

## **APPENDICES**

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## ***APPENDIX TO CHAPTER 2***

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## APPENDIX 2A

## (1) Population and Growth Trend of Mega Manila

Province/City/Municipality		Area (ha)	Population (000)			Share (%)			Density (person/ha)			AGR(%/year)	
			1990	2000	2010	1990	2000	2010	1990	2000	2010	'90-'00	'00-'10
Metro Manila	Manila	2,528	1,599	1,581	1,652	12.4	8.8	7.2	632	625	653	-0.1	0.4
	Mandaluyong	1,126	245	278	329	1.9	1.6	1.4	217	247	292	1.3	1.7
	Marikina	2,150	310	391	424	2.4	2.2	1.8	144	182	197	2.4	0.8
	Pasig	3,531	397	505	670	3.1	2.8	2.9	113	143	190	2.4	2.9
	Quezon	13,692	1,667	2,174	2,762	12.9	12.1	12.0	122	159	202	2.7	2.4
	San Juan	594	127	118	121	1.0	0.7	0.5	213	198	204	-0.7	0.3
	Caloocan	5,297	761	1,178	1,489	5.9	6.6	6.5	144	222	281	4.5	2.4
	Malabon	1,571	278	339	353	2.2	1.9	1.5	177	216	225	2.0	0.4
	Navotas	1,045	187	230	249	1.4	1.3	1.1	179	221	238	2.1	0.8
	Valenzuela	4,459	340	485	575	2.6	2.7	2.5	76	109	129	3.6	1.7
	Las Pinas	3,269	297	473	553	2.3	2.6	2.4	91	145	169	4.8	1.6
	Makati	14,480	453	471	529	3.5	2.6	2.3	31	33	37	0.4	1.2
	Muntinlupa	4,660	277	379	460	2.1	2.1	2.0	59	81	99	3.2	2.0
	Paranaque	4,504	308	450	588	2.4	2.5	2.6	68	100	131	3.9	2.7
	Pasay	1,444	367	355	393	2.8	2.0	1.7	254	246	272	-0.3	1.0
	Pateros	185	51	57	64	0.4	0.3	0.3	278	310	347	1.1	1.1
	Taguig	4,123	266	467	644	2.1	2.6	2.8	65	113	156	5.8	3.3
	Sub-total	68,658	7,929	9,933	11,856	61.3	55.5	51.5	115	145	173	2.3	1.8
Bulacan	Balagtas (Bigaa)	1,762	43	57	65	0.3	0.3	0.3	24	32	37	2.9	1.4
	Angat	5,072	34	46	55	0.3	0.3	0.2	7	9	11	2.9	1.9
	Baliuag	5,427	90	120	144	0.7	0.7	0.6	17	22	26	2.9	1.8
	Bocaue	1,882	67	87	106	0.5	0.5	0.5	36	46	57	2.6	2.0
	Bulacan	7,319	49	63	72	0.4	0.4	0.3	7	9	10	2.6	1.3
	Busotos	4,099	35	47	62	0.3	0.3	0.3	9	11	15	3.0	2.9
	Calumpit	4,697	59	81	101	0.5	0.5	0.4	13	17	22	3.2	2.2
	Dona Remedios Trionidad	89,410	9	14	20	0.1	0.1	0.1	0	0	0	4.7	3.8
	Guiguinto	2,264	45	68	91	0.3	0.4	0.4	20	30	40	4.3	3.0
	Hagonoy	10,453	90	111	126	0.7	0.6	0.5	9	11	12	2.1	1.2
	Malolos (Capital)	7,492	125	175	235	1.0	1.0	1.0	17	23	31	3.4	3.0
	Marilao	2,910	56	101	186	0.4	0.6	0.8	19	35	64	6.0	6.3
	Meycauayan	3,869	124	163	199	1.0	0.9	0.9	32	42	51	2.8	2.0
	Norzagaray	25,822	33	77	103	0.3	0.4	0.4	1	3	4	8.7	3.0
	Obando	1,728	46	53	58	0.4	0.3	0.3	27	31	34	1.3	0.9
	Pandi	3,791	33	48	67	0.3	0.3	0.3	9	13	18	4.0	3.3
	Paombong	4,502	32	41	51	0.2	0.2	0.2	7	9	11	2.5	2.2
	Plaridel	3,634	53	80	101	0.4	0.4	0.4	15	22	28	4.3	2.3
	Pulilan	3,865	48	68	86	0.4	0.4	0.4	12	18	22	3.5	2.3
	San Ildefonso	14,416	60	80	95	0.5	0.4	0.4	4	6	7	3.0	1.7
	San Jose del Monte	15,805	142	316	455	1.1	1.8	2.0	9	20	29	8.3	3.7
	San Miguel	25,949	91	124	143	0.7	0.7	0.6	4	5	6	3.1	1.4
	San Rafael	10,444	50	70	86	0.4	0.4	0.4	5	7	8	3.5	2.1
	Santa Maria	8,721	91	144	218	0.7	0.8	0.9	10	17	25	4.7	4.2
	Sub-total	265,331	1,505	2,234	2,924	11.6	12.5	12.7	6	8	11	4.0	2.7
Cavite	Alfonso	5,524	29	40	49	0.2	0.2	0.2	5	7	9	3.2	2.0
	Amadeo	4,507	21	26	33	0.2	0.1	0.1	5	6	7	2.0	2.7
	Bacoor	4,715	160	306	520	1.2	1.7	2.3	34	65	110	6.7	5.5

Province/City/Municipality		Area (ha)	Population (000)			Share (%)			Density (person/ha)			AGR(%/year)	
			1990	2000	2010	1990	2000	2010	1990	2000	2010	'90-'00	'00 - '10
	Carmona	2,025	28	48	75	0.2	0.3	0.3	14	24	37	5.4	4.6
	Cavite City	645	92	99	101	0.7	0.6	0.4	142	154	157	0.8	0.2
	Dasmariñas	8,797	137	380	576	1.1	2.1	2.5	16	43	65	10.8	4.3
	Gen. Mariano Alvarez	1,011	66	112	139	0.5	0.6	0.6	65	111	137	5.5	2.1
	General Emilio Aguinaldo	4,014	11	14	18	0.1	0.1	0.1	3	4	4	2.7	2.0
	General Trias	8,482	53	108	243	0.4	0.6	1.1	6	13	29	7.4	8.5
	Imus	5,227	92	195	302	0.7	1.1	1.3	18	37	58	7.8	4.4
	Indang	8,914	39	51	62	0.3	0.3	0.3	4	6	7	2.7	1.9
	Kawit	1,547	48	63	78	0.4	0.4	0.3	31	41	51	2.8	2.2
	Magallanes	7,039	13	18	21	0.1	0.1	0.1	2	3	3	3.7	1.6
	Maragondon	14,864	23	31	35	0.2	0.2	0.2	2	2	2	3.2	1.2
	Mendez-Nunez	1,528	18	23	29	0.1	0.1	0.1	12	15	19	2.7	2.2
	Naic	7,701	52	73	88	0.4	0.4	0.4	7	9	11	3.5	2.0
	Noveleta	585	20	32	42	0.2	0.2	0.2	35	55	71	4.6	2.7
	Rosario	678	45	74	92	0.4	0.4	0.4	67	109	136	5.0	2.3
	Silang	14,331	94	156	213	0.7	0.9	0.9	7	11	15	5.2	3.2
	Tagaytay City	6,210	24	45	62	0.2	0.3	0.3	4	7	10	6.7	3.2
	Tanza	7,261	62	111	189	0.5	0.6	0.8	9	15	26	6.0	5.5
	Ternate	4,213	12	17	19	0.1	0.1	0.1	3	4	5	3.7	1.2
	Trece Martires	4,519	16	42	105	0.1	0.2	0.5	3	9	23	10.3	9.6
	Sub-total	124,336	1,153	2,063	3,091	8.9	11.5	13.4	9	17	25	6.0	4.1
	Laguna	Alaminos	6,030	27	36	44	0.2	0.2	0.2	5	6	7	2.8
Bay		4,063	33	44	56	0.3	0.2	0.2	8	11	14	3.0	2.4
Binan		3,687	135	201	283	1.0	1.1	1.2	36	55	77	4.1	3.5
Cabuyao		3,937	67	107	248	0.5	0.6	1.1	17	27	63	4.8	8.8
City of Calamba		13,892	173	281	389	1.3	1.6	1.7	12	20	28	5.0	3.3
Calauan		7,911	33	43	75	0.3	0.2	0.3	4	5	9	2.8	5.6
Cavinti		9,714	15	19	21	0.1	0.1	0.1	2	2	2	2.6	0.7
Famy		3,333	8	10	15	0.1	0.1	0.1	2	3	5	2.8	3.7
Kalayaan		5,290	13	20	21	0.1	0.1	0.1	2	4	4	4.1	0.7
Liliw		3,614	22	28	34	0.2	0.2	0.1	6	8	9	2.3	2.1
Los Banos		5,028	66	82	102	0.5	0.5	0.4	13	16	20	2.2	2.2
Luisiana		6,107	14	17	20	0.1	0.1	0.1	2	3	3	1.9	1.7
Lumban		11,780	20	26	29	0.2	0.1	0.1	2	2	3	2.8	1.3
Mabitac		5,769	11	15	19	0.1	0.1	0.1	2	3	3	2.8	2.1
Magdalena		2,956	13	19	23	0.1	0.1	0.1	5	6	8	3.5	1.9
Majayjay		6,435	16	22	27	0.1	0.1	0.1	2	3	4	3.4	1.8
Nagcarlan		8,098	38	49	60	0.3	0.3	0.3	5	6	7	2.6	2.1
Paete		7,957	21	23	24	0.2	0.1	0.1	3	3	3	1.1	0.2
Pagsanjan		4,076	25	33	39	0.2	0.2	0.2	6	8	10	2.7	1.9
Pakil		2,938	13	18	21	0.1	0.1	0.1	5	6	7	3.0	1.5
Pangil		3,573	15	21	23	0.1	0.1	0.1	4	6	6	3.1	1.2
Pila		2,869	27	37	47	0.2	0.2	0.2	10	13	16	3.1	2.2
Rizal		2,396	10	13	16	0.1	0.1	0.1	4	5	6	3.2	1.8
San Pablo City		18,233	162	208	249	1.2	1.2	1.1	9	11	14	2.6	1.8
San Pedro		2,276	156	231	294	1.2	1.3	1.3	69	102	129	4.0	2.4
Santa Cruz		3,756	77	93	111	0.6	0.5	0.5	20	25	30	1.9	1.8
Santa Maria		13,442	21	25	27	0.2	0.1	0.1	2	2	2	1.8	0.9
Santa Rosa		5,637	95	186	285	0.7	1.0	1.2	17	33	51	7.0	4.4
Siniloan		2,617	23	30	35	0.2	0.2	0.2	9	11	14	2.8	1.7

Province/City/Municipality		Area (ha)	Population (000)			Share (%)			Density (person/ha)			AGR(%/year)	
			1990	2000	2010	1990	2000	2010	1990	2000	2010	'90-'00	'00 - '10
	Victoria	2,826	22	30	35	0.2	0.2	0.2	8	11	12	3.1	1.5
	Sub-total	180,239	1,370	1,966	2,670	10.6	11.0	11.6	8	11	15	3.7	3.1
Rizal	Angono	1,241	46	75	102	0.4	0.4	0.4	37	60	83	5.0	3.2
	Antipolo	28,462	208	471	678	1.6	2.6	2.9	7	17	24	8.5	3.7
	Baras	8,280	17	25	33	0.1	0.1	0.1	2	3	4	3.8	2.9
	Binangonan	5,144	128	188	250	1.0	1.0	1.1	25	36	49	3.9	2.9
	Cainta	2,961	127	243	312	1.0	1.4	1.4	43	82	105	6.7	2.6
	Cardona	3,303	33	39	47	0.3	0.2	0.2	10	12	14	1.7	2.0
	Jalajala	4,346	16	23	30	0.1	0.1	0.1	4	5	7	3.6	2.6
	Morong	3,545	32	42	52	0.2	0.2	0.2	9	12	15	2.8	2.1
	Pililia	7,849	33	45	60	0.3	0.3	0.3	4	6	8	3.3	2.8
	Rodriguez	26,971	67	115	281	0.5	0.6	1.2	2	4	10	5.6	9.3
	San Mateo	7,676	82	136	205	0.6	0.8	0.9	11	18	27	5.1	4.2
	Tanay	21,230	58	78	99	0.5	0.4	0.4	3	4	5	3.0	2.4
	Taytay	3,161	112	198	289	0.9	1.1	1.3	36	63	91	5.8	3.8
	Teresa	1,668	21	30	47	0.2	0.2	0.2	12	18	28	3.7	4.7
	Sub-total	125,837	980	1,707	2,485	7.6	9.5	10.8	8	14	20	5.7	3.8
Sub-total (BRLC)		695,742	5,008	7,970	11,170	38.7	44.5	48.5	7	11	16	4.8	3.4
Total		764,401	12,937	17,903	23,026	100.0	100.0	100.0	17	23	30	3.3	2.6

Source: 1990 Census of Population and Housing Report, Census 2000, 2010 Census of Population and Housing





## APPENDIX 2A

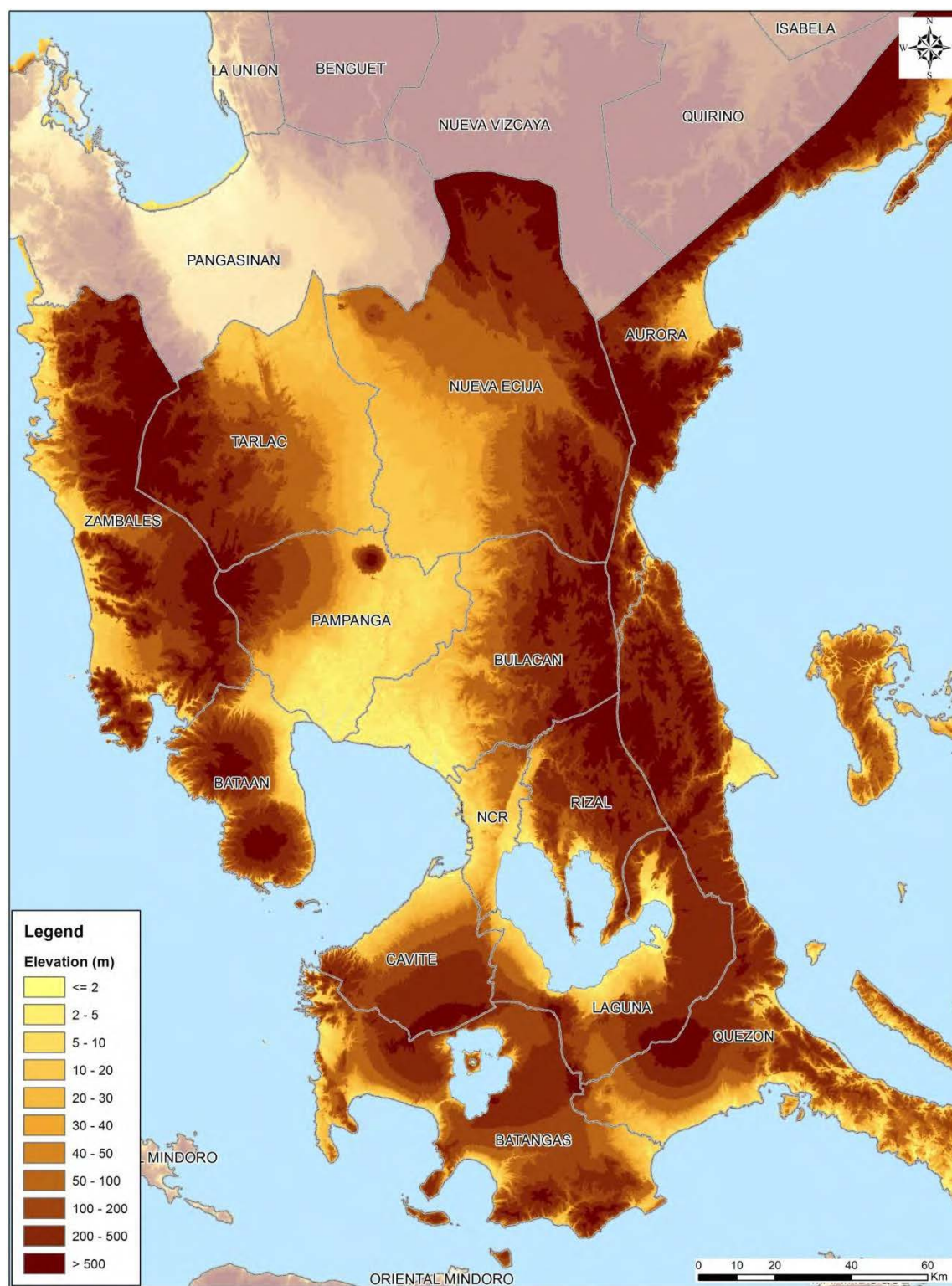
### (2) PHYSICAL DESCRIPTION OF GCR

#### 1 PHYSICAL CHARACTERISTICS

1.1 Topology of GCR is divided into coastal lowlands, plain, plateaus, valleys and mountains. Metropolitan Manila consists of coastal lowlands, central plateau and Marikina Valley. The coastal lowlands ranging from zero to five meters are from the Manila Bay coastal area such as the City of Manila to Mandaluyong and Makati (see Figure 1.1). The central plateau, elevation of which falls between 20 to 40 meters, is primarily used for residential areas such as those in San Juan, Makati and Quezon, though the northwest part of Metro Manila reaches from 70 to 100 meters. Marikina Valley is located along the Marikina River from the western area of Rizal province at 30 meters above sea level to the Laguna de Bay at 2 meters elevation. The slope of Metro Manila ranges from 10 to 40%.

1.2 In Region III, the central plain is located between the two mountain ranges of Sierra Madre in the east and Zambales Range, including Mt. Pinatubo, in the west. The plain, which is the largest plain in the country covering four provinces of Pampanga, Nueva Ecija, Tarlac, and Bulacan, is fertile ground for agriculture, particularly for rice production. The Pampanga River basin covers 10,500 km<sup>2</sup> including most of the provinces. The downstream of the basin, the lowlands of Pampanga and Bulacan elevation of which is around one meter, are flood-prone areas and often used for fishponds. Nearly 25% of the region is classified as more than 30% slope (see Figure 1.2). In particular, 56% and 45% of the areas of Aurora and Zambales provinces, respectively, are more than 30% of steep slope. Tarlac and Nueva Ecija are inland provinces. Two provinces of Aurora and Zambales have the longest coastal lines. Bataan is a peninsula, 81% of which lands are mountainous and uplands.

1.3 Region IV-A or CALABARZON also consists of coastal area, upland and mountains. The Sierra Madre range stretches through Rizal to Quezon and Laguna provinces, the east of Laguna de Bay. Hilly and mountainous areas are also found in Batangas where Mt. Taal, one of the active volcanoes and Taal Lake, the third largest lake in the country are located. A relatively large plateau is located in the middle of Cavite province. Lowlands are found in the coastal areas facing Manila Bay in Cavite, Laguna de Bay of Laguna and Rizal, and Tayabas Bay in Quezon. Lowlands of Rizal and Cavite are flood-prone areas. Some 37% of the region is steep hilly areas characterized by more than 30% of slopes. Such steep hill areas occupied 67% and 40% of the areas of Rizal and Quezon respectively. Flat or less than 8% of slope areas account for 44% and 41% of Cavite and Laguna. Figure 1.3 shows the water systems of GCR.



