Approaches for Systematic Planning of Development Projects <Transportation>

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Foreword

To adequately meet the demand of the diversified and complicated development issues faced by developing countries, JICA is strengthening its country-specific and issue-specific efforts. In 2004, JICA underwent a reorganization of its headquarters to further strengthen the effectiveness and efficiency of such work. In particular, the establishment of issue departments aims to enhance technical support abilities on the ground in developing countries by building up the database of knowledge and expertise about particular fields and subjects within each department. Furthermore, as part of specific efforts to enhance its ability to deal with development issues, JICA is creating country-specific programs, undertaking issue-specific Project Request Surveys, creating Field-Specific Thematic Guidelines, and establishing knowledge sites. However, the reality is that there is still a large disparity in the way development issues and cooperation programs are viewed. In order to plan and implement cooperation that appropriately and accurately addresses the important issues faced by a particular country, it is essential for JICA to clarify the cooperation that corresponds to the particular circumstances of each country based on a basic understanding of the overall picture of development issues and effective approaches to these issues.

This study was conducted as part of efforts to strengthen the abovementioned issue-specific approaches, and is Phase 4 of a program of study, following on from the three phases conducted since 2001. The first three phases covered 11 development issues (Basic Education, Anti-HIV/AIDS Measures, Rural Development, Promotion of Small and Medium Enterprises, Poverty Reduction, Trade and Investment Promotion, Higher Education, Information and Communication Technology, Water Resources, Reproductive Health, Agricultural and Rural Development). In Phase 4, JICA focused on the four field-specific issues of “Urban and Regional Development,” “Transportation,” “Water Pollution,” and “Air Pollution,” arranged these development issues systematically and defined effective approaches for each Development Objective to be met. In addition, proposals were made for important points in relation to cooperation efforts in each field and important considerations for implementation. It is sincerely hoped that more effective planning and implementation will be achieved in the future technical cooperation by incorporating the results of this study in JICA’s Field-Specific Thematic Guidelines, thus further strengthening issue-specific approaches.

To conduct this study and prepare this report, a task force was organized comprised of JICA staff and international cooperation specialists, associate specialists, field issue support units, and consultants. A considerable number of JICA staff members, as well as external experts, made further contributions by offering valuable comments on the draft report. I would like to take this opportunity to acknowledge the efforts and contributions of all of these individuals.

December 2005

TAGUCHI Toru
Director General
Institute for International Cooperation
Japan International Cooperation Agency

Terms and Abbreviations

Terms and Abbreviations	Description
Development and Assistance Terminology	
Agenda 21	This is a global-scale action plan that aims at achieving sustainable development in the 21st century. Agenda 21 was adopted at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992, with the Rio Declaration on Environment and Development, and the Statement of principles for the Sustainable Management of Forests. It consists of a preamble, and the four sections of "Social and Economic Dimensions," "Conservation and Management of Resources for Development," "Strengthening the Role of Major Groups," and "Means of Implementation."
Asset Management	In the field of road management, bridges, tunnels, and pavement, etc. are regarded as road assets. The most cost-effective maintenance is needed through monitoring the damage and deterioration now and in the future.
Association of Southeast Asian Nations (ASEAN)	ASEAN is a regional cooperation association that was established in August 1967 by the ASEAN Declaration (otherwise known as the Bangkok Declaration). Its objectives include (1) acceleration of economic growth, social progress and cultural development in the region, (2) ensuring of regional political and economic stability, (3) settlement of the various problems in the region and others. The ASEAN 10 is made up of the 10 Southeast Asian nations of Indonesia, Malaysia, the Philippines, Singapore, Thailand, Brunei Darussalam, Viet Nam, Laos, Myanmar, and Cambodia.
Baseline Survey	This is a survey that investigates the base indicators for a project prior to its implementation in order to provide a means of measuring the effects and outcomes of the project after the implementation.
Basic Human Needs (BHN)	This refers to the basic living needs and conditions such as food, housing, clothing, basic education, healthcare, sanitation and living infrastructure.
Civil Minimum	This is policy postulate to set out the minimum level of social living infrastructure required in relation to the actual circumstances in each region.
Community Driven Development (CDD)	CDD is a concept advocated by the World Bank regarding development assistance aimed at poverty reduction. It is an approach that entrusts decision-making of development activities and management of local residents and regional resources to the responsibility of community groups that serve public functions in the development area. It is said to be a desirable regional development scheme from the perspective of encouraging local residents' administrative autonomy and sustainable development assistance.
Decentralization	This means the transfer of authority of the central government regarding policy planning, management, and resource distribution to central government ministries, local governments, extragovernmental organizations, regional offices, and civic organizations such as NGOs and corporations.
Environmental and Social Considerations	This means considering environmental impacts on air, water, soil, ecosystem and biota as well as social impacts including involuntary relocation of people and respect for human rights of indigenous peoples and so on.
Feasibility Study (F/S)	The objective of a feasibility study is to investigate and determine the actual possibility, relevancy, and investment effects of a particular project to verify objectively whether the individual projects that have been allocated the priority levels by a Master Plan (M/P) are technically, economically, financially, socially, and environmentally feasible or not.
Free Trade Agreement (FTA)	These are agreements defined by GATT Article 24 and GATS (General Agreement on Trade in Services) Article 5. They may include provisions that abolish tariffs on goods and other trade limitations and obstacles to trade in services.
Globalization	This means formation of global information networks and markets in which information and capital move freely around the world with influences felt all around the world at the same time.

Terms and Abbreviations	Description
Good Governance	This is a concept relating to the political, economic, and social management of a country. This is a concept regarding how the government behaves, such as whether or not the government is performing effectively and efficiently with the aim of promoting development and improving the welfare of the people, whether authority is being appropriately used to achieve these ends, and the legitimacy of government and the protection of human rights.
Habitat II	This is the second United Nations Conference on Human Settlements, held in 1996. Attended by over 20,000 participants from 171 nations, this conference led to the adoption of the Global Plan of Action known as the Habitat Agenda. The launch of the Global Campaign was also decided as the specific activities to achieve the implementation of the targets given in the Habitat Agenda.
Human Security	This is the protection of crucial factors central to human lives, and the enhancement of all the individuals' human freedom and potential. To safeguard human lives, livelihood, and dignity, it is said that a strategy is required for the protection and empowerment of individuals.
Master Plan (M/P)	In a broad sense, this refers to various types of overall plans. In the field of transportation planning also, it is a comprehensive concept that refers widely to overall plans, from individual private-sector developments to integrated transportation plans on the national level.
Millennium Development Goals (MDGs)	The Millennium Development Goals were adopted in UN General Assembly in September 2000 as an extension of the International Development Goals formulated by the UN, OECD, IMF, and the World Bank in the 1990s. The 8 goals to be reached by 2015 are to (1) eradicate extreme poverty and hunger, (2) achieve universal primary education, (3) promote gender equality and empower women, (4) reduce child mortality, (5) improve maternal health, (6) combat HIV/AIDS, malaria, and other diseases, (7) ensure environmental sustainability, and (8) develop a global partnership for development.
Monitoring	These are activities of trying to understand issues by confirming the progress status and completion level to confirm whether particular assistance conditions are being achieved according to the plan, making course corrections as necessary.
National Minimum	This refers to the minimum standards of social capital that a nation should maintain in order to create an adequate living environment for its citizens.
Network on Poverty Reduction (POVNET)	The Development Assistance Committee (DAC) established this network in June 1998 with its objective as the New Development Strategy of reducing by half extreme poverty by the year 2015. Debates are carried out on the form of development cooperation required for effective poverty reduction. The DAC Guidelines on Poverty Reduction were formulated in May 2001. Since 2003, much emphasis has been placed on the relationship between economic growth and poverty reduction, and the network's activities were rejuvenated with the creation of three Task Teams to focus on the areas of agriculture, infrastructure, and private sector development.
Participatory Development	This means participation of community members themselves in activities that advance economic development and improvements in the social environment.
Poverty Reduction Strategy Paper (PRSP)	Poverty Reduction Strategy Papers are comprehensive 3-year plans aiming at poverty reduction based on Comprehensive Development Framework (CDF) concepts. The papers comprise (1) confirmation of a nation's poverty situation and diagnosis of its causes, (2) a statement of targets and policy measures, (3) review and evaluation systems for determining the effectiveness of the policies, (4) the effects and necessity of assistance, and (5) methods for securing a wide base of participation in the formulation and implementation processes.
Project & Program Management (P2M)	This is a method of project management. P2M is made up of Program Management, which designs organizations' overall missions, and Project Management, which manages the projects implemented to achieve these missions.
Pro-poor Design	This is an approach to project design to enhance the underlying potential of the poor that could be promising in the future. The particularly important thing is making the mission-critical infrastructure relevant to the poor from the viewpoint of the four As (Availability, Accessibility, Affordability, and Acceptability).

Terms and Abbreviations	Description
Socio-economic Frame	This expresses the regional socio-economic circumstances in the target year with a number of indices. They are commonly used as indices for Gross Regional Domestic Product (GRDP) by sector (agriculture, industry, and service), number of employments, and population.
Southern African Development Community (SADC)	This is comprised of 14 southern African nations. Its objectives are promoting regional economic development and poverty reduction, regional unification, maintenance and promotion of peace and security, and self-sustainable development based on the principle of mutual cooperation and dependence.
Special Economic Zone (SEZ)	SEZs are special areas set up by the Chinese government in 1979, in accordance with the open door policy, to introduce foreign capital and technology. Incentives such as exemption from customs duties for imports and exports and 3-year income tax deferrals for foreign corporations coming to China are implemented in these zones. At the same time, trial economic system reform measures such as reform of the wage and human resource management systems, and the protection of corporate administrative autonomy are implemented in these zones. Special economic zones with policies that give preferential treatment to foreign capital also exist in countries such as the Philippines, Republic of Korea, Malaysia, and Singapore in addition to China.
Sprawl	This is the unplanned expansion of cities into outer areas resulting in the disorderly formation of urban areas. Low quality urban areas are formed with inadequate and incomplete roads, water, and sewage facilities, resulting in environmental problems and disaster-prevention-related problems. In addition, not only is it difficult to improve the situation later due to social factors, but also it requires large economic outlays.
Trade Off	This is the situation where multiple factors conflict, and all cannot be perfectly satisfied simultaneously.
World Summit for Sustainable Development (WSSD)	WSSD is a world summit held 10 years after the United Nations Conference on Environment and Development (UNCED: the Earth Summit) in Rio de Janeiro. The WSSD was held to review the Agenda 21 action plan and to discuss new issues.
World Trade Organization (WTO)	This is an agency related to the United Nations. The WTO is an organization for systematically liberalizing trade and creating trade rules, and has as part of its objectives greater consistency in financial and fiscal policies as an international trade organization.
Transportation Terminology	
Asian Highway	The Asian Highway is a 140,000 km highway that spans 32 Asian countries. In response to demands from trade and tourism, it aims to establish a complete international land transportation network, and also promotes regional economic and social development. In November 2003, the Intergovernmental Agreement on the Asian Highway Network was adopted, and Japan signed it in April 2004. Future challenges include conformance with international design standards, the simplification of border crossing, and the establishment of the integrated transportation systems.
Concession	This is a contract by which the public sector grants a private sector entity the right to operate. It sets out the rights and obligations of the public sector and the private sector entity for the duration of operation. In general, it sets out such items as details of operations, the period when the right is granted, provision for payments to the private sector entity, actions to be taken in case of collapse or bankruptcy, contract termination provisions, and the right to intervene.
Container	“Container” is a general term for the containers used for the transportation with a standardized form as a unit load. Developed with the objective of transporting cargoes in unit containers, containers have predetermined dimensions decided to be suitable for different types of transportation methods, adequate strength for the intended usage, and resilience for repetitive use.
Cross-border Infrastructure	These are infrastructures that cross national borders and regional boundaries.
Electronic Data Interchange (EDI)	This means exchanging business documents/data (e.g. purchase orders and invoices) electronically according to standardized protocols, and also using this information for business between companies. At times, the term is also used to refer to electronic data itself.

Terms and Abbreviations	Description
Feeder Service	Originating from the term that refers to river tributaries, the word feeder here refers to feeder lines into trunk transportation systems. Feeder services play the roles of attraction or distribution of trips into or out of the trunk transportation systems. Buses and taxis play this role for railroads, and collector roads and access roads play this role with the trunk roads to which they are connected.
Independence of Implementation Section	This means the separation of the implementation sections from the planning sections of administrative activities, and the formation of independent governing bodies.
Intermodal Transportation System	This system transports a particular item of freight continuously using two or more different modes of transportation. This service transports the freight to its final destination in a unified and integrated manner using different modes of transportation under a single freight contract.
International Convention for the Safety of Life at Sea (SOLAS Convention)	The SOLAS Convention contains provisions for the inspection of ships and issuance of certifications, and defines technical standards regarding items such as the structure of ships, equipment and installations, life-saving appliances and arrangements-measures for the safe carriage of goods to ensure safe voyages.
International Maritime Organization (IMO)	The IMO is a specialist UN organization that aims to promote cooperation among governments with regard to technical and legal issues that affect maritime transportation, such as maritime safety, efficiency of navigation and prevention of marine pollution. The organization is also involved in the adoption of the most effective actions and the creation of conventions.
International Civil Aviation Organization (ICAO)	The ICAO conducts activities involving the adoption and monitoring of international standards and recommendations with the aim of securing the safety, security, and economical and sound operation of international civil aviation.
International Ship and Port facility Security Code (ISPS Code)	The ISPS Code is a set of regulations that coordinates ships and ports with the aim of deterring threats to international security, such as terrorism. It was adopted as a revision to the SOLAS Convention on December 13, 2002, and came into force on July 1, 2004.
Light Rail Transit (LRT)	LRT systems, which feature quiet, low-noise and fast transportation as well as low floors without steps so that the elderly or disabled can get on and off comfortably, are gaining attention as new and revolutionized versions of the old trams or trolleys. Positive adoption of such systems is occurring in cities in Europe and elsewhere, where they are being introduced as new transportation strategies to deal with environmental problems, traffic congestion, lack of parking lots, and other such problems.
Motorization	This refers to the motorization of society. This means the phenomenon that due to the rapid spread of cars for private use, the urban traffic becomes increasingly dependent on automobiles.
Open Sky Policy	This is the policy for liberalization in the air transportation field, including the liberalization of fares, the number of flights, air routes, and aviation ports.
Public-Private Partnership (PPP)	A PPP is an initiative whereby the public sector and the private sector work together efficiently on the improvement and administration of public social infrastructure.
Paratransit	This is a general term for means of transportation that are positioned in between mass transit (public transportation) and automobiles. In a sense, it means “individual public transportation.” This term applies to forms of transportation such as maxicabs, jeepneys, demand services, and community buses.
Permanent International Association of Road Congress (PIARC)	PIARC was founded in 1909 as an international organization dedicated to achieving advances in road technology and administration such as road construction, improvement, maintenance, and road use, and promotion of economic development resulting from these advances. The Congress, consisting of governments throughout the world, road-managing authorities, road-related organizations, and individual members, aims to develop the world’s road systems. The 11th International Winter Road Congress was held in Sapporo, Japan between January 28 and 31, 2002.
Redundancy	Redundancy here refers to “redundancy” or “surplus” in terms of transportation modes and routes. With regard to national development plans, it refers to preparing some level of reserve facilities in place so that when natural disasters, for example, cause obstructions and individual sections are interrupted or certain facilities are destroyed, the transportation system as a whole does not cease to function. This means preparing redundant transportation networks and lifeline facilities, and standby measures.

Terms and Abbreviations	Description
Road Station (Michi-no-Eki)	Road stations are facilities that act as central bases for regional coordination that provide a convenient rest place for road users, while also disseminating road, tourism, and medical information. Recently, know-how has been introduced into developing countries such as Thailand as a regional revitalization model in which regional inhabitants play a central role.
Transportation Demand Management (TDM)	TDM is a term for strategies that relieve traffic congestion at the city or regional level by managing the volume of transportation demand through measures such as changing road use time slots, routes, and transportation modes, the efficient use of automobiles, and managing trip generation. A smooth flow of transportation can also contribute to environmental improvements and regional revitalization.
Transportation Right	Transportation right is a new human rights concept that means the "right to transportation of citizens," and is a combination of related human rights set out in Article 22 (the freedom of choice of residence, migration, and occupation), Article 25 (the right to minimum standards of living), and Article 13 (the right to the pursuit of happiness) of the Japanese constitution, among others.
Vulnerable Road Users	Vulnerable road users are those who are unable to use individual means of transportation due to social, economic, and/or physical reasons.
International Development and Assistance Agencies	
ADB	Asian Development Bank
DAC	Development Assistance Committee (One of the three major OECD committees)
DFID	Department for International Development
ILO	International Labour Organization
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
OECD	Organization for Economic Cooperation and Development
World Bank	The World Bank (WB) generally refers to two organizations, the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA). The World Bank Group is made up of five organizations including the two above and the International Finance Corporation (IFC), the Multilateral Investment Guarantee Agency (MIGA), and the International Centre for Settlement of Investment Disputes (ICSID).
JICA Assistance Scheme Terminology	
Development Study	A Study team is dispatched in order to prepare public development plans that play an important role in social and economic development of a recipient country. This work creates blueprints for development, which is one link in the technical cooperation performed by JICA. Depending on the stage and content of surveys, there are Master Plan Study, Feasibility Study and so on.
Technical Cooperation Project	Among JICA's technical cooperation activities, these projects are based on a clear logical relationship between the outcomes and the inputs and activities invested to achieve them aiming to achieve a certain level of outcomes in a specified time frame. The dispatch of experts, training programs, and provision of equipment and other factors are combined as appropriate depending on the objective.

Source: International Development Journal (2004) and others.

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Contents

Outline of Study

1. Background and Purpose of the Study on *"Approaches for Systematic Planning of Development Projects"*

This study is Phase 4 of the study on *"Analysis and Evaluation Methods for Country-specific and Issue-specific Approaches"* started in 2001. The study was designed to enhance country-specific approaches by strengthening issue-specific approaches. In phases 1 to 3, 11 development issues[1] were systematically determined and the effective approaches for them were identified. Furthermore, the study reviewed JICA's activities based on Objectives Charts and the results were summarized in a report entitled *"Approaches for Systematic Planning of Development Projects."*

As there was a growing demand for similar systematic arrangements for other issues as well, in Fiscal 2004, relevant divisions within JICA systematically arranged the four field-specific issues of "Urban and Regional Development," "Transportation," "Water Pollution," and "Air Pollution." This report describes the issues of the "Transportation Sector."

The outcomes of the study were intended to be used as follows:

- As basic information for formulating and revising Development Issue Matrices for JICA's country-specific programs
- As basic information for project formulation studies and project and program formulation
- As basic information for program evaluations and country-specific evaluations
- As materials for use of JICA directors, staff and experts when explaining to recipient countries and other donor agencies JICA's views on issues during meetings
- As a field-specific issue database shared within JICA with respect to views and approaches to issues

2. Background and Purposes of Transportation Issues

In addition to JICA's enhancement of country-specific and region-specific activities by regional departments, a system of five issue departments was established in April 2004 in an effort towards strengthening issue-specific approaches. With the aim of strengthening the field-specific issue network and the ability to deal with transportation issues, a Transportation Issue Task Force was established, with Transportation Team I and Transportation Team II of Group III (Transportation) of the Social Development Department as secretariat. The field-specific issue network will create the "Issue-Specific Guidelines" organizing JICA's cooperation policies for major future development issues. The issue-specific guidelines are utilized in formulating JICA's country-specific programs and conducting appraisals for project requests.

Dealing appropriately with each country's priority development issues requires appropriate formulation of

[1] Basic Education, Anti-HIV/AIDS Measures, Rural Development, Promotion of Small and Medium Enterprises, Poverty Reduction, Trade and Investment Promotion, Higher Education, Information and Communication Technology, Water Resources, Reproductive Health, Agricultural and Rural Development.

programs and projects based on a fundamental understanding of the total image of the development issues and effective approaches toward them, while recognizing that situations and issues differ from country to country. For this purpose, JICA must systematically arrange the approaches to the various development issues, and appropriately clarify the areas in which JICA should cooperate based on the data while taking into consideration the actual circumstances in each country. Based on these ideas, the *"Approaches for Systematic Planning of Development Projects"* series was developed as a draft for the Issue-Specific Guidelines.

In preparing this report, core members and secretariat office staff mainly prepared a draft. From July 2004 onwards, regular discussions were conducted at meetings of the Transportation Task Force (a 24-member team led by Akira Nakamura, Group Leader, Group III (Transportation), Social Development Department). Joint meetings were also held with the Urban and Regional Development Task Force as required in order to coordinate the efforts.

3. Composition of This Report[2]

This report is comprised of three chapters. To present the basic recognition as a preliminary step to considering effective approaches to development issues, Chapter 1 summarizes the current status of issues, definitions, international assistance trends, and trends of Japan's assistance. By using the Development Objectives Chart, Chapter 2 describes an overall view of the situation to be achieved (Development Objectives) for each development issue, and describes effective approaches to and points of consideration for these issues, and the current status of JICA's activities. Chapter 3 summarizes major points for JICA to settle transportation issues in future, and points of consideration for implementing cooperation efforts. As reference materials, the appendices provide examples of the major cooperation activities of JICA and other donors, descriptions of the current status of individual regions, a list of check items for considering projects/programs, and so forth.

4. How to Use the Development Objectives Chart

In this study, a Development Objectives Chart as shown below was created for each development issue, and the general approaches for each issue are comprehensively described in the form of a tree-hierarchy structured chart[3]. This chart was created as a tool for examining problem-solving policies, directions, and details of cooperation by providing a crosscutting overview of the structure of each development issue in order to promote understanding of the total picture.

The "Development objective," "Mid-term objective," and "Sub-target of mid-term objective" in the chart represent a breakdown of each development issue.

The Total Development Objectives Chart, which shows Development objectives through Examples of Activities for achieving Sub-targets, is provided at the end. In the section describing each Development objective (Chapter 2), actual examples of JICA's activities are included, providing specific images for the purposes of examining cooperation.

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[2] As the outcomes of the study must be utilized in JICA's Issue-Specific Guidelines, the composition of this report is designed to be consistent with the standard composition of the future Issue-Specific Guidelines.

[3] In reality, the cause and effect relationships that make up the issues are not linear, as expressed in the Development Objectives Chart. But instead, the individual elements are intertwined with each other. This chart systematizes issues according to a particular cross-section in order to provide an easy to understand representation of the overall picture of the issues.

Sample Development Objectives Chart (excerpt)

Development Objective	Mid-term Objective	Sub-target of Mid-term Objective	Measure and Approach for Achieving Sub-target
1. Capacity Development of the Transportation Sector	1-1 Strengthening of Transportation Sector Administration	1-1-1 Clarification of Authority and Responsibility as well as Capacity Development of the Central Government for Transportation Administration	○ Establishment/Improvement of Management Laws and Regulations for Transportation Infrastructure/Projects ○ Establishment of Management System by Transportation Modes and Strengthening of Coordination Among Management Bodies ○ Development of Transportation Database ○ Coordination with National Development Plans ○ Management Improvement or Privatization of Publicly Managed Transportation Entities △ Strengthening with respect to Environmental Measure Capability

* The triangle, circle and blank marks in the "Measure and Approach for Achieving Sub-target" column indicate the status of JICA's efforts

○: JICA can demonstrate specific outcomes for implementation of this as an objective of cooperation activities.

△: Has been included as one element of JICA cooperation.

Unmarked: JICA has achieved very few outcomes in relation to these items.

Please note that these marks are only intended to give a rough indication of JICA's implementation outcomes, and that blank marks do not indicate that items are inadequate for cooperation activities. Blank marks simply indicate that, since JICA has not previously implemented such items, if they were included in new cooperation undertakings, they may be somewhat challenging.

5. Program Approach Concepts

In the transportation sector, program approaches are being pursued on the basis of the following concepts:

① In order to respond to the diversified and complicated needs of developing countries, program-level approaches that go beyond individual projects are important.

② Appropriate support frameworks must be developed based on the overall lifecycle of individual activities, from surveys and studies, through planning and implementation, to operation and maintenance.

③ In order to strengthen the program approach, program design for clarifying the vision and scenarios of the total aid activities must be enhanced (clarification of program objectives, creation of more elaborate scenarios), and more precise management of the work process must be achieved.

Although the level at which overall goals and program objectives are relevant differs depending on the scale of projects and the structure of issues, it is important to clarify structural concepts of programs using the Development Objectives Chart, and to achieve consistency among country-specific programs, cooperation programs (development issues), and individual projects.

6. How to Use the Development Objectives Chart: An Example

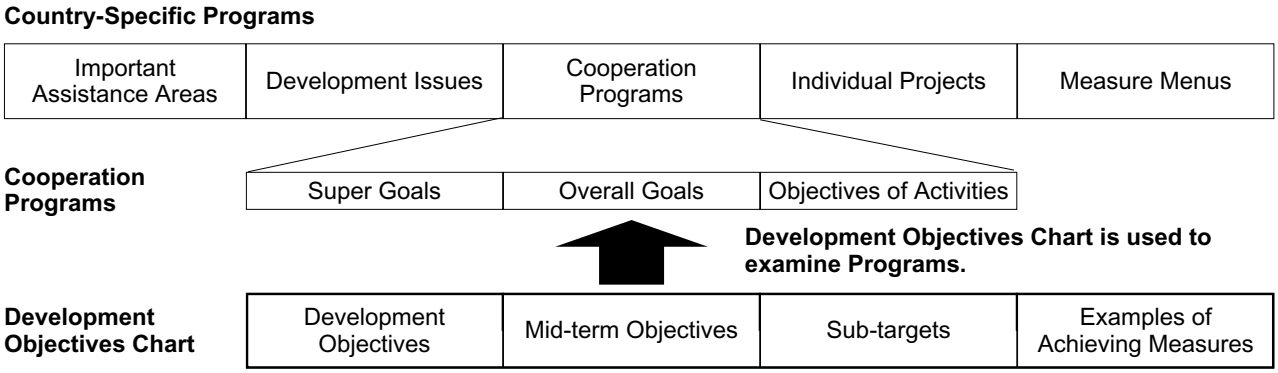
One objective of the Transportation Issue Task Force is to make the Development Objectives Chart useful when creating programs. The charts are designed so that issues can be organized at the program level, rather than taking an individual project approach by understanding the positions of issues in the transportation sector in an overall sense. How to use the Development Objectives Chart is shown below.

The procedure is as follows:

① Clarify the major problems that correspond to the needs of developing countries

② Ascertain where in the "Development Objective – Mid-term Objective – Sub-target of Mid-term Objective" hierarchy the major problems are positioned and set objectives
③ Examine overall goals and project objectives for cooperation programs and projects based on the set objectives
④ Investigate actual cooperation activities from the "Examples of Measures and Approaches for Achieving Sub-target"
⑤ Review similar JICA activities from "JICA's Major Activities" as required[4].

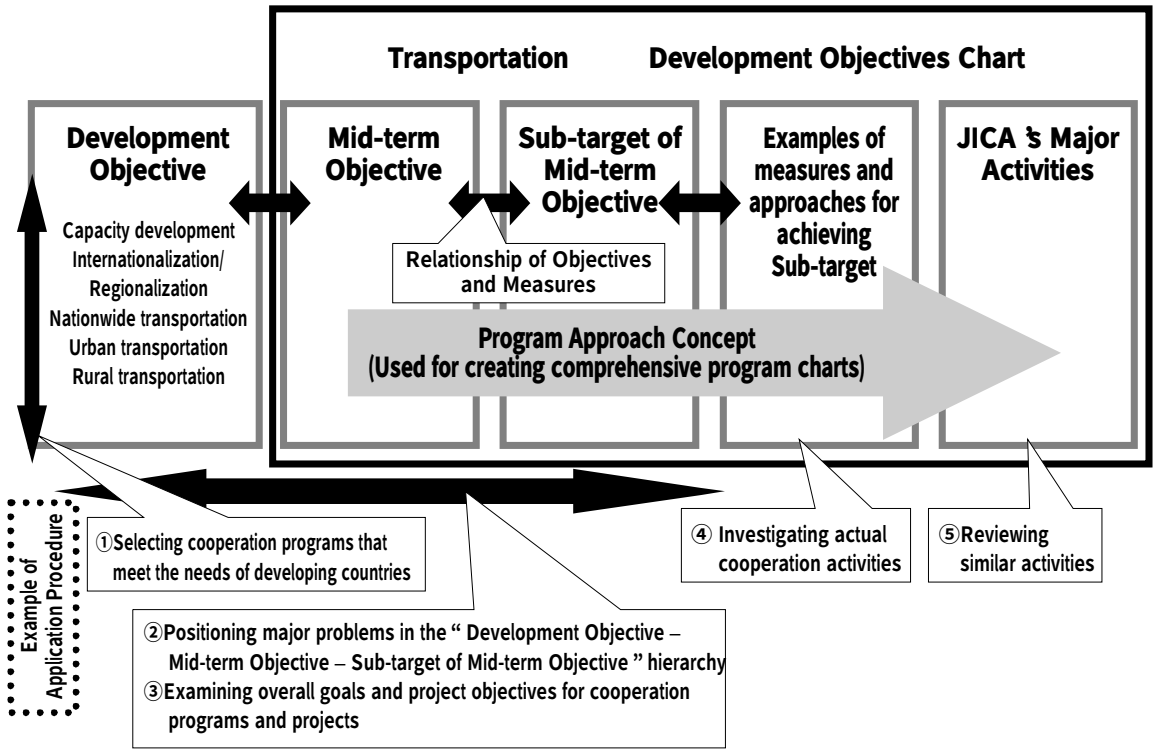
Relationship between Development Objectives Chart and Cooperation Programs



This Development Objectives Chart aims to make it possible to comprehensively understand measures at the "Examples of Measures and Approaches for Achieving Sub-target" level. Therefore, the same information may be duplicated and information to be considered when investigating programs and projects may be included for different Development Objectives. When utilizing the Development Objective Chart, it is recommended to review the overall structure of the Chart before proceeding with any further investigations.

[4] Since executive summaries (in Japanese) for the past 10 years of Development Studies in the area of Transportation are stored at JICA's Knowledge Site (internally disclosed), refer to them together with other materials if necessary.

How to Use the Development Objectives Chart: An Example



As a case study, a cooperation program (an example) investigated using the Development Objectives Chart is shown below. The "Mid-term Objectives" and "Sub-targets for Mid-term Objectives" required for each cooperation program are extracted from the five "Development objectives." The "Cooperation program" is formed by changing the "Mid-term Objectives" to "Overall Goals" and the "Sub-targets for Mid-term Objectives" to "Objectives of Activities."

Objectives shown in the Development Objective Chart for the "Establishment of Road Infrastructure" Cooperation Program (an Example)

Development Objective	Mid-term Objective	Sub-Objective of Mid-term Objective
1. Capacity Development of the Transportation Sector	Strengthening of Transportation Sector Administration	Clarification of Authority and Responsibility as well as Capability Development of the Central Government
		Capacity Development of Local Governments in the Progressing Decentralization for Transportation Administration
		Promotion of Private Sector Participation in the Development of Transportation Infrastructure and Provision of Transportation Services
	Updating of Transportation Laws and Regulations	Revision of Laws and Regulations regarding Provision of Transportation Services
		Revision of Laws and Regulations with a view to Market Economy and Decentralization
		Revision of Laws and Regulations as well as Capacity Development with a view to Promoting Private Sector Participation
	Strengthening of Transportation Sector Financing	Diversification of Financial Sources of the Government
		Appropriate Distribution of Transportation Fund to Central and Local Governments
		Introduction of the Benefit Principle
		Utilization of Private Capital
	Human Resource Development	Human Resource Development in the Public Sector
		Human Resource Development of the Private Sector
3. Toward Balanced Development of a Whole Country (National Transportation)	Improvement of Road Transportation	Improvement and Development of Trunk Road System
		Strengthening of Road Maintenance System
		Normalization and Standardization of Roads and Road Traffic
		Improvement of Road Transportation Services
5. Toward Sustainable Rural Development and Improvement of Rural Life (Rural Transportation)	Improvement of Rural Transportation Infrastructure	Provision of Basic Transportation Infrastructure and Services to Secure the Civil Minimum
		Enhancement of Transportation Safety and Reliability
	Improvement of Rural Public Transportation Services	Maintenance and Improvement of Public Transportation Services with a view to Satisfying the Civil Minimum
		Provision of Transportation Services for Better Living Standard
		Improvement of Safety and Reliability of Public Transportation Services
	Enhancement of Sustainability of Rural Transportation Systems	Improvement of Funding Mechanisms for Rural Transportation
		Supporting Private Sector and Technicians to study Technologies Suitable for the Locality
		Establishment of Road Development and Maintenance Systems based on Participation of Local People

Cooperation Program Formulation: "Establishment of Road Infrastructure" (an Example)

Important Assistance Area	Economic development and poverty reduction through improvement in economic and social infrastructure
Development Issue	Improvement in economic and social infrastructure
Cooperation Program	Road infrastructure development program

Super Goal	Overall Goal	Objective of Activity	Activity	Activity Name	Scheme
Promotion of wide-ranging national economic development and accomplishment of poverty reduction plans	Establishment of rural road infrastructure	Formulation of road establishment plans	• Allocate priorities to requests and projects, and conduct the F/S regarding the construction of intercity roads	Planning survey for intercity road between city A and city B	Development Study
		Improvement to rural road infrastructure	• Conduct basic design for road zones with high priority • Determine construction costs and maintenance and management procedures • Implement improvement tasks	Road widening project between city A and city C	Grant Aid
				Road construction project in district D	Grant Aid
				Community bridge construction project	Grant Aid
	Strengthening of road maintenance and management, and the improvement of management capabilities for transportation sectors	Strengthening of road maintenance and management	• Improve the effectiveness and efficiency of road maintenance and management systems • Improve road operation capabilities	Road maintenance and management in mountain and hill areas	Training
				Road planning/maintenance and management advisor	Dispatch of Experts
				Steel bridge design and management	Long-term Training
		Strengthening of transportation sector management and capacity development	• Establishment and operation of a new administrative system (examination of decentralization, private sector participation, road funding, etc.) • Capacity development of central and local governments	Road administrative management	Technical Cooperation Project

7. How to Use This Report

7-1 Using for Activity Formation

The Development Objectives Chart has been created mainly to be utilized in order to examine and prepare cooperation activities. When formulating activities (programs/projects), it is important to carefully investigate what types of activities and investments in resources are required to resolve the development issues facing a particular country, and what types of programs and projects would be most effective based on an overall understanding of issues.

Since the Development Objectives Chart systematically arranges the relationship of Objectives (outcomes) and Measures (activities), and examples of JICA's major activities have been listed as relevant to the Activities for Achieving Sub-targets, these are useful as a basis for formulating activities.

With regard to the formulation of activities, JICA is currently preparing the *"Transportation Handbook"* (a multimedia teaching material) aimed mainly at personnel in overseas offices[5]. This manual aims to develop the ability to produce the materials required for implementing Development Studies (such as requested project study application, implementation plan, and job instruction). Since it provides the expertise and reference materials for applying Issue-Specific Guidelines to actual jobs, it also should be fully utilized.

7-2 Using Field-Specific Issue Networks

Other field-specific issue networks can be used with this report. In the future, JICA also intends to enrich the information available on JICA's Knowledge Site regarding the activities such as other donors, standard tasks and basic knowledge. Furthermore, since executive summaries (in Japanese) for the past 10 years of development studies are also provided as reference materials, these should be reviewed when examining similar JICA activities on the Development Objectives Chart.

7-3 Using Results of Studies

JICA's previous survey studies in the area of transportation, which are available on the JICA website and the Knowledge Site, are as follows:

① *"Project Study on the Development Assistance Experiences and Prospects in the Field of Social Infrastructure Development"* Report, JICA (2004a)[6]: Japan's previous assistance activity trends in developing countries are analyzed. Based on these points of reflection, important points are identified in relation to the provision of infrastructure services to developing countries with a focus on people.

② *"PPP (Public-Private Partnership) Project Study"* Report, JICA (2005)[7]: Based on recent trends in PPPs, this report describes how PPPs are actually being implemented in the transportation sector, information and communication technology sector, and how JICA can be involved. The report gives actual examples of PPP projects, and demonstrates the way in which JICA activities correspond to the formation of PPP projects.

③ *"Basic Study for Implementing Environmental and Social Consideration Guidelines related to Development Studies"* Study Report, JICA (2004d)[8]: Useful as a reference when properly incorporating the ideals of JICA's Environmental and Social Consideration Guidelines, which came into effect in April 2004, into actual jobs such as studies and technical cooperation projects.

[5] The handbook is available on the JICA-Net Library (internally disclosed).

[6] The report (JICA(2004a)) can be downloaded from the JICA Library Portal Site, or from the JICA Knowledge Site (Topics and Sectors > Transportation > Reference Materials and JICA Publications).

[7] Downloadable from JICA's website (http://www.jica.go.jp/branch/ific/jigyo/report/etc/200504.html).

[8] Downloadable from the JICA Library Portal Site.

8. Future Plan

8-1 Plans for Revisions

This report was created with the aim of being useful (i) in providing a systematic understanding of field-specific issues, (ii) as a reference when formulating projects or selecting activities, and (iii) when explaining Japan's views to recipient countries and other donors. JICA intends to incorporate the outcomes into its Issue-Specific Guidelines, and to review them appropriately in conjunction with other field-specific networks so as to further develop the content herein.

This report is the first step for the creation of JICA's Issue-Specific Guidelines, and still contains inadequacies such as issues that require closer investigation or more information. Continuous review and enrichment of content will be required particularly in relation to Appendix 3: Basic Check List, and Appendix 4: Issues and the Current State of Transportation in Developing Countries[9].

Furthermore, JICA intends to review the Issue-Specific Guidelines every three to five years based on the knowledge and observations of the field-specific issue networks, future trends in the cooperation activities of other donors, and JICA's accumulated cooperation experience.

8-2 Other Various Usage of Development Objectives Chart

In addition to using it as a basis for formulating activities, the Development Objectives Chart can also be used for developing country-specific programs, holding practical discussions with partner countries, coordinating assistance efforts, and evaluations.

An original draft of this report was produced based on discussions held by JICA's internal Task Force, and then was reviewed based on comments from other domestic agencies and overseas offices to produce the final version. In the future, it will be essential to pursue cooperation activities that are consistent with the overall structure of Japan's ODA by consulting with other relevant domestic agencies in Japan and coordinating fundamental perceptions regarding development issues.

In addition, understanding the current status of the country and doing various evaluations require monitoring proper indices. Various approaches that allow the Development Objectives to be used in different situations are essential. This can be achieved, for example, by setting indices for developing countries depending on their current level of progress.

9. Implementation Task Force (Transportation sector)

For this study, individual groups were formed and given the task of creating drafts for each issue, while at the overall study meeting, the groups investigated manuscripts related to other issues, jointly coordinating progress and content. The final study report was completed as a result of revisions of the draft based on comments received from JICA staff at headquarters and overseas offices, experts, senior advisors, and the like.

[9] Since the Issue-Specific Guidelines are available on the Knowledge Site, this site will be updated with the revised content from time to time.

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*Where personnel have changed their tasks due to transfers, positions are shown at that point in time
*Refer to the appropriate reports in regard to tasks for the other Phase 4 issues (Urban and Regional Development, Water Pollution, Air Pollution).

Overview of the Effective Approaches for Transportation: Executive Summary

1. Outline of the Transportation Sector

1-1 Current State of Transportation

The transportation system has always been considered a key factor in the economic and social development of a country. However, there has been a widening gap in the capacity to move people and goods (in other words, "transportation rights") among the developing countries. In addition, serious transportation issues such as traffic congestion, deterioration of public transportation services, air pollution, and traffic accidents have been worsening, mainly due to continued urbanization and rapid progress of motorization in developing countries. Although transportation has been recognized as essential for poverty reduction and economic growth, most of the developing countries remain in an extreme shortage of capacity and funds for improving their transportation systems. Restructuring of transportation administration is also urgently needed to make the existing transportation system more flexible and efficient in responding to changing transportation demands, domestically and internationally.

1-2 Definition of Transportation

Transportation refers to the "movement of people and goods from one place to another." In this context, the problems associated with transportation could be classified into three groups: (i) transportation administration and management organizations; (ii) transportation infrastructure and facilities; and (iii) public transportation services provided.

1-3 Trends of International Assistance

The share of Official Development Assistance (ODA) on infrastructure development has been reduced worldwide in the past. However, because of the expected positive impact of transportation on poverty reduction as mentioned in the Millennium Development Goals (MDGs), it has started to regain its share in recent years. With the main ODA players' re-evaluation of the role of transportation in achieving the MDGs, the transportation sector has resumed its importance in the ODA portfolio. Whereas past ODA for the transportation sector has been focused on infrastructure, support is now diversifying to include that for regionalization, operation and maintenance, capacity development, and public-private partnership. In addition, ODA for the transportation sector towards poverty reduction has also been increasing.

1-4 Trends in Japan's Assistance

Japan's ODA, which consists of technical cooperation, grant aid and concessional loans, has been provided to developing countries with priority given to capacity development and infrastructure development including such transportation infrastructure as roads, railways, ports and airports. Japan's ODA has been provided under its ODA Charter with a focus on supporting "poverty reduction, sustainable development, global issues, and peace-building" through a comprehensive and integrated cooperation framework.

2. Effective Approaches for Transportation

2-1 Transportation Objectives and Issues

The main objective of transportation is to promote economic development and improve living standards

of people by facilitating smooth movement of people and goods. However, most of the developing countries are faced with the difficulty of addressing severe traffic congestion, a worsening living environment and increasing traffic accidents caused by a rapid increase of vehicle traffic. These situations have been aggravated by deteriorating transportation infrastructures caused by neglected maintenance due to a chronic shortage of financial resources.

Transportation issues have been diversifying but at the same time are closely interrelated with each other. In order to solve these issues, an issue-oriented approach in view of transportation market characteristics seems to be quite effective. This Study divides the transportation sector into four market groups, as follows: (i) international cross-border transportation; (ii) national transportation; (iii) urban transportation; and (iv) rural transportation. Based on this division, the following five development objectives are proposed as a general framework, including common needs for capacity development in every market.

2-2 Effective Approaches for Transportation

Development Objective 1: Capacity Development of the Transportation Sector

The capacity of developing countries for improving transportation issues has remained weak. This has been a great obstacle to the development and maintenance of sustainable transportation systems. Capacity development of the transportation sector is extremely important, for instance, in deregulation for effective competition, separation of policy and implementation functions, promotion of public-private partnership (PPP) and deconcentration/decentralization of decision-making powers. It is also important to establish good governance for transparent and accountable transportation administrations.

(1) Strengthening of Transportation Sector Administration

Clear demarcation of authority and responsibility is crucial for effective and efficient transportation administration, including policy-making, planning, supervision, and implementation. Demarcation of authority and responsibility should also be applied to central and local governments; with more policy, coordination and management functions for central governments, and with more implementation and monitoring functions for local governments.

(2) Updating of Transportation Laws and Regulations

It is necessary to develop transportation infrastructure and provide stable transportation services by updating the existing transportation laws and regulations. It is also necessary to improve the quality of transportation services by developing norms and standards for design, construction, environmental and social considerations and safety as well as establishing appropriate operation and management systems. It is again necessary to deregulate the current laws and regulations to encourage competition in the transportation sector as well as to introduce new laws for promoting PPP. All of these necessities require the updating of the current laws and regulations, as well as institutions.

(3) Strengthening of Transportation Sector Financing

It is necessary to improve the financing capacity of developing countries, including introduction of private capital, with a view to developing and maintaining transportation infrastructures and services. Establishment of a special fund earmarked for the transportation sector, for instance, based on vehicle registration fees and gasoline taxes, is an important mechanism for this purpose.

(4) Human Resource Development

It is necessary to upgrade the capacity of government officials in policy-making and planning as well as supervising project implementation on one hand, and to enhance the professional skills of engineers and managers of the private sector on the other. In order to make these measures for capacity development effective, it is important to provide financial support for skills training and to issue official certificates to those who have completed the training programs.

Development Objective 2: Toward Internationalization and Regionalization (International Cross-border Transportation)

This development objective aims to encourage internationalization and regional integration by minimizing the obstacles associated with the international transportation of people and goods as well as those associated with cross-border processing from one country to another. Air and maritime transportation have made greater progress for international transportation than land transportation, including keen competition among ports (and airports) as well as carriers. For the future, it will be necessary to ensure smooth and efficient land transportation services between countries to promote regional economic integration based on Free Trade Agreements (FTAs), coupled with advanced measures for higher safety and security.

(1) Facilitation of International Movement of People and Goods

Land transportation requires standardization that can be applied to bilateral as well as regional transportation, including, for instance, infrastructure and vehicles, transportation rules and regulations, traffic safety, documentation procedures, and so on. This kind of standardization is very important for ensuring efficient transportation services as well as sustainable use and maintenance of transportation infrastructures. Under the current situation, a greater importance needs to be placed on safety and security, factors which may be even more important than the efficiency of transportation.

(2) Expedition of Cross-border Processing

Under such frameworks as FTAs, regional economic integration and globalization, speedy and efficient cross-border processing becomes indispensable with a view to reducing the cost and time incurred in cross-border transportation. It is very important to: (i) introduce international norms and standards for facilitating exports and imports; (ii) lower the barriers of customs clearance; and (iii) modernize and integrate logistics systems.

Development Objective 3: Toward Balanced Development of a Whole Country (National Transportation)

This development objective aims to attain a balanced regional development of a country by way of making available transportation networks and services that can be most relevant to respective regions. It is expected that transportation network and services will give a significant stimulation for the development potential of each region to prosper. A national transportation market has a wide range of transportation demand; for instance, by cargo type from bulk to value-added cargoes, by passenger type from cost-conscious to time-conscious passengers and by transportation distance from short- to long-distance. Because of these market characteristics, various modes of transportation have been competing in the market. As a result, most of the economic regulations have been lifted in this transportation market. In the case of developing countries, attention should be paid to the possible existence of missing links, deterioration of transportation infrastructures due to neglected maintenance and aggravation of quality of transportation services.

