**XXIInd WORLD ROAD CONGRESS**
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# MEXICO - NATIONAL REPORT

## STRATEGIC DIRECTION SESSION ST5
## *Access to mobility: a basic social service*

## Summary

In this document, the actions taken by the Mexican Government through its Communications and Transportation Secretariat, to guarantee access by the most needy population sectors to basic services through an efficient, safe and sustainable transportation infrastructure are explained.

Among the main objectives of the Mexican Government is that of increasing equal opportunities between regions, companies, homes and individuals, This can be achieved if rural communities are granted access to basic services which will enhance their living standards.

To this end, different programs, strategies, financial schemes and investment evaluation methods have been set up in order to guarantee highway construction, conservation and modernization.

The Mexican Government has not neglected the need for access to transportation by handicapped persons and for this reason, within the area of different actions to be taken, has included the elimination of physical barriers and the importance of facilitating access by handicapped persons to different types of transportation.

In order to achieve the objectives mentioned above, it will be necessary to increase technology transfer and raise the levels of training for highway professionals, To this end, a program has been set up in each state of the country for Technology Transfer Centers.

# ACCESS TO MOBILITY: A BASIC SOCIAL SERVICE

## PAST RECORD

## MOBILITY

Mexico is a land of contrast, not only in its natural environment, but also from the point of view of development.

On the one hand, there are highly developed regions, with excellent economy and infrastructure, comparable to any other developed country, while on the other hand, there are undeveloped sub-regions, where access to services and mobility are severely restricted, due to an inadequate transportation network.

Inhabitants of these regions suffer from inadequate and expensive transportation infrastructure and services. Poor access to transportation constrains economic and social development and contributes to poverty.

The Mexican Ministry of Communications and Transportation believes that better transportation services can stimulate economic activity and social improvement, leading to an easier access and more efficient transportation services - a virtuous circle that reduces poverty and improves the lives of poor rural residents. Improving the rural population´s access to essential services requires improving mobility through transportation infrastructure and services as well as the location, price, and quality of facilities.

Due to budgetary restrictions and lack of resources, the government have not met the transportation needs of rural residents. To deliver significant economic and social benefits, investment in transportation must take an integrated approach. It should not focus solely on expanding road networks, but should also pay attention to smaller roads, pathways and tracks and the use of private and commercial means because better mobility gives rural people better access to services (education, health, finance) markets, income-earning opportunities, and social, political and community activities.

While costs in Mexico constrain the use of transportation services, a lack of concentrated demand, the topography, and social and political problems constrains the development of cheaper and more efficient services. Improving rural mobility to reduce poverty thus requires a combination of appropriate transportation infrastructure and better transportation services using affordable means of transportation.

Promoting rural transportation services also requires complementary actions to develop adequate interconnected infrastructure, encourage use of transportation brokers and communications technology, create rural markets, and improve rural terminals. Rural mobility depends on good rural transportation infrastructure (roads, paths, footpaths, bridges) as well as good, low-cost transportation services.

## INTRODUCTION

The 2001-2006 National Development Plan, sets out the political and economic objectives of the Mexican Government for:

- Quality Growth of the economy
- Sustained and dynamic growth to generate employment, combat poverty and increase business opportunities; and
- Growth with equal opportunities among regions, business and homes, with sufficient resources to make up deficiencies and finance projects for inclusion in development

As part of the Program for Communications and Transportation, certain priorities have been established for 2001-2006, the following being those for Highway infrastructure and construction.

- The maintenance of Federal Highways
- The construction, widening and modernization of the federal network
- Encourage the construction of toll highways and
- Rural and feeder roads

Within the general objectives is that of integrating an infrastructure network of safe, efficient transportation, which respects the environment and guarantees access to basic services for the entire population.

In Mexico the highway density (length of highway per Km 2 of territory) is relatively low: towards the end of 2000, the national highway network had a total length of 333,247 Km, of which 106, 571 were toll-free roads, 5,933 toll highways, 160, 185 were country and feeder roads and 60,557 were cart tracks. This means our country has a density of 0.14, considered relatively low in comparison to other countries and even though 10,371 Km were constructed or modernised from 1995 to 2000, there is still much to be done as our objective is to increase coverage and access for the entire population.

## THE STATE OF THE RURAL NETWORK IN MEXICO

According to the XII General Population and Dwelling Census of the year 2000, the population of Mexico is 97,483,412 inhabitants, 75% urban and 25% rural, the latter consisting of 24,723,590 inhabitants.

