Concept Symposium 2016
Governing the Front-End of Major Projects

International experience with implementation strategies

Olav Torp
Associate professor
NTNU
Norway

The choice of implementation strategies in public Norwegian construction projects (roads and railway) have primarily been design-bid-build, with some experiments with design-build and PPP. Recent years there has been an increase in the size of the projects and thereby increasing size of contracts. The Norwegian Public Roads Administration and Norwegian National Railway Administration have introduced new thoughts regarding implementation strategies. Norwegian Public Roads Administration plan to build the new E39 – ferryfree West Coast. As a part of the early planning, Norwegian Puclic Roads Administration want to identify relevalt experiences with relational implementation strategies in relevant countries. NTNU has done a research project, identifying experiences from different countries with different implementation strategies, focusing on relational contracts. Findings from the study of experiences with relational contracts in large infrastructure projects in Northern European countries will be presented.

We found that different variants of relational contracts are used in different counties. However, we found it difficult to spot patterns in factors that dictate choice of variant. We found concepts like Alliancing, Best Value Procurement, PPP, Partnering and Competitive dialogue used. It seems like the choice of variant is dependent on key persons with an idea they believe in. Most countries have experienced both positive and negative outcomes. Negative experiences have in some cases led to the abandoning of tested models. Where one has persisted and “mastered” the model, several countries have demonstrated positive results.

NTNU – Trondheim
Norwegian University of
Science and Technology

International experiences with implementation strategies

(On behalf of the Norwegian Ferryfree E39 project)

Associate Professor Olav Torp

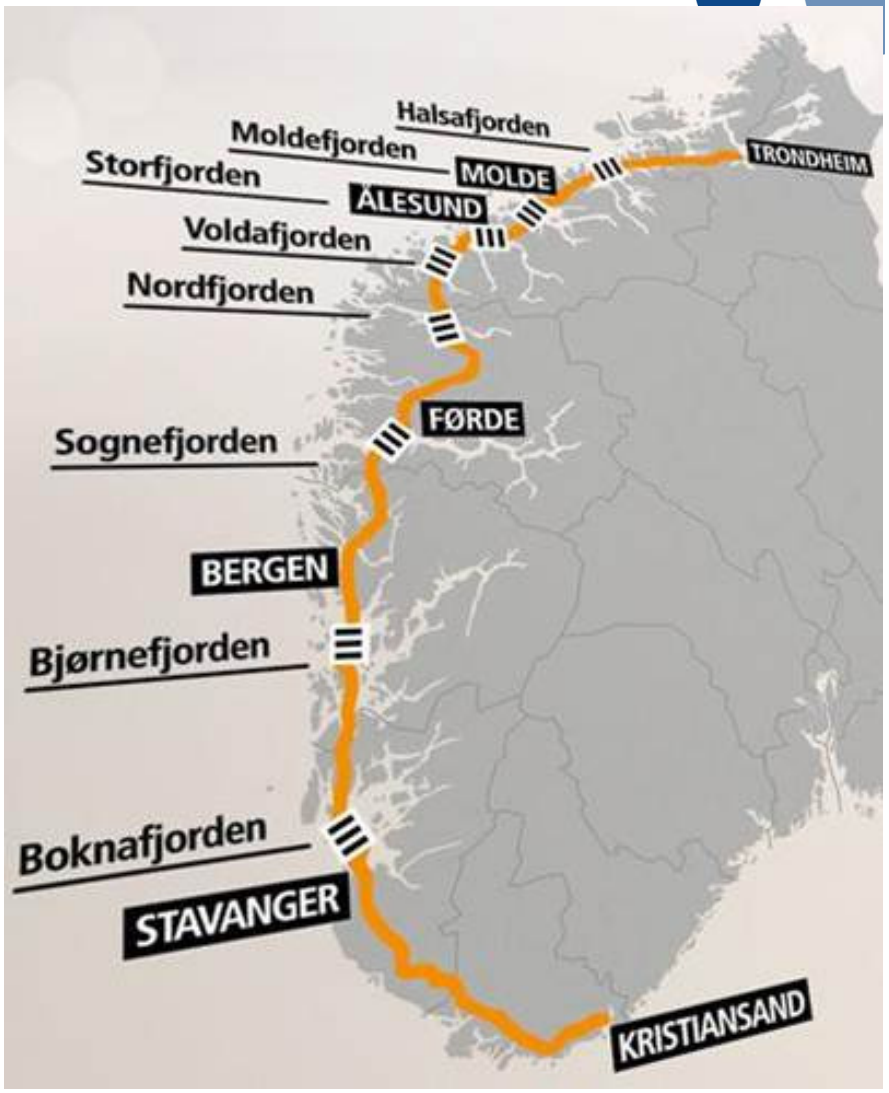
NTNU - Norwegian University of Science and Technology

