



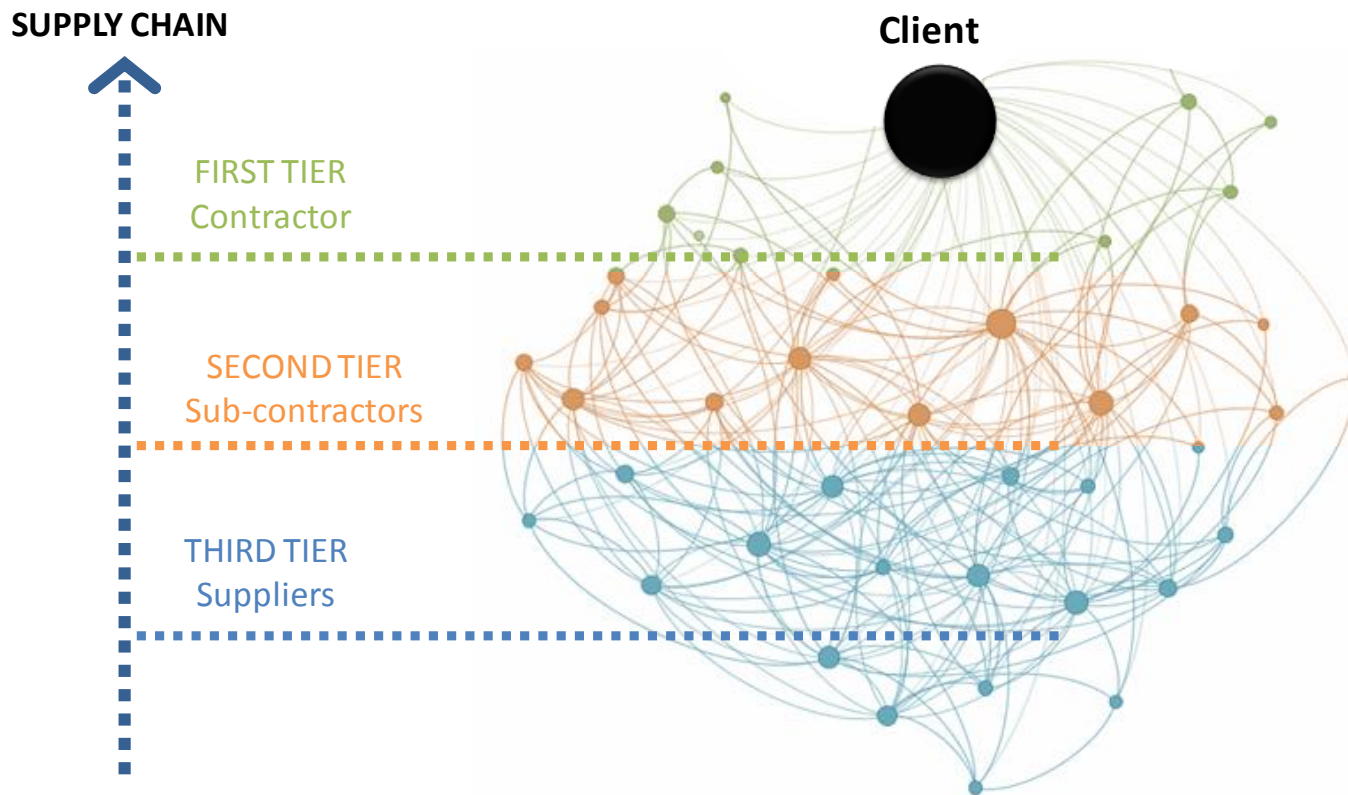
**UCL**

# **SNA in project organisations**

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# Supply chains as networks of individuals and organisations



Source: adapted from Pryke (2009)

# Supply chains as networks of individuals and organisations

- Project Relationship or Supply chains Relationships: Firms or individuals
- Contractual Relationships – Project
- Supply Chain Relationships – long term collaborative
- Innovation; design and value; carbon emission management; trust relate to long term relationships
- As the complexity of our projects increase, the specialised knowledge is located further away from the client in contractual terms

# Networks and Systems

- Hierarchies of contractual relationships between firms: procurement of resources
- Networks of inter firm and intra firm relationships at an interpersonal level: constitute the systems that deliver our projects
- Projects as information flow management systems
- Projects as relationship management networks
  
- We know relatively little about the systems that deliver our projects
- CONA aims to use SNA to map, analyse and graphically represent project relationships; and to redefine the way in which projects are managed
- Currently have Euro 200K funding from UK government to work with a major infrastructure client to improve their understanding of the systems that deliver their projects using SNA

