II. PRIORITY INVESTMENT NEEDS

A. Introduction

As indicated in chapter I, of the total 141,000 km of the Asian Highway some 22,000 km or 15.8 per cent of the network does not conform to the minimum specified design standards. Therefore, the primary focus should be on constructing and upgrading those sections that are below Class III standard.

In addition, some sections of the Asian Highway already meet the minimum design standards but are in poor condition or are approaching their capacities due to the high volume of traffic they are carrying. Therefore, maintenance, rehabilitation and upgrading of those sections are required.

The obligation to undertake the construction and upgrading of the network sections within a member State lies with that country. While some States are capable of mobilizing sufficient resources to undertake the development and upgrading of the Asian Highway within their borders, other States will need the assistance of international financing institutions and bilateral donors.

Estimates of investment requirements or the investments being made or committed are not yet available. Therefore, the ongoing or committed investments in the development and upgrading are considered below, together with an assessment of investment needs and the identification of priority projects along the Asian Highway.

B. Assessment of ongoing investment

Table 12 summarizes the considerable investment currently being made by member countries in developing the Asian Highway.

Table 12. Current investment in the Asian Highway network [a]

Country	Km	US$ million	Country	Km	US$ million
Afghanistan	3 134	829	Mongolia	430	78
Armenia	35	31	Myanmar	268	66
Azerbaijan	447	126	Nepal	179	49
Bangladesh	1 373	2 392	Pakistan	1 317	807
Bhutan	161	26	Philippines	505	413
Cambodia	308	190	Russian Federation	3 049	2 655
China	2 885	6 650	Sri Lanka	164	271
Georgia	–	108	Tajikistan	140	20
India	3 180	3 640	Thailand	1 273	373
Indonesia	3 576	245	Turkey	215	722
Iran (Islamic Republic of)	5 594	1 151	Turkmenistan	220	67
Kazakhstan	3 649	2 068	Uzbekistan	2 761	59
Kyrgyzstan	656	328	Viet Nam	572	1 961
Lao People's Democratic Republic	369	245	**Total**	**36 566**	**25 851**
Malaysia	106	281			

[a] These data represent investments as at 2004 and 2005 that are backed by a financial commitment from either a government or other source, including where construction will be carried out in future. These data have largely been compiled from the country reports submitted, presentations made by the member States during subregional expert group meetings and information on donors' web sites. This does not represent the current level of investment in the highway sector as the Asian Highway in a country is only part of that country's highway system.

Table 12 shows that member countries, multilateral and bilateral donors are currently investing about US$ 26 billion in the construction, rehabilitation and upgrading of some 37, 000 km of the Asian Highway network.

In absolute terms, it is clear that China is making a huge investment of about US$ 6,650 million in the development of the Asian Highway network, followed by India at US$ 3,640 million and the Russian Federation at US$ 2,655 million.

Some of the large investment projects being undertaken along the Asian Highway are outlined in table 13.

Table 13. Selected large ongoing or committed projects along the Asian Highway

Country	AH route	Sections of the Asian Highway	Km	US$ million
Afghanistan	AH1	Kabul – Ghazni – Kandahar	483	207
Afghanistan	AH76	Herat – Andkhoy	550	150
Bangladesh	AH41	Cox's Bazar – Teknaf	80	540
Bangladesh	AH41	Dhaka – Chittagong	224	516
Cambodia	AH1	Phnom Penh – Neak Loueng	61	57
Cambodia	AH11	Kratie – Stung Treng	198	85
China	AH14	Mengzi – Hekou	145	970
China	AH14	Kunming – Chuxiong	153	800
China	AH3	Xiaomengyang – Mohan	175	680
China	AH14	Baoshan – Longling	78	670
China	AH32	Hunchun – Tumen	66	160
India	AH1	Khaga – Varanasi	190	314
India	AH45	Kharagpur – Chandikhole	257	287
Iran (Islamic Republic of)	AH1	Zanjan – Tabriz	285	261
Iran (Islamic Republic of)	AH8	Rasht – Qazvin	150	151
Kazakhstan	AH63	Beineu – Akzhighit – border with Uzbekistan	80	363
Kazakhstan	AH70	Atyrau – Aktau	900	313
Kazakhstan	AH7	Astana – Kostanai – Chelyabinsk (Russian Federation)		240
Kazakhstan	AH61, AH63	Samara (Russian Federation) – Shymkent	2 093	194
Kazakhstan	AH5	Tashkent (Uzbekistan) – Shymkent – Almaty – Khorgos (border with China)		163
Kazakhstan	AH64	Borovoye – Kokchetav – Petropavlovsk – border with the Russian Federation		154
Kyrgyzstan	AH61	Bishkek – Torugart		189
Lao People's Democratic Republic	AH11	Huay Goan (Thailand) – Pak Baeng	50	32
Lao People's Democratic Republic	AH3	Boten (border with China) – Houayxay (border with Thailand)	240	90
Lao People's Democratic Republic	AH3	Bridge over the Mekong River connecting Houayxay to Chiang Kong (Thailand)	1	30
Malaysia	AH2	Seremban – Air Keroh and Rawang – Tanjung Malim	106	315

