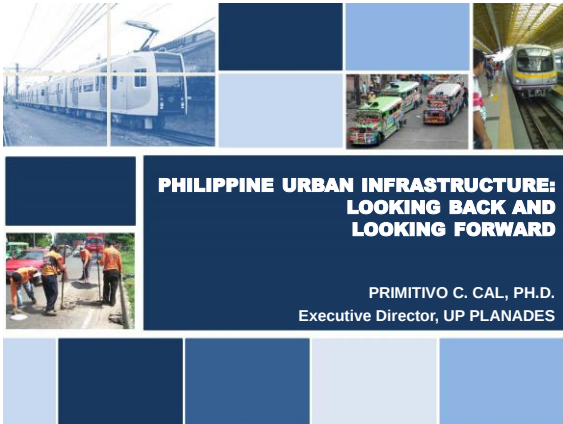


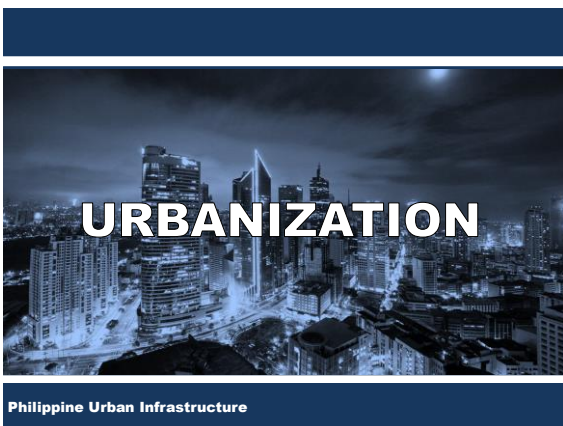


Outline of Presentation

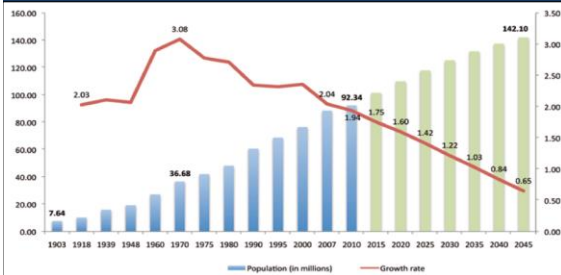
- Urbanization
- Presentation for each infra component (Transport, Communications, Water Supply, Drainage, & Solid Wastes Management):
 - Trends
 - Issues & Concerns
 - Policies, Plans & Programs

Philippine Urban Infrastructure

2



Population Trends

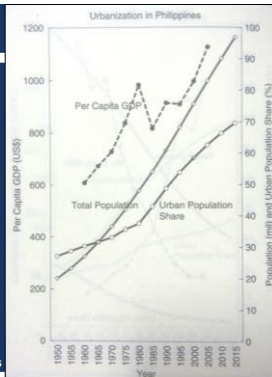


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4

Urbanization in the Philippines

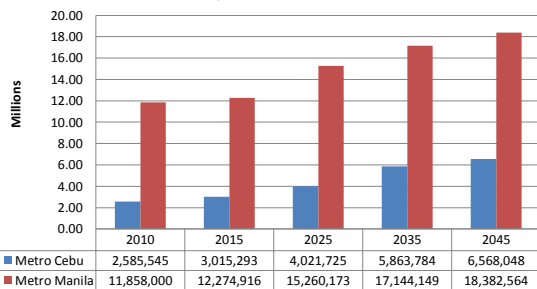
Source: UN Population Division, 2005



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5

Population Forecast



Notes: - Metro Cebu forecasts derived from NCSO provincial forecasts by year 2045;
 - Metro Manila forecasts taken from the JICA Study Report on Roadmap for Transport Infra Development for MM and its surrounding areas.

