

**APPROPRIATE LEVELS
OF ROAD AND ROAD TRANSPORT
DEVELOPMENT
ACCESS TO MOBILITY: A BASIC SOCIAL SERVICE**

Thursday 23 October 2003 (1.30 - 5.00 p.m.)

**SESSION AGENDA &
INTRODUCTORY REPORT**

Session Agenda

1. Opening Remarks and Introduction

Ir. ZAINI bin Omar (PIARC ST5 Coordinator/MALAYSIA)

2. Presentation: Can Roads Assist Development?

Prof. Martin S. SNAITH (The University of Birmingham/UK)

3. Presentations

a) Analysis of Relations Between Road Accessibility and Social and Economic Development in the Territorial Context Served

Prof. G. GATTI and Prof. E. CAVUOTI (Polytechnic University of Bari/ITALY)

b) An Accessibility – Activity Based Approach to Model Rural Travel Demand in Developing Countries

Dr. S. ALI (NED University of Engineering and Technology/PAKISTAN)

Dr. J. B. ODOKI and Dr. H. KERALI (University of Birmingham/ROYAUME-UNI)

c) Rural Road Networks and Rural Access Infrastructure Services in Developing Countries

Ms. Camilla I. LEMA (ILO/ASIST-Africa)

4. Panel Discussion: Political and Expert Views

Moderator: Prof. Martin S. SNAITH (The University of Birmingham/UK)

Panel members:

PIARC ST5 Coordinator

3 Invited Ministers from Malaysia, Uruguay and Tanzania

4 Chairpersons of Technical Committees under the ST5

5. Panel Discussion: Direction of the new Commission

Chairperson: Ir. ZAINI bin Omar (PIARC ST5 Coordinator/MALAYSIA)

Panel members:

Prof. Martin S. SNAITH (The University of Birmingham/UK)

4 Chairpersons of Technical Committees under the ST5

6. Conclusion and Closure

Ir. ZAINI bin Omar (PIARC ST5 Coordinator/MALAYSIA)

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EXECUTIVE SUMMARY

Roads contribute to local and regional economic development opportunities and provide an appropriate level of access to goods and services, employment opportunities and leisure activities.

The development of transport infrastructures is necessary to provide accessibility and mobility of the population. In the context of accessibility it is seen as that which encompasses economic, social and environmental dimensions including the physical aspect. This includes access by people to communities, services, employment and recreation as well as access by business operators to points of production and distribution. Mobility on the other hand relates to the efficiency and reliability of travel and the ease at which people can move and goods can be delivered via the transport system.

There are key challenges to be addressed within the urban and metropolitan area and those of remote and rural areas, which relate to people with limited access to transport choices and the need to provide equity of access. Programmes are to cover all forms of transport facilities to include a range of innovative technologies to the handicapped and vulnerable road users.

Towards an organised road management, an integrated system for optimised management of road network is to take account of public participation. Road management experience should focus on performance indices to ensure transparencies and customer satisfaction as well as the various media mechanisms.

Communications of technology and technology transfer should tailor toward training needs in terms of social and economic development. Methodologies used throughout the world to identify and measure non-economic benefits of road infrastructure in developing countries will help to determine the countries best practice in transport investment evaluation. Hence reviewing of successful practices for providing basic access against the many limitations in implementing projects is necessary. They are aimed at assessing methods for the economic evaluation of projects.

Providing access within resource constraints entails reviewing of successful practices. In this respect, the methodological approach to establish appropriate standards that take account of the local resources, socio-economic factors, technological options, resource costs, financial and social economic delivery options, traffic characteristics, adaptability and evolution of needs over time.

MEMBERS WHO CONTRIBUTED TO THE REPORT

Dato' Ir. Zaini bin Omar	PIARC ST5 Coordinator Director - General Public Works Department Malaysia
Ir. Mohamad Razali Othman	Director Roads Branch Public Works Department Malaysia
Mr. Oscar de Buen Richkardy	Chairman PIARC TC C3 Committee
Mr. Keso Msita	Chairman PIARC TC C20 Committee
Mr. Willy Burgunder	Chairman PIARC TC C2 Committee
Mr. Patrice Retour	Chairman PIARC TC Terminology
Mrs. Jamilah Mohd Marjan	Senior Assistant Director Roads Branch Public Works Department Malaysia
Ir. Dr. Safry Kamal Ahmad	Senior Assistant Director Roads Branch Public Works Department Malaysia

APPROPRIATE LEVELS OF ROAD AND ROAD TRANSPORT DEVELOPMENT

Road development levels

The appropriate acceptable levels of road development in meeting the basic access and needs to social services need to be defined. There are differences in the levels of road development between developed countries, developing countries as well as countries in transition. The treatment to each country to meet these levels varies in the context of social and technological development. Moreover, the different levels of travel demand indicate the types of road and transport that will be required. The question thus is to identify at what level or the minimum level of road development that needs to be provided. An understanding between the different levels would lead to provision of the required basic infrastructure.