Table 13. *(continued)*

Country	AH route	Sections of the Asian Highway	Km	US$ million
Mongolia	AH3	Choir – Saishand – Zammin Uud	430	78
Myanmar	AH1	Kalay – Monywa including bridge		42
Pakistan	AH1	Islamabad – Peshawar Motorway	154	460
Sri Lanka	AH43	Colombo – Matara expressway	126	260
Thailand	AH1/16	Mae Sot – Mukdahan	281	137
Thailand	AH16	Mukdahan – Savannakhet bridge	5.5	100
Turkey	AH84	Gaziantep – Birecik	55	215
Turkey	AH84	Suruc – Sanliurfa	73	199
Turkey	AH84	Birecik – Suruc	53	186
Viet Nam	AH14	Lao Cai – Ha Noi	291	600
Viet Nam	AH17	Bien Hua – Vung Tao	74	85
Viet Nam	AH1	Hue – Da Nang tunnel (Hai Van Pass Tunnel)	6.4	251

C. Regional cooperation programmes

In addition to the efforts by countries to improve their international highway infrastructure, international financing institutions and bilateral donors are assisting member countries to improve their transportation networks. Several regional or subregional initiatives are underway to improve road transportation in the region.

Afghanistan, Azerbaijan, Chian (Xinjiang Uygur Autonomous Region), Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan and Uzbekistan are participating in the Central Asia Regional Economic Cooperation (CAREC) programme. The transport sector is a major sector of cooperation and the Asian Development Bank, the World Bank, the European Bank for Reconstruction and Development, and the Islamic Development Bank are providing support to various transport projects of subregional importance.

Northern South-East Asian member countries, including Cambodia, China, the Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam are cooperating in road transport development (and other areas) under the Greater Mekong Subregion (GMS) initiative. In the area of transportation, the GMS project has been divided into three main corridors: North-South (comprising the Kunming – Haiphong and Kunming – Bangkok routes); East-West (comprising the Mawlamyine – Da Nang route); and South (comprising the Bangkok – Quy Nhon and Bangkok – Vung Tau/Nam Can routes).

In addition, the Association of South East Asian Nations (ASEAN) Highway initiative has considerable complementarities with the Asian Highway efforts.

The South Asia Subregional Economic Cooperation (SASEC) initiated among Bangladesh, Bhutan, India and Nepal by the Asian Development Bank has considered the development of most of the Asian Highway routes connecting these countries. Regional Technical Assistance (RETA) is being provided for upgrading the transport corridors[7] that are at different stages of implementation. Member States are also working towards the improvement of the above international corridors.

The Asian Development Bank, the Islamic Development Bank, the World Bank, the Japan Bank for International Cooperation, the European Bank for Reconstruction and Development, the Kuwaiti Fund for Arab Economic Development, the Saudi Fund for Development, the Japan International Cooperation Agency and the Infrastructure Development Institute, are assisting member countries in the development of the Asian Highway network. In addition, bilateral donors such as China, Thailand, Viet Nam, and the United Kingdom of Great Britain and Northern Ireland are providing support under bilateral assistance.

