JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
MINISTRY OF TRANSPORT, VIETNAM

THE COMPREHENSIVE STUDY ON THE SUSTAINABLE DEVELOPMENT OF TRANSPORT SYSTEM IN VIETNAM (VITRANSS 2)

Final Report
SUMMARY

May 2010

ALMEC CORPORATION
ORIENTAL CONSULTANTS CO. LTD.
NIPPON KOEI CO. LTD.

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Exchange Rate Used in the Report

USD 1 = JPY 110 = VND 17,000

(Average Rate in 2008)

PREFACE

In response to the request from the Government of the Socialist Republic of Vietnam, the Government of Japan decided to conduct the Comprehensive Study on the Sustainable Development of Transport System in Vietnam (VITRANSS2) and entrusted the program to the Japan International cooperation Agency (JICA)

JICA dispatched a team to Vietnam between November 2007 and May 2010, which was headed by Mr. IWATA Shizuo of ALMEC Corporation and consisted of ALMEC Corporation, Oriental Consultants Co., Ltd., and Nippon Koei Co., Ltd.

In the cooperation with the Vietnamese Counterpart Team, the JICA Study Team conducted the study. It also held a series of discussions with the relevant officials of the Government of Vietnam. Upon returning to Japan, the Team duly finalized the study and delivered this report.

I hope that this report will contribute to the sustainable development of transport system and Vietnam and to the enhancement of friendly relations between the two countries.

Finally, I wish to express my sincere appreciation to the officials of the Government of Vietnam for their close cooperation.

May 2010

HIROYO SASAKI,
Vice President
Japan International Cooperation Agency

May 2010

HIROYO SASAKI
Vice President
Japan International Cooperation Agency
Tokyo

Subject: Letter of Transmittal

Dear Sir,

We are pleased to formally submit herewith the final report of the Comprehensive Study on the Sustainable Development of Transport System in Vietnam (VITRANSS2).

This report compiles the results of the study which was undertaken both in Vietnam and Japan from November 2007 to May 2010 by the Team comprising ALMEC Corporation, Oriental Consultants Co., Ltd., and Nippon Koei Co., Ltd.

We owe a lot to many people for the accomplishment of this report. First, we would like to express our sincere appreciation and deep gratitude to all those who extended their extensive assistance and cooperation to the Team, in particular the Ministry of Transport of Vietnam.

We also acknowledge the officials of your agency, the JICA Advisory Committee, and the Embassy of Japan in Vietnam for their support and valuable advice in the course of the Study.

We hope the report would contribute to the sustainable development of transport system and Vietnam.

Very truly yours,

IWATA Shizuo
Team Leader
The Comprehensive Study
on the Sustainable Development
of Transport System in Vietnam
(VITRANSS2)

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ABBREVIATIONS

3PLs	Third-party logistics providers
ADB	Asian Development Bank
AIT	Asian Institute of Technology
ASEAN	Association of Southeast Asian Nations
BOT	Build-operate-transfer
BRT	Bus rapid transit
CAAV	Civil Aviation Administration of Vietnam
CFEZ	Central Focal Economic Zone
CIP	Core Investment Program
DWT	Dead weight ton
EIRR	Economic internal rates of return
FDI	Foreign direct investment
FEZ	Focal economic zone
FIRR	Financial internal rate of return
FS	Feasibility study
GDP	Gross domestic product
GHG	Greenhouse gases
GIS	Geographical information system
GMS	Great Mekong. Sub-Region
GRDP	Gross regional domestic product
GRE	General Road Administration
HAIDEP	The Comprehensive Urban Development Programme in Hanoi Capital City
HSR	High-speed railway
IATA	International Air Transport Association
IBRD	International Bank for Reconstruction and Development
ICAO	International Civil Aviation Organization
ICD	Inland container depot
ICT	Information and communications technology
IICBTA	Initial Implementation of Cross-Border Transport Agreement
IMO	International Maritime Organization
IWT	Inland waterway transportation
JBIC	Japan Bank for International Cooperation
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
JPY	Japanese yen
JR	Japan Railways
JVC	Joint venture company
JVs	Joint ventures
LGU	Local government unit
MC	Motorcycle
MCA	Multi-criteria analysis
MD	Mekong delta
MOC	Ministry of Construction
MOD	Ministry of Defense
MOF	Ministry of Finance
MOT	Ministry of Transport
MPI	Ministry of Planning and Investment
MRD	Mekong River Delta
MTI	Ministry of Trade and Industry
MTP	Medium-term Plan
MTTS	Maritime Technical Training School
NCC	North Central Coast
NFEZ	Northern Focal Economic Zone
NH	national highway
NSEXY	North–South Expressway

NSHSR	North-South High-speed Railway
O&M	Operation and management
ODA	Official development assistance
PC	People's committee
PCU	Passenger car unit
PDOT	Provincial Department of Transportation
PKT	Terms of passenger-km
PMU	Project management unit
PPC	Provincial people's committee
PPP	Public-private partnership
PPTA	Project Preparatory. Technical Assistance
PRR	Progress Report
PSP	Private sector participation
ROPAX	Roll-on/roll-off passenger
RORO	Roll-on/roll-off
RRD	Red River delta
SC	Steering Committee
SCC	South Central Coast
SEDP	Socio-Economic Development Plan
SFEZ	Southern Focal Economic Zone
SKRL	Singapore–Kunming Railway Link
SMS	Safety management system
SOEs	State-owned enterprises
TEDI	Transport Engineering Design Inc.
TRICC	Transport Investment and Construction Consulting
UMRT	Urban mass rail transit
VANSCORP	Vietnam Air Navigation Services Corp.
VEC	Vietnam Expressway Corporation
VIMARU	Vietnam Maritime University
VINALINES	Vietnam National Shipping Lines
VINAMARINE	Vietnam National Maritime Bureau
VINASHIN	Vietnam Shipbuilding Industry Corporation
VIPCO	Vietnam Petroleum Joint Stock Company
VITRANSS	The Study on the National Transport Development Strategy in the Socialist Republic of Vietnam
VITRANSS 2	The Comprehensive Study on the Sustainable Development of Transport System in Vietnam
VIWA	Vietnam Inland Waterway Authority
VNCC	Vietnam Construction Company
VND	Vietnam dong
VNDB	Vietnam Development Bank
VNR	Vietnam Railway
VNRA	Vietnam Railway Administration
VR	Vietnam Register
VRA	Vietnam Road Administration
VRC	Vietnam Railway Corporation
WB	World Bank
WTO	World Trade Organization

Executive Summary

Background and Objective

1. During the last decade, significant achievements were made in the development of Vietnam's transportation infrastructure, particularly roads, which have significantly contributed to the country's economic growth and to regional development. While the trend is expected to continue in the coming years, the gap between increasing demand and available infrastructure capacity has widened. Various issues have also emerged including, among others, worsening traffic safety, traffic congestion in urban areas, low mobility in rural areas, inadequate road maintenance, lack of funding, poor quality of infrastructure, and weak transportation services. In addition to these fundamental issues, Vietnam is also confronted with the need to further strengthen its competitiveness in transportation infrastructure and services as it gets increasingly more integrated with the global economy.

2. Given these circumstances and upon the request of the Vietnamese government, the Japanese government has provided technical assistance through the Japan International Cooperation Agency (JICA) to carry out "The Comprehensive Study on the Sustainable Development of Transport System in Vietnam" or VITRANSS 2, for short, and update the recommendations made in the first VITRANSS, or the "National Transport Strategy Study for the Socialist Republic of Vietnam," carried out in 1999–2000, or almost a decade ago.

Approach of VITRANSS2

3. The environment surrounding growth and development of Vietnam has changed quickly during the last decade and since the time VITRANSS 1 was conducted in 1999. Urbanization, economic growth, motorization, industrialization, and globalization have been made significant progress since then. Cities have grown in terms of population and urban areas. Big cities are becoming bigger and Hanoi and HCMC are expected to join the group of megacities in the coming decades. Medium-sized cities have also started to grow; towns are becoming cities and new urban areas emerge. This urbanization trend is expected to continue over the coming decades as experienced in other industrialized and industrializing countries in Asia. Controlling the urbanization process is extremely difficult, and the impact of further urbanization will dramatically change the distribution of socio-economic activities. Hence, transportation development and management should be carried out efficiently while ensuring that these are integrated with regional/urban development.

4. Based on the Socio-Economic Development Plan of Vietnam, the vision of Vietnam's transportation system can be classified into: (i) competitiveness, (ii) integration and inclusion, and (iii) sustainability and safety. The strategies, as well as the planning and implementation of projects, for each of the transportation subsectors need to be guided by a set of principles or policies. These are summarized in Table ES.1.

5. Translating objectives into a deliverable strategy needs to recognize at the outset some realities about Vietnam. These are:

(a) Vietnam's twin centers of economic gravity are 1700+ kilometers apart. They account for 60% of the GDP. In between, there is very little to speak of. Re-distributing growths, particularly to the central regions, will require deliberate policy interventions, whose results will take decades to materialize;

(b) Long-term plans in all transportation sectors have been laid out, but without regard to what realistically can be financed. The result is every project becomes a priority; therefore, there is

no clear overall priority;

(c) The size of the State sector has declined, but is still significant (if not dominant) in all transportation subsectors; and

(d) Importance is being attached to urban transportation because this will increasingly dominate national sustainability, and because it calls for large investments that would compete with other priorities.

Table ES.1 Main Factors in the Sustainable Transportation Sector Development Agenda

Main Policy Agenda	Description
1. Adoption of a Multimodal Planning Approach	• Transportation planning and projects must be viewed from the perspective of competing and complementary transportation modes. For example, the high-speed rail (HSR) option between north and south can be evaluated against an air transportation service, an expressway or a conventional railway. The aim is to achieve an appropriate balance, or mix, of transportation modes that utilizes the limited economic and human resources.
2. Seamless Freight Movement	• Movement of people and goods, particularly the latter, shall take into account the full journey across all modes. Accordingly, closer examination of the interface or transfer points, as well as the "last-mile" impediment – infrastructure or regulation, shall be made with the objective of ensuring as seamless travel as is feasible. The 'whole of supply chain' for strategic commodities deserves preferential attention. This also encompasses the harmonization or compatibility of transportation technology and rules at cross-border points.
3. Strengthening of Maintenance Capacity	• Rapid growth of socio-economic activities are bringing about increasing load on existing infrastructures in much faster speed than expected. Increase in overall traffic and share of heavy vehicles contributes to widening the maintenance gap.
4. Improvement of Traffic Safety	• The above change in traffic situation both in urban and rural area has been and will be continuously a threat to worsening traffic safety, especially on roads.
5. Enhancement of Private Sector Involvement	• In delivering the desired outcomes, involve the private sector whenever possible in the building and management of transportation infrastructure. In transportation services, private sector should be the first choice.
6. Establishment of Competitive Markets	• The transportation market should function as efficiently as possible, with minimum distortions from government regulations, so that each mode reflects its true cost to the economy and users are able to choose freely and respond. This also implies leveling the playing field, encouraging competition, consistency and predictability in the application of rules, and permitting inefficient enterprises (SOEs included) to fold, with government intervention seen as a last resort.
7. Adoption of Cost-recovery Schemes	• To the extent feasible, the full life-cycle cost of transportation infrastructure shall be recovered from its direct beneficiaries; where such is not possible, a mechanism for covering the shortfall shall be instituted. For example, the capital and maintenance cost of a river channel may not be recoverable from all users because of tolling practicalities. A frontage levy on riverbank users, or annual vessel fee on barges, could be imposed. A transportation fund created from a levy on fuel is also possible. It also implies cost-based tariff regime.
8. Promotion of Participatory, Inclusive Planning and Implementation Processes	• The views of relevant stakeholders within and without the governments, central as well as local governments, shall be considered whenever possible.

Source: VITRANSS 2 Study Team

Transportation Sector Issues

6. The issues that the transportation sector has to address as it moves toward an uncertain future are summarized in Table ES.2 below. It is difficult enough for Vietnam to resolve the above issues and simultaneously modernize its transportation system, in the predictable environment of a fast-growing economy. Then, the financial crisis struck unexpectedly in 2008 and plunged the world's future—and Vietnam's—into a much higher level of uncertainty. For the first time since 1982, global trade will shrink by 9% in 2009, according to the World Trade Organization. The International Air Transport Association expects Asia-Pacific carriers to be the hardest hit by the economic downturn. International shipping is also badly affected, as shown by idled gantries in once busy hub ports and many vessels moored for lack of business. Worse, the export-led and FDI-driven path to development, which Vietnam has followed, is now reeling under the crisis.

Table ES.2 Transportation Sector Issues in Vietnam

Infrastructure	Services
1. Disconnect between urban / regional planning with transportation infrastructure development	1. Unsustainable subsidies in urban transportation services, particularly in buses (and soon, also in rail transit)
2. Compartmentalized subsector planning that hampers inter-modal and multi-modal transportation development	2. Inefficient pricing and regulation across most transportation modes which results in an imbalance between mode choice and investment
3. Imbalances in resource allocation between sectors, and between capital and maintenance expenditures	3. Extensive involvement of State in the provision of services, particularly in ports and shipping
4. Lack of sustainable sources of financing for transportation, particularly for IWT and Railways	4. Poor level of safety, particularly in the road subsector and at railway crossings
5. Better use of existing assets, especially in ports and airports, takes a back seat to capacity expansion	5. Transition from motorcycle usage to public transit usage and car usage in urban commuting in large cities
6. Carbon emission and energy demand become important, with rapid motorization	6. Increasing need by export industries for more sophisticated logistics services
7. Appropriate participation by private sector in the development of ports, airports, expressways, and logistics is needed	7. Connecting remote villages and increasing their accessibility to the transportation network is paramount

Source: VITRANSS 2 Study Team.

