

MAKING DISASTER AND CLIMATE-RESILIENT COMMUNITIES

Symposium on Cities and Slums

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Presented by


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Presentation Overview

- **General principles** of planning for disaster and climate resilience
 - **Case examples**
 - Enhancement of the CLUP and CDP of Sorsogon City (UN-Habitat)
 - Risk-Sensitive Redevelopment Plan for Barangay Rizal, Makati (EMI)
 - Conceptual Master Plan for Barangay Bagumbayan, Taguig (AusAid)
 - **Conclusions and recommendations**
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- The diagram consists of two red curly braces on the right side of the slide. The top brace groups the first two case examples (Sorsogon City and Makati) and is labeled "City level plans". The bottom brace groups the last two case examples (Taguig and the Conceptual Master Plan) and is labeled "Area-specific plans".
- City level plans
 - Area-specific plans

General Principles of Planning for Climate and Disaster Resilience

Development regulation/ planning for future development

Prevent development in high hazard areas where possible.

Where development cannot be prevented, minimize land use intensity, buildings value, and occupancy.

Where development occurs, mitigate risk through urban design, site planning, and building construction.

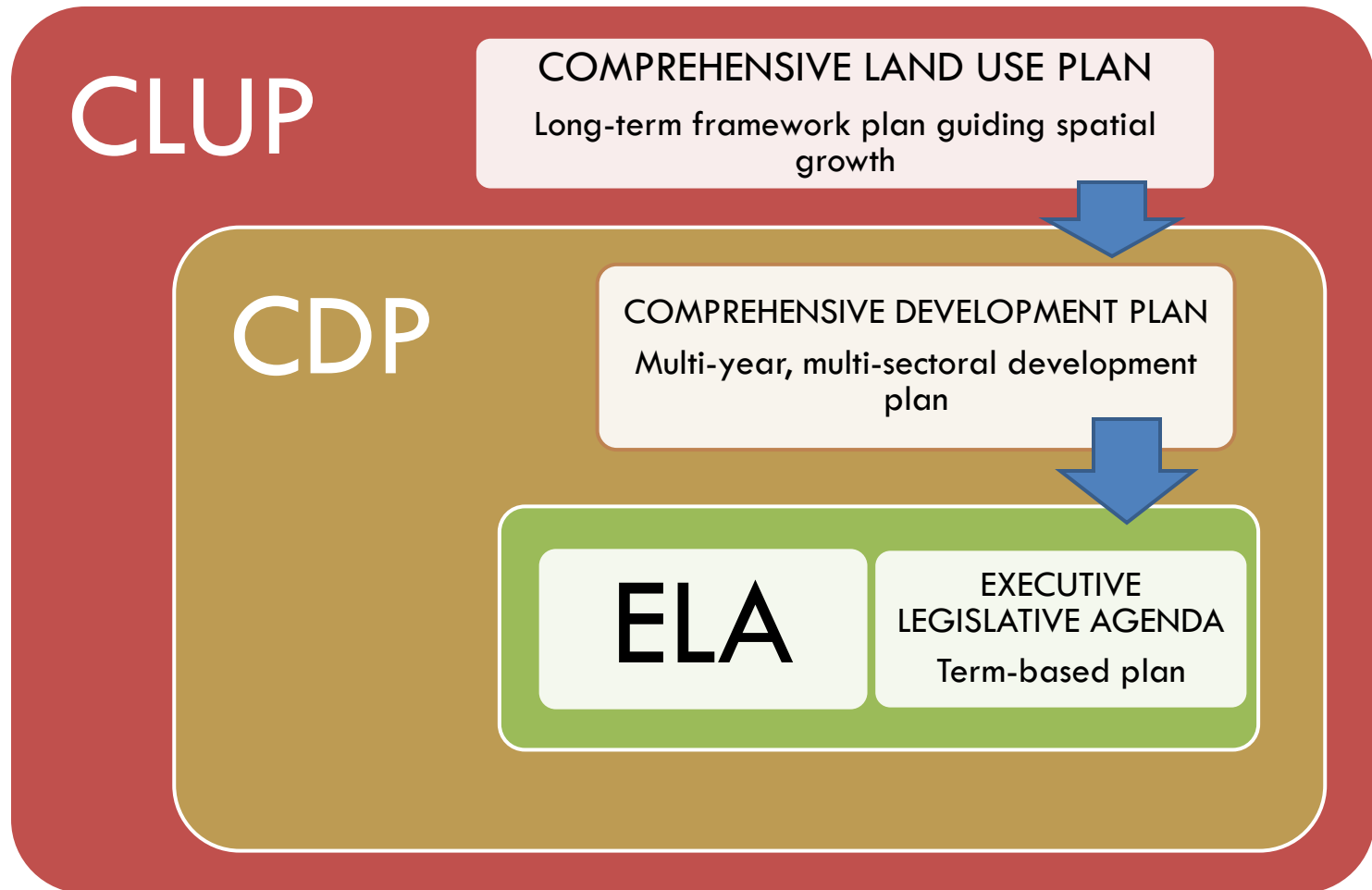
For communities nearly built-out, protect life and existing development through emergency preparedness, redevelopment/ retrofitting/ relocation.

Many communities in the Philippines fall under this situation (e.g. slums)

CASE EXAMPLE 1:

**Enhancement of the Comprehensive
Land Use Plan (CLUP) and
Comprehensive Development Plan
(CDP) of Sorsogon City**

Planning Context



What makes this ^{enhanced} CLUP different?

CLUP/CDP Process

Data Collection

Situational Analysis / Conduct of Detailed Sectoral Studies

Goal/ Objectives Setting

Formulation of Spatial Strategy, Land Use Plan, Sectoral Plans

Risk-Sensitive Planning Process

Multi-Hazard Assessment

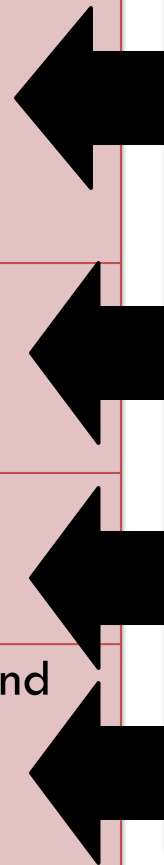
Climate Change Vulnerability and Adaptation Assessment

Emergency Response and Management Assessment

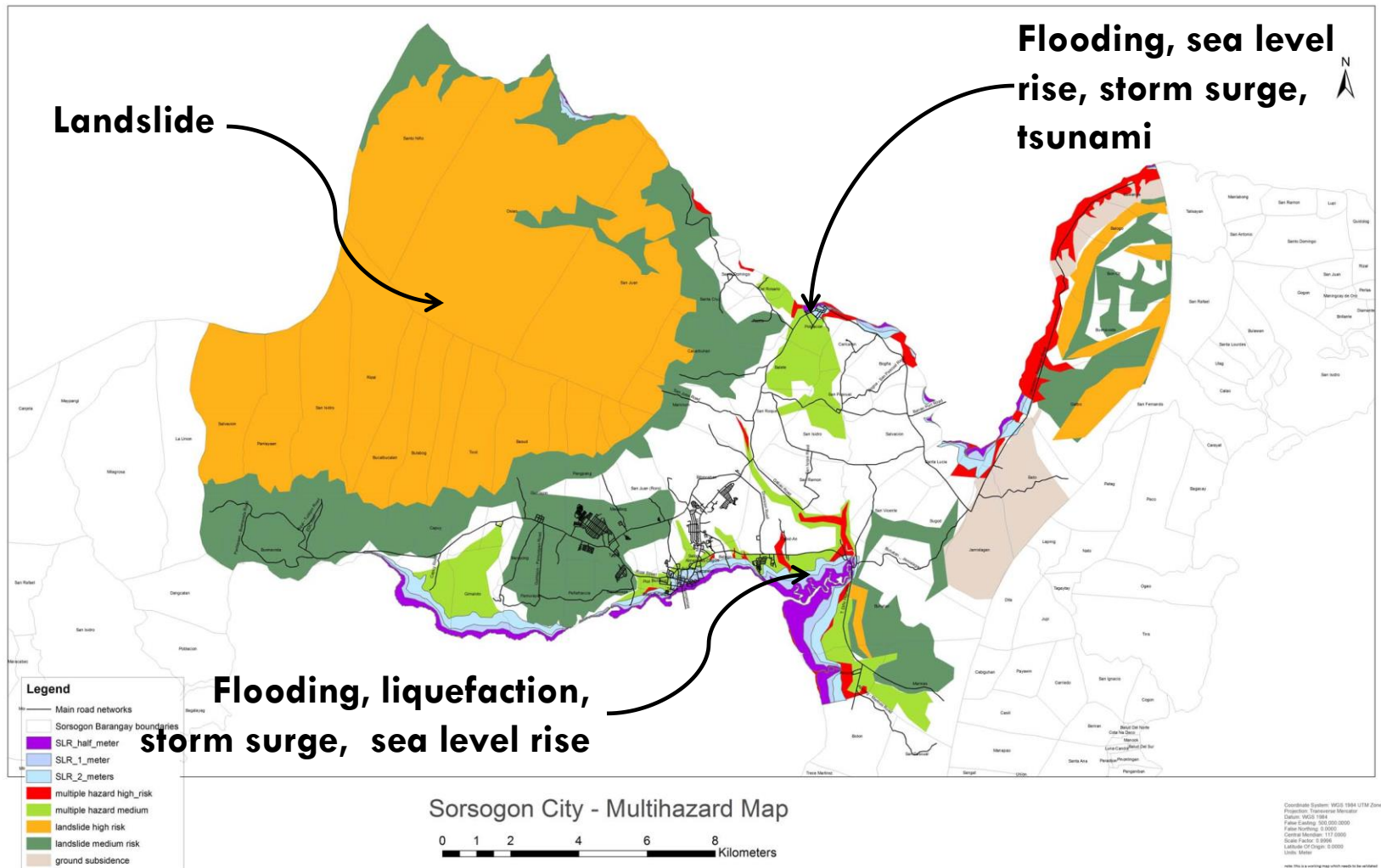
Identification of Risk and Adaptation Capacity per Area/ Sector