Source: Shuttle Radar Topographic Mission (SRTM) version 4, 2008.

**Figure 1.1 Elevation of GCR**

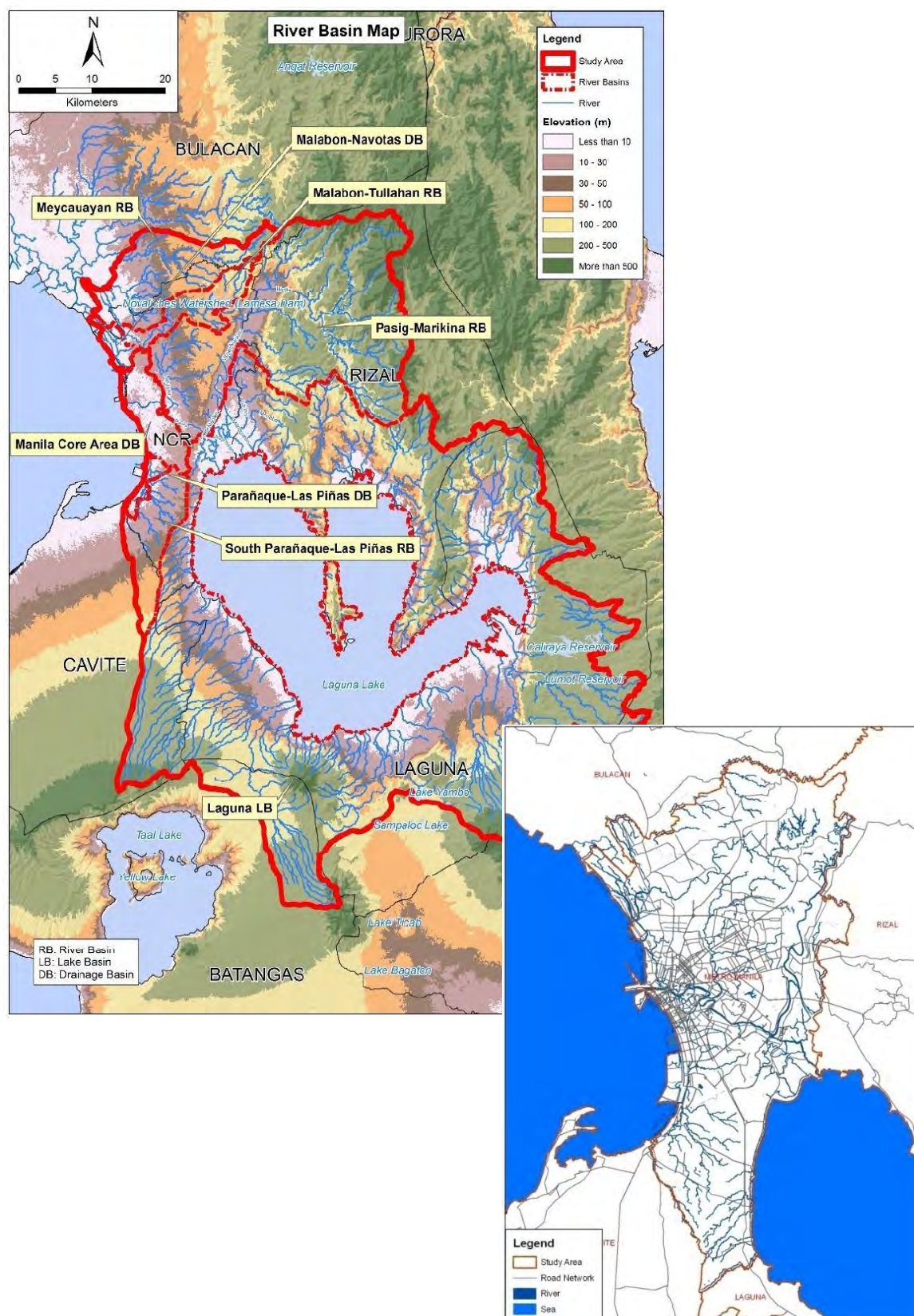




Source: Shuttle Radar Topographic Mission (SRTM) version 4, 2008.

**Figure 1.2 Slope Map of GCR**



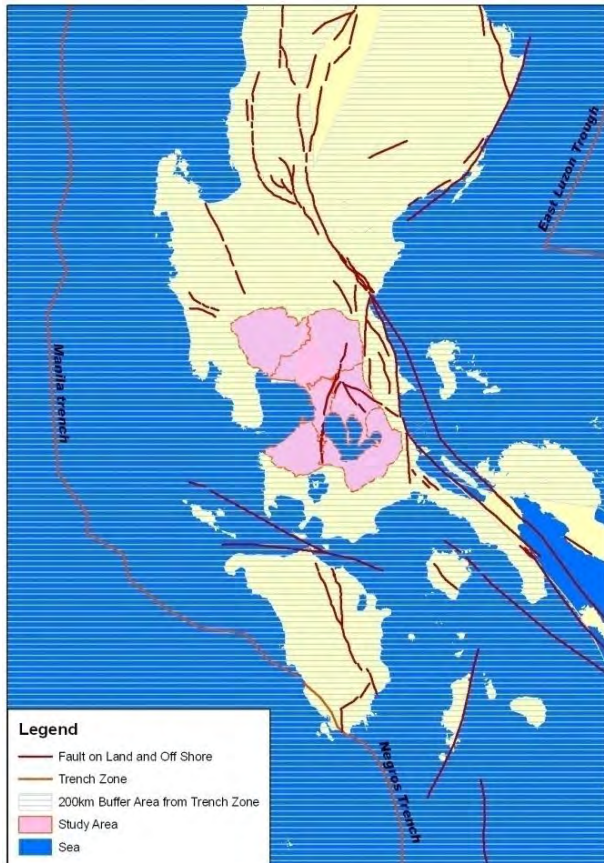


Source: Map of Mega Manila: World Bank. 2012, Master Plan for Flood Management in Metro Manila and Surrounding Areas; Metro Manila Map: MEIRS (JICA, 2004).

**Figure 1.3 Water Systems in GCR**

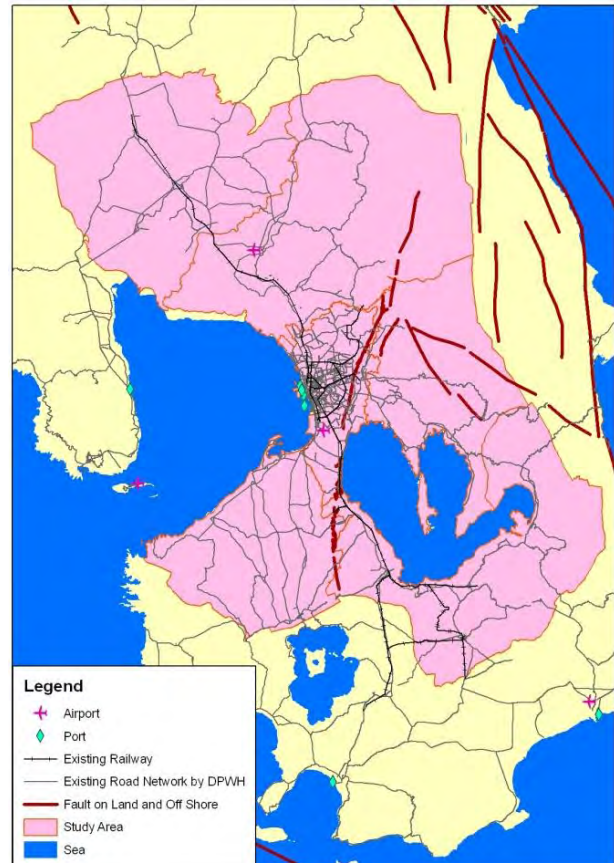
## 2 SEISMOLOGY

2.1 Metro Manila and GCR are located in Luzon Island where numerous earthquake sources are located in and around it (see Figure 2.1). Among these faults, the Valley Fault System, which transects the study area, is considered to potentially cause the largest impact on the Metro Manila area should it generate a large earthquake. Many research studies indicate that active phases of the Valley Fault are approaching and the estimated magnitude will be around 7 or more on the Richter scale. Figure 2.2 shows the distribution of potential earthquake sources vis-a-vis the existing transport system. It shows that a fault is crossing the west side of Metro Manila and many roads are lying on the fault. It means that the roads have a risk of damage by earthquake hits.



Source: MMEIRS (JICA, 2004).

**Figure 2.1 Distribution of Faults and Trenches in Luzon**



Source: MMEIRS (JICA, 2004).

**Figure 2.2 Distribution of Faults and Trenches and Transport System around the Study Area**

### 3 LAND COVER AND PROTECTED AREAS

3.1 Land cover of Region III and Region IV-A is shown in Figure 3.1. In Region III, vast areas of lands are used for agriculture. Primarily the central plain including Tarlac, Pampanga and Nueva Ecija, are cultivated for annual crops, in addition to the eastern part of Bataan. Eastern Batangas, the lowland of Laguna, Bondoc Peninsula of Quezon province, and the plateau of Cavite are mostly used for cultivation of annual crops, and partially for perennial crops.

3.2 The two mountain ranges of Sierra Madre and Zambales are mostly covered by forest. The Sierra Madre Range from Aurora to Quezon and Rizal of Region IV-A is mainly covered by both closed and open broadleaved forests, while the Zambales Range is covered by a mix of open forest, natural grassland, and other woodlands. Grasslands are found in the areas between the central plain and Sierra Madre Range in Rizal, the southern tip of Sierra Madre Range in Quezon, and a certain part of Batangas.

3.3 The coastal areas of Pampanga and Bulacan are used for fishponds. The land cover of the western provinces of Region III (i.e., Zambales and Bataan) are more diversified than the eastern provinces. Built-up areas are the entire area of Metro Manila and encroaching on Bulacan, Cavite and Laguna.

3.4 Protected areas in Region III and Region IV-A are illustrated in Figure 3.2. According to the Protected Areas and Wildlife Bureau of DENR, there are 24 protected areas totalling 284,295.95 ha including: (i) 6 National Parks, 37,223.27 ha; (ii) 1 Game Refuge and Bird Sanctuary, 12.35 ha; (iii) 11 Watershed Forest Reserves, 223,071.10 ha; (iv) 5 Protected Landscapes, 16,421.23 ha; and (v) 1 Marine Reserve, 7,568.00 ha.

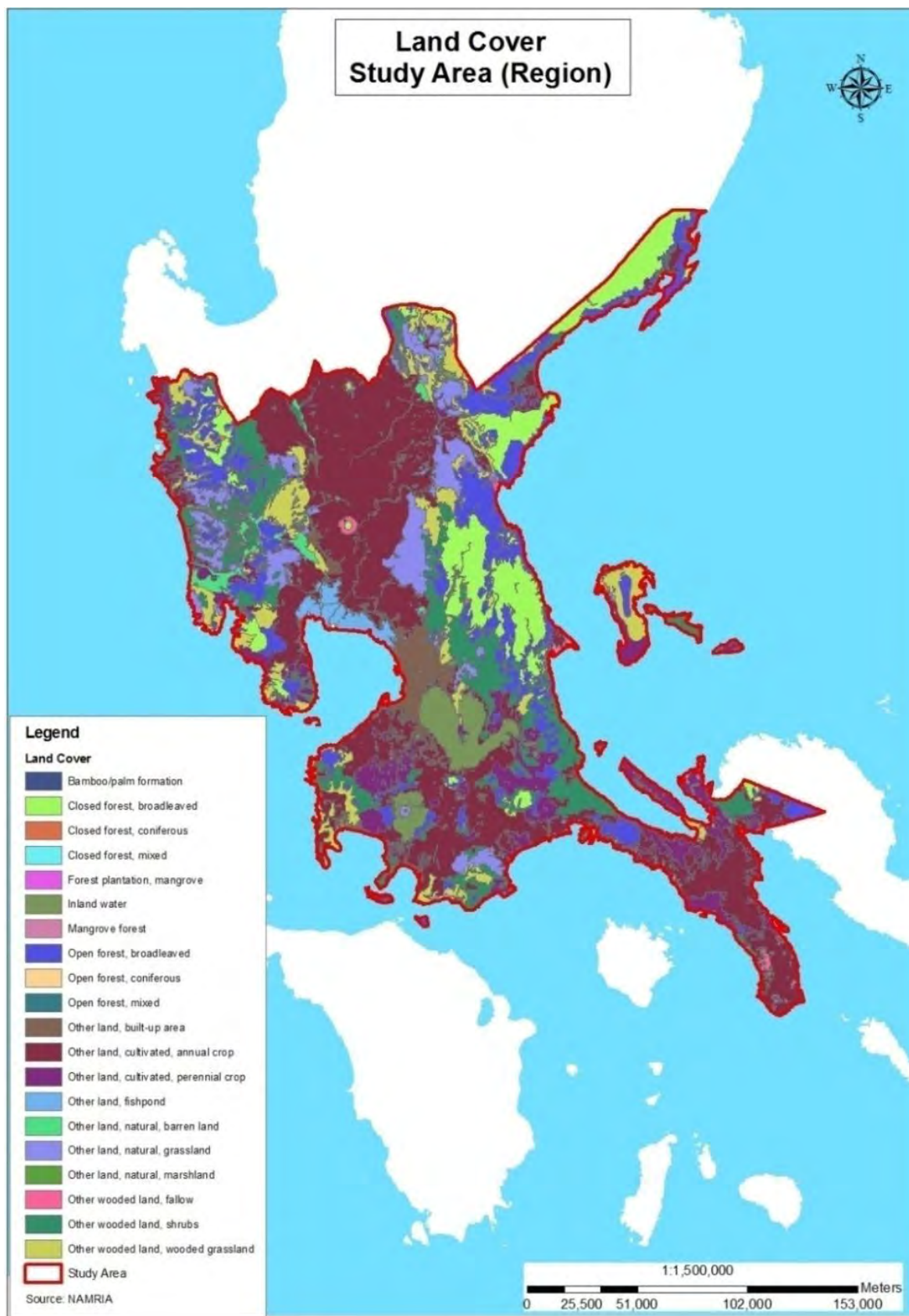
3.5 On the other hand, Region IV-A has a total of 23 protected areas covering 154,992.62 ha, including: (i) 2 National Parks, 46,362.00 ha; (ii) 1 Wilderness Area, 430.00 ha; (iii) 9 Watershed Forest Reserves, 2,719.00 ha; (iv) 3 Mangrove Swamp Forest Reserves, undetermined area; and (v) 7 Protected Landscapes, 104,665.98 ha.

3.6 There are three protected areas of 503.6 ha in NCR.<sup>1</sup>

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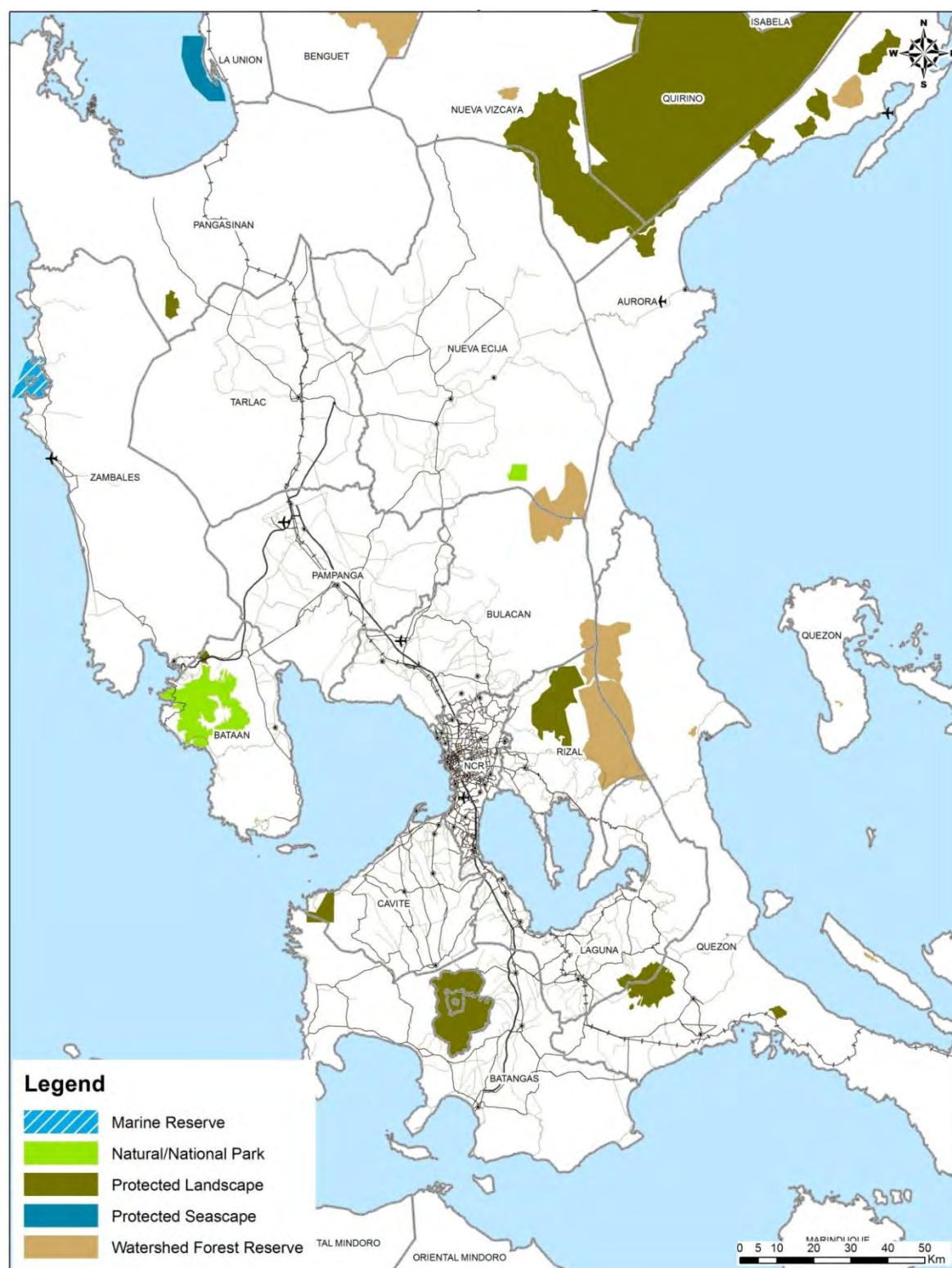
<sup>1</sup> Protected Areas and Wildlife Bureau of DENR. Available from <http://www.pawb.gov.ph>





Source: JICA Study Team.

**Figure 3.1 Land Cover Map**



Source: Protected Areas and Wildlife Bureau, DENR.

