5 DRAFT MASTER PLAN

5.1 Approach

The major criteria in identifying road improvement projects for the Master Plan on Road and Road Transport are as follows:

- Primary and secondary road networks[1] will be completed by accelerating the implementation of ongoing and committed projects as well as resolving bottlenecks and developing strategic links with adequate standards and pavement conditions;
- Bottlenecks, especially in and around large urban areas, which are expected to hinder smooth interprovincial transport must be prevented before the situation becomes critical and costlier;
- The north-south link alternative to NR1 will be developed to comply with the future level of transport demand;
- International links between the adjoining countries of China, Laos and Cambodia will be improved to an all-weather standard. The 14 road links should be prioritized according to the projected transport demand and international agreements;
- In general, future investments in roads should undergo critical economic evaluation. Prioritization must not only be within the road subsector but should apply to other transport subsectors as well. Of the identified six major growth corridors, the critical ones include Hanoi-Nam Dinh/Ninh Binh, Hue-Danang-Hoi An, HCMC-Da Lat-Nha Trang, and HCMC-Can Tho.
- Whereas rural roads are given high priority, the improvement of the network of provincial roads[2] to link them with primary/secondary network and rural roads should likewise be given importance.

The economic development and motorization levels in Vietnam are still in the early stage of development. Much more is expected particularly from rural road network development to lessen the economic disparity between urban and rural areas. Needless to say, the amount of the investment in economic corridors, such as National Road No.1, is much larger than the current investment levels in rural areas. Moreover, the road transport subsector will be expected to play a major role in the ASEAN regional transport system development in spite of the existing smaller traffic demand on cross-border gates.

Figures 4.4.1 and 4.4.2 illustrate the conceptual framework for the future road network with the domestic north-south axis, international axis (connections) and the major economic centers linked by the future road network.

[1] The VITRANSS proposes that current national roads be reclassified as primary, secondary or tertiary based on functional importance.
[2] Most provincial and rural roads under the tertiary category and below are not fully covered by the VITRANSS.

There will always be financial constraints, and economic justification may likewise pose a problem as in the case of radial trunk routes from Hanoi to the northern mountainous region such as NR2 and NR3. The routes play a role in the network system and are important for rural economic development. However, traffic demand is relatively small to justify any road improvement. Thus, for low-demand routes, the most practical approach is to maintain an all-weather road condition with minimum standards particularly in remote, mountainous areas.

Table 5.1.1 presents the five project categories adopted in project formulation which can be applied to newly proposed projects. Ongoing and committed projects have already been categorized and some of them are under "Rehabilitation", but the actual work can be "Upgrading", based on the definition indicated in Table 5.1.1.

Table 5.1.1
Basic Categories in Project Formulation

Project Type	Objective	Scope of the Projects
Rehabilitation	To provide minimum, all-weather accessibility within the existing ROW or road width	
Improvement	To provide sealed road surface within the existing road width or minimum requirement of the width	Minimum requirement (Proposed) Primary: Asphalt (Bitumen) w=5.5m Secondary: Gravel w=3.5m
Upgrading	To provide condition according to the design standard required	Minimum two lanes Asphalt concrete
Widening	From two lanes to four lanes with dual carriageway	Asphalt concrete
New Construction	(New construction)	Asphalt concrete

An important strategy in project implementation is to gradually improve the condition according to traffic demand. Economic expansion including motorization level in most of the regions or corridors except for the Hanoi-Hai Phong, HCMC-Vung Tau and NR1 corridors will be comparatively low, so that the following basic implementation strategies will be adopted:

Rural Areas: The highest priority in network development is to immediately remove impassable sections in the primary and secondary networks. Desirably, by year 2010, the primary road network will be sealed with bitumen asphalt at the least, and the secondary road network with gravel pavement. By year 2020, the primary network is expected to be all asphalt concrete roads and the secondary network, bitumen, at the least.

Economic Development Areas: Promoting the smooth completion of ongoing and

committed projects, the projects for further modernization of facilities, which are justified economically, will be formulated.

ASEAN Regional Cooperation: The ASEAN Highway Network system has been approved by the countries involved. The VITRANSS acknowledges this agreement.

Expressway Network Development: Based on economic expansion and motorization trends, the road and road transport systems are expected to play a greater role in the transport sector. To further enhance the expansion of economy and industrialization, road infrastructure modernization, including construction of expressways, will be planned. Expressways will provide faster, safer and reliable traffic flows. An expressway network can connect major economic focal points such as Hanoi, HCMC, Hai Phong, Danang, and others. However, it will require a large amount of investment and the current issue is when will the planned expressway network development be economically justifiable and financially viable.

Candidate Projects

The candidate projects have been identified based on the long term strategy as listed in Table 5.1.2.

