

V Encuentro UPR/MIT sobre el Tren Urbano
7-15 de enero de 1999

5th UPR/MIT Conference on Tren Urbano
January 7 – 15, 1999

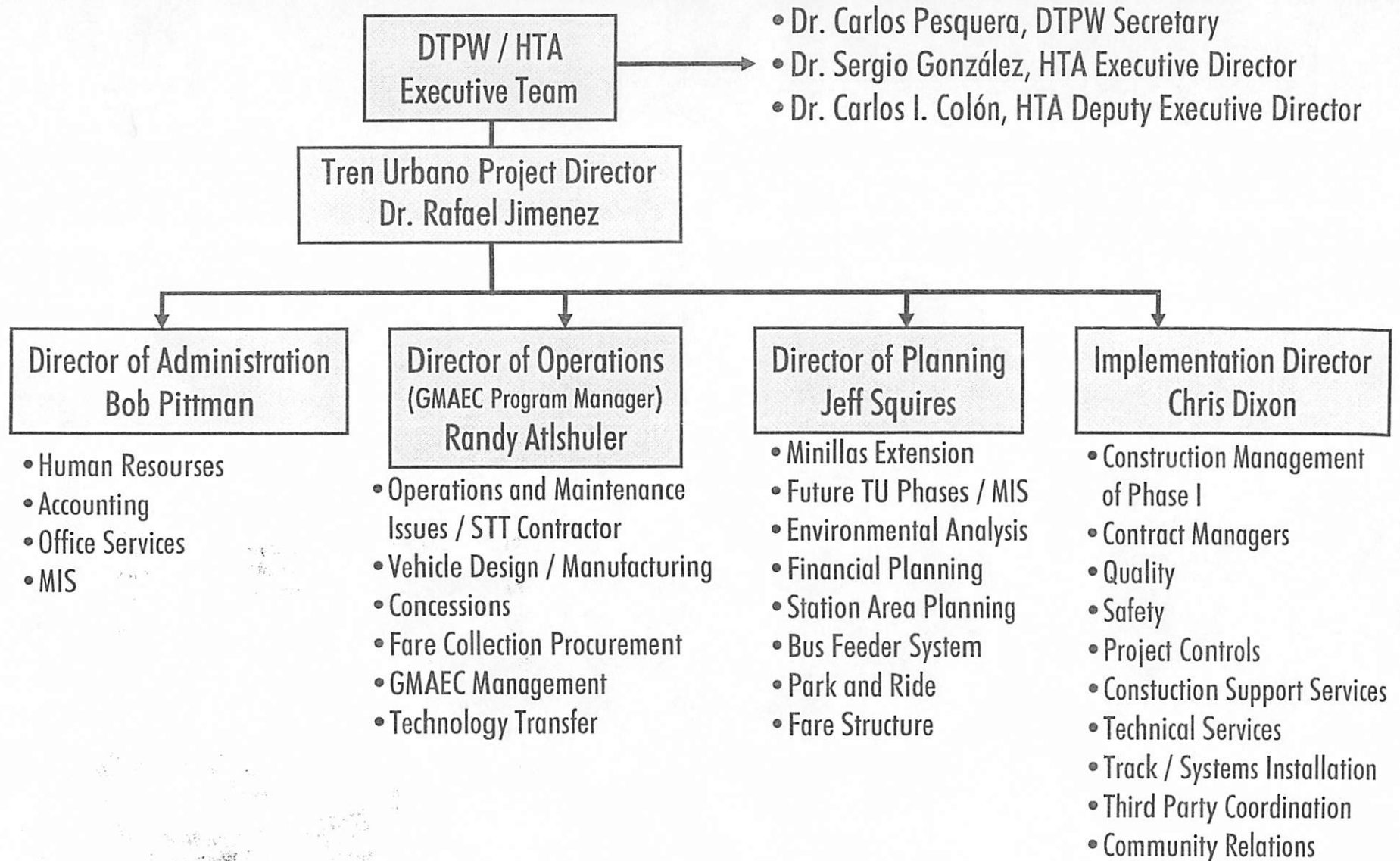
Jueves, 7 de enero de 1999		Thursday, January 7, 1999
Coordinador	Dr. Antonio A. González	Coordinador
Registro	8:30 - 9:00	Registration
Bienvenida e introducción al V Encuentro UPR/MIT Tren Urbano Dr. Antonio A. González UPR/Mayagüez y Sra. Lydia E. Mercado, Oficina del Tren Urbano	9:00-10:00	Welcome and Introduction to the 5th UPR/MIT Conference on Tren Urbano Dr. Antonio A. González, UPR/Mayagüez Ms. Lydia E. Mercado, Tren Urbano Office
Receso	10:00-10:30	Break
Retrato organizativo de la oficina del Tren Urbano Sr. Randy Altshuler, Director de Operaciones, Oficina del Tren Urbano	10:30 - 11:30	Organizational Portrait of the Tren Urbano Office Mr. Randy Altshuler, Operations Director, Tren Urbano Office
Estatus del proyecto Sr. Chris Dixon, Director de Implementación, Oficina del Tren Urbano	11:30-12:30	Project Status Mr. Chris Dixon, Implementation Director, Tren Urbano Office
Almuerzo	12:30-1:30	Lunch
El financiamiento del proyecto del Tren Urbano Dr. Carlos Colón de Armas, Sub-Director Ejecutivo, Autoridad de Carreteras y Transportación de Puerto Rico	2:00-3:00	Financing of Tren Urbano Project Dr. Carlos Colón de Armas, Deputy Executive Director, Puerto Rico Highway & Transportation Authority
Receso	3:00-3:30	Break
La visión del secretario Dr. Carlos I. Pesquera, Secretario, Departamento de Transportación y Obras Públicas de Puerto Rico	3:30-5:00	The Secretary's Vision Dr. Carlos I. Pesquera, Secretary, Puerto Rico Department of Transportation and Public Works

Note to faculty: Please gather for meeting at 7:00 PM at designated location to be announced.

Tren Urbano Team



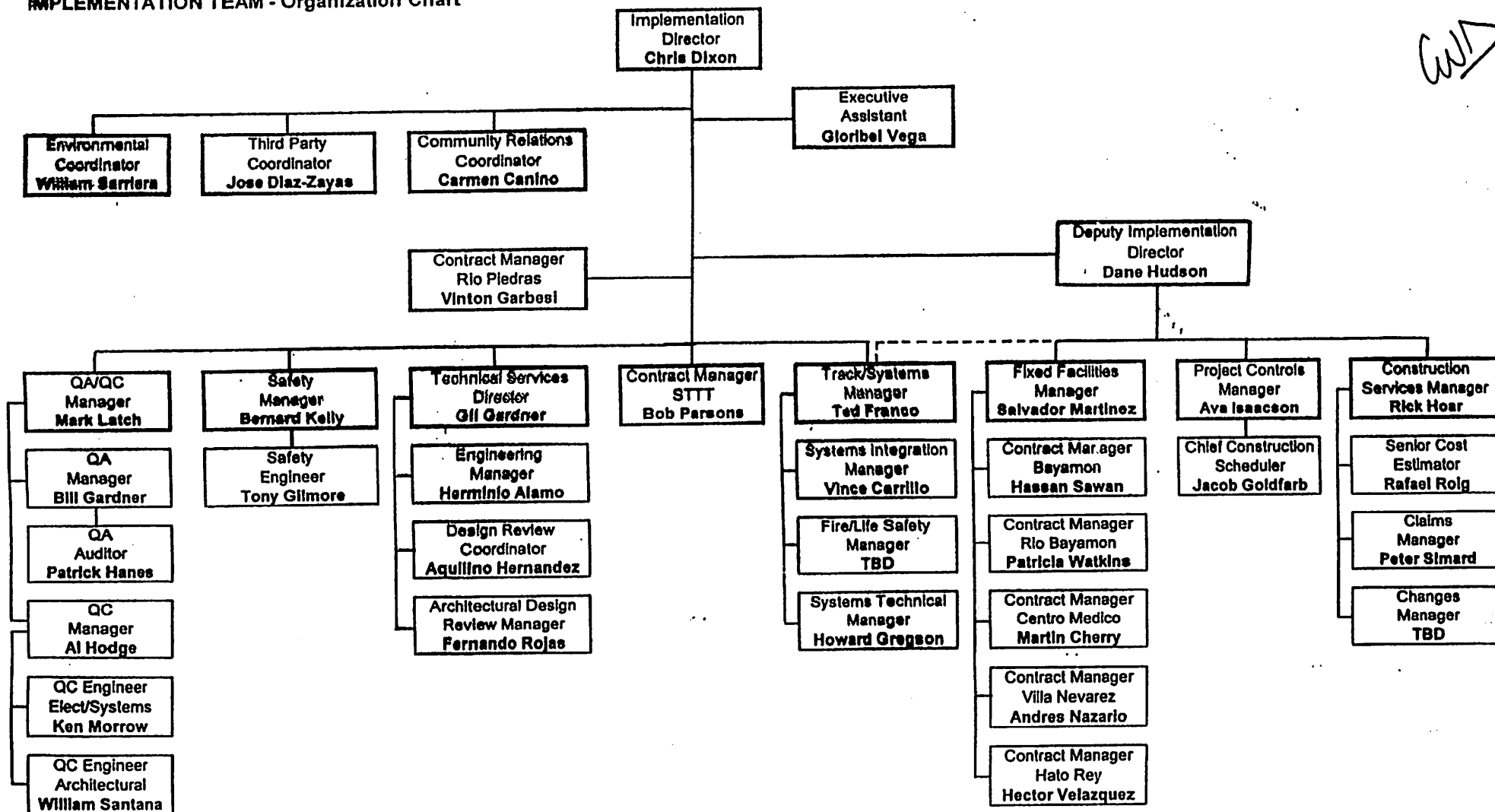
TREN URBANO



IMPLEMENTATION TEAM - Organization Chart

December 14, 1998

CWD

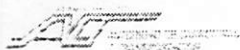


Government of Puerto Rico
Department of Transportation and Public Works
Highway and Transportation Authority

The Puerto Rico Highway and Transportation Authority: A Financial Perspective

January 7, 1999

Sergio L. González
Executive Director, PRHTA



Carlos I. Pesquera
Secretary, DTPW



Presentation Outline

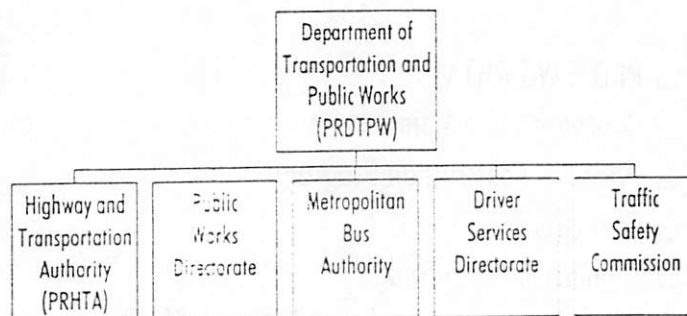
PUERTO RICO
HIGHWAY AND
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AUTHORITY

- ☐ PRDTPW/PRHTA
- ☐ Operations and Maintenance
- ☐ Priorities Construction Program
- ☐ Revenues
- ☐ Teodoro Moscoso Bridge
- ☐ PR-66 Tollroad: what form of privatization?