**Figure 3.2 Protected Areas in GCR**

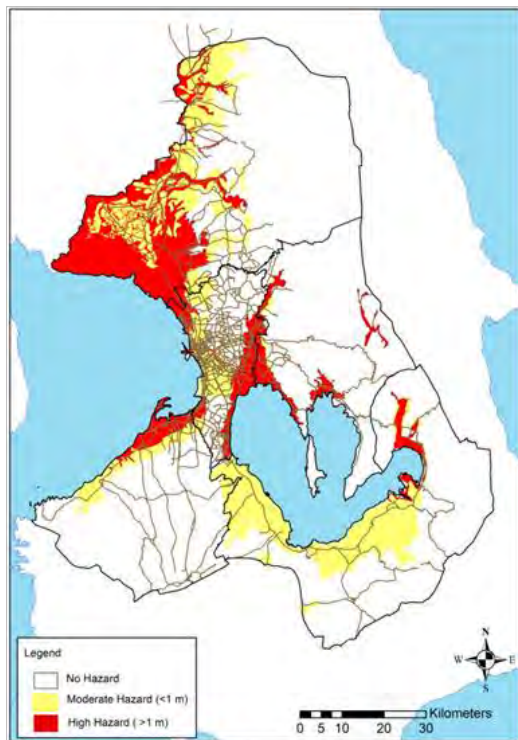


## 4 HAZARD RISK OF DISASTERS

4.1 The hazard risk of two disasters, i.e., flood and landslide, are anticipated in GCR as shown in Figure 4.1 and Figure 4.2. Regarding flood, high risk areas (shown in red in the map) are found in the coastal areas of Manila Bay in Bulacan, and Cavite, coastal areas of Laguna de Bay and the areas along Marikina Valley in Rizal and Metro Manila.

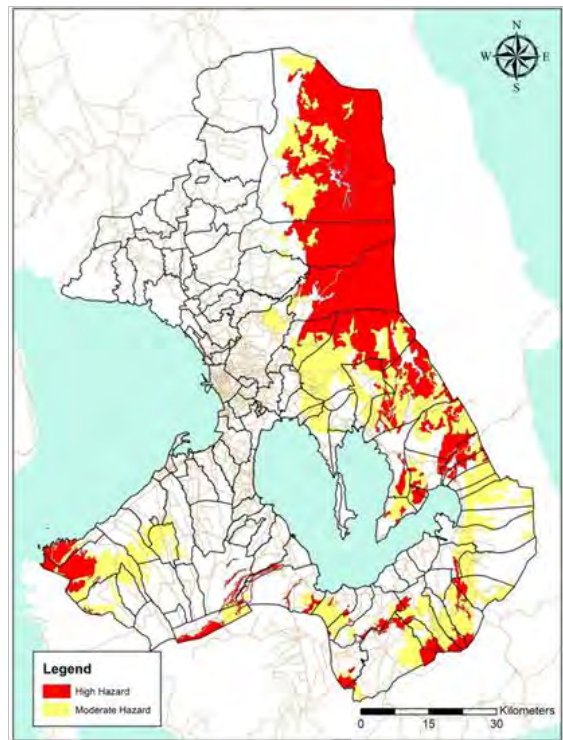
4.2 The landslide hazard map in Figure 4.2 shows that the mountainous areas in Sierra Madre Range in Bulacan and Rizal are identified as high hazard risk areas for landslide. Compared with the Figure 1.2 slope map, those areas have, indeed, very steep slope of over 30%. The other high hazard risk area is found in the western tip of Cavite and Batangas.

4.3 The areas with high risk of flood in Bulacan are mostly used for fish ponds; however, due to urbanization, subdivision development has encroached on the fish pond areas. Meanwhile, Metro Manila has expanded into the east to Rizal, such as Antipolo. Development should be prevented or controlled in those areas with high hazard risk of disasters so as not to cause any human suffering, property damages, and socioeconomic losses.



Source: Mines and Geosciences Bureau, 2012.

**Figure 4.1 Flood Hazard in Mega Manila**



Source: Mines and Geosciences Bureau, 2012.

**Figure 4.2 Landslide Hazard in Mega Manila**

## ***APPENDIX TO CHAPTER 3***

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## APPENDIX 3A

### INTEGRATION OF TRANSPORT PROJECTS

#### 1 PNR Row Optimum Utilization

1.1 The Philippine National Railways (PNR) facility has recently undergone rehabilitation and improvement and at present, the line within Metro Manila is fully operational. The rehabilitation project was initiated in 2007, aimed at removing informal settlers from the PNR right-of-way, and revitalizing commuter services in Metro Manila.

1.2 The PNR right-of-way, with an average width of 30 m, has been the object and interest of several project developers for multipurpose utilization due to scarcity of wide and long open spaces that could be used for the installation of the necessary infrastructure, which could solve two of the most recurring issues facing Metro Manila, i.e., “illegal settlers” and “traffic congestion.” One proposed development aiming to provide decent dwelling places to illegal settlers occupying the portion of the PNR right-of-way is the construction of the “Home Along the Riles” Project. Another project is the Elevated Expressway Project, which will realize the linkage of the North and South Luzon Expressways thereby facilitating access to these two expressways facilities.

1.3 A segment along the Pres. Sergio Osmeña Highway near the intersection of Pres. Quirino Highway was used by San Jose Builders for its five-storey Tenement Building Project, which aimed to relocate illegal dwellers previously occupying the open spaces along the PNR right-of-way. Several modules were constructed and some units have been sold and occupied.

1.4 The Elevated Expressway Project was aimed to eventually connect the existing South Luzon Expressway and North Luzon Expressway. The proposed project is intended to interface with the existing Manila Skyway Project, which terminates near Buendia Avenue along the Pres. Sergio Osmeña Highway, and then use the existing PNR right-of-way until the alignment interfaces with the North Luzon Expressway in Balintawak, Quezon City. This skyway project, which was conceptualized in the 1990s, has yet to be implemented and was shelved for the moment due to a franchise issue.

1.5 The plan to connect the North and South Luzon Expressways was revived in 2010 by DPWH since the current Tollway Operator of the Manila Skyway failed to install on schedule the segment that will link the two expressways. The necessity of implementing the expressways connection project was realized when the country’s economic condition was improving, more vehicles are being sold and being added to the under-capacitated road network system of Metro Manila, aggravating the traffic conditions along its already congested streets. The project proposal, which involves the original DPWH alignment, was due for submission to NEDA when another project proponent requested consideration of its alignment proposal using the PNR right-of-way. As of the moment, there are two alignment proposals being considered for the North and South Luzon Expressways connection and both projects are in the advanced project preparation stage.

1.6 This study considers the alignment along the PNR right-of-way for potential optimum utilization by integrating another mass transport mode and other viable infrastructure systems.

## **2 NLEX–SLEX Connector Project**

### **1) General**

2.1 The proposed NLEX–SLEX Connector Project will start at the terminus of the proposed Segment 10 of the C5 Expressway Project and will terminate at the existing terminus of the Manila South Skyway along Pres. Sergio Osmeña near Buendia Avenue. The project proponent is Metro Pacific Tollways Corporation and the alignment will use partly the existing PNR right-of-way starting from the intersection of C3 Road (Fifth Avenue) in Caloocan City up to the intersection of Pedro Gil and Pres. Quirino Avenue in Manila. The total length of the Connector Project is approximately 13.50 km and will be installed generally at the second level of the PNR railway, with average vertical clearance of more than 7 m from the top of PNR railway tracks. The proposed clearance will accommodate double layer of cargo containers that will be transported using the PNR tracks. The clearance is higher at existing viaducts and other structures such as LRT stations, reaching up to the third level of the PNR railway tracks.

2.2 While the NLEX–SLEX Connector Project is in its preparatory stage, this study attempts to determine the possibility of integrating the facility of another mass transport system within the PNR right-of-way boundary with minimum effect on the current NLEX–SLEX Connector Project but maximizes potentials of the PNR property for other infrastructure facilities. The mass transport mode being proposed is the LRT system.

2.3 An evaluation made on the proposed conceptual design of the NLEX–SLEX Connector Project, which is more likely to be adopted and implemented, indicates that its geometric alignment was designed at the most economical option considering vertical and horizontal clearance constraints and requirements. Realignment of the existing PNR railway was suggested in a few locations to accommodate wider spaces for toll plazas, ramps and other interconnection requirements with existing and proposed developments. Consideration is given to the project cost established by the proponent for its implementation, operation and maintenance.

### **2) Typical Cross-Section**

2.4 The typical cross-section developed for the proposed NLEX–SLEX Connector Project for its standard carriageway shows two posts or columns/piers supporting its superstructure system while the posts are founded on bored piles. The typical cross-section for the six-lane carriageway consists of 3 x 3.50 m lanes per direction, 1.00 m inner and 2.00 m outer shoulders, and 0.64 m for median barrier. A 2.00 m setback is provided at the edges of the carriageway for a minimum 32.64 m total right-of-way requirement, which suggests that the proposed Connector Project will require acquisition of additional right-of-way beyond the 30.00 meter PNR property boundaries.

### **3) Project Cost Estimates**

2.5 At the proposed conceptual design, the proposed ultimate stage of six lanes will cost around PHP17.90 billion for 13.50 km with two columns or piers supporting the cross-sectional width of the carriageway (see Table 2.1). Using AASHTO Girders could reduce the construction cost of the structure by 20%. The latest technology using precast concrete structures could further save on construction cost by another 10 to 15%.

**Table 2.1 NLEX–SLEX Connector Design Cost Estimate**

Item	Description	Total Construction Cost (PHP)		
		Box Girder	AASHTO	Precast Concrete
1	Gravel Columns			452,733,415
2	Bored Piles	2,892,060,000	2,014,518,639	865,290,021
3	Pile Cap /Isolated Footing	81,810,000	485,598,829	324,905,964
4	Columns	391,380,000	1,474,111,233	1,233,162,933
5	Coping Beam	1,119,345,000	1,660,398,227	1,611,534,165
6	Interchanges	4,048,950,875	(included in the estimate)	(included in the estimate)
7	Diaphragm	4,725,000	327,140,268	327,140,269
8	Shear Block		215,991,900	215,991,900
9	Slab	56,037,500	2,479,354,711	2,380,907,364
10	Temporary Structures		47,880,000	47,880,000
11	Girders	9,275,082,000	5,566,132,011	-
12	Precast Joist (10ksi)		-	3,790,119,488
13	Column (Additional Cost)		-	62,307,907
Total Construction Cost		17,869,390,375	14,271,125,818	11,311,973,426

Source: JICA Study Team, 2013.

2.6 The cost comparison presented above only indicates that the proposed project could be implemented at substantially reduced construction cost resulting in viable financial returns for the proponent and in lower tollway rates for the expressway users. Further value engineering study could translate into more savings in project cost.

2.7 In view of this observation, any change in the cross-sectional features of the proposed Connector Project will not have any significant impact on its overall project cost.

#### 4) Right-of-Way Requirement

2.8 The proposed Expressways Connector Project will require additional right-of-way at the following locations:

**Table 2.2 NLEX-SLEX Connector Additional ROW Requirement**

Item	Section		Length, m	Location
	Beginning Station	End Station		
1	Sta. 5+000	Sta. 8+010	3,010	Both Sides
2	Sta. 9+000	Sta. 9+330	330	Right (West) Side
3	Sta. 9+830	Sta. 10+140	310	Left (East) Side
4	Sta. 10+890	Sta. 11+100	210	Right (West) Side
5	Sta. 12+620	Sta. 12+980	360	Left (East) Side
6	Sta. 13+500	Sta. 13+900	400	Right (West) Side
Total			4,620.00	

Source: JICA Study Team based on DPWH project descriptions.

2.9 The project might not require additional right-of-way along locations where the PNR railway alignment abuts existing local roads or streets, other government-owned properties such as schools and offices, and natural bodies of water.

### **3 Proposed Transport Systems Integration**

#### **1) General**

3.1 Metro Manila is continuously challenged with increasing population growth, which also translates to aggravation in traffic conditions in its major roads and streets during peak periods and intermittent weather conditions. The Metro Manila area is heavily built up and available open spaces are too expensive to acquire for any infrastructure project. The Government is usually burdened by this requirement and it adds pressure to the government's budget, which is already very tight and constrained.

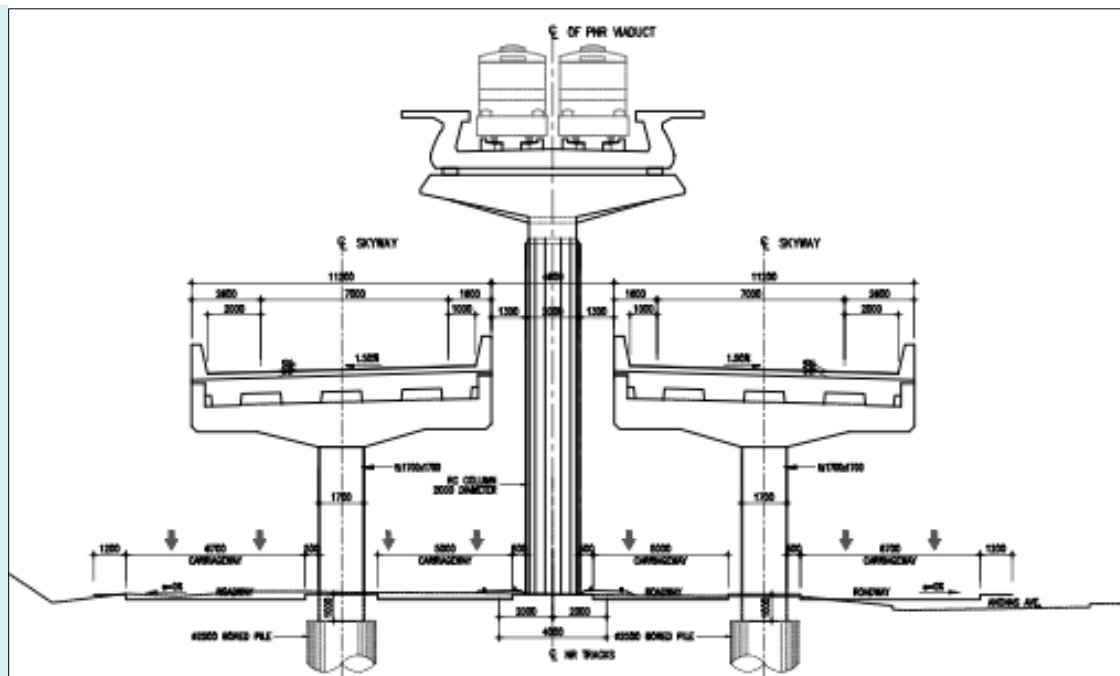
3.2 The only solution to any ROW issue besetting the successful completion of any infrastructure project is the use of available and underutilized government-owned land. For the purpose of putting up the necessary infrastructure necessary to address one of the many accessibility problems in Metro Manila, the PNR right-of-way would be the best available option due to the following reasons:

- (i) Longer route that could easily connect the two existing expressways with minimum interruption or constraint;
- (ii) Adaptability of the existing PNR railway geometric alignment to accommodate lower speed transport system or even high speed system with minimum adjustment along the locations of horizontal curves;
- (iii) The PNR railway alignment intersects major thoroughfares, which are planned for future physical expansion and level of service improvement similar to the proposed Expressways Connector Project, such that interfacing with these proposed developments will not be difficult or complicated;
- (iv) The existing PNR right-of-way does not have expensive structures that could constrain the budget of any infrastructure project; and
- (v) The PNR right-of-way has less social issues considering that illegal dwellers have been relocated to more conducive spaces.

#### **2) Proposed Typical Cross-Section**

3.3 The transport systems integration proposal requires adjustment in the established cross-sectional features of the proposed NLEX–SLEX Connector Project since the proposed LRT System will occupy the existing location of the PNR railway tracks and follow its alignment.

3.4 Several options were explored and it was observed that the best integration scheme is to install the LRT alignment at the center but above the proposed NLEX–SLEX Connector Project, basically one level up the latter's established vertical finish grade, as shown in Figure 3.1.



Source: JICA Study Team, 2013

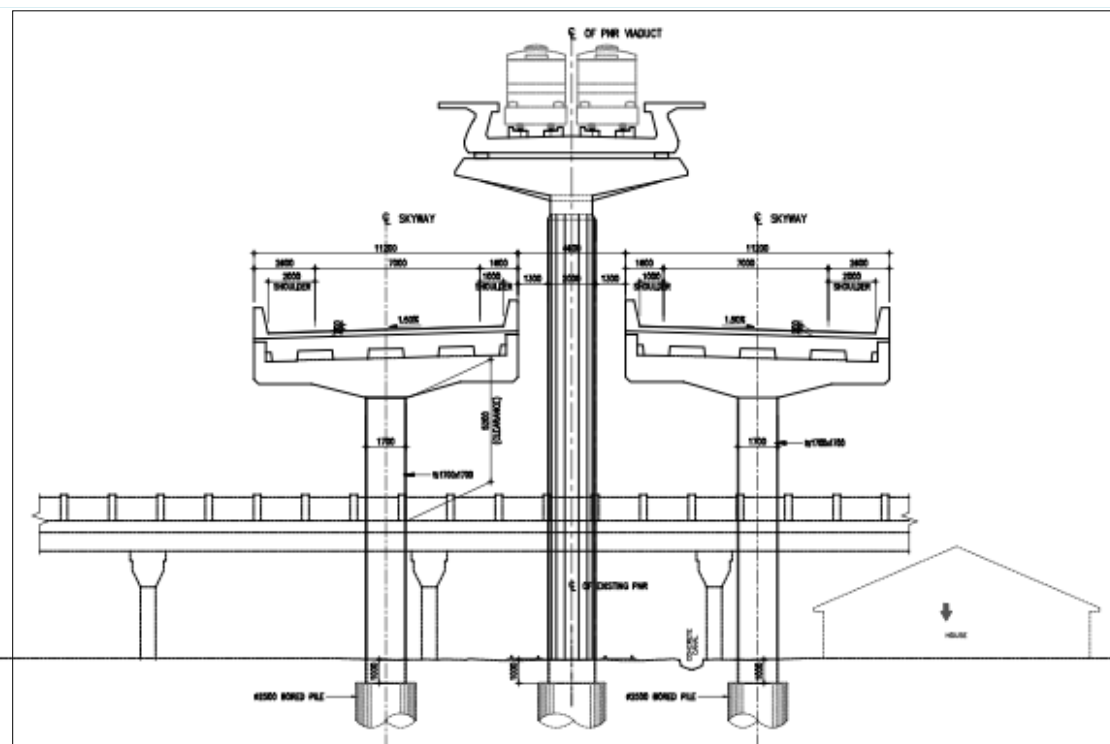
**Figure 3.1 Typical Standard Section (LRT & NLEX-SLEX Connector Expressway Projects)**

3.5 The proposed version of the integrated transport system's cross-section requires separation of the north and south bound lanes of the proposed NLEX-SLEX Connector Project by 4.5 to 5 m to accommodate sufficient clearance for the installation of the piers of the LRT System, if implemented later. This clearance will also provide sufficient space underneath the elevated structure for the development of 4 x 2 lane service roads, which will expand and increase the road network capacity in the influence area, thereby further addressing and resolving traffic congestion issues along the PNR route.

3.6 The integration of LRT and NLEX-SLEX Connector Expressway Projects faces challenges along several locations where there are existing physical constraints and conflicts in alignments with existing roadways and bridges and flyover structures.

