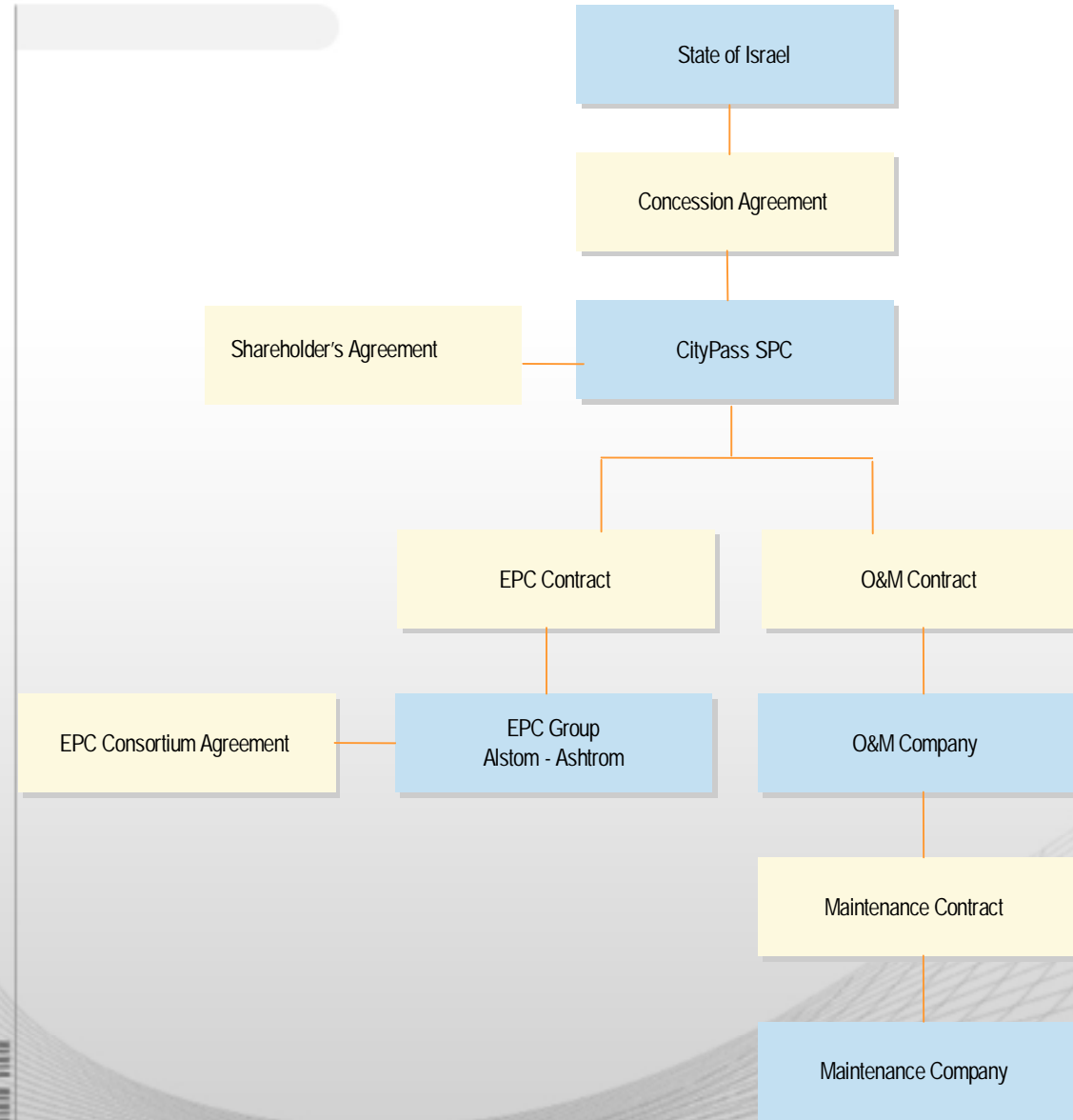


# Jerusalem LRT System

## Dr. Tomer Goodovitch



# The BOT framework



**First LRT in Israel**

# BOT environment Strategy

✓ Minority shareholder in the consortium –

Ashtrom (IS) 27.5%	CW
Alstom (FR) 20%	EM
Veolia (FR) 5%	OM
Polar (IS) 27.5% + Harel (IS) 20%	Financial