Growth in Traffic

7. Traffic has grown rapidly in the last decade, slightly faster than the country's economic growth (which grew at an annual average rate of 7.5% from 2000 to 2008). On the premise that the world economy, and Vietnam's, can get back on track, the country's economy pie by 2030 is forecast to be three times larger than it is now. The total population will be 28% larger, but the number of urban residents will expand by 90%, the equivalent of building seven more cities the size of HCMC over a short span of 20 years. Such economic growth translates into the forecast transportation demand shown in Table ES.3. Interprovincial passenger and freight traffic will be three times higher than at present.

Table ES.3 Forecast Increase in Passenger and Freight Traffic

Item		1999[1]	2008	2030	Growth	
					2030/08	%/Yr
Person (per Day)	Number (000)	595	985	2,978	3.0	5.2%
	Passenger-km (000)	113	161	662	4.1	6.6%
	Average Trip Length (km)	190	164	222	1.4	-
	% Intraregional (8 regions)	48.0%	67.2%	58.3%	-	-
Freight (per Day)	Tons (000)	241	1,332	3,732	2.8	4.8%
	Ton-km (000)	72	237	810	3.4	5.6%
	Average trip length (km)	299	178	217	1.2	-
	% Intraregional (8 regions)	35.4%	48.8%	49.6%	-	-

Source: VITRANSS 2 Study Team .
[1] 1999 data based on traffic counts only at provincial boundaries.

8. Regarding the future passenger and freight traffic demand, interregional transportation will grow throughout the country, especially within the north and the south and between the south and north.

Fundamentals of VITRANSS 2 Strategy

9. Sustainable transportation development aims to support and promote the national growth and poverty reduction strategy. Sustainability refers to economic, social, environmental, financial and administrative aspects, improving critical assessment of demand, efficiency and effectiveness (competitiveness), affordability, funding capability and management capacity. The fundamentals of the VITRANSS 2 strategy are as follows:

(a) Development of competitive intermodal transportation network and service at national/international level (national backbone network);

(b) Development of effective local transportation network and services integrated with the above national/regional transportation system at provincial level;

(c) Development of step-wise and incremental investment strategy with a core investment program at its center;

(d) Budget allocation to more closely support the objective assessment of sector priorities;

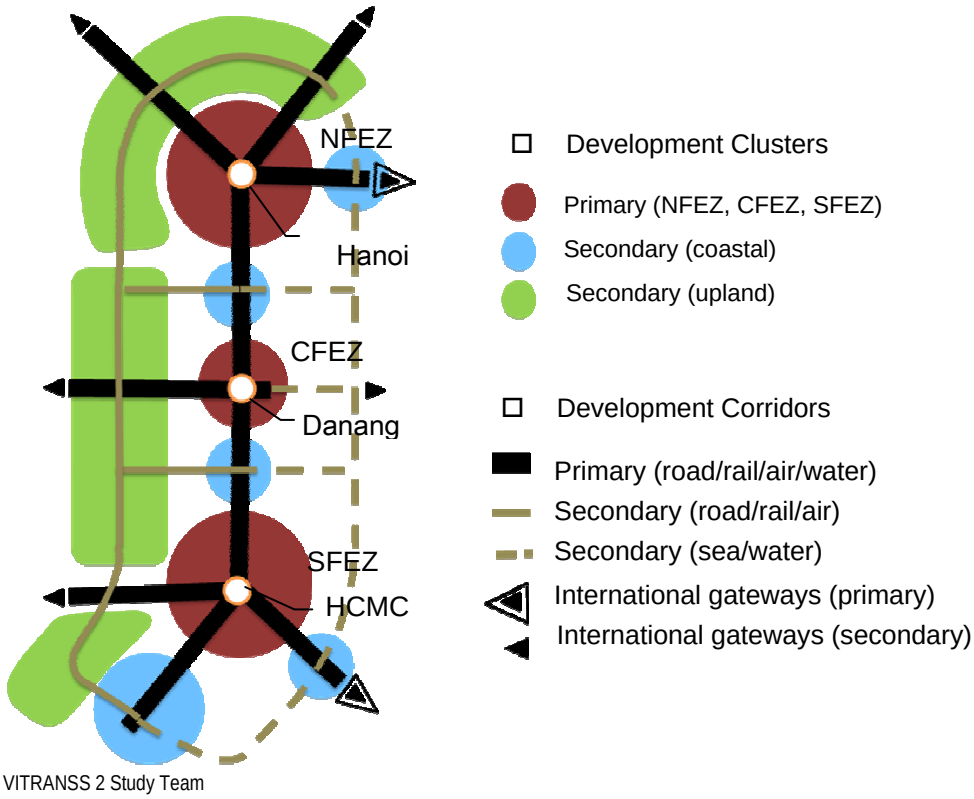
(e) Development of PSP to drive the strategy, increase sector efficiency and stimulate innovation; and

(f) Institutional reform to better address and align government goals with outcomes.

The Spatial Framework

10. While the transportation sector follows the patterns of economic development, it also provides its own contour and spatial distribution. On a macro-level, the transportation system will support and re-enforce the growth of three focal economic zones (schematically shown on Figure ES.1). The 3 main urban clusters are at the top of the hierarchy of human settlements, and will be supported and linked by a high-capacity strategic network of expressways, express railways, coastal shipping, and air transportation, while at the same time functioning as international gateways.

Figure ES.1 National Physical Framework



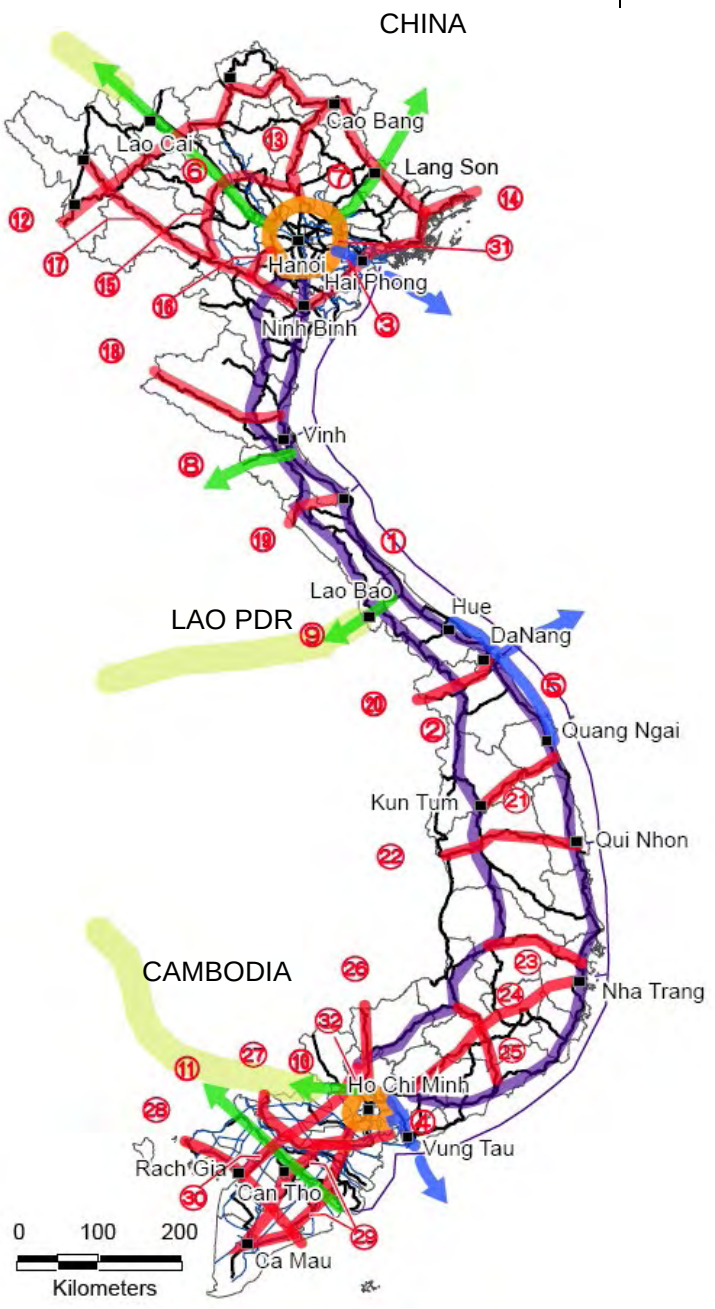
Source: VITRANSS 2 Study Team

Transportation Corridor Integration

11. Within and between the focal economic zones (FEZs), VITRANSS 2 adopted a corridor management approach in the planning, evaluation and eventual implementation of specific transportation projects. Transportation corridors provide a practical application of multimodal planning in identifying improvements in inter-modal networks that offer the greatest potential benefits to users of the network in terms of efficiency and quality of transportation services. The focus in every corridor is to increase mobility, safety and productivity; and this may include demand management measures, improvement of cross-network junctions, congestion management, etc.

Figure ES.2 Main Transportation Corridors

Corridor		Between	Distance (km)	Main modes[1)]
Type	Name			
National Backbone	1. North-South Coastal	Hanoi – HCMC	~1800	Rd, Ra, PS, A
	2. North South Upland	Hanoi – HCMC	~1800	Rd, A
International Gateway Corridor	3. NFEZ Gateway	Hanoi – Hai Phong	120	Rd, Ra, IWT
	4. SFEZ Gateway	HCMC –Ba Ria -Vung Tau	110	Rd, IWT
	5. CFEZ Gateway	Quang Ngai–Hue	190	Rd, Ra
Land Bridge Corridor	6. Hanoi – Lao Cai (China Border)	Hanoi – Lao Cai	260	Rd, Ra, IWT
	7. Hanoi – Lang Son (China Border)	Hanoi – Lang Son	145	Rd, Ra
	8. Vinh – NH8 – Lao Border	Vinh – Keo Noa	60	Rd
	9. Don Ha – Lao Bao	Dong Ha – Lao Bao	680	Rd
	10. HCMC – NH22 - Cambodia Border	HCMC – Moc Bai	70	Rd
	11.Soc Trang –Can Tho - Cambodia Border	Soc Trang – Chau Doc	180	Rd, IWT
Regional Corridor	12. North Frontier	Dien Bien Phu – Quang Ninh	500	Rd
	13. Hanoi – Cao Bang (China Border)	Hanoi – Cao Bang	220	Rd, (Ra)
	14. North Coastal (China Border)	Ninh Vinh – Mong Cai	260	Rd, IWT
	15. North transversal	Thai Nguyen – Moc Chau	200	Rd
	16. Hanoi – Hoa Binh	Hanoi – Muong Khen	60	Rd, IWT
	17. Ninh Binh – Lai Chau	Ninh Binh – Lai Chau	360	Rd
	18. Vinh – NH7 – Lao Border	Dien Chau – Nam Can	180	Rd
	19. Vung Ang – NH12 – Lao Border	Vung Anh – Cha Lo	60	Rd
	20. Da Nang – NH14B / 14D – Lao Border	Da Nang – Ta Oc	110	Rd
	21. Quang Ngai – Kon Tum	Quang Ngai – Kon Tum	120	Rd
	22. Quy Nhon – NH19 - Cambodia Border	Quy Nhon – Le Thanh	180	Rd
	23. Nha Trang – Buon Ma Thuot	Nha Trang – Buon Ma Thuot	130	Rd
	24. South Central Highland	Nha Trang – HCMC	300	Rd
	25. Phan Thiet – Gia Nghia	Phan Thiet – Gia Ngia	140	Rd
	26. HCMC – NH13 – Cambodia Border	HCMC – Hoa Lu	120	Rd
	27. HCMC – My Tho – Cambodia Border	HCMC – Tan Chau	220	Rd, IWT
	28. Bac Lieu – Rach Gia – Cambodia Border	Bac Lieu – Ha Tien	200	Rd
	29. South Delta Spine	HCMC – Ca Mau	250	Rd, IWT, A
	30. Upper South Delta	HCMC – Rach Gia	180	Rd, IWT, A
Metropolitan Ring Corridor	31. Hanoi Outer Ring		125	Rd
	32. HCMC Outer Ring		83	Rd



Source: VITRANSS 2 Study Team.
1) Road (Rd), Rail (Ra), Inland waterway (IWT), Port and Shipping (PS), Air (A).

Overall Transportation Sector Strategy

12. In order to attend to large and diversified transportation demand which requires not only sufficient capacity but quality of services, there is a need for further modification of focus and infrastructure policies as well as the strengthening of integration and coordination, as shown in Table ES.4. The priority strategies for transportation development in Vietnam are shown in Table ES.5.