Structure of Presentation

- Background, Ferryfree E39 challenges
- About the study
- Existing project/contract models
- Experiences from different countries
- Cross-country analysis

Background

- This study triggered by the Ferryfree E39 program in Norway:
  - Owned by the Norwegian Public Roads Administration (NPRA)
  - Existing route that runs along the western coast of Norway, a distance of almost 1100 km
  - Plan to replace eight ferries with fjord crossings
    - Example: The Sognefjord, about 4 km wide, depths of up to 1,300 m and 200-300 m of bottom deposits above the rock, is considered a most difficult and challenging fjord to cross
  - Additional challenge: Aim to utilize bridge infrastructures for producing energy from the renewable sources solar, tide currents, waves and winds
  - Total costs estimated at appr. 268 billion NOK (currently)



Ferryfree E39 Characteristics

- Long duration, but end date not (so far) critical
- High investment and life cycle costs
- Technically complex, high demand and ambitions for innovations
- Political ambitions to impact national industry
- But somewhat limited availability of suppliers able to undertake such a large program
- Owner organization that expects to come under pressure in terms of resources and competence to manage both engineering and execution

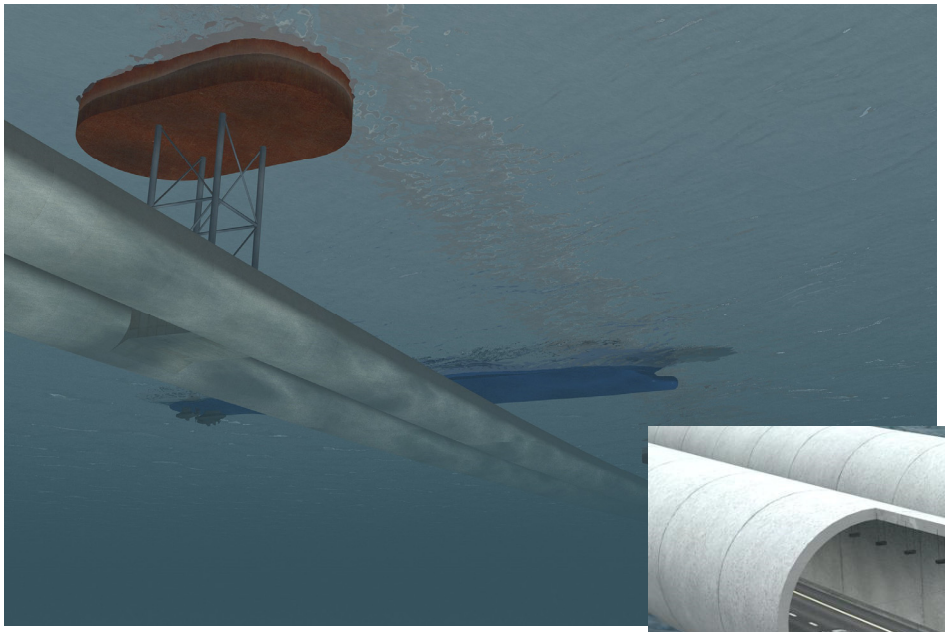
Some Concepts

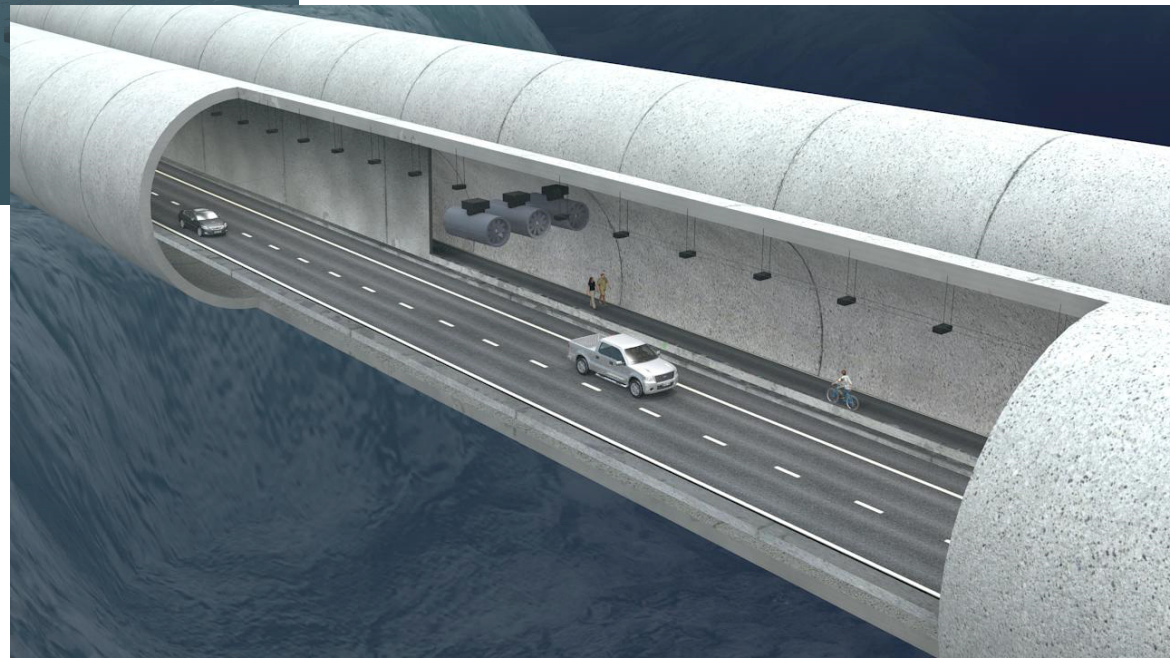
One-span suspension bridge

Some Concepts

Floating bridge with opening for ships

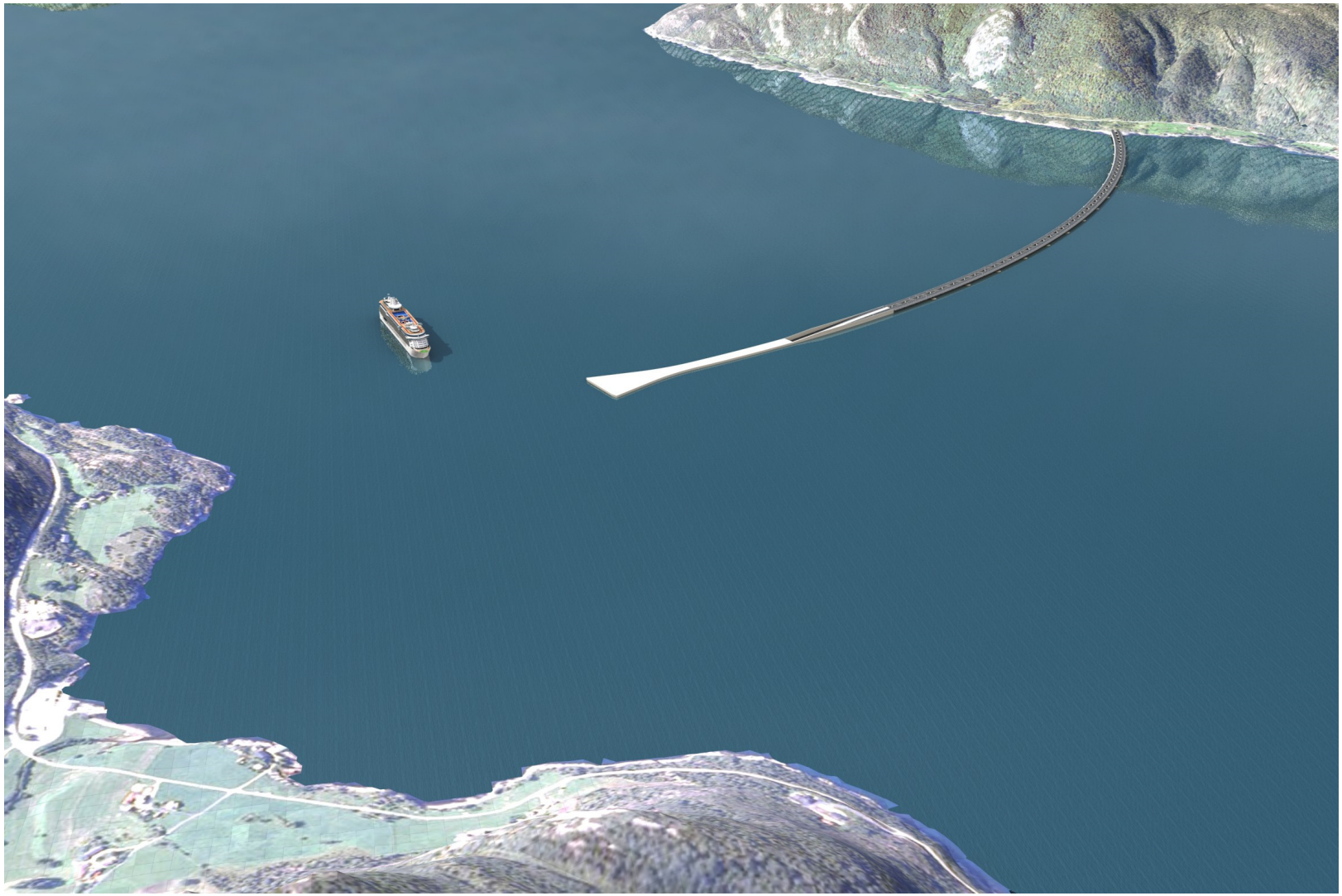
Some Concepts





Pipe bridge with pontoons

Some Concepts



Combination of floating bridge and pipe bridge

Ferryfree E39 Challenges

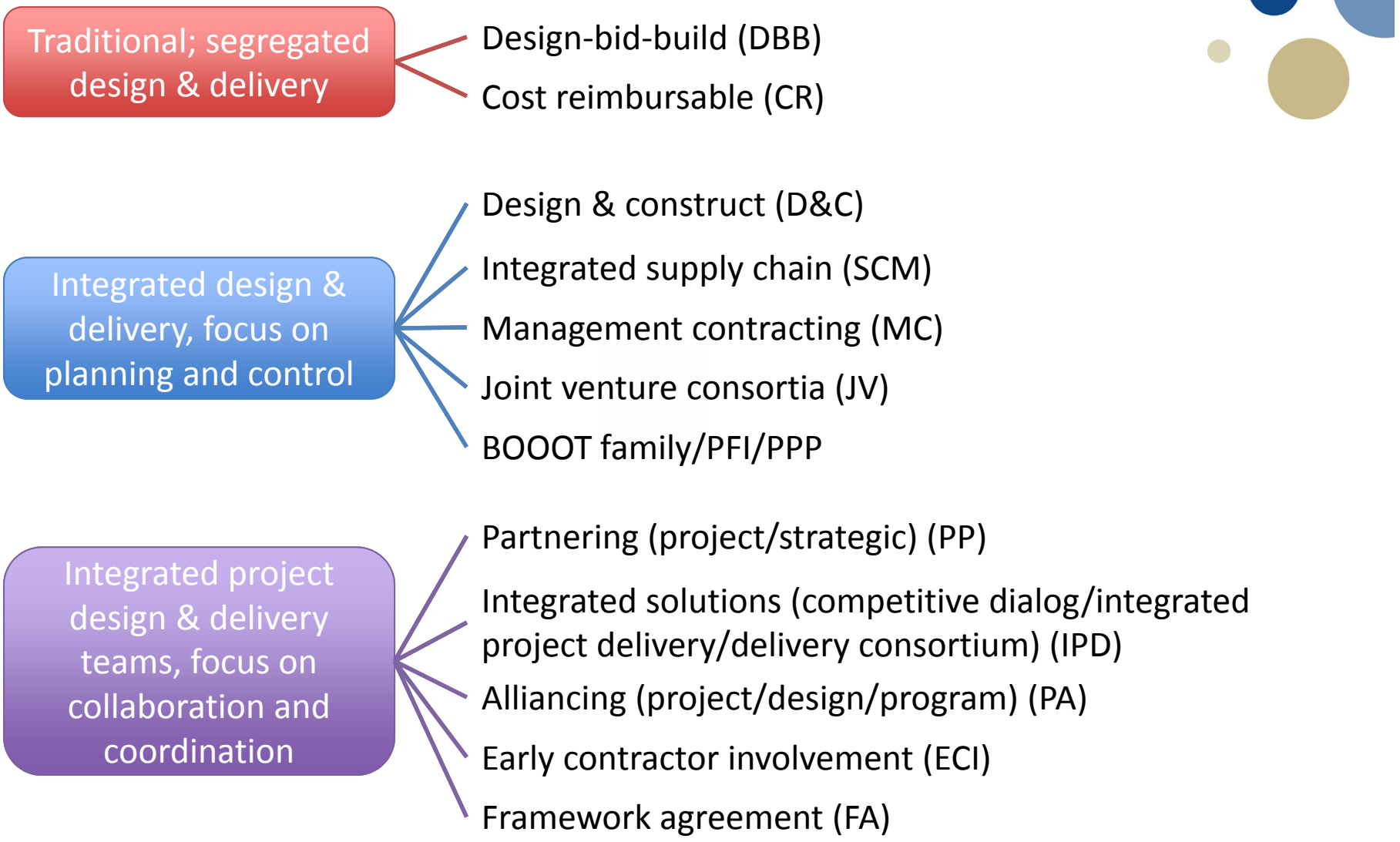
- NPRA has mostly relied on traditional design-build contracts
- But also experimented with PPPs and some form of partnering contracts
- This program will take things to a new level:
  - Easily the largest program ever undertaken by the NPRA
  - Contracts will be so large that they will attract global players
  - Need for extensive technical innovations to be able to build the project
- This will require a revised implementation strategy
- NTNU given the task to investigate experiences with innovative project/contract models in different relevant countries

The Study

- Team of researchers at NTNU (Ola Lædre, Olav Torp, Nils Olsson, Ali Hosseini, Bjørn Andersen)
- Research methods:
  - Literature review
  - Data collection from selected countries/case projects through semi-structured interviews
- Countries targeted:
  - Sweden
  - Finland
  - Denmark
  - The Netherlands
  - UK
  - Australia

