

Government of Puerto Rico
Department of Transportation and Public Works
Highway and Transportation Authority

The Highway Authority and Tren Urbano

Sergio L. González
Executive Director
Puerto Rico Highway and Transportation Authority



TREN URBANO



Outline

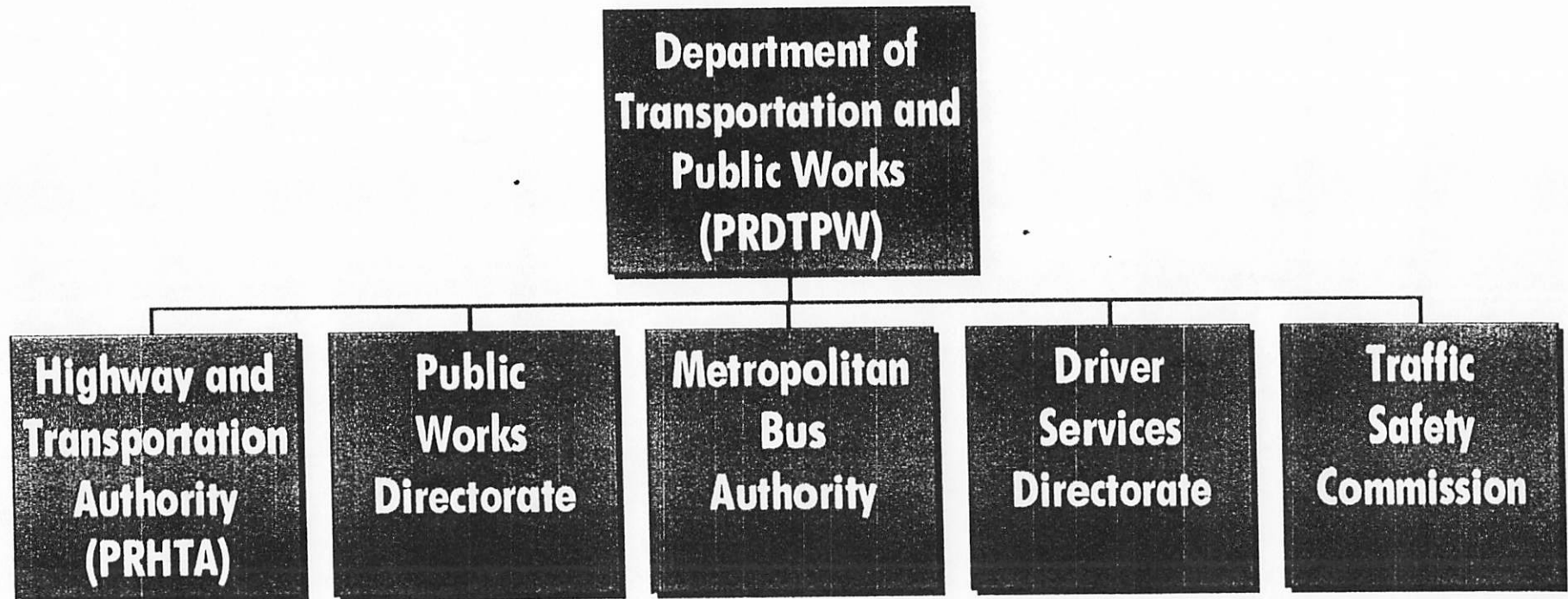
Introduction to the Highway and Transportation Authority

Examples of Innovative Contracting

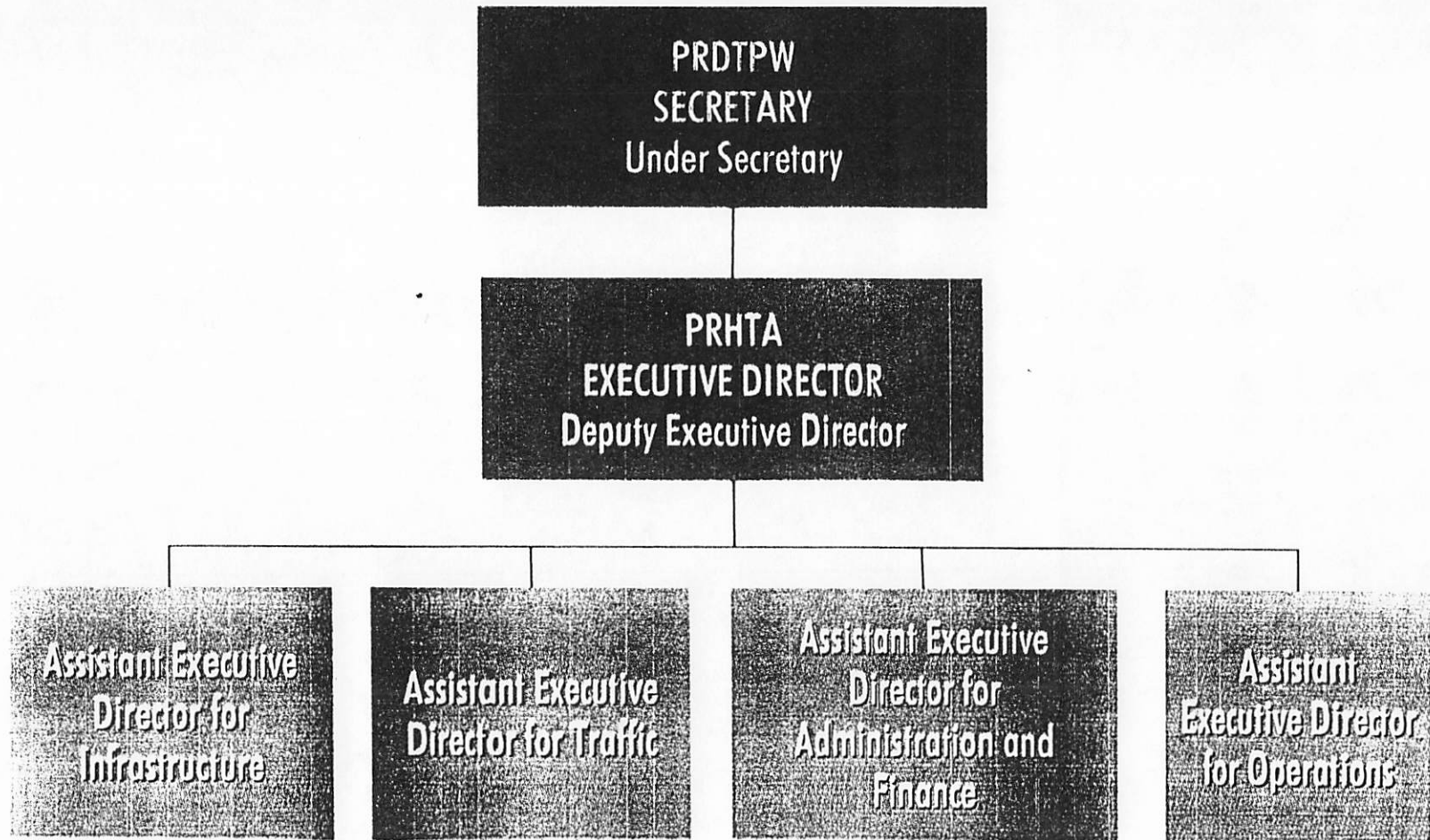
The Tren Urbano Challenge

- Introduction
- The Start-up Organizational Structure
- The Procurement Process
- Getting Ready for Construction
- Challenges Ahead

PRDTPW: An Intermodal Umbrella



PRHTA: Organization



PRHTA Responsibilities

Construction of roads and highways

Maintain and operate tollways

Develop transportation plan

Implement Secretary's mass transportation policy

The PRHTA: An Evolving Mission

Act 74 of June 23, 1965

Created the Puerto Rico Highway Authority (PRHA) as an autonomous public corporation.

Reorganization Plan Number 6 of 1971

- Attached the PRHA to the DTPW.
- Abolished the PRHTA board of Directors and gave its powers to the Secretary of the DTPW.

The PRHTA: An Evolving Mission (continued)

Act 4 of August 24, 1990

- Enabled the PRHTA to privatize transportation facilities.
- Authorized the PRHTA to use a negotiated bids procurement process.