✓ Sharing the risks of the O&M (with financial investors)

✓ Mobilization costs (X% of annual costs)

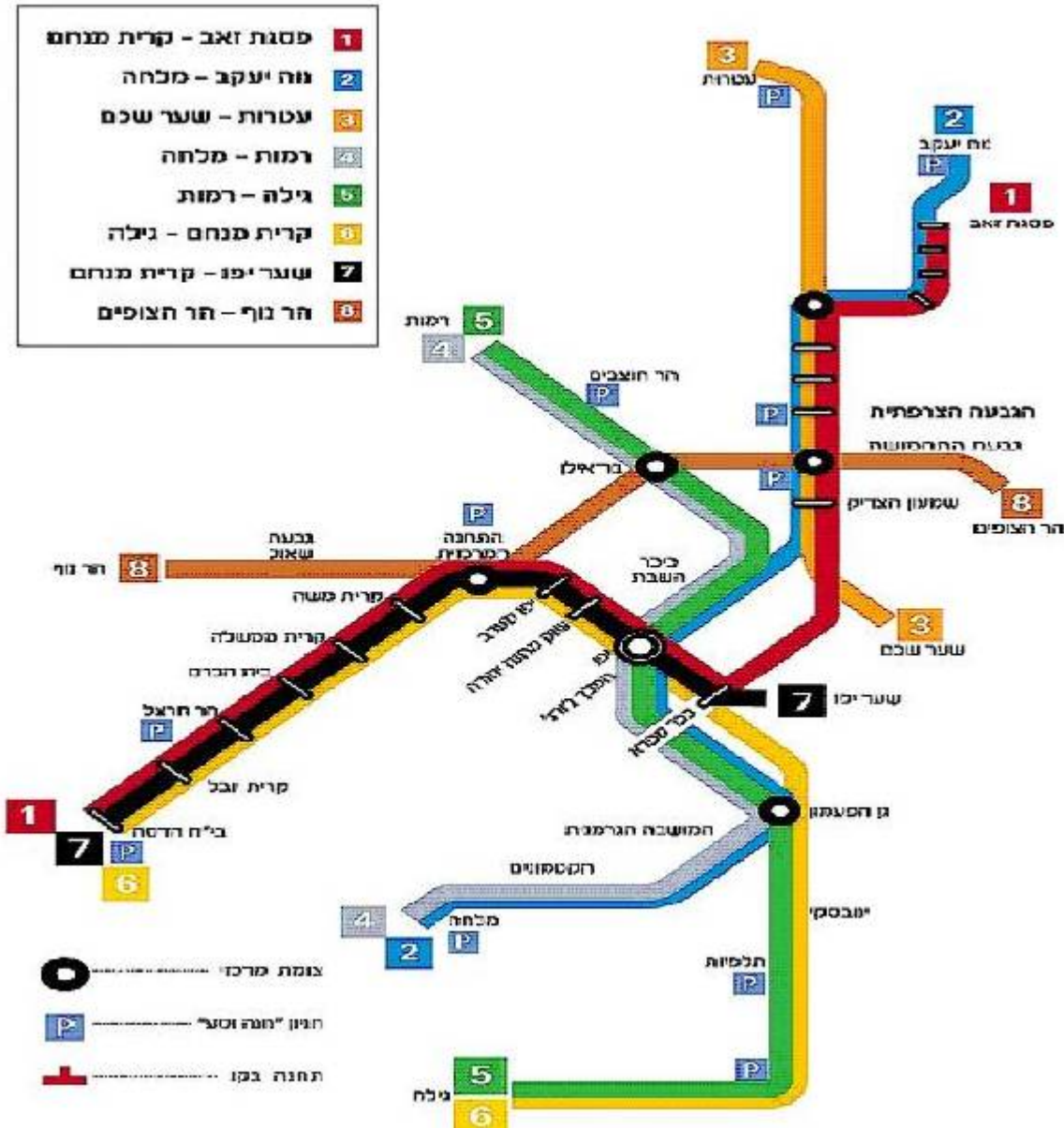
✓ Sub-contracting the maintenance activity