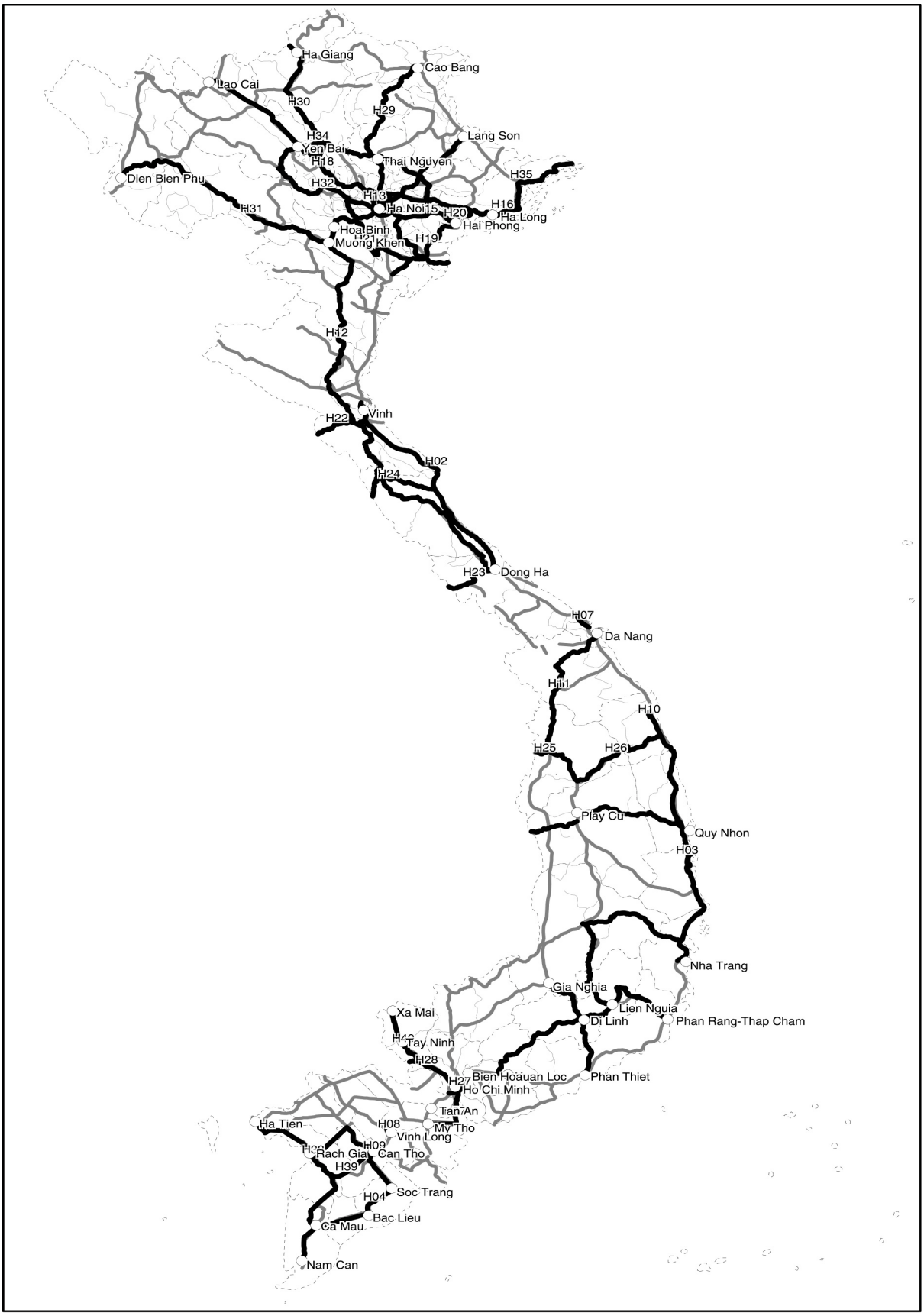
Table 5.1.2
List of Candidate Projects

Project No.	Project	Description	Cost 2001- (M US$)
Primary Road Network Development			
H10	National Highway No.1 Urban Bypass (Hanoi-HCMC; 70km)	To construct an urban bypass in the five major towns (Thanh Hoa, Vinh, Dong Hoi, Dong Ha, Quang Ngai) to ease traffic congestion and segregate through traffic to enhance traffic safety.	67.0
H12	National Highway No.14, 14B Upgrading Project (Danang-Tay Ninh; 900km)	To link Danang and the Central Highlands and promote rural economic development, particularly from Da Nang to Com Tum (310 km) and improve narrow and winding sections of Ho Chi Minh Highway from Com Tum to Tay Ninh.	350.0
H13	National Highway No.15 Rehabilitation Project (Hanoi - Hue; 748km)	To rehabilitate and pave (minimum; Bitumen AC) some impassable sections of Ho Chi Minh Highway. Traffic demand here will be small during the Master Plan period.	45.0
H14	Hanoi Ring Road	To provide bypass and alternative routes to traffic passing through or going to Hanoi City that will link all major radial arterials in the outskirts of the urbanized area. This project includes constructing new bridges.	256.0
H19	National Highway No.1 Hanoi - Ninh Binh Widening Project (80km)	To widen the road to a four-lane dual carriageway to accommodate future traffic demand which is expected to increase rapidly due to industrialization.	76.0
H20	National Highway No.70 Upgrading Project (Hanoi-Lao Cai; 191km)	To improve all the narrow, winding sections of the road, one of the important international links between Hanoi and Yunnan, China and the primary access to northern mountainous provinces.	125.0
H22	National Highway No.21 Upgrading Project (80km)	To upgrade to the 2-lane design standard. This highway which links NH10, NH1, NH6, and NH32, will provide the road network in the south of Hanoi, a potential area of economic growth.	58.0
H23	East-West Corridor Project (ASEAN 7; NH8, 8B; 110km)	To upgrade to 2-lane design standard. This highway is one of ASEAN's primary east-west corridors, linking Vientiane in Lao and Vinh (Cua Lo) Port in Vietnam. .	90.0

Project No.	Project	Description	Cost 2001- (M US$)
H26	National Highway No.40 Upgrading Project (ASEAN 7B,24km)	To upgrade to the 2-lane design standard in line with H11. This highway is one of ASEAN's primary east-west corridors, linking Pakse in Lao and Danang Port in Vietnam.	14.0
H27	Rehabilitation (NH19, 20, 24, 26, 27, 28)	To upgrade the access roads from NH01 to the Central Highlands to primary and secondary design standards. The roads will form a road network that will encourage rural economic development.	150.0
Secondary Road Network Development			
H31	Hanoi-Cao Bang (NH3) Improvement (310km)	To improve this primary access between Hanoi and the northern mountainous provinces to the standard of a 2-lane secondary road.	148.0
H32	Hanoi-Ha Giang (NH2) Improvement (300km)	To improve this primary access between Hanoi and the northern mountainous provinces to the standard of a 2-lane secondary road.	137.0
H33	Hanoi-Dien Bien Phu (NH6) Improvement (468km)	To improve this primary access between Hanoi and the northern mountainous provinces to the standard of a 2-lane secondary road. This is also the access road to Vientiane via the northern route, Loa.	223.0
H34	Hanoi-Lai Chau (NH32) Improvement (390km)	To improve NH32, a primary access in the area west of Red river. This road will be within the economic influence area of the future Metropolitan Hanoi.	200.0
H35	North C1 (North-East Ring, NH5-NH3, NH379; 150km)	To develop the outer, northeastern ring road of the future metropolitan region, linking with primary radial roads.	101.0
H36	North C1 (North Ring, NH3-NH70, NH379; 115km)	To develop the outer, north ring road of the future metropolitan region, linking with primary radial roads.	122.0
H37	North C1 (West-South Ring, NH70-NH1, NH379/15/47; 295km)	To develop the outer, southwest ring road of the future metropolitan region, linking with primary radial roads. The area is mountainous and has less traffic.	216.0
H38	North C2 (North-East Ring, NH5-NH3, NH279; 255km)	To develop the northeast ring road in the northern mountainous region that will provide better access to the rural area and promote growth. The area, however, has a steep terrain and less traffic demand.	171.0
H39	North C2 (North Ring, NH3-NH70, NH279/1B; 120km)	To develop the north ring road in the northern mountainous region that will provide better access to the rural area and promote growth. The area, however, has a steep terrain and less traffic demand.	83.0
H40	North C2 (North-West Ring, NH70-NH6, NH279; 150km)	To develop the northwest ring road in the northern mountainous region that will provide better access to the rural area and promote growth. The area, however, has a steep terrain and less traffic demand.	107.0
H41	Cua Ong-Bac Luan (NH18) Road Improvement (130km)	To improve the road linking Vietnam and China passing through the coastal area to promote tourism in Ha Long.	92.0
H42	Hanoi-Thai Binh Road (NH380) Improvement (100km)	To improve the road to the standard of a 2-lane route to the Red Delta area, southeast of Hanoi. This road will provide a better access to the high-density population and future industrial areas.	124.0
H43	HCMC-My Tho Road (NH50) Improvement (80km)	To improve the road passing through future urban areas south of HCMC, including construction of one long-span bridge. This will be an alternative route of NH01between My Tho and HCMC via Go Cong.	79.0
H44	My Tho-Soc Trang Route Improvement (120km)	To improve the road linking coastal provinces (from My Tho, Ben Tre, Tra Vinh and to Soc Trang) in the Mekong Delta. Ferries connect the road in 4 main river crossings.	235.0
H45	Can Tho-Ha Tien Improvement (200km)	To upgrade the road, an important arterial road for Can Tho and Kien Giang provinces, to promote industrialization in the Mekong Delta.	197.0
H46	Can Tho-Kien Giang-Ca Mau Route Improvement (200km)	To improve the access road in the country's most southern region, including construction of small and medium-size bridges for the many rivers and canals. The area is flood-prone.	197.0
H47	Ho Chi Minh Highway Extension (Chan-Thanh-An Giang; 60km)	To construct two new North-South axes running parallel to NH01, from Chan Thanh (NH13) to An Giang (NH80).	58.0

