Fossil-free construction logistics

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Construction transport a natural part of urban an infrastructural development

- The work has involved:
- Linköpings universitet; Anna Fredriksson, Mats Abrahamsson, Stefan Engevall, Maria Huge-Brodin,
- Linköpings universitet och VTI; Farah Naz
- VTI; Linea Kjellsdotter Ivert, Klara Ivanetti,
- Logistikia; Per Lindahl
- Participating organisations: Byggföretagen, PEAB, ED-Bygg, NCC, Trafikverket, Stångåstaden, SanktKors, SGDS-gruppen, Ragn-Sells, Renall, och Energifabriken.

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Project goal

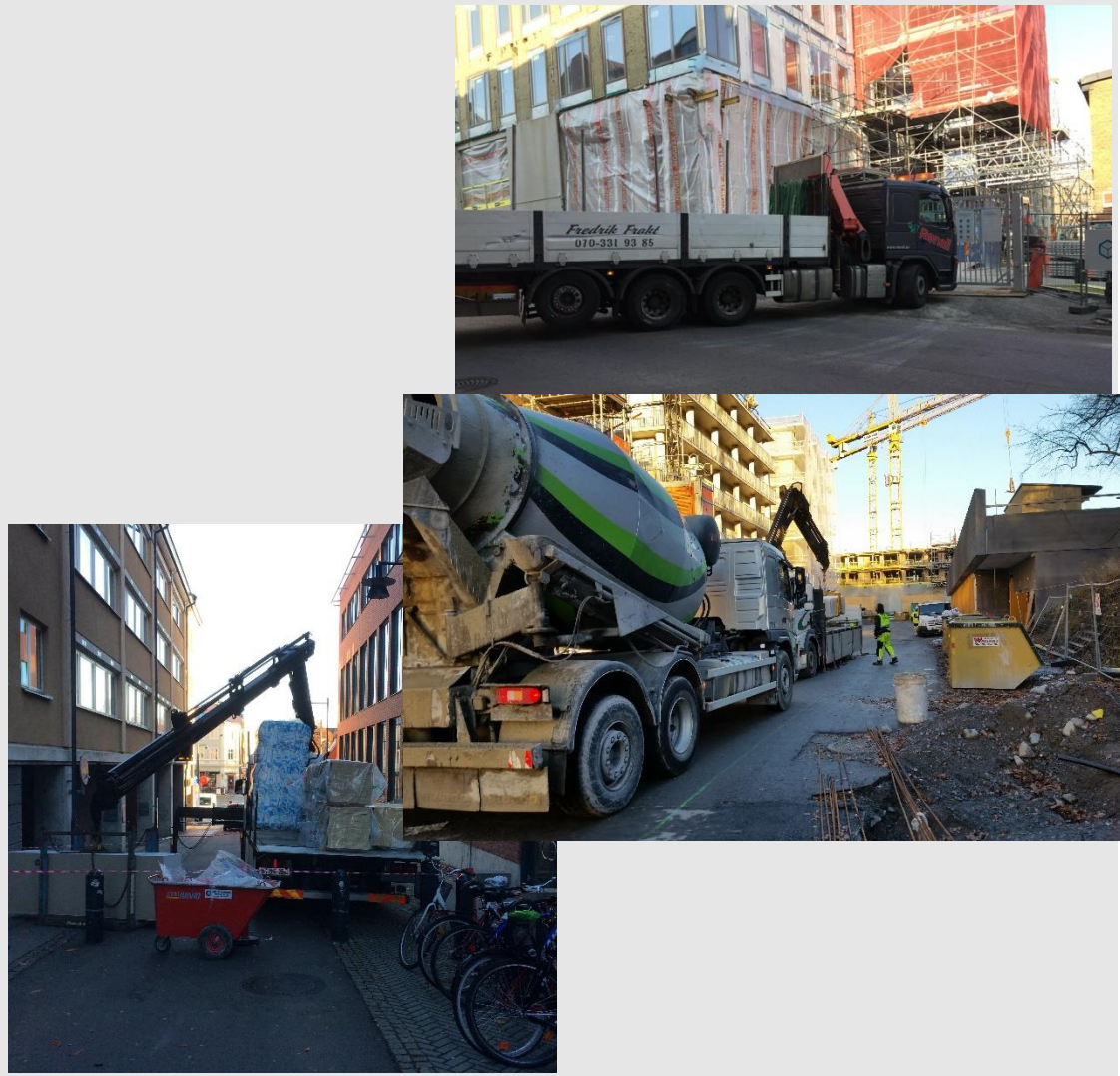
Through increased understanding of driving forces, prerequisites and obstacles, contribute to ***creating an increased demand for fossil-free construction logistics among both public and private actors****.*