[7] Draft summary of the Proceedings of the SASEC Workshop, 1-3 February 2004, Bangkok.

Subregional organizations such as the ASEAN Secretariat, the South Asian Association for Regional Cooperation Secretariat, the Economic Cooperation Organization Secretariat, Shanghai Cooperation Organization, Silk Road Initiatives and the Intergovernmental Commission-Transport Corridors Europe, Caucasus, Asia (IGC-TRACECA) also have programmes for developing regional/subregional road transportation networks in the region.

D. Priority investment needs

Because this was the first assessment of ongoing investment and identification of priority investment needs, a simple methodology was used. Information related to the status of national highway networks, ongoing and planned investment along the Asian Highway, national policies and priorities, and a list of priority projects were collected from each member State. A list of priority projects requiring investment in member countries were prepared, giving consideration to national strategies and priorities, the status and condition of the roads, their regional and subregional importance, and their potential to provide access to the landlocked countries.

Designated government representatives acting as focal points for the Asian Highway in member States provided information in the form of country reports. With the inputs from member States taking subregional approach, subregional overviews of investment needs and development priorities for the Asian Highway network were prepared separately for the South Asian, North, Central and South-West Asian and South-East Asian subregions.

Three subregional expert group meetings[8] were organized. The first meeting, for South Asia (including Afghanistan and the Islamic Republic of Iran), was held in Islamabad from 23 to 25 September 2004. The second, for North, Central and South-West Asia, was held in Tehran from 25 to 27 January 2005. The third, for South-East Asia (including Mongolia), was held in Bangkok from 25 to 26 April 2005. The objectives of those meetings were to:

(a) Review the status of the Asian Highway network in member countries;

(b) Assess the current level of investment and identify the investment requirements for the development of the Asian Highway network;

(c) Identify priority projects of subregional importance for the development of the Asian Highway network and related intermodal connections; and

(d) Highlight and promote the identified priority projects for investment. Representatives of the member countries, donors and related subregional organizations participated in the meetings.

The status of the network was reviewed and priority investment requirements identified at the above subregional expert group meetings. Based on the country inputs and statements by delegations from member States, and considering road status,[9] each meeting identified and finalized a list of priority projects along the Asian Highway and potential links to the highways requiring investment.

The three subregional meetings also provided forums for the member country delegates and the donor representatives to discuss strategies and priorities for the development of the road network. The meetings also facilitated dialogue between the participants as well as provided opportunities for the member countries and donors to discuss investment and priorities. The ESCAP secretariat is now working to further promote investment in the priority projects identified.

Table 14 provides a consolidated list of priority projects identified in 25 member countries by the three subregional expert group meetings.

[8] The report of the meetings can be found at http://www.unescap.org/ttdw/common/tis/ah/priority_investment.asp#profiles.

[9] The Asian Highway database can be found at http://www.unescap.org/ttdw/common/tis/ah/Member%20countries.asp.

Table 14. Identified priority projects for developing the Asian Highway in the South Asian, Central and South-West Asian, South-East Asian and North-East Asian subregions

Table 14a. South Asia

AH No.	Section	Km	Cost (US$ m)
Bangladesh			
AH41	Daukandi – Chittagong (upgrading to four lanes)	246	191
AH41	Chittagong – Cox's Bazar – Ramu – Gundam	186	144
AH2	Beldanga – Panchagarh	77	9
AH41	Dasuria – Paksey – Kushtia	38	4
AH41	Jhenaidah – Jessore	45	5
	Total	**592**	**353**
Bhutan			
AH48	Phuentsholing – Thimphu (upgrading to double lanes)	179	60
	Total	**179**	**60**
India			
AH1	Shillong – Dwaki	70	6
AH2	India – India/Nepal border	10	1
AH2	Siliguri – Fulbari Mod – border with Bangladesh	16	2
AH43	Madurai – Dhanushkodi	19	2
	Total	**115**	**11**
Nepal			
AH2	New Koshi bridge at Chatara and widening of bridges from Pathalaiya to Dhalkebar	170	31
AH42	Naubise – Thankot (tunnel) – Kathmandu – Kodari improvement and upgrading	48	24
AH42	Kathmandu – Birgunj ICD link road	110	80
	Total	**328**	**135**
Pakistan			
AH2	Improvement of Sibi – Sariab	160	68
AH2	Lakpass Tunnel		9
AH2	Improvement of the Dalbandin – Naushki section	167	34
AH4	Dualization of Hassanabdal – Abbottabad – Mansehra	90	51
AH7	Hub – Uthal	80	27
AH51	Improvement of Kuchlac – Zhob	306	60
Other	Gwadar – Turbat – Hoshab – Awaran – Khuzdar	650	271
Other	Hyderabad – Mirpurkhas – Umarkot – Khokhropar	222	50
Other	Sehwan – Dadu – Ratodero	199	103
Other	National Highway N-70 (Multan – Muzafargarh; Muzaffargarh Bypass; Muzafargarh and Bewatta)	202	103
	Total	**2 076**	**776**

