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**GOES**

**GOVERNMENT OF  
EL SALVADOR**

**NATIONAL RECONSTRUCTION PLAN**

**EL SALVADOR  
INTERMODAL TRANSPORT STUDY**

CONTRACT NO. 519-0394-C-00-4112-00

FINAL REPORT

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Financed by:  
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San Salvador, October 17, 1995

Mr. Ernesto Girón, CTO  
USAID Mission to El Salvador  
San Salvador

Ref.: Intermodal Transportation Study  
Contract No. 519-0394-C-00-4112-00  
Final Report

Dear Mr. Girón:

In compliance with Section F.2 (3) of above-referenced Contract, enclosed herewith are five (5) copies in English and Spanish of the Final Report, summarizing the Study's accomplishments, methods and recommendations.

This submission completes the implementation of this contract which we are confident meets both USAID and GOES expectations.

Once again, we wish to thank USAID, the GOES, the Study's Technical Committee and the private sector for their excellent cooperation during the implementation of the Study.

Very truly yours,

FREDERIC R. HARRIS, INC.

Joseph S. Weiss, Ph.D.  
Deputy Team Leader

*El Salvador Intermodal Transportation Study.*  
*USAID / GOES, in Association with Tech International, Inc and SONTAY S.A. DE C.V.*

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# ACKNOWLEDGEMENTS

The Consultant wishes to thank USAID for the generous assistance provided during the execution of this Study and its excellent coordination with the GOES.

We also wish to thank the Government of El Salvador, through the following institutions and others not mentioned here, for the extensive cooperation they gave to the Study and to our Specialists, not only to collect data but by participating actively with their valuable contributions, suggestions and comments:

Ministerio de Obras Públicas, Vivienda y Desarrollo Urbano  
Ministerio de Coordinación y Desarrollo Social  
Secretaría Nacional de Reconstrucción  
Viceministerio de Obras Públicas  
Viceministerio de Transporte  
Dirección General de Caminos  
Comisión Ejecutiva Portuaria Autónoma  
Ferrocarriles Nacionales de El Salvador

Our special thanks to the Study Technical Committee, which shared their valuable time at very frequent meetings to discuss the progress of the Study in detail, its results and recommendations and to guide us towards successful presentations of the Study before high Government Officials.

Finally, we wish to thank representatives of private industry for the information provided to us as well as the sharing of their concerns related to the transport industry in El Salvador.

Nevertheless, the Consultant remains solely responsible for all data, opinions, conclusions and recommendations given in this Study.

**EL SALVADOR**  
**INTERMODAL TRANSPORT STUDY**  
**FINAL REPORT**

<b>Table of Contents</b>		<i>Page</i>
<b>1.</b>	<b>Background</b>	<b>1</b>
<b>2.</b>	<b>Scope of Work</b>	<b>1</b>
<b>3.</b>	<b>Approach and Methods</b>	<b>2</b>
<b>4.</b>	<b>Achievements</b>	<b>4</b>
<b>5.</b>	<b>Recommendations</b>	<b>4</b>
<b>6.</b>	<b>GOES Needs for Continued Support</b>	<b>10</b>

## **1. Background**

After twelve years of civil war, the Government of El Salvador (GOES) began an economic recovery and reform program to boost the postwar economy and support local and international private investors, identifying the transportation sector as one of the country's most important constraints to development.

The 1989 Infrastructure Sector Assessment, funded by USAID, first identified the need for this Study. Subsequently, the Interamerican Development Bank (IDB), took a special interest in this study, financing the preparation of its terms of reference in 1991. With its implementation, the GOES met one of the IDB's preconditions to disburse the second tranche of its Highway Rehabilitation and Maintenance Loan; it will meet one of the conditions for releasing the third tranche as recommendations from this Study are implemented.

The GOES established a Technical Committee to review and approve the Study's terms of reference made up of representatives of the Ministry of Planning (MIPLAN), Ministry of Public Works (MOP), Autonomous Port Executive Commission (CEPA) and National Reconstruction Secretariat (SRN). The Technical Committee and USAID together selected **Frederic R. Harris, Inc.** to carry out the Study under Contract No 519-0394-C-00-4112-00 which was signed on August 15, 1994, with an implementation time frame of approximately ten months.

## **2. Scope of Work**

In synthesis, the scope of work was to help optimize the intermodal transportation system in El Salvador including:

- An intermodal analysis of critical infrastructure, legal, institutional, regulatory and operational problems affecting the sector now and through the year 2015;
- Recommendations for a more efficient, intermodally coordinated system, and policies for a more favorable investment environment, improved organizational efficiency (including privatization and decentralization), sector integration, and investment priorities.