PRDTPW/PRHTA

PRDTPW: An Intermodal Umbrella

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The PRHTA: An Evolving Mission

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- ❑ 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 PRDTPW.
 - ❑ Abolished the PRHTA board of Directors and gave its powers to the Secretary of the PRDTPW.

The PRHTA: An Evolving Mission (continued)

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- ❑ Act 4 of August 24, 1990
 - ❑ Enabled the PRHA to privatize transportation facilities.
 - ❑ Authorized the PRHA to use a negotiated bids procurement process.
- ❑ Act 1 of March 6, 1991
 - ❑ Added role in mass transportation.
 - ❑ PRHA becomes the PRHTA.

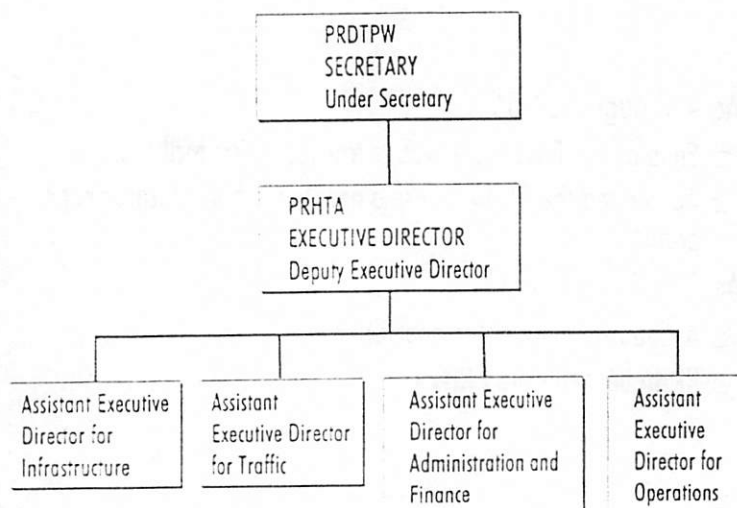
PRHTA Responsibilities

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- ❑ Construction of roads and highways
- ❑ Maintain and operate tollways
- ❑ Develop transportation plan
- ❑ Implement Secretary's mass transportation policy

PRHTA: Organization

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PRHTA - Key Characteristics

*PUERTO RICO
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AUTHORITY*

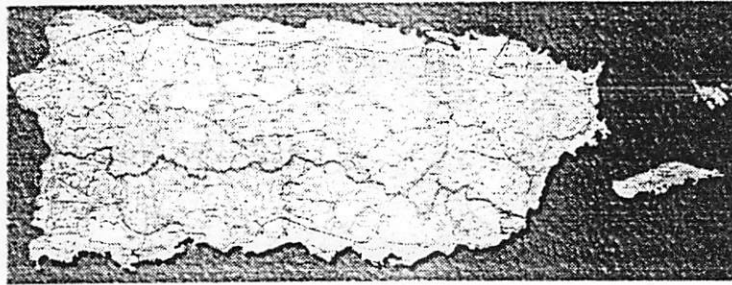
- ☐ A small, efficient organization of technical contract managers.
- ☐ 100% of construction, 90% of design, 90% of real estate acquisitions done by private sector.
- ☐ Toll collection 100% private.
- ☐ Starting to outsource toll road maintenance.

Operations and Maintenance

Existing Highway Network

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Primary System Highways	691 miles	1,137 kms.
Secondary System Highways	1,319 miles	2,138 kms.
Tertiary System Highways	2,580 miles	4,128 kms.
Municipal Roads	<u>9,967</u> miles	<u>16,166</u> kms.
Total	14,557 miles	23,569 kms.



PRHTA: O&M Responsibilities

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- ❑ 150 miles of tollways + 12.17 miles of connecting roads.
- ❑ Any projects recommended by traffic engineers on facilities financed by PRHTA's bonds.
- ❑ The Public Works Directorate bears the cost of maintaining the remainder of PR's highway system from annual appropriations.
 - ❑ If adequate funds are not provided, the PRHTA can use available monies in the Construction Fund for maintenance costs on facilities financed by PRHTA bond proceeds, after debt service reserve provisions have been met.

Priorities Construction Program

PRHTA: **Priorities Construction Program**

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- ☐ Prepared for a five-year period, based on long-range master plan, and updated annually.
- ☐ Focused on primary transportation facilities, while addressing the most essential needs of secondary and tertiary roads.
- ☐ Includes cost of repairs, improvements, reconstruction, and replacements.

Priorities Construction Program: 1998-2002

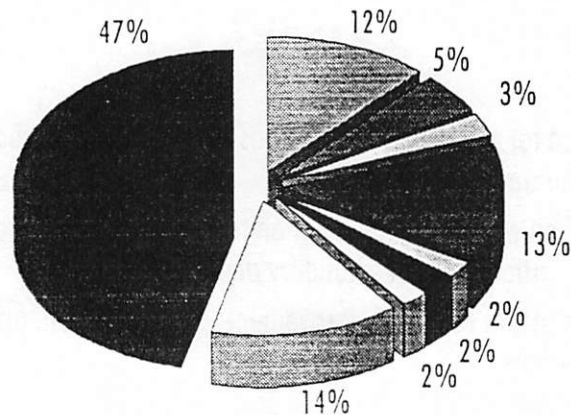
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(in millions)

□ Islandwide Strategic Network	\$369
□ Regional Network	148
□ Congestion Management - Islandwide	86
□ Congestion Management - SJMR	406
□ ITS	62
□ Reconstruction and Repavement	75
□ Safety and Signage	24
□ Enhancement Projects	62
□ Other Highway projects, ROW, and Design	412
□ Tren Urbano	<u>1,392</u>
Total	\$3,036

Priorities Construction Program: 1998-2002

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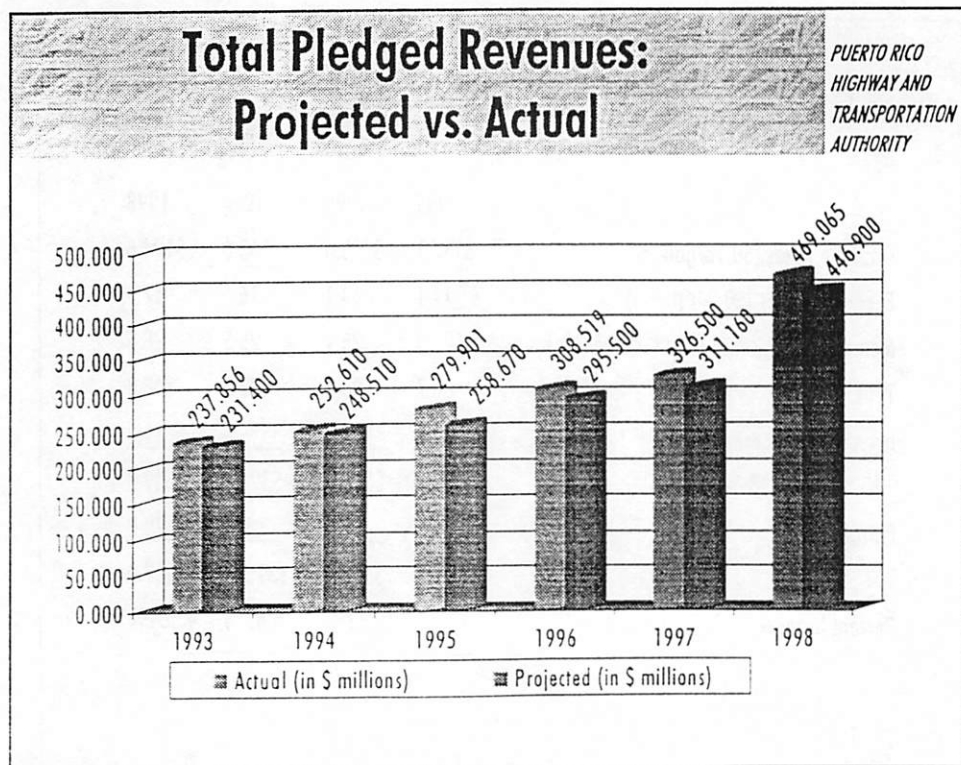
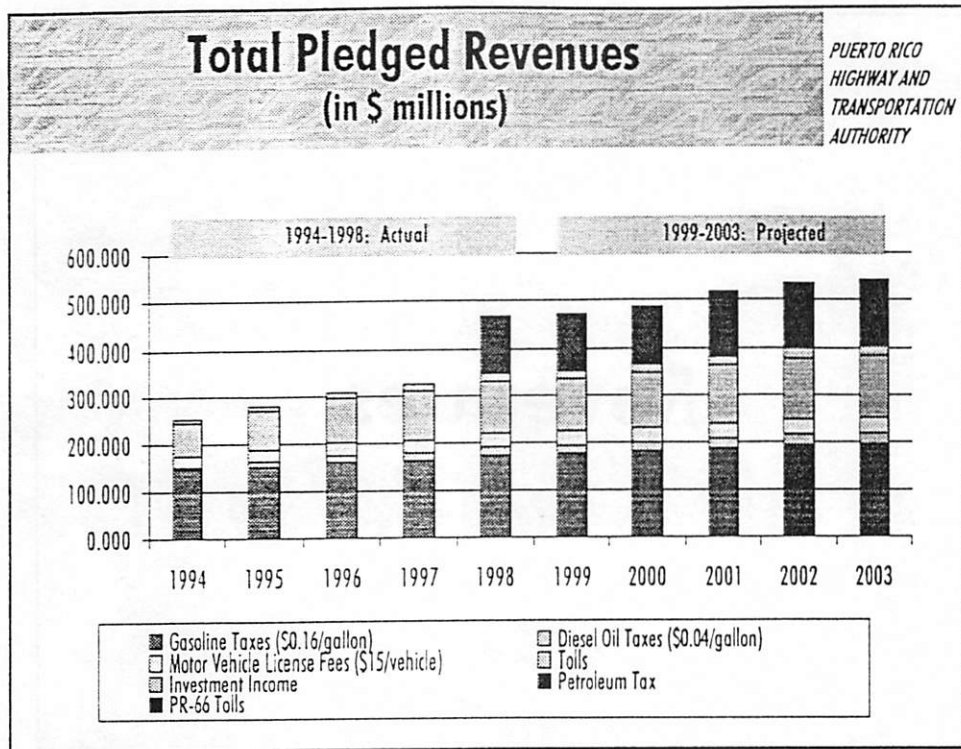
□ Islandwide Strategic Network	■ Regional Network
□ Congestion Management - Islandwide	■ Congestion Management - SJMR
□ ITS	■ Reconstruction and Repavement
□ Enhancement Projects	□ Others
■ Tren Urbano	

