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Document of
The World Bank

Report No: 20431-ME

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US$218 MILLION

TO THE BANCO NACIONAL DE OBRAS Y SERVICIOS PUBLICOS, S.N.C. (BANOBRAS)

WITH THE GUARANTEE OF THE UNITED MEXICAN STATES

FOR THE

FEDERAL HIGHWAY MAINTENANCE PROJECT

NOVEMBER 17, 2000

Finance, Private Sector and Infrastructure Department
Country Management Unit - LCC1C
Latin America and Caribbean Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective 9/11/2000)

Currency Unit = New Peso (N$)
N$ 1.00 = US$0.1055
US$1.00 = N$ 9.478

FISCAL YEAR

January 1 - December 31

ABBREVIATIONS AND ACRONYMS

APL	-	Adjustable Program Loan
BANOBRAS	-	National Infrastructure Development Bank
BRP	-	Bridge Rehabilitation Program
CAPUFE	-	Public Toll Roads Agency
CAS	-	Country Assistance Strategy
CREMA	-	*Contrato de Recuperación y Mantenimiento*
COMPRANET	-	*Sistema Electrónico de Contrataciones Gubernamentales*
EA	-	Environmental Assessment
EMP	-	Environmental Management Plan
DGAF	-	General Directorate for Federal Transport
DGCC	-	General Directorate for Maintenance of Roads
DP	-	Direct Payment
FARAC	-	Toll Roads Restructuring Agency
FARAH	-	Financial Accounting, Reporting and Auditing Handbook
GIS	-	Geographical Information Systems
HDM	-	Highway Development and Management Model
HMP	-	Highway Maintenance Program
HRTS	-	Highway Rehabilitation and Traffic Safety Project
IBRD	-	International Bank for Reconstruction and Development
ICB	-	Competitive Bidding
IDB	-	Inter-American Development Bank
IF	-	Implementation Framework
IRR	-	Internal Rate of Return
LACI	-	Bank Financial Management Initiative
MET	-	*Memorándum de Fundamento Técnico*
MIRR	-	Modified Internal Rate of Return
NAFTA	-	North American Free Trade Agreement
NCB	-	National Competitive Bidding
NGO	-	Non Governmental Organization
NPV	-	Net Present Value
PMR	-	Project Management Reporting
RED	-	Road Economic Decision Model
PCD	-	Project Concept Document
QAT	-	Quality Assurance Team
SBD	-	Bank Standard Bidding Document
SECAL	-	Sectorial Adjustment Loan
SECODAM	-	Secretariat of Control and Administration
SCT	-	Secretariat of Communications and Transport
SHCP	-	Secretariat for Finance and Public Credit
SISTER	-	Simulation Model of Highway Maintenance Strategies *Simulation de Strategies d'Entretien Routier*
SOE	-	Statement of Expenditures
VOC	-	Vehicle Operation Costs
UAC	-	*Unidad de Autopista de Cuota*

Vice President:	David de Ferranti
Country Manager/Director:	Oliver Lafourcade
Sector Manager/Director:	Danny Leipziger
Team Leader/Task Manager:	Jose Maria Alonso-Biarge

MEXICO
FEDERAL HIGHWAY MAINTENANCE PROJECT

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Annexes

MAP(S)
No. 31077

MEXICO

FEDERAL HIGHWAY MAINTENANCE PROJECT

Project Appraisal Document

Latin America and Caribbean Region
LCSFT

Date: November 17, 2000
Country Manager/Director: Olivier Lafourcade
Project ID: P065779
Lending Instrument: Specific Investment Loan (SIL)

Team Leader: Jose Alonso-Biarge
Sector Manager/Director: Danny M. Leipziger
Sector(s): TH - Highways
Theme(s):
Poverty Targeted Intervention: N

Project Financing Data
[X] Loan [ ] Credit [ ] Grant [ ] Guarantee [ ] Other:

For Loans/Credits/Others:
Amount (US$m): 218.00

Proposed Terms: Fixed-Spread Loan (FSL)
Grace period (years): 5
Commitment fee: 0.85% for first 4 years, and 0.75% thereafter
Front end fee on Bank loan: 1.00%
Years to maturity: 15
Service charge: 0.00%

Financing Plan: Source	Local	Foreign	Total
BORROWER	91.00	0.00	91.00
IBRD	20.00	198.00	218.00
Total:	111.00	198.00	309.00

Borrower: Banco Nacional de Obras y Servicios Publicos, S.N.C. (BANOBRAS)
Responsible agency: SECRETARIA DE COMUNICACIONES Y TRANSPORTES (SCT)
Guarantor: United Mexican States

Address: Calle Magdalena 21
Colonia del Valle
03100 Mexico City, Mexico
Contact Person: Ing. Mario Gonzalez
Tel: (52-5) 682-8615 Fax: (52-5)682-8928 Email:

Estimated disbursements (Bank FY/US$M):

FY	2001	2002	2003	2004	2005			
Annual	8.00	40.00	70.00	75.00	25.00			
Cumulative	8.00	48.00	118.00	193.00	218.00			

Project implementation period: 4 years
Expected effectiveness date: 02/01/2001 **Expected closing date:** 06/30/2005

Front-end fee: US$2.18 million
Loan amount including front-end fee: US$218 million

A. Project Development Objective

1. Project development objective: (see Annex 1)

The proposed project has been designed to assist the Government in providing Mexico with a road transport system that can support the needs of a rapidly modernizing and expanding economy and to enable meeting the NAFTA competitive challenges. The overarching development objective is to primarily improve transport efficiency on the federal road network. Complementary objectives include: (i) improving SCT's rehabilitation and maintenance planning performance; and (ii) enhancing private-sector participation in road maintenance.

2. Key performance indicators: (see Annex 1)

The project will support the ongoing qualitative improvement and preservation of the Federal highway network during the 2001-2003 planning period and beyond. The key indicators include: (i) reduction in vehicle operation costs (VOC) on project roads (an average reduction of 20% compared with the current costs); (ii) improvement in the condition of roads after rehabilitation in terms of roughness reduction; (iii) timely preparation of annual highway and bridge rehabilitation and maintenance programs; and (iv) progress achieved in the design and implementation of highway financing and of decentralization strategies. Other indicators are detailed in Annex 1.

B. Strategic Context

1. Sector-related Country Assistance Strategy (CAS) goal supported by the project: (see Annex 1)

Document number: R99-92 (IFC/R 99-82) **Date of latest CAS discussion:** 06/08/99

The CAS for Mexico seeks to support the Government in achieving three overall objectives: social improvement; removing obstacles to sustainable growth and maintaining macroeconomic stability in the context of globalization; and enhancing public governance.

This project is linked to the CAS objective related to sustainable growth and macroeconomic stability. Specifically it will support Government and Bank strategies related to: (i) removing impediments to private sector growth and competitiveness; and (ii) ensuring the provision of quality infrastructure.

Several risks are implicit: the potential for fiscal imbalances in the short- to medium-terms, macroeconomic and financial stability, unexpected deterioration in social conditions, and budgetary constraints. However, suitable risk-mitigating factors as well as encouraging government policy positions are in place.

2. Main sector issues and Government strategy:

Road transport is by far the dominant mode for both passenger and freight transportation in Mexico, accounting for about 98% of intercity passenger movement and about 89% of cargo movement by land. In general, road traffic grew by 10% per annum in the 1970s and by about 5% per annum thereafter. Traffic growth occurred despite periodic economic recessions and substantial real price increases for road freight. Within the context of NAFTA, traffic growth on roads comprising the major trade corridors, currently estimated at about 10% annually, is expected to continue at a similar rate or higher.

The 302,000 km of interurban roads in Mexico, of which about 31% are asphalt or concrete paved, are classified as federal, toll, state and rural roads in accordance with the source of funds for the respective segments and their economic and strategic roles. The states have jurisdiction over some 83,000 km of

mostly secondary links in the road network. Control and responsibility for the approximately 170,000 km of rural roads is shared by local governments, the states and the Federal Government. The Federal Government has primary responsibility for the 41,865 km of highways managed by SCT and for the 7,135 km of toll highways managed by the Federal Toll Roads and Bridges Authority (CAPUFE) and the *Unidad de Autopistas de Cuota* (UAC).

The Mexican Government has taken substantial steps in reforming the sector and in privatizing and deregulating key modes. While there is a still a need for strengthening the regulatory and related institutional framework as well as for addressing key urban transport issues, the Bank's main focus presently is with regard to the highway sector. The main issues with regard to intercity road transport are: (i) the persistent challenge to avoid the deterioration of the condition of the national road network in the face of seriously constrained budgets and of the need for institutional and financial reforms to ensure sustainability; (ii) the declining level of service of the national network as traffic levels increase faster than capital works can be funded. The situation is exacerbated as access to private capital is hampered by the lack of a clear solution to the issue of toll roads financing; (iii) the growth of similar maintenance and capacity issues at the State level and the challenges in light of the Government's decentralization policy; and (iv) the low level and poor quality of access available to low income rural populations in the more isolated parts of the country.

In general, there are no serious capacity bottlenecks in the SCT, or federal highway network. However, qualitatively, the latest 1999 inventory showed that about 24% of it is in very poor condition, 19% in poor condition, 34% in fair condition and the remaining 23% in good condition. This does not represent a network that can support national development goals efficiently and it arises from the fact that the government has not been allocating sufficient funds to maintain or to modernize the road network. However, as a rule, the sections in poor and fair condition comprise mostly the 19,060 km portion of the SCT network that do not serve as major trade axes and can be classified as being of regional or secondary importance. Although there is much variance between regions, average conditions on SCT's network appear to have worsened in the 1980s due mainly to the decline in real terms of budgetary allocations for the Highway Maintenance Program (HMP), from about US$230 million in 1983 to US$120 million in 1989. Because it has had to operate with inadequate budgets for several years, SCT generally limited maintenance to emergencies and to repair works; this resulted in a road network with only 45% in good and fair condition by 1995. However, there has been significant improvement in recent years as SCT's budget averaged US$310 million during the period 1995-1999, of which 40% were assigned to rehabilitation works and 60% to routine and periodic maintenance. The condition of the federal network thereby improved correspondingly during the second half of the 1990s (to 57% in good and fair condition in 1999). The Bank complemented the Government's efforts through the HRTS Project which apart from providing resources has helped to increase SCT's efficiency in using available maintenance funds through staff training and strengthening of the maintenance management system.

During the period 2001-2004, based on the HMP and BRP it is estimated that SCT's budget will average around US$370 million, of which 22% will be assigned to minor rehabilitation works and 78% to routine and periodic maintenance. The HMP is based on the results of a series of simulations of various strategies of road maintenance using the SCT's planning model. The proposed maintenance program for 2001-2004, will yield, according to the Simulation Model of Highway Maintenance Strategies (SISTER) planning system used by SCT, a network with 75% in good to fair condition in year 2004.

With respect to toll roads, conditions are generally better than on the federal highways. CAPUFE, which has higher financial resources per km, has been able to maintain its toll roads in a very satisfactory manner. However, long-term sustainability may be affected adversely by financial management problems of the

recent past. Currently, there is a debt of over US$9 billion, arising out of the government's rescue of 23 unsuccessful private toll roads. At the government's request, the Bank will prepare a separate operation to assist the SCT on highway financing issues, mainly related to restructuring the debt in the toll road system. Also, a study being financed under the ongoing Loan 3628-ME is aimed at establishing a road financing mechanism, based on a tariff on road users, to ensure the availability of reliable funds for the maintenance of the entire non-tolled road network. The proposed project would support follow-up design and implementation for both items.

The future management of the SCT network will be also affected by the decentralization process. There was an attempt in 1997 to transfer about 11,000 km of the more regional roads in the SCT road network to the states, but it was unsuccessful, due mostly to lack of adequate funds to support the transfer and to insufficient monitoring and accountability on the part of the recipient states. Moreover, the states highway administrations, which generally have far less capacity than the SCT, will need considerable strengthening to handle the decentralized responsibilities adequately. So far the Bank has been concentrating on the technical issues of decentralization, however, following a request from the government, Bank assistance will be extended to include a comparative study of different models of decentralization in Europe and Latin America, in order to identify models considered suitable for Mexico and to subsequently propose one or several decentralization options to the new Government.

An equally serious deficiency of Mexico's road network is its inability to provide sufficient accessibility for the rural poor. The rural roads network needs both expansion, to obtain adequate road density, and improvement, to ensure year-round passability. The CAS for Mexico provides assistance for a State Roads Project in the form of an Adjustable Program Loan (APL) that will address the states management options in a decentralized environment as well as the need to expand and improve the rural road network.

3. Sector issues to be addressed by the project and strategic choices:

SCT has prepared a plan for management of the federal highway network, which is based on economic and governmental priorities. The strategy seeks to: (i) adequately manage the federal network; (ii) support institutional reforms required for the development of better road network management practices; and (iii) focus investments on minor rehabilitation and maintenance of the network. In response, the Bank has launched a multi-faceted program to compliment this effort through a combination of lending and non-lending services. Sector work is underway and also the preparation of a SECAL related to the private financing of highways and the restructuring of the toll road system. In addition, as mentioned earlier a study is underway on the design of a road financing mechanism for the non-tolled system, both federal and state.

The proposed Project was designed as the culmination of the Bank's efforts to support the improvement of the maintenance of the national network as well as to lay the groundwork for future efforts to support the states. It is therefore focused mainly on the maintenance needs of the SCT managed federal highway network; to a limited extent it will also support the implementation of a mechanism for maintenance financing, decentralization, and the financial restructuring for toll roads.

The project will support the ongoing preservation of the federal network during the transition to decentralization. It would provide funds for SCT to safeguard its past investments in the federal highway network, as another Bank operation will try to implement solutions to the highway financing issues mentioned above, which will take some time. The project would also provide for the development of a strategy for the decentralization of highway administration in support of the decisions to be made by the Government (once the results of the study on different decentralization alternatives is completed) to be

implemented under the above mentioned State Roads Project. Lastly, the project would improve upon the road maintenance management systems through rehabilitation and maintenance contracts, the introduction of a pilot program on comprehensive maintenance by contract, and the implementation of the Highway Development and Management Model (HDM-4), and would support the government strategy on toll road management.

C. Project Description Summary

1. Project components (see Annex 2 for a detailed description and Annex 3 for a detailed cost breakdown):

The main components of the project are:

(1) Support for the SCT's 2001-2003 programs for highway maintenance (HMP) and bridge rehabilitation (BRP) along key segments of the federal highway network, which together amount to more than US$1,000 million. Subprojects from these programs will be selected for Bank financing based on the following criteria: (i) having an ERR calculated in accordance with a method satisfactory to the Bank of at least 12%; (ii) neither having environmental or social implications nor requiring changes in the road geometrical design; and (iii) having a structural design life of at least 15 years in the case of highway rehabilitation subprojects.

(2) Introduction of comprehensive maintenance by contract through a pilot program, including technical assistance for design and implementation. This three-year program will include comprehensive maintenance (periodic and routine), rehabilitation of selected segments of roads and of bridges, some minor works preparation of short term implementation programs, training and management of the program. This component is being piloted because there has been no experience with comprehensive maintenance contracts in Mexico. These contracts are also a first step towards the implementation of rehabilitation and maintenance contracts based on performance (or CREMA contracts, as they are called in Latin America).

(3) Construction of vehicle weight control stations. The principle being proposed is for slow speed weigh-in-motion scales, since this allows for faster processing of vehicles and only infringing vehicles would then be stopped and inspected. Under the HRTS Project, a study to control weights and dimensions of vehicles in Mexico was financed. This resulted in a program for the acquisition and operation of some 37 mobile scales. This project component will complement the mobile program by piloting the use of fixed scales at 2 stations (one single station, for only northbound traffic, on the route to the US border in Nuevo Laredo, and one twin station to serve both traffic directions for another route in the state of Querétaro) within a pilot program of national vehicle control. The project will finance only the station's civil works. The equipment, including its installation, will be financed by the Government.

(4) An institutional and technical development component to support the:

(i) implementation of the Highway Development and Management Model (HDM-4) in the DGCC and its departamental offices so as to help improve road maintenance management. The HDM-4 will gradually complement and replace the current system being used in Mexico for maintenance works planning (SISTER), which was implemented in Mexico in 1994. This change is justified because the SISTER model lacks capabilities for prediction of road conditions and HDM-4 has a wider range of functionality including strategic planning, programming and project evaluation. The cost of this sub-component includes acquisition of road survey equipment needed for the installation and operation of the model and also office equipment (all to be SCT financed);

(ii) development of a strategy for road decentralization. This sub-component will support the decentralization strategy as selected by the Government from the alternatives to be proposed by another study being carried out under separate financing. The study will analyze various decentralization models in Europe and America and will select those considered suitable for Mexico, in order to formulate an adequate basis for proposing one or several options to the Government;

(iii) implementation of a road financing mechanism. Currently, a study is underway, financed by the HRTS Project, which will provide recommendations on road financing strategies and resource mobilization options. Subsequently, the Government will prepare, and thereafter carry out, an action plan satisfactory to the Bank with respect to the implementation of such recommendations. This sub-component will support implementation of the plan;

(iv) implementation of a strategy for toll roads. Another study is underway to analyze and then discuss with the Mexican authorities the possible alternatives to solve the problem created by the rescued toll roads (FARAC). Once the study is completed, its recommendations will be discussed with the government. Subsequently, this sub-component would assist the SCT in implementing the recommended strategy; and

(v) staff training for the SCT directorates most involved in the project, emphasizing technical, managerial and administrative training. It would include formal training courses, attendance at conferences and study tours, both in Mexico and abroad.

The project components and their costs are summarized in the table overleaf.

Table 1 - Summary of Project Costs

Component	Sector	Indicative Costs (US$M)	% of Total	Bank-financing (US$M)	% of Bank-financing
I. Highway Maintenance and Rehabilitation: (i) Rehabilitation (1,000 km)	Highways	150.00	48.5	105.00	48.2
(ii) Periodic maintenance (1,200) km	Highways	60.00	19.4	42.00	19.3
(iii) Bridge rehabilitation (100 bridges)	Highways	20.00	6.5	14.00	6.4
(iv) Supervision (DGCC 2001-2003 programs)	Highways	15.00	4.9	10.50	4.8
II. Pilot program of comprehensive maintenance (routine, periodic and minor rehabilitation) by contract of an additional 240 km two lane road equivalent, including provision of consulting services for works supervision and for preparing and managing the program: (i) Civil works	Highways	18.00	5.8	12.60	5.8
(ii) Consulting services	Institutional Development	1.50	0.5	1.05	0.5
III. Construction of 2 (one single, plus one twin) weight-and dimensions control stations	Highways	4.50	1.5	3.15	1.4
IV. Institutional Strengthening Provision of technical assistance and training for: (i) installing the HDM-4 model	Institutional Development	1.70	0.6	1.70	0.8
(ii) developing a strategy for decentralization of road administration		0.60	0.2	0.60	0.3
(iii) implementing a road financing mechanism;		0.50	0.2	0.50	0.2
(iv) implementing the selected strategy on toll roads; and (v) training		1.20	0.4	1.20	0.6
V. Contingencies		33.82	10.9	23.52	10.8
Total Project Costs		306.82	99.3	215.82	99.0
Front-end fee		2.18	0.7	2.18	1.0
Total Financing Required		309.00	100.0	218.00	100.0

2. Key policy and institutional reforms supported by the project:

These focus on helping SCT to: (a) upgrade the planning and programming needed for the preservation of the road network, through the installation of the HDM-4 as part of the maintenance management system; (b) introduce the use of multi-year comprehensive road rehabilitation and maintenance contracts for executing road rehabilitation and maintenance; (c) develop a strategy for highway decentralization; (d) implement a road financing mechanism; and (e) rationalize, both administratively and financially the two sets of toll roads currently under its responsibility, namely the CAPUFE roads and the rescued toll roads (UAC managed) following the recommendations to be formulated under a separate Bank operation that is being prepared now.

3. Benefits and target population:

Benefits. Completion of the project would result in improvements to the physical condition of the federal highways and thereby reduce transport costs and also help to enhance the competitiveness of Mexico's products in international markets. Also, through the timely rehabilitation of rapidly deteriorating roads, the project would delay the need for costly reconstruction and help to conserve the already limited public funds. There are also many other benefits associated with each component:

- supporting the program of vehicle weight control would help to reduce damages on highways, pavements and bridges and to also improve road safety;

- introduction of an HDM-4 based road maintenance management system would result in better allocation of resources between rehabilitation and maintenance needs;

- implementing the strategy for road decentralization would help to strengthen the capacity of State Governments to better plan and implement sectoral development strategies;

- rationalizing the administration and financing of the CAPUFE and the rescued toll roads would contribute significantly to optimizing the benefits from the most costly assets in the road sub-sector; and

- project implementation would temporarily increase employment directly associated with the civil works components.

Target Population. The project's benefits would accrue primarily to direct road users. They would benefit primarily from the reduced vehicle operating costs and increased safety. The population in the corridors served by the project roads would benefit from eventual reductions in the price of transported commodities as the reduction in transport costs are passed on to shippers. This is expected to happen because road freight transport is de-regulated fully in Mexico.

4. Institutional and implementation arrangements:

Implementation Agencies. BANOBRAS will be the Borrower and will transfer the loan proceeds to the United Mexican States (the Guarantor) through SCT under the same terms and conditions as the Bank loan, with the Guarantor bearing the foreign exchange and interest rate risks. It was agreed at negotiations that, as a condition of effectiveness, the Borrower and the Guarantor will enter into contractual arrangements satisfactory to the Bank for the transfer of loan funds. No separate project management unit will be required. The project will rely for its implementation on existing institutions, especially the SCT, which has overall responsibility for the transport sector. It would be responsible for the execution of the project through its various Directorates. All of the above agencies have sufficient capacity to play their roles in executing the project, as demonstrated by the excellent implementation of the ongoing HRTS Project.