Table ES.4 Change in Focus of Transportation Development

Area	From the Present	To A New World
1. Focus	• Unimodal • Stand-alone projects • Supply-driven Lack of certainty in priority & funding	• Multimodal • Supply-chain orientation • Demand-driven
2. Infrastructure Policies	• Priorities are sector-based and political balance • Concentration on capacity • Ambiguous priorities and funding • State as provider of services	• Transparent competition among modes for funds • More focus on productivity and market orientation • Long-term strategic prioritization and fund sourcing • Private sector as provider of services
3. Integration & Coordination	• Sectoral planning • Disconnect between transportation and regional and urban strategies • Heavy reliance on State intervention for coordination	• Multimodal planning • Harmonization between transportation and development strategies • Use of market mechanism to influence demand & supply

Source: VITRANSS 2 Study Team.

Table ES.5 Priority Transportation Strategies

Area	Current Challenge	Possible Action
1. Multimodal Planning & Investment	• Compartmentalized approach • Lack of certainty in priority & funding	• Ensure integrated multimodal planning • Consider budget envelope • Assess risks in fund programming
2. Sustainable Funding & Cost Recovery	• Limited funds for maintenance • Heavy reliance on ODA	• Develop sound capital recovery framework (starting with Road Users Charge) • Promote private sector involvement
3. Seamless Movement & Supply Chain	• High logistics cost ~25% of GDP • Capacity development approach is too slow and insufficient	• Focus on bottlenecks of supply chain • Reduce inventory cost • Promote 3PLs + entry of foreign players
4. Environment & Energy	• Possible environmental negative impacts of projects • Impacts to greenhouse gas and energy use	• Mitigate impacts • Provide disincentives to environment and energy inefficiency
5. Safety & Security	• High accident rates (esp. roads) • Vulnerability to disasters	• Implement Traffic Safety Master Plan 2020 • Analyze risks and formulate mitigation measures
6. Rural Accessibility	• Inaccessibility and disaster vulnerability	• Continue with funding social projects
7. Human Resource Development	• Centralized planning	• Train on use of market mechanisms • Enhance PDOT capacity
8. Sector Governance	• Inadequate use of market forces • Low participation of PDOTs	• Accelerate reforms towards market-based approaches • Strengthen role of PDOTs

Source: VITRANSS 2 Study Team.

Subsector Strategy

13. For each transport subsector, the development strategy by 2030 was formulated as shown in table ES.6.

Table ES.6 Sub-sector Strategies

Goal	Specific Action
Road and Road Transport	
1. Improve road network capacity thru proper hierarchy and connectivity	• Balance expressways, primary, and secondary roads • Upgrade road surfaces to all-weather pavements • Intensify development of provincial roads in coordination with national roads
2. Segregate traffic to enhance safety and productivity	• Develop design standards suited to motorcycle traffic • Segregate long distance heavy vehicles from local traffic
3. Preserve road assets	• Negotiate long–term maintenance program and road user funds • Strengthen institutional mechanism and capacity • Intensify regulations on truck overloading
4. Foster environment and safety safeguards in road transportation	• Constantly review vehicle /safety standards • Improve design standards on landslide/flood-prone areas • Continue to implement road safety promotion programs
5. Modernize road sector industries	• Modernize transportation operators and foster business environment • Promote high-quality road construction through reforms in the procurement system
Railway Transport	
1. Shift the role of railway from traditional role to provider of high-grade transportation services	• Target investments into rail improvements to protect existing level of service • Upgrade sections to raise capacity of existing tracks • Create new services, especially in freight and suburban commuter
2. Strengthen intermodal connectivity between rail and other modes	• Ensure connectivity between origin and destination of passenger and freight traffic • Develop adequate intermodal facilities through collaboration or joint ventures with rail customers
3. Realize full benefits of rail restructuring	• Accelerate full separation of VNRA and VRC • Establish funding support for track maintenance under VNRA
Port and Shipping	
1. Enhance productivity of existing ports through various means	• Open up operations in the north and central to multiple operators • Extend the scope of port operators to provision of other logistics services
2. Develop gateway ports in association with capable access channels and feeder transportation network	• Focus investments on completion of deep-sea ports (Lach Huyen and Cai Mep) that can enhance regional trade • Enhance complementation of various ports as a system of feeders and hubs to avoid overlapping hinterlands • Ensure connectivity with road, rail and IWT as well as industrial zones in the hinterland • Develop and maintain main channels to ensure safe and smooth navigation of large vessels
3. Liberalize domestic shipping and modernize fleet	• Promote private sector innovation in coastal shipping, especially in container shipping • Adopt a ship-leasing program to upgrade/renew maritime fleet • Introduce RoRo and passenger services as cheaper alternative to land-based transportation
4. Comply with IMO standards on vessels and crews	• Intensify training of crews combined with international standards certification • Enhance vessel inspections and certification process
Inland Waterway	
1. Ensure sustainable scale of IWT operations	• Define minimum size of river network in RRD and MD the navigability of which must be protected and enhanced • Focus government investment funds on river channel improvements, dredging, and facilities for safe navigation and leave other aspects to private sector/province
2. Stabilize funding support for channel maintenance	• Institutionalize participation of industries that are reliant on waterways • Impose river frontage charges/fees to be earmarked for maintenance
3. Create a new market for IWT - particularly as an alternative for non-bulk freight and passenger traffic	• Promote riverbanks for 'green' re-development into mixed-use, industrial, commercial and residential complexes
4. Continuously improve traffic safety on riverways	• Identify and remedy black spots along rivers • Modernize barge fleet • Promote safety training and licensing of vessel pilots
Aviation	
1. Enhance complementation of airports	• Develop capacities of the 3 international gateway airports (e.g. new pax terminal and

as a hierarchical system	logistics terminal for Noi Bai, expanded parking slots for TSN, widening of Danang runway strip) • Upgrade existing airports to ICAO standards in accordance with airport class/category
2. Develop sustainable financing for airport development and maintenance	• Update and rationalize various charges, e.g. parking, air traffic control fees, ground-handling, etc. • Define level of government funding support for non-commercial obligations
3. Upgrade human resources capability, especially in safety, security, and management	• Train human resources, as recommended by the ICAO Audit Team • Conduct ICAO language proficiency training among airline crew and air traffic controllers
4. Provide competitive air transport services	• Encourage entry of low-cost carriers and charters, especially for tourism purposes • Level playing field in domestic scheduled services
Logistics	
1. Reduce overall logistics cost of Vietnam	• Implement interventions on bottlenecks of supply chain, e.g., port productivity, warehousing and transfer points • Ensure multimodal planning for faster development of least-cost transportation modes for freight • Identify opportunities for improvements for specific export products
2. Nurture growth of 3rd Party Logistics Providers (3PLs)	• Review regulations impeding growth of multi-service logistics enterprises • Liberalize entry of foreign logistics players • Develop human resources to upgrade competence and professionalism in the subsector
3. Intensify and integrate ICT in logistics processes, especially at customs and borders	• Strengthen logistics industry organization • Promote standardization in operations, such as documentation, technology standards, etc. • Develop logistics portals to link all players across the supply chain

Source: VITRANSS 2 Study Team.

North-south Corridor Development

14. Among the corridors identified in VITRANSS2, the north-south coastal corridor is the most important politically for Vietnam, since it serves to integrate the three focal economic zones. Planning for the improvements in this corridor also illustrate the required efforts for establishment of a multi-modal framework, environmental assessment and mitigation, and the funding constraints identified in VITRANSS 2.

15. Future traffic demand along the north-south coastal corridor is expected to be significant both for passenger and freight traffic. For example, cross-section passenger traffic along the corridor will increase by 4 to 5 times by 2030, while that of freight traffic will also increase by 3 to 4 times for the same period. Under the “Do-nothing Scenario,” large demand of passenger traffic request for travel by air which will be more and more preferred for long distance as people’s income increases. Shift to passenger cars is also notable for medium distance of travel. Increase in freight traffic demand require three modes of transportation; namely road by truck, rail and coastal shipping. This implies the following:

(i) How best to meet long-distance travel of passengers along the corridor which can hardly be met by air transportation alone. There is a need to provide high-speed services with affordable fare.

(ii) With regard to freight, a sharp increase in truck traffic is estimated when expressways are developed. In order to relieve expected congestions and mitigate the negative social and environmental impacts from using heavy vehicles, a shift to coastal shipping and railway seems necessary.

16. The significance of the North–South Coastal Corridor will become more and more important economically and socially in the future. The competitive coastal corridor also provides cities and growth centers located along the coast with opportunities for strong socio-economic integration and balanced development.

North–South High-speed Railway (NSHSR)

17. The study on the NSHSR is mainly composed of engineering study and economic/financial study. Although the study has been conducted both by VITRANSS 2 Team and the TRICC Team in close coordination, a main contribution of VITRANSS 2 is the analysis of the development scenarios and the formulation of strategies which provided the basis for discussion with the Steering Committee members and other stakeholders.

18. As the project requires a huge amount of public fund, a focus was to assess economic and financial viability of the project and find a realistic way to more the project forward. Tested scenario in the study includes following:

(i) Analysis of full section (Hanoi–HCMC) development scenario;

(ii) Analysis of conditions and factors which make "Full-development Scenario" feasible;

(iii) Analysis of "Partial-development Scenario" including (a) Hanoi–Vinh Section and (b) HCMC–Nha Trang Section; and

(iv) Concept of Danang–Hue Section development.

19. The results of the analysis of "Full-development Scenario" shown in Table ES.7 are briefly as follows:

(i) Ridership varies depending on the fare level between 146,000 and 248,000 passenger/day.

(ii) EIRR is low in all cases. In the case of 50% of air fare, it is 6.9%. However, if the fare is low (25% of the air fare), EIRR becomes 9.6%

(iii) FIRR cannot be calculated indicating investment cost cannot be recovered. However, operating costs can be covered by fare revenues if the HSR fare is higher than 50% of air fare.

(iv) Benefits are composed of vehicle operating cost saving (57%), travel time cost saving (17%) and reduction in traffic accidents (26%).

Table ES.7 Economic and Financial Indicator of HSR Project (Full-development Scenario)

Speed (km/h)	Fare	No of HSR Passengers 2030 (000/day)	Economic Indicator		Financial Indicator	
			EIRR(%)	B/C Ratio	FIRR(%)	Fare Box Ratio
300	Same as Air	146	-	0.46	-	1.9
300	3/4 of Air	172	5.6	0.58	-	1.5
300	Half of Air	208	6.9	0.66	-	1.1
300	Quarter of Air (equal to bus/CR)	248	9.6	0.84	-	0.6

Source: VITRNASS 2 Study Team.

20. **Analysis of Conditions to Make "Full-development Scenario" Feasible**: While the base case scenario is economically unfeasible, an exercise was made to find conditions to make the scenario feasible. The results are shown below. Results of financial analysis do not change much. FIRR cannot be calculated but fare box ratio is more than 1.0 in most cases.

(i) Accelerated urban development along the north-south corridor: As cities and urban areas are main source of HSR passengers it is assumed that urban population of main cities will further increase.[1] Then EIRR will increase from 6.9% to 9.3%

[1] Total urban population of Thanh Hoa, Vinh, Hue, Danang, Tam Ky, Quy Nhon, Nha Tran, Phan Thiet and Bien Hoa will increase from 4 million to 14 million from 2005 to 2030. MOC's estimate is 9 million by 2030.

(ii) Postponement of opening year by 10 years and 20 years:

- Opening of HSR in 2036: EIR is 11.6%
- Opening of HSR in 2046: EIRR is 16.3 %

(iii) Increase in fuel cost by 50% for road and air: EIRR will increase to 8.1%

(iv) Accelerated urban development + postponement of opening to 2036: EIRR is 14.1 %.

21. **Analysis of Partial-development Scenario**: Partial development of the priority sections of the NSHSR shows relatively higher EIRR (see Table ES.8). Both sections show higher EIRRs than full section development scenario, indicating competitiveness of HSR for the medium distance and nearness of the route to big cities.

Table ES.8 Analysis Results of Partial-development Scenario[1]

Item		Scenario		
		1. Base Case	2. Accelerated Urban Development	3. Accelerated Urban Development + 50% Increase in Fuel Cost
Ha Noi-Vinh	Ridership(000/day)	61	98	98
	EIRR	7.9 %	12.8 %	14.5 %
	FIRR	-	-	-
	Fare Box Ratio	0.9	1.0	1.0
HCM-Nha Trang section	Ridership(000/day)	101	129	129
	EIRR	9.1%	11.8%	13.8%
	FIRR	-	-	-
	Fare Box Ratio	1.0	1.1	1.1

Source: VITRANSS 2 Study Team.
1 Opening year is assumed to be 2020 because of shorter construction period

22. **Required Tasks before North-South High Speed Railway Development**: To realize the NSHSR, many key issues should be addressed besides the construction work. It is preferable to tackle these issues as soon as possible before the construction or the operation starts. The required tasks were identified as shown in the following table. Conducting these tasks carefully and substantially, the construction would be implemented smoothly and the operation would start in efficient and effective manner without any big troubles

Table ES.9 Required Tasks before North-South High Speed Railway Development

Tasks	Actions
1. Land Acquisition	(a) Adopt HSR to Urban Development Plan (b) Establish implementation system for local central government (c) Develop regulations regarding land acquisition (d) Acquire land for test truck (e) Acquire land for priority sections
2. Human Resource Development	(a) Develop human resource development plan (b) Develop human resource development system (c) Implement training
3. Design of Development and Operational Institutions	(a) Develop HSR operational institution Plan (b) Develop relevant regulations (c) Develop operational institutions
4. Development of Regulations including Technical Standards	(a) Develop regulations and implementation standards regarding HSR technical standards (b) Develop regulations regarding HSR construction and operations
5. Integrated High Speed Railway and Urban Development Plan	(a) Revise urban development plans and local development plans (b) Implement integrated urban development projects (c) Develop HSR promoting measures (d) Implement HSR promoting measures
6. Implementation Plan	(a) Conduct F/S (b) Formulate phased development plan (c) Implement Detailed Design for each phase

Source: VITRANSS 2 Study Team.