✓ Under BoStrab left with the responsibility

**How is the PPP project financing environment going to develop in PT market?**



# The Full LRT Future System



# The Project in Figures

## Capex

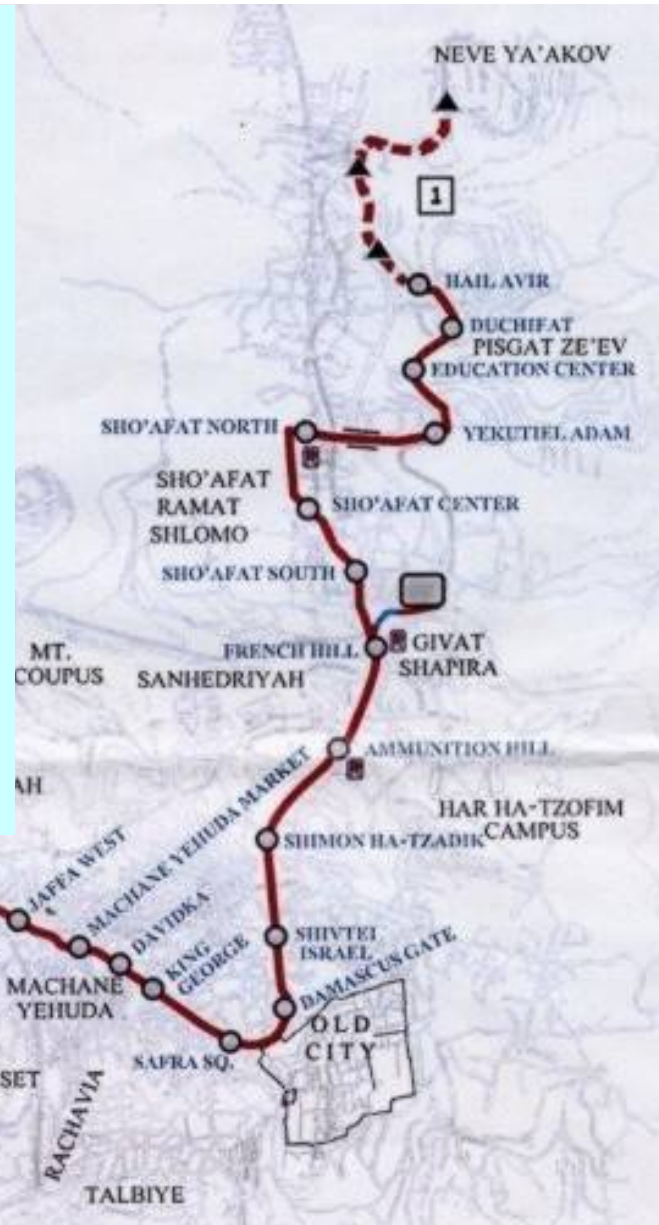
- 400m EUR (of which 300 is government grant, 25% SH equity, 75% Lenders)
- 13.8 km, entirely at grade (2.4 km are at over 6% slope, max 9%)
- 23 stations/stops (open system)
- 46 *Citadis 302* (to be operated in double-unit configuration)
- 30 years concession: Construction (3 years) O&M (27 years)

## Operation

- 31m Passenger (2009)      ►      46m passenger (2036)
- 25m EUR revenues (2009)      ►      45m EUR revenues (2036)
- Commercial speed 21kph
- 170 Operation employees, 60 Maintenance employees, 200 security officers

# Project Innovations

- Calatrava Bridge (320m suspended at curve)
- Double Unit operation
- Axel counter (block signaling)
- Slopes (10 sections 1.5km of over 7% slope)
- Fully Adaptive traffic signaling system
- AppiTrack Machine

