

Public/Private Roles in Rail Systems

- **Japan (late 1980s)**
- **Argentina (mid 1990s)**
- **British Rail (late 1990s)**
- **US Intercity Passenger**
- **London Underground PPP (2002)**
- **Puerto Rico - Tren Urbano (2004)**
- **Other US urban rail systems**

Japan

- **JNR was privatized in 5 geographical units with vertical integration - internal restructuring approach**
- **Surplus labor was not transferred**
- **Government takes the lead in new high-speed rail infrastructure**
- **JRs (East, Central, etc.) have to operate at a profit**
- **Government controls fare levels**
- **Viewed as a successful model**

Argentina

- **National, regional rail and subway system serving Buenos Aires with**
 - massive fare evasion
 - excess labor and many "no show" employees
 - inadequate maintenance
 - no investment
 - strong labor unions
- **Restructured as 7 separate bid packages with vertical integration**
- **Public sector owns facilities and sets fares, schedules, investment requirements**
- **Contractor keeps fare revenue**
- **Ten-year concessions agreements**
- **Subsidy to be continued with awards based on minimum subsidy bid**

Argentina (cont'd)

- **Required at least 2 operators so competition threat remained**
- **World Bank funded buyout of excess labor**
- **Broad outreach to solicit interested bidders**
- **Lengthy bidding and transition process harmed the system**

Immediate (1-year) results:

- **Improved quality, fare collection and ridership up by 30%**

Longer-term (5-year) results:

- **At least one of four concessionaires performing poorly**
- **Non-cooperation on unified fare system**
- **Lobbying to change contract terms and duration**
- **Quantity and Quality of public monitoring function eroded**
- **Government late on payments**

British Rail

- **British Rail restructured into ~100 separate companies (vertical segmentation) including:**
 - **Train Operating Companies (TOCs)**
 - **Rolling Stock Leasing Companies**
 - **Infrastructure company**
- **Oversight from the Office of the Rail Regulator**
- **TOC concessions awarded for seven-year terms with subsidy built in**
- **Infrastructure company, originally Railtrack, was a shareholder-owned company with assets transferred from the government and income from TOC access charges**
- **Railtrack did an inadequate job on maintenance and ended up going out of business**
- **Replaced by Network Rail as a public entity**

London Underground PPP

- **Operation of Underground remains responsibility of LUL - a public sector entity**
- **Infrastructure companies awarded long-term concessions to finance, improve, and maintain the rolling stock and infrastructure**

Tren Urbano

- **New heavy rail/metro system for San Juan metropolitan area**
- **Design-Build-Operate-Maintain approach taken**
- **Public sector controls schedules and fares and retains fare revenue, but with operator revenue incentive**
- **Aggressive outreach for consortia to bid on RFP**

PUERTO RICO: Some Relevant Data

- **Population: 3.6 million U.S. Citizens.**
- **37% of the population (1.3 million people) lives in the San Juan Metropolitan Area.**
- **Population density:**
 - Island 1,028/square mile
 - San Juan Metropolitan Area 3,410/square mile
 - City of San Juan 8,500/square mile

(In some sections of the City you find densities comparable to those of N.Y. City.)
- **Population in the San Juan Metropolitan Area is expected to increase by 20% for the year 2010, for a total that year of 1.55 million people.**

PUERTO RICO: Some Relevant Data (continued)

- **146 vehicles per mile of paved road:**
 - The highest such ratio in the world.
 - Three times more than in the continental U.S.
- **In SJMA urban core:**
 - 4,286 cars per square mile.
- **1.3 million residents of SJMA generate more than 3.2 million trips per day.**
- **Person trips per day are expected to increase 45% by the year 2010, for a total that year of 4.6 million trips per day.**
- **Daily trips per person are expected to increase from 2.46 in 1990 to 3.0 in 2010, a rate that is substantially lower than for most major U.S. cities, and which indicates a suppressed travel demand.**