Basic Plan for the North–South Expressway

23. The main roles of expressways defined by VITRANSS2 are thus envisioned as follows:

(i) Segregate long-distance traffic from local traffic;

(ii) Facilitate provision of competitive transportation services ensuring efficiency, safety, and amenity;

(iii) Serve as strategic means of regional development; and

(iv) Serve as core transportation corridors integrating key transportation modes with due consideration of the following:

- Guarantee of connectivity among major cities, provincial capitals, and growth centers including major industrial zones, gateway ports and airports, all of which must be accessed by expressways within a reasonable period of time;
- Realization of effective network configuration with national and major provincial roads, as well as urban roads; and
- Provision of the desired quality of passenger and freight transportation services by strengthening intermodal facilities, logistics, and road user service facilities, as well as introducing IT applications.

24. On the process of expressway network analysis, three new sections were identified for inclusion to the overall network[2]. They are as follows:

(i) Danang–Ngoc Hoi (250km) to strengthen between the central region with Danang and establish a new East-West corridor connecting Pakxe in Lao PDR;

(ii) Quang Nai–Dak To (170km) to strengthen connectivity between Dung Quat Industrial Zone, central high lands and Lao PDR;

(iii) Nha Trang–Da Lat (80km) to strengthen connectivity between central high land and coastal growth zone; and

25. **Demand Analysis**: The impact of expressways on overall transportation network especially on primary roads is significant. The network analysis shows that if the entire expressway network is completed it would accommodate 64% of car and 60% of bus traffic in terms of passenger-km and 71 % of freight traffic in terms of ton-km of total inter-provincial transportation demand in 2030. This means the traffic situation on primary roads are expected to improve significantly

26. **Economic & Financial Evaluation**: For each section of the expressway, economic and financial evaluation were undertaken preliminarily, based on the following assumptions.

(i) Opening year of expressway: 2020;

(ii) Project evaluation period: 30 years after opening;

(iii) Project cost: existing cost data was updated by the Study Team;

(iv) Operation and maintenance cost: 5% of project cost per year;

(v) Average growth rate of traffic: 4.9 %/year; and

(vi) Toll rate: US 5 cents/pcu/km

27. The result are shown in Table ES.10 and briefly described as follows:

(i) Many sections are economically feasible with more than 12% of EIRR. Some sections with EIRR close to 12% need extra measures to enhance the EIRR values;

[2] Although these sections must negotiate with difficult terrain conditions it is worth to be considered.

(ii) On the other hand, all sections are not financially viable although Vinh – Ha Tinh, Ring Road 3 in HCMC and Cau Gie - Ninh Binh have relatively high FIRR; and

(iii) The above indicates that overall economic viability of the entire NSEXY is verified but the Government need to work out adequate mechanism to provide financial support in a way to maximize capability of private sector.

Table ES.10 Result of Economic and Financial Evaluation of NSEXY

Code	Section	Length (km)	PCU (000/day)	Cost (US$ mil/km)	EIRR (%)	FIRR (%)
H01	Ninh Binh–Thanh Hoa	75	80.1	11.0	15.3	8.3
H02	Thanh Hoa–Vinh	140	57.2	15.2	12.1	6.5
H03	Vinh – Ha Tinh	20	45.7	10.1	17.0	12.6
H04	Ha Tinh – Quang Tri	277	38.3	9.5	9.9	5.2
H05	Quang Tri – Hue	73	41.2	9.8	12.5	7.5
H06	Hue – Da Nang	105	37.5	16.9	10.3	3.5
H07	Quang Ngai – Quy Nhon	150	35.6	11.9	10.3	5.2
H08	Quy Nhon – Nha Trang	240	36.4	14.1	8.9	3.9
H09	Nha Trang – Phan Thiet	280	23.7	10.3	8.0	2.6
H10	Long Thanh–Nhon Trach–Ben Luc	45	30.2	16.4	15.9	5.4
H30	Ring Road No.4 in Ha Noi	90	7.7	15.0	14.5	8.0
H32	Ring Road No.3 in HCMC	83	47.2	14.8	13.7	10.9
CH01	Cau Gie – Ninh Binh	50	73.3	9.0	18.1	12.6
CH02	Da Nang – Quang Ngai	131	39.6	8.0	11.3	8.0
CH03	Phan Thiet – Gia Ray	100	39.6	19.1	11.9	6.8
CH04	HCMC – Long Thanh – Dau Giay	55	74.9	20.2	15.5	8.8
CH05	HCMC- Trung Luong	40	67.8	19.4	15.1	8.6
CH06	Trung Luong–My Thuan–Can Tho	92	39.1	16.4	11.3	2.8

Source: VITRANSS 2 Study Team.

Funding Constraints and Opportunities

28. On the situation that the gap between investment demand and actual investment is getting wider, increasing sector financing must be part of transportation strategy. Increasing user charges (e.g., the recently announced Road Fund) and private sector participation (PSP) are practical ways of raising sector funds while also supporting economic efficiency. But PSP will take time to implement—maybe 5–10 years. During this transition period, it seems inevitable that sector funding will need to be a combination of (i) public sector budgets, sourced from taxes and bonds; (ii) ODA, like JICA, IBRD, ADB; (iii) tolls and other forms of direct user charges, which are still insignificant; and (iv) bilateral aids and grants, which are usually small and restricted.

29. **Available Public Funding**: VITRANSS 2 has prepared estimates of future public funding under three scenarios for the future GDP growth rates and also three scenarios for the percentage of GDP that can be spent for transportation sector investment. The former assumes:

30. And the latter, the share of GDP for transportation sector investment: 3% (Low), 5% (medium), and 7% (High). Table ES.11 presents the possible public investment amount for the transportation sector. As economy grows, the amount increases in an accelerated manner.

Table ES.11 Possible Public Investment for the Transportation sector by Period

(USD bil)

Period	Possible Investment as % of GDP								
	3			5			7		
	Low[1)]	Med[1)]	High[1)]	Low[1)]	Med[1)]	High[1)]	Low[1)]	Med[1)]	High[1)]
2009&2010	5	5	5	8	8	8	11	11	11
2011-2015	14	15	15	24	24	25	33	34	35
2016-2020	19	20	22	31	33	36	43	47	51
2021-2030	53	61	72	89	102	120	124	143	168

Source: VITRANSS 2 Study Team.
1) Annual GDP growth rate for 2011–2020: 5.5% (Low), 6.5% (Medium), 7.5% (High)
Annual GDP growth rate for 2021–2030: 4.5% (Low), 5.5% (Medium), 6.5% (High)

31. **Role of PSP Projects**: PSP will not happen without regulatory and institutional reform that create a predictable enabling environment, and demonstrate commitment to private sector participation for the medium and long-term. Effective PSP also delivers private financing; that is, when there is effective risk transfer private financing is its consequence, and subject to ensuring it provides value-for-money (when compared against public sector delivery) PSP will likely be very beneficial. Of course private financing is not 'free funding' – the private sector provides up-front financing to be repaid by a combination of users of the system and government. A major thrust of transportation strategy therefore needs to be to deploy PSP more effectively.

32. Regarding PSP in Expressway development the following measures are recommended and would need further attention and examination for detailed implementation mechanism:

(i) Infrastructure financing policy and mechanism focused explicitly on the general principle of matching cost and benefit of service provision;

(ii) Institutional setup for administration, funding and implementation of expressway network development based on the proper understanding of financial viability of expressway business – leadership role and function by the government entities;

(iii) Preparation of Viability Gap Funding Mechanism as soon as possible;

(iv) Utilization of ODA funding for financing Viability Gap Funding Mechanism;

(v) Capacity development for preparing, structuring and properly implementing expressway PPP projects with active initiative by GOV – specially the capacity building of the government officials to utilize outside expertise in implementing the above; and

(vi) Preparation of PPP mechanism based more on ad hoc and commercial contractual arrangement in each specific case of PPP expressway project – initially for the restructuring of ongoing PSP expressway projects.

Master Plan up to 2020

33. Candidate Master Plan Projects: the identified projects are categorized by subsector, as shown in Table ES.12. The categorization reflects major provisions to address transportation issues in each subsector.

Table ES.12 Categories of Identified Transportation Projects by Subsector

Subsector	Project
1. Road	• Construction of new expressways (Proposed:32 projects committed:12 projects) • Construction of new roads (Proposed: 25 projects Committed:16 projects) • Construction of bypasses (Proposed: 21 project Committed:5 projects) • Improvement of roads/bridges (Proposed: 62 projects Committed: 51 projects) • Securing all-weather 2-lane roads on corridors (Proposed: 7 projects) • Improvement of traffic safety (Proposed: 9 projects Committed: 3 project)
2. Railway	• Improvement of existing lines for capacity expansion (Proposed: 6 projects Committed: 2 project) • Construction of new lines (Proposed: 5 projects Committed: 3 projects)
3. Ports & Shipping	• Expansion and upgrading of ports (Proposed: 25 projects Committed 13 projects)
4. IWT	• Waterway improvement (Proposed: 37 projects Committed: 9 projects) • Improvement of river port Proposed: 6 projects Committed: 3 projects) • Landing stages improvement (Proposed: 1 project Committed: 1 project) • Safety improvement (Proposed: 2 projects) • Ship building (Proposed: 2 projects) • Institution improvement (Proposed: 3 projects Committed: 2 projects) • Maintenance (Proposed: 1 project Committed: 1 project)
5. Aviation	• Construction of new airport (Proposed: 1 project Committed: 1 project) • Capacity Expansion of existing airport (Proposed: 13 projects Committed: 7 projects) • Improvement of navigation facility (Proposed: 2 project Committed: 2 projects)
6. Multimodal (Logistics)	• Construction of new facility for multimodal cargo handling (Proposed: 5 projects)

Source: VITRANSS2 Study Team

34. **Evaluation of the proposed projects**: Multi-criteria analysis was adopted in evaluation and prioritization of the candidate projects and briefly as follows;

(i) Among the criteria, economic feasibility (EIRR) is considered as the most important indicator. In principle, economic benefit of a project was estimated based on the procedure of "with and without" comparison wherein generalized transportation costs were estimated.

(ii) Multi-criteria analysis (MCA) takes into account of evaluation criteria including: (i) demand, (ii) economic feasibility, (iii) financial feasibility, (iv) network connectivity, (v) environmental impact, (vi) maturity of the project for implementation and (vii) compliance with national development policy.

35. A review of all subsectors and other funding needs, it was determined that for the period 2011–2020, only committed road projects and proposed roads projects that scored the highest in the MCA can be accommodated. Projects not included in the core program are to be implemented for the period 2021–2030.

36. **Summary of Master Plan Projects**: Based on the analysis above, priority projects (Core Projects) were selected as shown in Table ES.13. Table ES.14 compares the investment requirement and the available fund. Assuming that the cost of maintenance/minor projects, urban transportation and rural transportation not covered by VITRANSS 2 are at 20%, 20% and 5%, respectively, of the central value of the budget envelope, the total investment requirement was calculated at USD70.0 without NSHSR and USD89.1 billion with partial completion of NSHSR. This amount falls in the range of the budget envelope, however, in its high side. The percentage of the transportation sector investment in GDP should be 6–7%, which is usually a difficult target experienced seldom in the world.