Road transport development levels

Road transport development, on the other hand, is the provision of the required transport modes and the changes to mobility, which varies between urban, rural and remote areas. Factors such as socio-economic background influence the basic transportation development needs. In urban areas, due to scarcity of space the focus would be on road transportation instead of road development. Whereas in the rural and remote areas, the basic transportation needs may not be road transport only but a combination of water, land and air transport.

Analysis of needs

The analysis of needs differs between countries and between regions. In developed countries urban accessibility requires the proper modes of transportation as compared to that of remote and rural areas. There is a need for transition in the changes to the modes of transport. In rural areas the needs are greater towards having access for social services.

Definition of priorities

The priorities given to each development plan should cater the socio-economic demands based on economic justification for developed countries and non-economic benefits in cases of the developing countries, where social benefits are important to provide more job opportunities. In this respect, improvements of infrastructure development should not be economically driven but more so towards social obligation.

Appropriate development threshold

What is the minimum level that obliges the authority to provide the basic access or mobility? This can be rated by the efficiency and reliability of travel and the ease with which people can move and goods can be delivered using the appropriate transport means.

Meeting the needs

In meeting the needs for the appropriate levels of road development and road transport development, focus shall be on mobility, the transfer of technology and the process involved during implementation via public consultation. Evaluation of the effectiveness of the technology transfer will require identification and selection of methods of successful technology. Improving the understanding of the needs of developing countries requires quantification of the social impact of roads so that issues can be integrated into economic tools. Transportation policy to users' expectation needs to be adapted, which requires the updating of procedures to allow for greater public outreach.

ORGANISATION OF STRATEGIC THEME 5 DIRECTION SESSION

Part A- General overview

The presentation of the guest speaker shall remain the focus of the session. This session aims at discussing issues in discussing the most relevant means, which enables analysis of population movements in a given country. In the absence of appropriate road network, which can hardly be connected to the social services available, and to the rest of the country's economy, there is much to be gained from such discussion. This session will aim at raising the awareness of politicians and decision makers, the protagonists, about the fact that access to mobility is a right that governments should guarantee to their population. Some time within the strategic theme session is dedicated where the political and expert views are sought and deliberated.

The session will address training actions and research and development programmes to facilitate the definition and implementation of a strong policy based on the mobility concept.

Part B- Paper presentation

Paper 1. An accessibility – activity based approach to model rural travel demand in developing countries.

The paper describes the development of a method for quantifying rural travel demand suitable for developing countries. The suggested methodology provides an approach to analysing household accessibility needs within a framework of a range of activities pursued by people in rural communities to support their livelihood. The accessibility-activity-based model developed recognises the derived nature of travel and considers the spatial, temporal, economic, cultural and social constraints faced by individuals.

Paper 2: Analysis of the relationship between road accessibility and social economic development of the territorial area served.

It is widely known that socio-economic development of a region is directly correlated to the presence of appropriate infrastructural support, roads in particular. Measurements of variations in accessibility allow the effect of interventions on the road system to be evaluated in terms of efficiency/costs and that which contribute to improving the profitability of resources used. The aim of the study is to contribute to better knowledge of the relationship between socio-economic development and the development level of road infrastructure of a territorial area.

Part C- Panel Discussion

Panel discussion focuses on identifying strategies for establishment of secondary infrastructure to remote areas in developing countries and countries in transition. Issues such as planning of the road network infrastructure, project funding, and training is to be emphasized in the next cycle. Top priority projects would include:

1. education;
2. institutional capacity building;
3. sustainable road infrastructure financing capacity;
4. governance and corruption issues;
5. non-motorized road transport;
6. basic access needs;
7. appropriate technical standards;
8. improving links with international development and funding agencies;
9. public and private sector partnership.

Organizations such as academic and research institutions, industry, public–private enterprise, and non-governmental organizations can be involved as partners and collaborators to accelerate these priorities.

In order to address issues in particular to developing countries and countries in transition, organizations such as The World Bank, Asian Development Bank can be involved regarding project funding. Among efforts to be undertaken are the training of personnel from these countries in the developed countries so as to gain knowledge from technology transfer.