Formulation of Risk Reduction and Adaptation Objectives

Formulation of Risk-Sensitive Plan



Multi-Hazard Assessment

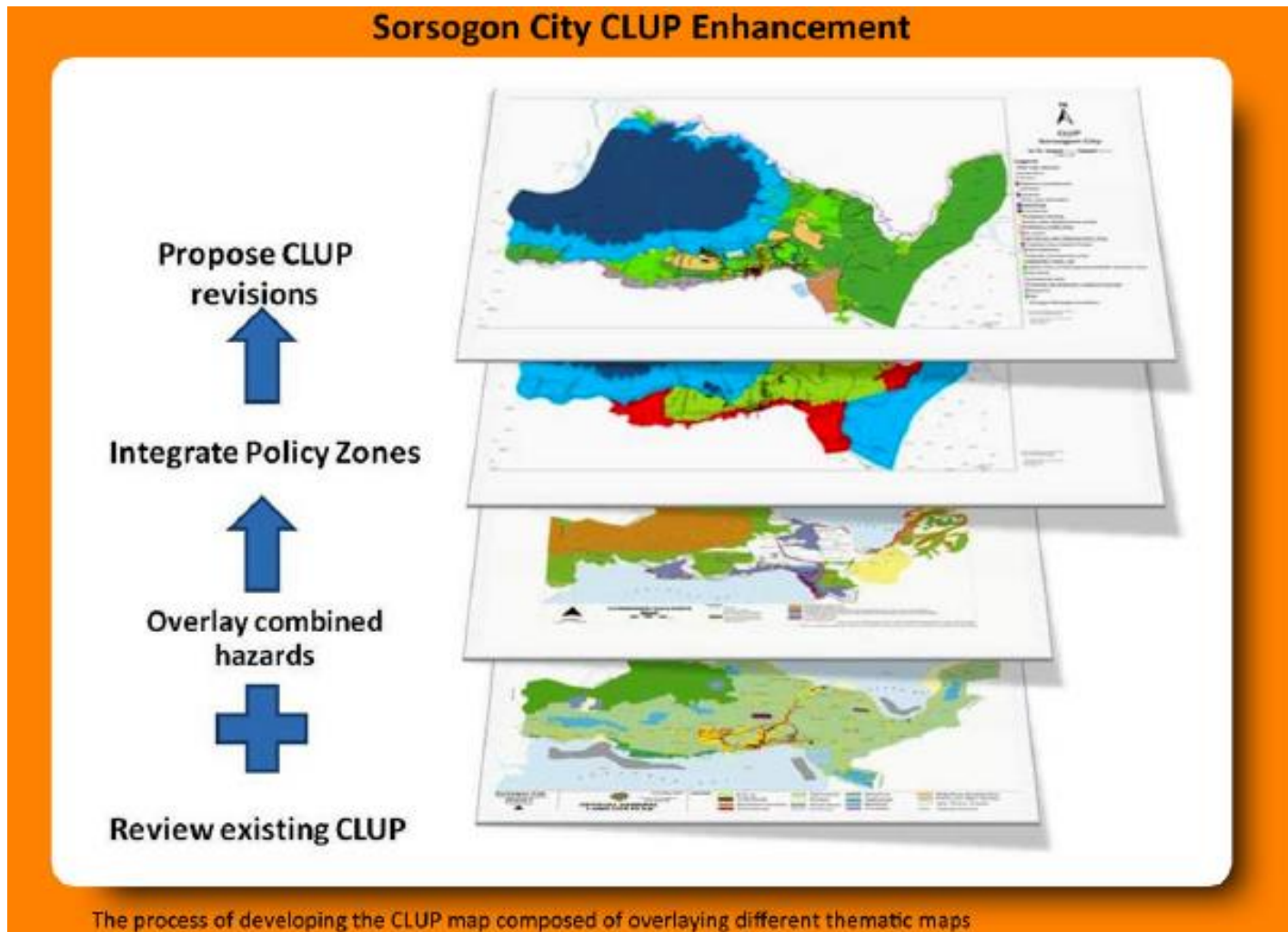


Climate Change Vulnerability & Adaptation Assessment

- High risk to tropical cyclones and storm surges, extreme rainfall/flooding, increased precipitation, temperature variability and sea level rise.
- 35,621 people or 24% of the city population who will be adversely affected as 9 urban coastal barangays were found to be highly vulnerable to climatic-induced hazards.
- Settlements are at high risk given their location, aging and previously damaged structures and linkage systems, and existing drainage facilities.
- 24 flood-prone barangays with a population of 55,452 (36.6%) risk being flooded



CLUP Updating Process



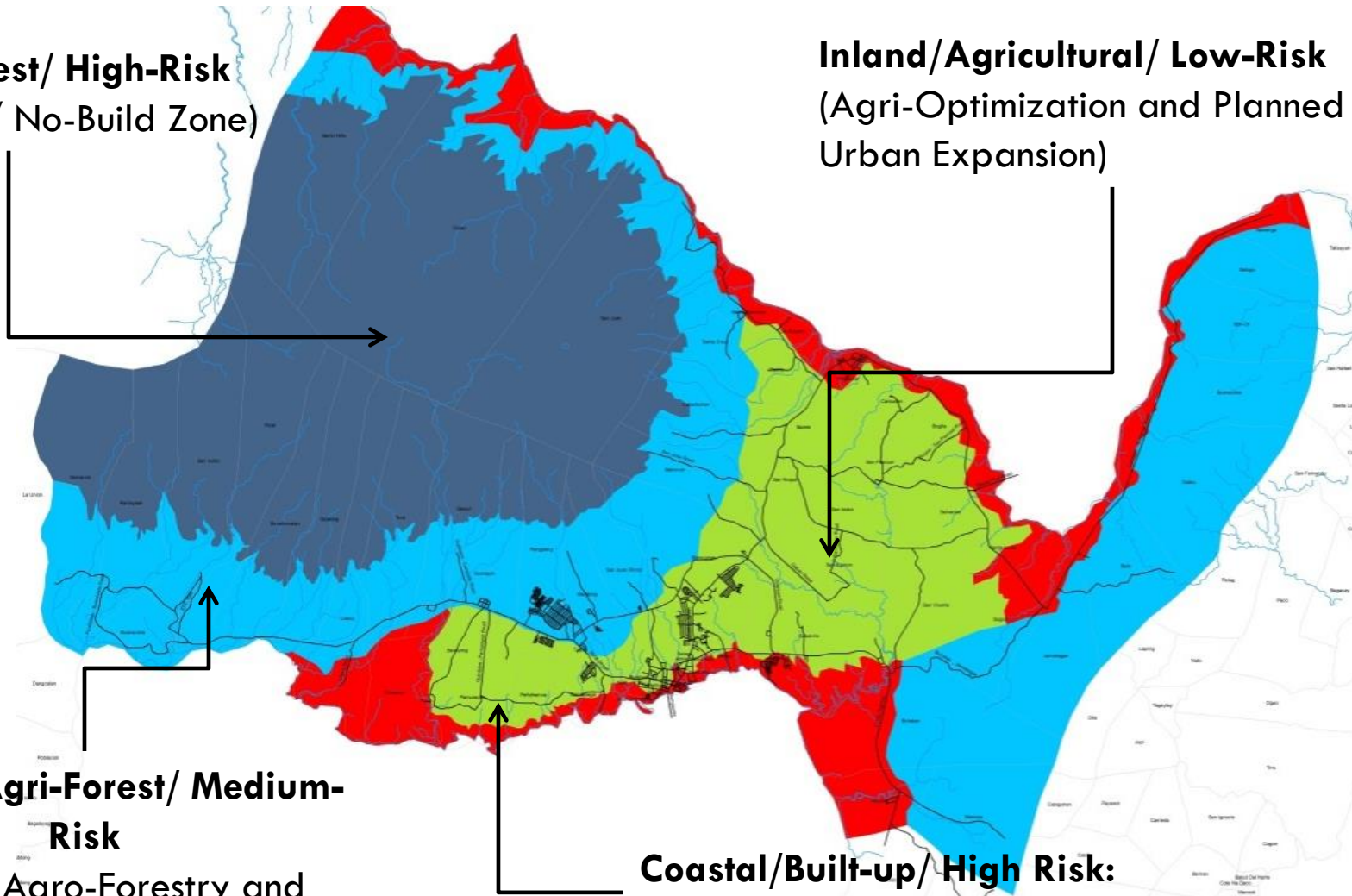
Policy Zones

Upland/ Forest/ High-Risk
(Conservation/ No-Build Zone)

Inland/Agricultural/ Low-Risk
(Agri-Optimization and Planned
Urban Expansion)

Upland/ Agri-Forest/ Medium-Risk
(Limited Agro-Forestry and
Ecotourism)

Coastal/Built-up/ High Risk:
(Disaster Risk-Sensitive Development)



Policy Zones

- Each policy zone...
 - ▣ is defined be based on:
 - the type and level of risk in the area
 - its topography
 - dominant land use
 - ▣ will have its own development strategy
 - to guide the land use
 - to harmonize programs, projects, and legislation specific to that area.

