



# Concept Symposium 2016

## Governing the Front-End of Major Projects

### Early Contractor Involvement (ECI) in Norwegian Bridge Projects



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It is widely accepted that contractor involvement in the front end can influence the outcome of the project in a positive way. However, in the traditional project delivery method of construction projects, the design and construction process are separated and sequentially. As a consequence of this, it is difficult to integrate construction knowledge in the front-end of projects. The evolving project methods are designed to remove such typical challenges by involving contractors early in the process. However, the EU public procurement directive represents a challenge for public owners when they consider early contractor involvement (ECI) in their projects.

This session will answer the following questions based on multiple case study and literature review.

- What are the approaches used to implement ECI in Norwegian bridge projects without violating EU public procurement directive?
- What are the success factors for ECI?
- How could the practised approaches be improved?

In this session seventeen approaches of ECI identified from literature as well as twelve approaches of ECI identified during case study will be explained. In addition six success factors of ECI identified from interviewees will be presented. The session will also reflect on the potential of the each of the practiced approaches of ECI and gives recommendation for improvement in future implementation of them.

Keywords - Early contractor involvement, approaches of ECI, Success factors, Public owner, public procurement.



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# **EARLY CONTRACTOR INVOLVEMENT (ECI) IN NORWEGIAN BRIDGE PROJECTS**

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# Who am I ?

- MSc from Chalmers University of Technology in DCPM, 2010
- Employee at Norwegian Public Roads Administration (NPRA) since 2011,
  - control engineer on Tresfjordbrua
- PhD Candidate at NTNU since 1. December 2015
  - Department of Civil and Transport Engineering
- The PhD position is financed by: Coastal Highway Route E39 (Ferjefri E39)
- PhD topic: Implementation Strategies and Contract Forms
- Until now I have been working on Early Contractor Involvement (ECI)

# Why Early Contractor Involvement ?

- ECI is all about involving the contractor in the early stage of project development, to get assistance in planning and design phase by working together as a team with owner and consultant.
- It is one of the strategies to integrating construction knowledge into design.
- ECI can ensure better value for money for clients by involving contractors' knowledge to the early phases of projects.

# What are the barriers to ECI ?

- Cultural change compare to traditional project delivery methods
- It demands teamwork
- Contracting practice is different from the traditional project delivery methods
- Lack of understanding of the concept and its benefits
- International and national legislation