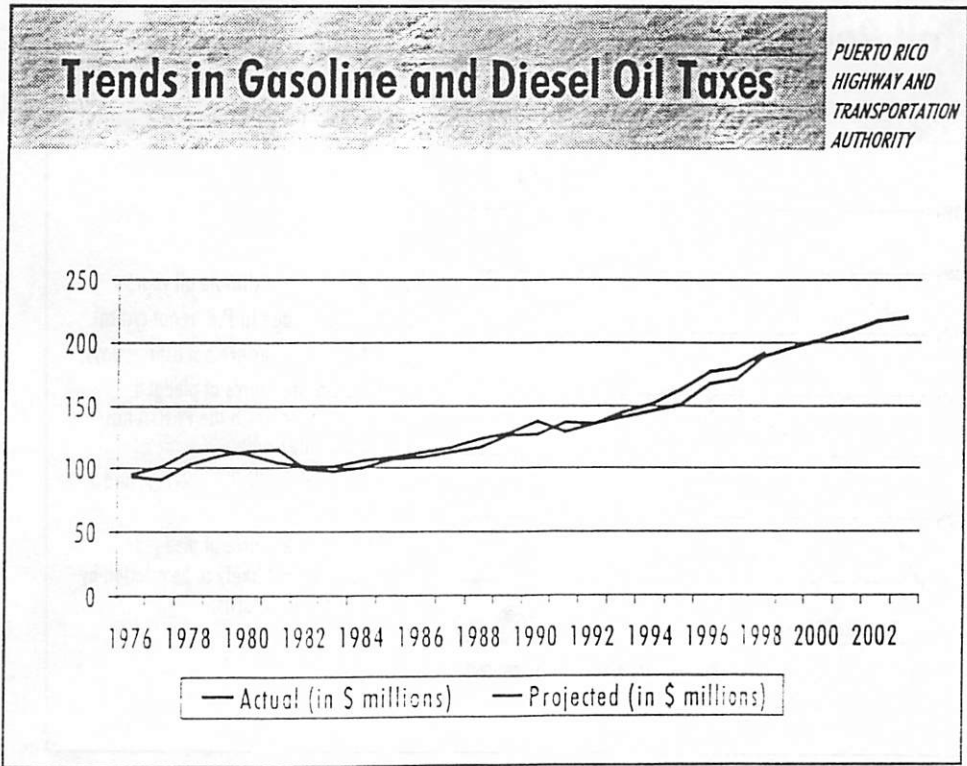
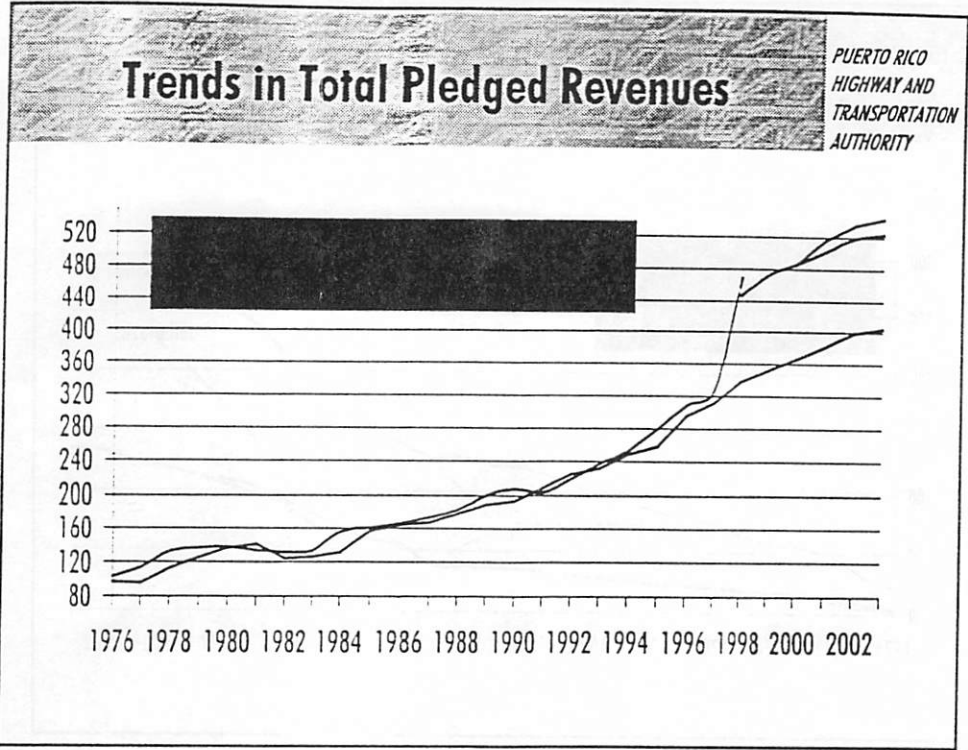
Revenues

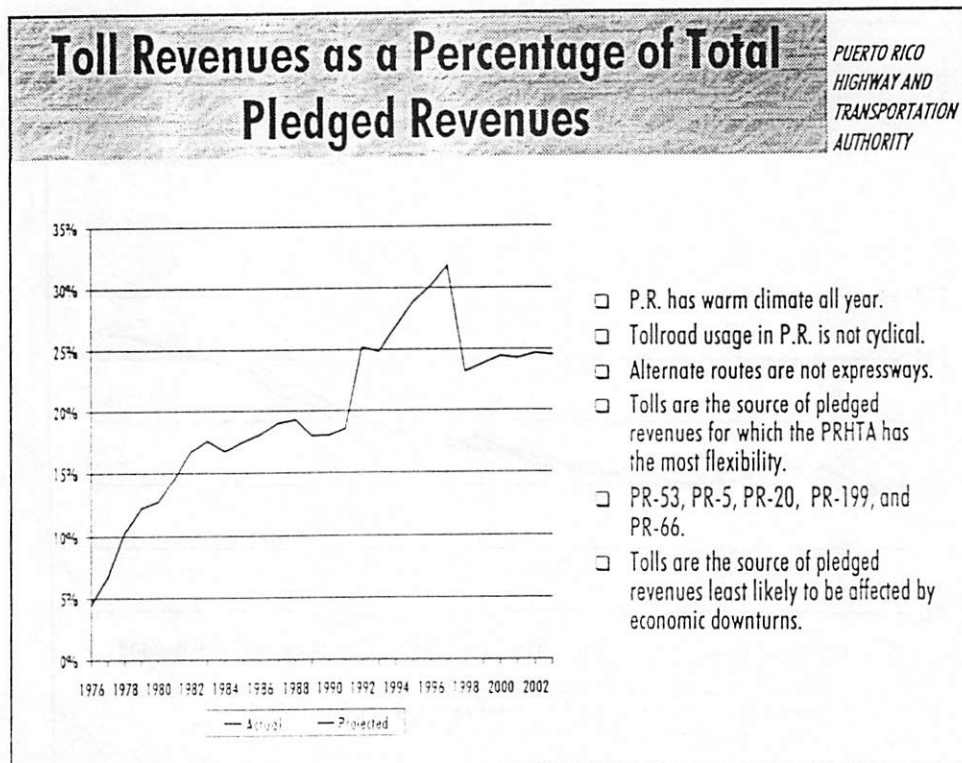
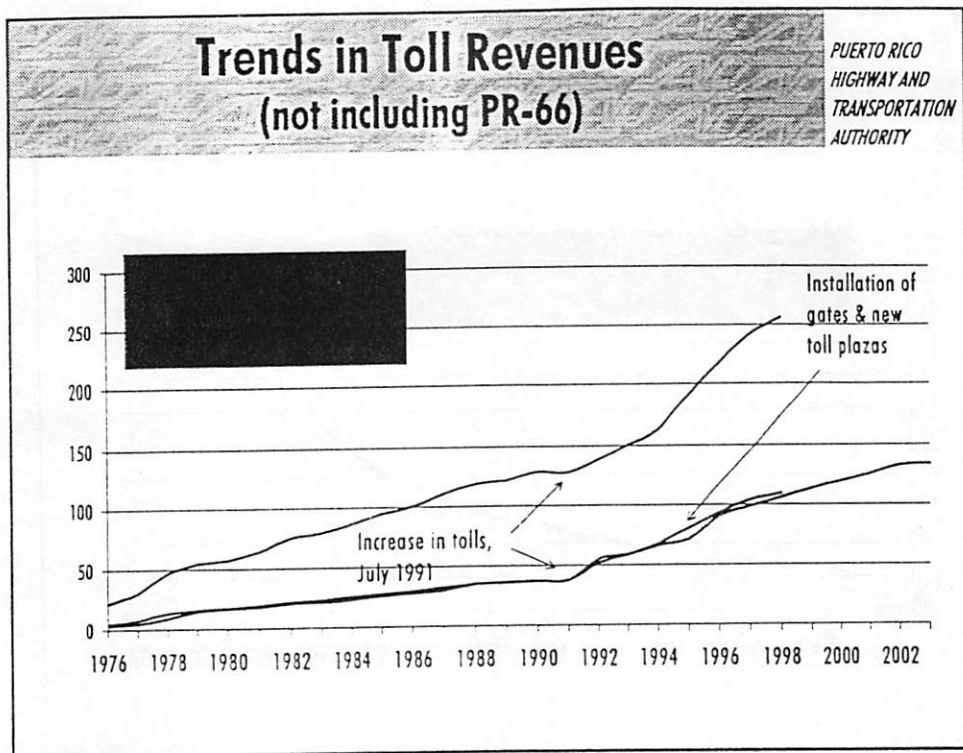
Pledged Revenues (in \$ millions)

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	1995	1996	1997	1998
Gasoline Taxes (\$0.16/gallon)	\$152.1	\$163.0	\$163.6	\$174.6
Diesel Oil Taxes (\$0.04/gallon)	11.1	14.1	16.6	17.9
Motor Vehicle License Fees (\$15/vehicle)	25.0	25.1	26.5	28.5
Tolls	80.7	93.0	103.7	108.8
Investment Income	11.0	13.3	16.1	19.2
Total 68-18 Resolution	\$279.9	\$308.5	\$326.5	\$349.0
Petroleum Tax	0.0	0.0	0.0	120.0
TOTAL	\$279.9	\$308.5	\$326.5	\$469.0
Percent Increase		10.22%	5.83%	43.64%