(1) Improvement of Road Transportation

Road transportation usually accounts for the largest share of transportation in developing countries. It is necessary to develop and improve road infrastructure, vehicles, rolling stocks and transportation industries in a coordinated manner with a view to attaining effective and efficient road transportation. It is also very important to maintain the existing road network by strengthening the funding mechanism earmarked for road maintenance.

(2) Improvement of Railway Transportation

Railway systems in developing countries have significantly deteriorated, and their rehabilitation and maintenance have been serious issues yet to be addressed. In addition, railway management requires complete restructuring to cope with the financial difficulties caused by decreasing transportation volumes of people and goods. Railway managers have no choice but to expedite rationalization and selective modernization. In recent years, most of the railway managers of developing countries have been making their best efforts to privatize railways, including vertical separation and rail-related businesses.

(3) Improvement of Maritime Transportation

The importance of container transportation has been significantly increasing in recent years. In this context, inefficiency of port management by the public sector has become a serious issue to be addressed. The public sector needs to monitor the compliance of the private sector operators with the International Maritime Organization (IMO) conventions and environmental regulations to ensure maritime safety and environmental protection.

(4) Improvement of Air Transportation

In recent years, importance has been placed on rationalization and modernization of airport management through private participation by taking advantage of the opening of newly constructed airport terminals. Security and air navigation safety have been attracting more attention and are considered to be more important than before. In the world air transportation market, international carriers have been experiencing severe competition under the framework of open-air policy and privatization of national carriers. In developing countries, rehabilitation and improvement of local airports have become important, following the modernization of international airports in their capital cities.

(5) Strengthening of Intermodal Transportation as well as Improvement of Issues Common to All Modes of Transportation

Aside from each mode of transportation's respective issues, there are some important issues common to all modes of transportation such as: (i) development of intermodal transportation systems which facilitate trans-shipment from one mode of transportation to another; (ii) transportation safety measures to avoid traffic accidents; and (iii) disaster prevention measures to minimize the damages caused by natural calamities.

Development Objective 4: Toward Sustainable Urban Development and Improvement of Urban Life (Urban Transportation)

This development objective aims to achieve sustainable urban development and a higher standard of living by providing good urban mobility and a good environment for all citizens through integrated implementation of a series of measures for easing traffic congestion, reducing traffic accidents and improving urban environment. Most of the capital cities of developing countries suffer great economic losses and

environmental degradation due to severe traffic congestion during the morning and evening peak hours. Urban transportation issues are caused by the combined effects of various factors; with various stakeholders playing key roles in the process of causes and effects of these issues. Integrated and participatory approaches are needed to build consensus on the possible policies and measures for tackling these issues.

(1) Improvement and Development of Urban Transportation Infrastructures

The rate at which vehicle traffic has been increasing is expected to exceed the traffic capacity of road networks. Traffic congestion has been worsening year after year. Thus, traffic capacity needs to be expanded through improvement of intersections, introduction of signaling systems and construction of bypasses and outer ring roads to detour the congested areas. Due to spatial, environmental and financial constraints, however, it is very difficult to expand traffic capacity, especially in urban centers where land acquisition is very difficult and costly. Therefore, joint efforts of central and local governments as well as close cooperation between neighboring local government units has become very important to address the issue.

(2) Improvement and Development of Urban Public Transportation Services

Encouraging a shift from private car use to public transportation is one of the most effective means to solve traffic congestion on road networks. However, the public bus transportation system needs to improve its quality of service in terms of punctuality, convenience, safety, and security. Rail-based public transportation is another alternative for bus transportation. Given its advantages of higher energy efficiency and less air pollution, however, its required large capital investment and difficulty in achieving the financial break-even point are its disadvantages. Thus, it is very important to find a good mixture of public transportation services under the PPP concept.

(3) Transportation Demand Management (TDM)

Transportation Demand Management (TDM), which restricts vehicle use in a designated area, is another effective means to solve traffic congestion on road networks. A prerequisite for introducing TDM would be availability of public transportation services to reach destinations in the designated area without relying on private vehicles. Due to the fact that those influenced by TDM are diverse and their perceived losses seem great, it becomes very important to build consensus among stakeholders under a strong political leadership.

(4) Enhancement of Transportation Safety

In accordance with the increasing number of vehicles, traffic accidents have steadily been increasing. Thus, an integrated approach towards strengthening measures towards traffic accident reduction has become more important, as follows: (i) improvement of roads and facilities; (ii) strengthening of laws and enforcement; and (iii) education and traffic safety campaigns. Enhancing people's awareness of traffic safety is crucial in reducing traffic accidents.

(5) Prevention/Improvement of Environmental Deterioration due to Urban Transportation

As a result of the increasing vehicle traffic, the urban environment, particularly air quality and noise, has been deteriorating along the main traffic corridors. The urban environment needs to be improved with the possible combination of the following measures: (i) improvement of vehicle inspection systems; (ii) strengthening of monitoring systems; and (iii) introduction and strict implementation of penalty systems for vehicles that do not comply with the laws and regulations. Enhancing people's awareness of environmental protection is crucial in tackling this environmental issue.

Development Objective 5: Toward Sustainable Rural Development and Improvement of Rural Life (Rural Transportation)

This development objective aims to attain sustainable rural development through revitalization of rural economy based on provision of transportation infrastructure and services to satisfy basic human needs at the least. In rural areas, mobility and accessibility tend to be severely restricted due to under-development of road networks and their insufficient maintenance. Such road conditions however may be attributed to low transportation demand as well as constraints in financial resources.

(1) Improvement of Rural Transportation Infrastructure

It is rather difficult to economically justify the development and improvement of rural roads mainly due to the low level of transportation demand. However, at the least, rural roads need to be developed and maintained to satisfy basic human needs for transportation such as access to primary health care, basic education and local markets. Such basic needs may be referred to as every person's "transportation rights."

(2) Improvement of Rural Public Transportation Services

Public transportation service needs to be provided for rural people who have no other transportation means. However, public transportation services in rural areas tend to be very poor, mainly because of scarce and dispersed transportation demand and severe shortages of financial resources. New types of public transportation systems for local communities need to be developed through the active participation of various players such as central and local governments, citizens, firms, and NGOs.

(3) Enhancement of Sustainability of Rural Transportation Systems

It is necessary to reserve a certain amount of funds for maintaining and improving public transportation services in rural areas. At the same time, it is also very important to: (i) strengthen the leadership of local governments for policy making; (ii) enhance the planning and implementing capacity of local people; and (iii) establish appropriate operation and maintenance systems for higher sustainability.

3. Directions of JICA's Cooperation

3-1 JICA's Priorities and Points for Concern

JICA now places importance on the following three principles for effective technical cooperation: (i) field-oriented approach; (ii) human security; and (iii) effectiveness, efficiency and speed. Under these principles, JICA has proposed to provide technical cooperation to the transportation sector of developing countries by taking into consideration the environment and conditions of respective countries and regions and focusing on the following policies and strategies, as follows:

① Cooperation needs to be based on the "Human-centered Approach" by reconfirming that the transportation infrastructure and services need to be developed and operated with a particular emphasis on the benefit of people.

② Cooperation needs to be based on the "Field-centered Approach" which places importance on strategic selectivity depending on each field, with a view to supporting development and operation of effective and efficient transportation systems.

③ Cooperation needs to be based on the "Ownership-Partnership Approach" for encouraging active participation of the recipient countries in view of continuity and sustainability of the cooperation. In this context, particular importance will be placed on "Capacity Development (CD)."

④ Visions and scenarios for cooperation need to be made clear in view of the "Program Approach (PA)," which intends to formulate a program which comprises a series of interrelated component projects. Flexible formulation of projects and best combination of input resources are critical factors for successful implementation of PA.

⑤ Aid coordination between a recipient country and multilateral/bilateral aid organizations needs to be strengthened to ensure effective and efficient development of the recipient country. Domestic aid coordination in Japan is important as well, especially good coordination and collaboration among technical cooperation, grant aid and concessional loans for the effective realization of outcomes.

⑥ For developing an effective and efficient transportation system for a recipient country, the "Inter-Modal Transportation Approach" needs to be promoted by taking into account the following:

- Promoting competition between modes of transportation based on their comparative advantages
- Improving accessibility into and transfer between services provided by different modes of transportation
- Strengthening management and maintenance of transportation infrastructures
- Furthering introduction of market competition in the transportation sector, including PPP
- Updating and modernizing the technologies traditionally used in the transportation sector

⑦ Due attention is needed for the development of transportation infrastructures in remote areas with a view to ensuring accessibility and financial sustainability. It is important to have proper coordination with rural development programs undertaken by other sectors.

⑧ Prompt and flexible assistance is needed in coping with urgent restoration and reconstruction requirements immediately after a ceasefire in the case of a conflict or the outbreak of disaster. For a post-conflict country, special importance needs to be placed on peace-building in association with restoration efforts of various sectors.

In the transportation sector, which aims to facilitate smooth movement of people and goods, it is most important to adopt an integrated approach based on a strategic mixture of various cooperation schemes. It is necessary to clearly identify the precise factors which hinder the smooth movement of people and goods as well as the ones that threaten the safety and reliability of transportation services.

3-2 Issues for Future Considerations

Making a step forward in development cooperation in the transportation sector, it will be necessary for JICA to strengthen its "Issue-Oriented Approach" by improving and revising this "Transportation Sector Guideline" in the near future. It will also be necessary to develop "Transportation Sector Guidelines by Region" and to conduct further study on how the transportation sector can contribute towards the improvement of people's standard of living in the context of the MDGs.

Chapter 1 Outline of the Transportation Sector

1-1 Current State of Transportation

Transportation is fundamental in enabling people to go about their lives, and is crucial for achieving economic or social objectives. Without transportation services and infrastructure such as automobiles, railways, aircraft, and ships, the range of activities available to us would be severely limited, and it is fair to say that modern society could not function. Meanwhile, the environments surrounding transportation are continuously changing, and the resulting issues are becoming more apparent and complex.

(1) Traffic Congestion Due to Rapid Urbanization and Obstruction of Smooth Transportation Due to Progress of Motorization

It is important to recognize the various problems in the transportation sector caused by urbanization

The global population as of this writing in 2004 is 6.38 billion[1], and 47% of people reside in urban areas. According to United Nations figures, the global urbanization rate is predicted to reach 60% in 2030. Urbanization in developing countries is particularly rapid, with urban populations rising 6% per year. It is predicted that the number of cities with populations in excess of one million in developing countries will double in the next 10 years. Increases in private automobile ownership are actually exceeding the level of urbanization, with between 15% to 20% increases per year in some countries. The rapid progress of motorization and urbanization is giving rise to various problems that obstruct smooth transportation, such as traffic congestion due to road capacity shortage, diminishing use of public transportation modes and worsening management status of transportation organizations, air pollution due to vehicle emissions, and increasing numbers of traffic accidents.

Measures towards motorization are generally aimed at expanding road capacity and have a tendency to emphasize the movement of vehicles rather than people. As a result, urban sprawl[2] advances, further reliance on automobiles as a means of transportation is encouraged, and the vicious cycle continues. Furthermore, policies that give priority to the movement of vehicles exacerbate disparities between people who have cars and those who don't with regard to the

[1] United Nations Population Fund (2004)

[2] Sprawl means the unplanned expansion of cities into surrounding areas resulting in the disorderly formation of urban areas. Low quality urban areas form with inadequate and incomplete roads, water and sewage facilities, resulting in environmental problems and disaster-prevention-related problems. Furthermore, not only is it difficult to improve the situation later due to social factors, but it also requires large economic outlays. (Atsuyuki Okabe, Professor at the University of Tokyo)

ability to move about and exercise transportation rights[3].

(2) Increased Concern about Poverty

Since economic growth is indispensable for ensuring poverty reduction, it is essential to consider transportation sector approaches.

Resolving the problems of poverty is a matter of great concern in contemporary development assistance, as demonstrated by the commitment of international society to the Millennium Development Goals (MDGs) and the introduction of the Poverty Reduction Strategy Paper (PRSP). This trend began in the 1970s. Since then, the concerns of international development assistance have turned to the social sector, quite noticeably to medical care and education, factors that directly benefit the poor. In the 1990s, however, in contrast to Asia, where half of the population that had been living in poverty were raised out of poverty amidst continued economic growth, it became clear that the situation was barely changing in Central and South America, which were facing economic stagnation, and that the number of poor was increasing in Africa. These experiences led to widespread awareness that economic growth is indispensable to achieve poverty reduction. The recognition is increasing in developing countries and among donors that achieving the comprehensive economic growth that benefits all people (inclusive growth, pro-poor growth) is important.

Transportation is an essential factor in achieving this objective and it is expected to:

(i) Benefit the poor indirectly by bringing about economic growth; and

(ii) Make direct contributions to the poor by providing basic access.

Through the improvement of large-scale infrastructure such as ports and harbors, airports, roads, and railways, the indirect approaches in (i) above are expected to provide adequate responses to globalization, contribute to regional economic integration, attract Foreign Direct Investment (FDI), and promote use of national land and resources.

The direct approaches in (ii) aim to secure the national minimum[4] and civil minimum[5] to a greater extent than before, with regard to access to various basic services including markets, education and medical care.

(3) Shortage of Revenue and Capacity in Developing Countries

Capacity development is crucial for appropriately understanding and resolving problems faced by countries.

The capacity of developing countries to deal with the abovementioned issues is restricted to low levels.

Since governments' budgets for implementing transportation measures are limited, securing new sources of revenue is of course a crucial issue for

[3] The transportation right is a new human right that indicates the right to transportation of citizens, and is a combination of related human rights set out in Article 22 (the freedom of choice of residence, migration, and occupation), Article 25 (the right to minimum standards of living), and Article 13 (the right to the pursuit of happiness) of the Japanese constitution, among others. (Tozaki (2002))

[4] This refers to the guarantee of access to social public services and treatment of particular minimum standards regardless of what region the citizens reside in. The basic standards are termed the national minimum. (Naoyuki Yoshino, Professor at Keio University)

[5] This is a political axiom that sets out the minimum required level of living standards to be secured from a relatively universal perspective, given the actual circumstances within a given region, based on the spontaneity of the people. (Matsushita (1971))

consideration along with the utilization of private-sector funds. Therefore, environmental improvements that facilitate the provision of transportation infrastructure and services by the private sector are essential, as is a shift in the role of government from provider to regulator.

In general, public transportation organizations in developing countries have been experiencing chronic problems due to low profitability resulting from low utilization and inefficient operation, with some of them heavily indebted. Therefore, since revenue required for expanding and improving services cannot be ensured or are absorbed by debt payments, transportation needs cannot be suitably met. On the other hand, there is a large supply of transportation and alternative means from the private sector, including the informal sector, either complementing or competing with public transportation modes. However, there are concerns related to the safety and reliability of such services.

In addition, for issues such as appropriately meeting transportation needs and the provision of management and maintenance of transportation infrastructure and services, the traditional central government-led approaches have been unable to provide effective solutions. New approaches and techniques such as participatory or demand-driven approaches are required for transportation infrastructure development, management and maintenance, and the provision of services in poverty-stricken remote and urban areas. Reform of the transportation sector is a matter of urgency, with appropriate measures including decentralization of government functions, the effective use of revenue through the introduction of private-sector technology and expertise, efficient asset management such as existing infrastructure, improvements to operational services, and appropriate legal reforms.

Like any other development issues, issues in transportation vary greatly depending on the particular economic, social, geographical, and other conditions, and are unique to each country. Thus, a single strategy or solution cannot be applicable to all countries. In the future, governments in developing countries must develop capacity through a cycle of transportation policy formulation, implementation, monitoring, and evaluation to appropriately deal with the unique transportation issues in their countries.

1-2 Definition of Transportation

Transportation (or transportation systems) in this report refers to: (i) transportation modes, (ii) transportation facilities and (iii) transportation services.

There are various definitions of transportation, but in simple terms, it means the movement of people and goods. The movement of people and goods requires transportation facilities such as roads and ports, and transportation modes such as automobiles and aircraft. It also requires entities to provide transportation facilities and services, and, in addition, organizations, systems and sources of financing are essential to support all of these. Therefore, in this report, transportation is regarded as the required elements for moving people and goods and is defined as (i) transportation modes, (ii) transportation facilities required for providing services and (iii) the services provided by transportation organizations. All of these elements are taken together as forming transportation systems, and

proceed on that basis. (However, transportation via pipelines is not included.)

1-3 Trends of International Assistance

1-3-1 Post-war Trends in Assistance

The trends of international assistance for developing countries can be broadly broken into (i) the era of prosperity (1950s–1990s), (ii) the era of review (1990s) and (iii) the era of revival (2000 onwards).

The Post-World War II assistance for developing countries from international society can be broadly broken into three periods: the era of prosperity between the 1950s and the 1990s, the era of review from the 1990s to 2000 and the era of revival (renewed awareness) from 2000 onwards.

<The Era of Prosperity>

The trends in postwar assistance for developing countries were to focus on support for post-war revival, placing the main emphasis on economic growth through large-scale support for economic infrastructure that would produce significant external economic effects, such as transportation, electricity generation, irrigation, and communications. As a result, while developing countries experienced considerable growth, economic disparities widened between developed countries and developing countries, and among developing countries themselves. During the 1970s, the traditional focus on the construction of infrastructure shifted towards the fulfillment of Basic Human Needs (BHN) aimed at poverty reduction.

<The Era of Review>

During the 1990s, there was criticism that large-scale infrastructures such as dams and roads were contributing to environmental damage and the division of regional society, and that they were not benefiting the people living there. Limitations emerged from a cost-benefit perspective on investments for large-scale projects such as these, and "assistance fatigue" led to a decreasing level of funds from donors. Consequently, a reevaluation of the efficiency of assistance, and of existing assistance measures, became increasingly necessary. As the transportation markets were revitalized, the private sector began to participate in infrastructure development. Assistance organizations shifted the focus of their aid activities towards system reforms to meet the needs of the markets and reforms of state-run enterprises.

The focus shifted further to new development issues such as escalating poverty, the importance of peace building, and the perspective of human security, and in 1990 poverty received attention as part of donor assistance strategies[6]. The Second United Nations Conference on Human Settlements (HABITAT II) held in 1996 dealt with the issues of the deterioration in human living environments and the inadequacy of infrastructure due to urbanization. The Development Assistance Committee (DAC) Network on Poverty Reduction (POVNET) was established in 1998 by the Organization for Economic

[6] The World Bank's *"World Development Report"* identified poverty as a topic, and the UNDP has begun producing the *"Human Development Report."*

Cooperation and Development's (OECD) DAC, and specialized Task Teams in the three areas of private sector development, agriculture and infrastructure work together to discuss and develop effective development cooperation strategies for poverty reduction.

<The Era of Revival>

Development objectives continued to become more diversified following the year 2000. When discussing international aid activities focusing on people, there were arguments that economic growth is not possible without infrastructure development, leading to renewed awareness of the importance of infrastructure[7], and emphasizing in the process the relationship between poverty reduction and infrastructure development. The international development goal of reducing absolute poverty by half by 2015 was set as part of the Millennium Development Goals (MDGs) adopted following the September 2000 United Nations Millennium Summit. The World Summit for Sustainable Development (WSSD) held in Johannesburg in August 2002 not only revised Agenda 21[8] and dealt with environmental issues, but there was also debate on wide-ranging and diverse themes such as poverty, health, trade and investment, and African development.

1-3-2 Activity Trends of Donors

The value of support for the infrastructure sector has been rediscovered in recent years.

Although the amount of support for infrastructure did fall after 1990, in recent years, donor countries and international organizations have rediscovered the important role of infrastructure in achieving the MDGs. Watching past trends in amounts for assistance, although the World Bank's contribution to the transportation sector had fallen by half in 2000, it subsequently experienced a continuous steady increase, and was at its highest level ever in 2004 (US $3.7778 billion as of 2004). Transportation and communication is the largest area of support provided by the Asian Development Bank. The amount increased to 2.5 fold over the five years between 1999 and 2003, and in 2003, it accounted for 42.2% of the total value of assistance (US $2.5777 billion for transportation and communication as of 2003). While the total value of assistance from many donors was falling around the year 2000, the figure is currently stable or increasing gradually in the transportation and communications sectors.

In addition to assistance in "hard" components, such as infrastructure, the implementation of assistance in "soft" components, such as capacity development and PPPs, is expanding.

Due to the unfortunate aspects of past support-that infrastructure development did not produce adequate external economic effects, and that services did not reach intended beneficiaries-contemporary assistance has expanded beyond the construction sector to include such areas as management and maintenance, and capacity development (including the enhancement of systems and organization capabilities). Also being pursued are strategies that

[7] JICA redefined infrastructure in the report (2004a) as an essential common base for preserving the lives and livelihoods of all people, and for securing their right to lead a safe and healthy life, and which acts as a common base for bringing out people's inherent abilities, and realizing their potential.

[8] This is a global action plan for achieving sustainable development in the 21st century; it was adopted at the 1992 United Nations Conference on Environment and Development (held in Rio de Janeiro, Brazil).

Box 1-1 World Bank PPP Studies

The World Bank has created a downloadable database that brings together information on PPP infrastructure projects around the world[9]. This database contains the project name, sector, type of PPP, amount of government and private investment, financing agreement conclusion time, and private sector entity name. Reports that provide an analysis of the database information are also produced regularly, allowing relevant parties to track the latest trends in PPP.

The World Bank also conducts assessments of the infrastructure sector in various countries, and summarizes investment and lending opportunities for private sector entities in the form of Recent Economic Developments in Infrastructure (REDI) reports. The assessments are consistently based on a set of standardized survey headings, aiming to facilitate comparative investigations of several countries.

Finally, the Public-Private Infrastructure Advisory Facility (PPIAF), a joint initiative of the governments of Japan and the United Kingdom and the World Bank, is an assistance facility aimed at improving infrastructure through private sector involvement. In addition to funding advisory services for a range of specific activities, the facility also collects information on the best practices in the world, and distributes this in the form of reports and toolkits.

create systems and environments that facilitate the private sector's activities such as the Public-Private Partnership (PPP) and privatization through private sector participation.

1-3-3 Issue-Specific Activities

International issues are as follows:
(i) poverty reduction,
(ii) regional integration and
(iii) management and maintenance, and ensuring revenue.

<Poverty Reduction>

Transportation is treated as the highest priority sector by many assistance organizations since it promotes pro-poor economic growth. The World Bank and the Asian Development Bank have outlined policies and strategies for transportation that have the ultimate objective of reducing poverty.

<Regional Integration>

In conjunction with the progress of regional economic integration and globalization, transportation plays an important role in rapid and efficient cross-border processing. Regional efforts and regional organizations such as the Greater Mekong Sub-region (GMS) program in Asia, the Southern African Development Community (SADC) in Africa and the Puebla Panama Plan (PPP) in Central and South America, are engaging in such efforts as expediting cross-border processing, creation of regional corridors, and trans-border transportation infrastructure.

<Management and Maintenance, and Ensuring Revenue>

The Sub-Saharan Africa Transport Policy Program (SSATP) is an international partnership aimed at developing and implementing policies and

[9] World Bank website, "Private Participation in Infrastructure Database" (http://ppi.worldbank.org/)

Box 1-2 Trends in the Creation of International Standards

Because of various transportation infrastructure assistance, the standardization of various facilities and specifications and the creation of international standards are essential for the smooth flow of people and goods and for ensuring public security in coordination with the progress of globalization. For example, in relation to the planning of the Asian Highway-which spans 32 Asian countries and which faces issues including conformity with international design standards, simplification of cross-border processing and construction of integrated transportation systems-standardization of specifications for roads and other transportation infrastructure and services is required across many countries and regions.

Practical examples of such efforts include: standardization and the creation of international standards in the air transportation sector by the International Civil Aviation Organization (ICAO); revisions to the International Convention for the Safety of Life at Sea (SOLAS); the adoption of the ISPS Code, and the standardization of maritime personnel carried out by the International Maritime Organization (IMO); and road technology research carried out by the Permanent International Association of Road Congress (PIARC).

strategies for the transportation sector in sub-Saharan Africa. As part of this program, the Road Management Initiative (RMI) pursues activities which are aimed towards systematic reforms and policy formulation for better road management and financing for public road services. Also implemented are activities to efficiently utilize limited resources in regional areas using Labor-Based Technology (LBT) proposed by the International Labour Organization (ILO).

1-4 Trends in Japan's Assistance

1-4-1 Characteristics of Japan's Assistance

Following World War II, Japan received support and financing from the World Bank and other international agencies for national rebuilding. Japan started borrowing from the World Bank in 1953 and constructed and improved facilities such as roads, electricity and hydraulic power. Around the same period, in 1954, Japan began providing international assistance in the form of economic cooperation that went side-by-side with postwar reparations in Asia[10]. Not only did this assist the development in Asian countries and promote social welfare, but by limiting funding to the procurement of Japanese goods and labor when providing assistance to recipient countries, these activities also supported the market for Japan's domestic industries, and improved the infrastructure to facilitate Japanese enterprises to diversify overseas.

Japan's assistance activities have tended to focus on support for infrastructure development. Developing countries are assisted through improvements in economic and social infrastructure that supports sustainable development.

Consisting mainly of concessional loans, grant aid and technical cooperation, Japan's ODA has contributed to capacity development and to economic infrastructure development in areas such as roads, ports and harbors,

[10] Paying Japan's reparations was completed in July 1976 with the final payment made to the Philippines.

Box 1-3 A Bridge in Myanmar Constructed by Technical Cooperation: (Example of JICA's Activity)

Back in the 1970s, there was no bridge across the Irawaji, a river that divided the fertile river basin from east to west, a situation which inhibited agricultural and industrial development. In addition, since Myanmar had very little experience with large bridge projects, they requested technical support from the Japanese government for capacity development of technical personnel involved in constructing and planning roads and bridges.

Since there are limitations in learning the construction technology inside a classroom, it was proposed to learn the technology during the actual bridge construction. As a result, technical assistance was provided for a period of six years between 1979 and 1985. This assistance was aimed at facilitating the transfer of design and construction technology used in the Thuwunna Bridge, a long, large pre-stressed concrete (PC) bridge constructed using domestically produced concrete. Thuwunna Bridge became the only bridge constructed through technical cooperation. Following that, in 1985, construction of the Ngawun Bridge began, and technical guidance was provided through the short-term dispatch of experts.

Following the completion of the project, the personnel that had received capacity development training on the technology used in the project played a central role in the construction of many other bridges. Thus, Myanmar became one of the few countries in Southeast Asia that was able to independently undertake bridge construction projects from design to construction.

Source: Fujiwara and Takagi (2004), JICA (2004c)

electrical utilities, and water utilities, and has been consistently focused on supporting infrastructure development[11].

Due to severe economic and financial conditions, ODA budgets have been decreasing in recent years. Although the proportion of ODA in the form of assistance for economic infrastructure is currently declining, when the actual figures are examined, it is clear that the focus on infrastructure remains constant. Japan's assistance activities are targeting economic growth in developing countries by tackling contemporary development issues such as poverty reduction and promoting trade and investment through improving the economic and social infrastructure that is the basis for supporting sustainable development[12].

1-4-2 Strengthening of Region-Specific and Sector-Specific Assistance

Japan's ODA Charter, approved by the Cabinet in June 1992, identifies Asia as a priority region, with infrastructure development as one of the priority tasks.

[11] The following brief examples outline the extent of the contribution of Japan's assistance activities to improvements in economic and social infrastructure, which forms the foundation for economic progress: approximately 20% of highways in the Jakarta metropolitan area, and around 50% of the double tracking section of the Java Trunk Line in Indonesia were constructed, and 13% of national roads in the Philippines were upgraded. (Information sourced from relevant diplomatic offices in May 2004, MOFA (2004) p.18)

[12] MOFA (2004) p.109

Political approaches to region- and country-specific assistance policies have been continuously strengthened since the 1990s. Region-specific activities include the bolstering of development cooperation aimed at Africa through the Tokyo International Conference on African Development (TICAD) process, and aggressive efforts towards Mekong regional development[13], an area that contains the majority of new member countries to the Association of Southeast Asian Nations (ASEAN).

The ODA Charter (2003) identifies (i) poverty reduction, (ii) sustainable development, (iii) global issues, and (iv) peace building as priority issues. It also notes that adequate attention must be paid to environmental and social considerations.

In August 2003, Japan's ODA Charter was revised for the first time in 11 years. With consideration for contemporary international development issues, the following main issues were identified: (i) poverty reduction, (ii) sustainable development, (iii) global issues, and (iv) peace building. The ODA Charter makes it clear that adequate attention must be paid to environmental and social impacts of ODA conducted in developing countries, and that fairness must be assured. Following the JBIC's Guidelines on *"Environmental and Social Considerations"* that were developed in April 2002 and enforced in October 2003, JICA revised[14] its *"Guidelines for Environmental and Social Considerations"* in 2004, which were then enforced in April of the same year. These efforts resulted in greater consideration being paid to environmental and social issues with regard to the implementation of Japan's ODA activities.

1-4-3 Japan's Current Assistance Activities

(1) Improvement of Transportation Infrastructure

JICA provides technical cooperation in relation to the construction of transportation infrastructure funded by JBIC and the implementation of grant aid for materials.

While financial cooperation can be broadly broken into grant aid and concessional loans, the financial assistance for transportation infrastructure such as roads, railways, airports, and ports and harbors consists mainly of concessional loans, since they are generally large-scale and produce long-term economic effects[15]. A fundamental concept that permeates Japan's activities is support for the capacity of developing countries to solve problems through their own efforts, and concessional loans encourage developing countries to use revenue efficiently, and act independently with a view to ensuring future repayments. JICA provides support through the implementation of grant aid in relation to necessary equipment and materials and the construction of transportation infrastructure.

(2) Knowledge-Based Contributions

JICA supports development planning and the creation of strategies, policies and systems in the transportation sector through development surveys. The Agency's activities are wide-ranging and JICA also engages in Technical

[13] The association is promoting the development of the East-West Corridor, a road that runs across the region, and the Second East-West Corridor, which links Bangkok, Phnom Penh, and Ho Chi Minh City.

[14] The basic principles of JICA's environmental and social considerations identified in the new guidelines state that JICA will support the efforts of recipient governments to conform appropriately to environmental and social considerations in order to avoid or minimize the impact that development projects have on the environment and regional society, and to avoid negative impacts while contributing to the sustainable development of developing countries.

[15] 146.7 billion yen (26.3% of total concessional loans) worth of support in the transportation sector was carried out in Fiscal 2003. (MOFA (2004) p.109)

Cooperation Projects, the dispatch of experts and the provision of training with a view to providing training for the technical personnel to manage and operate constructed facilities, and to provide the materials and equipment required for such management and operation.

Chapter 2 Effective Approaches for Transportation

2-1 Transportation Objectives and Issues

2-1-1 Transportation Objectives

Transportation infrastructure needs are becoming more diverse, and not only is quantity (infrastructure stock) important, but quality (service) is also required.

The objective of transportation is to "facilitate the smooth movement of people and goods, thereby promoting economic development and improving living standards."

"The smooth movement of people and goods" encompasses four types of movement, (i) regional and international movements that go beyond a single country (international cross-border transportation), (ii) national movement within a single country (national transportation), (iii) everyday movements within urban areas (urban transportation), and (iv) everyday movements in rural areas (rural transportation). Measures are required to meet the needs of each of these four types of movement.

Transportation measures aimed at achieving this should be implemented under a system of transportation administration based on an appropriate understanding of the needs involved, and should provide people with transportation systems consisting of a combination of (i) transportation infrastructure (roads, railway tracks, etc.), (ii) means of transportation (automobiles, trains, etc.) and (iii) transportation services (bus and air transportation services, etc.). Efficient transportation systems achieve faster travel, facilitate movement and secure means of transportation so as to achieve the goal of "the smooth movement of people and goods." The end result of providing these opportunities for movement and activity is that "economic activity is revitalized, contributing to increased income for people and improvements in living environments."

Transportation objectives: To revitalize economies, contributing to increased income and improved living environments by facilitating the smooth movement of people and goods.

Transportation needs and types of movement in developing countries generally vary widely depending on the current situation in the particular location concerned. Since there are restrictions on the human and financial resources that can be allocated to transportation infrastructure and facilities development, it is crucial to appropriately understand the four types of movement, and to allocate priority levels to the issues that require attention.

2-1-2 Issues in Transportation

Transportation issues: (i) traffic congestion and accidents due to rapidly rising numbers of automobiles, (ii) disparities in the convenience provided by transportation, (iii) poor maintenance and deteriorating infrastructure due to revenue shortages, etc.

One of the most important issues facing the transportation sector in developing countries is the increasing number of automobiles due to the increasing rate of motorization. However, developments in road infrastructure are unable to keep up with this rapidly increasing number of automobiles, and particularly in urban areas, traffic congestion is reaching the saturation point and causing adverse environmental effects due to exhaust emissions and severe noise

New issues: (i) efforts towards cross-border infrastructure, (ii) fundamental development required for achieving the civil minimum, (iii) ensuring effective transportation administration (finances, human resources), etc.

pollution.

Furthermore, maintenance of roads is not being implemented due to revenue shortages, and existing roads continue to deteriorate. Similarly, maintenance of other transportation modes such as railways, ports and airports, is also falling behind due to revenue shortages thereby leading to further deterioration of the infrastructure, effectively inhibiting "the smooth movement of goods and people."

Traditional restrictive administration systems have been ineffective and unsuitable for appropriately dealing with each of the four different types of movement. To be able to move forward, a transition towards administration systems that respond flexibly to each of these different issues is essential, and capacity building in transportation administration and operation systems is extremely important. Several initiatives are being implemented as part of flexible administration systems, including deregulation aimed at supplementing and strengthening shortages in public sector funding capacity, technological capacity, and business capacity, PPPs aimed at actively encouraging private sector participation, the enhancement of participatory approaches that strongly reflect the opinions of beneficiaries in development plans, and Community Driven Development (CDD)[16] efforts.

In the future, it is also essential that various systems be improved and upgraded so that the intended effects of these efforts can be sufficiently achieved.

2-2 Effective Approaches for Transportation

2-2-1 Creating the "Development Objectives Chart"

The Transportation Development Objectives Chart provides a comprehensive outline of the important development issues that must be addressed in order to achieve "the smooth movement of people and goods" in developing countries. There are various ways to describe the transportation-related development issues, as follows: (i) by transportation modes like roads and railways, (ii) by "hard" (physical) and "soft" (social, policy, etc.) considerations or (iii) by different roles of the public and private sectors. However, these approaches would make it difficult to clarify the relevance to the transportation objective of facilitating "the smooth movement of people and goods." This report should provide a comprehensive treatment of the development issues required for achieving this transportation objective with the intention that strategies for improvements in the form of cooperation programs will be proposed. Therefore, classifications are made according to the four different types of movement

Development Objectives: Organized into five categories: (i) capacity development, (ii) internationalization and regionalization, (iii) national, (iv) urban, and (v) rural.

[16] Community Driven Development (CDD) is a concept advocated by the World Bank regarding development assistance aimed at poverty reduction. It is an approach that bases management of the decision making process, and of local residents and regional resources for development efforts within the region under development. CDD seeks to entrust responsibility to community groups that serve public functions. It is also a useful regional development scheme when looked at from the perspective of encouraging local administrative autonomy, and sustainable development assistance. (Refer to the World Bank's website under "Community Driven Development.")

discussed above, and the structure of the individual issues is described as Development Objectives. In addition, “Capacity Development” is taken up as a common Development Objective required for achieving each of these four Development Objectives.

With regard to Mid-term Objectives and their Sub-targets, the chart has also been constructed so that, as the steps aimed at achieving Sub-targets, strategies and measures are comprehensively listed. This is so that the relationship between objectives and actual measures is clear for issues relating to each of the transportation modes.

Development Objectives for the transportation sector are described as follows:

Development Objective 1: Capacity Development of the Transportation Sector

Facilitating the sustainable development of transportation infrastructure through administrative reform and improvements to the market environment in the transportation sector.

Development Objective 2: Toward Internationalization and Regionalization (International Cross-border Transportation)

Providing support for internationalization and regional integration by minimizing barriers to movement and international cross-border transportation from a global perspective and from the perspective of regional economic zones.

Development Objective 3: Toward Balanced Development of a Whole Country (National Transportation)

Invigorating the developing regional capacity and potential, and achieving balanced interregional development by improving infrastructure to secure the national minimum in a way that takes into account the particular characteristics of the various transportation modes available, including roads, railways, air and maritime transportation.

Development Objective 4: Toward Sustainable Urban Development and Improvement of Urban Life (Urban Transportation)

Ensuring equal mobility for all people by providing integrated and participatory approaches to traffic congestion, traffic accidents, and urban environmental improvements.

Development Objective 5: Toward Sustainable Rural Development and Improvement of Rural Life (Rural Transportation)

Improving living standards and revitalizing the rural economy by securing the civil minimum by providing transportation infrastructure.

Direct and indirect effects on the social and natural environments caused by infrastructure development cannot be avoided. With regard to transportation infrastructure development, environmental and social issues must always be addressed during the consensus-building process. Consequently, strengthening with regard to environmental capabilities is an important issue in relation to transportation implementation systems, and is therefore included in the

Table 2-1 Transportation Issues Development Objectives–Mid-term Objectives–Sub-targets

Development Objective	Mid-term Objective	Sub-targets of Mid-term Objective
1. Capacity Development of the Transportation Sector	Strengthening of Transportation Sector Administration	Clarification of Authority and Responsibility as well as Capacity Development of Central Government
		Capacity Development of Local Governments in the Progressing Decentralization
		Promotion of Private Sector Participation in the Development of Transportation Infrastructures and Provision of Transportation Services
	Updating of Transportation Laws and Regulations	Revision of Laws and Regulations regarding Provision of Transportation Services
		Revision of Laws and Regulations with a view to Market Economy and Decentralization
		Revision of Laws and Regulations as well as Capacity Development with a view to Promoting Private Sector Participation
	Strengthening of Transportation Sector Financing	Diversification of Financial Sources of the Government
		Appropriate Distribution of Transportation Fund to Central and Local Governments
		Introduction of Benefit Principle
		Utilization of Private Capital
	Human Resource Development	Human Resource Development of the Public Sector
		Human Resource Development of the Private Sector
2. Toward Internationalization and Regionalization (International Cross-border Transportation)	Facilitation of International Movement of People and Goods	Development of International Transportation Network (Road/Railway/Airport/Port)
		Standardization and Modernization of Technologies Applied to International Transportation Network
		Strengthening of Safety and Security Measures
	Expedition of Cross-border Processing	Application of International Standards
		Facilitation and Expedition of Import/Export Processing
		Improvement of International Border Crossing Systems
3. Toward Balanced Development of a Whole Country (National Transportation)	Improvement of Road Transportation	Improvement and Development of Trunk Road System
		Strengthening of Road Maintenance System
		Normalization and Standardization of Roads and Road Traffic
		Improvement of Road Transportation Services
	Improvement of Railway Transportation	Restoration, Improvement and Development of Railway Network
		Strengthening of Railway Maintenance System
		Normalization and Standardization of Railway System
		Management Improvement and Privatization
	Improvement of Maritime Transportation	Restoration, Improvement and Development of Ports and Port Facilities
		Strengthening of Port Maintenance System
		Normalization and Standardization of Port System
		Improvement of Port Operation and Management
		Promotion of Maritime Transportation
	Improvement of Air Transportation	Improvement/Development of Airport Facilities
		Improvement/Development of Aeronautical Navigation Aid System
		Strengthening of Airport Facility Maintenance System
		Normalization and Standardization of Air Transportation System
		Improvement of Airport Operation and Management
	Strengthening of Intermodal Transportation as well as Improvement of Issues Common to All Modes of Transportation	Development and Introduction of Intermodal Transportation System
		Facilitation of Intermodal Connection
		Transportation Safety Measures
		Disaster Management
		Improvement and Development of Transportation Terminals to Contribute to Regional Development
4. Toward Sustainable Urban Development and Improvement of Urban Life (Urban Transportation)	Improvement and Development of Urban Transportation Infrastructure	Traffic Capacity Increase for Arterial Roads, Intersections and Bridges Under the Jurisdiction of Central Government
		Restoration and Improvement of Secondary Roads and their Maintenance System under the Jurisdiction of Local Government
		Promotion of Private Sector Participation in Urban Transportation through PPPs
	Improvement and Development of Urban Public Transportation Services	Improvement of Bus Services
		Introduction of Rail-based Public Transportation Services including MRT and LRT
		Management Improvement of Public Transportation Service Providers
	Transportation Demand Management (TDM)	Promotion of Modal Shift from Private Cars to Public Transportation Services
		Optimization of Urban Transportation Demand
		Improvement of Urban Transportation Operation and Management
	Enhancement of Transportation Safety	Traffic Safety Education
		Enforcement of Traffic Safety Laws and Regulations
		Improvement of Traffic Safety Technology
	Prevention/Improvement of Environmental Deterioration due to Urban Transportation	Exhaust Gas Emission Control
		Improvement of Road Infrastructure and Facilities in view of Preventing Environmental Degradation
		Introduction of Policy Measures to mitigate Urban Environmental Degradation
5. Toward Sustainable Rural Development and Improvement of Rural Life (Rural Transportation)	Improvement of Rural Transportation Infrastructure	Provision of Basic Transportation Infrastructure and Services to Secure Civil Minimum
		Enhancement of Transportation Safety and Reliability
	Improvement of Rural Public Transportation Services	Maintenance and Improvement of Public Transportation Services with a view to Satisfying Civil Minimum
		Provision of Transportation Services for Better Living Standard
		Improvement of Safety and Reliability of Public Transportation Services
	Enhancement of Sustainability of Rural Transportation Systems	Improvement of Funding Mechanisms for Rural Transportation
		Supporting Private Sector and Technicians to Study Technologies suitable for Locality
		Establishment of Road Development and Maintenance Systems based on Participatory Local People

Development Objectives Chart. In relation to actual environmental strategies, Appendix 5 organizes and describes measures in relation to environmental strategies according to each Development Objective.

2-2-2 Effective Approaches for Transportation

Development Objective 1: Capacity Development of the Transportation Sector

Development Objective 1: Capacity Development of the Transportation Sector

A problem faced by many developing countries is that the various systems, implementation frameworks and individuals are unable to deal adequately with contemporary issues including deregulation, the separation of policy-making and implementation, the introduction of private sector participation, and decentralization.

The transportation sector in some countries faces problems such as non-transparent contracting systems and corruption since sufficiently large amounts of funding are allocated to transportation infrastructure development. Thus, the establishment of good governance is therefore an important issue. These types of problems are brought on by the concentration of authority in certain central government agencies. To some extent, this is one of the reasons behind the promotion of initiatives for achieving the decentralization of authority, such as deregulation, the separation of policy-making and implementation branches, the introduction of private sector participation, and decentralization.

In order to facilitate the continuous growth of the transportation sector and respond to the various issues, environmental improvements that promote such sectoral growth must be implemented, and the environment itself must be continually transformed in accordance with the progress of that growth.

Mid-term Objective 1-1: Clarification of authority and responsibility as well as capacity development of central government; Capacity development of local governments in the progressing decentralization; Promotion of private sector participation in the development of transportation infrastructures and provision of transportation services

Mid-term Objective 1-1: Strengthening of Transportation Sector Administration

A central issue in strengthening transportation sector administration is the appropriate allocation of policy-making, planning, monitoring, and implementation roles to relevant parties, and the assignment of authority relevant to those particular roles. Based on appropriate recognition of these issues, international assistance provided by the World Bank and other parties in many developing countries is actively promoting the division of policy-making and implementation branches, the separation of departments directly responsible for managing activities and decentralization.

Central governments must perform higher-level policymaking, coordination and managerial functions (separate administration of each transportation mode, promotion of coordination among modes, creation of uniform standards, management of relevant statistics, coordination with related development plans, etc.), and this can be facilitated by the division of policymaking and implementation branches, and the separation of departments directly responsible for managing activities.

Important issues in relation to decentralization are (i) the transfer of authority and control of sources of funds from central to local governments, (ii)

the improvement of administrative systems of local governments and (iii) human resources development relating to local government administration. While the situation with regard to the transfer of authority and finances from central to local governments differs across countries, the greatest problem faced, even if authority and finances have actually been transferred, is disorganization and confusion due to inadequate local government capacity for handling these roles. The administrative capacity of local governments has traditionally been low, and there are cases of functional paralysis occurring because decentralization proceeded before this situation was first rectified. There is an urgent need for the establishment of systems, and the strengthening of institutional capacities and human resources.

Sub-target 1: Clarification of Authority and Responsibility as well as Capacity Development of Central Government for Transportation Administration

Sub-target 2: Capacity Development of Local Governments in the Progressing Decentralization for Transportation Administration

Sub-target 3: Promotion of Private Sector Participation in the Development of Transportation Infrastructure and Provision of Transportation Services

JICA's Activities

JICA has various activities in relation to Mid-term Objective 1-1. These include the proposal of systems reforms through Development Studies, as well as partial capacity development of systems through pilot projects, advice from experts, and group and country-specific training. However, in order to achieve visible outcomes from cooperation aimed at strengthening the capacity of systems, it is essential for JICA to enhance traditional cooperation efforts and establish Technical Cooperation Projects that have the specific objective of capacity development, and strive to produce comprehensive outcomes by combining the benefits of the various schemes.