Traffic Congestion

- **High population density.**
- **Concentrated patterns of development:**
 - 1/3 of the population of the SJMA lives in San Juan.
 - 1/3 of the population of the SJMA lives in Bayamón and Carolina.
 - 63% of the jobs of the SJMA are located in San Juan.
 - 26% of the jobs of the SJMA are located in Bayamón, Carolina, and Guaynabo.
- **Limited system of main roads: only approximately 1/4 of the roads in the SJMA have 4 lanes or more.**
- **Decrease in the use of public transportation: from 37% in 1964, to less than 10% in 1990.**

Tren Urbano

- **Fixed guideway rail transit will operate independently of vehicular traffic and serve as the backbone of a multimodal transportation system for the San Juan Metropolitan Area.**
- **10.5-mile (17-kilometer) inverted L-shaped alignment serving Bayamón, Guaynabo, the Medical Center, Río Piedras/UPR, Hato Rey, and Santurce.**
- **16 stations and a storage and maintenance yard.**
- **Travel time of approximately 30 minutes between Bayamón and Santurce.**
- **Approximately 50% of the alignment makes use of existing ROW.**
- **60% of the alignment will be elevated; 40 % will be at-grade.**
- **Expected ridership: minimum of 115,000 passengers per day.**
- **Estimated cost: \$1.675 billion.**

Environmental Permit Schedule

- **DEIS, Comments Period** **March 21-May 27, 1995**
- **DEIS, Public Hearing** **April 27, 1995**
- **FEIS, Comments Period** **November 6-December 28, 1995**
- **FEIS Approval by P.R. EQB** **January 22, 1996**
- **ROD (Record of Decision)** **February 7, 1996**
- **Full Funding Grant Agreement (FFGA)** **February 13, 1996**
- **P.R. Planning Board Approval** **May 1, 1996**