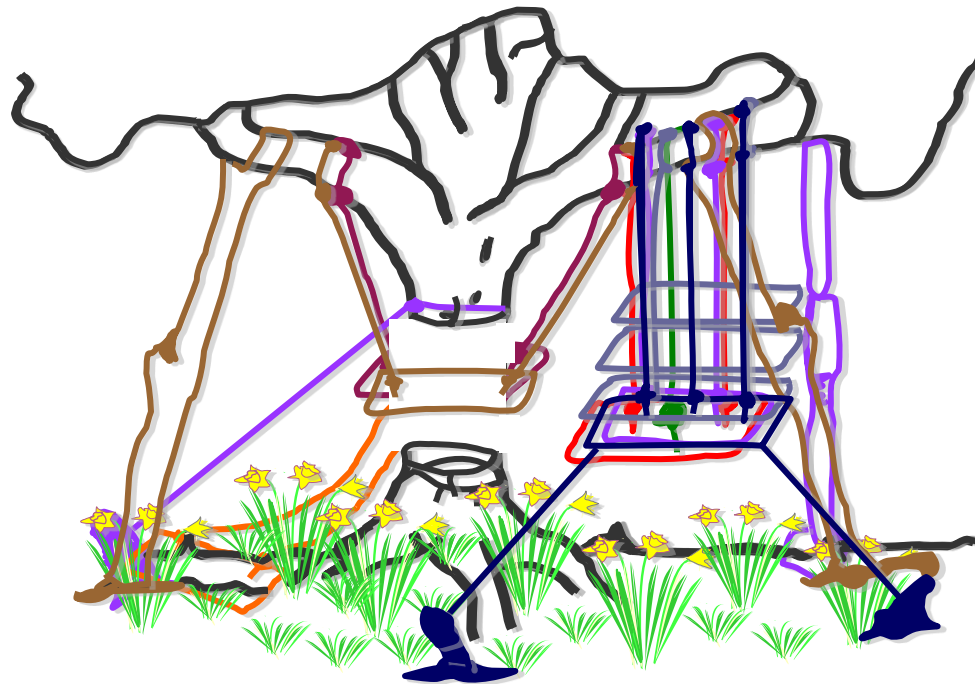
## Problem:

- Contracting System is flawed
  - Clients need ***completeness*** + ***open systems*** post contract
  - Clients get ***incompleteness*** + ***closed systems*** post contract
  - Procurement buys ***resources*** not systems

## Or expressed another way!

- Project definition: accuracy with foresight
- Outsourcing/ subcontracting: vested interest and long path lengths to specialised expertise
- Agency problem

# Defining projects; establishing appropriate governance



**As the building inspector saw it**

# SNA methodology

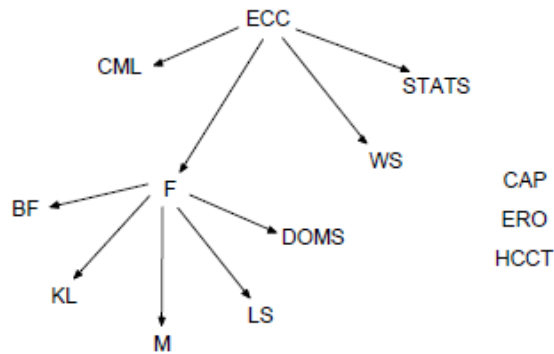
- Network case studies
- 4 UK projects comparing traditional and collaborative procurement strategies

Project	Gross floor area	Cost
Essex project (public/traditional)	5500	£20.20m
Uxbridge project (private/ traditional)	6500	£20.20m
Slough project (private/innovative)	6200	£11.40m
Aldershot project (public/ innovative)	6200	£21.20m

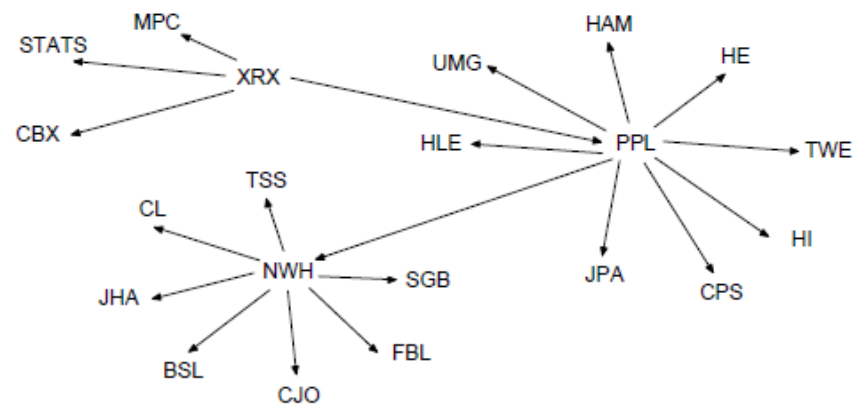


# Contractual relationships networks

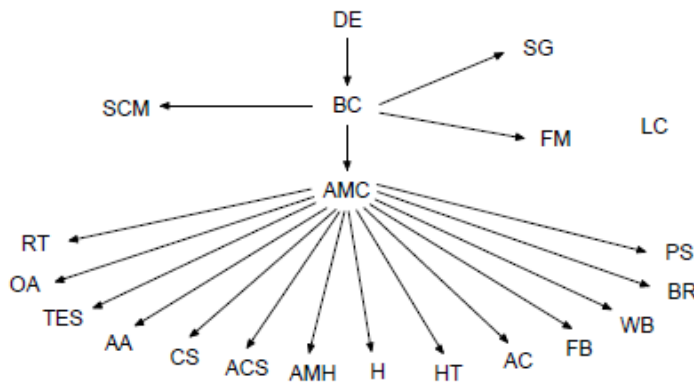
Essex project - Traditional public sector procurement