Table ES.13 Selection of Core Projects for the Master Plan (2011-2020)

Subsector		0. Candidate Projects (2009–2030)			1. Committed Projects			2. RankA Proposed Projects (2009–2020)			1+2. Core Program (2009–2020)		
		No.	Cost (USD million)		No.	Cost (USD million)		No.	Cost (USD million)		No.	Cost (USD million)	
			Total	To Gov't		Total	To Gov't		Total	To Gov't		Total	To Gov't
1. Road	Expressway	44	67,648	47,354	12	11,691	8,184	7	7,169	5,019	19	18,860	13,202
	Nat'l Highway	187	19,815	19,815	72	8,935	8,935	40	2,057	2,057	112	10,992	10,992
	Others	12	1,936	1,936	3	136	136	8	690	690	11	826	826
	Subtotal	243	89,399	69,105	87	20,762	17,255	55	9,916	7,765	142	30,678	25,020
2. Vietnam Railway (excluding NSHSR)		16	47,051	47,051	5	1,502	1,502	2	4,313	4,313	7	5,815	5,815
3. Maritime		38	13,980	9,786	13	3,076	2,153	4	721	505	17	3,797	2,658
4. IWT	River Port	9	267	240	3	7	6	0	0	0	3	7	6
	Waterway	46	1,647	1,647	9	245	245	7	455	455	16	700	700
	Others	13	2,263	2,263	4	12	12	3	145	145	7	157	157
	Subtotal	68	4,178	4,151	16	265	264	10	600	600	26	864	864
5. Aviation	New Airport	2	6,056	4,845	1	56	45	1	6,000	4,800	2	6,056	4,845
	Existing Airport	20	5,562	4,450	7	1,152	922	2	200	160	9	1,352	1,082
	Navigation Facility	4	263	263	2	113	113	2	150	150	4	263	263
	Subtotal	26	11,881	9,557	10	1,321	1,079	5	6,350	5,110	15	7,671	6,189
6. Logistics		5	264	132	0	0	0	3	246	123	3	246	123
Total (without NSHSR)		396	166,753	139,782	131	26,925	22,253	79	22,146	18,416	210	49,071	40,669
(NSHSR)		4	44,531	44,531	0	0	0	2	19,094	19,094	2	19,094	19,094
Total (with NSHSR)		400	211,284	184,313	131	26,925	22,253	81	41,240	37,510	212	68,165	59,763

Source: VITRANSS 2 Study Team.

[1] NSHSR was tentatively assumed to have four sections; i.e., Hanoi-Vinh, HCMC-Nha Trang, Vinh-Da Nang, and Nha Trang-Da Nang. The former two sections are included. The cost of NSHSR excludes that of rolling stock that is likely to be acquired by the operator.

[2] % of cost to government: expressway - 70%, maritime - 70%, river port - 90%, airport - 80%, logistics - 50%.

[3] See list of ongoing/committed projects in *Appendix A*.

Table ES.14 Investment Requirement vs. Fund Availability (2011-2020)[1]

Investment Requirement		USD billion
1. Outside of VITRNASS2		
1) Maintenance/minor projects not covered (20% of assumed budget envelope)		13.0
2) Urban transportation (20% of assumed budget envelope)		13.0
3) Rural transportation (5% of assumed budget envelope)		3.3
Subtotal		29.3
2. VITRANSS 2 Projects		
1) Ongoing/committed Projects		22.3
2) New Projects (Proposed Projects)	without NSHSR	18.4
	with NSHSR	37.5
Subtotal		40.7 or 59.8
Total		70.0 or 89.1
Ref: Possible Available fund 2009-2020[2]		37-96

Source: VITRANSS 2 Study Team.

[1] The budget equal to 5% of GDP under the medium growth scenario was assumed

[2] The budget equal to 3% of GDP under the low growth scenario was assumed (37 USD billion) as low side while the budget equal to 7% of GDP under the high growth scenario was assumed as high side.

Medium-Term Plan (2011-2015)

37. Priority projects for inclusion in the Medium-term Plan were selected from the Master Plan based on: (i) priorities within each subsector, (ii) priorities in corridor development, and (iii) balance among subsectors. Moreover, the total investment cost of the selected projects must fall within the budget envelop available for the MTP period.

Road Sector: While road traffic has been increasing rapidly, the road sector must meet urgent needs to remove bottlenecks and, at the same time, to increasing demand for high-quality transportation services. The sector must also attend to long pending maintenance and traffic safety issues. Thus priorities were given as follows:

(i) Road maintenance and traffic safety;

(ii) Improvement of existing arterial roads;

(iii) Removing bottlenecks including at river crossing near Hanoi and HCMC; and

(iv) Construction of expressways connecting major economic centres such as Hanoi, HCMC, Hai Phong, and Danang.

Railway Sector: Railway could and must much more important role in overall transportation system in Vietnam by improving its capacity and service quality to avoid excessive load on roads, reduce traffic accidents and greenhouse gas, and reduce energy. It is also expected that the railway forms an alternative national backbone of the country. For this, long-term commitment and realistic step-wise development is the key for success. For the MTP, the first sate improvement of existing railways to expand line capacity to 50 trains/ both directions/ day and improve service was **included.**

Port and Shipping Sector: Ports and shipping are lifelines for trade-oriented economy with growth centres distributed along long coast stretched coastlines. Especially, unless bulky cargo with long haulage is properly accommodated by the sector, negative impacts on economy and environment would be enormous. It is also important that the ports must be effectively connected with hinterland access including roads, railways and inland waterway. Priorities are given to:

(i) Deep-sea ports including access channels in SFEZ and NFEZ;

(ii) Enhancement of port function in the SFEZ and NFEZ as competitive distribution centres through integrated development access in the hinterlands; and

(iii) Introduction of RORO system to promote modal shift from road to coastal shipping.

Inland Waterway Sector: Inland Waterway must play a longer role, especially in NFEZ and SFEZ to meet increasing demand on bulky industrial goods, thereby avoid unnecessary load on roads. Priority projects include strengthening of maintenance work on arterial channels, removal of bottlenecks and improvement of river ports.

Aviation Sector: Considering the air traffic growth, attending to major airports including Noi Bai, Tan Son Nhat and Danang will be focused on.

Logistics Sector: Multimodal cargo handling facilities will be developed in the NFEZ and SFEZ to establish a base for promoting logistics services. To meet increasing cross-border traffic between the southwest China, facilities at Lao Cai gate will be improved.

38. The total fund requirements estimated for the Medium-term Plan will be USD40.7 billion wherein the fund requirements for maintenance, minor projects, urban and rural transportation were assumed (see Table ES.15). As possible available fund for the period is between USD19 and 46 billion, possible inclusion of new projects will highly depend on the future economic growth.

Table ES.15 Required Investment vs. Fund Availability for the Medium-term Plan (2011-2015)

Investment Requirement	USD billion
1. Outside of VITRNASS2	
1) Maintenance/minor projects not covered (20% of assumed budget envelope)	6.4
2) Urban transportation (20% of assumed budget envelope)	6.4
3) Rural transportation (5% of assumed budget envelope)	1.6
Subtotal	14.4
2. VITRANSS 2 Projects	
1) Ongoing/committed Projects	17.6
2) New Projects (Proposed Projects)	8.7
Subtotal	26.3
Total	40.7
Ref: Possible Available fund 2009-2015[2]	19–46

Source: VITRANSS 2 Study Team.
[1] The budget equal to 5% of GDP under the medium growth scenario was assumed
[2] The budget equal to 3% of GDP under the low growth scenario was assumed (19 USD billion) as low side while the budget equal to 7% of GDP under the high growth scenario was assumed (46 USD billion) as high side.

Recommendations

39. Recommendations for Roads subsectors are as follows;

(a) The VRA should be made to grow into its intended role of becoming the road authority in Vietnam – by resolving its favor the conflicts with VEC (with regards to overall network planning and determination of scale of expressways) and MOC (with regards to intra-urban transportation development).[3]

(b) The regulatory function over toll roads should be taken out of VEC, so that the latter can focus on its main role as developer and partner of private investors in expressways.

(c) Other key recommendations in the road sub-sector are the following:

(i) Institutionalization of a Five-Year Road Investment Program;

(ii) Creation of a Project Management bureau to formalize the status of PMUs and leverage the accumulated experiences of the staff;

(iii) Spin off the CIENCOs into joint-stock companies, one at-a-time, so that they can evolve into competitive civil works contractors, on arms-length relationship with MOT and its associated agencies;

(iv) Study the possibility of merging the unit responsible for development of technical standards and the unit responsible for the quality of construction into a "Road Technology Research and Development Institute".

(v) Formalize the system of usage of the road maintenance fund

40. Recommendations for Railways subsectors are as follows;

(a) Railway projects should be given a higher proportion of resources out of the total transportation investment budget to enable the railway to compete with other transportation modes. However, the allocation should be limited to those corridors where railway is the more efficient – energy and cost-wise.

(b) Instead of a shotgun approach of trying to cater for everybody, the railway sector should target

[3] During the study period, the institutional reform was conducted; VRA has changed to VRD (Vietnam General Road Directorate) covering also a part of road development in addition to O&M of national highway and all transportation companies moved from VRA to Vietnam General Automobile Company.

the specific market niches in which it has the best chance of becoming competitive – line by railway line. Clearly, the North-South Line is the most important with potentials for container transportation. On the shorter Hanoi-Haiphong Line, massive investments may not be able to overturn its disadvantage to trucking and to buses, when the parallel expressway gets built.

(c) VITRANSS2 has identified a basic package of improvement works; just enough to keep existing railway assets functioning at a capacity of 50 trains for both directions a day. This can be further decomposed and prioritized to support the railway's marketing plan. With additional funding, a second stage of railway improvements can be pursued – involving system rehabilitation and selective double-tracking that will result in step-increase in capacity and improved services. A third stage of system modernization will entail substantial technology upgrades, and should be last in priority.

(d) The HSR project is very capital-intensive and the development of full section should be deferred beyond 2030. There are other lower cost alternatives to improve the north-south linkage before then. In addition, phased development framework will be necessary and a lot of tasks will be required (including human resource development, technical transfer, land acquisition and integrated urban development provisions)

41. Recommendations for Ports and Shipping subsectors are as follows;

(a) The plans for the ports of Saigon and Haiphong are under implementation. Hence, the focus should now shift to improving the connectivity of ports to roads, railways, and inland waterways. They are vital to the success or viability of the new deep-seaports.

(b) For example, the Lach Huyen Port complex will need a bridge (about 2.4 –km long) to connect it to the mainland of Haiphong. In the south, an expressway must be provided, in time, for the full operation of Cai Mep – Thi Vai. The same can be said about channel dredging of the Soai Rap channel to coincide with the completion of terminals in Hiep Huoc Area, or the navigation channel to Lach Huyen. Linkages to the ports of Can Tho and My Thoi also require improvements – especially with the completion of Quang Chanh Bo channel.

(c) At the local level, every port area has to be planned and developed harmoniously with its surrounding communities. This can be realized through a multi-sectoral Port Management Board that will be responsible for regulating and concessioning of terminals, setting performance targets, the maintenance of harbors and common navigation channels, and provision of ship traffic management around the ports.

(d) The connectivity issue, compounded by changing trade patterns as a consequence of the global economic meltdown, warrants caution about the accelerated development of Lach Huyen Port. The case for the Van Pho Transshipment Port is even weaker, and may have become moot with the first call of a direct transpacific vessel at Cai Mep.

(e) Separating the ports development burden from the shipping business is recommended as a long term direction for VINALINES. A special financing facility for domestic fleet expansion should be established and be made available to other shipping companies. This should lead to greater competition, and efficiency, in domestic shipping services.

(f) MOT and its maritime arm – VINAMARINE – have to step into the role of a 'Conductor' in an orchestra of diverse players. It needs to become an effective planning and regulatory body – leaving the rest of the tasks and burden to others. It can take the baton, and enable a system of ports hierarchy to emerge. At the top of the hierarchy will be three international gateway ports – Cai Mep – Thi Vai, Haiphong, and Danang. More than 60% of national capacity will be for the SFEZ, 30% for the NFEZ, and less than 10% for the CFEZ. Without the guiding hand of a Conductor, surplus capacities may co-exist with shortages.

42. Recommendations for Inland Waterway subsectors are as follows;

(a) The sector should make a fundamental shift in strategy. Instead of aspiring to do more, the IWT sector should undertake a strategic retreat – by concentrating its limited resources on a core set of river corridors where it could be competitive and which it could defend and maintain adequately. The 'retreat' will mean: (i) devolving responsibilities over most river ports to provinces, (ii) focusing on improving the road-river and river-seaport interfaces, (iii) leaving ferry and barge services to the private sector, and (iv) allocating its full resources on channel navigability. Instead of planning for a 'do-maximum' scenario, the sector has to scale down its ambitions to where it can be most effective. A sustainable plan that it can adopt should entail investments of at least US$700 million but not exceeding US$1,400 million over 10 years (from 2010-2020).

(b) From the limited funds that it could get from the State Budget, it should give highest priority for the maintenance of a core set of waterways. Rivers need to be desilted regularly, and its curvature protected, in accordance with the technical standards to which they have been classified. It is said that 40% backlog in maintenance is occurring every year. Therefore, the sector needs to recover lost grounds by embarking on a major maintenance program in the next 10 years. In order to be effective, this needs to be empirically-based, a product of regular and continuous river surveys.

(c) To stabilize funding for waterway maintenance, the sector should aim to establish a river maintenance fund as follows;.

    (i) Use a share of Road Maintenance Fund

    (ii) Harness the support of the industrial enterprises that locate along riverbanks and use the waterway as lifelines for their viability.

(d) Next to asset maintenance, safety of river navigation deserves priority. Safety can be boosted through an annual process of vessel inspection and registration, as well as a more rigorous pilot licensing and training program.

43. Recommendations for Air Transportation subsectors are as follows;

(a) Aside from building bigger terminals and/or more runways, the regional airport authorities should pursue system innovations – which require little investment – to improve productivity (which results in higher throughput without new infrastructure).

(b) It should adopt standards for airport development, including technical classification to guide planning and development of every airport in the national system, using ICAO and international best practices as templates.

(c) The capital recovery mechanism should be reviewed and revised in the light of changes in the institutional set up. This is intended to improve the sector's financial sustainability. Also, a subsidy policy for 'missionary' routes should be defined.