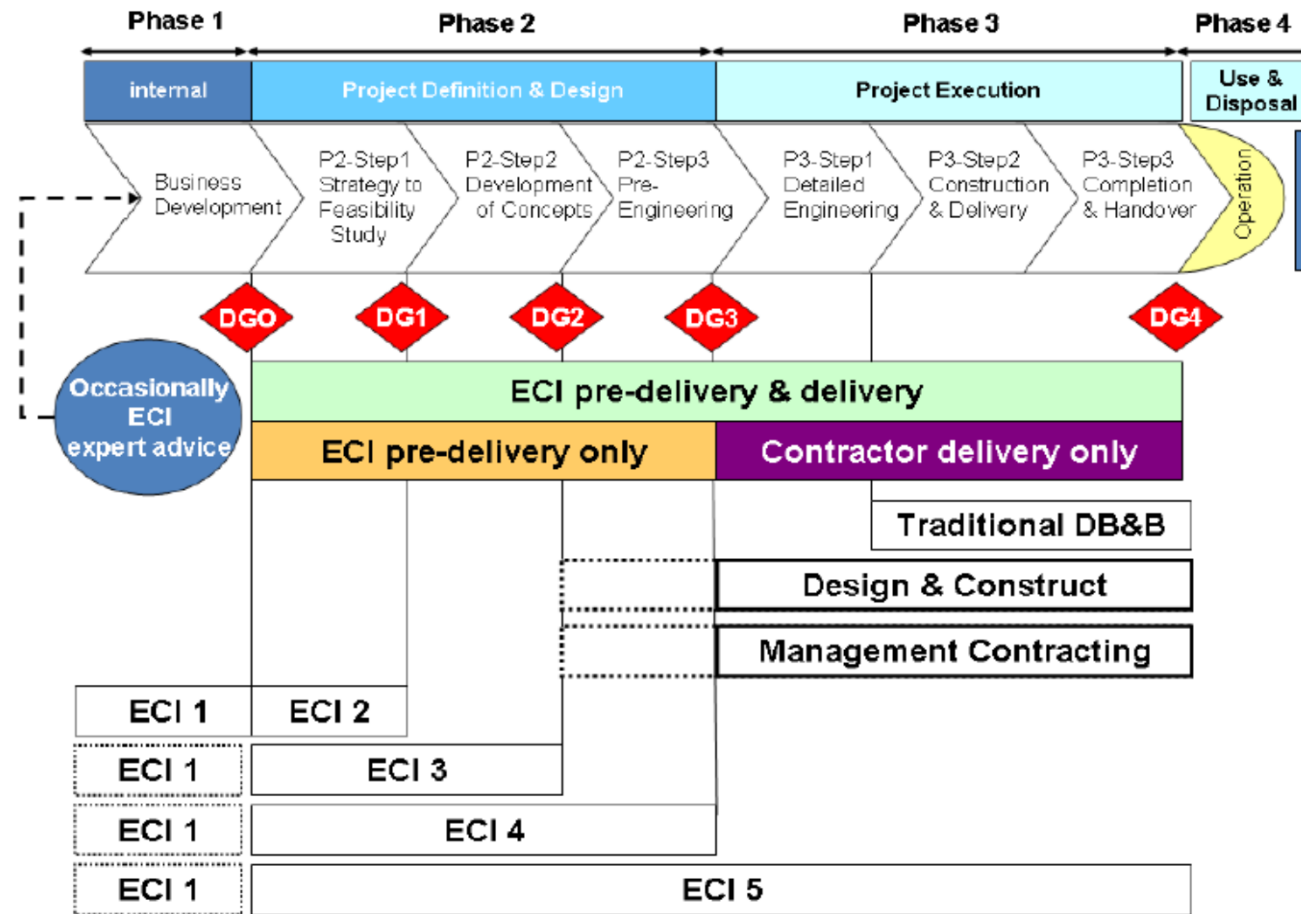
# Research questions

- What are the approaches used to implement ECI in Norwegian bridge projects without violating EU public procurement directive?
- What are the success factors for early contractor involvement?
- How could the practised approaches be improved?

# Research Methods

- Case study approach
  - 11 bridge projects
- Literature study
- Document study
- Fourteen interviews with key actors from the selected cases

# ECI Models



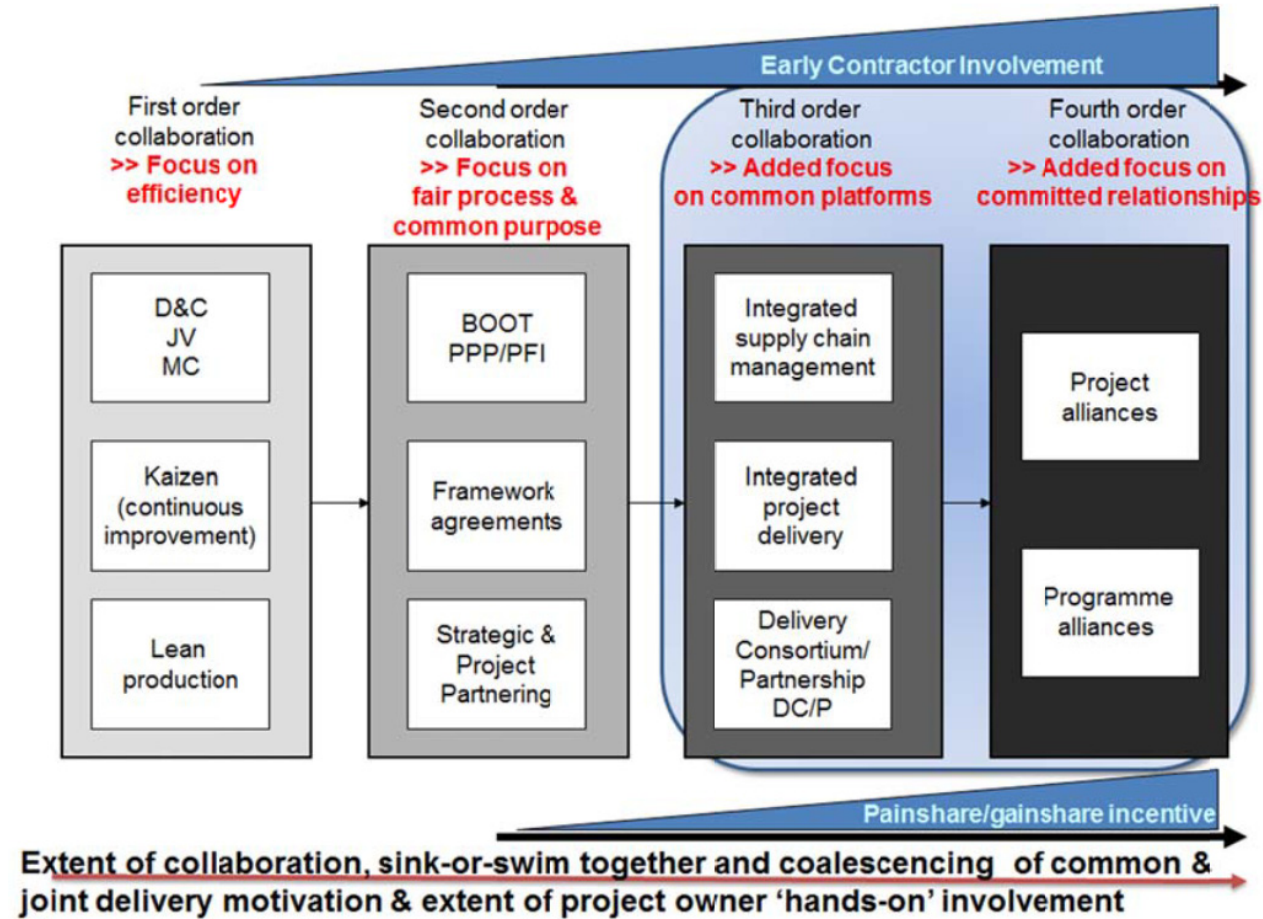
(Walker and Lloyd-Walker, 2012) adapted from  
(Klakegg et al., 2010)