Mid-term Objective 1-2:
Revision of laws and regulations regarding provision of transportation services; Revision of laws and regulations with a view to market economy and decentralization; Revision of laws and regulations as well as capacity development with a view to promoting private sector participation

Mid-term Objective 1-2: Updating of Transportation Laws and Regulations

One objective of updating transportation laws and regulations is the stabilization of administration systems in the sector, and the clarification of the allocation of roles and authority amongst related parties in order to facilitate the provision of transportation services in a smooth manner. Therefore, improvements to the legal system are required in the form of improvement laws and administration laws that comprehensively regulate transportation sector administration systems. Furthermore, in order to standardize the level of services provided, it is essential to develop various standards relating to design, construction, environmental considerations, safety, and so forth, and to ensure that such standards are in conformity by establishing institutional systems that will be appropriately operated and monitored.

In order to implement new policies in the transportation sector such as deregulation and the introduction of private sector participation, it is essential to develop new legal systems by updating and reforming existing legal frameworks.

In order to utilize the financial, technological and business capacities of the private sector, it is essential to clarify what type of work roles will be allocated to government and the private sector over the long term: from the construction of transportation infrastructure through its operation and maintenance. In particular, it is essential to pursue actions that encourage proactive private sector participation by clarifying what proportion of responsibility will be covered by the government in relation to perceived risks. At the same time, it is essential to monitor and guide activities in the desired direction in order to ensure that appropriate deregulation and private sector participation, and fair competition occur under the new systems.

Sub-target 1: Revision of Laws and Regulations regarding Provision of Transportation Services

Sub-target 2: Revision of Laws and Regulations with a view to Market Economy and Decentralization

Sub-target 3: Revision of Laws and Regulations as well as Capacity Development with a view to Promoting Private Sector Participation

JICA's activities

JICA's activities in relation to Mid-term Objective 1-2, particularly in the transportation sector, are extremely limited and consist only of partial cooperation in the form of expert dispatches and training. The introduction of private sector participation to overcome the limited financial, technological and business capacities of the public sector in order to facilitate transportation infrastructure development and the improvement of services is an important initiative worth pursuing. In the future, positively promoting technical cooperation with reference to actual domestic examples in Japan should also prove to be a beneficial activity.

Mid-term Objective 1-3:
Diversification of financial sources of the government; Appropriate distribution of transportation fund to central and local governments; Introduction of the benefit principle; Utilization of private capital

Mid-term Objective 1-3: Strengthening of Transportation Sector Financing

In order to increase the provision of transportation services, it is necessary to enhance finances to the required levels by either improving the funds procurement capacity of government, or by attracting outside funding, such as from the private sector.

There are many areas in the transportation sector where private sector participation cannot be expected such as road infrastructure development not accompanied by fee income. Various types of measures for enhancing finances have been implemented involving the benefit principle in an effort to supplement public sector transportation finances. Examples include the establishment of earmarked revenue sources for roads with fuel taxes as a base component, the provision of local resident labor for rural road development and levies in the form of environmental taxes in urban areas. When utilizing the benefit principle in enhancing finances, it is crucial that systems be established in such a way that there is an equal allocation of responsibilities and that spending is appropriate. When utilizing earmarked revenue sources for roads, a

beneficial approach is to form a “roads committee” made up of road users, transportation companies, road administration personnel and the like, in order to deliberate on priorities for uses of such funds, and to increase the transparency and accountability of project implementation through monitoring, among others.

With regard to areas where private sector participation can be expected, such as the operation and maintenance of heavily congested roads and the operation of public transportation services, improvements to the commercial environment through deregulation, for example, are essential. This is because this facilitates public-private cooperation geared towards attracting private sector financing. Finally, developing and revitalizing financial markets makes it easier for both government and the private sector to procure funds, so this is also a significant undertaking that must be considered.

Sub-target 1: Diversification of Financial Sources of the Government

Sub-target 2: Appropriate Distribution of Transportation Fund to Central and Local Governments

Sub-target 3: Introduction of the Benefit Principle

Sub-target 4: Utilization of Private Capital

JICA’s Activities

JICA’s activities with regard to Mid-term Objective 1-3 are reasonably adequate and not limited to expert dispatches and training, but also involve the preparation of proposals for appointed revenue sources of road funding through Development Studies. However, there are issues requiring modification, particularly in the limited provision of Japanese examples rather than formulating practical proposals based on actual circumstances in partner countries. In the future, it is crucial for JICA to emphasize the relationship between poverty reduction and transportation infrastructure development, and examine new methods wherein local residents, local governments and international cooperation can work together towards improving access to rural areas given the limited finances available.

Regarding the utilization of private sector capital, while some Development Studies do contain related proposals, they are limited to proposals for such capital as one part of overall funding, and do not provide practical investigations or advice that correspond with the actual circumstances in partner countries.

Mid-term Objective 1-4:
Human resource development of the public sector; Human resource development of the private sector

Mid-term Objective 1-4: Human Resource Development

Human resource development is essential so that personnel involved in the provision of transportation services are able to fulfill their allocated roles effectively.

Human resource involved in the provision of services can be divided into government employees who develop policies and plans and monitor activities, and private sector companies actually involved in carrying out those activities. With regard to government officials, it is essential to utilize capacity development organizations and establish an environment where central and local government officials can efficiently improve their skills. With regard to private

sector personnel, along with the enhancement of specialist education and training, an effective approach is to provide incentives for skills enhancement through such training and education, by jointly implementing subsidies for training and prior examination systems for project tenders.
Sub-target 1: Human Resource Development of the Public Sector
Sub-target 2: Human Resource Development of the Private Sector

JICA's Activities

Activities relating to capacity development are not limited to Technical Cooperation Projects, expert dispatches and training, but are also being actively pursued through Development Studies. JICA has demonstrable outcomes in establishing training centers, formulating curriculums and dispatching instructors, among others, as part of training activities intended for government personnel and capacity strengthening activities intended for private sector employees such as maritime personnel and civil engineers. JICA also has experience regarding the construction of education and training centers, and the like, through Grant Aid.

Development Objective 1: Capacity Development of the Transportation Sector

Mid-term Objective 1-1: Strengthening of Transportation Sector Administration		
Sub-targets of Mid-term Objective	**Examples of Activities for Achieving Sub-targets**	**JICA's Major Activities**
Clarification of Authority and Responsibility as well as Capacity Development of Central Government	○ Establishment/Improvement of Operation and Policy of Transportation Infrastructure/Projects	Road Engineering and Administration (Tr), Road Administration with Focus on Maintenance and Management, and Safety Measures (India) (TCP)
	○ Establishment of Management Systems by Transportation Modes and Strengthening of Coordination among Management Body	The Study on the National Transportation Development Strategy in Viet Nam (Viet Nam) (DS)
	○ Development of Transportation Databases	The Study on Metro Manila Urban Transportation Integration (Phases I and II) (the Philippines) (DS), National Transportation Plan (Pakistan) (DS)
	○ Coordination with National Development Plan	The Study on the National Transportation Development Strategy in Viet Nam (Viet Nam) (DS)
	○ Administrative Improvement/ Privatization of Public Managed Transportation Company	Study on Privatization of Polish State Railways (Poland) (DS), Study on Tariffs and Improved Cost Recovery for Egyptian National Railways: Alternative Study (Egypt) (DS), Railway Management Planning (Tr), Shipping Administration (Tr), National Transportation Plan (Poland) (DS)
	△ Strengthening with Environmental Issues Capability	(also dealt with under "Pollution Control" activities) Study on Integrated Urban Transportation Strategies for Environmental Improvement in Kuala Lumpur (Malaysia) (DS), Comprehensive Urban Transportation Study in Barranquilla (Colombia) (DS)
Capacity Development of Local Governments in the Progressing Decentralization	△ Strengthening of Management Capability of Local Governments	The Study on Rural Roads Improvement in Western Kenya (Kenya) (DS), Periodic Maintenance of Capacity Building for Regional Office (East Timor) (TCP)
	○ Coordination Between Urban Planning and Regional Master Plans	The Study on an Improvement Plan for Railway Transport in and around the Bangkok Metropolis in Consideration of Urban Development (Thailand) (DS)
	△ Establishment of Coordination Systems Between Central Government and Local Government	Master Plan Study on Long-term Management of Bulgarian Railways (Bulgaria) (DS)
Promotion of Private Sector Participation in the Development of Transportation Infrastructures and Provision of Transportation Services	△ Promotion of Deregulation	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS), Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)
	△ Creation of Enabling Environments for Public and Private Sector Cooperation	

Mid-term Objective 1-2: Updating of Transportation Laws and Regulations		
Sub-targets of Mid-term Objective	**Examples of Activities for Achieving Sub-targets**	**JICA's Major Activities**
Revision of Laws and Regulations regarding Provision of Transportation Services	△ Formulation/Improvement of a Law on Transportation Maintenance	Regulation and Type Approval System for Safety and Environmental Protection of Motor Vehicle (Tr), Seminar on Road Administration (Tr)
	△ Formulation/Improvement of a Law on Transportation Operation and Management	National Transportation Plan (Poland) (DS)
	○ Formulation of Transportation Standards (Design, Construction, Environment and Safety, etc.)	The Study on the Standardization for Integrated Railway Network of Metro Manila (the Philippines) (DS), The Study on the Standardization of Bridge Design (Malaysia) (DS)
	△ Establishment of Operation/Monitoring Systems for Law/Standard Enforcement	Motor Vehicle Inspection and Maintenance System (Tr), Regulation and Type Approval System for Safety and Environmental Protection of Motor Vehicle (Tr), Seminar on Road Administration (Tr)
Revision of Laws and Regulations with a view to Market Economy and Decentralization	Decentralization	
	△ Deregulation/Privatization	Study on Privatization of Polish State Railways (Poland) (DS), The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS), Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)
	△ Improvement of Tender/Procurement Processes	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS)
Revision of Laws and Regulations as well as Capacity Development with a view to Promoting Private Sector Participation	△ Establishment of a Law on Toll Roads	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS), Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)

Mid-term Objective 1-3: Strengthening of Transportation Sector Financing		
Sub-targets of Mid-term Objective	**Examples of Activities for Achieving Sub-targets**	**JICA's Major Activities**
Diversification of Financial Sources of the Government	△ Introduction of Special Taxes for Specific Purposes/Specific Revenue Sources	The Study on the Standardization for Integrated Railway Network of Metro Manila (the Philippines) (DS)
	○ Administrative Improvement of Public Managed Transportation company	National Transportation Plan (Poland) (DS), Study on Tariffs and Improved Cost Recovery for Egyptian National Railways: Alternative Study (Egypt) (DS), The Feasibility Study of the Proposed Cavite Busway System (the Philippines) (DS)
	△ Fosterage/Strengthening of Financial Organization	Study on Development of Domestic Maritime Transportation and Marine Industry (Indonesia) (DS)
Appropriate Distribution of Transportation Fund to Central and Local Governments	Financial Arrangements for Local Governments	
Introduction of the Benefit Principle	△ Introduction of User Tax/Fee (Passenger Duty)	Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS), Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS)
Utilization of Private Capital	△ Promotion of Deregulation	Study on Pan-Philippine Highway Ferry Service Plan (the Philippines) (DS)
	△ Creation of Enabling Environments of framework for Promotion of Public-Private Partnership	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS), Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)
	△ Provision of Incentive for Private Sector Participation in the Transportation Sector	Study on the Subic Bay Port Master Plan in the Republic of the Philippines (DS), Study on Urban Redevelopment Plan and Case Study in the Bangkok Metropolitan Area in the Kingdom of Thailand (DS)
	△ Institutional Setup for Promoting Finance to Transportation Sector both Internationally and Domestically	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS), Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)

Mid-term Objective 1-4: Human Resource Development		
Sub-targets of Mid-term Objective	**Examples of Activities for Achieving Sub-targets**	**JICA's Major Activities**
Human Resource Development of the Public Sector	○ Establishment of Efficient Capacity Development Systems	Study on Development of Domestic Maritime Transportation and Marine Industry (Indonesia) (DS), National Transportation Plan (Poland) (DS)
	○ Strengthening of Capacity Development Organizations	The Urban Transportation Human Resources Development Project (Brazil) (PTC), National Center for Transportation Studies Project (the Philippines) (PTC), The Panama Nautical School Up-grading Project (Panama) (PTC), Basic Design Study on the Project for the Improvement of Transportation Technical and Professional School No. 1 (Viet Nam) (GA), The Project for Upgrading Human Resources Development for Air Navigation Systems Specialist at the Civil Aviation Training Center in Manila (the Philippines) (PTC), Port Hydraulic Research Center (Turkey) (PTC), Aftercare Technical Cooperation for the Railway Training Center Project (Thailand) (PTC), Renovation of the Road Maintenance and Construction Equipment of IFEER (Morocco) (PTC), The Project on Philippine Coast Guard Human Resource Development (the Philippines) (TCP)
	△ Strengthening of Evaluation/Monitoring Capability	Road Administration with Focus on Maintenance and Management, and Safety Measures (India) (TCP)
Human Resource Development of the Private Sector	○ **Enhancement of Specialist Education and Training**	Technology Development for Electronic Navigational Charts (the Philippines) (PTC), The Project on Philippine Coast Guard Human Resource Development (the Philippines) (PTC), Yazd Signaling Training Center Project (Iran) (PTC), Promotion of the Ship Inspection System and Technique (the Philippines) (PTC), Project of Modernization of Perumka's Education and Training System in JABOTABEK (Indonesia) (PTC), Renovation of the Road Maintenance and Construction Equipment of IFEER (Morocco) (PTC), Project on Improvement of Maritime Education in Turkey (TCP), Study on the Utilization of Private Sector in the Road Maintenance System (Kenya) (DS), Road Administration with Focus on Maintenance and Management, and Safety Measures (India) (TCP)
	△ Establishment of Prior Examination Systems for Project Tenders	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS)

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△: Has been included as one element of JICA cooperation.
Unmarked: JICA has achieved very few outcomes in relation to these items.
Please note that these marks are only intended to give a rough indication of JICA's implementation outcomes, and that blank marks do not indicate that items are inadequate for inclusion in cooperation activities. Blank marks simply indicate that, since JICA has not previously implemented such items, such activities may be somewhat challenging if included in new cooperation undertakings.

DS: Development Study
GA: Grant Aid
PTC: Project-type Technical Cooperation Project
TCP: Technical Cooperation Project
Tr: Training program

Development Objective 2: Toward Internationalization and Regionalization (International Cross-border Transportation)

Development Objective 2: Toward Internationalization and Regionalization

Air transportation has played an important role in responding to internationalization related to people, with airport development given priority. Similarly, maritime transportation has played an important role in responding to internationalization related to goods, with port development given priority and containerization continuously progressing. Carriers in the form of airlines and shipping companies have moved from the public sector to the private sector, and there is also movement towards privatization of airports and port administration. Efforts in response to internationalization and streamlining in response to competition have already progressed positively in the air transportation and maritime transportation sectors.

This Development Objective emphasizes the promotion of economic regionalization through the liberalization of trade, as well as the higher speed and level of efficiency in land-based cross-border transportation which can be expected to increase along with this. The objective is to achieve "the smooth movement of people and goods" between member countries of organizations such as ASEAN in Asia, the Southern African Development Community (SADC), the Economic Community of West African States (ECOWAS), and the East African Community (EAC) in Africa, the Central American Common Market (CACM), the Andean Community (CAN-Comunidad Andina), and MERCOSUR (Mercado Común del Sur (Southern Common Market)). Achieving this will require (i) the facilitation of movement through cross-border and regional transportation infrastructure development, (ii) the standardization of weight restrictions, documentation required for movement and road standards, among others, (iii) the development of cross-border facilities that facilitate smooth movement, and (iv) the enhancement of safety and security measures with a view to the prevention of terrorism.

Mid-term Objective 2-1: Development of international transportation network; Standardization and modernization of technologies applied to international transportation network; Strengthening of safety and security measures

Mid-term Objective 2-1: Facilitation of International Movement of People and Goods

For developing the international infrastructure, in addition to standardizing and unifying bilateral and interregional specifications, standards and documentation, it is essential that a consensus be reached among concerned parties, including donors, regarding these items and if effective use and efficient management and maintenance are to be achieved following development. For example, the Puebla Panama Plan defines various types of conditions for road design standards for international trunk roads, such as those dealing with live loads.

The enhancement of air and maritime transportation security is becoming a more and more prevalent issue today than before. The International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) stipulate international standards to facilitate the efficient functioning of international infrastructure. With the objective to prevent terrorism, tendency

was to focus more on security in relation to the movement of people in recent times. However, it is essential to realize therefore, that facilitating the smooth movement of people is not necessarily given the highest priority in all countries.

Sub-target 1: Development of International Transportation Network (Road/Railway/Airport/Port)

Sub-target 2: Standardization and Modernization of Technologies Applied to International Transportation Network

Sub-target 3: Strengthening of Safety and Security Measures

JICA's Activities

JICA's main activities in relation to Mid-term Objective 2-1 are comprised of airport development projects and port development projects through Development Studies. The latter includes those focusing on containerization. Expert dispatches and training activities are also being undertaken in relation to partial functional improvements of ports such as the modernization of port administration and the modernization of customs systems. The upgrading of international freight transportation via roads and railways is also an important issue, and cooperation is being carried out for infrastructure development where standards and specifications differ among countries.

With regard to the strengthening of safety and security measures, in addition to the use of Grant Aid to provide radars at airports with the aim of preventing accidents, many maritime and aviation training programs have been undertaken. Strategies for dealing with terrorism still remain as an area of cooperation where Japan can demonstrate few practical outcomes.

Mid-term Objective 2-2:
Application of international standards; Facilitation and expedition of import/export processing; Improvement of international border crossing system

Mid-term Objective 2-2: Expedition of Cross-border Processing

There is pressure for the expedition and streamlining of cross-border processing in conjunction with progressing globalization, regionalization and bilateral Free Trade Agreements (FTAs). In order to reduce the various costs and physical and mental burdens, and to remove the various obstructions involved in cross-border processing, it is essential that progress be made in the application of international standards, the alleviation of customs barriers and the standardization of logistics systems. Regarding the movement of people, it should be possible to simplify processes such as passport control and visa issuance at border-crossing facilities. With regard to the movement of goods, increasing international competitiveness by modernizing logistic systems is important.

Sub-target 1: Application of International Standards

Sub-target 2: Facilitation and Expedition of Import/Export Processing

Sub-target 3: Improvement of International Border Crossing System

JICA's Activities

Mid-term Objective 2-2 is an area where JICA can demonstrate few outcomes since it does not stop at bilateral cooperation but is also linked to multilateral cooperation. However, since it is possible that cooperation in

conjunction with regional organizations such as ASEAN, SADC and ECOWAS will become increasingly important in the future, it is essential for JICA to strengthen efforts in this area with a view to coordinating and cooperating with other leading international organizations.

Development Objective 2: Toward Internationalization and Regionalization

Mid-term Objective 2-1: Facilitation of International Movement of People and Goods

Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
Development of International Transportation Network (Road/Railway/Airport/ Port)	○ **Development of International Trunk Road Networks**	The Project for Construction of a Bridge over the Mekong River (Cambodia) (GA), Study on the Detailed Design of the Second Mekong International Bridge Construction Project (Laos and Thailand) (DS), Feasibility Study on the Improvement of National Road No. 1 (Phnom Penh–Neak Loeung Section) (Cambodia) (GA), Feasibility Study on the Proposed New Bridge over the Zambezi River at Chirundu Border Post (Zambia and Zimbabwe) (DS), Study on the Integrated Development Plan for the Border Region in Thailand and Lao PDR (Thailand and Laos) (DS)
	△ Development of International Trunk Railway Networks	Study on the Transportation Master Plan (Bosnia and Herzegovina) (DS)
	○ Development of International Ports	The Study on the Development Plan of Suez Bay Coastal Area (Egypt) (DS)
	○ Development of International Airports	Feasibility Study on New Development Plan of Hanoi International Airport (Viet Nam) (DS), Detailed Design Study on Shanghai Pu-dong International Airport (China) (DS), Development of a New International Airport for Tegucigalpa (Honduras) (GA), The Project for Improvement of Terminal Building at Palau International Airport (Palau) (GA)
	○ Development of Cross-border Transportation Networks and Public Transportation Networks (Bus, Railway, etc.)	Study on the Transportation Master Plan (Bosnia and Herzegovina) (DS)
Standardization and Modernization of Technologies Applied to International Transportation Network	△ **Application of International Technical Standard to the Road Sector**	ESCAP, Regulation and Type Approval System for Safety and Environmental Protection of Motor Vehicle (Tr)
	○ Application of International Technical Standard to the Railway Sector (gauge, voltage, etc.)	The Study on the Standardization for Integrated Railway Network of Metro Manila (the Philippines) (DS)
	○ Development of Digital Geographic Information	Technology Development for Electronic Navigational Charts (the Philippines) (PTC), Study on Establishing Digital Topographic Maps (Georgia) (DS)
	△ Standardization of Transportation Signage	Regulation and Type Approval System for Safety and Environmental Protection of Motor Vehicle (Tr)
	Technical Standardization of Land Transportation	
	△ Participation in International Technical Exchange	Third Country Training Course, Road Administration with Focus on Maintenance and Management, and Safety Measures (India) (TCP)
Strengthening of Safety and Security Measures	○ **Enhancement of Security Management at International Borders**	Promotion of the Ship Inspection System and Technique (the Philippines) (PTC), The Project for Improvement of Equipment of the Kabul International Airport (Afghanistan) (GA)
	○ Enhancement of Maritime Security Management (Enforcement of the ISPS code, Establishment of Maritime Safety Agencies, etc.)	The Project on Philippine Coast Guard Human Resource Development (the Philippines) (PTC), Study for the Maritime Traffic Safety System Development Plan (Indonesia) (DS), Maritime Search and Rescue and Disaster Prevention Course for Policy Planners (Tr), The Project on Philippine Coast Guard Human Resource Development (the Philippines) (TCP)
	○ **Introduction of ICAO Standard in the Air Transportation Sector**	The Study of New Communications, Navigation and Surveillance / Air Traffic Management System (the Philippines) (DS), Study on the Transportation Master Plan (Bosnia and Herzegovina) (DS), Seminar on CNS Technology (Tr)
	△ **Introduction of IMO Standard of Water Transportation**	International Maritime Conventions and Ship Safety Inspection (Tr)

Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
	△ **Development of Manuals and Training for Emergency**	Project on Improvement of Maritime Education (Turkey) (TCP)
	○ **Quality Enhancement of Operation and Management of the Railway Sector and Port Sector**	Project on Improvement of Maritime Education (Turkey) (TCP)
	○ **Quality Enhancement of Air Traffic Control**	Project for Rehabilitation of the Approach Radar Facility in the Ninoy Aquino International Airport (the Philippines) (GA), The Project for Improvement of Existing Air Traffic Services Equipment System under the Tribhuvan International Airport Modernization Project (Nepal) (GA), The Project for Upgrading Human Resources Development for Air Navigation Systems Specialist at the Civil Aviation Training Center in Manila (the Philippines) (PTC), The Study of New Communications, Navigation and Surveillance / Air Traffic Management System (the Philippines) (DS), Master Plan Study on the Strategic Policy of the Air Transportation Sector (Indonesia) (DS)

Mid-term Objective 2-2: Expedition of Cross-border Processing

Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
Application of International Standards	△ **Application of International Vehicle Maintenance and Vehicle Certification**	Regulation and Type Approval System for Safety and Environmental Protection of Motor Vehicle (Tr)
	○ Standardization of Geographic Information	Study on Establishing Digital Topographic Maps (Georgia) (DS)
	Application to Open Sky Policy	
	Provision of Quality Management Standards (Quarantine Systems, etc.)	
	○ Introduction of New Air Navigation Systems	The Study of New Communications, Navigation and Surveillance / Air Traffic Management System (the Philippines) (DS)
Facilitation and Expedition of Import/Export Processing	**Introduction of EDI System to Administrative Procedures at Port, and Reduction/Elimination of Intraregional Tariff**	
	△ Introduction of One-Stop Border Services at International Borders	Feasibility Study on the Proposed New Bridge over the Zambezi River at Chirundu Border Post (Zambia and Zimbabwe) (DS)
Improvement of International Border Crossing System	△ **Development of International Logistic Network over International Border**	Study on the Improvement Plan for Transshipment Facilities at Zamyn-Uud Station (Mongolia) (DS)
	○ Development of Multi-Modal Transportation System	The Study on the Master Plan of Container Cargo Handling Ports, Dry Ports and Connecting Railways (Indonesia) (DS)

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DS: Development Study
GA: Grant Aid
PTC: Project-type Technical Cooperation
TCP: Technical Cooperation Project
Tr: Training program

Development Objective 3: Toward Balanced Development of a Whole Country

Development Objective 3: Toward Balanced Development of a Whole Country (National Transportation)

When road, railway, air, and maritime transportation networks are expanded around the entire country, the movement of people and goods from urban to rural, as well as from rural to urban areas, becomes possible. This then forms a foundation for balanced national development.

Although there are differences in national transportation depending on the country, in general, automobiles, trains, airplanes, and ships all compete for their allocation of the transportation of people and goods. The range of distances varies from tens of kilometers to thousands of kilometers. Since the particular characteristics of each transportation mode are quite distinct, national transportation is well suited to intermodal competition. This is why deregulation has progressed much further in this field relative to urban transportation and rural transportation. In the developing countries, on the other hand, several factors have brought about a definite rise in the share of automobile transportation, such as progressing motorization, the improvement of local road networks, the spread of container transportation, and qualitative declines in services and deterioration of railway and maritime transportation. This in turn has led to a remarkable decline in the share of railway and maritime transportation.

Although there are differences across countries depending on factors such as economic conditions and geographic characteristics, maritime and air transportation provide unique transportation services not present in land-based transportation. Although there is competition with land-based transportation, maritime and air transportation has maintained a certain level of market share. Maritime transportation is widely used in island nations such as the Philippines and Indonesia. Since air transportation provides high-speed transportation among airports, as time becomes more and more valuable due to economic growth, a transition from road transportation to air transportation is anticipated.

Mid-term Objective 3-1: Improvement and development of trunk road system; Strengthening of road maintenance system; Normalization and standardization of roads and road traffic; Improvement of road transportation services

Mid-term Objective 3-1: Improvement of Road Transportation

Along with being the basic transportation infrastructure for everyday automobile and pedestrian use, roads also perform other various functions.

Examples of these functions include the networking of cities and regions, access to markets, medical facilities and terminals, the formation of urban areas, and the function of roads as firebreaks and disaster prevention spaces. Roads provide an indispensable foundation for the transportation of people and goods in relation to everyday economic activity. This is why roads account for the overwhelming share of investment in transportation infrastructure in developing countries.

Therefore, the development of systems and implementation frameworks for road management and maintenance, education for the improvement of technical skills and securing sources of funds are important issues, for which major donors have implemented various strategies. The World Bank's Road Management Initiative (RMI), which supports Sub-Saharan countries, is one

Table 2-2 Road Function and Effect

Road Functions			Effects, etc.
Transportation Functions	Transportation Functions	• Carrying automobiles, bicycles, pedestrians, etc. • Forming the foundations of public transportation facilities	• Ensuring the safety of road transportation • Shortening time distances • Alleviating traffic congestion, reducing transportation costs • Reducing road traffic pollution, etc.
	Access Functions	• Access to land that runs along roads, buildings, facilities, etc.	• Basic foundations for regional development • Expansion of basic living infrastructure • Promotion of land-use
Spatial Functions		• Accommodating public facilities • Forming favorable roadside environments • Enhancing disaster prevention	• Accommodating lifelines such as electricity, telephone, etc. • Forming anatomy of cities, greening • Functioning as evacuation roads, facilitating fire fighting, etc.

example. This involves efforts towards enhancing management and maintenance in many Sub-Saharan countries in order to facilitate sustained utilization of existing roads. The basic RMI approach involves the establishment of earmarked revenue sources for roads; setting up bodies to perform the development, management and maintenance functions of trunk roads and includes the specialization of government policies. This also has the goal of utilizing a relatively high level of private sector participation in the implementation of road development, management, and maintenance.

In many developing countries, while donor support for new road construction is easy to obtain, securing sources of funding for road management and maintenance is a difficult task. For roads that do not produce income from road users' fees, establishing earmarked revenue sources on the premise of the user principle is important, and the implementation of toll road systems may be worth considering for roads where a certain volume of traffic can be expected.

In general, since large-scale increases in funding sources cannot be expected, it is essential to consider other means of fund procurement, as pointed out in Development Objective 1, such as private sector participation (financial capacity, technological capacity, business capacity) in addition to the efficient use of traditional public funding.

Sub-target 1: Improvement and Development of Trunk Road System
Sub-target 2: Strengthening of Road Maintenance System
Sub-target 3: Normalization and Standardization of Roads and Road Traffic
Sub-target 4: Improvement of Road Transportation Services

JICA's Activities

Japan conducts a significantly large amount of cooperation in relation to

Mid-term Objective 3-1; which, in particular, includes technical cooperation and concessional loans for the improvement and development of infrastructure such as roads, bridges and terminals, and grant aid for road management and maintenance, and construction equipment and materials as well as expert dispatches and training in relation to these activities. However, cooperation mechanisms between political and social issues such as securing sources of road funding, PPPs, and a transition to market economies for transportation services, is extremely limited. One possible reason for this may be the fact that deregulation of road administration progressed slowly in Japan. In any case, in the future, it is essential that emphasis also be given on cooperation relating to social and political issues.

Mid-term Objective 3-2:
Restoration, improvement and development of railway network; Strengthening of railway maintenance system; Normalization and standardization of railway system; Management improvement and privatization

Mid-term Objective 3-2: Improvement of Railway Transportation

Railway transportation features many superior characteristics when compared with other modes of transportation such as efficiency over long distances, high capacity and reliability for commuting to work, superior energy efficiency, low atmospheric pollution, and safety. On the other hand, since railways cannot offer door-to-door services, transportation for both goods and people is shifting towards automobiles, resulting in a significant fall in the usage volume of railway transportation. Furthermore, in countries where railways were developed many years ago, deterioration of this infrastructure is fairly advanced. As a result, many railway businesses have become bankrupt, with the need to improve railway company management as a matter of urgency.

Railways have been operated as monopolies under national jurisdiction in many countries because of their strategic importance. However, as volumes and demand have been declining, rationalization and selective modernization of railway administration are unavoidable. In many countries, privatization through vertical separation and company split-ups/privatization is ongoing.

Sub-target 1: Restoration, Improvement and Development of Railway Network
Sub-target 2: Strengthening of Railway Maintenance System
Sub-target 3: Normalization and Standardization of Railway System
Sub-target 4: Management Improvement and Privatization

JICA's Activities

Recent Japanese technical cooperation has been directed towards the rationalization and privatization of national railways. In addition to proposing cost-reduction strategies for cost centers identified through analyses of the industry, JICA has also provided proposals for related commercial activities in railway terminals and inner-city properties, and proposals directed towards raising railway incomes. Useful references here are the privatization of Japan National Railways, actual examples of the management of JR that followed and examples of management of private railway companies.

Mid-term Objective 3-3:
Restoration, improvement and development of ports and port facilities; Strengthening of port maintenance system; Normalization and standardization of port system; Improvement of port operation and management; Promotion of maritime transportation

Mid-term Objective 3-3: Improvement of Maritime Transportation

The relative advantages of maritime transportation in comparison to other modes of transportation are its ability to move higher volumes of passengers and goods at relatively low costs. Maritime transportation can be broadly divided into bulk transportation and container transportation; with container transportation growing remarkably in recent years. Since the administration of ports was traditionally under the public sector, inefficiency has always been an issue.

Private companies now account for the most portion of maritime transportation. Government administrative bodies must guide business activities in an appropriate direction and they should monitor private companies to ensure that maritime transportation activities are being conducted in accordance with IMO and environmental regulations.

Sub-target 1: Restoration, Improvement and Development of Ports and Port Facilities
Sub-target 2: Strengthening of Port Maintenance System
Sub-target 3: Normalization and Standardization of Port System
Sub-target 4: Improvement of Port Operation and Management
Sub-target 5: Promotion of Maritime Transportation

JICA's Activities

Japan's assistance with regard to Mid-term Objective 3-3 is quite varied, consisting mainly of Master Plans (M/P) and Feasibility Studies (F/S) for port development, the dispatch of experts and training related to port development and port management, and cooperation for the creation of nautical charts. In the future, it is essential for JICA to further enhance approaches towards environmental issues, looking at the relationship between activities and the prevention of marine pollution and preservation of the natural environment.

Mid-term Objective 3-4:
Improvement/development of airport facilities; Improvement/development of aeronautical navigation aid system; Strengthening of airport facility maintenance system; Normalization and standardization of air transportation system; Improvement of airport operation and management

Mid-term Objective 3-4: Improvement of Air Transportation

Air transportation provides faster travel time as compared with railway, road and maritime transportation. Generally, as economic development progresses and when people put more and more value on their time, there is a stronger orientation towards air transportation. Air transportation is not just common for the movement of people, but it is also often chosen by people moving goods from points of production to points of consumption, especially for goods that must be kept fresh (such as raw fish, etc.), and for items of high monetary value (precious metals, jewels, etc.). Air transportation is also an excellent choice during the initial investment and construction phases of new infrastructure development in island nations, and in countries that cover wide areas or where geographic conditions are harsh.

Recently, airport development has been integrated with the privatization of airport management, and common goals in this regard are the rationalization and modernization of management. Over-concentration of activities in the metropolitan airport is common in developing countries, and the development of

regional airports has fallen far behind in comparison to the metropolitan airport.

Deregulation and liberalization of air transportation was comprehensively implemented in America, and this led to liberalization and privatization being thoroughly pursued, with major airlines utilizing “Hub and Spoke” systems, and engaging in strong competition.

Sub-target 1: Improvement/Development of Airport Facilities

Sub-target 2: Improvement/Development of Aeronautical Navigation Aid System

Sub-target 3: Strengthening of Airport Facility Maintenance System

Sub-target 4: Normalization and Standardization of Air Transportation System

Sub-target 5: Improvement of Airport Operation and Management

JICA’s Activities

Although there are fewer activities in relation to Mid-term Objective 3-4 than for ports based on the number, the actual performance and outcomes are quite high. These outcomes have mainly been achieved through M/Ps and F/Ss in relation to the development of airports and safety facilities for navigation, and the dispatch of experts and training in relation to airport development and airport management. Future cooperation can be expected to be oriented towards the development of regional airports and the improvement of aviation security.

Mid-term Objective 3-5:
Development and introduction of intermodal transportation system; Facilitation of intermodal connection; Transportation safety measures; Disaster management; Improvement and development of transportation terminals to contribute to regional development

Mid-term Objective 3-5: Strengthening of Intermodal Transportation as well as Improvement of Issues Common to All Modes of Transportation

Examples of measures that are common in multiple modes of transportation include (i) establishing intermodal transportation systems to facilitate connections between different modes of transportation, (ii) implementing traffic safety measures to reduce traffic accidents and (iii) establishing disaster prevention measures to mitigate the damage caused by disasters.

Containerization is a capital-intensive, high tech, innovative technology of transportation that aims for greater economies of scale. Given that developing countries are generally lacking in all the relevant areas, including economic size, transportation demand density, financial capabilities, and maintenance and technological levels, the importance of containerized transportation must be assessed in light of the economic and technological conditions of each country. However, with the increasing regionalization and globalization of economies, efforts to implement containerization, which itself is an international standard of freight transportation, are essential requirements for economic development. The intermodal transportation system is one in which different transportation facilities are used to transportation containerized freight efficiently and quickly from the place of departure to the destination. An important part of this system is the transfer of freight between different modes of transportation, specifically between the maritime and the land transportation at the harbor and between the land transportation and trucks at the inland container depot. This system requires clear and consistent responsibilities for the intermodal transportation of freight.

Accidents involving automobiles are by far the most common type of traffic accidents, and strategies to deal with this are particularly important. Traffic accidents are mainly caused by a combination of factors relating to the road, the vehicle and the driver. In developing countries, there are many potential causes of traffic accidents because (i) road management and maintenance are neglected resulting in poor road conditions, (ii) automobiles are poorly maintained so that accidents are more likely and (iii) many drivers drive vehicles exceeding speed limits or with excessive loads. Therefore, it is important to as much as possible decrease, if not totally eradicate, these factors and to widely execute a traffic safety education program.

Also, with regard to disaster prevention measures, it is crucial to give emphasis to road disasters. Various types of road disasters can occur, including the destruction of roads due to landslides, the flooding of roads by flooding from rivers and the subsidence of roads due to earthquakes. As finances are enhanced through economic development, more funding becomes available for disaster prevention measures, and road disasters tend to decline. Nevertheless, it is crucial that strategies be established as early as possible especially for areas subject to high level of risk from disasters.

Sub-target 1: Development and Introduction of Intermodal Transportation System

Sub-target 2: Facilitation of Intermodal Connection

Sub-target 3: Transportation Safety Measures

Sub-target 4: Disaster Management

Sub-target 5: Improvement and Development of Transportation Terminals to Contribute to Regional Development

JICA's Activities

Cooperation with regard to Mid-term Objective 3-5 has been implemented in relation to individual Sub-targets. With regard to intermodal transportation systems, proposals have been made on the relationship between port, railway and truck terminals, and cooperation has been implemented in the form of short-term expert dispatches and training. Cooperation in relation to transportation safety and disaster prevention measures has been relatively limited, with activities limited to individual requests. Achieving this Mid-term Objective requires not only efforts from the public sector, but also active participation from the private sector as well as from individuals. Holding events such as seminars and training in order to broaden the cooperation base will therefore be important.

Development Objective 3: Toward Balanced Development of a Whole Country (National Transportation)

Mid-term Objective 3-1: Improvement of Road Transportation

Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
Improvement and Development of Trunk Road System	○ **Development of National Road Networks**	Study on the Roads Network Development (Oman) (DS)
	○ Development of Major Trunk Road Networks (National Roads and Regional Roads)	Feasibility Study on the Improvement of National Road No. 1 (Phnom Penh–Neak Loeung Section) (Cambodia) (GA), Basic Design Study Report on the Project for Construction of the Second Bridge over the Mekong River (Cambodia) (GA), The Feasibility Study on the Construction of Kathmandu–Naubise Alternate Road (Nepal) (DS), Road Network Study in Central and South-East Sulawesi (Indonesia) (DS)
	○ Development of High Standard Trunk Road (Highway) Networks	Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)
	○ Elimination of Missing Links	The Project for Construction of a Bridge over the Mekong River (Cambodia) (GA)
Strengthening of Road Maintenance System	○ **Road Rehabilitation and Road Maintenance**	The Study on the Maintenance and Rehabilitation of Highway Bridges (Turkey) (DS), The Study on Arterial Highway Maintenance (Turkey) (DS), Road Administration with Focus on Maintenance and Management, and Safety Measures (India) (TCP), The Project for Procurement of Road Construction Machinery (Bosnia and Herzegovina) (GA)
	○ Establishment of Road Operation and Maintenance System	Study on the Utilization of Private Sector in the Road Maintenance System (Kenya) (DS), Road Administration with Focus on Maintenance and Management, and Safety Measures (India) (TCP)
Normalization and Standardization of Roads and Road Traffic	○ **Standardization of Road**	The Study on the Standardization of Bridge Design (Malaysia) (DS), Feasibility Study on Upgrading Inter-urban Highway System (Sta. Rita–San. Jose Road Section) (the Philippines) (DS), The Feasibility Study on the Construction of Kathmandu–Naubise Alternate Road (Nepal) (DS)
	△ **Standardization of Vehicles**	Seminar on Road Administration (Tr), Road Engineering and Administration (Tr), Feasibility Study on Upgrading Inter-urban Highway System (Sta. Rita–San. Jose Road Section) (the Philippines) (DS), The Study on the Standardization of Bridge Design (Malaysia) (DS)
	△ **Preparation of Road Construction Ordinance**	
Improvement of Road Transportation Services	△ **Arrangement of Fair Competition Among Transportation Modes, and Provision of Safe Transportation Services** △ **Rationalization and Modernization of Bus Transportation Services and Truck Transportation Services**	The Study on the Standardization of Bridge Design (Malaysia) (DS), Feasibility Study on Upgrading Inter-urban Highway System (Sta. Rita–San. Jose Road Section) (the Philippines) (DS), The Feasibility Study on the Construction of Kathmandu–Naubise Alternate Road (Nepal) (DS)

Mid-term Objective 3-2: Improvement of Railway Transportation

Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
Restoration, Improvement and Development of Railway Network	△ **Development of High-speed Railway System**	Feasibility Study on Railway Improvement Plan of Transportation Capacity and Train Speed on the Delhi–Kanpur Section (India) (DS)
	○ Development of Interurban Railway System	The Feasibility Studies on the Rehabilitation and Improvement of Railway in Viet Nam (Viet Nam) (DS), Project for Repairing Railways (Mongolia) (GA)
	○ Railway Upgrading to Double/Double-double Tracking	The Master Plan Study on the Development of Syrian Railways (Syria) (DS)
	○ Electrification of Railway System	Study on the Detailed Design Study of Railway Electrification and Double Tracking of Java Main Line Project (Indonesia) (DS)
	△ Development of Railway Communication System	Study on the Detailed Design Study of Railway Electrification and Double Tracking of Java Main Line Project (Indonesia) (DS), Master Plan Study on Modernization and Rehabilitation of the National Railways (Bolivia) (DS)
	△ Development/Improvement of Railway Container Terminal	Study on the Railway Yard Improvement (Thailand) (DS)
	△ Development/Improvement of Passenger Facilities	The Study on the Standardization for Integrated Railway Network of Metro Manila (the Philippines) (DS)
	△ Modernization of Rolling Stock and Other Equipments	Study on the Detailed Design Study of Railway Electrification and Double Tracking of Java Main Line Project (Indonesia) (DS)

Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
Strengthening of Railway Maintenance System	○ Strengthening of Maintenance Technique and Capability of Railway Track, Rolling Stock and Railway System	Yazd Signaling Training Center Project (Iran) (PTC), The Feasibility Study on the Construction of Electric Locomotive Repair Workshop (Uzbekistan) (DS), The Feasibility Study on the Rehabilitation Project of the Mongolian Railway (Mongolia) (DS), The Master Plan Study on the Development of Syrian Railways (Syria) (DS)
Normalization and Standardization of Railway System	○ Standardization of Railway System	The Study on the Standardization for Integrated Railway Network of Metro Manila (the Philippines) (DS)
Management Improvement and Privatization	○ Improvement of Railway Company Management	Master Plan Study on Long-term Management of Bulgarian Railways (Bulgaria) (DS), Railway Management Planning (Tr), Study on Tariffs and Improved Cost Recovery for Egyptian National Railways: Alternative Study (Egypt) (DS)
	○ Privatization of National Railway Company	Study on Privatization of Polish State Railways (Poland) (DS), Master Plan Study on Long-term Management of Bulgarian Railways (Bulgaria) (DS)

Mid-term Objective 3-3: Improvement of Maritime Transportation

Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
Restoration, Improvement and Development of Ports and Port Facilities	○ **Development of International Container Terminal**	Study on the Rehabilitation Plan and the Container Terminal Operation Plan at the Port of Cristobal (Panama) (DS)
	○ Development of International Cargo and Passenger Terminal (Bulk, Ro/Ro, etc.)	The Study on the Cebu Integrated Port Development Plan (Preparatory Study) (the Philippines) (DS), The Master Plan Study for the Coastal Channels and Ports Development (Thailand) (DS)
	○ Development of Domestic Cargo and Passenger Terminal	The Study on Long Term National Port Development Plan (Turkey) (DS)
	○ **Development of Access Transportation Systems for Port Facilities (Roads/Railways)**	Study on the Rehabilitation Plan and the Container Terminal Operation Plan at the Port of Cristobal (Panama) (DS), Regional Development Study on the Three States: Espirito Santo, Minas Gerais and Goias (Brazil) (DS), The Study on the Master Plan of Container Cargo Handling Ports, Dry Ports and Connecting Railways (Indonesia) (DS)
Strengthening of Port Maintenance System	△ **Improvement of Maintenance and Repair Technique**	The Study for Maintenance and Improvement Plan of Access Channel of Beira Port (Mozambique) (DS)
	△ **Strengthening of Management and Operation System**	Study on the Effective Port Management and Operation System (Thailand) (other)
Normalization and Standardization of Port System	△ **Enhancement of Data Computerization (e.g. EDI)**	Study on Maritime Traffic Safety System Development Plan: Maritime Telecommunication Facilities; Inventory, Plant Records and Outlook (Indonesia) (DS)
	○ **Ratification of International Security Standard**	Master Plan Study on Coastal Shipping Rehabilitation and Development Project (Viet Nam) (DS), Comprehensive Study on Shipbuilding Industry Development (Indonesia) (DS), International Maritime Conventions and Ship Safety Inspection (Tr)
	○ **Ratification of International Safety Standard**	Master Plan Study on Coastal Shipping Rehabilitation and Development Project (Viet Nam) (DS), International Maritime Conventions and Ship Safety Inspection (Tr)
Improvement of Port Operation and Management	△ **Enhancement of Efficient Operation (e.g. Privatization)**	The Study for Port Development Strategy in the Republic of Indonesia (Indonesia) (DS)
	○ **Improvement of Security Measures**	Master Planning and Feasibility Study on the Sihanoukville Port (Cambodia) (DS), Study on Maritime Safety Plans Concerning Search and Rescue (Indonesia) (DS)
	△ **Institutional Setup and Improvement**	Study on the Effective Port Management and Operation System (Thailand) (other)

Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities	
Promotion of Maritime Transportation	○ Improvement of Safety	Education Program for Crew	The Study for Port Development Strategy in the Republic of Indonesia (Indonesia) (DS), Study on Maritime Safety Plans Concerning Search and Rescue (Indonesia) (DS)
		Improvement of Ship Management Technique	Master Planning and Feasibility Study on the Sihanoukville Port (Cambodia) (DS)
	○ Improvement of Services	Policy of Maritime Transportation Promotion and Legal System Setup	The Study for Port Development Strategy in the Republic of Indonesia (Indonesia) (DS), Study on Maritime Safety Plans Concerning Search and Rescue (Indonesia) (DS), Study on Development of Domestic Maritime Transportation and Marine Industry (Indonesia) (DS)
		Development of Maritime Transportation Routes	Study on Pan-Philippine Highway Ferry Service Plan (the Philippines) (DS)
		Improvement of Maritime Company Management	The Study for Port Development Strategy in the Republic of Indonesia (Indonesia) (DS)
	△ **Improvement of Shipbuilding (incl. Repair Technique)**	Master Plan Study on Coastal Shipping Rehabilitation and Development Project (Viet Nam) (DS), Comprehensive Study on Shipbuilding Industry Development (Indonesia) (DS)	

Mid-term Objective 3-4: Improvement of Air Transportation

Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
Improvement/ Development of Airport Facilities	○ **Development of Airport Facilities**	Study on the Development of Chittagong Airport (Bangladesh) (DS), Feasibility Study on New Alexandria International Airport Construction Project (Egypt) (DS)
	○ **Development of Access Transportation Systems to Airport Facilities (Roads/Railways)**	Study on the Development of Chittagong Airport (Bangladesh) (DS)
Improvement/Development of Aeronautical Navigation Aid System	○ **Development of Aeronautical Navigation Aid**	Study on Modernization of Tribhuvan International Airport in Kathmandu (Nepal) (DS)
	○ **Development of Air Traffic Control System**	Project for Rehabilitation of the Approach Radar Facility in the Ninoy Aquino International Airport (the Philippines) (GA (facilities + equipment and materials)), The Project for Improvement of Existing Air Traffic Services Equipment System under the Tribhuvan International Airport Modernization Project (Nepal) (GA (equipment and materials))
	○ **Development of Air Traffic Control Airspace/Flight Route**	Study on the Development of the National Air Transportation Network (Nepal) (DS)
Strengthening of Airport Facility Maintenance System	△ **Improvement of Maintenance and Repair Technique**	Seminar on Airport Engineering Policy (Tr)
	△ **Strengthening of Operation and Management**	
Normalization and Standardization of Air Transportation System	○ **Ratification of International Security Standard**	Study on the Development of Chittagong Airport (Bangladesh) (DS), Feasibility Study on the Bali International Airport Development (Indonesia) (DS)
	○ **Ratification of International Safety Standard**	
Improvement of Airport Operation and Management	△ **Improvement of Operational Efficiency**	The Study on Air Transport Development (Uzbekistan) (DS), Study on the Development of a New CNS/ATM System in the Republic of the Philippines (DS), The Project for Improvement of Equipment of the Kabul International Airport (Afghanistan) (GA (equipment and materials))
	△ **Improvement of Security Measures**	
	△ **Institution Setup and Improvement**	

Mid-term Objective 3-5: Strengthening of Intermodal Transportation as well as Improvement of Issues Common to All Modes of Transportation		
Sub-targets of Mid-term Objective	**Examples of Activities for Achieving Sub-targets**	**JICA's Major Activities**
Development and Introduction of Intermodal Transportation System	○ **Development of Multimodal Container Transportation Network**	The Study on the Master Plan of Container Cargo Handling Ports, Dry Ports and Connecting Railways (Indonesia) (DS), Study on the Integrated Development Project for Ports in the Capital City Region (the Philippines) (DS)
	△ **Enhancement of Logistic Terminal Capabilities**	Study on the Effective Port Management and Operation System (Thailand) (DS)
Facilitation of Intermodal Connection	○ **Development of Railway System as Airport Access**	Study on New Railway Line Jakarta-Cengkareng Airport (Indonesia) (DS)
Transportation Safety Measures	△ **Development of Transportation Safety Facilities**	Study on Road Traffic Safety in Hanoi (Viet Nam) (Overseas Basic Study), Traffic Safety Plan for Roads (Thailand) (DS), Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS)
	△ **Transportation Safety Education Program**	
Disaster Management	○ **Development of Framework and System of Disaster Prevention**	Study on Vulnerability Reduction for Major Roads (Nicaragua) (DS), Slope Disaster Management Study for Federal Highways (Malaysia) (DS), The Study on Road Disaster Prevention Plan (Thailand) (DS)
	Ensuring Traffic Channel for Emergency and Network Redundancy (Alternative Route)	
	○ **Measures for Slope Protection and Rock Fall Protection**	Feasibility Study on the Improvement of National Road No. 1 (Phnom Penh–Neak Loeung Section) (Cambodia) (GA)
	○ **Enhancement of Seismic Adequacy of Roads and Bridges**	The Study on the Improvement of Existing Bridges along Pasig River and Marikina River (the Philippines) (DS)
Improvement and Development of Transportation Terminals to Contribute to Regional Development	△ Development of "Michi-no-Eki"	Study on Tourism Development in the Central Areas (Viet Nam) (Preparatory Study) (DS)
	△ **Development of Tourist Route**	Study on Community-based Eco-tourism Development (Bosnia and Herzegovina) (DS)

The circle, triangle and blank marks in the Examples of Activities for Achieving Sub-targets column indicate the status of JICA's efforts.
○: JICA can demonstrate specific outcomes for implementation of this as an objective of cooperation activities.
△: Has been included as one element of JICA cooperation.
Unmarked: JICA has achieved very few outcomes in relation to these items.
Please note that these marks are only intended to give a rough indication of JICA's implementation outcomes, and that blank marks do not indicate that items are inadequate for inclusion in cooperation activities. Blank marks simply indicate that, since JICA has not previously implemented such items, such activities may be somewhat challenging if included in new cooperation undertakings.