Act 1 of March 6, 1991

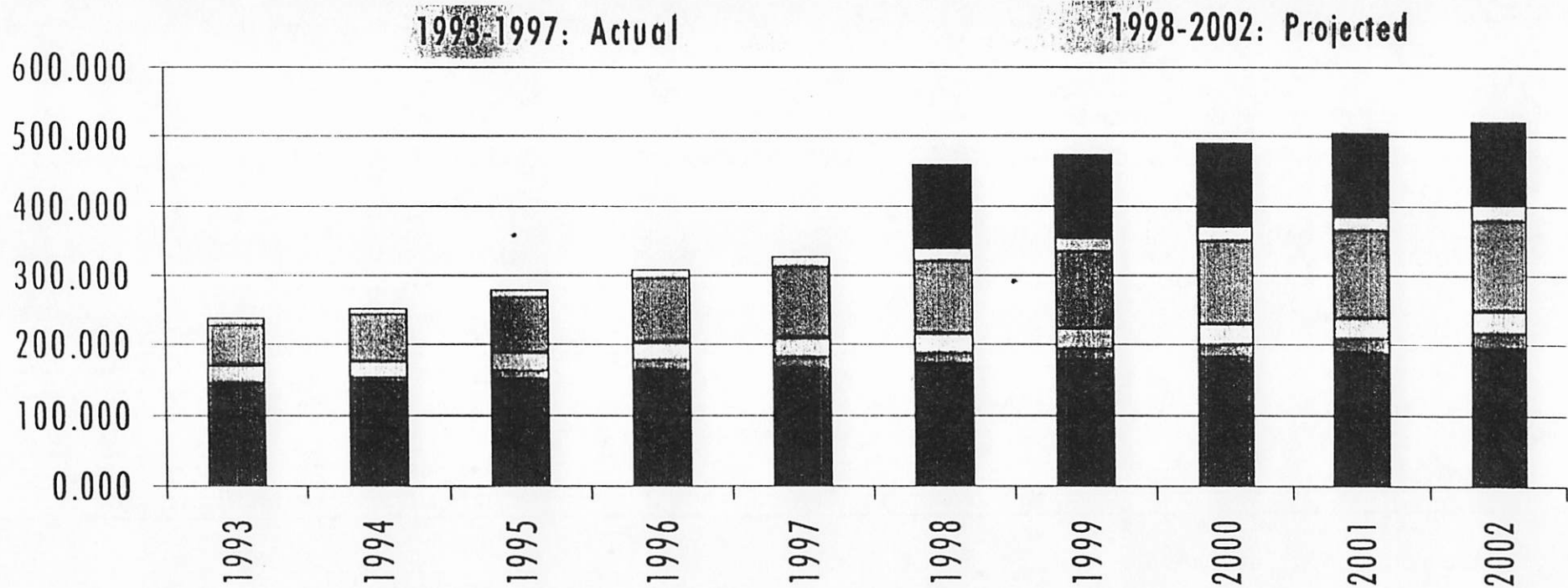
- Added role in mass transportation.
- PRHTA becomes the PRHTTA.

Pledged Revenues (in \$ millions)

		1996	1997	1998	1999
Gasoline Taxes (\$0.16/gallon)	\$152.1	\$163.0	\$166.0	\$171.9	
Diesel Oil Taxes (\$0.04/gallon)	11.1	14.1	16.8	16.6	
Motor Vehicle License Fees (\$15/vehicle)	25.0	25.1	26.8	27.6	
Tolls	80.7	93.0	103.7	105.5	
Investment Income	<u>11.0</u>	<u>13.3</u>	<u>14.3</u>	<u>17.5</u>	
Existing Pledged Revenues	\$279.9	\$308.5	\$327.6	\$339.1	
Petroleum Tax	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>120.0</u>	
Total	\$279.9	\$308.5	\$327.6	\$459.1	

Projected

Total Pledged Revenues (in \$ millions)



- Gasoline Taxes (\$0.16/gallon)
- Diesel Oil Taxes (\$0.04/gallon)
- Motor Vehicle License Fees (\$15/vehicle)
- Tolls
- Investment Income
- Petroleum Tax

PRHTA - Key Characteristics

A small, efficient organization of technical contract managers.

100% of construction, 90% of design, 90% of real estate acquisitions done by private sector.

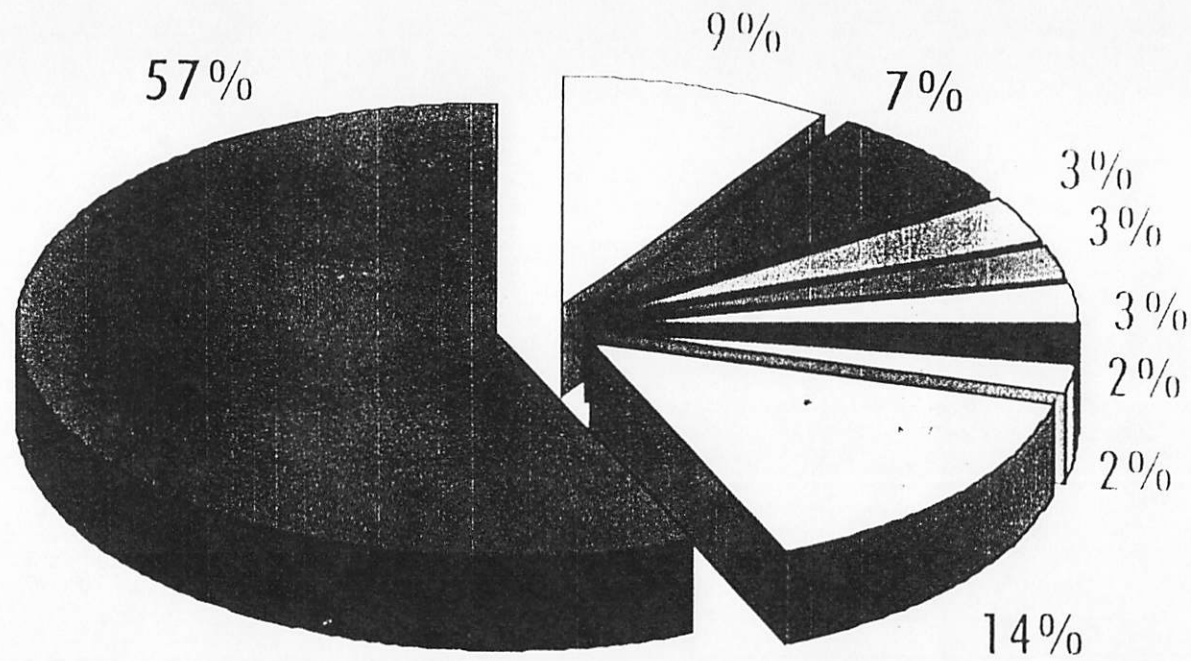
Toll collection 100% private.

Starting to outsource toll road maintenance.

Priorities Construction: 1998-2002

	(in millions)
Islandwide Strategic Network	\$225
Regional Network	160
Congestion Management - Islandwide	80
Congestion Management - SJMR	400
ITS	65
Reconstruction and Repavement	60
Safety and Signage	20
Enhancement Projects	50
Other Highway projects, ROW, and Design	330
Tren Urbano	<u>1,370</u>
Total	\$2,760

Highways Priorities Construction: 1998-2002



- Islandwide Strategic Network
- Congestion Management - Islandwide
- ITS
- Enhancement Projects
- Tren Urbano

- Regional Network
- Congestion Management SJMR
- Reconstruction and Repavement
- Others

Puerto Rico Strategic Network

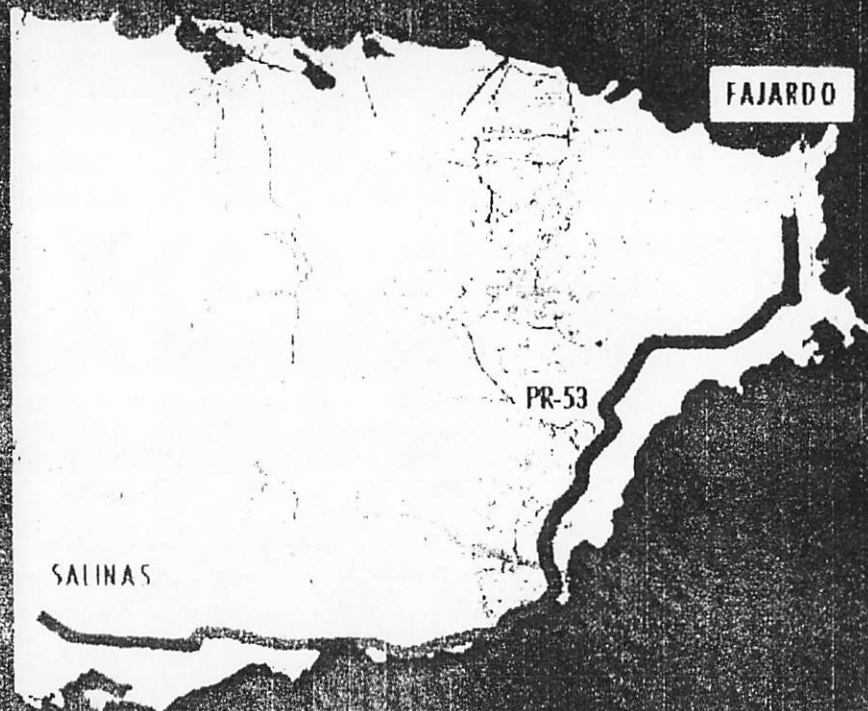


1998-2002 Investment = \$225 million

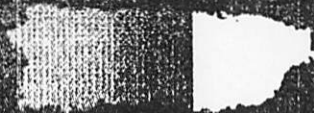
Completed
Under construction

Programmed

PR-53 Fajardo-Salinas



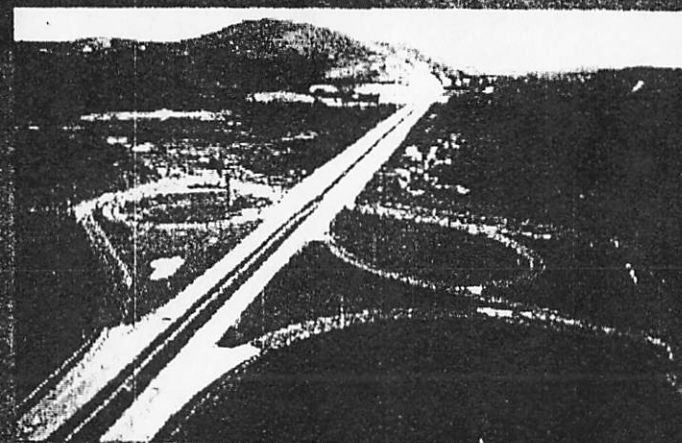
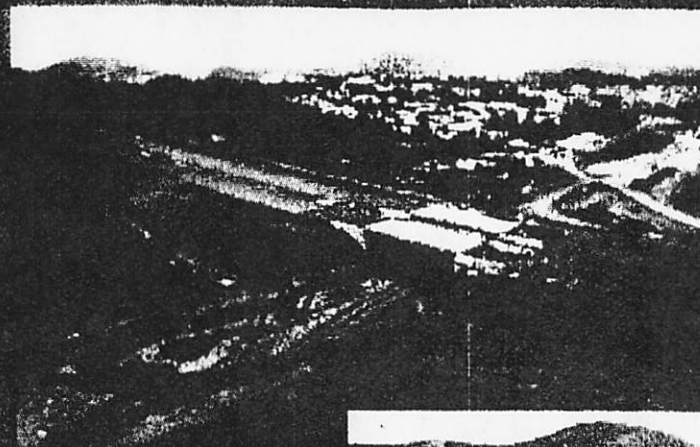
1998-2002 Investment = \$64 million



