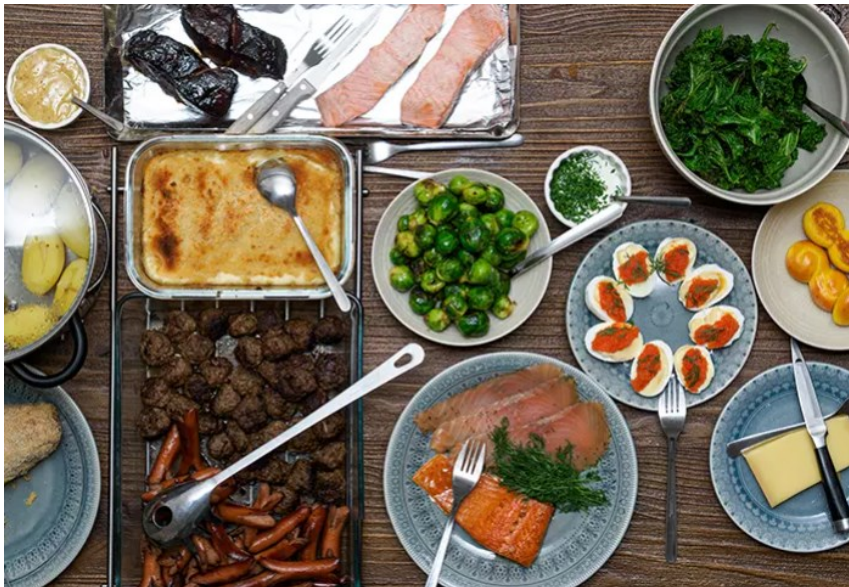


A Smorgasbord of thoughts

Industry needs for SE

Stockholm 2023-06-13



Anna Pernestål

Skogforsk: Senior Researcher

KTH: Docent - mechanical engineering & complex dynamic systems

Previously: Scania, SNC Lavalin Rail & Transit



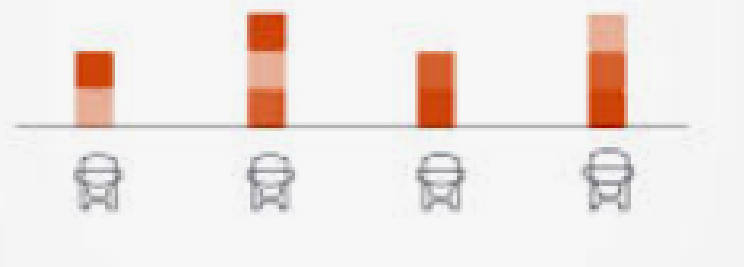
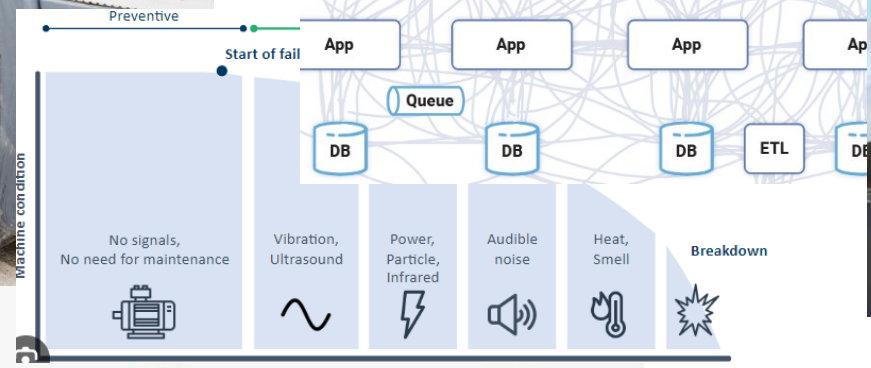
ITRL — INTEGRATED TRANSPORT RESEARCH LAB
KTH ROYAL INSTITUTE OF TECHNOLOGY