DS: Development Study
GA: Grant Aid
PTC: Project-type Technical Cooperation
TCP: Technical Cooperation Project
Tr: Training program

Development Objective 4:
Toward Sustainable Urban Development and Improvement of Urban Life

Development Objective 4: Toward Sustainable Urban Development and Improvement of Urban Life (Urban Transportation)

Economic disparities between the metropolitan area and rural areas are wide in developing countries, and the migration of populations from rural areas to the metropolitan area has continued over a long period. Private sector investment, in the form of FDI for example, tends to be strongly concentrated in the metropolitan area, and this has also been continuously true of economic activity. Restricting the concentration of population and economic activity in the metropolitan area is difficult, and the concentration as well as overcrowding of major cities is a significant development issue faced by many developing countries. Although the severity of urban transportation problems differs depending on the development level in the country or city concerned, severe traffic congestion during peak periods brought on by the rapid increase of motorization, together with the associated economic losses and adverse environmental effects are major issues. It will be essential to expand transportation capacity by improving existing roads and developing new roads in order to rectify these problems. However, since there are limits to how far transportation capacity can be expanded in limited urban areas, promoting the

Box 2-1 The City of London's Congestion-Charging Scheme

In the City of London, which was facing chronic road traffic congestion problems, on February 17, 2003, a system of charging £8 per day to cars entering the central London area (approximately 21 km^2) on weekdays between 7:00 and 18:30 was implemented in an effort to alleviate traffic congestion. A comprehensive network of CCTV cameras (surveillance cameras) and movable digital cameras records the number plates of vehicles entering the area, and this information is cross-referenced with a database at the transportation department to check for vehicles that have not paid the charge, thus regulating the violations.

The London Department for Transportation has reported that following the introduction of the charges, congestion within the area has decreased by 30% on the average; traffic has decreased by 18% and excessive bus waiting times have decreased by 30%. It was further reported that the number of automobiles in the congestion-charging zone has decreased by around 70,000 trips, and that this represents the following transitions:

(1) 50–60% shifting to public transportation
(2) 20–30% detouring to avoid the charge area
(3) 15–25% changing traveling hours

The reaction of city residents before the introduction of the charge system showed that 42% were against its implementation while 38% were in favor. A similar survey after the system's introduction showed that more people were now in favor of the system's implementation.

Source: Express Highway Research Foundation of Japan (2005), TMG Bureau of Environment website under *"Rondon no konzatsu kakin seido" [London's Congestion Charge System]*

transition from individual automobile transportation to public transportation is crucial. Therefore, the improvement of public transportation services, and the management of demand for individual automobile transportation are also very important issues.

Management of the demand for individual automobile transportation is an extremely important measure towards promoting a transition to public transportation. Main strategies in this regard include comprehensive parking regulations in inner-city areas and restrictions on vehicle entry into certain designated areas. Although restrictions on vehicle entry have succeeded in Singapore, in general, there are only a few other examples of this strategy being implemented because of difficulty in building a consensus.

Mid-term Objective 4-1:
Traffic capacity increase of arterial roads, intersections and bridges under the jurisdiction of central government; Restoration and improvement of secondary roads and their maintenance system under the jurisdiction of local government; Promotion of private sector participation in urban transportation through PPPs

Mid-term Objective 4-1: Improvement and Development of Urban Transportation Infrastructures

A problem facing urban transportation is heavy traffic. This heavy traffic has developed due to the volume of vehicular traffic which has reached the saturation point in terms of road capacity. It has become necessary to increase road capacity in traffic bottlenecks by, for example, increasing the number of lanes in two lane roads or replacing level crossings with overpasses. However, with the limited urban space available, it is extremely difficult to develop new roads. At the same time, the number of automobiles is rapidly increasing due to larger individual incomes and an expanding used-car market.

In many developing countries, major trunk roads in the metropolitan area have been developed and maintained relatively well under the jurisdiction of the central government. However, secondary roads, feeder roads and other roads under the jurisdiction of local governments are often left without proper maintenance, thus further contributing to the development of traffic congestion. To see improvements in this regard, it is extremely important to strengthen the road administration capabilities and financial resources of local governments and at the same time increase coordination among neighboring local governments.

In urban areas where traffic demand is significant, there is a greater need for the development of bypasses, ring roads and similar traffic infrastructures. There is a high possibility that private sector participation may be introduced by using such roads as toll roads.

Sub-target 1: Traffic Capacity Increase of Arterial Roads, Intersections and Bridges under the Jurisdiction of Central Government

Sub-target 2: Restoration and Improvement of Secondary Roads and their Maintenance System under the Jurisdiction of Local Government

Sub-target 3: Promotion of Private Sector Participation in Urban Transportation through PPPs

JICA's Activities

Ensuring smooth transportation structures within urban areas requires plans based on the city's current and planned future development. Therefore, for cities

that do not have master plans for urban transportation, JICA conducts cooperation for the formulation of M/Ps relating to mid- to long-term urban transportation. JICA also conducts F/S's regarding facilities that have been identified as priorities in M/Ps to verify the relevance of projects and the capacity for management and maintenance. Technical cooperation (development studies, expert dispatches, training, etc.) and Grant Aid or Concessional Loans are carried out for road development, the improvement of intersections, the construction of bridges and the like, within urban areas.

Mid-term Objective 4-2:
Improvement of bus services; Introduction of rail-based public transportation services including MRT and LRT; Management improvement of public transportation service providers

Mid-term Objective 4-2: Improvement and Development of Urban Public Transportation Services

If individual automobile transportation is to be reduced, alternative means of transportation are required and good public transportation services are indispensable. In general, public transportation fares are set at a low level to enable usage by the poor. However, in order to encourage a transition from individual automobile transportation to public transportation, it is necessary to provide high quality services that are punctual, reliable, comfortable, and safe, even if this will lead to raising of fares to some extent. This may involve, for example, the installation of bus lanes to improve the speed and punctuality of buses, the introduction of rail-based public transportation services that are separated from roads such as LRT (Light Rail Transit) and MRT (Mass Rail Transit) and the introduction of high-speed commuting services through the electrification of existing railways. Also, strategies that make public transportation services more attractive are also required to encourage the transition to these services, and this may be done by developing terminals that contain commercial facilities and improving feeder transportation facilities, and by pursuing development that is integrated with surrounding land use.

Sub-target 1: Improvement of Bus Services

Sub-target 2: Introduction of Rail-based Public Transportation Services including MRT and LRT

Sub-target 3: Management Improvement of Public Transportation Service Providers

JICA's Activities

JICA conducts a wide range of cooperation in relation to Mid-term Objective 4-2 including the creation of urban transportation master plans through Development Studies, the dispatch of experts to provide cooperation for the improvement of bus services management and the improvement of existing railway services, F/S's regarding the introduction of rail-based public transportation services such as LRT and MRT as indicated in Development Studies, and overall improvements in public transportation services through training.

Mid-term Objective 4-3:
Promotion of modal shift from private cars to public transportation services; Optimization of urban transportation demand; Improvement of urban transportation operation and management

Mid-term Objective 4-3: Transportation Demand Management (TDM)

If restrictions on vehicle entry into inner-city areas are to be implemented, there are many issues to be resolved on the basis of agreement among the various stakeholders. These include setting the target area, vehicle number restrictions, methods of collecting charges, systems of surveillance and monitoring, and administrative entities. Strong leadership from government is important in implementing these types of systems, and it is important to note that commercial activities in central areas may drop if alternative means of transportation are poor, which means that these strategies cannot be implemented in the same way in all large cities.

Sub-target 1: Promotion of Modal Shift from Private Cars to Public Transportation Services

Sub-target 2: Optimization of Urban Transportation Demand

Sub-target 3: Improvement of Urban Transportation Operation and Management

JICA's Activities

JICA's activities in relation to Mid-term Objective 4-3 focus mainly on cooperation for the formulation of urban transportation master plans through development studies. Although there are examples of vehicle restriction zones and parking restrictions proposed as part of M/P studies, practical outcomes of cooperation are extremely limited in this area.

Mid-term Objective 4-4:
Traffic safety education; Enforcement of traffic safety laws and regulations; Improvement of traffic safety technology

Mid-term Objective 4-4: Enhancement of Transportation Safety

The metropolitan area is home to large numbers of people and large volumes of concentrated traffic, and the incidence of traffic accidents is extremely high. It is essential to bring about transportation safety by combining various traffic accident prevention strategies such as (i) facilities related strategies for preventing traffic accidents, (ii) strategies aimed at improving driving and the road worthiness of vehicles, (iii) legal system upgrades and the enhancement of surveillance in order to prevent traffic accidents, and (iv) the enhancement of traffic safety education. It is also important to designate certain periods for traffic safety campaigns in order to raise people's awareness in this regard.

Sub-target 1: Traffic Safety Education

Sub-target 2: Enforcement of Traffic Safety Laws and Regulations

Sub-target 3: Improvement of Traffic Safety Technology

Mid-term Objective 4-5:
Exhaust gas emission control; Improvement of road infrastructure and facilities in view of preventing environmental degradation; Introduction of policy measures to mitigate urban environmental degradation

Mid-term Objective 4-5: Prevention/Improvement of Environmental Deterioration due to Urban Transportation

Environmental strategies are particularly important in large cities since there are higher numbers of private automobiles.

The major environmental impacts of private automobiles are due to noise and air pollutants such as carbon dioxide (CO_2), nitrogen oxides (NOx) and

suspended particles (SP). The effects are particularly prevalent in areas that run along heavily congested roads. Since older cars with no modifications to make them more environment-friendly are very common in developing countries, fuel consumption volume and exhaust emission volume are high because cars are not regularly maintained. Cooperation aimed at enhancing strategies for preventing environmental deterioration and for improving the environment would be a step in the right direction. This may include the establishment of a vehicle servicing system aimed at conforming with environmental laws that are in place, the enhancement of monitoring systems, the reduction of sources of emissions, and the application of penalties for vehicles that do not conform with legal requirements.

Sub-target 1: Exhaust Gas Emission Control

Sub-target 2: Improvement of Road Infrastructure and Facilities in view of Preventing Environmental Degradation

Sub-target 3: Introduction of Policy Measures to Mitigate Urban Environmental Degradation

Development Objective 4: Toward Sustainable Urban Development and Improvement of Urban Life (Urban Transportation)

Mid-term Objective 4-1: Improvement and Development of Urban Transportation Infrastructure		
Sub-targets of Mid-term Objective	**Examples of Activities for Achieving Sub-targets**	**JICA's Major Activities**
Traffic Capacity Increase of Arterial Roads, Intersections and Bridges under the Jurisdiction of Central Government	○ **Development of Trunk Road Network and Bypass**	The Master Plan and Feasibility Study to Alleviate Traffic Congestion and Improve Traffic Safety in the Nairobi Metropolitan Area (Kenya) (DS), Feasibility Study on Road Network Improvement for Development of Regional Growth Centers (the Philippines) (DS), Study on Upgrading Inter-Urban Highway System along the Pan-Philippine Highway (Plaridel, Cabanatuan, San Jose Bypass) (the Philippines) (DS), The Feasibility Study on Kuala Lumpur Outer Ring Road Project (Malaysia) (DS), The Transport Master Plan of the Phnom Penh Metropolitan Area (Cambodia) (DS), Feasibility Study on the Project of Highway and Bus Lane of Santa Fe de Bogota (Colombia) (DS)
	○ Improvement of Intersections	The Study on Improvement of Road Traffic Environment in Chiang Mai (Thailand) (DS), The Master Plan and Feasibility Study to Alleviate Traffic Congestion and Improve Traffic Safety in the Nairobi Metropolitan Area (Kenya) (DS), Study on Road Traffic Safety in Hanoi (Viet Nam) (Overseas Basic Study)
	○ Development of Hubs/Terminal (Airport, Port, Station, etc.)	The Master Plan and Feasibility Study to Alleviate Traffic Congestion and Improve Traffic Safety in the Nairobi Metropolitan Area (Kenya) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS)
	○ Enhancement of Access to Airports, Ports, Stations, etc.	Feasibility Study on Railway Improvement Plan in the Klang Valley Area (Malaysia) (DS)
	○ Development of Logistic Hubs in Urban Area	The Study on Greater Bangkok Truck Terminal (Thailand) (DS)
Restoration and Improvement of Secondary Roads and their Maintenance System under the Jurisdiction of Local Government	○ **Development/Improvement of Local Roads in Urban Area**	Study for Public Transportation Improvement in Chengdu City (China) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS), The Transport Master Plan of the Phnom Penh Metropolitan Area (Cambodia) (DS)

Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
Promotion of Private Sector Participation in Urban Transportation through PPPs	△ Setup of Legal System for PPPs	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS), Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)
	△ Capacity Improvement of Implementation Agency in PPP Introduction/Operation	

Mid-term Objective 4-2: Improvement and Development of Urban Public Transportation Services		
Sub-targets of Mid-term Objective	**Examples of Activities for Achieving Sub-targets**	**JICA's Major Activities**
Improvement of Bus Services	○ Improvement of Bus Services (Bus Network, Punctuality, Fare, etc.)	Study for Public Transportation Improvement in Chengdu City (China) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS)
	○ Development/Improvement of Bus Related Facilities	The Project for Rehabilitation of the Public Transportation System in Kabul City (Afghanistan) (GA), Rehabilitation of the Public Transportation Capacity in Belgrade City (Serbia and Montenegro) (GA), Basic Design Study Report on the Project for Rehabilitation of Mostar City Transportation System (Bosnia and Herzegovina) (GA), The Project for Improvement of Public Transportation in Ulan Bator (Mongolia) (GA)
	○ Re-organization and Improvement of Para-transit Transportation	The Transport Master Plan of the Phnom Penh Metropolitan Area (Cambodia) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS), Urban Transportation Improvement in the City of Baku (Azerbaijan) (DS)
	○ Development of Bus Priority Lane and Exclusive Bus Lane	The Feasibility Study of the Proposed Cavite Busway System (the Philippines) (DS), Feasibility Study on the Project of Highway and Bus Lane of Santa Fe de Bogota (Colombia) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS)
	○ Enhancement of Feeder Transportation	The Feasibility Study of the Proposed Cavite Busway System (the Philippines) (DS), Feasibility Study on the Project of Highway and Bus Lane of Santa Fe de Bogota (Colombia) (DS), Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS), Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS)
Introduction of Rail-based Public Transportation Services including MRT and LRT	○ Development of Medium Capacity Transit Systems (Tram, LRT)	The Comprehensive Urban Transport Study of Bucharest City and Its Metropolitan Area (Romania) (DS), The Study on Metro Manila Urban Transportation Integration (the Philippines) (DS), Urban Transportation Improvement in the City of Baku (Azerbaijan) (DS)
	△ Development of Mass-transit Transportation System	Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS), The Study on an Improvement Plan for Railway Transport in and around the Bangkok Metropolis in Consideration of Urban Development (Thailand) (DS), Study on Singapore Urban Transportation Improvement (Singapore) (DS)
Management Improvement of Public Transportation Service Providers	△ Promotion of Operational Efficiency of Public Transportation company	Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS), Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS)

Mid-term Objective 4-3: Transportation Demand Management (TDM)		
Sub-targets of Mid-term Objective	**Examples of Activities for Achieving Sub-targets**	**JICA's Major Activities**
Promotion of Modal Shift from Private Cars to Public Transportation Services	○ **Promotion of Public Transportation Use**	Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS), The Transport Master Plan of the Phnom Penh Metropolitan Area (Cambodia) (DS), The Study on Improvement of Road Traffic Environment in Chiang Mai (Thailand) (DS), The Comprehensive Urban Transport Study of Bucharest City and Its Metropolitan Area (Romania) (DS)
	○ **Promotion of Bicycle Usage**	The Study on Improvement of Road Traffic Environment in Chiang Mai (Thailand) (DS)
Optimization of Urban Transportation Demand	**Devisal of Vehicle Usage**	
	○ **Alleviation of Vehicular Transportation Demand**	Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS), Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS)
Improvement of Urban Transportation Operation and Management	○ **Vehicular Traffic Control Improvement**	Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS), Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS)
	△ **Vehicle Flow Control by Parking Policies**	The Comprehensive Urban Transport Study of Bucharest City and Its Metropolitan Area (Romania) (DS)
	○ **Development/Improvement of Traffic Control Centers**	Study on the Development of a Control System for Urban Transportation in Bangkok (Thailand) (DS)
	△ **Improvement of Intersection Traffic Flow Management System and Signal Management**	Study on the Development of a Control System for Urban Transportation in Bangkok (Thailand) (DS), The Project for Improvement of Intersections in Kathmandu City (Nepal) (DS)

Mid-term Objective 4-4: Enhancement of Transportation Safety		
Sub-targets of Mid-term Objective	**Examples of Activities for Achieving Sub-targets**	**JICA's Major Activities**
Traffic Safety Education	△ **Introduction and Improvement of License System**	Regulation and Type Approval System for Safety and Environmental Protection of Motor Vehicle (Tr)
	○ **Introduction of Transportation Safety Education Program**	Study on Road Traffic Safety in Hanoi (Viet Nam) (Overseas Basic Study), Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS), Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS)
Enforcement of Traffic Safety Laws and Regulations	○ **Provision of Transportation Safety Agency and Transportation Related Legal System**	Traffic Safety Plan for Roads (Thailand) (DS), Study on Road Traffic Safety in Hanoi (Viet Nam) (Overseas Basic Study)
	△ **Capacity Development of Enforcement Agency (Police)**	Traffic Police Administration (Tr)
Improvement of Traffic Safety Technology	△ **Setup and Improvement of Safety Standard for Vehicle and Motorcycle**	The Master Plan for Lima and Callao Metropolitan Area Urban Transportation (Peru) (DS), Motor Vehicle Inspection and Maintenance System (Tr)
	○ **Improvement of Road Facility and Structure**	The Project for Improvement of Intersections in Kathmandu City (Nepal) (GA), The Project for Improvement of Road Network in Luanda (Angola) (GA), The Study on Improvement of Road Traffic Environment in Chiang Mai (Thailand)

Mid-term Objective 4-5: Prevention/Improvement of Environmental Deterioration due to Urban Transportation		
Sub-targets of Mid-term Objective	**Examples of Activities for Achieving Sub-targets**	**JICA's Major Activities**
Exhaust Gas Emission Control	△ **Introduction of Vehicular Inspection System**	Motor Vehicle Inspection and Maintenance System (Tr)
	Improvement of Catalyst and Fuel	
Improvement of Road Infrastructure and Facilities in view of Preventing Environmental Degradation	△ **Improvement of Road Facilities and Road Structure**	Traffic Safety Plan for Roads (Thailand) (DS)
	△ **Environmental Measures for Road Development (Bypass Development, etc.)**	Study on Integrated Urban Transportation Strategies for Environmental Improvement in Kuala Lumpur (Malaysia) (DS), Comprehensive Urban Transportation Study in Barranquilla (Colombia) (DS)
Introduction of Policy Measures to Mitigate Urban Environmental Degradation	**Enhancement of Gas Emission Control**	
	△ **Introduction of TDM**	Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS), The Master Plan for Lima and Callao Metropolitan Area Urban Transportation (Peru) (DS), Study on Integrated Urban Transportation Strategies for Environmental Improvement in Kuala Lumpur (Malaysia) (DS), Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS)

The circle, triangle and blank marks in the Examples of Activities for Achieving Sub-targets column indicate the status of JICA's efforts.
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Unmarked: JICA has achieved very few outcomes in relation to these items.
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DS: Development Study
GA: Grant Aid
PTC: Project-type Technical Cooperation
TCP: Technical Cooperation Project
Tr: Training program

Development Objective 5:
Toward Sustainable Rural Development and Improvement of Rural Life

Development Objective 5: Toward Sustainable Rural Development and Improvement of Rural Life (Rural Transportation)

Economic disparities between major cities and rural areas are wide in developing countries, and the movement of populations from rural areas to major cities has been occurring continuously for a long time. The flow of the labor force out of rural areas is slowing rural activity, thereby further expanding disparities between these areas and large cities.

It is important for people in rural areas to be contented with their life even without moving to the cities. Thus, from the perspective of civil minimum, it is important that transportation arrangements within the rural areas, and between rural and other areas, are adequate.

Ensuring sufficient transportation arrangements between rural and other areas is related to Development Objective 3: Toward Balanced Development of a Whole Country (National Transportation). In particular, the improvement of road transportation and vessel-based (domestic shipping, airlines) transportation is important. It would be desirable to completely upgrade transportation conditions within regions. However, for areas that are experiencing financial constraints, it is important to consider the necessity, urgency and relevance of transportation infrastructure development, and to implement feasible measures according to needs.

Problems relating to rural transportation include (i) sparse population densities and underdeveloped roads, (ii) inadequate management and maintenance of existing road infrastructure due to insufficient sources of funds and (iii) low mobility faced by residents of remote rural areas.

Mid-term Objective 5-1:
Provision of basic transportation infrastructure and services to secure civil minimum; Enhancement of transportation safety and reliability

Mid-term Objective 5-1: Improvement of Rural Transportation Infrastructure

Although it is difficult to find the relevance for rural infrastructure development from the point of view of profitability and efficiency, the development of feeder roads that connect residences, farm villages, schools, medical facilities, markets, and the like, which are located some distance from trunk roads is extremely important for improving people's lives, and also with regard to the contemporary issue of poverty reduction.

In areas where the rainy season brings concentrated rainfall, since there are many roads that do not provide adequate passage due to the destruction of road surfaces, the restoration of road surfaces following the rainy season is crucial. Ensuring the civil minimum is desirable, and this may be achieved by upgrading to all-weather roads, or through regular maintenance.

There are some points of caution here. Road developments that go beyond rural management and maintenance capacities should be avoided, and it is desirable to utilize appropriate technology that will allow sustained management and development with local resources.

Sub-target 1: Provision of Basic Transportation Infrastructure and Services to Secure Civil Minimum

Sub-target 2: Enhancement of Transportation Safety and Reliability

JICA's Activities

Japan can demonstrate many successful outcomes in relation to Mid-term Objective 5-1, including the construction of roads and bridges through Grant Aid, and road restorations through grassroots grant aid. Since small-scale bridges constructed through Japanese cooperation are not washed away during rainy seasons ensuring access all year round, they are highly valued by residents from all areas concerned.

Mid-term Objective 5-2:
Maintenance and improvement of public transportation services with a view to satisfying civil minimum; Provision of transportation services for better living standard; Improvement of safety and reliability of public transportation services

Mid-term Objective 5-2: Improvement of Rural Public Transportation Services

There are various development issues that are unique to rural areas such as low population densities, a lack of industrial diversity, vulnerability to external environmental changes, and the difficulty of introducing market principles. Therefore, transportation services in rural areas are commonly limited to low standards.

Transportation services in rural areas such as buses and taxis are prone to be of low quality or may not be provided at all because of profitability and efficiency considerations. Where these types of situations occur, vehicles such as bike taxis, cyclos and pickup trucks are operated illegally. Although they readily provide a means of transportation for people, problems exist in relation to safety and other issues.

In rural areas, feeder transportation services that require small amounts of initial capital, such as bike taxis and pickup trucks, lend themselves to being provided at the individual level. Entry into the market for feeder transportation services is relatively easy, and this plays a significant role in terms of securing employment in developing countries. However, although these services are cheap, there are problems in terms of ensuring quality, safety and reliability, and it may be necessary for governments to provide operation, management and improvement.

Sub-target 1: Maintenance and Improvement of Public Transportation Services with a view to Satisfying Civil Minimum

Sub-target 2: Provision of Transportation Services for Better Living Standard

Sub-target 3: Improvement of Safety and Reliability of Public Transportation Services

JICA's Activities

Although JICA conducts activities in relation to Mid-term Objective 5-2 as part of integrated regional development plans created through Development Studies, there is still very little cooperation in this area. With regard to Japan's activities, there is an example of improvements to bus management being required in relation to the provision of buses in a rural city. However, this is an isolated example.

Mid-term Objective 5-3:
Improvement of funding mechanisms for rural transportation; Supporting private sector and technicians to study technologies suitable for locality; Establishment of road development and maintenance system based on participation of local people

Mid-term Objective 5-3: Enhancement of Sustainability of Rural Transportation Systems

Since transportation infrastructure development, management and maintenance involve high costs, securing the necessary financing is not an easy task. Since these problems are even more difficult in areas of low population density and transportation demand, finance from external areas is required. It is important to secure a certain level of funding sources through, for example, the establishment of legal and budgeting systems for procuring financial resources. Strategies may include clarifying the allocation of national and rural roles and introducing subsidies.

In order to promote self-sustaining development of rural infrastructure, it is important to accurately understand the needs, achieve cost reductions and efficient management and maintenance, and foster ownership. Involving residents from the planning stages and ensuring that their opinions are reflected in projects is an effective approach. Since it may also be leaving responsibilities and burdens on them, careful examination of the issues is required. Examples of the “Food for Work” approach being used at the construction stage are becoming more prevalent.

In general, rural industry is dominated by agriculture and there are limited opportunities for cash income. Therefore, using infrastructure development to provide employment opportunities is crucial. To facilitate this, it is essential to provide occupational training so that rural residents can be involved in infrastructure development, management and maintenance. It is also necessary to provide training for personnel involved in the provision of transportation services on a continuous basis in order to ensure that transportation services are highly reliable and safe.

Sub-target 1: Improvement of Funding Mechanisms for Rural Transportation

Sub-target 2: Supporting Private Sector and Technicians to Study Technologies Suitable for Locality

Sub-target 3: Establishment of Road Development and Maintenance System based on Participation of Local People

JICA’s Activities

Ensuring self-sustaining development is crucial to the success or failure of projects. Therefore, in relation to Development Study proposals and Basic Design Studies for Grant Aid, various suggestions aimed at securing sustainability and self-dependence are put forward in addition to the verification of project work plans, feasibility and relevance.

In relation to the road and bridge development projects that are being carried out over several years in the Philippines, construction and monitoring of construction for relatively long bridges in excess of 100m are carried out by Japanese personnel. For short bridges of around 50m, however, only the materials and equipment (superstructure, etc.) required for construction are provided from Japan. Local companies carry out construction, receiving

cooperation and advice from Japanese construction companies and construction monitoring companies. Having these companies build the bridges themselves not only allows appropriate technology to be utilized, but also contributes to their development, making these projects quite successful.

Development Objective 5: Toward Sustainable Rural Development and Improvement of Rural Life

Mid-term Objective 5-1: Improvement of Rural Transportation Infrastructure

Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
Provision of Basic Transportation Infrastructure and Services to Secure Civil Minimum	○ Development of Feeder Roads and Small Bridges with Appropriate Technique	The Project for Construction of Bridges along Rural Roads in Northern Luzon (the Philippines) (GA), The Project for Improvement of Portable Street Bridges for Feeder Roads (Bangladesh) (GA), The Project for Reconstruction of Bridges in the Northern District (Viet Nam) (GA), Feasibility Study on Road Network Improvement for Development of Regional Growth Centers (the Philippines) (DS)
	○ Development of Local Ports	Study on the Comprehensive Ports Development Plan (Panama) (DS)
	○ Development of Local Airports	The Study on Selected Airports Master Planning Project (the Philippines) (DS), The Study on Airport Development Master Plan in the Kingdom of Thailand (Thailand) (DS)
Enhancement of Transportation Safety and Reliability	○ Implementation of Regular Checks/Maintenance	The Study on Rural Roads Improvement in Western Kenya (Kenya) (DS), Study on the Utilization of Private Sector in the Road Maintenance System (Kenya) (DS)
	△ Implementation of Transportation Safety Measures	Master Plan Study on the Comprehensive Urban Transportation System in the Metropolitan Area (Guatemala) (DS), Feasibility Study on the Bogor-Bandung Road Project (Indonesia) (DS)
	○ Post-disaster Recovery	The Project for the Urgent Rehabilitation of Sindhuli Road (Section IV) (Nepal) (GA)

Mid-term Objective 5-2: Improvement of Rural Public Transportation Services

Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
Maintenance and Improvement of Public Transportation Services with a view to Satisfying Civil Minimum	△ Implementation of Transportation Safety Measures	Master Plan Study on the Comprehensive Urban Transportation System in the Metropolitan Area (Guatemala) (DS), Feasibility Study on the Bogor-Bandung Road Project (Indonesia) (DS)
	○ Development of Minimum Transportation Measures	The Development Study on Comprehensive Regional Development Plan for the Western Part of Kalimantan (Indonesia) (DS), Study on Pan-Philippine Highway Ferry Service Plan (the Philippines) (DS)
Provision of Transportation Services for Better Living Standard	△ Provision of Equipment (Bus, Ferry and other Transportation Equipment)	The Project for Construction of the Inter-islands Navigation Vessel (Samoa) (GA), The Project for Rehabilitation of the Public Transportation System in Kabul City (Afghanistan) (GA)
	△ Reorganization/Rearrangement of Informal Transportation Modes	The Study on the Standardization for Integrated Railway Network of Metro Manila (the Philippines) (DS), The Feasibility Study of the Proposed Cavite Busway System (the Philippines) (DS)
	△ Logistics Improvements in Rural Area	The Development Study on Comprehensive Regional Development Plan for the Western Part of Kalimantan (Indonesia) (DS), Regional Development Study on the Three States: Espirito Santo, Minas Gerais and Goias (Brazil) (DS), Study on Pan-Philippine Highway Ferry Service Plan (the Philippines) (DS)
Improvement of Safety and Reliability of Public Transportation Services	△ Introduction of Inspection System	The Master Plan Study on the Development of Syrian Railways (Syria) (DS), Study on Railcar Factories Modernization Project (India) (DS)

Mid-term Objective 5-3: Enhancement of Sustainability of Rural Transportation Systems		
Sub-targets of Mid-term Objective	**Examples of Activities for Achieving Sub-targets**	**JICA's Major Activities**
Improvement of Funding Mechanisms for Rural Transportation	△ **Establishment of Legal System and Budgetary System**	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS), Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)
	△ **Creation of Road Specific Funds**	
	△ **Introduction of Subsidy**	
	△ **Introduction of Benefit Principle**	
Supporting Private Sector and Technicians to Study Technologies Suitable for Locality	○ **Capacity Development of Local Contractors**	The Project for Improvement of Equipment for Rural Road Construction (Guatemala) (GA), The Project for Improvement of Equipment for Rural Roads (Morocco) (GA), Periodic Maintenance of Capacity Building for Regional Office (East Timor) (TCP)
	△ **Development of Necessary Technical Manuals**	Study on the Utilization of Private Sector in the Road Maintenance System (Kenya) (DS)
Establishment of Road Development and Maintenance System based on Participation of Local People	○ **Utilization of Community, NGOs, etc.**	The Study on Rural Roads Improvement in Western Kenya (Kenya) (DS)
	△ **Establishment/Diffusion of Labor-based Technology (LBT)**	Capacity Strengthening on Labor-based Technology (Tanzania) (TCP)

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Chapter 3 Directions of JICA's Cooperation

JICA's Priorities and Points for Concern

3-1 JICA's Priorities and Points for Concern

3-1-1 Fundamental Concepts

In order to respond to the diverse and complex issues involved in transportation, it is essential to properly understand the needs of each developing country and region, and provide support for the inhabitants of these countries in a timely fashion. It is essential to ensure that activities are selected appropriately given the particular characteristics of the transportation issues that individual countries and regions are facing, to enhance their strategic focus, and to take as the primary principles the human-centered approach, field-oriented approach, and effectiveness, efficiency, and speed espoused by JICA.

Based on the above, the fundamental concepts of JICA's cooperation are described here. By displaying the issues that developing countries themselves need to resolve in a general, yet comprehensive fashion, the Transportation Development Objectives Chart shown in Chapter 2 has been created as a useful reference for program design. This likewise provides the fundamental materials for consideration when carrying out the following support:

Providing support that demonstrates the development based on the Human-centered Approaches

(1) Human-centered approaches: JICA reaffirms its mission in transportation infrastructure as "Infrastructure for the People," and remains aware of considerations relating to the human-centered approaches. It is important to accurately determine the effects of transportation-related assistance, and in particular the way in which people's behavioral patterns and lives change, and to provide necessary transportation services. It is essential to focus on the consensus-building process from the planning stages, and to give increased consideration to safety, environmental preservation, and social effects.

Establishing more efficient transportation systems by making appropriate decisions based on local circumstances

(2) Selection and strategic focus based on local circumstances: The necessity of transportation infrastructure is influenced by people's behavioral patterns and preferences. And the viability of construction depends on topographical conditions. The possibility of achieving these projects also depends on the systems, organizations, human resources, and finances of partner countries. In order to provide support for the construction of more efficient transportation systems, it is important to undertake strategic activities that are selected appropriately given local circumstances. Making decisions that correspond to local circumstances is fundamental to guaranteeing efficiency and speed.

Confirming the importance of partner country's Ownership and Capacity Development in relation to activities

(3) Fostering Ownership and Capacity Development: Since transportation infrastructure has a long life, and it is important to ensure that activities are not limited to one-way contributions from Japan, JICA focuses on

fostering capacity development and ownership by relevant parties in partner countries as part of the support process. Fostering ownership and providing support for capacity development are imperative if the desired effects of cooperation are to be achieved.

Aiming at higher efficiency and speed through comprehensive activities for each program

(4) Best combination and creation of programs: It is essential to clarify overall visions and scenarios of cooperation activities, to comprehensively tackle important issues identified from the Development Objectives Chart at the individual program level, and to cultivate management capacity. Efficiency and speed must be increased by creating programs and implementing the best combination of investments in correspondence with the Development Objectives Chart, while continuously ensuring the flexibility of support.

Importance of coordination and cooperation with other donors and other Japanese cooperation efforts

(5) Coordination with financial cooperation: In order to resolve issues in the transportation sector where the needs for improvements are enormous but resources that can be invested are limited, it is imperative to promote coordination and cooperation with the international efforts being undertaken by other international agencies, donor countries, and other parties. Until now, JICA's aid activities have consisted mainly of Development Studies. And consequently, advancing coordination and cooperation with other domestic Japanese grant aid, concessional loans, and technical cooperation should yield better outcomes and improve the efficiency of cooperation.

Supporting activities that take the optimum modal mix into account aiming at establishing efficient transportation systems

(6) Considering the optimum modal mix: In order to increase overall efficiency, it is necessary to consider the optimum modal mix when undertaking aid activities. To establish efficient transportation systems, and achieve efficient operation of transportation systems, JICA will undertake support that emphasizes the following:

1) Activities that promote fair competition among transportation modes based on their relative advantages
2) Activities that increase the possibility of being complementary to services provided for different transportation modes
3) Activities that reduce the need for frequent facility renewals (reconstruction, expansion, etc.), and maintenance activities that improve the requirement for long-term expenses
4) Activities that introduce the principles of market competition into the areas of infrastructure, the provision of services, and management and maintenance
5) Activities that expand capacity, and improve quality and productivity of transportation through the enhancement of applied technologies and modernization

Providing many and various people with opportunities for progress by developing transportation infrastructure considering other sectors and services

(7) Consideration for remote areas: Transportation infrastructure provides opportunities for economic and social progress to a wide range of people. Particular consideration to improvements in remote areas is therefore given. However, opportunities for such progress cannot be provided without social services and infrastructure in other sectors, so it is essential to seek a balance with other services when carrying out the aid activities.

Responding flexibly and rapidly to emergency relief and recovery activities, meeting the needs of partner countries

(8) Emergency relief and recovery: Particularly in relation to conflict resolution, relief and recovery from a disaster, promptness will be emphasized, while appropriately responding to the needs of partner countries rapidly and flexibly. In countries where conflicts have been resolved, recognizing that long-term economic progress and investments in poverty reduction and social development play a large part in avoiding conflicts and securing regional stability, JICA will undertake support for peace-building that is also coordinated with activities in other areas.

Priority Issues

3-1-2 Priority Issues

In this section, JICA's transportation priority issues described in relation to each Development Objective, based on the discussions in Chapter 2 and Section 3-1-1. Development Objective 1 is particularly important, and should be regarded as a common objective towards achieving Development Objectives 2 to 5. Regarding these objectives, given that there are limitations in sources of funds, human resources, and the like in relation to transportation infrastructure development, good selection and a strategic focus are important.

Determining the development bottlenecks and strategically combining various schemes to provide comprehensive support

In particular, it is important to first determine, from the following, which central issues are proving to be bottlenecks to development: new infrastructure construction; the operation and maintenance of the existing infrastructure; the provision of transportation services; the enhancement of strategies in relation to transportation safety, disasters, the environment and the like; and capacity development and securing funding sources. It is very important to determine precisely where bottlenecks lie, and to implement comprehensive support by strategically combining various schemes.

(1) Development Objective 1: Capacity Development of the Transportation Sector

<Capacity Development> Importance of cooperation aiming at reforming and enhancing transportation administration and expanding competition.

It is essential to actively pursue cooperation in relation to strengthening and reforming transportation sector administration, and increasing competitiveness.

Reforms to transportation administration to achieve good governance.

Good governance, which enhances transparency and accountability, is generally being emphasized as one of the administrative issues in developing countries. Furthermore, large changes in the transportation sector, such as (i) the transition to market economies, (ii) private sector participation, and (iii) decentralization, are progressing and culminating towards a paradigm shift, and it is imperative that transportation administration is reformed so as to be able to cope.

As part of this process, Development Objective 1 aims to enhance general systems capacity in transportation so as to facilitate the achievement of Development Objectives 2 to 5. It is essential to strengthen administrative capacity that includes improvements and enhancements to legal systems, implementation capacity, human resources, finances, and so forth. In the future, it will be essential to remain aware of linkages with support for other issues, and to strengthen coordination aimed at the relevant development in the transportation sector.

Flexible system upgrades aiming at the promotion of private-sector participation and the importance of capacity development.

Furthermore, since the transition from traditional restrictive administration systems to more flexible administration systems that place emphasis on market needs is required, capacity development is extremely important. As part of flexible administration systems, new initiatives such as deregulation and PPPs which encourage private-sector participation are being pursued in an effort to strengthen and supplement the shortage of the public sector in relation to financing, technology, and business capacities. In the future, where private-sector participation is desired, it is also essential that the various systems for expanding market competition be improved and upgraded so that the intended purpose of such participation can be adequately achieved.

(2) Development Objective 2: Toward Internationalization and Regionalization (Cross-border Transportation)

<Cross-border transportation> Importance of transportation sector cooperation that takes global trends in regional economic integration into account.

It is essential to engage in cooperation that reduces cross-border processing time by standardizing customs documentation and seeking uniformity in cross-border systems. It is also essential to focus on cooperation that demonstrates an awareness of economic zones that cover wide regions and several countries.

In response to the movements towards regionalization through FTAs in ASEAN, SADC, and the like, and economic globalization due to a rise in WTO member countries, Development Objective 2 aims to provide ancillary support for movements towards internationalization and regionalization by minimizing barriers to transportation. *"Chiiki teki wakugumi wo tujita sekkyoku tekina gaiko"* [*Positive Diplomatic Relations through Regional Frameworks*] and *"Gurobaruka no shinten ni taio suru kokusai tekina ruru zukuri"* [*The Creation of International Rules in Response to the Progress of Globalization*] are taken up in the *"Wagakuni no juten gaiko seisaku (2005 nendo)"* [*Japan's Major Foreign Policies of Fiscal 2005*]. And these may also be regarded as development objectives requiring future attention.

When considering individual cooperation activities, it is becoming necessary to assume that the range over which effects will manifest themselves extends to regional economic zones. Where large economic zones made up of several countries can be envisioned, it is important to select and improve important routes that, from the perspective of economic globalization, may act as major international transportation trunk routes. Since transportation routes that contribute to the overall economic progress of wide regions are also the most important routes within the countries, these types of routes are also of high priority within the framework of bilateral cooperation.

<National transportation> Scrutinizing the necessity of activities from a national minimum perspective utilizing all transportation modes. Focusing on cooperation that emphasizes not just new constructions, but improvements to, and maintenance systems for, existing infrastructure, and the problems of inadequate financing also.

(3) Development Objective 3: Toward Balanced Development of a Whole Country (National Transportation)

JICA will continue to implement cooperation that facilitates transportation over major trunk routes since this forms the basis for national progress, and in particular, it will be essential to strengthen efforts aimed at establishing and operating efficient maintenance systems. It will also be essential to strengthen approaches towards encouraging fair competition between transportation modes

through deregulation, and towards safety and security measures.

The aim of Development Objective 3 is to establish the basis for a balanced development of whole countries by utilizing all available transportation modes, including roads, railways, airlines, and shipping. In the future, from the viewpoint of avoiding excessive investments, it is particularly important at the project formation stage to scrutinize whether the actions in question are really necessary from the national minimum perspective.

