

# Construction logistics: Reducing urban transportation through coordinated information & cooperation

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# Introduction

- Stefan Engevall, PhD, Linköping University
  - Dept. Of Science & Technology, Campus Norrköping
  - Division of Communications & Transportation Systems
    - 4 research groups
      - Quantitative logistics
      - Construction logistics
      - Traffic management
      - Telecommunications & Smart cities
    - Common grounds in
      - Optimization of flows, in a wide sense

# Research area, Background

- Swedish estimates
  - 20% of transported weight in Sweden, relates to construction
  - 50% of urban goods transportation relates to construction
- Historically
  - Construction projects seen as temporary disturbances
- Shift of perspective
  - Construction is and will be a permanent and important operation in every city
    - Even if the sites vary in time

# Urban Construction Logistics

- Challenges besides "ordinary logistics challenges"
  - Many different stakeholders
    - With different objectives
  - Many subcontractors involved
  - High interdependence of material & service
  - Short and Long distance supply
    - And also removal of rock/soil & waste
  - Limited storage capabilities
  - Delays very costly
    - For stakeholders as well as authorities
  - Limitations of vehicle use

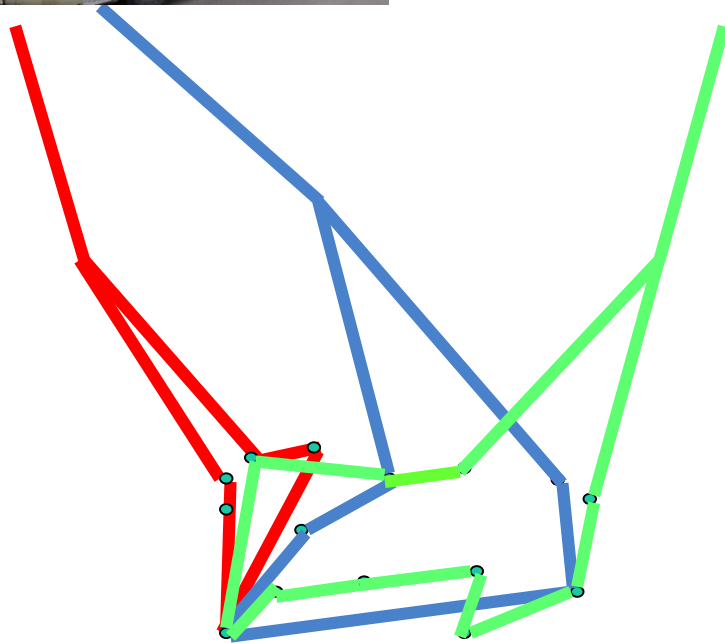
# Research interests of LiU Construction Logistics

- What type of requirements should be put forward by which stakeholders
  - And what are the consequences for
    - Efficiency of the construction project
    - Interests of other stakeholders
  - System perspective, using a 4 level system
    - On-Site
    - Close-to-Site
    - City
    - National/Global

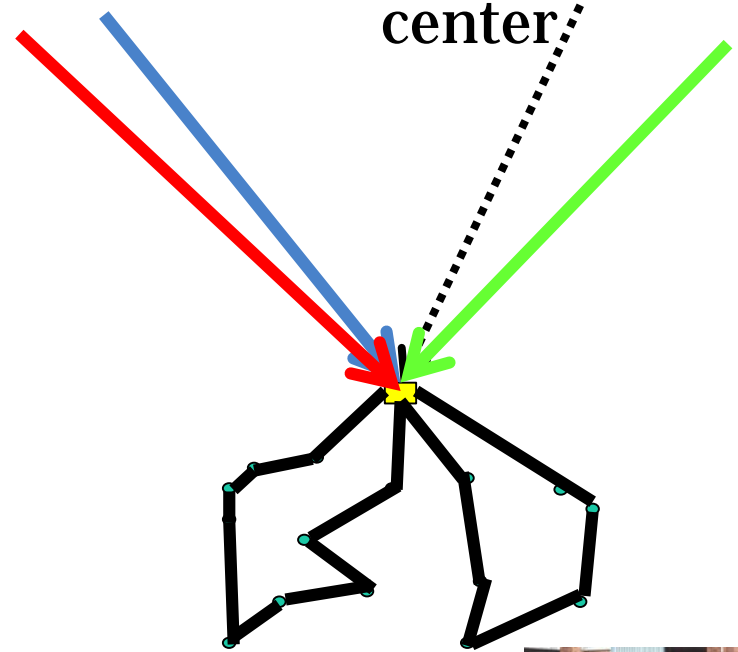
# Research interests of LiU Construction Logistics, ct'd

- What could be a benefit of a coordinated system for some/many/all constructions projects in a city
- Potential cooperative component of solution
  - Construction Consolidation Center
  - Split deliveries to construction sites
    - Direct deliveries
    - Via Consolidation Center

# Cooperative consolidation center principle



Consolidation center



# Research questions, samples

- How is a solution enabled?
- What economies can be made?
- What additional costs are there?
- What additional services can be offered?
  - Temporary storage
  - Pre-assembly off-site
- What is the potential for alternative distribution vehicles?
- What information needs to be collected, processed and communicated to which stakeholders, how and when?
- How are costs allocated among stakeholders?





# On-going projects LiU Construction Logistics, examples

- Several on-going projects
  - Fossile Free Construction Logistics (TripleF/Trafikverket(Swedish Transport Administration))
    - Ongoing and grant application
  - Disturbance-free Cities (VINNOVA)
  - Waterways for construction logistics (SSPA)
  - L E Lundberg Chair in Construction Logistics
    - Several projects

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