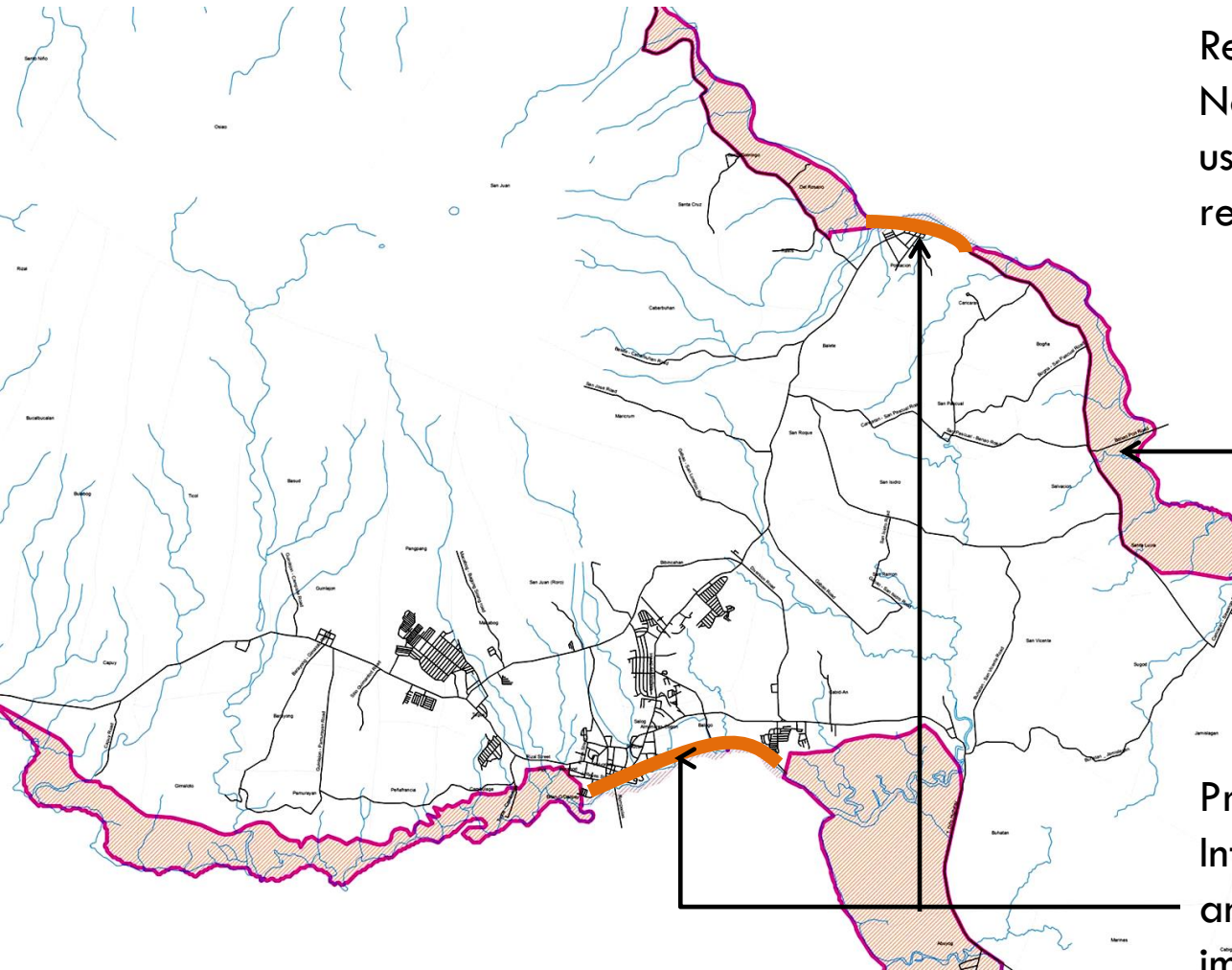


Development Strategy – Coastal Areas



- **Disaster risk sensitive redevelopment**
 - ▣ Minimizing damage
 - ▣ Protection of existing assets
 - ▣ Assistance to vulnerable communities
 - ▣ Preserving and protecting natural environment
 - ▣ Preventing further development in very high risk areas

Development Controls – Coastal Areas



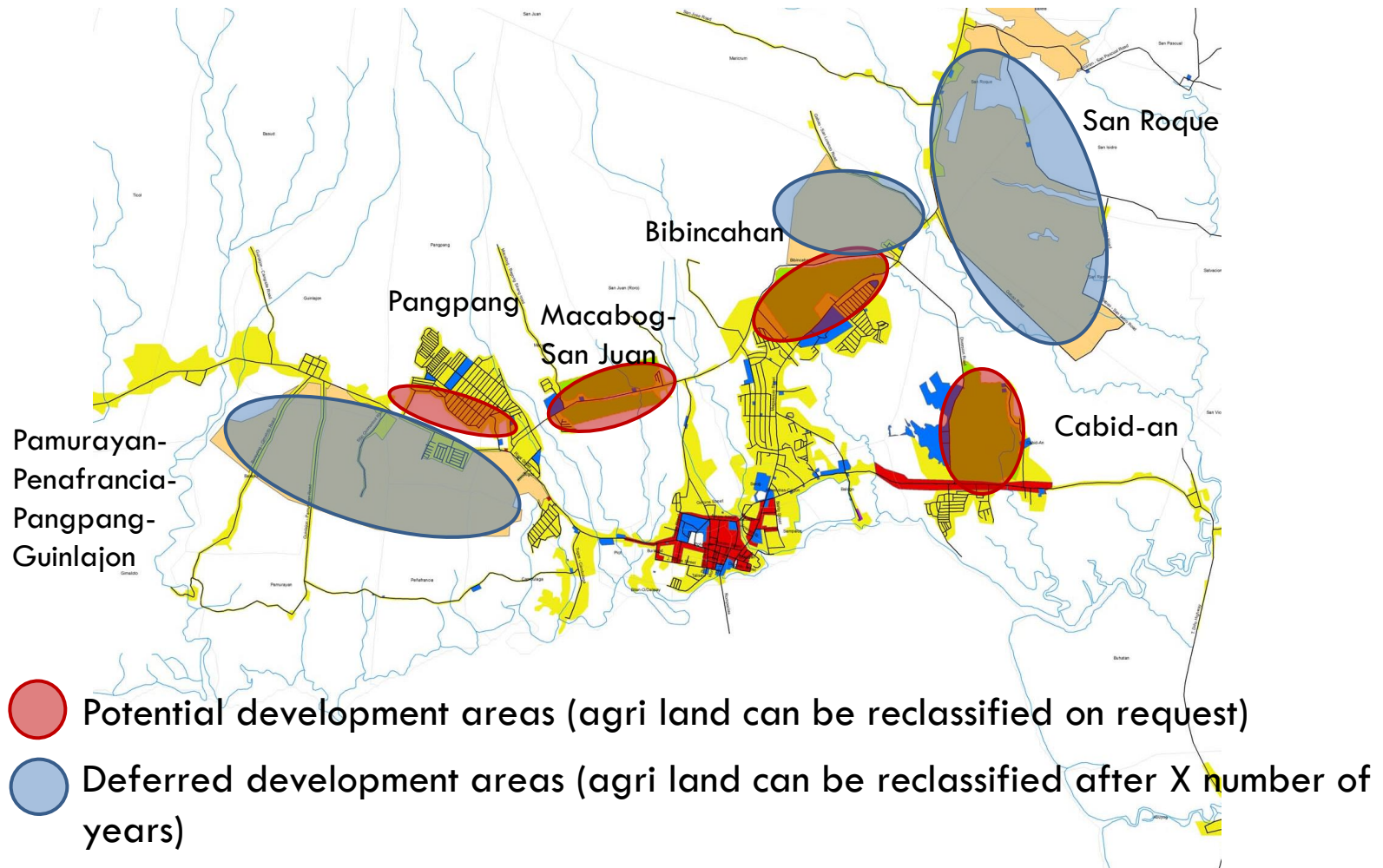
Restricted development;
No reclassification of agricultural
uses to higher order uses (e.g.
residential, commercial, industrial)

Protected built-up area;
Integrated waterfront planning
and development encouraged to
improve protection and reduce
risk

Development Strategy – Inland Areas

- **Agri Optimization and Planned Urban Expansion**
 - ▣ Preservation of prime agricultural areas
 - ▣ Identification of urban expansion sites
 - ▣ Development of infrastructure in urban expansion sites
 - ▣ Waterways protection and wastewater management to protect downstream areas from flooding and pollution
 - ▣ Explore possibility of floodwater retention areas

Development Strategy – Inland Areas

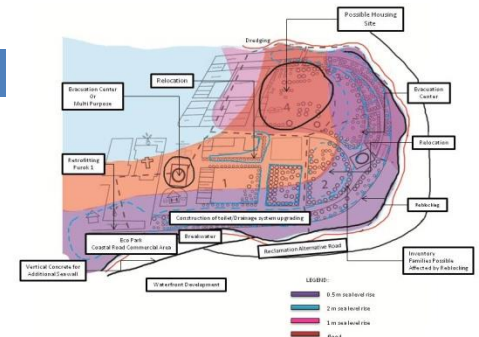


Implementation

- Zoning ← Required to follow
- Development Guidelines ← Flexible
- Incentives/ dis-incentives for private development
- Strengthening environmental management (coastal, forest, waterways)
- Public Capital Investment
- Area Development Plans (ADPs)

Area Development Plans

- Detailing the “vision” for an area



Community Action Plan (Sirangan)



