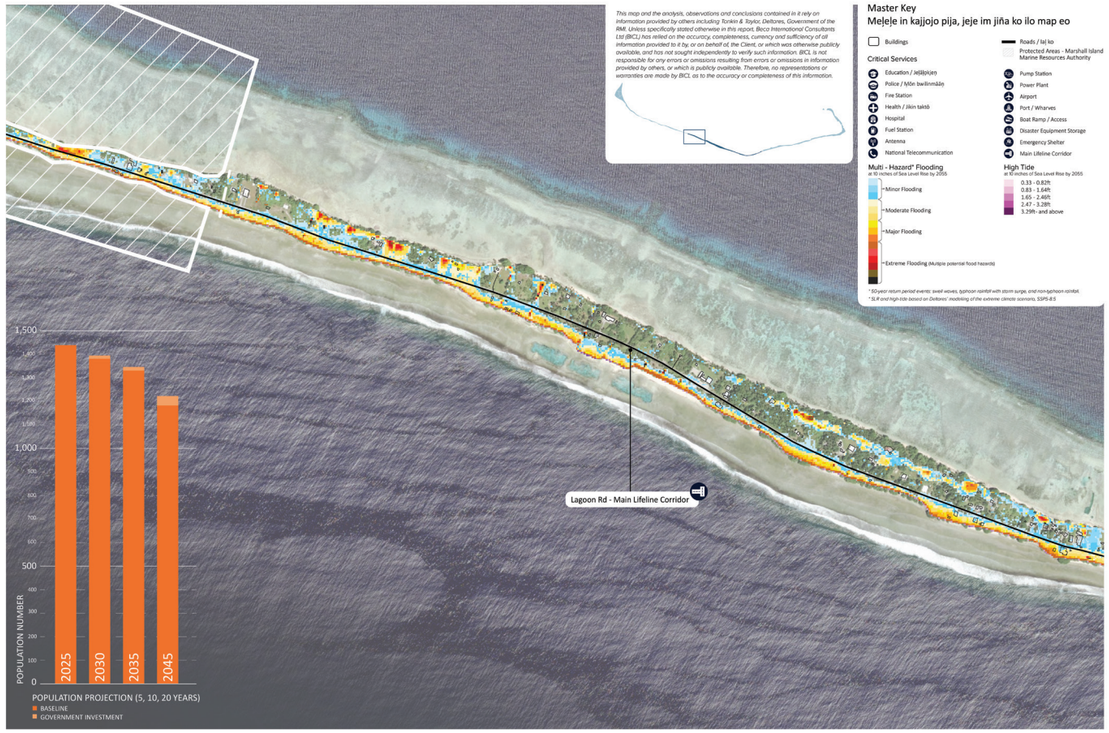
NOTE – these flood maps are modelled based on current day environment and coastal edge (not allowing for more seawalls or other changes to the ocean and coastal edge).



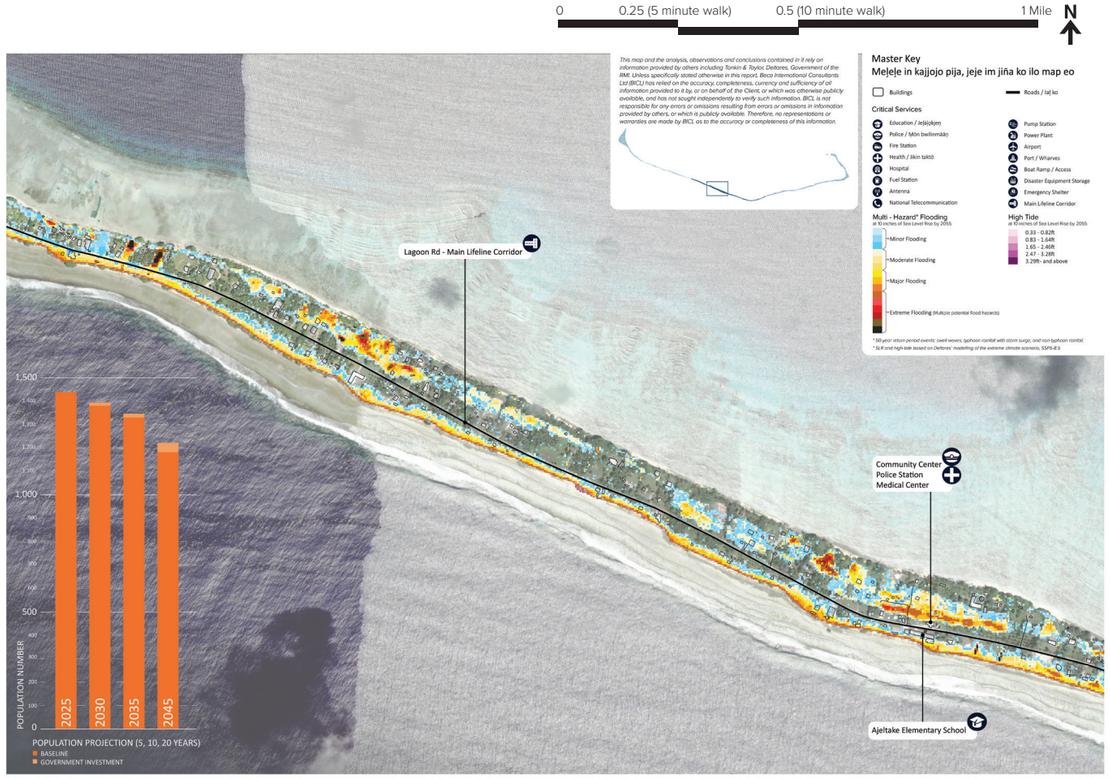
***Photo 69*** - Critical services – Fuel Station on entry to Ajeltake



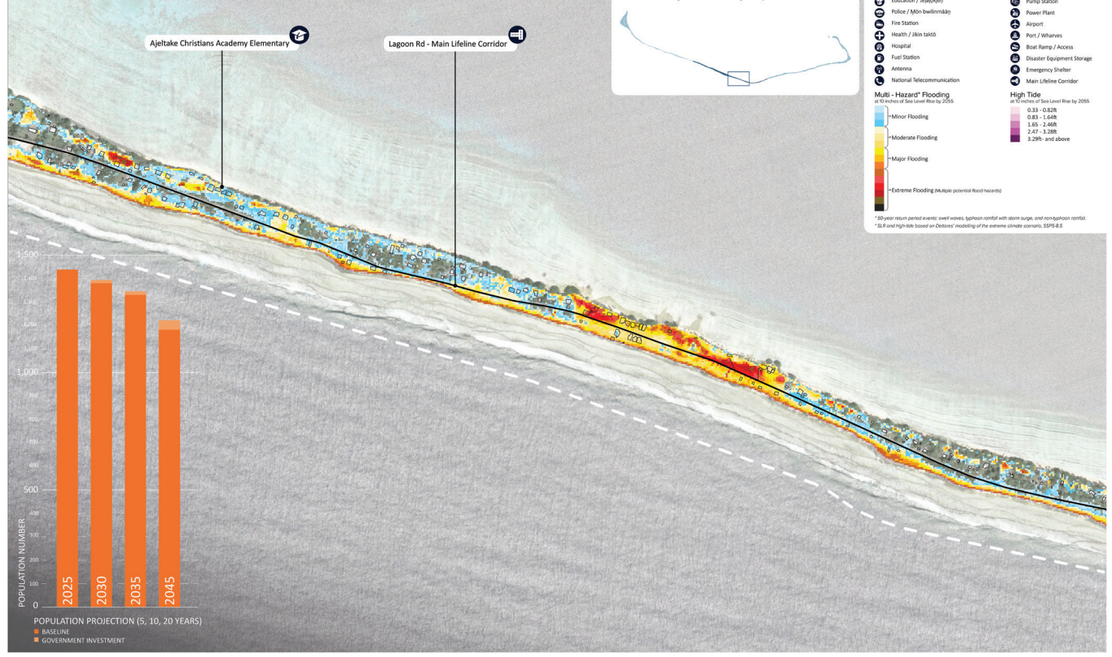
***Photo 70*** - Wall along the narrow section a the entry to Ajeltake from the south providing protection from wind driven salt spray



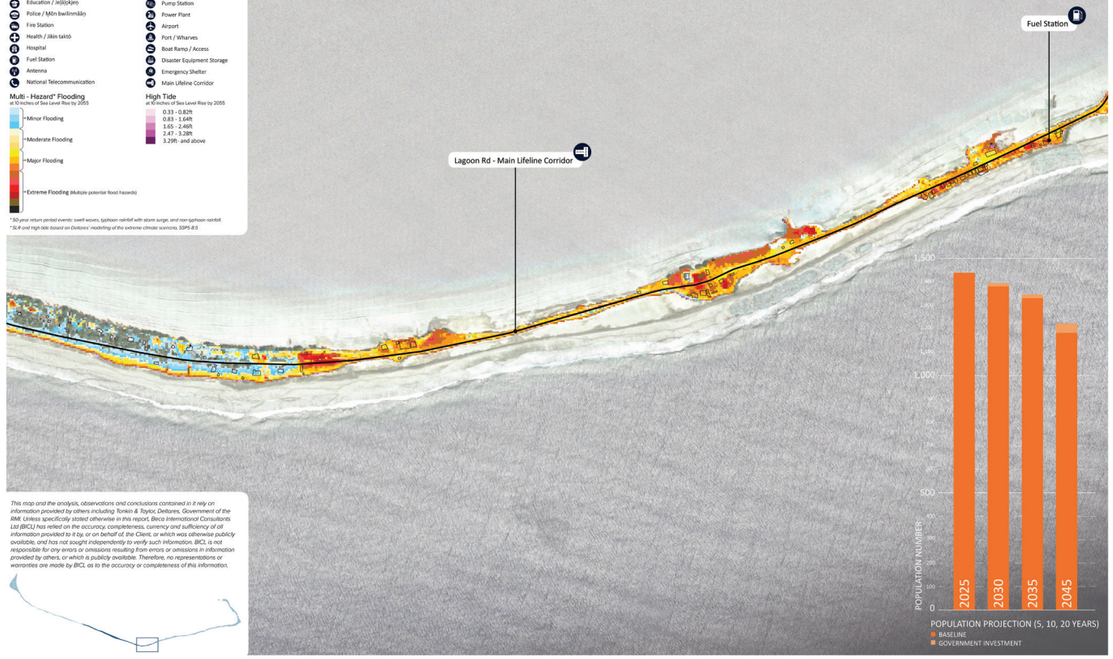

***Map 51*** - Anticipated change




***Map 52*** - Anticipated change

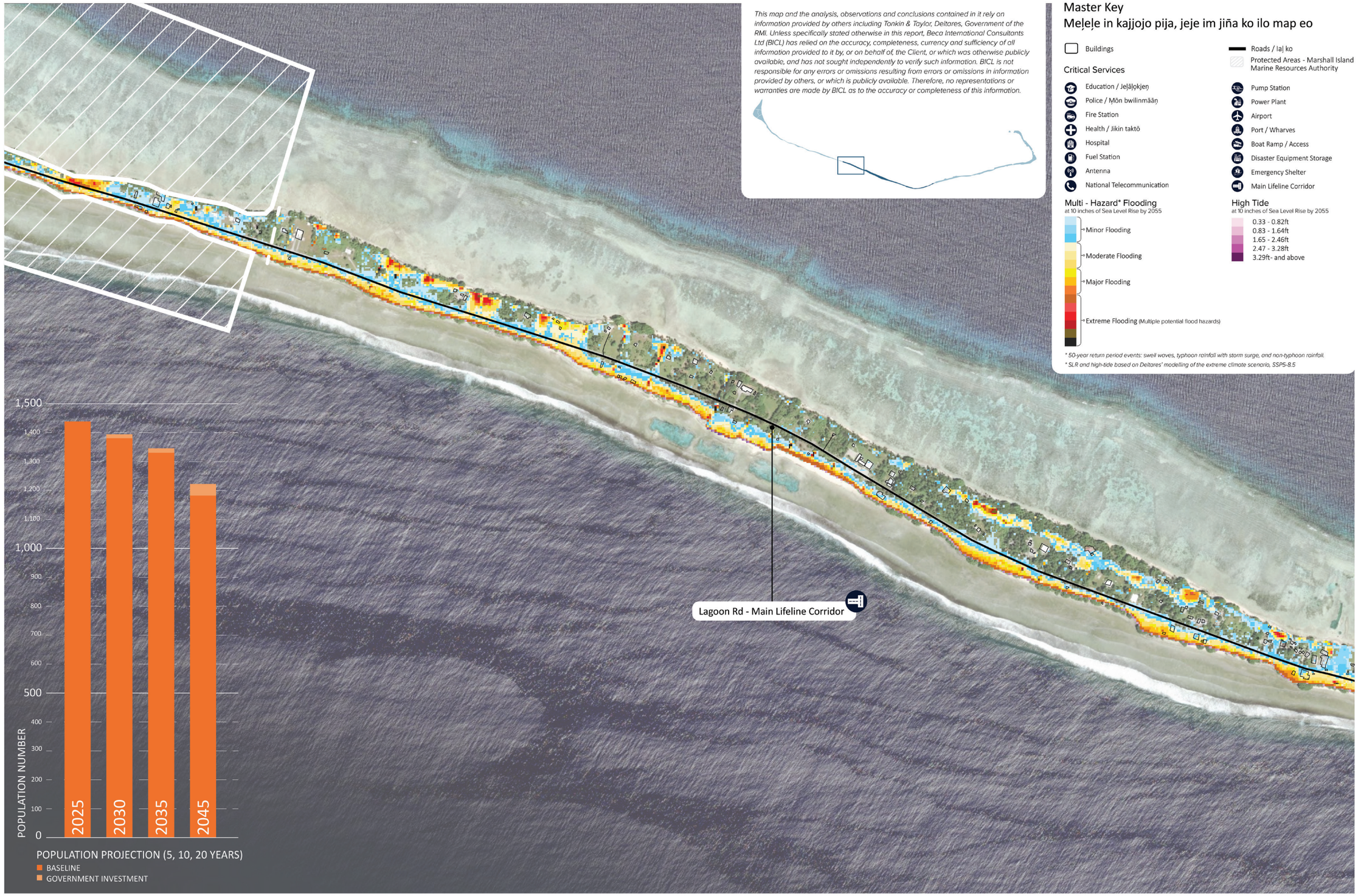



***Map 53*** - Anticipated change




***Map 54*** - Anticipated change

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

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## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

- Buildings
- Roads / laļ ko
- Protected Areas - Marshall Island Marine Resources Authority

### Critical Services

- Education / Jeļāļokjeņ
- Police / Ṃōn bwilinmāāṇ
- Fire Station
- Health / Jikin taktō
- Hospital
- Fuel Station
- Antenna
- National Telecommunication
- Pump Station
- Power Plant
- Airport
- Port / Wharves
- Boat Ramp / Access
- Disaster Equipment Storage
- Emergency Shelter
- Main Lifeline Corridor

### Multi - Hazard* Flooding
at 10 inches of Sea Level Rise by 2055

- Minor Flooding
- Moderate Flooding
- Major Flooding
- Extreme Flooding (Multiple potential flood hazards)

### High Tide
at 10 inches of Sea Level Rise by 2055

- 0.33 - 0.82ft
- 0.83 - 1.64ft
- 1.65 - 2.46ft
- 2.47 - 3.28ft
- 3.29ft- and above

** 50-year return period events: swell waves, typhoon rainfall with storm surge, and non-typhoon rainfall.*
** SLR and high-tide based on Deltares' modelling of the extreme climate scenario, SSP5-8.5*

***Map 55*** - Anticipated change

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N




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## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

- Buildings
- Roads / Iaḷ ko

### Critical Services

- Education / Jeḷāḷokjeṇ
- Police / Ṃōn bwilinmāāṇ
- Fire Station
- Health / Jikin taktō
- Hospital
- Fuel Station
- Antenna
- National Telecommunication
- Pump Station
- Power Plant
- Airport
- Port / Wharves
- Boat Ramp / Access
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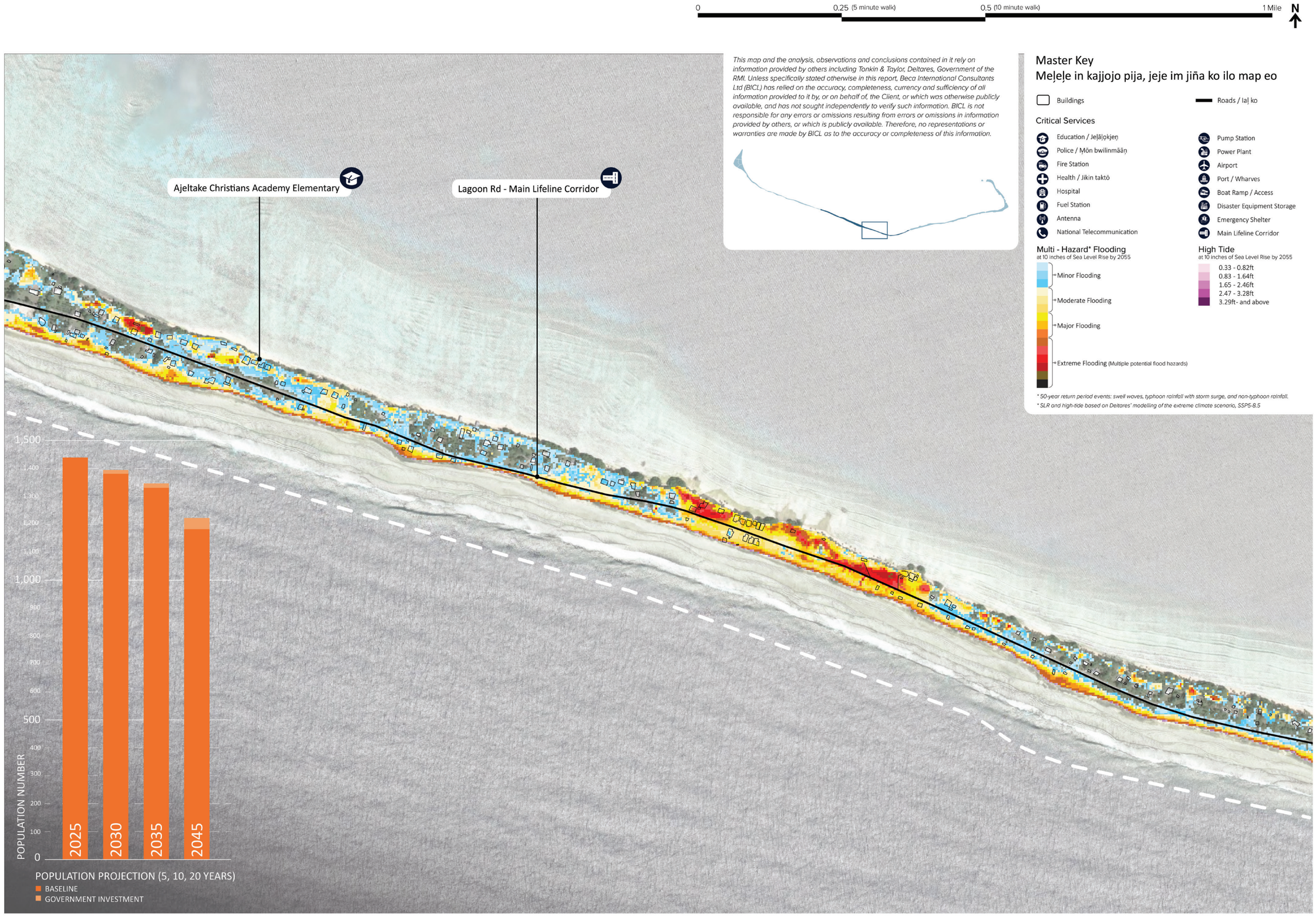
- 1.65 - 2.46ft
- 2.47 - 3.28ft
- 3.29ft- and above

** 50-year return period events: swell waves, typhoon rainfall with storm surge, and non-typhoon rainfall.*
** SLR and high-tide based on Deltares' modelling of the extreme climate scenario, SSP5-8.5*

***Map 56*** - Anticipated change




***Map 57*** **-** Anticipated change

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

- Buildings
- Roads / laḷ ko

### Critical Services

- Education / Jeḷāḷokjeṇ
- Police / Ṃōn bwilinmāāṇ
- Fire Station
- Health / Jikin taktō
- Hospital
- Fuel Station
- Antenna
- National Telecommunication
- Pump Station
- Power Plant
- Airport
- Port / Wharves
- Boat Ramp / Access
- Disaster Equipment Storage
- Emergency Shelter
- Main Lifeline Corridor

### Multi - Hazard* Flooding
at 10 inches of Sea Level Rise by 2055

- Minor Flooding
- Moderate Flooding
- Major Flooding
- Extreme Flooding (Multiple potential flood hazards)

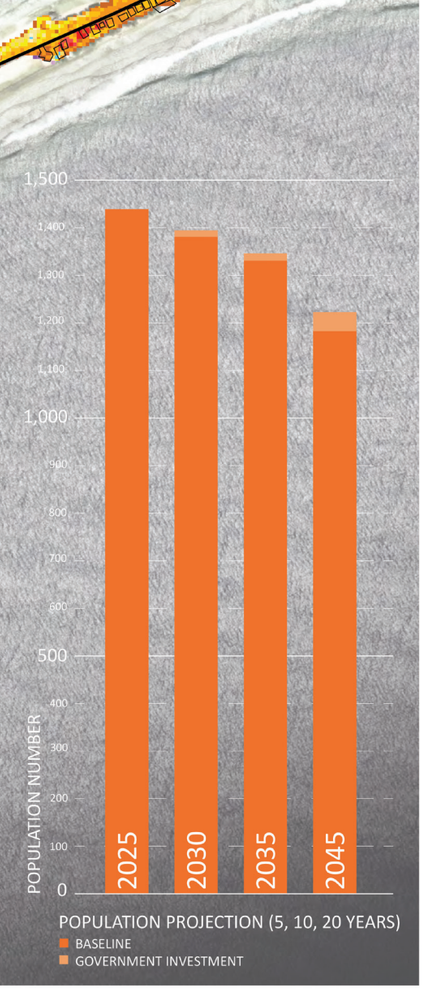
### High Tide
at 10 inches of Sea Level Rise by 2055

- 0.33 - 0.82ft
- 0.83 - 1.64ft
- 1.65 - 2.46ft
- 2.47 - 3.28ft
- 3.29ft- and above

** 50-year return period events: swell waves, typhoon rainfall with storm surge, and non-typhoon rainfall.*
** SLR and high-tide based on Deltares' modelling of the extreme climate scenario, SSP5-8.5*

Fuel Station

Lagoon Rd - Main Lifeline Corridor

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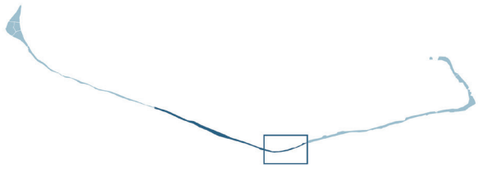


***Map 58*** - Anticipated change

### 3.10.3 FUTURE LAND USE PLAN AND INFRASTRUCTURE NEEDS

Ajeltake, another long connector village, will also remain predominantly low-density residential with scattered schools and churches. At the far eastern end near the airport, land use will transition toward light industrial and mixed-use activities (e.g. airport-related services), reflecting its role as a gateway to Majuro. Despite this slight shift, most of Ajeltake will continue to be a residential corridor.

## Opportunities

Opportunities raised in the July engagement session that formed the basis of discussion at the November stakeholder engagement:

- Clustering and elevating future development around existing community facilities to support walkable catchments and resilient communities.
- Identify and invest in a multi-purpose community facility that could accommodate mobile social services (medical, education etc.) in Woja and Ajeltake.
- Develop a strategy for protecting the Lifeline Corridor through the low-lying areas of Woja/Ajeltake, with focused interventions such as elevated roadways and bridges to maintain future connectivity across the atoll.
- A new boat ramp for safe lagoon access and an alternative to road-based connectivity to the wider atoll.
- Protect the existing vegetation and tree cover for future climate resilience.
- A strategy for upgrading or re-purposing existing public buildings such as schools and churches for use as community evacuation facilities.
- Develop a public transport or ride share strategy to improve connectivity to employment and critical infrastructure
- Improve safety of corridor through improved lighting and speed reduction measures, in particular through more populated areas.
- Take advantage of traffic passing through villages to stimulate the local economy, such as farmers market events.