# ECI implementation approaches identified from literature

	Approaches of ECI	Literature ( Authors)
1	Competitive dialogue	(Lenferink et al., 2012), (Hoezen, 2012)
2	Negotiated procedure	(Van Valkenburg et al., 2008), (Lenferink et al., 2012), (Hoezen, 2012)
3	Public Private Partnerships (PPP)	(Walker and Lloyd-Walker, 2012), (Rahmani et al., 2014)
4	Design & Construct contract	(Rahmani et al., 2014)
5	Project Partnering	(Rahman and Alhassan, 2012), (Walker and Lloyd-Walker, 2012), (Lahdenperä, 2012),
6	Alliancing	(Walker and Lloyd-Walker, 2012), (Rahmani et al., 2014), (Lahdenperä, 2012),(Rahman and Alhassan, 2012)
7	Management contracting	(Rahmani et al., 2014), (Walker and Lloyd-Walker, 2015), (Rahman and Alhassan, 2012)
8	Building Information Modelling (BIM)	(Gransberg, 2016), (Kent and Becerik-Gerber, 2010)
10	Most Economically Advantageous Tender (MEAT)	(Scheepbouwer and Humphries, 2011), (Lahdenperä, 2013)
11	Best Value Procurement (BVP)	(Hoezen, 2012), (Kashiwagi, 2016)
13	Cost led procurement	(Gransberg, 2016)
14	Integrated project Insurance	(Gransberg, 2016)
15	Open book target pricing	(Gransberg, 2016), (Scheepbouwer and Humphries, 2011), (Rahman and Alhassan, 2012)
16	Integrated project Delivery	(Gransberg, 2016), (Kent and Becerik-Gerber, 2010), (Lahdenperä, 2012)
17	Framework agreement	(Walker and Lloyd-Walker, 2015)

# ECI vs Collaboration



(Walker and Lloyd-Walker, 2015)

# What are the approaches used to implement ECI in Norwegian bridge projects without violating EU public procurement directive?

No	Approaches of ECI	1	2	3	4	5	6	7	8	9	10	11	Total
A1	Indirect approaches	X	X	X	X	X	X	X	X	X	X	X	11
A2	Information meetings	X			X	X		X	X	X	X	X	8
A3	A front-end partnering process	X			X	X	X	X	X	X	X		8
A4	Announcing the project with alternative technical solutions	X	X	X	X			X		X	X		7
A5	Design & construct contract (DB)					X	X	X	X			X	5
A6	Direct contact with specialist contractors in the front-end phase of projects	X			X								2
A7	Idea competition				X								1
A8	Contractors sell their idea to the owner in the early phase							X					1
A9	Negotiated bidding procedure					X							1
A10	Opening for alternative tenders												0
A11	Competitive dialogue												0
A12	Project partnering												0