SCANIA MAINTENANCE WITH FLEXIBLE PLANS

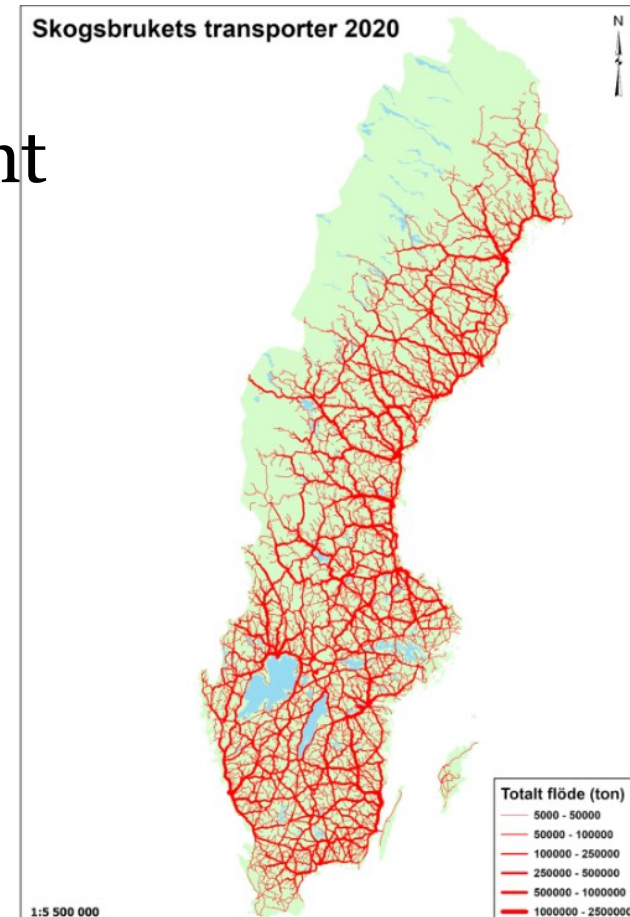
MAINTENANCE TAILORED FOR YOUR NEEDS.

- Increased Profitability
- Tailored plan via Operating data
- Maximise your Uptime
- Servicing when required



Forestry industry is important

- Creates value equal to 2,5% of Sweden's GDP
- Is distributed over the country
- Accounts for around 20% of heavy road freight transport and 20% of rail freight

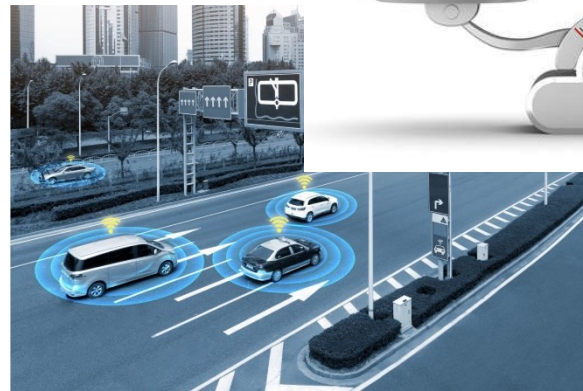
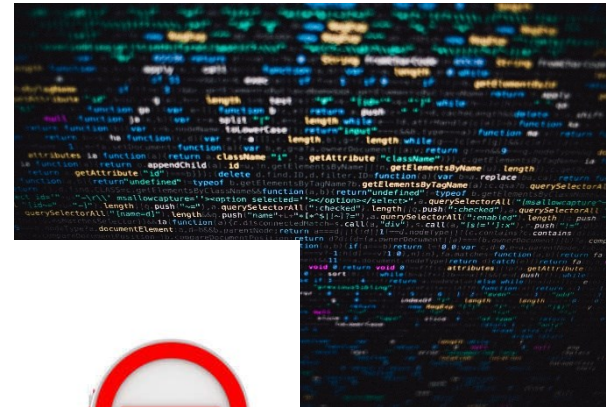