Implementation Period. Project implementation is expected to start in April of year 2001 and be completed by December 31, 2004.

Accounting, Financial Reporting and Auditing Arrangements. SCT has a good administrative capacity and ample experience in managing Bank projects. The financial management, accounting system, and internal controls are already in place and have been operating satisfactorily, and their use would be continued under the present project. SCT has begun to take steps to adapt its financial management systems in line with Bank's Financial Management Initiative (LACI) for project management.

BANOBRAS will be the financial agent, and hence will be responsible for the Special Account. This local development bank has ample experience on Bank requirements for disbursement, auditing and traditional reporting. The project will feature Project Management Reporting (PMR) but excludes PMR-based disbursements during the initial stages of Project Implementation.

Project accounts will be maintained by SCT and by BANOBRAS in accordance with accounting practices internationally accepted by the profession and satisfactory to the Bank, as required by the Financial Accounting, Reporting and Auditing Handbook (FARAH).

An annual audit report of project accounts, and a separate opinion with respect to the Statements of Expenditures or PMAs, as the case may be, and the Special Account prepared by independent auditors acceptable to the Bank, and in accordance with both Bank documents: (i) "Guidelines and Terms of Reference for audits of projects with financing by the World Bank in the Latin America and Caribbean Region" and (ii) FARAH; will be submitted to the Bank no more than six months after completion for each fiscal year. SECODAM via its SCT internal audit department, will audit all project operations (annually), as described in the Operation Manual and as established in the MET (*Memorándum de Entendimiento Técnico).*

Project expenditures will be recorded in such a way that all related sources of funds and types of expenditures are clearly identified. SCT will: (i) establish a consistent financial, accounting and reporting system for the project; (ii) maintain all required information and supporting documentation corresponding to project implementation; and (iii) be responsible for the preparation of PMRs with the support of BANOBRAS.

Disbursement. During preparation, disbursement arrangements were discussed in detail and agreed upon with SCT. As a consequence of the findings of the financial management assessment, as of today SCT is not eligible for PMR-based disbursements. Hence the disbursement procedure will be via the traditional

mechanism such as Statement of Expenditures (SOEs), Direct payments (DP) and Special commitments. Nevertheless, for project management, SCT will produce satisfactory PMRs within the first year after project effectiveness.

SCT will provide required information to BANOBRAS, which will submit to the Bank all applications for withdrawals regarding expenditures to be financed with the loan proceeds.

Monitoring and Evaluation Arrangements. SCT will monitor the project closely and will prepare and issue biannual reports, in March and in September, that will summarize the progress in project implementation. The SCT's reviews and the reports would focus on the: (a) progress against the previous annual project implementation schedule; (b) level and composition of the SCT road maintenance budget for the fiscal year in which the review takes place; (c) performance against the project monitoring indicators; and (d) finalization of the selection of sub-projects for the current year, taking into consideration the balance of the SCT road maintenance budget. SCT will take necessary actions update reports on the progress of each component of the project, at least one month before the date fixed for the Annual Bank Review.

Mid-Term Review. In April 2003, the Government and the Bank will conduct a mid-term review of the implementation progress, which in addition to the items covered in the Annual Review, would focus on the: (a) adequacy of funding for the maintenance of the federal network; (b) progress on the institutional strengthening being supported under the project; (c) progress being made in bringing the federal road network to good condition; and (d) progress of the training program.

Agreement was reached at negotiations that SCT would provide: (a) every six months, progress reports to the Bank for monitoring purposes on the basis of a format and methodology acceptable to the Bank; and (b) within six months of the closing date, an input to the project's Implementation Completion Report.

Bank Supervision. It is estimated that an average of about 18 staff weeks a year will be required for supervising the project.

D. Project Rationale

1. Project alternatives considered and reasons for rejection:

Other Lending Options. A supplemental loan to the ongoing Loan 3628-ME (HRTS) was considered and rejected at the time of the PCD discussion since it did not meet the criteria for supplemental loans.

Other Project Design Options. The possibility of including a pilot CREMA program (a rehabilitation and maintenance by contract program based on performance standards being implemented in Argentina and Uruguay and introduced in Brazil) was discussed for about 500 km of rehabilitation and subsequent maintenance at the PCD stage, but the SCT requested that it be dropped since it would involve changes in policy on contracting, which the then government did not want to commit the incoming administration to. A pilot program of comprehensive maintenance by contract was included instead, which doesn't require policy changes and is an important step in the same direction and will provide the SCT with the necessary expertise to consider the possibility of a CREMA program in the future. In general, CREMA contracts are practically the same as comprehensive maintenance by contract. They include routine and periodic maintenance, some minor occasional activities, preparation of short term implementation programs, even training and management of the program. The only difference between CREMA and the comprehensive maintenance program that is proposed here is that a CREMA contract is based on performance while the comprehensive maintenance contract is based on unit prices and lump sums. If SCT were to include

CREMA contracts in this project then it would be necessary to modify their procurement policy; such modifications are not feasible now. Comprehensive maintenance contracts are consistent with the existing procurement policy.

2. Major related projects financed by the Bank and/or other development agencies (completed, ongoing and planned).

Sector Issue	Project	Latest Supervision (PSR) Ratings (Bank-financed projects only)	
		Implementation Progress (IP)	Development Objective (DO)
Bank-financed Roads rehabilitation and maintenance, traffic safety improvements, introduction of a road maintenance management system and staff training	Highway Rehabilitation and Traffic Safety Project (Loan 3628-ME)	S	S
Other development agencies Inter-American Development Bank	Transportation and Communications Improvement Modernization of Feeder Highways Rural Roads Rehabilitation and Modernization Urban Development		

IP/DO Ratings: HS (Highly Satisfactory), S (Satisfactory), U (Unsatisfactory), HU (Highly Unsatisfactory)

3. Lessons learned and reflected in the project design:

The overall conclusion is that, after slow and at times halting starts, the Borrower has become progressively more effective in implementing highway projects. Furthermore, although the implementation of institutional measures has taken longer than expected, progress has been substantive.

Most of the lessons learned are reflected in the project design as follows:

(i) the budgetary reductions generated by the economic crises forced DGCC to postpone rehabilitation of important segments of the federal highway. Instead, they had to assign most of the resources available to heavy maintenance of longer segments so as to avoid their further deterioration. The proposed project, includes a higher Bank financing participation (70%), to help mitigate the risks associated with budgetary restrictions;

(ii) the adoption of standard bidding documents agreed by the Bank with the Mexican Government, under previous projects should help to streamline procurement;

(iii) the change in the criteria to prepare DGCC annual highway maintenance programs, from an empirical assessment of the physical conditions of the federal highway network to a maintenance management system, will permit a better definition of annual investments required under different scenarios. The project

will build on this experience in order to facilitate the transition from SISTER to HDM-4 modeling;

(iv) the environmental assessment model developed under the previous project, is expected to be applied by all SCT agencies, especially DGCC, as required; and

(v) the study of alternative mechanisms to finance the highway sector, being financed through the previous project, is expected to be completed by December 2000. Its recommendations are to be discussed with the Government and steps will be taken for its implementation under the project.

The Project Files include a comprehensive summary of the Bank's experience in the highway sector since 1960.

4. Indications of borrower commitment and ownership:

The government has shown full support for the implementation of the ongoing HRTS Project to which the proposed project represents a continuation. The government has demonstrated its priority for road maintenance by protecting as much as possible SCT's maintenance budget in the face of the last across-the-board reductions in public expenditure. SCT never waivered in its commitment to HRTS or to the subsequently prepared Federal Highway Modernization Project (1997). However, the severity of the fiscal situation at that time prevented the Government (SHCP) from meeting its counterpart requirements for the Federal Highway Modernization Project and hence the Loan never became effective and was cancelled. Currently the situation has improved and the proposed project will feature lower counterpart requirements given the higher proposed disbursement percentage. SHCP is strongly committed to this proposed project because it will cover the majority of the foreign exchange needs for the annual maintenance and rehabilitation programs.

5. Value added of Bank support in this project:

There is a continuing need to further improve all aspects of road maintenance, decentralization of road management, and toll roads management; these are areas in which the Bank has wide experience in Latin America. Continuing Bank support would prove helpful in assuring adequate attention is paid to maintenance as Mexico is entering a decade in which, given the strong prospects for NAFTA countries, there will be significant pressures for expansion of the road network. Also, the introduction of an innovative and effective approach to road maintenance by contract, and the implementation of the HDM-4 would significantly improve efficiency in the use of scarce resources.

E. Summary Project Analysis (Detailed assessments are in the project file, see Annex 8)

1. Economic (see Annex 4):

● Cost benefit NPV=US$395 million; ERR = 115% % (see Annex 4)

○ Cost effectiveness

○ Other (specify)

Currently 57% of the SCT managed network is in good or fair condition. The objective over the next 4 years is to increase this percentage to 75% by rehabilitation of selected sections in poor condition, by periodic maintenance for selected portions in fair condition and by routine maintenance for the segments in good condition, as well as the strengthening of selected bridges. Therefore, it is expected during the program period that SCT will prioritize economically and carry out: (i) 22,000 km of periodic maintenance; (ii) routine maintenance on at least 25,000 km in good and fair condition; (iii) 2,000 km of road rehabilitation (really pavement replacement); and (iv) rehabilitation of 350 bridges.

SCT evaluated each section to be maintained or rehabilitated during the first year of the project (2001) using the RED model, with current data for road, vehicle fleet and road works characteristics and costs. The resulting rates of return are much greater than the 12% minimum required, which is consistent with the HRTS project. The RED model adopts unit road user costs computed using the HDM-III model and simplifies the economic evaluation by maintaining a constant level of service (roughness) with and without the project over the evaluation period, which was set to ten years for rehabilitation works and five years for periodic maintenance works. With more detailed data to be available in the near future, the economic evaluation of the second year program (2002) will be done by SCT using the HDM-4 model to be introduced under the project.

SCT evaluated the bridge rehabilitation component by determining the road user benefits of the bridge improvements in terms of savings in vehicle operating costs and time costs. The without project case considers weight restrictions on the bridges implying that heavy vehicles are forced to use alternative routes or reduce their weight by transferring some of the cargo to other vehicles. The with project case considers structural strengthening of the bridges that eliminates travel restrictions.

The net present value (NPV) of the selected road rehabilitation and maintenance strategy over the next 20 years is US$395.00 million. The NPV of the resulting first year road rehabilitation and maintenance works (85% of civil works) financed under the project is US$250 million with an internal rate of return (IRR) of 114% and a modified internal rate of return (MIRR) of 36%, considering a financing and reinvestment rate of 12%. Assuming there is an increase of 20% in agency costs, the IRR decreases to 97% and the MIRR to 33%. A 20% decrease in traffic decreases the IRR to 91% and the MIRR to 32%. A combination of an increase in agency costs by 20% and decrease in traffic by 20%, decreases the IRR to 77% and the MIRR to 30%. To have a net present value equal to zero, agency costs have to be 560% higher than the estimated costs, or traffic levels only 18% of the estimated traffic. These events have a very low probability of occurrence indicating that the project's economic viability is very robust. The NPV of the comprehensive maintenance program is US$65 million with an IRR of 140% and a MIRR of 38%. The NPV of the first year bridge maintenance program is US$220 million with an IRR of 68% and a MIRR of 57%. The combined IRR of the three project components evaluated is 115% with a MIRR of 40%.

2. Financial (see Annex 4 and Annex 5):
NPV=US$ million; FRR = % (see Annex 4)
Financing Plan: The project's financing plan is shown on the cover sheet. The proposed loan of US$218 million would cover about 70% of project costs; the government would finance the remaining US$85 million.

Financial Management and Controls: BANOBRAS and SCT's financial management system and internal controls for Bank-financed projects are adequate. The current system and controls would be used for the proposed project.

Project Costs: (Details in Annex 3). Project costs are based on bids for similar works being carried out under the ongoing HRTS project and the prevailing costs of consultant services and training in Mexico. The government agreed at negotiations to provide timely counterpart funds for the project.

Fiscal Impact:

The fiscal impact will be small because the annual project investments represent less than 5% of the revenues collected from the road subsector through licenses fees and taxes on fuels, vehicle spare parts, etc. Also, by covering such a large part of the foreign cost of the program, the project will contribute to a

reduction in net Government financing requirements.

3. Technical:

The maintenance and rehabilitation works included under the proposed project are similar to those being carried out under the ongoing HRTS project. The works are not technically complex and well within the capacity and capability of the consultants who will complete the design of the second and third years of the program and carryout work supervision, and also of the contractors who will execute the works. The DGCC has completed the designs of the works for the first year, which are expected to be procured within calendar year 2000 and awarded in early 2001.

4. Institutional:

4.1 Executing agencies:

The SCT's *Dirección General de Conservación de Carreteras* (DGCC) will be the executing agency for the following components of the project: (i) highway rehabilitation and maintenance; (ii) comprehensive maintenance pilot program; and (iii) improvement of road-maintenance management. The SCT's *Dirección General de Autotransporte Federal* (DGAF) will be the executing agency for constructing and equipping the two weight and dimensions control stations. The *Unidad de Autopistas de Cuota,* SCT's toll roads regulating agency, will be responsible for the technical assistance required to implement a financing mechanism and the toll road management. The DGCC and the DGAF have significantly improved their capacity for road maintenance management, and for contracting and supervising the execution of highway rehabilitation/periodic maintenance works under the recently completed HRTS project. The proposed project would include further technical assistance and training in these areas.

4.2 Project management:

There is no specific coordinating unit for the project; instead, as was the case for the HRTS, project management will be integrated into the responsibilities of existing SCT directorates. For instance DGCC and DGAF have successfully managed the HRTS project, while BANOBRAS, in its role as the Borrower, has performed the liaison function with the Bank efficiently. All of these agencies are fully familiar with Bank procedures.

4.3 Procurement issues:

None. Standard Bank documents will be used.

A procurement assessment was carried out to determine if the Borrower and Guarantor have in place the appropriate procurement procedures and standards. During the discussions of the assessment the present authorities in BANOBRAS and SCT expressed their commitment to adhere to competitive selection and transparency in all activities. The Federal Government's Secretariat of Control and Administration (SECODAM) has an office in the SCT to perform internal audits and implement activities to promote and improve transparency. In addition, to increase governance, all complaints and their resolutions are available to the public through the Internet (COMPRANET).

In addition to external auditors, who conduct annual financial audits for the project, a procurement audit was performed, both of which show satisfactory performance by SCT.

A copy of the Assessment is included in the Project Files.

4.4 Financial management issues:

None. BANOBRAS will be responsible for project auditing and financial reporting.

A Financial Management assessment was carried out and it demonstrated that SCT has an appropriate financial management system in place.

5. Environmental: Environmental Category: B (Partial Assessment)

5.1 Summarize the steps undertaken for environmental assessment and EMP preparation (including consultation and disclosure) and the significant issues and their treatment emerging from this analysis.

Major: The proposed works involve the maintenance and rehabilitation (repaving) of existing federal highways along well-consolidated right of ways (RoW) and no impacts on sensitive ecosystems and human populations are expected. An initial screening of the proposed projects identified no direct or indirect impacts. As such, the subprojects do not require independent, stand-alone environmental analysis; instead the well tested SCT procedures used under HRTS, will be applied. The type of rehabilitation and repaving works will not entail any resettlement of population along the RoW.

Other: Construction related nuisances and disturbances along the right of way.

Justification/Rationale for category rating:

Any potential impacts related to the construction works will be minor and can be managed through the application of good environmental practices. A review of similar road rehabilitation projects recently carried out in the country showed that good environmental practices are being implemented satisfactorily for the design and construction of road rehabilitation and maintenance. In addition, the road sector is applying standard procedures for environmental assessment of road and transport projects *(Modelo de Evaluación Ambiental: automatizaciónde la información y modelo de simulación - Manual del Usuario).* This manual relies on the application of Geographical Information Systems (GIS) to categorize and identify environmental issues and mitigatory measures for road and other transport infrastructure.

Proposed Actions: Construction related impacts would be managed through the application of environmental clauses in construction contracts. These clauses will focus on the implementation of good housekeeping measures to reduce nuisances during construction. These measures include dust, noise and pollution control, protection of construction sites, final landscaping, proper disposal of construction wastes, selection, exploitation and restoration of borrow pits and quarries, traffic management and pedestrian safety, health and safety of workers and public relations. The application of these good housekeeping measures will be ensured by their inclusion in the tender documents and construction contracts. The contractors will be responsible for complying with these measures and the supervision engineers will help to ensure this.

All subprojects will comply with existing environmental requirements in Mexico. The General Law of Ecological Equilibrium and Environmental protection requires for this type of project the preparation of a very limited Type 1 Environmental Statement and the presentation to the environmental agency of very basic project information that follows simplified administrative procedures.

Status of any other environmental studies: No further environmental studies are required.

Resettlement

The type of rehabilitation of repaving works will not entail any resettlement of population along the RoW.

The 2001-2003 programs of the DGCC, of which the loan could finance about 25%, include only pavement and drainage rehabilitation and pavement maintenance activities, that are all to be implemented within the existing road platform and with no need for resettlement.

With respect to the construction of vehicle weight and dimension control stations in Nuevo Laredo, State of Tamaulipas and in Palmillas, State of Querétaro, it was agreed that the land (which is unoccupied) will be acquired by SCT in accordance with the provisions of OD 4.30. Adequate covenants were included in the Guarantee Agreement to help enforce the above mentioned arrangements.

5.2 What are the main features of the EMP and are they adequate?

Not applicable

5.3 For Category A and B projects, timeline and status of EA:

Date of receipt of final draft:

The project involves only pavement repair works within the existing platform. There are adequate provisions and procedures in the SCT manuals for the environmental management requirements. Further studies would only duplicate the manuals recommendations which are based on SCT implementation experience with Bank projects. Hence no stand alone environmental assessment was required. Please refer to Section 5.1.

5.4 How have stakeholders been consulted at the stage of (a) environmental screening and (b) draft EA report on the environmental impacts and proposed environment management plan? Describe mechanisms of consultation that were used and which groups were consulted?

Extensive consultations were carried out as part of the Social Assessment; these included local municipal authorities, user groups, and residents in influence areas. All groups expressed support for the project (see Section 6).

5.5 What mechanisms have been established to monitor and evaluate the impact of the project on the environment? Do the indicators reflect the objectives and results of the EMP?

Not applicable

6. Social:

6.1 Summarize key social issues relevant to the project objectives, and specify the project's social development outcomes.

The rehabilitation and maintenance works under the proposed project, like those financed by the ongoing HRTS project, are not expected to cause any adverse social impacts since the works are on the existing road alignments and within the existing road platform. The project would have a positive social impact by generating short-term increases in employment in the areas of influence of the project roads during implementation and will support regional development in the long run by providing improved access to markets and services.

The main outcomes of the HRTS project, of which the proposed project is a follow up, indicate that no land purchases nor involuntary resettlement, nor any other perceptible social impacts occurred during its six year implementation period. The ICR under preparation will document fully these results.

To confirm the above expectations, a social assessment was prepared in order to: (i) ensure that the project will not cause involuntary resettlement as defined in OD 4.30; (ii) identify possible impacts on indigenous peoples in compliance with OD 4.20; (iii) identify any other social impacts and design mitigation measures if necessary; (iv) better identify the project benefits; and (v) propose a simple method of monitoring any possible social impact arising from the project during its implementation.

The social assessment comprised field research of subprojects completed under the HRTS project and also subprojects to be implemented under the 2001 program in two social, economic and culturally distinct regions, the Western Region, comprising coastal areas of Jalisco, Nayarit and Sinaloa states; and the Gulf Region, including Veracruz, Tamaulipas and San Luis Potosi states. Overall, the survey analized 398 km of road subprojects and six bridges along a total distance of more than 4,000 km (a summary of the social assessment is included as Annex 11; the full report is available in the Project Files).

Possible Social Impacts

The social assessment confirmed that the rehabilitation and maintenance works under the project will not cause any social impacts and is in compliance with Bank policies, OD 4.30 Involuntary Resettlement or OD 4.20 Indigenous Peoples. On the contrary, municipal and local authorities, as well as beneficiaries interviewed during the social assessment pointed out that road improvement is a priority and they expect to benefit from better access to markets and services.

(a) Resettlement

The Bank has reviewed the overall three year program of said works to be carried out under the proposed Project and assessed in detail the year 2001 program thus removing any uncertainty about resettlement issues. Moreover, as project implementation proceeds, no resettlement is expected because of the following reasons:

Scope. The project focuses on maintenance and rehabilitation of the long existing (30 year old) federal network that features high volumes of traffic and that connects by definition the country's capital (Mexico City) with state capitals, main ports and major cities. Thus the federal network connects long developed regions rather than incorporating new areas that may incur the risk of resettlement. As a result the focus of this project will be primarily on maintaining the competitiveness of the country.

Technical. The project is a follow-up of the HRTS project, which did not incur any involuntary resettlement or land acquisitions. All works are to be carried out within the existing platform of the road; there are no changes in road alignment, elevated ways, or bypasses or any other work beyond the existing geometrical design. The field research proved that this is the case of the proposed works for the year 2001. The Bank will review and agree in advance on the work program for the following years to ensure that only works that fit the technical, economic and social criteria are implemented.

Institutional. SCT's internal regulations do not allow the project executing agency (DGCC) to undertake works that require land acquisition, occupy land beyond the original right of way or incur any involuntary resettlement.