In order to reduce investment costs but increase effects, it is essential to not just focus on new constructions, but to consider activities that include strengthening major existing transportation routes, and management and maintenance. Considering the objective of coordinating and cooperating with other donor's activities, it will also be essential to focus on cooperation aiming at establishing and operating efficient management and maintenance systems for existing infrastructure.

Furthermore, in conjunction with transportation infrastructure development, it will also be essential to improve transportation services through competition brought about by deregulation. In the future, JICA will focus on how to overcome transportation financing inadequacies in developing countries. Strengthening of safety and security measures will also be essential.

(4) Development Objective 4: Toward Sustainable Urban Development and an Improvement of Urban Life (Urban Transportation)

<Urban transportation>
In an environment where motorization is expanding from central to outer areas, the transition from individual transportation to public transportation, and the management of demand for individual transportation are important.

Important issues in relation to everyday movements in urban areas (urban transportation) include easing road traffic congestion during peak hours, and promoting a transition from individual automobile transportation to public transportation services through the improvement of bus and rail-based public transportation services, while at the same time managing demand for individual automobile transportation.

Development Objective 4 aims at resolving the transportation issues in the capital and other major cities. Population and economic activities in developing countries are concentrating in large cities, and combined with the rise of motorization, this is leading to concentrated traffic and congestion in urban areas, as well as disorganized urban sprawl into outer suburban areas. There is a limit to increasing the transportation capacity in limited urban areas, and the transition from individual automobile transportation to public transportation is crucial. Improving public transportation services and managing demand for individual automobile transportation are fundamental to achieving this. There are various stakeholders in urban transportation, including numerous central government agencies, and numerous local government bodies that make up urban regions, making consensus-building extremely difficult, so that delayed implementation is commonly a problem. In the future, it is imperative to focus on increasing implementation rates for proposed projects, and on strengthening systems capacity on the premise of promoting participatory approaches.

Since there are various stakeholders involved, it must be noted that consensus building takes a longtime.

(5) Development Objective 5: Toward Sustainable Rural Development and Improvement of Rural Life (Rural Transportation)

<Rural transportation>
In rural areas where demand is low, it is essential to examine the form of public transportation.

A major issue in relation to everyday movements in rural areas (rural transportation) is the provision of public transportation services to sparsely populated remote communities in an environment where motorization continues to rise. And it will be essential to consider the current state of poverty reduction and official assistance.

The aim of Development Objective 5 is transportation infrastructure development in regions that have fallen comparatively behind in development. Major targets include road disaster prevention and improvements to rural roads and small-scale bridges that do not meet national standards. Furthermore, at the international level the importance of infrastructure development aimed at rural poverty reduction is being emphasized. As demonstrated by the Poverty Reduction Strategy Paper (PRSP), there are efforts by local construction companies to make improvements to rural roads and their management and maintenance which are important pillars of regional vitalization. There are also initiatives such as the provision of construction materials through official assistance so that local residents can perform improvements and carry out management and maintenance, and initiatives that involve remuneration for labor to residents that participated in construction work. Moving forward, in providing support it is imperative to look at how these improvements to infrastructure and services will reduce rural poverty, and focus on participation and cooperation of local residents.

It is important to promote transportation infrastructure improvements that take poverty reduction and local resident participation into account.

3-1-3 Points for Concern

Points for Concern

When creating programs using the Development Objectives Chart, it is essential to base this process on the characteristics of each Development Objective and on the characteristics of each transportation mode.

Considering activities taking administrative reforms, as well as regional characteristics and transportation characteristics into account.

In particular, it has become necessary to undertake more thorough consideration when planning grant aid activities. And two important points to consider are the actual whereabouts of problems and analyses of the underlying causes. It is necessary to determine in which regions smooth transportation is being obstructed, and where safety and reliability have been lost, and to accurately understand the root cause of these problems.

It is also necessary to consider the relevance of implementation from the viewpoints of gaps among regions, social gaps (poverty, gender bias, etc.), and environmental considerations. It is also important to consider sustainability, effectiveness, and efficiency from a long-term perspective, based on the overall lifecycle (planning, construction, operation/repairs/maintenance, evaluation and renewal) of transportation infrastructure.

Development Objective 1 is a common objective that enables Development Objectives 2 to 5 to be achieved. And it is also essential to consider the possibility of introducing administrative reforms and competition in relation to transportation infrastructure and services.

While Development Objectives 2 to 5 aim for the efficient provision of

basic transportation services, since the effects expected of each of these Development Objectives have their own characteristics, it is essential that these characteristics be taken into account and that priority issues requiring resolution be accurately discerned when providing support. For example, it is necessary to determine whether economic development is being emphasized, whether social development is being emphasized, whether the national minimum is being sought, or whether a civil minimum is being sought, and to accurately determine which Development Objectives partner countries are focusing on.

Below, for each Development Objective, points for concern in relation to the priority issues given in Section 3-1-2 are described. In general, it might be assumed that once the national minimum is achieved that transportation sector support is complete. However, since national minimum standards are changing, making such judgments is difficult. Furthermore, it is also necessary to remain aware that where aid activities are based in a particular urban or rural area, the civil minimum is of greater concern than the national minimum.

(1) Development Objective 1: Capacity Development of the Transportation Sector

Appropriately determining the differing circumstances in each country, and promoting transportation administration reforms that can cope with these local circumstances.

With regard to transportation administration in developing countries, there are large differences from country to country in the actual circumstances surrounding activities related to (i) decentralization, (ii) deregulation and private sector participation, and (iii) poverty reduction and environmental preservation. There are also large gaps in the human and financial resources that are available to be allocated to transportation infrastructure and facilities improvements. Therefore, it is important to determine whether changes that are likely to bring about a paradigm shift with regard to traditional transportation administration are progressing in the relevant country, and to promote transportation administration reform that will be able to cope with such changes.

It is also important to understand the legal structures related to transportation in the relevant country, and methods and systems of contracting related to transportation. In order to improve transportation and facilitate smooth operation, it is important to allocate tasks to, and clarify the responsibilities and authority of supervisory authorities, local governments, construction consultants, construction companies, suppliers of construction materials, facility managing bodies, and other related entities, and to move forward by appropriately building a consensus while maintaining transparency. From a good governance standpoint in particular, it is important to give attention to equity and transparency in the work execution and bidding process in partner countries.

Cooperation that incorporates a consensus building process is important.

It is essential to analyze transportation infrastructure development, legal systems that regulate services, and related entities, to give consideration to how decision making and information communication should be carried out, and to engage in cooperation that incorporates a consensus-building process, not just in relation to Development Objective 1, which is directly related here, but also in relation to cooperation concerning Development Objectives 2 to 5.

It's essential to understand and analyze current situations in a number of countries, cities, and at several borders.

(2) Development Objective 2: Towards Internationalization and Regionalization (Cross-border Transportation)

With regard to cross-border transportation, it is essential that circumstances surrounding transportation between capital and other major cities in several countries and at border crossings be properly understood. It is also imperative to properly understand the international conventions, bilateral arrangements, and the like, that countries have concluded, the design standards related to each transportation mode, the situation with respect to conformity with international standards, customs arrangements, and so forth. Since transportation-related systems such as customs in airports, ports, and harbors, transportation services, road rules, signages, railway track gauges, and so forth differ among countries, it is essential to take into account these differences in transportation systems that span international borders.

Since JICA focuses on bilateral cooperation, direct support is difficult. However, since important regional transportation routes are also generally major domestic transportation routes, it is essential to assume that route shave effects over whole regional economic blocks.

Although it is difficult for JICA to provide direct support in relation to this Development Objective since it currently focuses mainly on bilateral cooperation, where obstructions to cross-border transportation exist within a particular country, it is highly possible to undertake support that simplifies cross-border transportation.

It is important to understand which are the potential major transportation routes in relation to visions for regionalization over wide areas. Since major international transportation routes form part of major transportation networks within the relevant countries, they are commonly of high priority at the domestic level also. It is essential to consider whether the effects of individual cooperation activities will be felt over whole regional economic zones.

(3) Development Objective 3: Toward Balanced Development of a Whole Country (National Transportation)

It is essential to take all of the transportation modes in a particular country into account, and to understand the characteristics and current state of transportation in between cities.

Determining the most appropriate modal mix in national transportation through free competition among these different modes is important. In order to secure continuously efficient transportation at the national level, it is essential to fully understand transportation between capital and major cities, and among major cities themselves. It is important to understand the characteristics of transportation of people and goods in the relevant country, and to determine the relative advantages of each transportation mode (land, water, air). Since the type of transportation infrastructure and services required differ depending on transportation distances, quantities, and speed (frequency) and since existing transportation modes differ depending on areas, it is essential to note that the level of services required for each transportation mode depends on the state of development in the country.

Since taking alternate routes can be difficult when such facilities have ceased to function, it is essential that adequate management and maintenance systems, safety and reliability be present, and that adequate consideration must be given to this at the planning stage. It is also important to envision and consider the necessity of and strategies for disaster prevention, reconstruction, expansion, and the like, at an early stage.

Table 3-1(1) Utilization of Transportation Modes in Japan (Travel)[17]

Type of Transportation (OD* and Purpose) \ Transportation Mode			Aircraft	Railway			Automobile		Passenger Vessels/ Ferries	Motorcycles/ Bicycles
				Bullet-train (Shinkansen)	Heavy Rail	Medium Capacity Rail	Buses	Passenger Vehicles		
Wide-area Transportation	International Transportation	Business/Personal	◎	–	–	–	–	–	–	–
		Tourism	◎	–	–	–	–	–	● Luxury Liner	–
	Long-distance Transportation (farther than 400-500km)	Business/Personal	◉	◉	○		●	○	△	–
		Tourism	◉	○	●	–	◉ Private Charter Bus	○	△	–
	Medium-distance Transportation (between 80-100km and 400-500km)	Business/Personal	△	◉	○	–	●	●	△	–
		Tourism	△	○	○	–	○ Private Charter Bus	◉	△	–
Urban Transportation	Metropolitan Transportation (10 to 80km)	Business	–	–	○	●	●	○	–	–
		Work Commuting	–	△	◎	○	○	●	–	–
		Personal	–	–	◎	○	○	○	–	–
	City Transportation: Large City Transportation (0.8-1 mil. people or more)	Business	–	–	○	○	●	◉	–	●
		Work Commuting	–	–	◎	○	○	●	–	○
		Personal	–	–	◎	○	○	○	–	○
	City Transportation: Medium City Transportation (between 100,000 and 700,000 people)	Business	–	–	●	●	●	◎	–	●
		Work Commuting	–	–	○	○	○	○	–	○
		Personal	–	–	○	○	○	◉	–	○
	City Transportation: Small City Transportation (100,000 people or less)	Business	–	–	–	–	●	◎	–	○
		Work Commuting	–	–	●	–	○	◉	–	◎
		Personal	–	–	●	–	○	◉	–	◎
	Local Area Transportation	Business	–	–	–	–	–	–	–	○
		Personal	–	–	–	–	–	–	–	◉
Rural Transportation	Transportation to Rural Areas (islands, etc.)	Business	△	–	●	–	●	○	△	–
		Personal	△	–	●	–	●	○	△	–
	Transportation within Rural Areas	Business	–	–	–	–	●	◉	–	○
		Personal	–	–	–	–	●	○	–	◉

*OD: origin and destination

Indicates appropriate range for railway use

◎ Extremely suitable, and used by most people
◉ Very suitable
○ Suitable
● Used some areas
△ Indicates OD that span the Seto Inland Sea or that cross seas between isolated islands.

Source: Amano, Maeda, and Miwa (2001)

[17] Refer to Chapter 2, pages 26-30, for the characteristics and relative advantages for each transport mode. Table 3-1 categorizes the characteristics of each transport mode according to transport volume and distance. However, it is also possible to assign advantages based on energy efficiency, transport costs, etc.

Table 3-1(2) Utilization of Transportation Modes in Japan (Goods)

Type of Transportation (OD* and Purpose) \ Transportation Mode		Aircraft	Railway		Automobile			Shipping	
			Direct Container Transportation	Direct Individual Item	Heavy Trucks	Medium and Light Trucks	Vans/ Light Vehicles	Cargo Ships/ Tankers/ Ore Ships	Ferries
Wide-area Transportation	International Transportation	○	–	–	–	–	–	◎	–
	Long-distance Transportation (400-500 km or farther)	○	○	●	○	●	–	◎	●
	Medium-distance Transportation (between 80-100 km and 400-500 km)	–	○	●	◎	○	●	○	●
Urban Transportation	Metropolitan Transportation (10 to 80 km)	–	–	–	●	◉	○	–	–
	Inner-city Transportation	–	–	–	–	◉	◎	–	–
Rural Transportation		–	–	–	–	●	○	△	△

*OD: origin and destination

Indicates appropriate range for railway use

◎ Extremely suitable, and used by most people
◉ Very suitable
○ Suitable
● Used some areas
△ Indicates OD that span the Seto Inland Sea or that cross seas between isolated islands.

Source: Amano, Maeda, and Miwa (2001)

In order to establish transportation networks that are efficient overall, and to provide efficient services, it is essential to enhance transportation services by carrying out improvements that are absolutely necessary from a national minimum perspective, and also to consider the possibility of introducing competition through deregulation. In order to efficiently allocate scarce resources, it is important to consider coordination and cooperation with other donors, and methods of establishing and operating efficient management and maintenance systems.

(4) Development Objective 4: Toward Sustainable Urban Development and Improvement of Urban Life (Urban Transportation)

Considering the optimum modal mix

In urban transportation, a shift from individual automobile transportation to public transportation is particularly important. Traffic congestion “at work and school commuting hours” is a major issue in urban areas, where the quantity and speed (frequency) of transportation are important all at once. It is essential to consider the optimum modal mix based on a thorough understanding of the current state of, most importantly, automobile transportation, public transportation (buses and railways), and pedestrian movements, and clear future visions for the city and the lives of residents. It is also essential to consider demand management, and the facilitation of smooth transfers at transportation nodes.

Importance of consistency with land-use plans and transportation safety measures

Since the space available for transportation infrastructure development in large cities is limited due to the concentration of population and economic activities, it is important to consider whether necessary transportation infrastructure and services can be provided or not while staying consistent with

land-use plans, aside from wanting to improve public transportation services. Furthermore, since traffic accidents have become a common problem, it is imperative that this issue be investigated also.

Consensus building between the various stakeholders is essential in the implementation of tasks, which is also one aspect of support activities.

Since there is a wide range of government's offices, other organizations and agencies involved in urban transportation, extending from central to local level, it is essential to clarify the breakdown of roles designated/mandated to these entities, and to increase the prospects for tasks to be implemented by building a consensus among them. In order to clarify future visions for cities, consensus-building involving residents is also essential. Therefore, it is important to incorporate this into support frameworks as well.

(5) Development Objective 5: Toward Sustainable Rural Development and Improvement of Rural Life (Rural Transportation)

It is essential to consider infrastructure improvements not just from the perspective of achieving civil minimums, but also to consider whether they will lead to the revitalization of the rural economy. Also remember that measuring the effects is difficult with old indicators alone.

It is essential to understand rural transportation needs, and the situation with regard to access to trunk transportation. Among other issues, it is essential to determine whether access to social facilities essential for the lives of residents is ensured, whether residents are suffering a disadvantage due to inability to access trunk transportation, whether the area is attractive enough to entice people in if access to trunk transportation was secured, and whether the area has products to sell to other areas. Then, under the central theme of improving livelihoods in the rural area in question, it is important to consider whether regional revitalization and improvements in the quality of lives can be achieved through improvements to roads, ferries, and the like. It is also important to incorporate into the support framework systems such as those for public assistance in relation to the procurement of construction machinery and materials, and those for remuneration for locally provided labor. Finally, it is crucial to remember that it is difficult to measure the actual effects of support for rural transportation with old indicators based on old paradigms that focus on economic effects such as Internal Rates of Return (IRR) and cost-benefit ratios.

3-2 Issues for Future Consideration

Issues for Future Consideration

There are various issues that may be mentioned in relation to the Guidelines for Environmental and Social Considerations, emergency relief and recovery support, the diversification of implementation methods and the applicability of PPPs, pro-poor design, and so on. However, in this section, issues for future consideration in relation to JICA's overall cooperation efforts in the transportation sector are dealt with.

(1) Strengthening Capacity to deal with Issues

We will pursue support efforts using the program approach and improve the capacity of overseas offices.

In order to strengthen JICA's capacity to deal with individual issues, it will be essential to further accumulate and organize the experience acquired through cooperation, and to utilize this in Country Programs and individual corporation programs/projects. Since JICA is currently undergoing a process of moving from cooperation that has the single objective of making facility improvements to

cooperation that aims to resolve issues, moving forward, it will be imperative to implement actual cooperation using the program approach, and to consider the form of process management most appropriate for programs and projects. Furthermore, in order to strengthen support efforts that take a field-based perspective, it is essential that it enhance transportation sector knowledge management to improve the independent capacities of overseas offices.

(2) Continuous Evaluation of Approaches to Issues

Transportation issues are diverse and complex, priority issues differ across cooperation programs/projects, and the central issues involved in cooperation programs commonly vary with the passage of time. Trends in international assistance for infrastructure also continuously undergo vigorous changes. Taking heed of this diversity and variability, it is essential that in conjunction with the strengthening of JICA's capacity to deal with issues, it continuously consider improvements and revisions to the Thematic Guidelines, Development Objectives Charts, and so forth.

(3) Region-Specific Approaches

The evaluation of region-specific approaches, and above all, the evaluation of approaches to the African region, are matters of urgency.

Economic zones over wide areas have been continuously forming in recent years in response to economic globalization, and it is essential that a grand design exist for the transportation sector since it supports progress in these regional economic zones. In response to this, it is essential to consider region-specific approaches for Asia, Central and South America, Africa, and so forth, independent of the overall Thematic Guidelines. The African region in particular is receiving much attention, and there is a pressing requirement for the consideration and evaluation of cooperation measures here.

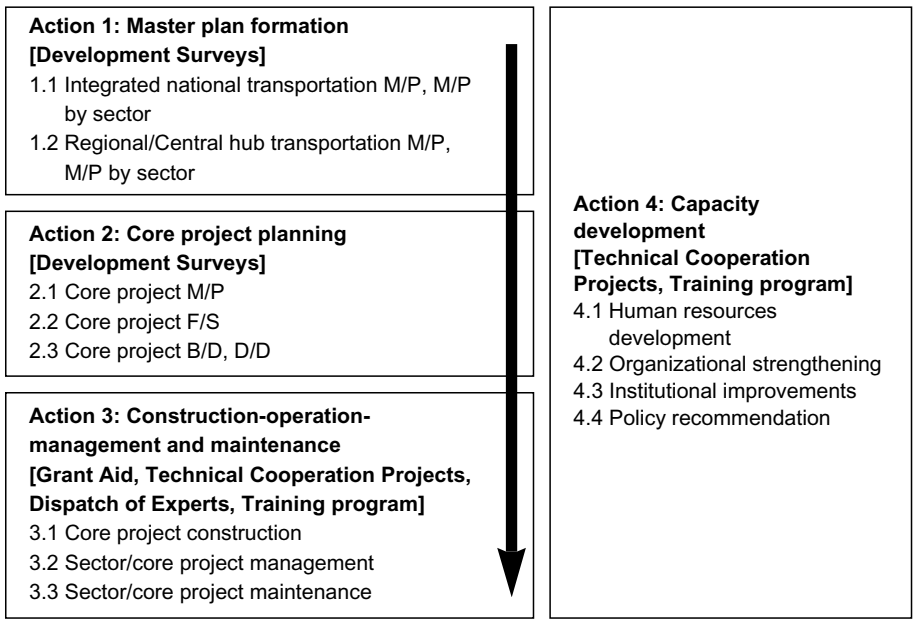
(4) Cooperation That Is More Human-Centered

Utilizing JICA's past cooperation experience, we will implement cooperation that takes a more human-centered perspective.

In order to achieve further outcomes from JICA's cooperation efforts, it is essential to consider transportation from a more human-centered perspective. Based on significant outcomes achieved through past cooperation, it is imperative to consider what sort of influence this cooperation in the transportation sector had on people's lives, how that influence should be perceived, and what sort of role the governments of developing countries and JICA fulfilled in relation to that process, and this experience should be reflected in future cooperation activities.

Appendix 1 JICA's Major Activities

The following demonstrates the flow of JICA's major cooperation activities in the transportation sector organized in chronological order.



As part of the promotion of the program approach at JICA, the following types of activities are being undertaken in the transportation sector. Support that demonstrates a departure from individualized JICA schemes and an awareness of program design strengthening and lifecycle management is being pursued:

(1) The promotion of program formulation based on Development Studies
(2) The promotion of organic coordination and integration of various items, such as Development Studies, Technical Cooperation Projects and Training programs
(3) The strengthening of coordination with Grant Aid activities and volunteer activities in relation to cooperation programs
(4) The promotion of comprehensive management at the individual program level

Essentially, JICA is pursuing a comprehensive and integrated approach that does not stop at the planning stages shown in Actions 1 and 2 above, and that, through the addition of Actions 3 and 4, aims to materialize proposed projects and ensure the sustainability and ownership of developing countries.

Based on these considerations, shown below are cooperation activities that JICA has engaged in until now, categorized according to the following rules.

<Activity Classification Method>

- To facilitate understanding of the relationship between activities and the Development Objective Chart, activities have been classified according to each Development Objective.
- Activities have been put into subcategories according to their content. Therefore, the subcategories do not necessarily coincide with the Mid-term Objectives and Sub-targets.
- Where activities correspond to several Development Objectives/Mid-term Objectives, they are classified according to their main objective.
- Subcategory lists are given in the following order: Sub-sector → Country → Period → Scheme.

<Using the Activity Outlines as a Reference>

- For the content of each activity, the proposed tasks (mainly for Development Studies) and details of implementation (mainly for Technical Cooperation Projects, Grant Aid Cooperation, and Training program) have been given.
- The Final Reports of Development Studies are made available internally in Japanese on the JICA Knowledge Site (with some exclusions). Please refer to these for project summaries. Some of these reports are also available on the JICA Library Portal Site, which may also be a useful reference.
- URLs indicating the location of Technical Cooperation Projects and Grant Aid Cooperation on JICA's web site are also given for reference.

Table A 1-1 List of Transportation Sector Activities (Representative Examples)

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
Development Objective 1: Capacity Development of the Transportation Sector							
Capacity Development of Regional Governments [Development Study, Technical Cooperation Project]							
1	Roads	East Timor	Periodic Maintenance of Capacity Building for Regional Office	2005.6〜2007.11	Tech. Cooperation Project	**1－2** **5－4**	- Development of systems required for the road maintenance, and repair activities carried out by the Ministry for Transportation, Communications and Public Works (MTCPW), and for restoration activities following road disasters; development of technical personnel required for these activities, such as construction machinery operators and mechanics, and materials and construction managers, providing technical support for appropriate and safe road management and maintenance activities
2	Roads	Kenya	The Study on Rural Roads Improvement in Western Kenya	1999.2〜1999.12	Development Study	**1－2** **5－1** **5－3**	- Road network planning and selection of priority roads: development of an improvement plan for rural roads (class C, D, and E roads) in the western region to form a basis for social and economic development - Maintenance plan: inclusion of members from the general public into the road council, establishment of a road register, strengthening of the administrative capacity of the Roads and Public Works Ministry, encouragement of maintenance using appropriate materials and establishment of regional material centers in major regional offices, and establishment of a lease market for construction materials and equipment through the privatization of the Machinery Transportation Department
Establishment and Strengthening of Research and Training Centers [Technical Cooperation Projects, Grant Aid]							
3	General transpor-tation	Philippines	National Center for Transportation Studies Project	1992.4〜1997.3	Project-type Technical Cooperation	1－3	- Establishment of the National Center for Transportation Studies mainly based on the Transportation Training Center (TTC) at the University of the Philippines as the core - Postgraduate education, transportation studies, training, transportation R&D services, information center function
4	Railways	Thailand	Aftercare Technical Cooperation for the Railway Training Center Project	2001.4〜2003.3	Project-type Technical Cooperation	1－3	- Design guidance, supply, installation guidance, and education guidance with respect to training facilities for emergency responses to rolling stock breakdowns - Advice regarding general railway education and training
5	Railways	Iran	Yazd Signaling Training Center Project	1993.12〜1996.11	Project-type Technical Cooperation	1－3 3－2	- Elementary level training course: training for the maintenance of signal equipment - Advanced training course: training for the acquisition of specialist knowledge regarding signals and signal planning techniques - Short-term dispatch of experts, provision of equipment, and creation of textbooks for training
6	Roads	Morocco	Renovation of the Road Maintenance and Construction Equipment of IFEER	1992.4〜1997.4	Project-type Technical Cooperation	1－3	- Implementation of training courses at the Institute of Training on Road Maintenance and Construction Machines - Training course: operation of construction machines, maintaining construction machines (engine, chassis, management), road maintenance
7	Roads	Viet Nam	Basic Design Study on the Project for the Improvement of Transportation Technical & Professional School No. 1	Fiscal 2000 (E/N signed)	Grant Aid (facilities + equipment and materials)	1－3	- Supply of materials required for the creation of a retraining course for experienced personnel in order to cultivate technical personnel for road construction machines - Facilities construction: maintenance training facility, student dormitory, office facilities - Procurement of materials: equipment for maintenance training (rooftop crane, oil pressure testing equipment, etc.), educational equipment (engine cutaway model, transmission cutaway model, etc.), welding and sheet metal work equipment, machine making equipment, vehicle equipment, etc.

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
8	Marine transpor-tation/ ports	Philippines	The Project on Philippine Coast Guard Human Resource Development	2002.7～ 2007.6	Project-type Technical Cooperation	1－3 2－1	- Technical support for the establishment of an education and training system for the Philippine Coast Guard (PCG) - Establishment of curriculum, donation of teaching materials and equipment and training of trainers, on subjects of "Law Enforcement," "Search & Rescue," "Safe Navigation," "Marine Environmental Protection," and "Oil Spill Combating," aimed at Coast Guard Education and Training Command (CGETC) (Refer to http://project.jica.go.jp/english/subject/transport/07_1.html)
9	Marine transpor-tation/ ports	Turkey	Port Hydraulic Research Center	1995.1～ 1999.12	Project-type Technical Cooperation	1－3	- Technology transfer at the Port Hydraulic Research Center required for planning, design, and implementation of port construction - Areas relating to hydraulic model tests, numerical modeling, and field investigations for wave measurement, and analysis of the collected data, harbor tranquility, wave resistance and sand drift of structures, etc.
Enrichment of Curricula, Manuals, etc. [Technical Cooperation Projects]							
10	Railways	Indonesia	The Project of Modernization of Perumka's Education and Training System in Jabotabek	1992.9～ 1997.8	Project-type Technical Cooperation	1－3	- Implementation of theoretical and practical training for personnel at a training center - Curriculum creation, preparation of educational materials, setup of equipment, etc.
11	Shipping/ ports	Philippines	The Project on Philippine Coast Guard Human Resource Development	2002.7～ 2007.6	Tech. Cooperation Project	1－3 2－1	- Establishment and operation of a curriculum improvement committee - Revision of course curricula and syllabi, development and implementation of teaching materials and textbooks - Training for instructors - Guidance and training in the operation of donated equipment - Various seminars, advocacy of issues towards various government and private groups involved in maritime affairs
12	Shipping/ ports	Philippines	Promotion of the Ship Inspection System and Technique	2000.9～ 2003.9	Project-type Technical Cooperation	1－3 2－1	- Creation of ship inspection guidelines - Creation of ship inspection recording systems - Creation of training materials and guidance materials for ship inspection officers - Creation of training course, formulation of an evaluation system for technology acquisition
13	Shipping/ ports	Philippines	Technology Development for Electronic Navigational Charts	2000.6～ 2003.6	Project-type Technical Cooperation	1－3 2－1	- Creation of a system for digitized and systematized hydrographic study on data collection, obtaining maintenance techniques, creation of manuals - Creation of a system and manual for producing and upgrading ENC, execution of operational training, installation of data evaluation equipment - Validation and revision of ENC using a survey ship outfitted ENC equipment - Seminars and workshops on the use of ENC and ENC display equipment
14	Shipping/ ports	Turkey	Project on Improvement of Maritime Education	2000.4～ 2005.3	Tech. Cooperation Project	1－3 2－1	- Improvement of navigation, on-board training, and engineering (i.e. engine room) curricula - Establishment and enhancement of laboratories for navigation and engineering subjects - Introduction of curricula using ship-handling simulators and engine room simulators - Enhancement of surveys and research regarding marine safety management, human technology management, and marine environment management - Enhancement and expansion of education and training for experienced seafarers in the Marine Safety and Training Center (MSTC) - Introduction of reeducation using ship handling and engine room simulators - Enhancement of teaching materials and reference materials (Refer to http://project.jica.go.jp/english/subject/transport/07_1.html)
15	Shipping/ ports	Panama	The Panama Nautical School Up-grading Project	1993.10～ 1998.9	Project-type Technical Cooperation	1－3	- Creation of syllabus and curriculum for practical training - Operation and maintenance of newly obtained machinery and facilities, and use in practical training - Development of a curriculum for theoretical training, and creation of required study materials - Development of educational methods for theoretical training

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
16	Air traffic/ airports	Philippines	The Project for Upgrading Human Resources Development for Air Navigation Systems Specialist at the Civil Aviation Training Center in Manila	1997.10～ 2002.9	Project-type Technical Cooperation	1－3 2－1	- Planning for a systematic training course, development/revision of curriculum and teaching materials - Planning and implementation for instructor training, creation of guidance manuals for instructors - Introduction to information regarding new technology (CNS/ATM) - Seminars regarding navigational aid systems for university instructors - Development of maintenance personnel for training materials and related facilities, development of a maintenance database
17	Urban transpor-tation	Brazil	The Urban Transport Human Resources Development Project	1998.8～ 2002.7	Project-type Technical Cooperation	1－3	- Guidance for creating training curricula - Guidance for creating textbooks - Guidance regarding teaching methodologies, use and maintenance of equipment, and student evaluation methods; introduction to actual Japanese case studies - Guidance relating to study and research for technology development regarding urban transportation planning
Improving Administration/Privatization [Development Study, Group Training]							
18	Railways	—	Railway Management Planning	Fiscal 2004	Group Training (JICA Tokyo)	1－1 3－2	- Objective: Resolution of railway management problems by mid-level managers in the railway management sector - Details: Japanese railway policies, railway management (multiple/diversified management and services), government regulation and support systems for railway entities, etc.
19	Railways	Bulgaria	Master Plan Study on Long-term Management of Bulgarian Railways	1996.10～ 1998.3	Development Study	1－1 3－2	- Full implementation of open access, separate account system, transition towards a market-based three department system and rationalization of employee numbers, fees and fare policies tied to the market, establishment of the intermodal transportation system for cargo, increase of railway speeds
20	Railways	Poland	Study on Privatization of Polish State Railways	1996.10～ 1998.2	Development Study	1－1 1－4 3－2	- Management style for privatization: Proposal for breakup/privatization and a joint-stock company structure of the Polish State Railways (Polskie Koleje Pañstwowe [PKP]) - Privatization plans: Maintenance of railway transportation, environmental preservation, revision of fares and fees (price raise), division of assets, review of inactive sections of track (abolishment of routes), review of redundant personnel, development of related activities, investment plans, government assistance, capacity development, passenger management, cargo management
21	Railways	Egypt	Study on Tariffs and Improved Cost Recovery for Egyptian National Railways: Alternative Study	1995.11～ 1996.12	Development Study	1－1	- Promotion of market-economy-oriented fare and fee policies, enhancement of ticket inspection, shortening of travel time on major lines, modernization of cargo transportation, government compensation for national projects, reduction of personnel, improvement of rolling stock utilization rates, revision of inactive sections of track, market-economy-oriented management organization, system improvements in order to obtain accurate data and information, etc.
22	Marine transpor-tation/ports	—	Shipping Administration	Fiscal 2004	Group Training (JICA Yokohama)	1－1 3－3	- Objective: Capacity development required in relation to maritime policymakers to facilitate development of maritime policy and the formation of a maritime master plan - Details: Maritime administration and management methods
23	Marine transpor-tation/ports	Egypt	The Study of Management and Development and Operate Plan of the Suez Canal	2000.8～ 2001.8	Development Study	1－1 3－3	- Estimation/prediction of the amount of vessels passing through the Suez Canal - Managerial and operational policy - Structure of canal passage fees and rates - Marketing system - Proposals for improvement of management and operation - Project evaluation

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
Public-Private Partnerships (PPPs) [Development Study]							
24	Urban transpor-tation	Philippines	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction	2002.1～ 2003.3	Development Study	1－1 1－2 1－4	- Development of the PPP technique appropriate to the Metro Manila Urban Expressway Network (MMUEN) (C-3/R-9 to be constructed by the private sector, and R10+R-10/C-5 link by government)
25	Roads	India	Feasibility Study on the Construction of Expressways in the National Capital Region in India	1998.11～ 2000.3	Development Study	1－4 3－1	- Planning of the northeastern section, between Kundali and Ghaziabad, of the planned ring expressway near the capital of Delhi - Planning of the section between Ghaziabad and Mellat of the section of the radial expressway that extends northeast from Ghaziabad - Investigation of implementation methods (public acquisition of land, PPP implemented under the assumption of ODA funding)
Enhancement of Special Education Training [Group Training, Technical Cooperation Projects]							
26	Roads	India	Road Administration with Focus on Maintenance and Management, and Safety Measures	2004.2～ 2006.2	Tech. Cooperation Project	1－3 3－1	- Technical support aimed at enhancing maintenance of expressways and toll roads, and improving transportation safety in India - Seminars: Maintenance technology for expressways and toll roads; planning, constructing and maintaining road drainage facilities; planning construction and maintenance of composite pavement; inspection of concrete structures; traffic conduction at intersections - Training in Japan regarding expressways and toll roads for Indian technical personnel (Refer to http://project.jica.go.jp/english/subject/transport/07_1.html)
27	Roads	–	Motor Vehicle Inspection and Maintenance System	Fiscal 2004	Group Training (JICA Hachioji)	1－3 1－4	- Objective: Acquisition of technology and expertise in the automobile administration sector with the aim of facilitating the establishment of inspection systems and maintenance systems - Details: Lectures, vehicle inspection practical exercises, etc.
28	Roads	–	Regulation and Type Approval System for Safety and Environmental Protection of Motor Vehicle	Fiscal 2004	Group Training (JICA Tokyo)	1－3 1－4	- Objective: Acquisition of technology and expertise in the automobile administration sector with the aim of facilitating the establishment of standards and certification systems regarding environmental impact and safety - Details: Automobile administration systems; internationalization of vehicle standards; studies regarding safety and adverse effects of automobiles; studies regarding traffic safety measures, efforts of vehicle makers toward safety and the environment; driver licensing systems
29	Roads	–	Seminar on Road Administration	Fiscal 2004/2005	Group Training (JICA Tokyo)	1－3 1－4	- Objective: Qualitative improvements in a wide range of fields including technology for road construction, management and maintenance, and finance and administration - Details: Introduction to Japanese road administration, and road technology (road structural standards, transportation safety, construction management, etc.)
Updating of Transport Laws and Regulations [Group Training]							
30	Roads	–	Road Engineering and Administration	Fiscal 2004	Group Training (JICA Sapporo)	1－3 1－5	- Objective: Improvement of the technical skills of mid-level technical officers in relation to road administration and works - Details: Acquisition of knowledge regarding road related legal systems, budgeting and finance and administration systems, executive organizations concerning roads, inspection and planning, design and construction, maintenance and repair, road management

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
Development Objective 2: Toward Internationalization and Regionalization							
Formulation of International Trunk Transportation Network Systems [Development Study]							
31	Roads	Cambodia	The Study on the Construction of Second Mekong Bridge	2004.3〜2005.11	Development Study	2－1 3－1	- Construction of a bridge over the river at Neak Loeung (two ferries currently in operation) that is a transportation bottleneck in Cambodia's National Highway No. 1, preventing it from performing its role as an international road that joins Ho Chi Minh City, Phnom Penh, Bangkok and various major cities in other countries as part of the Asian Highway A-1 Route
32	Roads	Cambodia	The Feasibility Study on the Improvement of National Road No. 1 (Phnom Penh-Neak Loeung Section)	2003.4〜2004.3	Development Study	2－1 3－1	- Refurbishment of the approximately 56 km stretch of National Highway No. 1 between Phnom Penh and Neak Loeung (1.800 km 4 lane section, 54.180 km two lane section, 3 bridge constructions, construction of nine culverts, 7.275 km of road drainage facilities improved, total of 3.86 km of work to prevent slope erosion, improvement of two intersections, etc.)
33	Roads	Multiple countries	The Detailed Design of the Second Mekong International Bridge Construction Project in the Lao People's Democratic Republic and the Kingdom of Thailand	1999.3〜2000.7	Development Study	2－1	- Implementation planning, Environmental Impact Assessment (EIA), project cost estimates, execution planning, formation of maintenance plans and creation of tender documents (drafts) - Roads: Basic design - Bridges: Prestressed concrete (PC) sail type continuous box girder bridge - Cross-border facilities: designed based on international standards that allow integrated BCF (cargo and passengers) usage
Construction and Development of International Ports and Airports [Development Study]							
34	Shipping/ ports	Egypt	The Study on the Development Plan of Suez Bay Coastal Area	1985.2〜1986.7	Development Study	2－1	- Construction work: Establishment of industrial complexes and free trade areas, water processing facilities, wastewater treatment facilities, dredging/land reclamation/quays, grain silo terminal, general goods terminal, railway, central district construction facilities, establishment of coastal industrial areas, coastal roads, storm water drainage facilities - Equipment provided: Grain unloader, tugboat, radar system
35	Air traffic/ airports	Guatemala	The Study on the Improvement/ Construction of the International Airport	2003.5〜2006.3	Development Study	2－1	- Development of access roads between the capital and the new international airport, and development of the area surrounding the new international airport - Formation of a M/P for improvement of the existing airport and construction of the new international airport, and implementation of a F/S regarding the new international airport (implementation based on the spirit of JICA's Guidelines for Environmental and Social Considerations)
36	Air traffic/ airports	Viet Nam	Feasibility Study on New Development Plan of Hanoi International Airport	1995.3〜1996.3	Development Study	2－1	- Mid-term Development Project: Construction of runways and adjoining taxiways; construction of the new international passenger terminal and transfer of the T1 passenger terminal to domestic route use; construction of an international cargo terminal; installation of aeronautical safety facilities related to runways and taxiways; installation of facilities for electrical supply, telephones, water supply and sewage, waste processing, and aviation fuel supply; procurement of fire engines and airport maintenance equipment - Long-term Development Plan: Construction of new airport facilities for international routes; use of the existing airport facilities for domestic routes; installation of new runways; connection of existing and new airport facilities with double connection taxiways
37	Air traffic/ airports	China	Detailed Design Study on Shanghai Pu-dong International Airport	1996.5〜1997.11	Development Study	2－1	- Development of aviation site (site development, drainage, paving, utilities and fixtures), aviation lights, aviation fueling facilities, firefighting and other emergency facilities
38	Air traffic/ airports	Palau	The Project for Improvement of Terminal Building at Palau International Airport	May 2001 (E/N signed)	Grant Aid (facilities + equipment and materials)	2－1	- Construction of facilities and provision of materials and equipment required for construction of the new international airport terminal ensuring the security of terminal users - Facilities: Passenger terminal building, boarding bridges, aprons, parking lots, etc.

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
39	Air traffic/ airports	Honduras	Development of a New International Airport for Tegucigalpa	June 1998 (E/N signed)	Grant Aid (facilities)	2－1	- Improvement of runways and installation of warning lights to improve airport safety to combat the frequent occurrence of accidents due to inadequate airport safety facilities - Facilities: Raising of runway pavement and grouping (ditches cut into pavement surface); installation of runway approach lighting system and aircraft warning lights
Improvement of International Cross-border Transportation Systems [Development Study]							
40	Air traffic/ airports	Philippines	The Study of New Communications, Navigation and Surveillance / Air Traffic Management System	1998.2～ 2000.3	Development Study	2－1 2－2	- M/P: Long-term development plan for a next-generation aviation system–switch to satellite navigation systems utilizing GPS; switch to air traffic control communication utilizing data communication methods; automation of air traffic control through the utilization of digital data communications; effective use of airspace through the utilization of information technology, and free selection of flight paths through the use of automatic collision avoidance systems; centralization of air traffic control and air traffic control facilities by data communications using satellite technology - F/S: Plan for establishing Manila air traffic control center and centralization of air traffic control and air traffic control facilities to the new Manila air traffic control center, and recommendations regarding the improvement of air traffic control methods
Facility for the Safety and Security, Designing and Provision of Equipment [Grant Aid, Group Training, Development Study]							
41	Shipping/ ports	—	International Maritime Conventions and Ship Safety Inspection	Fiscal 2004	Group Training (JICA Yokohama)	2－1	- Objective: Acquisition of knowledge related to shipping safety and prevention of marine pollution by maritime technology administrative officials - Details: Methods and application of shipping inspection in accordance with IMO conventions and international standards
42	Shipping/ ports	—	Maritime Search and Rescue and Disaster Prevention Course for Policy Planners	Fiscal 2004	Group Training (JICA Hyogo)	2－1	- Objective: To contribute to capacity development related to policy-making and administration through the acquisition of theory and technical knowledge by technical personnel involved in maritime search and rescue and disaster prevention - Details: Maritime search and rescue and disaster prevention theory, trends in international conventions, centralized disaster prevention systems, maritime pollution prevention measures, strategies for natural disasters, etc.
43	Shipping/ ports	**Indonesia**	Study for the Maritime Traffic Safety System Development Plan	2001.3～ 2002.5	Development Study	2－1	- Basic plans for navigation aid systems and maritime radio communication systems - Plans to establish Indonesian ship position notification systems with a view to maritime security and preservation of the marine environment in surrounding seas
44	Air traffic/ airports	**Afghanistan**	The Project for Improvement of Equipment of the Kabul International Airport	May 2003 (E/N signed)	Grant Aid (equipment and materials)	2－1	- Provision of materials and equipment to improve services at Kabul International Airport and to strengthen security arrangements - Equipment: X-ray inspection equipment for hand luggage, passenger boarding ramps, container dollies, high-lift loaders, catering loaders, water supply vehicles, luggage trolleys for passengers, etc.
45	Air traffic/ airports	**Philippines**	The Project for Rehabilitation of the Approach Radar Facility in the Ninoy Aquino International Airport	October 2000 (E/N signed)	Grant Aid (facilities + equipment and materials)	2－1	- Construction of facilities and provision of equipment required for improving radar control facilities in order to renew the outdated airport radar monitoring system - Construction of facilities: Antenna tower, radar office, radar approach control office - Procurement of equipment and installation: Radar transmitter/receiver equipment, radar processing facilities, radar display console, control console, power supply equipment, etc.
46	Air traffic/ airports	**Nepal**	The Project for Improvement of Existing Air Traffic Services Equipment System under the Tribhuvan International Airport Modernization Project	October 1999 (E/N signed)	Grant Aid (equipment and materials)	2－1	- Provision of materials and equipment related to airfield control in order to enhance the reliability of air traffic control at Tribhuvan International Airport - Provision of materials and equipment including airfield control equipment, flight route control equipment, aeronautical communication equipment, weather forecasting equipment, power supply equipment, etc.

