REPORT ON FINDINGS FROM CASE ANALYSES

Lessons learned from five case analyses validated in expert interviews and by the Advisory Board

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Content

Findings from the case analyses are filtered by defining features to identify the most relevant hypotheses for roll-out plan

DEEP DIVE ON THE NEXT PAGE

Lessons learned from the five case analyses

1. Coalition Building
2. Business case
3. Organizational model
4. Financing model

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Defining features of the Scandinavian HSR project

- Project characteristics
- Unique contextual factors

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Key questions for roll-out plan

1. Coalition Building?
2. Business case?
3. Organizational model?
4. Financing model?

Summary of lessons learned from the case analyses (1/2)

1 Coalition Building

Identifying the problem and key issues

- A clear **burning platform** from both public (e.g. job creation, free capacity for freight and passengers, limited finances, environment, crises) and private actors (market demand, core industry interests) is extremely important to get decision-makers to feel urgency
- **Environmental concerns** can play a decisive role particularly regarding the construction

Mobilizing key players

- A **broad political coalition** with **long-term commitment** is necessary to create stability both: I) domestically across political parties and II) internationally between states
- One or two **leading individuals** per country with strong passion for the project as well as credibility across sectors and parties is needed to mobilize a winning coalition
- Key **industrial groups** can be vital to lobby and push for government action, e.g. ERT, banks, etc.
- Scope and mobilize the project **inter-governmentally** from the beginning including sequencing needs from domestic infrastructures, e.g. Great Belt > Öresund

Key activities

- Conduct all necessary feasibility and viability **analyses before political decision making** to: I) avoid getting an early "No" due insufficient analytical foundation and II) not rush through design, tender and construction process – early mistakes can become very expensive

2 Business case

Getting the demand right

- Be extremely conservative on **passenger forecasts** (revenue) and use independent organizations to present the most realistic business case upfront

Getting the supply right

- Conduct thorough **competitor analyses** – in terms of new entrants, technologies and competing alternatives including potential infrastructure projects that can jeopardize the business case, e.g. price wars
- Business case can be strengthened by carefully considering **connectivity** to both existing and planned transport infrastructures, including conventional railway, metro, etc.

Mitigating risk

- Be critical towards promises on **construction time** and **costs** from actors with vested interests like banks, contractors, train manufacturers etc.
- Decrease operational risk by: I) considering **price parity** with alternatives , e.g. ferries, and II) using proven operators and technologies , e.g. trains, signal and communication systems
- If **state subsidy** on tickets is given, it is important to have a clear plan of distribution between potential operators in place prior to operation

Questions to the S8MC team:

- Any questions to the findings?
- Any findings you find misleading or missing?

Summary of lessons learned from the case analyses (2/2)

3 Organizational model

The ownership structure

- Make one, **cross-border organization** in charge of the project from the beginning
- Having the **states** as **project owners** is crucial: I) in dealing with strong environmental concerns and II) to ensure that decisions on infrastructure planning, construction and potential upgrades is contractually possible

Governance

- Ensure a **strong, unified organization** with the right **competencies** and **arm's length** to run the project – in terms of handling investors, contractors, operators etc.
- **Dispute Review Boards** can settle contractual conflicts
- Close **collaboration** or **ability to bypass** affected cities

Contracts and negotiation

- Acknowledge and **dovetail diverse country interests** in cross-border projects before entering any agreements, e.g. Fehmarn Belt, land construction at Kastrup paid by OC
- When using PPPs, ensure **contractual alignment** on project objectives and incentives between key players – investors, contractors, operators e.g. through a BOT or DFBM model
- If **BOT model** is chosen ensure that it meets state standards upon concession expiration and transfer to the public
- Crucial to get the contractual arrangement right from the beginning by using an **proven lawyer** to) balance risk, II) avoid long term social ramifications of weak contracts; and to manage the contractual complexity

4 Financing model

Investment type and structure

- Purely private finance is often too expensive - use state guarantees with **joint and separately** liability to increase creditworthiness and decrease: I) risk for investors and II) interest on loans
- **Stipulated government loans** can be a way to increase the attraction of private investors, e.g. by making repayment of loans depend on operators profit

Alternative funding sources

- To avoid use of "new tax-payer money", consider: I) **indirect state grants** by bundling the financing with existing state-owned companies, e.g. Sund & Bælt; II) ensuring revenues from other revenue streams, *e.g. cars, ferries , etc.*
- Including "**land grants" and property development** around new stations ("New Town") offers funding opportunities primarily in urban areas
- Consider **state gurantees** to: I) avoid competing infrastructures , II) ensure alignment on existing public offerings, and III) to optimize access and reliability through perfomance payment to operators

Cost overruns

- If contractual arragements are not in place to ensure **on budget** and **on time** construction, the risk for higher financial costs and cost overruns is high

Questions to the S8MC team:

- Any questions to the findings?
- Any findings you find misleading or missing?

Defining features of the Scandinavian HSR project

Defining features for the Scandinavian context

HSR project characteristics

- Cross-Border project with long distance, few stops, **complications from archipelago** north to Gothenburg
- **Small urban populations**: Oslo (~1.5M), KBH-Malmö (~3M), Stockholm (~2M)

Current and planned transport offerings

- Current transport infrastructure **offers fair/good alternatives** including train (slow); highways for car and bus; ferries (slow); cheap, fast and frequent flights
- **Incremental national transport plans** to upgrade existing railway (e.g. DK one-hour plan; Götalandsbanan, Vestlänken, etc.)
- However, increasing **capacity challenges** and congestions for road freight on Öresund Fixed Link

Political, economical and regulatory context

- Slow, but positive economic growth with strong focus on job creation
- Big governments with **state ownership** and **regulatory power** over railway and environment
- Long tradition with **public finance**, however, budget constrains and low interest rates has led to **growing interests for PPP** models
- **Diverting national interests** and needs for HSR (e.g. DK intersted in getting traffic on Fehmarn)

Based on the learnings from case analyses filtered by the project context, the key questions guiding the roll-out plan are identified

Key questions for roll-out plan

1. Coalition Building

- Where is the "burning platform"?
- What are the environmental constrains?
- Who could be the key leading individuals?
- Who should be included in an industry-led lobby coalition?
- What analyses must be done prior to political lobbying and decision making?

2. Business Case

- What are conservative estimates of passenger forecasts, construction costs and time?
- What are the current and future alternatives?
- What links to other infrastructures are needed?
- What should be done to mitigate operational risk in terms of price wars, new entrants and new technologies?
- What are the possible funding sources from the states in terms of grants and subsidies?

3. Organizational model

- What should the cross-border org. look like?
- What would it take to get the states as project owners and the affected cities to collaborate?
- What would it take to dovetail nat. interests?
- What is the optimal contractual PPP structure?
- What lawyers have proven track-record?

4. Financing model

- What does it take to get state-guaranteed and stipulated government loans?
- What indirect state grants is worth pursuing?
- What state guarantees is needed in terms of competing alternatives and access/reliability?
- What contractual arrangement is needed to avoid cost overruns as well as on budget and on time construction?

Appendix

The five case analyses

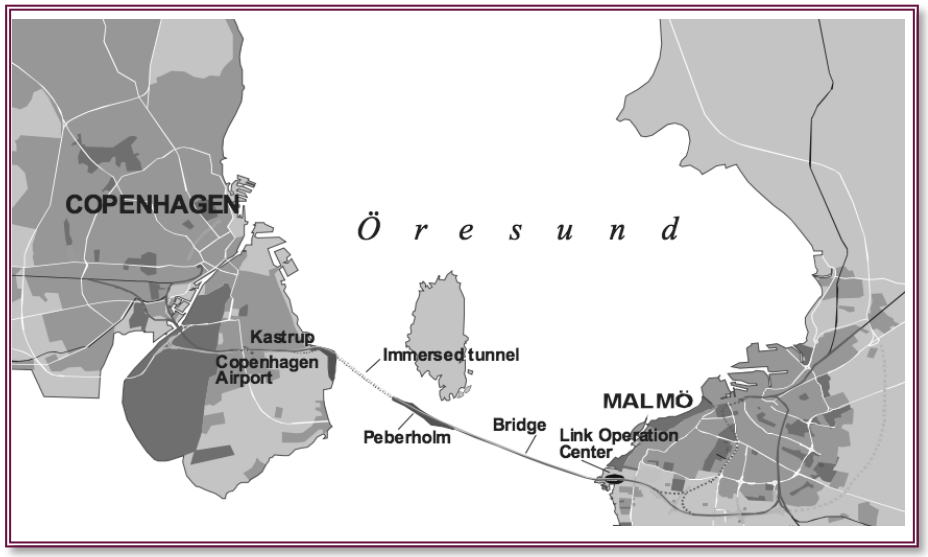
- **Øresund Fixed Link**
- Eurotunnel
- Arlandabanan
- HSL Zuid
- Copenhagen Metro

Each case analysis is structured in four dimensions

1. Coalition Building
2. Business Case
3. Organizational model
4. Financial model

A brief project overview of the Öresund Link

Project infrastructure



Project facts

Characteristics

- **Project:** 16 km fixed link with two tracks rail and four-lane motorway via tunnel and bridge between Denmark and Sweden
- **Max train speed**: 200km/h

Key events

- **Government agreement:** March 1991
- **Total duration:** 8 years
- **Construction time:** 5 years incl. railway
- **On time:** Yes, 9 months ahead
- **Opened to traffic**: July 2000

Key financials

- **Construction cost**: ~ DKK 30.1B*
- **Cost overrun:** Not from time of contract
  Yearly result (2012): ~ DKK 78.8M
- **Daily vehicles (2012):** 18,486
- **Train passengers p.a. (2012)**: 11M
- **User forecasts:** Underestimated

* Construction cost includes land works and coast-to-coast. Construction cost for coast-to-coast alone amounted to approximately DKK 15B

SOURCE: Orestad.dk, Expert Interview; UCL Omega, 2010

The coalition behind the Öresund Link was characterized by top industry leaders and Social Democrats both in DK and Sweden (1/2)

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Key stakeholder interests

1 Politically

Danish Government:

- Great Belt Link first priority
- Social Democrats in opposition promoter of fixed link, but reluctant of including road

Swedish Government:

- In favor, but key preconditions: I) toll-financed, not tax-payer; II) acceptable environment costs; III) Fehmarn Belt Link
- Minister of Environment Olof Johansson: strong opponent, left position as consequence

2 Government entities

- *Appointed DK-S Oresund Delegation:* promoters
- *DSB & SJ:* promoters

3 Interest groups

- *ERT, ScanLink, and Chamber of Commerce in South Sweden:* very active promoters
- *Stoppabron:* 30 environment and labor organizations against bridge

Timeline with key coalition-building events

Major events and initiatives	Year
First reports in Sweden and DK on potential benefits	1950s
Commitment by Danish and Swedish government to collaborate on Øresund link at Nordic Council. 3 years later, Malmö decides to reserve land for link	1953
Bilateral agreement to build fixed link was signed, but the plans came to a halt due to the energy and economy crisis, as well as DK's membership of EC	1973
ERT presented the 'Missing Links' report	1984
DK Parliament decides to build Great Belt Fixed Link, which had been a precondition for the Oresund Link	1986
Bilateral Agreement to build a Oresund Fixed Link	1991
Øresund Consortium Agreement	1992
Construction of land connection of 9km highway and 18km railway begins and Öresundskomiteen is formed	1993
Construction of coast-to-coast connection begins	1995

Outputs

1. **Broad political coalition** including both Social Democrats in government (Sweden) and in opposition (DK)
2. **Bilateral Agreement** with key preconditions including:
   - I. First Great Belt Link in DK
   - II. Toll-financed, no state grants[1]
   - III. Environmentally acceptable
   - IV. Swedish guarantee to transport railway goods via DK
   - V. DK to actively work with Germany on Fehmarn Link
3. Led by Volvo's CEO, Pehr Gyllenhammar, the **European Roundtable of Industrialists** mobilized strong lobby efforts to build 'missing links' between Scandinavia and Central Europe

1 The Öresund Link is toll-financed in principle, however the states have contributed to the funding via state-guaranteed loans and feasibility studies

SOURCE: Expert Interviews; Oresundsbron website; Oresundstid 2009; UCL Omega, 2011

The coalition behind the Öresund Link was characterized by top industry leaders and Social Democrats both in DK and Sweden (1/2)

Key players in the coalition building process

Context

- *Political*: End of Cold War and Sweden's negotiation for membership of EC implied a new regional balance
- *Economic*: Industrial sector in Copenhagen and Malmo was challenged by increasing globalization
- *Public opinion*: increasing environmental concerns and fear of loosing jobs

Phases	Year	Key players	Key activities	Output
Conceptualization	1950	• DK and Swedish government • Nordic Council • Malmö City	• Reports in Sweden and DK investigating potential benefits • First efforts to create bilateral governmental collaboration • Malmö prepared areas for future fixed link	• Bilateral commitment to collaborate on a potential Oresund Link via Nordic Council • Bilateral agreement came to halt due to the 1973 energy and economic crisis
Pre-study and feasibility	1983	• European Roundtable of Industrialists (ERS) • Oresund Delegation (OD) appointed by Ministries of Finance, Communication and Transport in both DK & Sweden • Railway companies DSB and SJ	• ERT established by initiative of PG Gyllenhammar, CEO of Volvo • ERT publish 'Missing Links' report • OD reviewed earlier reports and began focus on what became a critical issue : the effects of the Sound's water flow • Lobby by railway companies	• Heavy industry focus on integrating European transport sector • Decision to build Great Belt Fixed Link removed DK policy lock
Project advocacy and negotiation	1987 – 1991	• Oresund Delegation (OD) • Social Democrats in Sweden and DK, in particularly Sven Auken in DK • The two governments	• OD recommended combined road and rail link with two key premises: I) economically profitable without direct state grants; II) no impact on water flow • Swedish Social Democrats voted internally in favor of combined road and rail link after long conflict period • Swedish delegation put pressure on DK by threatening to use ferries for rail freight bypassing DK/Great Belt	• Bilateral Agreement to build the Oresund link including : I) toll-financed, no state grants; II) Environmentally acceptable; III) DK to build Fehmarn Link; II) Swedish guarantee to transport a yearly amount of railway freight via DK