ASSESSMENT OF NATIONAL REPORTS

In the preparation of this session, National reports were called, evaluated and assessed based on the following points:

- new methodologies for public consultation for sustainable road transport development;
- innovations in technological transfers;
- economic appraisals in project evaluation, the benefits and dis-benefits;
- human and social psychology approach to road engineering concept;
- evaluation method for prioritisation of road investment.

Ten National Reports received were analysed and summarised along these five points. They are addressed in one or more of these points either specifically or in the context of a more general description of the management and characteristics of the national road system concerned.

The evaluation and assessment on the following points between the National Reports that were carried out can be summarised as follows:

New methodologies for public consultation for sustainable road transport development

Hungary

The **Hungarian National Report** explains that it is usual that representatives of the National Motorway Company hold personal consultation with mayors of settlements affected by the newly designed alignments. Regional municipal co-operatives, opened public information bureaus are established at high level, including expert type relationships with all non-governmental organisations interested in or criticise developments.

The public information bureaus set up by the National Motorway Company can provide regular information about the development in the preparation of a particular project involving environmental and land acquisition issues. Based on an evaluation of the initial period of operation of public information bureau, it was concluded that the new institutions have helped in efficiently supplying information to those living in the affected region and to resolve any misunderstandings.

Romania

The **Romanian National Report** describes that Community Consultation has become a mandatory procedure in the promotion of road infrastructure projects in Romania. The legislative background of the community consultation is based firstly on the Law of Environment Protection. It defines three main phases in identifying public options, namely:

- identifying development requirements of the road network, aiming at establishing priority projects.
- identifying population options at macro-level, aiming at establishing the dimension of road network development programmes.
- identifying detail options to acquire certain information required for assessing the impact upon natural and human environment.

Public consultation is organized in four step procedures. Step 1 is to advertise the respective project, and to realize a first contact with persons affected by the project. Step II is to establish the route bringing the minimum negative impact to the physical, natural and human environment. Step II also includes consultation of governmental organizations and of specialized institutions with the view to gather data concerning present condition of the environmental factors in the corridor of the highway and the existence of protected areas. Step III is consultation before closing of the project and the impact study. Final consultation is covered in Step IV and is organized by the authority for environmental protection. It is in accordance with the Romanian Legislation in force namely the Order of the Ministry for Waters, Forests and Environmental Protection No. 125/1996.

Switzerland

As described in the **Swiss National Report**, a departure from the conventional notion of providing infrastructure based on basic social services, Switzerland's approach is to incorporate public consultation in the planning of road infrastructure. In the decision making process the social aspect in the acceptance of, and participation, is made important in transportation infrastructure development programme.

It is also known that Switzerland is slowly beginning to resolve its environmental conflicts, which is costly in energy and financial resources and is starting to accept healthy reflections of the concept of sustainable development. The notion of basic social services is not unanimously accepted but it is totally integrated in a project when a methodological process is used, and if key proponents participate in the decision-making process. They include decision-makers, administrative protagonists, non-governmental organisations, the public, infrastructure users, and political officials.

A direct process is practised in Switzerland with the right to initiative and referendum at both local and national levels. In addition, property laws guarantee strong protection of the individual and with respect to public interest.

Cuba

The **Cuban National Report** explains that there is no public consultation plan in Cuba. However, road infrastructure projects are backed by economic development plans, which focus on tourism, agriculture and industry. For each Road Infrastructure Project, consultation with state-owned entities and organisation is made in order to know the requirements that should be complied in the project, according to their interests and needs. The whole of this information is analysed, made compatible and conciliated with the objective of the project.

Subsequently, permission and licences are requested during the stage prior to construction (during the design stage) with the execution of the project being either approved or rejected.

Czech Republic

According to the **Czech National Report** public consultation process in the Czech Republic has been initiated as early as in the 60's. The Public took part in the process of development programme preparation of new roads, sites, and reconstruction. The tools used in public consultation make use of an urban design alliance, which is an association of the citizens who are interested in a solution of a certain part of their urban environment, and the collaborative ventures, a group consisting of citizens, local politicians, business persons, and experts such as developers, architects, and town planners. Open and democratic procedures involve important parts of the urban community in the decision making process.