(d) Caution must be exercised in the development of tourist-dependent airports, since traffic is seasonal and uncertain. The same caution should apply on a cargo hub airport (in Chu Lai) as its success hinges on the presence of large cargo volumes generated internally and is contingent on the entry of a global logistics player specializing in the business of air express delivery.

(e) The sector should re-examine its priorities and back this up with a realistic 10-year capital investment program that takes into account the budget envelope. The inadequacy of investments and the need to upgrade its airports to international standards should prod the government into pursuing private sector participation (PSP). There is a window of opportunity

– in the development of a new passenger terminal in Noi Bai, a new cargo terminal in Noi Bai and in Tan Son Nhat, and the new Long Thanh International Airport. For the smooth development of Long Thanh, the airport manager at TSN should be involved closely.

44. Recommendations for Logistics subsectors are as follows;

(a) The most basic step to move up the country status in logistics – from 1PL to 3PL level – is the upgrading of logistics competence. A wider appreciation of supply chain management in government and private circles is the key to subsequent reforms in policies and management practices. Organizing a public-private logistics forum, spearheaded by the freight forwarders' association, can trigger and push this agenda forward.

(b) For its part, the government should proceed with the full-scale implementation of EDI and paperless transaction system at Customs and border gates. The logistics industry will have no choice but to follow and adapt to this game-changing measure; then move farther up the ICT ladder into E-payments, B2B transactions, and cargo visibility.

(c) Thirdly, the government should consider amending its laws and regulations on foreign participation in logistics services. They are more restrictive than China's, and will only delay the country's logistics development.

(d) Lastly, the government should re-calibrate its transportation infrastructure program by giving priority to the multimodal needs of its large (and growing) FDI-enterprises. Containerization in shipping and railway should be promoted. As an added catalyst, it should establish two international Logistics Parks that are also multi-modal transportation hubs: one northeast of Hanoi, the other between HCMC and Cai Mep – Thi Vai. Going beyond the traditional ICD concept, these proposed logistics parks shall encompass: (i) a free-trade zone for customs bonded warehouse operations, (ii) a product exchange and trade exhibition center, (iii) a railway container depot, (iv) a regional warehouse distribution center with cross-docking facility, and (v) advanced ICT-based logistics application systems.

SUMMARY

1 INTRODUCTION

1) Background

1.1 During the last decade, significant achievements were made in the development of Vietnam's transportation infrastructure, particularly roads, which have significantly contributed to the country's economic growth and to regional development. While the trend is expected to continue in the coming years, the gap between increasing demand and available infrastructure capacity has widened. Various issues have also emerged including, among others, worsening traffic safety, traffic congestion in urban areas, low mobility in rural areas, inadequate road maintenance, lack of funding, poor quality of infrastructure, and weak transportation services. In addition to these fundamental issues, Vietnam is also confronted with the need to further strengthen its competitiveness in transportation infrastructure and services as it gets increasingly more integrated with the global economy.

1.2 To respond more appropriately to the country's internal needs and the rapidly changing external environment, the Government of Vietnam intends to accelerate the improvement of the national transportation system to include the development of high-speed transportation links between the north and the south, linking central Vietnam in the process. Toward this end, a need has arisen to update the country's national transportation strategies and formulate a feasible plan to develop a strategic transportation system that includes the north–south high-speed transportation corridors.[1]

1.3 Given these circumstances and upon the request of the Vietnamese government, the Japanese government has provided technical assistance through the Japan International Cooperation Agency (JICA) to carry out "The Comprehensive Study on the Sustainable Development of Transport System in Vietnam" or VITRANSS 2, for short, and update the recommendations made in the first VITRANSS, or the "National Transport Strategy Study for the Socialist Republic of Vietnam," carried out in 1999–2000, or almost a decade ago.

2) Objectives of VITRANSS 2

1.4 "The Comprehensive Study on the Sustainable Development of Transport System in Vietnam" (VITRANSS 2) is more than a simple update of the "National Transport Study for the Socialist Republic of Vietnam" (VITRANSS 1), which was carried out in the period 1999–2000. Rather, the current study promotes the concept of a sustainable transportation system in formulating the long-term transportation development strategy for Vietnam. It also considers multimodal transportation planning within an integrated planning environment and addresses the important issue of urban transportation.

[1] The request for a study on the north–south high-speed railway and the north–south expressway was expressed in the Joint Vietnam–Japan Communique prepared in October 2006.

1.5 VITRANSS 2 has the following objectives:

(i) To formulate comprehensive, long-term transportation sector development strategies up to the year 2030;

(ii) To formulate a comprehensive medium-term transportation master plan up to the year 2020;

(iii) To formulate a short-term investment program for the 2011–2015 period;

(iv) To formulate a master plan on the north–south expressway network and to conduct a feasibility study review for the two missing links around Ho Chi Minh City;

(v) To conduct preliminary planning for the north–south high-speed railway; and

(vi) To provide transfer of technology to the Vietnamese counterpart team during the course of the study.

3) Study Implementation

1.6 In November 2007, VITRANSS 2 commenced. In December 2007, discussions were held on the Inception Report. In March and August of the following year, the Progress Report and Interim Report were submitted, respectively.

1.7 This Summary of the Final Report summarizes the major findings and results of VITRANSS 2 on comprehensive transportation planning for all modes including road, rail, maritime, inland waterway, and air transportation. Logistics is also included to improve intermodal connectivity of services. In parallel to comprehensive transportation planning, detailed studies were conducted on the North–South High-speed Railway and the North–South Expressway, the results of which were presented in a special meeting on 2 June 2009 with Vietnam's Vice Prime Minister Hoang Trung Hai. The comments made in that meeting were incorporated as much as possible into this Final Report.

1.8 The entire VITRANSS 2 Report is composed of the following:

(i) Summary;

(ii) Main Text;

(iii) Subsector Reports (7 volumes): covering road and road transportation, railway, ports and shipping, inland waterway, aviation, institutions, and environment; and.

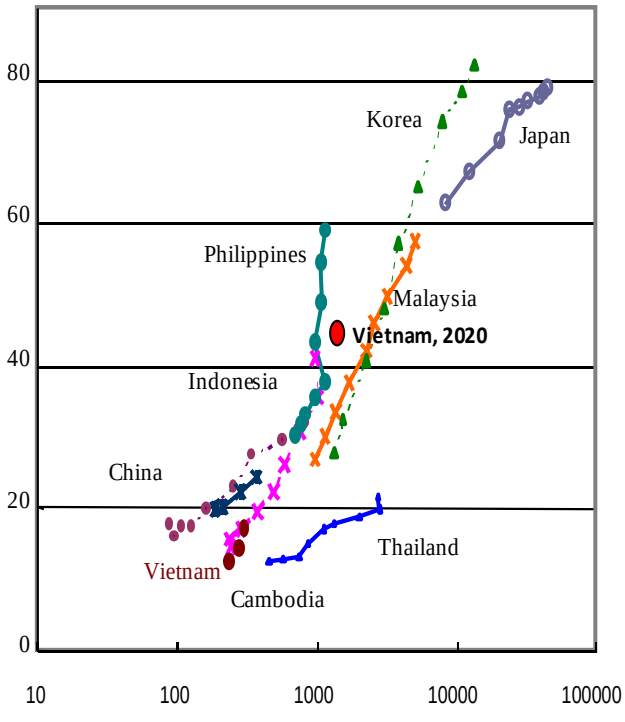
(iv) Technical Reports (10 volumes): covering traffic surveys and database, current transportation system, transportation demand analysis, main commodity analysis, logistics and transportation industries, regional planning development and socio-economic framework, corridor study, traffic safety, transportation cost and pricing in Vietnam, and GIS database.

2 CONTEXT AND APPROACH

1) Sustainability of the Transportation Sector

2.1 The environment surrounding growth and development of Vietnam has changed quickly during the last decade and since the time VITRANSS 1 was conducted in 1999. Urbanization, economic growth, motorization, industrialization, and globalization have been made significant progress since then. Cities have grown in terms of population and urban areas. Big cities are becoming bigger and Hanoi and HCMC are expected to join the group of megacities in the coming decades. Medium-sized cities have also started to grow; towns are becoming cities and new urban areas emerge. This urbanization trend is expected to continue over the coming decades as experienced in other industrialized and industrializing countries in Asia. Controlling the urbanization process is extremely difficult, and the impact of further urbanization will dramatically change the distribution of socio-economic activities. Hence, transportation development and management should be carried out efficiently while ensuring that these are integrated with regional/urban development.

Figure 2.1 Urbanization and Economic Growth Trend in Industrialized/Industrializing Countries in Asia



Source: HAIDEP, 2007

2.2 Hand in hand with urbanization and economic growth and supported by industrialization and increased FDI, motorization has made significant progress. The number of motorcycles has further increased and that of automobiles, comprising passenger cars, heavy trucks, and buses, has increased at faster rates to meet the demand.

2.3 The development of the core transportation system in Vietnam was successfully implemented during the last two decades. However, the demand is increasing faster than the development of necessary infrastructure and services at satisfactory and adequate quantities and quality. Unless more strategic interventions are made the sustainability of the transportation sector in Vietnam will be seriously threatened.

2.4 Sustainability is a simple concept which VITRANSS 2 adopted. It reflects a paradigm shift, a fundamental change in the way problems are defined and solutions are evaluated. It maintains a distinction between growth (increased quantity) and development (increased quality). The most widely accepted definition of a sustainable transportation system is that it:

(i) Allows the basic access and development needs of individuals, companies, and society to be met safely and in a manner consistent with human and ecosystem health, and promotes equity within and between successive generations;

(ii) Is affordable, operates fairly and efficiently, offers a choice of transportation mode and supports a competitive economy, as well as balanced regional development; and

(iii) Limits emissions and waste within the planet's ability to absorb them, uses renewable resources at or below their rates of generation, and uses non-renewable resources at or below the rates of development of renewable substitutes, while minimizing the impact on the use of land and the generation of noise.

The Prime Minister's Decision No: 153/2004/QD-TTg on Strategic Orientation for Sustainable Development stipulates key activities to successfully implement sustainable development in the transportation sector. VITRANSS2 is one of the said activities. These are:

(i) To build up a uniform policy system in order to sustainably develop the sector, including policies on land use, infrastructure development and construction of public transport network, to encourage private sector participation, and to use low-emission means of transport.

(ii) To plan transport network consistently with environmental conservation in harmony with regional development.

(iii) To focus on public transport network in large urban areas, encouraging use of public transport by economic and administrative measures, and restricting growth of private transport means, as well as promoting environmentally friendly means of transport.

(iv) To accelerate transport development in rural and mountainous areas.

(v) To improve traffic safety by education on traffic rules and regulations.

2) Main Policy Agenda

2.5 Based on the Socio-Economic Development Plan of Vietnam, the vision of Vietnam's transportation system can be classified into: (i) competitiveness, (ii) integration and inclusion, and (iii) sustainability and safety. The strategies, as well as the planning and implementation of projects, for each of the transportation subsectors need to be guided by a set of principles or policies. These are summarized in Table 2.1.

2.6 Translating objectives into a deliverable strategy needs to recognize at the outset some realities about Vietnam. These are:

(i) Vietnam's twin centers of economic gravity are 1700+ kilometers apart. They account for 60% of the GDP. In between, there is very little to speak of. Re-distributing growths, particularly to the central regions, will require deliberate policy interventions, whose results will take decades to materialize;

(ii) Long-term plans in all transportation sectors have been laid out, but without regard to what realistically can be financed. The result is every project becomes a priority;

therefore, there is no clear overall priority;

(iii) The size of the State sector has declined, but is still significant (if not dominant) in all transportation subsectors; and

(iv) Importance is being attached to urban transportation because this will increasingly dominate national sustainability, and because it calls for large investments that would compete with other priorities.

Table 2.1 Main Factors in the Sustainable Transportation Sector Development Agenda

Main Policy Agenda	Description
1. Adoption of a Multimodal Planning Approach	• Transportation planning and projects must be viewed from the perspective of competing and complementary transportation modes. For example, the high-speed rail (HSR) option between north and south can be evaluated against an air transportation service, an expressway or a conventional railway. The aim is to achieve an appropriate balance, or mix, of transportation modes that utilizes the limited economic and human resources.
2. Seamless Freight Movement	• Movement of people and goods, particularly the latter, shall take into account the full journey across all modes. Accordingly, closer examination of the interface or transfer points, as well as the "last-mile" impediment – infrastructure or regulation, shall be made with the objective of ensuring as seamless travel as is feasible. The 'whole of supply chain' for strategic commodities deserves preferential attention. This also encompasses the harmonization or compatibility of transportation technology and rules at cross-border points.
3. Strengthening of Maintenance Capacity	• Rapid growth of socio-economic activities are bringing about increasing load on existing infrastructures in much faster speed than expected. Increase in overall traffic and share of heavy vehicles contributes to widening the maintenance gap.
4. Improvement of Traffic Safety	• The above change in traffic situation both in urban and rural area has been and will be continuously a threat to worsening traffic safety, especially on roads.
5. Enhancement of Private Sector Involvement	• In delivering the desired outcomes, involve the private sector whenever possible in the building and management of transportation infrastructure. In transportation services, private sector should be the first choice.
6. Establishment of Competitive Markets	• The transportation market should function as efficiently as possible, with minimum distortions from government regulations, so that each mode reflects its true cost to the economy and users are able to choose freely and respond. This also implies leveling the playing field, encouraging competition, consistency and predictability in the application of rules, and permitting inefficient enterprises (SOEs included) to fold, with government intervention seen as a last resort.
7. Adoption of Cost-recovery Schemes	• To the extent feasible, the full life-cycle cost of transportation infrastructure shall be recovered from its direct beneficiaries; where such is not possible, a mechanism for covering the shortfall shall be instituted. For example, the capital and maintenance cost of a river channel may not be recoverable from all users because of tolling practicalities. A frontage levy on riverbank users, or annual vessel fee on barges, could be imposed. A transportation fund created from a levy on fuel is also possible. It also implies cost-based tariff regime.
8. Promotion of Participatory, Inclusive Planning and Implementation Processes	• The views of relevant stakeholders within and without the governments, central as well as local governments, shall be considered whenever possible.