Example of Riverside Development Master Plan



Example of Waterfront Development Master Plan

Identified Action Areas

Needs further planning

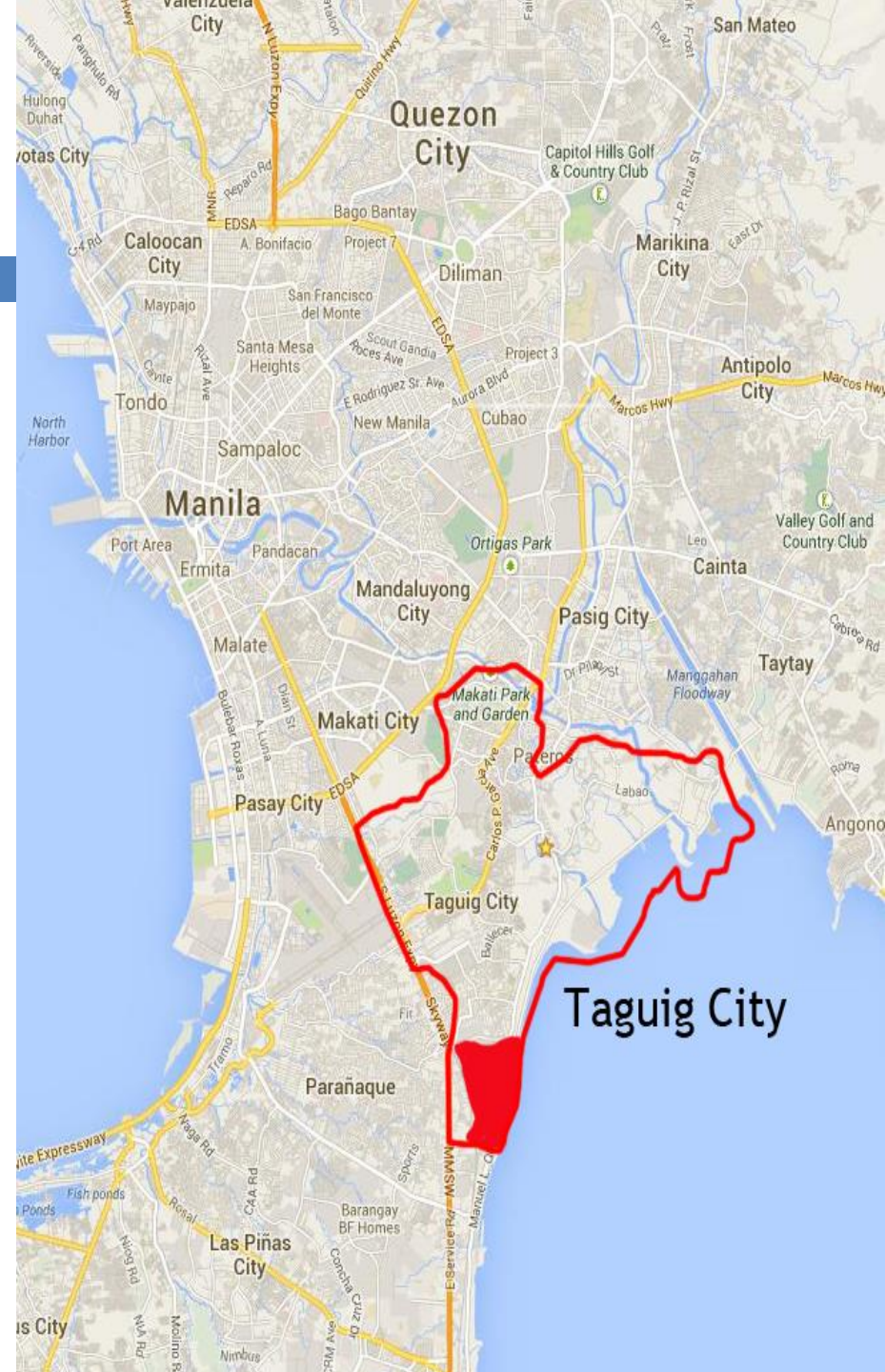
- Riverside development
 - ▣ Salog riverside (within CBD)
 - ▣ Anahaw river (Barangay Piot) – highway crossing
- Coastal development
 - ▣ Sorsogon Bay urban coastal barangays – possible recreational strip and enhanced shore protection
 - ▣ Bacon Poblacion coastal area – possible recreational strip and enhanced shore protection
- Sorsogon CBD
 - ▣ Improve traffic/ circulation system
 - ▣ Improve drainage
 - ▣ Identify green areas/ parks
 - ▣ Identify investment areas

CASE EXAMPLE 2

Conceptual Master Development Plan for Lower Bagumbayan, Taguig

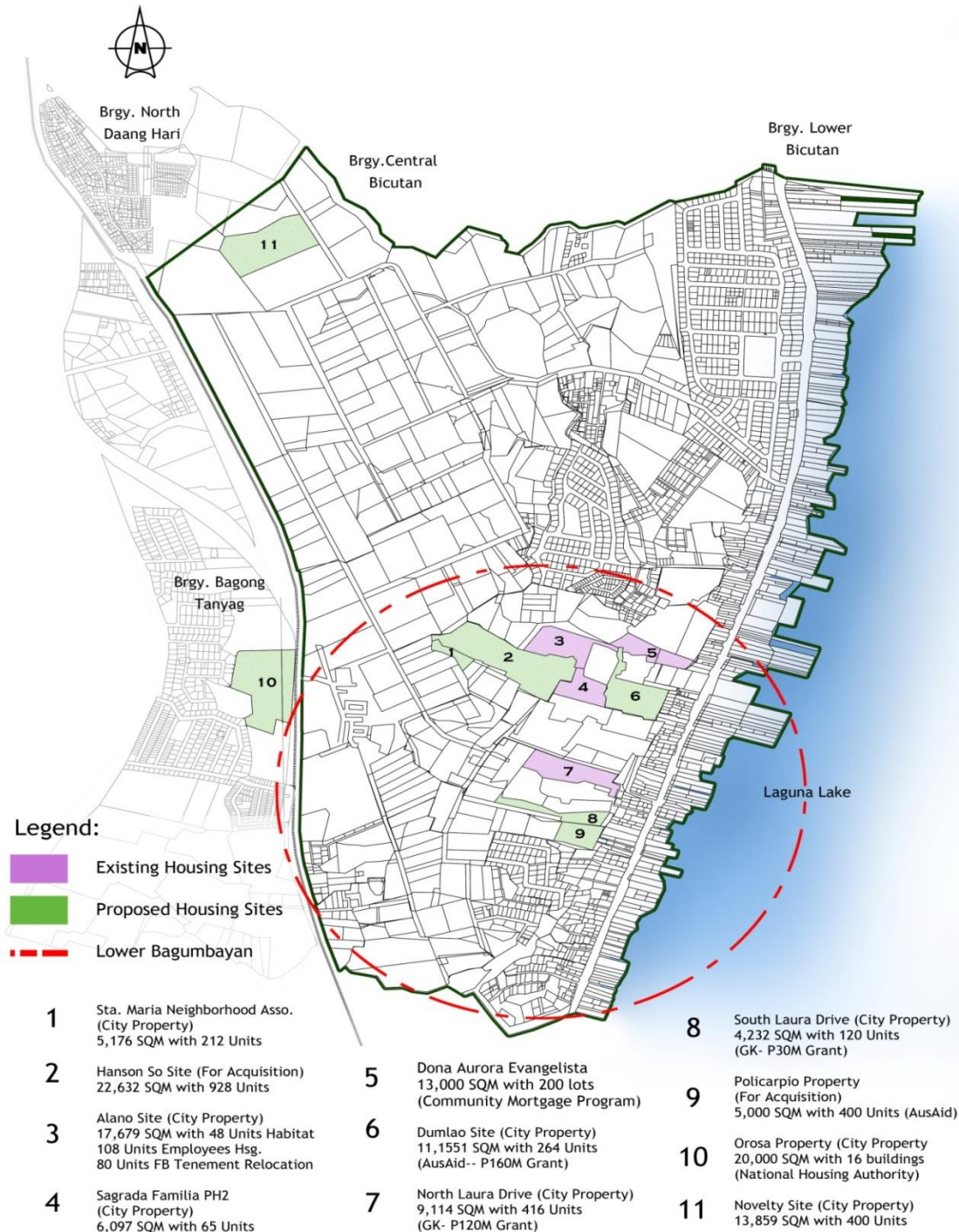
Location

- **Barangay Bagumbayan**
 - 362 hectares (8 % of Taguig)
 - 33,334 persons with 5,879 households (5.2% of Taguig)
 - 92 persons/ hectare population density
 - The site of proposed social housing projects which aim to accommodate informal settler families (ISFs) from danger areas of Taguig.



Housing Sites in Bagumbayan

- About 2,500 families can be accommodated in 11 proposed resettlement sites within and around the barangay
- There are also existing housing sites built by Gawad Kalinga and Habitat for Humanity and other initiatives.



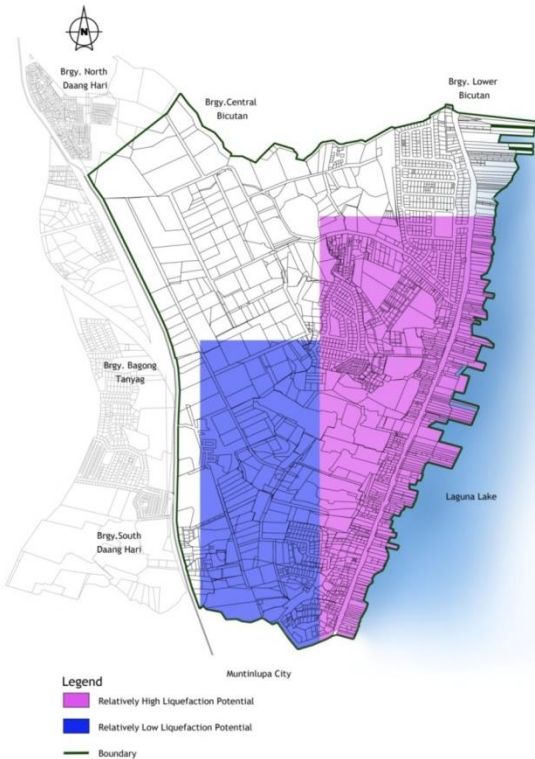
Objectives of the Master Plan

- **Outline the infrastructure works needed to improve walkability and accessibility, mitigate flooding, and contribute to making Lower Bagumbayan a safer and more livable community.** Specifically it aims to:
 - ▣ *Assess existing conditions and development constraints;*
 - ▣ *Recommend improvements in land use and zoning and basic infrastructure and utilities; and*
 - ▣ *Identify possible implementation mechanisms, further detailed studies and planning of the area.*