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
47	Air traffic/ airports	–	Seminar on CNS Technology	Fiscal 2004	Group Training (JICA Tokyo)	2－1	- Background: ICAO is attempting to establish a worldwide CNS system based on the Future Air Navigation Systems (FANS) concept - Objective: To encourage the establishment of future air navigation systems by personnel experienced in air navigation and control systems so as to contribute to aeronautical safety - Details: Problem areas in current systems, future air navigation systems (new CNS systems)
Creation of Mapping Information [Development Study, Technical Cooperation Projects] (Note: Refer to Approaches for Systematic Planning of Development Projects: "Urban and Regional Development")							
48	Urban and regional development	**Georgia**	The Study on Establishing Digital Topographic Maps	2005.3～ 2008.10	Development Study	2－2	- Digitized basic national map (1/50,000) of an approximately 30,000 km^2 area of Georgia - Six types of GIS Model Databases for the various Priority Assistance Sectors - Technology transfer related to techniques for creating the abovementioned items, and methods for distribution such as the sale and sharing of geographic information
Development Objective 3: Toward Balanced Development of a Whole Country [National Transportation]							
Nationwide/Regional Integrated Transportation Master Plan [Development Study]							
49	General transpor-tation	**Bosnia and Herzegovina**	The Study on the Transportation Master Plan in Bosnia and Herzegovina (BiHTMAP)	1998.11～ 2001.3	Development Study	1－1 2－1 3－1 3－2 3－3 3－4	- Roads: New bypass/dedicated roads for automobiles, current road improvements/widening/paving, etc. - Railways: Improvements to railway facilities (restoration of rolling stock and carriage facilities, signaling and communication facilities, improvement of track facilities) - Air traffic: Short-term project in conformity with ICAO standards to achieve safe operation - Inland water transportation: Rehabilitation of the Sava River shipping system - Establishment of a transportation training center
50	General transpor-tation	**Viet Nam**	The Study on the National Transportation Development Strategy in Viet Nam	1999.1～ 2000.7	Development Study	1－1 2－1 3－1 3－2 3－3 3－4	- Formation of long-term, mid-term, and short-term plans up to 2020 aimed at the whole country and all transportation modes in order to efficiently advance improvements to transportation systems as the basis for economic progress - Roads: Improvements to roads and bridges - Railways: Repairs and small-scale improvements - Ports and ships: Improvement, expansion, and development of ports and harbors - Air transportation: Expansion and development of airports
51	General transpor-tation	**Viet Nam**	Master Plan Study on the Transportation Development in the Northern Part in Viet Nam	1993.6～ 1994.6	Development Survey	3－1 3－2 3－3	- Transportation systems for the whole northern region excluding airports with a target year of 2010 - Roads: Improvement of National Highways 1, 2, 18, 70, and 379, and improvements to bridges on national and rural roads (10 projects) - Railways: Improvement of passenger transportation on the Hanoi to Hai-phong line, upgrade of the Sanlam Rolling Stock Factory and improvements to cross-border transportation (9 projects) - Ports: Improvement and development of ports at Hai-phong and Cai Lan - Inland water transportation: Upgrades to ports at Ninh Binh, Hanoi, and Viet Tri, dredging and improvement of major and other waterways
52	General transpor-tation	**Pakistan**	The Study on National Transportation Plan (8th 5-year Plan)	1994.1～ 1995.2	Development Survey	3－1 3－2 3－3 3－4	- Proposal of an investment program for the eighth 5-year Plan - Roads: Improvements of dedicated roads for automobiles, national route improvements, rural road improvements - Railways: Track upgrades, improvements to signaling systems, reinforcement of carriages, improvements to electricity and information systems, etc. - Ports: Improvements to ports at Karachi and Qasim, etc. - Airports/air traffic: Airport improvement projects, aviation-related projects

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
Sector-specific Infrastructure Improvement Project Survey/Policy Recommendations (Aimed at National and Central Hub Transportation)							
53	Roads	**Oman**	Study in the Roads Network Development	2004.1～2005.2	Development Survey	3－1	- M/P: Plans for national road network improvement between 2006 and 2030 for primary and secondary national routes - Pre-F/S: Plans to form the basis for the road sector plan for the seventh 5-year National Development Plan between 2006 and 2010
54	Roads	**Indonesia**	Road Network Study in Central and South-East Sulawesi	1997.3～1998.12	Development Survey	3－1	- M/P: A total of 6,552 km of road extensions - Pre-F/S: 1,200 km of road extensions, target year of 2008, plan for improvement of paved surfaces, bridge plans, sloped-surface preservation plans, tunnel plans
55	Roads	**Angola**	The Project for Improvement of Road Network in Luanda	Fiscal 1998/1999 (E/N signed)	Grant Aid23.533	3－1 4－2	- Improvement of major trunk roads in urban areas with the aim of rapidly restoring the functionality of roads destroyed by civil wars - Improvement of roads and road surfaces for major trunk roads within Luanda state that connect with the surrounding regions, construction such as road structural elements including drainage for areas under construction, lighting, traffic safety equipment and installations
56	Railways	**Syria**	The Master Plan Study on the Development of Syrian Railways	2000.4～2001.8	Development Survey	3－2	- M/P: (Syrian national railway) Rehabilitation and modernization of existing facilities, construction of new lines, (Hejas railway) rehabilitation of existing facilities - F/S: (Syrian national railway) Plan for improvement of the sections among Tartous, Homs, and Al Sharki (rehabilitation and improvements to tracks and electrical facilities, construction of new signal stations, double tracking plans), modernization plan for the locomotive factory
57	Railways	**Indonesia**	Study on the Detailed Design Study of Railway Electrification and Double Tracking of Java Main Line Project	1984.12～1986.2	Development Survey	3－2	- Railway electrification - Construction of new electrical substations for electric locomotives, passenger carriages, and freight cars, and adoption of automated and token-less signaling system
58	Shipping/ ports	**Indonesia**	The Study on Development of Domestic Sea Transportation and Marine Industry in Republic of Indonesia	2002.12～2004.3	Development Survey	1－1 1－2 3－3	- Examination of the public financing system for ship improvements - Maritime management: Strengthening management foundations through the integration and affiliation of small ship companies, consignment of ship administration to specialist ship administration companies, provision of opportunities for advanced management education, coordination with the international cooperation initiative advocated by ISO and IMO with the aim of modernizing the domestic shipping industry - Support for the formation of an advanced maritime education program
59	Shipping/ ports	**Indonesia**	The Study for Development of the Greater Jakarta Metropolitan Ports of Indonesia	2002.3～2003.9	Development Survey	3－3	- Port development and management and operation strategies with respect to the West Java region - Development of the Tanjung Priok Port and the Bojonegara Port, master plan and short-term improvement plans regarding management and operation
60	Shipping/ ports	**Indonesia**	The Study for Port Development Strategy in the Republic of Indonesia	1997.11～1999.3	Development Survey	3－3	- Strategy for port improvements and enhancement - Strategy for port financial administration and privatization - Strategy for port administration, and management and operation
61	Shipping/ ports	**Philippines**	The Study on the Master Plan for the Strategic Development of the National Port System	2002.11～2005.1	Development Survey	3－3	- Master plan related to improvement of the national ports network with a target year of 2024
62	Shipping/ ports	**Philippines**	The Study on the Cebu Integrated Port Development Plan (Preparatory Study)	2000.12～2002.3	Development Survey	3－3	- Improvement of the existing port and construction of a new port at Cebu - International trade container terminal, multipurpose international trade terminal, access roads, wharf upgrades, improvements to passenger ship terminal building, Ro/Ro wharf, high-speed vessel wharf, cargo ship wharf, yard, passenger ship terminal, etc.

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
63	Shipping/ ports	**Thailand**	The Master Plan Study for the Coastal Channels and Ports Development	2001.1～ 2002.12	Development Study	3－3	- M/P: Plans for the expansion of one general domestic cargo berth and one Ro/Ro cargo berth at Songkla Port, plans for work to prevent coastal erosion through a sand bypass for shipping route 10 - F/S: Plans for coastal preservation measures in relation to the domestic shipping berth and one Ro/Ro ship berth for general domestic cargo, plans for additional training walls to prevent losses to fishing villages and the filling in of waterways, plans for construction to prevent coastal erosion and re-sand bypass work
64	Shipping/ ports	**Ghana**	The Development Study of Ghana Sea Ports	2000.11～ 2002.1	Development Study	3－3	- Takoradi Port facilities improvement: Container berth, multipurpose berth, manganese berth, bauxite/clinker berth, small vessel pier, navigation aid facilities, tugboats, etc. - Tema Port facilities improvement: container berth, navigation aid facilities, tugboats, new approach waterway, new turning circle, container yard, etc.
65	Shipping/ ports	**Turkey**	The Study on Long Term National Port Development Plan	1999.7～ 2000.9	Development Study	3－3	- Port improvement strategy: Introduction of a port improvement system using port ratings (selection of trunk ports), improvement strategy for container port facilities, long-term plans (container berth extension), short-term plans (container terminal improvements, general cargo terminal improvements) - Port management strategy, port investment strategy, systematic framework creation strategy, port operation strategy, environmental consideration policy
66	Air traffic/ airports	**Philippines**	Master Plan Study on the Development of National Airports	2004.12～ 2006.3	Development Study	3－4	- Formulation of an airport improvement policy to act as a guideline for national airport improvement, maintenance, management and operation through the creation of an airport facilities ledger, etc. - Improvement of airport security - Reestablishment of the roles of the various airports based on airport type and functional allocation - Recommendation of practical policies, reflecting ideas such as securing means of revenue creation, in order to contribute to the re-examination of organizational systems and the efficient reform and upgrade of airports
67	Air traffic/ airports	**Indonesia**	The Master Plan Study for the Strategic Policy of the Air Transportation Sector	2003.2～ 2004.7	Development Study	2－1 3－4	- Formation of long-term policies for the aviation sector, and creation of improvement plans and proposals regarding safety control, aviation security, aircraft accident investigations, airport improvements, improvements to aeronautical safety systems, etc. - Strengthening of government functions: Strengthening of the safety supervising function, strengthening of the aviation security and air transportation policymaking functions, strengthening of the aviation accident investigation and accident prevention functions - Organizational restructuring in relation to service functions: Establishment of a single ATS provider, transfer of airports managed by the Directorate General of Air Communications (DGAC) to Angkasa Pura I (API), Angkasa Pura II (APII), and regional governments - Support for safe and efficient air transportation: Development of airport subsectors, development of the CNS/ATM sub-sector
68	Air traffic/ airports	**Uzbekistan**	The Study on Air Transport Development	1997.4～ 1998.6	Development Study	3－4	- Improvement of the existing airports: Expansion of the domestic passenger and cargo building, renewal of the firefighting office, new airport surface detection equipment (ASDE), runway extension, improvement of paved surfaces, extension of the passenger building, control tower, renewal of navigation aid facilities - Construction of new airports: new airports with facilities mainly for international routes - National navigation aid facilities: Replacement of NDB with VOR/DME at eight locations
69	Air traffic/ airports	**Kazakhstan**	The Study on Air Transport Development	1995.3～ 1997.3	Development Study	3－4	- M/P: Air transportation total development plan - F/S: Runway extensions and improvements, new terminal facilities, improvements to aviation security facilities, expansion of aprons, etc.

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
Infrastructure Development Project by Sector (Core Projects) [Development Study, Grant Aid]							
70	Roads	**Nepal**	The Feasibility Study on the Construction of Kathmandu-Naubise Alternate Road	2000.3～2001.3	Development Study	3－1	- Construction of high-standard bypass roads (approximately 21.4 km, 2 lanes) - Newly constructed tunnel (length: 705 m, 2 lanes) - F/S regarding natural energy generation to supply electricity for tunnel management and maintenance - Construction of a truck terminal near the Kathmandu outer ring road
71	Roads	**Cambodia**	The Project for Construction of a Bridge over the Mekong River	Fiscal 1996/1997 (E/N signed)	Grant Aid (facilities)	3－1	- Construction of a bridge at the section divided by the Mekong River of National Route 7, a major trunk road - Construction of 1 km main bridge (PC box girder bridge, 2-lane road), 360 m approach bridge (PC girder bridge, 2-lane road), approach road (2-lane paved road)
72	Shipping/ ports	**Kiribati**	The Project for Development of Betio Port	May 1997 (E/N signed)	Grant Aid (facilities + equipment and materials)	3－3	- Construction of facilities and provision of equipment required for the improvement of coastal wharves and container yards at Betio Port - Improvements to wharves, container yards, and access roads; construction of a cargo warehouse, administration office, and passenger terminal, etc.; cargo handling equipment
Improvement of Travel System [Development Study]							
73	Railways	**Philippines**	The Study on the Standardization for Integrated Railway Network of Metro Manila	2000.2～2001.3	Development Study	1－2 1－4 2－1 3－2	- Plan for improving the open space outside the station (project for installation of bus and jeepney terminals, footpaths, installation and improvement of access roads) - Project for improvement of facilities outside the station (improvements/installation of escalators, elevators, open access ways, etc.) - Direct connection project (northern Manila railway and southern Manila railway, LRT 1 and 3) - Project for reorganizing bus and jeepney routes with stations as central - Establishment of task forces with a view to implementation of integrated transportation policies and plans - Program for establishing an urban development fund - Program for capacity development in the railway sector - Development plan for residential area integrated with the railway
74	Railways	**Viet Nam**	The Feasibility Studies on the Rehabilitation and Improvement of Railway in Viet Nam	1994.2～1996.1	Development Study	3－2	- M/P: Improvement and repair of all slow-moving sections, and upgrades to emergency systems, tracks, signals, communications, and carriage maintenance - F/S: Improvements to passenger and cargo services, improvements to tracks, bridges, signals, and communications, installation of optical cables, installation of telephone exchanges, laying of tracks, improvement of tourist transportation, gauge conversion work
Operation and Maintenance System [Development Study, Grant Aid]							
75	Roads	**Kenya**	Study on the Utilization of Private Sector in the Road Maintenance System	2000.11～2003.1	Development Study	1－3 3－1	- More efficient utilization of existing resources for road maintenance systems - Proposal of programs for training, education and capacity development in relation to road maintenance project - Creation of road maintenance manuals
76	Roads	**Bosnia and Herzegovina**	The Project for Procurement of Road Construction Machinery	Fiscal 1998 (E/N signed)	Grant Aid (equipment and materials)	3－1	- Cooperation for the acquisition of road construction machinery, such as asphalt plants and bulldozers, with the aim of restoring national trunk lines and other destroyed roads within Sarajevo
77	Roads	**Turkey**	The Study on Arterial Highway Maintenance	1997.3～1998.7	Development Study	3－1	- Maintenance and inspection manuals - Evaluation and repair manuals - Implementation plan of a road maintenance system - Implementation plan for 18 selected subdivisions
78	Roads	**Turkey**	The Study on the Maintenance and Rehabilitation of Highway Bridges	1995.3～1996.8	Development Study	3－1	- Maintenance of bridges (repair, maintenance and reconstruction of significantly damaged portions, maintenance of bridges where alkali-aggregate reactions, etc. are evident)

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
79	Railways	**Mongolia**	Project for Repairing Railways	November 2000 (E/N signed)	Grant Aid (facilities + equipment and materials)	2－1	- Upgrade work and procurement of equipment for basic railway facilities such as bridges and embankments for railways that perform important roles in long-distance domestic transportation and international transportation - Construction of facilities: Rock fall prevention measures, construction/improvement of river retaining walls, improvement/construction of lateral drainage ditches for railway lines, etc. - Procurement of equipment: Bulldozers, truck cranes, dump trucks, etc. (equipment required for the construction of basic railway line facilities) - Improvement work such as construction to prevent rock falls, bridge repair work, lateral drainage work, etc., technical support for preservation and maintenance of facilities
80	Railways	**Mongolia**	The Feasibility Study on the Rehabilitation Project of the Mongolian Railway	1996.7～ 1998.2	Development Study	3－2	- Improvement plans for basic facilities and bridges for railway lines suffering deterioration - M/P: Improvement plans including measures to prevent erosion of embankments, rock falls, flooding of tracks, and measures for improving bridges, and lateral railway line drainage - F/S: Improvement plans including measures to prevent erosion of embankments, rock falls, and measures for improvements to bridges, and lateral railway line drainage (outline design)
81	Railways	**Uzbekistan**	The Feasibility Study on the Construction of Electric Locomotive Repair Workshop	1996.11～ 1997.8	Development Study	3－2	- Construction of a repair factory for electric locomotives
82	Shipping/ ports	**Mozambique**	The Study for Maintenance and Improvement Plan of Access Channel of Beira Port	1997.1～ 1998.2	Development Study	3－3	- Introduction of a dredging vessel for port maintenance dredging
Normalization and Standardization [Development Study]							
83	Roads	**Philippines**	Feasibility Study on Upgrading Inter-Urban Highway System (Sta. Rita-San Jose Road Section)	1998.1～ 1999.12	Development Study	3－1	- New construction for a wide area bypass road, conversion of sections of that road to meet higher standards including improvement plans for access roads - Construction of bypass roads in three urban areas along the Pan-Philippine Highway (Philippine-Japan friendship highway) between Plaridel and San Jose
84	Roads	**Malaysia**	The Study on the Standardization of Bridge Design	1994.8～ 1996.8	Development Study	1－4 3－1	- Development of a computerized design and drawing system, and creation of standard design drawings and manuals (planning, design, budgeting, execution) with the aim of standardizing bridge design
Intermodal Transportation Improvement (Issues common to all modes of transportation)[Development Study]							
85	Shipping/ ports	**Indonesia**	The Study on the Master Plan of Container Cargo Handling Ports, Dry Ports and Connecting Railways	1994.3～ 1995.6	Development Study	3－5 2－2	- M/P: Plans for advancing the national container handling port network, and railway container transportation in connecting areas at hinterlands of five national ports (new loading facilities at the port of Tanjung Priok, plans for new lines including Pasoso station) - F/S: Short-term railway improvement plans for priority ports, dry ports, and the Jakarta metropolitan region, improvement/construction of container terminal at multipurpose pier (yard plans, cargo handling machinery, improvement/construction of the container terminal [dry port] at the hinterlands of ports)

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
Disaster and Disaster Prevention [Development Study]							
86	Roads	**Nicaragua**	The Study on Vulnerability Reduction for Major Roads	2002.1～2003.1	Development Study	3－5	- M/P: Investigations regarding safety levels, and determination of sections requiring improvements for disaster prevention on the routes in question - F/S: Work proposals for disaster prevention improvement at the specified areas, creation of five types of manuals (surveying, planning, design and construction, maintenance, and design standards and technical drawing compilations)
87	Roads	**Malaysia**	Slope Disaster Management Study for Federal Highways	2000.10～2002.3	Development Study	1－3 3－5	- Improvement of the training implementation system for public and private road technicians in the field of road construction and maintenance at the Institute of Training on Road Maintenance and Construction Machines (Institut de Formation aux Engins et a l'Entretien Routier Skhirat [IFEER]), which is the only specialist training organization for the management, operation and repair of construction machinery - Formation of guidelines for road embankment management, development of a supporting information system, organizational reforms required for the implementation of road embankment management, formation of capacity development plans
Development Objective 4: Toward Sustainable Urban Development and Improvement of Urban Life							
Study on Integrated Urban Transportation and Formulation of Master Plan [Development Study]							
88	Urban transpor-tation	**Kenya**	The Master Plan and Feasibility Study to Alleviate Traffic Congestion and Improve Traffic Safety in the Nairobi Metropolitan Area	2004.7～2005.10	Development Study	4－1 4－2 4－3 4－4 4－5	- Formation of an integrated urban transportation strategy that includes "hard" improvements such as improvements to the road network, intersection upgrades, and the implementation of other traffic facilities, and "soft" considerations such as systems improvements - Implementation of a pilot project (intersection improvement) to verify the effects of works
89	Urban transpor-tation	**Peru**	The Master Plan for Lima and Callao Metropolitan Area Urban Transportation	2003.12～2005.6	Development Study	4－1 4－2 4－3 4－4 4－5	- Formation of an integrated long-term urban transportation plan (target year: 2025) with the objective of ameliorating various urban transportation problems in Lima, such as traffic congestion, traffic accidents, and atmospheric pollution; and creation of improvement plans and investment plans based on that
90	Urban transpor-tation	**Viet Nam**	The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS)	2002.8～2004.6	Development Study	4－1 4－2 4－3 4－4 4－5	- Proposal of seven basic objectives, 35 strategies, and 105 action plans aimed at achieving the vision for transportation development - Basic objectives: Promotion of social understanding with respect to large city transportation problems, management of continuous large city growth, development of an attractive public transportation system, effective road transportation management, integrated improvements to transportation spaces and environments, enhancement of transportation safety, strengthening of the administrative foundations of urban transportation
91	Urban transpor-tation	**Indonesia**	The Study on integrated Transportation Master Plan for JABODETABEK (Phase II) (SITRAMP)	2001.11～2004.3	Development Study	4－1 4－2 4－3 4－4 4－5	- Formation of a transportation master plan for the JABODETABEK region - Urban transportation policy: Promotion of public transportation use, amelioration of traffic congestion, reduction of air pollution and noise, reduction of traffic accidents and improvements to public security
92	Urban transpor-tation	**Egypt**	Transportation Master Plan and Feasibility Study of Urban Transport Projects in Greater Cairo Region (Phase II) (CREATS)	2003.2～2003.12	Development Study	1－1 1－3 4－2	- Integrated improvements in the urban transportation sector, including upgrade/construction of infrastructure, and the systems and human resources to support it, with the aim of creating the key systems for the formation of a new urban structure for the Greater Cairo Region - Program A: Program for the improvement of major public transportation corridors and district transportation management - Program B: Improvement program for the Cairo Transportation Agency (CTA) public transportation service in the eastern districts of Cairo

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
93	Urban transportation	**Romania**	The Comprehensive Urban Transport Study of Bucharest City and Its Metropolitan Area	1998.7～2000.3	Development Study	4－1 4－2 4－3	- M/P: Formation of a transportation master plan combining enhancements to ring roads and improvements to public transportation facilities (development of public transportation along multiple axes) with an emphasis on trams - Priority projects: Connection of inner ring roads with overpasses, improvement of bottleneck spaces, development of inner-city parking systems, development of a new public transportation corridor, and improvement of the fare systems
94	Urban transportation	**Cambodia**	The Transport Master Plan of the Phnom Penh Metropolitan Area	2000.3～2001.10	Development Study	4－1 4－2 4－3	- Roads: Improvements to paved surfaces in urban areas, construction of roads and bridges in outer areas - Public transportation: 1,306 buses, related facilities, and other items - Transportation administration: Improvements to traffic signals in urban areas = 117 signals, other - Organizations and legal systems: Organizational reform, capacity development, legal system upgrades
Provision of Basic Urban Transportation Infrastructure and Maintenance System [Development Study]							
95	General transportation	**Thailand**	The Study on Greater Bangkok Truck Terminal	1991.2～1992.9	Development Study	4－1	- Construction of a public truck terminal facility (including: platform, apron, parking lots, administration office, service station [repair facility, fueling station, vehicle washing facilities], greenbelts, and roads)
96	Roads	**Philippines**	The Study on the Improvement of Existing Bridges along Pasig River and Marikina River	2002.9～2004.4	Development Study	4－4	- Evaluation of the soundness of the 17 bridges under survey, bridge improvement M/P (target year: 2023), F/S on priority bridge improvements (target year: 2013), ship collision avoidance measures - Technology transfer: Survey and evaluation of the soundness of bridges, planning methods for urban civil engineering projects (including transportation management plans)
97	Roads	**Philippines**	Study on Upgrading Inter-Urban Highway System along the Pan-Philippine Highway (Plaridel, Cabanatuan, San Jose Bypass)	1998.11～1999.11	Development Study	4－1	- Construction of three bypass roads at points of traffic congestion on the Philippines-Japan friendship Highway
98	Roads	**Malaysia**	The Feasibility Study on Kuala Lumpur Outer Ring Road Project	1995.3～1996.7	Development Study	4－1	- Construction of a ring road to connect Kuala Lumpur's North-South Expressway and North-South Central Link Expressway (tunnels, bridges, etc.)
99	Urban transportation	**Colombia**	Feasibility Study on the Project of Highway and Bus Lane of Santa Fe de Bogota	1998.3～1999.7	Development Study	4－1 4－3	- Construction of an inner-urban elevated expressway - Improvement of major bus roads for 10 routes
Improvement of Public Transportation Services [Development Study, Grant Aid]							
100	Urban transportation	**Philippines**	The Feasibility Study of the Proposed Cavite Busway System	2001.12～2002.9	Development Study	4－2	- Formation of plans for busways in the Cavite district - Technology transfer: Technology and techniques for transportation planning, busway operation and management, legal system development, and site acquisition
101	Urban transportation	**China**	Study for Public Transportation Improvement in Chengdu City	2000.3～2001.7	Development Study	4－2	- M/P: Establishment of dedicated bus lanes, establishment of bus priority lanes, bus-related facilities, plans for upgrading transportation management facilities, plans for improving policies, systems, etc. - F/S: Trunk lanes of dedicated bus lanes, bus priority lanes, bus-related facilities (bus stations, transfer points, bus stops), plans for improving transportation management facilities, plans for improving policies, systems, etc.
102	Urban transportation	**Azerbaijan**	Urban Transportation Improvement in the City of Baku	2000.8～2002.3	Development Study	4－2	- M/P: Public transportation plan, road plans, transportation management plans - F/S: Plans for introducing motor coaches (60 coaches, installation of bus stops), improvements to five bottleneck locations (roads), tram upgrade plans, plans for introducing centralized traffic control system, intersection improvement plans

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
103	Urban transportation	**Philippines**	The Study on Metro Manila Urban Transportation Integration	1996.3～1999.3	Development Study	4－2	- MRT/LRT/Busways: Routes 1 and 6, route 2, route 3, route 4, north rail, and MCX - Roads: Improvements to expressways, trunk roads, and semi-trunk roads
104	Urban transportation	**Mongolia**	The Project for Improvement of Public Transportation in Ulan Bator	1994～1995	Grant Aid (facilities + equipment and materials)	4－2	- Provision of materials and equipment - Provision of a bus maintenance factory - Technology transfer guidance from Japanese maintenance technicians (cooperation volunteers) - Long-term expert dispatch to act as an operations and management director
Post-disaster Restoration of Public Transportation Services [Grant Aid]							
111	General transportation	**Afghanistan**	The Project for Rehabilitation of the Public Transportation System in Kabul City	March 2003 (E/N signed)	Grant Aid (equipment and materials)	4－2 4－4	- Provision of materials and equipment for improving the public transportation environment, which is plagued by breakdowns due to deterioration and destruction from civil conflict, and for resolving the inadequacy of transit buses for international airport passengers - Inner-city route buses (coach buses, minibuses), airport buses, spare parts, repair equipment, etc.
112	General transportation	**Serbia and Montenegro**	Rehabilitation of the Public Transportation Capacity in Belgrade City	April 2002 (E/N signed)	Grant Aid (equipment and materials)	4－1 4－4	- Provision of materials and equipment in order to ensure bus transportation capacity, and in particular the transportation capacity of inner-city routes that experience concentrated use, since these are common everyday forms of transportation for urban residents, including the large numbers of refugees and internally displaced persons that live in the city - Materials and equipment for coupled buses, coach buses, and maintenance workshops
113	Urban transportation	**Bosnia and Herzegovina**	Basic Design Study Report on the Project for Rehabilitation of Mostar City Transportation System	May 2001 (E/N signed)	Grant Aid (equipment and materials)	4－2 4－4	- Provision of equipment and material for the restoration of Mostar City bus routes that have suffered damage from civil conflict - Provision of coupled buses, coach buses, coach buses (lowered floors), mini-buses, spare parts, and workshop tools
Transportation Demand Management [Development Study]							
105	Urban transportation	**Thailand**	The Study on Improvement of Road Traffic Environment in Chiang Mai	2001.7～2002.9	Development Study	4－1 4－3 4－4	- Intersection improvements (construction of new traffic lights, addition of pedestrian lights to existing controlled intersections) - Construction of new traffic lights - Traffic light improvements (ATC connection) - Addition of pedestrian lights - Pedestrian and bicycle networks in older urban districts - Improvement of hazardous areas
Strengthening of Transportation Safety Measures [Development Study, Overseas Basic Study, Grant Aid]							
106	Urban transportation	**Viet Nam**	Study on Road Traffic Safety in Hanoi	2004.2～2005.1	Overseas Basic Survey	4－4	- Implementation of the traffic safety campaign (1 month × 3 times) (1) Ensuring a safe flow of traffic at intersections (changes to left turning lanes), ensuring an orderly and safe flow of traffic (division of lanes according to vehicle type) (2) Increased awareness for traffic safety of motorbike users, management to ensure safe driving by bus drivers (3) The correct way for pedestrians and bicycles to cross roads
107	Urban transportation	**Nepal**	The Project for Improvement of Intersections in Kathmandu City	February 2001 (E/N signed)	Grant Aid (D/D + facilities)	4－4	- Construction of facilities required for the improvement of major intersections in Kathmandu City - Installation of traffic lights, alterations to intersection layouts, installation of sidewalks, installation of gutters, etc.
108	Urban transportation	**Thailand**	The Study on an Improvement Plan for Railway Transport in and around the Bangkok Metropolis in Consideration of Urban Development	1993.5～1995.10	Development Study	1－1 4－2	- Formation of a M/P that integrates urban development and railway improvements in the Bangkok metropolitan area - Proposal of a F/S for the SRT east line, 2nd International Airport Branch Line (model urban development plan with stations as central, railway improvement plans [improvements for work commuters, electrification of the 2nd International Airport Branch Line, inter-city express transportation])

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
109	Urban transpor-tation	**Thailand**	Traffic Safety Plan for Roads	1983.5〜1984.12	Development Study	4－4	- Data collection and analysis - Determination of hazardous areas - Installation guidelines for safe facilities - Safe facility plans - Study on methods for creating mid to long-term plans for safe facility installations/improvements
Disaster Prevention Measures [Development Study]							
110	Roads	**Thailand**	The Study on Road Disaster Prevention Plan	1993.11〜1995.5	Development Study	4－2	- F/S: Selection of project roads, selection of 38 potential disaster areas for the creation of outline designs - Creation of disaster prevention manuals
Development Objective 5: Toward Sustainable Rural Development and Improvement of Rural Life							
Maintenance and Designing of Basic Infrastructure [Development Study, Grant Aid]							
114	Roads	**Viet Nam**	The Project for Reconstruction of Bridges in the Northern District	1993〜1995 (cooperation period)	Grant Aid (facilities)	5－1	- Construction of new and reconstruction of existing small to medium bridges on auxiliary roads in northern agricultural and mountainous areas or on regional residential roads - Bridge construction, provision of steel girders
115	Roads	**Philippines**	Feasibility Study on Road Network Improvement for Development of Regional Growth Centers	2003.3〜2005.8	Development Study	4－1 5－1	- Formation of a master plan for a road network project, involving national routes and rural roads, in relation to road improvements in order to relieve traffic congestion in central rural cities and to support regional economic progress - Advice regarding road network planning methods that utilize regional characteristics, and regarding work implementation methods that involve collaboration between central government and rural governments
116	Roads	**Philippines**	The Project for Construction of Bridges along Rural Roads in Northern Luzon	June 2002 (E/N signed)	Grant Aid (facilities + equipment and materials)	5－1	- Procurement of steel materials for bridges and execution of technically difficult bridge construction work for unconstructed bridges in rural road networks - Provision of steel materials for bridge construction, bridge construction (government bond)
117	Shipping/ ports	**Samoa**	The Project for Construction of the Inter-islands Navigation Vessel	Fiscal 1997 (provision)	Grant Aid (equipment and materials)	5－1	- Provision of passenger transportation ferries to take the place of ships decommissioned due to deterioration - Installation of fire detection systems, firefighting equipment, and sprinkler systems, as well as lifeboats and life rafts in accordance with SOLAS standards regarding ferries
118	Air traffic/ airports	**Thailand**	The Study on Airport Development Master Plan in the Kingdom of Thailand	1998.3〜2000.1	Development Study	5－1	- Selection of five priority airports regarding improvements from the approximately 30 regional airports - Expansion of existing airports (Lampang, Mae Hong Son, Phrae) and construction of new airports (Betong, Mukdahan) to deal with future expected increases in air transportation demand
119	Air traffic/ airports	**Philippines**	The Study on Selected Airports Master Planning Project	1996.3〜1997.3	Development Survey	5－1	- M/P: Survey of proposed sites for new airports, development of the existing airports - F/S: Construction of new airports
Introduction of Appropriate Technology [Grant Aid]							
120	Roads	**Morocco**	The Project for Improvement of Equipment for Rural Roads	December 2000 (E/N signed)	Grant Aid (equipment and materials)	5－3	- Provision of materials and equipment required for improvements to village roads in rural areas - Bulldozer, wheel loader, motor grader, hydraulic shovel, vibrating roller, dump truck, watering truck, truck trailer, oil supply truck, utility truck, air compressor, etc.
121	Roads	**Guatemala**	The Project for Improvement of Equipment for Rural Road Construction	Fiscal 1998 (E/N signed)	Grant Aid (equipment and materials)	5－3	- Provision of seven convoys (new machines) and supporting equipment to reinforce the rural convoy system that covers 6,150 kilometers of road with urgent needs for improvement in 159 municipal cities, in nine peaceful provinces - Securing access to markets and traffic flow throughout the year in rural villages, and access to public services in isolated villages by improvement of transportation system

No.	Sub-sector	Country	Activity Name	Period	Scheme	Mid-term Objective	Content (s) of Activity
Designing for Improvement of Rural Life [Development Study]							
122	Urban/ regional	**Palau**	The Study for Promotion of Economic Development	2000.2～ 2000.8	Development Survey	5－2	- M/P (transportation sector): Roads: Improvements to connecting roads, improvements to national roads; Airports: International airport runway extension; Ports: Port expansion - Pre-F/S: Tourism development plan, solid waste disposal management program
123	Urban/ regional	**Indonesia**	The Development Study on Comprehensive Regional Development Plan for the Western Part of Kalimantan	1997.3～ 1999.3	Development Survey	5－2	- Long-term comprehensive development plan: Formulation of a development plan with priority development areas and river basin divisions specified by spatial planning, formulation of an environmental M/P for development that is consistent across river basin areas, social infrastructure improvements for small to medium rural cities and farm villages, improvements to multi-transportation adequate for goods transportation, creation of plans for the diversification of industries and products, including capacity development - Transportation sector priority projects: Trans-Kalimantan highway improvement project, Pankalambun-Kumai city, industrial and ports development project master plan survey, Kalimantan upland rural infrastructure development project for poverty reduction measures
Disaster Prevention Measures and Post-disaster Recovery [Grant Aid Cooperation]							
124	Roads	**Nepal**	The Project for the Urgent Rehabilitation of Sindhuli Road (Section IV)	July 2003 (E/N signed)	Grant Aid (facilities)	5－1	- Restorative and preventative works on roads and road structural elements that were damaged in record heavy rainfalls in which numerous landslides and cave-ins occurred and road structural elements were washed away and destroyed, etc
125	Roads	**Bangladesh**	The Project for Improvement of Portable Street Bridges for Feeder Roads	June 2001 (E/N signed)	Grant Aid (facilities)	5－1	- Constructing necessary bridges and improving bridges on feeder roads that are frequently damaged during the rainy season - Procurement of materials for portable steel bridges required for the construction of 74 footbridges

Appendix 2
Activities of Major Donors in the Transportation Sector

The recent activities of major donors in the transportation sector have been organized in the following manner:

- ○ Region-specific activities: Asia (Mekong Subregion Development, Asian Highway, East Asia Infrastructure Studies), Africa (Regional Organizations, NEPAD and the African Development Bank, Road Improvement Activities), Central and South America
- ○ Issue-specific activities: Poverty Reduction (POVNET), Traffic Safety (GRSP), Promotion of Employment (ASIST)
- ○ Activities of Individual Donors (World Bank, Asian Development Bank, Department for International Development (U.K.))

2-1 Region-specific Activities

2-1-1 Asia

Activities in Asia

(1) Mekong Subregion Development

The Asian Development Bank plays a central role in the Greater Mekong Subregion (GMS) program, providing support aimed at poverty reduction and promoting economic growth.

The Mekong River basin (extending into six countries: Cambodia, Laos, Thailand, Myanmar, Viet Nam, and China's Yunnan Province), home to a population of 250 million, has experienced rapid growth due to modernization and industrialization. However, economic disparities within the region between urban and rural areas are still large. In 1992, the Asian Development Bank (ADB) began the Greater Mekong Subregion (GMS) program with the objectives of (i) enhancing economic relations among the six countries in order to promote their developmental growth, (ii) achieving sustainable economic growth and improvements in living standards, and (iii) reducing poverty in the region. US $1.2 billion worth of financing from the ADB, and an overall total of US $30.9 billion from cooperating sources have thus far been invested in the GMS program.

With a view to promoting pro-poor economic growth, the ADB is treating transportation as a sector of highest priority. Emphasis is being placed on increasing roads in strategic corridors within the region, and in particular on enhancing roads that cross national borders. The development and enhancement of inland water routes and ports are also progressing. As part of the GMS transportation sector project, the ADB is undertaking "hard," or physical activities such as the upgrading of roads in the Southern Economic Corridor (Bangkok-Phnom Penh-Ho Chi Minh City-Vung Tau), the upgrading of roads and construction of bridges in the East-West Corridor (Thailand-Laos-Viet Nam), and a project for upgrading roads in Cambodia, as well as "soft" activities such as the facilitation of cross-border transportation for people and goods.

Japan sees the significance of Mekong subregion development in (i) achieving development of a wide area (enhancing relations among countries in

the Mekong River basin) and (ii) correcting disparities among ASEAN members (further ASEAN integration). Japan also actively provides support for activities that meet the following conditions from both "hard" (infrastructure development) and "soft" (development studies, etc.) perspectives:

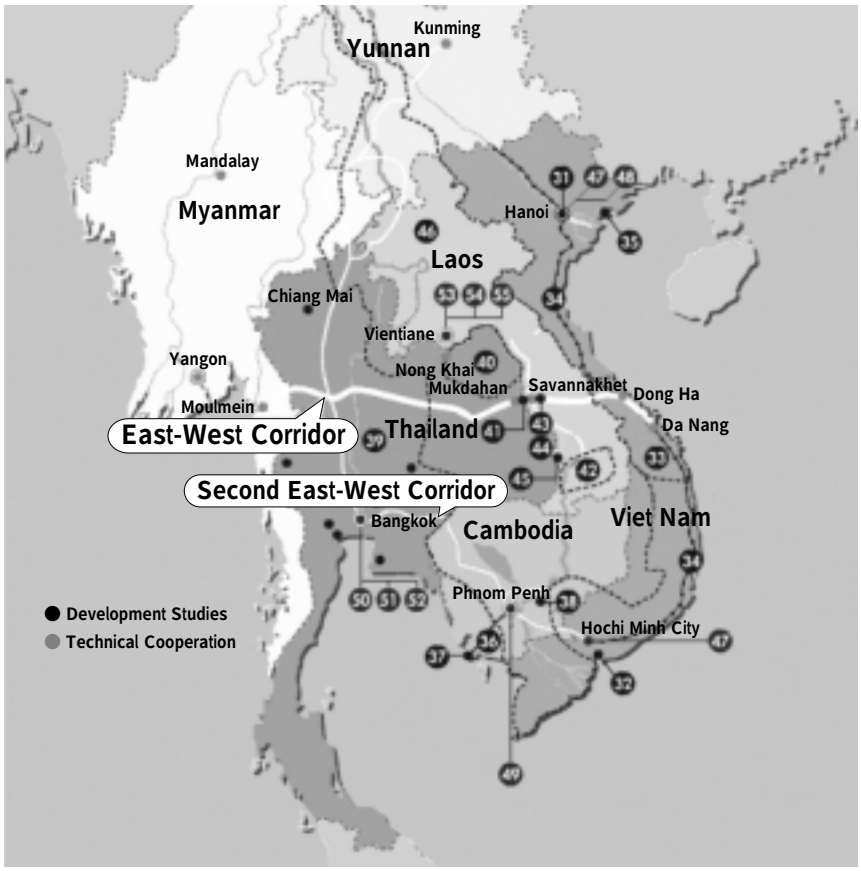
(1) Activities that extend across national borders within the region (genuinely wide area activities, for example, the Second Mekong International Bridge)

(2) Activities that form one part of greater plans extending across national borders within the region (activities that are in themselves domestic), for example, improvement of National Route 9 in Laos and construction of the Hai Van Tunnel in Viet Nam (part of the East-West Corridor)

(3) Activities for which the effects of assistance can be expected to flow over to nearby countries within the region (activities that are in themselves domestic), for example, airport related activities and wide area training

While there are many international organizations and frameworks in place in relation to Mekong subregion development, to ensure that activities are carried out in an efficient and effective manner, it is essential that mutual

Figure A 2-1 Mekong Subregion Development (Development Studies and Technical Cooperation)



Source: The Japanese Ministry of Foreign Affairs website: *"Mekon chiiki kaihatsu Kaihatsu chosa, Gijutsu kyoryoku"* [Mekong Subregion Development Development Studies, Technical Cooperation]

Note: Please refer to Table A 2-1 on the following page for the names of activities.

Table A 2-1 Mekong Subregion Development (Japanese Development Studies and Technical Cooperation)

Sector	Name of Activity	Cambodia	Laos	Viet Nam	Thailand	Mekong River Commission
General	33. Total Project for Social and Economic Development Focused on the Central Regions			○		
	36. Project Study on Total Development of the Capital/Sihanoukville Growth Corridor Region	○				
	40. Total Regional Development Project for the Northeastern Border Region				○	
	43. Total Regional Development Plan for Savannakhet		○			
	44. Special Economic Zone Development Plan in the Laos Border Area		○			
	46. Study on Hydraulic Monitoring in the Mekong River Basin					○
Roads	4. Project for Restoration of National Route 6A (Phase I, II)	○				
	6. Project for Restoration of National Routes 6/7 (Phase I, II)	○				
	8. Project for Upgrading the Kampong Cham Section of National Route 7	○				
	10. Project for Providing Construction Materials for National Route 8		○			
	16. Project for Improvement of National Route 9 (Phase I, II)		○			
	17. The Second Project for Improvement of National Route 9		○	○		
	19. Project for Improving National Route 5 (Phase I, II, III)			○		
	23. Hai Van Tunnel Construction Project (Phase I, II)			○		
	26. Construction Work for Enhancing the Rural Arterial Roads Network (Phase I, II)				○	
	42. Study on the Improvement of Regional Roads in Southern Laos		○			
Bridges	3. Project for Restoration of the Chrouy Changva Bridge (Phase I, II)	○				
	5. Project for Construction of a Bridge over the Mekong River	○				
	7. Project for Improving Bridges on National Route 6A (Phase I, II)	○				
	11. Project for Upgrading Bridges on National Route 13 (Phase I, II)		○			
	14. The Second Project for Upgrading Bridges on National Route 13 (Phase I, II)		○			
	15. Pakse Bridge Construction Project		○			
	20. Project for Restoration of Bridges on the North-South Railway Line (Phase I, II, III)			○		
	28. Second Mekong International Bridge Construction Project				○	
	30. Second Mekong International Bridge Construction Project		○			
	38. Basic Design Study on the Project for Construction of a Bridge over the Mekong River	○				
	41. Study on the Detailed Design of the Second Mekong International Bridge Construction Project		○		○	
	45. Study on the Laos Pakse Bridge Construction Project		○			
Railways	34. Project for Improving the North-South Railway Line			○		
Airports	13. Project for Upgrading Vientiane International Airport (Phase I, II)		○			
	27. Construction Work on the Second Bangkok International Airport (Phase I, II, III, IV)				○	
	31. New Development Plan of Hanoi International Airport			○		
Ports	21. Project for Rehabilitation of Haiphong Port (Phase I, II)			○		
	22. Project for Expansion of Cai Lan Port			○		
	24. Project for Improvement of Da Nang Port			○		
	25. Emergency Rehabilitation Work for Sihanoukville Port	○				
	32. Project for the Development of Ports in Southern Regions			○		
	35. Project for Expansion of Cai Lan Port			○		
	37. Project for Improvement of Sihanoukville Port	○				
Capacity Development	1. Japan–Viet Nam Human Resources Cooperation Center (VJCC) (Hanoi)			○		
	2. Japan–Viet Nam Human Resources Cooperation Center (VJCC) (Ho Chi Minh City)			○		
	18. Establishment of the National University of Laos and the Lao–Japan Human Resource Cooperation Center (Phase I, II)		○			
	47. Japanese Human Resources Development Centers (Hanoi, Ho Chi Minh City)			○		
	48. Dispatch of Third Nation Experts			○		
	49. Dispatch of Third Nation Experts	○				
	50. Project for the Asian Center for International Parasite Control in Thailand				○	
	51. ASEAN Engineering Higher Education Network (Proposed)				○	
	52. Training in a Third Nation				○	
	53. Program for the Acquisition of Degrees by Diploma Level Teachers at the Faculty of Engineering, National University of Laos		○			
	54. Japanese Human Resources Development Center		○			
	55. Dispatch of Third Nation Experts		○			

Source: The Japanese Ministry of Foreign Affairs website: *"Mekon chiiki kaihatsu Bun-yabetsu ichiran"* [Mekong Subregion Development List of activities by sector]

cooperation and coordination be promoted. Therefore, the GMS program framework, which has demonstrated tangible outcomes, is being utilized to the maximum extent possible.

UNESCAP plays a central role in moving the Asian Highway forward. It currently spans 32 countries with a total length of approximately 140,000 km.

(2) The Asian Highway Project

The Asian Land Transport Infrastructure Development (ALTID) project was launched by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) in 1992. The project's focus is on the three main components of the Asian Highway, the Trans-Asian Railway, and the facilitation of land transportation. In fiscal 2004-2005 (Phase VI), cooperation among various nations is advancing with a view to actual planning and implementation.

The Asian Highway consists of 55 routes in 32 countries, with an overall length of approximately 140,000 km (as of 2004). The initial objective of the Trans-Asian Railway was to link Singapore and Turkey, with possible onward connections to Europe and Africa. And currently, there are further plans for subregional railway corridors and regional railway networks. Issues requiring examination include the problem of incompatible gauges, and the construction of 'missing links' on some routes. The Intergovernmental Agreement on the Asian Highway Network (IGA) was adopted in November 2003, with Japan signing in April 2004. Future issues moving forward include conformity with international design standards, the simplification of cross-border transportation, and the creation of a total transportation system.

Figure A 2-2 The Asian Highway Network

Source: UNESCAP website: "Map of the AH Network"

(3) South Asia

While South Asia is home to 1.28 billion people, around 22% of the world's population, it accounts for only 1.8% of total world GDP, and no more than 1% of world trade. This region is one of the world's slowest growing regions. And around 40% of the world's poor live here. Based on the increasing need for a Regional Trade Agreement (RTA) among the various adjacent countries in South Asia, the South Asian Association for Regional Cooperation (SAARC) was established in 1985.

However, given that trade and economic growth within the SAARC region is sluggish, the concept of a growth quadrangle, comprising northeastern India, Bangladesh, Nepal, and Bhutan, aimed at accelerating economic integration has been proposed in place of SAARC. The South Asian Subregional Economic Cooperation (SASEC) development program is aimed at promoting economic cooperation at the subregional level among the four countries that make up the South Asia Growth Quadrangle (SAGQ)-Bangladesh, India, Nepal, and Bhutan. With the aim of achieving growth and poverty reduction in regions suffering severe poverty due to low growth, five priority sectors have been defined: (i) transportation and communication, (ii) energy and power, (iii) tourism, (iv) environment, and (v) trade, investment and private sector cooperation. Work that spans international boundaries is proceeding in these areas.

Under the support of the Asian Development Bank (ADB), programs being planned in the transportation sector include a transportation grid of east-west railways and highways linking the eastern Indian hill states with West Bengal through Bangladesh, as well as north-south transportation corridors linking Nepal, Bhutan, and the hill states of eastern India to ports on the Bay of Bengal. This grid could also be connected to the rest of India at Calcutta through the Golden Quadrilateral.