## Priorities and Projects

Looking to the future, the Ajeltake community is focused on advancing projects that will strengthen resilience and improve quality of life. Following engagement sessions in July and November 2025 as part of the Master Plan engagement, community and landowners identified the following key priorities:

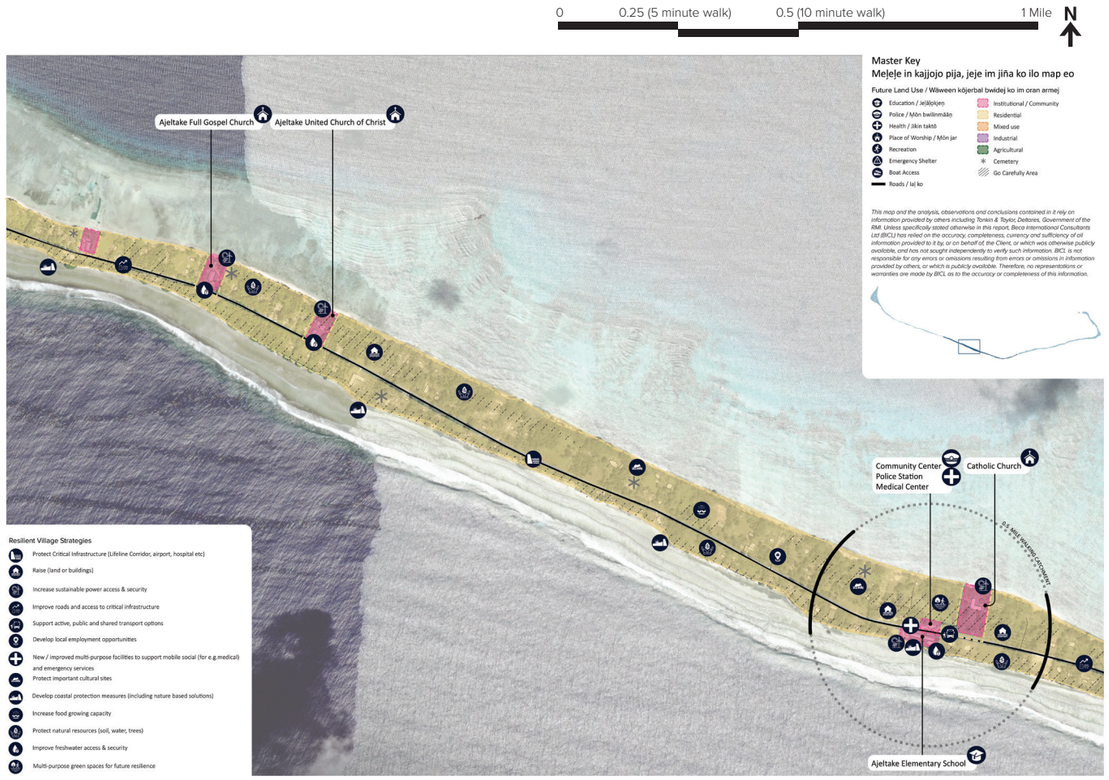
| Projects and Priorities (high priority in bold) | Master Plan Objectives: Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages |
|---|---|---|---|
| **Build and designate boat ramps for the Ajeltake community to access and to avoid disturbing the reef tidal flat on the oceanside of Ajeltake.** | | ✓ | ✓ |
| **Set up and designate trash bin deposit points to reduce littering and loose trash in order to maintain a clean Ajeltake environment.** | ✓ | ✓ | |
| **Some seawalls in Ajeltake are left unfinished, which is causing erosion in other unprotected locations.** | ✓ | ✓ | |
| **Build seawalls to protect all of Ajeltake's shorelines as soon as practical, both oceanside and lagoon side.** | ✓ | ✓ | |
| **Plant trees suited for coastlines to help prevent shoreline erosions.** | ✓ | ✓ | |
| **Sidewalks and bus stop** | | | ✓ |
| **More streetlights/solar lights for homes** | | ✓ | ✓ |
| **Cutting trees that destroy the road** | | | ✓ |
| **Waste Management – sewer system** | ✓ | ✓ | |
| Community Garden | ✓ | ✓ | |
| Public Bathroom | ✓ | ✓ | |
| Access to drinking and washing water | ✓ | ✓ | |
| Alternative energy (solar)/standby power | | ✓ | |

## Map explanation

Maps 59-62 illustrate the recommended land use changes and actions that should be taken to address the impacts of anticipated changes over the next 20 years. It also shows the priority projects identified by the community and includes those that will support daily life, community resilience and disaster preparedness.



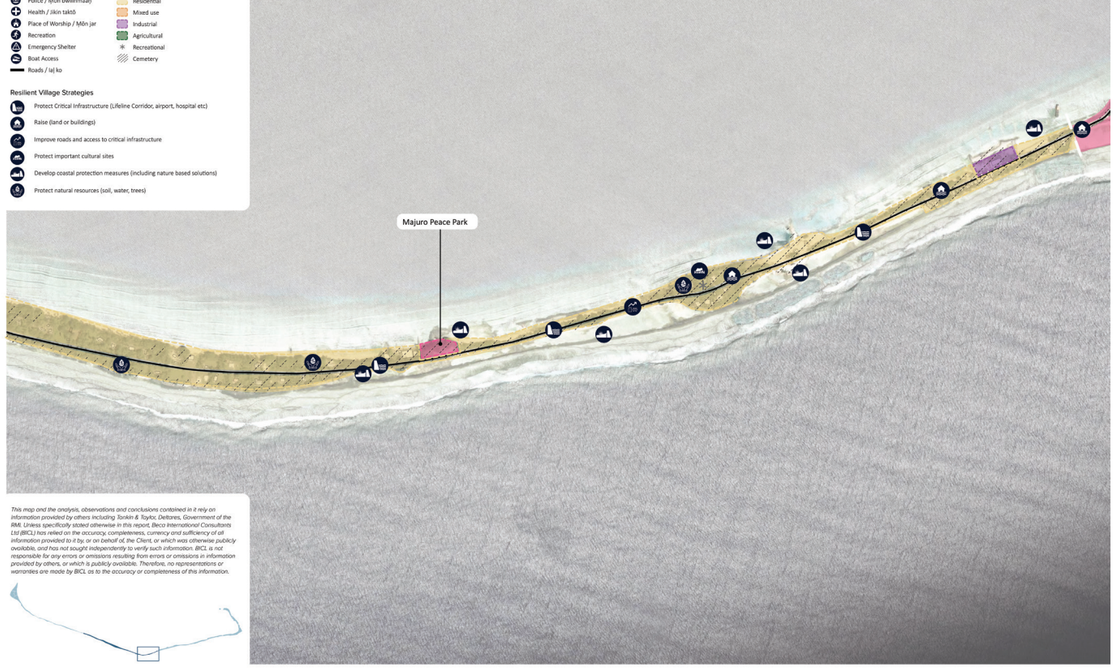

***Map 59*** - Future state




***Map 60*** - Future state




***Map 61*** - Future state




***Map 62*** - Future state

0 0.25 (5 minute walk) 0.5 (10 minute walk) 1 Mile N

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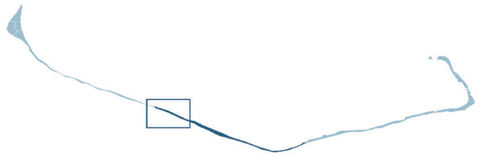





## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

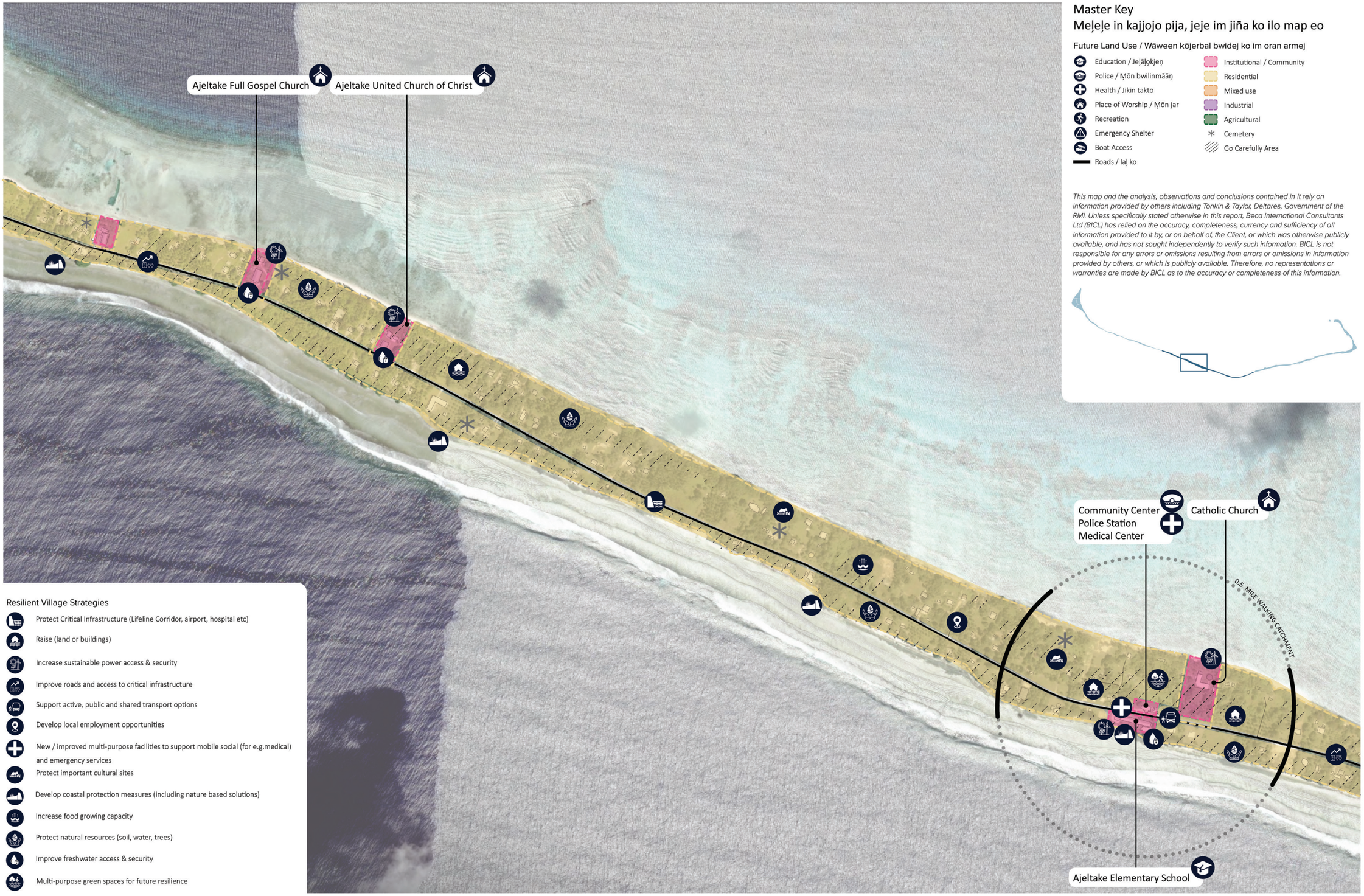
- Education / Jeḷāḷokjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / Laḷ ko
- Protected Areas - Marshall Island Marine Resources Authority
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Improve roads and access to critical infrastructure
- Support active, public and shared transport options
- Protect important cultural sites
- Develop coastal protection measures (including nature based solutions)
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security
- Increase sustainable power access & security

*Map 63* - Future state

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N




## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷokjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / Ial ko
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

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## Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Raise (land or buildings)
- Increase sustainable power access & security
- Improve roads and access to critical infrastructure
- Support active, public and shared transport options
- Develop local employment opportunities
- New / improved multi-purpose facilities to support mobile social (for e.g.medical) and emergency services
- Protect important cultural sites
- Develop coastal protection measures (including nature based solutions)
- Increase food growing capacity
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security
- Multi-purpose green spaces for future resilience

***Map 64*** - Future state

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N




## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeļāļọkjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / Iaļ ko
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Raise (land or buildings)
- Improve roads and access to critical infrastructure
- Support active, public and shared transport options
- Protect important cultural sites
- Develop coastal protection measures (including nature based solutions)
- Increase sustainable power access & security
- New / improved multi-purpose facilities to support mobile social (for e.g.medical) and emergency services
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security

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***Map 65*** - Future state

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷokjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / Iaḷ ko
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Recreational
- Cemetery

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Raise (land or buildings)
- Improve roads and access to critical infrastructure
- Protect important cultural sites
- Develop coastal protection measures (including nature based solutions)
- Protect natural resources (soil, water, trees)

Majuro Peace Park

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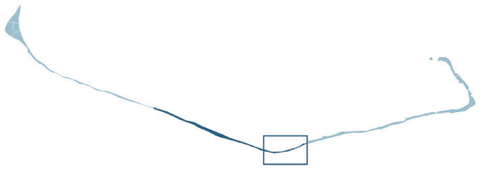


***Map 66*** - Future state

*Photo 7* : Aerial view of Rairok with the Amata Kabua International Airport

# RAIROK

## 3.11 RAIROK

### 3.11.1 CURRENT STATE/CURRENT LAND USE PLAN

Rairok has developed since the Amata Kabua International Airport opened. The Majuro reservoir is located to the north of the airport and the remaining land is a mix of housing, embassies, schools and churches.

#### Environment

Rairok's environment includes vegetation cover, which helps provide shade and contributes to the area's resilience. Some parts of Rairok are vulnerable to flooding and coastal hazards, especially near the airport and landfill zones.

#### Land use

Approximately one-third of the land use in Rairok (the western extent) is industrial, with critical infrastructure services located here supporting higher levels of employment. These include the airport and rainwater reservoir. Land use becomes more mixed, with some commercial (shops and restaurants) interspersed between more dense residential use including the Lojkar apartments. Churches and schools are also spread throughout the central and eastern extent, with some industrial land use (Jable landfill and Kramer Dock) also located at the eastern extent before Delap. Located along the coastal edge near Lojkar the University of the South Pacific provides job opportunities and is a destination for students across Majuro.

The historic landmark Bokedrikdrik is located centrally within Rairok and the Airport Beach Park, a large public open space is located on the western end of the airport.

#### Infrastructure

Infrastructure for water supply, solid waste management, and power is present, with piped water, rainwater catchments, and regular waste collection supporting daily life and resilience.

Flooding has been observed along the main road in Rairok and in the road access area between the apartments in Lojkar. The drain along the road in this area is below the high tide mark in high tides. It has been noted that backflow from the sea reaches this drain and is an example of the impact of SLR requiring need for adaptation.

#### Urban aspects

Housing stock is generally single story stand alone with space around each dwelling for a yard. This individual housing is generally set back from Lagoon Road with either an open frontage with trees and shrubs. Vehicle access branches off to housing that is clustered and facing out onto the lagoon or extends out to the ocean edge. There are a number of properties that are fenced compounds including embassies between the airport and Lojkar. These have a low level of interaction for pedestrians with the main road apart from the entry access. In the midpoint of Rairok. Lojkar provides an apartment complex area of three to four levels with approximately 200 units. These apartment blocks are arranged across the atoll width and features a central vehicle access with landscaped areas with large trees and a sports court providing an outlook for apartments. This space between the apartment blocks and the layout enables cooling breezes to be funneled across from the ocean side.

#### Map explanation

Maps 67-70 illustrate the building uses and names of key buildings. Each building activity has a different color. A dashed line is shown around groups of 'like' building uses – these are the land uses.



***Photo 72*** - Lojkar shops and laundromat provide for the surrounding community



***Photo 73*** - Typical road with solar panel lighting – some requiring maintenance



***Photo 74*** - Rairok Rainbow Elementary School with a bus shelter



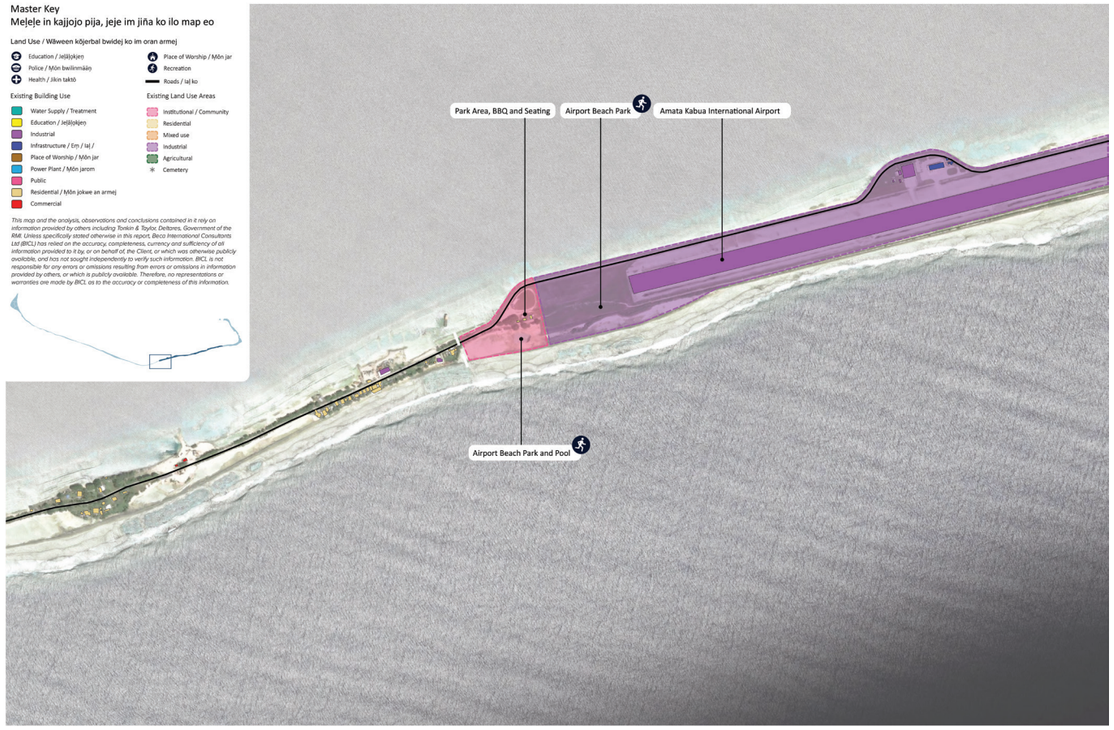
***Photo 75*** - Rairok Church




***Photo 76*** - Long Island Elementary School. Public schools are also emergency shelter locations



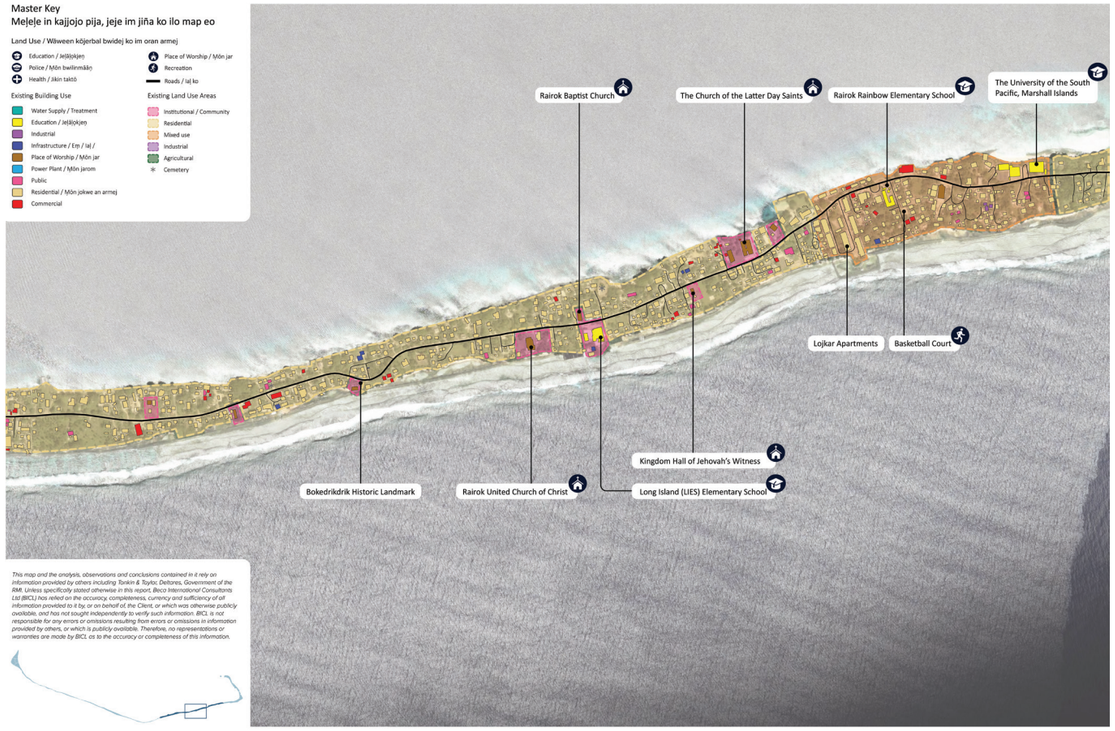
***Photo 77*** - Lojkar apartments which has around 200 apartments and is fully occupied




*Map 67* - Current state




*Map 68* - Current state




*Map 69* - Current state




*Map 70* - Current state

0 0.25 (5 minute walk) 0.5 (10 minute walk) 1 Mile N

## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

### Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeļāļokjeņ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Roads / Laļ ko

### Existing Building Use

- Water Supply / Treatment
- Education / Jeļāļokjeņ
- Industrial
- Infrastructure / Eṃ / laļ /
- Place of Worship / Ṃōn jar
- Power Plant / Ṃōn jarom
- Public
- Residential / Ṃōn jokwe an armej
- Commercial

### Existing Land Use Areas

- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery

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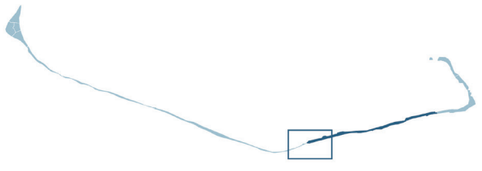

Park Area, BBQ and Seating

Airport Beach Park

Amata Kabua International Airport

Airport Beach Park and Pool

***Map 71*** - Current state

0 0.25 (5 minute walk) 0.5 (10 minute walk) 1 Mile N

## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

### Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷọkjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Roads / laḷ ko

### Existing Building Use

- Water Supply / Treatment
- Education / Jeḷāḷọkjeṇ
- Industrial
- Infrastructure / Eṃ / laḷ /
- Place of Worship / Ṃōn jar
- Power Plant / Ṃōn jarom
- Public
- Residential / Ṃōn jokwe an armej
- Commercial

### Existing Land Use Areas

- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery

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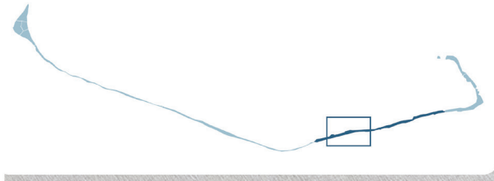




***Map 72*** - Current state

0 0.25 (5 minute walk) 0.5 (10 minute walk) 1 Mile N

## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

### Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeļāļokjeņ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Roads / Laļ ko

### Existing Building Use

- Water Supply / Treatment
- Education / Jeļāļokjeņ
- Industrial
- Infrastructure / Eṃ / laļ /
- Place of Worship / Ṃōn jar
- Power Plant / Ṃōn jarom
- Public
- Residential / Ṃōn jokwe an armej
- Commercial

### Existing Land Use Areas

- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery

Rairok Baptist Church

The Church of the Latter Day Saints

Rairok Rainbow Elementary School

The University of the South Pacific, Marshall Islands

Lojkar Apartments

Basketball Court

Kingdom Hall of Jehovah's Witness

Bokedrikdrik Historic Landmark

Rairok United Church of Christ

Long Island (LIES) Elementary School

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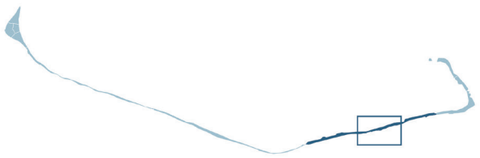

***Map 73*** - Current state

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

### Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷọkjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Roads / Iaḷ ko

### Existing Building Use

- Water Supply / Treatment
- Education / Jeḷāḷọkjeṇ
- Industrial
- Infrastructure / Eṃ / Iaḷ /
- Place of Worship / Ṃōn jar
- Power Plant / Ṃōn jarom
- Public
- Residential / Ṃōn jokwe an armej
- Commercial

### Existing Land Use Areas

- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery




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***Map 74*** - Current state

## 3.11.2 ANTICIPATED CHANGE

### Projected Population

Rairok's population was projected to gradually decline over the next two decades, from 4,432 residents in 2025 to between 3,671 and 3,785 by 2045. The decrease reflects broader demographic trends in Majuro, highlighting the need for future planning so that infrastructure and services can support a sustainable community size. Despite the decline, Rairok will remain one of the most populous villages, requiring ongoing adaptation of housing, amenities, and resilience strategies to meet changing needs.

### Climate Hazards:

Flood modelling completed by Deltares shows 0.82 feet (0.25 meters) of sea-level rise and increased intensity of rainfall events, which are anticipated to occur by 2055 under a rapid climate change scenario. Flood models indicate that the village will experience higher incidence of flooding than today, resulting from daily higher sea-levels and high tide events, and periodic rainfall from storm events such as typhoons or other heavy rains, and/or wave-drive overwash from storm surges or swell waves.

Flooding is most likely to be most problematic in the following areas of the village by 2055 if no interventions or additional coastal protection measures are implemented*;

- Rairok is expected to experience extreme flooding, predominantly along the ocean coastline and at the airport.
- Due to the narrow width of Rairok, it is exposed to flooding along the ocean and lagoon coastlines, and the land in between the coasts is expected to see patchy minor to extreme flooding, with greater flood risk on the western side of Rairok.
- There are very few segments of Rairok that are not exposed to at least minor flooding.

*Flood severity was determined by evaluating the modelled potential flood depths, with flooding increasing in severity from minor ➔ moderate ➔ major ➔ extreme.

### Map explanation

Maps 75-78 illustrate what could change at a village-level over the next 20 years because of a decrease in population and impacts from climate change. Note that there are other climate impacts – heat, drought, flooding from tsunamis that are not illustrated on the map.

The population bar chart shows two ways the population could change - the lower line shows the population projection of this village over the next 5, 10 and 20 years and the line above shows the population with potential interventions signaled by the RMI government.

The maps show 0.82 feet (0.25m) of sea-level rise, daily high tide, and flooding from rainstorms, typhoons, and swell wave events.

Critical services and infrastructure are shown as icons on the map. These support daily life, community resilience and disaster preparedness now and in the future and are to be retained and potentially moved if they are located in vulnerable areas.

Maps 75-78 have different colors to show the possible extent of flooding from typhoons, rainstorms, and swell waves in 2055 with 0.82 feet of sea-level rise (SLR):

- No color - these areas show where there is minimal flood risk.
- Blue shows where there would be minor flooding (less risk of flooding, lower levels of flooding expected).
- Light yellow shows where there would be moderate flooding (higher risk of flooding, possible deep flood waters).
- Bright yellow and orange show where there would be major flooding (even higher risk of flooding, area susceptible to multiple flood hazards, possible deep flood waters).
- Red, brown, black show where there would be extreme flooding (worst flooding for Majuro, area susceptible to multiple flood hazards, possible very deep flood waters).

The high tide map has different colors to show possible water depths from daily high tide in 2055 with 0.82 feet of SLR.

- Light purple shows where there will likely be 0.33-1.64 feet of water every day at high tide.
- Purple shows where there will likely be more than 1.65 feet of water every day at high tide.

NOTE – these flood maps are modelled based on current day environment and coastal edge (not allowing for more seawalls or other changes to the ocean and coastal edge).