There have been the following sub-goals:

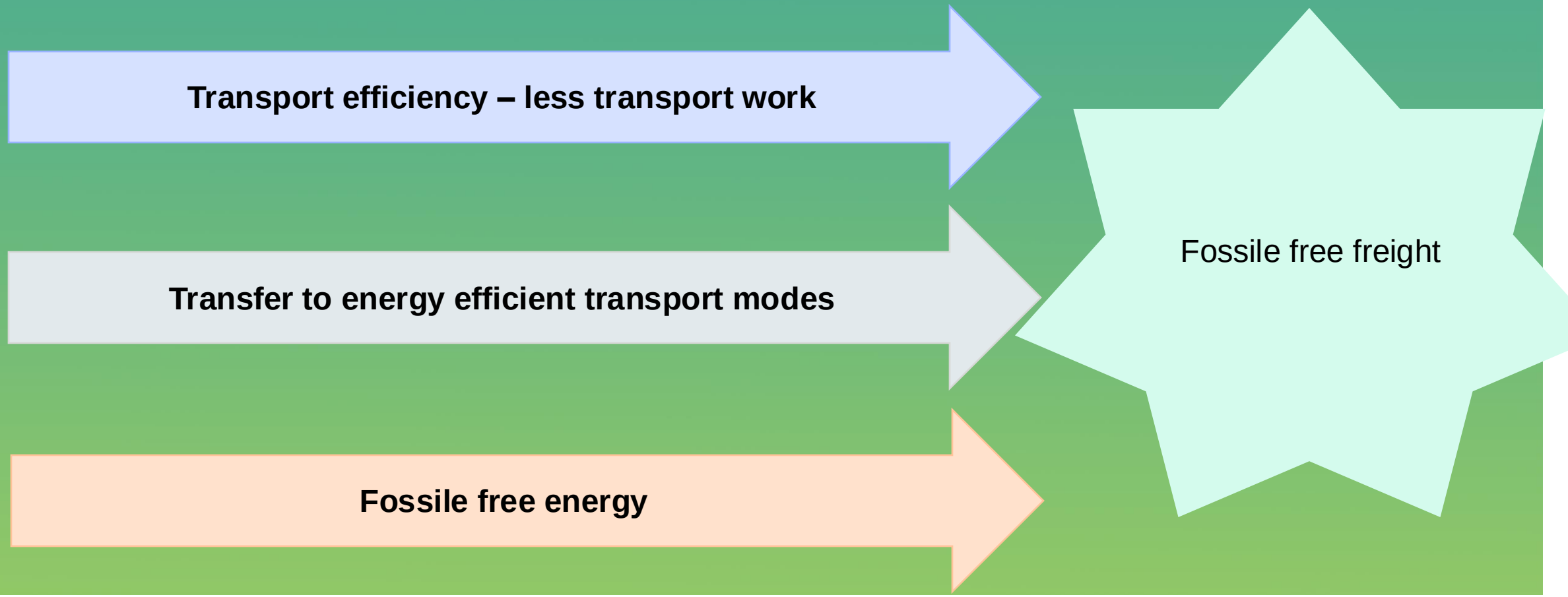
- *Create understanding among the various actors in the construction logistics system in terms of what can/should be done in the short and long term to reduce CO2 emissions from construction transport*
- *Prepare the basis for recommendations and decisions within the various levels of the construction logistics system*