Project No.	Project	Description	Cost 2001- (M US$)
H48	NH22B Improvement (Go Dau-Xau Mai; 80km)	To improve the secondary cross-border link to Phnom Penh, Cambodia, to a 2-lane design standard.	55.0
H49	Secondary Road Network rehabilitation Program	To rehabilitate the road and assure minimum traffic function as secondary network. The road has small traffic demand, hence its priority will be comparatively low.	94.0
Tertiary Road Network Development			
H50	Tertiary Road Improvement Project	To rehabilitate the tertiary road network and provide an all-weather access route to all the rural centers.	569.0
Road Safety			
H52	Road Safety Improvement Program	To identify accident-prone areas and implement preventive measures including education, enforcement and campaign, etc.	30.0
Expressway			
H53	North-South Expressway 1 (Hanoi-Vinh, 310km)	To develop the third North-South axis with modern road facilities. The expressway, which will have a 4-lane dual carriageway and access, will be in a high economic growth corridor.	930.0
H54	North-South Expressway 2 (Vinh-Hue, 400km)	To develop the third North-South axis with modern road facilities. The expressway, which will have a 4-lane dual carriageway and access, is expected to have less traffic demand.	1,200.0
H55	North-South Expressway 3 (Hue-Danang, 100km)	To develop the third North-South axis with modern road facilities. The expressway, which will have a 4-lane dual carriageway and access, is expected to promote economic growth in the central region.	300.0
H56	North-South Expressway 4 (Danang-Nha Trang, 550km)	To develop the third North-South axis with modern road facilities. The expressway, which will have a 4-lane dual carriageway and access, is expected to have a comparatively low demand.	1,650.0
H57	North-South Expressway 5 (Nha Trang-HCMC, 420km)	To develop the third North-South axis with modern road facilities. The expressway, which will have a 4-lane dual carriageway and access, is expected to strengthen tourism development in the area.	1,260.0
H58	Noi Bai-Ha Long Expressway (150km)	To develop an expressway, which will have a 4-lane dual carriageway. It is expected to strengthen infrastructure development in one of the leading corridors for industrial development in the north (Hanoi).	750.0
H59	HCMC-Vung Tau Expressway (90km)	To develop an expressway, which will have a 4-lane dual carriageway. It is expected to strengthen infrastructure development in one of the leading corridors for industrial development in the south (HCMC).	450.0
H60	HCMC-Can Tho Expressway 1 (HCMC-My Tho; 50km)	To develop an expressway, which will have a 4-lane dual carriageway. It is expected to alleviate the traffic congestion on NH01 and enhance accessibility between the national (HCMC) and regional centers (Can Tho), thus promoting economic growth. Higher traffic demand is projected in this section, due to rapid urbanization.	350.0
H61	HCMC-Can Tho Expressway 2 (My Tho-Can Tho; 80km)	To develop an expressway, which will have a 4-lane dual carriageway. It is expected to alleviate the traffic congestion on NH01 and enhance accessibility between the national (HCMC) and regional centers (Can Tho), thus promoting economic growth. Higher traffic demand is estimated in this section, due to rapid urbanization. (Phase 2)	560.0
	Total		**11,919.0**

Figure 5.1.1
Location of Candidate Projects



5.2 Master Plan Network and Projects

Initial Prioritization of Identified Primary and Secondary Road Network Projects

A total of 62 projects have been identified for the long-term conceptual road network. The next step is to prioritize these projects by applying the following criteria:
(1) traffic demand,
(2) economic viability,
(3) social/poverty,
(4) environmental,
(5) cost recovery,
(6) international linkage, and
(7) resettlement. Each criterion classifies the projects into three priority groups – composing a, b or c. Table 5.2.1 presents the results.

Based on this evaluation, the study team examined the overall result of each project, except in case of ongoing projects. The results show that it is not necessary for the high-priority Group “A” to be classified as Group “a” for all the evaluation criteria. However, the projects should at least be justified from the viewpoint of either traffic demand, social impact or international economy.

Priority ranking of the proposed projects was undertaken and these were classified into groups A, B or C. Projects with higher priority are classified A and B and will be nominated as Master Plan projects. Based on the results of Table 5.2.1, a list of candidate projects was developed shown in Table 5.1.1, with corresponding description and project cost estimates. Figure 5.1.1 shows the location of candidate projects. Development policies for the Master Plan network were likewise reviewed and classified taking into account long-term development policies and are discussed below:

(1) Traffic demand on the north-south NR1 is projected to increase rapidly and some sections require a four-lane dual carriageway. However, road and bridge rehabilitation projects for NR1 are ongoing, while the Hai Van Pass tunnel between Hue and Danang has been approved. Large investments were committed for NR1, and new investments will have to be undertaken once ongoing work is complete and sufficient economic returns are obtained to promote a more balanced distribution of investment distribution. However, due to increased traffic demand, traffic congestion and traffic accidents are projected to increase, particularly in urban areas. Therefore, an urban bypass is proposed in the Master Plan to minimize adverse environmental impacts as well.

(2) The second north-south axis, namely the Ho Chi Minh Highway (NR14 and 15), is being implemented by the MOT for some sections. Based on the traffic

demand forecast, the northern section (Hanoi-Danang) which will be NR15, will not have much traffic even in year 2020, but there are some additional traffic demand on the southern section (NR14). The area where NR15 is located, which is between the coastal line and the border with Lao is narrow. Despite its proximity to the coastal line (NR1), where major economic areas are located, and the border, where potential for cross-border trade exists, it is projected that economic activities along NR15 corridor will still be very limited in the future. In contrast with the condition of the northern section, the southern section which will be in the central highlands is expected to contribute to the agro-industry expansion in major urban areas, hence NR14 improvement as a Master Plan project is justifiable.

(3) Road and road transport development in both Mekong and Red River delta regions, considered as the most important areas of economic development, should be undertaken in addition to the ongoing projects which include the construction of long-span bridges such as My Thuan, Binh and Can Tho. NR21 and 39 in the Red River delta and NR50, 80 and 61 in the Mekong River delta will support the economic activities in their respective regions with better and more modern means of transport. Still, the inland water transport system will remain as the major transport mode in the region, but it is important to integrate it with intermodal linkages.

(4) Regarding cross-border traffic, the Master Plan gives higher priority to the implementation of the following linkages:

To China	(Dong Dang) (NR No. 1)
	Kunming (Lao Cai, NR No. 70)
To Lao	Vientiane (Vinh, NR No. 8)
	Savannakhet (Danang, NR No. 9)
	Pakse (Danang, NR Nos. 40 and 14, 14B or 24)
To Cambodia	Phnom Penh (Ho Chi Minh, NR No. 22)

(5) Expressway development is still in the early stage of development, judging from the present motorization and economic development levels in Vietnam, unless a number of private investors finance these projects. The Master Plan will thus identify the road sections that may be financially viable for private sector financing (see Table 5.2.2).