(4) Central Asia

The objective of the Central Asia Regional Economic Cooperation (CAREC) development program is to promote economic growth and to raise living standards in Azerbaijan, China, Kazakhstan, the Kyrgyz Republic, Mongolia, Tajikistan, and Uzbekistan, with a focus on financing infrastructure projects and improving the region's policy environment in the priority areas of transportation, energy, trade policy, and trade facilitation. Since its inception in 1997, six technical assistance projects have been undertaken, representing US $5.16 million invested (US $3.26 million of which has come from the Japan Special Fund). In order to avoid economic isolation with areas outside the region, in particular East Asia, and to meet the increasing demand for cargo transportation, strategic development of the transportation system is being pursued. This involves the strategic improvement and repair of cross-border roads and railways (in particular the corridor connecting the former-Soviet-Union countries with China) that were limited due to historical and geographic factors. Activities on the policy-environment side include the prevention of corruption, capacity development, and the streamlining of border-crossing procedures.

(5) East Asia Infrastructure Development Studies

Many countries in East Asia have actively participated, through trade for example, in the globalizing international economy, and have achieved high economic growth. Furthermore, there has been a significant fall in poverty along with this growth, with the number of people living on less than US $2 a day falling by about one third, or 250 million between 1999 and 2003. Infrastructure has played a considerable role in achieving such economic growth and poverty reduction in East Asia.

In order to determine the ideal state of infrastructure in East Asia, three organizations, the Japan Bank for International Cooperation (JBIC), the World Bank, and the Asian Development Bank (ADB) launched a joint study entitled "Connecting East Asia: A New Framework for Infrastructure" in September 2003. It is stated herein that *"Higashi ajia no tojokoku dewa, kyusoku ni kakudai suru toshi, fuetsuzukeru jinko, minkan sekuta kara no juyo zodai ni taio suru tame, kongo go nenkan de doro, mizu, tsushin, denryoku nado no infura seibi ni iccho bei doru ijo no shishutsu ga hitsuyo ni naru"* [to meet the demand of rapidly expanding cities, continuously increasing populations, and rising demand from the private sector, more than US $1 trillion of outflows will be required over the next five years for infrastructure development for roads, water, communications, electricity, and so forth], and of this around US $30 billion will be required in the road sector.

Activities in Africa

2-1-2 Africa

(1) Regional Organizations in Africa

While there are many regional organizations in Africa, the major bodies are the East African Community (EAC), the Economic Community of West African States (ECOWAS), and the Southern African Development Community (SADC). Merits of regional integration include (i) greater economies of scale, (ii) increasing intraregional trade and the creation of new trade, and (iii) more vibrant relations with neighboring countries. On the other hand, demerits include (i) widening income disparities among countries and unemployment due to reorganization and streamlining of production within the region, and (ii) failure to achieve economic effects due to the small scale of economies.

(2) NEPAD and the African Development Bank

NEPAD defines infrastructure development as one way of promoting regional integration. The African Development Bank implements these projects.

The New Partnership for Africa's Development (NEPAD) is a development strategy of the African Union (AU) aimed at eradicating poverty in Africa, achieving sustainable development and growth, and integrating with the world economy and political scene. Infrastructure development has been identified as one priority area for development, and activities in this area are being pursued in accordance with the Infrastructure Short-Term Action Plan (STAP). This plan defines infrastructure development as a way of promoting regional integration, and examines road development projects and the like in cooperation with regional economic organizations in Africa.

The African Development Bank (AfDB), one of the international

development financial institutes, provides support for these blueprints drawn up by NEPAD. The AfDB, in conjunction with the African Development Fund (AfDF), which conducts lending under fairly lenient conditions, and in continuous cooperation with NGOs, has recently been providing priority support for agricultural development, human development, and private sector development. Since NEPAD has no material funding of its own, the AfDB acts to implement the infrastructure projects advocated by NEPAD.

(3) Road Enhancement Activities

Road transportation is one of the most important means of transportation in Sub-Saharan Africa. Although it accounts for more than 90% of travel and cargo transportation, and connects with rural areas where 70% of the population live, only 15% of roads are paved.

Improvement and construction of international arterial roads in Sub-Saharan Africa are progressing. However, the inability of many roads to function properly as paved surfaces due to poor management and maintenance is becoming an issue.

The Trans African Highway, made up of roads commonly known as Corridors, contributes to progress and revitalization of economic zones within Africa. It runs from the Indian Ocean at the Port of Dar Es Salaam in Tanzania, and Mombasa Port in Kenya, connecting with inland countries such as Uganda, Rwanda, Burundi, and Sudan. A current issue is the inability of many roads to function properly as paved roads. Reasons for this include (i) inadequate financing, (ii) inadequate capacity for planning, implementation, and management, (iii) poor management of construction materials and equipment, and (iv) limited technical skills and materials of private sector entities.

The Sub-Saharan Africa Transport Policy Program (SSATP) is an international partnership that aims to develop and implement policies for the transportation sector in Sub-Saharan Africa. The program was conceived jointly by the World Bank and the United Nations Economic Commission for Africa (UNECA) in 1987, and currently has 17 participating member countries. SSATP is comprised of the five components of the Road Management Initiative (RMI), the Rural Travel and Transportation Program (RTTP), Urban Mobility (UM), Trade and Transportation (T&T), and Railway Reform (RR). The SSATP program tackles issues through the cooperation of countries in Sub-Saharan Africa, UNECA, the World Bank, the European Commission (EC), several European Union (EU) countries, various donor countries and private sector entities, and private society.

With regard to the area of road management and maintenance, the Road Management Initiative (RMI) of the SSATP has been carrying out activities since 1989 with the aims of achieving the system reforms and policy-making required for healthy road management, and the financing of public road services. Currently, nine donor organizations provide financing, with the World Bank as central body, giving the RMI an annual budget of around US $1 million.

The RMI proposed the commercialization of road management by charging for road use on a fee-for-service basis and managing roads as a business enterprise. Since roads fall under the jurisdiction of government, sustainable and commercially viable road management is being pursued through four types of reforms with regard to (i) road ownership structure, (ii) a stable supply of

financing, (iii) the clarification of organizational responsibilities, and (iv) the introduction of commercial management methods. Capacity development aimed at policy reforms, the supply of information, and the development of tools are also among the various initiatives.

Currently, through the cooperation of the various donors, debate continues regarding the optimal course for road infrastructure development based on an awareness of the relationships between regional development plans and development plans for Africa as a whole, between the relative priority of economic efficiency and human security, and between regional integration and free trade.

Activities in Central and South America

2-1-3 Central and South America

(1) Plan Puebla Panama

Regional integration is being sought among small countries in Central America and the Caribbean due to the potential advantages posed by the common languages, cultures, and issues requiring resolution shared by these countries, and the rationalization that cooperation would bring. Starting with a regionalization initiative known as the Central American Common Market (CACM) that began in 1960, the Central American Integration System (Sistema de la Integración Centroamericana: SICA) has worked towards cooperation in various sectors since 1991. MERCOSUR(Common Market of the South), an agreement on customs and tariffs, was founded in 1995. With the aim of international economic and trade cooperation, it promotes economic policy cooperation in various sectors including transportation and communications, and the abolishment of tariffs. In December 2000, Plan Puebla Panama (PPP) was announced. This is an effort to promote cooperation between Mexico and Central American countries, and advocates development through the integration of infrastructure from the southern areas of Mexico all the way to Panama. An Economic Partnership Agreement (EPA) between Japan and Mexico came into effect in April 2005, further advancing coordination and cooperation between the two countries in the transportation and tourism sectors.

(2) Regional Infrastructure Integration in South America

The Initiative for the Integration of Regional Infrastructure in South America (IIRSA) seeks to improve the integration of infrastructure within the South American region. IIRSA selects transportation routes to act as axes for the integration of logistics in South America, and sectoral processes being tackled which include the facilitation of border-crossings, the standardization of logistics systems, the promotion of multimodal transportation operating systems, increased utilization of air transportation, the securing of financing for wide-area logistics projects, and the standardization of systems related to regional energy interconnections.

Issue-specific Activities

2-2 Issue-specific Activities

2-2-1 Poverty Reduction

The Network on Poverty Reduction (POVNET) was established in June 1998 by the Organization for Economic Cooperation and Development's (OECD) Development Assistance Committee (DAC) to discuss and develop effective development cooperation strategies for poverty reduction. The DAC's Poverty Reduction Guidelines were formulated in May 2001. From 2003, Task Forces in the three areas of private sector development, agriculture, and infrastructure were established, and they have worked together to advance debate on the issues, focused on the relation between economic growth and poverty reduction.

2-2-2 Traffic Safety

The Global Road Safety Partnership (GRSP) was initiated by the World Bank in February 1999. GRSP is based on a partnership among business, civil society, and governmental organizations, and aims to raise awareness for traffic safety, and improve safety in developing countries. Projects include educating drivers, creation of various manuals, campaigns aimed at eradicating driving while drunk, campaigns aimed at children, and strategies for infrastructure.

2-2-3 Promotion of Employment

Through the Employment Intensive Investment Programme (EIIP), the International Labour Organization (ILO) aims to facilitate employment for the poor that provides a suitable level of remuneration. The Advisory Support, Information Services and Training (ASIST) program is under operation in Asian and African countries, and works to advance development projects that meet local needs in the four areas of roads, rural infrastructure, improvement of urban living standards, and preservation of water and soil quality. The ILO advocates Labor-Based Technology (LBT). This is being implemented in countries like Kenya, Tanzania, and Cambodia where the labor force in farm villages and excess urban labor forces play an important role in the construction and maintenance of roads. Rural roads are essential for communities that lack other means of access. And not only is access being improved by the creation of soil-pavement roads with human labor, but road construction and maintenance work also provide opportunities for employment and cash income, thereby producing local benefits. Advantages also include high cost-benefit ratios and low environmental impacts.

Small-scale contracting in the ASIST program allows parts of the infrastructure development programs of governments and donor organizations to be subcontracted to the community, and this is done with the objective of maximizing the utilization of locally provided labor. This contributes to the expansion of opportunities for community capacity development and local private sector participation in the market.

2-3 Activities of Individual Donors

2-3-1 The World Bank

(1) Characteristics of Fundamental Policies and Support regarding Cooperation in the Transportation Sector

The World Bank provides a high level of support for transportation infrastructure development, which is indispensable in improving access to work, education, health, and domestic and international trade. Meanwhile, due to the rise of private sector infrastructure investment in developing countries that began in the 1990s, the World Bank's own contributions in this area fell approximately 50% between 1993 and 2002. However, following a peak in 1997, private sector investment in infrastructure has fallen, and it is unlikely that the private sector can be relied on in the future for infrastructure development. Furthermore, global debates regarding development at international conferences such as the United Nations Millennium Summit, the New Partnership for Africa's Development (NEPAD), and the World Summit on Sustainable Development (WSSD) have identified the importance of infrastructure service provision aimed at poverty reduction and economic growth. In response to this, the World Bank has begun to reevaluate its position on support in the infrastructure sector.

The Infrastructure Action Plan, which lays out a new strategy for the World Bank's infrastructure business, was approved by the Board of the World Bank in July 2003. The plan identifies infrastructure development as *"seicho no tame no hitotsu no kagi to naru hashira"* [one key factor in achieving growth], and indicates that *"MDGs tassei no tame ni infura ga kagi to naru yakuwari wo hatasu koto ga kaihatsu komyuniti no aida dewa tsuyoku ninshiki sareteiru"* [there is a high level of recognition amongst the development community that infrastructure plays a key role in achieving the Millennium Development Goals (MDGs)], clarifying the Bank's enhanced position on assistance for infrastructure.

(2) Transportation Sector Issues and the Role of the World Bank

Transportation sector issues identified by the World Bank include (i) the globalization of trade and the advancement of international logistics (multimodal transportation technology, the digitization of documents, the rationalization of customs procedures, etc.), (ii) increasing environmental pollution and traffic accidents due to traffic congestion particularly in urban areas (especially in relation to pedestrians), (iii) pressure on public financing due to inadequate management of public transportation services, (iv) financing required for improvement, and management and maintenance of existing transportation infrastructure, and (v) the sharp drop in private financing flows.

Among the roles identified for the World Bank in the transportation sector are (i) the improvement of access to markets, employment, and services with the objective of promoting social and economic development, (ii) support for public and private sector participation in the provision of transportation services, and (iii) the promotion of systems for sustainable management and funds procurement in the transportation sector.

(3) Transportation Sector Policies

As part of the World Bank's policies in the transportation sector, a document entitled "Sustainable Transport: Priorities for Policy Reform" was formulated in 1996. This document details the World Bank's experience and lessons learned in the transportation sector, and defines its role as follows:

- **Necessity for transportation sector policy**: The expansion of production and trade on a global scale, and increasing desires for higher living standards have led to the requirement for transportation sector policies that facilitate more sustainable development from both environmental and social perspectives, and also from economic and financial perspectives.
- **Economic and financial sustainability**: Cost efficiency and competition are essential in the transportation sector. Therefore, the establishment of a transportation sector based on market forces, the commercialization (privatization) of public services, and the examination of charges for the use of infrastructure (benefit principle) are required.
- **Environmental sustainability**: Transportation cost reductions that correspond with environmental considerations, charges for traffic congestion and pollution, public transportation fees and service policies, demand management, the incorporation of non-motorized transportation into land use and transportation plans, modal balance, the reduction of health-threatening impacts, and road safety are required.
- **Social sustainability**: Transportation policies for the poor (improvement of physical access), community participation in local transportation planning, transportation programs to promote employment, the reduction of occupational and spatial dislocation through the impact of transportation are needed.
- **Redefining the role of governments in the transportation sector**: There should be a shift in the role of governments from suppliers to coordinators, the creation of institutional frameworks for fair competition, the stipulation of charges for the use of publicly provided infrastructure, the creation of systems to act as a basis for increasing private sector participation, the optimum allocation of scarce public resources, and the increase of community participation in decision-making.
- **The World Bank's roles**: These are (i) Technical support for governments with regard to systems, policies, and capacity development, (ii) continuous implementation of lending programs, and (iii) establishment of partnerships at the regional, national, and international level.

(4) Poverty Reduction and Transportation

The World Bank identifies the impacts of transportation on three core dimensions of poverty: (i) economic opportunities, (ii) security and empowerment, and (iii) the spread of cooperation among sectors. It also identifies three targets for policies and strategies: (i) systems reforms with regard to transportation facilities, (ii) the creation of policies and strategies for rural transportation, and (iii) the creation of policies and strategies for urban transportation.

2-3-2 The Asian Development Bank (ADB)

(1) Characteristics of Fundamental Policies and Support regarding Cooperation in the Transportation Sector

The long-term strategy announced by the Asian Development Bank in 2001 entitled "Moving the Poverty Reduction Agenda Forward in Asia and the Pacific (2001-2015)" recognizes the important linkages between poverty reduction and the provision of infrastructure, and outlines strategies for expanding both physical and social infrastructure. In particular, emphasis is placed on expanding financing for education, health, water supply, sanitation, and shelter. And it is indicated that support should also be provided for improving governance in the infrastructure sector. The ADB is moving forward with its activities based on the objective of "*chokiteki jiritsu hatten to hinkonso no enpawamento wo takameru infura no kyokyu*" [the supply of infrastructure that increases long-term independent development and the empowerment of the poor]. It is also indicated that partnerships between government and the private sector, and an appropriate regulatory environment that utilizes the principles of competition in the infrastructure sector is important for the supply of infrastructure.

Although there is no policy regarding the transportation sector at present, policies regarding other related issues, such as poverty reduction strategy and urban sector strategy, detail the roles and policies of the transportation sector.

(2) Poverty Reduction Strategy

The ADB formally adopted poverty reduction as its overarching role in 1999. The Poverty Reduction Strategy (PRS) approved in November of the same year identifies the three key elements of (i) pro-poor, sustainable economic growth, (ii) social development, and (iii) good governance. And it outlines a strategy for developing a policy framework in order to enhance these elements. Additionally, the current priority issues defined by the PRS are the environment, gender equality, private sector development, and regional cooperation.

The PRS analyzes the relationship between infrastructure and poverty reduction from the perspectives of (i) investment and services (market efficiency and promotion of employment for the poor), (ii) sustainable development, (iii) social development (provision of access and social services), (iv) governance, and (v) regional cooperation (cooperation among countries). The transportation and energy sectors are identified as making a large contribution to poverty reduction by improving access to and providing services for the poor, and promoting employment.

(3) Urban Sector Strategy

The Urban Sector Strategy formulated in 2003 identifies the following five areas for urban infrastructure and services: (i) institutional strengthening and capacity building, (ii) water supply, sanitation, and solid waste management, (iii) urban traffic, (iv) urban housing, and (v) urban land management.

Investment in the urban traffic sector is low when compared with other sectors. There are many problems to be faced when investing in traffic

infrastructure, such as a lengthy project preparation period, difficult and costly property expropriation, and vague relationships among various organizations. One useful lesson is to expand the view of approaches in urban traffic, for example, partnerships with the private sector such as BOT (build-operate-transfer), BOO (build-operate-own), pricing policies, traffic management, etc.

Urban traffic policy must support urban spaces and economic growth, and contribute to urban sustainability. The ADB has defined the following policies of high priority: (i) maximizing the benefits of traffic infrastructure, (ii) establishing clear roles for the public and private sectors, (iii) generating competitive markets, and (iv) developing public transportation alternatives.

(4) Support for Regional Cooperation

The ADB considers regional cooperation to be an important factor towards achieving poverty reduction, and provides support for the following regional cooperation efforts:

- Greater Mekong Subregion Program (GMS, 1993)
- Indonesia, Malaysia, Thailand Growth Triangle (IMT-GT, 1993)
- Brunei, Indonesia, Malaysia, Philippines East ASEAN Growth Area (BIMP-EAGA, 1995)
- Central Asian Republics (CARs, 1997)
- South Asia Subregional Economic Cooperation (SASEC, 2000)

All of these frameworks place emphasis on the role of physical infrastructure, and the improvement of work procedures (streamlining customs procedures, etc.). Issues moving forward include the extension of corridors, the procurement of finance, and the establishment of systems and institutions.

2-3-3 Department for International Development (DFID)

(1) Characteristics of Fundamental Policies and Support

The DFID, established in 1997, is responsible for Britain's support policies, from proposal to implementation in an integrated way. The objectives of the DFID's activities are based on two white papers, "Eliminating World Poverty: A Challenge for the 21st Century (1997)," and "Eliminating World Poverty: Making Globalization Work for the Poor (2000)," with the ultimate objectives of poverty reduction and achieving the Millennium Development Goals (MDGs). The DFID regards poverty reduction as a major issue, and the work focuses on "the poorest people in the poorest countries." As an approach, the DFID promises long-term financial support so that beneficiary countries are able to produce budget plans. Support is likewise provided for poverty reduction strategies that developing countries themselves control.

The DFID's activities fall under seven main themes. These are education, health and population, engineering (infrastructure and urban development), rural life and environment, social development, governance, and economics/statistics/business development, with transportation allocated to the Engineering Division of the Infrastructure and Urban Development Department (IUDD). The IUDD deals with seven sectors (energy, geoscience, transportation,

water and sanitation, urban development, environmental engineering, and information and communications technology).

(2) Support for Road Transportation

The DFID emphasizes support on the land-based transportation sector, in particular on road transportation (including transportation by foot). Two objectives can be given for the road transportation sector: (i) cost reductions in the supply and maintenance of transportation infrastructure, including the effective utilization of charges for road transportation use; and (ii) support for increased community living standards and relief from poverty through improvements of transportation services that meet the requirements of the poor.

The objectives of the transportation research program are: (i) the promotion of traffic safety to reduce accidents, (ii) ensuring reasonable road charges through the reduction of road construction, maintenance, and repair costs, (iii) the provision of cost-efficient means of transportation to the poor living in urban and other areas, such as public transportation and non-motorized transportation, and (iv) increased efficiency of national and regional transportation systems.

Furthermore, with regard to policy and program implementation, the DFID actively cooperates with other international organizations, promoting activities such as institutional strengthening and capacity building, and private sector participation. The Department works together with the World Bank, the African Development Bank, and other organizations on transportation policies for the poor.

Appendix 3 Basic Check List (Transportation)

Appendix 3 provides a list of the most representative indices and check items used when ascertaining the current level of infrastructure development in the transportation sector for a particular country or region. However, statistical data of developing countries is not by any means complete, and there are many instances where projects begin with preparatory study or development study due to inadequate or unreliable data.

While the desirable final result is that information on all of the check items be complete, here, the data items are separated into two categories: (1) Basic Data, which is relatively easy to obtain from past study reports and various statistical publications, and (2) Transportation Sector Data, obtaining a full set of which would be a favorable end result.

(1) Basic Data

In order to recognize the level of transportation infrastructure development in a particular country, it is first necessary to know the basic indicators. Comparing these with the average levels in low-income countries, lower-middle-income countries, and higher-middle-income countries can give an overall indication of the particular level of infrastructure development in that particular country or region.

Since there are limits to the transportation sector data that is obtainable in all developing countries, it is not possible to ascertain what level transportation infrastructure is at in a particular country with the basic data alone. It simply provides an estimate. Here, based on the World Bank's (2003) *"World Development Indicators"* and the Japan Railway Technical Service's (2005) *"Sekai no Tetsudo*[The World's Railways]," the following data is used.

Social and economic indicators:	surface area (km^2), GNI per capita (US $)
Transportation indices:	Roads: total road length (km), percentage of paved roads (%)
	Railways: total railway operating distance (km)
	Maritime transportation: volume of container transportation (Twenty-Foot Equivalent Unit: TEU)
	Air transportation: annual volume of air freight (ton-km)

Table A 3-1 Levels of Transportation Infrastructure (1996–2003)

	Surface area (km^2)	GNI (US $)	Road coverage ratio (km/km^2)	Percentage of paved roads (%)	Railway coverage ratio ($km/1{,}000km^2$)	Container transportation (1,000TEU)	Air freight volume (million ton-km)
Low-income countries							
Kenya	580,367	360	0.11	12.1	4.32	–	377
Viet Nam	329,566	430	0.28	25.1	7.89	1,290.6	524
Bangladesh	143,998	380	1.44	9.5	19.38	486.3	632
Lower-middle-income countries							
Peru	1,285,215	2,020	0.06	12.8	1.55	537.6	196
Philippines	300,076	1,030	0.67	21.0	1.62	3,270.8	1,661
Thailand	513,115	2,000	0.11	98.5	7.88	3,800.9	5,571
Higher-middle-income countries							
Malaysia	329,758	3,540	0.20	75.8	5.16	7,541.7	1,924
Poland	312,683	4,570	1.17	68.3	65.71	287.4	5,346

Source: World Bank (2003), and others

Figure A 3-1 Levels of Transportation Infrastructure by Income Level Displayed Using the Level of Transportation Infrastructure in Higher-Middle-Income Countries as an Index of 100

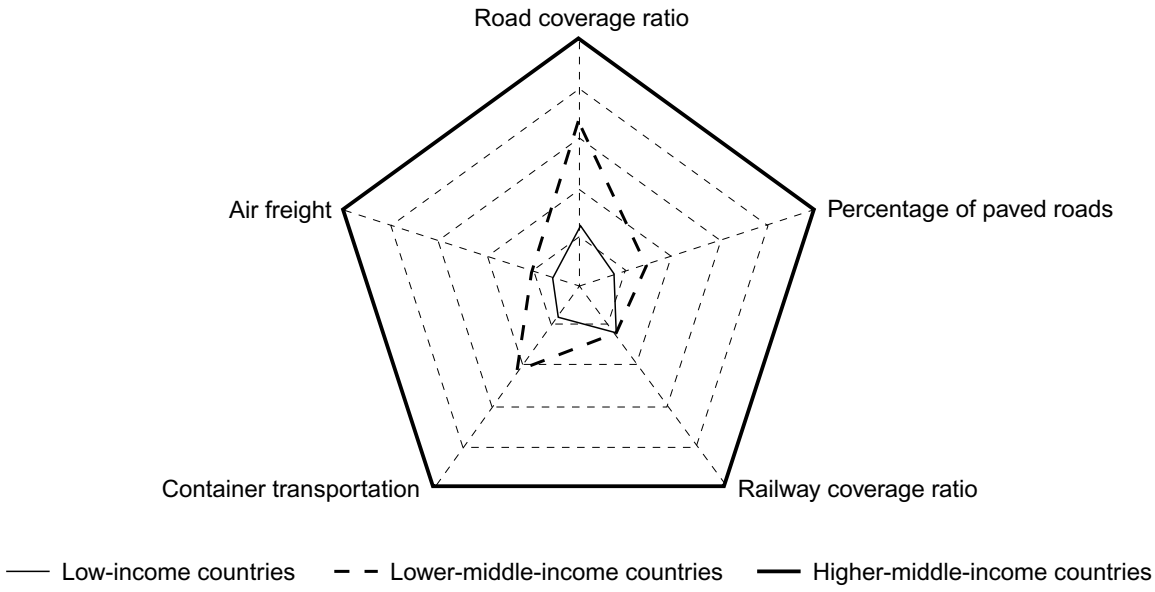


Table A 3-2 Basic indicators (Dataset for Figure A 3-1)

	Road coverage ratio (km/km^2)	Percentage of paved roads (%)	Railway coverage ($km/1{,}000km^2$)	Container transportation (1,000TEU)	Air freight volume (million ton-km)
Low-income countries	0.3	10	7	1000	600
Lower-middle-income countries	0.8	20	7	3000	1000
Higher-middle-income countries	1.2	70	30	7000	5000

(2) Transportation Sector Data

Provided here, based on the concepts and structure of the Transportation Development Objectives Chart, is a list of the indices and check items required for ascertaining the current state of transportation and implementing transportation infrastructure development.

Social and Economic Data

	Check item/Index	Unit	Calculation method	Remark
	Surface area (national)	km^2		
	Total population (current/future)	persons		
	Population in capital (current/future)	persons		
	Real GDP per capita (current/future)	US $		
	GINI coefficient (current/future)			
	Urban population rate	%		

Transportation Data

	Check item/Index	Unit	Calculation method	Remark
Improvements to the environment of transportation infrastructure development				
(Strengthening of sector administration system)				
1	Existence of road administration laws			
2	Existence of railway administration laws			
3	Existence of port administration laws			
4	Existence of airport administration laws			
5	Existence of transportation white papers			
6	Consistency with national development plans			
7	Private sector participation in the transportation sector			
8	Existence of local legal systems in the transportation sector			
9	State of BOT related laws			
(Strengthening financing)				
1	Inflows and outflows of transportation sector financing			
2	Existence of earmarked taxes/specific revenue sources			
3	Current management state of national transportation corporations			
4	Ratio of private sector capital in the transportation sector			
(Capacity development of personnel)				
1	Annual number of graduates from maritime universities/colleges	persons		
2	Annual number of graduates from aviation universities/colleges	persons		
3	Annual number of graduates from other transportation related technical universities/colleges	persons		
4	Number of licensed/certified maritime personnel	persons		
5	Number of licensed/certified aviation personnel	persons		
(Strengthening laws and regulations)				
1	Existence of road development/operation laws			
2	Existence of railway development/operation laws			
3	Existence of port development/operation laws			
4	Existence of airport development/operation laws			

	Check item/Index	Unit	Calculation method	Remark
Responses to internationalization and regionalization				
(Facilitation of the movement of goods and people)				
1	Total road length	km		
2	Total railway length	km		
3	Total number of berths at international ports	berths		
4	Total number of runways at international airports	runways		
5	Total number of cross-border railway services	services/day		
6	Total number of cross-border buses	services/day		
7	Existence of road development guidelines			
8	Existence of railway development guidelines			
9	Existence of ICAO membership			
10	Existence of IMO membership			
11	Volume of international freight (by sea)	ton		
12	Volume of international freight (by air)	ton		
13	Volume of international freight travel (by air)	ton-km		
14	Number of international passengers (by sea)	passengers		
15	Number of international passengers (by air)	passengers		
16	Volume of international passenger travel (by air)	passenger-km		
(Simplification of border-crossing procedure)				
1	Percentage of port facilities using EDI			
2	Percentage of airport facilities using EDI			
Balanced national development of a whole country				
(Improvement of road transportation)				
1	Share of cargo transportation by mode of transportation	%		
2	Share of passenger travel by mode of transportation	%		
3	Road construction ratio by road specification category	km/km^2		
4	Total road length by road specification category	km		
5	Total length of highways/expressways	km		
6	Percentage of paved roads	%		
7	Existence of road structure ordinance			
8	Number of registered vehicles by type of vehicle	vehicles		
(Improvement of railway transportation)				
1	Number of railway accidents	accidents		
2	Volume of freight (by railway)	ton		
3	Volume of freight travel (by railway)	ton-km		
4	Number of passengers (by railway)	passengers		
5	Volume of passenger travel (by railway)	passenger-km		
6	Railway operating distance	km		
7	Total length of double-track or greater sections	km		

	Check item/Index	Unit	Calculation method	Remark
(Improvement of maritime transportation)				
1	Ship tonnage by vessel type	vessels		
2	Ship tonnage by vessel type	G/T		
3	Ship tonnage by use, vessel age, tonnage class	vessels		
4	Ship tonnage by use, vessel age, tonnage class	G/T		
5	Number of shipbuilding facilities by scale	facilities		
6	Number of ports (by classification)	ports		
7	Total number of berths at domestic ports	berths		
8	Number of maritime accidents	accidents		
9	Volume of domestic cargo (by sea)	ton		
10	Volume of domestic cargo transportation (by sea)	ton-km		
11	Number of domestic passengers (by sea)	passengers		
12	Volume of domestic passenger travel (by sea)	passenger-km		
13	Volume of cargo handled nationwide (by sea)	ton		
(Improvement of air transportation)				
1	Number of registered airplanes by type	aircrafts		
2	Number of aviation accidents	accidents		
3	Volume of freight transportation (by air)	ton-km		
4	Volume of passenger travel (by air)	passenger-km		
5	Volume of domestic freight (by air)	ton		
6	Volume of domestic freight transportation (by air)	ton-km		
7	Number of domestic passengers (by air)	passengers		
8	Volume of domestic passenger travel (by air)	passenger-km		
9	Number of airports	ports		
10	Number of passengers by airport	passengers		
11	Volume of cargo handled by airport	ton		
Toward sustainable urban development and improvement of urban life				
(Development of transportation systems to secure smooth transportation)				
1	Total road length in urban areas	km		
2	Road construction ratio in urban areas	%		
3	Signalized intersection ratio	%		
4	Average urban congestion rate	%		
5	Total tram/LRT length	km		
6	Number of passengers (by tram/LRT)	passengers		
7	Total urban railway/subway length	km		
8	Number of passengers (by urban railway/subway)	passengers		
9	Bus operating distance	km		
10	Number of passengers (by bus)	passengers		
11	Share of public transportation by mode	%		
12	Percentage of heavy vehicles (vehicle mix)	%		
13	Existence of prior introduction of TDM			
14	Parking capacity in urban areas	vehicles		
15	Existence of a traffic control center			
(Establishment of a safe environment for urban transportation)				
1	Total number of road traffic accidents	accidents		
2	Total number of fatal accidents	accidents		
3	Number of traffic violation arrests	arrests		

Appendix 4 Issues and the Current State of Transportation Sector in Developing Countries (according to income level and region)

Appendix 4 provides a description of priority issues and the current state of the transportation sector on a region-by-region basis. The particular needs in this area are outlined according to income group and region.

Although there is a need for analysis of detailed transportation infrastructure data on a country-by-country basis, due to time restrictions, the data currently available is limited and sufficient analysis has not yet been conducted. JICA therefore intends to continue collecting data, and to perform further analyses and studies.

4-1 Infrastructure Needs by Stage of Economic Development

Although the need for infrastructure by a developing country naturally varies according to its particular conditions, industrial structure, conditions of urbanization, and historical background, from the macro viewpoint, it could be seen that the need has a high correlation to the economic level. Infrastructure needs should thus be organized according to economic level. Figures in square brackets [$] represent Gross National Income (GNI) per capita (US $, 2001).

4-1-1 Low-Income Countries [$745 or lower][1]

(1) Current Status

Infrastructure development in low-income countries mainly includes roads, bridges (particularly through grant aid) and the like.

(2) Infrastructure Needs

a. Roads: The level of road maintenance and amount of investment in low-income countries are almost the same as that in middle-income countries. Roads are also indispensable infrastructures for convenient living and industrial activities such as transportation of farm commodities. Since car usage is relatively low compared with that in middle-income countries, it is believed that the economic spin-offs of road development are more restricted. Therefore, it is deemed important to invest in maintenance and in the development of small but quality roads in farm villages and similar areas as well as national trunk lines to enhance national connectivity. The high share of bridge projects in grant aid is considered reflective of these needs.

b. Transportation: Among development study items, airports, as well as ports

[1] Classifications are according to the economic development levels defined by the World Bank (2003b). The World Bank provides four classifications according to economic level (Gross National Income (GNI) per capita): high-income countries, higher-middle-income countries, lower-middle-income countries, and low-income countries.

and harbors, occupy a comparably high proportion. This is probably due to the fact that international or extensive flows of people and products start to increase in tandem with economic development. Probably, this also serves as a stepping stone in achieving the next economic development stage. On the other hand, there is airport development aimed at tourism promotion. This is necessary to make prospective policies and master plans for urban traffic because urbanization and motorization are also advancing rapidly in low-income countries. There is, however, a possibility that actual development needs will remain restricted.

4-1-2 Lower-Middle-Income Countries [$746-$2,975]

(1) Current Status

Infrastructure stocks are twice those in low-income countries and basic infrastructures have been improved to some degree. Investments in roads are, however, low. In Central and South America, infrastructures have been considerably improved. In some countries, important issues are in terms of not only new investments but restoration and repairs, as well.

(2) Infrastructure Needs

a. Urban development: Along with issues of urbanization and rapid increase in population in the capital, large cities also get to account for high proportions of productive or economic activities. The trend is that urban problems, such as increases in the urban poor, traffic congestion, power shortages, deterioration of water, and air pollution, are becoming severe. Congruently, it is also necessary to prepare for natural disasters like the flooding from rivers. It is assumed that there will be more need for infrastructure development that supports urban populations and functions including roads, water supply and sewage systems, electricity and communication facilities, and river improvements. Furthermore, development studies have a tendency to increase city and road plans.

b. Roads: Although a definitive cause has not been pinpointed, a possible reason why relatively less road maintenance and development occurs in middle-income countries is because of constraints due to the increases in investments in electric power and other components. The supposition is that the need for road maintenance and development becomes higher than under normal conditions as the widespread use of cars increases and economic activities grow. Particularly, needs will increase in metropolitan areas where automobiles are heavily concentrated.

c. Transportation: Because the advance of industrialization increases international exchanges, the need for ports, harbors and airports of larger sizes will also grow.

4-1-3 Higher-Middle-Income Countries [$2,976-$9,205]

(1) Current Status

Countries of this group have a GNI per person of $2,976 or more. Advanced countries are included in this category. Other than the advanced countries, other countries, such as Malaysia in Asia and those in Europe, the Middle East, and Central and South America, belong to this group. These countries already have considerable significant infrastructure stocks, and self-development is substantially possible. Maintenance of infrastructure is, however, insufficient in Europe, and in Central and South America, and investments on this are necessary in some cases. It is a typical characteristic that investments in roads occupy a large part of overall investments.

(2) Infrastructure Needs

a. Correction of regional disparities: In case of economic growth, there may be problems such as differences between the rural areas and large cities as well as urban concentration. If so, the development of regional cities is important. For this purpose, it is necessary to raise the level of the whole infrastructure in regional cities and improve high-speed transportation networks that connect regions.
b. Disaster prevention: Needs for forest and river conservation, flood control and urban disaster prevention should be assumed because damage from natural disasters, such as earthquakes, floods, and landslides, can expand widely due to urban concentration. It is the higher-middle-income countries that have given much weight to river and sand control in the development studies.
c. Roads: Investments in roads in higher-middle-income countries are increasing, contrary to the tendency in the lower-middle-income countries. It is supposed that investments in construction of full-fledged road networks are being made due to progressive car use. It also seems that roads of higher categories, such as expressways, are required.
d. Transportation: What should be assumed are needs for transportation infrastructure including the upgrading of airports, ports and harbors, as well as operational and administrative techniques.

4-2 Infrastructure Needs by Region

The previous subsection clarified the needs for infrastructure. This necessitates the organization, by region and country, of the fields where future demand is assumed. In Japan, key regions are selected in a broad ODA outline, formulating what assistance per region should be and what assistance plans per country are moving forward. In this subsection, the socioeconomic circumstances in each region and the present levels of infrastructure development are summarized. The needs for infrastructure by region are also surveyed.

4-2-1 East Asia Region

(1) Current Status

In East Asia, while some countries like Korea and Singapore have experienced high economic growth and already transitioned themselves from beneficiary countries to donor countries, Least Developed Countries (LDCs) such as Cambodia and Laos still remain. As the number of ASEAN member countries increases, disparities within the ASEAN region are revealing. Along with cross-border transportation infrastructure development, such as for roads and bridges, cooperation such as ports and airports development to facilitate private sector trade and investment, and facilities upgrades to improve the safety and security of ports and airports in response to terrorism and safety concerns are all also being undertaken.

(2) Issues

In East Asia and Pacific countries, although infrastructure stocks in monetary value have steadily increased, the level of infrastructure stocks is still low. As the level of urbanization is comparatively low in both low- and middle-income countries, it is supposed that demand for transportation infrastructure such as urban road networks and public transportation systems will increase along with the expected development of urbanization in the future. In low-income countries, investments in basic social infrastructure will continue to be required in order to reduce poverty. It will also be necessary to make investments in the shift to market economies for sustainable development. In East Asia, the importance of cross-border infrastructure as a means of broad-based development and regional development (development of ASEAN, APEC, and the basin of the Mekong River) is rising.

4-2-2 Oceania Region

(1) Current Status

There are many relatively young countries in the Oceania region, and socially and economically independent nation building is a matter of urgency. In addition, this region faces problems that are relatively unique to island countries, such as small-scale economies, economies relying on primary industries, geographic dispersion of countries, and limited access to international markets. Transportation infrastructure developments thus far have concentrated on ports and airports, which, for island countries, are fundamental elements.

(2) Issues

For the Pacific, infrastructure development that is peculiar to island countries is required. These countries are commonly small in size, depend on primary industry heavily, and are vulnerable to external factors such as natural disasters and movements in the international market. They have development difficulties including their small domestic markets and great geographic distance from international markets. There are large needs for economic and social

infrastructures to overcome remoteness and geographical isolation such as provision of appropriate health-care services to residents and environmental preservation to reduce the impacts of natural disasters.

4-2-3 Europe and Central Asia

(1) Current Status

Transportation infrastructure such as roads and railways has developed to a fairly high standard in middle-income European countries such as Poland and Hungary. In contrast, since countries in Central Asia and the Caucasus are in a stage of transition from planned economies to market economies, it is important that cooperation should consider soft measures such as capacity development and institution building.

(2) Issues

In Europe and Central Asia, the level of infrastructure development is high, partly because of their historical and cultural background, and because their transportation infrastructure, such as roads and railway, have attained a level almost equal to that in high-income countries. These countries are still in a transition phase either to democratization or market economies. They require the development of transportation infrastructures, which are the foundations of independent economic development. What is required in regions that are in the period of post-conflict recovery and reconstruction is restoration and development of transportation infrastructure.

4-2-4 Central and South America

(1) Current Status

Some countries in Central and South America have not yet fully recovered from the effects of economic disaster in Argentina of December 2001. The level of social infrastructure in middle-income countries is fairly high. And the level of economic infrastructure is also relatively high when compared with other regions. However, infrastructure stock of roads and railways in low-income countries is still low, and disparities within the region are apparent.

(2) Issues

In middle-income countries in Central and South America, road infrastructures have been improved to high levels, and transportation infrastructure is at a relatively high level compared with that of middle-income countries in other regions. Also, infrastructure development through private investment is active. Although urbanization is already high in these countries, there is still a large need for transportation infrastructure to narrow income gaps and regional disparities. This is because there still exist regions that lag behind in the development of economic and social infrastructures and because the gap between the rich and the poor is still wide. An examination of the low-income countries in this region revealed that the level of both social and economic infrastructure is low and that it is required to improve economic and social

infrastructures for environmental improvement, which contributes to the active private participation and the promotion of investments from foreign countries.

4-2-5 Middle East and North Africa

(1) Current Status

While urban population rates in low-income countries in the Middle East and North Africa are low at 20%, the same figure is fairly high for middle-income countries at 60%. Economic infrastructure development has fallen behind in both low-income and middle-income countries.

(2) Issues

Countries in the Middle East and North Africa range from the oil producers to the least developed countries (LDCs). The conditions of each group also vary. The development of social infrastructure is comparatively advancing. Particularly, middle-income countries are on the same level as in the middle-income countries in Europe, Central Asia, and Central and South America. Economic infrastructure is, however, at a low level. In low-income countries, while the level of social infrastructure stocks is advancing in comparison with other regions, that of economic infrastructure stocks is still low and the need for them is still considered to be large.

These countries are principally crude-oil-producing countries and can exercise some form of influence on peace and stability in areas of the world such as in the Middle East and Iraq. It is supposed that high-income countries will require infrastructure development to promote investments from foreign countries for economic diversification (i.e. to grow out of their dependence on oil), as well as measures for environmental preservation. What is necessary in low-income countries is the development of basic economic and social infrastructures such as the development of agriculture and water resources.

4-2-6 South Asia

(1) Current Status

Urban population rates in both low-income and middle-income countries in South Asia are low, at around 30%. This is attributable to the significant role played by agriculture. While roads are relatively advanced in middle-income countries, railway development has fallen behind. In low-income countries, development of both roads and railways has fallen behind. Future demand for roads and railways development can be expected to increase.

(2) Issues

In South Asia, transportation infrastructure stocks in monetary value are steadily increasing, which is similar to East Asia. However, the level of infrastructure development is still low. The level of urbanization is low in both middle- and low-income countries and it is supposed that the need for infrastructure development along with urbanization will increase in the future. Since poverty groups are still substantially great in this region, requirements

include development of basic infrastructure as measures against poverty, development of economic and social infrastructures, environmental development for intraregional economic deregulation and regional cooperation, as well as measures for environmental preservation suitable for environmental overloads accompanying increases in population.

4-2-7 Sub-Saharan Africa

(1) Current Status

While urban population rates in low-income countries in Sub-Saharan Africa are around 50%, this is around 30% in middle-income countries. While roads and railways are relatively well developed in middle-income countries, infrastructure development has fallen behind in low-income countries, resulting in large disparities within the region.

(2) Issues

Sub-Saharan Africa has many problems that block development. These include concerns of being left in the heap of economic globalization, military conflicts, and the growing problem of AIDS. In addition, road and railway stocks are decreasing due to insufficient maintenance and management work. In middle-income countries, as transportation infrastructures show relatively high levels, it is supposed that operation and maintenance will be important in the future in addition to new investments. However, over half of the countries in Africa are considered least developed countries (LDCs) and/or heavily indebted poor countries (HIPCs). Therefore they require the development of basic infrastructures such as measures against poverty and social development. Also supposed are the increase of needs for development such as that of the private sector, industries and agriculture, and for infrastructure development to promote intraregional cooperation, which will bring about economic independence and political stability in Africa.

Appendix 5 Transportation Sector Development Objectives and Environmental Strategies

As mentioned in Section 2-2-1: Creating the Development Objectives Chart, “measures in relation to environmental strategies” are organized for each Development Objective and are described below.

In this report, the defined objective of transportation is to “facilitate the smooth movement of people and goods, thereby promoting economic development and improving living standards.” The reality is that although transportation infrastructure development can be expected to produce positive impacts such as shorter travel time and lower transportation costs, which in turn lead to economic effects, there are also negative impacts on the natural and social environment that cannot be avoided, such as air pollution, noise and the resettlement of residents.

Table A 5-1 Examples of Positive and Negative Impacts of Transportation Infrastructure Development

Sector	Positive Impacts (Social and Economic Impacts)	Negative Impacts (Environmental and Social Considerations)
Roads	-Alleviation of traffic congestion -Shorter traveling time Reduction of transportation costs	-Increases in gas emissions, noise, vibrations -The resettlement of residents and destruction of the natural environment due to land expropriation
Railways	-Shorter traveling time -Reduction of transportation costs	-The resettlement of residents and destruction of the natural environment due to land expropriation
Ports	-Reduction of logistics costs	-The resettlement of residents and destruction of the natural environment due to land expropriation -The emergence of water contamination
Airports	-Shorter traveling time	-Increases in noise and vibrations -The resettlement of residents and destruction of the natural environment due to land expropriation

In order to achieve transportation infrastructure developments that fulfill the abovementioned objective of “promoting economic development and improving living standards,” it is crucial that various social and environmental costs of development be included in the development costs, and in the social environment and institutional frameworks. Included in the development costs and in setting up institutional frameworks are “environmental and social considerations.” And it goes without saying that appropriate environmental and social considerations are indispensable in relation to transportation infrastructure development.

Take, for example, the development of existing roads and the construction of new roads in areas suffering significant traffic congestion due to the increased volume of vehicular traffic. There is a tendency to focus only on the favorable economic and environmental effects of such road developments, which may be brought about by the alleviation of congestion and so forth. However, it is also necessary to consider negative environmental and social impacts, such as environmental destruction and the resettlement of residents due to land expropriation, and to implement strategies aimed at reducing burdens on the environment.

The next chart shows “examples of environmental strategies” that should be considered in relation to each Development Objective.