Sri Lanka			
AH43	Talaimannar – Medawachchiya	112	36
AH43-new land link	Land bridge connecting Sri Lanka and India [b]	32	880
	Total	**144**	**916**
	Grand total for the South Asia subregion	**3 434**	**2 251**

[a] Part of State Road.
[b] At the conceptual stage. A feasibility study is required that involves Sri Lanka and India.

Table 14b. Central and South-West Asia [a]

AH No.	Section	Km	Cost (US$ m)
Afghanistan			
AH1	Kabul – Surubi	68	30
AH7/AH77	Kabul – Bamiyan	140	40
AH1	Kandahar – Gereshk	114	76
AH76	Herat – Andkhoy	550	80
AH76/AH62	Polekhumri – Hayratan	265	29
AH76	Balkh – Andkhoy	180	36
AH7	Bridge over the Ammou River	360 m	40
	Total	**1 317**	**331**
Armenia			
AH82	Vaik – Gorhayq	75	30
AH82	Goris – Agarak (Islamic Republic of Iran border)	140	56
AH82	Bavra – Gumri	10	5
AH81	Border of Azerbaijan – Agarak – Meghri – Azerbaijan border	51	25
	Total	**276**	**116**
Azerbaijan			
AH5	Kazakh – border of Georgia	38	20
AH81	Nakhchivan – Sadarak – border of Turkey	92	46
AH81	Goradiz – Gazi Mammed	185	74
AH8/AH5/ Other	Ring Road connecting AH5 and AH8 around Baku	40	20
	Total	**355**	**160**
Georgia			
AH5	Poti – Tbilisi – Red Bridge (Gori – Natakhtari section	397 57	2 300 212) [b]
AH5	Poti – Batumi – Sarpi	87	123
AH81	Mtskheta – Kazbegi – Larsi	139	39
	Total	**623**	**2 462**
Iran (Islamic Republic of)			
AH1	Bazargan – Tabriz Freeway	280	250
AH8	Qazvin – Saveh Freeway	153	135
AH8	Khorramabad – Andimeshk	159	200
AH70	Sirjan – Bandar Abbas	332	290
AH70	Qeshm Bridge in the Persian Gulf	2.5	349
	Total	**927**	**1 224**

Kazakhstan			
AH5/AH61	Border of the Russian Federation (to Samara) – Pogodaeva – Shymkent – Almaty – Khorgos	992	347
AH7/AH5	Kaerak – Kostanai – Astana – Almaty – Khorgos	710	230
AH70	Kotyaevka – Atyrau – Aktau – border with Turkmenistan	1 070	374
AH61	Kamenka – Ural'sk – Karabutak – Aralsk – Kyzylorda – Shymkent	1 795	628
	Total	**4 567**	**1 579**
Kyrgyzstan			
AH61	Bishkek – Naryn – Torougart	539	173
Other	Road around Lake Issyk – Kul and connection to AH Balykchy – Cholpon – Ata – Karakol – Bokonbaevo – Balykchy	438	131
Other	Taraz – Talas – Susamyr	199	60
Other	Osh – Isfana	413	133
	Total	**1 589**	**497**
Tajikistan			
Other	Ajni – Pendzhikent	113	4
AH7	Khujand – Dushanbe	258	23
AH7	Kurgan Tube – Nizhiny Panj	102	4
Others	Khujand – Buston	65	2
Others	Khujand – Kanibadam – Isfara	130	2
AH66/ Others	Korog – border with Kyrgyzstan (to Sary Tash)	450	67
	Total	**1 118**	**102**
Turkey			
AH5	Gerede – Merzifon	300	350
	Total	**300**	**350**
Uzbekistan			
AH5	Bukhara – Navoi – Samarkand – Syrdaria – Tashkent	76	38
AH7	Andijon – Tashkent – Syrdaria	163	82
AH62	Tashkent – Syrdaria – Samarkand – Surhandarya	159	80
AH63	Nukus – Bukhara – Kashkadarya	490	240
AH65	Termez – Uzun	78	40
	Total	**966**	**480**
	Grand total for Central and South-West Asia subregions	**12 038**	**7 301**