Takeaways

Key Success Factors

1. **Broad political coalition across borders** was enabled by reaching alignment between the **Social Democrats** in government in Sweden and in opposition in DK
2. **Differences in national interests** were overcome by : I) waiting till Danish **Great Belt Link** was in place, II) DK commitment to build **Fehmarn Link**, III) Swedish guarantee of annual amount of **railway goods** through DK
3. Coordinated **project advocacy by top industry leaders** in ERT in across national borders put high pressure on government indicating **strong demand**

Problems to avoid

1. Pay attention to key priorities in each country's domestic transport priorities to include potential preconditions such as building a "Great Belt Link"
2. Impossible to mobilize support without one or two **leading individuals**
3. The project became controversial in Sweden because test of **EIA** and compliance with **environmental domestic legislation** was not conducted before bilateral agreement and became challenging in Sweden

SOURCE: Expert Interview; Oresundsbron website; UCL Omega, 2011

The business case of the Öresund Link depends on user revenues, mainly road toll, due to decision to keep the project out of state budget

Key characteristics of business case*

Unique features
- User fee structure instead of direct state grant
- Fixed yearly rail fee
- Price parity between toll and the Helsingør-Helsinborg ferries

Business rationale
- **Most of revenues** come from **cars**
- Rail revenue is a yearly fee settled with the two national railway administrations that in turn charge the train operators

Risk
- **Construction risk** shared between construction companies and owner
- **Operation risk** shared by owner and national rail admins: The two rail admins could not agree on one shared risk structure, so OC made two contracts with more risk to OC

Rewards
- Operation contracts with two separate agreements with the national rail admins, since Banverket and Banedanmark could not agree

Socio economic benefits
- Increased access to cheaper housing and labor markets for commuters; freight to Germany

Major events and initiatives

Year	Major events and initiatives
2000	Inauguration of the Öresund Bridge
2001	
2002	
2003	**The initial prognoses for passing vehicles were too optimistic and disappointed in the first years**
2004	
2005	Previous traffic growth of 10-17% fell to 5% due to changes in housing prices and labor markets in Malmö and CPH
2006	
2007	Opening of the Citytunnel in Malmö
2008	
2009	Passing vehicles decreased by 3%.
2010	Freight transport reached more than 50% of DK-S freight transport market.
2011	Daily train passengers reached 30K and was not influenced by the economiic crisis
2012	
2013	Future Fehmarn Link is expected to lead to a 5.5% traffic growth on Øresund

Road | Rail | Revenue | Cost

Year	Avg. toll rer car Euro	Daily passing vehicles '000	Train Pass. M pers.	Work-force Staff	Road and rail/total revenue M Euro	Operational cost and revenue M Euro	Financial cost '000 Euro	Financial cost/ revenue In %	Yearly result M Euro
2000	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	N/A	N/A	N/A
2001	22,4	N/A	4,9	152	56 42	122 41	109	89	-75
2002	21,4	N/A	5,4	163	57 41	130 38	102	78	-136
2003	20,8	10,4	5,7	170	59 39	137 38	105	76	0
2004	20,3	11,8	6,2	168	61 38	146 36	91	62	-84
2005	19,5	13,6	6,6	163	63 36	155 37	99	64	-73
2006	18,8	15,8	7,8	173	66 34	168 38	102	61	76
2007	18,5	18,4	9,7	181	68 31	185 41	117	63	70
2008	19,2	19,4	10,7	177	68 31	194 38	118	61	-136
2009	19,5	19,5	9,5	178	68 31	194 36	102	53	-44
2010	20,8	19,4	9,7	178	69 30	204 38	99	49	-8
2011	21,0	19,1	10,4	181	68 30	208 39	97	47	-143
2012	21,8	18,5	11,0	180	69 30	215 39	91	42	11

Sum up
- The link depends heavily on road toll revenues, while the fixed rail fee only amount to a lower and decreasing share of total revenues

Takeaways
- The decision to finance the project outside the state budget by user fee structure required a viable business economic model, rather than socio-economic.

*The yearly financial results have been converted with constant currency, Euro = DKK 7.44

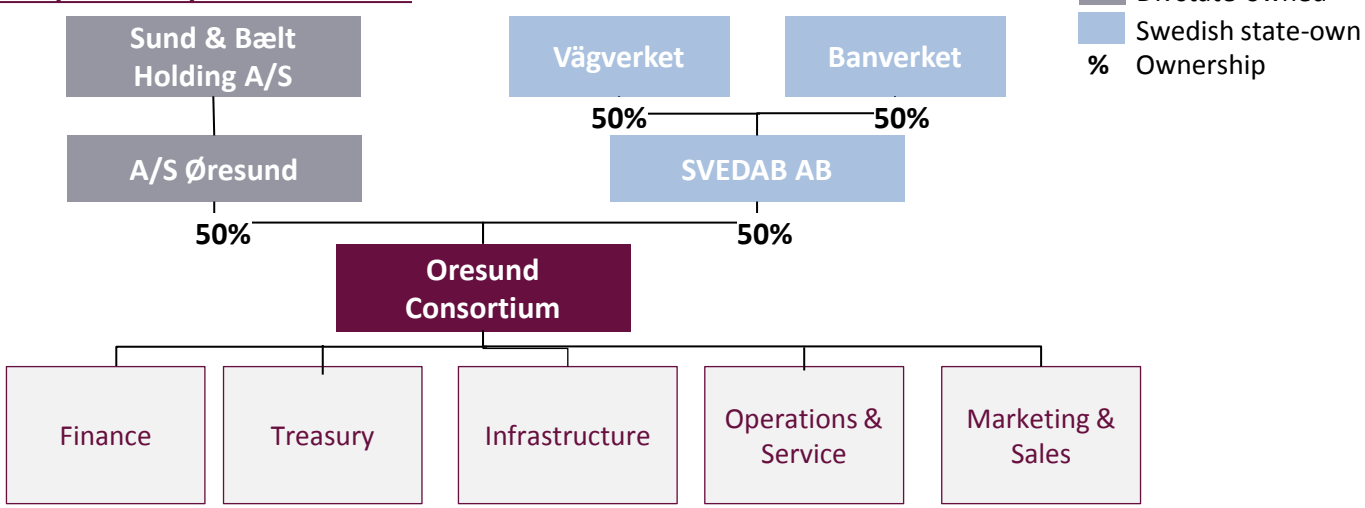
SOURCE: Expert Interviews; Oresundsbron website; UCL Omega, 2011

Öresund Consortium is a unique bi-national state-owned company with responsibility for design, construction, operation, and financing

Organizational characteristics, ownership, and operation structures

Phases / Parameters	Design	Build	Own	Operate
Actors	• The Øresundsbro Consortium (OC) was responsible for planning, building, operating and financing	• Öresund Tunnel Contractors • Öresund Marine Joint Venture • Sundlink • NRA and Peab	• 50-50% DK-Swedish state via Sund & Bælt and SVEDAB	• OC • Banverket/Trafikverket • DSB/Banedanmark
Public	✓	✓	✓	✓
Private*	✗	✓	✗	✗

Ownership model upon construction



Key characteristics

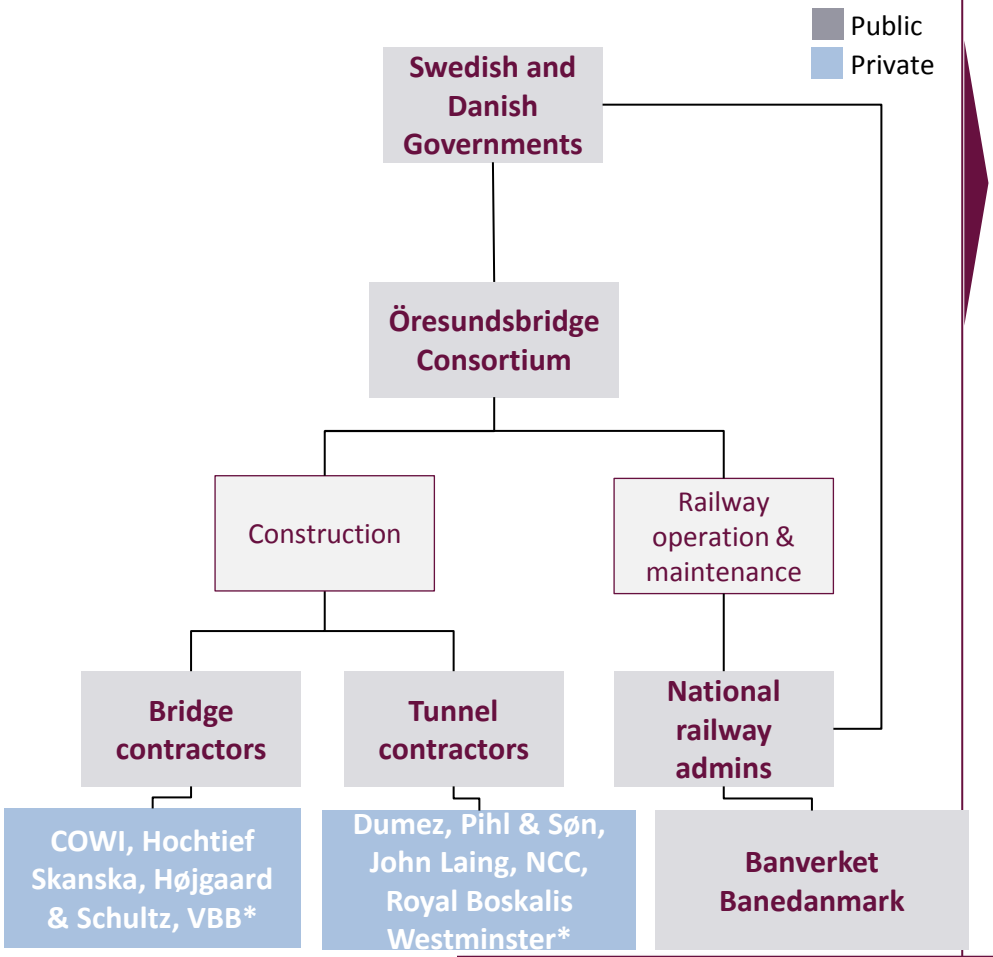
1. OC is a unique and successful cross-border organization
2. The secret to OC's success lies in the choice of organizational model: 100% state-owned **single legal entity** run as a private company in all aspects (law, board management) and with **high competence** and **responsibility** for design, construction, operation and financing
3. Having the **state as sole shareholder** was critical to ensure **environmental** concerns were met

* OC's organizational model is unique, since it both state-owned and funded via state-guaranteed loans, however run as a private company

SOURCE: Øreund Consortium 2008; UCL Omega 2011; expert interview

The choice of a single and competent organizational model enabled OC to manage contracts effectively with alignment on key objectives

Structure of main contracts



Key contractual characteristics and challenges

Characteristics

- Lucrative mix of: I) state-ownership that enabled high guarantees and low capital costs, and II) staffed, organized and operated as a commercial enterprise made it effective and less bureaucratic
- OC's contract management strategy focused on aligning owner and contractors on key objectives, e.g. via: I) Milestone Concept with financial reward if goal is met; II) Dispute Review Boards

Challenges

- Meeting the **legislative requirements** of two states is highly complex and very time consuming
- **Environmental issues** is particularly important and costly in terms of EIA investigations as well as **regulatory and political requirements**
- **Technical challenging and costly** that the two countries use two different signal, communication and train systems - instead of one unified system, parts of these systems have been duplicated
- The National **Railway** Administrations have been perceived as very **conservative** when it comes to investing in new technologies for rail infrastructures. However, today, DK is among the first-movers when it comes to investing in **ERTMS-based modern signal technology**.

Takeaways

- A state-owned, single legal entity with competent staff has many benefits
- Using incentive structures and Dispute Review Boards can be an effective in aligning owner and contractor objectives in the construction process

* Only names on co-contracters are listed

SOURCE: Oresundsbron website; Expert Interviews; UCL Omega, 2011

The Öresund Link financing model combines state-guaranteed loans to be paid by collection of road tolls and a yearly fixed fee for train operations

Investment	Investment structure (Percentage)	Investment type	Break down (Million DKK)
Construction	Public / Private / Total; DK, Sweden, Total	Debt	Government loan, EU, Total
		Equity	50; State seed funding, Total
		Government benefits	State –guaranteed loans, Total
Operation	National Rail Admins / Total; DK, Sweden	Key issues and characteristics	

Debt

- State-guranteed loans
- Repayment period: ~25 years
- Currency of loans: DKK, SEK, EUR.