***Photo 78*** - Fuel station on the ocean edge



***Photo 79*** - Pooling water in some areas in Rairok after rainfall



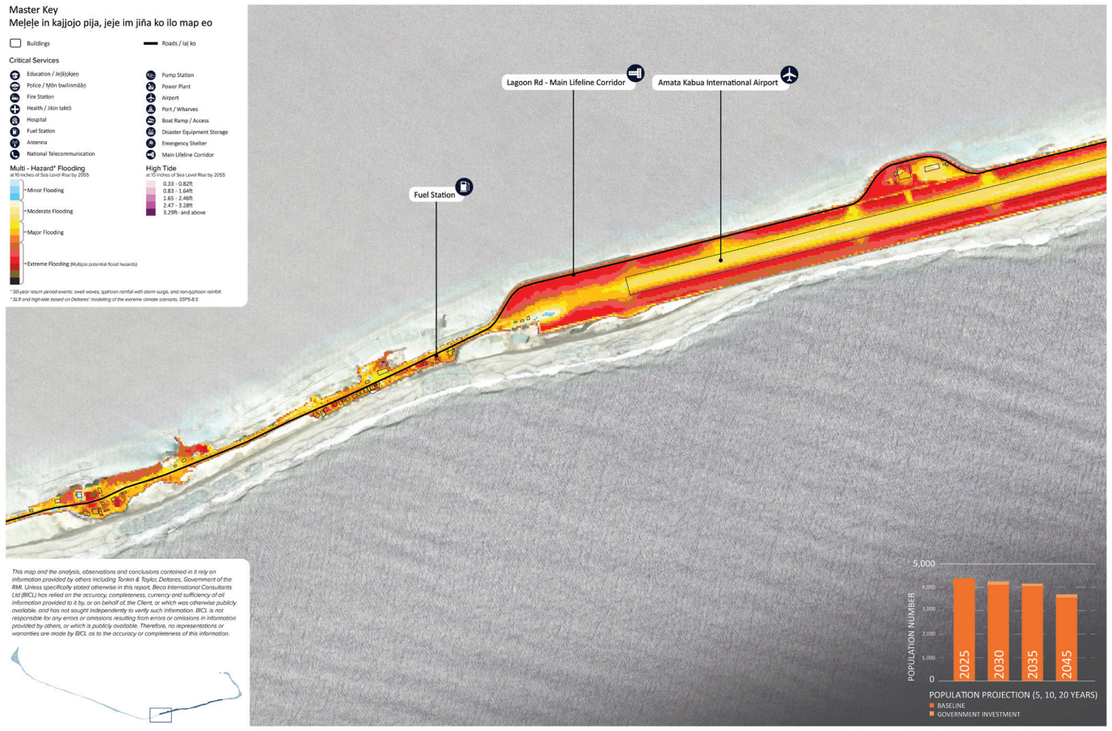
***Photo 80*** - Opportunity for review of buildings and number of dwellings that are occupied



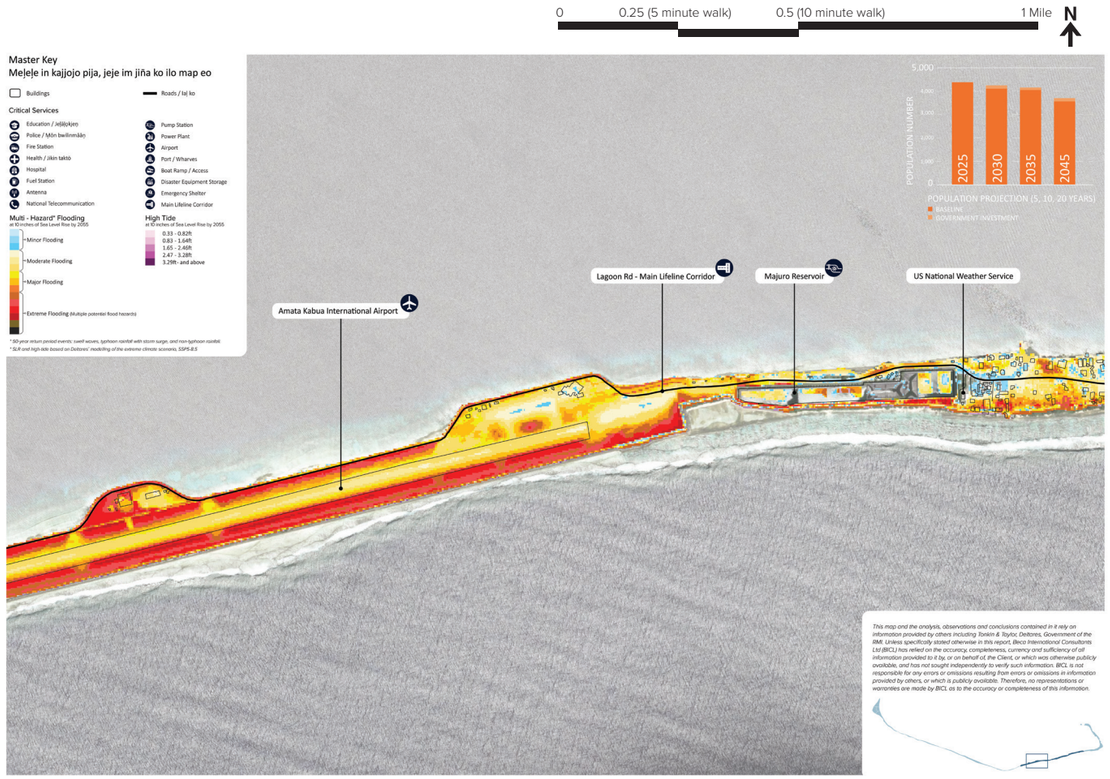
***Photo 81*** - Storm surges wash over the lagoon edge road. The mangrove type planting on the rock bund areas has been illustrated as a good solution



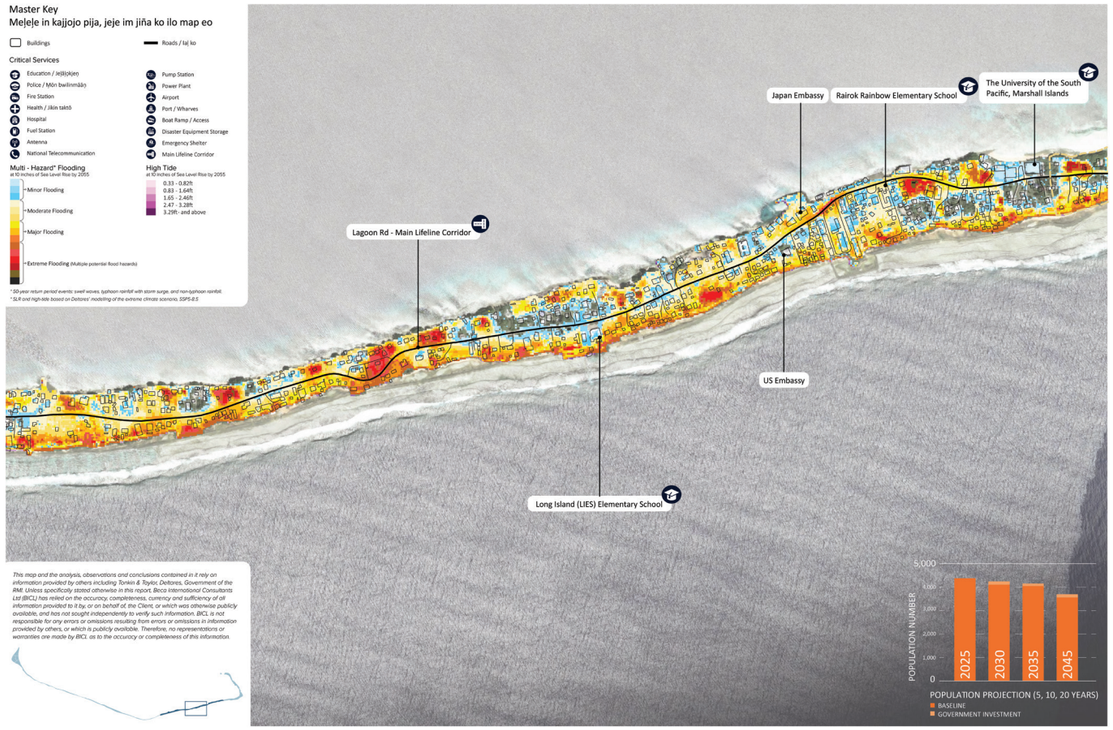
***Photo 82*** - Jable dump and landfill



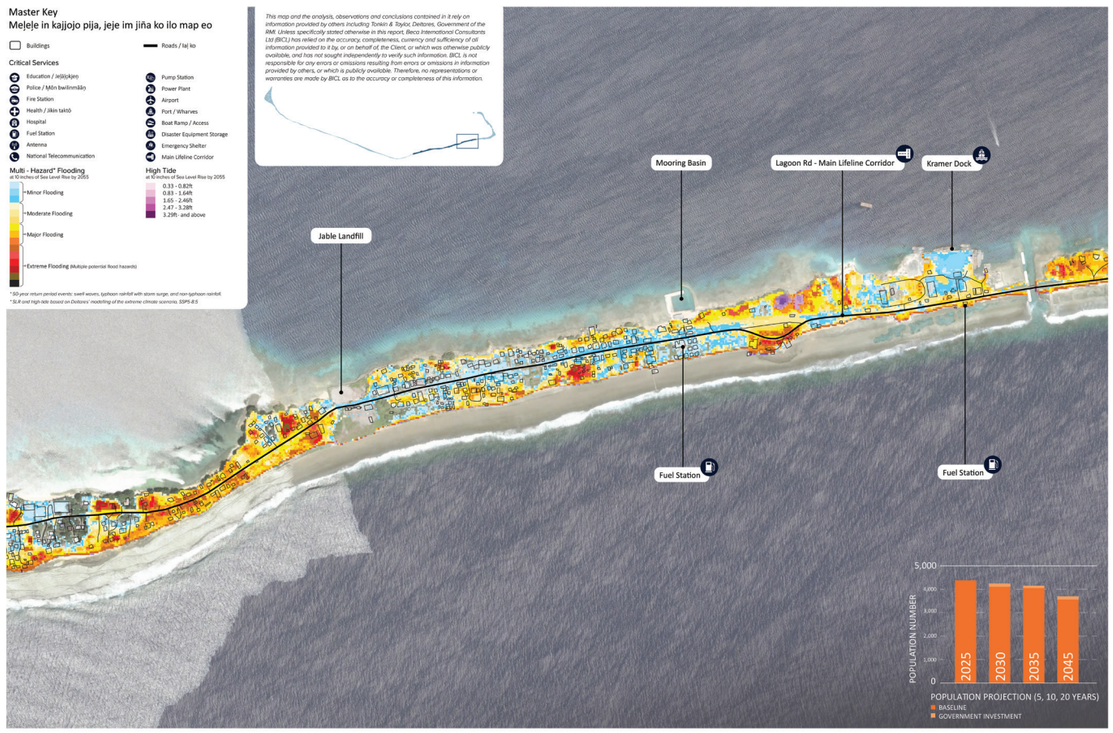

*Map 75* - Anticipated change




*Map 76* - Anticipated change




*Map 77* - Anticipated change




*Map 78* - Anticipated change

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

- Buildings
- Roads / Iaḷ ko

### Critical Services

- Education / Jeḷāḷokjeṇ
- Police / Ṃōn bwilinmāāṇ
- Fire Station
- Health / Jikin taktō
- Hospital
- Fuel Station
- Antenna
- National Telecommunication
- Pump Station
- Power Plant
- Airport
- Port / Wharves
- Boat Ramp / Access
- Disaster Equipment Storage
- Emergency Shelter
- Main Lifeline Corridor

### Multi - Hazard* Flooding
at 10 inches of Sea Level Rise by 2055

- Minor Flooding
- Moderate Flooding
- Major Flooding
- Extreme Flooding (Multiple potential flood hazards)

### High Tide
at 10 inches of Sea Level Rise by 2055

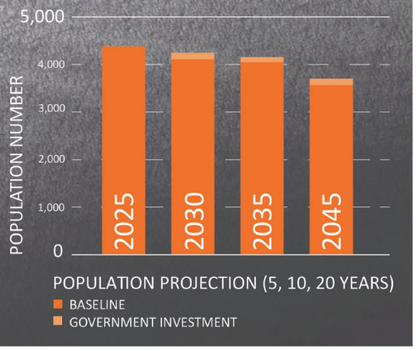
- 0.33 - 0.82ft
- 0.83 - 1.64ft
- 1.65 - 2.46ft
- 2.47 - 3.28ft
- 3.29ft- and above

** 50-year return period events: swell waves, typhoon rainfall with storm surge, and non-typhoon rainfall.*
** SLR and high-tide based on Deltares' modelling of the extreme climate scenario, SSP5-8.5*

Lagoon Rd - Main Lifeline Corridor

Amata Kabua International Airport

Fuel Station

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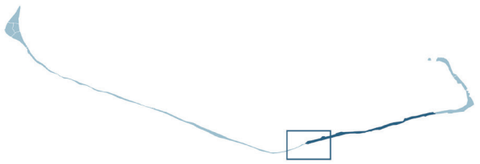


***Map 79*** - Anticipated change

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

- Buildings
- Roads / laḷ ko

### Critical Services

- Education / Jeḷāḷokjeṇ
- Police / Mōṇ bwilinmāāṇ
- Fire Station
- Health / Jikin taktō
- Hospital
- Fuel Station
- Antenna
- National Telecommunication
- Pump Station
- Power Plant
- Airport
- Port / Wharves
- Boat Ramp / Access
- Disaster Equipment Storage
- Emergency Shelter
- Main Lifeline Corridor

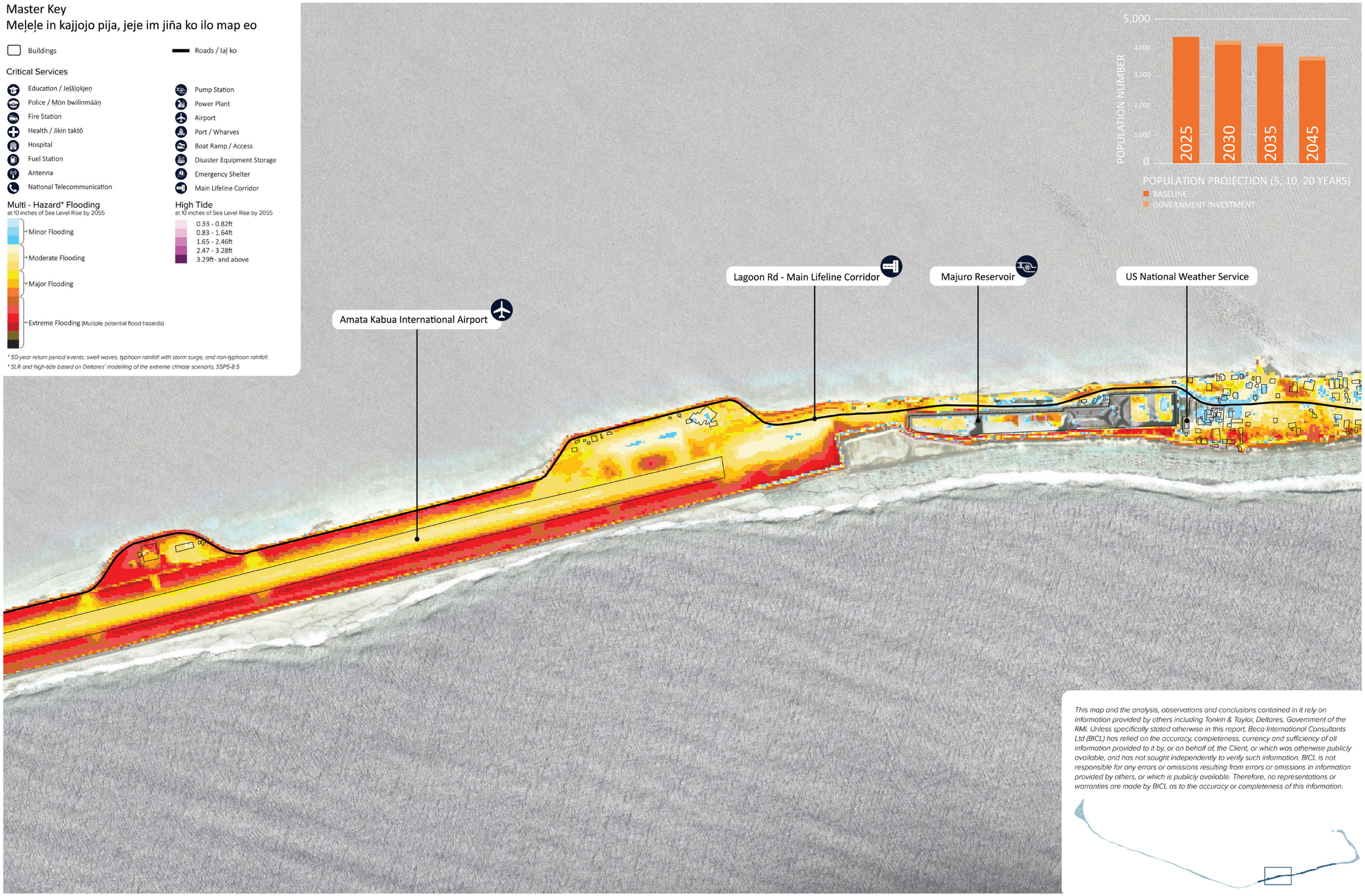
### Multi - Hazard* Flooding
at 10 inches of Sea Level Rise by 2055

- Minor Flooding
- Moderate Flooding
- Major Flooding
- Extreme Flooding (Multiple potential flood hazards)

### High Tide
at 10 inches of Sea Level Rise by 2055

- 0.33 - 0.82ft
- 0.83 - 1.64ft
- 1.65 - 2.46ft
- 2.47 - 3.28ft
- 3.29ft- and above

** 50-year return period events: swell waves, typhoon rainfall with storm surge, and non-typhoon rainfall.*
** SLR and high-tide based on Deltares' modelling of the extreme climate scenario, SSP5-8.5*

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***Map 80*** - Anticipated change

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

- Buildings
- Roads / Iaḷ ko

### Critical Services

- Education / Jeḷāḷokjeṇ
- Police / Ṃōn bwilinmāāṇ
- Fire Station
- Health / Jikin taktō
- Hospital
- Fuel Station
- Antenna
- National Telecommunication
- Pump Station
- Power Plant
- Airport
- Port / Wharves
- Boat Ramp / Access
- Disaster Equipment Storage
- Emergency Shelter
- Main Lifeline Corridor

### Multi - Hazard* Flooding
at 10 inches of Sea Level Rise by 2055

- Minor Flooding
- Moderate Flooding
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- Extreme Flooding (Multiple potential flood hazards)

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at 10 inches of Sea Level Rise by 2055

- 0.33 - 0.82ft
- 0.83 - 1.64ft
- 1.65 - 2.46ft
- 2.47 - 3.28ft
- 3.29ft- and above

** 50-year return period events: swell waves, typhoon rainfall with storm surge, and non-typhoon rainfall.*
** SLR and high-tide based on Deltares' modelling of the extreme climate scenario, SSP5-8.5*

Japan Embassy

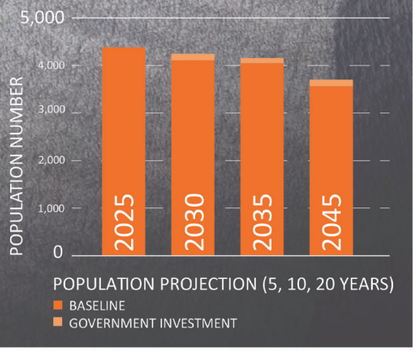
Rairok Rainbow Elementary School

The University of the South Pacific, Marshall Islands

Lagoon Rd - Main Lifeline Corridor

US Embassy

Long Island (LIES) Elementary School

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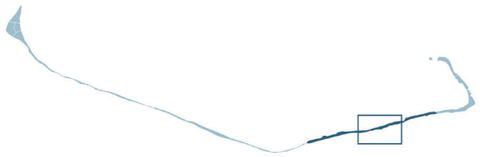

***Map 81*** - Anticipated change

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

- Buildings
- Roads / laḷ ko

### Critical Services

- Education / Jeḷāḷokjeṇ
- Police / Ṃōn bwilinmāāṇ
- Fire Station
- Health / Jikin taktō
- Hospital
- Fuel Station
- Antenna
- National Telecommunication
- Pump Station
- Power Plant
- Airport
- Port / Wharves
- Boat Ramp / Access
- Disaster Equipment Storage
- Emergency Shelter
- Main Lifeline Corridor

### Multi - Hazard* Flooding
at 10 inches of Sea Level Rise by 2055

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### High Tide
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- 2.47 - 3.28ft
- 3.29ft- and above

** 50-year return period events: swell waves, typhoon rainfall with storm surge, and non-typhoon rainfall.*
** SLR and high-tide based on Deltares' modelling of the extreme climate scenario, SSP5-8.5*

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***Map 82*** **-** Anticipated change

### 3.11.3 FUTURE LAND USE PLAN AND INFRASTRUCTURE NEEDS

Rairok's future land use vision reflects its status as an urbanizing area close to the DUD town center. Development will be guided toward a more compact, mixed-use corridor along the main road, encouraging shops, services, and possibly multi-story housing where elevation and population support it. In essence, Rairok is proposed to be an urban fringe neighborhood.

#### Opportunities

Opportunities raised in the July engagement session that formed the basis of discussion at the November stakeholder engagement:

- Develop a housing strategy for Rairok to improve residential capacity and living conditions in Delap where mixed use and residential intensification are proposed.
- Protect the Lifeline Corridor including the bridge connecting Delap to the airport and western villages of the atoll.
- A need for more government and community facilities (health clinic and community center) to support a consolidated village core.
- Protect dock and increase public access to water through boat ramps.
- Protect and maintain the rainwater catchment reservoir and water treatment facilities, which serve Rairok and the majority of DUD.
- Opportunity to develop hotel accommodation near the airport
- Improve the condition and safety of road connections
- Consolidate industrial and employment development and buffer from residential areas.
- Protect existing vegetation and increase tree cover for future climate resilience
- Develop a public transport or ride share strategy to improve connectivity to the wider Atoll.

#### Priorities and Projects

Looking to the future, the Rairok community is focused on advancing projects that will strengthen resilience and improve quality of life. Following engagement sessions in July and November 2025 as part of the Master Plan engagement, community and landowners identified the following key priorities:

| Projects and Priorities (high priority in bold) | Master Plan Objectives | | |
|---|---|---|---|
| | Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages |
| **Maintain and improve solar lighting and consider solar as an energy source.** | | ✓ | |
| **Training for the Rairōk community on work skills including trade training.** | | ✓ | |
| **There should be a playground for the children in Rairōk.** | ✓ | ✓ | |
| **There should be a health clinic to provide instant access to the community instead of traveling to town.** | | ✓ | |
| Build a police station that is secured and safe for the workers in it. | | ✓ | |
| Build a middle school (e.g., 7 & 8 graders) in Rairōk to enable walking distance access | | ✓ | |
| Need an ATM machine to be placed at the K&K Long Island store. | | ✓ | |

#### Map explanation

Maps 83-86 illustrate the recommended land use changes and actions that should be taken to address the impacts of anticipated changes over the next 20 years. It also shows the priority projects identified by the community and includes those that will support daily life, community resilience and disaster preparedness.



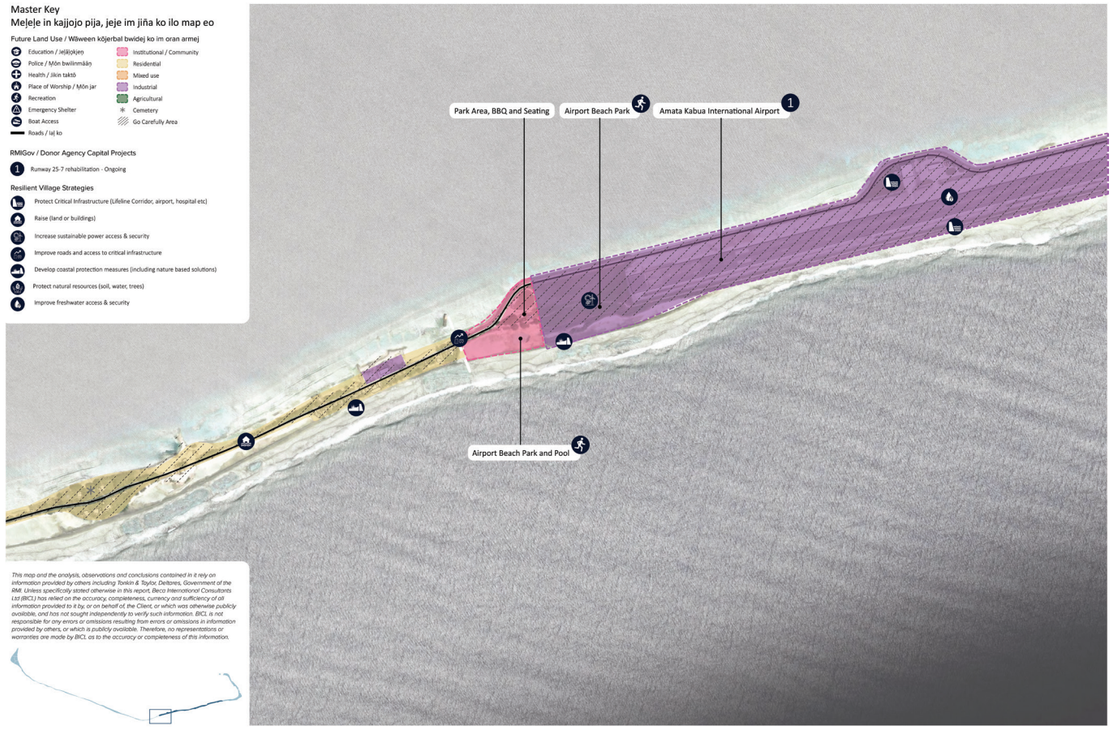
***Photo 83*** - Drains provided for stormwater in some locations along Rairok