Construction transport makes an impact

- 20% of the transported weight in Sweden
- 50% of the urban freight (weight wise)
- 10-20 % of CO2 emissions during production come from transports



Routes to a fossile free society



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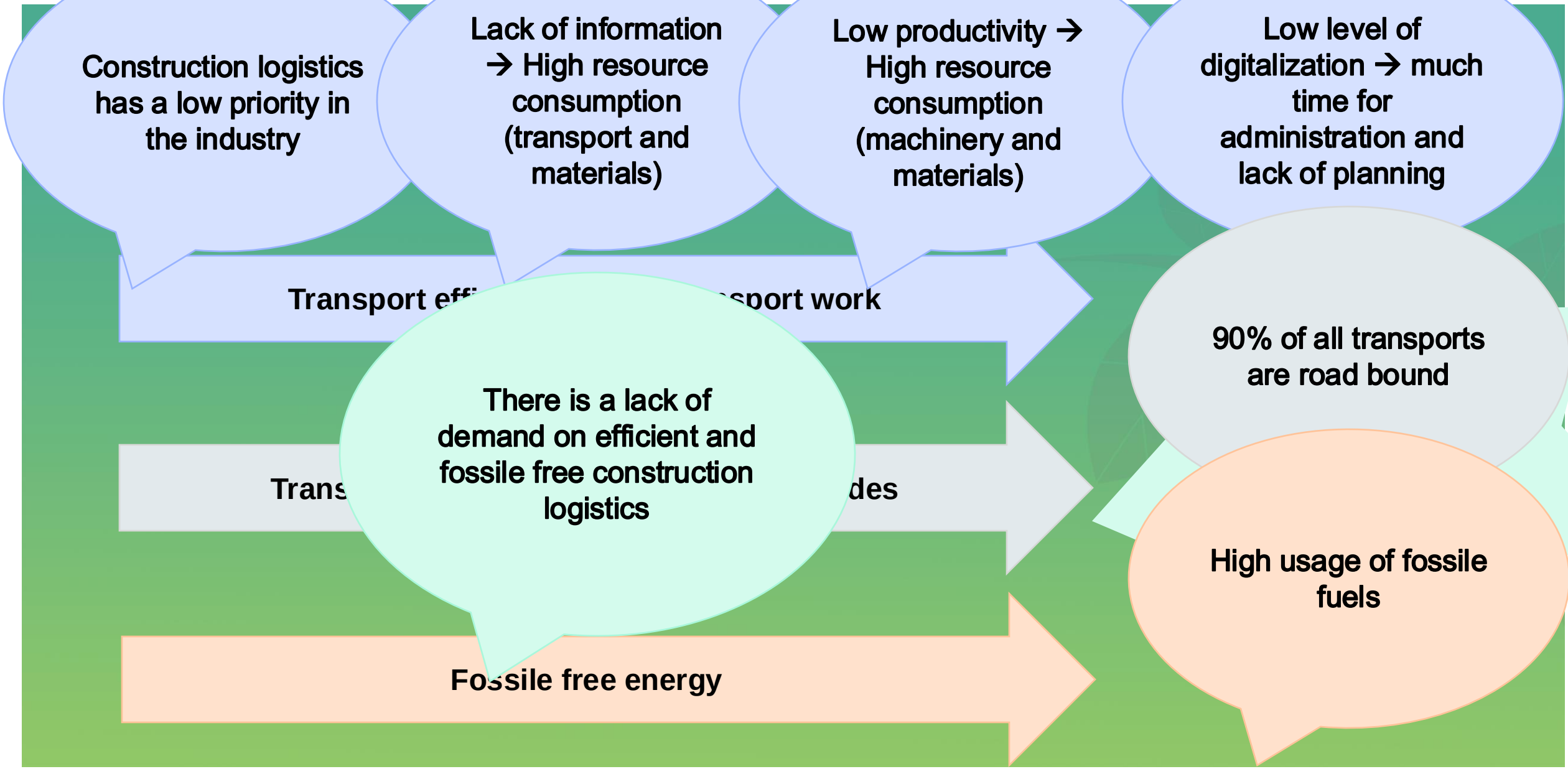