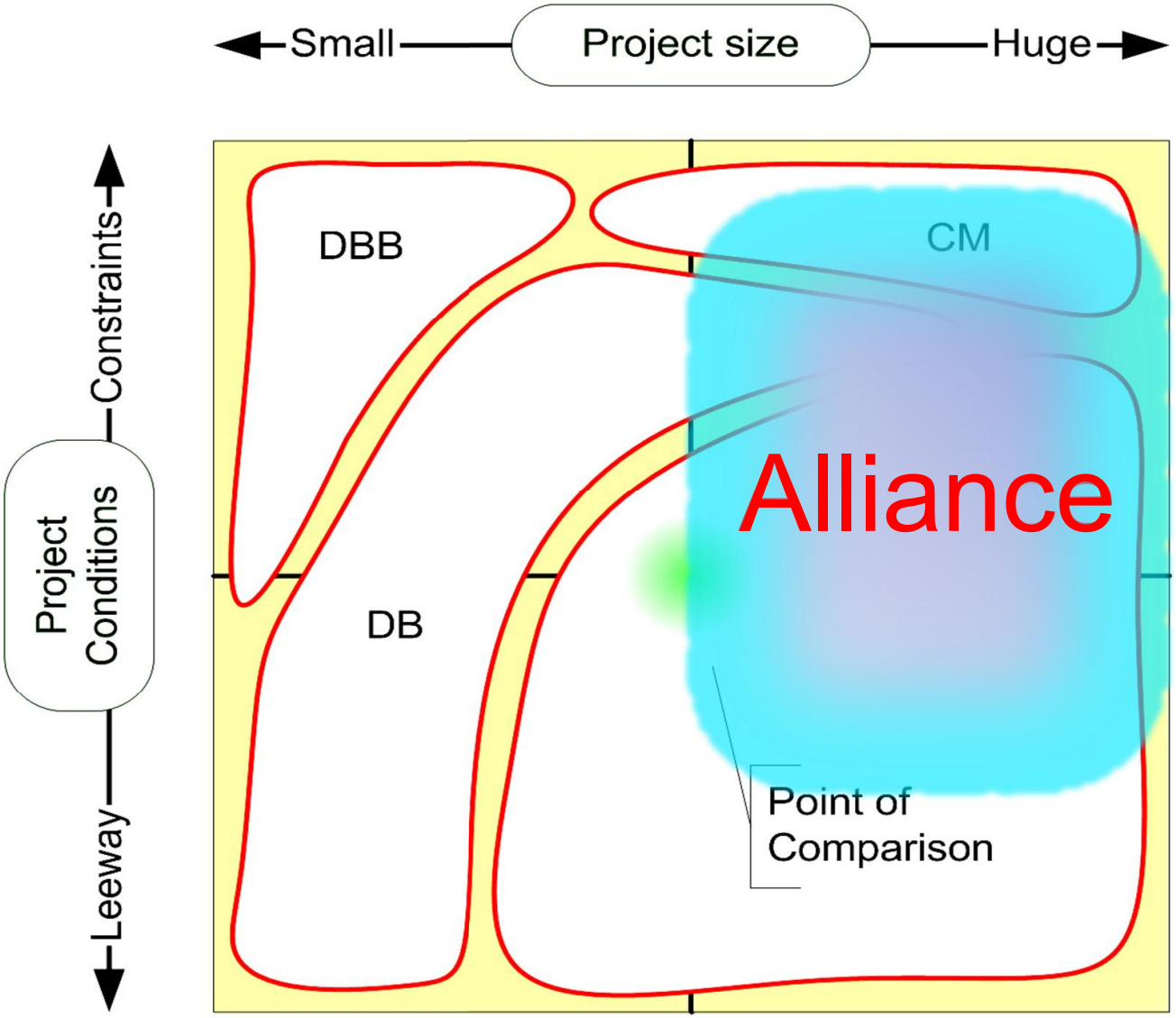
Existing contract models

One (Very Recent) Overview of Models



Walker & Lloyd-Walker: **Collaborative Project Procurement Arrangements**, 2015, PMI

View on Different Models (FTA)



Findings from the study

Norway

Experiences from Norway

- Infrastructure, two-stage development:
  1. Early 2000s, 3 PPP road projects (evaluation next slide), PPP abandoned by labor government, being revitalized
  2. From mid-2000s, partnering has been widely used in road and rail projects, termed partnering, but in reality mostly traditional contracts with short phase of “getting to know one another”
- Other large, public projects:
  - St. Olavs Hospital, comprehensive partnering bordering on alliancing, very positive results
  - Statsbygg, four partnering pilots, mainly positive results, but some challenges

Finland

Experiences from Finland

- Finnish Transport Agency (FTA) motivated by low productivity
- Two-stage development:
  1. 1997 and onward, PPP road projects (attempted rail), primarily motivated by access to financing, good execution performance, but front-end/contracting phase demanding, FTA not likely to use PPP again unless politically instructed to do so
  2. From 2010, 3 alliance projects (so far), strongly inspired by the Australian model:
     - Lielahti-Kokemäki rail renovation (completed), “easy” suitable first pilot
     - Tampere Rantatunneli road tunnel (in construction)
     - Taavetti-Lappeenranta road project (in project development)
     - Aim to improve productivity, change to a more open and trusting culture, improve the customer satisfaction with end products, and develop innovativeness and knowledge
     - Initial issues with EU legislation