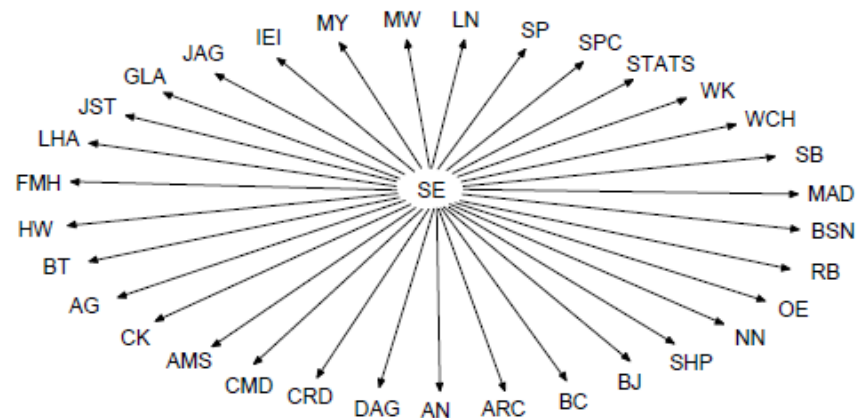
Uxbridge project - Traditional private sector procurement



Aldershot project - Collaborative public sector procurement

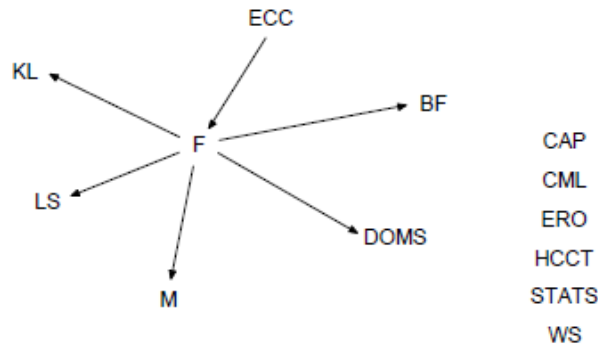


Slough project - Collaborative private sector procurement

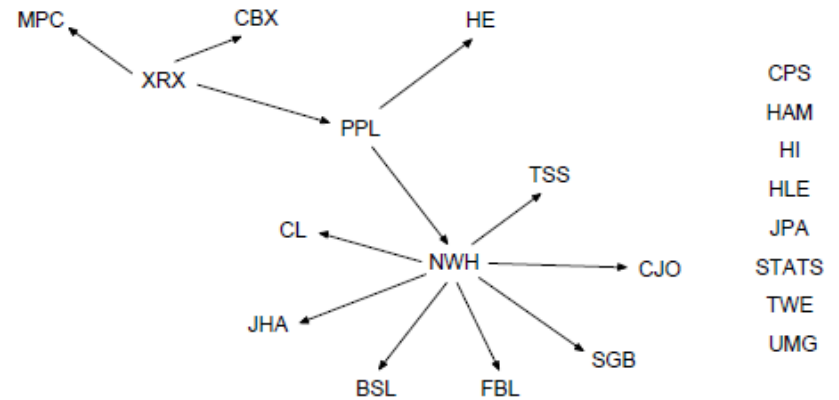


# Performance incentive networks

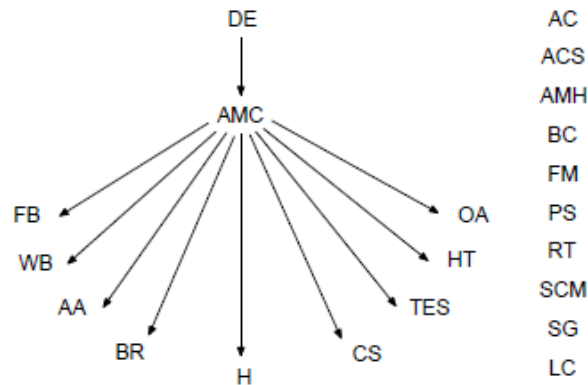
Essex project - Traditional public sector procurement



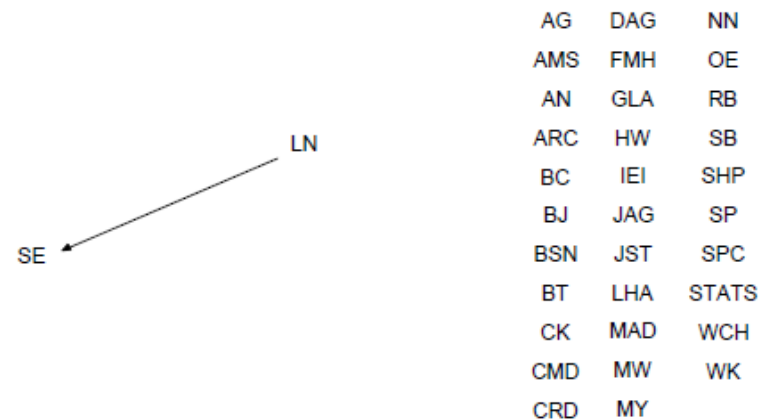
Uxbridge project - Traditional private sector procurement