Table 5.2.1
Initial Prioritization of Proposed Road Sector Projects

Project No.	Project	Project Cost 2001- (M US$)	Demand	Economy	Social/ Equity/ Poverty	Environ-ment	Cost Recovery	Int'l Linkage	Resettlement/ ROW Acquisition	Judgement (VITRANSS)
Primary Road Network Development										
I. Trans-Nation North South Primary										
1. National Highway No.1										
H01	Highway Rehabilitation Project (Hanoi-Lang Son; 190km)	16.3	b	a	b	a	c	b	a	A
H02	Highway Rehabilitation Project II (Vinh-Dong Ha; 100km)	23.7	b	a	b	a	c	c	a	A
H03	2nd Road Development (Nha Trang-Quang Ngai; 600km)	81.5	b	a	b	a	c	c	a	A
H04	Highway Rehabilitation Project III (Can Tho-Nam Can; 230km)	180.0	c	b	c	b	c	c	a	A
H05	Bridge Rehabilitation Project - Phase I (435km)	16.2	b	a	b	b	c	c	a	A
H06	Bridge Rehabilitation Project - Phase II (752km)	105.5	b	a	b	b	c	c	a	A
H07	Hai Van Pass Tunnel (2 lanes, 14km)	225.9	b	b	c	c	c	c	a	A
H08	My Thuan Bridge (1,535m)	15.9	a	b	b	c	c	c	b	A
H09	Can Tho Bridge Construction	294.0	b	b	b	c	c	c	b	A
H10	NH.1 Urban Bypass (Hanoi-HCMC; 70km)	67.0	a	a	b	b	c	c	c	A
H11	Hai Van Pass Tunnel (2nd tunnel, 10km)	250.0	c	c	c	c	c	c	a	C
2. North South Highway										
H12	NH14, 14B Upgrading Project (Danang-Tay Ninh; 900km)	350.0	b	a	b	b	c	b	b	A
H13	NH15 Rehabilitation Project (Hanoi - Hue; 748km)	45.0	b	b	a	b	c	b	b	A
II. Hanoi Metropolitan Area										
H14	Hanoi Ring Road	256.0	a	a	b	b	c	c	c	A
H15	Thanh Tri Bridge Construction	410.0	a	b	b	b	c	c	c	A
H16	National Highway No.5 Improvement Project (remaining section, 91km)	215.6	a	b	b	b	c	c	b	A
H17	National Highway No.18 Widening Projects - Phase 2 (remain section, 70km)	232.0	b	b	b	b	c	c	b	A
H18	Bai Chay Bridge Construction	98.0	b	b	c	c	c	c	c	B
H19	NH.1 Hanoi - Ninh Binh Widening Project (80km)	76.0	a	a	b	b	c	c	c	A
III. Northern Region										
H20	NH.70 Upgrading Project (Hanoi-Lao Cai; 191km)	125.0	c	c	a	b	c	a	c	A
H21	National Highway No.10 Upgrading Project (147km)	302.0	a	b	b	b	c	c	b	A
H22	National Highway No.21 Upgrading Project (80km)	58.0	a	a	c	c	c	c	c	B
IV. Central Region										
H23	East-West Corridor Project (ASEAN 7; NH8, 8B; 110km)	90.0	c	c	a	b	c	b	b	B
H24	East-West Corridor Project (ASEAN 8; NH9; 75km)	24.0	c	c	a	b	c	a	b	A
H25	East-West Corridor Project (ASEAN 7A; NH12A, 29; 120km)	39.0	c	c	a	b	c	a	b	A
H26	National Highway No.40 Upgrading Project (ASEAN 7B,24km)	14.0	c	c	a	b	c	b	b	B
H27	Rehabilitation (NH19, 20, 24, 26, 27, 28)	150.0	c	c	a	b	c	c	b	A
H28	Rehabilitation Phase II (NH19/20/24/25/26/27/28; 868km)	805.0	c	c	a	b	c	c	b	C
V. HCMC Metropolitan Area										
H29	Trans HCMC Highway Project (21.4km)	758.6	a	a	b	b	c	c	c	A
H30	Trans Asia Highway Project (NH22 to Cambodia; 80km)	144.7	b	b	c	b	c	a	b	A
Secondary Road Network Development										
H31	Hanoi-Cao Bang (NH3) Improvement (310km)	148.0	c	c	a	b	c	b	b	B

Project No.	Project	Project Cost 2001- (M US$)	Demand	Economy	Social/ Equity/ Poverty	Environ-ment	Cost Recovery	Int'l Linkage	Resettlement/ ROW Acquisition	Judgement (VITRANSS)
H32	Hanoi-Ha Giang (NH2) Improvement (300km)	137.0	c	c	a	b	c	b	b	B
H33	Hanoi-Dien Bien Phu (NH6) Improvement (468km)	223.0	c	b	a	b	c	b	b	A
H34	Hanoi-Lai Chau (NH32) Improvement (390km)	200.0	c	c	a	b	c	c	b	B
H35	North C1 (North-East Ring, NH5-NH3, NH37; 150km)	101.0	c	c	b	b	c	c	b	B
H36	North C1 (North Ring, NH3-NH70, NH37; 115km)	122.0	c	c	b	b	c	c	b	B
H37	North C1 (West-South Ring, NH70-NH1, NH37/15/47; 295km)	216.0	c	c	b	c	c	c	b	C
H38	North C2 (North-East Ring, NH5-NH3, NH279; 255km)	171.0	c	c	a	c	c	c	b	C
H39	North C2 (North Ring, NH3-NH70, NH279/1B; 120km)	83.0	c	c	a	c	c	c	b	C
H40	North C2 (North-West Ring, NH70-NH6, NH279; 150km)	107.0	c	c	a	c	c	c	b	C
H41	Cua Ong-Bac Luan (NH18) Road Improvement (130km)	92.0	c	c	b	b	c	c	b	B
H42	Hung Yen-Thai Binh Road (NH39) Improvement (100km)	124.0	b	c	b	b	c	c	b	B
H43	HCMC-My Tho Road (NH50) Improvement (80km)	79.0	a	a	b	c	c	c	b	B
H44	My Tho-Soc Trang Route Improvement (NH60) (120km)	235.0	c	c	b	b	c	c	b	C
H45	Can Tho-Ha Tien Improvement (NH80) (200km)	197.0	b	a	b	c	c	b	b	B
H46	Can Tho-Kien Giang-Ca Mau Route (NH61,63) Imprvt. (200km)	197.0	b	b	b	c	c	c	b	B
H47	Ho Chi Minh Highway Extension (N2)(Chan-Thanh-An Giang; 60km)	58.0	c	c	b	b	c	c	b	C
H48	NH22B Improvement (Go Dau-Xau Mai; 80km)	55.0	b	c	b	b	c	b	b	B
H49	Secondary Road Network rehabilitation Program	94.0	c	c	a	b	c	c	b	A
Tertiary Road Network Development										
H50	Tertiary Road Improvement Project	569.0	c	-	a	b	c	c	b	A
H51	Tertiary Road Improvement Project - Phase 2	404.0	*	*	*	*	*	*	*	*
Road Safety										
H52	Road Safety Improvement Program	30.0	-	-	a	a	c	c	c	A
Expressway										
H53	North-South Expressway 1 (Hanoi-Vinh, 310km)	930.0	b	b	c	c	b	c	c	C
H54	North-South Expressway 2 (Vinh-Hue, 400km)	1,200.0	c	c	b	b	c	c	b	C
H55	North-South Expressway 3 (Hue-Danang, 100km)	300.0	b	c	b	b	c	c	b	C
H56	North-South Expressway 4 (Danang-Nha Trang, 550km)	1,650.0	c	c	b	b	c	c	b	C
H57	North-South Expressway 5 (Nha Trang-HCMC, 420km)	1,260.0	b	c	c	c	b	c	c	C
H58	Noi Bai-Ha Long Expressway (150km)	750.0	b	c	c	c	b	c	c	C
H59	HCMC-Vung Tau Expressway (90km)	450.0	b	b	c	c	c	c	c	C
H60	HCMC-Can Tho Expressway 1 (HCMC-My Tho; 50km)	350.0	a	a	c	c	a	c	c	B
H61	HCMC-Can Tho Expressway 2 (My Tho-Can Tho; 80km)	560.0	b	c	c	c	b	c	c	C
H62	Lang - Hoa Lac Expressway (30km)	60.0								
H63	Hanoi Ring Road 3 Expressway (70km)	350.0								
H64	Dong Anh - Thai Nguyen Expressway (54km)	81.0								
H65	Ba La - Xuan Mai Expressway (21km)	21.0								
H66	Noi Bai - Viet Tri Expressway (50km)	50.0								
H67	Binh Phuoc - T. D. Mot Expressway (30km)	90.0								
H68	HCMC Ring Road Expressway (80km)	400.0								
	Total	**16,560.9**								

Note: - committed or ongoing project
* Identified as second phase project after 2010

Traffic Demand in 2010: a: More than 10,000; b: 2,000 - 10,000; c: Less than 2,000
Economy: a: EIRR of more than 15%; b: 10 % - 15 %; c: Less than 10 %
Social/Equity/ Poverty: a: Significant; b: Less significant; c: Neutral/negative
Environment: a: No negative impact; b: Minor impact; c: Negative impact
Cost Recovery: a: Possible; b: Limited; c: None
International Linkage: a: Strong; b: Moderate; c: None
Resettlement/ROW Acquisition: a: No constraints; b: Minor constraints; c: Major constraints
Judgment (VITRANSS): a: High priority; b: Medium priority; c: Low priority