In some states there is a higher concentration of rural population, Oaxaca 55.5%, Chiapas 54.3% and Hidalgo 50.7%. At the other extreme there are states in which there is a lower percentage of rural population. Such is the case in Nuevo León 6.6%, Baja California 8% and Coahuila 10%.

Concerning population distribution by type and size of location, there are 199,369 locations in the whole country, with a high proportion of small centers, as 98.5% of the total number of towns or hamlets corresponds to places with fewer than 2,500 inhabitants, including rural population.

This means that the rural population in this country, while being only 25% of the total population, lives in 98.5% of the population locations in the country. In other words, it is scattered over a wide area.

For this reason greater resources are required from the federal government in support of local or state governments for the construction, modernization, reconstruction and maintenance of rural and feeder roads so that the rural population has the means to travel to basic services and access a higher standard of living.

Despite the fact that investment in these roads will not be recuperated from an economy point of view, the roads will meet the social need for transportation and communication.

Within the road network, country and feeder roads are an important regional and local asset since they provide permanent communication between population and production centres in those areas, access for large groups to health and education and the basic elements to improve their quality of life as web as greater opportunities for work and general development.

Thus the actions of the federal government., channeled towards providing the means of communication needed by the country, have resulted in a gradual increase in the number of feeder and country roads, in addition to an improvement in their physical state as can be seen from Tables 1 and 2 and Chart 1

**Tables 1 and 2.- Increase in the number of feeder and country roads**

| YEAR | RURAL NETWORK (KM) | KM BUILT IN YEAR | % GROWTH RATE PER YEAR |
|---|---|---|---|
| 1995 | 151,942 | 591 | 0.4 |
| 1996 | 153,531 | 1,589 | 1.0 |
| 1997 | 153,584 | 53 | 0.1 |
| 1998 | 157,463 | 3,879 | 2.5 |
| 1999 | 157,721 | 258 | 0.2 |
| 2000 | 160,185 | 2,464 | 1.6 |

| YEAR | RED FEEDER ROAD NETWORK (KM) | KM BUILT IN YEAR | % GROWTH RATE PER YEAR |
|---|---|---|---|
| 1995 | 56,901 | 839 | 1.5 |
| 1996 | 59,258 | 2,357 | 4.1 |
| 1997 | 60,984 | 1,726 | 2.9 |
| 1998 | 61,872 | 888 | 1.5 |
| 1999 | 62,344 | 472 | 0.8 |
| 2000 | 64,706 | 2,362 | 3.8 |

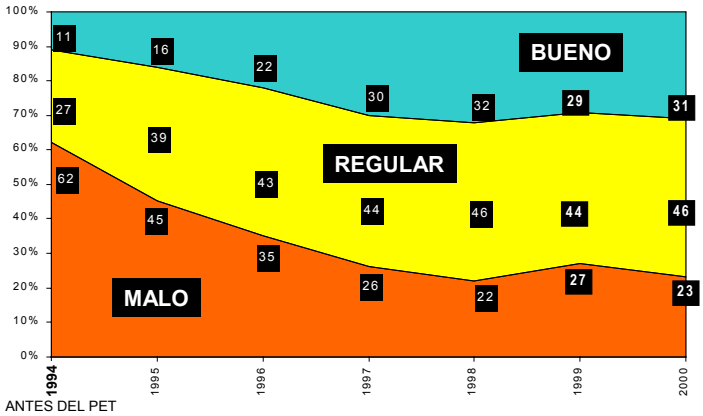


Chart 1 THE PHYSICAL STATE OF THE RURAL NETWORK ( GOOD, FAIR OR BAD)

The road network in Mexico currently reaches a length of 161,764.5 Km of which 113,814.9 are the responsibility of local state governments, 4,315.2 the federal government and 43,634.4 the responsibility of a large variety of dependencies, organisms and public and private companies. The latter make up some 48% of the country's road network.

The feeder network has a total length of 65,446.4 Km and is the responsibility of local state governments. It makes up 20% of the total road network.

## CRITERIA FOR INVESTMENT IN THE MEXICAN HIGHWAY NETWORK

At the present time, the highway network in this country is over 333,000 Km in length and 106,571 km consist of roads which are not controlled by federal or state legislation, 5,798 km are toll roads and the remainder are country roads and cart tracks. By means of this system, 98% of passenger traffic and 80% of motor carriers move from city to city which explains the importance of the highway system for this country.