Aldershot project - Collaborative public sector procurement

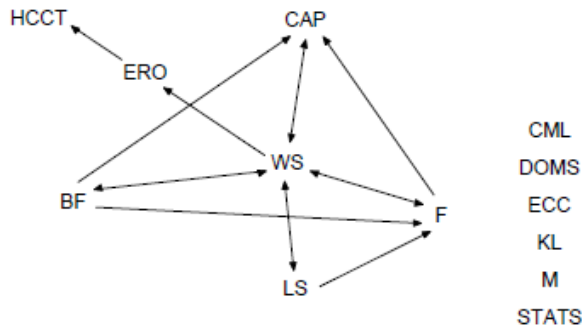


Slough project - Collaborative private sector procurement

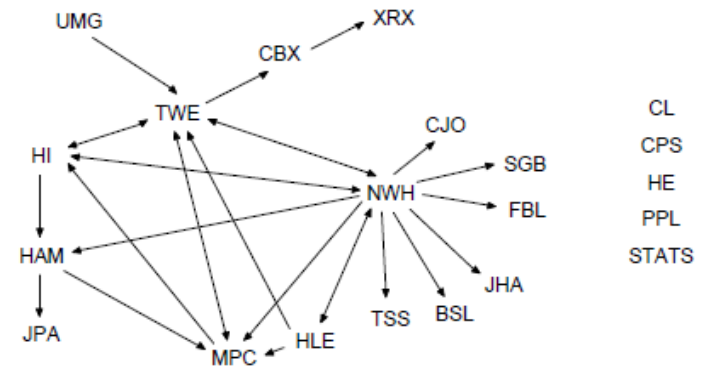


# Information exchange networks

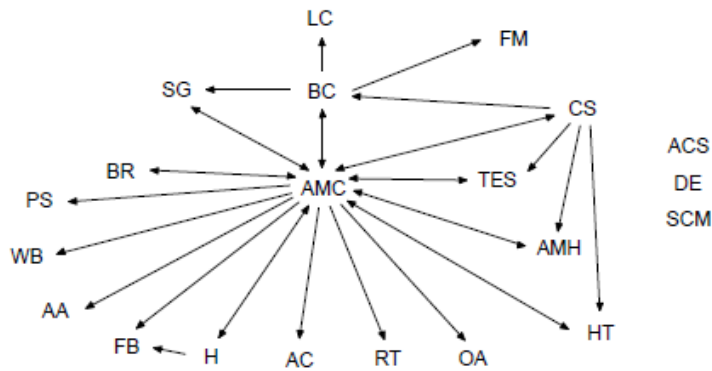
Essex project - Traditional public sector procurement



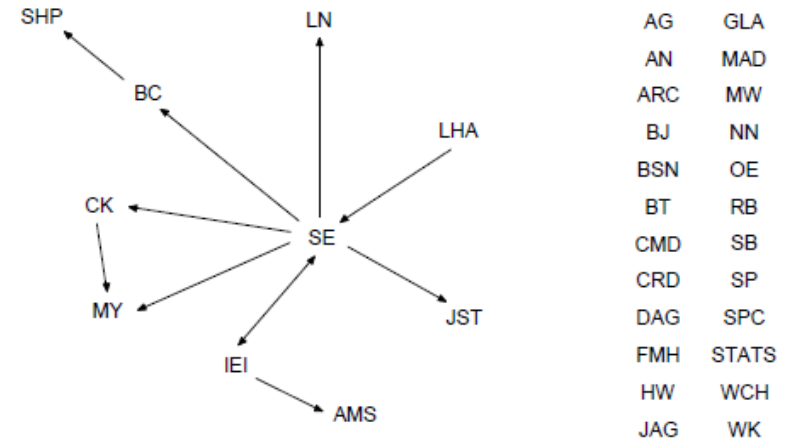
Uxbridge project - Traditional private sector procurement



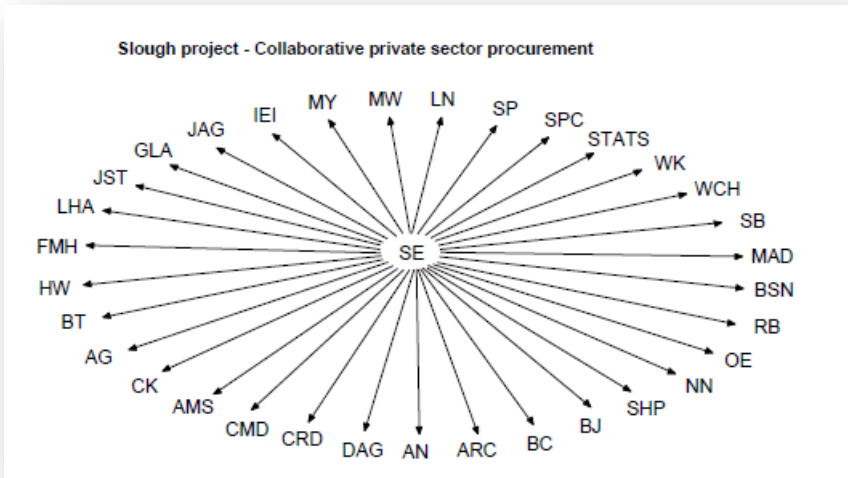
Aldershot project - Collaborative public sector procurement