The Study covered sector management, intermodal coordination, traffic analysis, interurban transport, roads, the railroad, ports and air transport, including the following specific areas:

## **Sector Management and Intermodal Coordination**

Although not a part of the scope of work, the Consultant analyzed and made recommendations regarding the definition of sector objectives, institutional strengthening, intermodal coordination and management policies.

### **Interurban Transport**

The organization, regulations, administrative procedures, and quality of service of inter-urban public transportation are analyzed, along with the impact of the public transit fuel subsidy and an overview of freight transportation.

### **Highways**

The highway analysis is closely linked to the performance of the General Directorate of Highways (DGC), responsible for the administration of inter-urban paved road construction and maintenance covered by this Study, the application of road regulations and issues of highway financing. The main points analyzed are the following:

- Maintenance needs and the privatization of maintenance operations
- A review of the axle weight control system
- Analysis of road user charges
- Determination of paved road investment needs and
- Financial projections for the road system.

### **The Railroad**

The railroad system was studied to determine whether it has a role in optimizing El Salvador's transportation system and to develop criteria for determining financial and economic feasibility. Rehabilitation and operating costs were carefully analyzed for operating the system under public or private management and financing.

### **Ports**

The study focuses on the prospects and means for improved operations and the privatization of the Port of Acajutla. It also covers the alternative or complementary use of ports in Guatemala and Honduras, as well as the upgrading of the Port of Cutuco as a possible container terminal for El Salvador.

## **Air Transport**

The Study emphasis is placed on cargo transport, its management and the possibility of transferring cargo facility management to the private sector, taking into consideration the growing role of air transport in carrying non-traditional Salvadorean exports. The Study also covers ongoing works at the International Airport of El Salvador (AIES) and the possibility of converting it into a cargo hub for Central America. Finally, the Ilopango airport is analyzed.

### **3. Approach and Methods**

The sub-sector analyses were generally carried out in two phases:

- **Assessment:** All pertinent information was collected including legal, institutional and regulatory constraints to greater efficiency and privatization; the existing infrastructure, its physical condition, and degree of maintenance it received; operational and financial issues (tariffs, user charges, etc.).
- **Detailed Analysis and Evaluation:** During this stage of the study, each sub-sector was analyzed in-depth with emphasis on the key institutional, legal, regulatory, infrastructure, operational and financial issues.

In parallel with the first phase:

- **Intermodal traffic analysis** was completed by applying the TRANUS transport planning model to Salvador's intermodal transport network. To calculate current demand, the consultant divided the country and surrounding regions into traffic zones, compiled and compared information from various sources and estimated origin and destination matrices of freight and passengers for the 1992 base year. Demand estimates were prepared by origin and destination for the following categories: passengers, general cargo and bulks, containers and low-value cargo. Port and airport demand analyses were detailed outside the model.

The proposed strategies, policies and programs were evaluated, according to the scope for each mode, from four perspectives as follows:

- Management effectiveness of privatization and institutional proposals;
- Economic efficiency of policies and programs;
- Financial returns and equilibrium by mode; and

- Environmental impacts.
  - Recommendations: Recommendations were made to upgrade the infrastructure as well as other investment needs, possible financing sources and related policies. Given current public sector modernization policy, all possible actions toward modernization, decentralization and privatization were analyzed.

#### 4. Achievements

As contracted, the following final products were delivered to USAID and GOES:

- the executive summary in Spanish and English
- a ten-volume final report, also in Spanish and English
- presentations for each of the volumes delivered
- a USAID-donated computer loaded with the TRANUS model, the data base and all software purchased by the project.

As a result, the participating agencies are much more aware of the steps to be taken to achieve sector efficiency, including the steps needed to achieve GOES privatization, decentralization and public sector modernization objectives. GOES officials indicated their intentions to implement most of the Study's recommendations.

#### 5. Recommendations

##### **Transport Sector Management and Coordination**

Transport sector management and intermodal coordination is now concentrated in the Ministry of Public Works (MOP), divided in two areas, public works and transportation services, without the structure nor the capacity for their coordination and planning.

This Study conceives the development of sector management and intermodal coordination in two phases: *a transition phase*, to define MOP's strategic objective and scope, while building management capacity; and *a new MOP implementation phase*, following a modernization study, to carry out strategic decisions and consolidate its management capacity.