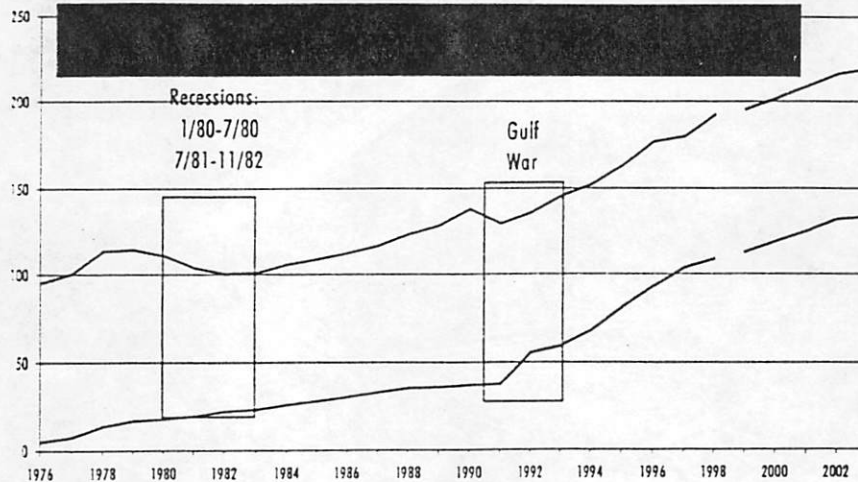






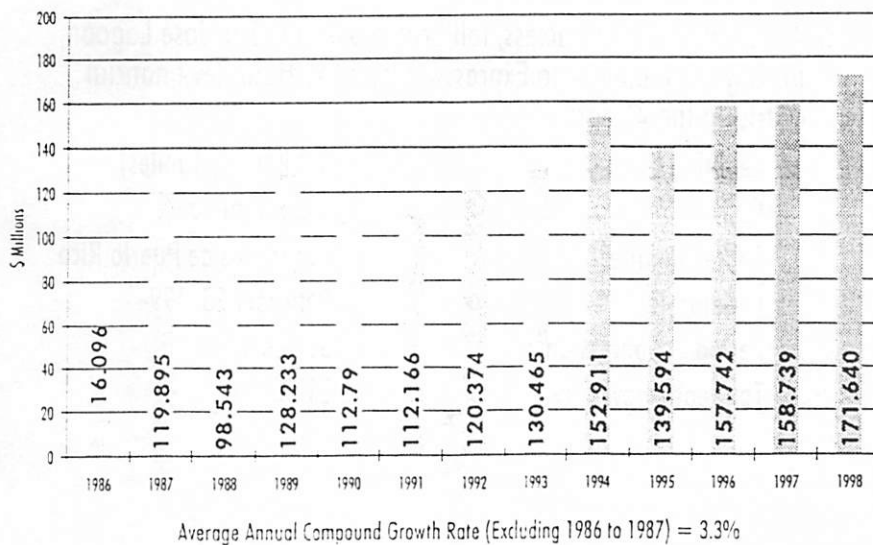
Gasoline and Diesel Oil Taxes and Tolls: A Comparison

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Revenue Generated from Petroleum Tax

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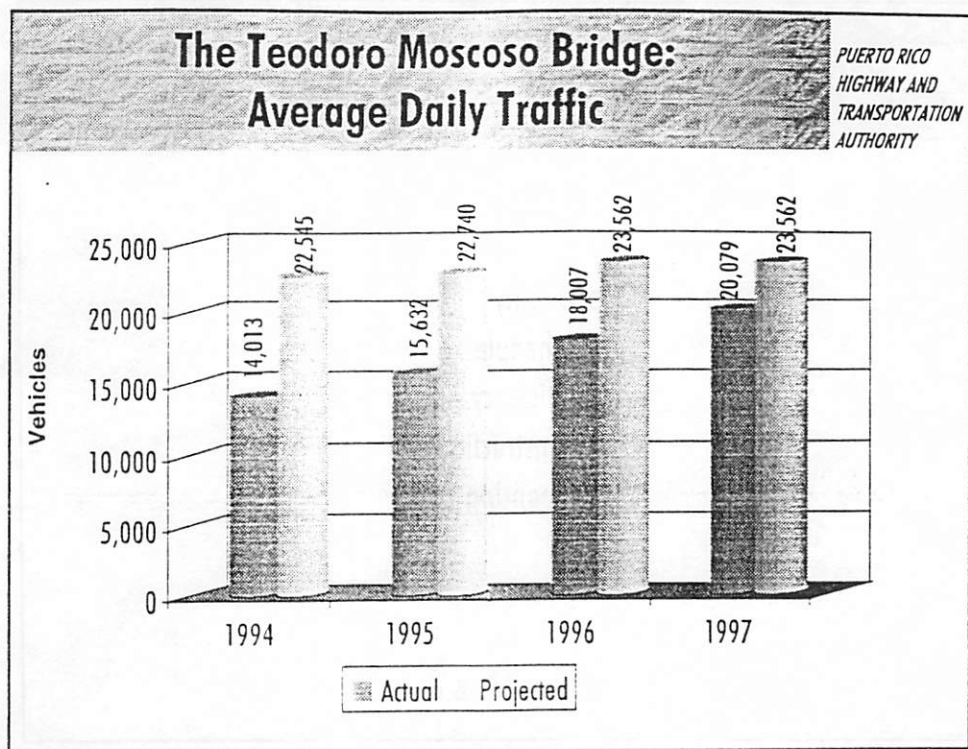


The Teodoro Moscoso Bridge: A Privatization First

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- 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



**PR-66: What form of
privatization?**

Privatization: Factors to Consider

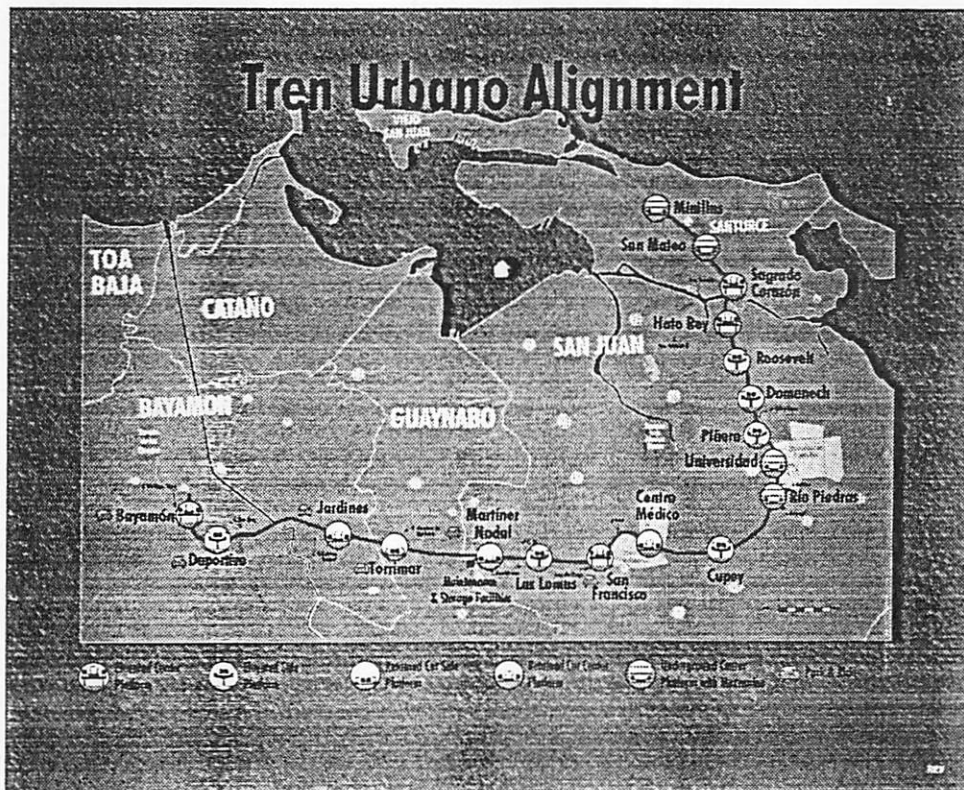
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- ☐ Quality
- ☐ Schedule
- ☐ Efficiency
- ☐ Construction cost
- ☐ Financing Cost



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5th UPR-MIT Tren Urbano Construction Progress



Segment 1 - Bayamón



Bayamón



Deportivo



Bayamón

Deportivo

Grupo Metro San Juan	
Investment	\$68M
Start	09/96
Finish	09/99

Bayamón Contract



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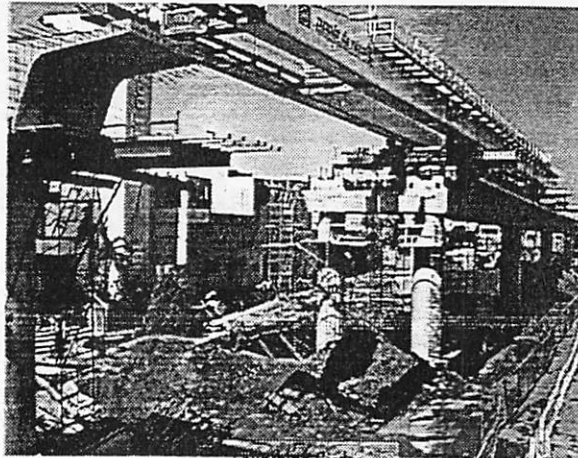
Bayamón Contract



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Guideway - Construction Status Overall Progress 54%

☑ Piles fabricated	87%
☑ Piles driven	70%
☑ Pile Caps	75%
☑ Spreadfooting	35%
☑ Piers	50%
☑ Pier Caps	35%
☑ Segments	50%



Launching Girder
Span 19-20 L

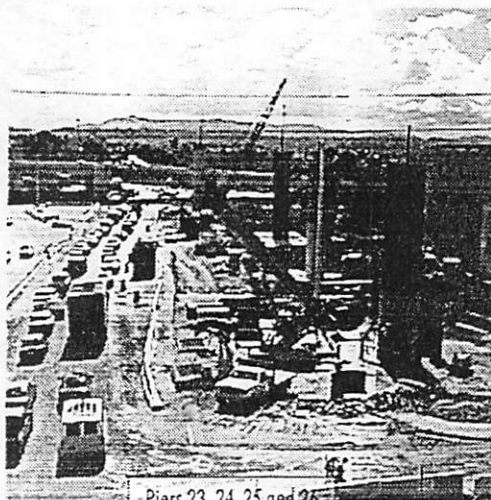
Bayamón Contract (continued)



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Guideway - Construction Status

- ☑ All single track segments - Casted
- ☑ 8 precast molds producing double track segments
- ☑ 19 spans - Erected and post tensioned
- ☑ Utility Relocation
 - Utility Relocation PR2 - 20%
 - Relocation of high voltage overhead lines at Pier 82 - Complete
- ☑ Santa Rosa Mall - Three Piers in under construction



Piers 23, 24, 25 and 26

Bayamón Contract (continued)



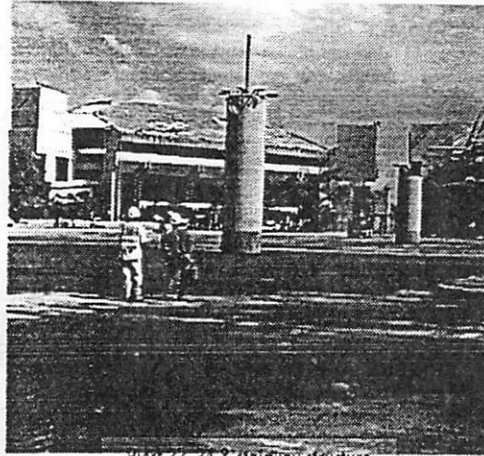
Stations - Design Status

☑ Bayamón Centro

- | | |
|-----------------------------|------|
| • Architectural | 95% |
| • Civil & Structural | 95% |
| • Electrical and mechanical | 100% |