Sweden

As indicated by the **Swedish National Report**, the public consultation process was initiated in 1999 by the Swedish National Road Administration on the Sikea-Robertfors-Bygdsiljum stretch of road in order to determine views and needs of road users and different stakeholders in terms of winter road maintenance by conducting an open dialogue. Ascertaining the different groups of road users and their representatives to become part of the target group, dialogues were then carried out. In addition, market survey through questionnaire forms were distributed to drivers of both private and commercial vehicles. The aim was to show how drivers experience the winter road maintenance along this stretch of road. Examples of questions asked are as follows:

- how fast do you expect skid control and snow removal measures to be undertaken after a normal snowfall?
- what is your opinion on how winter maintenance is carried out with respect to snow ploughing, sanding, surface planing and skid control?
- has winter maintenance become better or worse than last year?
- assessment in the change of attitude to winter road maintenance during the year.

From the conclusion it was felt that winter road maintenance on this particular stretch of road had on the whole improved after implementing the appropriate measures. What was thought to be particularly better was snow ploughing and surface planing. However, views showed that they were very much in favour of less salt in the sand mixture. Road signing initiatives have been met with high approval.

In addition, many felt that removal of the smaller particle sizes not only resulted in stone chips but also in worse skid control protection since the particles had blown off the roadway faster. The vulnerable road users which were found to be equally important were however, not included in the survey.

Innovations in technology transfers

Romania

The Romanian National Report describes that Romania is part of the World Interchange Network (WIN) for Exchanging Technology and Information in the road sector, which operates under the auspices of PIARC. The technology transfer promotion includes professional training of staff locally and abroad, through acquiring of highly technical tools and equipment, and the participation of Romanian specialists in international workshops, especially those having working contracts with experienced companies from developed countries.

Cuba

The **Cuban National Report** describes that in Cuba, technology transfer is at the government, organisation, user groups and the individual level. Consideration is given to utility, transfer policy, the needs, success possibility, the subject to transfer and adaptability to conditions of the country.

Technology Transfer Centre has been established in Cuba collaborating with PIARC, WIN, and ITRD within and outside the countries. Cuba is currently developing and in the midst of setting up the National Road Information Network (RNIC). Presently it embraces the 14 provinces of the country, each having an appointed representative.

A Digital Information Centre is another project, which is currently being developed in Cuba. Currently it has a database with 8000 full-text documents in electronic format and request, search, retrieval and answer services that are being supplied in electronic format through e-mail, its geographical coverage being world wide.

Mexico

The **Mexican National Report** describes that the Mexican Government, through the Communications and Transportation Secretariat, has implemented a program for Technology Transfer Centres for the modernization of scientific research that are specifically focused on transportation in each state. The goals are:

- to encourage activities involving scientific research and technological modernization;
- to promote excellence, academic quality and formation of high-level human resources in scientific and technological research;
- to provide incentives for the participation of the productive sector as a main participant in the process of the country's technological modernization;
- to promote allocation of resources to programmes, projects and human resource development in scientific and technological research;
- to disseminate scientific and technological research in order to contribute to knowledge and to increase social awareness about its importance for the country's social and economic development.

Czech Republic

The **Czech National Report** explains that Transfer Technology Centre in the Czech Republic was established in 1998 with the aim of exchanging knowledge and experience concerning effective procedures and methods, including sharing results of research and development projects. Users of Technology Transfer Centre use the information of technologies for fair, exact and effective decision-making, or prepares documents to use in the decision making process. This involves ministries' officials, road network construction and maintenance workers, researchers and consultants participating in the technology development.

The Government and transport decision makers are aware of their basic duty to guarantee the citizens fair access to mobility and that they do create, both on the expert and decision making levels, systematic prerequisites for technology transfer in supporting this sphere. The internet facility is used to create conditions for public access to information, in particular in schools, libraries and public [www](#) terminals.

Economic appraisals in project evaluation, the benefits and disbenefits

France

According to the **French National Report**, France has developed a project assessment system based on Cost-Benefit Analysis CBA using monetized effects. The choice of a road project using cost/efficient approach is based on accessibility, employment, economic induction, consistency between project and local decision strategies. It is a mixed assessment process between pure CBA and multi-criteria analysis that is dependent upon the studies and characteristics of the project. It is the comparison between do-something and do-nothing scenarios to review costs in relation to benefits (advantages), and discounted throughout a project life.