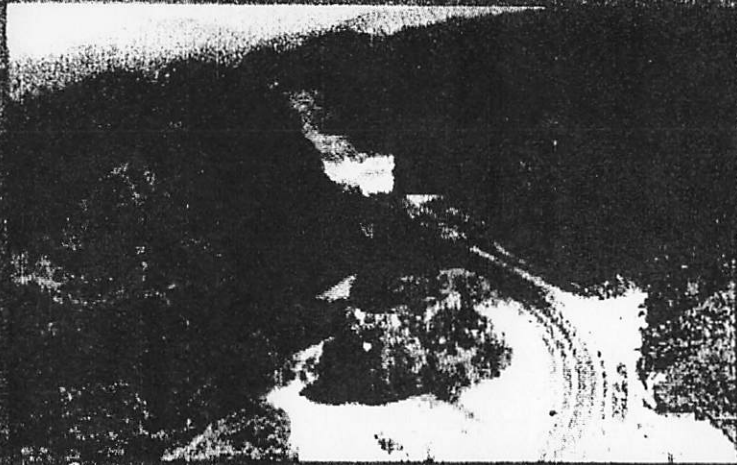
Programmed

Completed

Under construction



PR-10 Arecibo-Ponce



1998-2002 Investment = \$74 million

Programmed

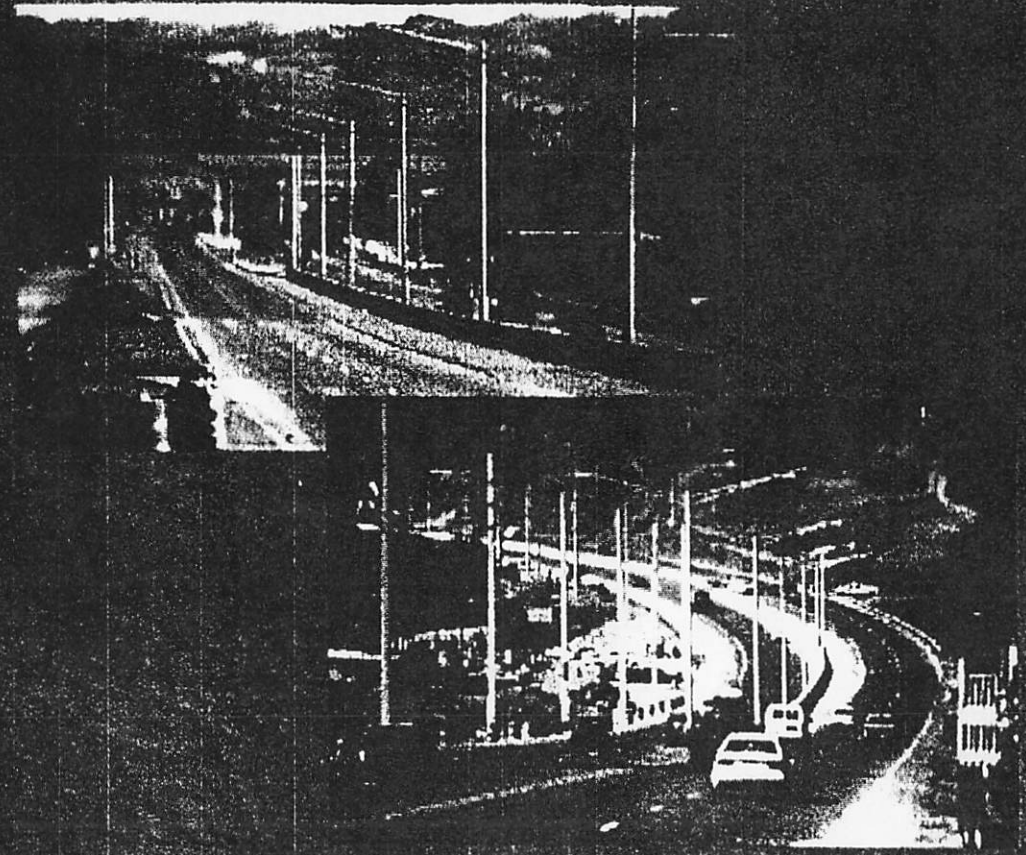
Completed

Under construction

PR-2 Arecibo-Ponce-Mayagüez



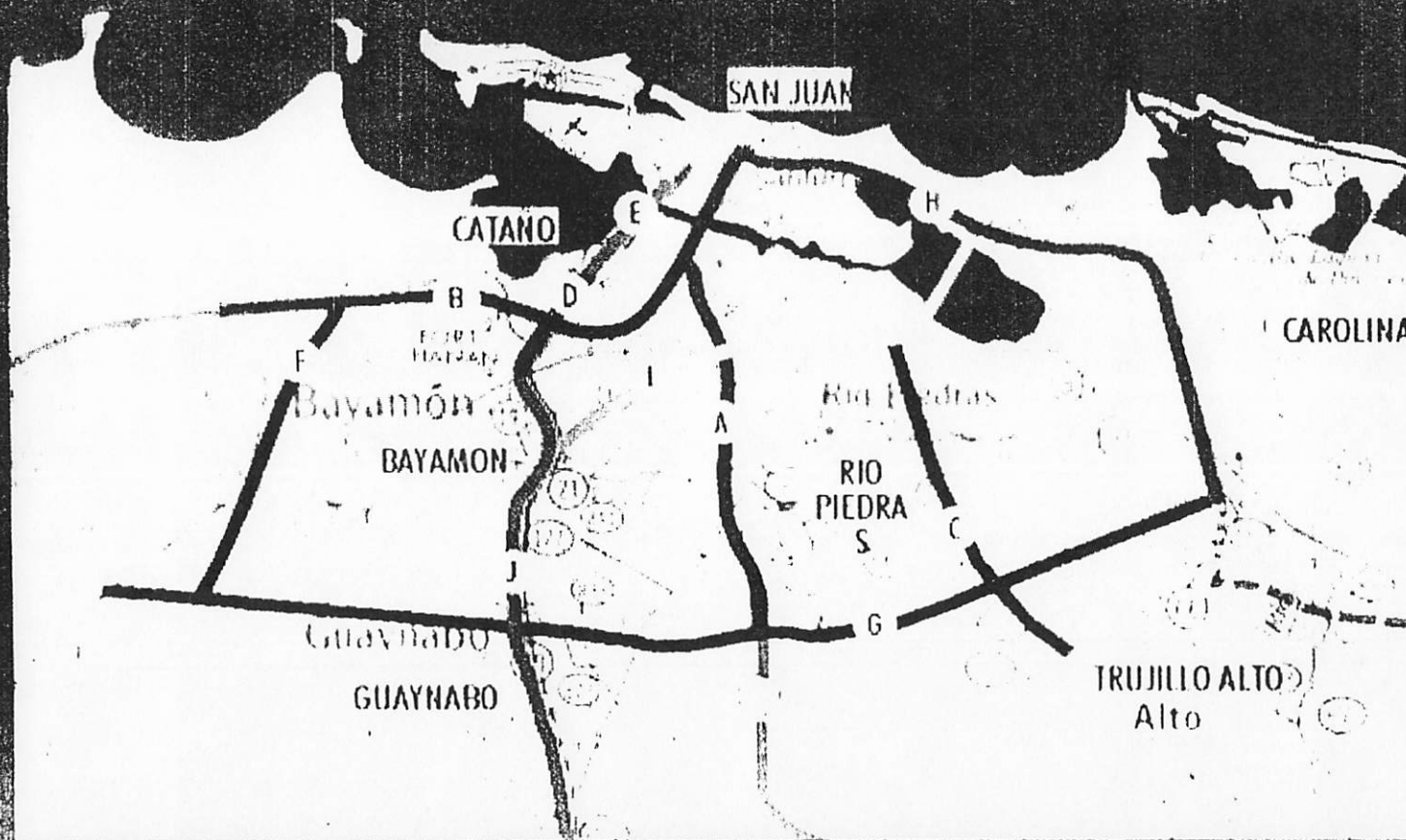
1998-2002 Investment = \$20 million



Repavement or Reconstruction
Completed
In progress

Widening
Completed
In progress

San Juan Metropolitan Area Strategic Network



Programs:

- A. Exp. Las Americas
- B. Exp. De Diego
- C. Exp. Trujillo Alto (PR-181)
- D. Int. Caparra
- E. Exp. Kennedy
- F. Exp. Rio Hondo
- G. Exp. Las Cumbres
- H. Exp. Baldorioty
- I. Exp. Piñero
- J. Exp. Martínez Nadal
- K. ITS (Intelligent Transportation)

1998-2002 Investment = \$400 million

Congestion Management - SJMR

	(in millions)
⇒ Parallel Expressway (San Juan-Caguas)	
• PR-20 Extension	\$18
• Caparra Intersection	25
• Kennedy Expressway	20
• PR-1 Improvements	11
⇒ PR-18/PR-22 Corridor Improvements	74
⇒ PR-199: Las Cumbres Avenue	65
⇒ PR-5: Río Hondo Expressway	60

Congestion Management - SJMR (continued)

(in millions)

⇒ Capacity Improvements to Baldorioty de Castro Expressway	\$25
⇒ Trujillo Alto Expressway	22
⇒ Piñero Expressway	18
⇒ Geometric and Strategic Improvements	50
⇒ Others	<u>12</u>
Total	\$400

Parallel Expressway San Juan-Caguas



Parallel Expressway PR-2,
PR-20 and PR-1

Las Américas Corridor PR-
18 and PR-52

1998-2002 Investment = \$74 million

Kennedy Expressway

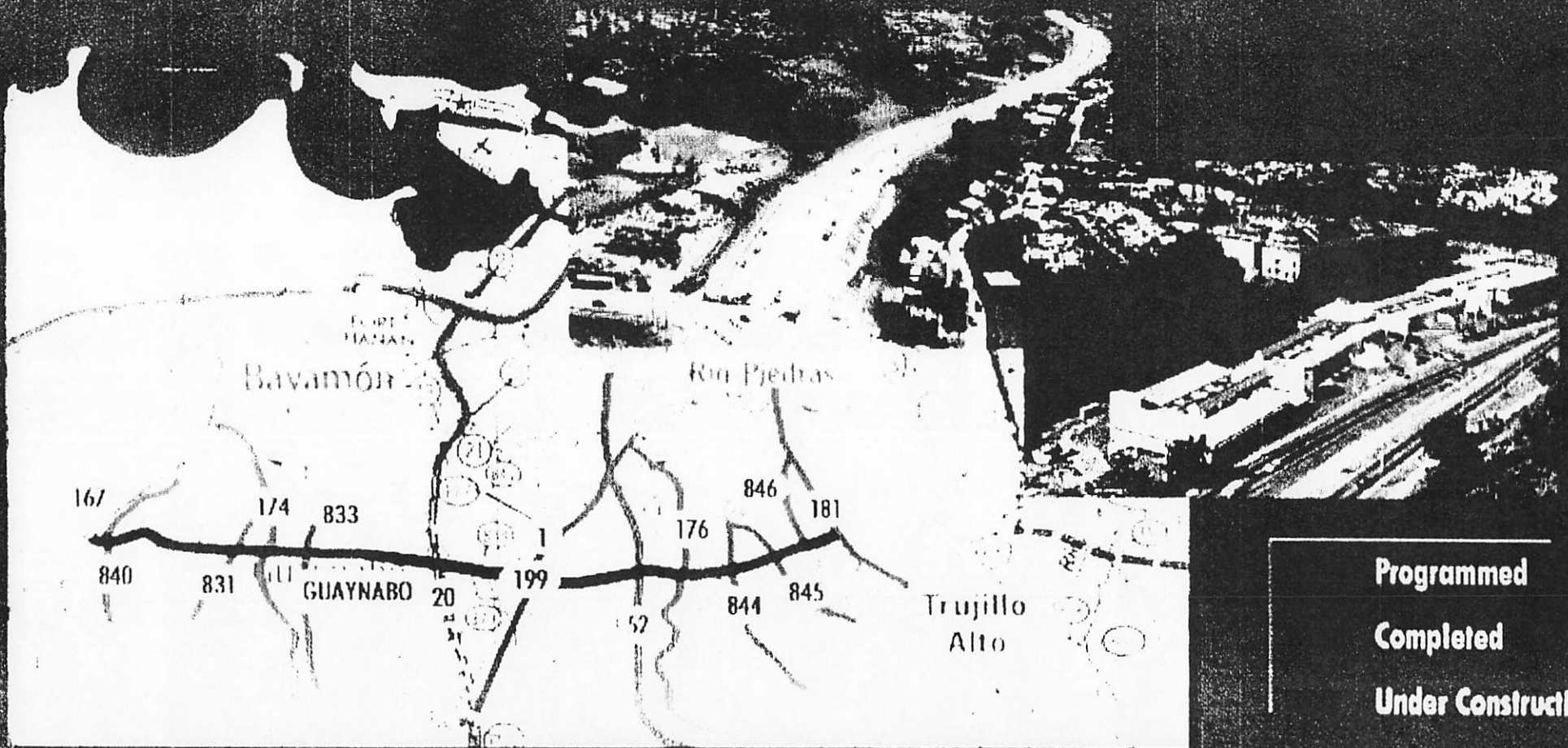
1998-2002 Investment = \$20 million

An aerial, high-contrast black and white photograph of a highway interchange. A large semi-truck is visible on the right side of the road. The image is grainy and has a high level of contrast, making details difficult to discern. Three punch holes are visible at the top of the page.