Equity

- No direct state subsidy apart from seed capial of DKK 50M for OC from Øresund A/S. However, this amount came from the original seed capital from Great Belt via Sund & Bælt*

Government benefits

- All debt is state-guaranteed by the two states jointly and separately

Key issues and characteristics

- State-guranteed loans financed construction costs, which is to be **repaid by revenues from road tolls** and yearly fix fee from railway
- The bonds issued by the Øresund Consortium highest creditworthiness (AAA) due to **governmental guaranteed loans** with joint liability by the Danish and Swedish state
- Up to 25% construction **cost overrun** Compared to the original project proposals, however upon timing of the initial contract, the construction budget was kept from the bridge, but the land became more expensive leading to lack of capacity at Kastrup St.
- **Agreement between the municipality of Malmö and Euroc** regarding **land** use connecting infrastructure provides an **indirectly funding source**. It is difficult to estimate what the deal meant for the funding of the project, however it must have meant a **substantially lower cost for land acquisitions.**

Takeaways

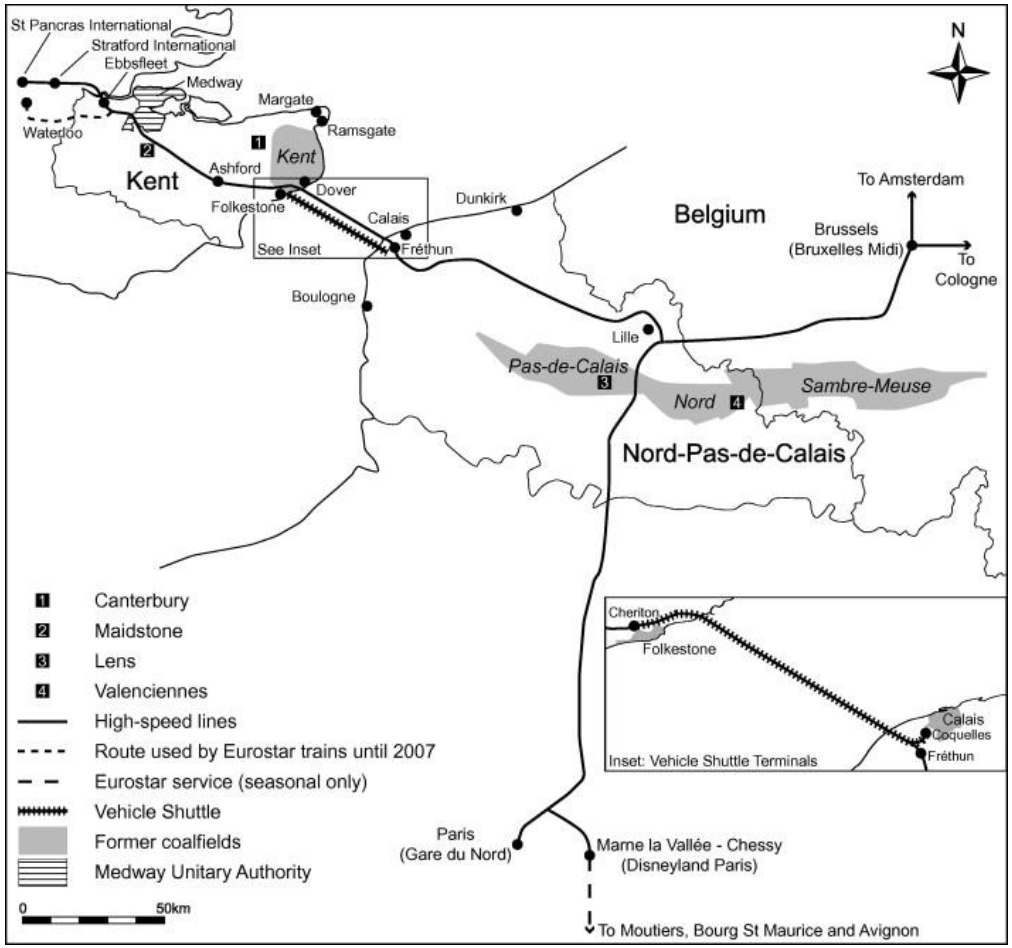
- A strong financial position was possible due to state-guaranteed loans with joint and separately. This minimized the capital costs for loans on the credit markets significantly.

*The reuse of seed capital from the Great Belt Bridge to the Öresund bridge meant that no *new* capital was necessary in DK

SOURCE: Expert interviews, Oresundsbron website 2013; www.logistikkforeningen.no/file.php?id=601

A brief overview of the Eurotunnel project

Project infrastructure



Project facts

Characteristics

- **Project:** 50.5km rail in the two tunnels plus a separate safety tunnel. Cars and trucks are carried on railway carriages.
- **Operating train speed**: 160km/h

Key events

- **Bi-lateral treaty :** 1986
- **Total duration:** 14 years
- **Construction time:** 8 years
- **On time:** No, 12 months delay
- **Opened to traffic**: 1994

Key financials

- **Construction cost**: ~ £9.35B*
- **Cost overrun:** ~ £4.35B (87%)
- **Turnover (2012)**: ~ €993M
- **Passengers p.a. (2012)**: ~18M
- **Passenger forecast:** Overestimated

* 1994 prices

SOURCE: UCL Omega, 2008

An early bilateral attempt by the two governments failed due to public spending concerns of the new UK government … (1/2)

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Key stakeholder interests

1 Politically

- *The British Government*
  - Shifting UK governments both Labour (Wilson)and Conservatives (Thatcher) had an interest in a tunnel link, but worried about the cost
- *The French Government*
  - President Francois Mitterrand was keen on a fixed link in the form of a bridge

2 Government entities

- *British Rail (BR):* Less in favor
- *SNCF (French railways):* More in favor of the Tunnel than BR

3 Private sector

- *Banks:* Most were interested in investing
- *Ferries:* Heavily against the channel link and publicly complained about the potential loss of 6000 jobs and safety issues with tunnel fire

Timeline with key coalition-building events

Major events and initiatives	Year
France & UK signs tunnel treaty, but it was abandoned by the New Labour Government lead by Wilson in UK in 1975	1973
Thatcher becomes Prime Minister and brings the fixed link idea back on the table with Mitterrand	1979
Anglo-French Report recommends rail link	1982
Report by 5 banks suggest complete private financing model for fixed link because Mrs. Thatcher was adamant that no public finance should be used	1984
French & UK governments invite for a concession to bid	1985
Anglo-French consortium CTG-FM is granted concession to operate the Eurotunnel	1986
A passenger and freight ferry capsized and sank between FR and UK with the loss of 197 lives, which questioned the safety of ferry transport	1987

Outputs

1. **Thatcher creates** a new **coalition with Mitterand** and the private **bank sector**
2. **Private finance** becomes a publicly **viable opportunity** through the banks' report, which is also used to **tone down critics**
3. The fixed link project becomes an **ideological prestige project** under Thatcher and Mitterrand in regard to **applying private finance**

SOURCE: UCL Omega, 2008; Expert interviews; The Institute of Economic Affairs, 2007

… However the needed political momentum was created by 5 banks presenting a viable private finance model (2/2)

Key players in the coalition building process

Context

- *Political*: Focus on deregulation and privatization
- *Economic*: Ongoing economic recession
- *Public opinion*: Skeptical after the first attempt came to nothing and focused on jobs

Phases	Year	Key players	Key activities	Output
Conceptualization	1973	• The first plans for a cross-English Channel link dates back to 1753 • Prime Minister Harold Wilson, Labour • Prime Minister Margaret Thatcher, Conservatives • President Francois Mitterand, Socialist party	• An **Anglo-French treaty signed in 1973** to construct a twin-bore rail tunnel was **lapsed without ratification by the British Parliament,** when the Conservative government lost elections in 1974 • **Thatcher brings the idea back** in the early 1980s, but only if possible with **private finance**	• UK and France again on track in terms of a fixed link either a bridge or a tunnel if private finance can be used
Pre-study and feasibility	1982	• Prime Minister, Margaret Thatcher, Conservatives • President Francois Mitterrand • The "Arranging banks" • The channel ferry operators	• In 1982 the two governments commissioned a **report recommending a Channel rail** link • In 1984 an Anglo-French **coalition of five banks** presented a report on how a twin-bore rail tunnel could be **entirely privately financed** • The banks formed an Anglo- French **consortium**, CTG-FM, together with the largest construction companies in UK and FR	• Political momentum given I) the governments' report and II) the private financing proposal for a tunnel III) the fact the banks constructed a consortium to carry out the project
Project advocacy and negotiation	1985 – 1987	• The "Arranging banks" • The CTG-FM • The UK Government • The French Government • Alistair Morton, Co-Chairman in Eurotunnel	• In 1985, the governments issued an **invitation for bids** for financing, construction, and operation of a fixed link without access to government funds or guarantees • The **CTG-FM's** Eurotunnel Project **won** out of 10 proposals due to **low risk and low cost** • A **bilateral treaty** authorized the construction of the Eurotunnel and **granted CTG-FM** the **concession** to operate	• A treaty was signed • The five banks won the bid by I) pro-actively issuing a report on the private financing opportunity and II) presenting the proposal with lowest cost and risk

Takeaways

Key Success Factors

1. Strong coalition with banks that saw a **financial interest** in moving the project forward and were **willing to invest** in a pre-study to **preserve political momentum** and **indicate** to the **equity market** that the debt financing was "locked up"
2. **Aligned heads of state were instrumental** in moving the project forward with high speed
3. The private **tunnel-project matched** the overall **public opinion for privatization**

Problems to avoid

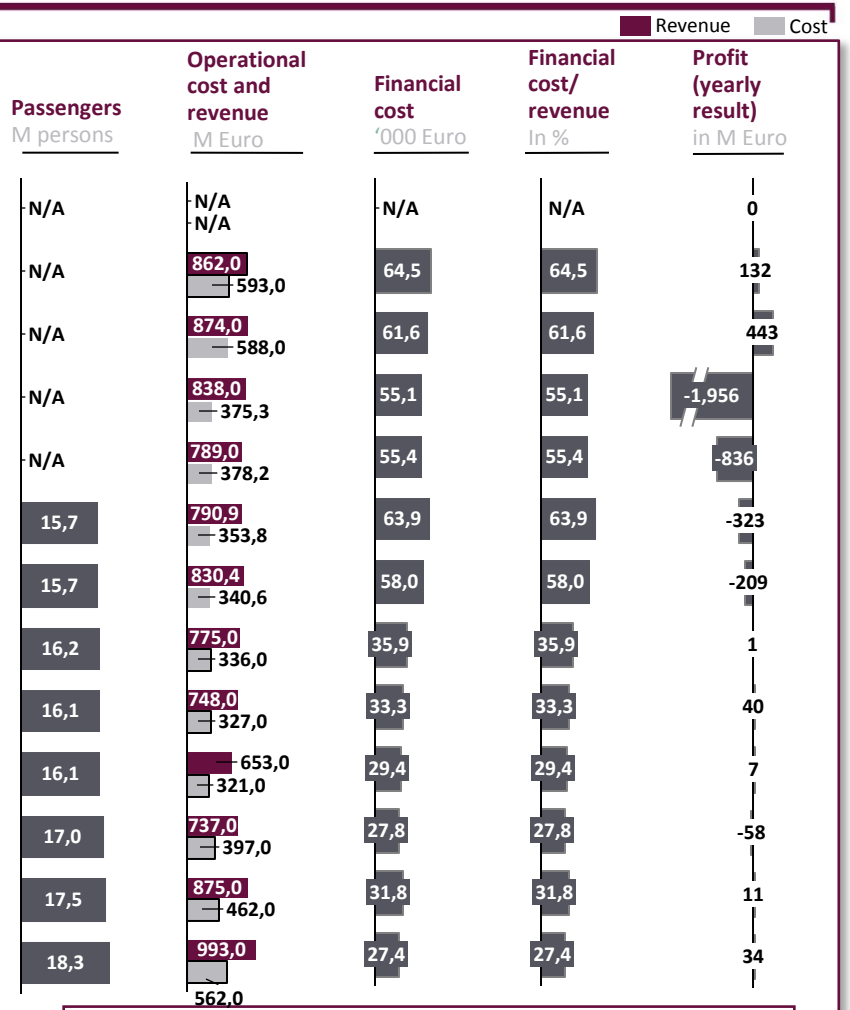
1. Political **risk increases** significantly with **narrow** political **coalitions**
2. Important to be **critical towards** information from **actors** like e.g. banks that have a **vested interest in the project**, as it later showed out that the **projections** on I) construction cost and II) traffic volume **were highly optimistic**

SOURCE: UCL Omega, 2008; Expert interviews; The Institute of Economic Affairs, 2007

After significant financial and organizational restructurings and expansion into new business areas Eurotunnel eventually became profitable

Key characteristics of business case	
Unique features	▪ **Finance-build-operate-transfer** model with 99-years concession period ▪ **No Government role** in tunnel project – only the connecting lines in UK and FR
Business rationale	▪ **Manage and operate** the tunnel, ▪ Revenue from: – Vehicle shuttle service, Eurostar, BR, SNCF and other traffic ▪ Business **expanded** to include **rail freight** and **ferries** to remain competitive, gain market shares and increase revenue
Risk	▪ Both **financial, construction,** and **operational risk** resides **with operator** ▪ **UK government failed** to deliver the promised **HSR link to London causing low demand**
Rewards	▪ Right to **build and operate** the system **for 99 years** from 1987 with a **59% tax** from year **2052-2068** ▪ Free to determine commercial policy/strategy incl. tariffs ▪ No competing fixed link before 2020
Socio economic benefits	▪ **Connectivity** gains between **UK, France** and **Continental Europe** ▪ **Environmental benefits from decreased ferry and air transport**

Major events and initiatives	Year
Officially opened by Queen Elisabeth II and President Francois Mitterrand on May 6 1994 – 1 year delay	1994 / 2000
Critical **shareholder group takes over** the **Board** in April 2004 and appoint **new CEO and Chairman**	2001
Shareholders **voted for a deal to half the debt** in **exchange for 85% equity** – but failed in August	2002
August 2 2006 the **company was placed into bankruptcy protection** by a French court for six months	2003
Financial and organizational restructuring. CitiGroup, Deutsche Bank and Goldman Sachs provides **£2.8bn of long-term funding**	2004
Eurotunnel announces **first ever net profit** of €1M in 2007	2005
Eurotunnel issues **first ever dividend** of **€0,4 per share** following a €40M profit	2006
Eurotunnel **plans to issue 119.4M new shares** to **gain capital** and **reduce debt**	2007
Eurotunnel **acquires Veolia Cargo** with SCNF	2008
Eurotunnel **gains 7-years contract for the operations** of Port of Dunkerque's **200km rail**	2009
Eurotunnel **acquires British rail freight company, FIRST GBRf**	2010
Eurotunnel **takes over responsibility of three channel ferries from SeaFrance**	2011
	2012
	2013



Sum up

- Eurotunnel **continuously** faced **bankruptcy** until 2007 due to high competition, overestimated **demand** particularly for car trains, **ineffective organization, delayed links to Amsterdam and Cologne**
- **Expansion** into new **business areas** along with **organizational** and **financial restructuring** have made Eurotunnel **profitable** since **2007**

Takeaways

- **The operating success depended heavily on I) construction costs, II) traffic volume and III) price level - all of which fell out negatively**
- **Expansion of business to include freight and ferries together with restructurings allowed profit creation**