Source: VITRANSS 2 Study Team.

3) Approach

2.7 VITRANSS 2 took into account the following:

(a) **Nature of Planning Changes:** More balanced approach is necessary between "building out incrementally from today toward an uncertain future" and "developing a

long-term master plan and then phasing its implementation."

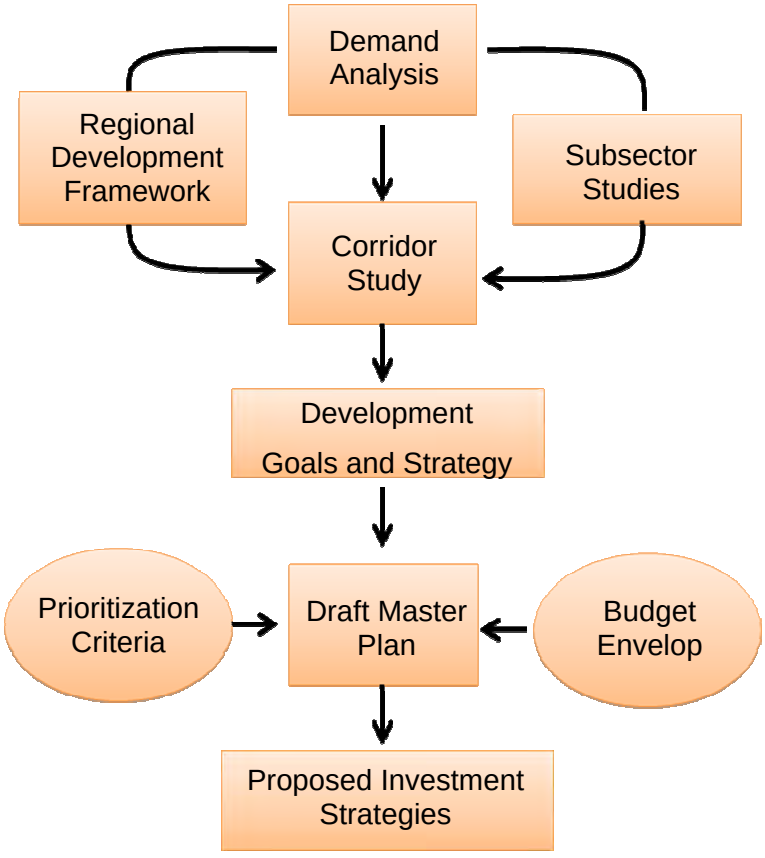
(b) **Approach to Allocation of Funds by Subsector Changes:** It is necessary to meet emerging needs and link resource allocation closer to strategies. Urban transportation has become increasingly important; backlogs of funding maintenance in road, inland waterways, and railways need to be addressed.

(c) **Understanding of a 'Good Project' Changes:** It will be toward those that have greater certainty to deliver the forecast benefits and those that can fit in under the three constraints of funding, carbon, and energy. This argues for projects whose scale and cost estimates are based on sound engineering analysis and feasibility studies to minimize cost escalation, implementation delays, and unsound forecast

2.8 These changes will better equip Vietnam to face the future, supporting its international competitiveness, developing along a sustainable path, and being responsive and adaptable to face an uncertain future. The FDI-driven, export-led growth that has put Vietnam into a fast track to industrialized status has been affected by the global economic crisis of 2009, the effects of which are likely to linger for a longer period. It may force a major re-thinking of the globalization growth model, though the negative effects on Vietnam are relatively less significant compared to other industrialized or industrializing countries.

2.9 Planning approach in VITRANSS 2 also took into account the following: (i) detailed demand analysis based on updated database, (ii) integration of transportation sector with regional development and intermodal coordination through corridor study, (iii) formulation of a comprehensive Master Plan based on defined development goals and strategies, including projects with clear priority which fall within the budget envelope, and (iv) investment strategies including opportunity for PPP (see Figure 2.2).

Figure 2.2 Planning Process



Source: VITRANSS 2 Study Team.

3 THE TRANSPORTATION SECTOR: PAST AND FUTURE

1) Existing Problems

3.1 In recent years, fundamental reforms have taken place in nearly all the subsector institutions—changes that will enable Vietnam to better address future challenges. The separation of policy, regulatory, and operator roles in the aviation subsector is noteworthy; however, similar progress in other subsectors has been slow. A multimodal planning orientation is lacking, resulting in imbalances and sub-optimal integration between transportation subsectors. Funding for maintenance is lagging, particularly in IWT and road subsectors.

3.2 Provinces have not been as involved in meeting the transportation challenges as they could be; the size of their budgets for transportation (about 2–3% of their respective GRDPs) could be leveraged for maximum impact.

3.3 Private finance in transportation infrastructure provision is still at its infancy, constrained by a non-favorable PSP environment.

3.4 There are too many projects under consideration—a product of a strong attachment to long-term planning—but priority-setting is weak, resulting in unrealistic expectations. The issues that the transportation sector has to address as it moves toward an uncertain future are summarized in Table 3.1 below.

Table 3.1 Transportation Sector Issues in Vietnam

Infrastructure	Services
1. Disconnect between urban / regional planning with transportation infrastructure development	1. Unsustainable subsidies in urban transportation services, particularly in buses (and soon, also in rail transit)
2. Compartmentalized subsector planning that hampers inter-modal and multi-modal transportation development	2. Inefficient pricing and regulation across most transportation modes which results in an imbalance between mode choice and investment
3. Imbalances in resource allocation between sectors, and between capital and maintenance expenditures	3. Extensive involvement of State in the provision of services, particularly in ports and shipping
4. Lack of sustainable sources of financing for transportation, particularly for IWT and Railways	4. Poor level of safety, particularly in the road subsector and at railway crossings
5. Better use of existing assets, especially in ports and airports, takes a back seat to capacity expansion	5. Transition from motorcycle usage to public transit usage and car usage in urban commuting in large cities
6. Carbon emission and energy demand become important, with rapid motorization	6. Increasing need by export industries for more sophisticated logistics services
7. Appropriate participation by private sector in the development of ports, airports, expressways, and logistics is needed	7. Connecting remote villages and increasing their accessibility to the transportation network is paramount

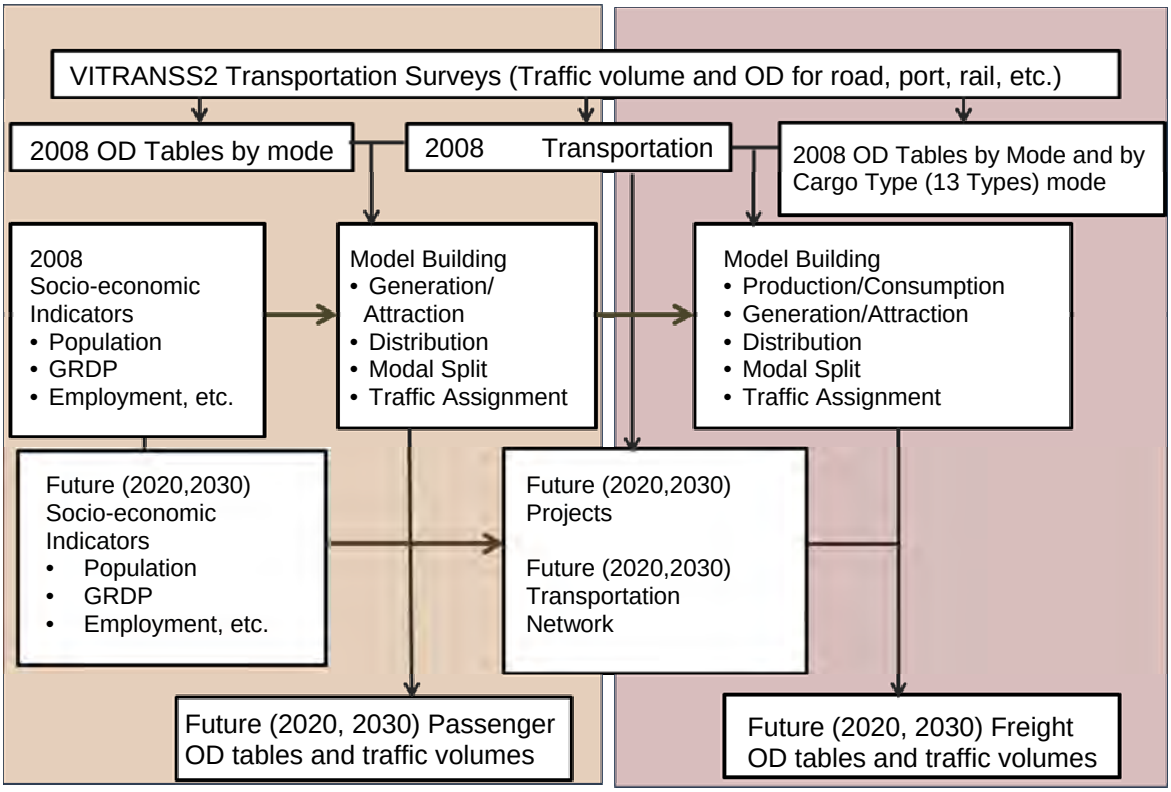
Source: VITRANSS 2 Study Team.

3.5 It is difficult enough for Vietnam to resolve the above issues and simultaneously modernize its transportation system, in the predictable environment of a fast-growing economy. Then, the financial crisis struck unexpectedly in 2008 and plunged the world's future—and Vietnam's—into a much higher level of uncertainty. For the first time since 1982, global trade will shrink by 9% in 2009, according to the World Trade Organization. The International Air Transport Association expects Asia-Pacific carriers to be the hardest hit by the economic downturn. International shipping is also badly affected, as shown by idled gantries in once busy hub ports and many vessels moored for lack of business. Worse, the export-led and FDI-driven path to development, which Vietnam has followed, is now reeling under the crisis.

2) Growth in Traffic

3.6 Forecasting future transportation demand is an important input to formulate plans and strategies. Supplementary traffic surveys, including road traffic/ volume/ OD survey, river traffic/ volume/ OD survey, transportation terminal survey at railway stations, airports and bus terminals, and port cargo OD survey, provide the basic inputs in demand forecast. These surveys were conducted more or less at the same survey stations of VITRANSS which was conducted in 1999 so that the change during the past period can be analyzed (see Figure 3.1). STRADA software was used in this work.

Figure 3.1 Demand Forecast Methodology in VITRANSS 2



Source: VITRANSS 2 Study Team.

3.7 Traffic has grown rapidly in the last decade, slightly faster than the country's economic growth (which grew at an annual average rate of 7.5% from 2000 to 2008). On the premise that the world economy, and Vietnam's, can get back on track, the country's economy pie by 2030 is forecast to be three times larger than it is now. The total population will be 28% larger, but the number of urban residents will expand by 90%, the equivalent of building seven more cities the size of HCMC over a short span of 20 years. Such economic growth translates into the forecast transportation demand shown in Table 3.2. Interprovincial passenger and freight traffic will be three times higher than at present.