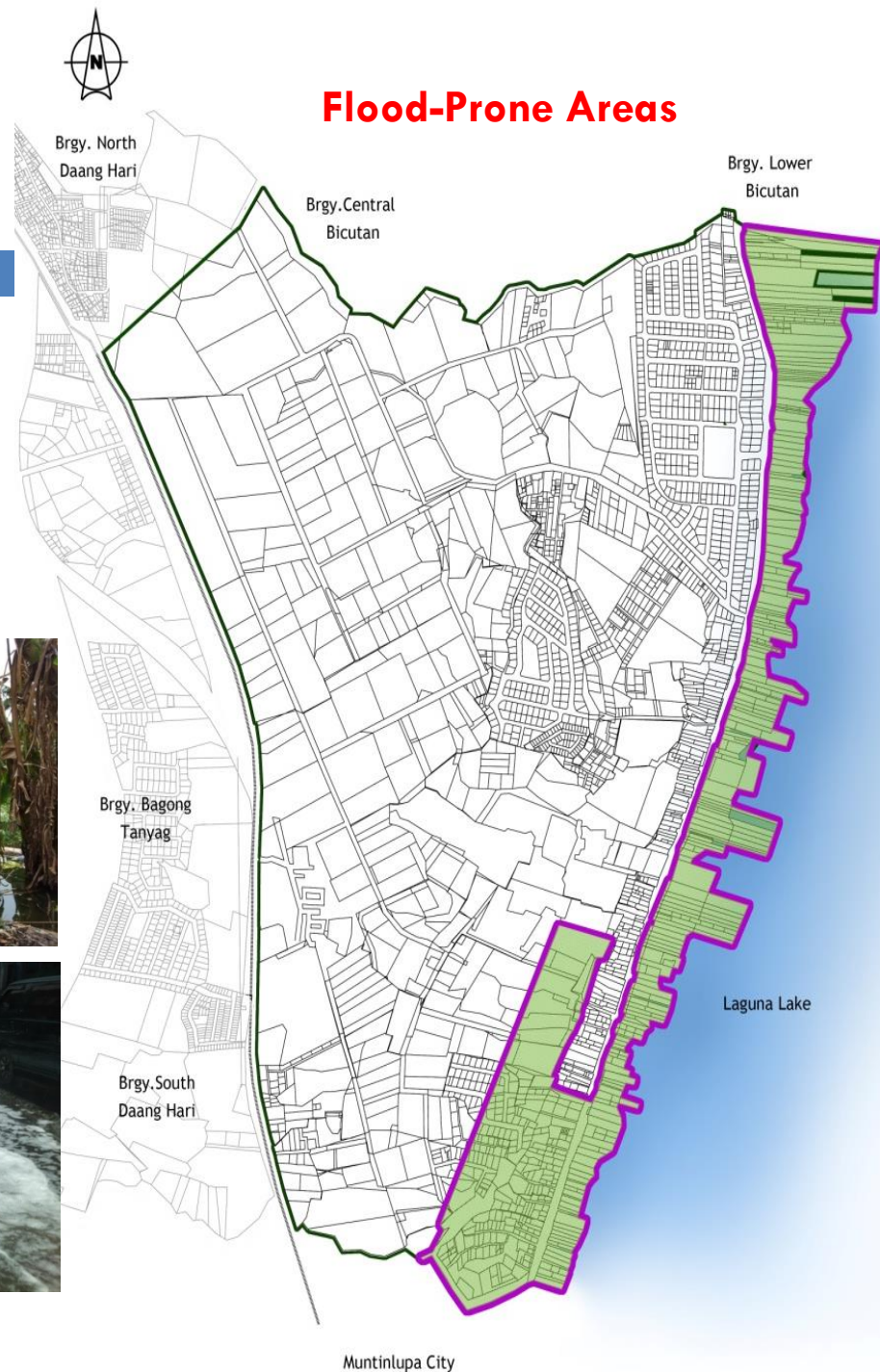


Development constraints

- **Susceptibility to flooding and liquefaction of lakeshore and low-lying areas**

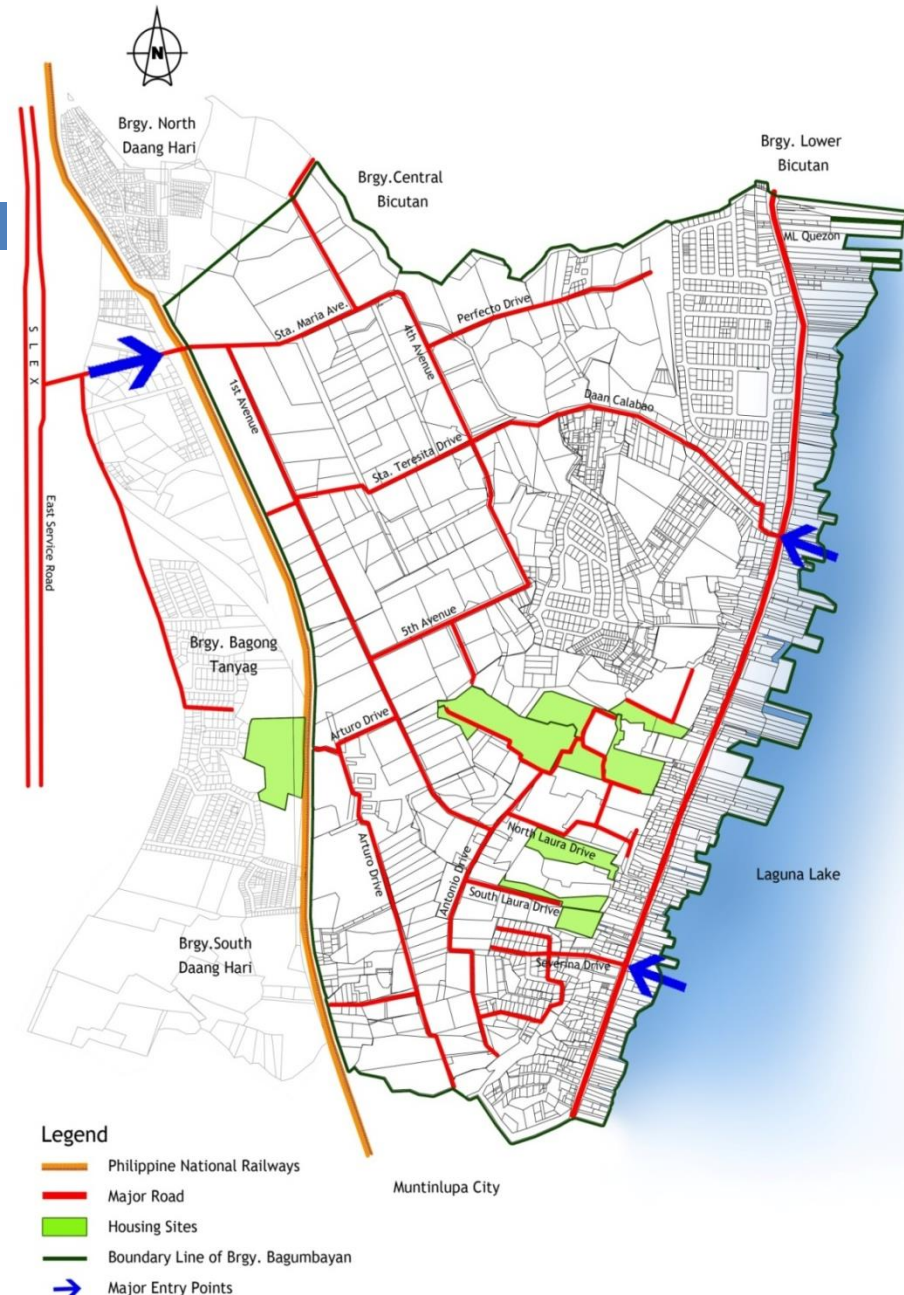


Liquefaction map



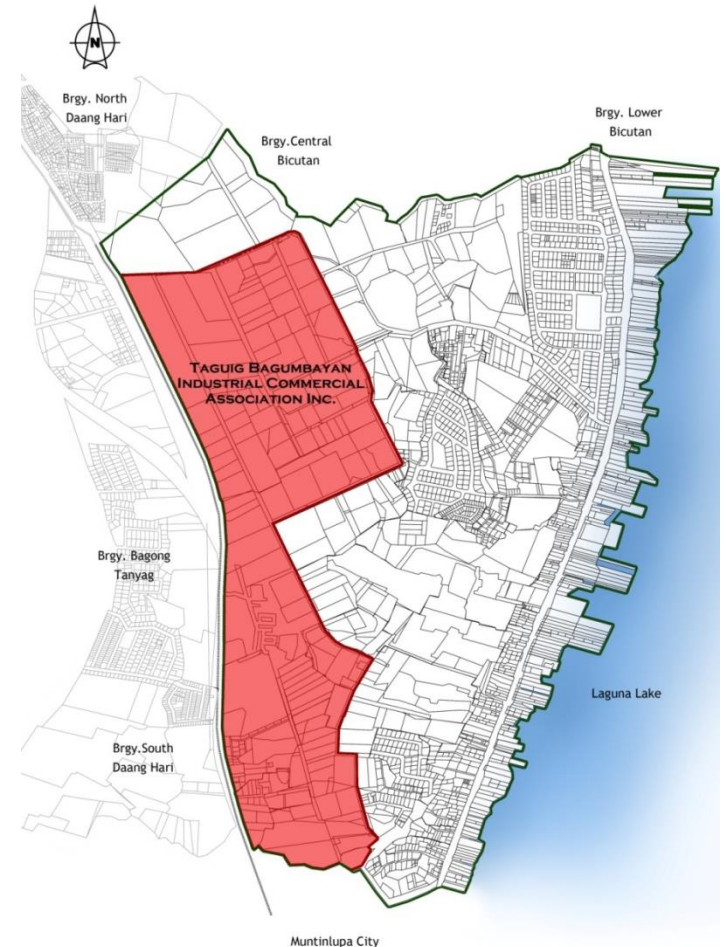
Development constraints

- **Inadequate physical and social infrastructure.**
 - ▣ **Limited access to M.L. Quezon, SLEX, and PNR**
 - ▣ **Disconnected internal circulation network**
 - ▣ **Insufficient drainage system**
 - ▣ **Lack of flood protection along the lakeside**
 - ▣ **Limited capacity of existing social services and facilities**