[a] Information from Turkmenistan on investment requirements is not available.

[b] This is a section of the Poti – Tbilisi road.

Table 14c. South-East Asia

AH No.	Section	Km	Cost (US$ m)
Cambodia			
AH11 (link)	NR7 Junction to Banlung (Rattanak Kiri)	125	44
AH11 (link)	Banlung (Rattanak Kiri) – Oyadav – border with Viet Nam	78	27
AH1 (link)	Battambang – Palin – border with Thailand	113	40
AH1/AH11 (link)	Preak Kdam – Thnal Keng	16	6
AH11 (link)	Snoul to Sen Monorom (Mondulkiri) – Lumphat (Rattanakiri)	335	117
AH11 (link)	NR7 Jct at Pratheat to Chhlong	57	20
AH1	Neak Leoung Mekong River bridge	2.5	200
AH1/AH11 (link)	Siem Reap – Stung Treng	253	260
	Total	**980**	**714**
Indonesia			
AH2	Improvement and upgrading of various sections	160	14
AH25	Improvement and upgrading of various sections	412	15
	Total	**572**	**29**
Lao People's Democratic Republic			
AH13 (link)	Oudomaxay – Muangkhua – Tai Chang	202	40
AH11 (link)	Phiafai – Attapeu (NH18A)	114	23
	Total	**316**	**63**
Myanmar			
AH1	Myawadi (border with Thailand) – Kawkareik	40	19
AH1	Monywa – Kalay/Kalewa	184	40
AH2	Kyaing Tong – Takaw – Loilem – Taunggyi	450	23
	Total	**674**	**82**
Philippines			
AH26	Tuguegarao City Bypass	8	5
AH26	Santiago City Bypass	3	2
AH26	San Jose City Bypass	7	8
AH26	Tiaong Bypass	3	2
AH26	Candelaria Bypass	9	5
AH26	Sariaya Bypass	8	5
AH26	Daraga Diversion Road	15	9
AH26	Sipocot – Putiao Diversion Road	58	36
AH26	Palo Bypass	4	2
AH26	Cebu North Coastal Road	9	6
AH26	Tagum City Bypass	13	8
AH26	Panabo City Bypass	10	6
AH26	Davao City Coastal Road	10	6
AH26	Cotabato City Bypass	12	7
AH26	Digos City Bypass	6	4
AH26	Koronadal City Bypass	10	6
AH26	General Santos City Bypass	14	9
	Total	**199**	**126**

Viet Nam			
AH14	Ha Noi – Hai Phong Expressway (four-six lanes)	100	410
AH1	Bien Hoa – Vung Tau Expressway (four-six lanes)	90	600
AH16	Da Nang – Quang Ngai (four lanes)	140	700
AH1	Sai Gon – Long Thanh – Dau Day (four-six lanes)	55	350
AH14	Ha Noi – Lao Cai Expressway	290	600
AH15	Vinh – Cau Treo rehabilitation	85	44
AH1/AH14	Ha Noi Ring Road	65	600
	Van Phong Transshipment Hubport (two terminals, 700 m, 500,000 TEU/year)		200
	Rehabilitation of the Soai Rap Assess Channel in Ho Chi Minh City (for ships of 30,000 DWT assessable)	30	120
	Total	855	3 624
	Grand total for South-East Asia subregion	3 569	4 638