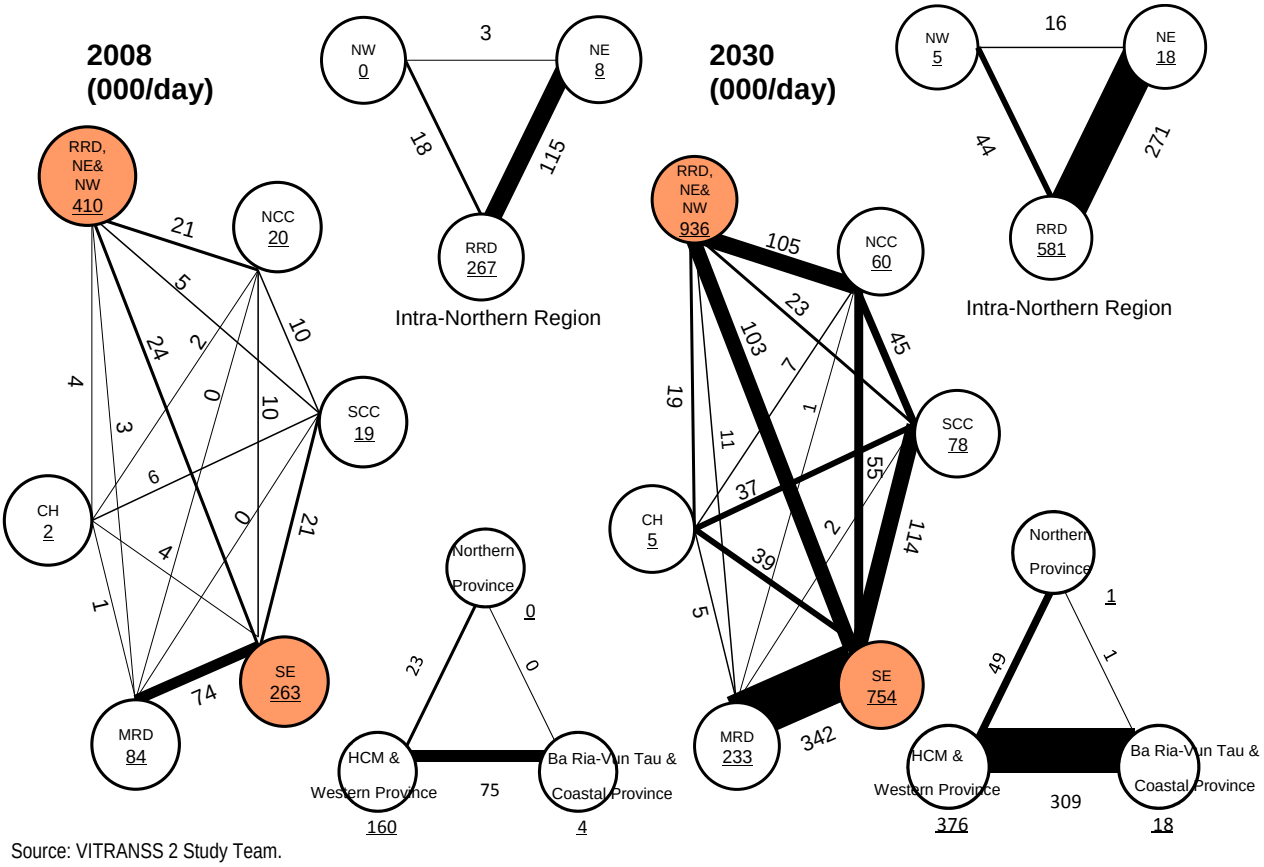
Table 3.2 Forecast Increase in Passenger and Freight Traffic

Item		1999[1]	2008	2030	Growth	
					2030/08	%/Yr
Person (per Day)	Number (000)	595	985	2,978	3.0	5.2%
	Passenger-km (000)	113	161	662	4.1	6.6%
	Average Trip Length (km)	190	164	222	1.4	-
	% Intraregional (8 regions)	48.0%	67.2%	58.3%	-	-
Freight (per Day)	Tons (000)	241	1,332	3,732	2.8	4.8%
	Ton-km (000)	72	237	810	3.4	5.6%
	Average trip length (km)	299	178	217	1.2	-
	% Intraregional (8 regions)	35.4%	48.8%	49.6%	-	-

Source: VITRANSS 2 Study Team .
[1] 1999 data based on traffic counts only at provincial boundaries.

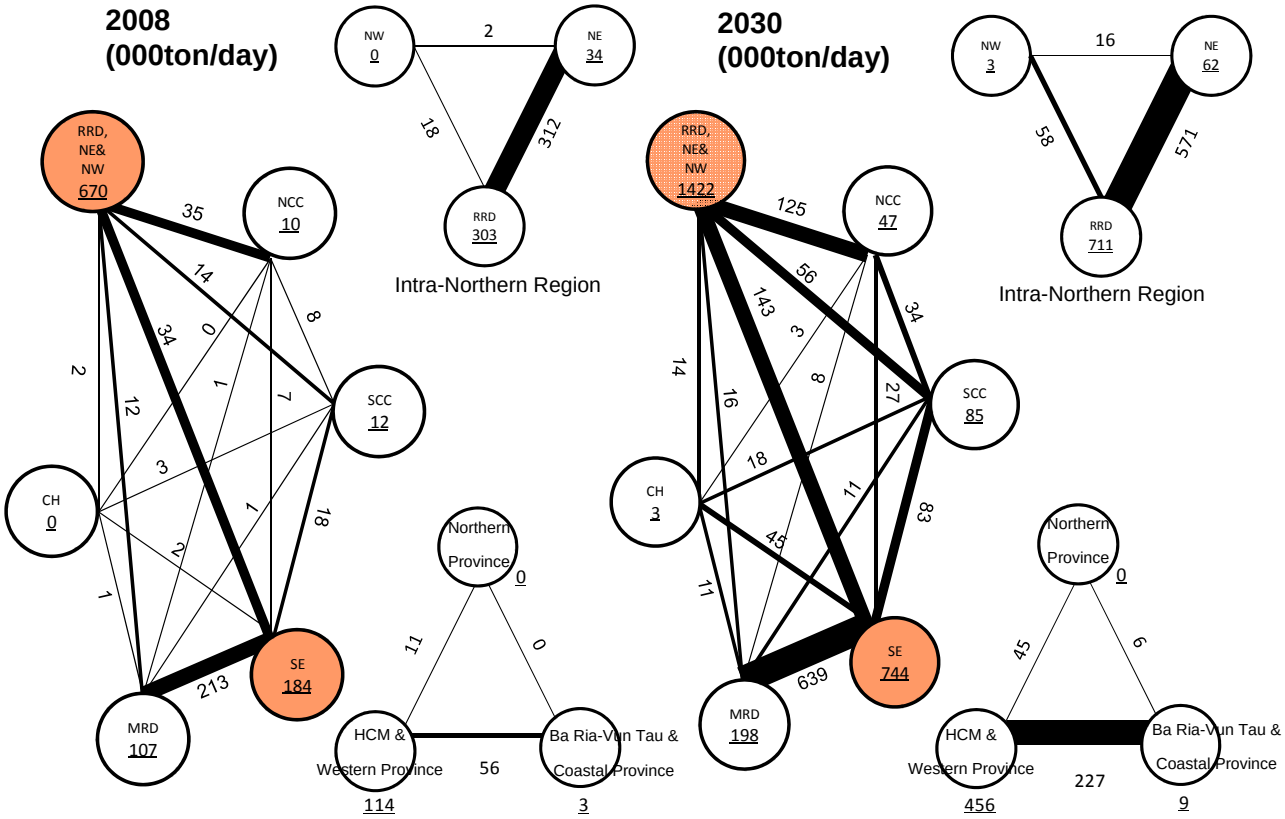
3.8 Distribution of traffic demand is further summarized in figures 3.2 and 3.3 for passenger and freight, respectively. They clearly indicate that interregional transportation will grow throughout the country, especially within the north and the south and between the south and north.

Figure 3.2 Passenger Traffic Demand Distribution, 2008 and 2030



Source: VITRANSS 2 Study Team.

Figure 3.3 Freight Traffic Demand Distribution, 2008 and 2030



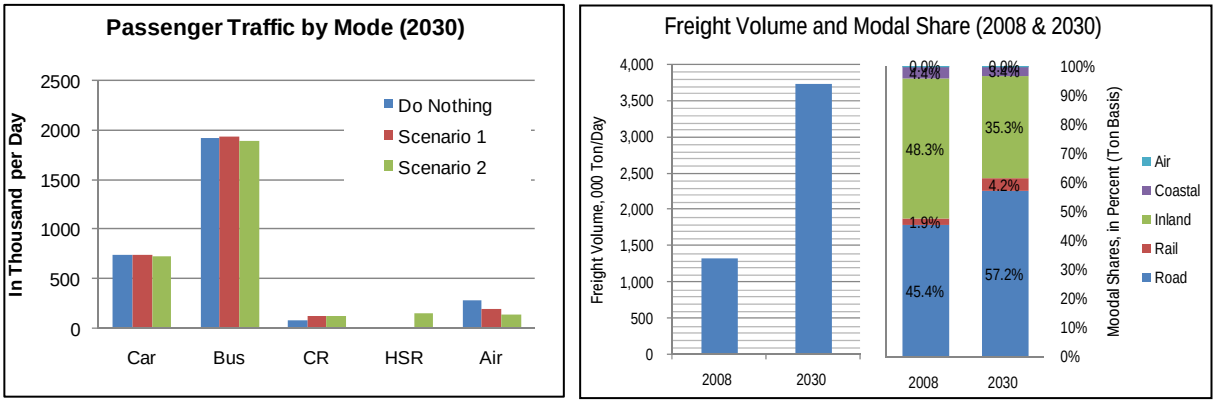
Source: VITRANSS 2 Study Team.

3.9 The traditional transportation planning approach automatically seeks to provide the required capacity based on predicted demand. This has been the case with past master plans, which, because of a compartmentalized approach, led to conflicting traffic and market shares for each transportation mode. In reality, the modal shares may decline and vary by corridor. Hence, the need to disaggregate traffic analysis in practical terms, i.e., by transportation corridor for the different subsectors and framed by conditions in urban and sub national clusters. This is what VITRANSS 2 has done, which is to carry out the transportation demand analysis at the corridor and cluster level.

3.10 The new planning does not take the projected traffic as inevitable or unavoidable, as these can be modulated by policies or shifted to another link and mode. Figure 3.4 illustrates the possible modal split under three scenarios.[2] In each scenario, there is little passenger traffic assumed on coastal shipping services; however, if such services become popular, then the passenger shares for other competing transportation modes would be expected to decline.

[2] 3 Scenarios are assumed, namely, "Do-nothing Scenario," "Scenario 1" (existing VR lines (CR) are improved from speeds of 60km/h to 100km/h and all the expressways planned by MOT are developed), and "Scenario 2" (In addition to Scenario 1, the development of HSR is assumed).

Figure 3.4 Passenger and Freight Transportation Demand by 2030



Source: VITRANSS 2 Study Team.

3.11 Aviation and inland water subsectors are especially vulnerable to future demand swings, and by extension, to strategy and policy changes. If energy prices return to their recent high levels and carbon limits are adopted globally, as is likely before 2030, air travel could grow less quickly. If coal is replaced in the future by other fuels for environmental reasons, then projected coal traffic on inland waterways and the railways could drop.

3) Transportation Sector Opportunities

3.12 VITRANSS 2 assessed the performance of the transportation sector in some depth. Many good things are happening. Sector institutions and policies are being reformed and the legal basis for operations established, problems of increasing demand are often being met, and a policy for private sector participation is strongly supported, albeit at the early stages yet of development. It can be said that much more remains to be done. The Study Team has identified the following issues as particular opportunities for the future.

3.13 **Economic Competitiveness:** Funding is allocated on the basis of past trends. The roads subsector receives the most funding—80% of all sector funds in 1999–2007—and this tends to be replicated each year. By comparison, the inland waterway and rail subsectors received minimal levels of funding (2% each over this 13-year period). It is by no means obvious that this represents a balanced transportation strategy; instead, funding should depend upon the objective merit of each subsector and its projects.

3.14 Attention and funding focus on big projects, not on minor projects, or maintenance/ rehabilitation. Yet, the maintenance of the existing transportation asset base should be the first priority: preserving and enhancing the value of the existing asset base should always be the first concern of the transportation strategy. Yet, too often, it appears to be the last priority.

3.15 **Sustainability:** Urbanization is rapidly creating serious problems. While some good things are happening, the focus is too often on providing mobility for vehicles, not accessibility for people and goods. The latter, combined with development controls on suburbanization, is needed to preserve and expand Vietnam's existing compact cities. These should preserve and enhance conditions for 2-wheel vehicles, including in the design of new infrastructure, and control the use of private cars at congested areas and times.

3.16 Pricing policy is not yet used fully as an instrument of transportation policy. The

Road Maintenance Fund is a step in the right direction. But much remains to be done, e.g., in controlling car use in major cities.

3.17 Planning ambition runs the serious danger of “plans” being ineffective. In the past, plans have not been constrained by likely available funds, and they have been found to be un-implementable. Projects have too often not been subject to serious study before becoming “committed.” Some are hugely risky mega projects that have huge opportunity costs. So, plans have in some respects become “wish lists” of politically attractive projects that do not serve government’s goals of increasing economic competitiveness and sustainable development, and proactively managing an uncertain future. Meanwhile, little or no attention is given to lower cost and high-impact maintenance and improvement expenditure.

3.18 **Managing Uncertainty:** Plans need to change to become relevant in tomorrow’s uncertain environment. They need to be prioritized so that a core strategy is implementable in nearly all circumstances, with additional projects identified and roughly prioritized and readied for implementation, as and when more optimistic scenarios occur.

3.19 Projects need to change, too. Some projects provide predictably high returns;, these are mostly small-scale projects and improvements. But, often, major new-building projects are necessary. But, they often do not provide the impact that was expected when committed. This is because costs often escalate, implementation time overshoots, and traffic/ demand are below forecast. Such projects are therefore risky, and megaprojects that are mega-costly are especially mega-risky.

3.20 Within this group of megaprojects, major roads tend to be less risky because they can be developed incrementally and their record of viability is internationally often acceptable. But rail projects are much riskier, and HSR is at the extreme of risk: here the full route would need to be built before demand is known.