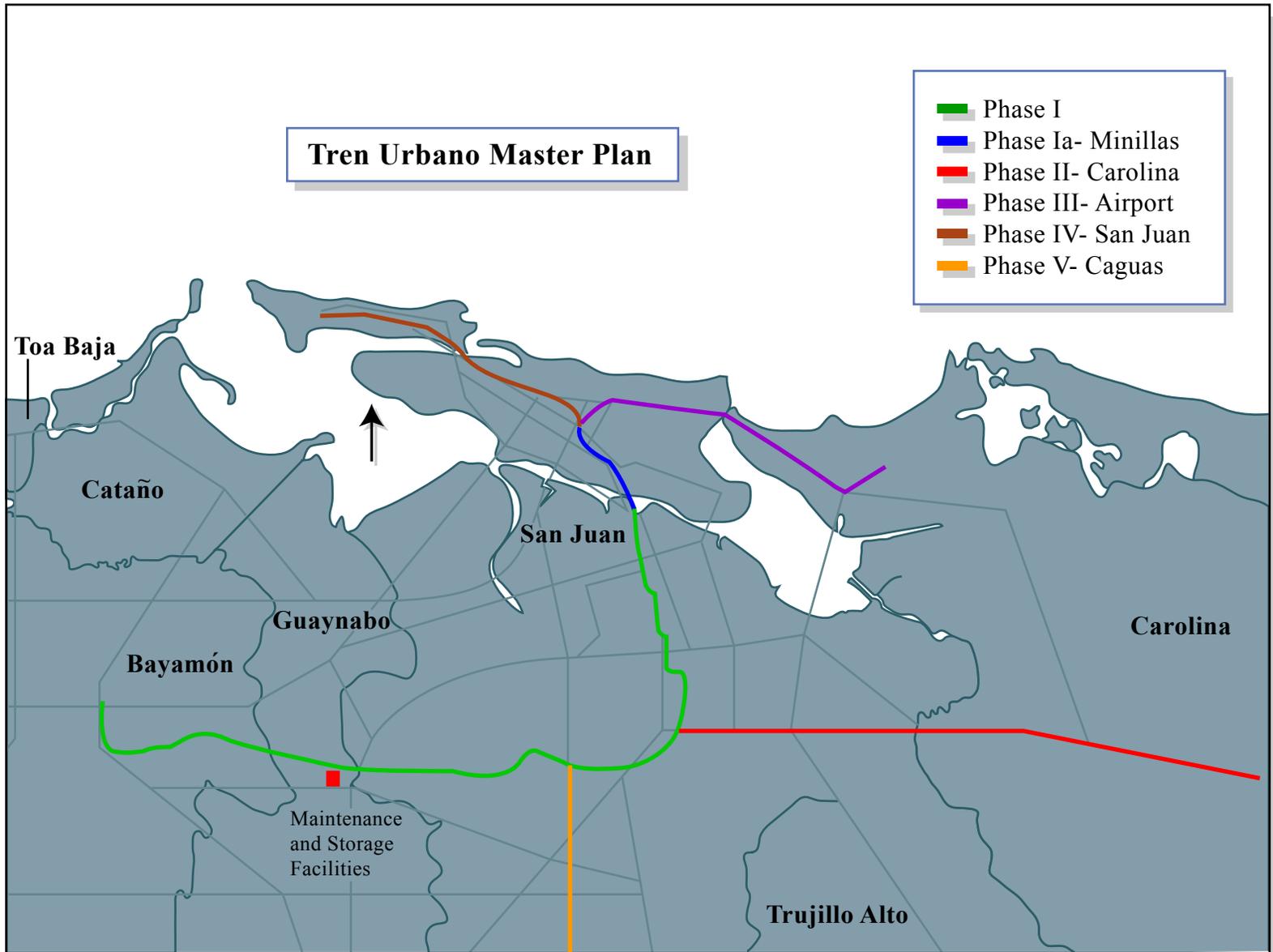