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6



URBAN TRANSPORT

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Current State of Urban Transport

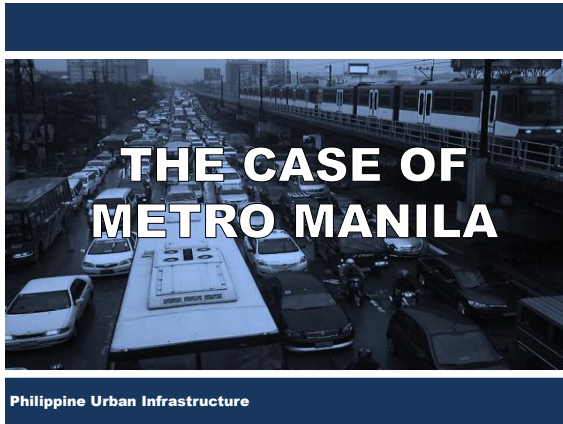
- Medium to big cities experiencing worsening transport & traffic problems
 - Traffic congestion
 - Low public transport level of service
 - High rate of traffic accidents
 - Air pollution in major cities

Philippine Urban Infrastructure

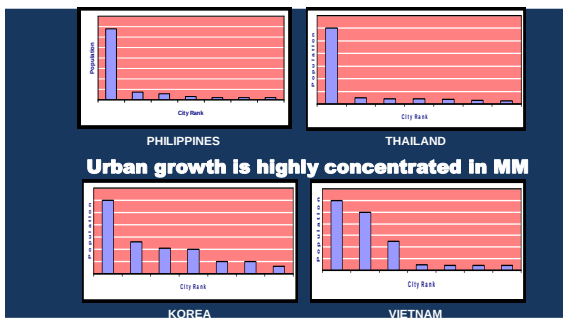
Current State of Urban Transport (2)

- Resources for TPTM limited
- Insufficient data for scientific analyses
- Budget spent for personnel & little left for substantive measures
- Inadequate institutional set-up to do TPTM
- Planning personnel lack TPTM capability

Philippine Urban Infrastructure



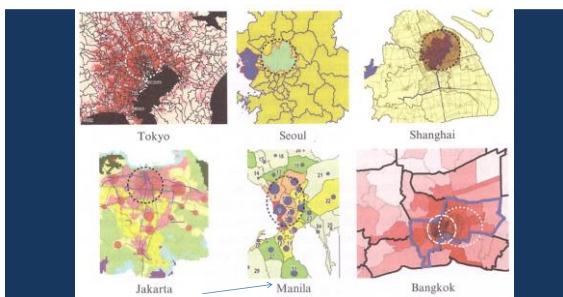
City Size Distribution



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11

Urban form of Asian megacities: (a) Seoul, (b) Tokyo, (c) Jabotabek, (d) Metro Manila, (e) Shanghai, (f) Bangkok



Urban form of MM is mono-centric

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12

Note the low capacity of the LRT system in MM

Asian MRT^a and their daily ridership 2010

City	Opening year	Length, 2010 (km)	Daily passengers ('000)	Car ownership No./1,000 population	Remarks	Urbanized density ^b (persons per ha)	Population (greater MA), million
Seoul	1974	287	5,610	229	Rapid expansion, refinancing for alternative modes, BRT	230	24.5
Metro Manila	1984	52	948	50 ^b	No expansion due to financial constraint, low capacity	206	21.4
Shanghai	1995	423	3,560	95	Rapid expansion, 400 km by 2010 (using leasing fee)	196	19.2
Taipei	1996	101	1,270	244	Rapid expansion, 118 by 2010	220	6.7
Bangkok	1999	75	564	227 ^a	Uncertain expansion plan	138	11.9

Source: STREAM compilation from city case studies

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13

Proposed Strategy

- Improve public transport level of service
- Expand capacity of rail mass transit system
- Improve traffic management
- Expand road network to improve highway level of service
- Improve land use planning
- Pursue institutional reforms

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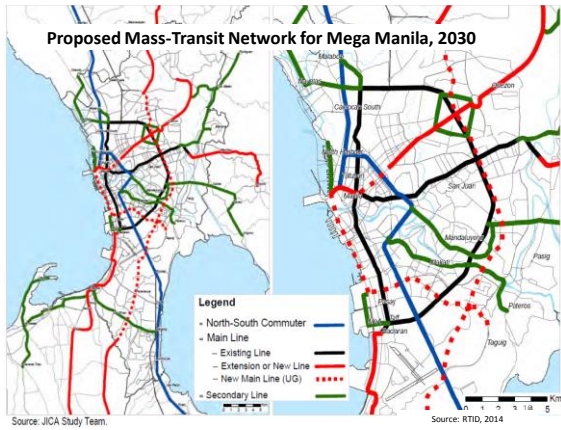
14