☑ Complejo Deportivo

- | | |
|--|------|
| • Architectural | 95% |
| • Civil & Structural | 95% |
| • Electrical and mechanical | 100% |
| • Relocation- Stairway structure & Ticket booth (Ruben Rodriguez Coliseum) | 20% |

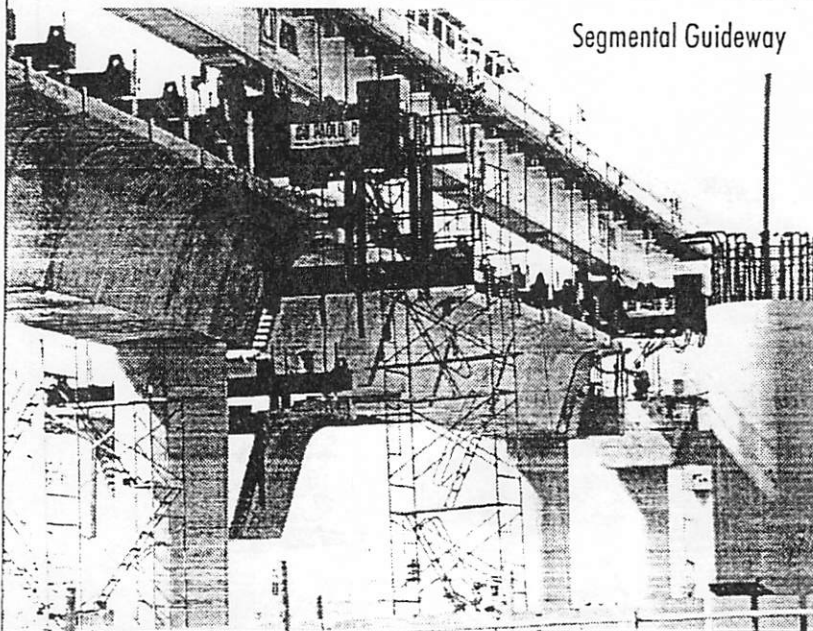


Piers 33, 34 & stairway structure

Bayamón Centro (continued)



Segmental Guideway



Bayamón Contract (continued)



TREN URBANO

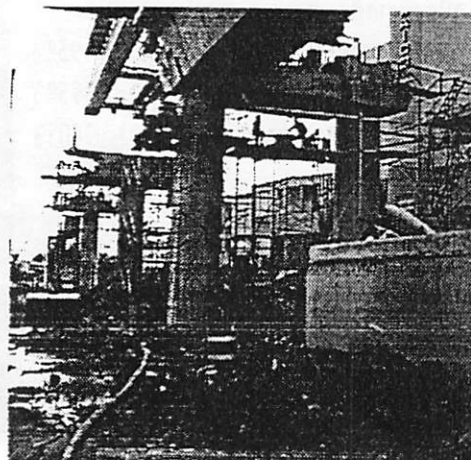
Stations Construction Status

☑ Bayamón Centro

- Pre-cast T-beams 100%
- Platform Pre-cast Beams 75%
- General Gases Building:
 - ▢ Removal of Gas Cylinders In progress
 - ▢ Phase III survey for underground oil tank In progress

☑ Complejo Deportivo

- Utilities relocation 60%



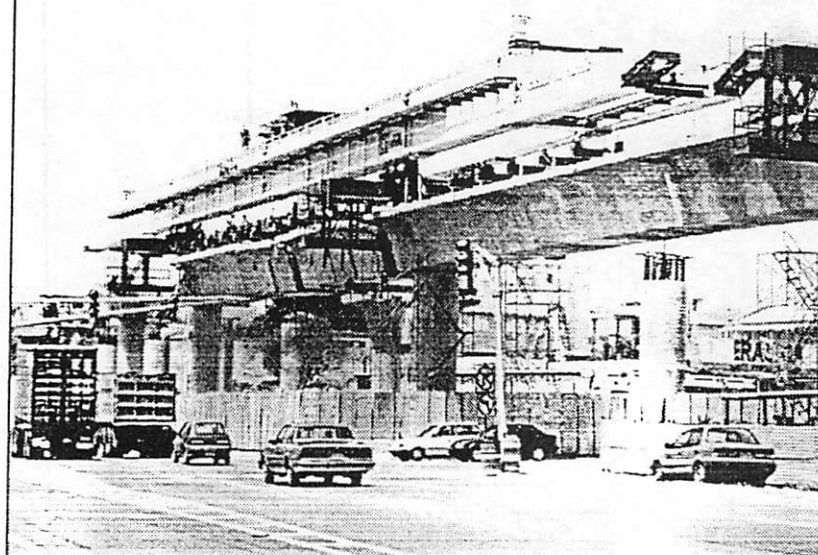
Pier Cap 20 Transition Structure

Bayamón Centro (continued)



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Segmental Guideway



Segment 2 - Río Bayamón



Redondo Entrecanales	
Investment	\$37M
Start	02/97
Finish	09/99

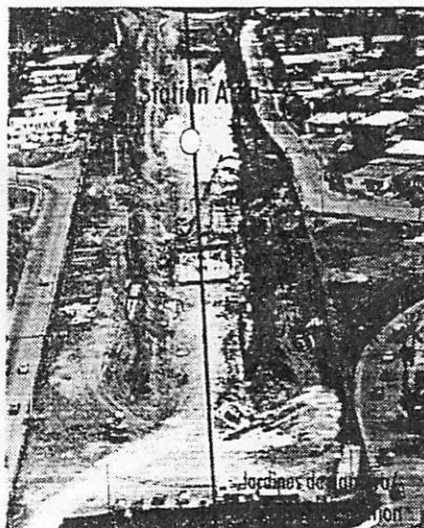
Río Bayamón Contract



TREN URBANO

Design- Status

☒ Geotechnical Report	Approved
☒ Hydrologic & Hydraulic report	Approved
☒ Retained cut section	Complete
☒ Grading and drainage	Complete
☒ Station	88% Complete



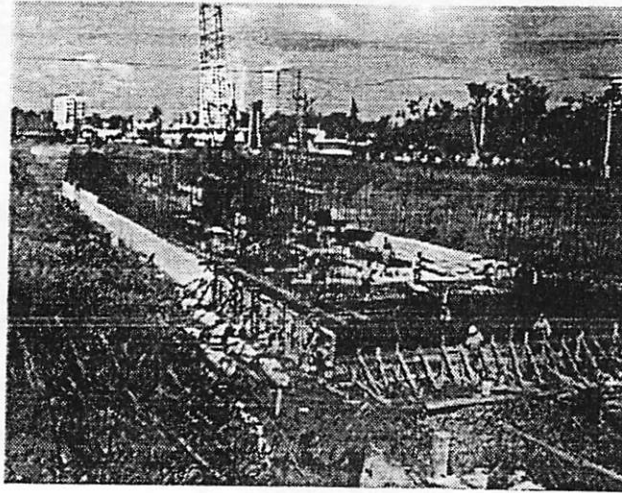
Río Bayamón Contract



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Retained Cut Structure

10% Completed



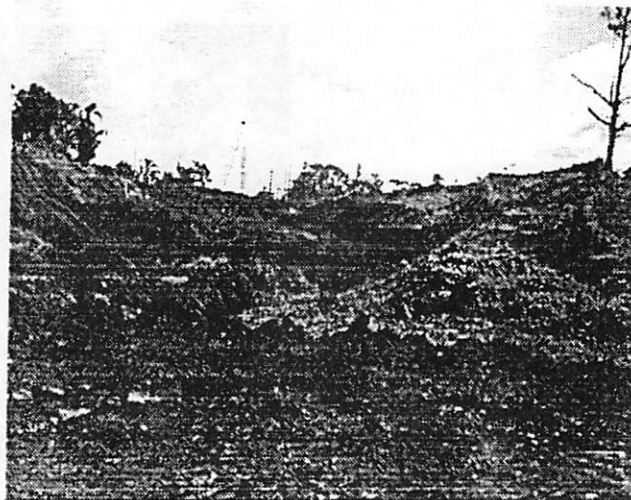
Río Bayamón Contract



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Open Cut Section

30% Completed



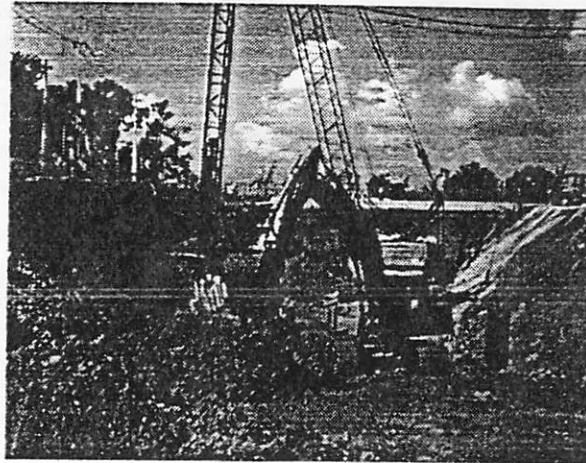
Río Bayamón Contract



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Buen Samaritano Bridge
Excavation and concrete piling

100 % Completed



Río Bayamón Contract (continued)



TREN URBANO

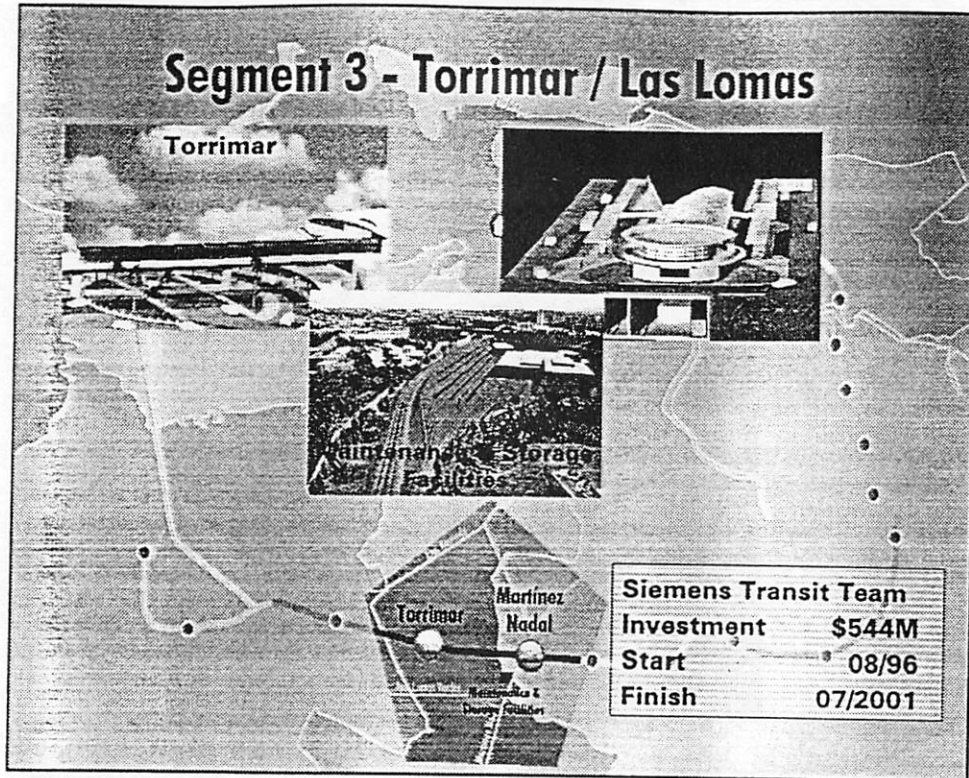
Construction- Status

- ☒ Temporary utilities relocation
- ☒ Excavation of boat section

Complete

95% Complete

Segment 3 - Torrimar / Las Lomas



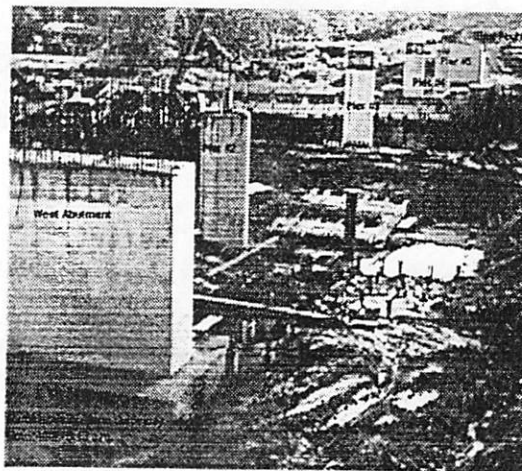
STTT Contract



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Fixed Facilities Design Progress