The parameters used in project assessment methodologies are in terms of the benefit and costs. The benefits considered are in terms of travel-time savings, vehicle operating costs and fuel consumption, accident costs, driving comfort including trip reliability, noise in built-up areas, pollution, tolls and variations. Whilst capital costs are in terms of investigation and design costs, land cost, construction cost, yearly maintenance, yearly operational costs, and residual value of the infrastructure. The non-monetized effects in the CBA are perceived in terms of congestion, access to community services and to employment, impact on employment in the road industry and other sectors, induced economic effects on companies outside the transport sector, and consistency with local decision makers' investment and equipment strategies.

In the treatment of uncertainties and risks, this comes from assumptions in terms of traffic growth, which result from the combination of transport policy scenarios and economic growth scenarios. Sensitivity tests are performed based on a + 10% construction cost, and - 10% traffic level. Changes were introduced to the socio-economic assessment methods in the use of shipper's cargo value, value of time, hedonic pricing (depreciation of real estate) plus damage to human health for noise valuation and accounting at a much higher accident costs.

Mexico

The **Mexican National Report** mentions that Mexico currently adopts HDM-4 to carry out economic evaluation for investing and prioritising of project. It is still in the first phase of implementation which comprises gathering of information of the quantitative and physical road characteristics, such as the International Road Index (IRI), deflection, cracks, road geometry, surface type, etc.

The aim of HDM-4 program software is to carry out investigation on the choices of investing road transportation infrastructure. These choices include:

- developing new roads;
- improving existing roads;
- maintaining existing roads;
- introducing new vehicle technology;
- introducing new ways for funding and managing road assets.

This system enables Mexican managers of road networks to investigate the possibilities for providing cost-effective development and upkeep of their road system which will bring benefits to the communities they serve. It is a decision support tool to systematically process information in supporting resource allocation based on a clear and proven technical and economic justification.

Czech Republic

According to the **Czech National Report** the economic assessment of road sector programmes funded using the EU financial means or foreign banks loans, the HDM-4 software program is the instrument used in road economic management and evaluation. This activity resulted in the proposed Czech Road Evaluation System (CRES) laying down conditions for CRES usage, defining the scope of input data and prescribing output forms that the evaluation processor produced. CRES uses the modulus Construction and enables to trigger the following works:

- maintenance;
- repair;
- widening, and;
- new road construction.

Economic assessments are carried out based on a 20-year analysis period with 8% discount rate. The Road and Highway Management uses the CRES system as an efficient instrument of economic assessment of proposed construction and adjustments which enable considerable improvement to the effectiveness of using financial means available and which result in better road network conditions.

Morocco

The **Moroccan National Report** indicates that a study of the rural road socioeconomic impact in the northern area of Morocco was launched in 2002. It aimed at evaluating the socioeconomic impact of ten rural roads projects in the provinces of Taza and Taounate. The methodology used is based on two kinds of complementary analyses:

- before and after project analyses to compare the current state (state of reference or zero state) and the state after the project is carried out (five years later),
- with and without the project analysis with the final aim of comparing the project area's economic data with those of a test area that had the same characteristics as those of the project area before it is carried out; and that shall not undergo any change (no road construction) during the next five years.

Several studies on rural road socioeconomic impact carried in Morocco were prominent in terms of the road infrastructure's contribution to improve the living standards of population in the country. Direct impacts are quantified in the following manner:

- periodically, every two years, the impact on the transport infrastructure needs and services;
- impact on the agricultural economy;
- impact on social services such as health and education;
- economic impact, and,
- impact on the environment.

Studies on the impact of infrastructure investments on development carried out by the Ministry of Equipment and Transport in 1998 had focused on the socioeconomic impact of two constructed rural roads. The main conclusions drawn are as shown in the following table:

Impacts	Extent
Infrastructure and transportation service	
Cut in the duration of journeys to the main social services	Up to 7 %
Cut in the cost of transportation to the main social services	At least 33%
Increase in the number of urban contacts of hemmed in households.	+2/3
Increase in traffic	From 10 to 200 veh/day in Tiznit From 10 to 70 veh/day in Beni Mellal
Increase in public transport's shuttle services.	Doubling
Cut in commodity transportation	Divided by 2 in Tiznit (by 3 in winter) - 25% in Beni Mellal during winter.

An assessment of the socioeconomic impact of rural roads in Morocco has also resulted in the following:

- at the transport infrastructures and services level, vehicles user costs decreased tremendously. Commodity transportation cost has fallen from 30 USD to 15 USD per ton over a 10 km distance and passengers transport services increased sharply.
- the agricultural level, on the one hand, that is, the fruit production, increased up to 31% between 1985 and 1995. Farmers raised by 150% their investment in the thoroughbred livestock. On the other hand, the use of fertilizers increased by 60% and the number of non-agricultural jobs increased by six-fold.
- at the social level and in particular, the standards of living of girls and women, attendance at medical centres doubled with the road infrastructure facilitating the provision for health care and which afforded better service quality.