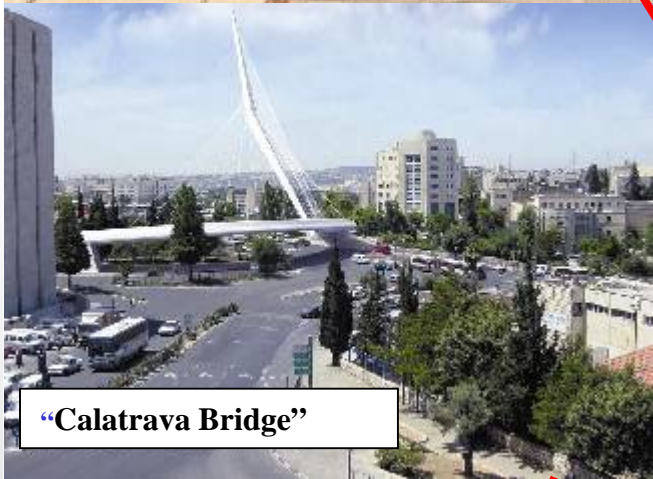




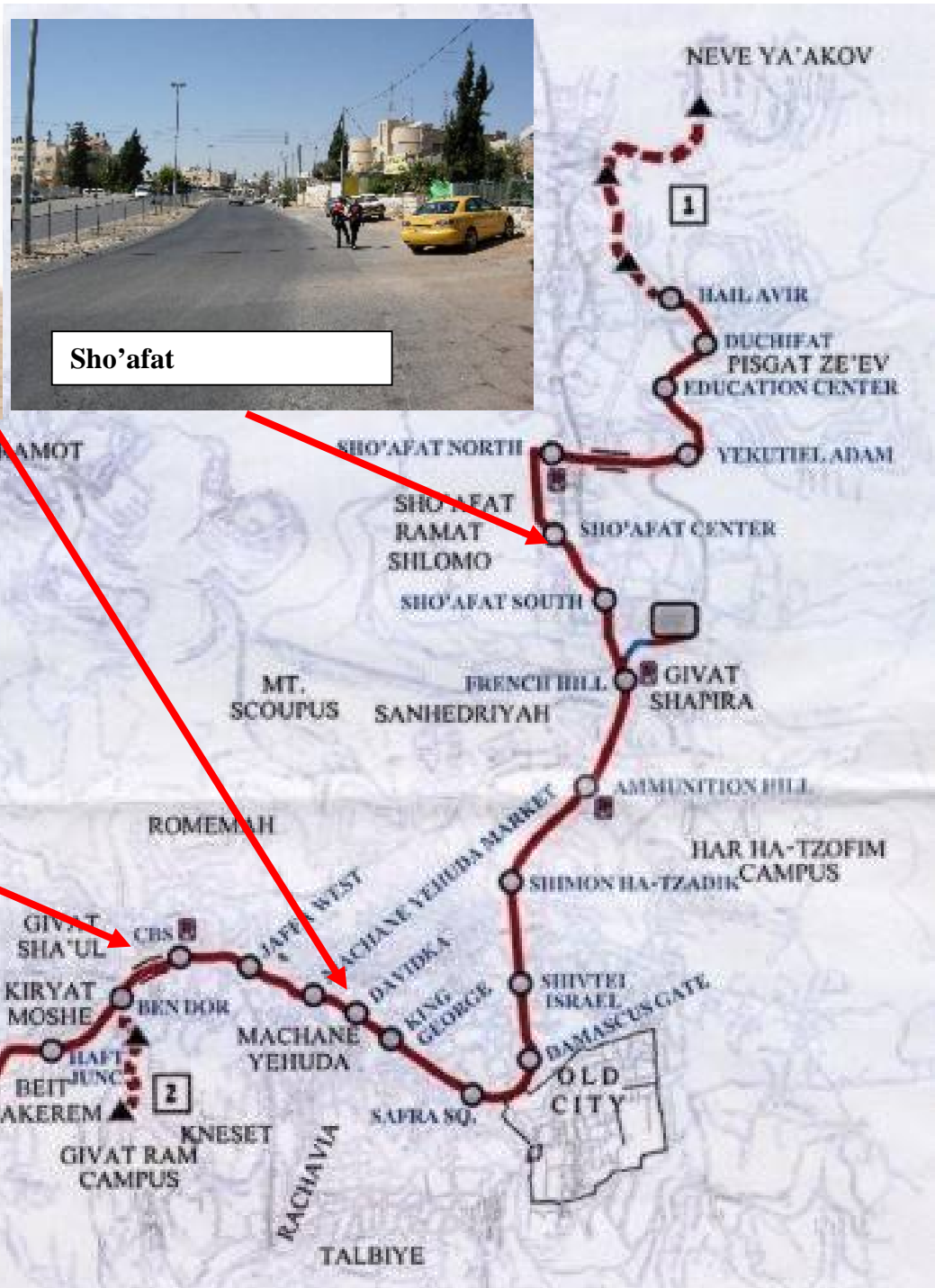
Jaffa Street – Pedestrian Mall



Sho'afat



“Calatrava Bridge”



“Appitrack Machine”



## First LRT in Israel - in the Capital - Jerusalem



- **Jerusalem is the largest city in Israel – 126 sq-km and 700,000 residents.**
- **Diverse population - 68% Jews (one third Ultra-Orthodox), 32% Non-Jews.**
- **Largest number of pupils - 204,000 (60,000 in Tel-Aviv, 51,000 in Haifa)**
- **Most visited by tourists.**

# Project Milestones

- November 2002 Signing the Concession Agreement
- October 2005 Design Review for building Permits
- February 2006 Financial Close
- August 2006 Start of Construction and Rolling Stock production

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6-10 months delay

- October 2007 Completion of Depot building  
Arrival of 1<sup>st</sup> LRV
- July 2008 Begin Testing and Commissioning
- January 2009 Operating Certificate