***Photo 84*** - Opportunities for expression of Majuro specific art



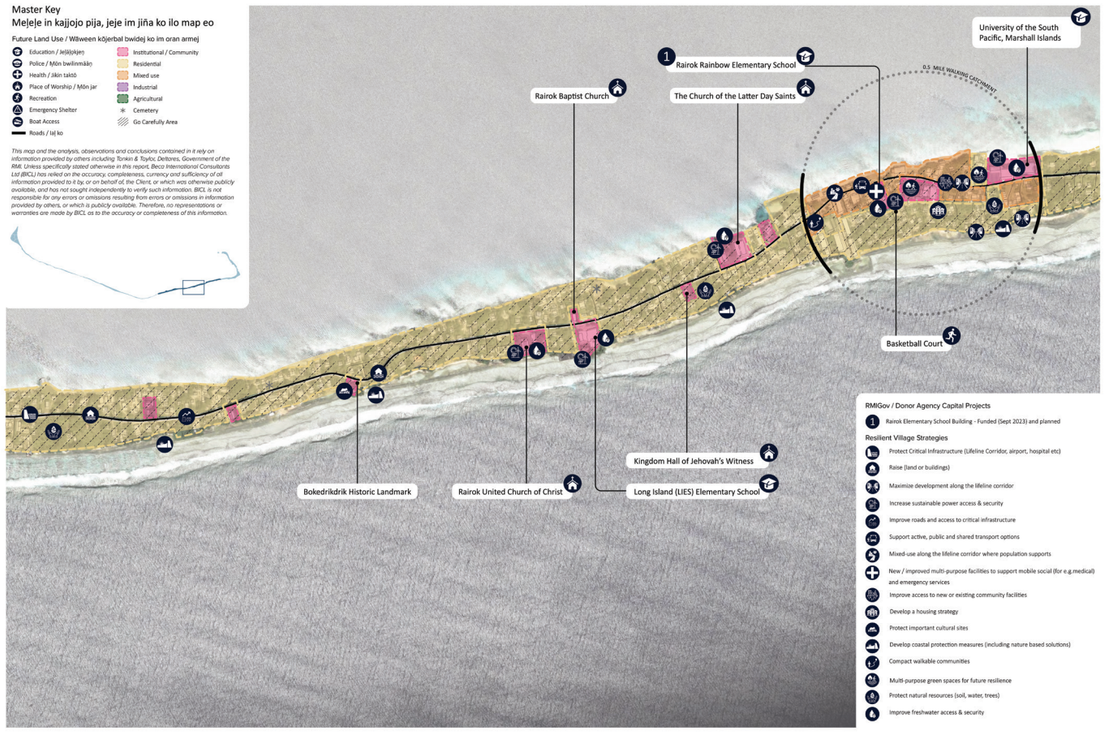
***Photo 85*** - Areas where people can meet and play social games



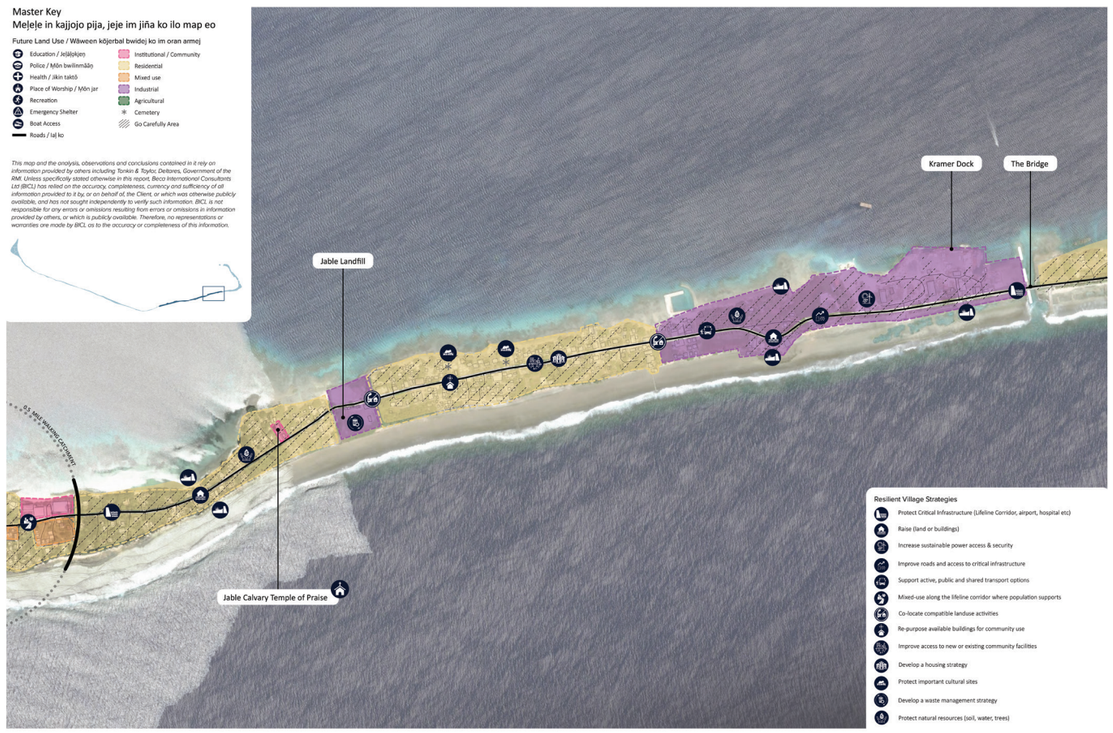

***Map 83*** - Future state




***Map 84*** - Future state




***Map 85*** - Future state




***Map 86*** - Future state

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeļāļokjeņ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / Iaļ ko
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

### RMIGov / Donor Agency Capital Projects

1 Runway 25-7 rehabilitation - Ongoing

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Raise (land or buildings)
- Increase sustainable power access & security
- Improve roads and access to critical infrastructure
- Develop coastal protection measures (including nature based solutions)
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security

Park Area, BBQ and Seating

Airport Beach Park

Amata Kabua International Airport 1

Airport Beach Park and Pool

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***Map 87*** - Future state

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷokjeṇ
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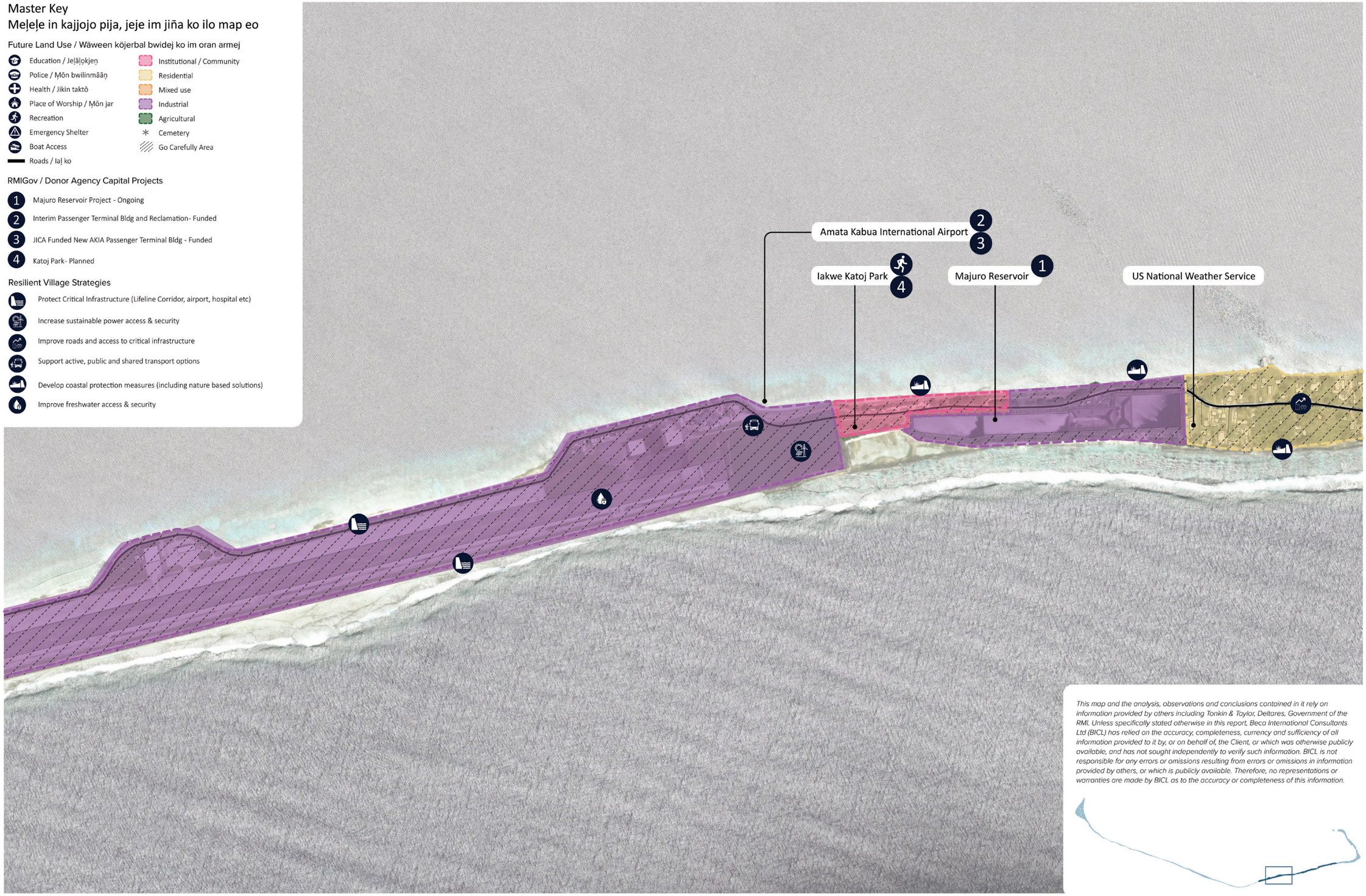
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / Iaḷ ko
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

### RMIGov / Donor Agency Capital Projects

1. Majuro Reservoir Project - Ongoing
2. Interim Passenger Terminal Bldg and Reclamation- Funded
3. JICA Funded New AKIA Passenger Terminal Bldg - Funded
4. Katoj Park- Planned

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Increase sustainable power access & security
- Improve roads and access to critical infrastructure
- Support active, public and shared transport options
- Develop coastal protection measures (including nature based solutions)
- Improve freshwater access & security

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***Map 88*** - Future state

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷokjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / laḷ ko
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

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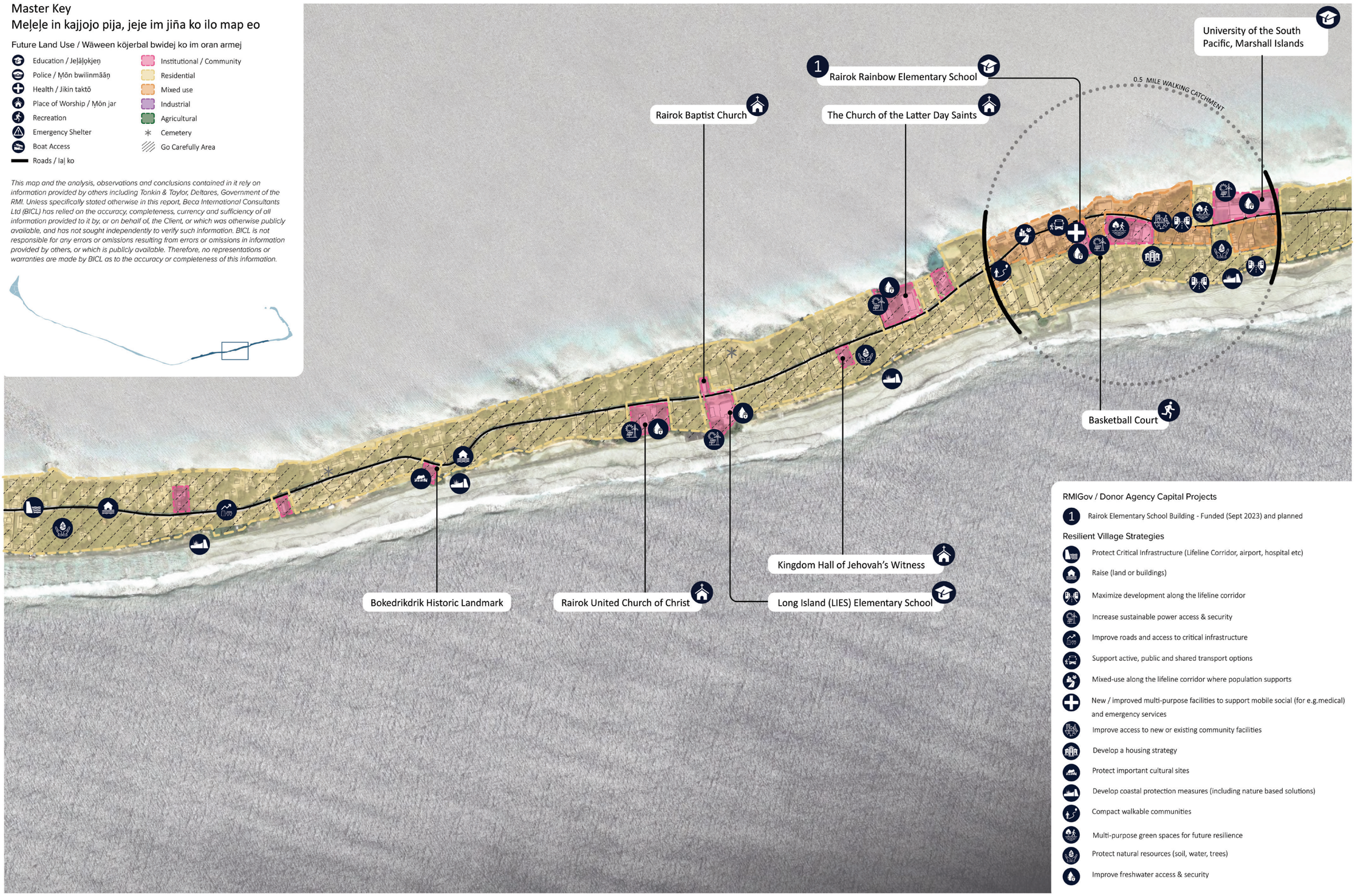


### RMIGov / Donor Agency Capital Projects

1. Rairok Elementary School Building - Funded (Sept 2023) and planned

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Raise (land or buildings)
- Maximize development along the lifeline corridor
- Increase sustainable power access & security
- Improve roads and access to critical infrastructure
- Support active, public and shared transport options
- Mixed-use along the lifeline corridor where population supports
- New / improved multi-purpose facilities to support mobile social (for e.g.medical) and emergency services
- Improve access to new or existing community facilities
- Develop a housing strategy
- Protect important cultural sites
- Develop coastal protection measures (including nature based solutions)
- Compact walkable communities
- Multi-purpose green spaces for future resilience
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security

*Map 89* - Future state

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷọkjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / laḷ ko
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

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### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Raise (land or buildings)
- Increase sustainable power access & security
- Improve roads and access to critical infrastructure
- Support active, public and shared transport options
- Mixed-use along the lifeline corridor where population supports
- Co-locate compatible landuse activities
- Re-purpose available buildings for community use
- Improve access to new or existing community facilities
- Develop a housing strategy
- Protect important cultural sites
- Develop a waste management strategy
- Protect natural resources (soil, water, trees)

***Map 90*** - Future state

*Photo 86* - Aerial view of Delap with Delap Park in the foreground with the K and K Island Pride supermarket behind. Photo credit: Urban Resilience Project

# DELAP

# 3.12 DELAP

## 3.12.1 CURRENT STATE/CURRENT LAND USE PLAN

As the urban center of Majuro, Delap has the highest proportion of critical infrastructure, civic, retail, industrial, and hospitality development. Delap forms part of an extended urban area known as DUD (Delap, Uliga, Djarrit). Of these three urban villages Delap is the most densely populated, home to an estimated 6,109 people in 2025 and is around 324 acres in area (131 hectares). Challenges facing Delap include its low lying and flood prone topography, a lack of vegetation and potential for urban heat island as temperatures increase. It is known for having the densest population and being congested with traffic due to its central location.

### Environment

Delap features flat topography, and is approximately 0.4 miles at its widest from the ocean to lagoon side. The densely populated area and associated hard surfacing lacks any substantial shade or open spaces that would provide environmental benefits such as urban cooling and flood mitigation along roads and in yard spaces next to houses. Delap is susceptible to flooding and some parts of the ocean side are vulnerable to storm surges, making coastal resilience and vegetation cover important for mitigating environmental risks.

### Land use

Delap functions as the employment (civic, industrial and commercial) heart of DUD, with dense clusters of retail (multiple shops, supermarkets, restaurants and cafés) and hospitality (Marshall Islands Resort) along the main spine and lagoon edge. Of note is K&K which has a supermarket and other shops and acts as an employment and customer attractor to this central area due to its scale. Major government, institutional and community assets are concentrated here including the Parliament/Capitol Building, City/Town Hall, ministry and government offices (e.g., Banking Commission, Visitors Authority, economic development agency), schools (Delap Elementary, Majuro Cooperative School, Majuro Seventh Day Adventist School, Life Skills Academy), and recreation facilities (Delap Park, ECC Gym, tennis courts).

Port and utilities anchor the working waterfront, with Delap Dock/Majuro Fishing Port and the Majuro Power Plant, plus warehousing and other infrastructure nearby. Places of worship (e.g., Assembly of God, Seventh Day Adventist, Christian Church) are distributed across residential blocks.

Overall land use is a highly mixed blend of residential, government/civic, commercial, education, and industrial activities.

### Infrastructure

Delap is the administrative and commercial hub of Majuro and has access to critical infrastructure and services including paved roads, street lighting, and direct access to the Lifeline Corridor, ensuring connectivity to other parts of the atoll. The area has reticulated water and sewerage services, is connected to the Majuro power grid and home to the Majuro Power station, and benefits from solid waste collection, telecommunications, and the Delap Dock, Majuro's main port for shipping international goods, making it one of the most serviced communities in the Marshall Islands.

### Urban

Delap's urban form is defined not only by the Lifeline Corridor but the significant infrastructure and development with which it connects. The higher density development of Delap is typically narrow and linear as it transitions from Rairok before it widens at its center surrounding the Government and Hospital precincts. This more compact urban form promotes the opportunity for mixed use development and walkable catchments to residential communities. Beyond the lifeline corridor, Delap's secondary street network is narrow and less structured limiting capacity and circulation.

### Map explanation

Map 91 illustrates the building uses and names of key buildings. Each building activity has a different color. A dashed line is shown around groups of 'like' building uses – these are the land uses.



***Photo 87*** - Delap Marshall Islands Resort provides accommodation and tourism facility



***Photo 88*** - Aerial view of Majuro with ECC and Delap Park area in the foreground. Photo credit: Urban Resilience Project




***Photo 89*** - Delap Convention Center in the parliamentary area



***Photo 90*** - Aerial view of Delap with Marshall Islands Resort facing onto the lagoon and medium rise buildings along the main Lagoon Road. Photo Credit: Lee Arkhie Perez



***Photo 91*** - K and K supermarket in the center of Delap

0 0.25 (5 minute walk) 0.5 (10 minute walk) 1 Mile N

## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

### Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeļāļokjeņ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Roads / laļ ko

### Existing Building Use

- Water Supply / Treatment
- Education / Jeļāļokjeņ
- Industrial
- Infrastructure / Eṃ / laļ /
- Place of Worship / Ṃōn jar
- Power Plant / Ṃōn jarom
- Public
- Residential / Ṃōn jokwe an armej
- Commercial

### Existing Land Use Areas

- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery

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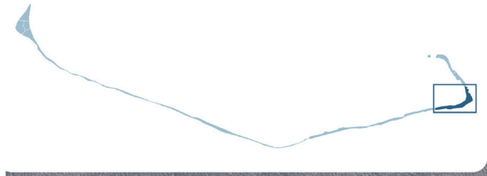

Office Mart
Water Infrastructure
National Telecommunications Authority
Federal Government Office
North Delap Elementary School
Delap SDA Elementary and High School
Assembly of God Church
Majuro Coop (Cooperative) Elementary and High School
Ministry or Public Works, Infrastructure and Utilities (MPWIU)
Majuro Power Plant
Life Skills Academy Elementary
Marshall Islands Resort
Delap Park
Delap Dock
Majuro Hospital
New Attorney General Office
Church
Eugenes's Store
Majuro Water and Sewer Authority
ECC Gymasium
Delap Elementary School
Majuro City Hall
Formosa Shopping Center
K & K Island Pride Supermarket

*Map 91* - Current state

## 3.12.2 ANTICIPATED CHANGE

### Projected Population

Delap's estimated population in 2025 was 6,109. Projections indicate a gradual decline, with forecasts of 5,825 to 5,879 by 2030, 5,550 to 5,636 by 2035, and 4,866 to 5,017 by 2045. This trend highlights the need for future planning to ensure that infrastructure and services can support a sustainable community size.

### Climate Hazards

Flood modelling completed by Deltares shows 0.82 feet (0.25 meters) of sea-level rise and increased intensity of rainfall events, which are anticipated to occur by 2055 under a rapid climate change scenario. Flood models indicate that the village will experience higher incidence of flooding than today, resulting from daily higher sea-levels and high tide events, and periodic rainfall from storm events such as typhoons or other heavy rains, and/or wave-drive overwash from storm surges or swell waves.

Flooding is most likely to be most problematic in the following areas of the village by 2055 if no interventions or additional coastal protection measures are implemented*:

- Delap is expected to experience moderate to major flooding along most of the lagoon and ocean coastlines.
- There are several areas that are very low-lying which will be impacted by daily high-tides, and expected to be inundated by 2055.
- Most of the inland flooding in Delap is expected to be minor to major, with some pockets of extreme flooding.
- There are very few segments of Delap that are not exposed to at least minor flooding.

*Flood severity was determined by evaluating the modelled potential flood depths, with flooding increasing in severity from minor ➔ moderate ➔ major ➔ extreme.

### Map explanation

Map 92 illustrates what could change at a village-level over the next 20 years because of a decrease in population and impacts from climate change. Note that there are other climate impacts – heat, drought, flooding from tsunamis that are not illustrated on the map.

The population bar chart shows two ways the population could change - the lower line shows the population projection of this village over the next 5, 10 and 20 years and the line above shows the population with potential interventions signaled by the RMI government.

The map shows 0.82 feet (0.25m) of sea-level rise, daily high tide, and flooding from rainstorms, typhoons, and swell wave events.

Critical services and infrastructure are shown as icons on the map. These support daily life, community resilience and disaster preparedness now and in the future and are to be retained and potentially moved if they are located in vulnerable areas.

Map 92 has different colors to show the possible extent of flooding from typhoons, rainstorms, and swell waves in 2055 with 0.82 feet of sea-level rise (SLR):

- No color - these areas show where there is minimal flood risk.
- Blue shows where there would be minor flooding (less risk of flooding, lower levels of flooding expected).
- Light yellow shows where there would be moderate flooding (higher risk of flooding, possible deep flood waters).
- Bright yellow and orange show where there would be major flooding (even higher risk of flooding, area susceptible to multiple flood hazards, possible deep flood waters).
- Red, brown, black show where there would be extreme flooding (worst flooding for Majuro, area susceptible to multiple flood hazards, possible very deep flood waters).

The high tide map has different colors to show possible water depths from daily high tide in 2055 with 0.82 feet of SLR.

- Light purple shows where there will likely be 0.33-1.64 feet of water every day at high tide.
- Purple shows where there will likely be more than 1.65 feet of water every day at high tide.

NOTE – these flood maps are modelled based on current day environment and coastal edge (not allowing for more seawalls or other changes to the ocean and coastal edge).




***Photo 92*** - Delap Power Plant



***Photo 93*** - Delap Port provides berthing for inter-island ships and international ships. Photo Credit: Lee Arkhie Perez



***Photo 94*** - Delap National Telecommunications Center



***Photo 95*** - The Government Multipurpose facility will provide capability and storage of materials that can be accessed in case of a disaster



***Photo 96*** - Delap Majuro and Sewer Authority with sewerage outlet pipe that extends into the ocean

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

- Buildings
- Roads / laḷ ko

### Critical Services

- Education / Jeḷāḷokjeṇ
- Police / Ṃōn bwilinmāāṇ
- Fire Station
- Health / Jikin taktō
- Hospital
- Fuel Station
- Antenna
- National Telecommunication
- Pump Station
- Power Plant
- Airport
- Port / Wharves
- Boat Ramp / Access
- Disaster Equipment Storage
- Emergency Shelter
- Main Lifeline Corridor

### Multi - Hazard* Flooding
at 10 inches of Sea Level Rise by 2055

- Minor Flooding
- Moderate Flooding
- Major Flooding
- Extreme Flooding (Multiple potential flood hazards)

### High Tide
at 10 inches of Sea Level Rise by 2055

- 0.33 - 0.82ft
- 0.83 - 1.64ft
- 1.65 - 2.46ft
- 2.47 - 3.28ft
- 3.29ft- and above

** 50-year return period events: swell waves, typhoon rainfall with storm surge, and non-typhoon rainfall.*
** SLR and high-tide based on Deltares' modelling of the extreme climate scenario, SSP5-8.5*

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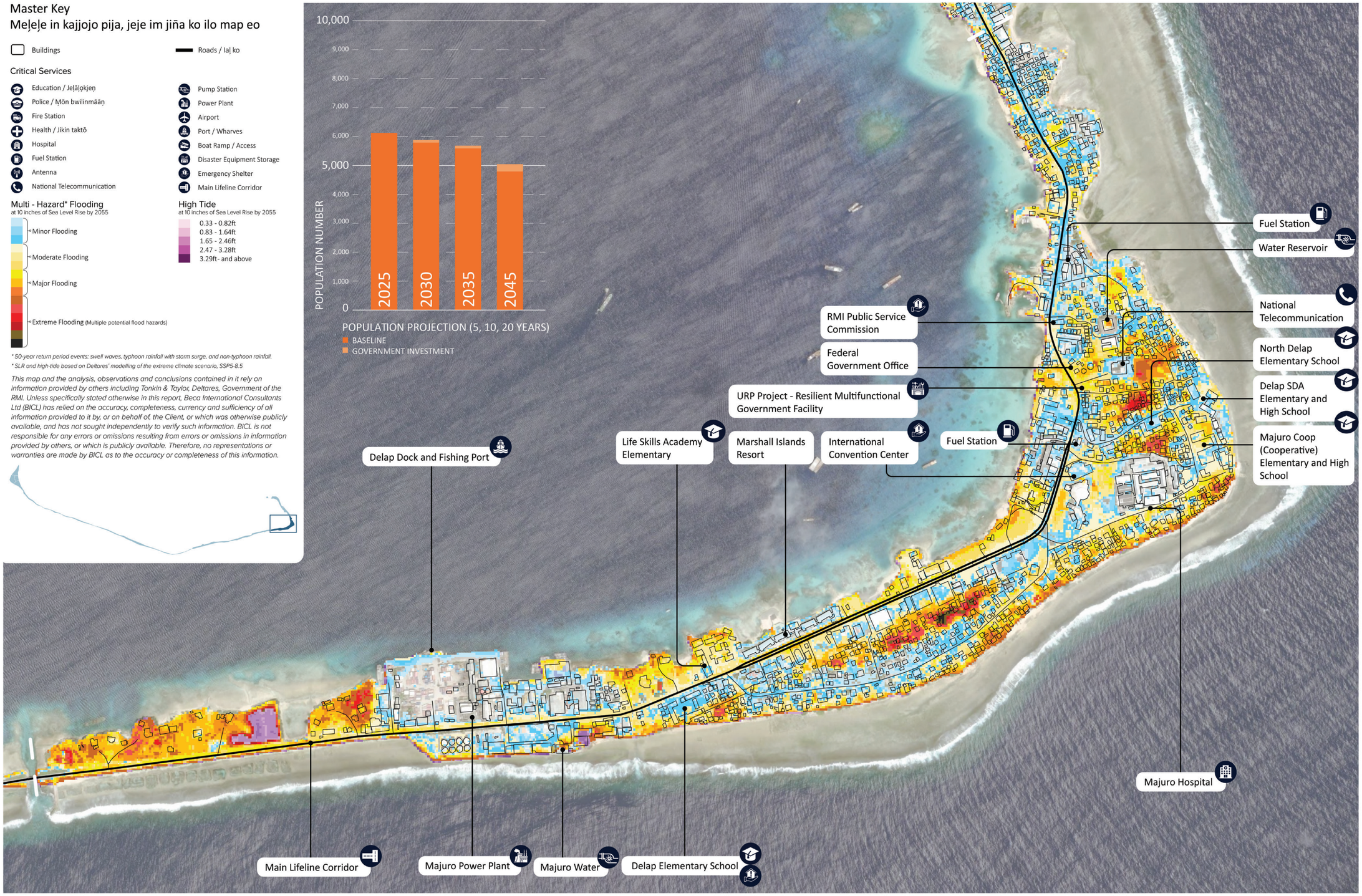


*Map 92* - Anticipated change

### 3.12.3 FUTURE LAND USE PLAN AND INFRASTRUCTURE NEEDS

As part of Majuro's downtown), Delap's future land use will reinforce its role as the administrative and commercial heart of the Marshall Islands. The plan encourages intensified mixed-use development along Delap's main arteries, bringing together government offices, businesses, and multi-family residences in a compact form. In the future, development is maximized on safer land along the lifeline road, critical facilities are flood-protected or elevated, and land use is coordinated (through measures like a new housing strategy and co-location of facilities, provision of sidewalks along road corridors) to support a walkable city core creating and a more resilient urban center.