In the *transition phase*, the Consultant proposes establishing and providing the needed resources for:

- A *Transport Committee* to facilitate decision-making, consensus building and intermodal coordination.
- A *General Directorate of Planning* to carry out sector-wide planning.
- A transitory *Planning Unit* at the Vice-Ministry of Transport (VMT) to develop national plans and policies for improved transport services.
- Enhanced technical and administrative capacity at the VMT to improve regulations, controls and development, including a *Ground Transport Regulatory Commission* guaranteeing independent decisions on key issues.
- Until the proposed planning units are established, the Technical Study Committee could monitor Study implementation and advise upper MOP management in sector planning.

In the *new MOP implementation phase*, GOES should reorganize MOP, merge the specialized vice-ministries and integrate planning capabilities. To increase transport planning knowledge, the capacity of the sector's professionals, and a national capability in this area, the GOES should arrange for in-country short-term training and technical assistance in transportation planning.

### **Intermodal Traffic Analysis**

Future demand is estimated using GOES population and macroeconomic projections. Passenger traffic is expected to grow at the average rate of 6.7% per year from 1992 to 2015, general cargo at 5.4% and containers at 10.3%. This demand is assigned among the modes and modal projections lead to the intermodal identification of those sub-sector investment needs which complement each other effectively.

### **Interurban Transport**

Passenger and cargo fleets and terminals are inadequate, requiring additional financing for the private sector from the existing credit program, including concessions to build bus terminals.

The diesel subsidy bus operators receive is costly, inefficient and prone to irregularities, and should be eliminated.

Responsibility for fare policy should be transferred to the VMT and technified. The VMT should also develop transport legislation, let bus terminal concessions and promote the self-regulation of public transit service standards.

The proposed independent *Ground Transport Regulatory Commission* should assure that concessions are granted based on technical, competitive and transparent criteria.

The *General Directorate of Ground Transport* should obtain technical assistance to organize a management information system and data base, and re-engineer its procedures. The balance between the supply and demand of bus services should be analyzed to determine the need to increase and simplify existing routes and re-engineer its cumbersome public transit regulations. It should promote organized firms to provide passenger and freight services.

### **Highway Studies**

The Consultant proposes a routine and periodic maintenance program for the existing paved highway network which will cost ¢3,184 million colones from 1995 to 2014, with an average internal rate of return of 108%, that reduces future financial requirements for network rehabilitation and minimizes total maintenance costs, but demands higher funds in the initial years. Assurance of maintenance financing is essential. A special highway maintenance account should be set up, funded by fuel taxes according to a pre-approved formula by type of road.

Routine maintenance can be carried out by promoting micro-enterprises to absorb unskilled MOP personnel. Periodical maintenance can be contracted with established construction firms. Concessions and highway management contracts may also be considered on selected highways along with the reintroduction of tolls. Technical assistance to enhance maintenance is recommended.

Road reconstruction recently completed, underway and planned will require unprecedented financial resources. These construction costs, together with the proposed maintenance and reduced revenues due to lower duties result in projected highway sector revenue deficits (costs higher than revenues or user charges) for the next ten years.

Three additional investment programs are proposed for the main corridors:

- Two urban bypasses around San Salvador to be built beginning in 2005 to overcome the only capacity constraints identified through the year 2015, which could be partly financed by special property assessments. The North Bypass would cost about ¢1,013 million and the South Bypass about ¢520 million.

- The Northern East-West Highway and its access roads, thus developing the North, estimated to cost about ¢3,150 million, is not completely feasible when considering only transport cost savings, and merits further study as part of a regional development plan.

Highway improvements outside of the main corridors are not studied.

Benefits of axle weight control are not clear. The existing system should be maintained but not expanded while being evaluated further.

### **Rail Studies**

The Consultant recommends the complete closure of the El Salvador National Railways (FENADESAL). None of the rehabilitation scenarios studied are financially feasible. The economic benefits are not sufficient to justify retaining part of the system. With heavier urban congestion, the economic analysis indicates rehabilitation of the Metapán and Acajutla services would be marginally feasible.

However, if GOES considers that total closure is not socially or environmentally acceptable and elects to retain sections of the railroad network, it should:

- Establish FENADESAL as a government, owned-commercial company, possibly by the Autonomous Executive Port Commission (CEPA) with effective management, a flexible regulatory environment and clear independence.
- Rehabilitate sections of Districts 2 and 3 (to Metapán and Acajutla) at a cost of at least ¢183 million, plus annual maintenance of about ¢20 million, with funds from the national treasury.
- Provide fixed subsidies as Public Service Obligation (PSO) grants to pay for government-mandated deficit services, or justified by forecasted economic benefits.

In addition, to continue operation:

- The two key users should firmly commit to use rail services.
- All funds should be available for the needed railroad investments.