The road network service condition is also ensured by regular maintenance according to the standards, aimed at keeping the level of service offered to the user. The Department of Road Construction, DRCC, has developed and implemented, since 1990, a road maintenance management aid system. This system is based on three main modules:

- the first module allows better knowledge of the road network. It uses a road data bank (BDR) and a SIG system that covers the cartography of the entire road network. The BDR is regularly supplied by data from visual inspections and data from UNI, the high-yield auscultation and deflection devices. This enables elaboration of indicators that help the network administrators identify programmes of resurfacing reinforcement or shoulders works;
- the second module concerns the evaluation of road maintenance strategies based on the use of HDM pattern that has been adapted to the Moroccan conditions. Strategy studies under budgetary constraints allowed better planning of road maintenance operations, taking into account two goals, that is, preserving assets and improving services to road user;
- the third module enables improving the road network service level periodically, every two years, and to evaluate the effectiveness of the strategy used in maintaining this network.

Human and social psychology approach to road engineering concept

Czech Republic

The **Czech National Report** mentions that in the Czech Republic, the key is to address issues with a system that comprises the individual, means of transportation, and transport environment, i.e. the road. The system mutually interacts with individuals that control these functions. The activity of system function is realised in the following stages:

- reception;
- processing of information and realisation of decision, and;
- control and checks.

The aim of psychological approach dealing with transportation sector is to determine regularities of human mental activity in relation to transport and the use of such knowledge for purposes of increasing traffic safety and to ensure free flowing traffic.

In this respect, roads are designed, built and used with respect to humans, their sensors and psychic capacity. Psychology helps road engineering by providing information on road perception errors that may result in traffic accidents. Knowledge gained is used both in the process of improvements to existing roads and in the building of new roads. Besides incorporating technical parameters the perception parameters as perceived by drivers is equally vital.

Switzerland

The **Swiss National Report** explains that Switzerland has stressed the social needs in project evaluation. Based on the principle of sustainability, which includes solidarity and social development the approach to social needs in project evaluation is made with the following objectives:

- to guarantee basic provisions over the entire territory;
- to take into consideration persons who do not have easy access to transportation infrastructures;
- to ensure the well being of persons and to reduce health risks and accidents to a minimum.

The general process includes the social part of sustainable development with the principal aims to guarantee basic transportation services, encourage social solidarity, and to guarantee acceptance, participation and co-ordination. Aspects considered are in terms of:

- basic transportation over the entire territory;
- accessibility to transportation;
- distribution of costs/advantages;
- possibility of participation;
- health and well-being of the individuals;
- independence/individuality;
- social compatibility;
- comfortable zones for rehabilitation.

Methods for prioritisation of road investments

Cuba

The **Cuban National Report** mentions that from the mid 90's, the Ministry of Economy and Planning (MEP), the organisation in charge of the country's investment control and planning, requires presentation of economic studies (cost benefit) between reconstruction of existing roads and the construction of new roads. A procedure or methods guide for realizing economic studies were formulated. The procedure, after being submitted to a test evaluation and analysis process, presently is used at national level by the National Road Centre.

The demand for economic studies by the Ministry of Economy in the planning and setting up of the above mentioned procedures have allowed using the most updated economic indexes in terms of the net updated value, cost-benefit relation, internal rate of return, capital reimbursement period, etc. Three benefits are examined in project appraisals from the points of vehicle operations, travel, and traffic accidents. In Cuba the execution of new road construction and reconstruction of existing road priorities can be given in a more rational and efficient manner.

Mexico

The Mexican National Report describes that with a highway network of over 333,000 km in length, of which 106,571 km comprise roads controlled by either the Federal or State Mexican Government, another 5,798 km are toll roads and the remainder are country roads and cart tracks. In the transport sector, investment priorities have included:

- maintenance of the federal highway network with resources directed at providing an economic, efficient and safe vehicle operations,
- construction, widening and modernization of the highway network with resources aimed at modernization of 14 routes. This is to ensure the efficient communication between main cities, seaports, border towns and production and distribution centres throughout the country,
- toll roads, where resources are aimed at consolidating functions, homogenizing service conditions as well as an expansion and extension of both coverage and service quality,
- country feeder roads, where the focus is on decentralization of resources and responsibilities in addition to providing states and municipalities with the assistance needed for maintaining their networks in good condition and to provide ongoing efficient service.