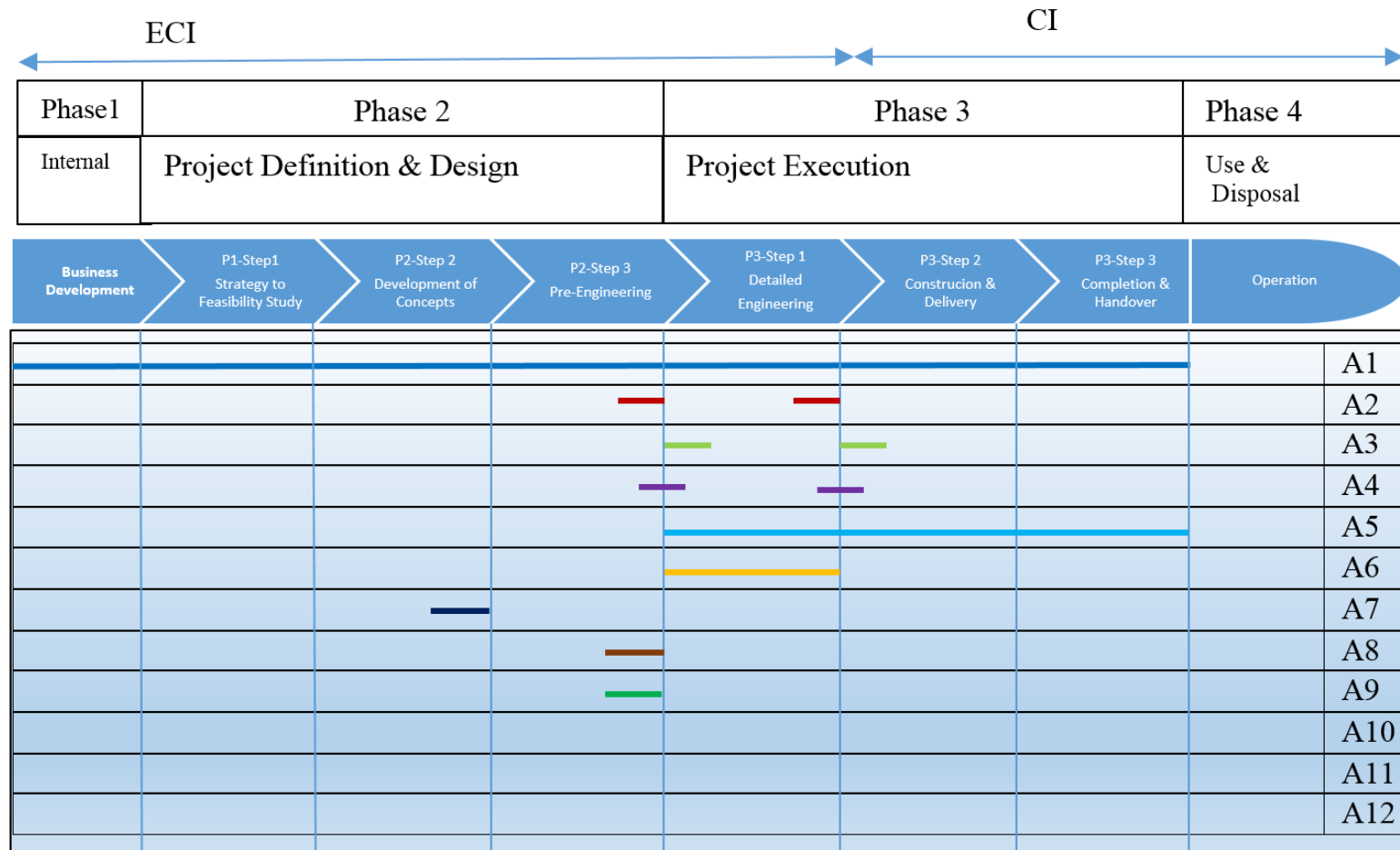
# What are the success factors of ECI ?

No.	Identified ECI Success factors
1	Involve contractors early enough
2	Manageable risk transfer to the contractors
3	Project owners` competence
4	Proper compensation for the contractors` contribution
5	Qualification of the contractors
6	Trust between the project owner and contractors