Legal. Several articles of Mexico's applicable laws (the *Ley de Vias Generales de Comunicación* and *Ley General de Bienes Nacionales)* specifically forbid occupation of the right of way of federal roads. Illegal occupation of the right of way is a federal violation that has been strongly enforced. *Centros* SCT (decentralized SCT units, one in each state) through their Right of Way Units, are in charge of enforcing this regulation. This process has discouraged irregular occupation of the right of way of the federal roads.

Social. The high traffic levels of the federal roads, of which approximately 25% is heavy vehicles, make it difficult and dangerous to establish irregular settlements along these roads. There are however, seasonal and occasional vendors in some segments of the roads (during harvests for instance). SCT has tolerated

this occasional use of the right of way but it issues a "notice of advice" that fixed structures are forbidden. Established businesses are careful to keep out of the right of way to avoid sanctions and they support this control as it helps to minimize "unfair competition" from merchants operating illegally within the RoW. Following the survey of some 4,000 km of roads, the social assessment corroborated these findings. (The Project Files contain further details and photos).

(b) **Indigenous People**

Because the proposed project involves only works within the long established federal highway network serving major cities and well developed urban areas, indigenous communities are not affected. The Social assessment verified that no indigenous communities will be affected adversely by the proposed Project, as proved by the field visits to states with important indigenous populations such as Nayarit and Veracruz. On the contrary, rural communities that live in isolation, including some with indigenous population can benefit from the access, through feeder roads, to existing federal roads. Indigenous communities around Ixmiquilpan in the Mezquital Valley, visited during project preparation, are a good example of such benefits. In the opinion of local authorities and beneficiaries interviewed, having access to roads is a priority demand for most indigenous communities.

(c) **Cultural Assets**

There is no danger of damaging cultural assets because of the scope of the project and above-mentioned technical reasons. Any occasional (chance) findings are protected under the contracts with the private firms executing the works and Mexican regulations.

(d) **Other Social Issues**

Beneficiaries mentioned other minor social issues that may occur during execution of the works such as delays in finishing the works, deviations, inadequate signaling, etc. All of these aspects are governed by specific clauses of the construction contracts with SCT and will be enforced during implementation.

(e) **Weigh Stations**

Under the proposed project two such stations will be built: (i) one twin scale station near Palmillas in Querétaro State; and (ii) a single scale station in Nuevo Laredo, near the border with USA in the State of Tamaulipas. According to SCT, this type of infrastructure requires a strip of land one kilometer long by 6 meters wide on average, largely to provide deceleration and acceleration lanes. Because a station can be built at any point along any given road it is possible to avoid sites that involve displacement of people or any other social impact. The stations in Nuevo Laredo and Palmillas will be situated so as to meet similar conditions and to avoid any social impact. This agreement has been reached at negotiations. The land in the areas in which both stations will be located is unoccupied land and the purchase of said land will be carried out in accordance with OD 4.30. It was further agreed during negotiations that no bidding documents will be issued for the construction of said stations until the Bank has received, evidence acceptable to the Bank, that the land on which each station will be located has been acquired in a manner satisfactory to the Bank. Land has already been obtained for the Palmillas station.

Implementation Framework

To ensure that the rehabilitation and maintenance works under the Project are in compliance with Bank policies during implementation, an "Implementation Framework", comprising technical, social, and

environmental criteria, has been prepared and included as Annex 12. This Implementation Framework includes:

- *Proposed Subprojects :* Starting in September 2001, SCT would submit to the Bank the HMP and BRP detailing the subprojects to be carried out during the next year, under a letter to be signed by the Sub-Secretario of Infrastructure.

- *Proof of compliance.* SCT will provide supporting information to ensure that all subproject candidates meet agreed criteria in terms of their: (i) technical; (ii) economic; and (iii) social aspects.

- *Verification.* The SCT's letter would confirm that there is no land acquisition requirements nor the need to resettle people.

- *Annual Reviews.* The Bank supervision team will carry out annual reviews of compliance with the social, environmental, and other policies.

Using as a model the social assessment recently carried out, subsequent social compliance reviews will include: (i) reports on work progress to ensure that communities are not adversely affected; (ii) selection and supervision of a sample from the proposed annual program to identify possible social impacts; and (iii) quick consultations with municipal and local officials, as well as potential beneficiaries.

6.2 Participatory Approach: How are key stakeholders participating in the project?

Because the federal network is long established and the type of works in the project require certain specialization, direct involvement of local communities is limited. However, local people interviewed during the social assessment mentioned these works as a source of temporary employment and an indirect source of income.

The SCT center in each state, which is responsible for supervising all works in federal roads, should inform the community in adance about the type and duration of the works to be carried out under its jurisdiction and address any conflicts that might arise during execution.

6.3 How does the project involve consultations or collaboration with NGOs or other civil society organizations?

See above

6.4 What institutional arrangements have been provided to ensure the project achieves its social development outcomes?

Mitigation measures and a framework to regulate project implementation was agreed during negotiations.

6.5 How will the project monitor performance in terms of social development outcomes?

Not applicable

7. Safeguard Policies:

7.1 Do any of the following safeguard policies apply to the project?

Policy	Applicability
Environmental Assessment (OP 4.01, BP 4.01, GP 4.01)	● Yes ○ No
Natural habitats (OP 4.04, BP 4.04, GP 4.04)	○ Yes ● No
Forestry (OP 4.36, GP 4.36)	○ Yes ● No
Pest Management (OP 4.09)	○ Yes ● No
Cultural Property (OPN 11.03)	○ Yes ● No
Indigenous Peoples (OD 4.20)	○ Yes ● No
Involuntary Resettlement (OD 4.30)	○ Yes ● No
Safety of Dams (OP 4.37, BP 4.37)	○ Yes ● No
Projects in International Waters (OP 7.50, BP 7.50, GP 7.50)	○ Yes ● No
Projects in Disputed Areas (OP 7.60, BP 7.60, GP 7.60)	○ Yes ● No

7.2 Describe provisions made by the project to ensure compliance with applicable safeguard policies.

See sections 5 and 6.

F. Sustainability and Risks

1. Sustainability:

The sustainability of the project would be determined by subsequent adequate maintenance of the rehabilitated roads and the continued application of the improved maintenance management systems. Regarding road maintenance funding, the government is currently carrying out a comprehensive review of SCT's highway financing issues with Bank assistance under another operation. The review is expected to lead ultimately to the establishment of financing mechanisms that will ensure the financial sustainability of the sector. In terms of institution building, SCT has demonstrated its willingness and commitment to the application of systems and skills to be developed under the project, through its performance under the ongoing HRTS project.

2. Critical Risks (reflecting the failure of critical assumptions found in the fourth column of Annex 1):

Risk	Risk Rating	Risk Mitigation Measure
From Outputs to Objective		
(i) The Government does not increase its road maintenance funding to appropriate levels.	M	Recent budgetary provisions have demonstrated an improving trend.
(ii) The procurement documents can not be designed timely for comprehensive maintenance.	M	The documents will be based on models being used in other countries. Consultants will assist SCT to adapt them to Mexico.
(iii) There will not be adequate enforcement of weight and dimensions regulations.	M	SCT through DGAF has adequate regulations and institutional arrangements in place for enforcement.
(iv) The SCT does not place sufficient emphasis on institutional development and improvement in maintenance management.	N	Momentum will be maintained through the introduction of new modeling techniques (HDM-4) and through staff training and study tours.
(v) The Government does not agree on a decentralization strategy to be implemented.	M	Government has been implementing decentralization programs and their efforts are being reinforced by this and other Bank programs.
(vi) The SHCP will not maintain dialogue on financing issues.	M	SHCP has accorded high priority to resolving financing issues. Additional support will also be provided under another Bank operation.
From Components to Outputs		
Adequate counterpart funds are not available on a timely basis.	M	Timely supervision missions by the Bank will help ensure the availability of counterpart funds supported by loan covenants.
SCT does not follow Bank procurement procedures.	M	Use of Bank standard documents combined with continuous follow-up by Resident Mission staff.
SCT reduces priority assigned to institutional development.	M	Project will finance training for SCT staff in management, policy and institutional issues.
Overall Risk Rating	M	

Risk Rating - H (High Risk), S (Substantial Risk), M (Modest Risk), N(Negligible or Low Risk)

3. Possible Controversial Aspects:

Not applicable.

G. Main Loan Conditions

1. Effectiveness Condition

The Borrower and the Guarantor will enter into contractual arrangements satisfactory to the Bank for the transfer of loan funds.

2. Other [classify according to covenant types used in the Legal Agreements.]

(a) Dated Covenants for the Annual Highway and Bridge Programs:

(i) the DGCC will prepare an annual HMP, starting in year 2002, with the SISTER Model or the HDM-4 Model, provided that subprojects to be included in HMP for year 2003 shall be designed in accordance with the HDM-4 Model, that will feature adequate expenditure balance between road rehabilitation, resurfacing and maintenance needs;

(ii) the Government will review with the Bank, by October 31, of each year the budget proposals for the following year, and by February 15 of such year the HMP and BRP budget approved for that fiscal year; and

(iii) the annual HMP and BRP will comply with the criteria shown in the Implementation Framework (IF) outlined in Annex 12. The Borrower will submit the annual programs for Bank review in an Implementation Letter covering the: (i) technical requirements; (ii) economic feasibility; (iii) environmental procedures; and (iv) social compliance that includes: (a) legal certification of the right of way; and (b) consultation with municipalities.

(b) Reporting:

(i) that the SCT will prepare and furnish to the Bank, 45 days after the end of each year, a summary report assessing progress made in implementing the annual HMP and BRP;

(ii) on the arrangements for project monitoring; scope and timing of the annual and mid-term reviews and scope and frequency of progress reports; and

(iii) that at the mid-term review, the performance of the project will be examined thoroughly.

H. Readiness for Implementation

☒ 1. a) The engineering design documents for the first year's activities are complete and ready for the start of project implementation.
☐ 1. b) Not applicable.

☒ 2. The procurement documents for the first year's activities are complete and ready for the start of project implementation.
☒ 3. The Project Implementation Plan has been appraised and found to be realistic and of satisfactory quality.
☐ 4. The following items are lacking and are discussed under loan conditions (Section G):

I. Compliance with Bank Policies

☒ 1. This project complies with all applicable Bank policies.
☐ 2. The following exceptions to Bank policies are recommended for approval. The project complies with all other applicable Bank policies.

Jose Alonso-Biarge **Team Leader**	Danny M. Leipziger **Sector Manager**	Olivier Lafourcade **Country Manager**

Annex 1: Project Design Summary

MEXICO: FEDERAL HIGHWAY MAINTENANCE PROJECT

Hierarchy of Objectives	Key Performance Indicators	Monitoring & Evaluation	Critical Assumptions
Sector-related CAS Goal: The project supports overall CAS objectives related to removing obstacles to sustainable growth and maintaining macroeconomic stability in the context of globalization. Specifically, it will support Government and Bank strategies related to:	**Sector Indicators:** Removal of transportation bottlenecks in key export corridors.	**Sector/ country reports:** Bank and Government annual consultative meetings.	**(from Goal to Bank Mission)** That the Government would continue to pursue a development strategy which emphasizes the alleviation of poverty and increased economic growth.
(i) removing impediments to private sector growth and competitiveness; and	Improved financing mechanisms for road sector. Improved contract management procedures.	Review of work done on the highway financing mechanism and on toll roads.	That the Government will pursue its plan for enhanced sustainability of road sector financing.
(ii) ensuring the provision of quality infrastructure.	Improving management of the federal highway network.	Increasing from 57% to 64% the share of the network (41,865 km) in good and fair condition.	Timely implementation of the project.
Project Development Objective: To improve transport efficiency on the road network	**Outcome / Impact Indicators:** Reduction in VOC on project roads (an average reduction of 20% compared with the current value)	**Project reports:** Information from SCT surveys and annual inventory.	**(from Objective to Goal)** That counterpart funds will be provided in a timely manner and at adequate levels.
To improve SCT's rehabilitation and maintenance planning performance.	Timely preparation of HMP and BRP economically prioritized annual plans.	Analysis of rehabilitation and maintenance plans.	SCT willingness to phase out its SISTER model, and upgrade staff capacity as well as the collection and analysis procedures needed for HDM-4.
To enhance private-sector participation in road maintenance.	Amounts invested and number of contracts managed annually, including the comprehensive maintenance contracts.	Supervision consultants' reports on maintenance programs, including the pilot program of comprehensive maintenance by contract.	That SCT accords priority to implementing maintenance by contract and the pilot program of comprehensive maintenance.

Hierarchy of Objectives	Key Performance Indicators	Monitoring & Evaluation	Critical Assumptions
Output from each Component:	**Output Indicators:**	**Project reports:**	**(from Outputs to Objective)**
A. Civil Works			
(i) Highway Maintenance and Rehabilitation	(a) km of roads maintained and rehabilitated under the project; (b) number of bridges rehabilitated; and (c) condition of roads in terms of roughness reduction.	(a) Bank's supervision missions; (b) civil works supervision consultants' reports; (c) field measurements by SCT; and (d) borrower's completion report.	That the Government continues to increase its road maintenance funding to match the rehabilitation rate.
(ii) Comprehensive Maintenance	Introduction of comprehensive maintenance concept to Mexico. Successful implementation and analysis of steps taken to improve road maintenance.	SCT's annual reports and Bank's supervision missions.	That procurement documents can be designed timely for comprehensive maintenance.
(iii) Weight Control Stations	Effective operation and subsequent reduction of vehicle overloading.	SCT's annual reports and Bank's supervision missions.	That there will be adequate enforcement of weight and dimensions regulations.
B. Capacity Building			
(i) Annual Planning and Prioritizing	Establishment of HDM-4 team. Road condition inventories carried out on time each year. % of contracts completed on time.	SCT's annual reports and Bank's supervision missions.	That SCT continues to consider institutional development and improvement in maintenance management as a high priority objective.
(ii) Decentralization Strategy	Decentralization strategies suitable for Mexico axe designed.	Consultants' reports and Bank's supervision missions and sector work.	That the Government agrees on the decentralization strategy to be implemented.
(iii) Highway Financing Mechanisms and Toll Roads	Analysis completed and workshops on strategic options held by SCT. Solutions are designed for the acute sector financing problems.	SCT's annual reports and Bank's sector work.	That SHCP is willing to maintain a dialogue on financing issues.

Hierarchy of Objectives	Key Performance Indicators	Monitoring & Evaluation	Critical Assumptions
Project Components / Sub-components:	**Inputs: (budget for each component)**	**Project reports:**	**(from Components to Outputs)**
I. Highway Maintenance and Rehabilitation	245.0		
Rehabilitation of selected federal roads and bridges including supervision of the entire HMP and BRP (2001-2003).		Information from road work consultants supervision reports against benchmarks established at appraisal.	I, II and III: (a) that adequate counterpart funds are available; and (b) that SCT continues to use the Bank's standard documents for procurement.
II. Pilot Program of Comprehensive Maintenance	19.5		
Including provision of consulting services for design and supervision.		Supervision reports.	
III. Construction of 2 Weight Control Stations	4.5		
To support the pilot program of national vehicle weight and dimensions control.		Supervision reports.	II and IV: that SCT continues to give high priority to institutional development.
IV. **Institutional Strengthening**	4.0		
Provision of consulting services for: implementing the HDM-4; developing a strategy for road decentralization; implementing the selected road financing mechanism; implementing the strategy to be recommended for toll roads; and staff training.		Supervision reports.	
V. Contingencies	33.82		
VI. Front end fee	2.18		
Total	309.0		

Annex 2: Detailed Project Description
MEXICO: FEDERAL HIGHWAY MAINTENANCE PROJECT

By Component:

Project Component 1 - US$245.00 million

A. Highway Rehabilitation and Maintenance - SCT has prepared the 2001-2003 HMP and BRP along key segments of the 41,865 km federal highway network based on the results of a series of simulations of various strategies of road maintenance rehabilitation and resurfacing using the SISTER model. The programs require a total expenditure level of about US$380 million per year.

This component includes subprojects selected from those programs and is composed of:

Part A1. Rehabilitation of about 1000 km of highways, with an estimated cost of US$150 million, from which the Bank would finance 70% of the total cost. The works are designed to improve the base, sub-base and pavement bearing capacity required by the relatively high percentage of trucks in the traffic stream. Rehabilitation works may also include the improvement/repair of drainage and sub-drainage systems and of shoulders. The table below shows the first year rehabilitation program.

First Year Rehabilitation Program

Road	State	Initial km	Final km	Length (km)	Condi _tion (1-20)	Traffic ADT	Cost (M US$)
El Sueco -Janos	Chihua	97.6	112.0	14.4	1	2120	1.62
Monclova-Piedras Negras Cpo.A	Coahui	116.0	127.0	11.0	1	6495	1.24
Piedras Negras-Cd. Acuña	Coahui	14.0	17.0	3.0	1	2540	0.34
Lim.Edosqro./Gto.-Limedosgto./Slp.C.B	Guanaj	37.0	46.0	9.0	1	7717	1.01
Lim.Edosqro./Gto.-Limedosgto./Slp.C.B	Guanaj	46.0	62.0	16.0	1	6772	1.80
Lim.Edosqro./Gto.-Limedosgto./Slp.C.B	Guanaj	62.0	67.0	5.0	1	6772	0.56
Lim.Edos.Mex./Hgo.-Pachuca	Hidalg	49.0	50.0	1.0	1	10249	0.15
Lim.Edos.Mex./Hgo.-Pachuca	Hidalg	53.0	58.0	5.0	1	6943	0.75
Lim.Edos.Mich./Jal.-T.Acatlan	Jalisc	65.0	82.0	17.0	1	6300	2.55
Jiquilpan-Lim.Edos.Mich./Jal (2 Cpos)	Michoa	0.0	5.0	10.0	1	10781	1.50
Cuautla-Lim. Edos.Mor./Pue.	Morelo	77.1	89.0	11.9	3	12259	2.16
San Gregorio-Oaxtepec	Morelo	35.5	38.5	3.0	2	3992	0.54
Lib. Norte De Monterrey	Nvo. L	15.0	35.0	20.0	1	8655	3.00
Huajuapan De Leon-Oaxaca	Oaxaca	60.0	72.5	12.5	1	2470	1.41
Lim.Edos.Mex./Pue.-Puebla	Puebla	72.0	81.0	9.0	2	11790	1.15
Lim.Edos.Mex./Qro.-Palmillas	Queret	128.0	132.0	4.0	1	4563	0.60
Lim.Edos.Nay./Sin.-Mazatlan	Sinalo	144.6	160.0	15.4	5	5690	2.48
Lim.Edos.Nay./Sin.-Mazatlan	Sinalo	190.0	199.2	9.2	5	5690	1.38
Estacion Manuel-La Coma	Tamaul	107.0	132.0	25.0	2	2200	2.81
Tampico-Estacion Manuel Cpo.A	Tamaul	25.0	36.0	11.0	1	8292	1.24
Lib.Apizaco	Tlaxca	0.0	10.5	10.5	5	9060	1.34
Cordoba-Veracruz	Veracr	59.0	80.0	21.0	4	9490	3.78
Naranjos-Ozuluama	Veracr	78.6	100.0	21.4	1	4455	3.85
Tihuatlan-Alazan	Veracr	45.0	57.0	12.0	1	5275	2.16
Jalpa-Zacatecas	Zacate	285.0	298.0	13.0	2	7060	1.95
Jalpa-Zacatecas	Zacate	308.0	312.0	4.0	2	7060	0.60
Lim.Edos.Ags./Zac.-Jalpa	Zacate	78.5	85.0	6.5	4	1981	0.98
Total				300.8			42.93

Condition: 1-6 Very Bad, 7-11 Bad, 12-17 Regular, 18-20 Good

Part A2. Periodic maintenance of about 1200 km, with an estimated cost of US$60 million, from which the Bank would finance 70% of the total cost. The works are designed to protect the pavement's useful life and improve the physical conditions of the surface, shoulders and drainage ditches. The table below shows the first year periodic maintenance program.