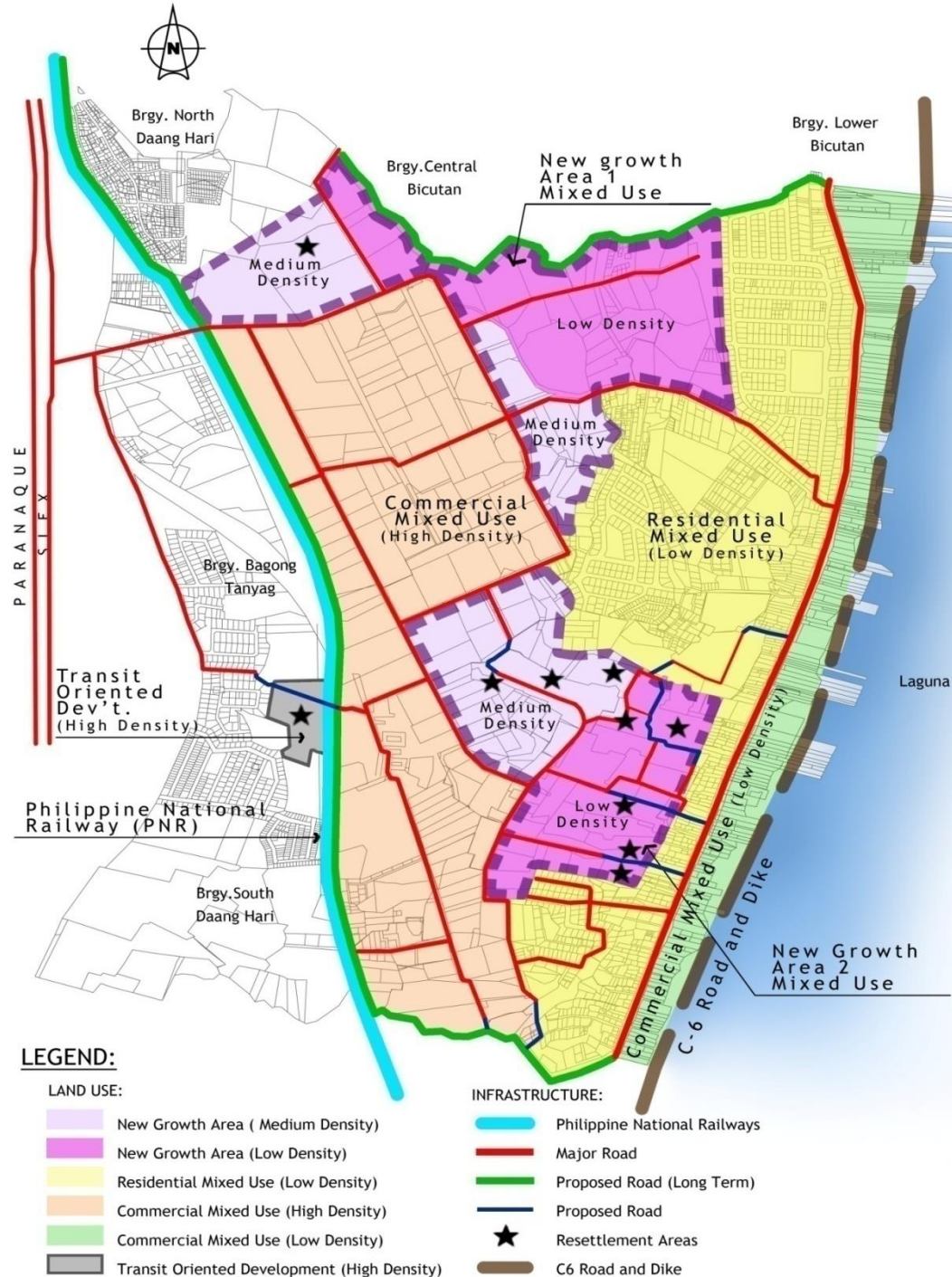
Development potentials

- **Proximity to major arteries** such as SLEX, M.L. Quezon, PNR and the future C6 Expressway
- **Lakefront location.** Potential may be developed if better access and views to the waterfront is provided.
- **Open spaces for new development and properties for redevelopment.** A number of empty lots in Lower Bagumbayan are still undeveloped; locators in the industrial complex may choose to eventually commercialize their area.



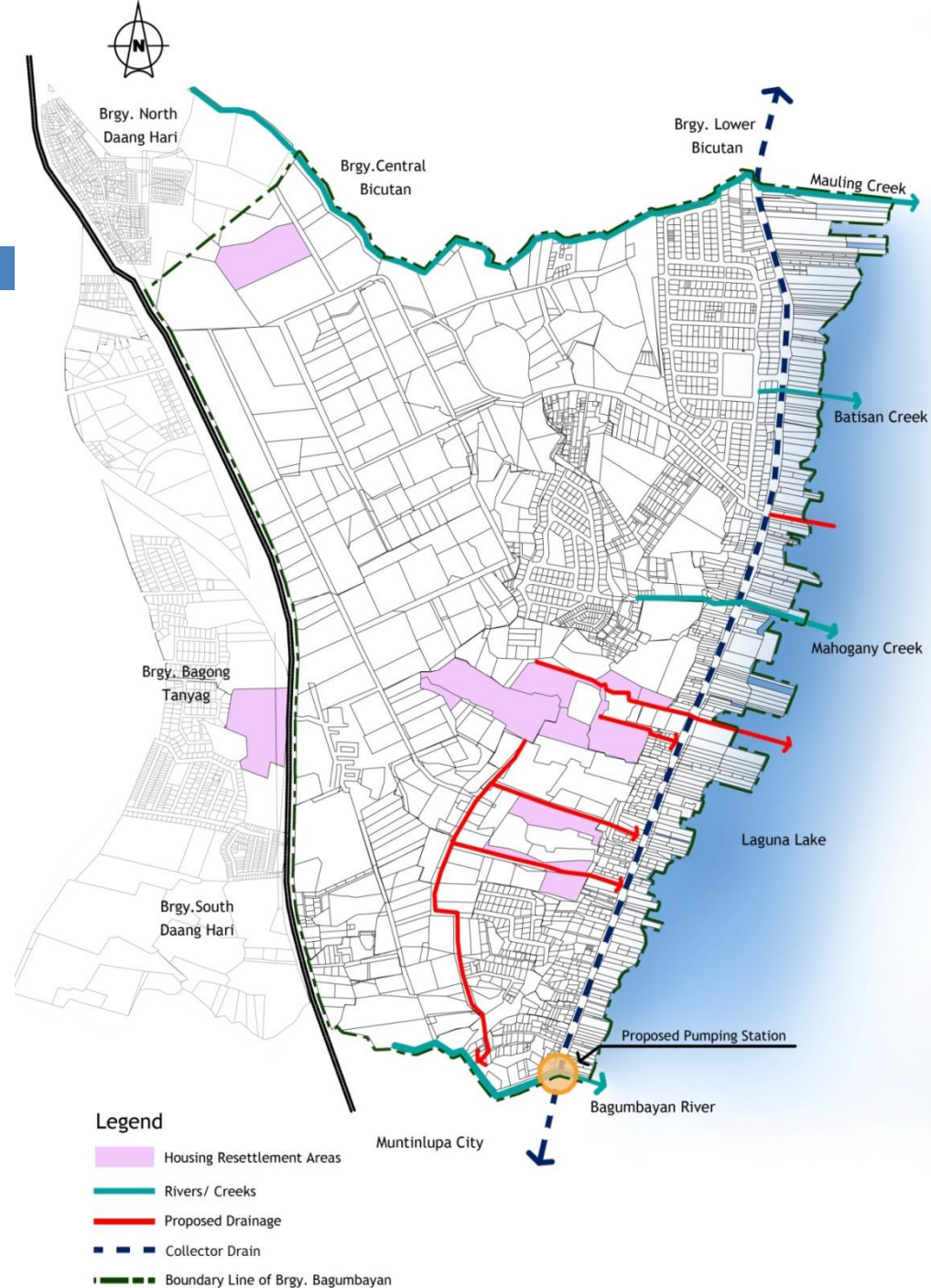
The Master Plan

- Proposed land use
- Proposed roads and drainage
- Mitigation measures for hazard, environmental, and traffic impacts
- Housing development approach



The Master Plan

- Proposed new drainage to solve shallow flooding in low elevation areas



The Master Plan

- **Housing development approach**
 - ▣ Medium-rise apartments
 - ▣ Earthquake and flood-resilient design
 - ▣ Provision for social facilities
 - ▣ Combination of units for rental and ownership