3.7 At Dimasalang St., the NLEX-SLEX Connector Expressway alignment goes up at the third level over the existing bridge while the LRT crosses the same structure at the fourth level, as shown in Figure 3.2.

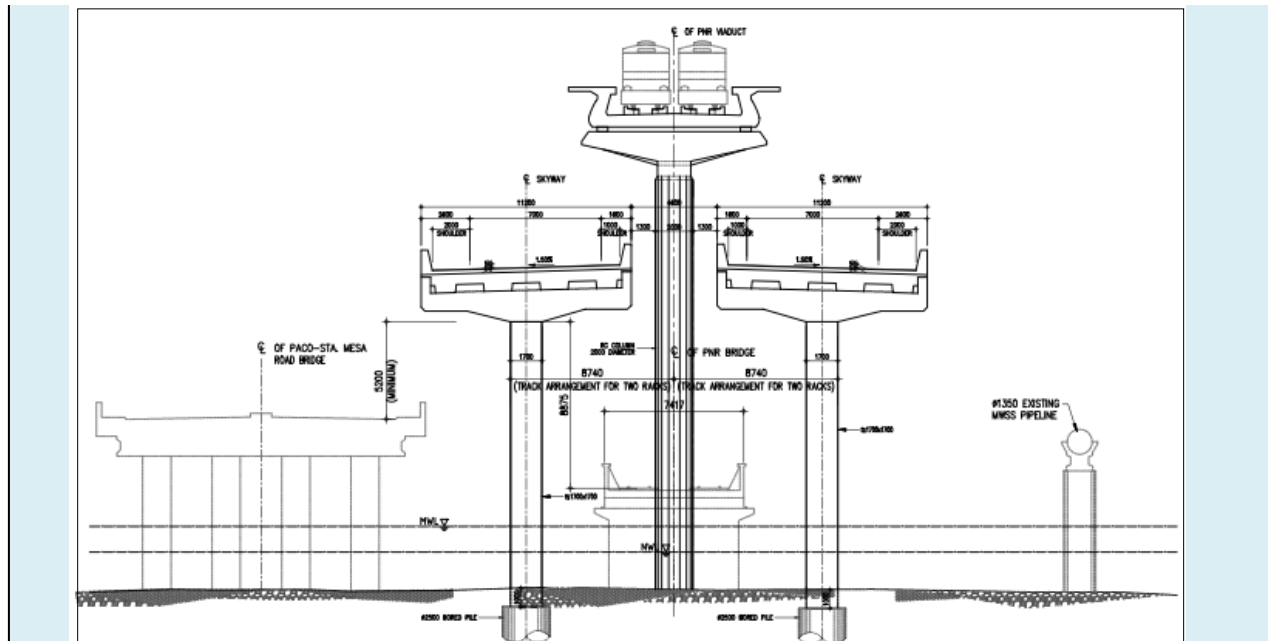




Source: JICA Study Team

**Figure 3.2 LRT & Expressway Section at Dimasalang St.**

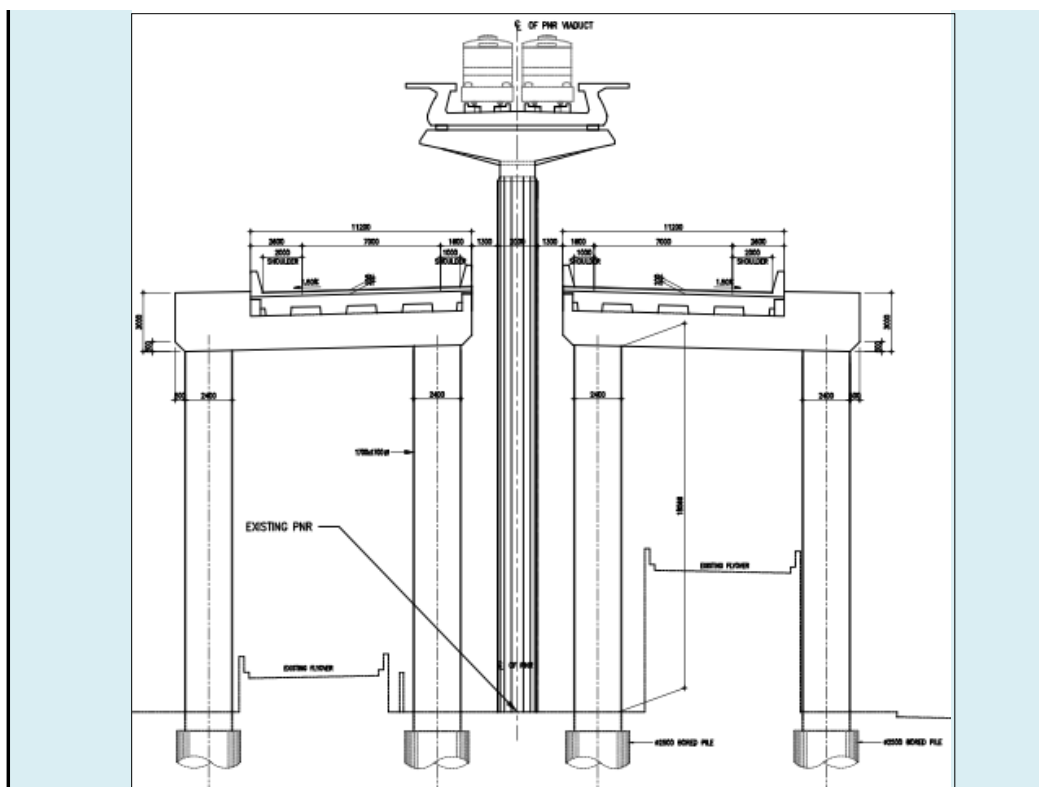
3.8 At Paco–Sta. Mesa section, there are three different structures that need to be considered, namely the (i) Paco–Sta. Mesa Road Bridge, (ii) PNR Bridgeand (iii) 300 mm diameter MWSS Pipeline. As the integrated LRT and Expressway alignment passes this area, the superstructure of the proposed NLEX–SLEX Connector Expressway will hang over the travel way of the Paco–Sta. Mesa Road Bridge. Therefore, it is necessary to raise the alignment of NLEX–SLEX Connector Expressway by a minimum of 5.20 m over the existing Paco–Sta. Mesa Road Bridge. With the installation of LRT over the existing PNR centerline, the existing PNR Bridge can be removed already as shown in Figure3.3.



Source: JICA Study Team

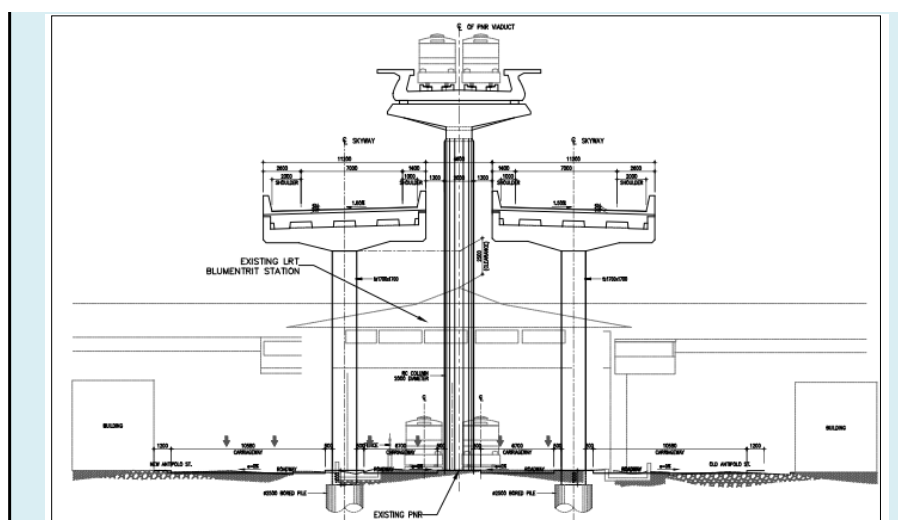
**Figure 3.3 LRT & Expressway Section at Pasig Split Section**

3.9 The same situation exists along Pandacan, Rizal Avenue and Ramon Magsaysay Boulevard where the LRT and NLEX–SLEX Connector Expressway alignments have to fly over the existing structures at the fourth and third levels, respectively. The schemes are presented in Figures 3.4, 3.5 and 3.6.



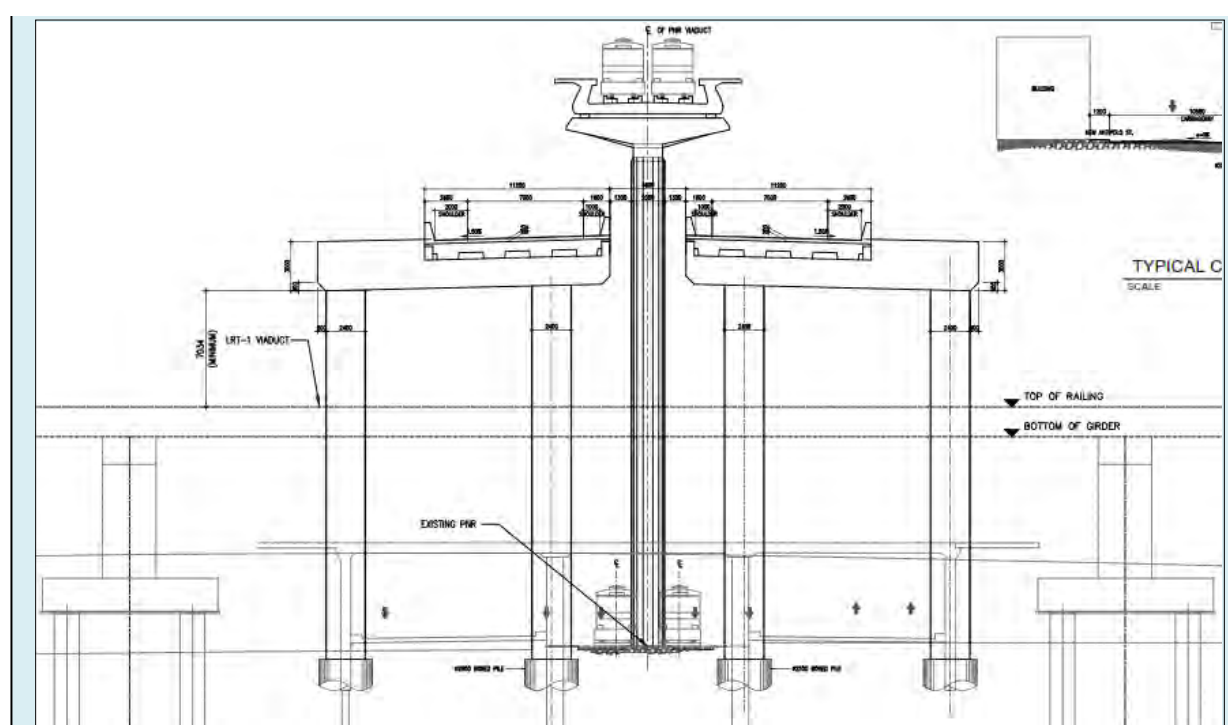
Source: JICA Study Team

**Figure 3.4 Pandacan Area**



Source: JICA Study Team.

**Figure 3.5 Rizal Avenue**



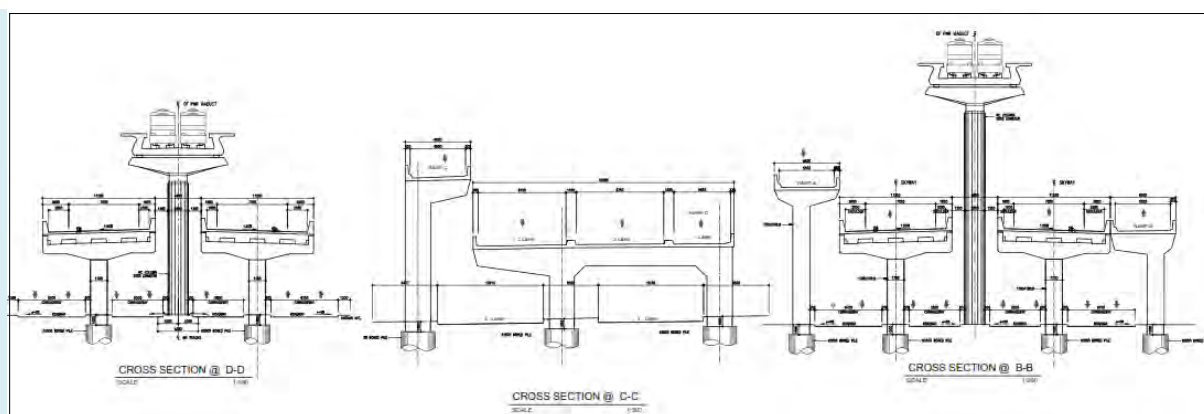
Source: JICA Study Team.

**Figure 3.6 Ramon Magsaysay Area**

3.10 Along the sections with on and off ramps, the proposed typical section of the LRT and NLEX–SLEX Connector Expressway is shown in Figure 3.7.

### Figure 3.7 Typical Section With On and Off Ramps

### Figure 3.8 Interface with Other Projects



### Figure 3.9 Interface with Other Projects

### **3) Proposed Geometric Alignment Characteristics**

#### **(1) Horizontal Alignment**

3.12 The established horizontal alignment for the proposed LRT System generally follows the existing horizontal alignment of the PNR railway, which was also adopted by the Proposed NLEX–SLEX Connector Project except at some segments where the PNR railway was realigned to accommodate wider space requirement of the Connector Project for ramps, toll plazas and interconnection with existing roads. The established horizontal alignment for the proposed LRT System generally follows the existing horizontal alignment of the PNR railway, which was also adopted by the Proposed NLEX–SLEX Connector Project except at some segments where the PNR railway was realigned to accommodate wider space requirement of the Connector Project for ramps, toll plazas and interconnection with existing roads.

#### **(2) Vertical Alignment**

3.13 On the other hand, the vertical alignment for the proposed LRT System was based on the most possible alignment for the proposed Connector Road, setting the latter having priority over the former. The proposed LRT System will be installed at one level higher than the Connector Project since the cross-sectional and structural requirement of the rail transit system is less than that of the Connector Project. It would be more expensive to put the Connector on the third level as more columns or piers have to be lengthened or extended upward, which will add more load and pressure to the Connector Project foundation system, thus requiring more material, labor and equipment costs.

3.14 This vertical alignment scheme for the LRT System also avoids crossing conflicts with the existing local roads intersecting the PNR railway alignment at the ground surface and reduces the vertical clearance requirement between the PNR railway tracks and NLEX–SLEX Connector Road to 5.20 m only instead of the present requirement of 6 to 8 m, redounding to further construction cost reduction for the said project.

### **4) Proposed Right-of-Way Requirement**

3.15 The proposed transport systems integration will require additional right-of-way of 5 m (2.50 m each side) to accommodate clearance for later stage construction of the LRT System and provision of additional (at least) 8 lanes of service roads underneath the elevated structures. On the other hand, the additional ROW is also required where the proposed Connector Road needs it, as indicated in the Table 3.1.

3.16 On the contrary, the LRT System will save right-of-way at some locations since the PNR railway alignment abuts existing local roads or streets, and natural bodies of water.

**Table 3.1 ROW Requirement for PNR and Proposed LRT**

Item	Section		Length, m	Location
	Beginning Station	End Station		
1	Sta. 8+070	Sta. 9+000	930	Both Sides
2	Sta. 9+000	Sta. 9+330	330	Left (East) Side
3	Sta. 9+330	Sta. 9+830	500	Both Sides
4	Sta. 9+830	Sta. 10+140	310	Right (West) Side
5	Sta. 10+140	Sta. 10+490	340	Right (West) Side
6	Sta. 10+480	Sta. 10+890	510	Both Sides
7	Sta. 10+890	Sta. 11+100	210	Left (East) Side
8	Sta. 11+100	Sta. 11+440	340	Both Sides
9	Sta. 12+620	Sta. 12+980	360	Right (West) Side
10	Sta. 13+360	Sta. 13+500	140	Both Sides (Pasig River)
11	Sta. 13+500	Sta. 13+900	400	Left (East) Side
12	Sta. 13+900	Sta. 18+850	4950	Both Sides
Total			9,320.00	

Source: JICA Study Team

3.17 Based on the said schedules, the proposed LRT System will affect only 32% of the length of the entire PNR railway alignment or about 20,375 m<sup>2</sup> (2.04 ha) for its right-of-way requirement.

## 5) Project Cost

### (1) Proposed LRT System

3.18 The Proposed LRT System with the established horizontal and vertical alignments will have the following cost components:

**Table 3.2 Cost Components of Proposed LRT System**

Project Cost Estimates				
Item	Components	Unit	Cost, PHP	Remarks
1	Viaduct Structure	Km	500,000,000	
2	Stations	Location	460,000,000	Inclusive of Services
3	Substation			
	a. Structure	Lot	410,000,000	
	b. OCS	Lot	350,000,000	
	c. Services	Lot	150,000,000	
4	Signaling	Lot	525,000,000	
5	Telecoms	Lot	350,000,000	
6	Automated Fare Collections	Lot	375,000,000	
7	Track work	km	175,000,000	

Source: JICA Study Team.

3.19 These project cost components were estimated based on recent contracts with similar project scope and magnitude.

### (2) Effect on the Cost of the Proposed NLEX–SLEX Connector Road

3.20 With the slight change in the cross-sectional features of the proposed NLEX–SLEX Connector Project to accommodate the LRT System, the construction cost of the former will increase by around PHP12.5 million per km or around 2% of the cost of expressway viaduct for every km.

## 6) Other Infrastructure Systems

3.21 Other infrastructure systems that could be integrated into the PNR Railway Right-of-Way are the following:

- Underground Road Drainage System; and
- Utility Systems such as Water Supply and Sewerage Systems, Telecommunication System and Underground Power Distribution System.

## 4 Proposed PNR Rehabilitation

### 1) Existing Condition

4.1 The PNR alignment from Malolos City to Calamba City has a total length of about 90 km and traverses heavily built-up areas with residential, industrial and commercial structures erected along the sides of the railway right-of-way, especially those sections located from Malolos City in Bulacan to Sta. Rosa City in Laguna. From the municipality of Cabuyao to Calamba City, the railway side development is light.

4.2 From Malolos City, the railway has 30 stations, namely:

- |                         |                         |
|-------------------------|-------------------------|
| • Bocaue Station        | • Vito Cruz Station     |
| • Marilao Station       | • Buendia Station       |
| • Valenzuela Station    | • Pasay Road Station    |
| • Malabon Station       | • EDSA Station          |
| • Caloocan City Station | • Nichols Station       |
| • 5th Avenue Station    | • FTI Station           |
| • Hermosa Station       | • Bicutan Station       |
| • Solis Station         | • Sucat Station         |
| • Blumentritt Station   | • CommexAlabang Station |
| • LaongLaan Station     | • Alabang Station       |
| • Espana Station        | • Muntinlupa Station    |
| • Sta. Mesa Station     | • San Pedro Station     |
| • Pandacan Station      | • Pacita Station        |
| • Paco Station          | • Binan Station         |
| • San Andres Station    | • Calamba Station       |

4.3 The existing railway alignment crosses 183 roads of different classifications mostly subdivision roads, barangay roads, city streets, major highways such as MacArthur Highway, EDSA, Buendia, Manila South Road or National Road, and crosses over 9 creeks and 5 rivers.