Investment priorities for this sector include:

- Maintenance of the federal highway network. Resources are directed at providing an economical, efficient and safe vehicle operation.
- The construction, widening and modernization of the highway network with resources aimed at completing the modernization of 14 routes. These actions are meant to ensure efficient communication between the main cities, sea ports, border towns and production and distribution centres throughout the country
- .Toll roads. Resources are aimed at consolidating their functions, homogenizing service conditions as well as an expansion and extension of both coverage and service quality.
- Country and feeder roads. The focus of efforts here is the decentralization of resources and responsibilities in addition to providing states and municipalities with the assistance needed for the maintaining their networks in good repair and to provide ongoing efficient service.

The following outlines the standards used for prioritization and resource distribution within this sector:

Criteria for resource allocation to the rural and feeder road network

| Programs | Standard | Enforcing office |
|---|---|---|
| Temporary Employment Program | Marginalization level<br>Topography<br>Length of Network<br>Rainfall | Communication and Transportation Secretariat |
| Descentralization | Branch 33<br>Different criteria for network attention | Local State and Municipal Government |
| Modernization and Construction | Complement State and Municipal Programs<br>Marginalization level<br>Works in progress<br>Regional development works.<br>Indigenous population<br>Topography<br>Network density<br>Population density | Communication and Transportation Secretariat s |

The Temporary Employment Program was created in 1995 when an economic crisis took place in this country, for the purpose of alleviating poverty in country areas with a low level of productivity. The Communications and Transportation Secretariat set up this labor-intensive program for the maintenance and reconstruction of country roads.

**Methods for the evaluation and prioritization of highway investment in Mexico**

For several years, Mexico has been developing management systems to improve and maintain its highway infrastructure. Presently, the General Directorate of Highway Maintenance (DGCC in Spanish) is trying to implement the Highway Development and Management System - HDM-4 instead of the SISTER (Highway Maintenance Strategy Simulation System). HDM-**4** is a software system for investigating choices in investing in road transportation infrastructure.

These choices may include:

- Developing new roads,
- Improving existing roads,
- Maintaining existing roads,
- Introducing new vehicle technology,
- Introducing new ways for funding and managing road assets.

It will enable Mexican managers of road network to investigate the possibilities for providing cost-effective development and upkeep of their road system, which will bring benefits to the communities they serve.

HDM-4 will:

- Provide assessment of the economic and environmental impact of investment choices;
- Consider new development works, maintenance works and improvement works as possible investment choices;
- Permit the consideration of investment in a single section of road, or a large network of road links (many sections), or any combination of road sections in a sub-network;
- Predict future changes in the critical aspects of road system performance, which affect the performance of an investment:
  - traffic volume and composition,
  - deterioration of the road condition,
  - the effect of works on road condition,
  - the effect of condition and road works on road users, in terms of vehicle operating performance and costs, road user and cargo time delay and costs, accident rates and costs, and
  - the effect of the investment on vehicle emissions;
- Allow an analyst to refine the accuracy of predictions relating to a particular country, geographic region or locality by calibrating the predictive models to local experience.

The new HDM-4 provides a powerful system for the analysis of road management and investment alternatives. The system can be applied to:

- road management
- programming road works
- estimating funding requirements
- budget allocations
- predicting road network performance
- project appraisal
- impact policy studies
- a wide range of special applications

The HDM-4 is intended to cater for the wide ranging needs of road agencies, international funding institutions, consultants and research organisations through separate application tools developed to perform the following management functions:

- Strategic planning
- Roadwork programming
- Project preparation
- Research and policy studies.

At the present time, HDM-4 implementation in Mexico is in its first phase, which consist of gathering information of quantitative and physical road characteristics, such as the International Roughness Index (IRI), deflection, cracks, road geometry, surface type etc.

In this decision support tool system that is already in operation, these information is systematically processed in order to allow the SCT to obtain useful elements for supporting resource allocation to actions having a clear and proven technical and economical justification.

**Challenges and Opportunities**

According to studies carried out by the Communications and Transportation Secretariat for calculating the investment required in order to satisfactorily attend to the highway network, some 43,400 million pesos are needed, to be distributed as follows:

| | |
|---|---|
| ▪ Federal Highway Maintenance | 7,100 million |
| ▪ State highway maintenance | 10,200 million |
| ▪ Construction and modernization of federal highways | 17,200 million |
| ▪ Country roads | 4,200 million |
| ▪ Feeder roads | 4,700 million |

If the amount required is compared to available resources in the 2002 budget, which is 13,481 million pesos, it can be seen that this figure is equal to 31% of the annual requirement and 0.21% of the estimated GIP for this year. It means that the country is investing some 30,000 million pesos less than the amount required and about one fifth of that recommended by organizations such as the World Bank and the European Union (1% of the GIP per year).