Alliancing in Strong Growth

	Project Alliances in Finland* (date 22.10.2014) Client/Owner	Project	M€	2010 Q1 Q2 Q3 Q4	2011 Q1 Q2 Q3 Q4	2012 Q1 Q2 Q3 Q4	2013 Q1 Q2 Q3 Q4	2014 Q1 Q2 Q3 Q4	2015 Q1 Q2 Q3 Q4
1	Finnish Transport Agency (FTA)	Lielahti-Kokemäki Railroad Renovation	100						
2	University of Helsinki	Vuolukiventie Residential Housing Renovation	18						
3	City of Tampere & FTA	Tampereen Rantatunneli tunnel	180						
4	Finnavia	Helsinki Airport Paving*	20						
5	Senate Properties	National Institute for Health and Welfare Head Office*	18						
6	Järvenpää City	Järvenpää City Hospital	50						
7	University of Helsinki	Franzenia Renovation from school to day care centre*	6						
8	City of Lahti	Lahti Transport Terminal	19						
9	Senate Properties	Joensuun Justice and Police Station	30						
10	City of Helsinki	Pakila Maintenance	6						
11	Senate Properties	Nuclear Safety Building for National Research Centre	30						
12	Fira Ltd	Retkeilijänkatu Rental Residential Housing	10						
13	Seafarer's Pension Fund	Gunillankallio Rental Residential Housing	10						
14	KOy Jyrkkälänpolku**	Jyrkkälä Suburban Renovation	20						
15	Turun Seudun Energiatuotanto Ltd	Naantali Powerplant alliance contract	45						
16	University of Helsinki	Administration Building Renovation	18						
17	Kainuu Central Hospital	Kainuu Central Hospital	120						
18	FTA	Highway 6 Taaveti-Lappenranta renovation	76						
19	Municipality of Kempele?	Kempele Medical Center	14						
20	Senate Properties	Kotka Police Hedquarters	20						
21	City of Oulu	Hiukkavaara Community Center	24						
22	City of Tampere	Tampere Tramway / Infra	250						

Strategic phase
Procurement phase
Development phase
Implementation phase
Maintenance phase

Holland

Experiences from The Netherlands

- Actively implemented the Best Value procurement model (originally developed at Arizona State University)
- Motivated by long duration of projects and “over-management” of contractors
- Handled by Rijkswaterstaat, agency under Dutch Ministry of Infrastructure and the Environment, responsible for roads and waterways
- Applied in increasingly more complex projects