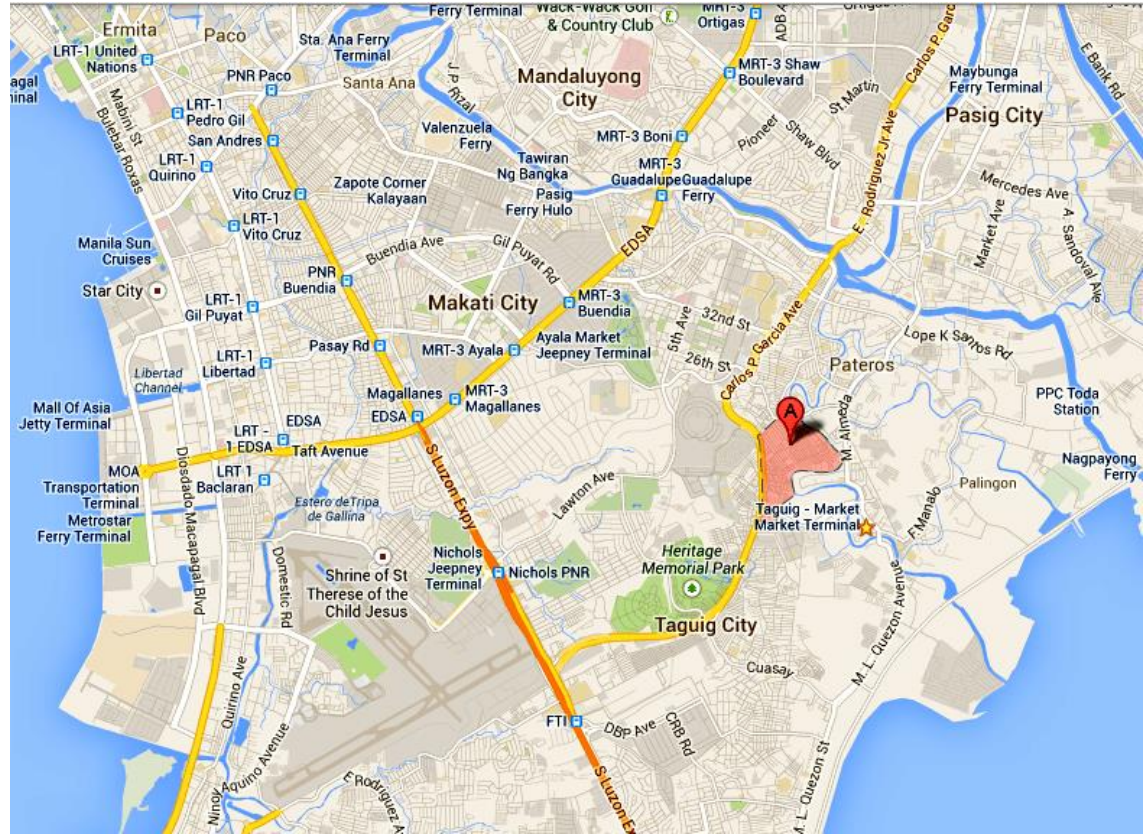


CASE EXAMPLE 3

Risk Sensitive Urban Redevelopment Plan For Barangay Rizal, Makati

Barangay Rizal, Makati

- Located on eastern fringe of Makati
- Population about 40,000
- Dense residential settlements (1-2 storeys) with narrow streets
- West Valley Fault runs along the western portion
- Chosen because of its high physical risk, high degree of social vulnerability, and high redevelopment potential.



Objectives of Redevelopment Plan

- Prepare a risk sensitive urban redevelopment master plan for Barangay Rizal that will reduce disaster risk, mitigate potential damage and losses due to earthquakes and enhance the sustainability of the area in the long term
- Aim to be a model for risk-sensitive redevelopment planning which other high-risk areas can adapt

Situational Analysis (components)

- Hazard assessment
- Building risk analysis
- Vulnerability and capacity analysis
- Site analysis
- Emergency management evaluation
- Identification of redevelopment concerns and issues

EXISTING SITUATION



Narrow roads



Potential fault rupture

Critical Issues

□ PHYSICAL VULNERABILITY

- Unsafe buildings and structures (6% very high risk, 34% high risk based on engineering evaluation)
- Lack of open spaces
- Narrow and obstructed roads

□ SOCIO-ECONOMIC VULNERABILITY

- Inadequate economic capacity (16% below poverty line)
- Presence of highly vulnerable households
- Rising population density

□ EMERGENCY MANAGEMENT

- Evacuation difficulty
- Inadequate capacity in emergency preparedness and response

Risk Reduction Objectives

- ❑ Eliminate permanent human exposure in “very high-risk” structures (within fault zone)
- ❑ Reduce risk of residents in “high-risk” structures (in liquefaction prone areas)
- ❑ Ensure safety of critical buildings and facilities (schools and emergency centers)
- ❑ Ensure safety of buildings with high occupancy density
- ❑ Address post-earthquake emergency response needs (access to emergency vehicles, temporary shelter, medical services, debris storage)
- ❑ Address potential impact of fault rupture and debris on emergency access/ evacuation

REDEVELOPMENT PLAN

High risk
community



**Disaster-resilient
community**



IMMEDIATE (1 year)



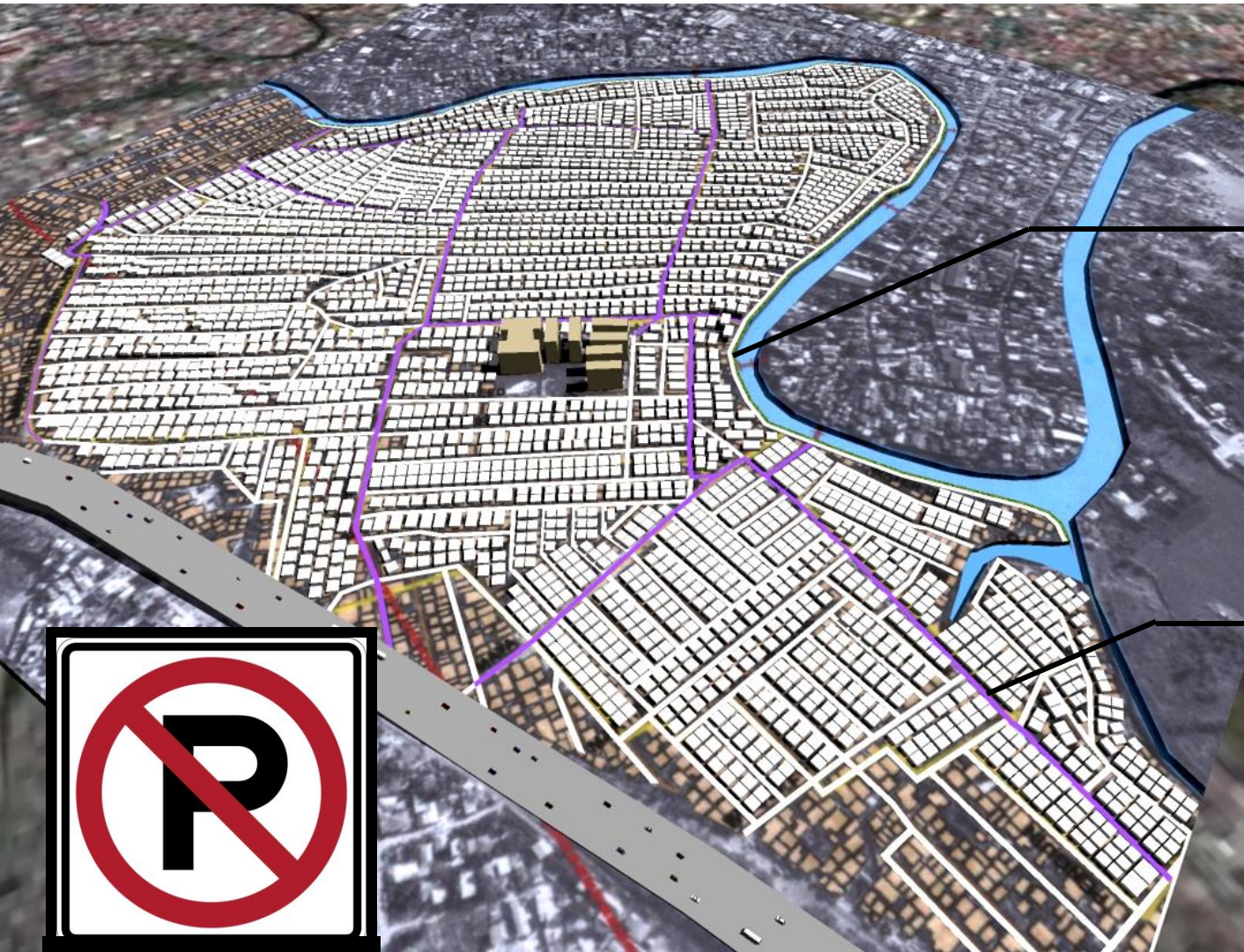
Study of property acquisition for road widening and open space requirements

Seismic investigation of critical and high risk structures

Feasibility study on creekside linear park

Detailed study on rehousing and modes of compensation for households on fault zone

SHORT TERM (2-3 years)