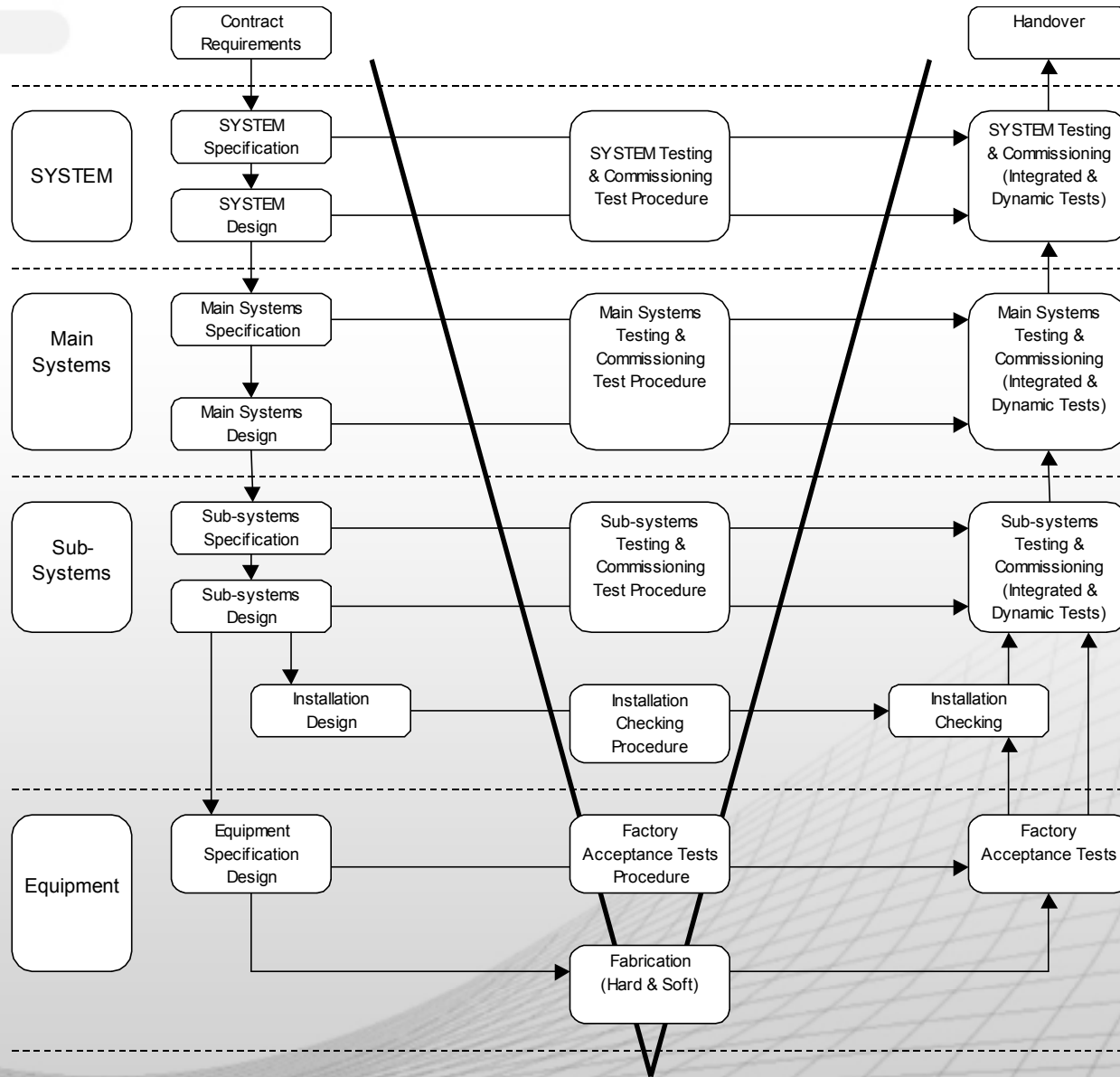


# Jerusalem Project complexity

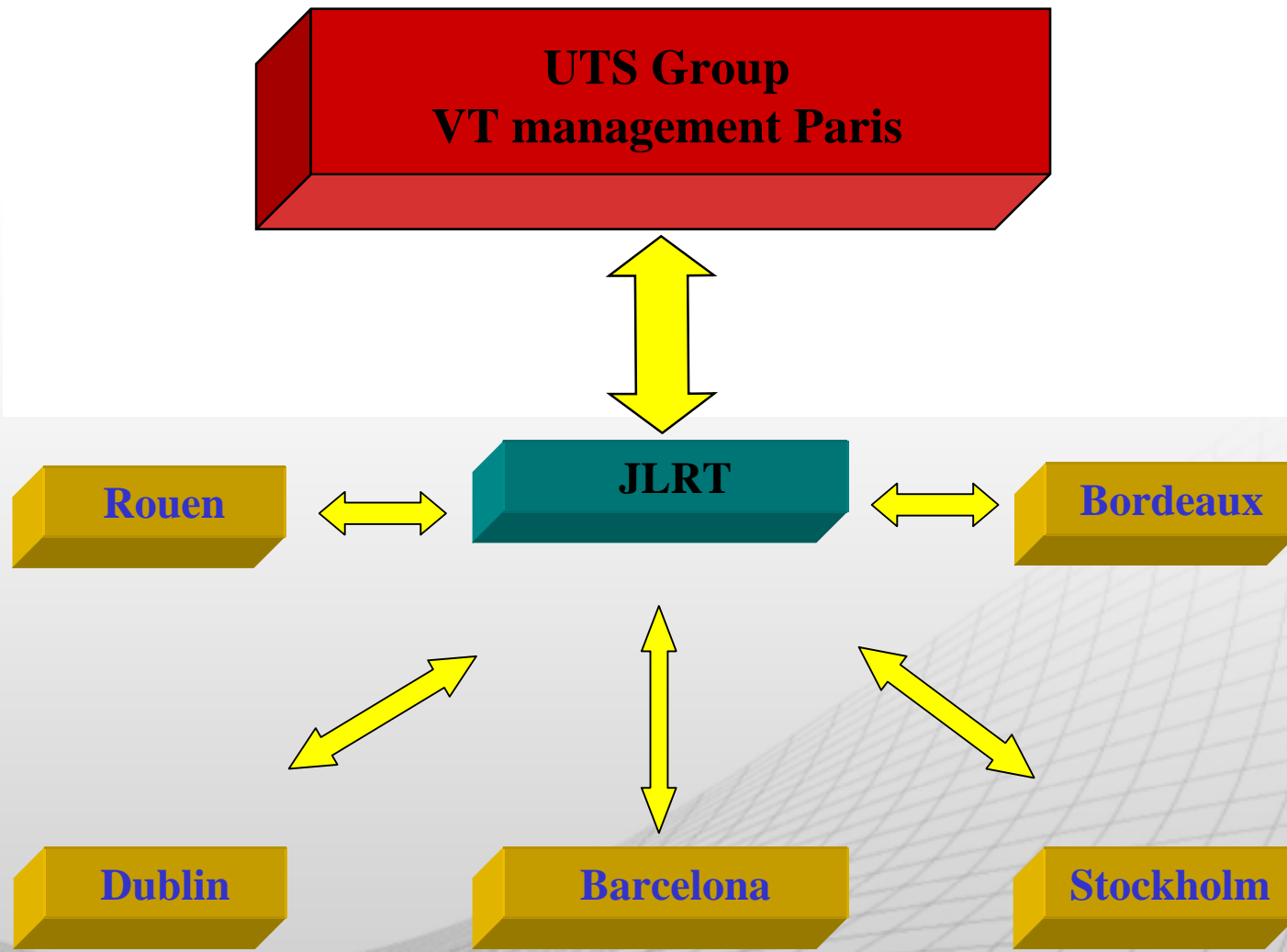
- ❑ **Project Technical Complexity**
  - Double Unit operation in 9% slopes
  - Security Issue and large number of passengers
- ❑ **The BOT complex environment**
  - Fix budget
  - Service quality and penalty regime
- ❑ **BoStrab new regulations**
  - Novel application outside Germany translated to IS5350
  - Complexity of French and German philosophy (i.e., DKE)
- ❑ **Alstom project design rookie**
  - Apitrack Machine; Standard VE Citadis
  - Civil work interface and integrative systems
- ❑ **Relationship with Municipality**
  - Gain future system extensions
  - Veolia synergy and Veolia City