### 2) Initial Stage Development

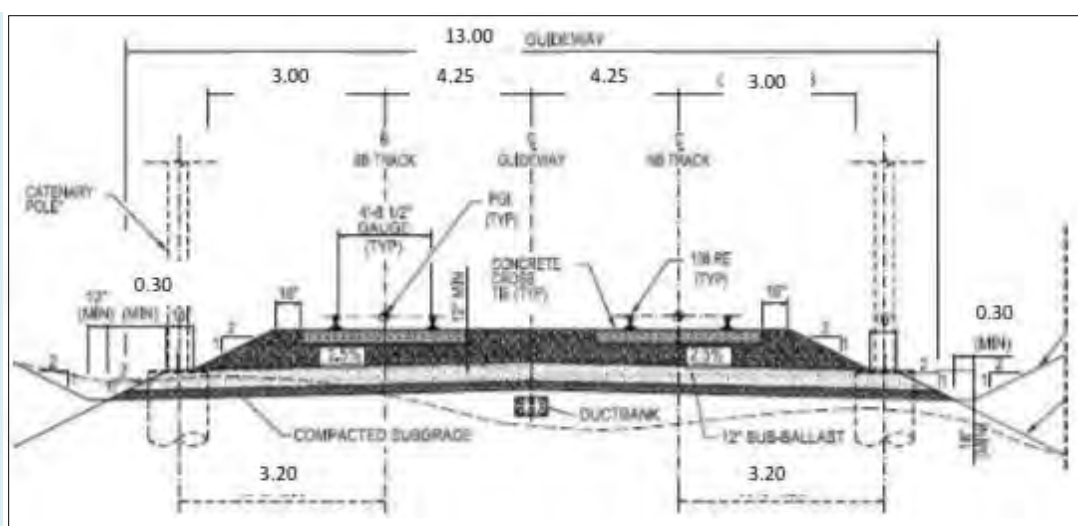
4.4 The proposed rehabilitation of PNR will include replacement of poor and deteriorated railway tracks, installation of new tracks, ballast and sub-ballast, compaction of sub-grade, installation of drainage culverts and ditches, and replacement or new construction of railway bridges over existing major waterways and creeks (see Table 4.1). These are estimated to cost a total of PHP21 billion.

**Table 4.1 Cost Components of Initial Stage Development of Proposed PNR Rehabilitation**

Project Cost Estimates (Initial Stage Development)					
Item	Components		Unit	Cost, PHP	Remarks
1	Trackwork including Concrete Sleepers	90	km	175,000,000	15,750,000,000
2	Stations (20 m x 200 m)	30	Location	100,000,000	3,000,000,000
3	Ballast	90	km	15,000,000	1,350,000,000
4	Sub-Ballast	90	km	5,500,000	495,000,000
5	River Bridges (80 m)	6	Each	40,000,000	240,000,000
6	Creek Bridges (20 m)	9	Lot	10,000,000	90,000,000
7	Cross Drains (900 mm dia)	300	each	125,000	37,500,000
Total					20,962,500,000

Source: JICA Study Team.

4.5 A typical cross-section of the new railway at initial at-grade construction is presented in Figure 4.1.



Source: JICA Study Team, 2013.

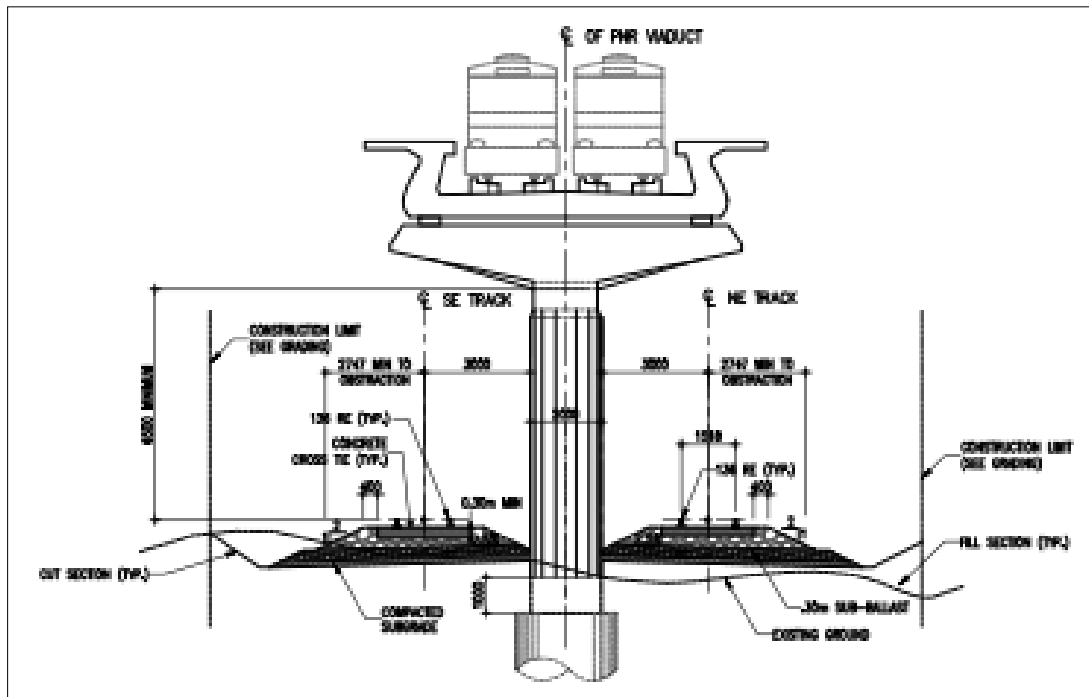
**Figure 4.1 Typical Railway At-Grade Cross-Section**

### 3) Ultimate Stage Development

4.6 For ultimate stage construction, when the volume of railway passenger traffic has increased and more services are needed to preclude delays during travel but the expansion of the facility is constrained by numerous at-grade road crossings, the railway shall be installed overhead or on elevated platform structure.

4.7 Beforehand, at-grade railway section will be installed with sufficient space to accommodate future expansion of the railway or the installation of elevated structure, as shown in Figure 4.2.





Source: JICA Study Team.

**Figure 4.2 Typical Railway Ultimate Stage**

4.8 The estimated cost of PHP63.8 billion for the proposed Ultimate Stage Development is broken down as follows:

**Table 4.2 Cost Components of Ultimate Stage Development of Proposed PNR Rehabilitation**

Project Cost Estimates (Ultimate Stage Development)					
Item	Components		Unit	Cost, PHP	Remarks
1	Track work including Concrete Sleepers	90	km	175,000,000	15,750,000,000
2	Stations (20 m x 200 m)	30	location	100,000,000	3,000,000,000
3	Viaduct	90	km	500,000,000	45,000,000,000
Total					63,750,000,000

Source: JICA Study Team.

## ***APPENDIX TO CHAPTER 4***

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## APPENDIX 4A

### (1) INSTITUTIONAL REVIEW OF TRANSPORT SECTOR

#### 1 Institutions Matter

1.1 Institutional strengthening is a recurring theme in nearly all studies about the Philippines transportation sector in the last two decades. They focused on policy and planning coordination as an explanatory variable to the lack of integration of transport infrastructure projects. Different agencies in government are involved in the planning and development of roads, railways, ports, and airports – system components that should really evolve and function as an interconnected network. The problem and the solution becomes even more evident at sub-national levels – such as metropolitan area or region.

1.2 Invariably, the proposed remedies involved: (i) the creation of inter-agency committees (such as the Inter-Agency Committee on Transport Planning at the middle-level, or the Infrastructure Committee of NEDA; and/or (ii) capacity building in the planning units of the various agencies. In addition to organizational arrangements, the institutional proposals also encompassed policies.

1.3 As Douglas North argued in his seminal paper, “institutions matter” in development<sup>1</sup>. It is, perhaps, more evident in the development (or lack thereof) of the transport sector. Had it been otherwise, there would be no need for this latest effort<sup>2</sup>.

#### 2 Current Structure

2.1 Based on extant organizations, the desired coordination or meshing of agency plans should be a reality.

2.2 At the highest level is the NEDA – which, by its charter and membership composition is a coordinating body.

2.3 The Philippines is divided into 16 administrative regions – each of which has a Regional Development Council (RDC) that is backstopped by a regional office of NEDA. In the study area, there are three RDCs; with the Metro Manila Development Authority serving as the RDC for the National Capital Region. These bodies were meant to harmonize sectoral plans with geographical strategies.

2.4 The INFRACOM is sub-committee of the NEDA Board which consists of the heads of DPWH, DOTC, NEDA, DBM, and DOF. It is a cabinet-level committee supported by a technical committee called Inter-Agency Technical Committee on Transport Planning (IATCTP). These bodies were in existence for more than 3 decades and deemed successful in the 1970s.

2.5 There were other coordinating bodies, ad hoc or permanent, that were set up to address sub-national concerns. Foremost of this was the National Council for Integrated Area Development (NACIAD). At one time, a Cabinet Officer for Regional Development (CORD) was also appointed. The NACIAD and CORD were failures since they had little control over budgets and resources and had no political clout to influence the agencies that had direct control over resources.

<sup>1</sup> North, Douglas C., “The Role of Institutions in Economic Development”, ECE Discussion Papers Series 2003\_2, UNECE (2003).

<sup>2</sup> JICA, “Formulation of a Transportation Road Map for Sustainable Development of Metro Manila”, 2013.

2.6 In terms of planning documents, the Philippines has a long history of physical framework planning and development planning, aside from the production of master plans for roads, aviation, ports, and Metro Manila's transport.

2.7 None of the preceding plans, integration or coordination mechanisms had been effective, as explained in by F Medalla in his 2004 paper "Policy Coordination, Planning, and Infrastructure Provisions in the Philippines"<sup>3</sup>. Among the reasons cited, most of which are still valid, are:

- (i) Coordinating bodies have little control over budgets and resources, especially concerning sectoral plans vis-à-vis geographic strategies;
- (ii) Inability to take into account the network feature of transportation infrastructure, especially at the sub-national level;
- (iii) Large projects that benefit the entire network, no matter how catalytic, are unlikely to get support in Congress who are predisposed to look at their parochial needs;
- (iv) Middle-level officials cannot commit their heads, or their agencies, and are conditioned to accept their superiors' orders without argument.
- (v) Theoretically, the Investment Coordination Committee (ICC) is the gatekeeper on what projects get implemented, but its power to veto projects has been very limited. By the time the proposed project reaches the ICC, it may have already built up a strong constituency.

2.8 Another established practice in the Philippines is land use planning. All the 17 local government units (LGUs) that comprised Metro Manila have land use plans and corresponding zoning ordinance to enforce them. A similar mechanism can be found among the LGUs in the Central and Southern Luzon regions. Most of the plans are difficult to fault, but finding one LGU where it actually worked or got applied is like looking for a needle in a haystack. For example, as far back as the 1977 MMETROPLAN, the Marikina Valley was recommended for controlled developments. This did not happen, and the disaster wrought by Typhoon Ondoy in 2009 was blamed on the lack of land use control. The high-rise developments happening on the Bay Area is another case in point.

2.9 If a property development is not in accord with existing land plans, the developer invariably gets a special ordinance exempting it from the general rule. All the urban and regional plans emphasized the close inter-relationships between transport and land use plans. Failure to control one leads to failure in the other.

2.10 During the 1970s, the inter-agency model worked. There were several factors: One, Congress was not involved in the process then. Two, NEDA was directly involved in planning – its staff worked hand-in-glove with those of the infrastructure agencies in project identification and conduct of feasibility studies. It was controlling a fund for this purpose and in conducting other studies. Hence, there was no surprise by the time a project reached the NEDA-ICC level. Third, the technical capability of the line agencies were more pronounced, as a result of working as real counterparts of foreign experts. Fourth, institutional memory was preserved. None of these factors are observable in the last decade.

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<sup>3</sup> Medalla, Felipe. "Policy Coordination, Planning and Infrastructure Provision in the Philippines", UP School of Economics (2004).

### 3 Recent Attempts to Revitalize Coordination

3.1 The most recent iteration of the committee-approach to the problem was in 2010, under the AusAid program “Formulating a National Transport Plan”<sup>4</sup>. Its key proposal to address the institutional dysfunction in the transport sector is the “establishment of a Transportation Policy Committee (TPC) to be chaired by the DOTC Secretary and co-chaired by the DPWH Secretary with members comprising of the DOTC Undersecretaries for Land, Air, Water and Rail Transport and the designated DPWH Undersecretary, the DOTC Assistant Secretary for Policy/Planning and the DPWH Assistant Secretary for Planning and the Assistant Secretaries for Legal Affairs of DOTC and DPWH.” It did not elaborate on how a TPC would function vis-à-vis INFRACOM or IATCTP. One of its recommendations is an Executive Order to re-iterate the formal status of DOTC as the responsible body for transport strategy. It should be noted that the DOTC charter already contains this mandate since its creation.

3.2 A technical assistance project of ADB in 1999 (TA No. 2968-PHI: Transport Infrastructure and Capacity Development Project) was supposed to revitalize the INFRACOM and IATCTP. One of its outputs is a Transport Sector Action Plan that was claimed to have been a result of participatory approach, inter-agency consultations and consensus building. Very little of the Action Plan ever got implemented.

3.3 Despite the prevailing institutional weaknesses, the recommended strategy in almost all plans – as exemplified in PTSS<sup>5</sup> - is anchored on strong institutions. As stated in PTSS (1997):

4.1 *“...funds are not the main problem in the near-term (there is an inadequate number of ‘good’ projects identified that could be implemented). Institutions are the problem (and the reason why - in spite of the need - projects have not been prepared for implementation). The core of the transport strategy for the next Plan period is to revitalise transport institutions so that they can manage the transformation to the new world”.*

<sup>4</sup> KBR and TTPI, “RA-008-02: Formulation a National Transport Plan”, for PEGR/AusAid, March 2010.

<sup>5</sup> Halcrow Fox, “The Philippine Transport Strategy Study”, ADB (1997)

## 4 Towards a Workable Framework

4.2 The reality is that over the next 10 years, no radical changes or improvements can be expected on the institutional front. Given the lack of planning and project preparation capacities within the key agencies, any exercise in re-arranging organizational boxes or in creating new one would be futile. Project selection, packaging and priority-setting for the Study Area will remain donor-driven and dependent on external consultants.

4.3 However, some real policy shifts is deemed feasible. Official plan documents already contain or expressed the right policies. What is missing is adherence or compliance – which could happen if the President adopt them as his own. Therefore, the formulation of a new transport strategy must start from this premise.

4.4 Previous studies have already identified the policy desiderata, such as :

- “no definitive policy or strategy which deliberately favors public transport over private transport or mass rail systems over roads, based on comparative advantage”;
- “No authoritative and consistent overall pricing policy in the transport sector, particularly on user fees in relation to the cost of services”; and
- The provision of land transport infrastructure should shift from accommodative, supply-focused transport approaches to a more balanced approach that includes pro-active land use and transport demand management.

4.5 The Infrastructure chapter of the latest iteration of the Philippine Development Plan has the following provisions (or more accurately, aspirations):

4.6 *“To ensure an integrated and coordinated transport network, adopt a comprehensive long-term national transport policy . . . establish the government policy in the areas of resource generation and allocation, the criteria for the preparation of agency plans, programs and projects; cost recoveries and subsidies, regulation for passenger transport services; urban transport and settlements; transport logistics; and governance.”*

4.7 Transport infrastructure – especially railways - will entail huge funding requirements from the national government. LGUs, despite their internal revenue allotments (IRA) and their financial capability, are not likely to contribute to projects that benefit them and their neighbors. But if the national government allocates more to the Study Area (considered the richest among other regions in the country), there is much less resources available to other regions. To avoid the equity issue, the government should pursue these projects – to the maximum extent possible – on PPP. This leverages small public sector funding, effectuate the “users-pay” principle, and obligate residents in the greater metro region to pay more for their transport provisions. Fortunately, the big-ticket projects - like expressways and railways – are more attractive to private sector if these are in the Study Area. A tollway in Mindanao would not have the same appeal due to its low motorization.

4.8 Although the implementation of PPP projects is more complex than traditional procurement, there are several plus factors. The current administration has made PPP a keystone of its infrastructure program. It has had nearly 3 years on the learning curve. The policy framework – at least, for toll roads is well-established, especially on toll setting and regulations. The financial markets – domestic and foreign – are liquid and would accept decent returns (as opposed to the high risk premium of yesteryears). The Philippines credit rating has improved, and nearing investment-grade status. And finally, it can always

hire a transaction advisor to overcome lack of internal capacity – a practice that it is now pursuing.

4.9 On the other hand, the policy framework on rail is still ambiguous. This will adversely affect realization of rail projects, as it has done so in the last decade. For one, the fares on rail transit services have been kept stagnant in the last 10 years. Recent attempts to adjust the fares and keep them aligned with those for buses and jeepneys have not been successful. As a consequence, any prospective operator of a rail line will start from a very low base. First to be affected is the on-going bidding for the LRT 1 Extension Project, which shall be implemented on PPP – nearly 10 years after an analogous PPP scheme failed to take off. In the bidding documents, fare adjustment will not be automatic – unlike those for toll roads. Although a shortfall between actual and allowable fare is compensable, it cannot be recovered by the private operator from users, but via budget allocation from the national government. It is an open invitation to political intrusion. Furthermore, there is no clear policy on what to do with the other rail lines (LRT2 and MRT3), which are directly operated by government.

4.10 Hence, for the rapid expansion of the urban rail network, as well as their efficient operations, it is imperative that a policy framework be put in place. A suitable template is the successful privatization of the Manila water supply (MWSS), which split the concession into two. Privatization of the three rail lines into three separate concessions would avoid a monopoly and extricate government from direct involvement in rail operations.