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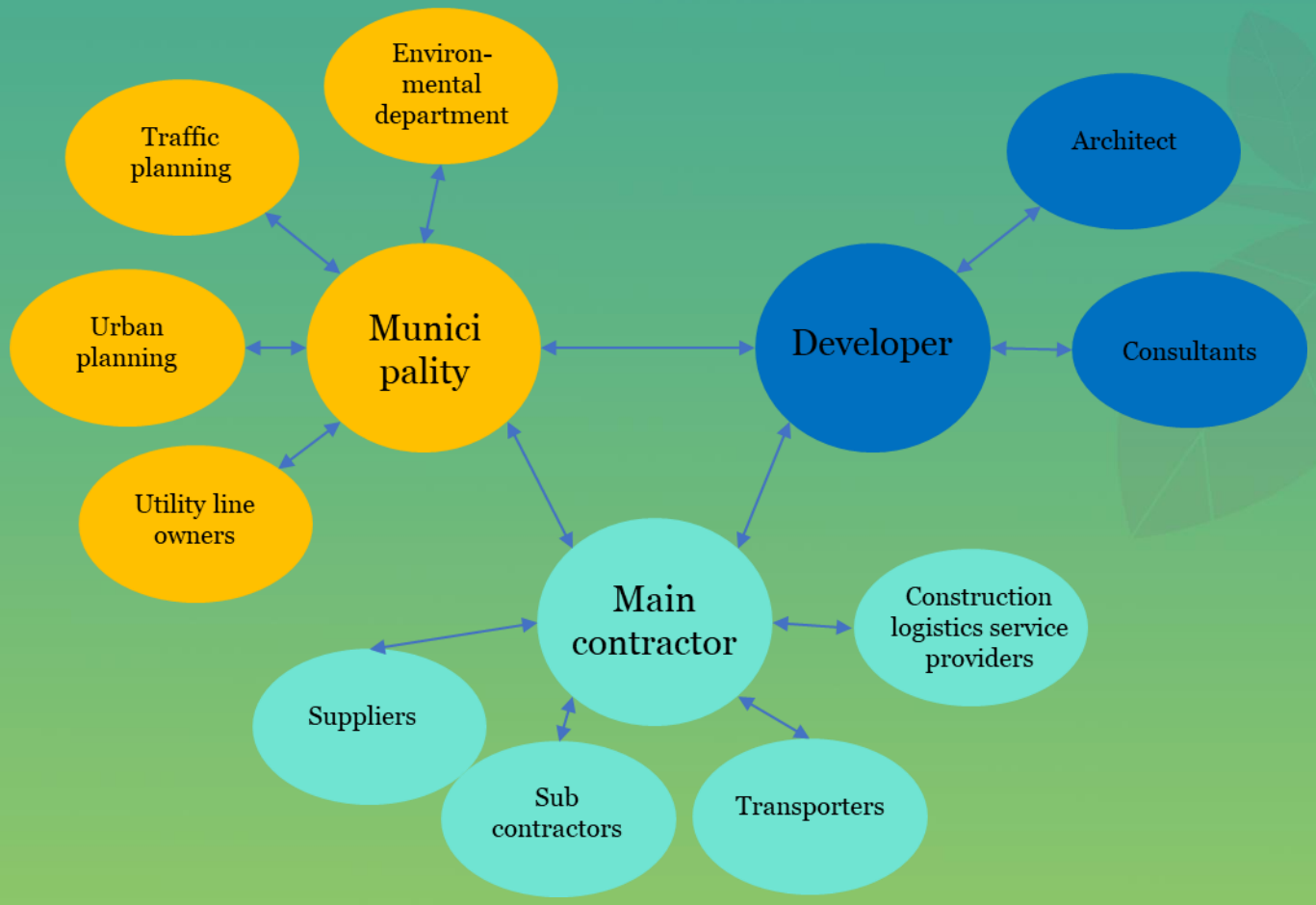