## Opportunities

Opportunities raised in the July engagement session that formed the basis of discussion at the November stakeholder engagement:

- Promote commercial development either side of the Lifeline Corridor to support integrated transport and land use outcomes.
- Protect and increase vegetation cover to improve the future livability of Delap.
- Introduce multiuse green buffers to support residential intensification and to mitigate coastal flooding, breezeways and visual connection to the coastal edge.
- Reduce traffic congestion by improving sidewalks and walkable access to social services. Increasing capacity of side roads or new/improved side roads that could provide alternative access routes to the main road if damaged.
- Develop a housing strategy for DUD to improve residential capacity and living conditions in Delap where mixed use and residential intensification are proposed. A housing strategy/subdivision plan with a set of rules will guide intensification to support resilient and higher quality living outcomes that contribute to a quality physical and social environment.
- Protect the Lifeline Corridor including the bridge connecting Delap to the airport and western villages of the atoll.
- Consolidate industrial and employment development and buffer from future residential areas.

## Priorities and Projects

Looking to the future, the Delap community is focused on advancing projects that will strengthen resilience and improve quality of life. Following engagement sessions in July and November 2025 as part of the Master Plan engagement, community and landowners identified the following key priorities:

| Projects and Priorities (high priority in bold) | Master Plan Objectives: Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages |
|---|---|---|---|
| **Provide for better water supply and also water catchment from houses** | ✓ | ✓ | |
| **Provide a Community Center** | ✓ | ✓ | |
| **Seawall for both ocean and lagoon sides/complete seawall project** | ✓ | ✓ | |
| **Require immediate attention on solar streetlights** | | | ✓ |
| Consider greenhouses and ability for households or communities to grow food | ✓ | ✓ | |
| Reverse Osmosis facility for water supply | ✓ | ✓ | |
| Safe, filtered drinking water to be stationed at Educational Cultural Center (ECC). Could the ECC provide safe drinking water for gardeners and for households with many members | ✓ | ✓ | |
| Widen the main road to reduce congestion - increase the ability to pass stationary vehicles | | | ✓ |
| Remove coconut trees from and ban planting of coconut trees alongside the road and replace with street tree that will provide shade | | | ✓ |
| Land reclamation and/or increase land height in risk areas | ✓ | ✓ | |
| Provide more sidewalks so people can walk safely | | | ✓ |
| Assist households who need piggeries/more stringent policies and enforcement | ✓ | ✓ | |
| Underground well systems for flushing toilets | ✓ | ✓ | |
| Consider land reclamation and increase land height for Majuro | ✓ | ✓ | |
| Crossing zones for school kids especially in the back roads | | | ✓ |
| Roadside markers for those who have limited eyesight | | | ✓ |
| Support small business ownership | | ✓ | |
| Protect the water lens | ✓ | | |
| Delineate where the wetos (land parcels) are in maps | | ✓ | |

## Map explanation

Map 93 illustrates the recommended land use changes and actions that should be taken to address the impacts of anticipated changes over the next 20 years. It also shows the priority projects identified by the community and includes those that will support daily life, community resilience and disaster preparedness.




***Photo 97*** - Delap building supply warehouse



***Photo 98*** - The open canopy area that sells food and has public attractions



***Photo 99*** - Three level building in Delap

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N

## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeļāļọkjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / laļ ko
- New Road Connection
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Raise (land or buildings)
- Maximize development along the lifeline corridor
- Increase sustainable power access & security
- Support active, public and shared transport options
- Mixed-use along the lifeline corridor where population supports
- Co-locate compatible landuse activities
- New / improved multi-purpose facilities to support mobile social (for e.g.medical) and emergency services
- Develop a housing strategy
- Protect important cultural sites
- Develop coastal protection measures (including nature based solutions)
- Compact walkable communities
- Multi-purpose green spaces for future resilience
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security

### RMIGov / Donor Agency Capital Projects

1. Reclamation Project - Planned and unfunded
2. Eletutu Beach seawall Project - Funded
3. Resilient Multi-functional Government Facility - Funded (under construction 2025)
4. Delap Park - Planned
5. Delap Wharf expansion - Funded (Sept 2023) and ongoing
6. New Power Plant - Under construction
7. Majuro sewer outfall replacement - Funded (Sept 2023) and ongoing
8. New RMI capital building - Planned and unfunded
9. Nitijela - Under construction 2025
10. Majuro Hospital Redevelopment Project - Unfunded (Sept 2023) and planned
11. Emergency Operating Center - Funded/ongoing

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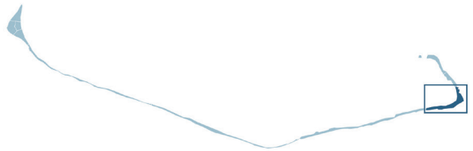


*Photo 100* - Aerial photo of Uliga looking towards Djarrit/Rita with the Majuro Track and Field Stadium in the middle of the photo

# ULIGA

## 3.13 ULIGA

### 3.13.1 CURRENT STATE/CURRENT LAND USE PLAN

Like many of Majuro's villages, Uliga is part of the DUD area and is defined by a narrow and linear settlement pattern extending north from Delap. Uliga features strong civic, education, and waterfront functions. Uliga was home to an estimated 1,948 people in 2025 and is around 112 acres in area (45 hectares). The College of the Marshall Islands, Majuro Track and Field Stadium, Alele Museum, Courthouse, and Uliga Pier are important destinations. The Lifeline Corridor runs centrally through Uliga connecting to the schools and residential land of Djarrit.

#### Environment

Uliga's flat topography, typically spans approximately 0.19 to 0.25 miles from ocean to lagoon side. Some parts of the ocean side are vulnerable to storm surges, making coastal resilience and vegetation cover important for mitigating environmental risks. There are some areas of higher ground along the northeastern coastline of Uliga.

#### Land use

Key land uses include the government offices, police and fire services, youth center, track and field stadium, and multiple schools. Commercial activities (retail and food businesses) line the Lifeline Corridor alongside community and worship facilities. Piers/docks and shoreline access points support maritime activity along the lagoon edge, with a small light industrial area. Residential areas sit behind the commercial strip and civic areas. Overall land use is also a mixed blend of residential, government/civic, commercial, education, and industrial activities.

#### Infrastructure

Uliga is a key commercial and residential area with a mix of recreational and government services. It is connected to the Lifeline Corridor, providing paved road access and proximity to the domestic wharf at Uliga Dock, which supports inter-island transport and fishing activities. The village is linked to the Majuro power grid, has access to reticulated water and sewerage services, and benefits from solid waste collection and telecommunications coverage, though some systems rely on aging infrastructure and have varying levels of reliability and service.

#### Urban aspects

Uliga's urban form is defined by its narrower landform in comparison to Delap. Its land uses are a continuation of Delap featuring higher levels of retail and employment based development as well as school and recreation. Beyond the Lifeline Corridor, Uliga's street network is narrow but well structured providing secondary access and connectivity to the Lifeline Corridor.

Some higher density apartments are present above shops along the Lifeline corridor. Housing is otherwise generally single level standalone housing. The relatively higher density of development in Uliga results in a lack of vegetation and open space.

#### Map explanation

Map 94 illustrates the building uses and names of key buildings. Each building activity has a different color. A dashed line is shown around groups of 'like' building uses – these are the land uses.



***Photo 101*** - Aerial view of Uliga Port which serves international ships. Photo credit: Lee Arkhie Perez



***Photo 102*** - The Alele Courthouse



***Photo 103*** - Robert Riemers and carpark in the center of Uliga with access to Shoreline dock

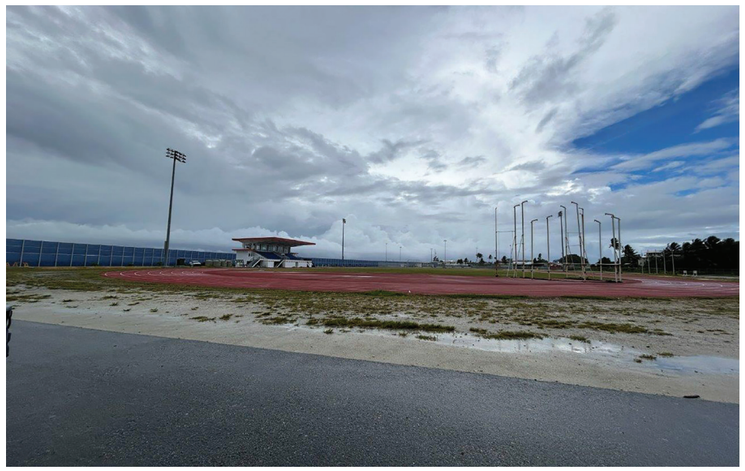


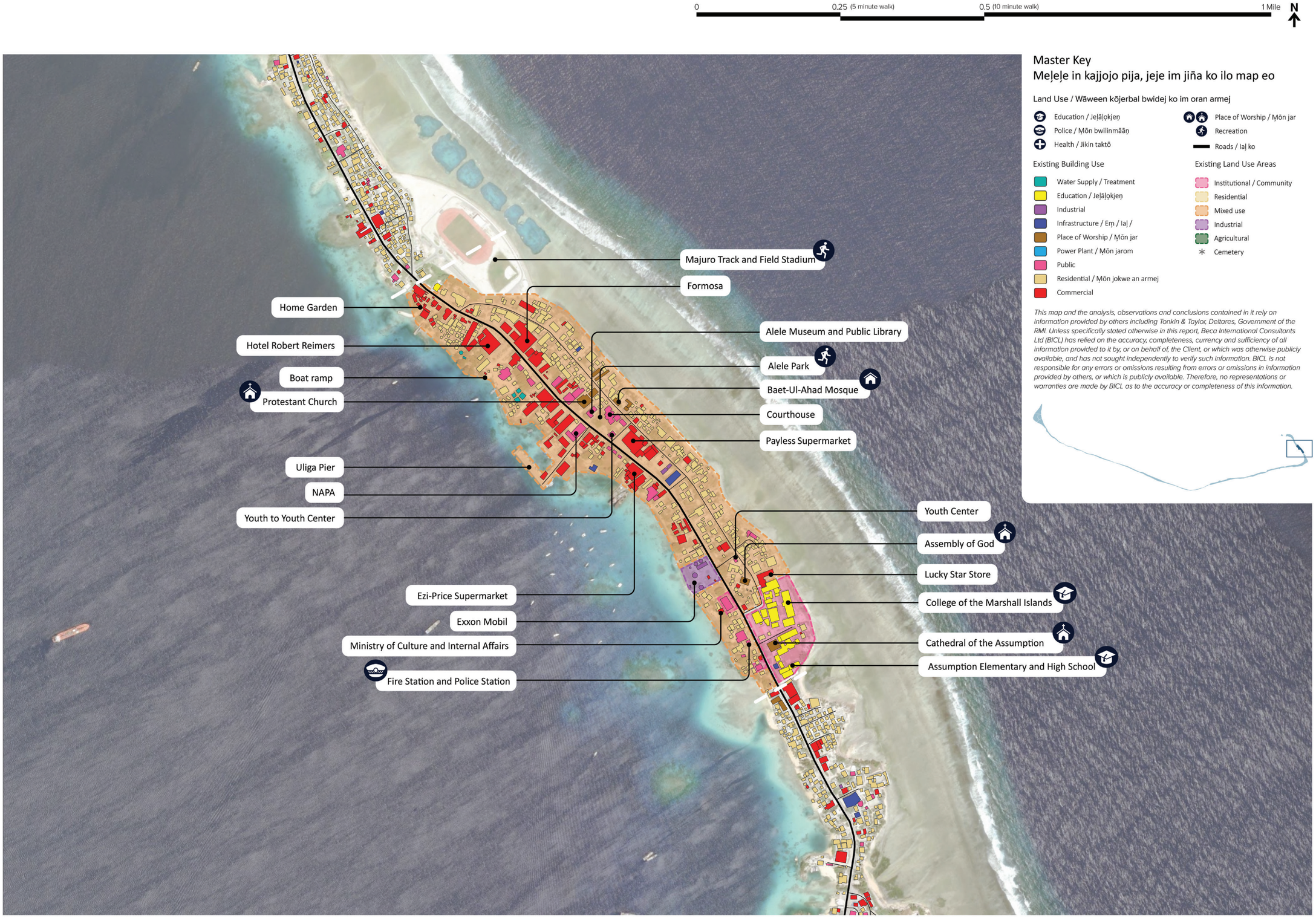
***Photo 104*** - The Majuro Track and Field stadium completed for the Micronesian Games




***Photo 105*** - NAPA building in Uliga - the tallest building in Majuro



***Photo 106*** - Uliga United Church of Christ




*Map 94* - Current state

## 3.13.2 ANTICIPATED CHANGE

### Projected Population

Uliga's estimated population in 2025 was 1,948. Projections show a gradual decline, with forecasts of 1,892 to 1,910 by 2030, 1,842 to 1,871 by 2035, and 1,716 to1,769 by 2045. This trend highlights the importance of planning for future infrastructure and services to support a sustainable community size.

### Climate Hazards

Flood modelling completed by Deltares shows 0.82 feet (0.25 meters) of sea-level rise and increased intensity of rainfall events, which are anticipated to occur by 2055 under a rapid climate change scenario. Flood models indicate that the village will experience higher incidence of flooding than today, resulting from daily higher sea-levels and high tide events, and periodic rainfall from storm events such as typhoons or other heavy rains, and/or wave-drive overwash from storm surges or swell waves.

Flooding is most likely to be most problematic in the following areas of the village by 2055 if no interventions or additional coastal protection measures are implemented*:

- Uliga is expected to experience moderate to major flooding along its lagoon coastline.
- The ocean coastline is anticipated to see minor flooding, much less severe flooding than the lagoon coastline.
- Inland flooding is likely to be mostly minor, with some pockets of moderate flooding.

*Flood severity was determined by evaluating the modelled potential flood depths, with flooding increasing in severity from minor ➔ moderate ➔ major ➔ extreme.

### Map explanation

Map 95 illustrates what could change at a village-level over the next 20 years because of a decrease in population and impacts from climate change. Note that there are other climate impacts – heat, drought, flooding from tsunamis that are not illustrated on the map.

The population bar chart shows two ways the population could change - the lower line shows the population projection of this village over the next 5, 10 and 20 years and the line above shows the population with potential interventions signaled by the RMI government.

The map shows 0.82 feet (0.25m) of sea-level rise, daily high tide, and flooding from rainstorms, typhoons, and swell wave events.

Critical services and infrastructure are shown as icons on the map. These support daily life, community resilience and disaster preparedness now and in the future and are to be retained and potentially moved if they are located in vulnerable areas.

Map 95 has different colors to show the possible extent of flooding from typhoons, rainstorms, and swell waves in 2055 with 0.82 feet of sea-level rise (SLR):

- No color - these areas show where there is minimal flood risk.
- Blue shows where there would be minor flooding (less risk of flooding, lower levels of flooding expected).
- Light yellow shows where there would be moderate flooding (higher risk of flooding, possible deep flood waters).
- Bright yellow and orange show where there would be major flooding (even higher risk of flooding, area susceptible to multiple flood hazards, possible deep flood waters).
- Red, brown, black show where there would be extreme flooding (worst flooding for Majuro, area susceptible to multiple flood hazards, possible very deep flood waters).

The high tide map has different colors to show possible water depths from daily high tide in 2055 with 0.82 feet of SLR.

- Light purple shows where there will likely be 0.33-1.64 feet of water every day at high tide.
- Purple shows where there will likely be more than 1.65 feet of water every day at high tide.

NOTE – these flood maps are modelled based on current day environment and coastal edge (not allowing for more seawalls or other changes to the ocean and coastal edge).



***Photo 107*** - Large shade tree in Uliga



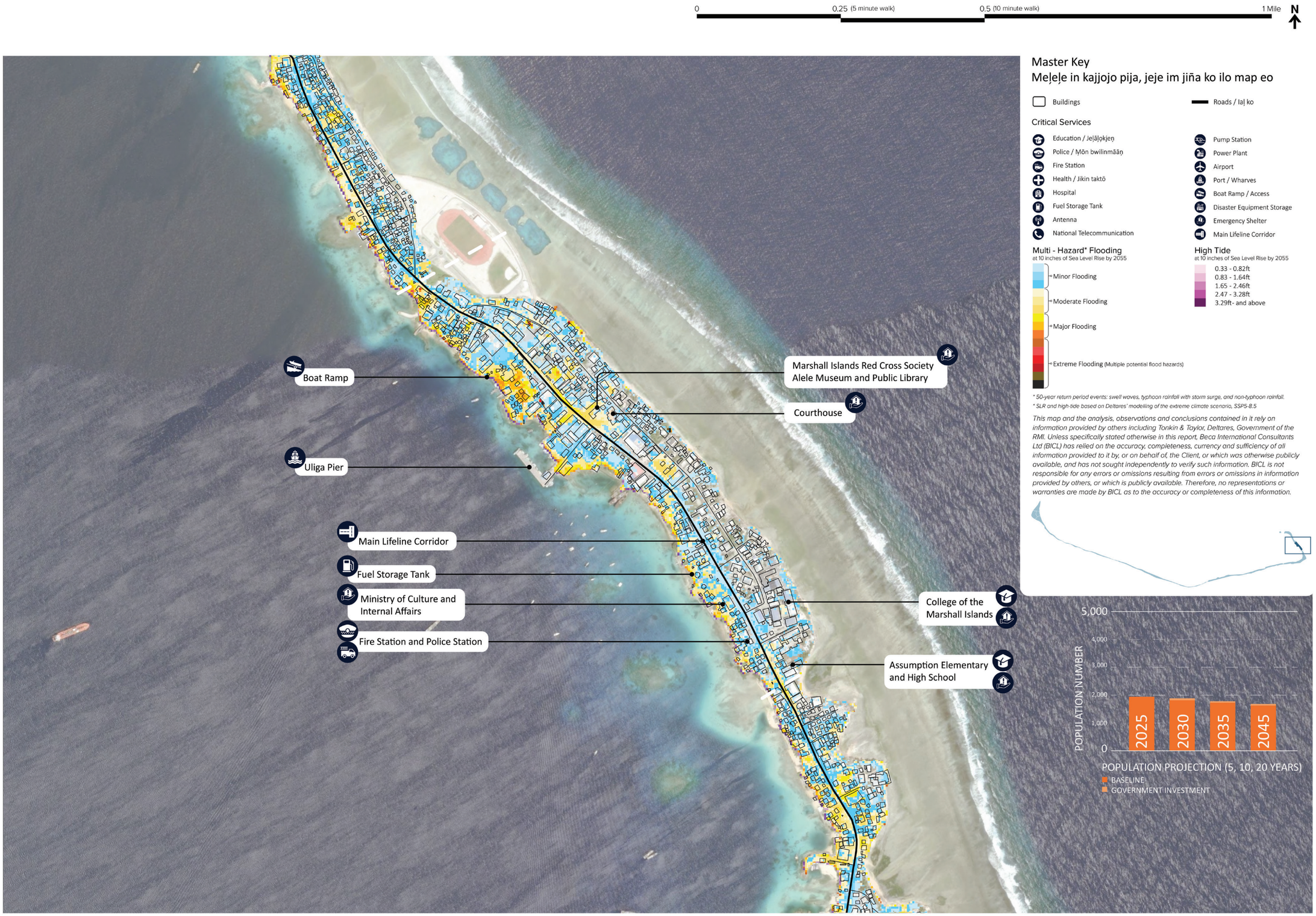
***Photo 108*** - The Shoreline Dock in Uliga where boats depart for the outer Majuro islands



***Photo 109*** - The shelter over the CMI basketball court providing protection from sun and rain plus roof area that can accommodate solar panels




***Photo 110*** - Previously occupied Bowling Hall - there are a number of unoccupied buildings in different conditions




***Map 95*** - Anticipated change

### 3.13.3 FUTURE LAND USE PLAN AND INFRASTRUCTURE NEEDS

In Uliga, which forms the central part of the DUD urban core, future land use will emphasize a balanced urban mix and strengthened resilience. Uliga is set to sustain its blend of institutional, commercial, and residential uses, with encouragement for mixed-use infill around existing civic assets. Like Delap, Uliga will adopt compact, walkable community principles and cluster development along the primary road.

## Opportunities

Opportunities raised in the July engagement session that formed the basis of discussion at the November stakeholder engagement:

- Develop a housing strategy for DUD to improve residential capacity and living conditions where residential intensification is appropriate.
- Create additional multi-function open spaces that add to livability and amenity and support flood management, and drainage.
- Enhance access to employment and education through the consolidation of residential development within walkable catchments along the Lifeline Corridor.
- Increasing capacity of side roads and sidewalks (or possible locations for new) to reduce traffic congestion or alternative access routes in emergencies.
- Maintain Uliga Pier to provide boat access to employment, services and critical infrastructure for the Islets of Majuro.
- Improve/increase community infrastructure (health clinic)
- Develop a reverse osmosis water plant for freshwater security
- Improve solid waste infrastructure
- Consolidate industrial development and buffer from future residential areas. Relocate high risk and undesirable land uses (fuel storage) and jail away from residential areas.
- Protect cemeteries from climate change. Increase cemetery space or other ways for burials.

## Priorities and Projects

Looking to the future, the Uliga community is focused on advancing projects that will strengthen resilience and improve quality of life. Following engagement sessions in July and November 2025 as part of the Master Plan engagement, community and landowners identified the following key priorities:

| Projects and Priorities (high priority in bold) | Master Plan Objectives: Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages |
|---|---|---|---|
| **Seawall development both ocean and lagoon areas which are highly vulnerable to coastal inundation and erosion.** | ✓ | ✓ | |
| **Improve road infrastructures which includes drainage systems, sidewalks, and small residential roads.** | | | ✓ |
| **Build water sanitation facilities for accessible free clean drinking water.** | ✓ | ✓ | |
| **Need housing complexes for vulnerable homes along coastal areas** | | ✓ | |
| Need to improve pig pen waste management | ✓ | ✓ | |
| Maintain existing and provide more solar streetlights | | ✓ | |
| Improved water access with RO Unit (Uliga Track and Field Facility) | ✓ | ✓ | |
| Public Elementary School for Uliga | | ✓ | |
| Maintain current bus stops | | ✓ | |
| Health Clinic (Uliga Track and Field Facility) | | ✓ | |
| Assistance for residential homes to be more resilient | | ✓ | |

## Map explanation

Map 96 illustrates the recommended land use changes and actions that should be taken to address the impacts of anticipated changes over the next 20 years. It also shows the priority projects identified by the community and includes those that will support daily life, community resilience and disaster preparedness.