First Year Periodic Maintenance Program							
Road	State	Initial km	Final km	Length (km)	Condi _tion (1-20)	Traffic ADT	Cost (M US$)
Leon-Aguascalientes (2 Cpos).	Aguasc	103.0	110.9	15.8	9	11190	0.49
Mexicali-Tecate	Baja C	0.0	18.0	18.0	6	9624	1.49
Mexicali-Tecate	Baja C	109.0	113.0	4.0	7	4447	0.21
Lim. Edos. Tab./Camp.-Cescarcega	Campec	200.0	230.0	30.0	11	2100	0.63
Delicias-Chihuahua (Cpo. B)	Chihua	186.0	203.0	17.0	6	4630	0.55
Saltillo-Monterrey (Cpo. A)	Coahui	15.3	32.9	17.6	9	11305	0.49
Colima-T. Tecoman (Cpo. A)	Colima	33.0	37.0	4.0	7	5655	0.17
Colima-T. Tecoman (Cpo. A)	Colima	12.0	16.5	4.5	7	5213	0.17
Colima-T. Tecoman (Cpo. B)	Colima	26.0	29.0	3.0	7	5374	0.06
Gom. Pa.-Li.Edo.Dgo./Chi.(2 Cps.)	Durang	25.0	40.0	30.0	7	7470	1.08
Celaya-Salamanca	Guanaj	57.0	81.0	24.0	3	18077	0.77
Queretaro-San Luis Potosi (Cp. B)	Guanaj	67.0	89.0	22.0	2	6772	0.71
Acapulco-Zihuatanejo	Guerre	69.0	74.0	5.0	1	5478	0.26
Acapulco-Zihuatanejo	Guerre	135.0	144.0	9.0	1	5805	0.47
Iguala-Chilpancingo	Guerre	124.0	140.0	16.0	12	13215	0.46
Guadalajara-Lim. Edos. Jal./Zac.	Jalisc	46.0	77.0	31.0	1	2853	1.33
Toluca-Cd. Altamirano	Mexico	49.0	80.0	31.0	5	4728	1.60
Libramiento Norte De Zamora	Michoa	0.0	7.0	7.0	1	5068	0.30
Cuernavaca-Lim. Edos. Mor./Gro.	Morelo	37.0	41.0	4.0	7	5500	0.10
Matehuala-Saltillo	Nuevo	100.0	130.0	30.0	1	7940	1.29
Oaxaca-Tehuantepec	Oaxaca	41.0	48.0	7.0	3	3370	0.23
Ent. San Hipolito-Tehuacan	Puebla	39.0	59.0	20.0	1	12360	1.17
San Juan Del Rio-Xilitla	Queret	43.0	55.0	12.0	4	2985	0.52
Reforma Agraria-Puerto Juarez	Quinta	0.0	9.0	9.0	9	3472	0.39
San Luis Potosi-Ojuelos	S.L.P.	40.0	45.0	5.0	11	3900	0.22
Lim. Edos. Chis./Tab.-El Bellote	Tabasc	167.0	176.0	9.0	8	7315	0.28
Est. Gonzalez-Ent. Llera De Canales	Tamaul	30.0	60.0	30.0	1	3490	0.97
Lim. Edos. Mex./Tlax.-Apizaco	Tlaxca	74.0	87.0	13.0	5	10295	0.40
Cd. Aleman-Sayula	Veracr	127.0	136.0	9.0	1	8540	0.75
Merida-Puerto Juarez	Yucata	161.0	230.0	69.0	5	2662	2.23
Lim. Edos. Jal./Zac.-Jalpa	Zacate	96.0	116.0	20.0	1	3770	1.38
Total				525.9			21.14

Condition: 1-6 Very Bad, 7-11 Bad, 12-17 Regular, 18-20 Good

Part A3. Rehabilitation of 100 bridges with an estimated cost of US$20 million, from which the Bank would finance 70% of the total cost. The works are designed to ensure the superstructure's ability to support the loads imposed by heavy traffic, and adapt its width to that of the road they are part of; repair/reinforce the superstructure, supports, the structural elements, and their protection against erosion. The table below shows the first year bridge rehabilitation program.

First Year Bridge Rehabilitation Program						
Bridge	State	km	Length (m)	Condi _tion (0-5)	Traffic ADT	Cost (M US$)
Arroyo Seco Der. (100)	Baja C	26+600	47	4	12128	0.12
Arroyo Seco Izq. (100)	Baja C	26+600	47	4	12128	0.12
El Saltito (100)	Baja C	122+250	85	4	1446	0.12
Icahao Izq. (100)	Campec	155+000	17	4	3180	0.10
Si - Ho (100)	Campec	166+458	17	4	3180	0.10
Candelaria Ii (100)	Campec	218+240	125	4	2582	0.21
El Dorado N*3 (100)	Coahui	74+580	19	5	3706	0.02
El Pilar Izq. (101)	Coahui	16+600	21	4	5785	0.25
La Becerra (100)	Coahui	182+700	50	4	4746	0.24
El Dorado N* 1 (100)	Coahui	72+200	23	4	3300	0.03
El Dorado N* 2 (100)	Coahui	73+700	24	4	3706	0.03
El Dorado N* 4 (100)	Coahui	75+400	17	4	3706	0.02
Marabasco Ii (101)	Colima	53+200	117	4	1157	0.25
Cahuacan (100)	Chiapa	296+300	78	5	9560	0.13
Peatonal Urbina (100)	Chiapa	138+720	35	5	5432	0.03
El Ojito (100)	Chihua	181+750	23	4	10319	0.16
San Ignacio (100)	Chihua	75+200	29	4	8009	0.12
Las Agujas (101)	Chihua	368+600	100	4	1780	0.13
El Pastor (101)	Chihua	105+500	23	4	1312	0.10
Cañitas (100)	Durang	136+000	22	4	6108	0.05
Providencia Iii (101)	Durang	4+700	11	4	850	0.02
Tecuescontitlan I (100)	Guerre	147+950	26	4	7418	0.25
Ayutla (101)	Guerre	80+312	71	4	724	0.19
El Guaricho (101)	Jalisc	38+000	31	4	8069	0.18
Querendaro Izq. (100)	Michoa	134+500	21	4	3220	0.12
Guacamayas Ii Izq.	Michoa	1+726	82	4	2866	0.11
Rio Santiago (100)	Nayari	50+484	303	4	8750	0.25
Acaponeta (100)	Nayari	132+859	168	4	7340	0.35
El Tropical (101)	Nayari	11+020	31	4	3177	0.10
Chalma (101)	Nayari	18+650	33	4	2697	0.03
Novillero (101)	Nayari	33+096	181	4	2087	0.25
El Palillo (101)	Nayari	13+929	75	4	1442	0.02
Carbajal Der, (100)	Nuevo	54+600	59	4	17600	0.30
El Salado (100)	Nuevo	155+100	111	4	17600	0.65
Palmeras (100)	Nuevo	72+300	14	4	6570	0.07
Puente Bajo (100)	Nuevo	74+400	12	4	6570	0.05
De La Cruz (100)	Nuevo	110+600	14	4	6570	0.08
El Solitario Izq. (100)	Nuevo	180+400	14	4	6570	0.08
Atotonilco (100)	Puebla	97+440	36	4	4836	0.10
Cañones (101)	San Lu	33+311	13	4	3384	0.12
Taman (101)	San Lu	260+940	23	4	2807	0.12
Presidio Auxiliar (100)	Sinalo	268+554	132	5	17490	0.50
Nevarez (100)	Sinalo	113+953	16	4	6033	0.07
Estacion (100)	Sonora	114+600	11	4	8314	0.08
El Maraton (100)	Sonora	25+970	11	4	6099	0.09
Corona Poniente (100)	Tamaul	25+880	117	4	6824	0.06
Las Casitas (100)	Tamaul	9+050	6	4	3628	0.02
Peatonal El Naranjito	Veracr	28+500	35	5	4610	0.10
Tamos I (100)	Veracr	123+200	26	4	8935	0.11
Tampamachoco (101)	Veracr	8+000	145	4	4735	0.15
Jarillas (100)	Zacate	44+590	10	4	14541	0.08
Total			2754			7.00

Condition: 0 - Excellent, 5 - Very Poor

Part A4. Consultants services for the supervision of the 2001-2003 DGCC Highway Rehabilitation and Maintenance Program and Bridge Rehabilitation Program, including those works not financed by the Bank, with an estimated cost of US$15 million from which the Bank would finance 70% of the total cost. These supervision services will be directly retained by DGCC's Directorate of Supervision and Control, at the central offices, but performed at each of the 31 SCT Centers responsible for the execution of the works through civil works contractors.

Subprojects from those programs will be selected for project financing based on the following criteria: (i) have an ERR calculated in accordance with a method satisfactory to the Bank of at least 12% each; (ii) neither have significant negative environmental or social implications nor require changes in the road geometrical design; and (iii) have a structural design life of at least 15 years in the case of highway rehabilitation subprojects.

Project Component 2 - US$19.50 million
Part B. Pilot Project for Comprehensive Maintenance by Contract

Introduction of comprehensive maintenance by contract through a pilot program, including technical assistance for design and implementation. This three-year program includes comprehensive maintenance (periodic and routine), rehabilitation of selected segments of roads and of bridges, some minor works, operation of road side facilities for assistance to road users, preparation of short-term implementation programs, training and management of the program. Maintenance by contract is being piloted because there has been no experience with comprehensive maintenance contracts in Mexico. These contracts are also a first step towards the implementation of rehabilitation and maintenance contracts based on performance (or CREMA contracts, as they are called in Latin America), which are practically the same as comprehensive maintenance by contract with the only difference being that the comprehensive maintenance program as proposed here is based on unit prices and lump sums.

This pilot comprises a comprehensive maintenance program along two important routes covering 242.5 two lane km equivalent of the federal highway network. The routes are number 136, a two-lane highway in the State of Tlaxcala, between the limits with the states of Mexico and Puebla (121 km), and route number 110 in the State of Guanajuato, between Irapuato and La Piedad (42.5 km of a two-lane highway and 39.5 km of a four-lane highway, totaling 121.5 of a two-lane highway). The component will be split into two contracts of three years, one for each route. The comprehensive maintenance program is composed of:

Part B1. Civil Works (US$18.0 million). Two contracts of three years duration and with activities grouped as follows: (i) routine maintenance in the 242.5 km of both routes: operations that should be programmed and performed at least once a year; (ii) periodic maintenance in 100 km (50 km in each contract): operations that can be planned for and which must be carried out periodically, normally for periods exceeding one year, to ensure the adequacy of the condition of the highways; (iii) depending on the deficiencies presented by some of the sections of the highways in the contract, rehabilitation up to 15 km in each route and other priority actions to be carried out in the first year of the contract; (iv) rehabilitation of bridges in both routes as needed; (iv) minor works: occasional activities aimed at correcting deficiencies or improving certain parts of the highway; (v) program management: all those tasks required to plan, monitor and document the execution and evaluation of the work and activities carried out; and (vi) training in comprehensive maintenance activities for maintenance professionals and specialists of the public and private sectors. The proposed loan would finance 70% of this Part.

Part B2. Provision of consulting services for work supervision and for preparing and managing the program (US$1.5 million). The proposed loan would finance 70%.

Table - Comprehensive Maintenance by Contract Program Routes									
Route	Start	End	Length (km)	Width (m)	Surface	Traffic (ADT)	Condition Rating	Cost (US$'000)	State
136	Limite Estado Mexico	Limite Estado Puebla	121.0	7.50-8.00	AC	10,500 (35-41% heavy vehicles)	Fair	9,000	Tlaxcala
110	Irapuato	La Piedad	121.5 *	7.30/12 2 x 11	AC	9,277-13,593 (35%-40% heavy vehicles)	Fair to good	9,000	Guanajuato
	Total		**242.5**					**18,000**	

*42.5 km two-lane road.
* 39.5 km four-lane road.

Project Component 3 - US$ 4.50 million

C. Vehicle Weight and Dimensions Control Stations.

Under the HRTS project a study to control weights and dimensions of vehicles in Mexico was financed. The study defined the mechanisms needed to establish a weight and dimensions control program along the federal highway network. As a result of the study, and also through the HRTS project, the Bank financed the acquisition of 37 mobile scales that are currently in operation. However, the study recommended also the establishment of fixed weigh stations at strategically located points on roads with the highest volumes of heavy vehicles. The principle being proposed is for a low speed weigh-in-motion operation, since this allows for faster processing of vehicles and then only infringing vehicles are stopped and inspected. This project component will complement the mobile program by piloting the use of fixed scales at 2 stations (one single station, for only one traffic direction, on the route to the US border in Nuevo Laredo, and one twin station for both sides of another route in Palmillas in the state of Querétaro). The fixed scales can be very helpful and will contribute to the already successfully started program of weights and dimension control, but a strong emphasis will be placed on monitoring and on defining how to judge the results of their effectiveness. The overall enforcement environment and provision for making the new stations effective looks appropriate.

The project will finance only the civil works of the stations, including acceleration and deceleration lanes and the station buildings with complementary services for physical-mechanical inspection of the vehicles, and physical and medical examination of the drivers. The equipment, including its installation, will be financed by the Government.

The project would finance 70% of Part C.

Project Component 4 - US$4.00 million

D. Institutional Strengthening. Provision of technical assistance to SCT for:

Part D1. Implementing the HDM-4 in the DGCC and its departmental offices to improve road maintenance management.

This project sub-component aims at implementing the Highway Development Management Model (HDM-4) in Mexico for network level and project level technical economic evaluation of maintenance and

improvement options. HDM-4 will gradually complement and replace the current system being used in Mexico for maintenance works planning (SISTER), which was implemented in Mexico in 1994. This change is justified because SISTER lacks capability for prediction of road conditions and HDM-4 has a wider range of functionality including strategic planning, programming and project evaluation.

The SISTER system is a useful planning tool at a network level because it systematically collects every year the traffic and the condition of the network, by means of a surface quality index based on a detailed visual survey, and has means of assessing the physical, agency and road user cost consequences of implementing different maintenance policies. HDM-4 will be a more comprehensive network planing tool, because it also considers the roughness and strength of roads, has detailed models to predict the road deterioration and road user costs under local conditions, and more evaluation options. HDM-4 will also be more useful to the preparation of a more detailed work program, perform the economic evaluation of any maintenance or improvement project, help formulate technical policies, and help formulate proper road user charges.

The HDM-4 implementation will involve the following steps: (a) definition of a working group to carry out the implementation; (b) HDM-4 training and familiarization with the experience in other Latin American countries either by means of inviting experts to visit Mexico or by the participation of Mexican professionals at international HDM-4 events; (c) review and adaptation of the current SISTER visual survey methodology for possible improvements; (d) definition of new network data to be collected (roughness, deflections, etc.) and of the level of detail, extent and methods of collection of all data, to determine the most sustainable approach for DGCC; (e) data collection at network and project levels; (f) project level and network level evaluations; and g) calibration and systematization of all of the processes.

Staff training, the definition of network data to be collected, and a pilot data collection for selected roads will be carried in 2000 and 2001 with the objective of performing the economic evaluation of the road maintenance works program of the second year of the project (2002) with HDM-4. A full network data collection will be done in 2002 to start performing the planning and programming of maintenance works, with HDM-4, starting in 2003. The cost of this Part includes acquisition of road survey equipment needed for the installation and operation of the model and office equipment.

Part D2. Developing a strategy for decentralizing road administration. The project will include technical assistance to support the decentralization strategy to be followed, after the new Government analyzes and selects among the alternatives to be proposed by a study being carried out under separate financing. This study will analyze diverse decentralization models to select those considered suitable for Mexico, in order to have sufficient elements to propose one or several options to the new Government. The project will support the implementation of the selected alternative. Prior to the definition of the scope and final composition of the technical assistance required, foreign experts that have participated in decentralization processes in other countries/regions would visit Mexico and transmit to SCT and SHCP lessons learned in other countries. The relationship between the decentralization process and the prospects for developing sustainable road network financing mechanisms will be one of the major themes to be discussed.

Part D3. Implementing a road financing mechanism. After long delays, the Government finally agreed to prepare the study and recommendations on the road financing strategies and resource mobilization options. The study is currently underway and its completion is scheduled for December 2000. Its recommendations are expected to be discussed with the Government by February 2001 and, if the Bank and the Government agree with regard to the suitability of such recommendations, the latter will prepare by April 2001, and thereafter carry out, an action plan satisfactory to the Bank with respect to the implementation of such recommendations.

Part D4. Implementing the government strategy on toll roads. There is a debt of over US$9 billion, arising from government's rescue of 23 unsuccessful private toll roads. Private sector investments for additional toll roads have dried up both due to Mexico's financial problems and to experience with the existing toll roads. A study is underway to analyze and then discuss with the new authorities the possible alternatives to solve the problem created by the rescued toll roads (FARAC). Beyond the immediate concerns of managing the debt, the study analyzes the possibility to undertake a more strategic, long term view of toll roads and their role in the national transportation framework and the potential to generate new revenues, improve the utilization of existing and planned facilities, correct deterioration of FARAC infrastructure, and facilitate private investment in new roads. Among other recommendations, the preliminary report of the study proposes to replace both CAPUFE and FARAC with a new entity for managing, operating and financing Mexico's public toll roads, with the existing entities as legal "shells" for purposes of preserving prior financial obligations. This recommendation is intended to yield a functional realignment and institutional framework for managing Mexico's road investment and maintenance needs more comprehensively. Once the study is completed, its recommendations will be discussed with the Government. In the meantime, at the government's request, the Bank will prepare a project to assist the SCT on highway financing issues. When a strategy is adopted finally by the Government, the project would assist the SCT in implementing that strategy.

Part D5. Staff training, for continuation of the training program started under the HRTS Project for the SCT directorates most involved in the project, emphasizing technical, managerial and administrative training. It would include equipment, formal training courses, attendance at conferences and study tours, both in Mexico and abroad.

The proposed loan would finance 100% of Parts D1 to D5.

Project Component 5 - US$33.85 million

Project Component 6 - US$2.15 million

Annex 3: Estimated Project Costs
MEXICO: FEDERAL HIGHWAY MAINTENANCE PROJECT

Project Cost By Component	Local US $million	Foreign US $million	Total US $million
I. Highway Rehabilitation and Maintenance	94.00	151.00	245.00
II. Pilot program for comprehensive maintenance by contract	5.20	14.30	19.50
III. Vehicle Weight and Dimensions Control Program	1.30	3.20	4.50
IV. Institutional Strengthening Program	0.00	4.00	4.00
Total Baseline Cost	100.50	172.50	273.00
Physical Contingencies	7.55	19.20	26.75
Price Contingencies	2.95	4.12	7.07
Total Project Costs	111.00	195.82	306.82
Front-end fee		2.18	2.18
Total Financing Required	111.00	198.00	309.00

Project Cost By Category	Local US $million	Foreign US $million	Total US $million
			0.00
Works	95.05	157.45	252.50
Services	5.45	14.85	20.30
Training	0.00	0.20	0.20
Price contingencies	2.95	4.15	7.10
Physical contingencies	7.55	19.17	26.72
Total Project Costs	111.00	195.82	306.82
Front-end fee		2.18	2.18
Total Financing Required	111.00	198.00	309.00

Annex 4: Cost Benefit Analysis Summary

MEXICO: FEDERAL HIGHWAY MAINTENANCE PROJECT

Present Value of Flows	Rehab. & Maint. Program	Compreh. Maint. Program	Bridge Maint. Program	All Programs
Benefits (M$):	304	77	231	612
Costs (M$):	54	12	11	77
Net Benefits (M$):	250	65	220	535
IRR (%)	114%	140%	68%	111%
MIRR (%):	36%	38%	57%	40%

Summary of Benefits and Costs:

The project's main objective is to reduce road transport costs and preserve the road network in an efficient and sustainable manner. The proposed investments will reduce road user transport costs by lowering vehicle operating and travel time costs. An economic analysis was done for the civil works programs under the project consisting of: (i) rehabilitation and maintenance program (85% of civil works); (ii) comprehensive maintenance by contract program (7% of civil works); and (iii) bridge rehabilitation program (8% of civil works).The net present value (NPV) of the first year road rehabilitation and maintenance works financed under the project is US$250 million with an internal rate of return (IRR) of 114% and a modified internal rate of return (MIRR) of 36%, considering a financing and reinvestment rate of 12%. The NPV of the comprehensive maintenance program is US$65 million with an IRR of 140% and a MIRR of 38%. The NPV of the first year bridge maintenance program is US$220 million with an IRR of 68% and a MIRR of 57%.

Main Assumptions:

Net benefits were evaluated using unit road user costs, estimated using the Highway Design and Maintenance Standard Model (HDM-III), that were incorporated into the "Simulation de Strategies d' Entretien Routier" (SISTER) planning system and the Road Economic Decision model (RED). SCT estimated maintenance and rehabilitation costs in financial and economic terms (net of taxes), economic costs being on average 85 percent of financial costs; and defined vehicle fleet characteristics and unit costs for five vehicle classes. Traffic growth rate was set to 3% based on past trends for the duration of the analysis period. The discount rate was set to 12%. Typical economic road user costs as a function of roughness and the typical traffic composition are given in the table below.

Roughness (IRI)	Typical Vehicle Operating Costs ($/veh-km)				
	Car	Large Bus	Light Truck	Medium Truck	Artic. Truck
2	0.22	0.65	0.21	0.42	1.09
3	0.23	0.66	0.21	0.43	1.10
4	0.23	0.68	0.22	0.46	1.15
5	0.24	0.70	0.23	0.50	1.22
6	0.25	0.72	0.24	0.53	1.28
7	0.26	0.74	0.25	0.57	1.35
8	0.28	0.77	0.27	0.61	1.42
9	0.30	0.80	0.28	0.65	1.49
10	0.32	0.83	0.29	0.69	1.56
11	0.34	0.87	0.31	0.74	1.63
12	0.36	0.90	0.33	0.78	1.71
	Typical Traffic Composition (%)				
Paved Roads	70	6	2	17	5

Federal Network Rehabilitation and Periodic Maintenance Program

The road rehabilitation and periodic maintenance program and the comprehensive maintenance by contract program are part of the investments of the Four-Year Rehabilitation and Maintenance Plan for 2001-2004 prepared by SCT. The 2001-2004 plan was defined by SCT evaluating the Federal Network (41,865 km) using the SISTER planing system, that collects yearly data on network traffic and road condition, by means of a surface quality index based on a detailed visual survey, and assesses the physical consequences and road agency and road user costs of different maintenance strategies for a series of budget levels. An analysis of the current network condition indicates that 23% of the network is in good condition, 34% in fair condition (requiring seals or thin overlays), 19% in poor condition (requiring overlays) and 24% in very poor condition (requiring thick overlays or reconstruction). The table below presents the 1999 condition and traffic distribution of the Federal Network.

Mexico Federal Network in 1999 (km)						
	Road Condition					
Daily Traffic	Good	Fair	Poor	Very Poor	Total	Percent
500	871	2,003	1,555	1,831	6,259	15%
1500	2,627	5,145	3,020	3,480	14,271	34%
3000	4,519	5,301	2,753	3,824	16,398	39%
4500	1,271	1,381	733	874	4,259	10%
6000	248	266	82	82	678	2%
Total	9,536	14,096	8,142	10,092	41,865	
Percent	23%	34%	19%	24%		100%

The Federal Network has a key subset called the Basic Network (22,805 km), which contains the most functionally important roads. The table below presents the 1999 condition and traffic distribution of the Basic Federal Network.