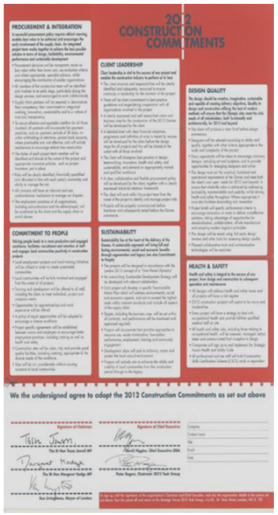
UK

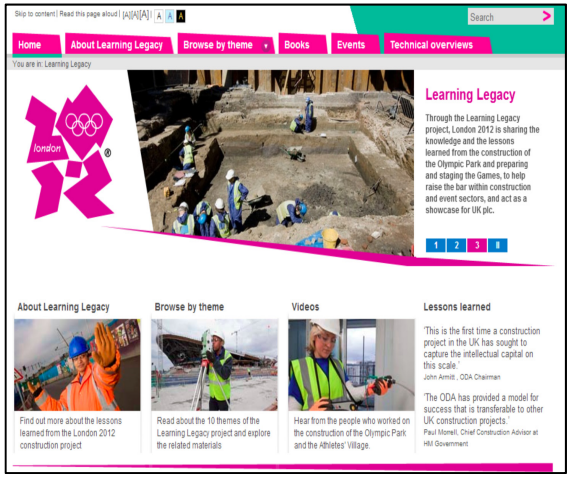
Experiences from the UK

- One of the countries where different relational models have been applied most extensively, especially partnering
- Alliancing less used, Heathrow Terminal 5 agreement pioneer in integrated SCM
- Wide variety of experiences, good and bad, from different models in different types of projects and contexts
- Seems highly dependent on motivation, skills in implementing the chosen model, external factors, etc.
- Impossible to summarize results succinctly, but Constructing Excellence has assembled findings from the most comprehensive experiments

London 2012 Test Case for Many “Best Practices”

- Stakeholder governance and management
- Programme management
- Supplier engagement
- Strategic procurement
- Pre-planning
- Building Information Modelling
- Logistics
- Sustainability
- Legacy value
- Safety, health & welfare
- Local training & apprentices





Sweden

Experiences from Sweden

- Infrastructure projects have typically relied heavily on traditional execution contracts
- Large infrastructure projects have shown good budget performance
- But seen the need for more innovation, in recent years changed to more EPC-type contracts, Swedish Transport Administration (STA) should use about 50% of this type
- Tried partnering (utökad samverkan) in a few projects, with good results, including reduced level of change orders, but STA sees partnering more as a qualification requirement
- Partnering dependent on the people involved
- Gothenburg West Link project uses Design & Build contracts supplemented by Early Contractor Involvement, key motivation to elicit innovations in the design phase

Denmark

Experiences from Denmark

- Femern Belt project, 60 – 70 Billion DK, need for innovative solutions
- Used competitive dialogue and DB
- Pre-qualification, then award criterion “Most Economically Advantageous Tender” with much weight on management resources
- Competitive dialogue is suited for large, complex projects with a need for innovation
- Both client and suppliers use more resources in the procurement process (contractors compensated for “approved tenders”)
- Technical tenders delivered first, then the financial tenders
- Partnering only introduced after signed contract - informal partnering
- Good experiences with competitive dialogue
- Femern company solely for this project - competitive dialogue will be used for in large road projects, but the main strategy will be to use traditional models for smaller projects

Australia

Experiences from Australia

- Extensive use of partnering and ECI, but alliancing has been the main focus, with several Australian government departments being important promoters of project alliances and how to ensure and pursue Value for Money
- Extensive use of project alliances in different sectors
- Later variants include design alliances and program alliances
- From 2012, a weak trend that the scale and number of projects delivered using an alliance approach is declining, attributed to:
  - State and commonwealth (federal) government changes
  - A perceived ”over-use” of alliances
  - Some hint of high levels of fatigue by senior management about the commitment and energy required of alliances

Discussion and Recommendations

Cross-Country Analysis

- Very high variation in chosen approaches and maturity in adopting relational models
- Seems to be somewhat random and based on coincidence which model has been tested
- Often determined by chance or sources of inspiration
- Dependent on champions to push pilot projects and possibly permanent usage
- Often facing strong opposition

Observations

- Two approaches:
  - Sweden and Denmark: Partnering is an attitude, not a contractual issue
  - Great Britain, Finland, Netherlands and Australia: Partnering need support from incentives and contract
- Competitive dialogue often used, also as a tool for early contractor involvement
- It is important to select a suited supplier
- Most of the relational based contracts/strategies we have studied do not include operations or maintenance

Results Achieved

- Most countries have experienced both positive and negative outcomes
- Negative experiences have in some cases led to the abandoning of tested models
- Changes in political power has also triggered changes in usage
- Where one has persisted and “mastered” the model, several countries have demonstrated very positive results

Implications for Ferryfree E39

- The case countries/projects are relevant and have much in common with the project
- All of them have chosen contract models with relational characteristics
- Difficult to see a pattern of project characteristics dictating the choice of contract model
- We suspect coincidence, personal experiences, influence by external actors, and political strategies to have influenced the decisions

- Questions / Comments ?