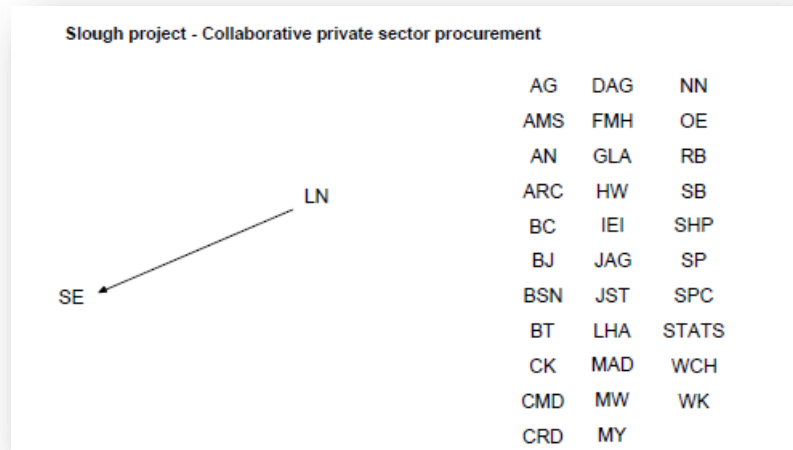
Slough project - Collaborative private sector procurement



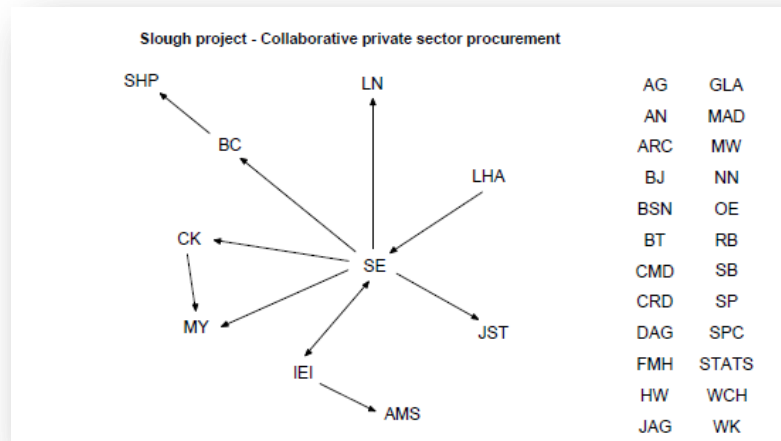
# Within case comparison



**Fig 1: Contractual relationships network**



**Fig 2: Performance incentives network**



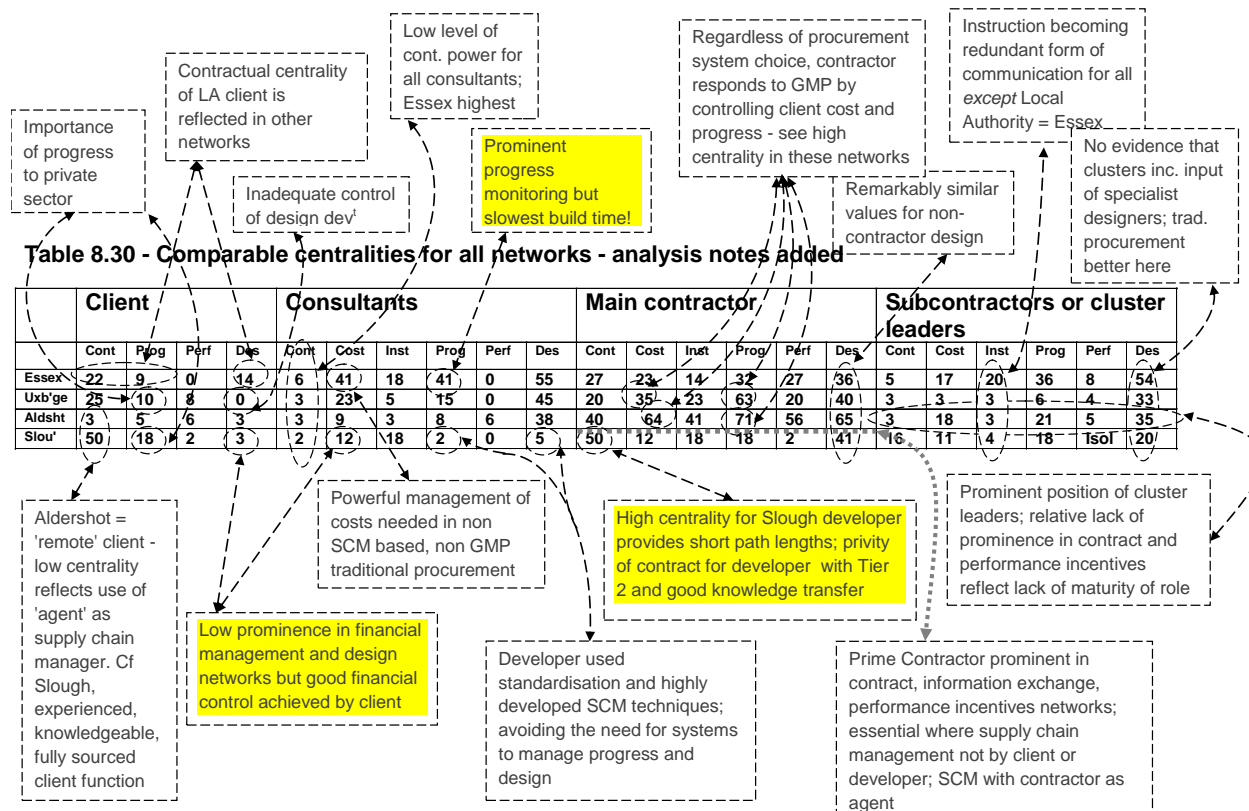
**Fig 3: Information exchange network – Cost Management**