Table 5.2.2
Conceptual Expressway Network Development

Corridor	Distance/ Cost (US$)	Needs and Roles	Development Concept/Strategies
Hanoi-Hai Phong-Ha Long	L=150km C=750mil	Provide modern linkages between the national capital, Hanoi, and international gateways such as Noi Bai International Airport and Hai Phong/Ha Long international port to introduce international industrial investment.	Maximum utilization of the ongoing project on NH 5, NH 18 and NH 10. Road capacity will increase tremendously with the ongoing projects, hence the expressway will be justified after year 2020.
North-South	L=1800km C=5,400mil	Reduce the time or distance between the two economic growth poles of Hanoi and HCMC to encourage a balanced development in the country.	Maximum utilization of investments of just-completed and ongoing projects on NH1. The second north-south highway, the Ho Chi Minh Highway, is given higher priority. Therefore, expressway development should not be urgent. However, large traffic demand on the corridor, particularly in both Hanoi and HCMC may be attractive enough for private sector investments.
HCMC-Can Tho	L=130km C=910mil	Strengthen the access between the national center, HCMC, and a regional center, Can Tho to further enhance regional economic development in the Mekong Delta. At the same time, urbanization of the corridor will be accelerated.	
HCMC-Vung Tau	L=90km C=450mil	Strengthen the accessibility between the southern industrial triangle of HCMC, Bien Hoa and Vung Tau.	The road widening project for NH 1 and NH 51 have just been completed. For the time being, the road capacity will be sufficient to accommodate the future traffic demand forecast.

Master Plan Projects

The Master Plan projects have been selected as shown in Table 5.2.3 and Figure 5.2.1.

Table 5.2.3
List of Master Plan Projects (up to 2010)

Project No.	Project	Status (Original Schedule)	Fund Source	Project Cost (million US$)		Priority
				Total	2001-	
Primary Road Network Development						
H01	Highway Rehabilitation Project (Hanoi-Lang Son; 190km)	Ongoing (1997-2000)	ADB	162.5	16.3	A
H02	Highway Rehabilitation Project II (Vinh-Dong Ha; 100km)	Ongoing (1997-2000)	WB	236.6	23.7	A
H03	2nd Road Development (Nha Trang-Quang Ngai; 600km)	Ongoing (1999-2002)	ADB	163.0	81.5	A
H04	Highway Rehabilitation Project III (Can Tho-Nam Can; 230km)	Ongoing (2000-2004)	WB	180.0	180.0	A
H05	Bridge Rehabilitation Project - Phase I (435km)	Ongoing (1995-2000)	JBIC	162.2	16.2	A
H06	Bridge Rehabilitation Project - Phase II (752km)	Ongoing (1996-2001)	JBIC	211.0	105.5	A
H07	Hai Van Pass Tunnel (2 lanes, 14km)	Ongoing (1998-2003)	JBIC	251.0	225.9	A
H08	My Thuan Bridge (1,535m)	Ongoing (1997-2000)	Australia	79.3	15.9	A
H09	Can Tho Bridge Construction	Ongoing (2000-2004)	JBIC	294.0	294.0	A
H10	NH1 Urban Bypass (Hanoi-HCMC; 70km)	New		67.0	67.0	A
H12	National Highway No.14, 14B Upgrading Project (Danang-Tay Ninh; 900km)	New		350.0	350.0	A
H13	NH15 Rehabilitation Project (Hanoi - Hue; 748km)	New		45.0	45.0	A
H14	Hanoi Ring Road	New		256.0	256.0	A
H15	Thanh Tri Bridge Construction	Ongoing (2000-2004)	JBIC	410.0	410.0	A
H16	National Highway No.5 Improvement Project (remaining section, 91km)	Ongoing (1995-2000)	JBIC	215.6	215.6	A
H17	National Highway No.18 Widening Projects - Phase 2 (remain section, 70km)	Ongoing (1998-2003)	JBIC	232.0	232.0	A
H18	Bai Chay Bridge Construction	Ongoing (2000-2004)	JBIC	98.0	98.0	A
H19	NH1 Hanoi - Ninh Binh Widening Project (80km)	New		76.0	76.0	A
H20	NH70 Upgrading Project (Hanoi-Lao Cai; 191km)	New		125.0	125.0	A
H21	National Highway No.10 Upgrading Project (147km)	Ongoing (1998-2003)	JBIC	302.0	302.0	A
H22	National Highway No.21 Upgrading Project (80km)	New		58.0	58.0	B
H23	East-West Corridor Project (ASEAN 7; NH8, 8B; 110km)	New		90.0	90.0	B
H24	East-West Corridor Project (ASEAN 8; NH9; 75km)	Ongoing (1999-2003)	ADB	30.0	24.0	A
H25	East-West Corridor Project (ASEAN 7A; NH12A, 29; 120km)	Ongoing	GOV	65.0	39.0	A
H26	NH40 Upgrading Project (ASEAN 7B,24km)	New		14.0	14.0	B
H27	Rehabilitation (NH19, 20, 24, 26, 27, 28)	New		150.0	150.0	B
H29	Trans HCMC Highway Project (21.4km)	Ongoing (2000-2004)	JBIC	758.6	758.6	A
H30	Trans Asia Highway Project (NH22 to Cambodia; 80km)	Ongoing (1999-2002)	ADB	144.7	144.7	A
Secondary Road Network Development						
H31	Hanoi-Cao Bang (NH3) Improvement (310km)	New		148.0	148.0	B
H32	Hanoi-Ha Giang (NH2) Improvement (300km)	New		137.0	137.0	B
H33	Hanoi-Dien Bien Phu (NH6) Improvement (468km)	New		223.0	223.0	B
H34	Hanoi-Lai Chau (NH32) Improvement (390km)	New		200.0	200.0	B
H35	North C1 (North-East Ring, NH5-NH3, NH37; 150km)	New		101.0	101.0	B
H36	North C1 (North Ring, NH3-NH70, NH37; 115km)	New		122.0	122.0	B
H41	Cua Ong-Bac Luan (NH18) Road Improvement (130km)	New		92.0	92.0	B
H42	Hung Yen-Thai Binh Road (NH39) Improvement (100km)	New		124.0	124.0	B
H43	HCMC-My Tho Road (NH50) Improvement (80km)	New		79.0	79.0	B
H45	Can Tho-Ha Tien Improvement (200km)- NH80	New		197.0	197.0	B
H46	Can Tho-Kien Giang-Ca Mau Route Improvement (200km) – NH61, 63	New		197.0	197.0	B
H48	NH22B Improvement (Go Dau-Xau Mai; 80km)	New		55.0	55.0	B
H49	Secondary Road Network rehabilitation Program	New		94.0	94.0	A
H50	Tertiary Road Improvement Project	New		569.0	569.0	A
Road Safety						
H52	Road Safety Improvement Program	New		30.0	30.0	A
Expressway						
H60	HCMC-Can Tho Expressway 1 (HCMC-My Tho; 50km)	New		350.0	350.0	B
	Total			**7,944.5**	**7,131.9**	