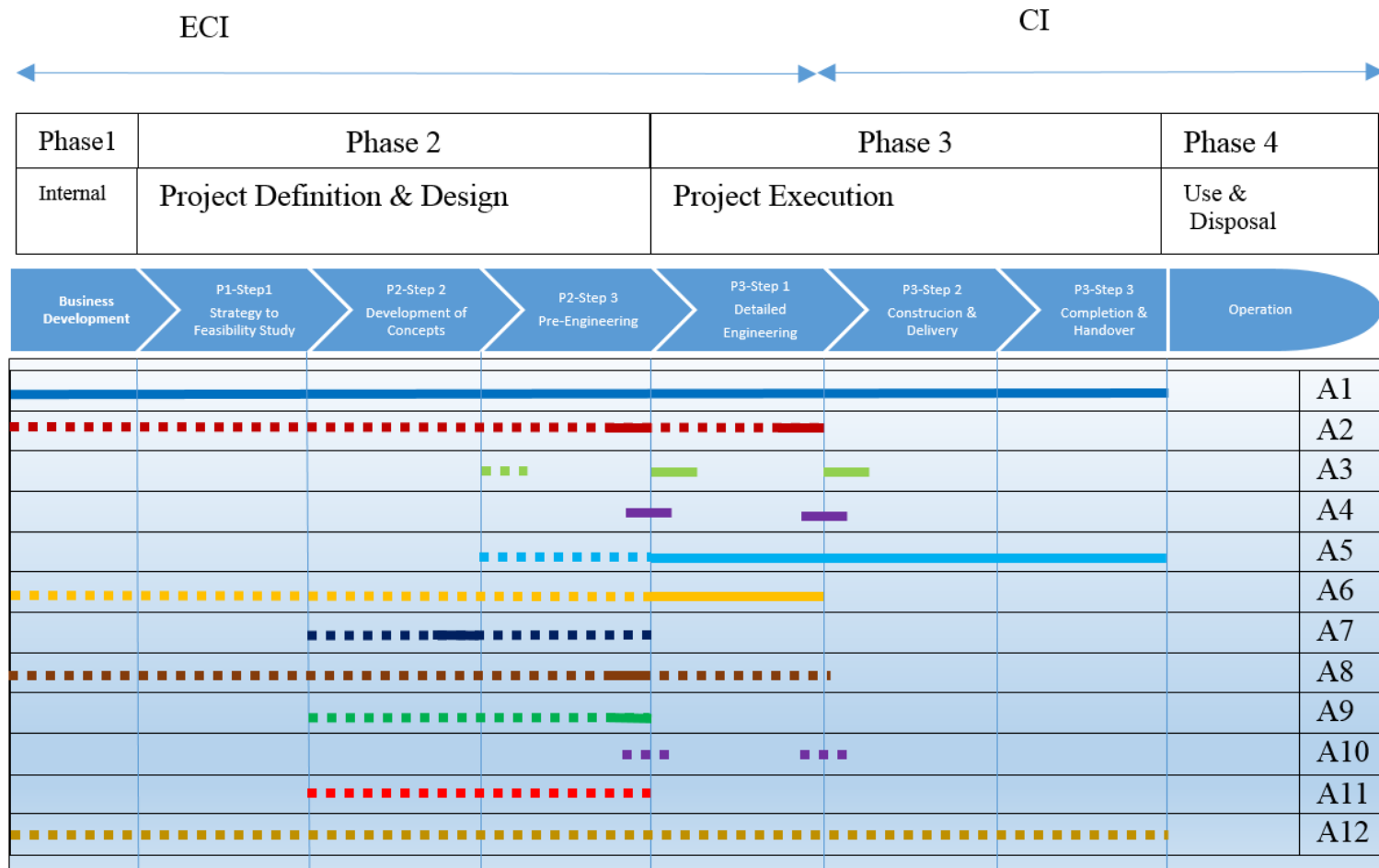
# How could the practised approaches be improved?

- Determined evaluation criteria
  - ECI success factors
    - Involve contractors early enough (Time)
- Evaluated the approaches & identified the weakness in the implementation of the practiced approaches.

# In which phases of projects have they been used ?



# What is the contractor involvement potentials of the identified approaches?



# The identified weakness in the implementation of the practiced approaches

- Most of the practiced approaches were used in late phases of the projects, then they were used to implement contractor involvement but not ECI.
- Most of the practiced approaches lack continuity during implementation as they were not used in several phases of projects.
- Most of the approaches of ECI full potential were not exploited .
- The practiced approaches should be tried in projects that demand their implementation in the earlier phases and in several phases. By doing so, it is possible to realize as well as exploit their full potential.



# Conclusion

- ❑ What are the approaches used to implement ECI in Norwegian bridge projects without violating EU public procurement directive?

Nine approaches that NPRA has used to implement ECI were identified.

- ❑ What are the success factors for early contractor involvement?

Six success factors of ECI were identified.

- ❑ How could the practised approaches be improved?

The recommendation is, the practiced approaches would be improved if appropriate consideration is given to the success factors of ECI while implementing them.

# Further work

- Competitive dialogue
- Best Value Procurement

How can these approaches of ECI be implemented effectively in Coastal Highway Route E39 project ?



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# Questions?