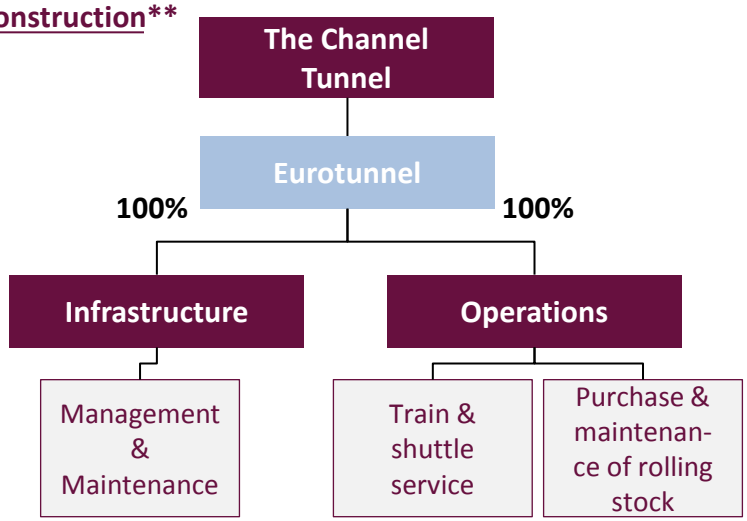
SOURCE: UCL Omega, 2008; www.Eurotunnel.com; The Institute of Economic Affairs, 2007; Expert interviews

Eurotunnel was organized as a complex bi-national BOT project that was restructured into a more simple and efficient French company

Organizational characteristics, ownership, and operation structures

Phases / Parameters	Design	Build	Own	Operate
Actors	• Eurotunnel (at that time called CTG-FM) • TransManche Link (TML) (Translink, UK and Transmanche Construction, FR) • Inter-Governmental Commission (ICG)*	• Eurotunnel • TML • Atkins • Société d'Etudes Techniques et Economiques (SETE) • Louis Berger Associates	• Eurotunnel (ownership for 99 years thereafter owned by the French and UK government)	• Eurotunnel • Until 2006 a bi-national company, but it was highly ineffective due to bureaucracy, duplication and complexity and was united in one
Public	[✗]	✗	✗	✗
Private	✓	✓	✓	✓

Ownership model upon construction**



Public ownership
Private ownership

Key characteristics

1. **Eurotunnel** was **restructured** to one French company, in 2006 **due to the inefficiency of being a bi-national company**

2. **Private ownership** and **operation** has been **extended in 1997 to 99 years** due to high construction costs and debt

3. **Complex design and building** phases **due to lack of trust** between Eurotunnel and TML made Eurotunnel hire first Atkins and SETE to oversee the process, but found that the two were too close to TML and **hired Louis Berger Associates** as a third ***'maîtres d'oeures'***

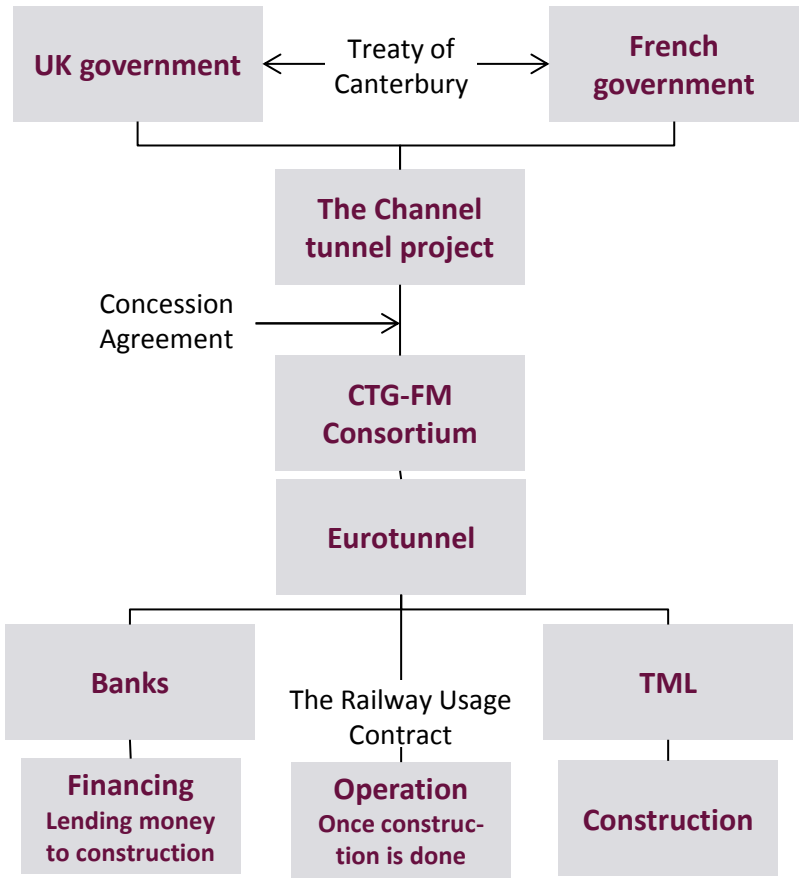
- The ICG was setup by the two governments to oversee and supervise on all matters concerning construction and operation of the fixed link

** Detailed ownership structures in appendix

SOURCE: UCL Omega, 2008; The Institute of Economic Affairs, 2007; Expert interviews

Complexity of the organizational setting was further challenged by misalignment of contractual obligations and objectives

Structure of main contracts



Key contractual characteristics and challenges

Characteristics

- The **three main contracts** were I) **The Treaty of Canterbury** (Bilateral), II) **the Concession Agreement** and III) **the Railway Usage Contract** that links to EU law on fare prices
- Upon winning CTG-FM **spun out into three organizations** with **individual roles**, **responsibilities** and **contractual obligations** to each other and Eurotunnel had to negotiate terms with the banks and TML again, e.g. TML was liable to pay damages of £0.33M per day the project ran overdue (£0.5M per day after 6 months)

Challenges

- **Lack of trust** appeared due to I) **lack of alignment** of objectives and **incentives** between the consortium players II) the **unequal power balance** between Eurotunnel vis-à-vis especially the banks
- **In return** for not providing any public funding or guarantee, the **French and British governments promised to deliver HSR** connection to their respective ends of the tunnel, but **the British HSR connection was not ready until 2004**
- The **French** government has **prolonged** the **permission** to let **German trains (DB) connect to the tunnel** through France, which has made it **difficult for Eurotunnel to expand their connections from London** and hauled a potential revenue stream

Takeaways

- **Alignment** and **clarity** on all **contract objectives** and **obligations** is crucial investments to avoid any changes in the promised business case

SOURCE: UCL Omega, 2008; expert interviews; The Institute of Economic Affairs, 2007

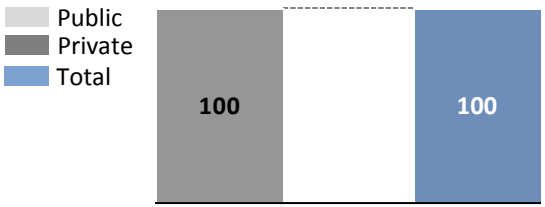
The private financing of the Eurotunnel had a huge budget overrun due to exploding construction costs, delay and high capital costs

Investment

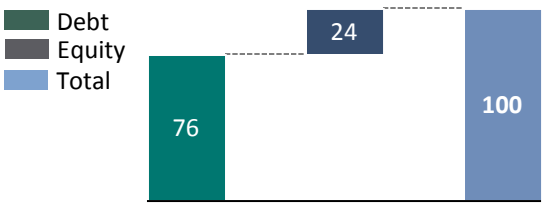
Construction

Investment structure – Percentage

Public vs. private



Debt vs. equity



Investment type

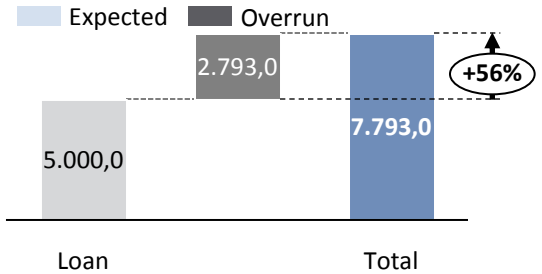
Debt

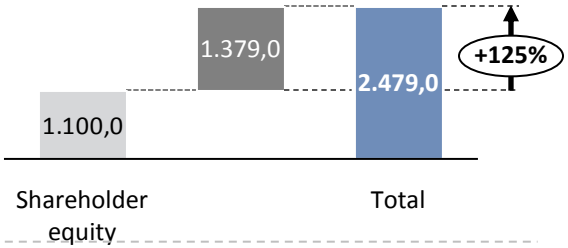
- Five arranging banks
- Loan from **50 banks** (syndicated globally)
- 200+ underwriting banks
- European Investment bank

Equity

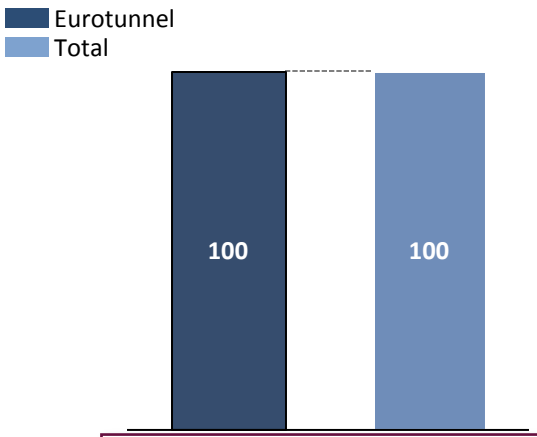
- **Shareholders** invested **upfront in 3 installments**, including:
  - Institutional investors
  - Private investors
  - General public

Break down – Million £ (1994 prices)





Operation



Key issues and characteristics

- The construction turned out to **demand a much larger investment** than originally expected leaving the **budget with a 87% overrun**, excluding capital cost
- The **investment case was jeopardized** mainly by overly optimistic:
  - **Construction cost** estimates
  - **Construction time schedule** due to pressure from banks – **1 year delay**
  - **Passenger estimates** - the **actual demand** was **less than half mainly due to missing HSR link to London**
- **The one year delay had a cost of approx. £500M net for Eurotunnel –** half of the original equity invested – as **Interest** on borrowed money was **roughly £1M/day and lost revenue was £1M/day**
- Due to an **act of the British Parliament** the construction **project could not gain** either **state loans, grants, or guarantee**, **leaving** the entire **financial risk on the equity shareholders and banks.** The lack of gov. involvement led to chaos and higher costs

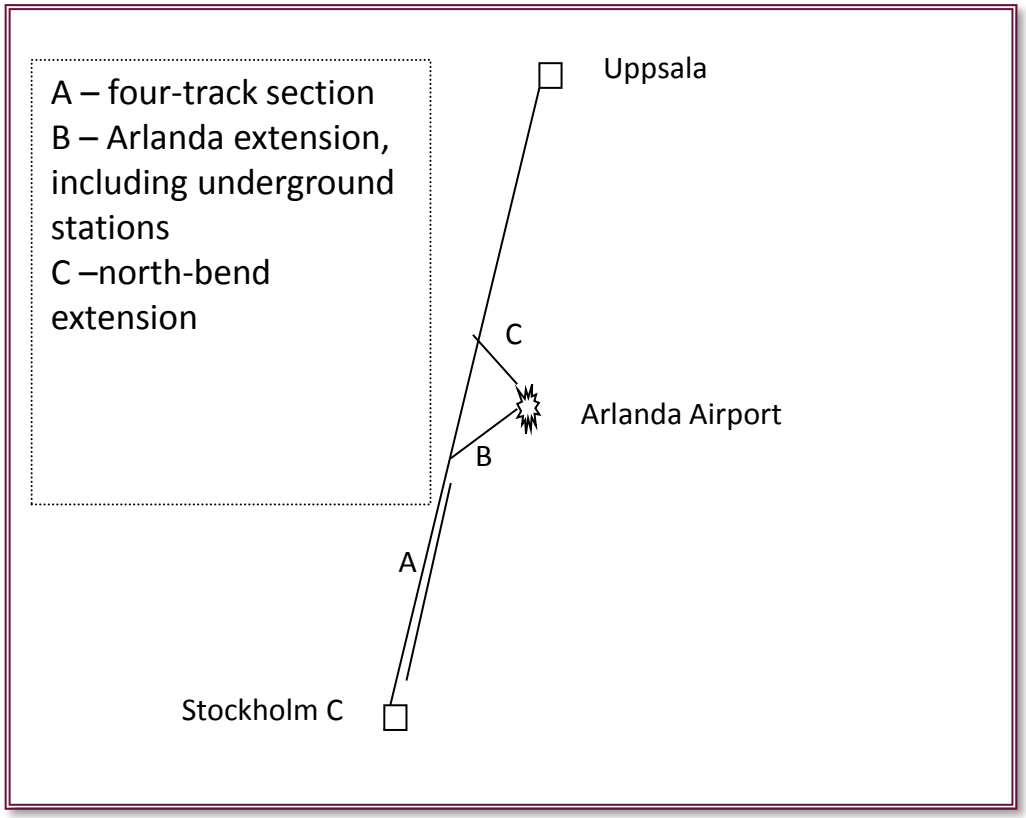
Takeaways

- The Eurotunnel was a **100% privately financed** project with a **high financial gearing** and **high risk profile** leaving it **extremely vulnerable** to I) **delays in construction**, II) **traffic volume** and III) **tariff level and competition**
- A **public financial role e.g. a state guarantee could have decreased financial risk and thereby financial costs**

SOURCE: UCL Omega, 2008; The Institute of Economic Affairs, 2007; Expert interviews

A brief project overview of Arlandabanan

Project infrastructure



Project facts

Characteristics

- **Project:** 20km rail connecting Arlanda Airport and Stockholm
- **Max train speed**: 200km/h

Key events

- **Contract signed:** July 1995
- **Total duration:** 13 years
- **Construction time:** 4 years and 4 months after contract award
- **On time:** Yes, 12 months ahead
- **Opened to traffic**: November 1999

Key financials

- **Construction cost**: ~ €688M*
- **Cost overrun:** No, ~ €20M under budget
- **Turnover (2012)**: ~ €72M
- **Passengers p.a. (2012)**: 3.3M
- **Passenger forecast:** Overestimated

* 1990 prices

SOURCE: Arlanda Express website; www.arlandabanen.se

The coalition behind the realization of Arlandabanan was characterized by strong Government leadership and private sector focus (1/2)

DEEP DIVE ON THE NEXT PAGE

Key stakeholder interests

1 **Politically**

Conservative-Liberal Government:

- Strongly in favor of increased privatization
- Severe national budget constraints

Social Democrats:

- In favor of Arlandabanan focusing on environment

2 **Government entities**

National Railway Administration:

- Strong advocate and initiator of Arlandabanan, but for a public construction with a private operator

3 **Private sector**

- In favor of increased privatization
- Interest in potential construction opportunities