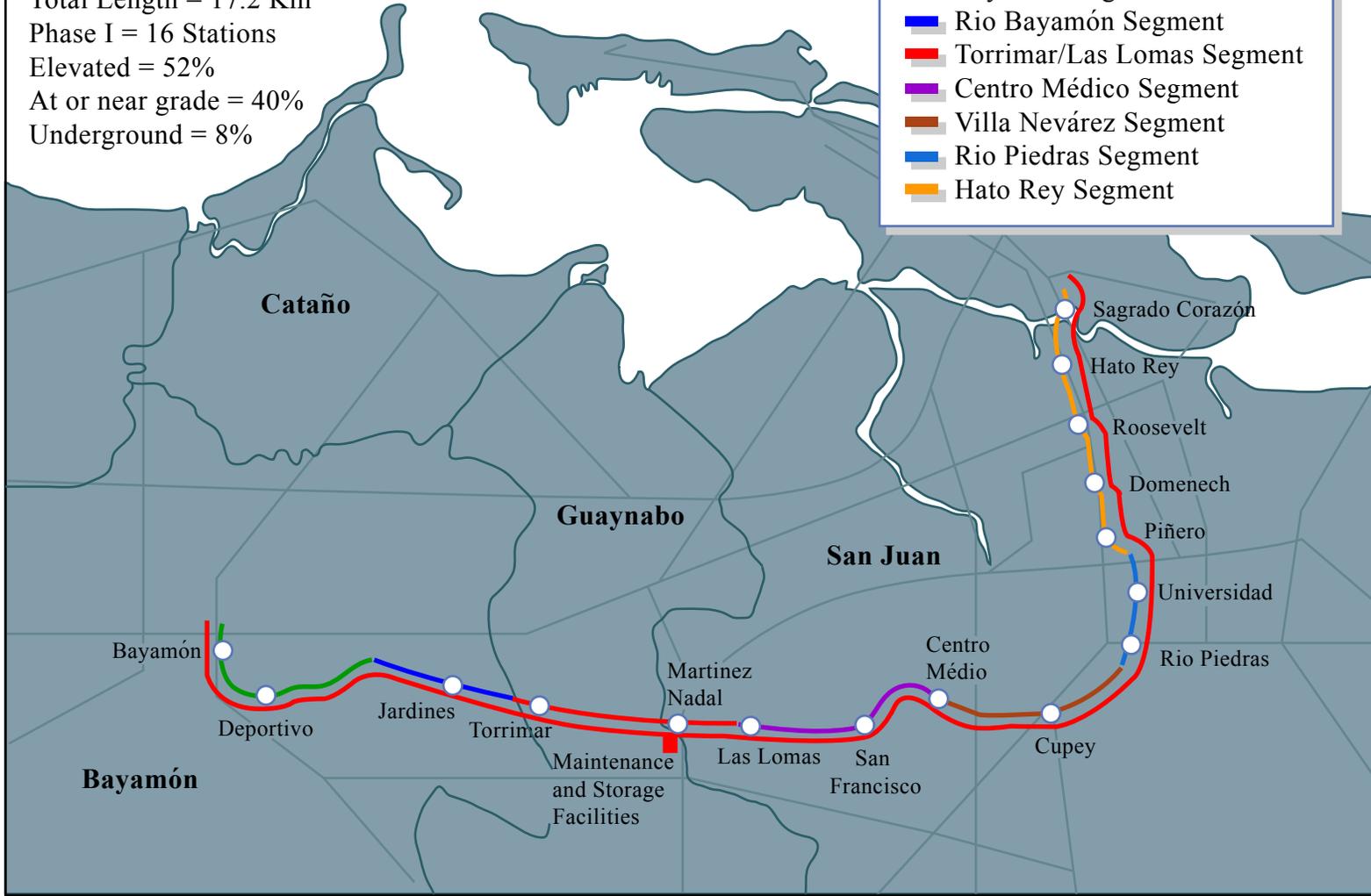