***Photo 111*** - Central business area in Uliga

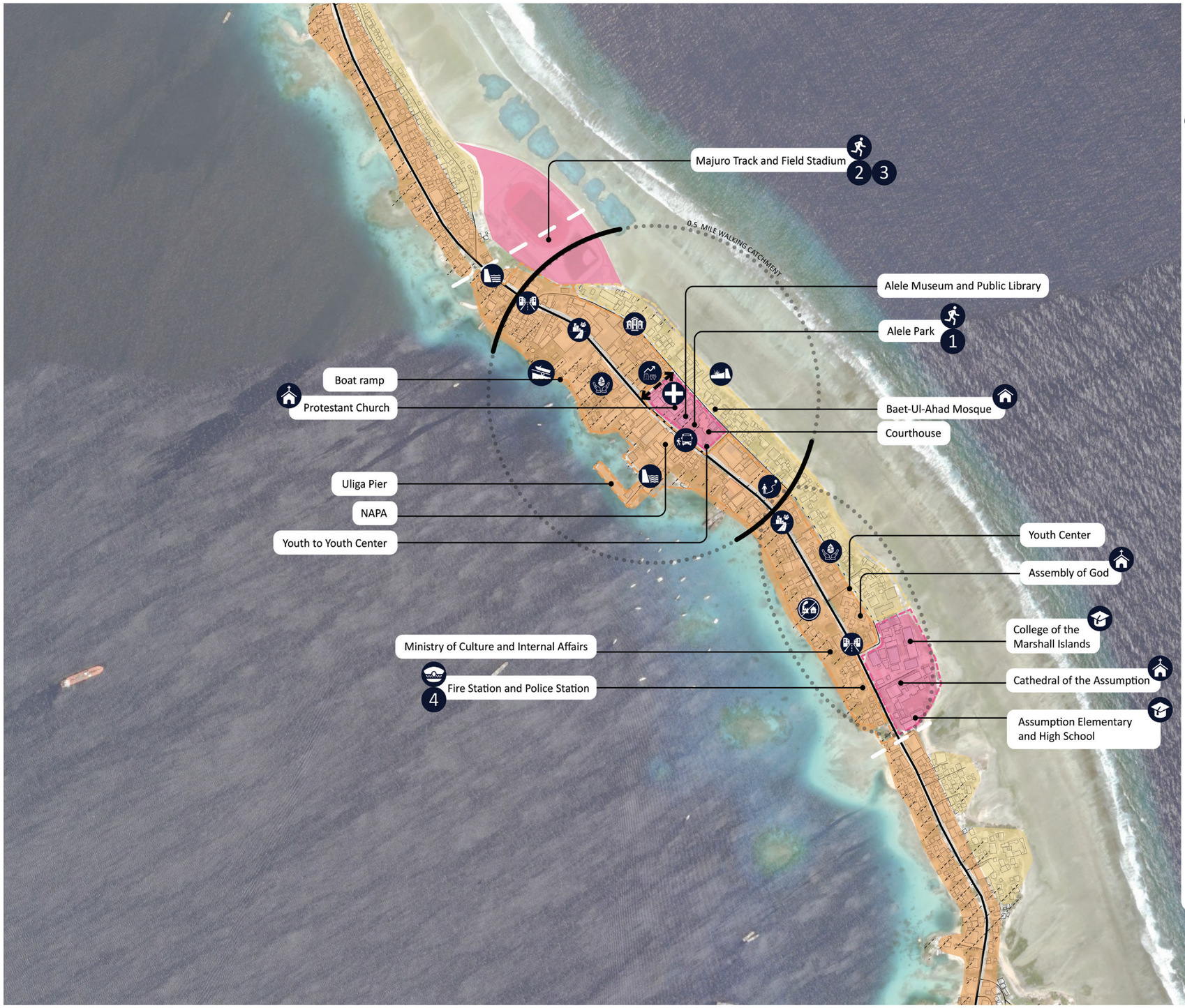


***Photo 112*** - Alele Park area



***Photo 113*** - Eletutu Beach which has a seawall being constructed and will enable access to the water

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N




## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷokjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / laḷ ko
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Recreational
- Cemetery

### RMIGov / Donor Agency Capital Projects

1. Alele Park - Planned
2. Majuro Track and Field - Funded (Sept 2023) and completed
3. Track and Field carpark and shelter with solar panels- Funded
4. New Majuro MIPD Building and Jail Repair - Partially funded and planned

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Develop coastal protection measures (including nature based solutions)
- Maximize development along the lifeline corridor
- Support active, public and shared transport options
- Mixed-use along the lifeline corridor where population supports
- Co-locate compatible landuse activities
- New / improved multi-purpose facilities to support mobile social (for e.g.medical) and emergency services
- Develop a housing strategy
- Improve boat access and connectivity (ramp, dock etc.)
- Improve roads and access to critical infrastructure
- Compact walkable communities
- Multi-purpose green spaces for future resilience
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security

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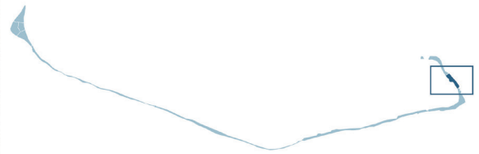


***Map 96*** - Future state

*Photo 114* - Aerial photo of Djarrit/Rita looking towards Uliga.
Photo credit: Urban Resilience Project

# DJARRIT/ RITA

# 3.14 DJARRIT/RITA

## 3.14.1 CURRENT STATE/CURRENT LAND USE PLAN

Djarrit is commonly known as Rita (referenced as Djarrit/Rita in the Master Plan) is located on the eastern end of Majuro Atoll and once was separated from the Delap and Uliga islets.

Primarily a residential area with education facilities to the south Djarrit/Rita has a main road on the lagoon side and a parallel road on the ocean side.. The village area contains a number of churches and schools with some warehouse type buildings on the lagoon side.

### Environment

Djarrit/Rita features a flat topography, with the atoll spanning approximately 300 to 400 meters from ocean to lagoon side. There are areas shaded by a number of significantly scaled trees, which provide environmental benefits along roads and in yard spaces next to these houses. Where the housing is dense there is little tree cover. Some parts of the ocean side are vulnerable to storm surges, as seen with a number of abandoned buildings in this area. This highlights making coastal resilience and vegetation cover important for mitigating environmental risks.

### Land use

Land use in Djarrit/Rita is predominantly residential, with schools, commercial shops, and worship facilities interspersed throughout. Near the center of the village is the Marshall Islands High School, which occupies a large portion of land and serves as a key community asset. To the south on the main road is a basketball court used by the community and Chihaya Park which has playground area for younger children and is located on the lagoon edge.  Retail spaces are typically located in front of or alongside housing on the main roads, while warehouse-type buildings are found on the lagoon side.

### Infrastructure

Djarrit/Rita is a populated area with access to essential infrastructure. It is connected to the Lifeline Corridor, providing paved road access and links to critical infrastructure. Djarrit/Rita has access to the Majuro power grid, reticulated water and sewage, solid waste collection, and telecommunications coverage. Like other parts of Majuro, infrastructure faces resilience and reliability challenges due to infrastructure deterioration from limited maintenance and climate exposure.

### Urban aspects

Djarrit/Rita's urban layout has a loop road with local shops. Most services are in Uliga and Delap so require transport to get to these villages. There are few crossroads to provide connection across this section of the atoll and the area within the loop road. This lack of formalized access means a number of houses are accessed by a narrow informal accessways. Housing is generally single-level, stand-alone dwellings with space around each for a yard for some houses while others have little outdoor space between dwellings. There is a higher proportion of unsealed accessways and sidewalks in Djarrit/Rita compared to other urban areas. While this  helps reduce flooding and allows water to be absorbed into the ground, in the area around the Majuro Independent Baptist Church School there is consistent ponding on the road because it is low level and there is a lack of drainage

### Map explanation

Map 97 illustrates the building uses and names of key buildings. Each building activity has a different color. A dashed line is shown around groups of 'like' building uses – these are the land uses.



***Photo 115*** - Aerial view of Djarrit/Rita looking from towards Uliga.  Photo credit: Lee Arkhie Perez



***Photo 116*** - Rita Elementary School in the middle of Djarrit/Rita



***Photo 117*** - Aerial view of Djarrit/Rita looking north with the Marshall Island High School in the foreground. Photo credit: Lee Arkhie Perez



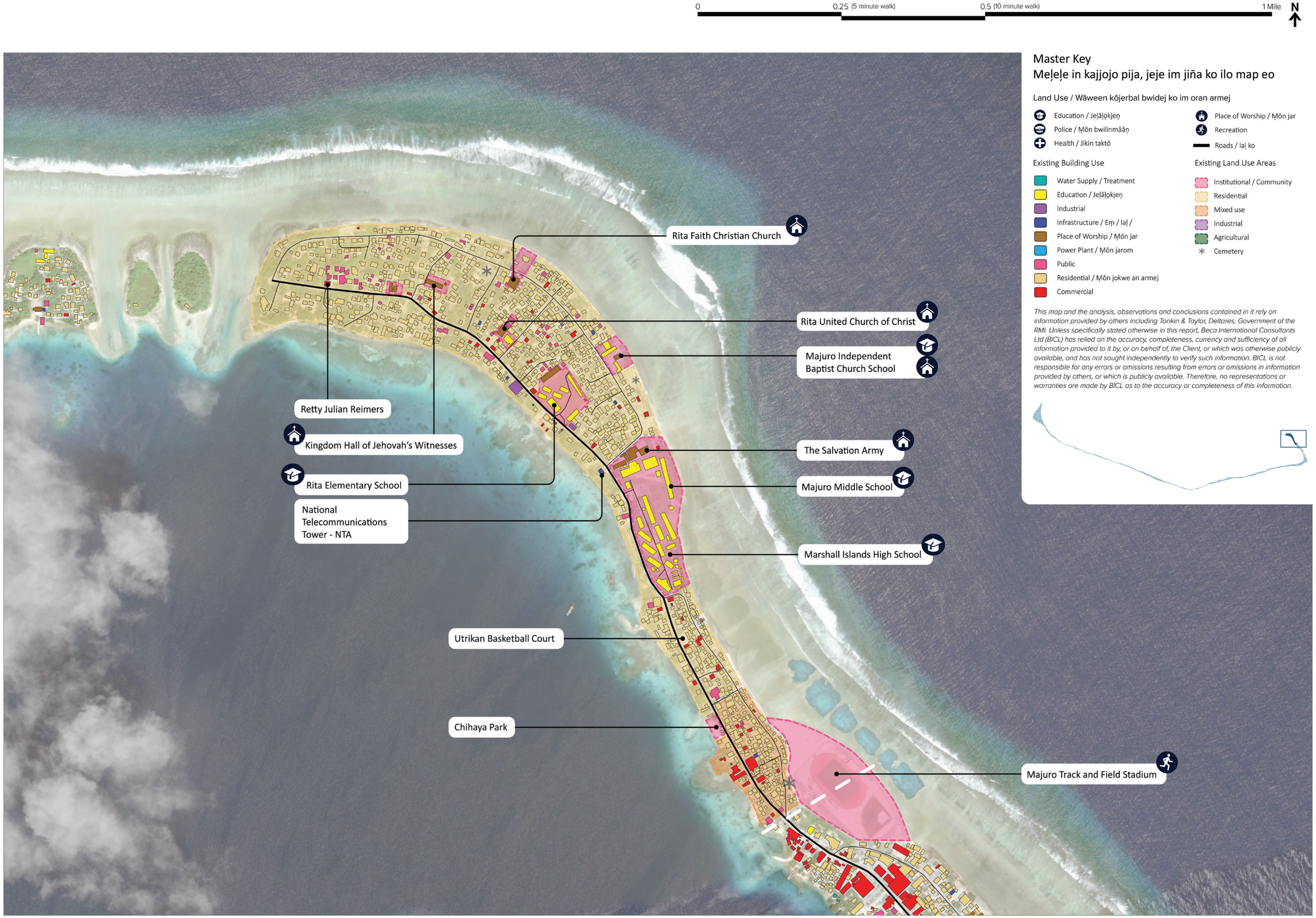
***Photo 118*** - Chihaya Park on the lagoons side provides a playground for young children and a meeting place for groups



***Photo 119*** - Marshall Islands High School. Public schools are also emergency shelter locations



***Photo 120*** - Areas around houses and roads used by groups




*Map 97* - Current state

## 3.14.2 ANTICIPATED CHANGE

### Projected Population

In 2025, Djarrit Rita's estimated population was 5,359. Projections show a gradual decline, with forecasts of 4,879 to 4,924 by 2030, 4,378 to 4,446 by 2035, and 3,156 to 3,523 by 2045. This trend reflects broader demographic shifts in the region and highlights the importance of planning for a sustainable community size in the future.

### Climate Hazards

Flood modelling completed by Deltares shows 0.82 feet (0.25 meters) of sea-level rise and increased intensity of rainfall events, which are anticipated to occur by 2055 under a rapid climate change scenario. Flood models indicate that the village will experience higher incidence of flooding than today, resulting from daily higher sea-levels and high tide events, and periodic rainfall from storm events such as typhoons or other heavy rains, and/or wave-drive overwash from storm surges or swell waves.

Flooding is most likely to be most problematic in the following areas of the village by 2055 if no interventions or additional coastal protection measures are implemented*:

- Rita/Djarrit is expected to experience moderate to extreme flooding along the entire length of the lagoon coastline, with the more severe flooding anticipated for the northern tip of Djarrit/Rita.
- The length of the lagoon coastline is likely to experience minor flooding.
- Inland areas of the village are expected to have patchy moderate to extreme flooding, increasing in severity in the northern area of the village.
- There are very few segments of Rita that are not exposed to at least minor flooding.

*Flood severity was determined by evaluating the modelled potential flood depths, with flooding increasing in severity from minor ➔ moderate ➔ major ➔ extreme.

### Map explanation

Map 98 illustrates what could change at a village-level over the next 20 years because of a decrease in population and impacts from climate change. Note that there are other climate impacts – heat, drought, flooding from tsunamis that are not illustrated on the map.

The population bar chart shows two ways the population could change - the lower line shows the population projection of this village over the next 5, 10 and 20 years and the line above shows the population with potential interventions signaled by the RMI government.

The map shows 0.82 feet (0.25m) of sea-level rise, daily high tide, and flooding from rainstorms, typhoons, and swell wave events.

Critical services and infrastructure are shown as icons on the map. These support daily life, community resilience and disaster preparedness now and in the future and are to be retained and potentially moved if they are located in vulnerable areas.

Map 98 has different colors to show the possible extent of flooding from typhoons, rainstorms, and swell waves in 2055 with 0.82 feet of sea-level rise (SLR):

- No color - these areas show where there is minimal flood risk.
- Blue shows where there would be minor flooding (less risk of flooding, lower levels of flooding expected).
- Light yellow shows where there would be moderate flooding (higher risk of flooding, possible deep flood waters).
- Bright yellow and orange show where there would be major flooding (even higher risk of flooding, area susceptible to multiple flood hazards, possible deep flood waters).
- Red, brown, black show where there would be extreme flooding (worst flooding for Majuro, area susceptible to multiple flood hazards, possible very deep flood waters).

The high tide map has different colors to show possible water depths from daily high tide in 2055 with 0.82 feet of SLR.

- Light purple shows where there will likely be 0.33-1.64 feet of water every day at high tide.
- Purple shows where there will likely be more than 1.65 feet of water every day at high tide.

NOTE – these flood maps are modelled based on current day environment and coastal edge (not allowing for more seawalls or other changes to the ocean and coastal edge).



***Photo 121*** - Pump stations for services are located near the antenna




***Photo 122*** - Gas station on the northern ocean edge



***Photo 123*** - National Telecommunications Tower

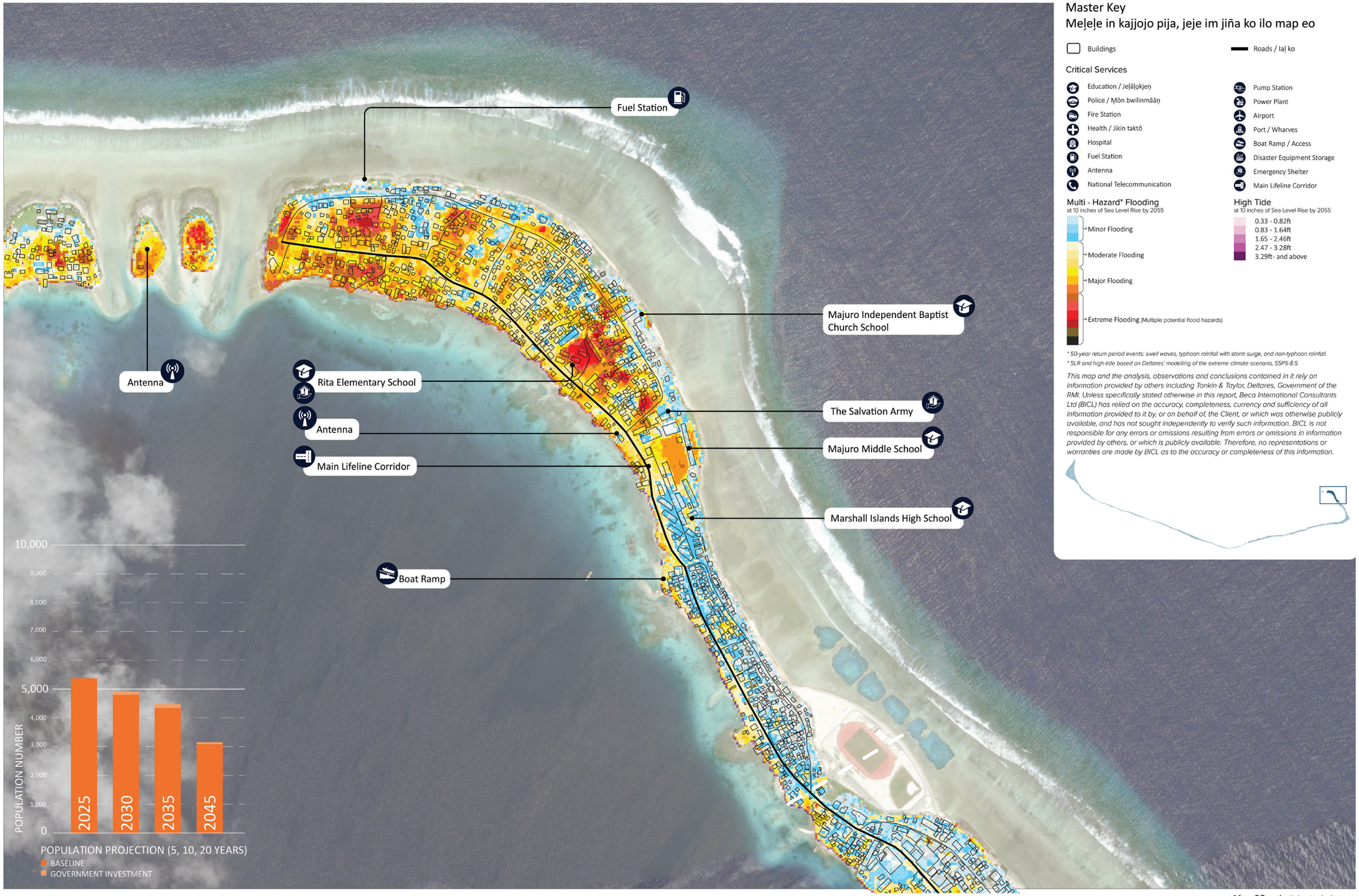


***Photo 124*** - Shops along Lagoon Road provide good in a walkable distance for the community



***Photo 125*** - Some roads have no stormwater drainage which in some areas is an issue leading to ponding of water

0 — 0.25 (5 minute walk) — 0.5 (10 minute walk) — 1 Mile — N




## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

- Buildings
- Roads / laļ ko

### Critical Services

- Education / Jeļāļọkjeṇ
- Police / Ṃōn bwilinmāāṇ
- Fire Station
- Health / Jikin taktō
- Hospital
- Fuel Station
- Antenna
- National Telecommunication
- Pump Station
- Power Plant
- Airport
- Port / Wharves
- Boat Ramp / Access
- Disaster Equipment Storage
- Emergency Shelter
- Main Lifeline Corridor

### Multi - Hazard* Flooding
at 10 inches of Sea Level Rise by 2055

- Minor Flooding
- Moderate Flooding
- Major Flooding
- Extreme Flooding (Multiple potential flood hazards)

### High Tide
at 10 inches of Sea Level Rise by 2055

- 0.33 - 0.82ft
- 0.83 - 1.64ft
- 1.65 - 2.46ft
- 2.47 - 3.28ft
- 3.29ft- and above

** 50-year return period events: swell waves, typhoon rainfall with storm surge, and non-typhoon rainfall.*

** SLR and high-tide based on Deltares' modelling of the extreme climate scenario, SSP5-8.5*

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***Map 98*** - Anticipated change

### 3.14.3 FUTURE LAND USE PLAN AND INFRASTRUCTURE NEEDS

Future land use in Djarrit/Rita aims to reduce residential density in the highest-risk strips while creating a more sustainable, livable urban environment on the remaining land with improved access. Land use remains predominantly residential but with key changes: denser housing is planned in select areas encouraging multi-level residences and clustering more homes around the high school to form a compact, walkable community hub. The main road corridor (Lagoon Road) continues as a mixed-use spine, with small shops fronting houses to serve local needs and sustain Djarrit/Rita's vibrant neighborhood center.

## Opportunities

Opportunities raised in the July engagement session that formed the basis of discussion at the November stakeholder engagement:

- Develop a housing strategy for DUD to improve residential capacity and living conditions with access to existing employment and education where residential intensification is appropriate.
- Create additional multi-function open spaces that add to livability and amenity and support flood management, and drainage.
- Enhance access to Djarrit/Rita's education precinct through consolidation of residential development within walkable catchments.
- Improving side roads (or possible locations for new) to reduce traffic congestion or alternative access routes in emergencies.
- Support public and shared mobility (car share, ride share) and safe active travel along the Lifeline Corridor to reduce traffic congestion.
- Protect vegetated areas for climate resilience (drainage and storm buffers, shade etc.). Identify areas for food growing.
- New community center required.

## Priorities and Projects

Looking to the future, the Djarrit/Rita community is focused on advancing projects that will strengthen resilience and improve quality of life. Following engagement sessions in July and November 2025 as part of the Master Plan engagement, community and landowners identified the following key priorities:

| Projects and Priorities (high priority in bold) | Master Plan Objectives: Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages |
|---|---|---|---|
| **More softball fields for men/women/children** | ✓ | ✓ | |
| **Elevate all houses in Rita to be higher than the main road. Elevate the community members' houses** | ✓ | ✓ | |
| **Need one community hospital (medical clinic) in Djarrit/Rita** | ✓ | ✓ | |
| **Improve the road surface and eliminate mud ponds** | | | ✓ |
| **Improve water catchments and storage tanks in each of our communities** | ✓ | ✓ | |
| **Plan for productive use of idle assets** | | ✓ | |
| **Provide ways to deal with and reduce the salt spray, especially at high tide and wind** | | ✓ | |
| **Need to raise land for half of Djarrit/Rit** | ✓ | ✓ | |
| **Connect all the existing seawalls in Djarrit/Rita** | ✓ | ✓ | |
| Ability to farm fish or aquaponics for residents | ✓ | ✓ | |
| Have more land that can be cultivated | ✓ | ✓ | |
| Need more restrooms in housing and public sanitation | ✓ | ✓ | |
| Develop a house strategy outlining how to provide for increased number of new residents migrating to the central area of Majuro | ✓ | ✓ | |
| Improve the sidewalks and road drainage | | | ✓ |
| Rita Elementary School to provide more outdoor space for student activities. Need more playground areas for little kids | ✓ | ✓ | |
| Provide more public boat ramps and also access from lagoon to land. | | ✓ | ✓ |
| Provide a new elementary school | | ✓ | |
| Maintain the current bus stops | | | ✓ |
| Landscaping should be taken into consideration as new houses are being built | ✓ | ✓ | |

## Map explanation

Map 99 illustrates the recommended land use changes and actions that should be taken to address the impacts of anticipated changes over the next 20 years. It also shows the priority projects identified by the community and includes those that will support daily life, community resilience and disaster preparedness.



***Photo 126*** - Trees provide heat cover

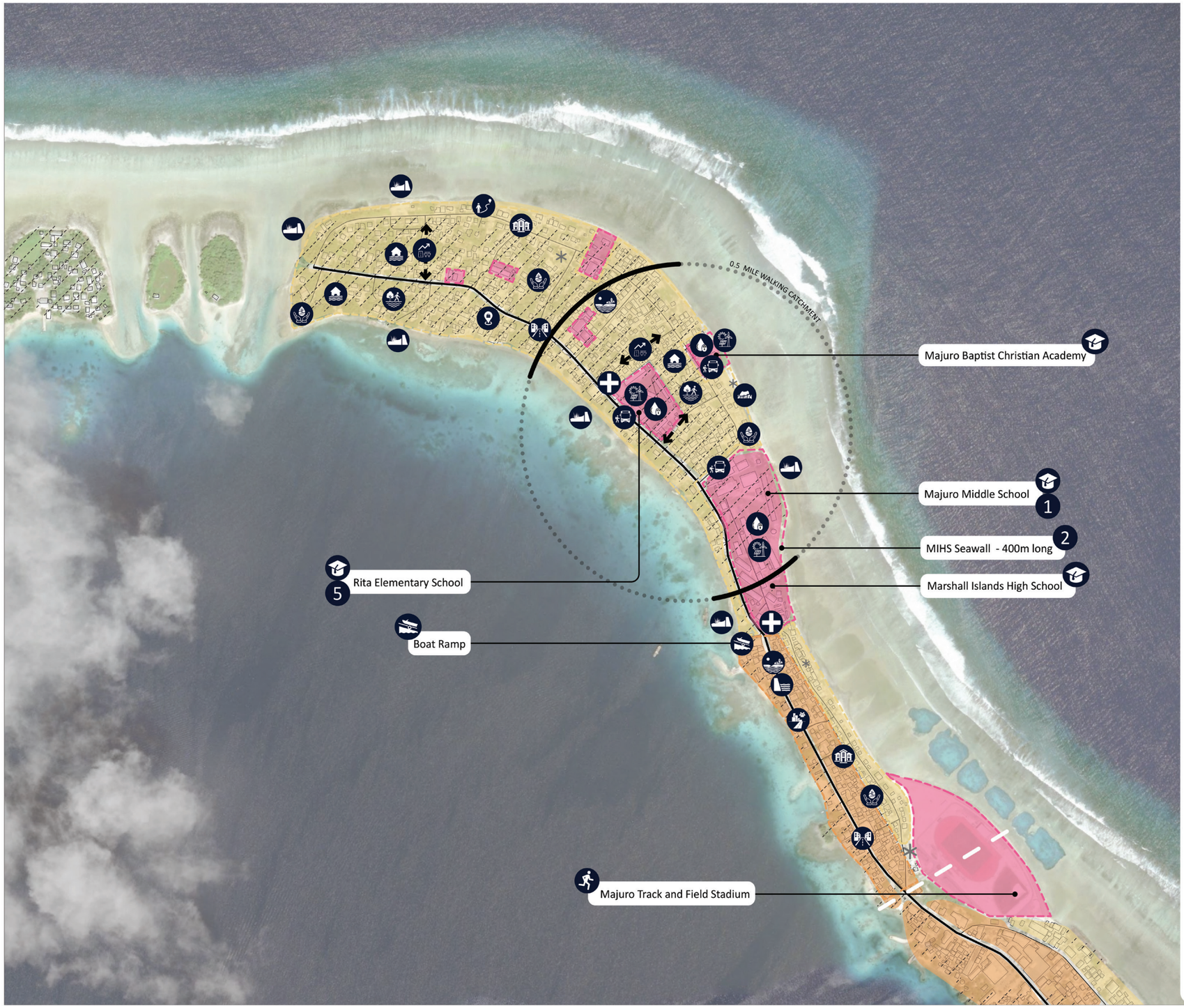


***Photo 127*** - Shops along Lagoon Road show the mixed use nature of Lagoon Road



***Photo 128*** - Opportunities for better walking facilities and review of solar lighting

0 0.25 (5 minute walk) 0.5 (10 minute walk) 1 Mile N




## Master Key
## Meḷeḷe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeḷāḷọkjeṇ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / laḷ ko
- New Road Connection
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

### RMIGov / Donor Agency Capital Projects

1. MIHS student center - Funded (Sept 2023)/and planned
2. MIHS Seawall - 400m long - Funded
3. Rita Water Supply Upgrade - Ongoing
4. Rita Health Center - Unfunded (Sept 2023) and planned
5. Rita Elementary School - 4 classrooms - Funded (Sept 2023) and planned

### Resilient Village Strategies

- Protect Critical Infrastructure (Lifeline Corridor, airport, hospital etc)
- Raise (land or buildings)
- Develop coastal protection measures (including nature based solutions)
- Maximise resilient land for development
- Maximize development along the lifeline corridor
- Increase sustainable power access & security
- Improve boat access and connectivity (ramp, dock etc.)
- Improve roads and access to critical infrastructure
- Support active, public and shared transport options
- Mixed-use along the lifeline corridor where population supports
- New / improved multi-purpose facilities to support mobile social (for e.g.medical) and emergency services
- Develop a housing strategy
- Protect important cultural sites
- Compact walkable communities
- Multi-purpose green spaces for future resilience
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security

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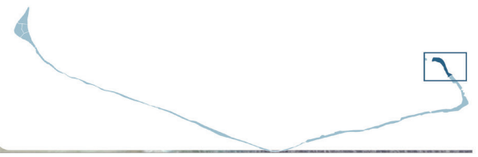


***Map 99*** - Future state



*Photo 129* - Aerial view of Ejit. Photo credit: Lee Arkhie Perez

# EJIT

# 3.15 EJIT

## 3.15.1 CURRENT STATE/CURRENT LAND USE PLAN

Ejit was home to an estimated 222 people in 2025 and is around 15 acres in area (6 hectares). It is a 15 minute boat trip from the wharf on the lagoon side to Uliga or can be accessed by foot at low tide from Rita. The residents of Ejit are dependent on the connection to the services in Uliga and Delap including the hospital, fuel, food and water supplies.  Ejit is managed by the Kili-Bikini -Ejit Government with the local government building located in Uliga.