Timeline with key coalition-building events

Major events and initiatives	Year
Arlandabanan **developed as a solution to decrease emissions** from an expansion of Arlanda Airport.	1986
The **Social Democratic Government asked** National Railways Administration **to examine the possible use of private finance** to build Arlanda-Stockholm rail link	1989
National Railway Administration released their study - the **only feasibility study** prior to the decision– recommending it to be a public project.	1990
The **Liberal-Conservatives** came into power with a **desire to promote privatization** – a process in which **Arlandabanan became a spearhead project.**	1991
Government commissioned a **working group chaired by senior executives from SAAB Scania** to explore how the Arlanda project could proceed. **Neither the Swedish Railway nor the National Railway Administration** were **included.**	1991
A **sub-group** of the working group **with minimal public sector representation** officially formed the Arlanda Banan Project	1993

Outputs

1. The initiative to **Arlandabanan** was taken by the Social Democrats. It **survived the change in government** due to an **interest in** exploring **privatization**
2. A lean **coalition of politicians and private executives** drove the process forward
3. The **National Railway Administration was sidetracked** by the coalition

Source: Arlanda Express website; Colverson&Perera, 2012; UCL Omega 2012

The coalition behind the realization of Arlandabanan was characterized by strong Government leadership and private sector focus (2/2)

Key players in the coalition building process

Context

- *Political*: Center-right government focused on privatization and PPPs
- *Economic*: Severe Swedish budget crises and lack of public funds
- *Public opinion*: Environmental concern about emissions

Phases	Year	Key players	Key activities	Output
Conceptualization	1986	• The National Railway Administration (founded in 1989)	• Arlanda connection mentioned in Committee report • General discussions mostly around environment concerns	• Arlandabanen was framed as a solution to an environmental problem and planted in the political and public sphere
Pre-study and feasibility	1989	• The NRA • The Social Democrats • The Civil Aviation Administration	• NRA launched 10-year investment plan with Arlanda connection as top priority • Social Democrats ordered a study exploring the opportunity of using private finance to build the Arlandabanan	• Study by NRA showed that public finance was required as ticket sales alone could not cover construction and operation
Project advocacy and negotiation	1991 – 1993	• Conservative-Liberal Government • Mats Odell, Minister of Communications • Urban Karlström, Secretary of state , Ministry of Communication • Georg Karnsund & Sivert Nordgren, SAAB Scania • Solomon Brothers (investment bank) • Manheimer Swartling (legal advisory)	• New Government in 1991 led by Carl Bildt • Planning commission led by SAAB Scania executives • Sub-group formed to handle procurement led by Georg Karnsund with external advisory partners • Project moved forward politically by Mats Odell and Urban Karlström	• Strong political ownership and ideological mission • Process rushed through by private oriented planning commission to ensure a political deal

Takeaways

Key Success Factors

1. Strong **Government ownership and public declared political aim** lead by a centrally placed Minister, Mats Odell and his Secretary of state Urban Karlström
2. Key players **Mats Odell and Urban Karlström succeeded** in creating **a powerful and dedicated coalition** that bridged the public and private sector
3. **Arlandabanan was promoted as a clearly defined solution** to an environmental challenge

Problems to avoid

1. Too strong a focus on **privatization** outbalanced the focus on decreasing **emissions**
2. The most crucial phase in PPPs, the **planning process was rushed through** to provide the Government political results
3. **Lack of public entity involvement** in initial planning process

Source: Arlanda Express website; UCL Omega, 2011; Colverson&Perera, 2012

Arlandabanen was the first PPP and BOT in Sweden that granted high degrees of freedom and risk to the private operator

Key characteristics of business case

Unique features

- **Life cycle contract with entrepreneur** (builds and maintains infrastructure and operates services ,**BOT**)
- **A-TRAIN** carries **responsibility for management of everything** from tracks to stations

Business rationale

- **Revenues** from:
  - Ticket sales
  - Station access for intercity
  - Income from infrastructure
- **Revenues pay for project build costs**

Risk

- **Private** ownership of the operator, A-Train
- The **private consortium** bears
  - **Full cost risk** of construction
  - **Full market risk** of operation e.g. change in traffic flows
- **Government could end contract after 15 years in** 2010, but did not

Rewards

- A-Train has 40 years **exclusive concession** to operate services and **set prices** after construction + **option to operate 10 years more**
- A-Train have **exclusive rights** to operate the shuttle if interested

Socio economic benefits

- **Reduction of emissions**
- Time reductions for business people

Major events and initiatives

Year	Major events and initiatives
1999	
2000	A-TRAIN **started operating on the Arlandabanan**
2001	
2002	A-TRAIN **close to bankrupt** and the ALC Consortium **lost nearly Euro23M**
2003	
2004	The ALC Consortium **sold A-Train to Macquarie Bank** in 2004 **for Euro46M** including its debt of Euro46M
2005	
2006	**Profitable for the first year** since the first trip
2007	
2008	
2009	**Best ever financial performance** with Euro62,5M revenue and **Euro6,4M pre-tax profit**
2010	
2011	
2012	**Refinancing of A-Train in process**
2013	

Revenue / Cost

Year	Ticket price Euro	Passengers M persons	Operational cost and revenue M Euro (Revenue / Cost)	Financial cost '000 Euro	Financial cost/ revenue In %	Profit (Yearly Result) in M Euro
1999	N/A	2,1	27,0 / 38,0	7,0	140,3	-18
2000	22	2,9	35,8 / 37,5	6,6	104,8	-8
2001	18	2,8	38,8 / 34,7	9,8	89,4	-6
2002	21	2,6	40,8 / 35,2	11,4	86,4	-6
2003	N/A	2,9	45,7 / 35,8	17,6	78,4	-8
2004	N/A	3,0	50,0 / 33,9	15,2	67,7	1
2005	N/A	2,7	53,3 / 38,4	14,4	72,1	1
2006	N/A	2,7	58 / 40,2	13,4	70,7	18
2007	25	3,2	60,9 / 42,3	12,7	69,4	4
2008	29	2,9	59,2 / 39,3	14,7	66,4	4
2009	29	2,9	62,0 / 41,6	1,7	67,0	5
2010	29	3,3	71,1 / 43,9	12,5	61,7	11
2011	29	3,3	73,0 / 45,0	11,7	61,7	12

Sum up

- **Initially not profitable** due to low passenger numbers and cheaper alternatives (bus and taxi) but since the transition to Macquarie Bank **profitability has increased starting from 2005**
- **Numbers are difficult to find** and will be confirmed in interviews

€-exchange rate used is 8,8

Takeaways

- **Too much risks carried by private operator** led to: I) low transparency regarding cost efficiency; II) very high ticket prices, and III) high vulnerability to external changes , i.e. 9-11, financial crisis, and construction of two competing airports jeopardized profitability
- **Operator rights to decide on rental** of tracks , stations and ticket prices made these expensive

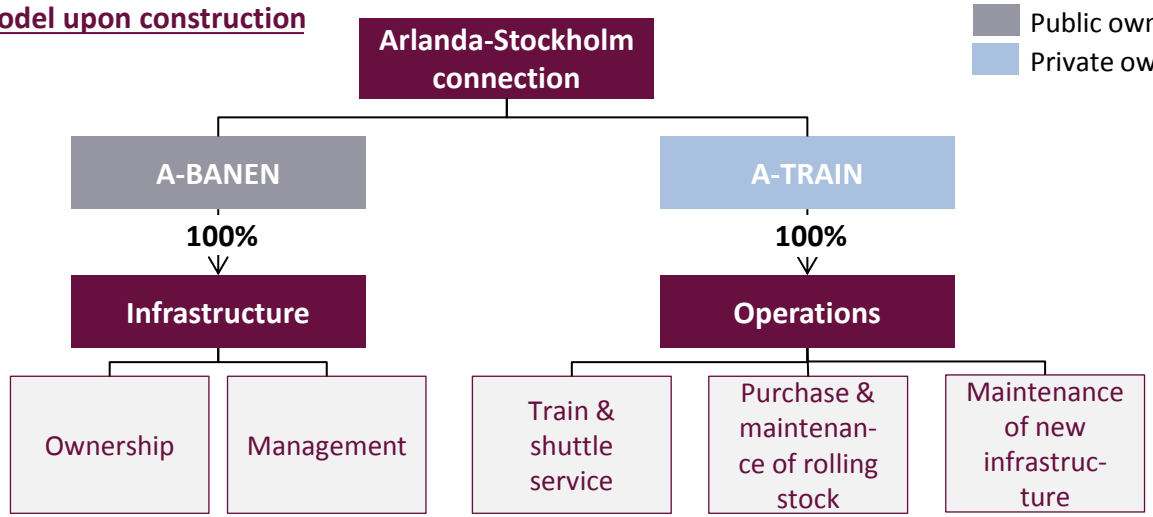
SOURCE: Arlanda Express MTC Stiftelsen website; Colverson&Perera, 2012; OECD 2007; VTI, 2003, UCL Omega, 2011

Arlandabanan's organizational model is based on public ownership of infrastructure and private operator with a 40-year contract

Organizational characteristics, ownership, and operation structures

Phases / Parameters	Design	Build	Own	Operate
Actors	• The NRA • The Civil Aviation Administration • Georg Karnsund and Sivert Nordgren	• NCC • Siab • Alstom • Mowlem • Kraftbyggarna	• A-BANAN	• A-Train
Public	[✗]*	✗	✓	✗
Private	✓	✓	✗	✓

Ownership model upon construction



Key characteristics

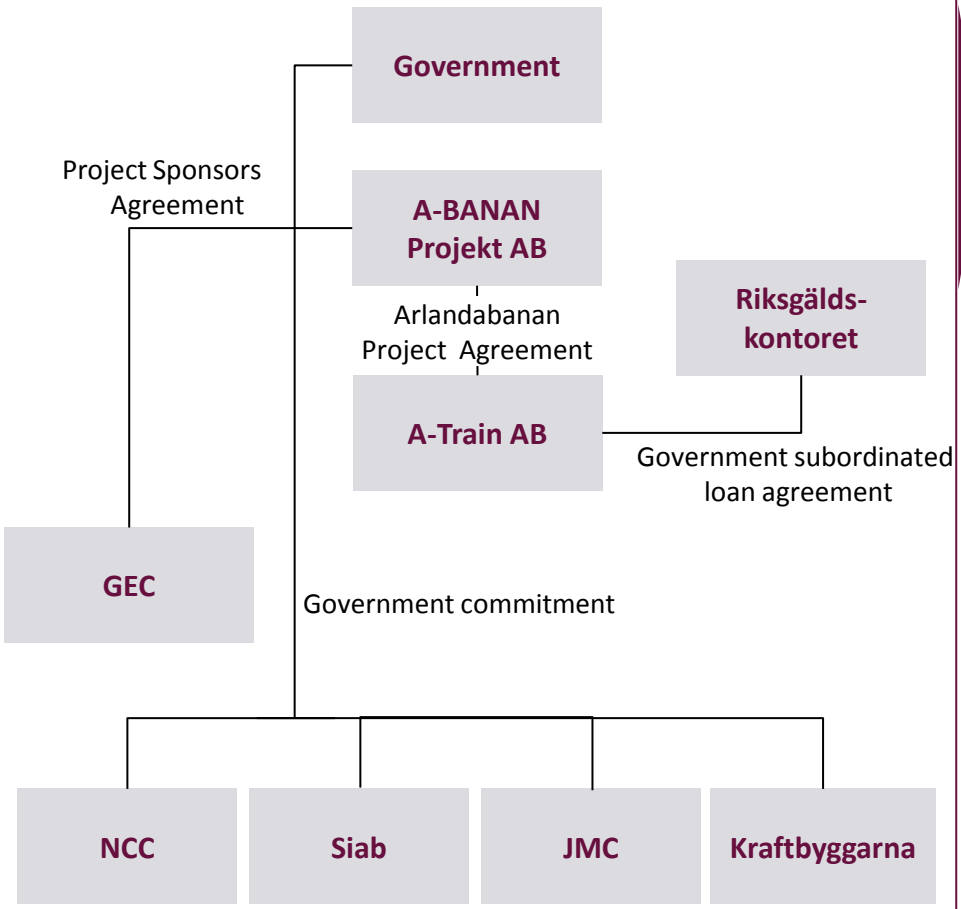
1. **Unique** feature is that construction **consortium** gained **right** to **operate** by **building** the infrastructure and then handing it over to the state
2. Construction consortium carried construction risk against a 40-year exclusive right to operate
3. Within the **40-year contract** there is a **clear division of roles** and responsibility between **public** (infrastructure) and **private** (operations)

*The government entities, NRA and Civil Aviation Administration, were only loosely affiliated and not an integrated part of the process

SOURCE: Arlanda Express website; UCL Omega 2011

The contractual negotiations of Arlandabanan were complex and have brought a number of undesirable societal outcomes

Structure of main contracts



Key contractual characteristics and challenges

Characteristics

- Arlandabanan consists of about **40 sub-agreements** involving more than **20 parties**
- **Government is directly involved in ten of the agreements** including **the overall Arlandabanan Project Agreement**, Arlandabanan Project Sponsor Agreement, Government **commitment** to constructors and **a Subordinated Loan Agreement**
- The remaining **30 primarily involve** the private construction and operating unit **A-Train AB**

Challenges

- A **fast planning** and **design phase** and **limited involvement of the NRA and Civil Aviation Administration** meant that key public considerations were not duly represented in the contracts., i.e.:
  - **Trains used are not fully compatible with Swedish standards** for size, capacity and systems meaning that it will be difficult for the Government to integrate the link after the 40+ years
  - **Exclusivity rights granted to A-train have restricted public transport services** as operators have to lease trains from A-Train, which is too expensive as prices are kept high
  - **Decisions** made **by A-Train** regarding **segments** and **strategy** have hindered passenger flows and the following impact on road traffic and emissions

Takeaways

- Getting the initial planning and negotiation contractual phases right through use of experienced lawyer is critical for successful PPPs due to the long term societal ramifications of weak contracts

Source: Arlanda Express website; UCL Omega, 2011; expert interview

The financial model of Arlandabanan is based on a BOT model that attracted 45% private finance