Figure 5.2.1
Road Master Plan Projects

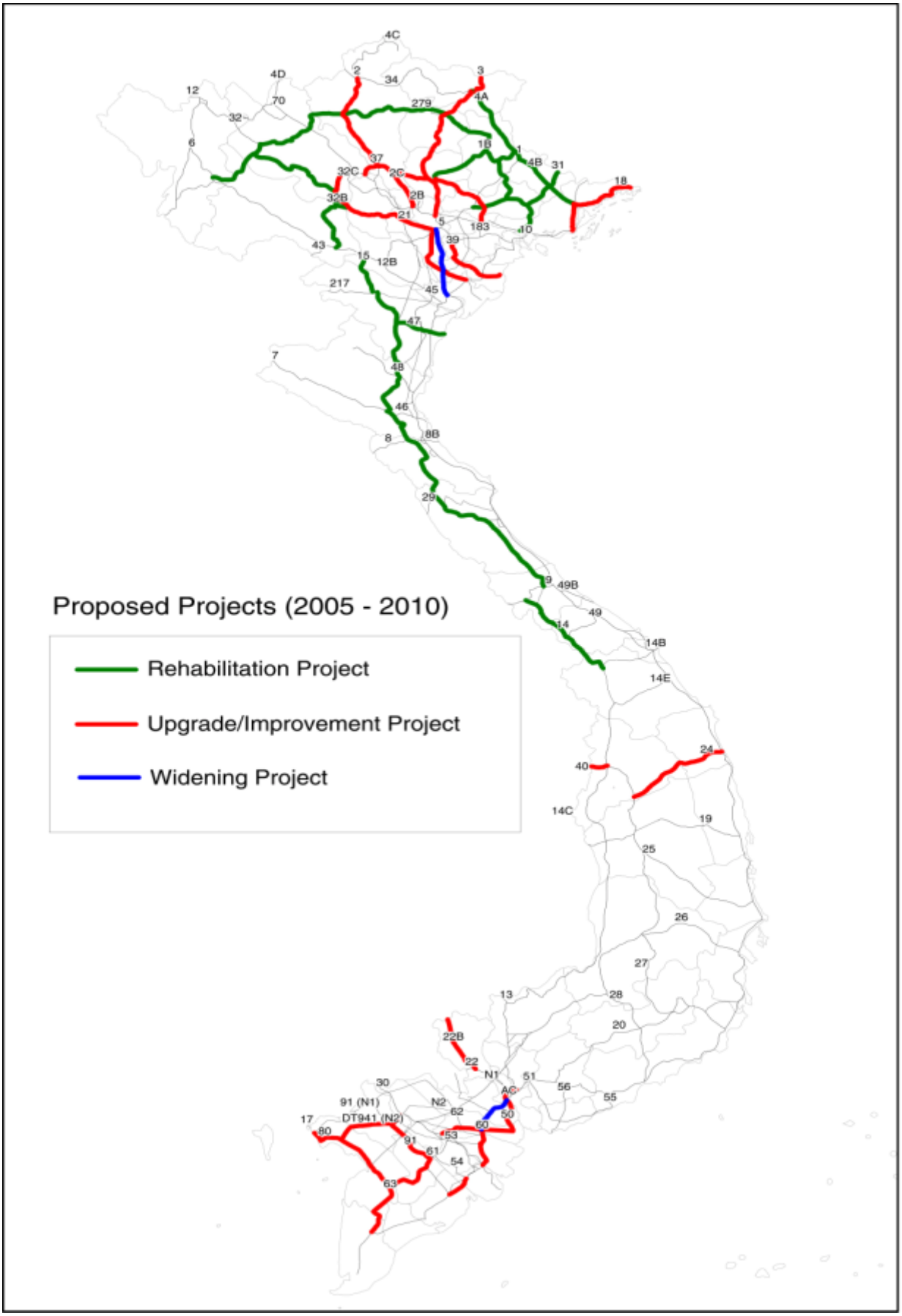
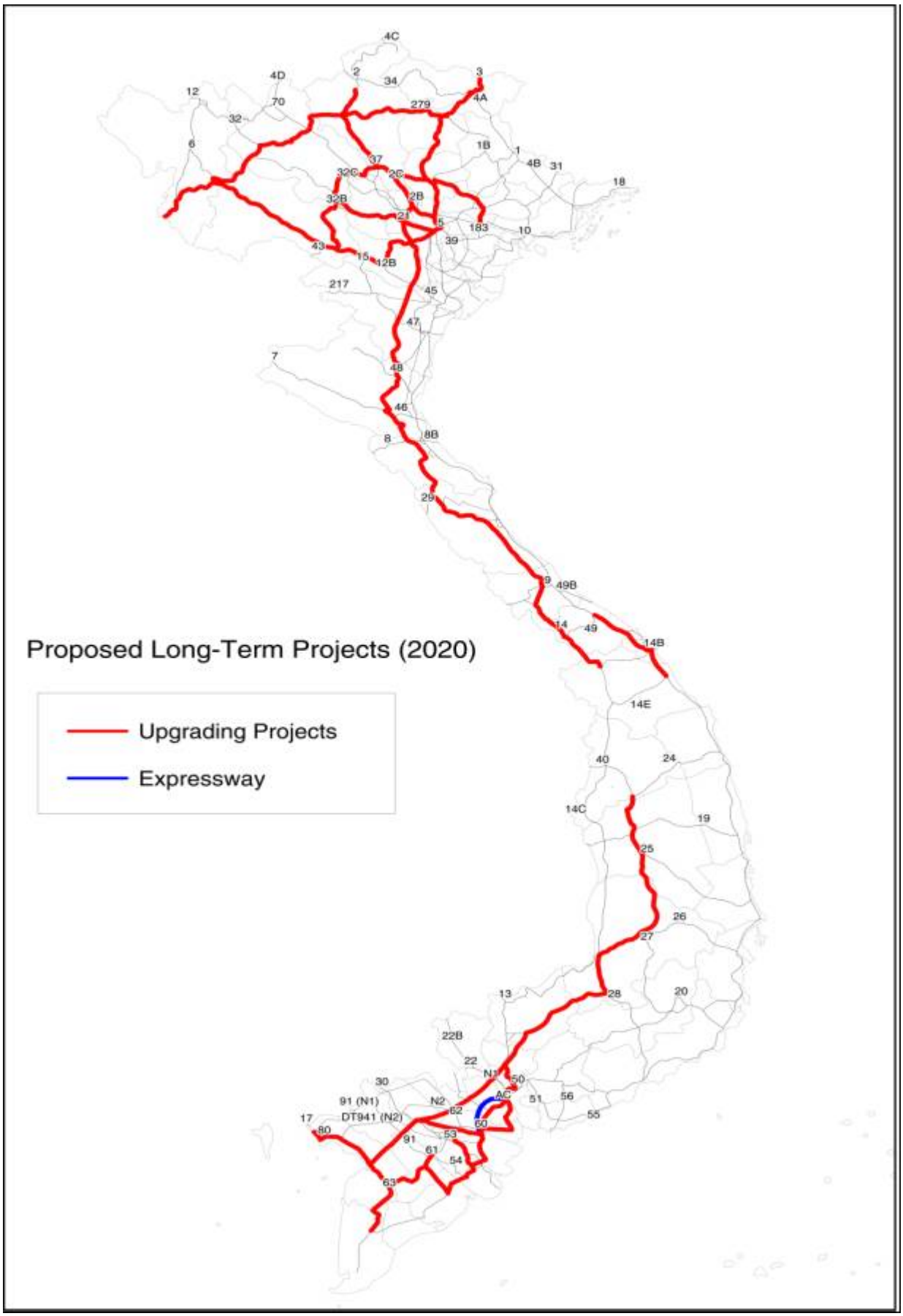


Figure 5.2.2
Proposed Long-term Projects, 2020



Rehabilitation of Primary and Secondary Roads

Although huge investments have been committed for rehabilitation projects, these investments were for selected national roads. There still remain many road sections that are in damaged condition and require immediate repair. According to the projected traffic demand for the Master Plan year, only national roads located in major economic growth areas, such as Hanoi and HCMC, can expect substantial economic benefits. However, in spite of their economic nonviability, most national roads still have to play an important role in the development of regions. Therefore, the Master Plan proposes a budget for the rehabilitation of national roads comprising not only the primary road network but also the secondary and tertiary road networks.