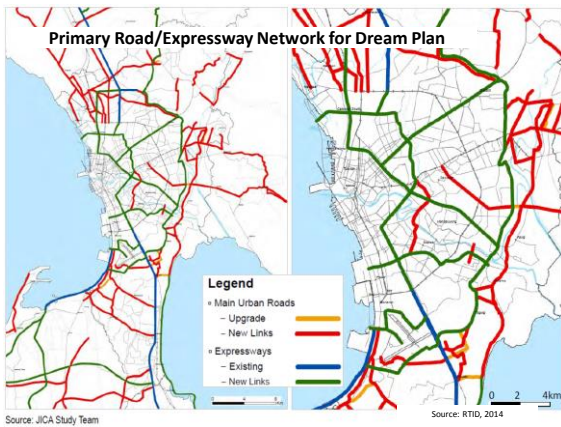
Proposed GCR Spatial Structure



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15







History of communications devt in the Phil.

1867 - The first telegraph link was established between Manila & Corregidor.
 1890 - The Country's first telephone system was inaugurated.
 1923 - Radio broadcasting was introduced.
 1967 - Color television was introduced into the country.
 1988 – PLDT inaugurated its cellular mobile telephone network, the country's first.
 Source: *Oquindo, n.d.*

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19

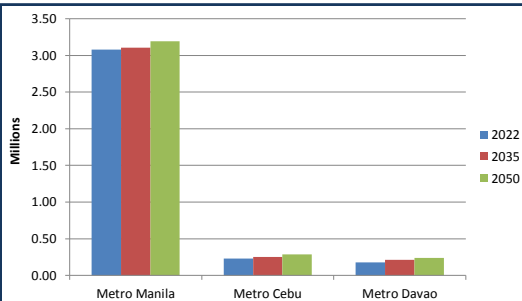
IN BRIEF: Telecom Sector in the Philippines

- While the telecom sector in the Philippines has witnessed considerable investment and activity since deregulation, the market has continued to fall short of its potential.
- The mobile market has been particularly energetic for some years now, for example, with a genuine revolution in the development of SMS as an effective communications service.

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20

Fixed Installed Lines



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21

Broadband in the Philippines

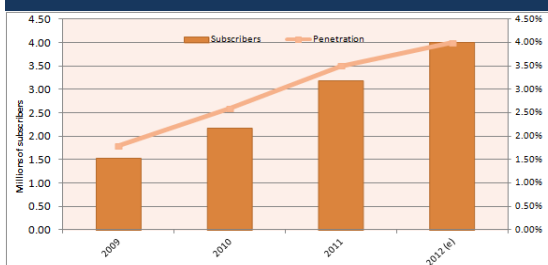
Table 12 - Broadband statistics - 2014

Broadband	Statistics
Total broadband subscribers	7.03 million
DSL subscribers(e)	2.33 million
Broadband household penetration(e)	12%
Broadband penetration	7.0%

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22

Broadband in the Philippines



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23

Role Of Internet In the Philippines

Table 20 - Internet user statistics - 2013

Internet User	Statistics
Internet users	6.6 million
Internet user penetration	37%
Internet subscribers(e)	3 million
Number of PCs(e)	6.5 million
PC penetration(e)	37%

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24

Forecast: Internet Subscribers (2015,2020,2022,2035, and 2050)

Year	Lower Growth Scenario		Higher Growth Scenario	
	Subscribers (million)	Penetration	Subscribers (million)	Penetration
2009	3.6	4%	3.6	4%
2010	4.3	5%	4.3	5%
2011	5.2	8%	5.2	5%
2012	6.2	9%	6.2	6%
2013	7.0	7%	7.0	7%
2014	8.2	10%	8.4	9%
2015	9.5	12%	15.0	14%
2020	18.0	18%	30.0	28%
2022	21.4	19%	36.0	32%
2035	43.5	33%	75.0	57%
2050	69.0	47%	120.0	82%