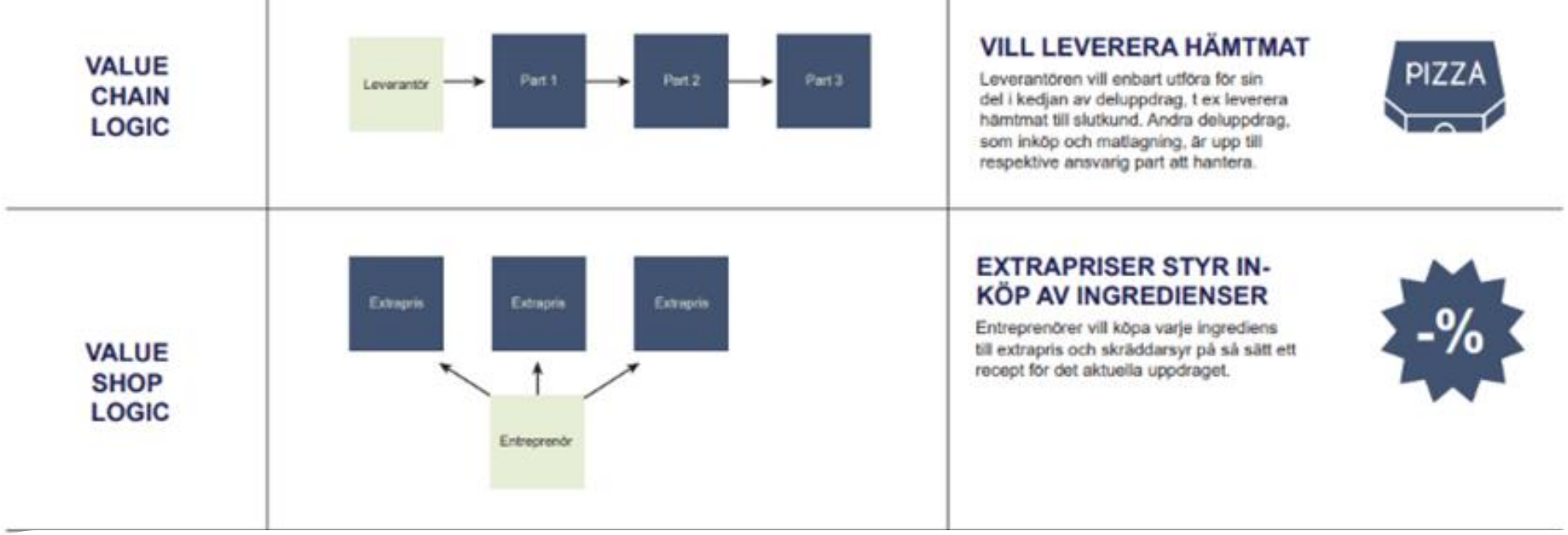
The construction logistics system actors