Creek linear park and road

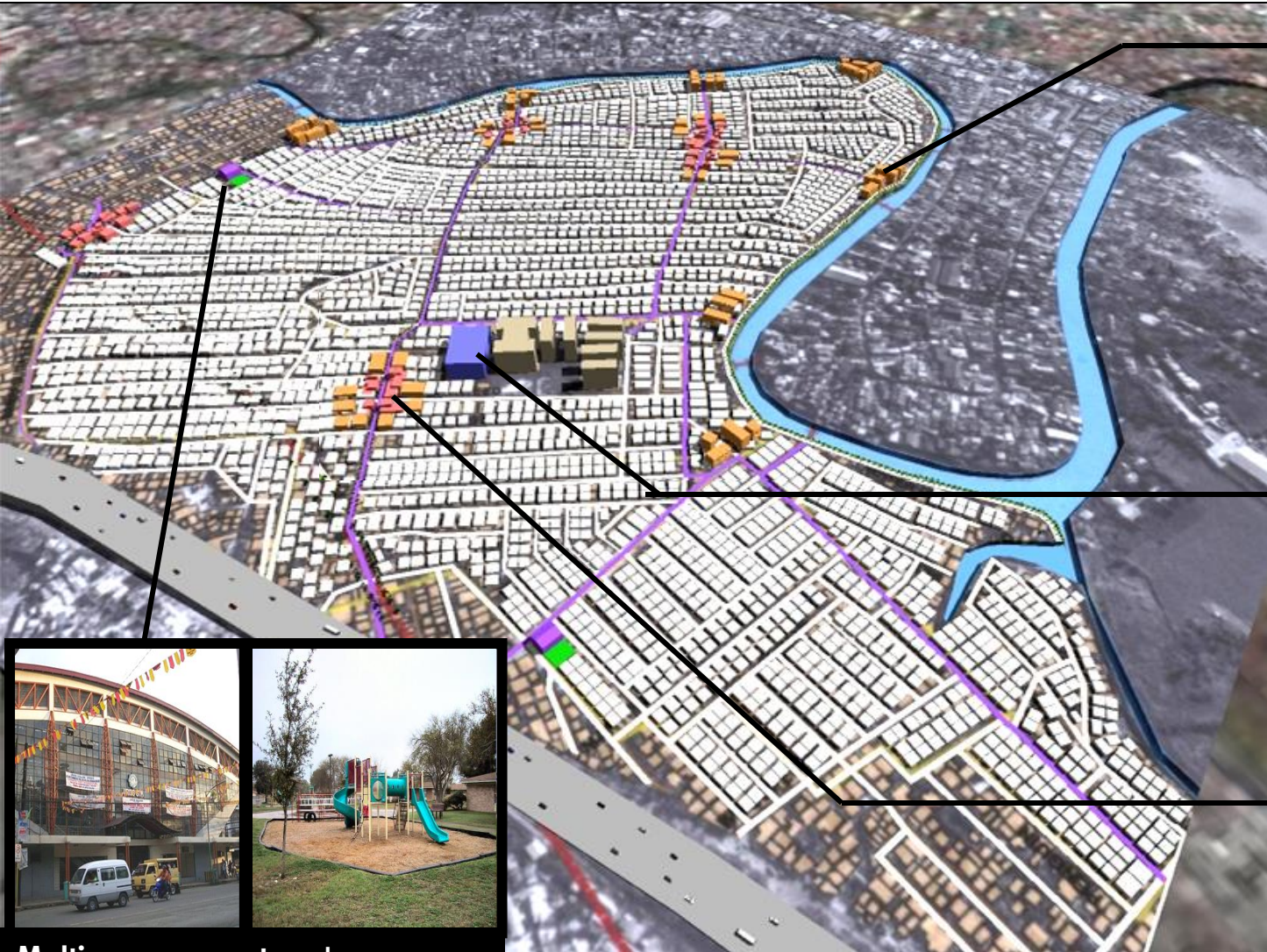


Road widening and connections



Traffic Management

MEDIUM (4-6 years)



Medium-rise housing



School expansion

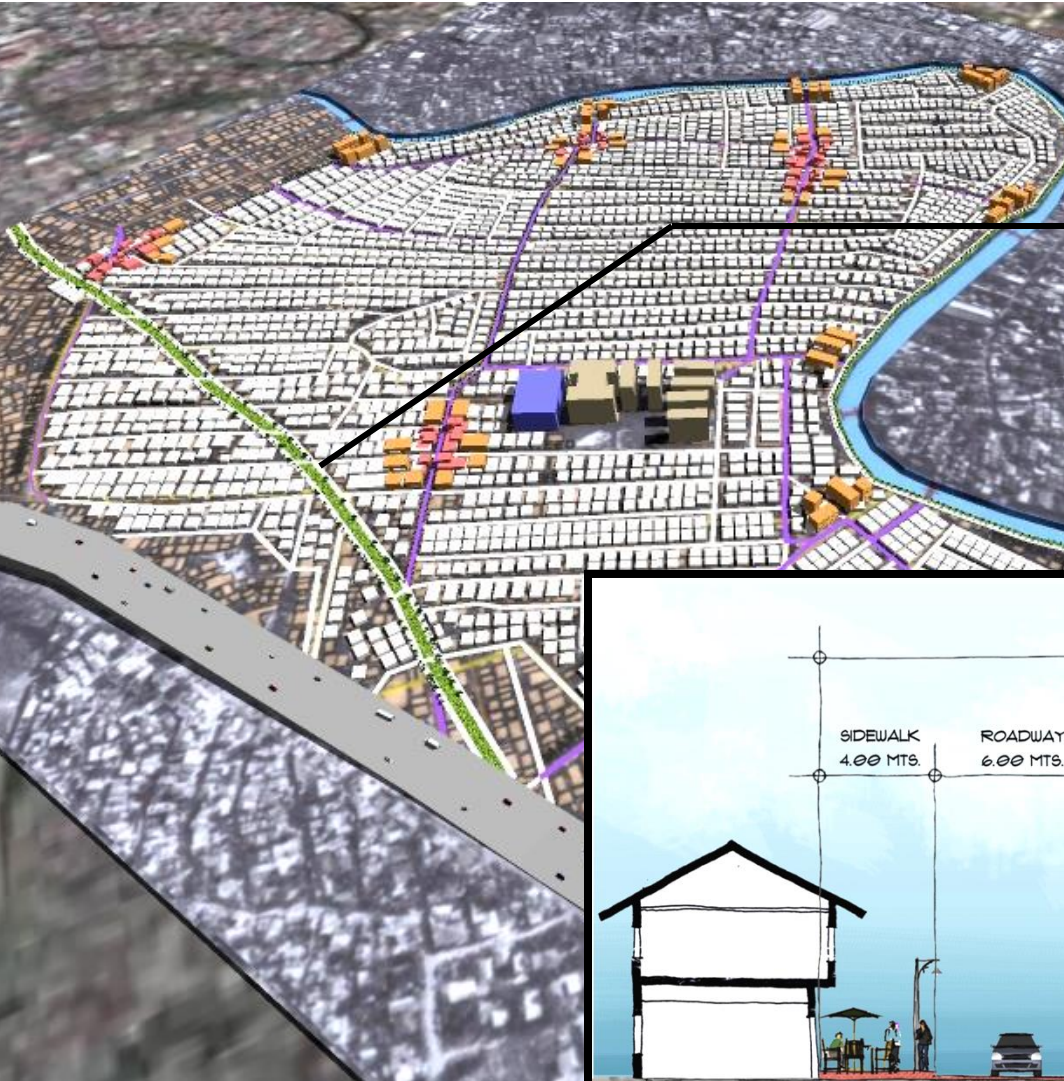


Multi-purpose centers + neighborhood open spaces

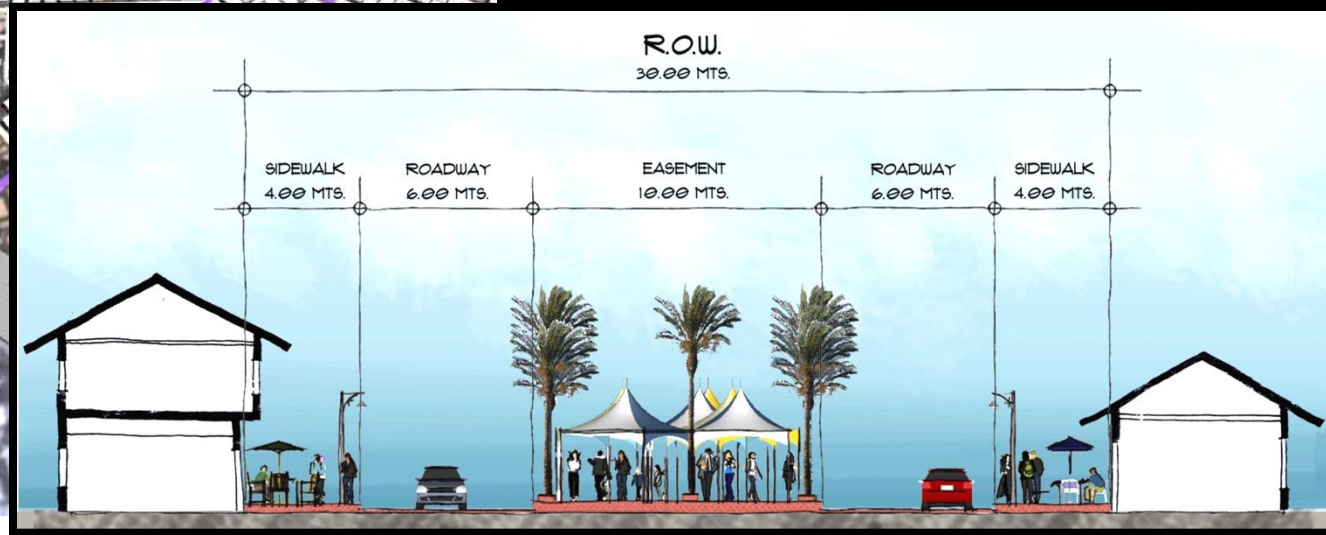


Commercial areas

LONG-TERM (7-9 years)



Fault Zone Development



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CONCLUSIONS & RECOMMENDATIONS

CONCLUSIONS & RECOMMENDATIONS

- Selection of sites for redevelopment/ upgrading needs to be informed by city-level planning and analysis
- Housing interventions should also be anchored to a city housing policy/ shelter plan
- Need for barangay/ community-level assessment of conditions and hazards to determine appropriate interventions

CONCLUSIONS & RECOMMENDATIONS

- Clear risk reduction objectives need to be set (what is the level of acceptable risk?)
- Proposed improvements can address multiple objectives of risk reduction, livability, and sustainability
- Consider institutional capacity of city to implement improvements over the long-term
- Consider possible participation of private sector