Source: BuddeComm

Average Download Speeds in ASEAN Region (July 2014)

Country	Broadband Speed	Mobile Speed
Singapore	69.69 Mbps	15.41 Mbps
Thailand	20.83 Mbps	4.5 Mbps
Vietnam	15.07 Mbps	1.39 Mbps
Malaysia	5.93 Mbps	4.06 Mbps
Brunei	5.74 Mbps	6.86 Mbps
Cambodia	5.44 Mbps	3.32 Mbps
Myanmar	4.64 Mbps	0.47 Mbps
Indonesia	4.54 Mbps	2.18 Mbps
Laos	3.76 Mbps	2.36 Mbps
Philippines	3.4 Mbps	3.8 Mbps

Source: Ookla Net Index

Infrastructure Developments

- Voice Over Internet Protocol (VoIP) – took several years to reach conclusion with NTC and the Telcos.
- Several companies now offer this service to both local and international calls.
- There are around 20 licensed VoiP providers in the Philippines in 2007.
- PLDT launched a VoiP in 2008 for OFWs.
- Broadband started to flourish in 2005 offered by PLDT.

Issues and Concerns

- Slow internet speed
- High infrastructure cost
- Outdated law
- Unsatisfactory mobile service
- Hackers

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28

Proposals

- Expand market liberalization
- Consider open access approaches to infra
- Establish a National Broadband Network
- Review licensing schemes
- Evaluate policy structures for spectrum

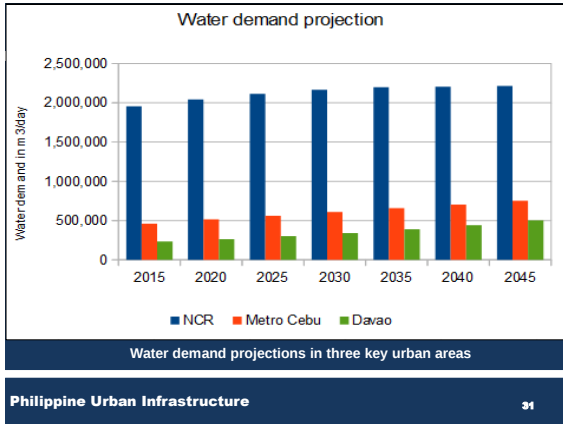
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29



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30



Supply/Demand Situations, m3/day

City	Demand	Supply
Metro Manila	1,850,000	4,000,000
Metro Cebu	408,176	233,000
Metro Davao	362,000	175,000

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32

COMPONENTS

- Source
- Treatment
- Storage
- Distribution
- Metering

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33

Issues and Concerns

- Insufficient water supply
- High rate of non-revenue water
- Water quality and treatment
- User competition
- Fiscal support

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34

Advancement in Technology

- Leakage detection equipment
- Water-efficient products
- Efficient irrigation systems
- Water recycling systems
- High-efficiency desalination plants

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35

Proposals

- New water supply infrastructure
- Water conservation
- Watershed management
- Water quality management
- Capacity building of water districts
- Legislative measures
 - Rainwater harnessing
 - Storm water disposal
 - Monitoring

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36

DRAINAGE

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37

Flood Incidence (Metro Manila-Ondoy)



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38

Flooding (Iloilo City)



Typhoon Frank

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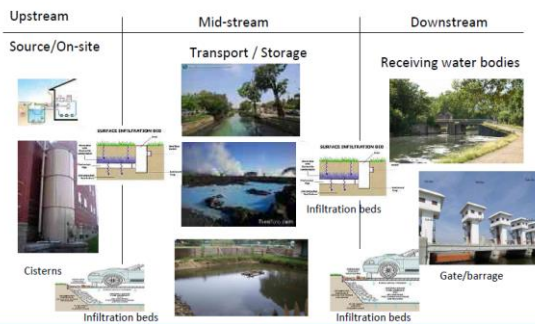
39

Flooding (Cagayan De Oro City)



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40



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41

Causes of Flooding

- Inadequate or no drainage system
- Flat terrain
- Siltation and clogging of drainage
- Constriction of river systems