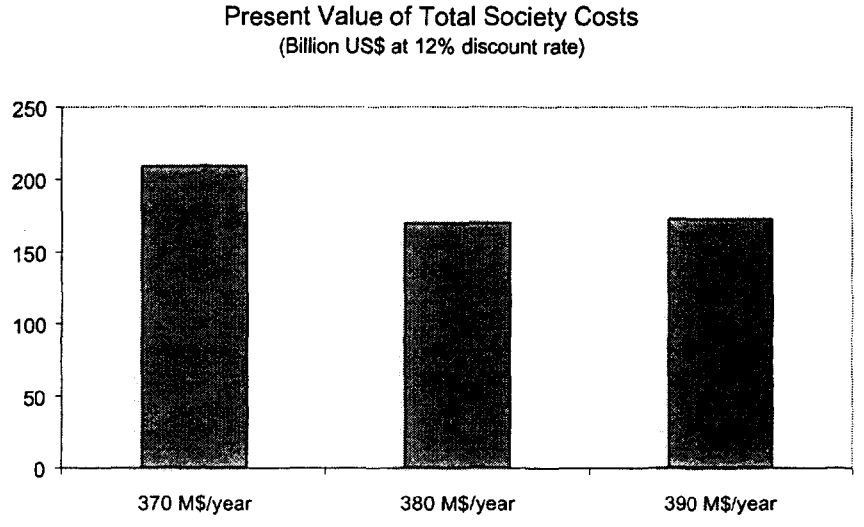
Mexico Basic Federal Network in 1999 (km)						
	Road Condition					
Daily Traffic	Good	Fair	Poor	Very Poor	Total	Percent
500	310	474	219	146	1,148	5%
1500	1,120	1,785	1,020	719	4,645	20%
3000	3,543	3,534	2,404	2,523	12,004	53%
4500	1,248	1,430	738	902	4,317	19%
6000	209	291	109	82	692	3%
Total	6,430	7,514	4,490	4,372	22,805	
Percent	28%	33%	20%	19%		100%

The table below presents the federal network length and condition by state.

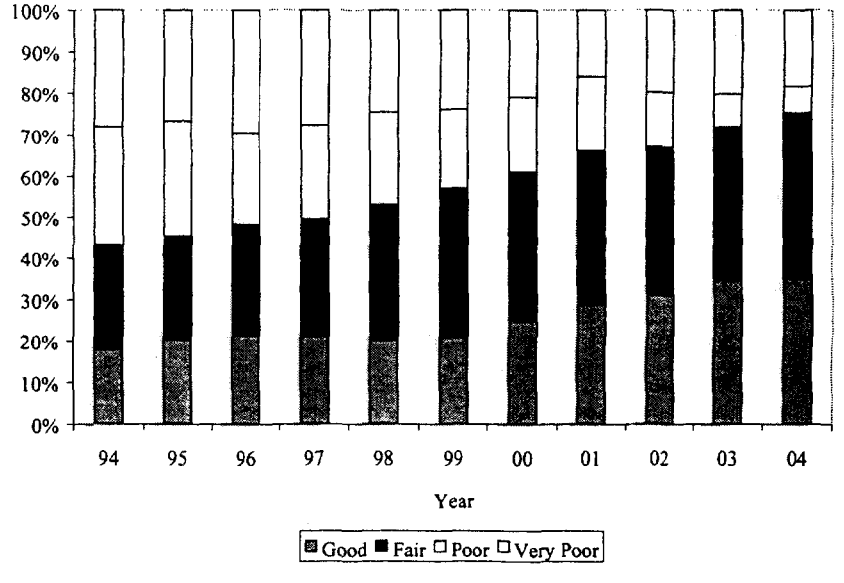
Mexico Federal Network in 1999							
	Network Length (km)			Network Condition (%)			
State	Basic	Secondary	Total	Good	Fair	Poor	V. Poor
Aguascalientes	109	266	375	47%	21%	28%	4%
Baja California	838	674	1513	28%	29%	31%	13%
Baja California Sur	943	253	1196	5%	55%	30%	9%
Campeche	836	441	1277	24%	25%	22%	29%
Coahuila	1045	515	1561	29%	46%	16%	9%
Colima	176	129	305	49%	31%	20%	0%
Chiapas	1419	580	1999	50%	37%	6%	7%
Chihuahua	1072	1129	2201	18%	42%	17%	23%
Distrito Federal	40	61	101				
Durango	720	1155	1876	17%	28%	22%	32%
Guanajuato	472	643	1115	28%	25%	19%	28%
Guerrero	844	1068	1912	13%	17%	17%	54%
Hidalgo	309	667	977	25%	29%	12%	34%
Jalisco	1097	949	2045	24%	43%	24%	10%
Mexico	358	422	780	18%	42%	17%	22%
Michoacan	1391	900	2292	15%	40%	21%	24%
Morelos	133	152	285	18%	41%	23%	18%
Nayarit	400	400	800	24%	34%	20%	21%
Nuevo Leon	744	460	1205	29%	36%	9%	27%
Oaxaca	1221	1572	2794	16%	25%	23%	36%
Puebla	613	522	1134	13%	38%	16%	33%
Queretaro	65	387	452	27%	56%	16%	1%
Quintana Roo	508	364	872	32%	32%	15%	21%
San Luis Potosi	776	890	1667	27%	44%	23%	6%
Sinaloa	693	55	748	26%	30%	23%	21%
Sonora	1258	507	1765	25%	33%	15%	27%
Tabasco	485	84	569	21%	43%	23%	13%
Tamaulipas	1421	765	2185	28%	22%	18%	32%
Tlaxcala	227	320	547	28%	37%	28%	7%
Veracruz	1238	1353	2591	21%	13%	16%	50%
Yucatan	341	892	1233	17%	44%	29%	10%
Zacatecas	1010	484	1494	11%	37%	22%	30%
Total	22805	19060	41865	23%	34%	19%	24%

SCT evaluated three possible maintenance strategies, using the SISTER planning system, with levels of expenditures of U$370 million, US$380 million and US$390 million per year for routine maintenance, periodic maintenance and rehabilitation works from 2001 to 2004. For each strategy and corresponding work program, SISTER estimated the future network condition and the present value of total society costs (road agency plus road user costs). The comparison of strategies, which is shown on the graph below,

indicates that the strategy of US$380 million per year incurs the least total costs to society, therefore, it was selected to be undertaken by SCT considering also that it was in line with prior and expected future levels of expenditures of SCT.



The overall rehabilitation and periodic maintenance program to be undertaken by SCT with local and external financing has an estimated budget of around U$380 million per year for routine maintenance, periodic maintenance and rehabilitation works in 2001 to 2004, for a network of 41,865 km, representing around US$9,000 per km-year. The net present value of the overall maintenance and rehabilitation program is estimated to be around US$39,500 million. The graph below presents the network condition from 1994 to 1999 and the expected condition from 2000 to 2004, which shows good improvement over the years. In 2004, if the program is implemented, the roads in good and fair condition will be 75% .



First Year Program of Rehabilitation and Maintenance

SCT evaluated each section, financed by the Bank, to be rehabilitated or to receive periodic maintenance during the first year of the project (2001), using the RED model, with current data for road, vehicle fleet and road works characteristics and costs. The RED model adopts unit road user costs computed using the HDM-III model and simplifies the economic evaluation by maintaining a constant level of service (roughness) with and without the project over the evaluation period, which was set to ten years for rehabilitation works and five years for periodic maintenance works. The current condition of each section is given by the SISTER condition index, which varies from 1 (very bad) to 20 (very good). This index was correlated to road roughness by adopting a road roughness of 6.5 IRI for very bad roads, 5.0 IRI for bad roads, 3.5 IRI for regular roads and 2.0 IRI for good roads. With more detailed data (for example: roughness, deflections, ages) to be available in the near future, the economic evaluation of the second year program (2002) will be done by SCT using the HDM-4 model following the HDM-4 to be implemented under the project. The table below presents the main section characteristics and corresponding results for the first year rehabilitation program.

First Year Rehabilitation Program												
					Condi			Base Case			IRR Sensitivity	
		Initial	Final	Length	_tion	Traffic	Cost	NPV	IRR	MIRR	Cost	Traffic
Road	State	km	km	(km)	(1-20)	ADT	(M US$)	(M US$)	(%)	(%)	+20%	-20%
El Sueco -Janos	Chihua	97.6	112.0	14.4	1	2120	1.62	2.3	46%	25%	38%	36%
Monclova-Piedras Negras Cpo.A	Coahui	116.0	127.0	11.0	1	6495	1.24	7.7	145%	42%	121%	116%
Piedras Negras-Cd. Acuña	Coahui	14.0	17.0	3.0	1	2540	0.34	0.5	51%	26%	42%	40%
Lim.Edosqro./Gto.-Limedosgto./Slp.C.B	Guanaj	37.0	46.0	9.0	1	7717	1.01	9.0	198%	47%	165%	159%
Lim.Edosqro./Gto.-Limedosgto./Slp.C.B	Guanaj	46.0	62.0	16.0	1	6772	1.80	13.9	174%	45%	145%	139%
Lim.Edosqro./Gto.-Limedosgto./Slp.C.B	Guanaj	62.0	67.0	5.0	1	6772	0.56	4.3	174%	45%	110%	139%
Lim.Edos.Mex./Hgo.-Pachuca	Hidalg	49.0	50.0	1.0	1	10249	0.15	1.2	180%	45%	150%	144%
Lim.Edos.Mex./Hgo.-Pachuca	Hidalg	53.0	58.0	5.0	1	6943	0.75	4.2	131%	40%	110%	105%
Lim.Edos.Mich./Jal.-T.Acatlan	Jalisc	65.0	82.0	17.0	1	6300	2.55	10.0	98%	36%	82%	78%
Jiquilpan-Lim.Edos.Mich./Jal (2 Cpos)	Michoa	0.0	5.0	10.0	1	10781	1.50	12.9	191%	46%	133%	154%
Cuautla-Lim. Edos.Mor./Pue.	Morelo	77.1	89.0	11.9	3	12259	2.16	13.2	142%	41%	143%	114%
San Gregorio-Oaxtepec	Morelo	35.5	38.5	3.0	2	3992	0.54	0.7	45%	25%	45%	35%
Lib. Norte De Monterrey	Nvo. L	15.0	35.0	20.0	1	8655	3.00	21.9	166%	44%	139%	133%
Huajuapan De Leon-Oaxaca	Oaxaca	60.0	72.5	12.5	1	2470	1.41	2.5	54%	27%	45%	43%
Lim.Edos.Mex./Pue.-Puebla	Puebla	72.0	81.0	9.0	2	11790	1.15	12.8	243%	50%	203%	195%
Lim.Edos.Mex./Qro.-Palmillas	Queret	128.0	132.0	4.0	1	4563	0.60	2.0	87%	34%	73%	70%
Lim.Edos.Nay./Sin.-Mazatlan	Sinalo	144.6	160.0	15.4	5	5690	2.48	6.4	71%	31%	59%	57%
Lim.Edos.Nay./Sin.-Mazatlan	Sinalo	190.0	199.2	9.2	5	5690	1.38	3.9	76%	32%	63%	61%
Estacion Manuel-La Coma	Tamaul	107.0	132.0	25.0	2	2200	2.81	4.1	47%	25%	39%	37%
Tampico-Estacion Manuel Cpo.A	Tamaul	25.0	36.0	11.0	1	8292	1.24	9.9	180%	45%	150%	144%
Lib.Apizaco	Tlaxca	0.0	10.5	10.5	5	9060	1.34	7.2	127%	40%	106%	102%
Cordoba-Veracruz	Veracr	59.0	80.0	21.0	4	9490	3.78	19.4	122%	39%	102%	98%
Naranjos-Ozuluama	Veracr	78.6	100.0	21.4	1	4455	3.85	8.6	64%	29%	53%	50%
Tihuatlan-Alazan	Veracr	45.0	57.0	12.0	1	5275	2.16	5.8	73%	31%	73%	58%
Jalpa-Zacatecas	Zacate	285.0	298.0	13.0	2	7060	1.95	10.8	131%	40%	109%	105%
Jalpa-Zacatecas	Zacate	308.0	312.0	4.0	2	7060	0.60	3.3	131%	40%	109%	105%
Lim.Edos.Ags./Zac.-Jalpa	Zacate	78.5	85.0	6.5	4	1981	0.98	0.2	19%	15%	14%	13%
Total				300.8			42.93	198.7	112%	38%	95%	90%

Condition: 1-6 Very Bad, 7-11 Bad, 12-17 Regular, 18-20 Good

The rehabilitation sections have a median traffic of 7,000 ADT and a median cost of US$150,000 per km. All sections yielded an IRR greater than 12%, even under the sensitivity scenarios of increasing the rehabilitation costs by 20% or reducing the traffic by 20%. The table below presents the main section characteristics and corresponding results for the periodic maintenance program.

First Year Periodic Maintenance Program												
					Condi			Base Case			IRR Sensitivity	
Road	State	Initial km	Final km	Length (km)	_tion (1-20)	Traffic ADT	Cost (M US$)	NPV (M US$)	IRR (%)	MIRR (%)	Cost +20%	Traffic -20%
Leon-Aguascalientes (2 Cpos).	Aguasc	103.0	110.9	15.8	9	11190	0.49	2.5	222%	82%	184%	176%
Mexicali-Tecate	Baja C	0.0	18.0	18.0	6	9624	1.49	3.6	118%	57%	96%	91%
Mexicali-Tecate	Baja C	109.0	113.0	4.0	7	4447	0.21	0.3	77%	43%	61%	57%
Lim. Edos. Tab./Camp.-Cescarcega	Campec	200.0	230.0	30.0	11	2100	0.63	0.3	40%	27%	28%	25%
Delicias-Chihuahua (Cpo. B)	Chihua	186.0	203.0	17.0	6	4630	0.55	1.0	97%	50%	78%	74%
Saltillo-Monterrey (Cpo. A)	Coahui	15.3	32.9	17.6	9	11305	0.49	2.6	234%	85%	194%	186%
Colima-T. Tecoman (Cpo. A)	Colima	33.0	37.0	4.0	7	5655	0.17	0.2	64%	38%	81%	46%
Colima-T. Tecoman (Cpo. A)	Colima	12.0	16.5	4.5	7	5213	0.17	0.2	74%	42%	59%	55%
Colima-T. Tecoman (Cpo. B)	Colima	26.0	29.0	3.0	7	5374	0.06	0.2	138%	62%	113%	107%
Gom. Pa.-Li.Edo.Dgo./Chi.(2 Cps.)	Durang	25.0	40.0	30.0	7	7470	1.08	2.6	118%	57%	96%	91%
Celaya-Salamanca	Guanaj	57.0	81.0	24.0	3	18077	0.77	8.0	418%	113%	348%	334%
Queretaro-San Luis Potosi (Cp. B)	Guanaj	67.0	89.0	22.0	2	6772	0.71	2.7	175%	72%	144%	138%
Acapulco-Zihuatanejo	Guerre	69.0	74.0	5.0	1	5478	0.26	0.6	114%	55%	93%	88%
Acapulco-Zihuatanejo	Guerre	135.0	144.0	9.0	1	5805	0.47	1.1	120%	57%	98%	93%
Iguala-Chilpancingo	Guerre	124.0	140.0	16.0	12	13215	0.46	2.1	202%	78%	168%	160%
Guadalajara-Lim. Edos. Jal./Zac.	Jalisc	46.0	77.0	31.0	1	2853	1.33	0.6	34%	24%	48%	21%
Toluca-Cd. Altamirano	Mexico	49.0	80.0	31.0	5	4728	1.60	2.2	75%	42%	59%	56%
Libramiento Norte De Zamora	Michoa	0.0	7.0	7.0	1	5068	0.30	0.4	78%	43%	99%	58%
Cuernavaca-Lim. Edos. Mor./Gro.	Morelo	37.0	41.0	4.0	7	5500	0.10	0.3	131%	61%	108%	102%
Matehuala-Saltillo	Nuevo	100.0	130.0	30.0	1	7940	1.29	4.2	151%	66%	186%	118%
Oaxaca-Tehuantepec	Oaxaca	41.0	48.0	7.0	3	3370	0.23	0.2	62%	37%	48%	44%
Ent. San Hipolito-Tehuacan	Puebla	39.0	59.0	20.0	1	12360	1.17	6.6	242%	86%	201%	192%
San Juan Del Rio-Xilitla	Queret	43.0	55.0	12.0	4	2985	0.52	0.2	31%	23%	44%	18%
Reforma Agraria-Puerto Juarez	Quinta	0.0	9.0	9.0	9	3472	0.39	0.1	26%	20%	38%	14%
San Luis Potosi-Ojuelos	S.L.P.	40.0	45.0	5.0	11	3900	0.22	0.1	29%	21%	41%	16%
Lim. Edos. Chis./Tab.-El Bellote	Tabasc	167.0	176.0	9.0	8	7315	0.28	0.9	152%	66%	125%	119%
Est. Gonzalez-Ent. Llera De Canales	Tamaul	30.0	60.0	30.0	1	3490	0.97	1.6	87%	46%	70%	65%
Lim. Edos. Mex./Tlax.-Apizaco	Tlaxca	74.0	87.0	13.0	5	10295	0.40	2.3	252%	88%	209%	200%
Cd. Aleman-Sayula	Veracr	127.0	136.0	9.0	1	8540	0.75	1.5	104%	52%	85%	80%
Merida-Puerto Juarez	Yucata	161.0	230.0	69.0	5	2662	2.23	1.1	36%	25%	25%	22%
Lim. Edos. Jal./Zac.-Jalpa	Zacate	96.0	116.0	20.0	1	3770	1.38	0.9	45%	30%	33%	31%
Total				525.9			21.14	51.3	117%	56%	102%	92%

Condition: 1-6 Very Bad, 7-11 Bad, 12-17 Regular, 18-20 Good

The periodic maintenance sections have a median traffic of 5,500 ADT and a median cost of US$38,000 per km. All sections yielded an IRR greater than 12%, even under the sensitivity scenarios of increasing the periodic maintenance costs by 20% or reducing the traffic by 20%. The NPV of the first year road rehabilitation and maintenance works financed under the project is US$250 million with an IRR of 114% and a MIRR of 36% considering a financing and reinvestment rate of 12%.

Comprehensive Maintenance by Contract Program

The comprehensive maintenance contracts financed under the project include routine maintenance, periodic maintenance and rehabilitation works on selected routes. These routes were identified at appraisal, but the specific sections to be rehabilitated or to receive periodic maintenance on the selected routes will be

selected by the contractors with SCT's approval. Therefore, a preliminary economic evaluation was done for the routes following the same methodology as the rehabilitation and maintenance program. The table below presents the main road characteristics and corresponding results.

Comprehensive Maintenance by Contract Program										
			Condi			Base Case			IRR Sensitivity	
Works	State	Length (km)	_tion (1-20)	Traffic ADT	Cost (M US$)	NPV (M US$)	IRR (%)	MIRR (%)	Cost +20%	Traffic -20%
Ruta 136 - Limite Edos. Mex./Tlax										
Rehabilitation Works	Tlaxca	15.0	1	10500	3.0	20.4	156%	43%	130%	125%
Periodic Maintenance Works	Tlaxca	50.0	7	10500	4.0	9.4	116%	56%	95%	90%
Total		65.0			7.0	29.8	134%	37%	111%	106%
Ruta 90 - Irapuato/La Piedad										
Rehabilitation Works	Guanaj	15.0	1	14000	3.0	28.0	207%	48%	173%	166%
Periodic Maintenance Works	Guanaj	50.0	7	9000	4.0	7.6	97%	50%	79%	74%
Total		65.0			7.0	35.6	147%	39%	122%	117%

Condition: 1-6 Very Bad, 7-11 Bad, 12-17 Regular, 18-20 Good

The two routes included for comprehensive maintenance have a median traffic of 10,000 ADT and an estimated rehabilitation cost of US$200,000 per km and periodic maintenance cost of US$80,000 per km. Both routes yielded an IRR greater than 12%, even under the sensitivity scenarios of increasing the works costs by 20% or reducing the traffic by 20%. The NPV of the comprehensive maintenance works is US$65 million with an IRR of 140% and a MIRR of 38% considering a financing and reinvestment rate of 12%.

Bridge Rehabilitation

The bridge rehabilitation component economic benefits were evaluated by SCT by estimating the road user benefits of the bridge improvements in terms of savings in vehicle operating costs and time cost. The without project case considers the weight restrictions on the bridges implying that only light vehicles can circulate while heavy vehicles are forced to use alternative routes or reduce their weight by transferring some of the cargo to other vehicles. The "with" project case considers a strengthening of the bridges that eliminates travel restrictions. The table below presents the main bridges characteristics and corresponding results.