## Some of the conclusions from the 4 way study:

- Financial incentives are short lived: long term interdependency better
- Central actors not always making a positive contribution: poor design quality causes many iterations
- A lot of activity post contract is concerned with design
- Complex sub systems not always effective
  - Slough v little cost management; cost managed through design
  - Essex progress management sub system well resourced but slowest build times achieved: other factors such as transaction frequency more important

[See Pryke, S.D. (2011) *Social Network Analysis in Construction*]

# Node analyses



# Identifying communication gaps in a construction project

Figure 1: Formal Communication Networks

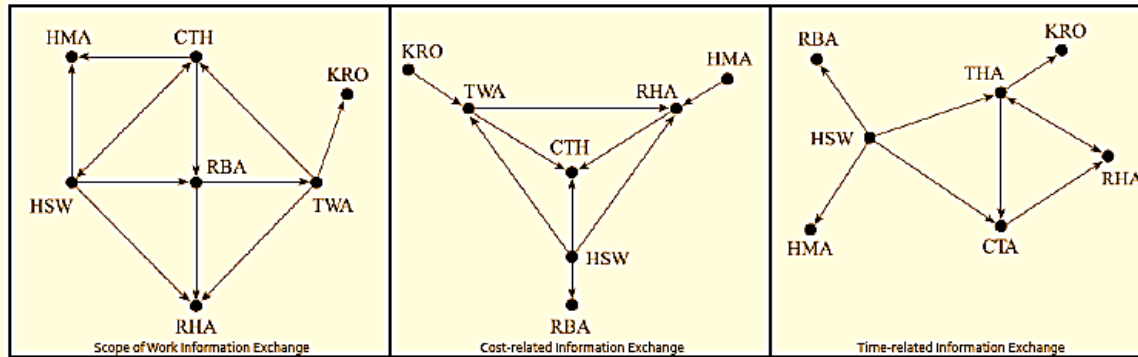
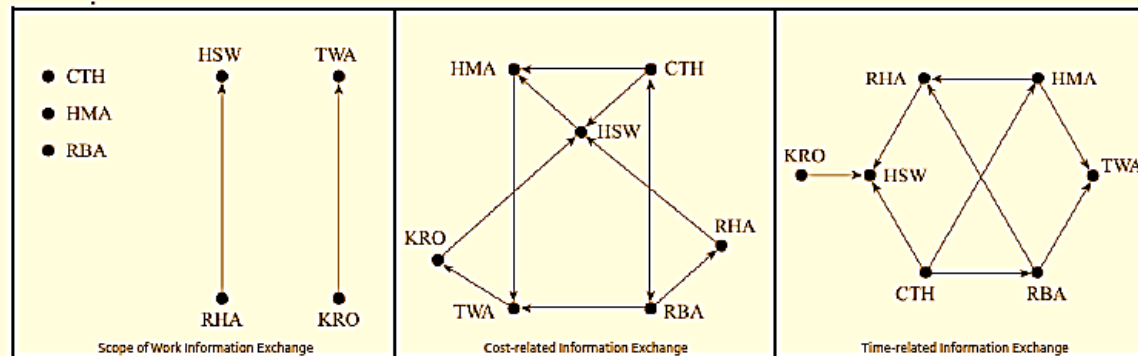


Figure 2: Informal Communication Networks



Key: RHA: Architect; HSW: Construction project manager; KRO: Employer's agent; TWA: Quantity surveyor; CTH: Contractor; HMA: Service engineer; RBA: Structural engineer.