The objective of rehabilitating roads is to maintain all national roads in good and all-weather condition to ensure uninterrupted road and road transport services. Table 5.2.4 and Figure 5.2.3 show a development strategy for the rehabilitation of primary and secondary networks. As of 1999, over 20% of primary and 40% of secondary roads were in bad condition, while 32% of primary and 35% of secondary roads were in fair condition. The target of rehabilitation projects is for primary and secondary roads to be rehabilitated and maintained to an all-weather condition with asphalt pavement by the year 2010 and 2020, respectively.

There are 12 cross-border corridors out of which seven are primary and five are secondary. For all of these cross-border corridors, transport demand will not be so large as to require a road of more than two lanes, although there are uncertainties and opportunities with regard to cross-border arrangements with neighboring countries. However, for primary cross-border corridors, improved transport service and rehabilitated transport infrastructure should be provided to promote cross-border movement in line with Vietnam's integration to the region. For the secondary routes, upgrading of existing roads to all-weather condition is required to improve rural access.

Table 5.2.4
Rehabilitation Projects for Primary and Secondary Roads

A. Primary Road Network

Year	Total Length: km (%)	Pavement Type						Existing Condition		
		Concrete	Asphalt Concrete	Asphalt Bitumen	Gravel	Laterite	Earth	Good	Fair	Bad
1999	6,119.1	20.7	2,890.1	1,990.9	219.9	933.8	63.8	2,747.1	1,990.2	1,381.8
	100%	0.3%	47.2%	32.5%	3.6%	15.3%	1.0%	44.9%	32.5%	22.6%
2005	6,119.1	20.7	3,309.4	1,990.9	67.5	704.7	25.9	4,743.1	532.0	844.0
	100%	0.3%	54.1%	32.5%	1.1%	11.5%	0.4%	77.5%	8.7%	13.8%
2010	6,119.1	20.7	4,107.5	1,990.9	0.0	0.0	0.0	6,119.1	0.0	0.0
	100%	0.3%	67.1%	32.5%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%
2020	6,119.1	20.7	6,098.4	0.0	0.0	0.0	0.0	6,119.1	0.0	0.0
	100%	0.3%	99.7%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%

Table 5.2.4 (cont')

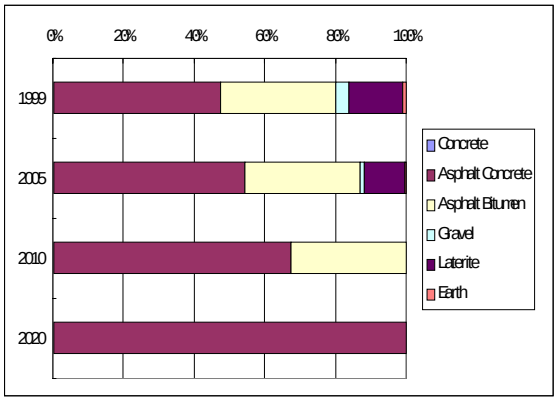
B. Secondary Road Network

Year	Total Length: km (%)	Pavement Type						Existing Condition		
		Concrete	Asphalt Concrete	Asphalt Bitumen	Gravel	Laterite	Earth	Good	Fair	Bad
1999	5,036.8	49.8	936.4	1,942.0	690.6	1,113.2	304.8	1,282.7	1,764.8	1,987.3
	100%	1.0%	18.6%	38.6%	13.7%	22.1%	6.1%	25.5%	35.1%	39.5%
2005	5,036.8	49.8	936.4	1,942.0	1,558.6	550.0	0.0	2,278.0	1,764.8	994.0
	100%	1.0%	18.6%	38.6%	30.9%	10.9%	0.0%	45.2%	35.0%	19.7%
2010	5,036.8	49.8	936.4	1,942.0	2,108.6	0.0	0.0	3,272.0	1,764.8	0.0
	100%	1.0%	18.6%	38.6%	41.9%	0.0%	0.0%	65.0%	35.0%	0.0%
2020	5,036.8	49.8	936.4	4,050.6	0.0	0.0	0.0	5,036.8	0.0	0.0
	100%	1.0%	18.6%	80.4%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%

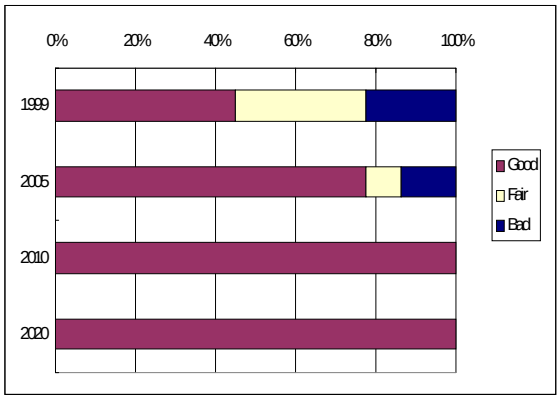
Figure 5.2.3

Upgrading of Road Pavement and Condition by Development Term

A. Primary Road Network

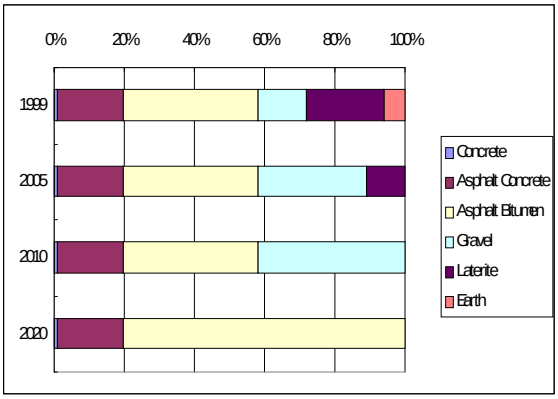


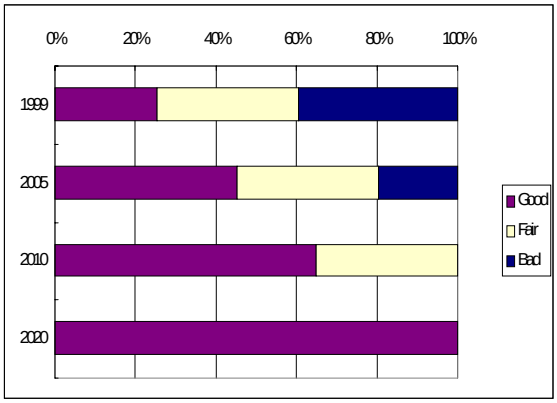
Type of Pavement



Condition of Road Surface

B. Secondary Road Network





5.3 Tertiary and Local Road Improvement

An important function of the tertiary road network is to provide regional access between provincial and district capitals, so that the national road network will be able to contribute significantly to the industrialization and rural development of remote areas in particular, as well as promote a more balanced development in Vietnam. The Study's objective is to develop the interprovincial network as the backbone of the road transport system and connect the tertiary network to the road transport system.

The administration of the tertiary system will be basically under the local government (provincial government). However, according to existing functional classification, some national roads are classified as part of tertiary, particularly in rural areas. Because the present economic growth in rural areas is still very low and traffic demand is also very limited, some national roads linking the different provinces can be categorized as part of the tertiary system.

At present, a total of 15,250 km are designated as national roads, 38% of which is classified as primary, 32% as secondary and the rest as tertiary roads. Figure 5.3.1 shows the location of tertiary roads. Most tertiary national roads are located in the northern mountainous areas and south of Hanoi.

Higher priority should be given to the rehabilitation of impassable road sections or those roads in bad condition. It is also important to improve and upgrade tertiary roads based on transport needs and projected economic expansion activities. Figure 5.3.1 shows the existing condition of tertiary roads and the proposed level of improvement.

The total length of the roads which are classified as tertiary and below in the VITRANSS is approximately 195,000 km, which include 4,500 km of national road, 17,400 km of provincial road, 36,400 km of district road, and 137,600 km of communal local/village road.