First Year Bridge Rehabilitation Program											
				Condi			Base Case			IRR Sensitivity	
			Length	_tion	Traffic	Cost	NPV	IRR	MIRR	Cost	Traffic
Bridge	State	km	(m)	(0-5)	ADT	(M US$)	(M US$)	(%)	(%)	+20%	-20%
Arroyo Seco Der. (100)	Baja C	26+600	47	4	12128	0.12	4.6	80%	74%	76%	75%
Arroyo Seco Izq. (100)	Baja C	26+600	47	4	12128	0.12	4.6	80%	74%	76%	75%
El Saltito (100)	Baja C	122+250	85	4	1446	0.12	0.4	38%	36%	35%	34%
Icahao Izq. (100)	Campec	155+000	17	4	3180	0.10	2.3	45%	40%	41%	40%
Si - Ho (100)	Campec	166+458	17	4	3180	0.10	2.3	45%	40%	41%	40%
Candelaria Ii (100)	Campec	218+240	125	4	2582	0.21	1.5	57%	54%	54%	53%
El Dorado N*3 (100)	Coahui	74+580	19	5	3706	0.02	1.5	57%	54%	54%	53%
El Pilar Izq. (101)	Coahui	16+600	21	4	5785	0.25	10.3	75%	53%	70%	69%
La Becerra (100)	Coahui	182+700	50	4	4746	0.24	4.9	58%	51%	54%	54%
El Dorado N* 1 (100)	Coahui	72+200	23	4	3300	0.03	0.7	52%	52%	49%	48%
El Dorado N* 2 (100)	Coahui	73+700	24	4	3706	0.03	1.5	57%	54%	54%	53%
El Dorado N* 4 (100)	Coahui	75+400	17	4	3706	0.02	0.7	52%	52%	49%	48%
Marabasco Ii (101)	Colima	53+200	117	4	1157	0.25	0.4	38%	36%	35%	34%
Cahuacan (100)	Chiapa	296+300	78	5	9560	0.13	4.6	80%	74%	76%	75%
Peatonal Urbina (100)	Chiapa	138+720	35	5	5432	0.03	5.1	73%	63%	69%	68%
El Ojito (100)	Chihua	181+750	23	4	10319	0.16	7.5	67%	58%	63%	62%
San Ignacio (100)	Chihua	75+200	29	4	8009	0.12	7.7	83%	70%	78%	77%
Las Agujas (101)	Chihua	368+600	100	4	1780	0.13	0.4	38%	36%	35%	34%
El Pastor (101)	Chihua	105+500	23	4	1312	0.10	0.6	30%	28%	27%	27%
Cañitas (100)	Durang	136+000	22	4	6108	0.05	3.1	71%	66%	67%	67%
Providencia Iii (101)	Durang	4+700	11	4	850	0.02	0.4	38%	36%	35%	34%
Tecuescontitlan I (100)	Guerre	147+950	26	4	7418	0.25	4.9	58%	51%	54%	54%
Ayutla (101)	Guerre	80+312	71	4	724	0.19	0.7	37%	34%	34%	33%
El Guaricho (101)	Jalisc	38+000	31	4	8069	0.18	7.7	83%	70%	78%	77%
Querendaro Izq. (100)	Michoa	134+500	21	4	3220	0.12	2.3	45%	40%	41%	40%
Guacamayas Ii Izq.	Michoa	1+726	82	4	2866	0.11	0.7	52%	52%	49%	48%
Rio Santiago (100)	Nayari	50+484	303	4	8750	0.25	2.1	72%	72%	68%	68%
Acaponeta (100)	Nayari	132+859	168	4	7340	0.35	5.1	73%	63%	69%	68%
El Tropical (101)	Nayari	11+020	31	4	3177	0.10	2.4	58%	51%	54%	54%
Chalma (101)	Nayari	18+650	33	4	2697	0.03	0.7	52%	52%	49%	48%
Novillero (101)	Nayari	33+096	181	4	2087	0.25	1.5	57%	54%	54%	53%
El Palillo (101)	Nayari	13+929	75	4	1442	0.02	0.2	35%	35%	32%	31%
Carbajal Der, (100)	Nuevo	54+600	59	4	17600	0.30	13.0	96%	80%	91%	90%
El Salado (100)	Nuevo	155+100	111	4	17600	0.65	12.8	78%	67%	74%	73%
Palmeras (100)	Nuevo	72+300	14	4	6570	0.07	5.1	73%	63%	69%	68%
Puente Bajo (100)	Nuevo	74+400	12	4	6570	0.05	5.1	73%	63%	69%	68%
De La Cruz (100)	Nuevo	110+600	14	4	6570	0.08	5.0	64%	56%	60%	60%
El Solitario Izq. (100)	Nuevo	180+400	14	4	6570	0.08	5.0	64%	56%	60%	60%
Atotonilco (100)	Puebla	97+440	36	4	4836	0.10	5.1	73%	63%	69%	68%
Cañones (101)	San Lu	33+311	13	4	3384	0.12	4.8	56%	41%	51%	50%
Taman (101)	San Lu	260+940	23	4	2807	0.12	2.4	50%	44%	47%	46%
Presidio Auxiliar (100)	Sinalo	268+554	132	5	17490	0.50	12.9	85%	72%	81%	80%
Nevarez (100)	Sinalo	113+953	16	4	6033	0.07	5.1	73%	63%	69%	68%
Estacion (100)	Sonora	114+600	11	4	8314	0.08	7.6	73%	63%	69%	68%
El Maraton (100)	Sonora	25+970	11	4	6099	0.09	7.4	68%	54%	64%	63%
Corona Poniente (100)	Tamaul	25+880	117	4	6824	0.06	1.4	64%	64%	61%	60%
Las Casitas (100)	Tamaul	9+050	6	4	3628	0.02	2.4	58%	51%	54%	54%
Peatonal El Naranjito	Veracr	28+500	35	5	4610	0.10	10.3	75%	53%	70%	69%
Tamos I (100)	Veracr	123+200	26	4	8935	0.11	7.6	73%	63%	69%	68%
Tampamachoco (101)	Veracr	8+000	145	4	4735	0.15	1.4	64%	64%	61%	60%
Jarillas (100)	Zacate	44+590	10	4	14541	0.08	12.8	78%	67%	74%	73%
Total			2754			7.00	220.1	68%	57%		

Condition: 0 - Excellent, 5 - Very Poor

The bridge maintenance roads have a median traffic of 5,000 ADT and a median bridge rehabilitation cost of US$110,000 per bridge All bridges yielded an IRR greater than 12%, even under the sensitivity scenarios of increasing the works costs by 20% or reducing the traffic by 20%. The NPV of the bridge maintenance program is US$220 million with an IRR of 68% and a MIRR of 57% considering a financing and reinvestment rate of 12%.

Sensitivity analysis / Switching values of critical items:

The first year rehabilitation and maintenance program (85% of civil works) IRR is 114% and the MIRR is 36%. Assuming there is an increase of 20% in agency costs, the IRR decreases to 97% and the MIRR to 33%. A 20% decrease in traffic decreases the IRR to 91% and the MIRR to 32%. A combination of increase in agency costs by 20% and decrease in traffic by 20%, decreases the IRR to 77% and the MIRR to 30%. To have a net present value equal to zero, agency costs have to be 560% higher than the estimated costs or traffic levels reduced to only 18% of the estimated traffic. These events have a very low probability of occurrence indicating that the project economic viability is very robust.

Annex 5: Financial Summary

MEXICO: FEDERAL HIGHWAY MAINTENANCE PROJECT

Years Ending
Bank's Fiscal Years

	IMPLEMENTATION PERIOD						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Total Financing Required							
Project Costs							
Investment Costs	65.9	99.2	106.3	35.5	0.0	0.0	0.0
Recurrent Costs	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Project Costs	65.9	99.2	106.3	35.5	0.0	0.0	0.0
Front-end fee	2.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Financing	68.0	99.2	106.3	35.5	0.0	0.0	0.0
Financing							
IBRD/IDA	48.0	70.0	75.0	25.0	0.0	0.0	0.0
Government	20.0	29.2	31.3	10.5	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Provincial	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Co-financiers	0.0	0.0	0.0	0.0	0.0	0.0	0.0
User Fees/Beneficiaries	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Project Financing	68.0	99.2	106.3	35.5	0.0	0.0	0.0

Main assumptions:
Front-end fee of US$2.15 million included

Annex 6: Procurement and Disbursement Arrangements
MEXICO: FEDERAL HIGHWAY MAINTENANCE PROJECT

Procurement

Procurement of works financed by the Bank under the project shall carried out in accordance with Bank's Guidelines for Procurement under IBRD Loans and IDA Credits (January 1995, revised in January and August 1996, September 1997 and January 1999) and the following provisions of this Annex.

Grouping of Contracts

To the extent practicable contracts for rehabilitation and maintenance works shall be grouped in bid packages estimated to cost US$10,000,000 equivalent or more each.

Notification and Advertising

All invitations to bid shall be published in the *"Diario Oficial de la Federación"* and in COMPRANET. In addition, invitation to bid for each contract estimated to cost US$10,000,000 equivalent or more shall be advertised in the Development Business in accordance with the procedures applicable to large contracts under para. 2.8 of the Guidelines.

Procurement Methods

The methods to be used for the procurement are described below, and the estimated amounts for each method, are summarized in Table A. The threshold contract values for the use of each method are fixed in Table B.

Procurement of Works

Works procured under this project would include rehabilitation and periodic maintenance of roads and bridges and construction of two vehicle weight and dimensions control stations, totaling US$286.15 million equivalent. Major contracts for these works expected to total US$98.15 million will be procured following International Competitive Bidding procedures (ICB), using Bank Standard Bidding Documents (SBDs). Contracts estimated to cost less than US$10,000,000 million equivalent per contract, up to an aggregated amount of US$186.00 million, may be procured using National Competitive Bidding procedures (NCB) and agreed Standard Bidding Documents. Small works, estimated to cost less than US$500,000 equivalent per contract, up to an aggregated amount of US$2 million, may be procured through price comparison received from at least three contractors in response to a written invitation to at least three contractors. The written invitation will include a detailed description of the works, including basic specifications, the required completion date, and a basic contract form acceptable to the Bank.

Employment of Consultants

Consultant services shall be procured in accordance with Guidelines for the use of Consultants by the World Bank Borrowers and the Bank as Executing Agency (January 1997, revised in September 1997 and January 1999) and the following provisions of this Annex. These services are estimated to cost US$18.3 million equivalent and would be procured using Bank Standard Request for Proposals.

Firms: All contracts for firms would be procured using QCBS procedures except for *small contracts* estimated to cost less than US$100,000 equivalent which would be procured using Fixed Budget Selection, up to an aggregate amount of US$2,000,000 million.

Individuals: Specialized advisory services would be provided by individual consultants selected in accordance with the provisions of paragraph 5.1 to 5.3 of the Consultant Guidelines, up to an aggregated amount of US$2,000,000.

The short list of consultants, for services estimated to cost less than US$200,000 equivalent per contract, may comprise entirely national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

Procurement Responsibilities and Capacity

A procurement capacity assessment for the project was carried out by the Country Procurement Specialist and approved by RPA on 5/17/2000. BANOBRAS (*Banco Nacional de Obras y Servicios Públicos),* will be responsible for coordinating the project activities, executing the loan and ensuring quality of procurement activities. Contracts below the threshold for Bank prior review would be reviewed by BANOBRAS who will hire and maintain dedicated staff reporting to its *Gerencia de Financiación Internacional* for this purpose. Such staff would ensure quality control of all procurement processes, effectively liaise with the Bank and the executing agency, organize and maintain procurement records, prepare draft quarterly reports, and would be responsible for project accounting, financial reporting, and compliance with audit requirements.

The executing agency for the project, the Secretariat of Communications and Transport *(Secretaria de Comunicaciones y Transportes-SCT)* through its SCT's Centers will carry out all procurement activities for the project. The SCT's centers are decentralized units in each state. To ensure SCT staff knowledge of Bank procurement Guidelines and procedures, several procurement seminars, with the participation of staff from the SCT Centers, were successfully carried out during the implementation of the first HRTS Project. In addition to the above, the procurement function in SCT and its Centers was audited by consultants retained by the Bank. The audit report was unqualified.

Review by the Bank. The proposed thresholds for prior review by the Bank are based on the procurement assessment of the project executive agency and are summarized in Table B. In addition to this review of individual procurement actions, the annual procurement plan will be reviewed and approved by the Bank.

Frequency of Procurement Supervision. Based on the overall risk assessment (average) the post-review missions for the project shall be completed every twelve months and shall cover not less than 1 to 10 signed contracts.

Procurement methods (Table A)

Table A: Project Costs by Procurement Arrangements
(US$ million equivalent)

Expenditure Category	Procurement Method[1] ICB	NCB	Other[2]	N.B.F.	Total Cost
1. Works	98.15 (68.70)	186.00 (130.00)	2.00 (1.40)	0.00 (0.00)	286.15 (200.10)
2. Goods	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
3. Services	0.00 (0.00)	0.00 (0.00)	20.47 (15.52)	0.00 (0.00)	20.47 (15.52)
4. Miscellaneous	0.00 (0.00)	0.00 (0.00)	0.20 (0.20)	0.00 (0.00)	0.20 (0.20)
5. Front-end fee	0.00 (0.00)	0.00 (0.00)	2.18 (2.18)	0.00 (0.00)	2.18 (2.18)
Total	98.15 (68.70)	186.00 (130.00)	24.85 (19.30)	0.00 (0.00)	309.00 (218.00)

1/ Figures in parenthesis are the amounts to be financed by the Bank Loan. All costs include contingencies

2/ Includes civil works and goods to be procured through national shopping, consulting services, services of contracted staff of the project management office, training, technical assistance services, and incremental operating costs related to (i) managing the project, and (ii) re-lending project funds to local government units.

Table A1: Consultant Selection Arrangements (optional)
(US$ million equivalent)

Consultant Services Expenditure Category	Selection Method							Total Cost[1]
	QCBS	QBS	SFB	LCS	CQ	Other	N.B.F.	
A. Firms	17.00 (12.00)	0.00 (0.00)	2.00 (2.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	19.00 (14.00)
B. Individuals	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	2.00 (2.00)	0.00 (0.00)	2.00 (2.00)
Total	17.00 (12.00)	0.00 (0.00)	2.00 (2.00)	0.00 (0.00)	0.00 (0.00)	2.00 (2.00)	0.00 (0.00)	21.00 (16.00)

1\ Including contingencies

Note: QCBS = Quality- and Cost-Based Selection
QBS = Quality-based Selection
SFB = Selection under a Fixed Budget
LCS = Least-Cost Selection
CQ = Selection Based on Consultants' Qualifications
Other = Selection of individual consultants (per Section V of Consultants Guidelines), Commercial Practices, etc.

N.B.F. = Not Bank-financed
Figures in parenthesis are the amounts to be financed by the Bank Loan.

Prior review thresholds (Table B)

Table B: Thresholds for Procurement Methods and Prior Review [1]

Expenditure Category	Contract Value Threshold (US$ thousands)	Procurement Method	Contracts Subject to Prior Review (US$ millions)
1. Works	>10,000,000	ICB	All
	<10,000,000	NCB	All costing US$3 million or above
	<500,00	Shopping from quotation of at least 3 contractors	Only post review
2. Goods			
3. Services Firms and Individuals			
Firms	>100,000	QCBS	All
	<100,000	QCBS-SFB	Only post review
Individuals	>50,000	In accordance with the Guidelines	All
	<50,000	In accordance with the Guidelines	Only post review
4. Miscellaneous			
5. Miscellaneous			
6. Miscellaneous			

Total value of contracts subject to prior review: US$160 million

Overall Procurement Risk Assessment

Low

Frequency of procurement supervision missions proposed: One every 12 months (includes special procurement supervision for post-review/audits)

[1] Thresholds generally differ by country and project. Consult OD 11.04 "Review of Procurement Documentation" and contact the Regional Procurement Adviser for guidance.

Disbursement

Allocation of loan proceeds (Table C)

Project disbursements will be based on traditional procedures: (i) withdrawal via SOEs (to the borrower) and/or direct payment (a specified third party) or (ii) special commitment. The documentation showing the eligibility of the works or services will be included. As a consequence of the financial management assessment, Statements of Expenditures (SOEs) will be mainly used by the borrower via BANOBRAS, which is the financial agency

Table C: Allocation of Loan Proceeds

Expenditure Category	Amount in US$million	Financing Percentage
I. Civil Works. Highway Rehabilitation and Maintenance and Supervision	171.50	70
II. Civil Works. Pilot Program for Comprehensive Maintenance by Contract and Supervision	15.00	70
III. Civil works. Vehicle Weight and Dimensions Control Program	3.50	70
IV.Other Consulting Services and Training	4.20	100
V. Unallocated	21.62	-
Total Project Costs	215.82	
Front-end fee	2.18	
Total	218.00	

Use of statements of expenditures (SOEs):

Standard disbursements profiles prepared by the Bank for the LAC region, and in particular for Mexico, indicate that a four year period is required to obtain full disbursement for this type of project. The disbursement period has accordingly been estimated at four years and the closing date on June 30, 2005. However, if SCT decides to accelerate project execution and SHCP agrees to provide additional budget allocation required to match the loan funds necessary, the project could be completed in about three years. The initial allocations of loan proceeds and the corresponding percentage to be disbursed by category are shown in Table C.

Project disbursements will be based on traditional procedures: (i) withdrawal via SOEs (to the borrower) and/or direct payment (a specified third party); or (ii) special commitment. The documentation showing the eligibility of the works or services will be included. Disbursements under the project will be made against full documentation of expenditure except for the following items, for which disbursements would be on the basis of statement of expenditures (SOEs): (a) civil works contracts costing less than US$3 million equivalent; (b) consultant contracts with firms estimated to cost less than US$100,000 equivalent and with individuals costing less than US$50,000 equivalent; and (c) training. Supporting documentation in respect of SOEs will be made available to Bank staff as required for inspection during supervision. SOEs will be prepared by BANOBRAS based upon information furnished by the federal implementing agencies. The federal implenting agencies will retain supporting documentation for all SOEs.

Special account:

Payments from the loan proceeds will be administered by BANOBRAS from a Special Account, which will be opened and maintained in US dollars in the Central Bank (Banco de Mexico). BANOBRAS will use data submitted by executing agencies to prepare statements of expenditures (SOEs) and related loan withdrawal requests for submission to the Bank. It will authorize disbursements from the Special Account to reimburse eligible expenditures incurred or to make direct payments to supplies for such expenditures.

The authorized allocation, sufficient for financing four months of eligible expenditures, will be US$18 million. The first advances from this account will be limited to US$12 million equivalent until the aggregate amount of withdrawals from the loan account plus the total amount of all outstanding special commitments have reached US$40 million equivalent.

The information related to project Special Account should be provided by BANOBRAS to be included in the quarterly Project Management Reports (PMRs), which SCT will prepare according to the action plan.

Annex 7: Project Processing Schedule
MEXICO: FEDERAL HIGHWAY MAINTENANCE PROJECT

Project Schedule	Planned	Actual
Time taken to prepare the project (months)		
First Bank mission (identification)	04/03/2000	04/03/2000
Appraisal mission departure	06/11/2000	06/11/2000
Negotiations	10/31/2000	10/31/2000
Planned Date of Effectiveness	02/01/2001	

Prepared by:

Jose Maria Alonso-Biarge

Preparation assistance:

Emmanuel James

Bank staff who worked on the project included:

Name	Speciality
Jose Maria Alonso-Biarge	Team Leader/Task Manager
Emmanuel James	Deputy Team Leader/Task Manager
Juan D. Quintero	Environmental Assessment
María Elena Castro	Social Assessment
Rodrigo Archondo-Callao	Economic Evaluation
Lea Braslavsky	Procurement Analysis
Victor Ordonez	Financial Management Analysis
Gustavo Unda	Technical Analysis
Jose Augusto Carvalho	Legal Aspects
Teresa Genta-Fons	Legal Aspects
Reynaldo Pastor	Legal Aspects
Amadeu Blasco	Legal Aspects
Michael Fowler	Disbursements
Gladys Sakata	Report Production
Robin Carruthers	Peer Reviewer
William Paterson	Peer Reviewer
Denis Robitaille	Peer Reviewer

Annex 8: Documents in the Project File*
MEXICO: FEDERAL HIGHWAY MAINTENANCE PROJECT

A. Project Implementation Plan

Plan de Implantación del Proyecto - SCT, June 2000

B. Bank Staff Assessments

1. Programa de Rehabilitación y Mantenimiento de Carreteras 2001-2003, DGCC
2. Programa de Rehabilitación y Mantenimiento de Puentes 2001-2003, DGCC
3. Ayuda Memoria: Misión de Evaluación. Mexico, June 2000
4. Introduction to HDM-4
5. Evaluación Socio-Ambiental de la Rehabilitación de los Programas de Rehabilitación

C. Other

1. Summary of Bank's Experience in the Highway Sector, May 2000
2. Mexico Toll road Rationalization, Jeffrey Parker and Associates, April 2000

*Including electronic files

Annex 9: Statement of Loans and Credits

MEXICO: FEDERAL HIGHWAY MAINTENANCE PROJECT

15-Oct-2000

				Original Amount in US$ Millions			Difference between expected and actual disbursements*		
Project ID	FY	Borrower	Purpose	IBRD	IDA	Cancel.	Undisb.	Orig	Frm Rev'd
P048505	1999	Mexico	AGRICULTURAL PRODUCT	444.45	0.00	0.00	266.35	11.30	0.00
P067491	2000	Mexico	Bank Restructuring Facility	505.06	0.00	0.00	150.00	144.94	0.00
P007700	1997	Mexico	COMMUNITY FORESTRY	15.00	0.00	0.00	7.81	2.66	0.00
P007610	1999	Mexico	FOVI RESTRUCTURING	505.05	0.00	0.00	462.00	282.00	0.00
P007723	1993	Mexico	HWY RHB & SAFETY	480.00	0.00	0.00	6.83	6.83	0.00
P044531	1998	Mexico	KNOWLEDGE & INNOV.	300.00	0.00	0.00	251.23	26.23	0.00
P007648	1993	Mexico	MEDIUM CITIES TRANSP	200.00	0.00	23.00	107.49	130.49	107.49
P066938	2000	Mexico	MX GENDER (LIL)	3.07	0.00	0.00	3.07	0.00	0.00
P007720	1998	Mexico	MX: HEALTH SYSTEM REFORM - SAL	700.00	0.00	0.00	350.00	350.00	0.00
P040199	1998	Mexico	MX: BASIC EDUC.DEVELOPMENT PHASE I	115.00	0.00	0.00	69.40	27.83	0.00
P007689	1996	Mexico	MX: BASIC HEALTH II	310.00	0.00	0.00	94.30	75.29	60.30
P055061	1998	Mexico	MX: HEALTH SYSTEM REFORM TA	25.00	0.00	0.00	15.39	9.59	0.00
P049895	1998	Mexico	MX: HIGHER ED. FINANCING	180.20	0.00	0.00	164.68	33.74	0.00
P007725	1994	Mexico	MX: PRIMARY EDUC.II	412.00	0.00	40.00	66.67	106.67	66.67
P034490	1995	Mexico	MX: TECHNICAL EDUC/TRAINING	265.00	0.00	30.00	124.11	154.11	9.08
P007710	1994	Mexico	N. BORDER I ENVIRONM	368.00	0.00	300.99	36.22	322.21	46.11
P007701	1994	Mexico	ON-FARM & MINOR IRRI	200.00	0.00	30.00	51.22	81.22	10.95
P007711	1998	Mexico	RURAL DEV. MARG.AREA	47.00	0.00	0.00	35.29	14.80	0.00
P057530	2000	Mexico	RURAL DEV.MARG.ARII	55.00	0.00	0.00	51.45	-0.55	0.00
P007612	1994	Mexico	SOLID WASTE II	200.00	0.00	193.06	1.48	-4.46	1.47
P007713	1996	Mexico	WATER RESOURCES MANA	186.50	0.00	0.00	133.86	65.22	12.07
			Total:	5516.33	0.00	617.05	2448.85	1840.12	314.14