Las Américas and De Diego Expressway

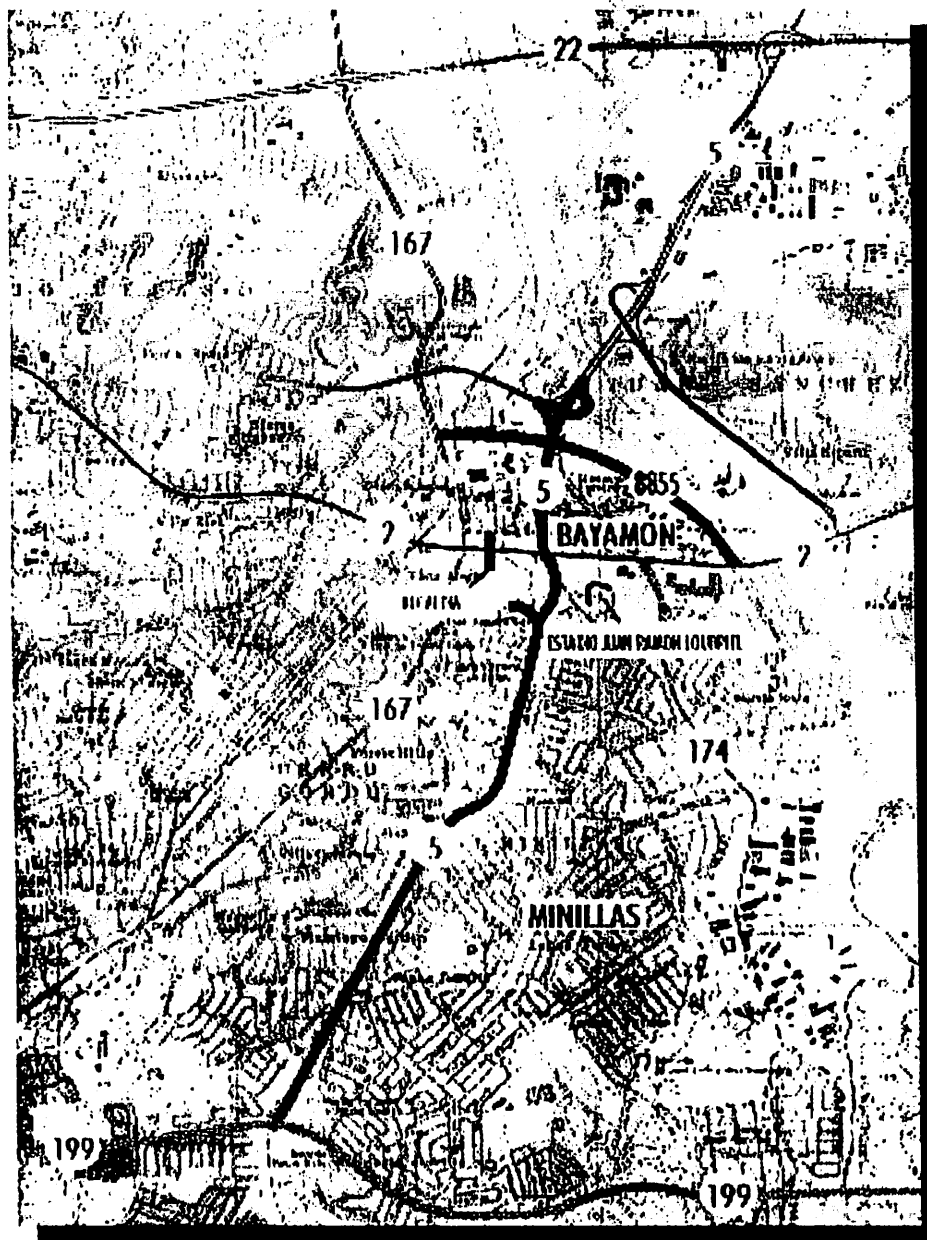
1998-2002 Investment = \$74 million

Las Cumbres Avenue, PR-199 Bayamón - Trujillo Alto



Programmed
Completed
Under Construction

1998-2002 Investment = \$65 million

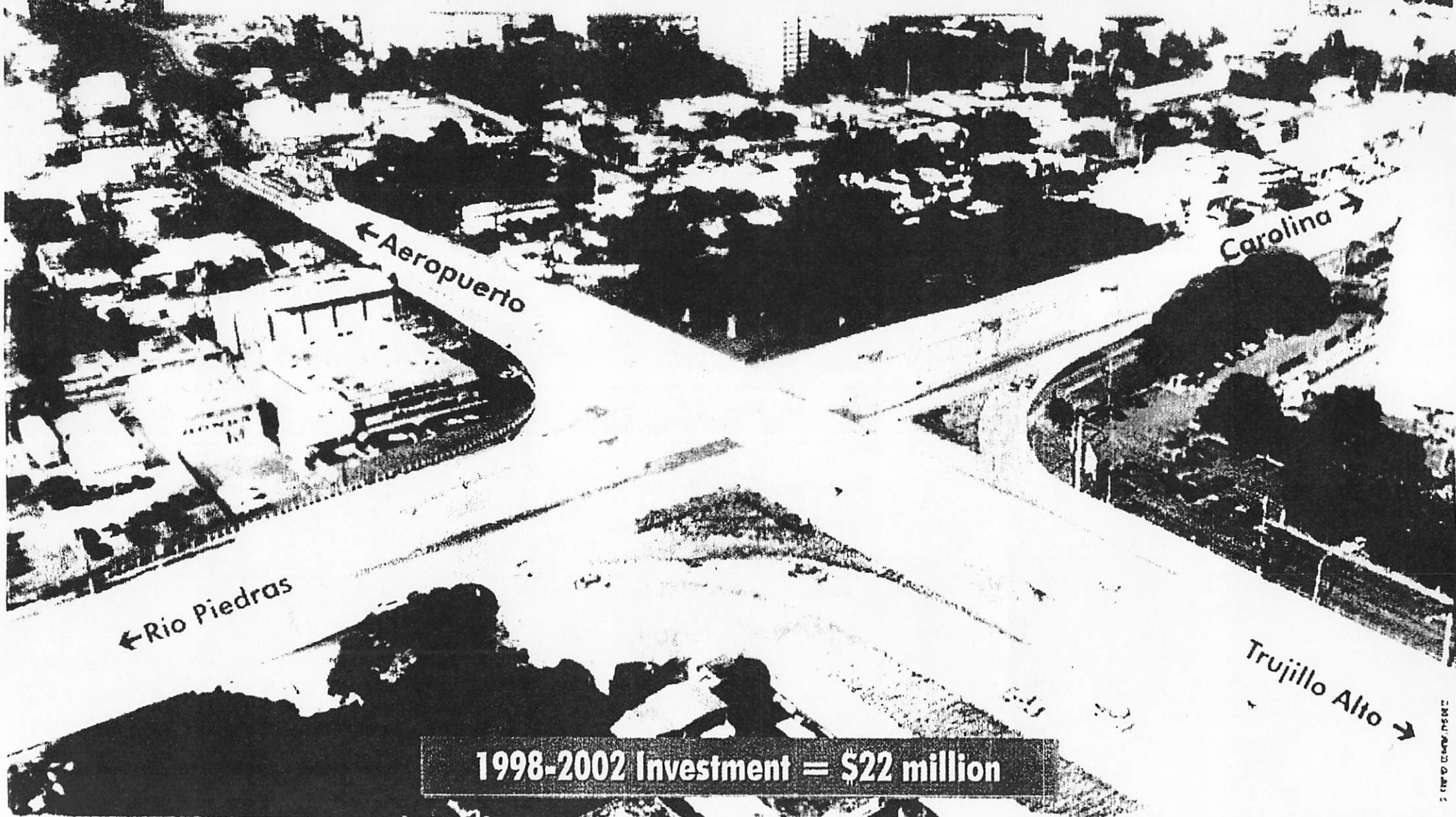


Río Hondo Connector (PR-5) and North Arterial, Bayamón

1998-2002 Investment = \$20 million

- Programmed
- Completed
- Under construction

Trujillo Alto Expressway

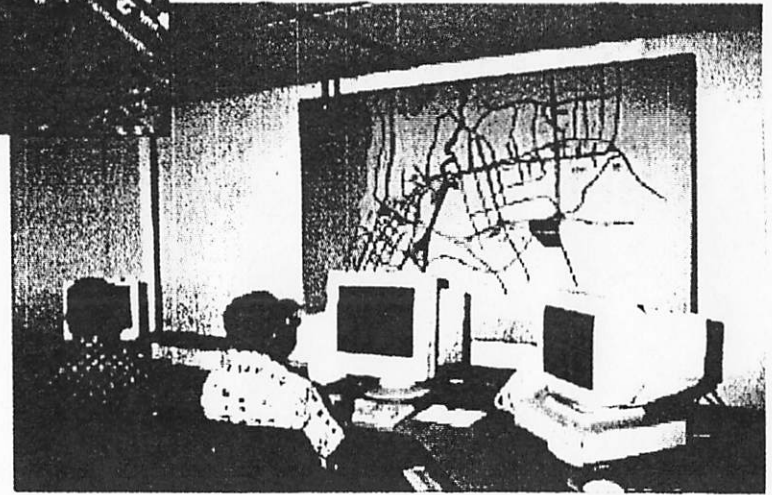
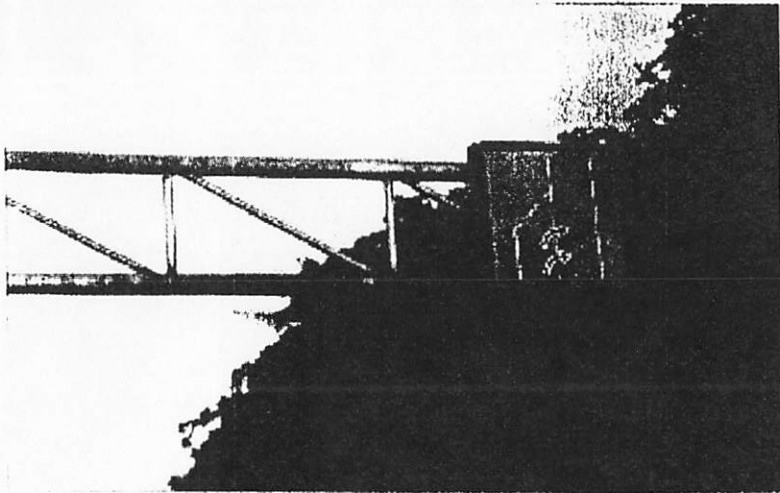
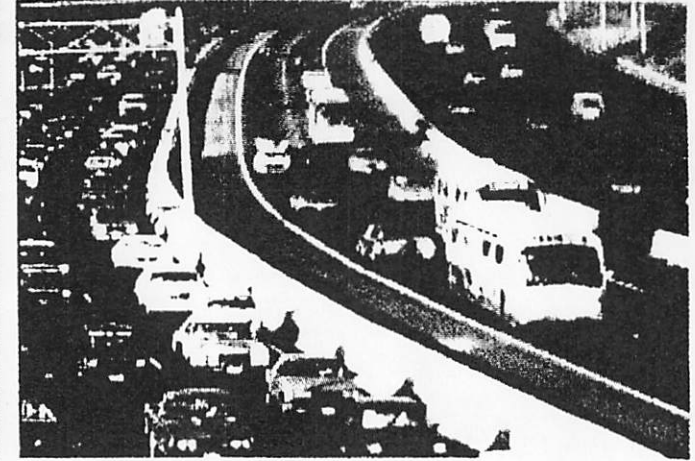
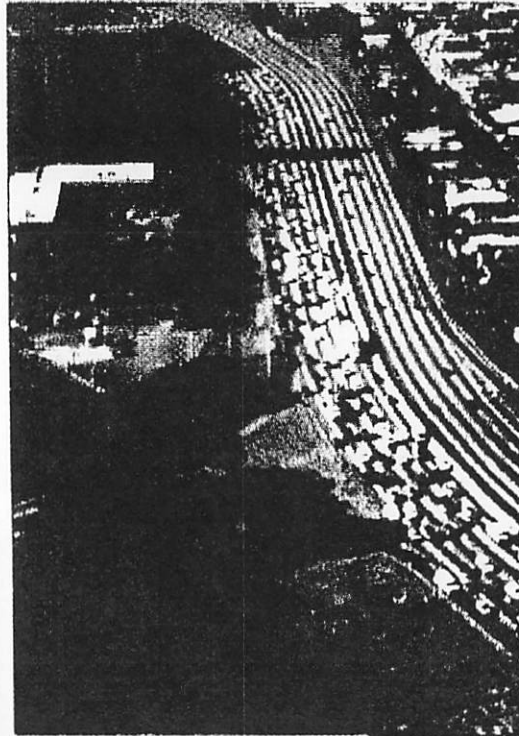


1998-2002 Investment = \$22 million

ITS

	(in millions)
⇒ Incident Management	\$5
⇒ Traffic Control Center and Advanced Traffic Management	10
⇒ Dynamic Traffic Assignment with VMS	10
⇒ Advanced Traffic Signals	30
⇒ AVI Toll Collection System	<u>10</u>
Total	\$65