☒ Torrimar Area	95%
☒ Storage & Maintenance Facilities	95%
☒ Las Lomas Area	97%



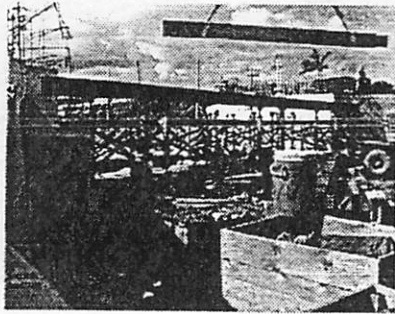
STTT Contract (Continued)



TREN URBANO

Fixed Facilities Construction Progress

☑ Torrimar Station	10%
☑ Ramirez de Arellano Guideway	30%
☑ Torrimar Guideway	50%
☑ Serrania Street Guideway	40%
☑ Garden Hills Guideway	60%



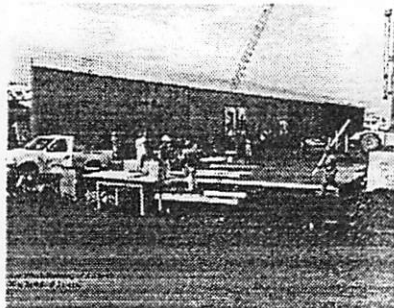
STTT Contract (Continued)



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Fixed Facilities Construction Progress

☑ Yard Area	40%
☑ Operations & Maintenance Building	15%
☑ Maintenance of Way Bldg.	0%
☑ Car Wash Building	15%



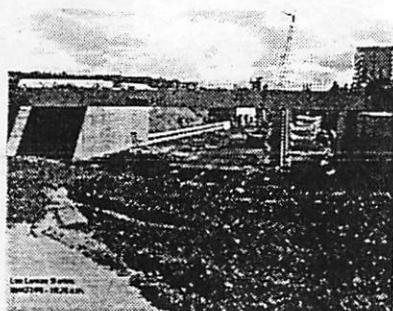
STTT Contract (Continued)



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Fixed Facilities Construction Progress

- ☑ Las Lomas Station 20%
- ☑ Las Lomas Bridges 45%
- ☑ Station Head House 10%
- ☑ Station Platform 3%



Las Lomas Station
09/02/2016 - 10:26 AM



Las Lomas Station

Station Area

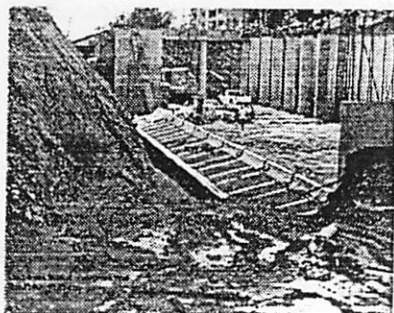
STTT Contract (Continued)



TREN URBANO

Fixed Facilities Construction Progress

- ☑ Evergreen Walls 30%
- ☑ CIP Retaining Walls 80%

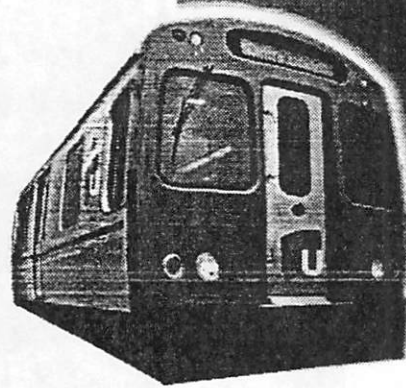


STTT Contract (Continued)



Vehicles

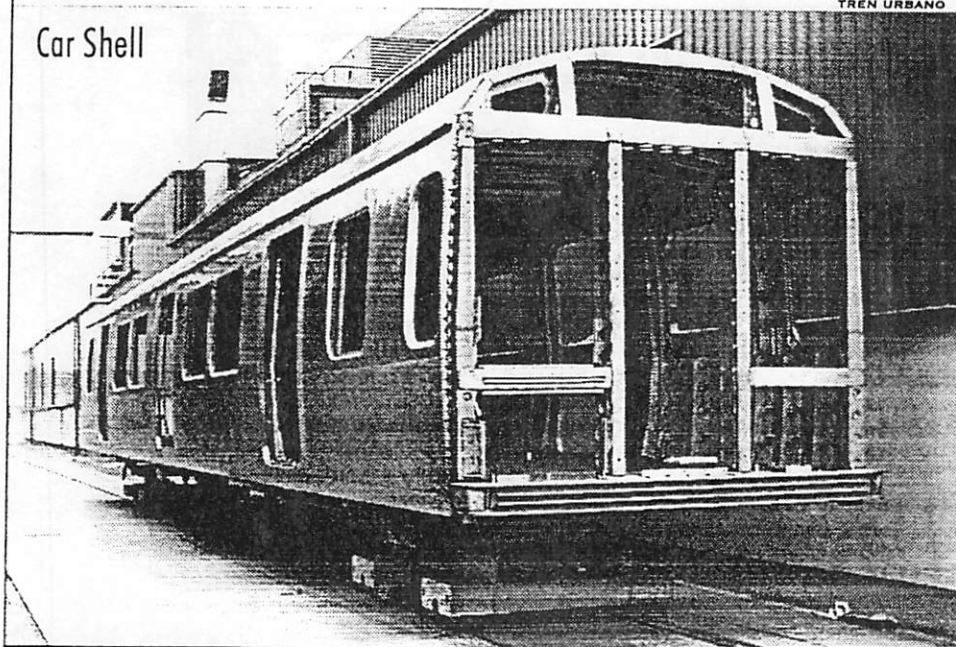
- | | |
|--|----------------|
| ☒ Final Design | Complete |
| ☒ Fabrication of Car Shells | In Progress |
| ☒ First Car Shell Complete | January, 1999 |
| ☒ First Married Pair in
Puerto Rico | November, 1999 |



STTT Contract (Continued)



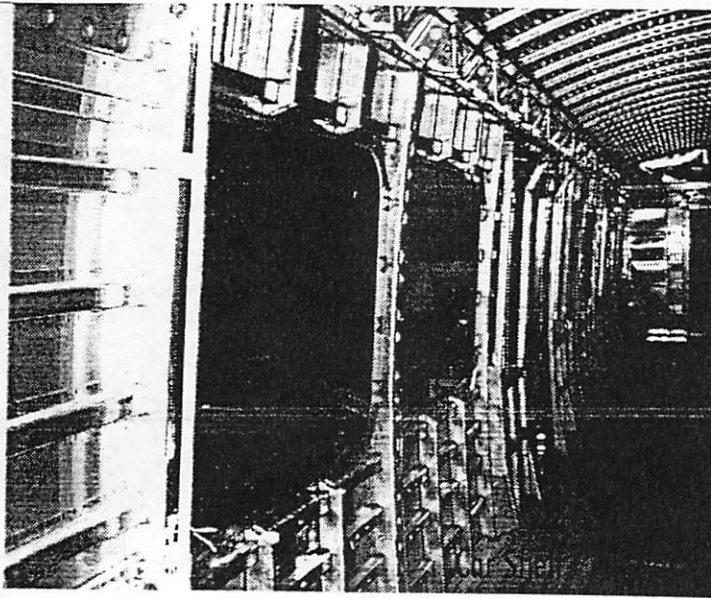
Car Shell



STTT Contract (Continued)



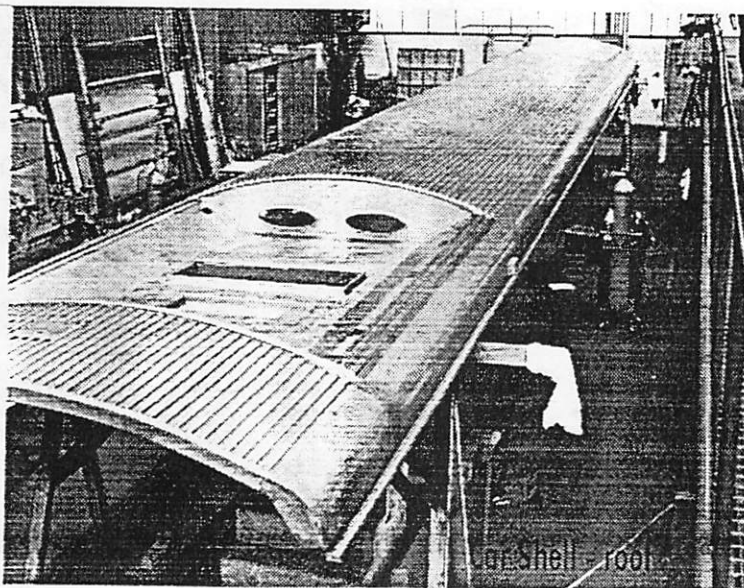
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STTT Contract (Continued)



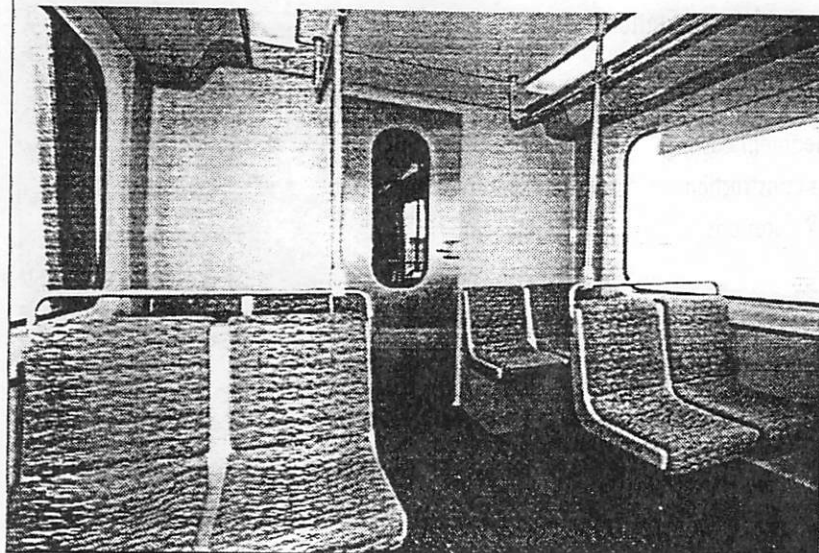
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STTT Contract (Continued)