MEXICO
STATEMENT OF IFC's
Held and Disbursed Portfolio
15-Oct-2000
In Millions US Dollars

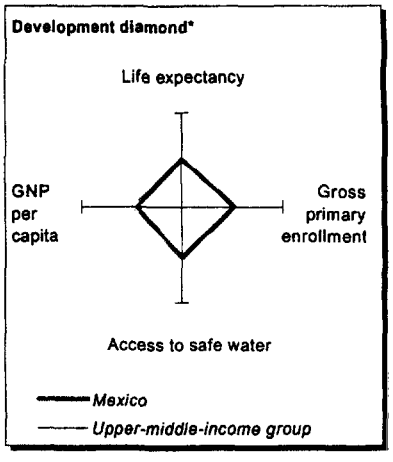
		Committed				Disbursed			
		IFC				IFC			
FY Approval	Company	Loan	Equity	Quasi	Partic	Loan	Equity	Quasi	Partic
1988/91/92/93/95	Apasco	12.60	0.00	0.00	50.40	12.60	0.00	0.00	50.40
1998	Ayvi	10.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
1990/92/96	BANAMEX	96.21	0.00	0.00	45.18	96.21	0.00	0.00	45.18
1997	Banco Bilbao MXC	70.59	0.00	30.00	0.00	70.59	0.00	30.00	0.00
1992	Banorte-SABROZA	3.00	0.00	0.00	0.00	3.00	0.00	0.00	0.00
1995/96	Baring Mex. FMC	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.00
1995/99	Baring Venture	0.00	2.73	0.00	0.00	0.00	0.00	0.00	0.00
1998	CIMA Mexico	0.00	4.80	0.00	0.00	0.00	4.80	0.00	0.00
1998	CIMA Puebla	7.00	0.00	0.00	0.00	3.50	0.00	0.00	0.00
1994	CTAPV	3.73	0.00	2.32	0.00	3.73	0.00	2.32	0.00
0	Chiapas-Propalma	0.00	0.80	0.00	0.00	0.00	0.31	0.00	0.00
1997	Comercializadora	3.06	0.00	2.19	6.25	3.06	0.00	2.19	6.25
1999	Corsa	13.00	3.00	0.00	0.00	13.00	3.00	0.00	0.00
1993	Derivados	2.20	0.00	0.00	0.00	2.20	0.00	0.00	0.00
1997	Fondo Chiapas	0.00	4.20	0.00	0.00	0.00	0.43	0.00	0.00
1998	Forja Monterrey	13.00	3.00	0.00	13.00	13.00	3.00	0.00	13.00
1991/96	GIBSA	21.64	0.00	10.00	72.76	21.64	0.00	10.00	72.76
1993	GIDESA	6.25	8.00	0.00	4.25	6.25	8.00	0.00	4.25
1996/00	GIRSA	45.00	0.00	0.00	60.00	22.71	0.00	0.00	30.29
1993	GOTM	0.82	0.00	0.00	0.22	0.82	0.00	0.00	0.22
1997/98	Gen. Hipotecaria	0.00	1.20	0.00	0.00	0.00	0.00	0.00	0.00
1998	Grupo Calidra	12.00	6.00	0.00	10.00	12.00	6.00	0.00	10.00
	Grupo FEMSA	0.00	9.43	0.00	0.00	0.00	9.43	0.00	0.00
1989	Grupo Minsa	18.00	10.00	0.00	27.00	18.00	10.00	0.00	27.00
1997	Grupo Posadas	25.00	0.00	10.00	10.00	25.00	0.00	10.00	10.00
1992/93/95/96/99	Grupo Probursa	0.00	1.32	0.00	0.00	0.00	1.32	0.00	0.00
1992/96/97/98	Grupo Sanfandila	9.58	0.00	0.00	4.70	6.25	0.00	0.00	3.03
1998	Heller Financial	0.00	0.32	0.00	0.00	0.00	0.32	0.00	0.00
1994/96/98/00	ITR	14.00	0.00	0.00	4.00	10.90	0.00	0.00	3.10
2000	Interceramic	8.00	0.00	6.00	3.50	8.00	0.00	6.00	3.50
1994	InverCap	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00
2000	Masterpak	2.40	0.00	0.00	0.00	2.40	0.00	0.00	0.00
1993	Merida III	30.00	0.00	0.00	73.95	27.36	0.00	0.00	67.44
1998	Mexplus Puertos	0.00	1.41	0.00	0.00	0.00	1.41	0.00	0.00
1995/99	NEMAK	0.00	0.00	0.83	0.00	0.00	0.00	0.83	0.00
1996/99/00	Punta Langosta	2.63	1.00	0.00	4.55	2.63	1.00	0.00	4.55
1998	Rio Bravo	50.00	0.00	0.00	59.50	22.83	0.00	0.00	27.17
2000	Saltillo S.A.	35.00	0.00	0.00	43.00	0.00	0.00	0.00	0.00
2000	Sudamerica	0.00	15.00	0.00	0.00	0.00	15.00	0.00	0.00
1999	TMA	2.77	0.00	2.10	9.60	2.77	0.00	2.10	9.60
1997	Toluca Toll Road	7.16	0.00	0.00	0.00	7.16	0.00	0.00	0.00
1992	Vitro	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1991/92	Vitro Flotado	4.96	0.00	0.00	2.07	4.96	0.00	0.00	2.07
1991	ZN Mxc Eqty Fund	0.00	25.30	0.00	0.00	0.00	9.81	0.00	0.00
1998									
	Total Portfolio:	529.60	98.53	63.44	503.93	432.57	74.85	63.44	389.81

		Approvals Pending Commitment			
FY Approval	Company	Loan	Equity	Quasi	Partic
1999	BANAMEX LRF II	50000.00	0.00	0.00	0.00
1999	Baring BMPEF FMC	0.00	0.00	60.00	0.00
1998	Cima Hermosillo	7000.00	0.00	0.00	0.00
2000	Educacion	9700.00	0.00	0.00	0.00
2000	FCCM	10500.00	0.00	2000.00	17700.00
2000	Hospital ABC	30000.00	0.00	0.00	14000.00
2000	Innopack	15000.00	0.00	15000.00	0.00
2000	Teksid Aluminio	25000.00	0.00	0.00	0.00
2000	Teksid Hierro	15000.00	0.00	0.00	30000.00
	Total Pending Commitment:	162200.00	0.00	17060.00	61700.00

Annex 10: Country at a Glance

MEXICO: FEDERAL HIGHWAY MAINTENANCE PROJECT

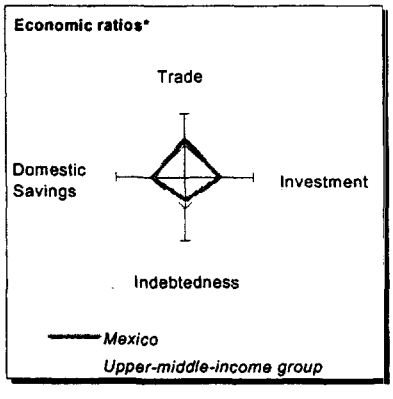
POVERTY and SOCIAL	Mexico	Latin America & Carib.	Upper-middle-income
1999			
Population, mid-year *(millions)*	97.4	509	573
GNP per capita *(Atlas method, US$)*	4,410	3,840	4,900
GNP *(Atlas method, US$ billions)*	429.6	1,955	2,811
Average annual growth, 1993-99			
Population *(%)*	1.7	1.6	1.4
Labor force *(%)*	3.0	2.5	2.1
Most recent estimate (latest year available, 1993-99)			
Poverty *(% of population below national poverty line)*	..	..	..
Urban population *(% of total population)*	74	75	76
Life expectancy at birth *(years)*	72	70	70
Infant mortality *(per 1,000 live births)*	30	31	27
Child malnutrition *(% of children under 5)*	..	8	7
Access to improved water source *(% of population)*	83	75	78
Illiteracy *(% of population age 15+)*	9	12	10
Gross primary enrollment *(% of school-age population)*	114	113	109
Male	116	..	..
Female	113	..	..



KEY ECONOMIC RATIOS and LONG-TERM TRENDS

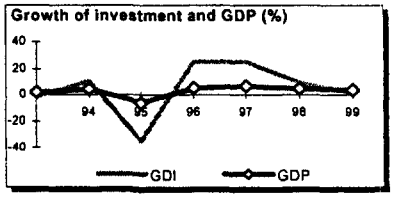
	1979	1989	1998	1999
GDP *(US$ billions)*	134.5	223.0	416.3	483.7
Gross domestic investment/GDP	26.0	22.9	24.3	23.2
Exports of goods and services/GDP	11.2	19.0	30.8	30.8
Gross domestic savings/GDP	24.7	22.9	22.3	21.9
Gross national savings/GDP	21.7	20.3	20.5	20.6
Current account balance/GDP	-4.1	-2.6	-3.9	-2.9
Interest payments/GDP	2.5	3.5	2.4	1.7
Total debt/GDP	31.8	42.1	38.4	34.0
Total debt service/exports	72.4	32.9	19.2	24.6
Present value of debt/GDP	..	..	37.4	33.0
Present value of debt/exports	..	..	111.5	100.4

	1979-89	1989-99	1998	1999	1999-03
(average annual growth)					
GDP	1.3	2.9	4.8	3.7	4.9
GNP per capita	-0.9	1.1	3.1	2.5	3.2
Exports of goods and services	8.4	13.6	12.0	13.9	7.4

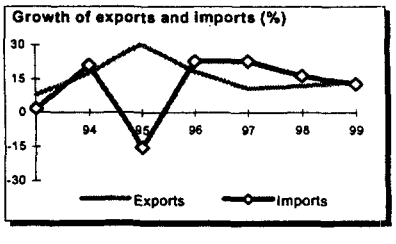


STRUCTURE of the ECONOMY

	1979	1989	1998	1999
(% of GDP)				
Agriculture	9.8	7.8	5.3	5.0
Industry	33.4	29.4	28.5	28.2
Manufacturing	22.7	21.9	21.3	21.1
Services	56.7	62.9	66.3	66.8
Private consumption	64.4	68.9	67.3	68.0
General government consumption	10.9	8.3	10.4	10.0
Imports of goods and services	12.5	19.1	32.8	32.0



	1979-89	1989-99	1998	1999
(average annual growth)				
Agriculture	1.2	1.7	0.8	3.5
Industry	0.9	3.5	6.3	3.8
Manufacturing	1.1	4.0	7.3	4.1
Services	1.8	2.7	4.5	3.6
Private consumption	1.4	2.2	5.5	4.3
General government consumption	3.1	1.7	2.2	1.0
Gross domestic investment	-4.3	4.3	9.5	1.5
Imports of goods and services	-1.1	11.9	16.5	12.8
Gross national product	1.2	2.9	4.8	4.2

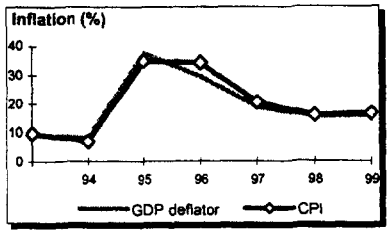


Note: 1999 data are preliminary estimates.

* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

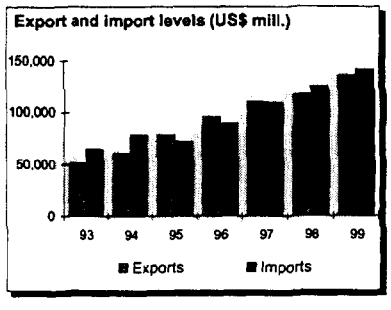
PRICES and GOVERNMENT FINANCE

	1979	1989	1998	1999
Domestic prices				
(% change)				
Consumer prices	..	20.0	15.9	16.7
Implicit GDP deflator	19.6	26.5	15.4	15.9
Government finance				
(% of GDP, includes current grants)				
Current revenue	..	25.8	20.4	20.7
Current budget balance	..	-1.8	2.1	1.7
Overall surplus/deficit	..	-4.6	-1.2	-1.1



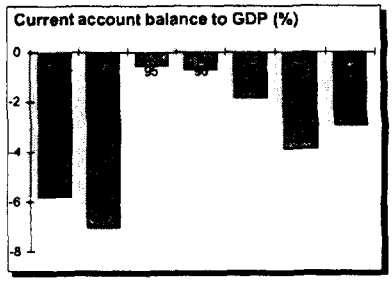
TRADE

	1979	1989	1998	1999
(US$ millions)				
Total exports (fob)	..	35,171	117,460	136,391
Oil	..	7,876	7,134	9,928
Agriculture	..	1,754	3,797	3,926
Manufactures	..	24,936	106,062	122,085
Total imports (cif)	..	34,766	125,373	141,975
Consumer goods	..	3,499	11,109	12,175
Intermediate goods	..	26,499	96,935	109,270
Capital goods	..	4,769	17,329	20,530
Export price index *(1995=100)*	..	96	95	98
Import price index *(1995=100)*	..	89	100	99
Terms of trade *(1995=100)*	..	108	94	99



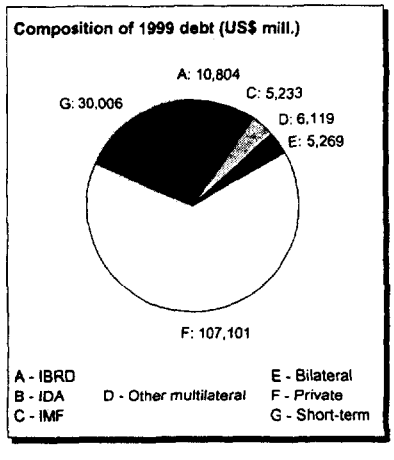
BALANCE of PAYMENTS

	1979	1989	1998	1999
(US$ millions)				
Exports of goods and services	15,131	42,362	128,982	148,083
Imports of goods and services	16,704	42,426	137,801	155,465
Resource balance	-1,573	-63	-8,818	-7,382
Net income	-4,111	-8,302	-13,284	-13,083
Net current transfers	131	2,544	6,012	6,313
Current account balance	-5,553	-5,821	-16,090	-14,153
Financing items (net)	5,868	6,093	18,227	14,746
Changes in net reserves	-315	-272	-2,137	-594
Memo:				
Reserves including gold *(US$ millions)*	..	6,376	29,032	31,829
Conversion rate *(DEC, local/US$)*	2.3E-02	2.5	9.2	9.6



EXTERNAL DEBT and RESOURCE FLOWS

	1979	1989	1998	1999
(US$ millions)				
Total debt outstanding and disbursed	42,765	93,826	159,962	164,532
IBRD	1,731	7,821	11,514	10,804
IDA	0	0	0	0
Total debt service	11,591	15,559	26,778	39,072
IBRD	221	1,245	2,024	2,171
IDA	0	0	0	0
Composition of net resource flows				
Official grants	27	37	32	..
Official creditors	284	936	-776	-1,262
Private creditors	3,798	-2,397	12,219	6,308
Foreign direct investment	1,332	3,037	10,238	11,568
Portfolio equity	0	0	730	3,769
World Bank program				
Commitments	527	2,325	2,212	1,616
Disbursements	326	1,297	1,283	839
Principal repayments	76	677	1,257	1,326
Net flows	250	620	26	-487
Interest payments	145	567	767	846
Net transfers	105	52	-741	-1,332



Additional
Annex No.: 11

MEXICO: FEDERAL HIGHWAY MAINTENANCE PROJECT

SOCIAL ASSESSMENT

I. Objectives

As part of project preparation, a social assessment was carried out in order to: (i) ensure that the rehabilitation and maintenance works under the Project will not cause involuntary resettlement as defined in OD 4.30; (ii) identify possible social impacts on indigenous peoples in compliance with OD 4.20; (iii) identify any other possible social impacts and to design mitigation measures if necessary; (iv) better identify the project's benefits; and (v) propose a simple method of monitoring any possible social impact arising from the project during its implementation.

II. Methodology

The social assessment comprised two phases: (i) desk-analysis of technical and socioeconomic data; and (ii) field research of a sample of selected works. The sample included: (i) rehabilitation of roads and bridges proposed for the year 2001 program; (ii) works carried out under Loan 3628-ME; and (iii) civil works for the weigh station in Veracruz state which will not be included in the Project.

The field research was carried out in two distinct regions: (i) the Western Region; and (ii) the Gulf Region. Both selected regions present different socioeconomic and cultural characteristics that facilitated the analysis of a wide range of alternatives so as to better assess any possible social impacts that might occur under the project and identify mitigation measures, if necessary.

The Western Region, comprising coastal areas of Jalisco, Nayarit and Sinaloa states, is an agricultural and tourist area with middle to low levels of poverty. The road surveyed is one of the most important in the country, connecting the industrial area of Guadalajara in Jalisco state to the border with the USA. The analysis in this region included 174.5 km of roads (proposed and completed) and six bridges over a total run of 2,705 km.

The Gulf Region, including Veracruz, Tamaulipas and San Luis Potosi states, though near some oil production centers, is mainly dedicated to agriculture and cattle rearing. With the exception of some localities, it is defined as a very poor area. The analysis in this region included 223.5 km of roads (proposed and completed) over a total run of 1,617 km.

During the appraisal mission, the team visited proposed and completed works in Hidalgo, one of the poorest states in the highly populated central region of Mexico. In this visit 120 km of roads were surveyed over a total run of 400 km. The research also covered material sources and camping sites so as to better identify any possible impact.

During the field trips key informants were formally interviewed including several mayors (13 of the 27 municipalities involved), local government officials and technical personnel within SCT Centers as well as some beneficiaries. All of them answered four basic questions related to: (i) expected benefits; (ii) possible impacts and conflicts; (iii) recommendations to mitigate such impacts; and (iv) identifying poor communities and/or indigenous communities that might benefit or be affected by the works. The scope and

characteristics of the works to be carried out under the FHMP were discussed so as to better understand the possibilities of social impact.

III. Main Findings

SCT authorities participating in the mission were aware that the Bank's safeguard policies apply to the whole project, independently of the source of financing therefore the four-year program will include only works that satisfy the Bank's requirements. The PAD section, which describes project's components, clearly defines the type of works that fit these requirements.

(a) Project Benefits

Based on the positive results of the HRTS Project of which the proposed project is a follow up, similar benefits are expected from the FHMP. In the roads improved under the first project, safety and speed increased while travel time and related costs diminished. Increase in traffic on these roads is an indication of the support provided to the regional development of their influence areas. In the opinion of municipal and local officials as well as beneficiaries, the proposed project will benefit their communities by providing better access to services and markets in cities within the region and other parts of the country and spur business related to transport services. Better opportunities for exporting agricultural products and tourism were also mentioned. The general improvement fostered by such roads helps motivate municipal authorities and local residents to seek to get connections to federal roads as a development mechanism.

(b) Resettlement

Based on the results of the HRTS Project and the findings of the social assessment, it is possible to state that the type of rehabilitation and maintenance works to be carried out under the proposed project will not involve involuntary resettlement because of the following reasons:

Scope. The critical works under the project comprise rehabilitation and maintenance of the long existing (30 years old in average) federal network with high volume of traffic connecting, by definition, the country' s capital (Mexico City) with state capitals and main ports and other important cities. To build and improve the federal network under such principles has been a key policy of Mexico during decades. The federal network constitutes the axis of internal and international trade for the country, connecting long developed regions rather than incorporating new areas. The project's main objective of maintaining the competitiveness of the country fits within this policy.

Technical. The project is a follow-up of the HRTS Project, which did not incur involuntary resettlement or land acquisitions during its five-year execution of 9,500 km rehabilitation and maintenance works with a cost of $480 million. The field research undertaken proved that the similar type of works to be carried out under the proposed project are to be executed within the existing platform of the road; there are no changes in road alignment, elevated ways, or bypasses or any other work beyond the existing geometrical design. This exercise comprised works completed under the first project and proposed works for the year 2001. During the upcoming years, the Bank will have the opportunity to review and agree in advance upon annual work programs according to the technical, social and environmental criteria agreed during negotiations in order to ensure that no social and/or environmental impacts are likely to occur.

Institutional. SCT's internal regulations do not allow the project's executing agency *(Dirección General de Conservación de Carreteras/DGCC)* to undertake works that require land acquisition, occupy land beyond the original right of way or incur any involuntary resettlement.