ITS



1998-2002 Investment = \$65 million

OUTLINE

- Introduction to PRHTA
- Teodoro Moscoso Bridge (\$116 million DBTO)
- PR-53: Yabucoa Valley Crossing (\$30 million DB)
- Tren Urbano (\$1.5 billion DBO rapid transit system)
- PR-66 (\$110 million DB tollroad)

The Teodoro Moscoso Bridge: A Privatization First

➤ A four-lane, limited access, toll bridge over the San José Lagoon, linking the Trujillo Alto Expressway and the Hato Rey financial district to the Airport:

- Length : 3.4 kms. (2.1 miles)
- Cost : \$109.5 million
- Concessionaire : Autopistas de Puerto Rico
- Inaugurated : February 23, 1994
- Period of Concession : 35 years
- Toll (each way) : \$1.50

TEODORO MOSCOSO BRIDGE

PROF. TEODORO MOSCOSO
JULY 20 - 1994

Concession Agreement

- › Concessionaire: Autopistas de Puerto Rico y Compañía, S.E. (APR), a partnership with 75% foreign, and 25% local, ownership interests.
- › BTO 35-year agreement (2 for construction and 33 for operation). The construction, which was expected to last two years, was completed ahead of schedule and within budget.
- › Fast track method of construction.
- › Cost-plus agreement with a guaranteed maximum construction cost of \$83 million, adjusted for inflation and changes in scope.
- › The PRHTA retained a private consortium of engineering, management, and economic consultants to help select the candidates for the public/private venture to negotiate and prepare the contract, and to supervise the works. The PRHTA also retained Vollmer Associates to perform the traffic study used to estimate toll revenues and define the financial structure for the project.

PRHTA Responsibilities

- Preliminary design
- Right of way acquisition
- Permits (Department of Natural Resources, Corps of Engineers, FAA, etc.)
- Environmental Impact Statement

APR Responsibilities

- ⇒ Final design
- ⇒ Construction
- ⇒ Completion guarantee
- ⇒ Maintain required insurance
- ⇒ Operation and maintenance

Risk Sharing

○ PRHTA assumes risks due to:

- Changes in law
- Force majeure
- Construction of competing facilities
- Lower than expected traffic volume (termination clause)

○ APR assumes all of the construction and most of the operation risks.

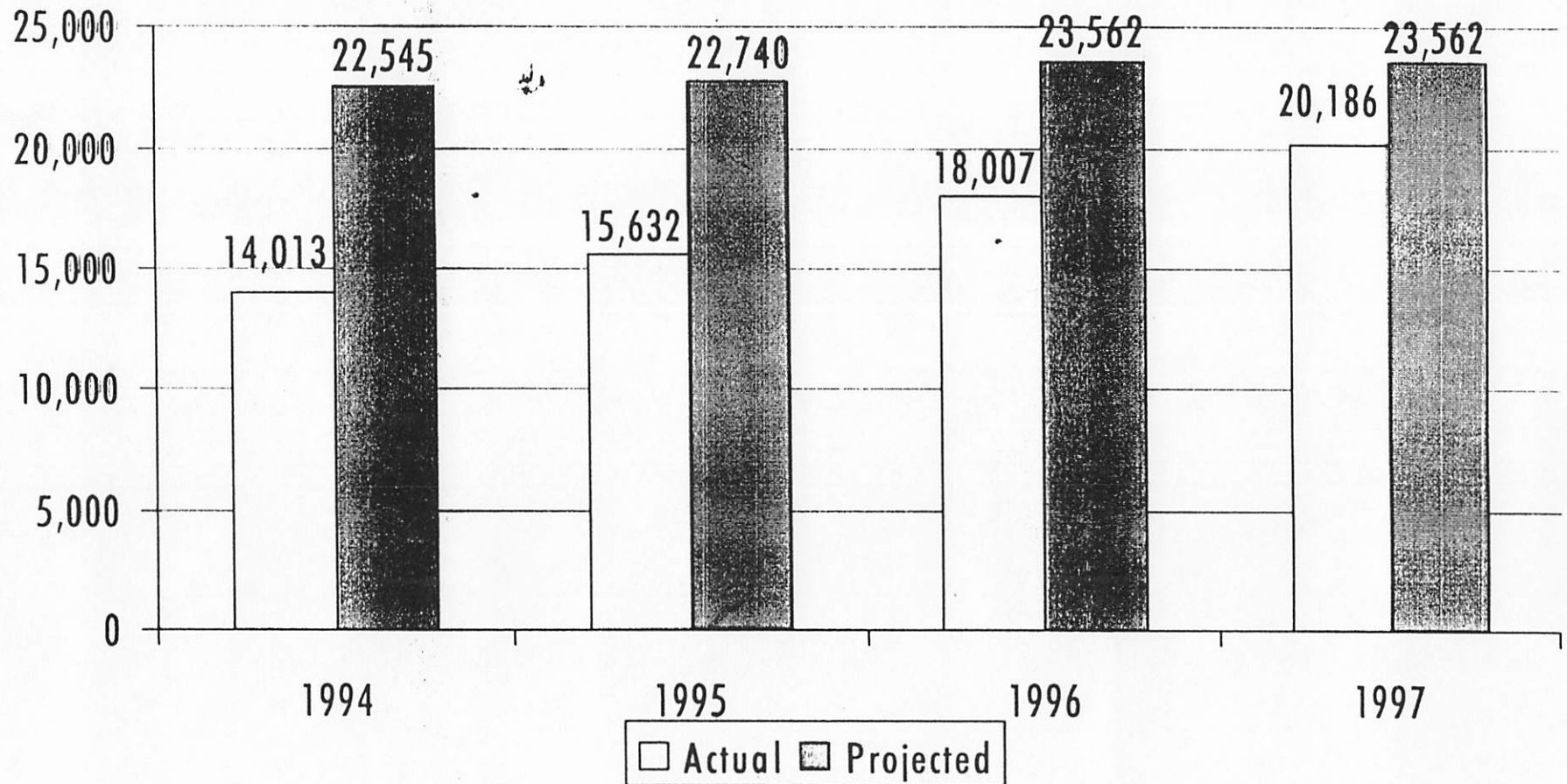
Financing

- Capital structure consists of 10% private capital (contributed proportionally by the owners of APR on a monthly basis) and 90% debt.
- PRHTA issued tax-exempt Special Facility Revenue Bonds for \$116,752,769.70. These bonds will be repaid from toll revenues.
- The proceeds from these bonds were then loaned to APR to be used to:
 - pay part of the cost of developing and constructing the bridge, its preopening costs and expenses, and to provide working capital.
 - pay two years interest on the bonds.
 - fund a Reserve Account in the amount of \$11,675,276.97.
 - fund a Contingency Fund in the amount of \$4,000,000.
 - pay the cost of issuing the bonds.

Cash-Flow Distribution

- Debt service, operation, and maintenance.
- APR's owners are entitled to a 19% after-tax return on their 10% investment before any excess revenues are paid to the PRHTA.
- However, in any year during which this base return is reached, any excess revenues that remain will be shared with the PRHTA in the proportion of 60% for the PRHTA and 40% for APR's owners until they reach a 22% after-tax return on their investment, and
- When APR's owners reach a 22% after-tax return on their investment, any excess revenues that remain will be shared in the proportion of 85% for the PRHTA and 15% for the owners of APR.