TREN URBANO



Segment 4 - Centro Médico



Las Lomas



Centro Médico



San Francisco

Redondo Entrecanales	
Investment	\$72M
Start	01/97
Finish	09/99



Centro Médico



TREN URBANO

Fixed Facilities- Construction Status

☒ San Alfonso Guideway / Station

- | | |
|--------------------------------------|------------|
| • Piling | 100% |
| • Footings and Columns (in progress) | 95% |
| • Guideway Segment Casting | 95% |
| • Storm Drain Construction | 40% |
| • Utility Line Relocations | (on going) |



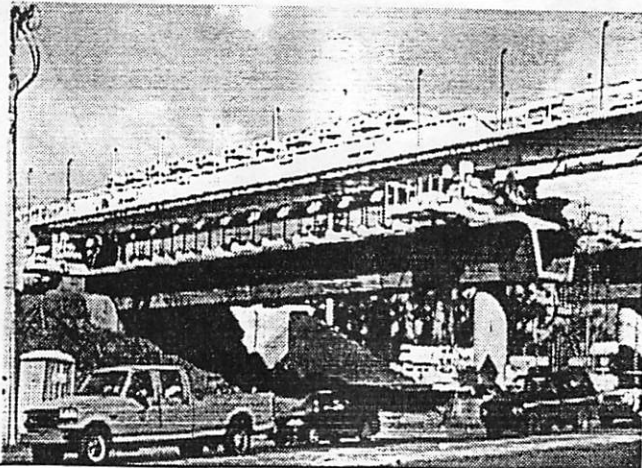
Centro Médico (Continued)



TREN URBANO

San Alfonso - De Diego at Grade

- | | |
|---|-----|
| ☒ Earthworks | 75% |
| ☒ Sub Ballast | 0% |

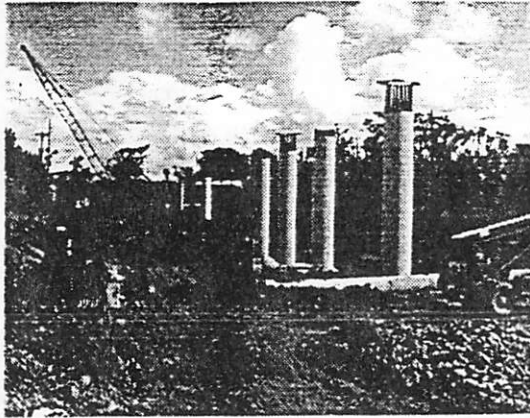


Centro Médico (Continued)



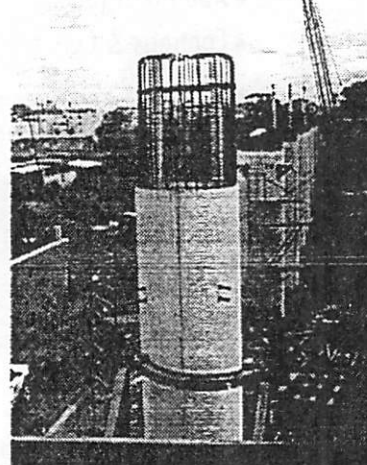
TREN URBANO

Pier 9 looking East on San Alfonso guideway



San Alfonso guideway

Pier 6 looking East on San Alfonso guideway

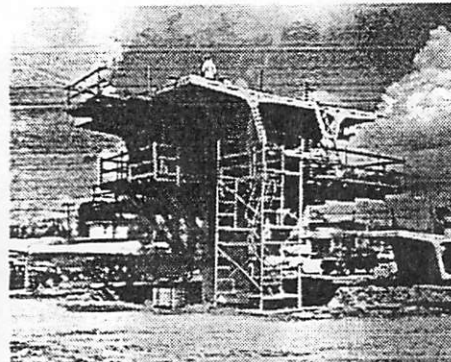
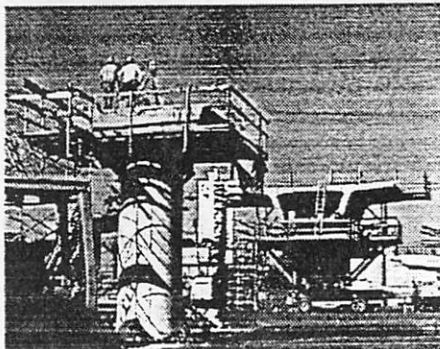


Centro Médico (Continued)



TREN URBANO

Pier 3- Fixed pier cap and Pier 4- Expansion pier cap



Fixed pier cap and double track segment

San Alfonso Station

Centro Médico (Continued)



☒ De Diego Guideway / Station

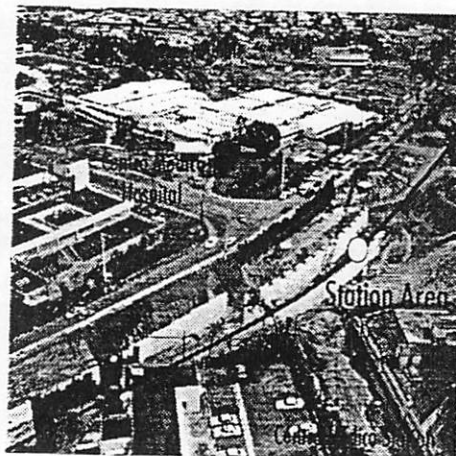
• Abutment (west)	100%
• Abutment (east)	30%
• Footings & Columns	75%
• Pier Caps	25%
• Pier Cross Beams	0%
• Guideway Segments	2.5%
• Guideway Segments Casting	95%

Centro Médico (continued)



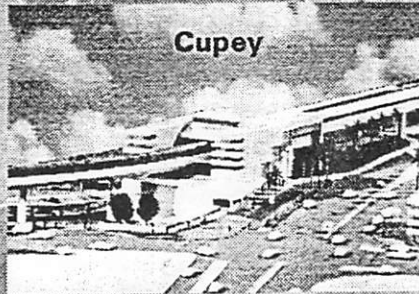
☒ Excavation

• Cut Section area (188 + 40 to 189 + 160)	120m	85%
• Retained cut area (189 + 60 to 191 + 160)	280m	85%
• Rigid Frame area (191 + 60 to 194 + 20)	140m	85%
• Station area (192 + 20 to 194 + 20)	280m	15%
• Cut Area (194 + 20 + to 195 + 60)	140m	10%



Segment 5 - Villa Nevárez

Cupey



Redondo Entrecanales

Investment \$72M

Start 06/97

Finish 09/99

Cupey

Villa Nevárez Contract



TREN URBANO

Fixed Facilities - Design Status

- | | |
|--|------|
| ☒ Substructure | 100% |
| 195 + 86.22 to 207 + 75 | |
| Abutment #1 @ Pier 38 | |
| ☒ Substructure | 60% |
| 207 + 75 to 217 + 40 | |
| Pier 39 @ abutment #65 | |
| ☒ Superstructure | 100% |
| 195 + 86.22 to 207 + 75 | |
| Abutment #39 @ pier #38 | |
| ☒ Superstructure | 60% |
| 207 + 75 to 217 + 40 | |
| Pier 39 @ abutment #65 | |

Station- Design Status

- | | |
|---|------|
| ☒ Station | 60% |
| ☒ Tunnel and sitework | 100% |



Villa Nevárez Contract (Continued)



TREN URBANO

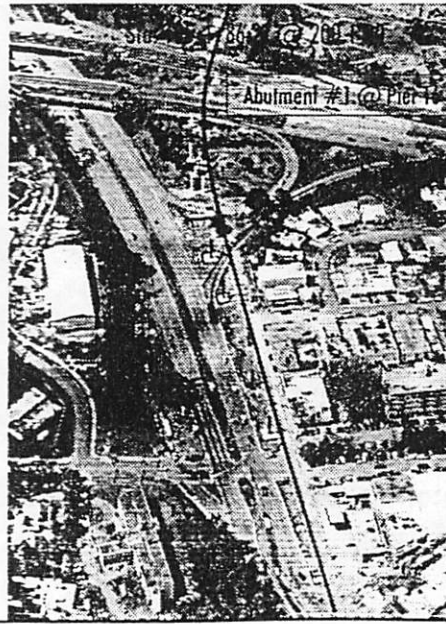
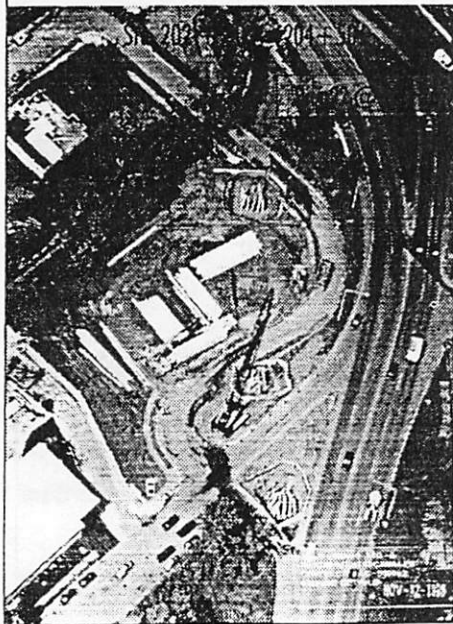
Fixed Facilities - Construction Status

☑ 195+86.22 to 204+00 (abutment #1 @ Pier #25)	
• Excavation for structure	78%
• Pile driving	78%
• Pile caps	50%
• Columns	30%
• Segments	44%
☑ Electrical relocation for PR-1	70%
☑ Electrical relocation for PR-21	100%
☑ PRASA relocation for PR-1	45%
☑ PRASA relocation for PR-21	100%

Villa Nevárez Contract (Continued)