Legal. Mexico's applicable laws, the *Ley de Vias Generales de Comunicación* (Articles 2,3) and *Ley General de Bienes Nacionales* (articles 1,2,3, 5,6, 8, 23, 24, 26, 28, 29, and 74), forbid any occupation of the right of way of the federal networks. There are also specific regulations (Reglamento para el aprovechamiento del derecho de via de carreteras federales y zonas aledañas) to control any legal use of right of ways of federal roads. Illegal occupation is a federal violation. *Centros SCT* (decentralized SCT units, one in each state) through their Right of Way Units, are in charge of enforcing those regulations. Technical units in the *Centros* supervising ongoing works support this surveillance. An initial admonition followed by monetary sanctions usually make it unnecessary to proceed with legal actions. This process has discouraged illegal occupation of the right of way of federal roads.

Social. The high traffic of the federal roads, of which approximately 25% is heavy traffic, makes it difficult and dangerous to establish irregular settlements along those roads. There are, however, seasonal and occasional vendors in some segments of the roads (during harvests for instance). SCT has a policy of tolerance to this occasional use of the right of way. Established businesses are careful to keep out of the right of way to avoid sanctions and they support control of illegal occupants in order to reduce or eliminate "unfair competition". Field research carried out during the social assessment along more than 4,000 km of roads proved that this is the prevailing situation. There are photographs in the Project File of all the works visited.

(c) Indigenous Peoples

Indigenous Peoples. As explained above, the 30 year old federal network connects mainly long developed urban areas and some regional centers that have become focal points for services and trade for rural populations. Rural communities are served also through other types of roads and indigenous communities are usually in remote locations. Because the proposed project comprises only federal infrastructure and works to be executed within the existing pavement platform and legal right of way, it will not create any potentially adverse effect on indigenous peoples. Field research carried out under the social assessment confirmed that no indigenous communities are to be affected by the proposed Project, as proved by the field visits to states with an important indigenous population such as Nayarit or Veracruz. On the contrary, through feeder roads that reach the federal network, many rural communities have benefited, including some with small amounts of indigenous population. In the opinion of local authorities and beneficiaries interviewed during the social assessment, roads are a priority demand for most communities.

Ixmiquilpan in Hidalgo, for instance, visited during a preparation mission, which has now access to a federal road, still maintains the role as the traditional trade center of the Otomi people, one of the poorest indigenous groups in Mexico. Monday is still the "market day" as it has been since pre-Hispanic times. Through Ixmiquilpan, the 150 very poor indigenous communities scattered in the Mezquital Valley have been able to better market their vegetables. Officials at the municipality estimated that improved transport services have helped to increase by around 30% the sales of local production while allowing indigenous communities to maintain their traditions.

(d) Cultural Assets

There is no danger of damaging cultural assets because of the scope of the project and the technical reasons mentioned above. Field research indicates that no cultural assets are near the federal roads surveyed during social assessment. According to Mexican regulations any occasional findings are protected under the law and in through contracts with private contractors.

(e) Other Possible Social Issues

Findings of the social assessment indicate that the main complaints by the community occur during execution of the works (usually less than a year), namely: (i) delays in finishing the works on schedule; (ii) inadequate use of material sources; (iii) inadequate signalling of detours; and (iv) in some cases, inconsistent quality of the works. All these aspects are governed or penalized under the construction contracts, and can serve as a mechanism to protect community rights.

Construction contracts include provisions to compensate for any damage caused during construction to the communities and a recommendation to use local labor. Contracts to occupy temporary land or to use material sources are signed directly with the owners involved and protected under Mexican laws. Centros SCT's Legal Unit intervenes unpon the request of the community to enforce provisions in the contracts and to address conflicts arising from the works.

(f) Weigh Stations

The weigh stations were analyzed separately because they are different from road works. Weigh stations aim to control specifications and weight of trucks to protect roads. The proposed project would include a pilot to build two such stations: (i) a double station, near Palmillas, in Querétaro state, with units south and north bound; and (ii) a single station in Nuevo Laredo, near the border with the USA in Tamaulipas. The proposed "model" for such stations in Mexico comprises access and exit lanes and an area for weighing and supervision. According to SCT, this type of infrastructure requires a strip of land one-kilometer long by 6 meters wide, typically well within the right of way (usually of more than 40 meters in width). Because a station can be built at any point along any given road, within certain parameters, it is typically possible to avoid sites that involve displacement of people or any other social impact.

The Nuevo Laredo and Palmillas stations sites are located in unoccupied lands with no apparent productive activity *(tierras baldías)* therefore no displacement of population is envisaged nor any other social impact is expected. However, it has been agreed during negotiations that the purchase of said land will be carried out in accordance with OD 4.30, and that no bidding documents will be issued for the construction of said stations until the Bank has received, evidence acceptable to the Bank, that the land on which each station will be located has been acquired in a manner satisfactory to the Bank. The site in Nuevo Laredo and Palmillas will meet similar conditions and hence avoid social impacts. No other impacts, beyond those already mentioned in relation to road works have been identified.

IV. Community Participation

Because the federal network has been long established and the type of works to be implemented require certain technical specialization, direct involvement of local communities is limited. However, local people interviewed during the social assessment mentioned these works as a source of temporary employment and indirect source of income.

The SCT Center in each state, which is responsible for supervising all works in federal roads, should inform the community in advance about the type and duration of the works to be carried under its jurisdiction. Private construction contracts should include provisions to pay any damage caused during construction to the communities and a recommendation to use local labor as much as possible, which is

usually the case for certain works. Contracts to occupy temporary land or to use material sources are signed directly with the owners involved and protected under Mexican laws. SCT Legal Unit intervenes when the requested by the community to enforce provisions in such contracts.

V. Mitigation Measures and Recommendations

In order to address the typical problems associated with the execution of the road works, legal contracts with private contractors will include specific covenants to protect community rights and penalize non-compliance with such agreements.

Additional
Annex No.: 12

MEXICO: FEDERAL HIGHWAY MAINTENANCE PROJECT

IMPLEMENTATION FRAMEWORK FOR REHABILITATION AND MAINTENANCE WORKS

Background and Objective

The Federal Highway Maintenance Project (the Project) will support the ongoing SCT efforts to improve the maintenance of the federal highway network. The project will finance key segments of the SCT maintenance program, which as a whole, includes only works that do not require changes in the road geometrical design. As discussed throughout the PAD comprehensive Environmental, Social and Technical analyses were carried out on the SCT program. In summary, the environmental analysis indicated that since the proposed works involve only rehabilitation and maintenance of existing federal highways along well-consolidated right of ways, direct impacts on sensitive ecosystems and human population are not expected. The identified sub-projects do not represent potentially direct or indirect impacts and therefore do not require independent, stand-alone environmental analyses. Minor impacts are related to the construction works and can be managed through the application of good environmental practices already in practice in Mexico under the *Modelo de Evaluación Ambiental* in SCT. The Project will help to standardize these measures through the preparation of standard environmental manuals for road rehabilitation and maintenance.

Field research and consultation carried out during the social assessment (Annex 11), ratified that no indigenous territories or natural resources are affected by the proposed rehabilation and maintenance works under the Project, as proven by the field visits to states where there are indigenous populations such as Hidalgo, Nayarit and Veracruz. Municipalities with indigenous populations (identified as those speaking a native language) visited during the social assessment are expected to benefit from better transport infrastructure. Such is the case of Ixmiquilpan in the Mezquital Valley in Hidalgo; Santa María del Oro and Acaponeta in Nayarit; and Chontal and Tantoyuca in Veracruz. In the opinion of local authorities and beneficiaries interviewed, to have access to roads is a priority demand for most communities.

Hence, no environmental or social impacts are expected to occur during the three-year project implementation period. Upon this basis, the objective of this framework is to establish an implementation process that ensures continually that the project will not cause social or environmental impacts during implementation and that it will comply fully with Bank's policies, namely OD 4.30: Involuntary Resettlement and OD 4.20 Indigenous Peoples.

Principles

To ensure that the project maintains the above-mentioned conditions that guarantee that no impacts related to OD 4.30 and OD 4.20, or any other social impact, occur during its implementation the executing agency will comply with the following implementation principles:

Technical: The referenced works under the Project will concentrate on the existing federal network

undertaking maintenance works within the existing road surface and its right of way. SCT will select subprojects using the SISTER and HDM models to help ensure compliance with technical and economic criteria approved by the Bank. All FHMP sub-projects will comply with the following criteria: (i) to have an ERR satisfactory to the Bank; (ii) do not require changes in geometrical design; and (iii) to have a structural design life of at least 15 years. As corroborated by the social impact assessment this type of works do not cause social or environmental impacts.

Environmental: Construction related issues would be managed through the application of environmental clauses in construction contracts. These clauses will focus on the implementation of good housekeeping measures to reduce nuisances during construction. These measures will also address main complaints expressed by stakeholders during the social assessment. Tender documents and construction contracts will include such measures to be executed by contractors and enforced by SCT supervision units in Centros SCT. Moreover, all subprojects will comply with existing environmental requirements in Mexico, which are satisfactory to the Bank for this type of project.

Social: The whole program, regardless of the source of financing (SCT or Bank) will include only works that ensure that: (a) no resettlement occurs during implementation; (b) indigenous populations, where involved, benefit from the works; and (c) that mitigation measures are in place to minimize disruption during construction. Based on the model established during the social assessment, compliance with these principles will comprise the following steps:

- *Program Review*. Review of the annual program to verify that it comprises only maintenance of federal highway subprojects as defined in the technical and environmental principles of this framework.

- *Verification*. *SCT* will verify that the right of way of subprojects included in the annual program has been enforced, and that there is no risk of resettlement or land tenure issues related to said works under the Project. This verification would cover highway works and bridges.

- *Quick Consultation*. As established in SCT procedures, SCT Centers through its technical units will inform municipal authorities of the works to be executed under their jurisdiction, and will take into account their opinion to establish mitigation measures as necessary to avoid/or minimize social impacts during works execution.

Annual Reviews

To ensure compliance with this implementation framework, the Bank supervision team, including a social scientist, will carry out annual reviews under the following process:

(a) The executing agency (DGCC) will present every year work progress reports including information to support compliance with the objective and principles of this framework.

(b) The Bank will review and agree in advance every year on the work program for the following year to ensure that only works that meet technical, economic, and social criteria, as defined in the principles of this implementation framework, are included in said annual plans.

(c) The Bank supervision team will survey a sample of subprojects defined under the following criteria: (i) works executed or under construction in the program of the previous year; (ii) works proposed for the next annual program; (iii) works to be carried out in marginal areas as defined by CONAPO; and

(iv) a representative mix of works to be executed. Weigh stations will be in the sample when included in the work program.

(d) The Bank supervision team will carry out field trips to survey the sample in order to identify possible social impacts, and/or expected benefits. This process will include a quick consultation with municipal and local officials, as well as potential beneficiaries. If municipalities with indigenous population are involved the visit will include such municipalities.

(e) The Bank team will complete a report upon the results of this supervision trip, and the progress report prepared by SCT, providing recommendations to improve project execution.

(f) The Bank and DGCC will agree on mitigation measures to address social and/or environmental issues to be promptly implemented. Because no resettlement or land acquisition problems are expected, these issues, as explained in this framework, are related only to nuisances during construction and can be addressed under the provisions included in construction contracts.

Legal Documents

This implementation framework, as appropriate, will be incorporated into the project documentation including: (i) Project Appraisal Document; (ii) Guarantee Agreement; and (iii) Annual implementation letter to be provided by the executing agency. A model of the letter for the year 2002 programs follows.

Model Letter

MEXICO: FEDERAL HIGHWAY MAINTENANCE PROJECT

ANNUAL IMPLEMENTATION LETTER: FY2002
September 15, 2001

Mr. Olivier Lafourcade
Director,
Mexico Country Department,
The World Bank,
Washington, D.C.

I am writing this letter in connection with the selection and finalization of the list of eligible subprojects proposed for inclusion as the Second year of the program for the conservation of the Federal Highway Network, being financed under Loan_____ ME.

We consider efficient road transportation to be indispensable to sustaining Mexico's economic development goals, and hence it is necessary that we take steps to minimize capacity constraints and to address the conservation needs of our Federal Highway Network. While other initiatives are underway in terms of relieving capacity constraints, the Federal Highway Maintenance project represents a key component of our strategy for addressing the conservation needs of this 42,000 km network. The major elements of the annual conservation needs, are generated largely by the age of the network, the expired economic life of some assets and the high prevailing traffic levels. Hence it is for the purpose of the adequate restoration of transport facilities that our Highway and Bridge Maintenance Programs (HMP & BRP) are developed and provide the basis from which we select a subset for financing by the International Bank for Reconstruction and Development (the Bank). It is worth noting that the *Sub-Secretaría de Infraestructura* of the *Secretaría de Comunicaciones y Transporte* (SCT) has advanced substantially in the implementation of the First Year program of conservation works for the Federal Highway Network, being financed under Loan _____ME.

The methodologies and criteria applied by our *Dirección General de Conservación de Carreteras (DGCC)* for the design of the ongoing First Year program have been appraised and found acceptable to the Bank. The purpose of this letter and its supporting annexes is to reconfirm to you that the same high standards have been maintained in establishing the Second Year program. Hence, we are submitting for your review and no objection a list of subproject candidates (Plan 2002) that were selected from the Year 2002 HMP and BRP for Bank financing. These are fully detailed in Attachment 1 of this letter, which supplies information on their technical and economic criteria.

I am pleased to inform you that all subprojects in Plan 2002 are consistent with DGCC's goals and objectives. In Attachments 1 and 2, you will find supporting information to show that all the proposed subprojects meet the implementation criteria, agreed between SCT and the Bank, especially the requirements for their: (i) technical and economic feasibility, and (ii) environmental and social impacts.

Consistent with our commitments under this Loan, we have reviewed Plan 2002 and verified that the rights-of-way have been secured and that there are no land tenure issues or social issues associated with the projects and subprojects.

I would also like to mention that DGCCs program, has been subjected to periodic implementation reviews by SCT. In Attachment 3 you will find some of the important features of the reviews such as assessments of DGCCs monitoring of the adherence to the agreed social and environmental policies, including the enforcement of the environmental and social specifications that were included in contract documents for civil works.

Continued implementation of the Federal Highway Maintenance Project is important to Mexico's economic development. We await the Bank's no objection to our finalizing and implementing Plan 2002.

With best regards

Sincerely Yours

Sub-Secretario de Infraestructura
Secretaría de Comunicaciones y Transporte

Attachments (3)

MEXICO: FEDERAL HIGHWAY MAINTENANCE PROJECT

ANNUAL IMPLEMENTATION LETTER: FY2002
September 15, 2001

Attachment 1: List of Proposed subprojects

State	Item Description	Length (km)	Cost	Traffic	ERR	NPV
Totals						

MEXICO: FEDERAL HIGHWAY MAINTENANCE PROJECT

ANNUAL IMPLEMENTATION LETTER: FY2002
September 15, 2001

Attachment 2: Environmental and Social Assessment Summary

1. The assessment's criteria were based on the study carried out in July 2000 for analyzing the social and environmental impact of the First Year program (Plan 2001). Of the____km listed in Attachment 1, rapid social assessments were carried out by SCT's Centros on ___km in _____states. The main features of the study included:

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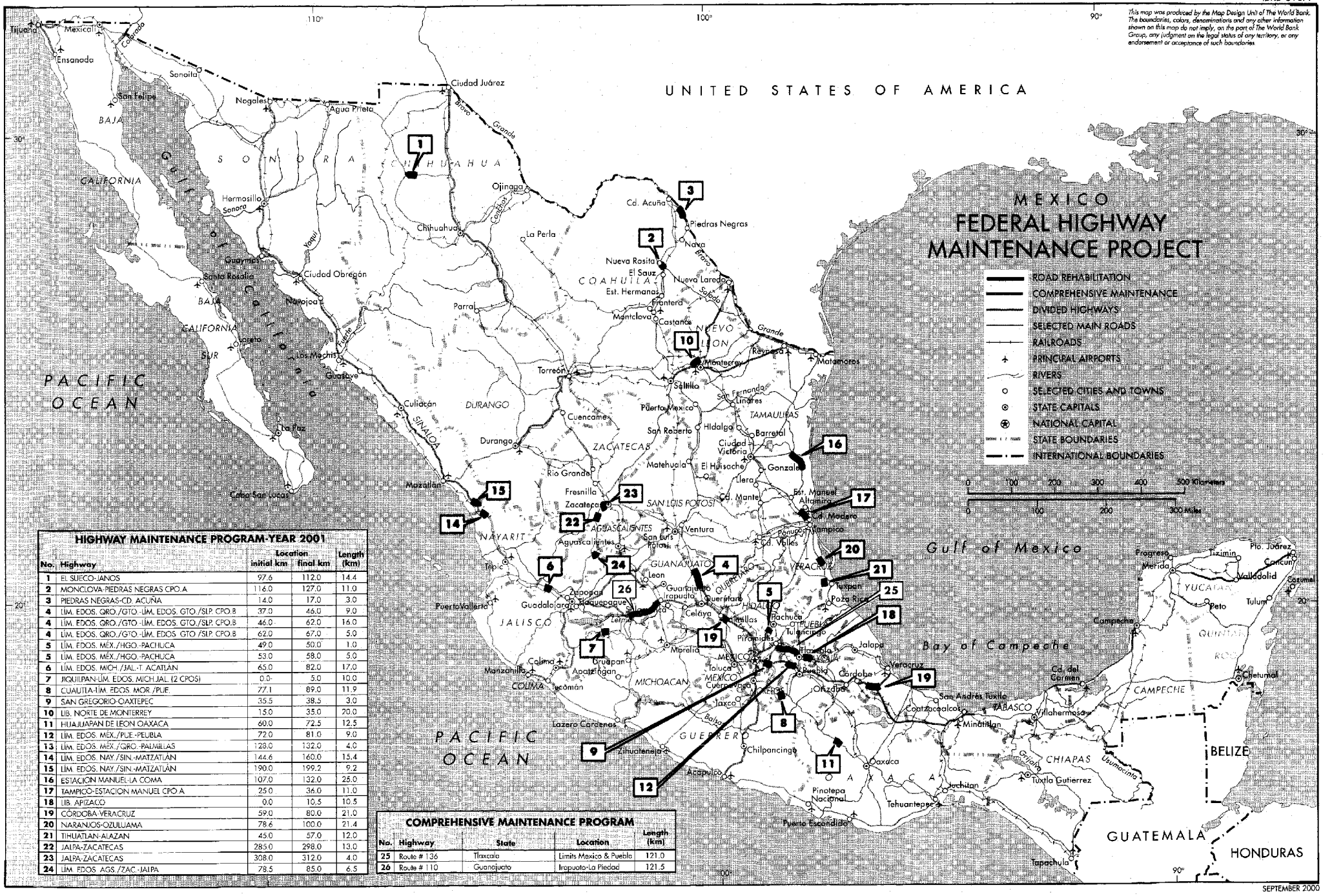

HIGHWAY MAINTENANCE PROGRAM-YEAR 2001

No.	Highway	Location initial km	Location final km	Length (km)
1	EL SUECO-JANOS	97.6	112.0	14.4
2	MONCLOVA-PIEDRAS NEGRAS CPO.A	116.0	127.0	11.0
3	PIEDRAS NEGRAS-CD. ACUÑA	14.0	17.0	3.0
4	LÍM. EDOS. QRO./GTO.-LÍM. EDOS. GTO./SLP. CPO.B	37.0	46.0	9.0
4	LÍM. EDOS. QRO./GTO.-LÍM. EDOS. GTO./SLP. CPO.B	46.0	62.0	16.0
4	LÍM. EDOS. QRO./GTO.-LÍM. EDOS. GTO./SLP. CPO.B	62.0	67.0	5.0
5	LÍM. EDOS. MÉX./HGO.-PACHUCA	49.0	50.0	1.0
5	LÍM. EDOS. MÉX./HGO.-PACHUCA	53.0	58.0	5.0
6	LÍM. EDOS. MICH./JAL.-T. ACATLÁN	65.0	82.0	17.0
7	JIQUILPAN-LÍM. EDOS. MICH.JAL. (2 CPOS)	0.0-	5.0	10.0
8	CUAUTLA-LÍM. EDOS. MOR./PUE.	77.1	89.0	11.9
9	SAN GREGORIO-OAXTEPEC	35.5	38.5	3.0
10	LIB. NORTE DE MONTERREY	15.0	35.0	20.0
11	HUAJUAPAN DE LEON OAXACA	60.0	72.5	12.5
12	LÍM. EDOS. MÉX./PUE.-PEUBLA	72.0	81.0	9.0
13	LÍM. EDOS. MÉX./QRO.-PALMILLAS	128.0	132.0	4.0
14	LÍM. EDOS. NAY./SIN.-MATZATLÁN	144.6	160.0	15.4
15	LÍM. EDOS. NAY./SIN.-MATZATLÁN	190.0	199.2	9.2
16	ESTACION MANUEL-LA COMA	107.0	132.0	25.0
17	TAMPICO-ESTACION MANUEL CPO.A	25.0	36.0	11.0
18	LIB. APIZACO	0.0	10.5	10.5
19	CÓRDOBA-VERACRUZ	59.0	80.0	21.0
20	NARANJOS-OZULUAMA	78.6	100.0	21.4
21	TIHUATLAN-ALAZAN	45.0	57.0	12.0
22	JALPA-ZACATECAS	285.0	298.0	13.0
23	JALPA-ZACATECAS	308.0	312.0	4.0
24	LÍM. EDOS. AGS./ZAC.-JALPA	78.5	85.0	6.5

COMPREHENSIVE MAINTENANCE PROGRAM

No.	Highway	State	Location	Length (km)
25	Route # 136	Tlaxcala	Limits Mexico & Puebla	121.0
26	Route # 110	Guanajuato	Irapuato-La Piedad	121.5

SEPTEMBER 2000