Investment	Investment structure (Percentage)	Investment type		Break down (Million Euros)
Construction	Public 55; Private 45; Total 100	Debt	▪ Union Bank of Schwitzerland, Bayerische Landesbank and Bank of Tokyo (Bank consortium) ▪ Nordic Investment Bank (NIB) ▪ Government subordinated loan	Bank consortium 114,7; NIB 34,4; Government loan 114,7; Total 263,8
		Equity	▪ Project sponsors ▪ Nordbanken Finans (lease of rolling stock)	Sponsors equity 68,8; NF 117,6; Total 186,4
		Government benefits	▪ Grant	Grant 97,5; Total 97,5
Operation	Mowlem 7; Vattenfall 29; Alstom 20; NCC/+Siab 44; Total 100	Key issues and characteristics	▪ The **construction cost** of Arlandabanan was **3% under budget** ▪ The players in the construction consortium **A-Train gained ownership of the operations** in return for the infrastructure ▪ The **subordinate state loan** given to the construction consortium was **a stipulated loan** meaning that the **refund is dependent on the profits** of the operating company ▪ The **size of the stipulated loan** was **decided in a bargaining process** were the **high degrees of freedom** given to the operator **served as a trade-off** - e.g. the loan would have been lower if a reduction of bus service to Arlanda from Stockholm had become reality	

Takeaways

- BOT model can be a way to avoid to finance projects with government budgets
- Stipulated governmental loans is worth considering for attracting private investors

Note: No previous evaluations have been able to present the total cost of the project as A-train will not provide access to the relevant material

SOURCE: Arlanda Express website; Expert interview

A brief overview of the HSL-Zuid project

Project infrastructure

Project facts

Characteristics

- **Project:** A 125km (85km is HSR tracks) high speed train line linking the Netherlands to the Trans European Network of High Speed Lines through Belgium
- **Max train speed**: 300km/h

Key events

- **Contract signed:** 1997
- **Total duration:** 12 years
- **Construction time:** 9 years
- **Opened to traffic**: 2009
- **On time: No,** 2 years delayed

Key financials

- **Construction cost**: €6.9B*
- **Cost overrun:** €3.1B*
- **Turnover (2012)**: N/A
- **Passengers p.a. (2012)**: N/A
  Passenger forecast: Overestimated

* In 2006 prices. Others state the cost to be €7.2B (www.nshispeed.nl)
SOURCE: UCL Omega, 2011; http://www.railway-technology.com

Early leadership by the Ministry of Transport with support from diverse interest groups paved the way for a decision (1/2)

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Key stakeholder interests

1. **Politically**
   - *The Dutch government:* keen on project
   - *Belgian/Flemmish government:* Reluctant about the connection
2. **Government entities**
   - *Ministry of Transport*, promotor
   - *Ministry of VROM,* promotor
3. **Private sector**
   - *Belgian railroad companies*: Interested in the line suggested by the Dutch into Belgium
   - *KLM & Schipphol Airport:* pro
4. **Interest groups**
   - *Stichting Natuur en Miilieu*, environmental concerns
   - *ANWB*, a union for users of transport on wheels
   - *LTO Nederland*, Agri- and horticultural entrepreneurs and employers, business concerns
   - *Chambers of Commerce of the region of the Hague*, business concerns
   - *WWF*, environmental concerns

Timeline with key coalition-building events

Major events and initiatives	Year
Lobbying effort by informal coalition of interest groups for an HSR connection	
Agreement between the Netherlands, Belgium, France and Germany on HSR collaboration	1989
First HSL Green Paper sent to parliament	1991
Decision to produce new HSL Green Paper as the first was insufficient to drive decision making	1993
	1994
The Trace Act is introduced in 1994 to speed up decision-making allowing for top-down approach	1996
New HSL Green Paper presented to parliament	1997
Conflict between the Dutch and the Belgium/ Flemish government about the best cross-border route – the Dutch government pays €400M in compensation	1998
	1999
Agreement with Belgium ratified in Dutch parliament	
Final decision on precise route	2000
Construction HSL-Zuid started in Breda-Prinsenbeek	

Outputs

1. Political ownership of the idea at the highest level
2. Bureaucratic support to the idea in key ministries
3. A broad coalition of diverse players that support the HSL-Zuid for different reasons

SOURCE: UCL Omega, 2011; Expert interview

Strong ownership in key ministries and the ability to centralize decision making at national level via the Trace Act speeded up HSL-Zuid (2/2)

Key players in the coalition building process

Context

- *Political*: Focus on connecting the Netherlands to Europe and mitigate road traffic bottlenecks
- *Economic*: Need to boost economic development in the Netherlands through better connectivity
- *Public opinion*: Focus on sustainability and better transport opportunities

Phases	Year	Key players	Key activities	Output
Conceptualization	1973	• Ministry of Transportation • Stichting Natuur en Miilieu • ANWB • LTO Nederland • Chambers of Commerce of the region of the Haque • WWF	• The coalition of interest groups actively engage in the public debate around the key benefits of HSR • The SVV-2 (Tweede Structuurschema Verkeer en Vervoer) is the first to mention the HSL in 1990 and focus is on sustainability and alternatives to cars • First take on design is started	• A HSR line is framed as the solution to I) environmental concerns and II) road traffic congestion and III) connectivity to Europe
Pre-study and feasibility	1990	• Ministry of Transportation • Rijkswaterstaat (Ministry of Transportation's implementation unit) • Ministry of Housing, Spatial Planning and the Environment (VROM)	• First HSL Green Paper sent to parliament in 1991 by the Ministry of Transport • Several feasibility studies made between 1992-1994, e.g. by McKinsey, VROM highlights the environmental and economic rationale of HSR • Decision to produce new HSL green Paper since the first was insufficient to pass the decision-making process in 1993	• Feasibility studies showed that it could be done • Strong commitment to project from key ministries
Project advocacy and negotiation	1994 – 1998	• Ministry of Transportation • The Dutch Government and Parliament • The Belgium/Flemmish Government • Rijkswaterstaat (Ministry of Transportation's implementation unit) • Ministry of Housing, Spatial Planning and the Environment	• The Trace Act is introduced in 1994 to speed up decision-making by creating I) national coordination and II) time limit on the different phases III) giving the state the power to overrule localities • Presentation of new HSL Green Paper 1994 • The Belgian and Dutch states reach agreement on route and the Dutch state pays €400M in compensation in 1996 • Definite decision is taken and tender strategy is determined	• The Trace Act tipped the power balance in favor of the government and the project • Negotiations settled the dispute between the Netherlands and Belgium

Takeaways

Key Success Factors

1. **Government** willing to **push** the **project** in new ways **I)** the **Trace Act** and II) the **compensation** to **Belgium**
2. **Early buy-in** from key **ministries**
3. Clearly **defined problem** and **solution** promoted from **early** on by a **broad** and **very internally different** coalition

Problems to avoid

1. **Ensure** that **policy proposal** is **well-planned** before presenting it to parliament **to I) save time and II) avoid conflicts in parliament** – this cost two years in the HSL-Zuid case.
2. Focus on **solving environmental disputes early** in the process
3. **Focus** strongly on **solving conflicts of national interest early on** to limit I)cost and II) too many vested interests

SOURCE: UCL Omega, 2011; Expert interview

The business case of HSL-Zuid is built around the state and two private providers and it has not been successful so far

Key characteristics of business case

Unique features
- **Design, Build, Finance, Maintenance** (DBFM) contract
- Combined **air** (KLM) and **rail** (NS) operating consortium

Business rationale
- **NS Hispeed** (NS & KLM*) pay a flat rate of **€148M/year** to the state to operate the infrastructure given that it is available 99% of the time
- **Infraspeed** receives **€106M/year** from the state for maintaining the infrastructure if it is available 99% of the time

Risk
- **Risk** is **divided** on **two** private **companies:**
- **Construction risk** sits with **Infraspeed**
- **Operation risk** sits **with NS Hispeed**

Rewards
- **NS Hispeed** has **exclusive rights** to the operation in **15 years**
- **Infraspeed** has a **25 years right** to maintain the tracks

Socio economic benefits
- **Environmentally**, less air traffic
- **Freed capacity** on Amsterdam-Rotterdam railway, improving train connectivity and local supply

Major events and initiatives	Year
Southern section **finished in 2006 and the Northern section** was **finished** in **2007**	2007
	2009
Italian **train manufacturer unable** to **deliver** in time and ERMTS **security systems** also heavily **delayed**	2010
	2011
The HSL-Zuid **started operations** in **2009** – 2 years delayed – with Thalys' trains	2012
The **new train** to operate **Amsterdam-Bruxelles, FYRA** is **presented** on July 6. However, due to malfunctioning trains, speed level is still not high-speed	2013
KLM left NS Hispeed due to failure of business case	
NS Hispeed **Airrail booking up and running** reaching 100,000 airrail bookings (Combined flight+rail ticket)	
NS Hispeed **collaborate** and connect with **TGV**, **Eurostar**, **ICE International**, and **Thalys**	

Revenue | Cost

Ticket price Euro	Passengers M persons	Operational cost and revenue M Euro	Financial cost '000 Euro	Financial cost/ revenue In %	Ticket sales/ Revenue In %	Profit EBITDA in M Euro	Profitability EBITDA / Revenue in %
N/A	N/A	N/A N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A			N/A	N/A	N/A	N/A
N/A				N/A	N/A		N/A
N/A				N/A	N/A		N/A
N/A	N/A			30,5	N/A		N/A
N/A	N/A						N/A
N/A	N/A		N/A	N/A			N/A
N/A	N/A		N/A	N/A	N/A		A
N/A	N/A		N/A	N/A	N/A	N/A	N/A
N/A	N/A		N/A	N/A	N/A	N/A	N/A
N/A	N/A		N/A	N/A	N/A	N/A	N/A
N/A	N/A		N/A	N/A	N/A	N/A	N/A

Not available due to confidentiality

Sum up
- Combined air and rail tickets enable a **larger hinterland** to **KLM** in Amsterdam and **Air France** in Paris
- The operator **NS Hispeed** has been **close to bankrupt** almost since the beginning due to I) very **expensively** bought rights to operate and II) increased competition from budget airplane companies

Takeaways
- The operator has experienced **strong competition** and **dumping of market prizes** due to budget airlines, which have put the business case under pressure
- The **99% availability criteria** for state payment related to both **maintenance** and **operator ensures** a **strong incentive** for **reliability** and **availability**

* Since the merger with AirFrance KLM has had a strong position on the travel market between Amsterdam and Paris

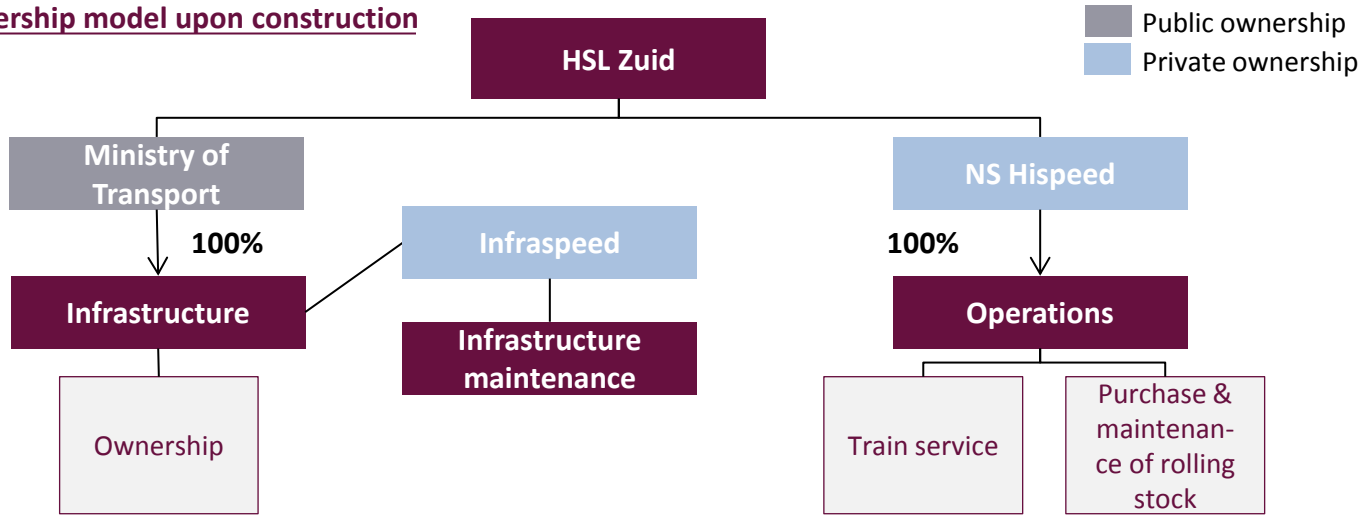
SOURCE: Expert interview; UCL Omega, 2011; www.railway-technology.com; www.nshispeed.nl; http://www.hsr.ca.gov

The HSL-Zuid infrastructure is state owned while maintenance and operations are split between two different private providers

Organizational characteristics, ownership, and operation structures

Phases / Parameters	Design	Build	Own	Operate
Actors	• Infraspeed • Spatial Core Decision (PKB) procedure of three steps are required for planning in the Netherlands*	• Sub-structure contractors • Infraspeed	• Ministry of Transport	• NS Hispeed Alliance (Air plane company KLM and the national rail operator, NS)
Public	✓	✗	✓	✗
Private	✓	✓	✗	✓