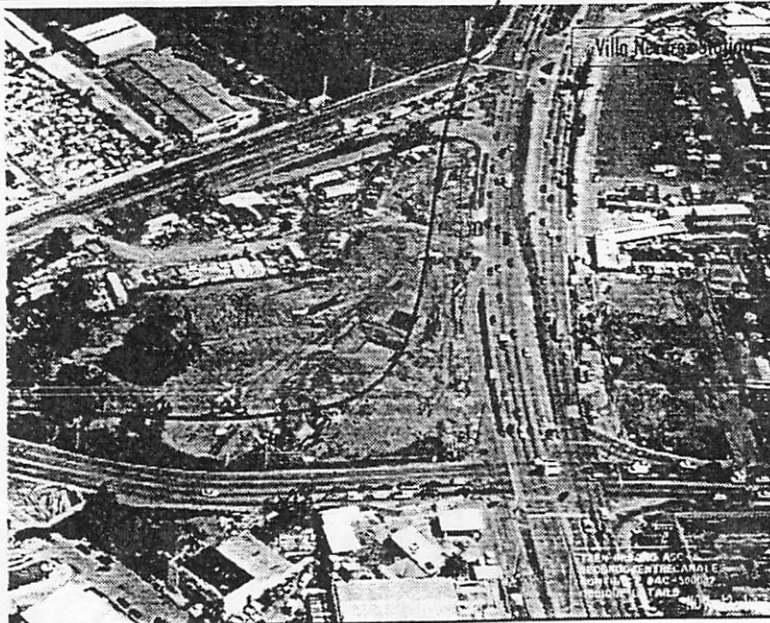
TREN URBANO



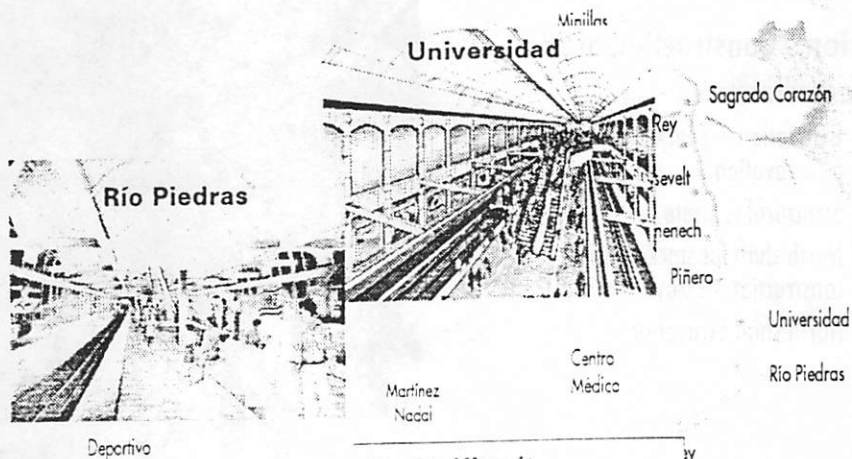
Villa Nevárez Contract (Continued)



TREN URBANO



Segment 6 - Río Piedras



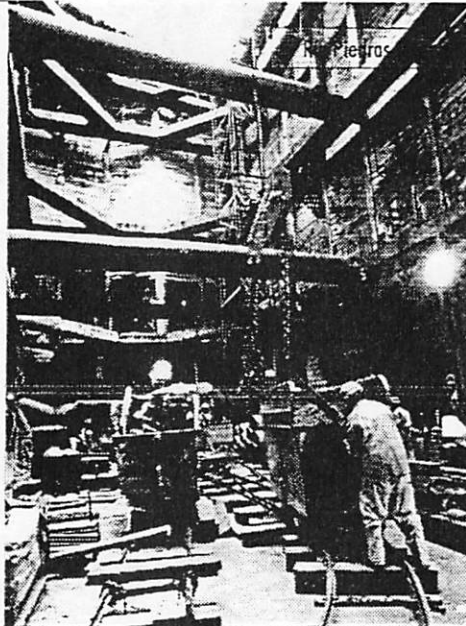
Grupo Kiewit	
Investment	\$226M
Start	04/97
Finish	09/2000

Río Piedras Contract



Station - Design Status

- ☑ Río Piedras Station 100%
- ☑ UPR Station 100%

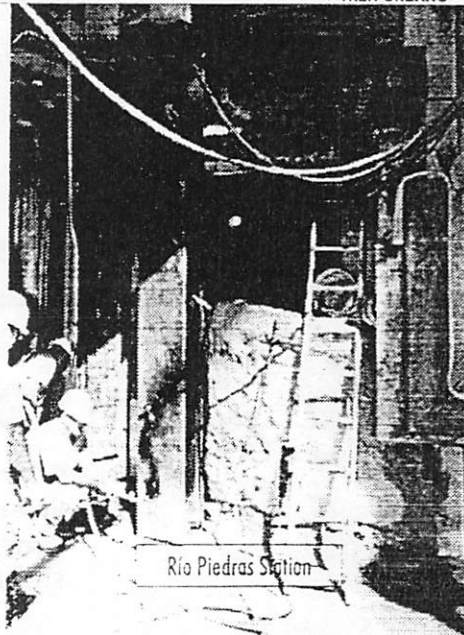


Río Piedras Contract (Continued)



Station - Construction Status

- ☑ Río Piedras station
 - Excavation & South shaft support of excavation 100%
 - Structural concrete 5%
 - North shaft for stacked drift construction - Excavation 100%
 - North shaft excavation 45%



Río Piedras Contract (Continued)

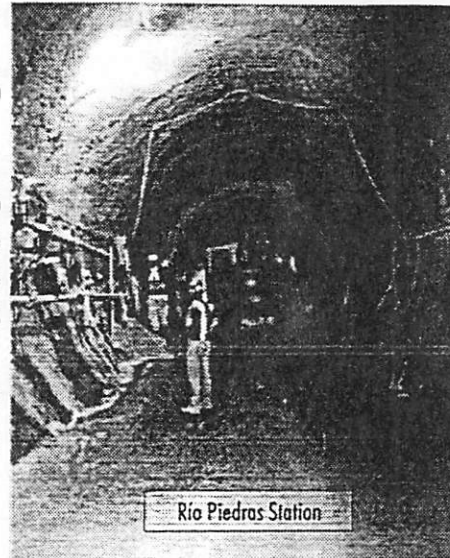


TREN URBANO

Station - Construction Status

☑ Río Piedras station

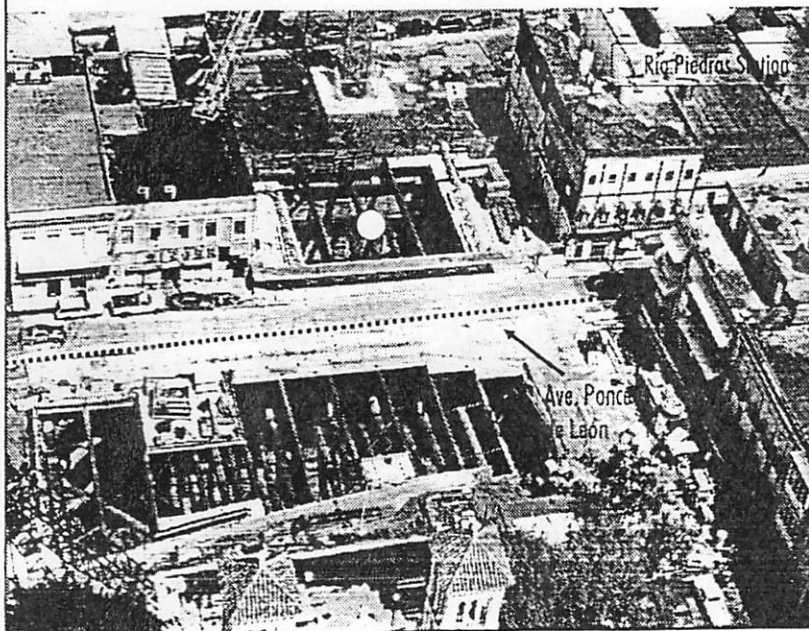
- Pre-excavation consolidation grouting 100%
Station, NATM and EPBM Tunnels
- Stacked drifts:
 - ☐ 1W- 1E- excavation 100%
 - ☐ 1W- 1E- mass concrete 100%
 - ☐ 2W- excavation 5%
 - ☐ 2E- excavation 10%
- NATM - Tunnels
 - ☐ Excavation - Carolina left 70%
- South Cut-And-Cover excavation 35%



Río Piedras Contract (Continued)



TREN URBANO



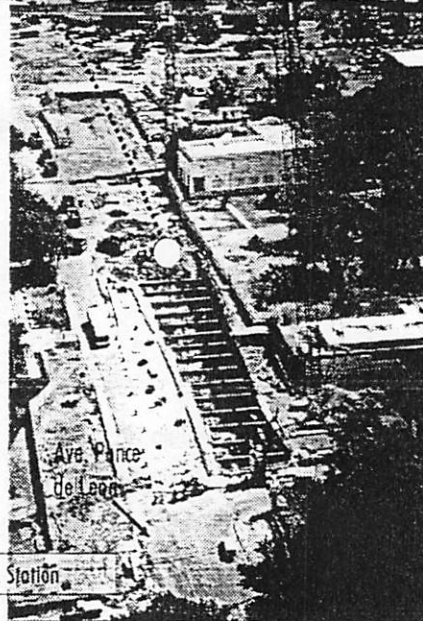
Río Piedras Contract (Continued)



TREN URBANO

UPR Station - Construction Status

- ☒ Soldier and secant pile
 - Installation 100%
 - Excavation 70%
- ☒ Radio station
 - Phase I 100%
 - Temporary facilities 100%
 - Phase II design 100%
- ☒ North Cut & Cover
 - Soldier pile installation 95%



UPR Station

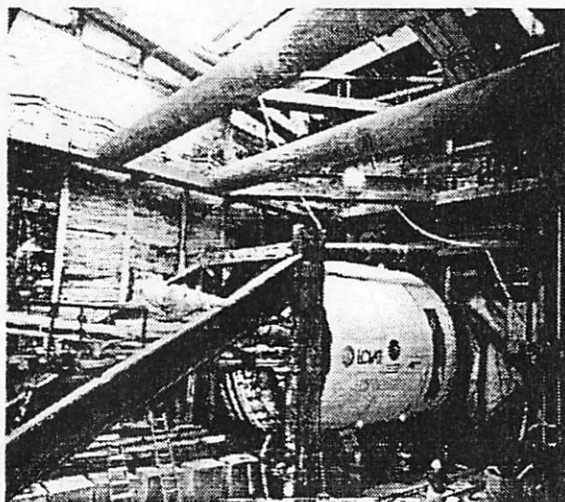
Río Piedras Contract (Continued)



TREN URBANO

Miscellaneous

- ☒ On-site concrete mix plant erected and operating at South Retained Cut
- ☒ Utility relocation
 - Phase I 95%
 - Phase II 60%
- ☒ Dewatering system operational



UPR Station

Segment 7 - Hato Rey



Necso Redondo	
Investment	\$117M
Start	05/97
Finish	04/2000

Hato Rey Contract



TREN URBANO

Station - Design Status

☒ Piñero	100%
☒ Domenech	60%
☒ Roosevelt	100%
☒ Hato Rey	60%
☒ Sagrado Corazón	100%



Hato Rey Contract (Continued)



Hato Rey Contract (Continued)



Fixed Facilities - Design Status

≡ Deck Design	30%
≡ 70% Piles and foundations Submitted	100%



Hato Rey Contract (continued)



TREN URBANO

Fixed Facilities - Construction Status

☒ Driving Piles Activity	664 Piles Driven
☒ Parking Lot near Centro Judicial	95%
☒ Piles Casted in Casting Yard	1,121
☒ Segment Casted for Centro Medico & Villa Nevarez Alignment	767

Hato Rey Contract (continued)



TREN URBANO



Hato Rey Contract



Hato Rey Station



Tren Urbano Master Plan