**APPENDIX 4A****(2) PROJECT LISTINGS BY STATUS****(1) On-going Projects**

Project Code	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
<b>Expressway</b>						
T-EX-1	Tarlac-Pangasinan-La Union Toll Expressway (TPLEX). Design, financing, construction, operation and maintenance by the private sector of a 88.5 kilometer, 2-lane expressway from the Terminus of SCTEX in Tarlac City to Rosario, La Union, Phase I section2, Rosales, Pangasinan to Urdaneta City, Pangasinan	III	Tarlac and Pangasinan Provinces	14,501.00 PPP	DPWH; 2012 - 2017	74.66% completed as of January 2013
<b>Urban Roads</b>						
T-UR-1	Widening/Concreting of R-10, including ROW, Malabon City, Navotas City and Manila City. (Urgent National Arterial / Secondary Roads and Bridges)	NCR	Manila, Malabon and Navotas Cities	330.00 Local funds	DPWH; 2011 - 2013	
T-UR-2	Widening/Concreting of Pres. Garcia Ave. (C-5) Extension. (Urgent National Arterial / Secondary Roads and Bridges)	NCR	Paranaque City	1,340.00 Local funds	DPWH; 2011 - 2013	
T-UR-3	Construction/Improvement of Visayas Ave Extension and Other Parts of Quezon City	NCR	Quezon City	2,150.00 Local funds	DPWH; 2011 - 2013	
T-UR-4	Widening/concreting of Commonwealth Ave., Q.C.	NCR	Quezon City	55.000 Local funds	DPWH	
T-UR-5	Construction of flyover crossing Commonwealth Avenue. connectingTandangSora and Luzon Avenue in Quezon City. 522-lneal meter flyover project is part of the C-5 Road Extension Project.	NCR	Quezon City	520.00	DPWH	
T-UR-6	Sta. Rita-(Bulacan)-NeuvaEcija Road. Rehabilitation and maintenance on the intermittent section of the existing 169-kilometer road in the boundary of Bulacan and Nueva Ecija	III	Bulacan and Nueva Ecija Provinces	2,936.00 JICA	DPWH; 2012 - 2023	Bidding process ongoing as of February 2013
T-UR-7	Bongabon-Pantabangan-Baler Road, N. Ecija-Aurora Road. Upgrading and maintenance on intermittent sections of 51.4-kilometer road	III	Nueva Ecija and Aurora Provinces	886.79 JICA	DPWH; 2012 - 2016	Bidding process ongoing as of February 2013
T-UR-8	Gapan-San Fernando-Olongapo Road (Sta. Cruz, Lubao- Dinalupihan Section), Phase II, Pampanga. Widening / Improvement / rehabilitation of 15.37-kilometer road	III	Nueva Ecija, Pampanga and Zambales Province	2,058.00 KEDCF	DPWH; 2009 - 2014	12.70% completed as of January 2013.
T-UR-9	Widening of Gapan-San Fernando-Olongapo (GSO) Road and Bridges (Dolores Flyover-Sta. Cruz Section)	III	Nueva Ecija, Pampanga and Zambales Provinces	114.07 KEDCF	DPWH; 2011 - 2013	
T-UR-10	Lipa-Alaminos-San Pablo-Tiaong Road. (Batangas, Laguna & Quezon). Upgrading and maintenance on intermittent sections of 45-kilometer road. The road connects Lipa City along the Laurel Highway with the municipality of Alaminos and San Pablo City which are situated along Pan Phil highway	IV-A	Batangas, Laguna and Quezon Provinces	447.41 JICA	DPWH; 2012 - 2017	Design concept/criteria approved by BOD, mylar being prepared by Consultant
T-UR-11 (B1)	Daang Hari-SLEX Link Road Project Bacoar, Cavite to the South Luzon Expressway Thru Susana Heights. Construction of new 4-kilometer, 4-lane toll road that passes through the New Bilibid Prison reservation going to Bacoar, Cavite and SLEX thru Susana Heights, providing additional access between Metro Manila and Cavite	IV-A	Cavite Province	1,956.00 PPP	DPWH; 2012 - 2017	Construction has already started at segment I while DED for segment II is 95% completed as of December 2012

Project Code	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
T-UR-12	Widening of CALA Roads	IV-A	Cavite and Laguna Provinces	537.00; Local fund	DPWH; 2011 - 2013	
T-UR-13	Construction/Opening of Quezon Eco-Tourism Road. Lucena City - Batangas Coastal Road including RROW	IV-A	Quezon Province	645.00 Local fund	DPWH; 2011 - 2016	
T-UR-14	Rizal Barangay - Famy - Quezon Barangay Road Linking Marikina - Infanta Road via Sta. Maria	IV-A	Rizal and Quzon Province	158.40; Local fund	DPWH; 2012 - 2014	
<b>Bridges/Interchanges</b>						
T-BI-1	Foreign Assisted Project (FAP) Bridges. Tulayng Pangulosa Kaunlaran Project UK assisted Phase I	Inter-Regional		6,238.00 United Kingdom Gov't	DPWH; 2011 - 2013	
T-BI-2	Foreign Assisted Project (FAP) Bridges. Tulay ng Pangulo sa Kaunlarang Pang-Agraryo (TPKP) (French Loan)	Inter-Regional		14,437.00 French Gov't	DPWH; 2011 - 2014	
<b>Urban Rail</b>						
T-R-1	Re-Opening of Main Line South	NCR		566.00	PNR	
T-R-2	Rolling Stock Repair Program	NCR		206.00	PNR	
<b>Public Transport System</b>						
T-PT-1	Development of Alternative Modes of Transport e.g. Implementation of Bicycle Lanes. In support of preserving the environment and reducing air pollution in the metropolis, MMDA promotes the use of non-motorized transport such as bikecycles by establish bike lanes.	NCR	Metro Manila	10.00	MMDA	Implementation ongoing in various locations
T-PT-2	Energy Efficient Electric Tricycle (E-Trike) Project	NCR		21,500.00	DOE	
<b>Traffic Management</b>						
T-TM-1	Construction of Rotundas in strategic locations. These rotundas serve as an alternative to the u-turn slots and traditional signalized intersections.	NCR	Metro Manila	-	MMDA	Implementation ongoing in various locations
T-TM-2	EDSA Make-Over Project. MMDA EDSA makeover project include s partnering with the concerned government agencies and the private sector in transforming EDSA into a traffic discipline zone, making it a motorist/ commuter/ and pedestrian-friendly thoroughfare.	NCR	Metro Manila	-	MMDA	
T-TM-3 (F1)	Metro Manila Traffic Signalization Project (Phase I). Migration to a new traffic system which will initially cover 85 (out of 455) intersections which is capable of handling future ITS functions; Construction of a new and modern Traffic Command Center (Metrobase) which will integrate the agency's monitoring and response functions on emergency response, disaster, flood monitoring and transport and traffic management.	NCR	Metro Manila	295.26 TBD	MMDA; 2012 - 2013	Ongoing implementation
T-TM-4	60 KPH Speed Limit Along Commonwealth Avenue and Macapagal Avenue. Enforced 60 kph speed limit to reduce fatal accidents due to over speeding and unnecessary swerving and conflicts among private, public vehicles and pedestrians.	NCR	Metro Manila	-	MMDA	
T-TM-5	Blue Lanes (Motorcycle lanes). Designated non-exclusive lanes to improve safer travel for motorcycle users	NCR	Metro Manila	-	MMDA	Implementation ongoing in various locations
<b>Airports</b>						
T-AP-1	Ninoy Aquino International Airport (NAIA). Retrofitting/Renovation of NAIA Terminal 1	NCR	NAIA	1,500.00	DOTC-MIAA; 2012 - 2013	

Project Code	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
(G1-b)	Ninoy Aquino International Airport (NAIA). Continuous Repair of Terminal CRs	NCR	NAIA	30.93	DOTC-MIAA; 2011 -2013	
T-AP-2	NCR - CAAP Central Office Infra and Operations Equipment	NCR	NCR	1,693.34	DOTC-CAAP; 2011 - 2014	
T-AP-3	New Communication, Navigation and Sureillance/Air Traffic Management System Development Project	NCR	NCR	4,095.07	DOTC; 2011 - 2014	
T-AP-4	Plaridel Airport Development Project	III	Bulacan Province	24.80	DOTC-CAAP; 2011 - 2014	
T-AP-5	Casiguran Airport Development Project	III	Casiguran (Aurora)	192.05	DOTC-CAAP; 2011 - 2013	
T-AP-6	Various Upgrading and Rehabilitation of Passenger Concourse, Waiting Areas, Restrooms, Lobbies and Processing Areas of Airports	Nation wide	Nationwide	6,720.00	DOTC-CAAP; 2011-2016	
T-AP-7	Air Navigation Facilities Development	Nation wide	Nationwide	4,339.67	DOTC-CAAP; 2011-2016	
<b>Ports</b>						
T-P-1	Lamiao (Limay) Port, Bataan - Construction of Seawall & Breakwater	III	Bataan Province	21.99	PPA; 2011 - 2013	
	Lamiao (Limay) Port, Bataan - Upgrading of electrical system	III	Bataan Province	20.16	PPA; 2011 - 2013	
T-P-2	Various feeder/terminal port development	Nation wide		4,016.50	DOTC - LGU; 2011 - 2016	
<b>Others</b>						
T-PCG-1	Multi-Role Response Vessels (MRRVs) for the Philippine Coast Guard. Acquisition of ten 40-meter Multi-Role Response Vessels (MRRVs) to be deployed in 10 PCG Districts.	NCR		8,807.00 ODA (JICA STEP Loan) with GOP counterpart	DOTC; 2012 - 2015	The MRRVs may be utilized by the PCG in border protection roles.

Source: DOTC , DPWH, MMDA and NEDA, March 2013.

## (2) Committed Projects

Code3 (new)	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
<b>Expressway</b>						
T-EX-2 (B3)	NAIA Expressway (Phase 2) End of Phase I to Macapagal Boulevard/ PAGCOR City, Metro Manila. Construction of a 7.15-kilometer elevated expressway. A continuation from end of Phase 1 to Macapagal Boulevard, in PAGCOR City, Metro Manila to connect NAIA Terminals I, II, & III. (Public-Private Partnership Expressway Projects)	NCR	Paranaque City	15,520.00 PPP	DPWH; 2013 - 2015	Approved by NEDA Board; Procurement ongoing; For bidding on Feb 26, 2013.
T-EX-3	Operation and Maintenance of Marcos Highway and Kennon Road. 42.703km	NCR		106.76 Private fund	DPWH; 2013 - 2015	
T-EX-4 (B2-b)	Skyway 3 Project. A 14-kilometer, 6-lane elevated toll way that will link North and South Luzon Expressways (NLEX and SLEX). The skyway was meant to decongest EDSA, the capital's major thoroughfare.	NCR	Metro Manila	25,000.00 Citra / PPP	Citra; 2013 - 2015	approved in principle by TRB
T-EX-5	C-6 Expressway and Global City Link NLEX between Marilao and Bocaue, Bulacan to Skyway at Bicutan, Eastern Metro Manila and Rizal. Construction of a 50-kilometer expressway that starts from NLEX at Bocaue/Marilao boundary and through the towns of Sta. Maria and San Jose del Monte in the Province of Bulacan, to Rodriguez, San Mateo, Antipolo and Taytay in the province of Rizal, and connects with the Skyway at Bicutan, Taguig. A Global City Link of C-6 Expressway provides a vital access to commercial and business centers. It is a 59.5 km (including Global City Access Link Road with a total of 3.0 kms), 4-6 lanes, at grade expressway with some elevated portions near Taguig area.	NCR	Metro Manila, Bulacan and Rizal Provinces	44,590.00 PPP	DPWH; 2013 - 2017	Supplemental FS completed by KOICA Study Team in December 2012. Report finalization for said study is ongoing.
T-EX-6 (A3)	C-5/FTI/Skyway Connector Road (Nichols and Bicutan) to C-5. Construction of 3-kilometer elevated expressway from Nichols to Bicutan to C5 that will provide access to Food Terminal Inc. (FTI) from both Skyway and elevated expressway.(Public-Private Partnership Expressway Projects)	NCR	Taguig City	5,640.00 PPP	DPWH; 2013 - 2015	FS was completed in 2006; DED was also completed in 2010, and under review by the DPWH.
T-EX-7	Central Luzon Link Expressway (CLLEX) Phase I (La Paz, Tarlac-Cabanatuan City). Construction of a 30.7-kilometer, 4-lane expressway that diverges from SCTEx at 2.5 km north of Luisita Interchange and traverses flat plain of Central Luzon in the east-west direction, then ends in Cabanatuan City	III	Tarlac to Cabanatuan City(Nueva Ecija)	14,940.00 JICA & PPP	DPWH; 2013 - 2017	Construction financed under ODA while O & M is under PPP
T-EX-8 (B4)	CALA Expressway (Cavite). Construction of a 4-lane expressway with a total length of 30.70 kilometers for Phasel from Tarlack City to Cabanatuan and a construction of a 2-lane highway with a total length of 35.70 kilometer for Phase II from Cabanatuan City to San Jose City.	IV-A	Cavite Province	14,940.00 (Phase I) PPP	DPWH; 2013 - 2017	NEDA Board final approval January 18, 2013
T-EX-9	SLEX Extension from Batangas to Lucena city. Construction of 47.8-kilometer at-grade expressway to form South Development Axis	IV-A	Batangas to Lucena City (Quezon)	14,350.00 SLTC / PPP	DPWH; 2013 - 2015	SLTC to finance, design, construct, operate and maintain the project after concession agreement
<b>Urban Roads</b>						
T-UR-15	Flyover along Pres. C. P. Garcia Ave. (C5) ext.	NCR	Paranaque	252.00	DPWH	

Code3 (new)	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
(A1-a)	crossing Sucat Road. Construction of 250 meter flyover.		City			
T-UR-16 (A1-b)	Construction of flyovers at coastal road	NCR	Las Piñas	250.00	DPWH	
T-UR-17	Widening of National Roads Quezon City 4th Legislative District	NCR	Quezon City	1234.45 Local fund	DPWH; 2013 - 2016 beyond	
T-UR-18	Widening of National Roads San Juan City	NCR	San Juan	15,242.52 Local fund	DPWH; 2013 - 2016 beyond	
T-UR-19 (A5)	Improvement of EDSA (C-4). (Urgent National Arterial / Secondary Roads and Bridges)	NCR	From Pasay to Quezon City	3,744.00 Local funds	DPWH; 2013 - 2016 beyond	
T-UR-20	Widening of Gen. Luis, Valenzuela City. (Urgent National Arterial / Secondary Roads and Bridges)	NCR	Valenzuela City	551.50 Local funds	DPWH; 2013 - 2015	
T-UR-21	Baler-Casiguran Road. Construction of 50.95-kilometer road, road drainage structures and bridge	III	Aurora Province	1,664.00 KEDCF	DPWH; 2013 - 2017	Review of DED ongoing
T-UR-22	Pantabangan-Canili Bypass Road, Road Improvement	III	Aurora Province	100.00 Local funds	DPWH	
T-UR-23	Olongapo-Bugallon Road. Asphalt overlay and maintenance of 65.549-kilometer road	III	Olongapo City (Zambales)	607.44 ADB	DPWH; 2013 - 2014	Bidding process ongoing
T-UR-24	Nueva Ecija - Aurora Road (Assets Preservation of National Road Generated from Pavement Management System/Highway Development and Management)	III	Nueva Ecija and Aurora Province	156.96 Local fund	DPWH 2013	
T-UR-25	Improvement of Sabang - Baler Road	III	Aurora Province	50.00 Local funds	DPWH 2013	
T-UR-26	Widening of Clark-Angeles-Magalang Road	III	Angeles City (Pampanga)	120.00 Local funds	DPWH; 2013 - 2014	
T-UR-27	Widening of West Circumferential Road (Friendship Highway), Angeles Section	III	Angeles City (Pampanga)	149.00 Local funds	DPWH; 2013 - 2014	
T-UR-28	Dalton Pass East Alignment, Digdig-Carranglan-Aritao Road. Construction of a 63.7-kilometer alternate route east of Dalton Pass Section of the Philippine-Japan Friendship Highway	III	Nueva Ecija and Nueva Viscaya Provinces	9,510.00 Foreign funds	DPWH; 2013 - 2017	
T-UR-29	Widening of Aquino Byway-MNR (Via San Jose-Malino-Anao Road and Del Monte-Calulut)	III	San Fernando City (Pampanga)	266.00 Local funds	DPWH; 2013 - 2015	
T-UR-30	Upgrading (Gravel to Concrete) Taal Lake Circumferential Road	IV-A	Batangas Province	165.00 Local fund	DPWH; 2013 - 2014	
T-UR-31	Asphalt Overlay Cavite - Batangas Road	IV-A	Cavite Province	136.00 Local fund	DPWH; 2013 - 2014	
T-UR-32	Improvement/widening Tagaytay City to Batangas via Tuy Road	IV-A	Cavite Province	100.00 Local funds	DPWH; 2013	
T-UR-33	Upgrading (Gravel to Concrete) Atimonan - Mauban Road	IV-A	Quezon Province	120.00 Local fund	DPWH; 2013 - 2014	
T-UR-34	Improvement/Widening Marikina - Infanta Road (Marcos Highway)	IV-A	Rizal Province	100.00 Local funds	DPWH; 2013	
T-UR-35	Improvement of san Mateo - Rodriguez Road	IV-A	Rizal	250.00 Local fund	DPWH; 2013 - 2014	
T-UR-36	Road opening/concreting of General Aguinaldo - Magalanes - Nasugbu Road (East West Road)	IV-A	Batangas and Cavite Provinces	150.00 Local fund	DPWH; 2013	

Code3 (new)	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
T-UR-37	CALA Roads (Laguna Side). Construction of 11.01-kilometer road to improve the existing road network to support socio-economic and development activities	IV-A	Laguna Province	14,099.00 Foreign funds	DPWH; 2013 - 2017	
T-UR-38 (C4)	South Luzon Package (Laguna-Quezon-Camarines Norte Roads Improvement). Rehabilitation/improvement of 206-kilometer roads (Pagsanjan-Lucena Road, Tiaong-Lucena Junction Road, Pagbilao-Camarines Road, and Lucena Diversion Road)	Inter-Regional	Laguna, Quezon and Camarines Norte Provinces	536.19 IBRD	DPWH; 2013 - 2015	DED ongoing
T-UR-39 (C3)	North Luzon Package: Manila North Road (Monumento- Agoo/AringayBdry), La Union, Bulacan, Pangasinan. Asphalt overlay and maintenance on the intermittent section of the existing of 233.25-kilometer road	Inter-Regional	Metro Manila, Bulacan, Pangasinan and La Union Provinces	641.35 IBRD	DPWH; 2013 - 2016	DED ongoing
T-UR-40	Harmonized and Improved National-Local Road Development and Management Program (Road Sector). Improvement of national and local roads	Nationwide		5,461.00	DILG; 2013 - 2018	
<b>Bridges/Interchanges</b>						
T-BI-3 (A8-f)	C-2 (Gov. Forbes)/R7 (Espana St) Interchange. Construction of Interchange to alleviate and improve the severe traffic congestion at the major roads in Metro Manila. (Metro Manila Interchange Construction Project V)	NCR	Manila City	1,067.00 Foreign funds	DPWH; 2016 - 2018	
T-BI-4 (A8-a)	EDSA/Taft Interchange. The project involves the construction of two (2) lanes (each direction) of 1.613km 3rd level flyover from near approach of Tramo left turning flyover on EDSA (Sta. 1+696.685, West and Sta. 1+826.594, East) and ends between F. B. Harrison and Roxas Blvd. (Sta. 0+213.671)	NCR	Pasay City	2,700.00 Local funds	DPWH; 2013 - 2014	
T-BI-5 (A2)	Lawton - Sta. Monica Bridge (Global City to Ortigas Center Link Road). A1-kilometer bridge traversing the Pasig River from Lawton Avenue in Fort Bonifacio, Makati City going to Pasig City. (Urban Transport in Metro Manila)	NCR	Makati and Pasig Cities	3,200.00 Local Fund	DPWH; 2013 - 2017	
T-BI-6	Widening of Gil Puyat Ave-Roxas Boulevard Flyover. (Urgent National Arterial / Secondary Roads and Bridges)	NCR	Pasay City	730.00 Local Funds	DPWH; 2013 - 2015	
T-BI-7 (A8-e)	C-5/Lanuza-Julia Vargas Ave Interchange. Construction of Interchange to alleviate and improve the severe traffic congestion at the major roads in Metro Manila. (Metro Manila Interchange Construction Project V)	NCR	Pasig City	432.80 Foreign funds	DPWH; 2016 - 2018	
T-BI-8 (A6)	Arterial Road Bypass Project Phase II Construction of Contract Packages III and IV, Plaridel Bypass (Bustos to San Rafael), Bulacan. Construction of Contract Package-III with a length of 2.22 kilometers and Contract Package-IV with a length of 7.74 kilometers. It is the vital link to CP I& II of Plaridel Bypass	III	Bulacan Province	543.00 JICA	DPWH; 2013 - 2017	Bidding documents sent to JICA for comments
T-BI-9	Widening of Ilang-Ilang Bridge Road I along Kawit-Noveleta Diversion Road including RROW	IV-A	Cavite Province	100.00 Local funds	DPWH; 2013	
T-BI-10	Widening of bridges along Lucena Diversion Road	IV-A	Quezon Province	198.85 Local fund	DPWH; 2013	
T-BI-11	DPWH Bridge Construction/Replacement Project under the Spanish Government Financing Facility (Supplemental Loan)	Inter-Regional		1,784.00 Spanish Gov't	DPWH; 2013 - 2015	