The Teodoro Moscoso Bridge: Average Daily Traffic

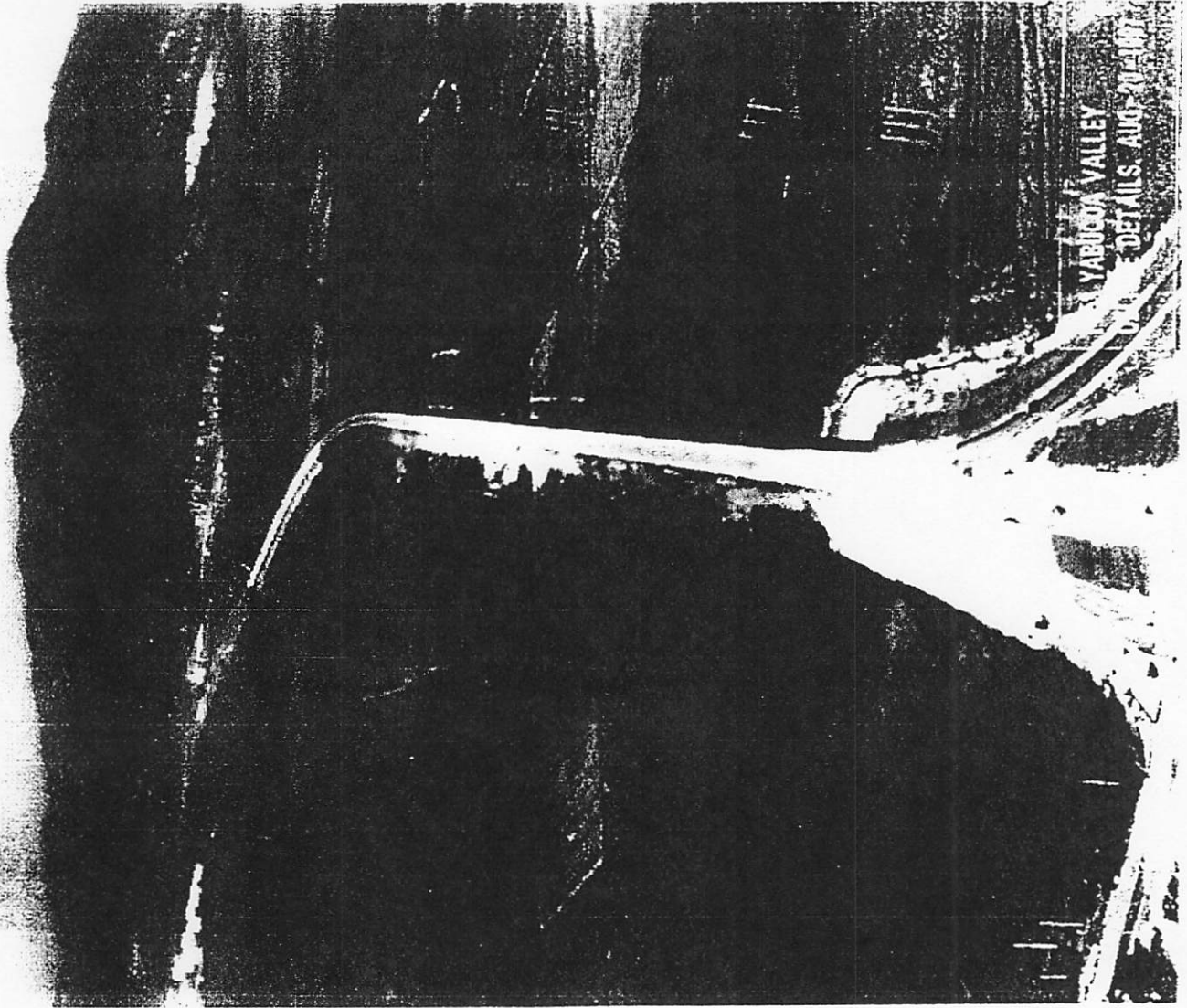


Teodoro Moscoso Bridge: Lessons Learned

- Quality construction and tight schedule were accomplished.
- Very high development cost, including interest rates.
- The potential profits of the operation did not benefit the Authority in getting construction cost savings.

PR-53 Yabucoa Valley Crossing: General Characteristics of the Project

- ⦿ 5.33 km with two 3.65 m lanes and a 3 m outside shoulders.
- ⦿ Includes 2.52 km of viaduct.
- ⦿ Construction cost \$30.76 million.
- ⦿ Design/Construction time: 20 months.



YABUCCA VALLEY
DETAILS - AUG 20 1971

PR-53 Yabucoa Valley Crossing: General Characteristics of the Contract

- ⇒ Authority included environmental and general technical requirements, including horizontal and vertical alignment, in contract documents.
- ⇒ Design/Build contract.
- ⇒ QA/QC testing and inspection included in contract.
- ⇒ Authority monitored audit QA/QC with resident engineer and very small staff.
- ⇒ Progress payments based on milestones, 10% retained if not on schedule.
- ⇒ \$10,000/day penalties for delays.
- ⇒ \$10,000/day incentive for early completion from a fixed date, up to \$1,000,000.

PR-53 Yabucoa Valley Crossing: Lessons Learned


- ⊕ Involvement of contractor in design resulted in 20% savings to the Authority.
- ⊕ About 1 year time savings due to design-build/fast-track.
- ⊕ Quality construction on tight schedule was accomplished.
- ⊕ Cost overruns limited to less than 1% of original contract price.



TREN URBANO

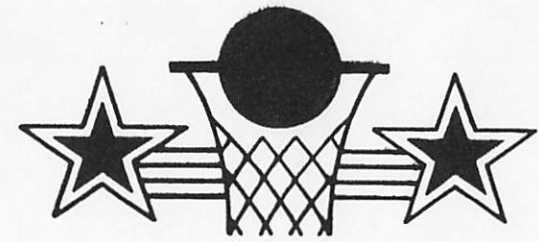


Tren Urbano PRHTA Biggest Challenge

- ◆ Why?
 - ◆ Definition of Success
 - Complete best system on schedule and budget
 - Come out of it as a better organization, better prepared for future challenges
- 

How to Meet the Challenge

An All Star Team
of teamplayers



The Start-up Organization: Key Ingredients

⇒ Boston Mafia - has done it before

- Fred Salvucci
- Carmen Canino
- MDA
- Ken Kruckermeyer
- Palmer and Dodge

⇒ RJA +

⇒ GMAEC - International Experts

⇒ HTA

Procurement Strategy: Criteria

- Owner Control
- Operational Expertise: Operations and Maintenance by Turnkey Contractor
- Turnkey Contractor involved in all Construction
- Compatible with Schedule: Earliest reasonable Project Start

Procurement Strategy: Criteria

- Quality of Systems
- Flexibility to Overcome Unforeseen Conditions:
 - R.O.W.
 - Utilities
 - Contract Award
- Compatibility with Financial Plan

Procurement Strategy: Criteria

○ FTA Turnkey Demonstration Program

Objectives:

- Advance New Technology
- Lower Cost of New Transit Construction
- Provide Case Study

Procurement Strategy

⇒ **STTT: Systems and Test Track Turnkey**

- **Fixed facilities (all design/build)**
 - 2.5 km of track, two stations (Torrimar and Las Lomas), yards and shops, elevators, escalators, and signage.
- **Systems**
 - Vehicles (phased purchase option), trackwork, power, train control, and communications.
- **Management Role**
 - Coordination for other civil Design/Build packages.
Operations and maintenance (at least 5 years).

⇒ **Design/Build civil packages**

Evaluation of Hybrid Turnkey Strategy

Advantages

- Avoided Dominance of Contractor Culture Typical of Super-Turnkey
- Reduced Beginning of Critical Activities, Thus Allowing Earlier Completion
- Strong O & M Client Within STTT
- MOS Option Preserved
- Financial Flexibility to Start Up

Disadvantages

- Management of Interphases



The San Juan Star

Virgin Islands 85¢

The only Pulitzer Prize-Winning Publication in Puerto Rico

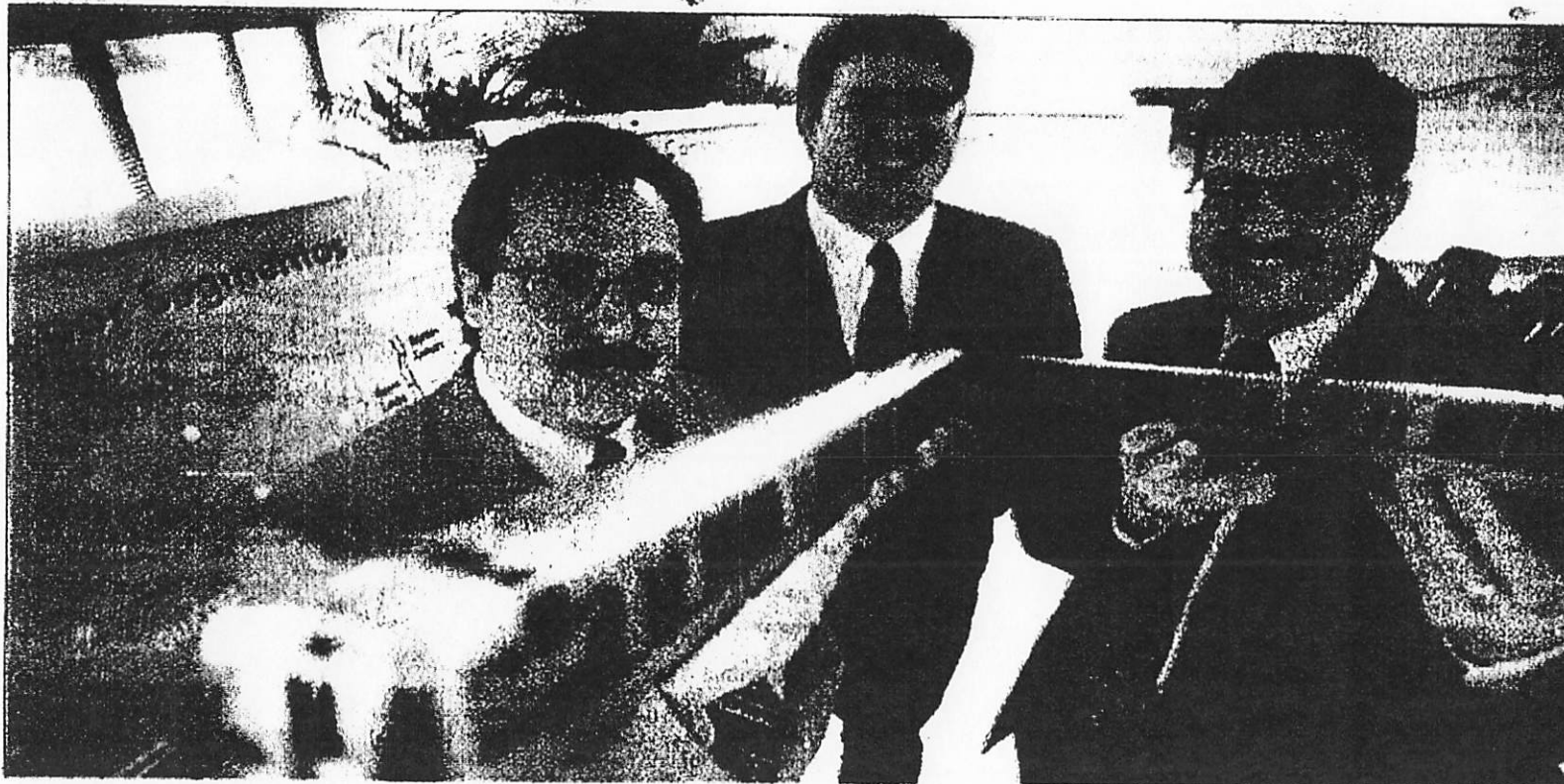
Saturday, May 4, 1996

Puerto Rico 35¢

Siemens wins Urban Train bid

Consortium to build first section of train, oversee entire project.