# Where does knowledge reside in your team?

Figure 1: Information Flow Network

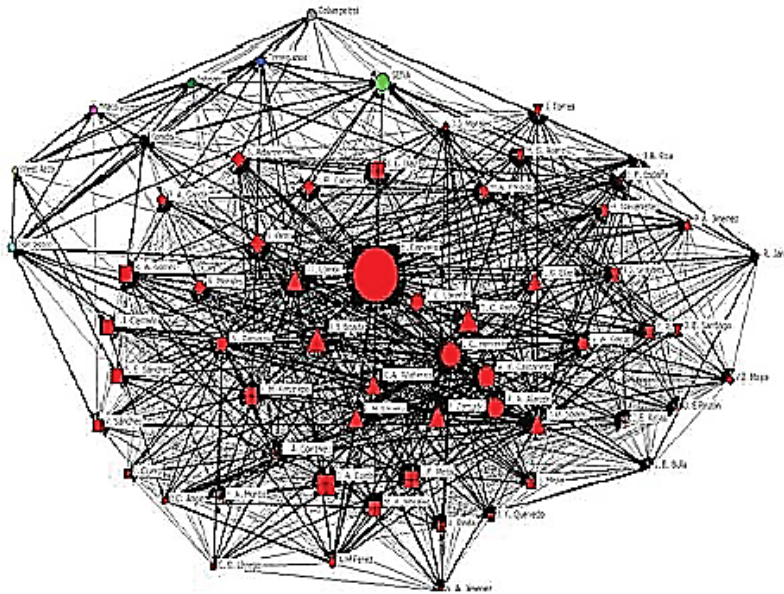


Figure 2: Instruction Flow Network

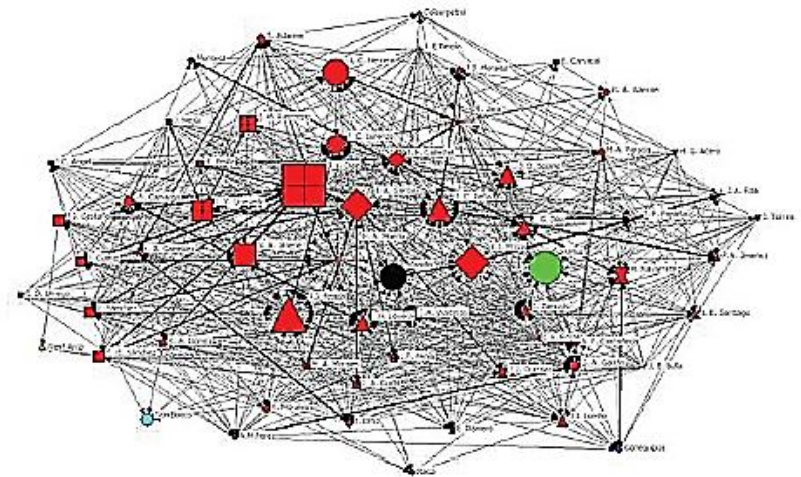
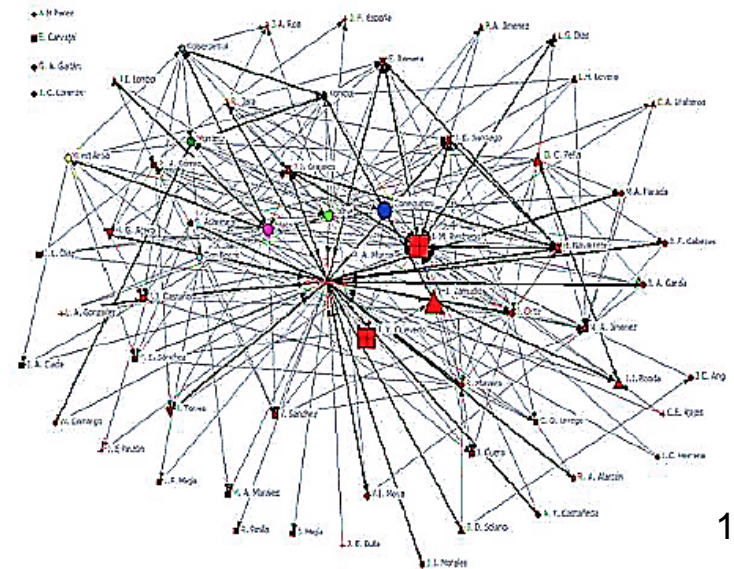


Figure 3: Discussion Flow Network





# Mapping project relationships for effective risk identification and management

Figure 1: Information Network

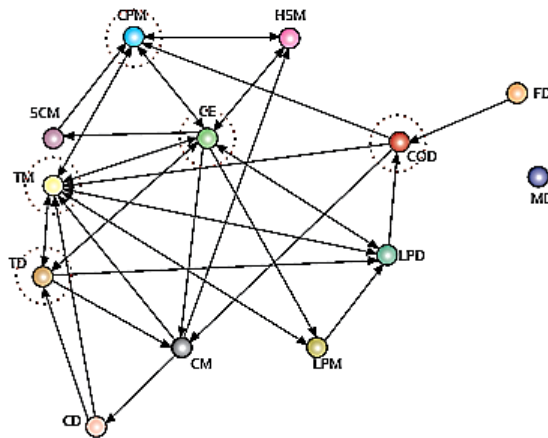


Figure 2: Instruction Network

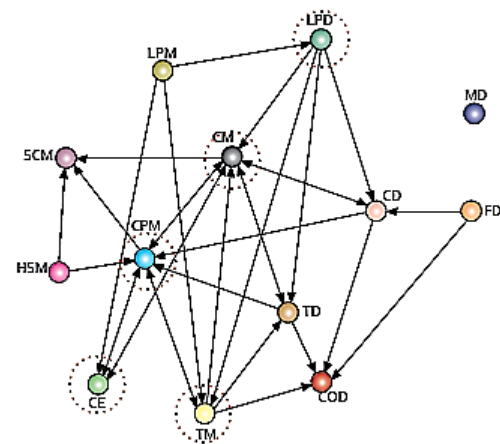


Figure 3: Decision Making Network

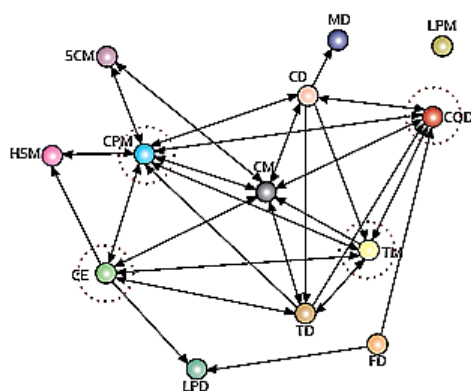
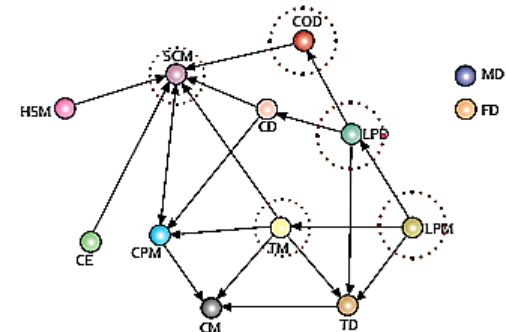