Code3 (new)	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
T-BI-12	Major Inter-Regional Bridge Reconstruction Projects for Rural Development, JICA Assisted	Inter-Regional		10,421.00 proposed for JICA	DPWH; 2013 - 2017	
T-BI-13	National Road Bridge Replacement Project (NRBRP), formerly United Kingdom (UK)-Assisted DPWH National Road Bridge Replacement Project	Inter-Regional		8,101.00 Foreign funds	DPWH; 2013 - 2018	
<b>Urban Rail</b>						
T-R-3 (D2)	LRT Line 2 East Extension Project (formerly LRT Line 2 East Extension, including JICA TA for FS). Extension of LRT Line 2 by 4.19 kilometers from the current terminal station in Santolan, Pasig to Masinag, Antipolo.	NCR	Masinag and Antipolo City (Rizal)	9,980.00	DOTC-LRTA; 2012 - 2016	
T-R-4 (D6)	Line 1 and Line 2 System Rehabilitation	NCR	Metro Manila	7,515.00	DOTC-LRTA; 2011 - 2013	
T-R-5	Northrail-Southrail Linkage Project, Phase I (Additional Works)	NCR		690.03	DOTC-PNR; 2012 - 2013	
T-R-6	Contactless Automatic Fare Collection System	NCR		1,722.00	DOTC; 2013 - 2015	
T-R-7 (D4)	Construction of MRT 7. Construction and operation of a 22-kilometer metro rail transit (MRT) system connecting TriNoma, along EDSA and North Avenue, to San Jose, Bulacan via the 6-lane highway from the Bocaue interchange of NLEX to an inter-modal transport terminal that will be constructed in San Jose.	NCR, III	Quezon City, San Jose (Bulacan)	66,500.00	DOTC	Drafting of Implementing Agreement by Proponent and DOF
T-R-8 (D1)	LRT Line1 South Extension Project (formerly LRT Line 1 Cavite Extension, including JICA TA for FS). Construction of additional 11.7-kilometer railway. There will be 8 new stations, including 3 intermodal facilities and 1 satellite depot. This extension will pass through the cities of Parañaque and Las Piñas and the province of Cavite.	NCR, IV-A	Cavite Province	60,630.00 PPP/ODA	DOTC-LRTA; 2013 - 2017	
T-R-9	Rehabilitation of PNR Commuter Line	NCR, IV		322.75	DOTC-PNR; 2013 - 2014	
<b>Public Transport System</b>						
T-PT-3 (D8)	Makati-Manila-Pasay-Paranaque Mass Transit System. Establishment of a Mass Transit System (MTS) with the following alignment: C5-32nd Street, EDSA-Buendia, crossing PNR Buendia Station, LRT 1 Buendia Station, CCP Complex and Mall of Asia, EDSA Ayala, Ayala Triangle)	NCR	Manila, Makati, Pasay and Paranaque Cities	62.58	DOTC; 2013 - 2015	
T-PT-4 (D6)	Common Ticketing / Contactless Automatic Fare Collection System. This project will develop a single ticket for LRT Line 1, LRT Line 2, and MRT 3. These three lines currently serve more than 1 million passengers daily. The proposed smartcard should be more than just a ticket; able to capture full economic value through other uses (e.g., as a debit card for other purchases).	NCR	Metro Manila	1,800.00 PPP	DOTC-LRTA; 2013 - 2014	Procurement for FS ongoing
T-PT-5 (E1)	Integrated Provincial Bus Terminals. Establishment of three integrated terminals: North-ALI (beside TriNoma) in Q.C., South-SLEX (FTI) in Taguig City, and South-Coastal Road (PRA)	NCR	Quezon, Taguig and Paranaque Cities	7,500.00	DOTC; 2013 - 2015	Ongoing FS
T-PT-6	Manila Bay - Pasig River - Laguna Lake Ferry System Improvement. This involves a draft a business case assessing the commercial viability	NCR, IV-A		546.40	DOTC, LGU, PRRC; 2013 - 2015	



Code3 (new)	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
	of reviving the Pasig Ferry Service.					
<b>Traffic Management</b>						
T-TM-6	DOTC Road Transportation IT Infrastructure project. Development of a system to aid the Land Transportation Office in complying with its licensing and vehicle registration functions --- software development, purchase of software and hardware, and operations and maintenance of the system for a period of 7 to 8 years.	NCR		8,220.00 GAA	DOTC	Under bidding process
T-TM-7	Installation of Elevated Loading and Unloading Bays. More than just creating bus bays at important strategic points, proposed bays are customized in such a way that strictly prevents loading and unloading of passengers outside designated areas.	NCR	Metro Manila	-	MMDA; 2013	Ongoing study
<b>Airports</b>						
T-AP-8 (G1-a & b)	Ninoy Aquino International Airport (NAIA). Repair and Rehabilitation of Terminal 1 Apron (Wheel Path and Parking Bay)	NCR	NAIA	310.00	DOTC-MIAA; 2013	
	Ninoy Aquino International Airport (NAIA). Construction of Rapid Exit Taxiway and Widening of Taxiway Echo 1	NCR	NAIA	300.00	DOTC-MIAA; 2013	
	Ninoy Aquino International Airport (NAIA). Construction of Taxiway November Extension	NCR	NAIA	426.00	DOTC-MIAA; 2013	
	Ninoy Aquino International Airport (NAIA). Expansion of Arrival and Departure Areas at NAIA Terminal 4	NCR	NAIA	30.00	DOTC-MIAA; 2013	
	Ninoy Aquino International Airport (NAIA). Supply and Installation of Primary Line Conduit of AFL System (Phase 2)	NCR	NAIA	110.00	DOTC-MIAA; 2013	
T-AP-9	Baler Airport Development Project	III	Baler (Aurora)	60.31	DOTC-CAAP; 2013 - 2016	
T-AP-10 (G2-a & b)	Clark International Airport (CIA). Supply and installation of Thermoplastic paint at Taxiways F7, F5, F4, F2, F1, A & D	III	CIA	7.92	DOTC-CIAC; 2013	
	Clark International Airport (CIA). Replacement of Navigational Aids Equipment	III	CIA	230.00	DOTC-CIAC; 2013	
	Clark International Airport (CIA). Rehabilitation of pavement at portion of Taxiway Delta	III	CIA	20.00	DOTC-CIAC; 2013	
	Clark International Airport (CIA). Upgrading of passenger boarding bridge to two finger aero bridge	III	CIA	110.00	DOTC-CIAC; 2013	
	Clark International Airport (CIA). Passenger Terminal Phase II Expansion	III	CIA	360.00	DOTC-CIAC; 2013 - 2015	
<b>Ports</b>						
T-P-3 (H1)	Slip 0, North Harbor - Prop. Security fence, improvement and installation of security gates	NCR	Manila City	-	PPA; 2013	
	Slip 0, North Harbor - Improvement of Slip 0 (Pay Parking Development for cargo trucks and light vehicles)	NCR	Manila City	84.77	PPA; 2011 - 2012	
T-P-5 (H2)	South Harbor, Port Area - Rehabilitation of Breakwater (North Side)	NCR	Manila City	0.05	PPA; 2013 - 2015	
	El Codo Canal, Pasig River, South Harbor, Manila. Construction of Landing Ramp and Security Fence	NCR	Manila City	-	PPA; 2013	
	Movers and Managers Compound, Pasig River, South Harbor, Manila. Construction of Landing Ramp and Security Fence	NCR	Manila City	-	PPA; 2013	

Code3 (new)	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
	South Harbor, Port Area. Construction of Presidential Berth at PCG Area	NCR	Manila City	-	PPA; 2013 - 2014	
T-P-6	Lamiao (Limay) Port, Bataan - Widening and extension of Finger Pier and concrete paving of back up area (6,510 sq.m)	III	Bataan Province	85.00	PPA; 2013 - 2014	
T-P-7	Dingalan Port, Brgy. Aplaya. Construction of RORO Ramp and Construction of Breasting Dolphin at Finger Pier	III		5.00	PPA; 2013 - 2014	
T-P-8	Bauan Port, Batangas. Port development/expansion of backup area	IV-A	Batangas Province	30.00	PPA; 2013 - 2014	
T-P-9	Nasugbu Port, Batangas. Construction of RC Fender Cluster	IV-A	Batangas Province	7.69	PPA; 2013	
T-P-10	Batangas Port. Construction of additional three (3) RORO Ramps (9 x 11m)	IV-A	Batangas Province	20.00	PPA; 2013	
	Batangas Port, Mppog, Marindugue. Construction of RC wharf extension (51.30 x 9m), backup area	IV-A	Batangas Province	60.00	PPA; 2013 - 2014	
T-P-11	Lucena Port, Brgy. Talao-talao, Lucena City. Expansion of PTB and Construction of Walkway	IV-A	Lucena City (Quezon)	20.00	PPA; 2013 - 2014	
	Lucena Port, Brgy. Talao-talao, Lucena City. Construction of marshaling yard and paving of existing back up area	IV-A	Lucena City (Quezon)	37.72	PPA; 2013	
T-P-12	Unisan, Quezon - Port Development	IV-A	Quezon Province	24.00	PPA; 2013	
T-P-13	Central Spine RORO Development. Construction and operation of an integrated transport system combining roll-on roll-off (RORO) ferry port network and services with connecting new toll roads linking Manila-Panay-Negros-Cebu-Bohol-Northern Mindanao.	IV-A, VI, VII, X	Manila City	33,780.00 PPP	DOTC; 2013 - 2014	Bidding for consultancy ongoing; Negotiations stage; Pre-FS: 17.732 M

### (3) Proposed Projects

Project Code	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
<b>Expressway</b>						
T-EX-10 (B2-a)	NLEX-SLEX Connector Road. Construction of 13.53-kilometer elevated expressway to link the existing NLEX and SLEX passing through Metro Manila and utilizing the existing PNR alignment as its route Public-Private Partnership Expressway Projects)	NCR	Metro Manila	25,560.00 PPP	DPWH; 2014 - 2015	NEDA Board Approval; advertisement for LOI, for Prequalification and Bid rescheduled for January to February 2013.
T-EX-11	R-7 Expressway Welcome Rotonda to Don Mariano Marcos Ave. in Fairview, Quezon City. Construction of 16.1-kilometer partially elevated and partially underground expressway from Welcome Rotonda to Don Mariano Marcos Ave, Fairview in Quezon City, to connect Quezon City and Manila City with high speed transport facility, thus decongest traffic of at-grade road. (Public-Private Partnership Expressway Projects)	NCR	Quezon City	25,820.00 PPP	DPWH; 2014 - 2016	For Business Case study. For issuance of Notice of Award to J.F. Cancio and Associates for Business Case.
T-EX-12 (A1-e)	Segment 8.2 of NLEX. An 8-km road that will link Mindanao Avenue and the C5-Commonwealth connection.	NCR	Quezon City	7,000.00 PPP	DPWH 2014-2016	Detail design will be finish by mid of 2013
T-EX-13	NLEX East Expressway/La Mesa Parkway, Don Mariano Marcos Ave., Quezon City to Cabanatuan City. Construction of a 103-kilometer expressway from La Mesa Parkway at Don Mariano Marcos Ave, Quezon City to Cabanatuan City, Nueva Ecija that will form an important transport axis in the eastern area of Region III. It will serve the areas of Bulacan and Nueva Ecija provinces. (Public-Private Partnership Expressway Projects)	NCR, III	Quezon City to Cabanatuan City (Nueva Ecija)	16,860.00 PPP	DPWH; 2014 – 2016	At conceptual stage; unsolicited proposal submitted in 2001 and original proponent status was given to Ausphil Tollways Corp. in 2007
T-EX-14 (B5)	Central Luzon Link Expressway (CLLEX) Phase II (Cabanatuan City-San Jose City). Construction of a 35.7 kilometer, 2-lane expressway. The project is an extension of CLLEX Phase I and will connect Cabanatuan City to San Jose City in Nueva Ecija Province	III	Nueva Ecija Province	19,640.00 PPP	DPWH; 2014 – 2017	Funding proposed under PPP
T-EX-15 (B6)	Calamba-Los Banos Expressway. Construction of 14.72-kilometer, 6-lane expressway to support tourism development of Los Banos and nearby tourist spots.	IV-A	Laguna Province	10,380.00 PPP	DPWH; 2014 – 2016	Business case study completed; Report finalization ongoing.
T-EX-16 (B8)	C-6 Extension (Laguna De Bay Flood Control Dike Expressway). Construction of 43.60 kilometer, 4-lane highway from coastal area in Laguna de Bay from Taguig, Rizal to Los Banos, Laguna. I Will also serve as flood control measure in Laguna de Bay coastal area	IV-A	Laguna Province	42,380.00 PPP	DPWH; 2014 – 2017	Business case study completed; Report finalization ongoing
<b>Urban Roads</b>						
T-UR-41	Rizal Avenue (Monumento)-Samson Road (Caloocan/Manila Boundary). Construction of a 2.251-kilometer road connecting Caloocan City and Manila. (Urban Transport in Metro Manila)	NCR	Caloocan and Manila Cities	977.05 Foreign funds	DPWH; 2016 – 2017	
T-UR-42	Construction of Metro Manila Skybridge (formerly San Juan Elevated Highway). The proposed Metro Manila Skybridge is a 6.75-kilometer long and 25 meters wide elevated road with 6 lanes (3-lanes each) direction. The Skybridge will traverse five (5) cities and will have 6 major	NCR	Makati, Mandaluyong, San Juan and Quezon Cities	13,640.00 TBD	MMDA	Ongoing study

Project Code	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
	intersections namely: E. Rodriguez Avenue; Aurora Blvd; N. Domingo; Shaw Blvd; New Panaderos and J. P. Rizal					
T-UR-43	Radial Road 10. Construction of the Delpan Bridge (C4). (Urban Transport in Metro Manila)	NCR	Manila City	375.18 Foreign funds	DPWH; 2016 – 2017	
T-UR-44	Gov. Forbes (Tayuman-Espana-Plaza Avelino), Espana (Lerma-Rotonda) Road. Construction of 4.341-kilometer road from Gov. Forbes (Tayuman to Espana - Plaza Avelino) to Espana (Lerma to Rotonda). Locations are Manila and Quezon City. (Urban Transport in Metro Manila)	NCR	Manila City	792.25 Foreign funds	DPWH; 2016 – 2017	
T-UR-45	Improvement of Access Road and Rehab. of Street Lighting Leading to Isla PutingBato	NCR	Manila City	16.79	DOTC-PPA	
T-UR-46	Rehabilitation of Arnaiz Avenue, Banawe Ave., New Balara-Marikina Road, North Avenue, Roosevelt Avenue, Central Avenue, Del Monte Avenue, TandangSora Avenue, 20.38km	NCR	Metro Manila	1,931.00 Foreign funds	DPWH; 2016 – 2017	
T-UR-47 (A1-3)	Construction of flover at SLEx. Connecting Taguig and Parangue and Pasay Cities. 1,400 meter with two (2) lanes flyover.	NCR	Taguig, Parangue and Pasay Cities	225.00	DPWH	
T-UR-48	Batasan(Quezon City)-Dingalan (Aurora) Road, Quezon City and Aurora. Construction of roads connecting Aurora to Metro Manila to improve rural road network and provide access from rural areas to major arterial roads	NCR, III	Quezon city and Aurora Province	2,165.00 Chinese Gov't	DPWH; 2016 – 2020	
T-UR-49	Improvement of Sabang-Baler Road	III	Aurora Province	50.00 Local funds	DPWH	
T-UR-50	Bagac-Mariveles Road. Construction of 44.7-kilometer road to improve the road network	III	Bataan Province	614.90 ADB/PPP	DPWH; 2016 – 2019	
T-UR-51	Bigaa-Plaridel-Bulacan-Malolos Road, 22.08km	III	Bulacan Province	181.12 ADB	DPWH; 2015 – 2016	
T-UR-52	Pantabangan-Canili Bypass Road Phase III, Road Opening/Construction of Bridges	III	Nueva Ecija Province	300.00 Local funds	DPWH; 2013	
T-UR-53	San Nicolas-Natividad-San Quintin- Umingan-Guimba Road. Improvement of the 15.1-kilometer rural road network that provides access from rural to major arterial roads	III	Pangasinan and Nueva Ecija Provinces	237.00 Foreign funds	DPWH; 2015 – 2017	
T-UR-54	San Fernando City Bypass Road. Construction of a 4.8-kilometer bypass road	III	San Fernando City (La Union)	135.60 Foreign funds	DPWH; 2014 – 2016	
T-UR-55	Iba-Tarlac Road, Zambales, Tarlac 87.25km, 2,397lm	III	Tarlac and Zambales Provinces	71.33 Foreign funds	DPWH; 2015 – 2020	
T-UR-56	Upgrading (Gravel to Concrete) of Lourdes-Clark Air Base Road	III	Tarlac Province	100.00 Local funds	DPWH; 2013	
T-UR-57	Capas-Botolan Road. Construction of 63.33-kilometer and 2,397-linear meter bridge to improve rural road network and provide access from rural areas to major arterial road	III	Zambales and Tarlac Provinces	7,663.00 KEDCF	DPWH; 2015 – 2025	
T-UR-58	Asphalt Overlay of Critical/Strategic FAB Roads	III		165.00	AFAB	
T-UR-59	Batangas-Bauan Ring (Bypass) Road. Construction of 22.3-kilometer road to ease traffic of concerned area	IV-A	Batangas Province	1,358.00 Foreign funds	DPWH; 2015 – 2018	
T-UR-60	Mabini Circumferential Road. Construction of 19.6-kilometer road to improve the existing road network	IV-A	Batangas Province	411.60 Foreign funds	DPWH; 2016 – 2019	

**Roadmap for Transport Infrastructure Development for Metro Manila and Its Surrounding Areas (Region III and Region IV-A)**