Given the budgetary limitations which affect and will continue to affect the highway infrastructure, it is ever more important that investments be evaluated and prioritized. The social, political, economic and financial advantages and disadvantages of each investment should be studied so as to design and define mechanisms for financing road works which, with the participation of the private and public sectors as well as local governments, will permit available amounts to be optimised and important project throughout the country to be streamlined.

## FUTURE PROGRAMS FOR IMPROVING MOBILITY ACCESS IN MEXICO

At the present time, in this country's highway system there are different needs to be filled so that transportation continues to play its strategic role. On the one hand, the important national heritage must be preserved without excessive cost for the vehicles in circulation. This need is obvious for both the paved highways and the secondary roads.

On the other hand, the country must continue its efforts to modernise and extend the paved highway network with high specifications on which the majority of vehicular traffic is transported throughout the country in addition to widening the network of country roads. The latter is a fundamental need for isolated rural populations, so as to improve development opportunities in vast regions.

Within the 2001-2006 Sector Program for Communications and Transportation. One of the established objectives is "to widen the coverage of and accessibility to the highway infrastructure for the whole population", by means of the following action plans:

- Modernization of highways through projects for national coverage by means of the National program for Construction and Modernization of Federal Highways .
- Ongoing efforts will be made to build new roads for communication regions and population centres as web as modernising and increasing the capacity of existing roads with safety or congestion problems. According to a study carried out, work needs to be done on 111 stretches of road, at a cost of 72,500 million pesos. This will enable 89% of 14 roads to be improved by the end of 2006.
- Private investment will be sought for the development of a new highway infrastructure, using the Program for the Construction of New Toll Roads with Concessionary Financial Schemes. Part of the total number of highways to be built with consist of concession toll highway projects incorporating the private sector. Available preliminary studies indicate the existence of 40 stretches of road in which public participation could be involved. That is to say, the public sector could take part in the construction of toll roads, under a new system of concessions of which the main characteristics would be:

1) Finances so that the projects would be feasible;
2) A fixed concession term of 30 years which is the maximum established by the relevant law;
3) Fixed rates for different types of vehicle, updated under the terms of the concession;
4) The Communications and Transportation Secretariat would provide the executive project, the right to free passage and the studies on the environmental impact, the cost of which to be recuperated when the concession is granted and
5) The concession would be awarded by means of an invitation to bid, the winner being the one who requests the least amount of official funds.

On the other hand, There are elements which must be considered when setting the contents of annual building and modernization programs. These are variable factors and are related to market movement or social changes, among others. They are, however, relevant and must be taken into account when formulating plans for highway investment. Some of the most outstanding are:

- Greater participation from other levels of government, especially local state governments, in the decisions made on the contents of the highway program as well as increased contribution from them of resources and work carried out.

- More rapid completion of procedures for permits and rights of way enabling work to be carried out without incurring increased costs and a longer completion time.
- An obligation to make available to the public all information relating to budgeting for carrying out the investment program.
- Work must be oriented towards satisfying the needs of the user as a client for the services provided by the national highway network with increased service quality, especially concerning safety issues.
- A concern for providing an efficient intermodal integration of the highway system together with other transportation facilities such as ports, railroads and airports.

**Regional Development**

Through the execution of the program for country roads, a contribution will be made to promote regional development and combat a lack of infrastructure. Investments will be aimed at carrying out work in those areas which are most isolated and more marginalized.

Primary results in this field are regional linking with safety, rapidity and efficiency, due to the fact that rural roads enable intercommunication and plans for state development. Priority regions will thus be able to access goods and services in less time and at lower cost.

The following are the main elements to be considered for improvements to rural and feeder roads:

- Conserve in optimum condition the viability of the rural road network so as to guarantee permanent access from the communities they serve.
- Increase the coverage of this type of infrastructure so as to communicate all population centres with over 500 inhabitants
- To increase and modernise country and feeder roads which need to be improved so as to better support economic and productive activities.
- Help to combat poverty by providing more work opportunities for peasant and indigenous laborers in the more marginalized areas.
- Promote social and regional development by means of transportation providing access to goods and services as well as communication between the communities served.
- To continue and consolidate the decentralization of the functions, programs and responsibilities of the SCT, concerning country roads, to local government in each state
- To plan and coordinate with local governments, actions for the development of country roads.
- To support the carrying out of programs for country roads arising from interdepartmental cooperation such as:
    - The fight against poverty in 250 micro-regions by means of the Temporary Work Program
    - An Integral program of Sustainable Agriculture and Productive Recovery in Zones of Recurrent Drought
    - Tourism Projects
    - Development for the Indigenous Population.