Figure 4: Risk Transfer Network



## **Current Study: CONA with UK Transport for London (TfL)**

- £500M – 600M Euros infrastructure upgrade scheme
- Contractual relationships
- Problem solving communications
- Risk reduction and risk pricing reduction
- Funded by UK Knowledge Transfer Partnership (KTP)

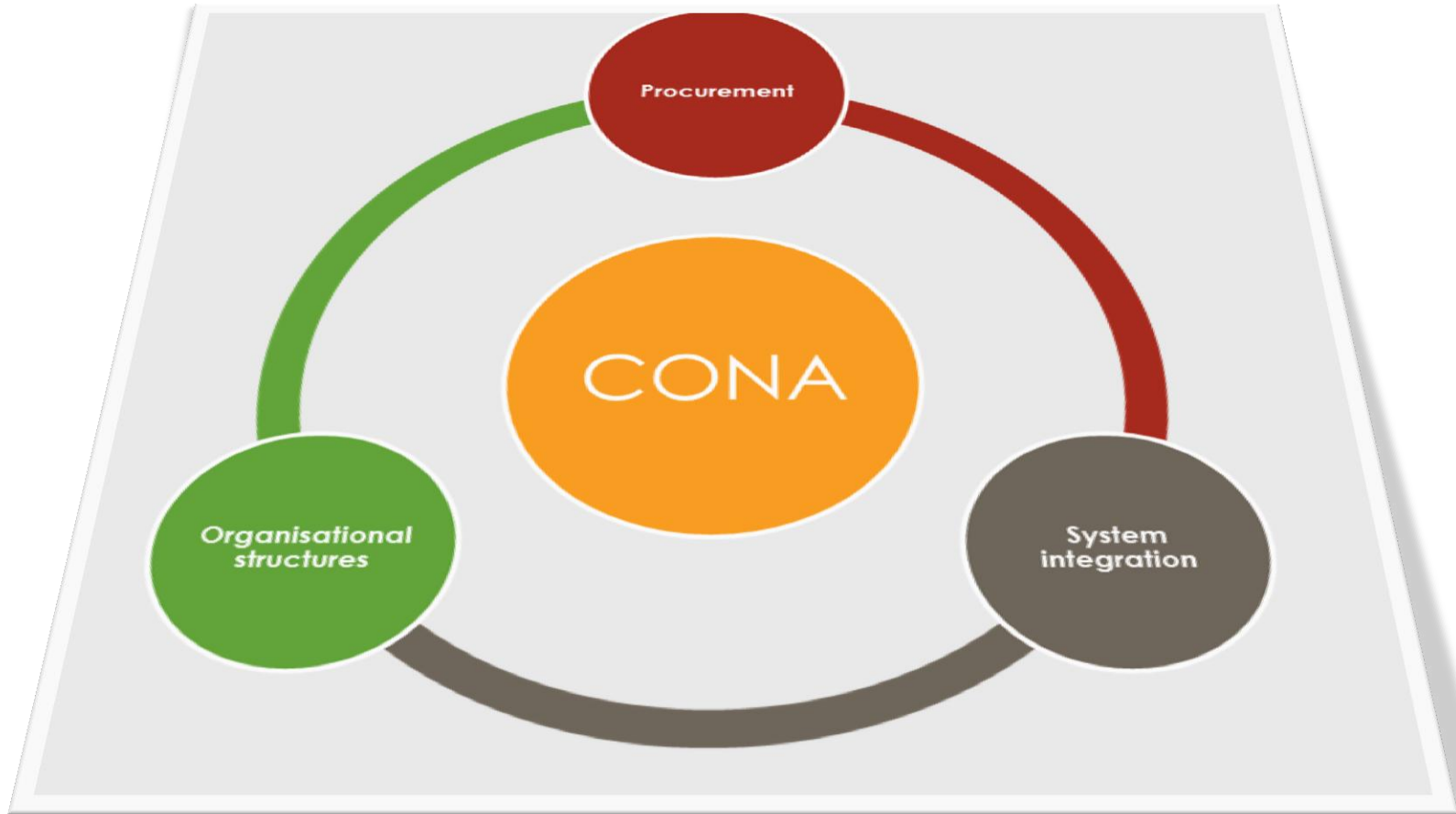
# Transport for London (TfL) project

## Network Measures

- Contractual and information flow path lengths
- Bridges in communication networks
- Brokers; training and introduction of 'network role only brokers'
- Tie strengths in advice and problem resolution networks

# CONA@UCL

<http://www.ucl.ac.uk/cona>



## Selected reading

- Pryke, S.D. (2011) *Social Network Analysis in Construction: Analysis, Case Studies & Management*, Wiley - Blackwell, Oxford
- Smyth, H. & Pryke, S.D. (2009) *Mapping Business Development Relationship Ties across Supply Clusters*, paper presented to the 5<sup>th</sup> Nordic Conference on Construction Economics and Organisation, 10-12 June 2009, Reykjavik
- Smyth, H. & Pryke, S.D. (2008) *Collaborative Relationships in Construction: Concepts and Practice*, Blackwell, Oxford
- Pryke, S. D. & Smyth, H. (2006) *The Management of Complex Projects: A Relationship Approach*, Blackwell, Oxford

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