FINAL REPORT

Appendix 4A (2) Project Listings by Status

Project Code	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
T-UR-61	Manila South Road, Malvar-Lipa Section, Batangas, 25.24km	IV-A	Batangas Province	249.97 ADB	DPWH; 2015 – 2017	
T-UR-62	Palico-Balayan-Batangas Road, Batangas 53.32km. Construction of 53.32-kilometer road	IV-A	Batangas Province	204.14 ADB	DPWH; 2015 – 2017	
T-UR-63	Alaminos-San Pablo City Bypass Road, along Maharlika Highway, Laguna. Construction of 12.02-kilometer road to ease traffic in concerned area	IV-A	Laguna Province	605.13 Foreign funds	DPWH; 2014 – 2018	
T-UR-64	Famy-Infanta-Dalahican Port Road, Quezon, 37.05km	IV-A	Quezon Province	93.65 ADB	DPWH; 2015 – 2016	
T-UR-65	Mulanay-San Francisco Road. Construction of 24-kilometer road to improve rural road network and provide access from rural to major arterial roads	IV-A	Quezon Province	520.00 Foreign funds	DPWH; 2015 – 2018	
T-UR-66	Tiaong Bypass Road. Construction of a 3-kilometer bypass road	IV-A	Tiaong (Quezon)	102.90 Foreign funds	DPWH; 2014 – 2016	
T-UR-67	Manila East Road, Rizal. (Assets Preservation of National Roads Generated from Pavement Management System/Highway Development and Management - 4 (HDM-4))	IV-A	Rizal Province	190.88 Local fund	DPWH; 2013	
T-UR-68	Upgrading Quezon - Alabat - Perez Road	IV-A	Quezon Province	109.98 Local fund	DPWH; 2013	
T-UR-69	Improvement of Bauan - Mabini Circumferential Road	IV-A	Batangas Province	40.000 Local funds	DPWH; 2014	
T-UR-70	Improvement of Tanza - Trece Martirez City - Indang Road	IV-A	Cavite Province	7.73 Local fund	DPWH; 2014	
T-UR-71	Improvement of Tagaytay - Talisay - Taal Lake Road	IV-A	Cavite Province	32.52 Local fund	DPWH; 2014	
<b>Bridges/Interchanges</b>						
T-BI-14	C5/Kalayaan Avenue Interchange. Construction of Interchange to alleviate and improve the severe traffic congestion at the major roads in Metro Manila. (Metro Manila Interchange Construction Project Phase IV)	NCR	Makati City	240.00 proposed for JICA	DPWH; 2016 – 2018	2 interchange projects
T-BI-15	Improvement of Existing Bridges along Pasig River, Phase II (Quezon, Lambingan, and Vargas Bridges). Improvement of 3 existing bridges to provide structurally sound permanent bridges along all national roads to improve basic, social, industrial and agricultural activities and provide safe and faster transport effectively using the existing transport system	NCR	Manila and Pasig Cities	1,206.00 Foreign funds	DPWH; 2016 – 2018	
T-BI-16	2nd Ayala Bridge. A 0.410-kilometer bridge connecting the streets of San Marcelino and Carlos Palanca located in Manila City. (Urban Transport in Metro Manila)	NCR	Manila City	986.40 Foreign funds	DPWH; 2016 beyond	
T-BI-17	Improvement of Existing Bridges along Pasig River, Phase I (Jones and Ayala Bridges). Improvement of 2 existing bridges to provide structurally sound permanent bridges along all national roads to improve basic, social, industrial and agricultural activities and provide safe and faster transport effectively using the existing transport system	NCR	Manila City	2,136.00 Foreign funds	DPWH; 2016 – 2020	
T-BI-18 (A8-d)	C-5/Green Meadows/Acropolis/Calle Industria/ Eastwood, Pasig City. A 1,098 meter four (4) lane flyover structure with 276m approach road along C-5 to provide a grade separator on the	NCR	Quezon and Pasig Cities	1,573.82	DPWH; 2016 – 2018	2 interchange projects

Project Code	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
	alternating roads of C-5, Green meadows Ave., Acropolis and Calle Industria at Eastwood. (Metro Manila Interchange Construction Project Phase IV)					
T-BI-19 (A8-b)	EDSA/Roosevelt Avenue/ Congressional Avenue Interchange. A 366.0 m flyover and 208 meters approach road six (6) lane (3-lane each direction along EDSA separated by the MRT 3 Extension) crossing Roosevelt Avenue/ Congressional Avenue. (Metro Manila Interchange Construction Project VI)	NCR	Quezon City	851.06	DPWH; 2016 – 2018	2 interchange projects
T-BI-20	C-3 (Araneta Ave.)/E. Rodriguez Ave Interchange. Construction of Interchange to alleviate and improve the severe traffic congestion at the major roads in Metro Manila. (Metro Manila Interchange Construction Project Phase IV)	NCR	Quezon City	1,015.00 proposed for JICA	DPWH; 2016 – 2018	Conflict with Skyway Stage 3
T-BI-21 (A8-c)	EDSA/West Avenue/ North Avenue Interchange. A 342.0 m North bound and 319 m South bound flyover and 227m and 245m approach road for North and South bound respectively, six (6) lane flyover along EDSA (3-lane each direction separated by the MRT 3 line) crossing North and West Avenue. (Metro Manila Interchange Construction Project VI)	NCR		778.09	DPWH; 2016 – 2018	2 interchange projects
T-BI-22	North Avenue/Mindanao Avenue Interchange. A 95 m two (2) lane left turning tunnel from North Avenue., towards Mindanao Avenue., and a 493.40 m two (2) lane left turning flyover from Mindanao Avenue towards North Avenue. The approach road is 205 meter. (Metro Manila Interchange Construction Project VI)	NCR	Quezon City	723.61	DPWH; 2016 - 2020	
T-BI-23	Arterial Road Bypass Project Phase III Cabanatuan & San Jose Bypass Road, Nueva Ecija. For feasibility and Business Case Studies as a Tollway facility (4-lane widening flyovers etc., and O&M)	III	Cabanatuan and San Jose Cities (Nueva Ecija)	5,604.00 Foreign funds	DPWH; 2015 - 2020	
T-BI-24	Calumpit Bridge along Manila North Road (MNR), Bulacan	III	Calumpit (Bulacan)	225.00 Local funds	DPWH	
T-BI-25	Batangas Port - Construction of Bridge/Ramp Connecting Phase 1 to Phase II	IV-A	Batangas Province	27.95	DOTC-PPA	
T-BI-26	DPWH Bridge Construction Acceleration Project for Calamity-Stricken Areas, Phase II (formerly DPWH Bridge Construction Acceleration Project for Calamity Stricken Areas II, Austrian-Assisted)	Inter-Regional		6,115.00 Foreign funds	DPWH; 2015 - 2020	
T-BI-27	Rehabilitation and Maintenance of Bridges along Arterial Road, Phase V	Nationwide		63.40 Foreign funds	DPWH; 2016 - 2020	
<b>Urban Rail</b>						
T-R-10	Makati-Taguig-Pasay Elevated Monorail	NCR	Makati, Taguig and Pasay Cities	26,200.00	BCDA; 2015	
T-R-11	NAIA Airport Link	NCR	Metro Manila	5,052.00	DOTC-LRTA ; 2011 - 2014	
T-R-12	Line 3 West Extension. Construction of approximately 2.0-kilometer Line 3 extension from Taft terminal station to Entertainment City	NCR	Metro Manila	TBD	DOTC	
T-R-13	MRT 3 Capacity Improvement. Procurement of	NCR	Metro Manila	4,500 -	DOTC	Pending RDC

Project Code	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
(D3)	additional 52 coaches to increase system capacity and address overloading problems.			Phase 1; 4,100 - Phase 2 TBD		approval
T-R-14	C-5 MRT. Development of a new Metro Railway in Metro Manila along C5 to serve new CBDs along the corridor, such as the Bonifacio Global City. It will also decongest road and rail traffic along C4 (EDSA).	NCR	Metro Manila	-	DOTC	
T-R-15	Integrated Luzon Railways. Modernization fo the PNR railway system from San Fernando, La Union to Metro Manila to Legazpi, Albay	NCR	Metro Manila and other parts of Luzon	TBD PPP	DOTC	F/S ongoing
T-R-16	Manila-Clark Airport Express Rail Link. Construction of around 100 kilometers of elevated commuter and high speed railway from Manila (EDSA of FTI) to Clark Airport. Three (3) out of 19 stations to be stops for express airport service train. First phase to be from FTI to Malolos. Phase II from Malolos to Clark.	NCR, III	Metro Manila, Bulacan and Pampanga Provinces	5,594.00	DOTC-PNR- Northrail; 2012 - 2016	
T-R-17	Northrail-Southrail Linkage Project, Phase II	NCR, IV	Metro Manila	4,319.00	DOTC-PNR; 2012 - 2015	
T-R-18	South Line Modernization	NCR, IV-A, V		109,250.00	DOTC-PNR; 2011 - 2016	
T-R-19	LRT1 Dasmariñas	IV-A	Cavite Province	TBD	DOTC	
<b>Public Transport System</b>						
T-PT-7	Metro Manila BRT. Deployment of a special bus system with dedicated buses and lanes on several strategic corridors in Metro Manila. The scope includes physical infrastructure, stations, guide ways, automated traffic control systems, barriers and special buses for the system. DOTC preparing demonstration project; Ongoing Feasibility Study commissioned by WB (Ortigas-R5, C5, R7)	NCR	Metro Manila	TBD	DOTC	DOTC preparing demonstration project; Ongoing FS commissioned by WB (Ortigas-R5, C5, R7)
T-PT-8	Establishment of the Mega Manila Provincial Integrated Bus Axis System (PIBAS)	NCR	Metro Manila	3,600.00	MMDA	Ongoing
T-PT-9	Construction of Southern Bus Terminal Feeder Lane. Construction of a main transportation line	NCR	Quezon, Parangue and Taguig Cities	102.00	MMDA	
T-PT-10	MMDA Bus Management and Dispatch Facilities (BMDS). Rehabilitation of MMDA bus management facilities and acquisition of an automated bus dispatch system	NCR		TBD	MMDA	Ongoing
T-PT-11	Electric Bus Project	NCR		36.00	DOE-PNOC	
T-PT-12	Compressed Natural Gas Vehicle Development Project	NCR, IV-A		400.00	DOE-PNOC	
<b>Traffic Management</b>						
T-TM-8	Installation of LED Message Board. MMDA will be installing additional light emitting diodes message boards in major roads in metro manila to provide traffic advisories as well as road safety reminders to guide road users.	NCR	Metro Manila	-	MMDA	
T-TM-9	Installation of Intelligent Transport System (Module A: Traffic Signal System Upgrading)	NCR	Metro Manila	4,143.00	MMDA	
T-TM-10	Installation of Intelligent Transport System (Module B: Communication and Monitoring)	NCR	Metro Manila	651.80	MMDA	

Project Code	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
T-TM-11	Metro Manila Traffic Navigator II (TNAV 2). TNAV 2 will cover additional major corridors. The major component of this undertaking is the installation of high definition cameras which can also be used in pinpointing 'kolorum' vehicles and Traffic Constables engaged in illegal activities.	NCR	Metro Manila	20.00 TBD	MMDA	Request for Budget allocation was submitted to the President through ES Paquito Ochoa Jr. last 11 December 2012. Detailed cost breakdown to be submitted to ES Ochoa
T-TM-12	Electronic Tagging System or 'E-tagging'. Use of Radio Frequency Identification (RFID) technology to track PUVs authorized by LTRFB to ply certain designated routes	NCR	Metro Manila	-	MMDA; 2012	Ongoing development
T-TM-13	Implementation of Uniform Ticketing System and System for Interconnectivity. A Uniform Traffic Violation ticket bearing the MMDA Logo and those of the seventeen LGUs will be issued by all traffic operatives within metro manila and shall be recognized Metro-wide.	NCR	Metro Manila	-	MMDA	MMC/MMDA Resolution No. 12-02 Entitled " Adopting A Uniform Ticketing System And The Establishment Of A System Of Inter-Connectivity Among Government Instrumentality Involved In The Transport And Traffic Management In Metro Manila" was approved last Jan. 26, 2012
T-TM-14	Motor Vehicle Inspection and Type Approval System	Nationwide		2,000.00	DOTC-LTO	
T-TM-15	New Communication, Navigation and Surveillance/Air Traffic Management Systems Development. Project	Nationwide		5,382.00	DOTC-CAAP	
T-TM-16	Categorization of Navigational Areas in the Philippines	Not Indicated		TBD	DOTC-MARINA	
<b>Airports</b>						
T-AP-11 (G1-a & b)	Ninoy Aquino International Airport (NAIA). Taxiway H1 and C1 (Phase - 1) (Upgrading of Taxiway H-1 to Taxiway C-5 (phasing))	NCR	NAIA	56.07	DOTC-MIAA; 2014	
	Ninoy Aquino International Airport (NAIA). Taxiway C-2 (Phase - 2) (Upgrading of Taxiway H-1 to Taxiway C-5 (phasing))	NCR	NAIA	69.87	DOTC-MIAA; 2015	
	Ninoy Aquino International Airport (NAIA). Taxiway C-3 (Phase - 3) (Upgrading of Taxiway H-1 to Taxiway C-5 (phasing))	NCR	NAIA	11.29	DOTC-MIAA; 2015	
	Ninoy Aquino International Airport (NAIA). Taxiway C-4 (Phase - 4) (Upgrading of Taxiway H-1 to Taxiway C-5 (phasing))	NCR	NAIA	87.63	DOTC-MIAA; 2016	
	Ninoy Aquino International Airport (NAIA). Taxiway C-5 (Phase - 5) (Upgrading of Taxiway H-1 to Taxiway C-5 (phasing))	NCR	NAIA	99.43	DOTC-MIAA; 2016	
	Ninoy Aquino International Airport (NAIA). Construction of Remote Parling at Terminal 2	NCR	NAIA	231.00	DOTC-MIAA; 2015 - 2016	
	Ninoy Aquino International Airport (NAIA). Upgrading of the Existing Fuel Storage Facility	NCR	NAIA	TBD	DOTC-MIAA; 2014	



**Roadmap for Transport Infrastructure Development for Metro Manila and Its Surrounding Areas (Region III and Region IV-A)**
**FINAL REPORT**
**Appendix 4A (2) Project Listings by Status**

Project Code	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
	Ninoy Aquino International Airport (NAIA). Construction of Arrival and Departure VIP Lounge at NAIA Terminal 2	NCR	NAIA	52.80	DOTC-MIAA; 2014	
	Ninoy Aquino International Airport (NAIA). Cargo Terminal & Unit Loading Device Yard at T3 Triangular Area	NCR	NAIA	TBD	DOTC-MIAA; 2014	
T-AP-12 (G2-a & b)	Clark International Airport (CIA). Replacement of Airfield Ground Lighting System (AGLS)	III	CIA	400.00	DOTC-CIAC; 2014	
	Clark International Airport (CIA). Replacement of Airport Weather Observation System (AWOS)	III	CIA	40.00	DOTC-CIAC; 2014	
	Clark International Airport (CIA). Rehabilitation of Overrun at Runway 02R/20L	III	CIA	32.00	DOTC-CIAC; 2014	
	Clark International Airport (CIA). Replacement of Perimeter Security Lighting System	III	CIA	7.00	DOTC-CIAC; 2014	
	Clark International Airport (CIA). Repainting of Pavement Markings at Runway 02R/20L	III	CIA	16.00	DOTC-CIAC; 2014	
	Clark International Airport (CIA). Asphalt overlay at shoulder of Main Ramp and North Ramp	III	CIA	12.00	DOTC-CIAC; 2014	
	Clark International Airport (CIA). Asphalt overlay at Taxiway A, F5 and F7	III	CIA	40.00	DOTC-CIAC; 2014	
	Clark International Airport (CIA). Rehabilitation of Taxiway F2 from Taxiway Delta up to Passenger Terminal Building exit area	III	CIA	12.00	DOTC-CIAC; 2014	
	Clark International Airport (CIA). Construction of a Budget/ Low Cost Carrier (LCC) Terminal	III	CIA	6,242.71	DOTC-CIAC; 2013 - 2015	
T-AP-13	Iba Airport Development Project	III	Zambales Province	22.00	DOTC-CAAP; 2014	
<b>Ports</b>						
T-P-19	Coast Guard Base FAROLA	NCR		15.49	DOTC-PCG	
T-P-20	Coast Guard Base Taguig	NCR	Taguig City	126.00	DOTC-PCG	
T-P-21 (H1)	Marcos Road, North Harbor. Conversion/major repair of former MBRS warehouse and old halfway house into PPD-NH Station Office/ Headquarters	NCR	Manila City	24.00	DOTC-PPA; 2014 - 2015	
	Pier 18, North Harbor, Manila. Upgrading and port development	NCR	Manila City	-	PPA; 2016	
T-P-22 (H2)	South Harbor, Port Area. Conversion of existing Halfway House into PMO-SH Port Police Office Bldg.	NCR	Manila City	-	PPA; 2016	
	South Harbor, Port Area. Construction of New Office Building	NCR	Manila City	-	PPA; 2016	
T-P-23	Casiguran Port, Aurora. Additional port Improvement	III	Aurora Province	60.00	PPA; 2016	
	Casiguran Port, Aurora. Additional construction of PTB	III	Aurora Province	10.00	PPA; 2015	
T-P-24	Lamiao (Limay) Port, Bataan. Construction of two (2) storey visitors quarters	III	Batangas Province	5.00	PPA; 2015	
T-P-25	Candelaria Port, Macabebe, Pampanga. Financial assistant for port construction	III	Pampanga Province	5.00	PPA; 2016	
T-P-26	Consuelo Port, Macabebe, Pampanga. Financial assistant for port construction	III	Pampanga Province	5.00	PPA; 2016	
T-P-27	Bagac Port, Municipality of Bagac. Construction of port	III		30.00	PPA; 2016	
T-P-28	Lobo Port, Batangas. Port Rehabilitation	IV-A	Batangas Province	20.00	PPA; 2016	
T-P-29	Nasugbu Port, Batangas. Construction of RC	IV-A	Batangas	50.00	PPA;	

Project Code	Project Title / Description	Region	Location	Estimated Project Cost (PHP Million) & Funding	Implementing Agency & Schedule	Remarks
	Pier/Wharf		Province		2016	
T-P-30	Batangas Port. Construction of Bridge/Ramp connecting Phase 1 to Phase 2	IV-A	Batangas Province	23.97	PPA; 2014	
	Batangas Port. Proposed security fence project	IV-A	Batangas Province	65.00	PPA; 2016	
T-P-31	General Luna Port, Quezon. Construction of Pier	IV-A	Quezon Province	17.62	PPA; 2015	
T-P-32	Lopez Port, Quezon. Development of Tertiary Port	IV-A	Quezon Province	30.00	PPA; 2016	
T-P-33	Mauban Port, Quezon. Port improvement project (phase2)	IV-A	Quezon Province	40.00	PPA; 2016	
T-P-34	San Narciso Port, Quezon. Port Development	IV-A	Quezon Province	13.50	PPA; 2016	
<b>Others</b>						
T-PCG-2	Multi-Role Response Vessels (MRRVs) for the Philippine Coast Guard. Acquisition of two 92-meter and six 25-meter Multi-Role Response Vessels.	NCR	Metro Manila	-	DOTC	

Source: DPWH, DOTC, MMDA and NEDA, March 2013