Bygglogistikssystemets aktörer och deras relationer (Fredriksson & Huge-Brodin, 2022).



The developer and the main contractor are following different logics –
i.e. producing value through different ways of combining resources

The construction logistics system- hiearchical order

Level 1: Local municipality & Developer

- Lack of goals and strategies for fossile free construction logistics

Level 2: Main contractors

- Lack of logistics strategies and focus on environmental consequences of the same

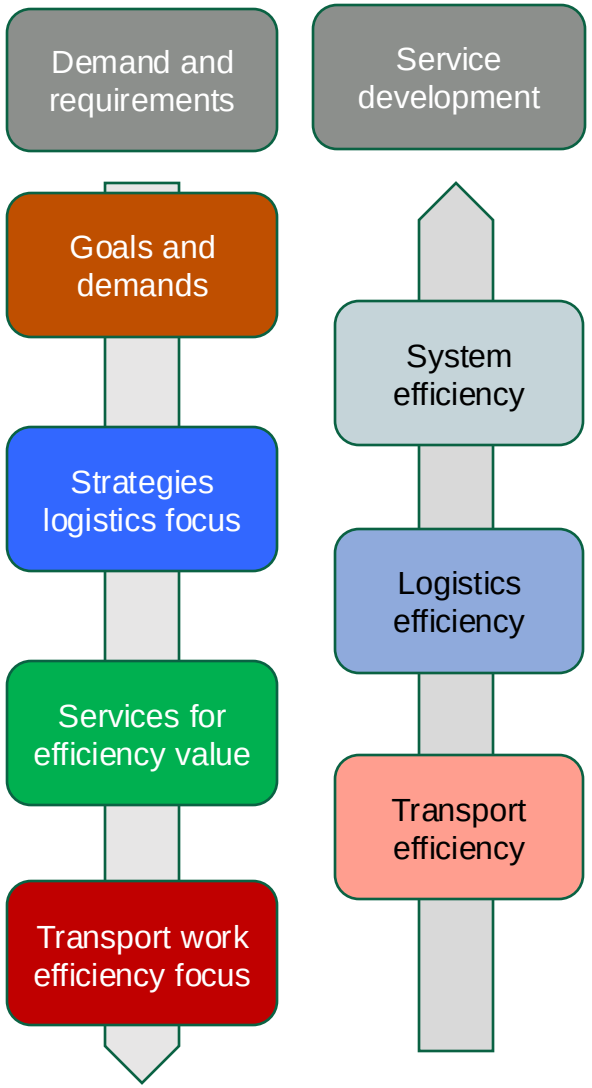
Level 3: Material suppliers

- Logistics with focus on keeping costs down and short delivery times

Level 4: Transporter

- Lack of incentives for environmental friendly transports

Missing prerequisites



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Gap analysis

1. Logistics gap between transport buyer and transporers
   - Services offered need to provide value and there need to demands on services that support efficiency and fossile free production
   - How can the collaboration be improved to support this developement?
2. Technological gap between vehicle providers and transporters/contractors
   - Customers must be prepared to invest in new technology
   - Cost and returns need to be the same or higher as for diesel driven vehicles and machinery

Logistics service gap

Technological gap

Other gaps ???

Overbridging the gaps

Level 1: Local municipality & Developer

- Take a systems responsibility and have goals and develop understanding of the whole system and its relationships

Level 2: Main contractors

- Develop overarching-goals to sub-goals and integrate these in the procurements of materials and machinery

Level 3: Material suppliers

- Together with transporters and customers develop logistics setups that support energy efficiency and logistics efficiency

Level 4: Transporter

- Provide operational initivatives regarding vehicles, fuels and routing

Short term situation	Long term possibility
Lack knowledge and goals drive change for the system as a whole. Do not see their responsibility for the change and lack demands from owners to make change.	Based on goals of what is best from a societal perspective and with clear directives from their owners, these drive change based on demands in procurement, land agreements and traffic permits.
Lack of knowledge among regional actors and lack of tradition to drive change on a larger scale than project level.	Through developed strategies and knowledge sharing the big actors drive change among their subcontractors.
Consolidated businesses with resources and knowledge to make change. However, lack initiatives to implement change.	Developed strategies and value propositions helping their customers understand the value and potential of services provided. Furthermore, support their suppliers through investments in vehicles and infrastructure.
A business dominated by small actors with lack of capital to make investments and knowledge of how to implement.	Consolidation provide more capital strong actors and new business models from vehicle providers make it possible for these to provide fossile free transport on a large scale.

Future research

To see construction logistics as a central part of last mile deliveries

Develop adapted construction logistics setups and services – what is the best setup in the specific project ”the devil is in the details”.

Value of logistics services in heavy goods transport?

Increased understanding of how to plan and control what heavy goods transport

Infrastructure transports – it takes more than just to know the amount of material to transport to plan these in a good way – what is needed in the setups for a project or an actor to make these efficient

How to electrify the industry

www.liu.se/en/research/urban-development-and-logistics

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