Additionally, in 1995 Mexico introduced the Temporary Employment Program during the economic crisis in order to alleviate poverty in country areas with a low level of productivity. The Communications and Transportation Secretariat has set up a labour-intensive program for maintenance and reconstruction of country roads.

Financing

Hungary

The **Hungarian National Report** explains that until late 1998, the national road network was financed through the Road Fund formed from earmarked tax revenues and managed by the Ministry of Transport. Since the Road Fund has ceased to exist, the planning of road expenditure, in particular network development costs has become less reliable than previously due to uncertainties in the budgetary allocation of funds.

In the early 90s, efforts were made to remove the discrepancy between budgetary constraints and road network development needs, in parallel to the privatisation of road construction companies. Contracts were awarded through successful international tender procedures for the construction, mostly with the participation of foreign private capital for their financing. Progressively, projects were implemented in a concession system, followed by financing by state-owned enterprise that was formed, mostly using loans raised with Government guarantee. Toll revenues collected on toll highways built by concession companies cannot meet repayment of loans. In such circumstances, the parties agreed on the restructuring of the project where concession right is transferred to a substitute company owned by the state. Loans are then rescheduled with Government.

Romania

The **Romanian National Report** explains that financing of road projects is supported through budget grant, in aid and external credits, as well as through their integration with non-reimbursable financing programmes. Amounts that are collected at national level in the special funds for public roads are partially turned to local administrations for financing of road projects.

Mexico

The **Mexican National Report** indicates that in Mexico some 43,400 million pesos are required. In the financing of road works participation of private and public sector as well as local government is allowed to permit amounts to be optimised. Private investment is sought for the development of new highway infrastructure using program for the construction of new toll roads with concession financial schemes. Financing takes account the feasibility of project, investment returns, and fixed rates. Concession term of 30 years is fixed, which is the maximum established by the relevant law.

Czech Republic

The **Czech National Report** states that in the Czech Republic, a State Transport Infrastructure Fund (STIF) was set up and effective on 1 July 2000. The purpose of the fund is for the development, construction, maintenance, and improvement of roads, highways, railways, and domestic waterways. The funds provide the means to fund research and project activities, study and expert activities focussing on transport infrastructure. The sources for this fund are gained from road tax, tax on carbohydrate fuels and lubricants, and highway tolls.

Morocco

The **Moroccan National Report** states that road financing in the countryside, borne solely by the public departments, based on the state budget, did not allow (before 1995) to construct more than 250 km of new roads each year, while the needs according to inventoried list by the DRCCR in 1992, exceed 38,000 km.

To absorb this deficit, the Ministry of Equipment and Transport launched in 1995 the Rural Roads National Program (PNRR) that concerns 11,236 km to service a population of about 6 million inhabitants. The implementation of this program is beginning to take shape by raising new financial means, developing partnership and improving design studies and paving ways for new roads construction techniques.

A Road Special Fund (FSR) was set up in 1989, which contributed to expenses that are related to road maintenance. These resources which were levelled off up at 53 million USD in 1995, has been reinforced by about 46 million USD which were assigned to construct rural roads. The main taxes that are channelled to the FSR are:

- fuel tax (TIC);
- vehicle registration additional tax;
- axle tax.

Technologies of Accessibility

Australia

The **Australian National Report** states that in Australia, facilities to provide accessibility take account of accommodating the whole of the population spectrum. Australia's vast area with a population of 20 million has a large road network length of around 900,000 km. The population settlement pattern includes large urban cities as well as regional and remote communities similarly to that of developed and developing countries. Challenges are faced in providing communities with accessibility and mobility options. Accessibility is seen as a broad concept that includes economic, social and environmental dimensions as well as physical aspects. It encompasses access by people to communities, services, employment and recreation as well as access by business operators to points of production and distribution. The provision of equitable and accessible transport, participation in the planning and implementation phases of transport plans, level of service offered and cost of travel play an important role in Australia's transport policies. Key elements in the plan include non-motorised accessibility, public transport accessibility and equity for disabled transport users.

In the context of accessibility, the State of Victoria has commenced a twenty-year programme of transport infrastructure upgrading. The programme covers all forms of transport facilities that include a range of innovative technologies especially in the mobility of handicaps under the Disability Discrimination Act 1992 (DDA) that came into effect in March 1993. Examples are the wheel detection devices linked to traffic signals. Another form of accessibility technology is where pedestrian crossings are equipped with infrared sensors to automatically extend walking times, and the use of audio tactile devices and tactile ground surface indicators at pedestrian crossings. Other innovations include the provision of low floor buses and trams, and ramped tram stops.