Page 3

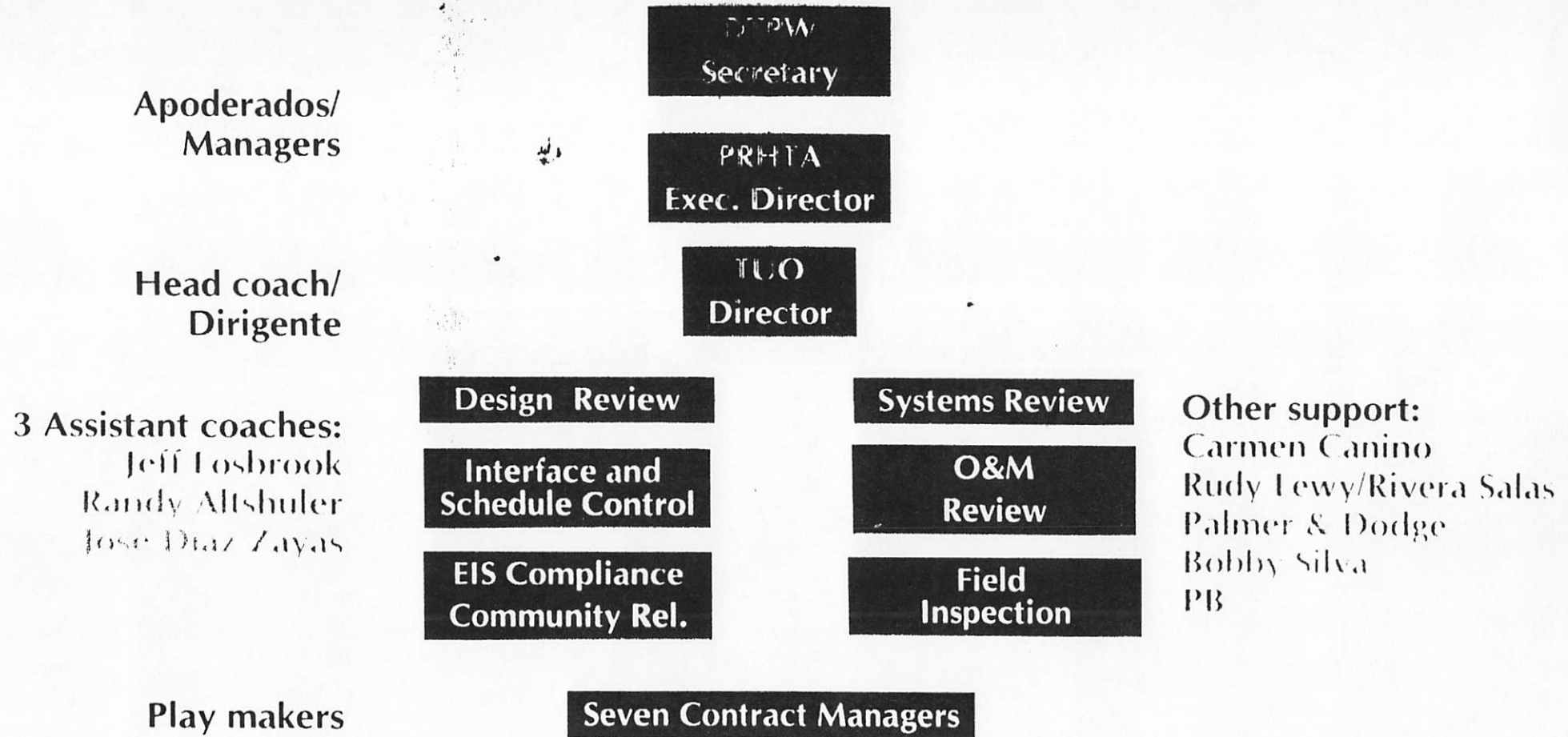


Transportation and Public Works Secretary Carlos I. Posquera, flanked by Highway and Transportation Authority Executive Director Sergio González, left, and Sub-Executive Director Carlos Colón de Armas, show off models of

STTT Contract: Management Role

- ⇒ Contract Administration & Coordination for other Civil Design/Build Packages
 - Review and Certify Design/Build Design for Interface
 - Monitor Design/Build Schedule
 - Certify Acceptance of Design/Build Construction
 - Design/Build Change Order Review and Comment
- ⇒ O & M (5 years with additional 5-year option)

Tren Urbano All Star Team



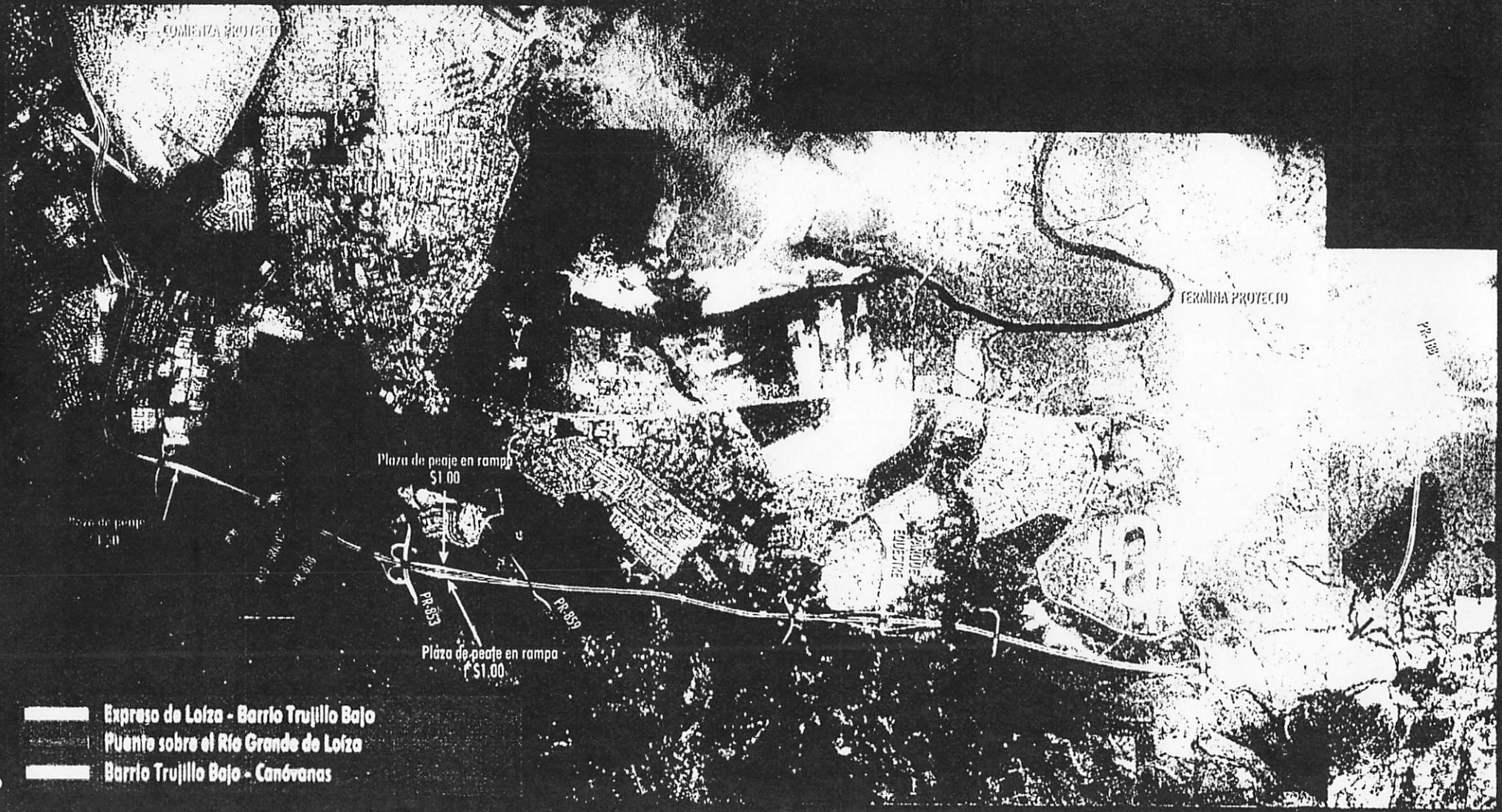
PR-66

- \$110 million DB tollroad
- Divided in 3 design-build contracts
- First segment, proposals to be received Jan. 20, 1998
- Second segment, proposals to be received Feb. 24, 1998, third segment, not critical.
- Completion by summer 2000
- LS contracts, with MGP including change condition contingencies and early completion bonus.

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PR-66 Carolina - Canóvanas



- Expreso de Loíza - Barrio Trujillo Bajo
- Puente sobre el Río Grande de Loíza
- Barrio Trujillo Bajo - Canóvanas