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## Appendix 5 Transportation Sector Development Objectives and Environmental Strategies

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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<br>-Shorter traveling time<br>Reduction of transportation costs | -Increases in gas emissions, noise, vibrations<br>-The resettlement of residents and destruction of the natural environment due to land expropriation |
| Railways | -Shorter traveling time<br>-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<br>-The emergence of water contamination          |
| Airports | -Shorter traveling time  | -Increases in noise and vibrations<br>-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<br>Introduction of green banking systems<br>Introduction of asset management<br>Zero emission construction work |   |
|   | Environmental impact assessments   | Strategic environmental impact assessments and project environmental impact assessments<br>Increase of people's awareness, promotion of understanding of environmental considerations       |   |
|   | Environmental strategies through institutional and policy measures   | Subsidies systems for environmental improvement work<br>Implementation of traffic regulations and controls  |   |
|   | Vehicle related regulations  | Introduction of vehicle inspection systems  | Introduction of vehicle inspection systems  |
|   |  | Setting of fuel standards   | Setting of fuel standards   |
|   |  | Development of new fuels  | Development of new fuels  |
|   |  | Introduction of equipment for reclaiming fluorocarbons when inspecting or disposing of vehicles   | Introduction of equipment for reclaiming fluorocarbons when inspecting or disposing of vehicles               |
|   |  | Equipment that uses alternative cooling gases   | Equipment that uses alternative cooling gases   |
|   |  | Emission control  | Emission control  |
|   | 2. Toward Internationalization and Regionalization   | Efforts to preserve the ozone layer   | Establishment of systems prohibiting the use of fluorocarbons<br>Development of alternatives to fluorocarbons |
| Efforts to prevent global warming                                     |  | Examination and promotion of CDM (Clean Development Mechanism)<br>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<br>Development of vehicles that run on new fuels   |   |
| Efforts to prevent marine pollution                                   |  | Ratification of environmental preservation conventions adopted by the IMO<br>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  | Setting up and ratification of international environmental standards  |
|   |  | Measures to conserve energy   | Measures to conserve energy   |
|   |  | Efforts to develop new and renewable energy   | Efforts to develop new and renewable energy   |
|   | Technology development and transfer compatible with actual conditions in developing countries                            | 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   |   |
|   | Efforts in relation to ports   | Decommissioning/disposal of dilapidated ships/vessels   |   |
|   |  | 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  |   |
| Efforts in relation to airports and air transportation                | Prevention of marine pollution caused by maritime accidents  |   |   |
|   | Preservation of submarine resources (breakwaters that coexist with nature, etc.)   |   |   |
|   | Measures for areas surrounding airports  |   |   |
|   | Modernization of air traffic control and landing device (ATM, RANV, etc.)  |   |   |
|   | Measures for radio disturbance   |   |   |
| Efforts in relation to railways                                       | Measures for noise and vibrations  |   |   |
|   | Measures for falling objects   |   |   |
|   | Measures for environmental and water quality preservation in conjunction with airport construction                       |   |   |
|   | Measures for railway noise   |   |   |
|   | Improvement of trains/rolling stock that are more environmentally friendly (electrification, increased efficiency, etc.) |   |   |
| Efforts in relation to road structure                                 | Higher operation efficiency through the improvement of maintenance technology  |   |   |
|   | Policies for promoting railway use   |   |   |
|   | Promotion of a modal shift   |   |   |
|   | Construction of embankments (environmentally friendly roads)   |   |   |
|   | Sound insulation walls, steep inclined walls   |   |   |
|   | Low noise pavement   |   |   |
| 4. Toward Sustainable Urban Development and Improvement of Urban Life | Improvement of logistics systems   | Modal shift towards maritime and railway transportation<br>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.)   |   |
|   | Improvement of urban environments  | Introduction of TDM<br>Development of bicycle friendly road facilities (overpasses, ring roads, etc.)   |   |
| Development of transit malls  | Development of transit malls<br>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<br>Measures to prevent adverse environmental effects in relation to quarries                                   |   |