### Environment

Ejit is generally flat, with a low area running through the center from the boat ramp to the ocean side and features significant vegetation cover throughout the village. Notably, plants for gardening are grown in raised areas due to limited soil, and approximately one-third of the coastline on the eastern side where the cemetery is located is protected by a concrete seawall.

### Land use

Ejit's infrastructure features a concrete seawall that protects about one-third of the coastline. A concrete foundation and reinforcing is in place for the completion of this seawall along the northern coastal edge to address erosion and king tide risks. Power is supplied by cable from Rita, and new solar-powered lights have been installed throughout Ejit. Water is sourced from a 12ft-deep bore and rainwater tanks, while residents often travel to Rita to refill drinking water. Wastewater is managed by septic tanks, and solid waste is retained on island and disposed of behind the seawall as backfill, with future plans to level the surface once it is full.

### Infrastructure

Ejit's infrastructure features a concrete seawall that protects about one-third of the coastline. A concrete foundation and reinforcing is in place for the completion of this seawall along the northern coastal edge to address erosion and king tide risks. Power is supplied by cable from Rita, and new solar-powered lights have been installed throughout Ejit. Water is sourced from a 12ft-deep bore and rainwater tanks, while residents often travel to Rita to refill drinking water. Wastewater is managed by septic tanks, and solid waste is retained on island and disposed of behind the seawall as backfill, with future plans to level the surface once it is full.

### Urban aspects

Ejit has a small proportion of hard surfaces, with no formal roads and mostly permeable footpaths, which helps reduce flooding and allows water to be absorbed into the ground. Housing is generally single-level, stand-alone dwellings with space around each for a yard. All amenities in Ejit are accessible within a 10-minute walking radius, making the village highly walkable and compact.

### Map explanation

Map 100 illustrates the building uses and names of key buildings. Each building activity has a different color. A dashed line is shown around groups of 'like' building uses – these are the land uses.



***Photo 130*** - Accessible by boat the wharf on the lagoon side is a vital connection that should be safeguarded. Photo credit: Lee Arkhie Perez



***Photo 131*** - The baseball field next to the school provides a recreation space and also an area that is undeveloped as it currently has water wash across when there are king tides



***Photo 132*** - The basketball court provides a space for the community - there is discussion about this becoming a covered community space



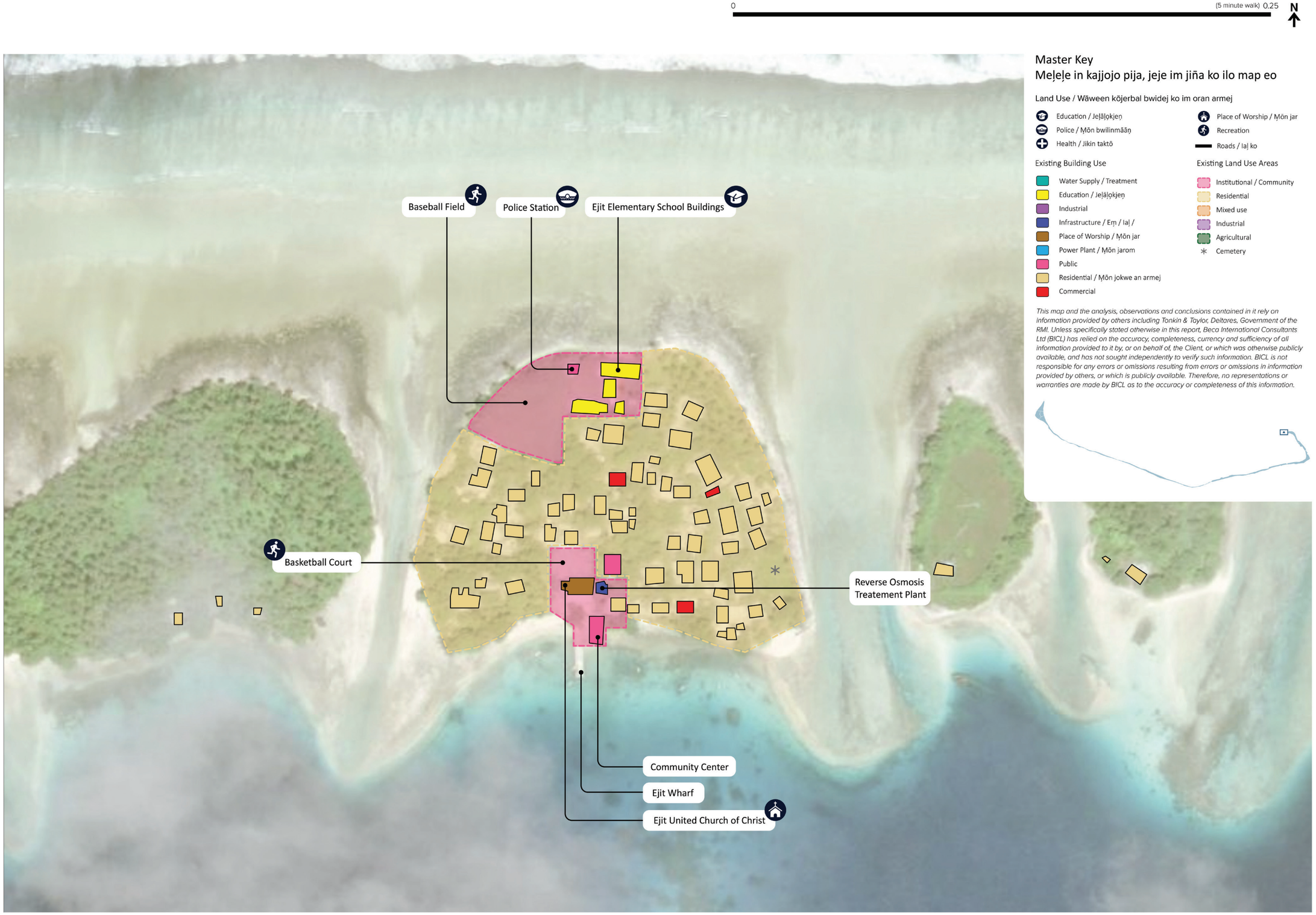
***Photo 133*** - The boat ramp provides access to boats moored in the lagoon area



***Photo 134*** - The church is a central building in Ejit next to the wharf and protects the basketball court from southerly winds



***Photo 135*** - The school occupies the buildings that are back from the ocean edge




***Map 100*** - Current state

## 3.15.2 ANTICIPATED CHANGE

### Projected Population

Ejit's population is expected to remain relatively stable in the coming decades, with projections indicating a slight decline. In 2025, the estimated population was 222, with forecasts showing a gradual decrease to 217 to 219 by 2030, 213 to 217 by 2035, and 203 to 209 by 2045. This trend reflects broader demographic shifts in the region and highlights the importance of planning for a sustainable community size in the future (that is, a population size that can be maintained by infrastructure and services on-island).

### Climate Hazards

Flood modelling completed by Deltares shows 0.82 feet (0.25 meters) of sea-level rise and increased intensity of rainfall events, which are anticipated to occur by 2055 under a rapid climate change scenario. Flood models indicate that the village will experience higher incidence of flooding than today, resulting from daily higher sea-levels and high tide events, and periodic rainfall from storm events such as typhoons or other heavy rains, and/or wave-drive overwash from storm surges or swell waves.

Flooding is most likely to be most problematic in the following areas of the village by 2055 if no interventions or additional coastal protection measures are implemented*:

- Ejit is expected to experience moderate to extreme flooding on the lagoon coastline.
- The ocean coastline along the northern region of Ejit is not expected to see a change from present-day, but the coastlines straddling the lagoon/ocean divide are anticipated to see moderate to major flooding.
- With the exception of the northern area of Ejit, all inland areas of Ejit are likely to experience minor to extreme flooding.

Additionally, erosion has already reduced land area in some places, and storm events have caused the loss of trees and damage to infrastructure, underscoring the urgent need for ongoing adaptation and resilience measures.

*Flood severity was determined by evaluating the modelled potential flood depths, with flooding increasing in severity from minor ➔ moderate ➔ major ➔ extreme.

### Map explanation

Map 101 illustrates what could change at a village-level over the next 20 years because of a decrease in population and impacts from climate change. Note that there are other climate impacts – heat, drought, flooding from tsunamis that are not illustrated on the map.

The population bar chart shows two ways the population could change - the lower line shows the population projection of this village over the next 5, 10 and 20 years and the line above shows the population with potential interventions signaled by the RMI government.

The map shows 0.82 feet (0.25m) of sea-level rise, daily high tide, and flooding from rainstorms, typhoons, and swell wave events.

Critical services and infrastructure are shown as icons on the map. These support daily life, community resilience and disaster preparedness now and in the future and are to be retained and potentially moved if they are located in vulnerable areas.

Map 101 has different colors to show the possible extent of flooding from typhoons, rainstorms, and swell waves in 2055 with 0.82 feet of sea-level rise (SLR):

- No color - these areas show where there is minimal flood risk.
- Blue shows where there would be minor flooding (less risk of flooding, lower levels of flooding expected).
- Light yellow shows where there would be moderate flooding (higher risk of flooding, possible deep flood waters).
- Bright yellow and orange show where there would be major flooding (even higher risk of flooding, area susceptible to multiple flood hazards, possible deep flood waters).
- Red, brown, black show where there would be extreme flooding (worst flooding for Majuro, area susceptible to multiple flood hazards, possible very deep flood waters).

The high tide map has different colors to show possible water depths from daily high tide in 2055 with 0.82 feet of SLR.

- Light purple shows where there will likely be 0.33-1.64 feet of water every day at high tide.
- Purple shows where there will likely be more than 1.65 feet of water every day at high tide.

NOTE – these flood maps are modelled based on current day environment and coastal edge (not allowing for more seawalls or other changes to the ocean and coastal edge).



***Photo 136*** - Coastal edges have been affected with trees that once sat on the southern edge having been removed by storms



***Photo 137*** - Boat access is difficult when the water is choppy

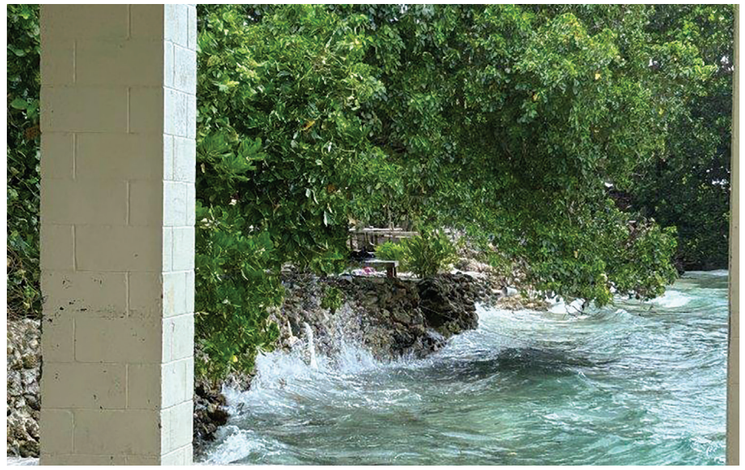


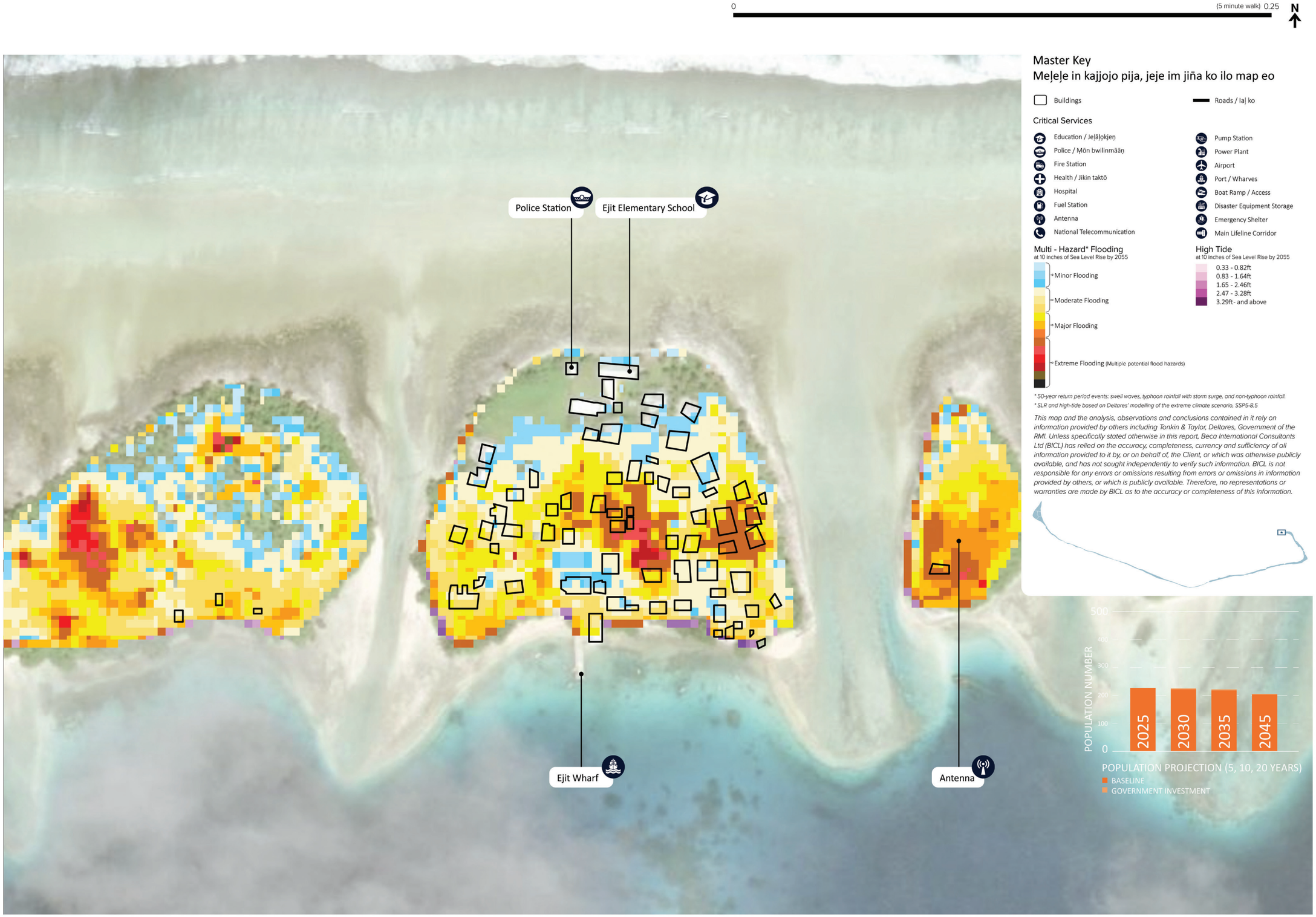
***Photo 138*** - The coastal edge of Ejit is affected in storms and in stormy weather access by boat is difficult



***Photo 139*** - Land has been lost through coastal erosion on this northern edge Photo credit: Lee Arkhie Perez



***Photo 140*** - In areas where there isn't a seawall king tides it was shared in the engagement that water washes across the western edge




***Map 101*** - Anticipated change

### 3.15.3 FUTURE LAND USE PLAN AND INFRASTRUCTURE NEEDS

In the future, the land use patterns on Ejit will remain largely the same. Some shift in community land uses (such as the location of the basketball court and community center) may occur to make space for expanding existing facilities. A key shift on Ejit is a transitional overlay across the majority of the islet in areas that will experience significant impacts as a result of the risks described overleaf. The intention of this overlay is to encourage any redevelopment or new construction within the overlay to be designed to manage risks like sea-level rise and adapt to the impacts of climate change. In practice, this may mean raising buildings, coastal protection or limiting development in high-risk zones to non-habitable uses, such as open space or recreational areas, to reduce exposure and maintain community safety.

#### Opportunities

Opportunities raised in the August engagement session that formed the basis of discussion at the November stakeholder engagement:

- Repair the wharf to improve access to employment, critical infrastructure and services and increase future resilience.
- Protect vegetated areas of the island for climate resilience (drainage and storm buffers, shade etc.).
- Improve community resilience through improved community facilities and spaces.
- Improve accessibility (public buildings and spaces) for people with disabilities,
- Upgrade the health center and medical service,
- Energy self-sufficiency through solar power.

#### Priorities and Projects

Looking to the future, the Ejit community is focused on advancing projects that will strengthen resilience and improve quality of life. Following two engagement sessions in November, the community identified several key priorities:

| Projects and Priorities (high priority in bold) | Master Plan Objectives: Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages |
|---|---|---|---|
| Raise and extend the wharf to create a protected area from king tides and provide a safe mooring area for small boats. | | ✓ | ✓ |
| Extend the existing seawall further west to enhance coastal protection. | ✓ | ✓ | |
| Upgrade the health center and staff to meet local needs. | | ✓ | |
| Repair the reverse osmosis facility to secure a safer and more reliable water supply. | ✓ | ✓ | |
| Invest in more dependable power, such as solar energy, to improve the reliability of the village's electricity supply. | | ✓ | |
| Expand community gardening activities | ✓ | ✓ | |

#### Map explanation

Map 102 illustrates the recommended land use changes and actions that should be taken to address the impacts of anticipated changes over the next 20 years. It also shows the priority projects identified by the community and includes those that will support daily life, community resilience and disaster preparedness.



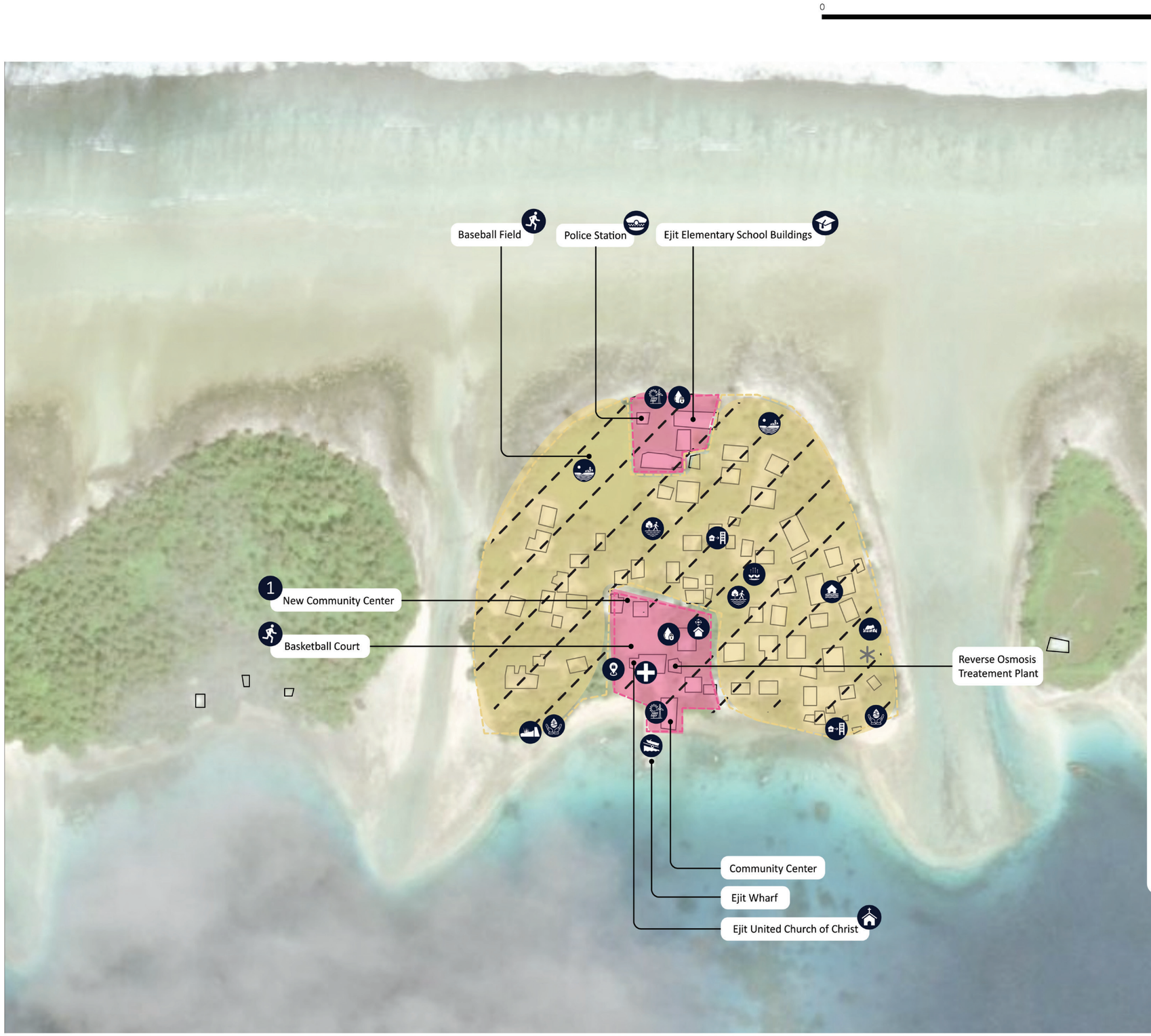

***Photo 141*** - Extending the seawall is an important project as relayed by the community



***Photo 142*** - Maintaining tree cover is important with hotter temperatures



***Photo 143*** - Improving the wharf access is identified as a project by the community




## Master Key
## Meļeļe in kajjojo pija, jeje im jiña ko ilo map eo

### Future Land Use / Wāween kōjerbal bwidej ko im oran armej

- Education / Jeļāļọkjeņ
- Police / Ṃōn bwilinmāāṇ
- Health / Jikin taktō
- Place of Worship / Ṃōn jar
- Recreation
- Emergency Shelter
- Boat Access
- Roads / Ial ko
- Institutional / Community
- Residential
- Mixed use
- Industrial
- Agricultural
- Cemetery
- Go Carefully Area

### RMIGov / Donor Agency Capital Projects

1. New Community Center- Funded and planned

### Resilient Village Strategies

- Raise (land or buildings)
- Relocate (buildings or infrastructure)
- Develop coastal protection measures (including nature based solutions)
- Maximise resilient land for development
- Increase sustainable power access & security
- Improve boat access and connectivity (ramp, pier, dock etc.)
- Develop local employment opportunities
- New / improved multi-purpose facilities to support mobile social (for e.g.medical) and emergency services
- Potential to re-purpose available buildings for community use
- Improve access to new or existing community facilities
- Protect important cultural sites
- Multi-purpose green spaces for future resilience
- Increase food growing capacity
- Protect natural resources (soil, water, trees)
- Improve freshwater access & security

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***Map 102*** - Future state

# 4.

*Photo 144* - Aerial photo of Delap looking towards Uliga with Eletutu Beach in the foreground. Photo credit: Urban Resilience Project

# 4.1 ACTION PLAN

## 4.1.1 INTRODUCTION

This section sets out the actions identified to support implementation of the Master Plan and translate its strategic directions into practical next steps. These actions reflect the collective input of residents, stakeholders, and technical experts and are practical, actionable steps designed to respond to the unique challenges and opportunities facing Majuro. Each action is supported by a clear rationale, suggested timeframe and each identify how they align with the broader Master Plan objectives. The actions are grouped into the following two types of actions:

- Actions to update and implement the Master Plan
- Further work/studies.

The Action Plan table groups projects, actions, and tasks as either short (0 to 5 years), medium (6 to 10 years) or long-term (11 to 20 years). Those identified as short-term are given higher priority because they have been identified as those that need to be completed promptly as they are essential for the health, wellbeing, and safety of residents. On the other hand, medium-to-long-term tasks, while necessary to meet the Master Plan's objectives, do not require immediate action and thus hold a lower priority. This preliminary prioritization will be reviewed on a regular cycle by the Chief Planner, as part of their role.

Existing and proposed Sector Strategies as well as those covered by Ministries and Agencies have been factored into this list.

## 4.1.2 MAJURO'S ECONOMIC RESILIENCE

As noted in Section Two - Approach, the Master Plan allocates land and space for future housing, services, protective infrastructure, enterprise areas, circulation networks, and nature-based buffers. It provides a single integrated spatial reference for all development on Majuro. There are several ways that economic development outcomes can be enabled through implementation of the Master Plan. This includes the creation of construction jobs, enabling ongoing roles to operate new infrastructure and services, and opening up opportunities for local suppliers and businesses. The Master Plan and supporting actions can also improve investor confidence and protect economic activity through more resilient, connected infrastructure. Achieving these outcomes will still depend on a coordinated approach and targeted economic development programs that sit outside the Master Plan's scope.

## 4.1.3 MAJURO'S CLIMATE RESILIENCE

A key outcome from the Master Plan is improving climate resilience. As a low-lying atoll, Majuro faces pressures from rising seas that drive more frequent coastal flooding and erosion, saltwater intrusion into the thin freshwater lens, and greater heat and rainfall variability that can strain water security and public health. With most people, services, and roads concentrated along narrow ocean and lagoon shorelines, even modest changes in sea-level and storm conditions can disrupt daily life, damage homes and critical infrastructure, and affect reefs and other natural defenses that communities depend on.