# Project Life Cycle



# Veolia Transport International Support



## O&M stages of involvement/Influence

- Selection of partners
- ↓ Design and system Leadership
- ↓ Bid preparation
- ↓ Concession Contract
- ↓ Financial Close
- ↓ System Requirements Review
- ↓ Preliminary and Final Design
- ↓ Design for construction
- ↓ Type Tests, Factory Acceptance Tests
- ↓ Quality Assurance, Quality Control
- ↓ Site Test
- ↓ Testing and Commissioning
- System acceptance and Operating Certificate

**“It’s too late, too expensive, too complicated” (EPC)**

# Cooperating with Alstom



# BoStrab Regulation & O&M Project Phases

		BoStrab/System components						
		§1.6 §§ 10-14	§1.8-1.10 §§ 33-48,57	§1.7 15-30,57	§§ §§ 31,32,57	§1.4 §§ 49-59	§1.4, §15	§1, 23
		Staff	LRV	Tracks	Stations	Signaling/ Communication	Schedule	Ticketing/PIS
Project phases	Design	recruiting	review specifications	review specifications	review specifications	review/design specifications	Operating Plan	review/design specifications
	Construction	training	review	review	review	review	Vehicle Scheduling	review/design specifications
	Testing/ Commissioning	examining	acceptance tests	acceptance tests	acceptance tests	acceptance tests	Driver Rostering	acceptance test
	Operating	supervising/ empowering/ refresh	Manuals	Operating Procedures	Operating Procedures	Operating Procedures	Verifying LOS	Operating Procedures
	Maintenance	supervising/ empowering/ refresh	Manuals	Manuals	Manuals	Manuals	Alternative Operating Plan	N/A
	Renewal	examining	specifications/ acceptance tests	specifications/ acceptance tests	specifications/ acceptance tests	N/A	N/A	N/A

### Legend

	Explicit Bostrab regulation
	Implicit Bostrab regulation
	Not covered in BoStrab
	Parts of the Rule Book

## Cooperating with the Municipality

- ✓ Building a Veolia synergy (i.e., track + road cleaning; stations + street light maintenance)
- ✓ Cooperating for future line extensions, LRT system development or promoting BRT as a cheaper PT solution
- ✓ Promoting the system and ridership through joint projects (i.e., P&R, residents smart card, information center)
- ✓ Sharing infrastructures (traffic management, security and surveillance CCTV, call center)

**By how much can we increase our turnover?**