In the event the GOES does not decide whether to rehabilitate or close the railway based upon the results of this study, a two-to-three month final

review could further analyze the key issues. If GOES decides to rehabilitate, design work would be required.

### **Port Studies**

*The Port of Acajutla's* operating inefficiencies can be remedied by implementing the proposed improved operations and setting gang incentives per ton handled.

After overcoming several constraints to privatization, the Consultant recommends that CEPA establish Acajutla as a landlord port authority which would let concessions, following proposed bidding procedures, for integrated services in the handling of break bulk cargo, dry bulks, and containers as well as pilot, tug and docking services. The port authority should concentrate on: marketing the Port's services, promoting competition among concessionaires, developing master plans and building the port's facilities. Training on privatization would also be needed for CEPA port labor and professional staff.

Acajutla will need two multi-purpose cranes with an estimated total capacity of 500,000 tons of containers per year, and 4 more hectares of container yard, costing about ¢179 million; a grain terminal which would cost about ¢132 million; and a specialized container terminal estimated at ¢700 million, before the crane capacity is exceeded.

The Consultant recommends that GOES hand over *The Port of Cutuco* to CEPA to proceed with its rehabilitation, including highway access, which would cost roughly ¢44 million and require design. CEPA should complete a feasibility study to build a new container terminal at Cutuco. This terminal would cost about ¢437 million.

### **Air Transport Studies**

CEPA should institutionally market abroad the services of the International Airport of El Salvador (AIES) towards the goal of becoming an air cargo hub for Central America.

Delays in customs processing of imported cargo and inappropriate handling charges reduce the warehouse's dynamic capacity. Cargo handling and customs procedures should be streamlined by developing and implementing the appropriate operating and information systems. Graduated rates should be applied to improve cargo flow and minimize on-airport storage time. These improvements will defer facility investments to future years.

There is a need for an overall review and update of air cargo tariffs.

The Consultant recommends carrying out a Master Plan for the AIES including an inventory of existing facilities and planned expansion, a computerized cargo management system, concession policies, and plans to expand the cargo terminal by about 2005 at an approximate cost of \$29 million for the highest demand scenario. Long-term strategies for the development of the airport's area of influence should also be updated.

The General Directorate of Air Transport (DGTA), a government department, directly manages Ilopango Airport, an activity which is naturally a function of a private or government-owned company. The Consultant recommends this responsibility be passed on to CEPA and Ilopango's fees be updated.

### **Environmental Review**

This review was undertaken to pre-evaluate a list of projects, identify main conflicts and foreseeable problems and not as an environmental impact study (EIS) for any of these.

The criteria used for environmental assessment are based on World Bank Technical Papers also applied by the IDB and compatible with Environment Executive Secretariat (SEMA) criteria. Projects identified in the Study are classified at three levels of environmental impact: low, moderate and high. Among those with high impact are railroad rehabilitation in urban areas, and new highway, railway and port construction.

The Consultant prepared specific guides and recommends they be adopted and fully applied under the supervision of MOP's Sector Environment Unit (UAS). Estimates are made of the cost of environmental impact studies for each type of project.

For all projects on new lands, archeological prospections should be carried out or the opinion of the General Directorate of Cultural Patrimony should be requested.

The Consultant reviewed the draft Environment Protection Law currently being discussed in the Assembly, finds it generally well conceived and proposes the following modifications:

- Environmental permits should be issued only by SEMA following EIS reviews by the UAS. Each UAS should have no more than 4 to 5 staff.
- SEMA should coordinate directly rather than through multi-sector committees, which would not be operational.

Also, policies are proposed to reduce fuel consumption and pollution.

## **6. GOES Needs for Continued Support**

To implement these recommendations, the GOES needs further assistance to reform sector management, improve financial policy and plan investments:

Regarding sector management, GOES needs help to:

- Reorganize and strengthen the Ministry of Public Works and its Vice-Ministry of Transport.
- Develop its transport sector planning capacity.
- Improve bus transportation.
- Facilitate highway maintenance privatization and decentralization
- Reengineer and privatize the Port of Acajutla.

To set sector fiscal and financial policy, GOES needs to:

- Develop a general sector financial strategy.
- Remove the bus diesel subsidy.
- Revise administered price policies.
- Assure highway maintenance financing.

In addition to the investments already planned in transportation infrastructure, GOES may need assistance in planning:

- A new belt way around San Salvador to prevent future worsening of congestion
- the proposed Northern East-West Highway
- the country's port container handling capacity
- expansion of the Port of Acajutla's grain facilities
- rehabilitation of the Cutuco pier
- improvements and future expansion of air cargo systems and facilities.