Ownership model upon construction



Characteristics

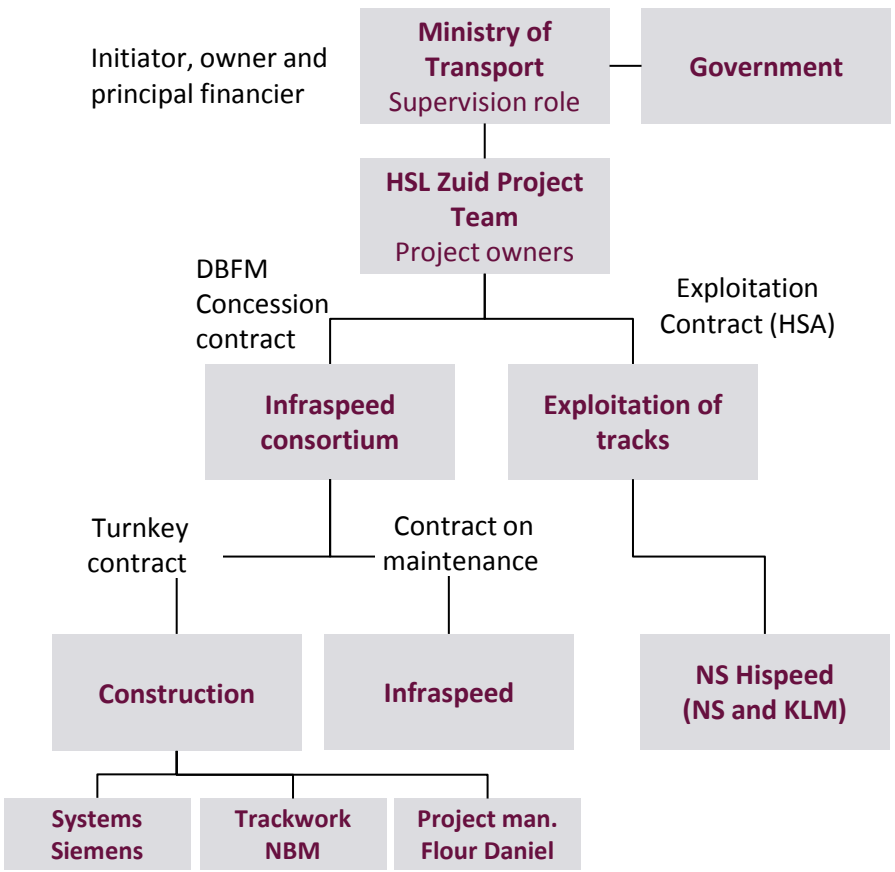
1. The **state owns** the **infrastructure**, but are not obliged to handle maintenance
2. The **PKB** process **allowed** the **state** to **follow** the **design** and **planning** closely
3. **Operations** and **maintenance** are **split** between **two** different **private providers**

* This means that the state was closely involved in the planning and sequencing of the project e.g. to conduct environmental impact assessments. The PKB is a part of the Trace Act

SOURCE: UCL Omega, 2011; Expert interview

The contractual structure was designed with smaller contracts given to a number of different providers causing coordination challenges

Structure of main contracts



Key contractual characteristics and challenges

Characteristics

- **Construction** of civil works was **divided** into **six tenders** of about **€400M** done by different consortia – the **overall coordinating responsibility (the seventh tender)**was won by the **consortium Infraspeed** (Flour Infrastructure; Siemens Nederland; Koninklijke BAM Groep; Innisfree Ltd.; and HSBC Infrastructure)
- **Design, Build, Finance and Maintenance (DBFM) contract** with a clause that the tracks should be available 99% of the time for 25 years (2031)
- The **Dutch state** pays a **fee** to the **infrastructure provider** dependent on whether the 99% is achieved
- **Contract on Exploitation (HSA)** of the tracks was won by **NS Hispeed** (NS and KLM) to operate the line

Challenges/learnings

- The **government** sold the operating rights to NS Hispeed for **2 times the actual price** (NS Hispeed overbid to keep competitors out)
- The government has **faced difficulties** in improving the infrastructure after the construction because Infraspeed resisted due to contractual terms
- **Managing** the **interface** between **Infraspeed** and the **seven sub-contracters** has been challenging and ended with delays
- The **main delays** happened primarily due to decision to use the **European standard ERMTS security system** at a time when ERMTS was **not specified yet** – these specifications were known very late meaning that the trains were ordered late

Takeaways

- Creating **seven tenders rather than one big** can be **beneficial** but **also challenging** in terms of **managing** the **interface**
- Important **create very strict contracts** to **avoid loopholes**
- **Use proven technology** to avoid problems similar to the ERMTS system

SOURCE: Expert interview; UCL Omega, 2011; http://www.hsr.ca.gov

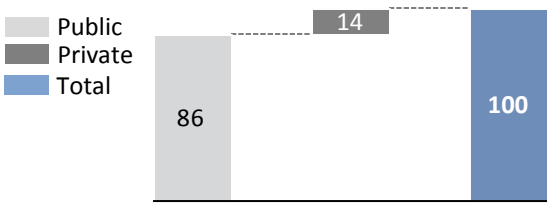
HSL-Zuid is considered a financial failure due to cost overruns and time delay

Investment

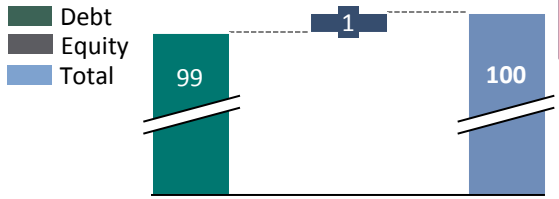
Construction

Investment structure – Percentage

Public vs. private



Debt vs. equity

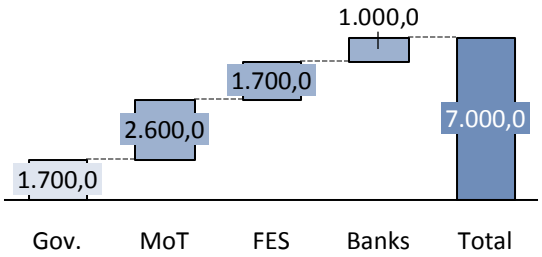


Investment type

Debt

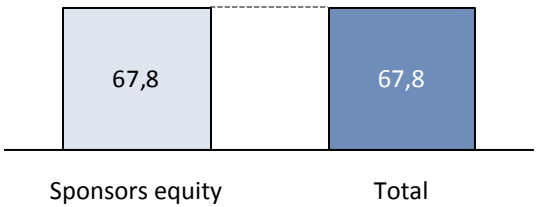
- Consortium of **24 banks**, incl. ING, Rabobank, KBC, KfW, Dexia and Hypovereinsbank (Banks)
- **Government** (Gov.)
- **Fonds Economische Structuurversterkning** (FES)
- **Ministry of Transport (MoT)**

Break down – Million Euros

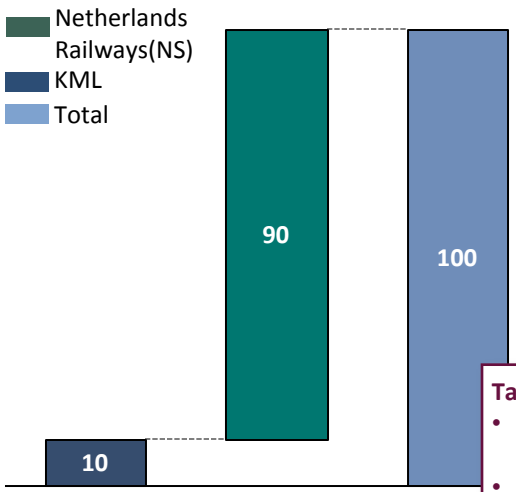


Equity

- **Project sponsors**
  - Flour
  - Siemens
  - BAM



Operation



Key issues and characteristics

- Predicted financing prior to the decision was **€3.9B –** this number **increased continuously through** the **construction period to** a final **€7B** due to construction delays, train delivery delays and system delivery delay
- Revenues from **gas exports** was **essential** to **finance** the HSL-Zuid connection through a fund to strengthen the economic structure of the Netherlands (***Fonds Economische Structuurversterkning***)
- Due to rejected Ansalto trains the line is still **not running with high-speed,** which limits the revenue streams

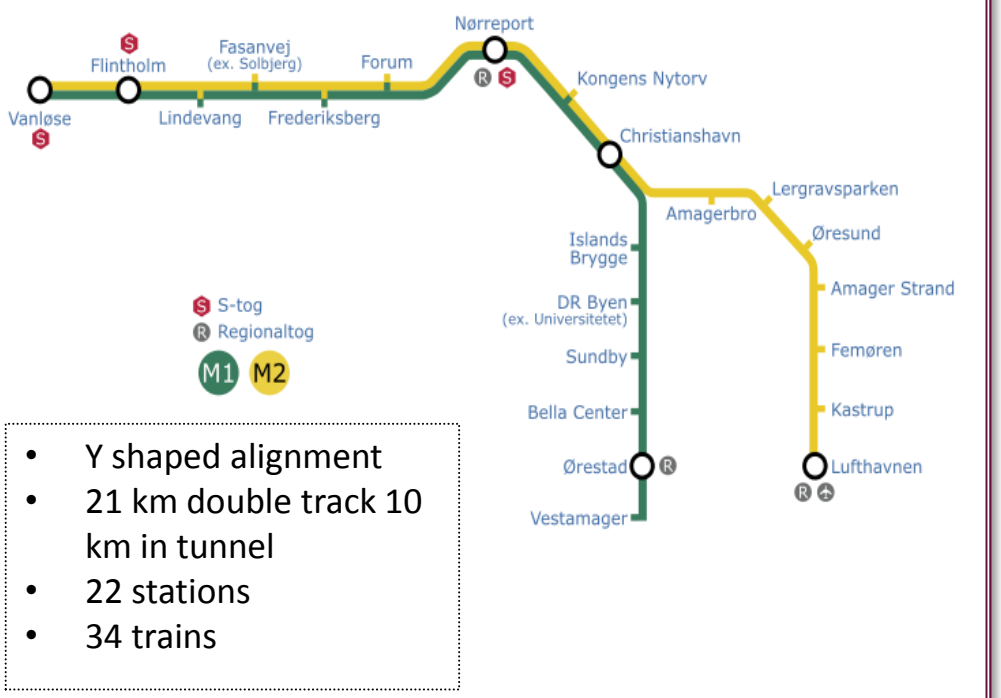
Takeaways

- The project **overran** its **budget** with **79%** due to **construction delays and adjustments to existing infrastructure**
- The HSL-Zuid connection was a **PPP with 14% private finance** and **most** of the **financial risk** placed **with** the **public sector**

SOURCE: Expert interviews, UCL Omega, 2011; www.railwaypeople.com; http://www.hsr.ca.gov; http://www.railway-technology.com; www.nshispeed.nl ; http://www.railwaygazette.com

A brief overview of the Copenhagen Metro project (Phases 1, 2 & 3)

Project infrastructure



- Y shaped alignment
- 21 km double track 10 km in tunnel
- 22 stations
- 34 trains

Project facts

Characteristics

- **Project:** Line through the old City Centre, to the Airport and the new development area in Ørestad
- **Max train speed**: 80km/h

Key events

- **Ørestadsselskabet created:** March 1993
- **Contract signed:** October 1996
- **First section opened:** October 2002
- **On time:** No, 2 year delay
- **Project complete:** September 2007

Key financials

- **Construction cost**: ~€ 1.6B
- **Cost overruns:** ~€ 540M
- **Turnover (2012)**: € 47.5M
- **Passengers p.a. (2012)**: 54.3M
- **Passenger forecast**: Overestimated

SOURCE: Metroselskabet I/S Annual Report 2012;

The CPH Metro was part of a larger coalition and plan to revitalize Copenhagen through Ørestaden, expanded airport and the Øresund link…

DEEP DIVE ON THE NEXT PAGE

Key stakeholder interests

1 Politically

- *The Schlüter Government:* Interested in giving Copenhagen an economic boost
- *Municipality of Copenhagen:* High interest in improving the infrastructure in CPH
- *Municipality of Frederiksberg:* High interest in improving the connectivity to CPH

2 Government entities

- *Ministry of Finance:* Interested in improving infrastructure and create jobs
- *"The Würtzen Committee":* Focus on future transport investments in CPH

3 Private sector

- *CPH Airport:* Interested in a fast connection to the city center

Timeline with key coalition-building events

Major events and initiatives	Year
A **law** for a **Metro** line was **passed** through **Parliament**, but was **cancelled** before it was implemented	1960
DSB presented an **underground S-train** link between **Vanløse** and **CPH Airport**, but it was **too expensive**	1980
Copenhagen experienced and **economic crises**	
A **Governmental and municipal working group** came up with the **idea** of **Ørestaden** and the **Metro** together with the idea of the **Øresund Link**	1989
Ørestaden and the **Metro** were **presented together** with the **Øresund link** in the **DK Parliament** in May	1991
The Danish **Parliament passed** the **Ørestad Law including** a **light rail** in **Copenhagen**	1992
Ørestad Development Corporation (Ørestadssselskabet I/S) is **created** t o **handle** the **development** of the Metro	1993
Due to early success, decision on new lines is made	2009

Outputs

1. The Metro **coalition** was **built** on the **momentum** created by the Government working group
2. The **Metro** was a **part** of a larger **infrastructure plan**
3. Economic **crises** in Copenhagen served as a **"burning platform"**

Note: Ministry of Transport was not included in the original coalition

Source: www.m.dk; CPH Metro Inauguration Seminar, 2002; Financing and Organizing the Metro, Olsen 2001; Expert Interview; www.ørestad.dk

And strong determined government and municipal ownership secured a short decision-making process

Key players in the coalition building process

Context

- *Political*: Focus on making an economic turnaround for CPH
- *Economic*: Severe economic crises
- *Public opinion*: In favor of changing CPH to a more attractive capital

Phases	Year	Key players	Key activities	Output
Conceptualization	1989	• The Schlüter Government • The "Würtzen Committee" • City of Copenhagen • Lord Mayor Jens Kramer Mikkelsen • Ministry of Finance • Minister of Finance Henning Dyremose	• As a reaction to the economic crises Schlüter appointed the "Würtz Committee" to suggest actions • The Würtz Committee presented "*What do we want with our Capital?*" a plan for future transport investments in CPH and untraditional financing methods, incl. using development of Ørestaden to finance infrastructure	• A new financing opportunity was planted • The plans were positively received by the Government
Pre-study and feasibility	1991	• Parliament • City of Copenhagen • Lord Mayor Jens Kramer Mikkelsen • Ministry of Finance • Minister of Finance Henning Dyremose	• Parliament passed a number of traffic investments in line with the recommendations • The bill on Ørestaden was put forward at the same time as the Øresund Link in 1991 • It came through with a slim majority of the Conservatives, the Liberals and the Social Democrats	• The Act on Ørestad act of 1992, provided political buy-in in the project
Project advocacy and negotiation	1992	• Parliament • City of Copenhagen	• City of Copenhagen and the Parliament decided to establish Ørestad Development Corporation – a vehicle to plan, develop, construct and sell Ørestaden incl. the Metro	• The New town principle* was chosen and the Government created Ørestad Development corporation to led the project
	1993			