Figure by MIT OCW.

Alignment by Segments - Phase I

Total Cost = \$1.67 Billion
Total Length = 17.2 Km
Phase I = 16 Stations
Elevated = 52%
At or near grade = 40%
Underground = 8%

- Bayamón Segment
- Rio Bayamón Segment
- Torrimar/Las Lomas Segment
- Centro Médico Segment
- Villa Nevárez Segment
- Rio Piedras Segment
- Hato Rey Segment



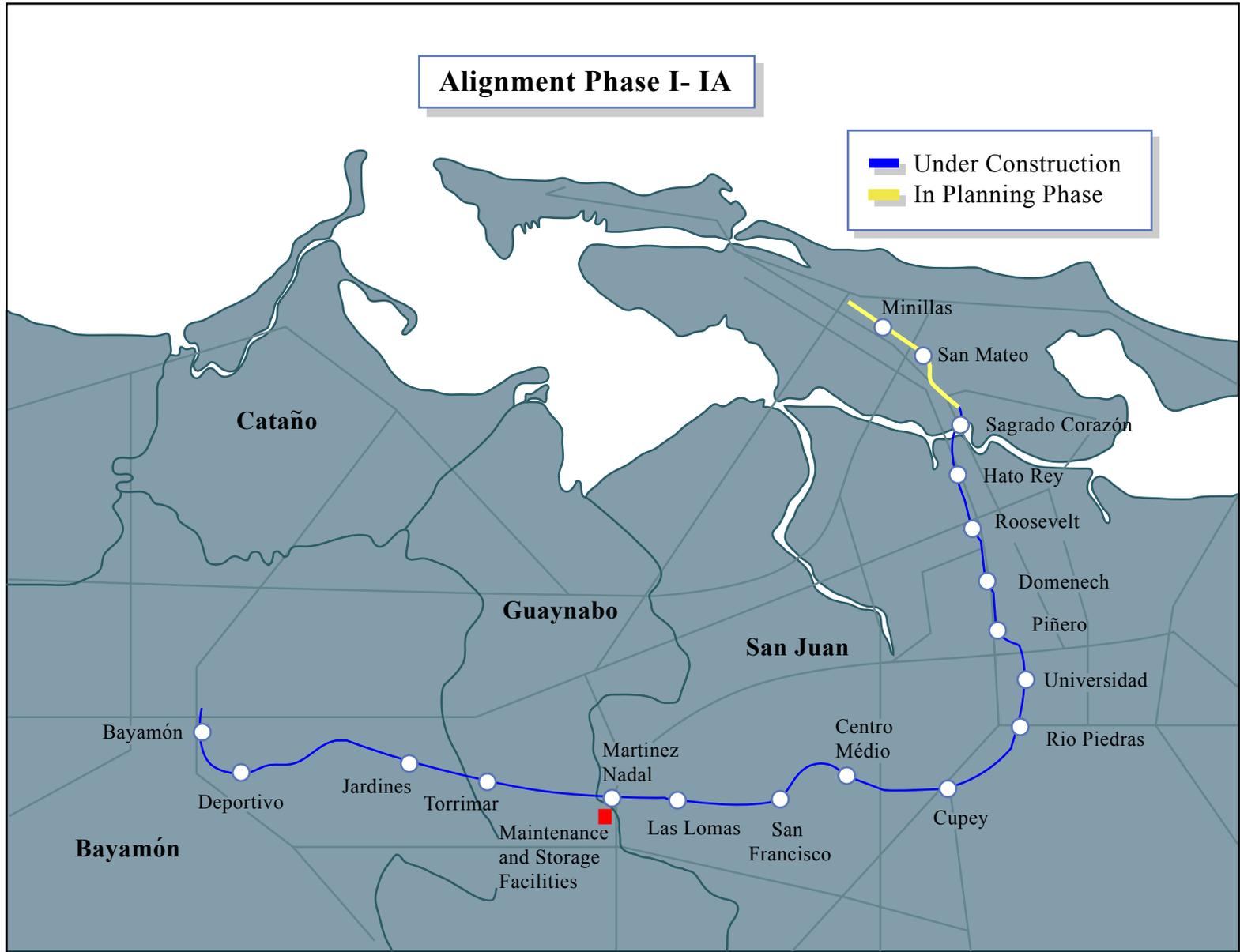


Figure by MIT OCW.

Tren Urbano Phase I - Summary

Segment	Length	Stations	Investment (\$ MM)	Finish	Consortium
1 Bayamón	2.9 KM	1 Bayamón 2 Deportivo	78	4/2001	Grupo Metro San Juan
2 Río Bayamón	1.7 KM	3 Jardines	42	3/2001	Redondo- Entrecanales
3 Torrimar/ Las Lomas	2.6 KM	4 Torrimar 5 Martínez Nadal	656	5/2002	Siemens Transit Team
4 Centro Médico	2.5 KM	6 Las Lomas 7 San Francisco 8 Centro Médico	81	6/2001	Redondo- Entrecanales
5 Villa Nevárez	1.9 KM	9 Cupey	78	8/2001	Redondo- Entrecanales
6 Río Piedras	1.8 KM	10 Río Piedras 11 Universidad	279	5/2001	Grupo Kiewit
7 Hato Rey	3.6 KM	12 Piñero 13 Domenech 14 Roosevelt 15 Hato Rey 16 Sagrado Corazón	134	10/2001	Necso- Redondo

Tren Urbano: Short-term Results

- **Successful in getting construction underway quickly compared with traditional approach**
- **Operator's perspective influenced the design**
- **Many interfaces created major problems**
- **Inadequate public sector oversight of construction process**
- **Major contractor problems resulted in significant delays and cost overruns**

Other US Urban Rail Systems

- **BART**
- **WMATA**
- **Los Angeles**
- **San Diego**
- **Portland**
- **Denver**
- **Salt Lake City**