Table A 5-2 Examples of Environmental Strategies in the Transportation Sector

Development Objective	Efforts as Part of Environmental Strategies	Examples of Environmental Strategies
1. Capacity Development of the Transportation Sector	Introduction of lifecycle management	Introduction of environmental consideration systems from the planning stage
		Introduction of green banking systems
		Introduction of asset management
		Zero emission construction work
	Environmental impact assessments	Strategic environmental impact assessments and project environmental impact assessments
		Increase of people's awareness, promotion of understanding of environmental considerations
	Environmental strategies through institutional and policy measures	Subsidies systems for environmental improvement work
		Implementation of traffic regulations and controls
	Vehicle related regulations	Introduction of vehicle inspection systems
		Setting of fuel standards
		Development of new fuels
		Introduction of equipment for reclaiming fluorocarbons when inspecting or disposing of vehicles
		Equipment that uses alternative cooling gases
		Emission control
2. Toward Internationalization and Regionalization	Efforts to preserve the ozone layer	Establishment of systems prohibiting the use of fluorocarbons
		Development of alternatives to fluorocarbons
	Efforts to prevent global warming	Examination and promotion of CDM (Clean Development Mechanism)
		Political measures towards EST (Environmentally Sustainable Transportation)
	Efforts to prevent trans-boundary air pollution, acid rain, etc.	Development of new fuels as alternatives to fossil fuels
		Development of vehicles that run on new fuels
	Efforts to prevent marine pollution	Ratification of environmental preservation conventions adopted by the IMO
		Environmental considerations on high seas
	Efforts in relation to destruction of rain forests	Examination of infrastructure development in tropical and subtropical zones
	Conservation of biodiversity	Protection of valuable species
	Efforts to prevent desertification	Installation of erosion control material
	Efforts in relation to the Kyoto Protocol	Setting up and ratification of international environmental standards
		Measures to conserve energy
		Efforts to develop new and renewable energy
		Technology development and transfer compatible with actual conditions in developing countries
3. Toward Balanced Development of a Whole Country	Efforts in relation to maritime transportation and ships/vessels	Ratification of environmental preservation conventions adopted by the IMO
		Ratification of UN maritime laws and conventions (SOLAS, STCW, MARPOL, OPRC, etc.)
		Promotion and expansion of ISO14001 certification and environmental actions
		Establishment, maintenance, and operation of environmental management systems
		Promotion of a modal shift
		Comprehensive maintenance of ships/vessels (energy conservation strategies)
		Development of new environmentally friendly shipbuilding (structure, coatings, refrigerators, etc.)
		Improvement of ship lubricating oil management system and wastewater management system
		Upgrade of maritime accident prevention measures and technologies, and the improvement of equipment
		Ensuring of safe navigation
		Decommissioning/disposal of dilapidated ships/vessels
	Efforts in relation to ports	Improvement of the environment around ports (rocky shores, tidal flats, etc.)
		Measures to improve water/seabed quality (introduction of aeration device, promotion of sea water circulation, etc.)
		Effective use of dredged soil
		Consideration of marine environment destruction caused by land reclamation
		Improvement of waste oil processing facilities
		Prevention of marine pollution caused by maritime accidents
		Preservation of submarine resources (breakwaters that coexist with nature, etc.)
	Efforts in relation to airports and air transportation	Measures for areas surrounding airports
		Modernization of air traffic control and landing device (ATM, RANV, etc.)
		Measures for radio disturbance
		Measures for noise and vibrations
		Measures for falling objects
		Measures for environmental and water quality preservation in conjunction with airport construction
	Efforts in relation to railways	Measures for railway noise
		Improvement of trains/rolling stock that are more environmentally friendly (electrification, increased efficiency, etc.)
		Higher operation efficiency through the improvement of maintenance technology
		Policies for promoting railway use
		Promotion of a modal shift
	Efforts in relation to road structure	Construction of embankments (environmentally friendly roads)
		Sound insulation walls, steep inclined walls
		Low noise pavement
		Dust reducing/suppressing pavement
		Underground water conscious tunnel construction
	Other efforts	Protection of aquatic ecosystems
		Prevention of water contamination
4. Toward Sustainable Urban Development and Improvement of Urban Life	Improvement of logistics systems	Modal shift towards maritime and railway transportation
		Reduction in gas emissions through increased transportation efficiency
	Development and promotion of the use of environmentally friendly transportation facilities	Development of LRT and railway transportation services
		Revitalization of bus services
		Introduction/Promotion of ITS (bus lanes, public transportation priority systems, park and ride facilities)
		Elimination of transportation bottlenecks (railway crossings, intersections)
		Introduction of environmentally friendly vehicles (CNG buses, LPG taxis, etc.)
		Traffic restrictions related to environmental preservation (promotion of idling stop, etc.)
		Introduction of TDM
		Development of bicycle friendly road facilities (overpasses, ring roads, etc.)
	Improvement of urban environments	Development of transit malls
	Development of transit malls	Ensuring of green areas
5. Toward Sustainable Rural Development and Improvement of Rural Life	Development that respects biosphere reserves	Protection of forests
	Preservation of the natural environments	Prevention of illegal dumping
	Strategies in relation to the acquisition of construction materials	Measures to prevent adverse environmental effects in relation to borrow pits
		Measures to prevent adverse environmental effects in relation to quarries

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Development Objectives of Chart of Transportation (1)

Development Objective	Mid-term Objective	Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
1. Capacity Development of the Transportation Sector	1-1 Strengthening of Transportation Sector Administration	1-1-1 Clarification of Authority and Responsibility as well as Capacity Development of Central Government	○ Establishment/Improvement of Operation and Policy of Transportation Infrastructure/Projects	Road Engineering and Administration (Tr), Road Administration with Focus on Maintenance and Management, and Safety Measures (India) (TCP)
			○ Establishment of Management Systems by Transportation Modes and Strengthening of Coordination among Management Body	The Study on the National Transportation Development Strategy in Vietnam (Viet Nam) (DS)
			○ Development of Transportation Databases	The Study on Metro Manila Urban Transportation Integration (Phases I and II) (the Philippines) (DS), National Transportation Plan (Pakistan) (DS)
			○ Coordination with National Development Plan	The Study on the National Transportation Development Strategy in Vietnam (Viet Nam) (DS)
			○ Administrative Improvement/ Privatization of Public Managed Transportation Company	Study on Privatization of Polish State Railways (Poland) (DS), Study on Tariffs and Improved Cost Recovery for Egyptian National Railways: Alternative Study (Egypt) (DS), Railway Management Planning (Tr), Shipping Administration (Tr), National Transportation Plan (Poland) (DS)
			△ Strengthening with Environmental Issues Capability	(also dealt with under "Pollution Control" activities) Study on Integrated Urban Transportation Strategies for Environmental Improvement in Kuala Lumpur (Malaysia) (DS), Comprehensive Urban Transportation Study in Barranquilla (Colombia) (DS)
		1-1-2 Capacity Development of Local Governments in the Progressing Decentralization	△ Strengthening of Management Capability of Local Governments	The Study on Rural Roads Improvement in Western Kenya (Kenya) (DS), Periodic Maintenance of Capacity Building for Regional Office (East Timor) (TCP)
			○ Coordination Between Urban Planning and Regional Master Plans	The Study on an Improvement Plan for Railway Transport in and around the Bangkok Metropolis in Consideration of Urban Development (Thailand) (DS)
			△ Establishment of Coordination Systems Between Central Government and Local Government	Master Plan Study on Long-term Management of Bulgarian Railways (Bulgaria) (DS)
		1-1-3 Promotion of Private Sector Participation in the Development of Transportation Infrastructures and Provision of Transportation Services	△ Promotion of Deregulation	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS), Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)
			△ Creation of Enabling Environments for Public and Private Sector Cooperation	
	1-2 Updating of Transportation Laws and Regulations	1-2-1 Revision of Laws and Regulations regarding Provision of Transportation Services	△ Formulation/Improvement of a Law on Transportation Maintenance	Regulation and Type Approval System for Safety and Environmental Protection of Motor Vehicle (Tr), Seminar on Road Administration (Tr)
			△ Formulation/Improvement of a Law on Transportation Operation and Management	National Transportation Plan (Poland) (DS)
			○ Formulation of Transportation Standards (Design, Construction, Environment and Safety, etc.)	The Study on the Standardization for Integrated Railway Network of Metro Manila (the Philippines) (DS), The Study on the Standardization of Bridge Design (Malaysia) (DS)
			△ Establishment of Operation/Monitoring Systems for Law/Standard Enforcement	Motor Vehicle Inspection and Maintenance System (Tr), Regulation and Type Approval System for Safety and Environmental Protection of Motor Vehicle (Tr), Seminar on Road Administration (Tr)
		1-2-2 Revision of Laws and Regulations with a view to Market Economy and Decentralization	Decentralization	
			△ Deregulation/Privatization	Study on Privatization of Polish State Railways (Poland) (DS), The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS), Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)
			△ Improvement of Tender/Procurement Processes	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS)

Development Objectives of Chart of Transportation (2)

Development Objective	Mid-term Objective	Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
		1-2-3 Revision of Laws and Regulations as well as Capacity Development with a view to Promoting Private Sector Participation	△ Establishment of a Law on Toll Roads	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS), Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)
	1-3 Strengthening of Transportation Sector Financing	1-3-1 Diversification of Financial Sources of the Government	△ Introduction of Special Taxes for Specific Purposes/Specific Revenue Sources	The Study on the Standardization for Integrated Railway Network of Metro Manila (the Philippines) (DS)
			○ Administrative Improvement of Public Managed Transportation company	National Transportation Plan (Poland) (DS), Study on Tariffs and Improved Cost Recovery for Egyptian National Railways: Alternative Study (Egypt) (DS), The Feasibility Study of the Proposed Cavite Busway System (the Philippines) (DS)
			△ Fosterage/Strengthening of Financial Organization	Study on Development of Domestic Maritime Transportation and Marine Industry (Indonesia) (DS)
		1-3-2 Appropriate Distribution of Transportation Fund to Central and Local Governments	Financial Arrangements for Local Governments	
		1-3-3 Introduction of the Benefit Principle	△ Introduction of User Tax/Fee (Passenger Duty)	Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS), Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS)
		1-3-4 Utilization of Private Capital	△ Promotion of Deregulation	Study on Pan-Philippine Highway Ferry Service Plan (the Philippines) (DS)
			△ Creation of Enabling Environments of framework for Promotion of Public-Private Partnership	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS), Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)
			△ Provision of Incentive for Private Sector Participation in the Transportation Sector	Study on the Subic Bay Port Master Plan in the Republic of the Philippines (DS), Study on Urban Redevelopment Plan and Case Study in the Bangkok Metropolitan Area in the Kingdom of Thailand (DS)
			△ Institutional Setup for Promoting Finance to Transportation Sector both Internationally and Domestically	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS), Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)
	1-4 Human Resource Development	1-4-1 Human Resource Development of the Public Sector	○ Establishment of Efficient Capacity Development Systems	Study on Development of Domestic Maritime Transportation and Marine Industry (Indonesia) (DS), National Transportation Plan (Poland) (DS)
			○ Strengthening of Capacity Development Organizations	The Urban Transportation Human Resources Development Project (Brazil) (PTC), National Center for Transportation Studies Project (the Philippines) (PTC), The Panama Nautical School Up-grading Project (Panama) (PTC), Basic Design Study on the Project for the Improvement of Transportation Technical and Professional School No. 1 (Viet Nam) (GA), The Project for Upgrading Human Resources Development for Air Navigation Systems Specialist at the Civil Aviation Training Center in Manila (the Philippines) (PTC), Port Hydraulic Research Center (Turkey) (PTC), Aftercare Technical Cooperation for the Railway Training Center Project (Thailand) (PTC), Renovation of the Road Maintenance and Construction Equipment of IFEER (Morocco) (PTC), The Project on Philippine Coast Guard Human Resource Development (the Philippines) (TCP)
			△ Strengthening of Evaluation/Monitoring Capability	Road Administration with Focus on Maintenance and Management, and Safety Measures (India) (TCP)

Development Objectives of Chart of Transportation (3)

Development Objective	Mid-term Objective	Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
		1-4-2 Human Resource Development of the Private Sector	○ Enhancement of Specialist Education and Training	Technology Development for Electronic Navigational Charts (the Philippines) (PTC), The Project on Philippine Coast Guard Human Resource Development (the Philippines) (PTC), Yazd Signaling Training Center Project (Iran) (PTC), Promotion of the Ship Inspection System and Technique (the Philippines) (PTC), Project of Modernization of Perumka's Education and Training System in JABOTABEK (Indonesia) (PTC), Renovation of the Road Maintenance and Construction Equipment of IFEER (Morocco) (PTC), Project on Improvement of Maritime Education in Turkey (TCP), Study on the Utilization of Private Sector in the Road Maintenance System (Kenya) (DS), Road Administration with Focus on Maintenance and Management, and Safety Measures (India) (TCP)
			△ Establishment of Prior Examination Systems for Project Tenders	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS)
2. Toward Internationali-zation and Regionalization (International Cross-border Transportation)	2-1 Facilitation of International Movement of People and Goods	2-1-1 Development of International Transportation Network (Road/Railway/ Airport/Port)	○ Development of International Trunk Road Networks	The Project for Construction of a Bridge over the Mekong River (Cambodia) (GA), Study on the Detailed Design of the Second Mekong International Bridge Construction Project (Laos and Thailand) (DS), Feasibility Study on the Improvement of National Road No. 1 (Phnom Penh–Neak Loeung Section) (Cambodia) (GA), Feasibility Study on the Proposed New Bridge over the Zambezi River at Chirundu Border Post (Zambia and Zimbabwe) (DS), Study on the Integrated Development Plan for the Border Region in Thailand and Lao PDR (Thailand and Laos) (DS)
			△ Development of International Trunk Railway Networks	Study on the Transportation Master Plan (Bosnia and Herzegovina) (DS)
			○ Development of International Ports	The Study on the Development Plan of Suez Bay Coastal Area (Egypt) (DS)
			○ Development of International Airports	Feasibility Study on New Development Plan of Hanoi International Airport (Viet Nam) (DS), Detailed Design Study on Shanghai Pu-dong International Airport (China) (DS), Development of a New International Airport for Tegucigalpa (Honduras) (GA), The Project for Improvement of Terminal Building at Palau International Airport (Palau) (GA)
			○ Development of Cross-border Transportation Networks and Public Transportation Networks (Bus, Railway, etc.)	Study on the Transportation Master Plan (Bosnia and Herzegovina) (DS)
		2-1-2 Standardization and Modernization of Technologies Applied to International Transportation Network	△ Application of International Technical Standard to the Road Sector	ESCAP, Regulation and Type Approval System for Safety and Environmental Protection of Motor Vehicle (Tr)
			○ Application of International Technical Standard to the Railway Sector (gauge, voltage, etc.)	The Study on the Standardization for Integrated Railway Network of Metro Manila (the Philippines) (DS)
			○ Development of Digital Geographic Information	Technology Development for Electronic Navigational Charts (the Philippines) (PTC), Study on Establishing Digital Topographic Maps (Georgia) (DS)
			△ Standardization of Transportation Signage	Regulation and Type Approval System for Safety and Environmental Protection of Motor Vehicle (Tr)
			Technical Standardization of Land Transportation	
			△ Participation in International Technical Exchange	Third Country Training Course, Road Administration with Focus on Maintenance and Management, and Safety Measures (India) (TCP)

Development Objectives of Chart of Transportation (4)

Development Objective	Mid-term Objective	Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
		2-1-3 Strengthening of Safety and Security Measures	○ Enhancement of Security Management at International Borders	Promotion of the Ship Inspection System and Technique (the Philippines) (PTC), The Project for Improvement of Equipment of the Kabul International Airport (Afghanistan) (GA)
			○ Enhancement of Maritime Security Management (Enforcement of the ISPS code, Establishment of Maritime Safety Agencies, etc.)	The Project on Philippine Coast Guard Human Resource Development (the Philippines) (PTC), Study for the Maritime Traffic Safety System Development Plan (Indonesia) (DS), Maritime Search and Rescue and Disaster Prevention Course for Policy Planners (Tr), The Project on Philippine Coast Guard Human Resource Development (the Philippines) (TCP)
			○ Introduction of ICAO Standard in the Air Transportation Sector	The Study of New Communications, Navigation and Surveillance / Air Traffic Management System (the Philippines) (DS), Study on the Transportation Master Plan (Bosnia and Herzegovina) (DS), Seminar on CNS Technology (Tr)
			△ Introduction of IMO Standard of Water Transportation	International Maritime Conventions and Ship Safety Inspection (Tr)
			△ Development of Manuals and Training for Emergency	Project on Improvement of Maritime Education (Turkey) (TCP)
			○ Quality Enhancement of Operation and Management of the Railway Sector and Port Sector	Project on Improvement of Maritime Education (Turkey) (TCP)
			○ Quality Enhancement of Air Traffic Control	Project for Rehabilitation of the Approach Radar Facility in the Ninoy Aquino International Airport (the Philippines) (GA), The Project for Improvement of Existing Air Traffic Services Equipment System under the Tribhuvan International Airport Modernization Project (Nepal) (GA), The Project for Upgrading Human Resources Development for Air Navigation Systems Specialist at the Civil Aviation Training Center in Manila (the Philippines) (PTC), The Study of New Communications, Navigation and Surveillance / Air Traffic Management System (the Philippines) (DS), Master Plan Study on the Strategic Policy of the Air Transportation Sector (Indonesia) (DS)
	2-2 Expedition of Cross-border Processing	2-2-1 Application of International Standards	△ Application of International Vehicle Maintenance and Vehicle Certification	Regulation and Type Approval System for Safety and Environmental Protection of Motor Vehicle (Tr)
			○ Standardization of Geographic Information	Study on Establishing Digital Topographic Maps (Georgia) (DS)
			Application to Open Sky Policy	
			Provision of Quality Management Standards (Quarantine Systems, etc.)	
			○ Introduction of New Air Navigation Systems	The Study of New Communications, Navigation and Surveillance / Air Traffic Management System (the Philippines) (DS)
		2-2-2 Facilitation and Expedition of Import/Export Processing	Introduction of EDI System to Administrative Procedures at Port, and Reduction/Elimination of Intraregional Tariff	
			△ Introduction of One-Stop Border Services at International Borders	Feasibility Study on the Proposed New Bridge over the Zambezi River at Chirundu Border Post (Zambia and Zimbabwe) (DS)
		2-2-3 Improvement of International Border Crossing System	△ Development of International Logistic Network over International Border	Study on the Improvement Plan for Transshipment Facilities at Zamyn-Uud Station (Mongolia) (DS)
			○ Development of Multi-Modal Transportation System	The Study on the Master Plan of Container Cargo Handling Ports, Dry Ports and Connecting Railways (Indonesia) (DS)

Development Objectives of Chart of Transportation (5)

Development Objective	Mid-term Objective	Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
3. Toward Balanced Development of a Whole Country (National Transportation)	3-1 Improvement of Road Transportation	3-1-1 Improvement and Development of Trunk Road System	○ Development of National Road Networks	Study on the Roads Network Development (Oman) (DS)
			○ Development of Major Trunk Road Networks (National Roads and Regional Roads)	Feasibility Study on the Improvement of National Road No. 1 (Phnom Penh–Neak Loeung Section) (Cambodia) (GA), Basic Design Study Report on the Project for Construction of the Second Bridge over the Mekong River (Cambodia) (GA), The Feasibility Study on the Construction of Kathmandu–Naubise Alternate Road (Nepal) (DS), Road Network Study in Central and South-East Sulawesi (Indonesia) (DS)
			○ Development of High Standard Trunk Road (Highway) Networks	Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)
			○ Elimination of Missing Links	The Project for Construction of a Bridge over the Mekong River (Cambodia) (GA)
		3-1-2 Strengthening of Road Maintenance System	○ Road Rehabilitation and Road Maintenance	The Study on the Maintenance and Rehabilitation of Highway Bridges (Turkey) (DS), The Study on Arterial Highway Maintenance (Turkey) (DS), Road Administration with Focus on Maintenance and Management, and Safety Measures (India) (TCP), The Project for Procurement of Road Construction Machinery (Bosnia and Herzegovina) (GA)
			○ Establishment of Road Operation and Maintenance System	Study on the Utilization of Private Sector in the Road Maintenance System (Kenya) (DS), Road Administration with Focus on Maintenance and Management, and Safety Measures (India) (TCP)
		3-1-3 Normalization and Standardization of Roads and Road Traffic	○ Standardization of Road	The Study on the Standardization of Bridge Design (Malaysia) (DS), Feasibility Study on Upgrading Inter-urban Highway System (Sta. Rita–San. Jose Road Section) (the Philippines) (DS), The Feasibility Study on the Construction of Kathmandu–Naubise Alternate Road (Nepal) (DS)
			△ Standardization of Vehicles	Seminar on Road Administration (Tr), Road Engineering and Administration (Tr), Feasibility Study on Upgrading Inter-urban Highway System (Sta. Rita–San. Jose Road Section) (the Philippines) (DS), The Study on the Standardization of Bridge Design (Malaysia) (DS)
			△ Preparation of Road Construction Ordinance	
		3-1-4 Improvement of Road Transportation Services	△ Arrangement of Fair Competition Among Transportation Modes, and Provision of Safe Transportation Services	Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS), Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS)
			△ Rationalization and Modernization of Bus Transportation Services and Truck Transportation Services	
	3-2 Improvement of Railway Transportation	3-2-1 Restoration, Improvement and Development of Railway Network	△ Development of High-speed Railway System	Feasibility Study on Railway Improvement Plan of Transportation Capacity and Train Speed on the Delhi–Kanpur Section (India) (DS)
			○ Development of Interurban Railway System	The Feasibility Studies on the Rehabilitation and Improvement of Railway in Viet Nam (Viet Nam) (DS), Project for Repairing Railways (Mongolia) (GA)
			○ Railway Upgrading to Double/Double-double Tracking	The Master Plan Study on the Development of Syrian Railways (Syria) (DS)
			○ Electrification of Railway System	Study on the Detailed Design Study of Railway Electrification and Double Tracking of Java Main Line Project (Indonesia) (DS)
			△ Development of Railway Communication System	Study on the Detailed Design Study of Railway Electrification and Double Tracking of Java Main Line Project (Indonesia) (DS), Master Plan Study on Modernization and Rehabilitation of the National Railways (Bolivia) (DS)
			△ Development/Improvement of Railway Container Terminal	Study on the Railway Yard Improvement (Thailand) (DS)
			△ Development/Improvement of Passenger Facilities	The Study on the Standardization for Integrated Railway Network of Metro Manila (the Philippines) (DS)
			△ Modernization of Rolling Stock and Other Equipments	Study on the Detailed Design Study of Railway Electrification and Double Tracking of Java Main Line Project (Indonesia) (DS)

Development Objectives of Chart of Transportation (6)

Development Objective	Mid-term Objective	Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
		3-2-2 Strengthening of Railway Maintenance System	○ Strengthening of Maintenance Technique and Capability of Railway Track, Rolling Stock and Railway System	Yazd Signaling Training Center Project (Iran) (PTC), The Feasibility Study on the Construction of Electric Locomotive Repair Workshop (Uzbekistan) (DS), The Feasibility Study on the Rehabilitation Project of the Mongolian Railway (Mongolia) (DS), The Master Plan Study on the Development of Syrian Railways (Syria) (DS)
		3-2-3 Normalization and Standardization of Railway System	○ Standardization of Railway System	The Study on the Standardization for Integrated Railway Network of Metro Manila (the Philippines) (DS)
		3-2-4 Management Improvement and Privatization	○ Improvement of Railway Company Management	Master Plan Study on Long-term Management of Bulgarian Railways (Bulgaria) (DS), Railway Management Planning (Tr), Study on Tariffs and Improved Cost Recovery for Egyptian National Railways: Alternative Study (Egypt) (DS)
			○ Privatization of National Railway Company	Study on Privatization of Polish State Railways (Poland) (DS), Master Plan Study on Long-term Management of Bulgarian Railways (Bulgaria) (DS)
	3-3 Improvement of Maritime Transportation	3-3-1 Restoration, Improvement and Development of Ports and Port Facilities	○ Development of International Container Terminal	Study on the Rehabilitation Plan and the Container Terminal Operation Plan at the Port of Cristobal (Panama) (DS)
			○ Development of International Cargo and Passenger Terminal (Bulk, Ro/Ro, etc.)	The Study on the Cebu Integrated Port Development Plan (Preparatory Study) (the Philippines) (DS), The Master Plan Study for the Coastal Channels and Ports Development (Thailand) (DS)
			○ Development of Domestic Cargo and Passenger Terminal	The Study on Long Term National Port Development Plan (Turkey) (DS)
			○ Development of Access Transportation Systems for Port Facilities (Roads/Railways)	Study on the Rehabilitation Plan and the Container Terminal Operation Plan at the Port of Cristobal (Panama) (DS), Regional Development Study on the Three States: Espirito Santo, Minas Gerais and Goias (Brazil) (DS), The Study on the Master Plan of Container Cargo Handling Ports, Dry Ports and Connecting Railways (Indonesia) (DS)
		3-3-2 Strengthening of Port Maintenance System	△ Improvement of Maintenance and Repair Technique	The Study for Maintenance and Improvement Plan of Access Channel of Beira Port (Mozambique) (DS)
			△ Strengthening of Management and Operation System	Study on the Effective Port Management and Operation System (Thailand) (other)
		3-3-3 Normalization and Standardization of Port System	△ Enhancement of Data Computerization (e.g. EDI)	Study on Maritime Traffic Safety System Development Plan: Maritime Telecommunication Facilities; Inventory, Plant Records and Outlook (Indonesia) (DS)
			○ Ratification of International Security Standard	Master Plan Study on Coastal Shipping Rehabilitation and Development Project (Viet Nam) (DS), Comprehensive Study on Shipbuilding Industry Development (Indonesia) (DS), International Maritime Conventions and Ship Safety Inspection (Tr)
			○ Ratification of International Safety Standard	Master Plan Study on Coastal Shipping Rehabilitation and Development Project (Viet Nam) (DS), International Maritime Conventions and Ship Safety Inspection (Tr)
		3-3-4 Improvement of Port Operation and Management	△ Enhancement of Efficient Operation (e.g. Privatization)	The Study for Port Development Strategy in the Republic of Indonesia (Indonesia) (DS)
			○ Improvement of Security Measures	Master Planning and Feasibility Study on the Sihanoukville Port (Cambodia) (DS), Study on Maritime Safety Plans Concerning Search and Rescue (Indonesia) (DS)
			△ Institutional Setup and Improvement	Study on the Effective Port Management and Operation System (Thailand) (other)

Development Objectives of Chart of Transportation (7)

Development Objective	Mid-term Objective	Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities	
		3-3-5 Promotion of Maritime Transportation	○ SImprovement of Safety	Education Program for Crew	The Study for Port Development Strategy in the Republic of Indonesia (Indonesia) (DS), Study on Maritime Safety Plans Concerning Search and Rescue (Indonesia) (DS)
				Improvement of Ship Management Technique	Master Planning and Feasibility Study on the Sihanoukville Port (Cambodia) (DS)
			○ Improvement of Services	Policy of Maritime Transportation Promotion and Legal System Setup	The Study for Port Development Strategy in the Republic of Indonesia (Indonesia) (DS), Study on Maritime Safety Plans Concerning Search and Rescue (Indonesia) (DS), Study on Development of Domestic Maritime Transportation and Marine Industry (Indonesia) (DS)
				Development of Maritime Transportation Routes	Study on Pan-Philippine Highway Ferry Service Plan (the Philippines) (DS)
				Improvement of Maritime Company Management	The Study for Port Development Strategy in the Republic of Indonesia (Indonesia) (DS)
			△ Improvement of Shipbuilding (incl. Repair Technique)	Master Plan Study on Coastal Shipping Rehabilitation and Development Project (Viet Nam) (DS), Comprehensive Study on Shipbuilding Industry Development (Indonesia) (DS)	
	3-4 Improvement of Air Transportation	3-4-1 Improvement/ Development of Airport Facilities	○ Development of Airport Facilities	Study on the Development of Chittagong Airport (Bangladesh) (DS), Feasibility Study on New Alexandria International Airport Construction Project (Egypt) (DS)	
			○ Development of Access Transportation Systems to Airport Facilities (Roads/Railways)	Study on the Development of Chittagong Airport (Bangladesh) (DS)	
		3-4-2 Improvement/ Development of Aeronautical Navigation Aid System	○ Development of Aeronautical Navigation Aid	Study on Modernization of Tribhuvan International Airport in Kathmandu (Nepal) (DS)	
			○ Development of Air Traffic Control System	Project for Rehabilitation of the Approach Radar Facility in the Ninoy Aquino International Airport (the Philippines) (GA (facilities + equipment and materials)), The Project for Improvement of Existing Air Traffic Services Equipment System under the Tribhuvan International Airport Modernization Project (Nepal) (GA (equipment and materials))	
			○ Development of Air Traffic Control Airspace/Flight Route	Study on the Development of the National Air Transportation Network (Nepal) (DS)	
		3-4-3 Strengthening of Airport Facility Maintenance System	△ Improvement of Maintenance and Repair Technique	Seminar on Airport Engineering Policy (Tr)	
			△ Strengthening of Operation and Management		
		3-4-4 Normalization and Standardization of Air Transportation System	○ Ratification of International Security Standard	Study on the Development of Chittagong Airport (Bangladesh) (DS), Feasibility Study on the Bali International Airport Development (Indonesia) (DS)	
			○ Ratification of International Safety Standard		
		3-4-5 Improvement of Airport Operation and Management	△ Improvement of Operational Efficiency	The Study on Air Transport Development (Uzbekistan) (DS), Study on the Development of a New CNS/ATM System in the Republic of the Philippines (DS), The Project for Improvement of Equipment of the Kabul International Airport (Afghanistan) (GA (equipment and materials))	
			△ Improvement of Security Measures		
			△ Institution Setup and Improvement		
	3-5 Strengthening of Intermodal Transportation as well as Improvement of Issues Common to All Modes of Transportation	3-5-1 Development and Introduction of Intermodal Transportation System	○ Development of Multimodal Container Transportation Network	The Study on the Master Plan of Container Cargo Handling Ports, Dry Ports and Connecting Railways (Indonesia) (DS), Study on the Integrated Development Project for Ports in the Capital City Region (the Philippines) (DS)	
			△ Enhancement of Logistic Terminal Capabilities	Study on the Effective Port Management and Operation System (Thailand) (DS)	
		3-5-2 Facilitation of Intermodal Connection	○ Development of Railway System as Airport Access	Study on New Railway Line Jakarta-Cengkareng Airport (Indonesia) (DS)	

Development Objectives of Chart of Transportation (8)

Development Objective	Mid-term Objective	Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
		3-5-3 Transportation Safety Measures	△ Development of Transportation Safety Facilities	Study on Road Traffic Safety in Hanoi (Viet Nam) (Overseas Basic Study), Traffic Safety Plan for Roads (Thailand) (DS), Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS)
			△ Transportation Safety Education Program	
		3-5-4 Disaster Management	○ Development of Framework and System of Disaster Prevention	Study on Vulnerability Reduction for Major Roads (Nicaragua) (DS), Slope Disaster Management Study for Federal Highways (Malaysia) (DS), The Study on Road Disaster Prevention Plan (Thailand) (DS)
			Ensuring Traffic Channel for Emergency and Network Redundancy (Alternative Route)	
			○ Measures for Slope Protection and Rock Fall Protection	Feasibility Study on the Improvement of National Road No. 1 (Phnom Penh–Neak Loeung Section) (Cambodia) (GA)
			○ Enhancement of Seismic Adequacy of Roads and Bridges	The Study on the Improvement of Existing Bridges along Pasig River and Marikina River (the Philippines) (DS)
		3-5-5 Improvement and Development of Transportation Terminals to Contribute to Regional Development	△ Development of "Michi-no-Eki"	Study on Tourism Development in the Central Areas (Viet Nam) (Preparatory Study) (DS)
			△ Development of Tourist Route	Study on Community-based Eco-tourism Development (Bosnia and Herzegovina) (DS)
4. Toward Sustainable Urban Development and Improvement of Urban Life (Urban Transportation)	4-1 Improvement and Development of Urban Transportation Infrastructure	4-1-1 Traffic Capacity Increase of Arterial Roads, Intersections and Bridges under the Jurisdiction of Central Government	○ Development of Trunk Road Network and Bypass	The Master Plan and Feasibility Study to Alleviate Traffic Congestion and Improve Traffic Safety in the Nairobi Metropolitan Area (Kenya) (DS), Feasibility Study on Road Network Improvement for Development of Regional Growth Centers (the Philippines) (DS), Study on Upgrading Inter-Urban Highway System along the Pan-Philippine Highway (Plaridel, Cabanatuan, San Jose Bypass) (the Philippines) (DS), The Feasibility Study on Kuala Lumpur Outer Ring Road Project (Malaysia) (DS), The Transport Master Plan of the Phnom Penh Metropolitan Area (Cambodia) (DS), Feasibility Study on the Project of Highway and Bus Lane of Santa Fe de Bogota (Colombia) (DS)
			○ Improvement of Intersections	The Study on Improvement of Road Traffic Environment in Chiang Mai (Thailand) (DS), The Master Plan and Feasibility Study to Alleviate Traffic Congestion and Improve Traffic Safety in the Nairobi Metropolitan Area (Kenya) (DS), Study on Road Traffic Safety in Hanoi (Viet Nam) (Overseas Basic Study)
			○ Development of Hubs/Terminal (Airport, Port, Station, etc.)	The Master Plan and Feasibility Study to Alleviate Traffic Congestion and Improve Traffic Safety in the Nairobi Metropolitan Area (Kenya) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS)
			○ Enhancement of Access to Airports, Ports, Stations, etc.	Feasibility Study on Railway Improvement Plan in the Klang Valley Area (Malaysia) (DS)
			○ Development of Logistic Hubs in Urban Area	The Study on Greater Bangkok Truck Terminal (Thailand) (DS)
		4-1-2 Restoration and Improvement of Secondary Roads and their Maintenance System under the Jurisdiction of Local Government	○ Development/Improvement of Local Roads in Urban Area	Study for Public Transportation Improvement in Chengdu City (China) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS), The Transport Master Plan of the Phnom Penh Metropolitan Area (Cambodia) (DS)
		4-1-3 Promotion of Private Sector Participation in Urban Transportation through PPPs	△ Setup of Legal System for PPPs	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS), Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)
			△ Capacity Improvement of Implementation Agency in PPP Introduction/Operation	

Development Objectives of Chart of Transportation (9)

Development Objective	Mid-term Objective	Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
	4-2 Improvement and Development of Urban Public Transportation Services	4-2-1 Improvement of Bus Services	○ Improvement of Bus Services (Bus Network, Punctuality, Fare, etc.)	Study for Public Transportation Improvement in Chengdu City (China) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS)
			○ Development/Improvement of Bus Related Facilities	The Project for Rehabilitation of the Public Transportation System in Kabul City (Afghanistan) (GA), Rehabilitation of the Public Transportation Capacity in Belgrade City (Serbia and Montenegro) (GA), Basic Design Study Report on the Project for Rehabilitation of Mostar City Transportation System (Bosnia and Herzegovina) (GA), The Project for Improvement of Public Transportation in Ulan Bator (Mongolia) (GA)
			○ Re-organization and Improvement of Para-transit Transportation	The Transport Master Plan of the Phnom Penh Metropolitan Area (Cambodia) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS), Urban Transportation Improvement in the City of Baku (Azerbaijan) (DS)
			○ Development of Bus Priority Lane and Exclusive Bus Lane	The Feasibility Study of the Proposed Cavite Busway System (the Philippines) (DS), Feasibility Study on the Project of Highway and Bus Lane of Santa Fe de Bogota (Colombia) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS)
			○ Enhancement of Feeder Transportation	The Feasibility Study of the Proposed Cavite Busway System (the Philippines) (DS), Feasibility Study on the Project of Highway and Bus Lane of Santa Fe de Bogota (Colombia) (DS), Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS), Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS)
		4-2-2 Introduction of Rail-based Public Transportation Services including MRT and LRT	○ Development of Medium Capacity Transit Systems (Tram, LRT)	The Comprehensive Urban Transport Study of Bucharest City and Its Metropolitan Area (Romania) (DS), The Study on Metro Manila Urban Transportation Integration (the Philippines) (DS), Urban Transportation Improvement in the City of Baku (Azerbaijan) (DS)
			△ Development of Mass-transit Transportation System	Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS), The Study on an Improvement Plan for Railway Transport in and around the Bangkok Metropolis in Consideration of Urban Development (Thailand) (DS), Study on Singapore Urban Transportation Improvement (Singapore) (DS)
		4-2-3 Management Improvement of Public Transportation Service Providers	△ Promotion of Operational Efficiency of Public Transportation company	Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS), Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS)
	4-3 Transportation Demand Management (TDM)	4-3-1 Promotion of Modal Shift from Private Cars to Public Transportation Services	○ Promotion of Public Transportation Use	Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS), The Transport Master Plan of the Phnom Penh Metropolitan Area (Cambodia) (DS), The Study on Improvement of Road Traffic Environment in Chiang Mai (Thailand) (DS), The Comprehensive Urban Transport Study of Bucharest City and Its Metropolitan Area (Romania) (DS)
			○ Promotion of Bicycle Usage	The Study on Improvement of Road Traffic Environment in Chiang Mai (Thailand) (DS)
		4-3-2 Optimization of Urban Transportation Demand	Devisal of Vehicle Usage	
			○ Alleviation of Vehicular Transportation Demand	Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS), Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS)

Development Objectives of Chart of Transportation (10)

Development Objective	Mid-term Objective	Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
		4-3-3 Improvement of Urban Transportation Operation and Management	○ Vehicular Traffic Control Improvement	Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS), Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS)
			△ Vehicle Flow Control by Parking Policies	The Comprehensive Urban Transport Study of Bucharest City and Its Metropolitan Area (Romania) (DS)
			○ Development/Improvement of Traffic Control Centers	Study on the Development of a Control System for Urban Transportation in Bangkok (Thailand) (DS)
			△ Improvement of Intersection Traffic Flow Management System and Signal Management	Study on the Development of a Control System for Urban Transportation in Bangkok (Thailand) (DS), The Project for Improvement of Intersections in Kathmandu City (Nepal) (DS)
	4-4 Enhancement of Transportation Safety	4-4-1 Traffic Safety Education	△ Introduction and Improvement of License System	Regulation and Type Approval System for Safety and Environmental Protection of Motor Vehicle (Tr)
			○ Introduction of Transportation Safety Education Program	Study on Road Traffic Safety in Hanoi (Viet Nam) (Overseas Basic Study), Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS), Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS)
		4-4-2 Enforcement of Traffic Safety Laws and Regulations	○ Provision of Transportation Safety Agency and Transportation Related Legal System	Traffic Safety Plan for Roads (Thailand) (DS), Study on Road Traffic Safety in Hanoi (Viet Nam) (Overseas Basic Study)
			△ Capacity Development of Enforcement Agency (Police)	TRAFFIC POLICE ADMINISTRATION (SEMINAR)
		4-4-3 Improvement of Traffic Safety Technology	△ Setup and Improvement of Safety Standard for Vehicle and Motorcycle	The Master Plan for Lima and Callao Metropolitan Area Urban Transportation (Peru) (DS), Motor Vehicle Inspection and Maintenance System (Tr)
			○ Improvement of Road Facility and Structure	The Project for Improvement of Intersections in Kathmandu City (Nepal) (GA), The Project for Improvement of Road Network in Luanda (Angola) (GA), The Study on Improvement of Road Traffic Environment in Chiang Mai (Thailand)
	4-5 Prevention/ Improvement of Environmental Deterioration due to Urban Transportation	4-5-1 Exhaust Gas Emission Control	△ Introduction of Vehicular Inspection System	Motor Vehicle Inspection and Maintenance System (Tr)
			Improvement of Catalyst and Fuel	
		4-5-2 Improvement of Road Infrastructure and Facilities in view of Preventing Environmental Degradation	△ Improvement of Road Facilities and Road Structure	Traffic Safety Plan for Roads (Thailand) (DS)
			△ Environmental Measures for Road Development (Bypass Development, etc.)	Study on Integrated Urban Transportation Strategies for Environmental Improvement in Kuala Lumpur (Malaysia) (DS), Comprehensive Urban Transportation Study in Barranquilla (Colombia) (DS)
		4-5-3 Introduction of Policy Measures to Mitigate Urban Environmental Degradation	Enhancement of Gas Emission Control	
			△ Introduction of TDM	Study on Integrated Transportation Master Plan for JABOTABEK (Indonesia) (DS), The Study on Urban Transport Master Plan and Feasibility Study in HCM Metropolitan Area (HOUTRANS) (Viet Nam) (DS), The Master Plan for Lima and Callao Metropolitan Area Urban Transportation (Peru) (DS), Study on Integrated Urban Transportation Strategies for Environmental Improvement in Kuala Lumpur (Malaysia) (DS), Transportation Master Plan and Feasibility Study of Urban Transportation Projects in Greater Cairo Region (Egypt) (DS)
5. Toward Sustainable Rural Development and Improvement of Rural Life (Rural Transportation)	5-1 Improvement of Rural Transportation Infrastructure	5-1-1 Provision of Basic Transportation Infrastructure and Services to Secure Civil Minimum	○ Development of Feeder Roads and Small Bridges with Appropriate Technique	The Project for Construction of Bridges along Rural Roads in Northern Luzon (the Philippines) (GA), The Project for Improvement of Portable Street Bridges for Feeder Roads (Bangladesh) (GA), The Project for Reconstruction of Bridges in the Northern District (Viet Nam) (GA), Feasibility Study on Road Network Improvement for Development of Regional Growth Centers (the Philippines) (DS)
			○ Development of Local Ports	Study on the Comprehensive Ports Development Plan (Panama) (DS)
			○ Development of Local Airports	The Study on Selected Airports Master Planning Project (the Philippines) (DS), The Study on Airport Development Master Plan in the Kingdom of Thailand (Thailand) (DS)

Development Objectives of Chart of Transportation (11)

Development Objective	Mid-term Objective	Sub-targets of Mid-term Objective	Examples of Activities for Achieving Sub-targets	JICA's Major Activities
		5-1-2 Enhancement of Transportation Safety and Reliability	○ Implementation of Regular Checks/Maintenance	The Study on Rural Roads Improvement in Western Kenya (Kenya) (DS), Study on the Utilization of Private Sector in the Road Maintenance System (Kenya) (DS)
			△ Implementation of Transportation Safety Measures	Master Plan Study on the Comprehensive Urban Transportation System in the Metropolitan Area (Guatemala) (DS), Feasibility Study on the Bogor-Bandung Road Project (Indonesia) (DS)
			○ Post-disaster Recovery	The Project for the Urgent Rehabilitation of Sindhuli Road (Section IV) (Nepal) (GA)
	5-2 Improvement of Rural Public Transportation Services	5-2-1 Maintenance and Improvement of Public Transportation Services with a view to Satisfying Civil Minimum	△ Implementation of Transportation Safety Measures	Master Plan Study on the Comprehensive Urban Transportation System in the Metropolitan Area (Guatemala) (DS), Feasibility Study on the Bogor-Bandung Road Project (Indonesia) (DS)
			○ Development of Minimum Transportation Measures	The Development Study on Comprehensive Regional Development Plan for the Western Part of Kalimantan (Indonesia) (DS), Study on Pan-Philippine Highway Ferry Service Plan (the Philippines) (DS)
		5-2-2 Provision of Transportation Services for Better Living Standard	△ Provision of Equipment (Bus, Ferry and other Transportation Equipment)	The Project for Construction of the Inter-islands Navigation Vessel (Samoa) (GA), The Project for Rehabilitation of the Public Transportation System in Kabul City (Afghanistan) (GA)
			△ Reorganization/Rearrangement of Informal Transportation Modes	The Study on the Standardization for Integrated Railway Network of Metro Manila (the Philippines) (DS), The Feasibility Study of the Proposed Cavite Busway System (the Philippines) (DS)
			△ Logistics Improvements in Rural Area	The Development Study on Comprehensive Regional Development Plan for the Western Part of Kalimantan (Indonesia) (DS), Regional Development Study on the Three States: Espirito Santo, Minas Gerais and Goias (Brazil) (DS), Study on Pan-Philippine Highway Ferry Service Plan (the Philippines) (DS)
		5-2-3 Improvement of Safety and Reliability of Public Transportation Services	△ Introduction of Inspection System	The Master Plan Study on the Development of Syrian Railways (Syria) (DS), Study on Railcar Factories Modernization Project (India) (DS)
	5-3 Enhancement of Sustainability of Rural Transportation Systems	5-3-1 Improvement of Funding Mechanisms for Rural Transportation	△ Establishment of Legal System and Budgetary System	The Establishment of the Public-Private Participation Technique of Metro Manila Urban Expressway Construction (the Philippines) (DS), Feasibility Study on the Construction of Expressways in the National Capital Region in India (India) (DS)
			△ Creation of Road Specific Funds	
			△ Introduction of Subsidy	
			△ Introduction of Benefit Principle	
		5-3-2 Supporting Private Sector and Technicians to Study Technologies Suitable for Locality	○ Capacity Development of Local Contractors	The Project for Improvement of Equipment for Rural Road Construction (Guatemala) (GA), The Project for Improvement of Equipment for Rural Roads (Morocco) (GA), Periodic Maintenance of Capacity Building for Regional Office (East Timor) (TCP)
			△ Development of Necessary Technical Manuals	Study on the Utilization of Private Sector in the Road Maintenance System (Kenya) (DS)
		5-3-3 Establishment of Road Development and Maintenance System based on Participation of Local People	○ Utilization of Community, NGOs, etc.	The Study on Rural Roads Improvement in Western Kenya (Kenya) (DS)
			△ Establishment/Diffusion of Labor-based Technology (LBT)	Capacity Strengthening on Labor-based Technology (Tanzania) (TCP)

The circle, triangle and blank marks in the Examples of Activities for Achieving Sub-targets column indicate the status of JICA's efforts.
○: JICA can demonstrate specific outcomes for implementation of this as an objective of cooperation activities.
△: Has been included as one element of JICA cooperation.
Unmarked: JICA has achieved very few outcomes in relation to these items.
Please note that these marks are only intended to give a rough indication of JICA's implementation outcomes, and that blank marks do not indicate that items are inadequate for inclusion in cooperation activities. Blank marks simply indicate that, since JICA has not previously implemented such items, such activities may be somewhat challenging if included in new cooperation undertakings.

DS: Development Study
GA: Grant Aid
PTC: Project-type Technical Cooperation Project
TCP: Technical Cooperation Project
Tr: Training Program