Takeaways

Key Success Factors

1. Short **government led** process
2. **International best practice** used to select **alternative financial** and organizational model
3. **Close collaboration** between parliament and City of Copenhagen

Problems to avoid

1. **Slim majority** decisions are **undesirable** for long term and **large scale infrastructure projects** as it may cause **instability** around the project

* The New Town Principle: Inspired by the way Docklands and London were developed – using land ownership and property development in funding

SOURCE: www.m.dk; CPH Metro Inauguration Seminar, 2002; Financing and Organizing the Metro, Olsen 2001; Expert Interview

The CPH Metro has become profitable but started out facing lower passenger numbers than expected due to competition from existing options

Key characteristics of business case

Unique features
- The **Metro** was **financed** using the **"New Town" principle** (Metro is established prior to the city to make the land value increase)
- Operational **revenue pays** for **expansion** of the **system** (2 & 3 leg)
- Metro Service are provided a **fee** for the operation of the Metro

Business rationale
- **Operating profit and land development revenue is expected** to pay for:
- **I) expansion costs** and **II) loans**

Risk
- **Construction** and **financial risk** was **carried** by **Ørestad Development Corporation Operating risk** is **carried** by **operator**
- Operator **cannot set** fare **prices** these are **decided** collectively by transport companies in CPH
- **Insufficient increase** in **land value** is a **key risk**

Rewards
- **Operations** are **expected** to provide a **profit** and there is **no subvention granted**
- **5 year contract** for Metro Service

Socio economic benefits
- Increased **connectivity** in **Copenhagen**
- Environmental benefits

Major events and initiatives	Year
The **Metro opened first leg** on **October 19**	2002
Preparations for the **third leg** began	2003
The **second leg** to **Frederiksberg openened** in October	2004
Estimated passenger **number 61M – actual** number was **34M**	2005
The metro faced **competition** from the dense **bus and S-train** system in CPH during the first 3-5 years of existence	2006
The **third leg** to **CPH Airport opened** in late September	2007
Ørestad Development Corporation was **split** into **Metroselskabet** and **By & Havn** in 2007	2008
The **€389M** metro **connection** to **Nordhavnen** approved	2009
54M passengers used the Metro - **expectations** were **72+M**	2010
400M passengers **used** the **Metro** during it's **first 10 years** of existence	2011
	2012
	2013

Revenue / Cost

Year	Ticket price Euro	Passengers M persons	Operational cost and revenue M Euro	Net financial cost M Euro	Net Financial cost/revenue In %	Profit (yearly result) in M Euro
2002	N/A	N/A	N/A N/A	63,5	N/A	48,9
2003	N/A	20,0	66,2 111,4	-67,4	102	-113
2004	2	34,0	77,7 129,9	-153,4	197	-206
2005	2	35,0	141,4 120,5	-137,4	97	2
2006	3	37,0	366,8 143,2 64,3	19,6	5	207
2007	3	40,0	61,3	7,1	4,2	4,2
2008	3	47,0	89,8 75,7	32,4	7,6	7,6
2009	3	50,0	96,8 81,0	15,1	8,9	8,9
2010	3	52,0	115,8 100,9	-6,0	14,9	14,9
2011	3	54,3	131,4 105,8	-61,2	25,6	25,6
2012	3	54,0	147,5 116,0	-16,49	31,5	31,5

Sum up
- Given the **income** from **land tax** the **financial costs** of the Metro is **balanced** by a financial income
- **Passenger** numbers and **revenue** have **increased** steadily with the **expansion** of the metro

Takeaways
- The business case was **challenged** by I) **overestimated** passenger **numbers**, II) **competition** from the existing dense bus and S-train system and III) **inability** to **set** fare **prices**
- **Extension** of network has **increased** the passenger numbers

* The €-exchange rate used is 7,46

* This makes it possible to build 3.1M sqm

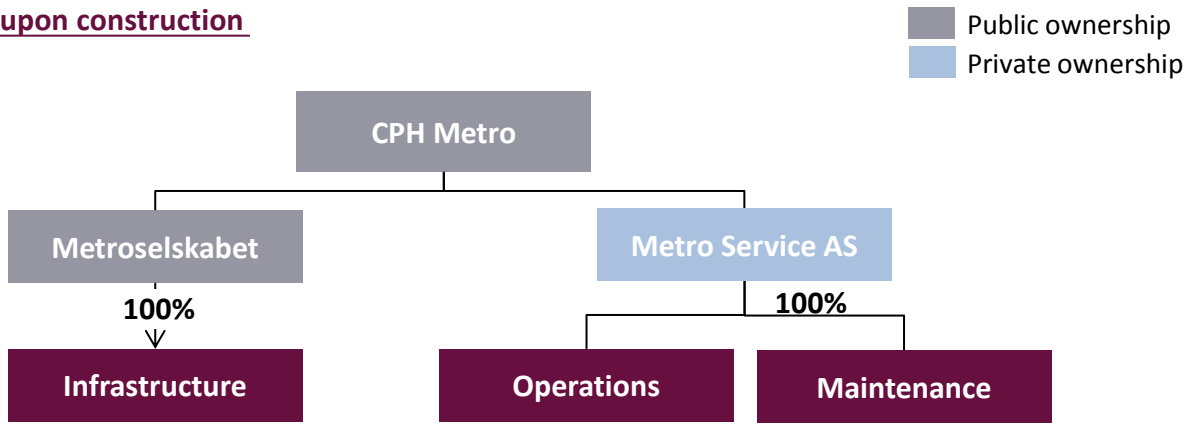
Source: www.m.dk; CPH Metro Inauguration Seminar, 2002; Financing and Organizing the Metro, Olsen 2001; Expert Interview, Metroselskabet Annual Reports

The organizational model is based on public ownership through Metroselskabet and a private operator, Metro Service with a 5 year contract

Organizational characteristics, ownership, and operation structures

Phases / Parameters	Design	Build	Own	Operate
Actors	• Ørestad Development Corporation • Frederiksbergbaneselskabet I/S • Østamagerbaneselskabet I/S	• COMET (Copenhagen Metro Construction Group*) • Ansaldo STS • Hoffmann-Arkil-Novejfa • INTABB v/ABB	• Metroselskabet** (Publicly owned)	• Metro Service AS
Public	✓	✗	✓	✗
Private	✗	✓	✗	✓

Ownership model upon construction



Key characteristics

1. The **infrastructure** is owned by **Metroselskabet** (the state) and **operations and maintenance** done the private operator, **Metro Service**
2. The model is a **Develop – tender – build – tender-operate model**, which allows Ørestad Development Corporation /Metroselskabet to **optimize** during the process
3. **Incentive** based **contract** between **Metroselskabet** and **Metro Service** based on e.g. customer satisfaction and passenger numbers

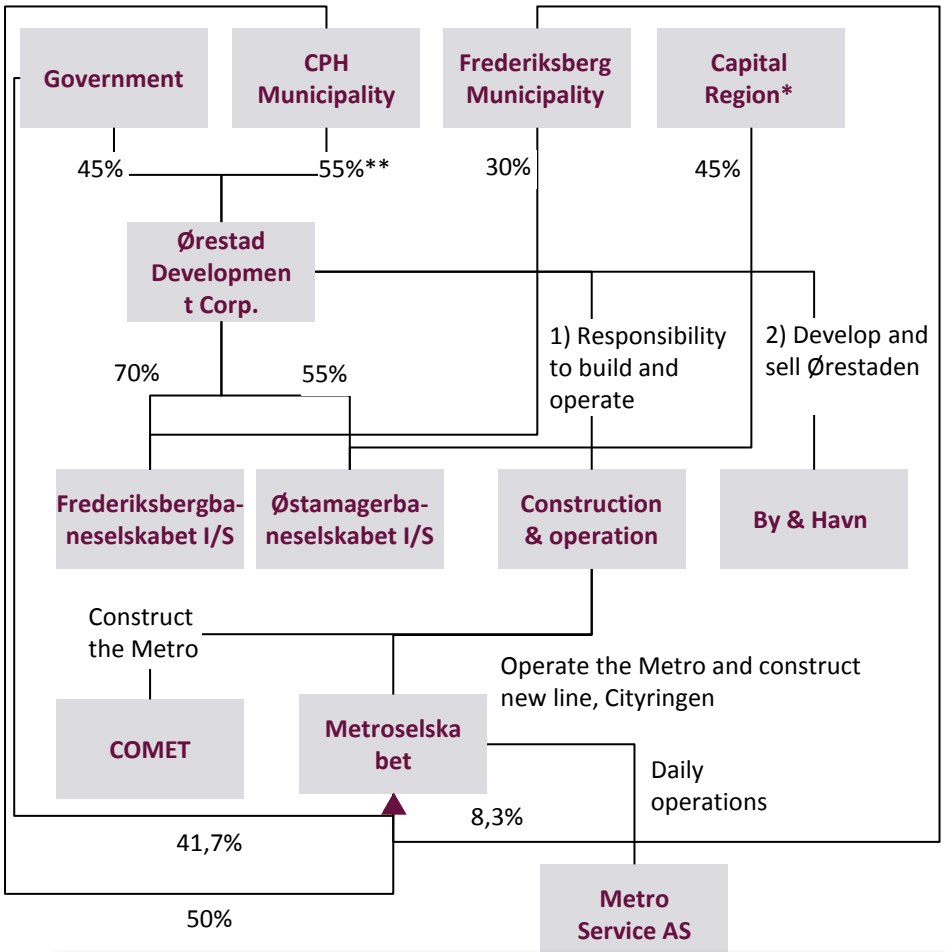
*COMET consisted of Astaldi, Bachy, SAE, Ilbau, NCC Rasmussen & Schiøtz Anlæg and Tarmac Construction

**Ørestad Development Corporation was split into Metroselskabet and By & Havn in 2007

Source: www.m.dk; CPH Metro Inauguration Seminar, 2002; Financing and Organizing the Metro, Olsen 2001; Expert Interview

CPH Metro is build around three state and municipality owned development corporations, most importantly the Ørestad Dev. Corporation

Structure of main contracts and ownership



Key contractual characteristics and challenges

Characteristics

- **Ørestad Development Corporation**, **Frederiksbergbaneselskabet** I/S and **Østamagerbaneselskabet** I/S have the **responsibility** to **build** and **operate** the **Metro - Ørestad Development Corporation takes on the entire responsibility**
- **Ørestadsselskabet** is **obliged** to **develop** and **sell Ørestaden** along with developing its infrastructure – in **2007 Ørestad Development Corporation was split into Metroselskabet** (responsible for operations and construction of the new line) and **By & Havn** (responsible for the development of Ørestaden)
- **Metro Service AS** is **owned by International Metro Service** (ATM (Aziende Transporti Milanese) and AnsaldoSTS)

Challenges

- The **revenue-sharing** system between the transport companies in CPH was **not** fully **agreed** in advance and ongoing disputes have been settled by the Ministry of transport
- **COMET** had until recently a **268M€** unsettled **claim** on Metroselskabet, which posed a **financial risk** to the balance in Metroselskabet
- **Two year delay** due to general construction problems and especially **two stations** were more **complicated** to build than expected
- The decision to **use untried technology has** implied **challenges**

Takeaways

- Be **clear** about I) what **technology** to **use** and II) the potential **limitations** and **challenges following** this technology **early in the process**
- **Contracts** describing the **financial relationships** between public and private are **crucial to get right** to **avoid financial disputes** and instability

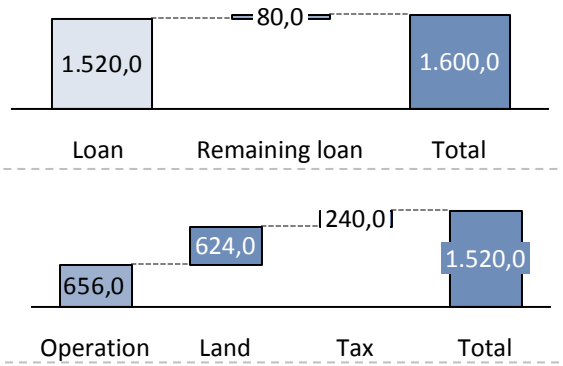
*At that time Københavns Amt

** Resembles the previous division of land ownership between the two

Source: www.m.dk; CPH Metro Inauguration Seminar, 2002; Financing and Organizing the Metro, Olsen 2001; Expert Interview; www.eltis.org

The CPH Metro was financed using the "New Town" principle and has been financed purely with public finances

Investment	Investment structure (Percentage)	Investment type	Break down (Million Euros)
Construction	Private vs. public: Public, Private, Total — 100 / 100	Debt	▪ Loans by the owners of Ørestad Development Corporation (state and City of Copenhagen) financed the entire construction ▪ 5% will remain government loan
	Debt vs. equity: Debt, Equity, Total — 100 / 100	Sources of re-payment	▪ Operational revenue (Operation) ▪ Land sale (Land) ▪ Property tax (Tax)
		Government benefits	▪ **310 ha** of land in Ørestaden from the state and the City of Copenhagen
Operation	Metro Service, Total — 100	Key issues and characteristics	▪ The Metro experienced **significant cost overruns** as the **expected cost** was **1065M€** and the **actual** cost was close to **1600M€** ▪ The cost **overruns** have been **mitigated** by the fact that **land** has been **sold** more **easily** and **expensively** than expected and borrowing has been done at a lower interest rate than planned ▪ **Ørestad Dev. Corporation** had access to **full financing** through **re-lending of government loans**, which financed the cost of construction ▪ **A 25-30 years repayment period made** it possible to develop the land over a **longer time period (30-40 years)** to **increase** the **ultimate revenue** ▪ **Loans are paid** for by **income** from I) **sale of land**, II) **operations** and III) **reversal of land tax** from sold land



Takeaways

- The **cost** of **construction** was **underestimated,** but the **land** was **sold** more **expensively** than expected and the **interest** on the **loans** were **lower than foreseen**
- The **New Town principle** is a **useful** model but it **depends** on having the **sufficient** size of right **land**

Note: The company Metro Service is owned partly by Metro International and Ansaldo STS
Source: www.m.dk; CPH Metro Inauguration Seminar, 2002; Financing and Organizing the Metro, Olsen 2001; Expert Interview; www.eltis.org