To improve accessibility to and within remote communities, telecommunications infrastructure and the use of higher productivity freight vehicle such as B-doubles, B-triples and Road Trains are provided. In this respect, roads play a vital contribution to accessibility between sparsely populated areas.

Enhanced access through modal integration has been considered within the Lockhart River Aboriginal Community situated north of Cairns where community mobility relies on barge and air services to move freight, people and services into and out of the community.

Mexico

The **Mexican National Report** reports that Mexico with a density of 0.14 is considered low when compared to other countries in the region. Ongoing efforts toward modernization of highways include building of new roads for communication to region and population centres as well as modernising and increasing the capacity of existing roads to solve safety and congestion problems. The need for access to transportation by handicapped persons has included programmes to eliminate physical barriers and to facilitate access by handicapped persons to different types of transportation modes.

An integrated approach is undertaken in the investment of transportation development. In the road expansion programme special attention is given to smaller roads, pathways and tracks and use of private and commercial means because this gives better mobility to rural population. Contribution is made towards promoting regional development and to combat lack of infrastructure. Considerations are given to conserve optimum condition, and the viability of rural network to guarantee permanent access from the communities they serve. The modernization of country and feeder roads requires improvement to better support economic and productive activities.

Proposals are made to promote, improve and enhance accessibility to land, sea and air transport sector. Among the tasks required is the setting up of a new official Mexican standard, and the promotion and acquisition of vehicles, as well as personnel training. The Mexican Government will develop an unprecedented effort to guarantee accessibility for the handicapped to different forms of transport.

Czech Republic

The **Czech National Report** describes the ongoing effort in the improvement of the quality of public passenger transport services to complement the Individual Car Transport (ICT) approach. This involves citizen network by means of park and ride systems. The Government supports automatic integration by means of financial support in the process of awarding studies concerning transport service accessibility. To justify the need for high quality public passenger transport, issues in terms of social aspect and capacity including ecological aspects are further addressed.

Public service obligation requires not only one particular transport type. All transport types should work as a system through the concept of 'inter-modality'. Attempts have been made to optimise the transport system function and yet reducing the ecological loading of an area.

In terms of mobility the following are the Czech objectives:

- harmonisation of conditions for transportation service providers entering the transport market;
- a step – by – step implementation of the EU's passenger transport related political measures;
- maintaining the state's influence on the transport infrastructure development and continuing efficient programmes of transport infrastructure development;
- amending the set of laws related to taxes and field of transportation;
- harmonising the offer of capacities with the demand, while respecting the changes in division of transportation labour;
- creating equal access to rules for transport infrastructure and transport facilities;
- active co-operation on creating regional development programmes;
- preferring public passenger transport to individual transport and improving the quality of public passenger transport;
- reducing and eliminating negative impacts of transport upon the environment;
- a step-by-step improvement to mobility of the disabled/handicapped.

In terms of accessibility the Czech government addresses strategies in providing infrastructure as the basic condition for mobility, and providing transport infrastructure in agglomerations (areas with the most loaded network). The modernisation of long-distance networks representing both highways and expressways requires establishing the Transport Network Development in the Czech Republic till 2010 comprising both medium and long term strategy in the transport, telecommunications and post sectors in order to enhance the country's economy.

Morocco

The **Moroccan National Report** describes accessibility in terms of determining to what extent a person is given access to a place. Accessibility to a place is determined easily in the expenditure of effort and time, and risks, which are greatly compensated by the advantages obtained by travelling.

Mobility, on the other hand, allows determining to what extent the ease for a person to travel. Rural population's mobility need is approached through examining the following points:

- reasons for travelling,
- public transports services availability,
- state of existing roads,
- used mode of commodity displacement and transportation;
- economic and socio-administrative services availability in relation to population density.

In terms of costing, the accessibility cost is directly linked to the road network performance which is the investments made in road infrastructures. Mobility, on the other hand, is a complex function that is relevant to many socioeconomic factors, including the population's standard of living, spatial redistribution of socio-administrative services generating displacement and the availability of means of transport.

DRAFT CONCLUSIONS

Ten National Reports received were analysed and summarised along five points that are relevant to this Strategic Theme Direction session. Overall the ten National Reports have addressed one or more of these points either specifically or in the context of a more general description of the management and characteristics of the national road system concerned, based on economic and social considerations.