Table 5.3.1
Road Length by Function and Administration

<table>
<tr><th colspan="2">Function</th><th colspan="2">Administration</th></tr>
<tr><th>Classification</th><th>Length (km)</th><th>Length (km)</th><th>Classification</th></tr>
<tr><td>Primary</td><td>5,840 (38%)</td><td rowspan="3">15,250
(100%)</td><td rowspan="3">National</td></tr>
<tr><td>Secondary</td><td>4,950 (32%)</td></tr>
<tr><td rowspan="2">Tertiary</td><td>4,460 (30%)</td></tr>
<tr><td>17,449</td><td>17,449</td><td>Provincial</td></tr>
<tr><td rowspan="3">Local</td><td rowspan="3">167,827</td><td>36,372</td><td>District</td></tr>
<tr><td>46,910</td><td>Village</td></tr>
<tr><td>84,545</td><td>Subdivision</td></tr>
<tr><td>Total</td><td colspan="2">200,526</td><td></td></tr>
</table>

Figure 5.3.1
Tertiary Section in the National Road Network

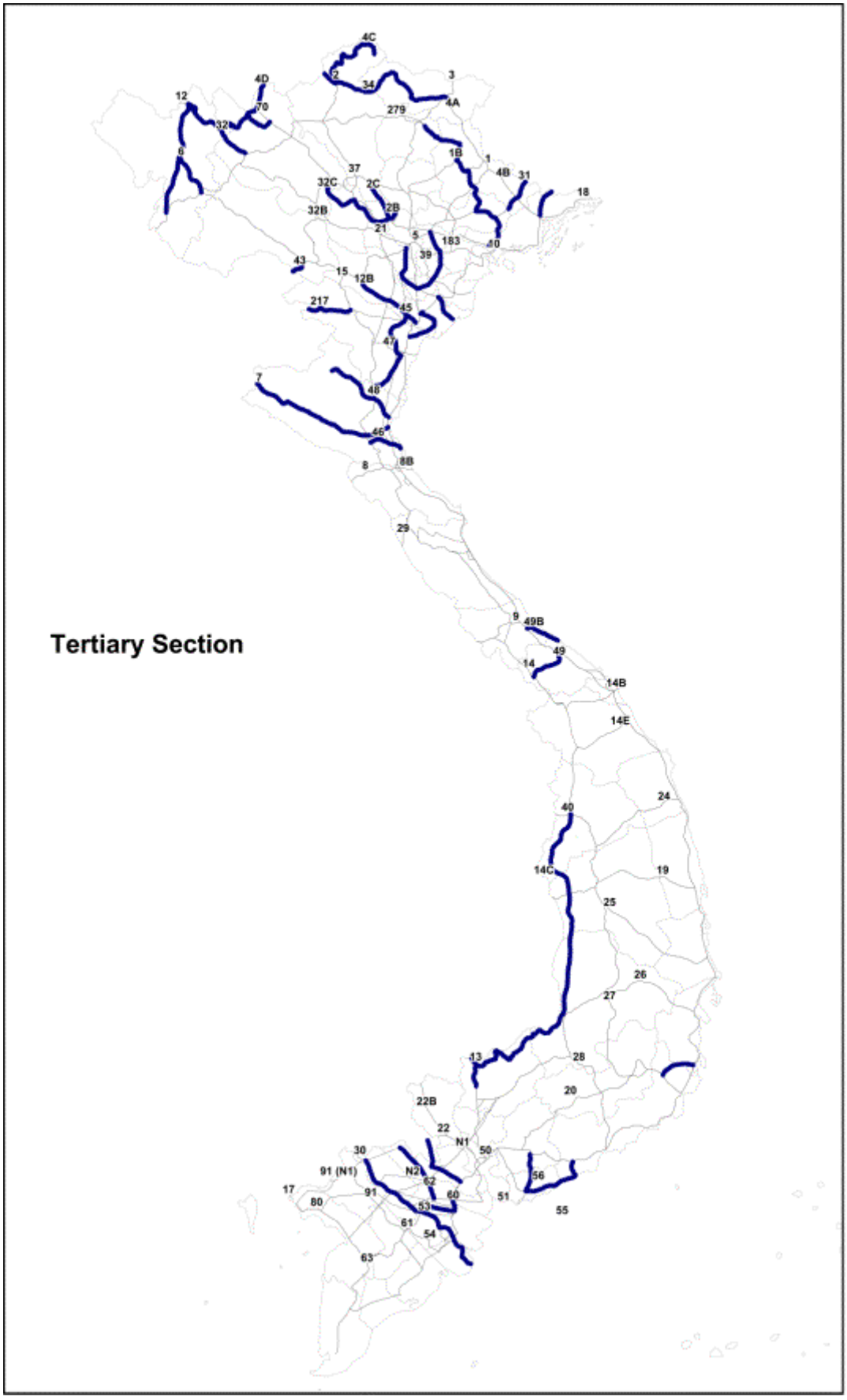
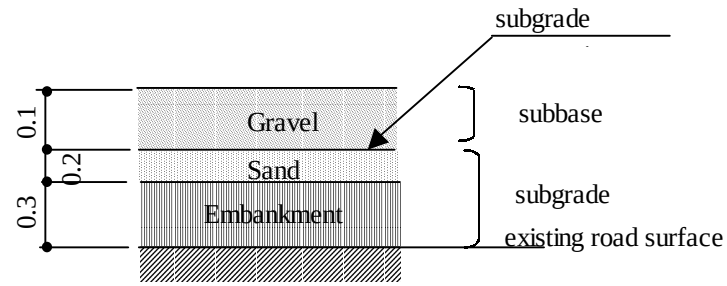


Figure 5.3.2
Existing Condition of Tertiary and Local Roads

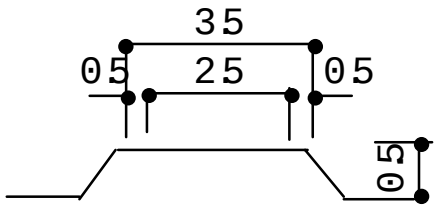
Assumed Improvement Level

Figure 5.3.3
Existing Condition and Proposed Geometric Standards

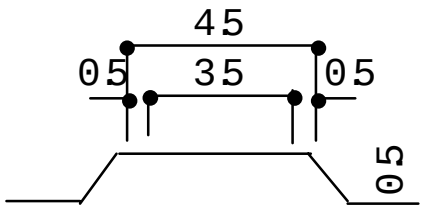
Assumed Geometric Standards



For Communal Road



For District Road



Most provincial, district and local roads are mostly dirt roads in poor condition (as discussed in Chapter 4). The funding required to upgrade these roads to an all-weather condition with a gravel surface by year 2010 is thus estimated as shown in Table 5.3.2.

Table 5.3.2
Summary of Investment Cost

	Investment Cost (US$ mil)					
	Year 2000-2010		Year 2010-2020		Total (US$ Million)	
	(US$ mil)	%	(US$ mil)	%	(US$ mil)	%
National Road[1/]	178	62.5	107	37.5	285	5.8
Provincial Road	391	56.8	297	43.2	688	14.2
District Road	639	71.8	251	28.2	890	18.3
Communal Road	2,314	77.2	683	22.8	2,997	61.7
Total	3,522	72.5	1,339	27.5	4,861	100.0

1/ Classified as tertiary

Thus, about USD 4.86 billion is required to finance the development of the total road network system, 61.7% of which will be for communal/local roads. About 72.5% of the total investment requirement of USD 4.861 million is needed in the period 2000-2010 to improve the road network, and the rest of the amount in the period 2010-2020. Figure 5.3.1 shows the tertiary section in the national road network system which requires upgrading and the levels of improvement targeted for year 2010 as compared to existing condition.