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42

Proposals

- Improve drainage system
- Enact local legislation on:
 - Reforestation & watershed mngt
 - Protection of waterways
 - Land use control
 - Installation of cisterns
- Develop & implement an IEC Program
- Strengthen enforcement of laws & policies

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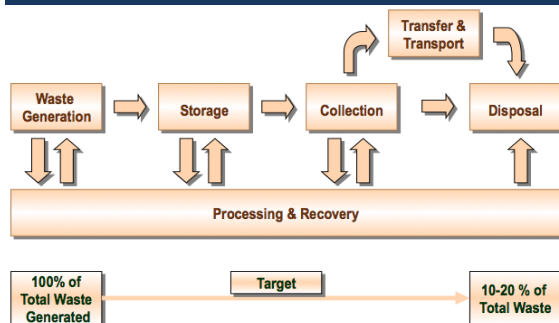
49



SOLID WASTE MANAGEMENT

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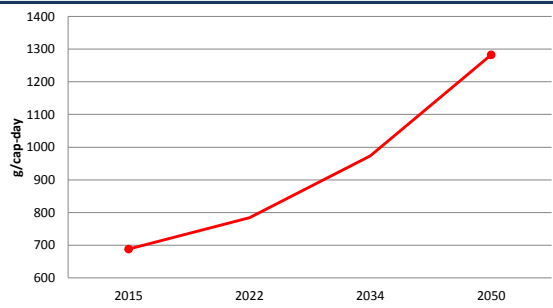
Elements of SWM



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48

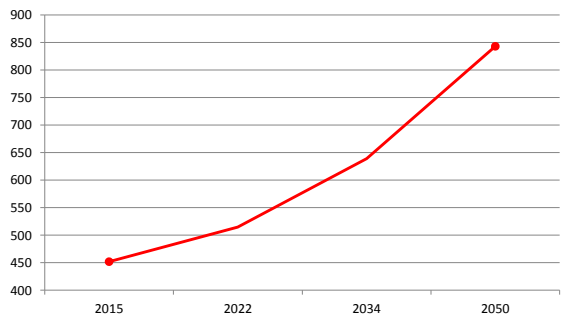
SW Generation Projection in Metro Manila



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46

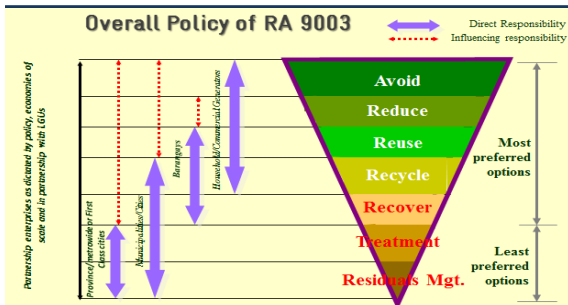
SW Generation Projection in Metro Cebu



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47

NSWM Framework



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Source: NSWM, 2004

48

Issues/Challenges in SWM

- Existence of open dumpsite disposal facilities,
- Need for more functional SLFs and waste to energy technology,
- Inadequate enforcement in the segregation of wastes and other provisions of RA 9003,
- Need for more functional MRFs in barangays or cluster of barangays,
- Recycling and composting are not yet practiced by many LGUs,
- Garbage collection does not cover all barangays, and
- Need for more PPPs in SWM

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49

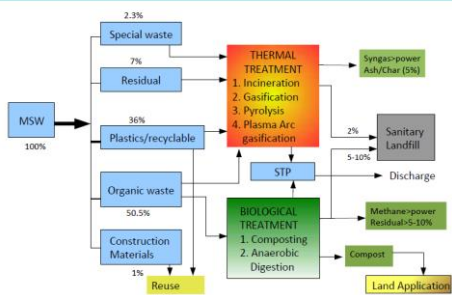
Proposals

- Accelerate the implementation of the 3Rs of SWM
- Invest in the construction of sanitary landfills
- Consider the use of waste-to-energy technology
- Develop and implement an IEC program
- Improve the enforcement of laws and policies

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50

Technology/treatment Options/Byproduct



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