Table 14d. North-East Asia [a]

AH No.	Section	Km	Cost (US$ m)
China			
AH3	Jinghong – Mohan	343	1 160
AH3	Jinghong – Daluo	60	60
AH4	Kashi – Honqiraf	360	70
AH42	Lhasa – Zhangmu	680	140
	Total	1 443	1 430
Mongolia			
AH4	Ulaanbaishint – Ulgii – Khovd – Bulgan – Yarant	785	114
AH32	Western link: Ulaanbaatar – Hovd	1 291	188
AH32	Eastern link: Baganuur – Ondorhaan – Choibalsan – Sumber – border with China	1 044	152
	Total	3 120	454
Russian Federation			
AH6/AH30	Moscow – Khabarovsk – Vladivostok	1 400	950
AH8	Moscow – Tambov – Volgograd – Astrakhan – Mahachkala	390	300
AH61	Border of Ukraine – Kursk – Voronezh – Saratov – border with Kazakhstan with Kazakhstan	50	30
AH70	Bridge over the Kigach River in Astrakhan – Atyrau road section	393 m 3	11
AH61/AH7/ AH6	Yekaterinburg – Tumen – Ishim – Omsk	140	60
	Total	1 983	1 351
	Total for North-East Asia	6 546	3 235
	Grand total	25 587	17 425

[a] Information from the Democratic People's Republic of Korea on investment requirements is not available.

Table 14 clearly shows that almost US$ 18 billion in investment is required to implement 121 priority road projects for upgrading some 26,000 km of the Asian Highway in 25 member countries. Central and South-West Asia require about US$ 7.3 billion followed by South-East Asia at US$ 4.6 billion.

The US$ 18 billion in investment requirements for the Asian Highway is a very small amount compared to a recent ESCAP study[10] that an estimated a total investment of US$ 367 billion per year would be required in the road sector for developing Asia-Pacific countries during 2005-2010. The estimate for total transport infrastructure during the same period was US$ 448 billion per year. It shows that road infrastructure investment needs are about 82 per cent of total transport requirements.

Japan, Malaysia, the Republic of Korea, Singapore and Thailand are developing and upgrading of their sections of the Asian Highway entirely from their national budgets. China and Kazakhstan have also indicated that they will finance their part of the identified priority projects.

Following the identification of priority projects, member States provided details in a project profile template with the objectives of promoting and highlighting the projects among interested bilateral and multilateral donors or private sector investors.

The Annex features selected project profiles of the priority projects identified (table 14) in 25 member countries. Each project profile contains essential information such as project name and location, brief outline, the rationale and objectives, scope of work, expected impacts and benefits, status and other project-related information, and a contact address.

Some of the identified priority projects that have high priority are already in different phases of implementation or entering the implementation phase.

E. Prioritization of investment needs

Numerous approaches are available for assisting in the process of prioritizing various alternate infrastructure investments.

It is usual practice to use parameters such as internal rate of return (IRR), benefit-cost ratio (B/C ratio), net present value (NPV), potential traffic and a combination of these with national and subregional policies to prioritize investments. Economists usually prefer this approach to ensure a thorough, consistent ranking of investment alternatives. These methods attempt to quantify the net project benefits in order to ensure the selection of projects that generate the greatest benefits.

The extent and length of the Asian Highway rules out the use of thorough cost-benefit project evaluation to assist prioritization. Instead, a subjective methodology based on criteria such as current status of the route, national policies, subregional and regional priorities, and the potential of the route/corridor to provide transit to other countries (including landlocked countries) can provide a valuable hint for ranking various investment alternatives. These criteria – while not ideal – can adequately filter out competing investment alternatives. For example, missing and inter-country links and roads below Class III standard and with poor surface conditions could be considered as having a higher priority than other groups, as these improvements could have wider benefits, both for the country concerned and for neighbouring countries.

Those projects that member countries consider potentially worthwhile, and which are consistent with national road investment plans, can then move forward to further detailed assessment prior to commissioning and implementation.

[10] *Enhancing Regional Cooperation in Infrastructure Development Including that Related to Disaster Management*, Economic and Social Commission for Asia and the Pacific, 2006, p. 38.