In order to achieve these, it will be necessary to continue the programs carried out so far, with the following goals:

- Conservation of 86,700 Km of country roads per year.
- Reconstruction of 45,000 Km of country roads.
- Increase and modernise 4,500 Km of which the original specifications have been raised.

In order to increase country road coverage it will be necessary to construct 45,000 Km of which 17,000 Km have been identified to meet the greatest demand.

This factor has not been established for each sector but if the period 1995 – 2000, is any guide, not more than 3,500 Km will be built.

It is important to point out that the country road program brings about social effects such as: greater confidence in communal safety, more integration, family unity, and community organization for work, access to basic services, and transportation to basic services in less time, among other social benefits which have not yet been totally evaluated for their magnitude and social impact.

The outlook for the future us a tendency to continue with the programs carried out which will meet the demands for maintenance of country roads and to some extent the need for modernization and construction.

It is important, however, that new financial means be sought in order to meet new targets for attention to the most important needs of the population.

## Social Aspect: Accessibility for the handicapped

The Mexican government, through its office representing the promotion and social integration of handicapped persons intends to promote the National Accessibility Project so that all sectors of society develop a culture for the inclusion and participation of the handicapped with three main priorities: architectural accessibility, urban transportation and communication. It is aimed at eliminating social barriers so as to permit free access to all handicapped persons.

In the field of transportation, the following proposals have been made concerning land, sea and air transportation:

Accessibility to Land Transportation

- Set a new official Mexican standard
- The promotion of fiscal exemptions and procedures for the adaptation and acquisition of vehicles.
- Promotion of personnel training for attention to members of the public with special needs, on federal public transportation.
- Promotion of discounted travel.
- Provision of a national identity card, solely for the handicapped.
- Reserved places for persons with special needs.
- Promotion of devices which will extend the time allowed for crossing roads and street.

Accessibility to sea transportation:

- Adaptation and setting of standards for port and boarding installation (non-slip flooring and wheelchair ramps)
- Provision of suitable equipment (wheelchairs, signs, movable ramps, elevators etc) as well as the correct training of personnel employed.
- Publication of manuals and emergency instruction signs in Braille, graphic symbols and broadcasting.
- The promotion of ongoing media campaigns to inform the community of acccess rights and use of space for handicapped persons with special needs.

Accessibility to air transportation::

- Promote the setting of standards for accessibility to air terminals and transportation.
- Personnel training in matters of accessibility.
- Personnel training in sign language.
- Audio and video flight information
- Assistance to be made available at luggage claim, immigration, customs etc.
- Review standards concerning special needs for accessibility.
- Promote personnel training in suitable treatment of the handicapped.
- Publicity for accessibility standards in air transport.
- Safe and comfortable boarding arrangements

The Mexican Government, by these measure, will develop an unprecedented effort to guarantee accessibility for the handicapped to different forms of transport.

**Technology transfer**

In order to increase and improve the technological transfer and the means and levels of training to road professionals, the Mexican Government through SCT and the Mexican Transportation Institute, has implemented a program for technology transfer centers for modernization and scientific research that are specifically focused to transportation in each state of the country, with the following goals:

- To encourage activities involving scientific research and technological modernization.
- To promote excellence, academic quality and the formataion 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 the allocation of resources to programs, 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 the social awareness about its importance for the country´s social and economical development.

## Conclusion

The Mexican Government through SCT is carrying out important actions to guarantee accessibility for the most needy people in the country to basic services by means of an integrated transportation infrastructure that is efficient, safe and sustainable.

Among its objectives is that of growth with equal opportunities between regions, companies, homes and individuals. This will be achieved by means of communication and greater accessibility for rural communities to basic services which will afford them an improved welfare standard.

Diffrent programs have been established for this purpose, with financial mechanisms, strategies and investment evaluation methods which will guarantee the construction, conservation and modernization of highways.

The Mexican government has not forgotten the handicapped and their special accessibility needs. Several actions plans have been set up within the transportation area which are aimed at eliminating physical barriers and achieving free access for the handicapped to different types of transportation.

In order to achieve these objectives, it will be necessary to increase technology transfer and raise the levels of personnel training for transportation employees. For this purpose, a program has been set up to establish Technology Transfer Centers in each state of the country.