While the Master Plan focuses on a 20-year action horizon, it has been informed by longer-term climate information and emissions scenarios - including sea-level rise projections to 2100 - to test choices and avoid locking in assets or land uses that would increase future risk. The plans prioritize near-term, no-regrets and flexible actions for the next two decades, such as increasing tree canopy for extreme urban heat effects, and the maximization of additional green spaces for water storage and drainage. The Master Plan is explicitly set to be reviewed and updated regularly to incorporate new data on risks and ensure that opportunities for enhanced resilience are incorporated.

| | Action | Objective | | | Short 0-5 | Med 5-10 | Long 10-20 | Rationale / Reason | Owner<br>TBC = To be confirmed which government authority will be designated as responsible. |
|---|---|---|---|---|---|---|---|---|---|
| | | Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages | | | | | |
| **Master Plan Updates/Implementation** | | | | | | | | | |
| 1 | Action Plan scoping and short-term prioritization | | | | | | | As a priority, the Chief Planner to review short-term actions from this list and prioritize those that are implementable within existing budgets. Following this, and in collaboration with identified Action Owners, develop one-page scopes with costs and resource needs, key performance indicators and reporting cadence. | TBC |
| 2 | Master Plan Awareness Strategy | | | | | | | Develop and implement an awareness strategy to raise awareness about the Master Plan including:<br>▪ Village specific pack provided to each councilor in MALGoV as a resource for future discussions with the community. Make Village specific packs available digitally for landowners and community. | TBC |
| 3 | Update the Master Plan to reflect the requirements of the Planning and Zoning Act (once in force) and any other relevant regulation | | | | | | | Once the Planning and Zoning Act is finalized the Master Plan should be updated as follows:<br>▪ the land uses identified in the Master Plan are aligned with the zones in the Planning and Zoning Act and will be upgraded to zones.<br>▪ the area of the Master Plan, which for Stage 1 extended from Laura to Ejit, should be extended to the rest of Majuro to align with the requirements of the Planning and Zoning Act.<br>▪ To include those required elements as specified in the Planning and Zoning Act, such as climate change adaptation and disaster risk reduction elements and the general locations and arrangements of infrastructure.<br>**This relies on the Planning and Zoning Act coming into force.** | TBC |
| 4 | Periodic update of the Master Plan | | | | | | | The Master Plan and the Action List should be updated on a regular basis (every five years) to reflect any changes in zoning, land use or in situations where a plan or strategy may impact zoning or land use. The timing should align with the timing indicated in the Planning and Zoning Act (once in effect) (timing tbc). The Master Plan should also be updated once any Sector Strategies have been completed and should any Ministry or Agency Plans be developed or updated. Updates to the Action List should consider the actions identified by landowners and the community. | TBC |
| 5 | Integrate proposed cultural center into Master Plan | | | | | | | Working alongside the Office of Commerce, Investment and Tourism, identify a central location for a cultural center in Majuro and integrate this into the Master Plan. | Lead TBC<br>With OCIT |
| 6 | Incorporate the housing strategy and detailed village plans | | | | | | | Incorporate the housing strategy and prepare detailed village concept plans that respond to the proposed land use changes (consolidated centers approach) and community infrastructure upgrades. | TBC |
| **Further work/studies** | | | | | | | | | |
| 7 | Digital Mapping | | | | | | | Complete weto boundary survey and provide it in a digital format. Update to apply zoning to wetos as determined by the Master Plan. This information should be made available to landowners and the public and updated alongside the Master Plan. | MoCIA and MPWIU in collaboration |
| 8 | Map cemeteries and cultural sites | | | | | | | In collaboration with the Cultural and Historic Preservation Office. Identify the location and map cemeteries and sites of cultural importance that are impacted by their proximity to the coastal edge. Provide mapping information to MoCIA to include in an update of the Master Plan. Note that this action could link with action IN8 of the National Adaptation Plan. | MoCIA / Cultural and Historic Preservation Office |
| 9 | Update fixed asset register - Infrastructure asset registers and condition assessment. | | | | | | | A key aspect of planning and delivering improved infrastructure involves understanding existing infrastructure assets, the levels of service it provides and asset condition (including climate change vulnerability to align with action W4 of the National Adaptation Plan). Comprehensive asset information will allow for appropriate maintenance interventions and development planning, including a focus on areas where upgrades to asset design or condition can contribute to enhanced resilience to climate change. It is recommended that existing asset management registers and asset management systems are updated and a comprehensive review and condition assessment of existing infrastructure be undertaken to support ongoing O&M implementation, infrastructure development and design standards. The provision and condition of fire hydrants and solar lighting are two assets that would benefit from this assessment. It is recommended that all assets be included in the register (including three-waters and lighting, etc.) and updated on an annual basis. | MPWIU in coordination with Ministry of Finance, Banking and Postal Services |

| | Action | Objective | | | Short 0-5 | Med 5-10 | Long 10-20 | Rationale / Reason | Owner<br>TBC = To be confirmed which government authority will be designated as responsible. |
|---|---|---|---|---|---|---|---|---|---|
| | | Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages | | | | | |
| 10 | Public/Shared Transport Infrastructure Study | | | | | | | A shared transport study to determine how to improve active, public and shared transport options to reduce traffic congestion in urban areas, improve connectivity between the villages and increase social equity through access to health, education and employment locations efficiently. Consideration should be given to the work currently underway to upgrade roads and sidewalks as part of the URP Majuro Streetscaping Program. | MPWIU |
| 11 | Integrated Infrastructure Development & Maintenance Plan (IDMP) | | | | | | | Development and implementation of an atoll-wide Infrastructure Development & Maintenance Plan to provide an integrated plan for existing and planned critical infrastructure operation, maintenance and development projects needed in the short-, medium-, and long-term. The plan is expected to align delivery of projects to improve coordination and delivery efficiency across sectors and would be based on implementing various infrastructure policies and plans. This includes the Climate Adaptation Plan, sector strategic plans, NIIP and drawing from costed feasibility and concept designs to enable adaptation and the Master Plan outcomes.<br><br>This plan should also include community infrastructure. For example, a survey of school infrastructure should be completed to identify what assets a school has, and what gaps need to be filled, so that they are fit-for-purpose and resilient to natural hazards (this was noted during engagement with the Lomar, Jeirok, Ajeltake, Delap, and Djarrit/Rita communities). Additionally, the plan should identify the location, structure, size, access to basic requirements of disaster facilities, with the locations mapped in the Master Plan.<br><br>**Action 12 is dependent on Action 1 being completed, and Action 20 facilities review being progressed as identified within the Ready2Respond Development Plan (a component of the Emergency Preparedness and Response in the Republic of the Marshall Islands).** | MPWIU |
| 12 | Housing Strategy | | | | | | | Develop a strategy for new housing along with examples of adaptations and improvements that can be made to existing housing stock that seeks the following outcomes:<br>▪ Address areas where there is limited land availability and constraints on horizontal expansion by outlining the potential for Majuro appropriate alternate housing forms.<br>▪ Improve housing resilience to impacts of climate change in accordance with the homeowners' guidance to resilient housing.<br>▪ Improve the condition, security, energy efficiency and suitability of homes. This will be assisted by providing a framework to facilitate good quality development standards.<br>▪ Improve building structures and design by providing a variety of design templates for future housing development.<br>▪ Foster and enhance a strong sense of community within each housing area by providing for communal amenities (for example community and/or productive gardens) and enhancing safety and wellbeing.<br>▪ Encourage setbacks and multi-level residential dwellings to enhance relationship of private and public realm and enhance safety.<br>▪ Set a development ratio to provide open space for urban heat, water storage/drainage, gardens and other resilience measures.<br><br>**Action 13 is dependent on Action 1, 14 being completed, and the Planning and Zoning Act coming into force.** | MoCIA / MPWIU / MALGoV as a collaboration including Division of Building Safety & Regulations and EPPSO . |
| 13 | Updated abandoned and underutilized building survey and plan | | | | | | | Review the existing URP Component 1 – Public Facilities: Underutilized Buildings and Land Stocktake. Identify further existing and abandoned buildings and create a plan that identifies what to do with abandoned buildings and prioritizes actions for buildings that are a public safety hazard. (refer to Jurisdiction of Court with respect to dangerous, deserted, ruinous and dilapidated buildings in the NATIONAL BUILDING CODE ACT 2025, S1419). The survey should identify whether the buildings are located in an area of high risk and opportunities to remove and repurpose land for enhanced resilience. This action may align with action W7 of the National Adaptation Plan that suggests the establishment of a 'Build back Better' best practice guideline. | Ministry of Finance, Banking and Postal Services in collaboration with MPWIU |

| | Action | Objective | | | Short 0-5 | Med 5-10 | Long 10-20 | Rationale / Reason | Owner TBC = To be confirmed which government authority will be designated as responsible. |
|---|---|---|---|---|---|---|---|---|---|
| | | Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages | | | | | |
| 14 | Community and Recreation facilities demand and location study | | | | | | | Community centers and recreation facilities promote health, well-being, and community engagement. These include access to fresh water, boat ramps and lagoon access, playgrounds and sports fields, etc. These facilities offer safe spaces for all ages in the community to play and participate in physical activities, fostering social ties and supporting healthy development. The need for such facilities was highlighted in community feedback, particularly in the Lomar, Lobat, Iolap, Jeirok, Woja, Delap, Djarrit/Rita and Ejit communities. A review of the distribution of these recreation areas across Majuro, the distance for the community to access these and locations for co-location or increased facilities where there is a need identified is recommended. Their intended location can be mapped in the Master Plan. | MALGoV (lead) input from MPWIU and MoCIA |
| 15 | Majuro Long-term Climate Adaptation Plan (Building upon the sea-level rise Policy Action Plan) | | | | | | | Development of a Majuro-wide long-term (75-100-year) climate adaptation plan is highly recommended for immediate action. Adaptation planning should devise a flexible strategy for the implementation of cross-sectoral strategic actions and timeframes over the next 75-100 years, with the intention of making smart investment decisions in the short-term that can flexibly respond to a changing climate (inclusive of sea-level rise and other climate hazards like heat), community values, and Majuro's aspirations. The plan should consider the sea-level rise Policy Action Plan, and implement the National Adaptation Plan at a Majuro specific scale. This Majuro specific climate adaptation plan will guide future updates and revisions of the 20-year Village Master Plans. | CCD |
| 16 | Urban heat and tree strategy | | | | | | | This strategy would identify existing cover first in the short-term and develop a strategy that protects existing mature vegetation and identifies the areas where additional shade would assist in reducing urban heat island effects. The strategy would also note methods that can be implemented to reduce heat in buildings and in open spaces (trees or shelters) and areas where more tree canopy cover can be provided. The strategy can also consider how trees can help to address impacts of salt spray. **The strategy should be considered alongside the Housing Strategy (Action 13).** | Natural resources (everyone) |
| 17 | Update LIDAR survey | | | | | | | In areas where community engagement identified that survey data was incomplete or inaccurate, more accurate survey data will support development and climate resilience planning for e.g. flood modelling. New LIDAR and flood modelling information may require updates to the zoning / overlays in the Master Plan . | EPA (lead) |
| 18 | Update flood modelling, inclusive of rainfall and coastal processes | | | | | | | If LIDAR data is revised, then Deltares' flood modelling will need to be updated to better identify flood risk across the atoll, which informs critical decisions around coastal protection and flood risk mitigation.<br>**This Action is dependent on Action 18 being completed.** | MPWIU (lead) with input from Ministry of Finance, Banking and Postal Services |
| 19 | Update the Master Plan to spatially identify the emergency response and preparedness areas | | | | | | | Update the Master Plan based on the outcomes of the Ready2Respond Development Plan items from Component 3: Facilities including;<br>▪ Emergency and temporary shelter mapping and associated level rating<br>▪ Inventory and assessment of public space suitability for emergency operations<br>▪ Disaster evacuation routes | NDMO (lead)/ MoCIA |

***Table 18*** - Action Plan

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# APPENDICES

**NOTE: APPENDIX F IS INCLUDED IN THE PRINTED BOOK VERSION.**

*Photo 145* - Aerial view over the Majuro lagoon looking from Uliga towards Rairok

# APPENDIX F - COMMUNITY AND LANDOWNER CONSULTATION – VILLAGE SPECIFIC PROJECTS AND OPPORTUNITIES

Community consultations were held in two primary stages, a first and second round of stakeholder engagement. The first round of community consultation was undertaken through July and August 2025 with the second round of engagement completed during November and December 2025. A consolidated list of opportunities and projects that were suggested through the community consultation is captured in the table below indicating the village that recommended each of these.

P Projects and priorities noted as more important by community and landowners in November/ December 2025 engagement.

O Opportunities raised in the July/ August engagement session that formed the basis of discussion at the November/ December engagement.

These priorities and projects are arranged in the following categories:

- Environment, Topography, and Natural Resources
- Land Use, Economic, and Social Services
- Transportation and Connectivity
- Infrastructure

This information is also contained in each of the village sections in **Section 3 - Resilient Village Plans.**

For each village the projects and priorities to be prioritized have been highlighted in bold text.

| Categories | Projects and Opportunities from Community and Landowner Consultation | Description | Related Objective | | | Village | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages | Lomar | Lobat | Iolap | Jeirok | Woja | Ajeltake | Rairok | Delap | Uliga | Djarrit/Rita | Ejit |
| Environment, Topography, and Natural Resources | Protect the water lens | Protecting the freshwater lens is essential for ensuring a sustainable supply of potable water. Safeguarding this resource supports community health and resilience to drought and contamination. | | | | P | O | O | O | | | | P | | | |
| | Waste disposal and management system | Implementing an effective waste disposal and management system is crucial for public health and environmental protection. Proper waste management reduces pollution, prevents disease, and maintains a clean and healthy community. | | | | | P | | | | P | | | | | |
| | Establish trash bin deposit points | Designating trash bin deposit points helps reduce littering and loose rubbish, supporting public health and environmental protection. Proper waste management keeps the community clean, reduces pollution, and promotes a healthier living environment. | | | | | | | | | P | | | | | |
| Actions to Address Flooding | Raising Land | Raising land in flood-prone or low-lying areas protects homes, infrastructure (for example, the communications towner in Jeirok), and agricultural land from inundation and storm damage. This action increases resilience to climate change and extreme weather events. | | | | | | | P | | | | P | | P | |
| | Raising Homes | Raising the elevation of houses above the main road helps protect homes and families from flooding, storm surges, and the impacts of sea-level rise. This action increases community resilience and reduces the risk of property damage and displacement. The Planning and Zoning Act may consider how best to signal this need in a future iteration of the Master Plan. It may also be implemented through the Building Code. | | | | | | | | | | | | P | P | |
| | Targeted coastal protection/ connecting/improve existing seawalls | Implementing targeted and comprehensive coastal protection measures in areas prone to inundation safeguards homes and critical infrastructure from erosion, flooding, and storm surges. Focusing on dwellings helps protect vulnerable residents and supports long-term community resilience to climate change. Connecting existing seawalls (in Rita and other areas) will provide continuous and comprehensive protection from coastal erosion, storm surges, and flooding. This integrated approach safeguards the community and critical infrastructure. | | | | P | | | P | P | P | | P | P | P | P |
| | Nature based erosion/coastal protection | Planting trees near shoreline areas helps prevent coastal erosion, provides shade, and supports biodiversity. Trees act as natural barriers against storm surges and flooding. | | | | O | O | P | O | P | P | | O | | | O |

Legend

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages | Lomar | Lobat | Iolap | Jeirok | Woja | Ajeltake | Rairok | Delap | Uliga | Djarrit/Rita | Ejit |
| | Addressing sea salt spray, especially at high tide with high winds | Mitigating the effects of salt spray protects infrastructure, agriculture, and public health from the corrosive and damaging impacts of saltwater, particularly during high tides and strong winds. This action helps maintain the longevity of buildings and crops. | | | | | | | | | | | | | P | |
| Land Use, Economic, and Social Services | Delineation of wetos (land parcels) | Clear delineation of land parcels helps resolve disputes, supports effective land management, and enables better planning for development and infrastructure. | | | | | | | | | | | P | | | |
| | Plan for productive use of idle assets | Utilizing idle assets, such as vacant houses or unused land, supports economic development, reduces blight, and maximizes the value of existing resources. Productive use of these assets can generate income, provide housing, or support community initiatives. | | | | | | | | | | | | | P | |
| | Playground areas and sports fields for youth (including expanding existing areas at schools) | Providing additional playgrounds creates safe, accessible spaces for young children to play, supporting their physical, social, and emotional development. Playgrounds also foster community interaction and family well-being. Softball and baseball are the most popular sports on the island, providing opportunities for physical activity, social interaction, and community events. Expanding access to fields encourages healthy lifestyles, supports youth development, and strengthens community ties through sport. Expanding outdoor space at schools also supports student health, recreation, and educational activities. It provides safe areas for play, sports, and learning, contributing to child development. | | | | P | O | | | | | P | | | P | |
| | Housing complexes for vulnerable homes along coastal areas | Developing resilient housing complexes for vulnerable coastal homes reduces exposure to flooding and erosion. Safe, well-designed housing protects families, supports long-term settlement, and increases community resilience to climate impacts. | | | | | | | | | | O | O | P | P | |
| | Integrate universal inclusive design | Incorporating universal design principles ensures accessibility for people with disabilities, making it easier for everyone to move around the community. Inclusive design supports independence and equal participation. | | | | | | | | | | | | | | O |
| | Evacuation Centers | Establishing an evacuation center provides a safe shelter for residents during emergencies such as storms, floods, or other disasters. These centers are essential for protecting lives and supporting community resilience in times of crisis. | | | | P | P | | | O | O | | | | | |
| | Community hospital/health clinic | A local community hospital or clinic will improve access to essential healthcare services, reduce travel time for medical treatment, and enhances health outcomes for residents. Locating these nearby existing community facilities, such as at the Uliga Track and Field Facility would improve access to healthcare, reduces travel time for medical services. Local clinics strengthen emergency response and support preventative care. | | | | | | | | | | P | | P | P | P |
| | Community center/covered community space | Creating a covered and sheltered community space on the basketball area in Ejit can provide a multifunctional venue for gatherings, recreation, and events. Community centers serve as hubs for gatherings, events, education, recreation, and emergency coordination. They strengthen social cohesion, provide safe spaces for community activities, and can function as shelters during emergencies. | | | | P | P | P | P | P | | | P | | P | O |
| | Law enforcement | Enforcing laws ensures compliance with safety, environmental, and planning regulations, supporting orderly development and protecting community interests. | | | | | | | | | | | | | | |
| | Maintain/improve streetlights | Installing and maintaining street lighting improves safety and visibility at night, reduces accidents, and enhances security for residents. Well-lit streets support community activities and contribute to a safer public environment. | | | | | P | P | P | P | P | P | P | P | | |
| | Solar lighting for homes | Solar lighting improves safety and visibility at night and for homes reduces reliance on grid electricity and supports sustainability. | | | | | P | O | | | P | | | | | |

Legend

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| Categories | Projects and Opportunities from Community and Landowner Consultation | Description | Related Objective | | | Village | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages | Lomar | Lobat | Iolap | Jeirok | Woja | Ajeltake | Rairok | Delap | Uliga | Djarrit/Rita | Ejit |
| | Support for local small businesses/ local employment opportunities | Supporting local businesses strengthens the economy, creates jobs, and fosters community resilience. Revitalizing small enterprises encourages entrepreneurship and local investment. Creating local employment opportunities enables community members to work closer to home, reducing the need for travel and improving quality of life. Local jobs support economic development, strengthen families, and foster community stability. | | | | O | P | | | O | O | P | P | | | |
| | Public restrooms | Providing additional public restrooms improves hygiene, health, and comfort for residents and visitors, particularly in busy or communal areas. Adequate sanitation facilities are essential for public health and support inclusive access to public spaces. | | | | | | | P | | P | | | | P | |
| | Identify areas to establish Community Gardens | Potentially located on the school grounds, community gardens contribute to food security, nutrition, and resilience. Providing support empowers residents to maintain productive gardens, which is especially important in remote or resource-limited settings. | | | | P | O | P | | | P | | | P | | P |
| | Improve pig-pen waste/piggery/ livestock management | Enhancing waste management for pig pens promotes public health and environmental protection by reducing pollution and the spread of disease. Proper management supports sustainable agriculture and improves living conditions for both residents and livestock. | | | | | | P | P | | | | P | P | | |
| | Remove coconut trees from the side of the road/consider banning them from being planted along the roadside | Removing and banning coconut trees along roads reduces hazards from falling coconuts, improving road safety for pedestrians and motorists. This action also helps maintain clear sightlines and reduces maintenance needs. | | | | | | | | | P | | P | | | |
| | Fish farming | Establishing facility for fish farming at different scales enhances food security by increasing local production of protein-rich foods, supports livelihoods through job creation, and reduces reliance on imported seafood. This action also promotes sustainable resource management and economic resilience. | | | | | | | | | | | | | P | |
| | Farming, plantations, agriculture | Expanding plantations and implementing agriculture and husbandry projects increases local food production and builds resilience against supply disruptions. These initiatives support food security, improve nutrition, and promote sustainable livelihoods. | | | | P | P | O | O | P | | | | | P | |
| | Community fishing vessels | Access to fishing vessels enables livelihoods, improves food security, and supports economic independence. It also allows the community to sustainably manage and utilize local marine resources. | | | | P | | | | | | | | | | |
| **Transportation and Connectivity**<br>Land Transport Actions | Improve road safety, surfaces and signage | Upgrading road surfaces and addressing potholes / mud ponds, widening the road, adding road crossings (cross walks) and implementing speed bumps improves accessibility and safety for all road users, particularly during adverse weather. Widening the main road improves traffic flow, safety, and accessibility, and enhanced roads support daily mobility, emergency access, and economic activity. Roadside markers enhance accessibility and safety for visually impaired residents, enabling independent mobility and reducing the risk of accidents. | | | | P | P | P | | P | | | P | P | P | |
| | Stormwater/road drainage | Effective drainage systems are crucial for preventing flooding and waterlogging, particularly in low-lying atoll communities. Improved drainage protects infrastructure, reduces disruption to daily life, and minimizes health risks associated with standing water. | | | | | | P | | | | | | O | | |
| Sea Transport Actions | Upgrade and extend existing wharfs | Upgrading and extending the wharf provides safer and more reliable facilities for the mooring and transfer of people and goods. Raising the wharf above king tide levels increases resilience to sea-level rise and extreme weather, ensuring continued access and supporting economic activity and emergency response. | | | | | | | | | | | | | | P |

Legend

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O Opportunities raised in the July/ August engagement session that formed the basis of discussion at the November/ December engagement.

| Categories | Projects and Opportunities from Community and Landowner Consultation | Description | Related Objective | | | Village | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Healthy Adaptive Environments | Resilient Future Focused Communities | Safe Connected Villages | Lomar | Lobat | Iolap | Jeirok | Woja | Ajeltake | Rairok | Delap | Uliga | Djarrit/Rita | Ejit |
| | Public boat ramps | Constructing more public boat ramps improves access to the lagoon and ocean for fishing, transportation, and emergency response. Enhanced access supports livelihoods, food security, and community safety. | | | | O | | P | | P | P | | | | P | |
| Community Improvement Actions | Public transport | Taxis are expensive. Introducing public transport offers an affordable alternative to taxis, improving access to the center and essential services. Enhanced mobility supports economic participation and reduces transport barriers for residents. | | | | O | P | | O | P | O | | O | | | |
| | Bus stop maintenance/improvements | Maintaining and improving bus stops improves pedestrian safety and accessibility. | | | | | | | | | P | | | P | P | |
| | Improve sidewalks | Upgrading and expanding sidewalks improves pedestrian safety, accessibility, and encourages active transportation such as walking and cycling. Safe walkways support community mobility and reduce the risk of accidents. | | | | | O | P | O | P | P | | P | P | P | |
| | Establish crossing zones for school children | Designated crossing zones improve safety for children walking to and from school, especially in areas with high traffic or poor visibility. These measures help prevent accidents and support active travel. | | | | | | | | | | | P | | | |
| **Infrastructure**<br>Water Security Actions | Water supply | Ensuring a reliable water supply is essential for providing safe drinking water, supporting hygiene, and preparing for emergencies. Improved water infrastructure reduces vulnerability to drought and contamination and is critical for community health and well-being. This may mean establishing water sanitation, new water supply, or implementing new / fixing existing reverse osmosis machines. Safe, filtered drinking water can also be considered at ECC.<br>Underground wells and sewer systems provide a secure and sustainable water source for sanitation, which is vital for health and hygiene. | | | | | | | P | P | P | | P | P | | P |
| | Improve water catchments and storage tanks in each of our communities | Reliable water catchment and storage systems are critical for ensuring access to safe drinking water, supporting hygiene, and preparing for emergencies. Improved infrastructure reduces vulnerability to drought and contamination. | | | | O | O | | O | | | | | | P | |
| Energy Security Actions | Energy Supply | Identifying and developing alternative energy sources increases energy security, reduces reliance on imported fuels, and supports sustainability. Solar energy supports sustainability by providing a renewable source of power, reducing reliance on grid electricity, and lowering carbon emissions. It is especially valuable in areas with unreliable power supply, ensuring consistent access to energy for households and community facilities. Diversifying energy supply also enhances resilience to power disruptions and supports economic and social development. | | | | | | | | | P | | | | | P |
| Wastewater System Actions | Sewer System | Connection into the Majuro-wide system was raised as important for health outcomes as an alternate to septic tanks. Reliable wastewater management reduces environmental contamination and supports public health. | | | | | | P | | P | P | | P | | | |

Legend

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**The Majuro Master Plan (Stage 1): Development of Resilient Majuro Village Plans** has been prepared as part of the Urban Resilience Project (URP) for the Republic of the Marshall Islands (RMI).

The Master Plan is informed by the RMI National Adaptation Plan (*Pāpjelmae*, adopted in 2023). It establishes a spatial and land-use framework, supported by prioritised actions and policy directions, to guide coordinated government and donor investment over the next 20 years. The Plan sets out resilient, community-informed plans for eleven villages from Laura to Ejit - collectively referred to as the **Resilient Village Plans** - and is referenced as a spatial planning tool in the proposed update of the Planning and Zoning Act.

The Master Plan is structured into four sections: **Introduction, Approach, Resilient Village Plans, and Action Plan**. Together, these sections respond to accelerating climate risks, demographic change, and the need for a more strategic, long-term approach to land-use planning across Majuro Atoll.