**CO₂ storage,
fossilfree materials & products,
Biodiversity
recreation**

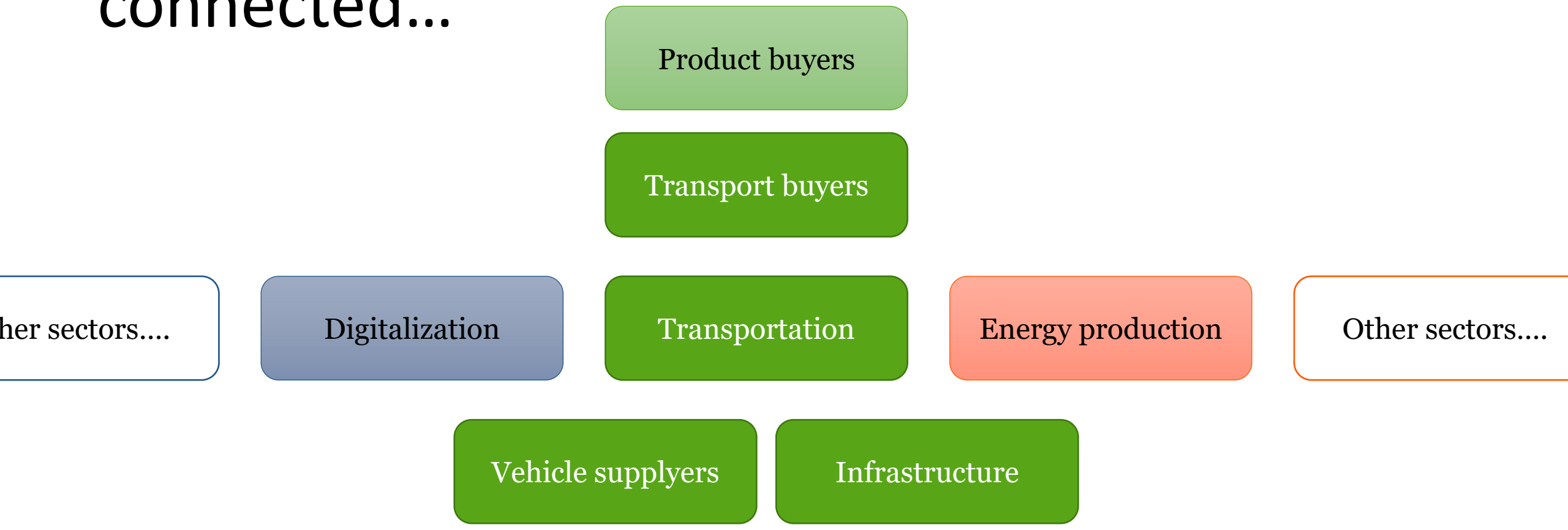




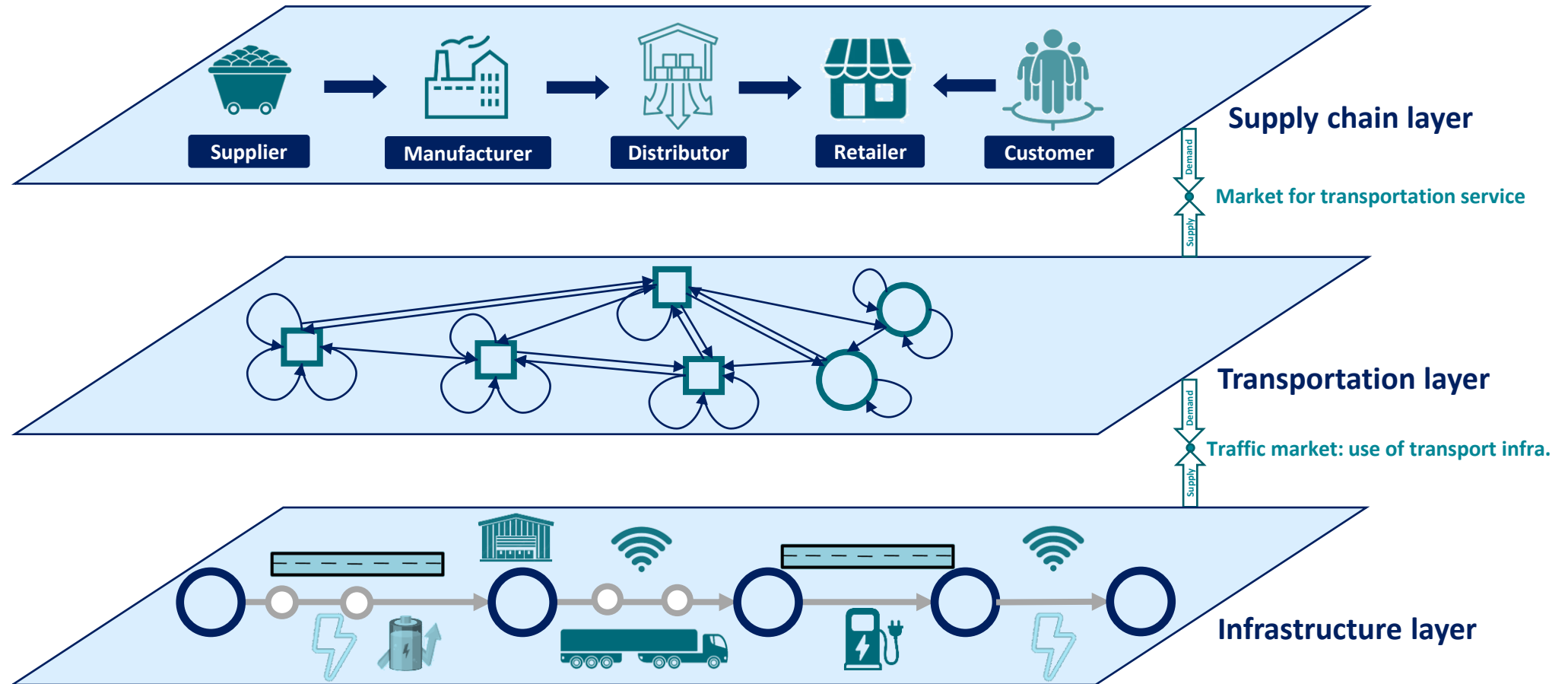
Focus on transport - dramatic changes are going on



The system get more and more connected...



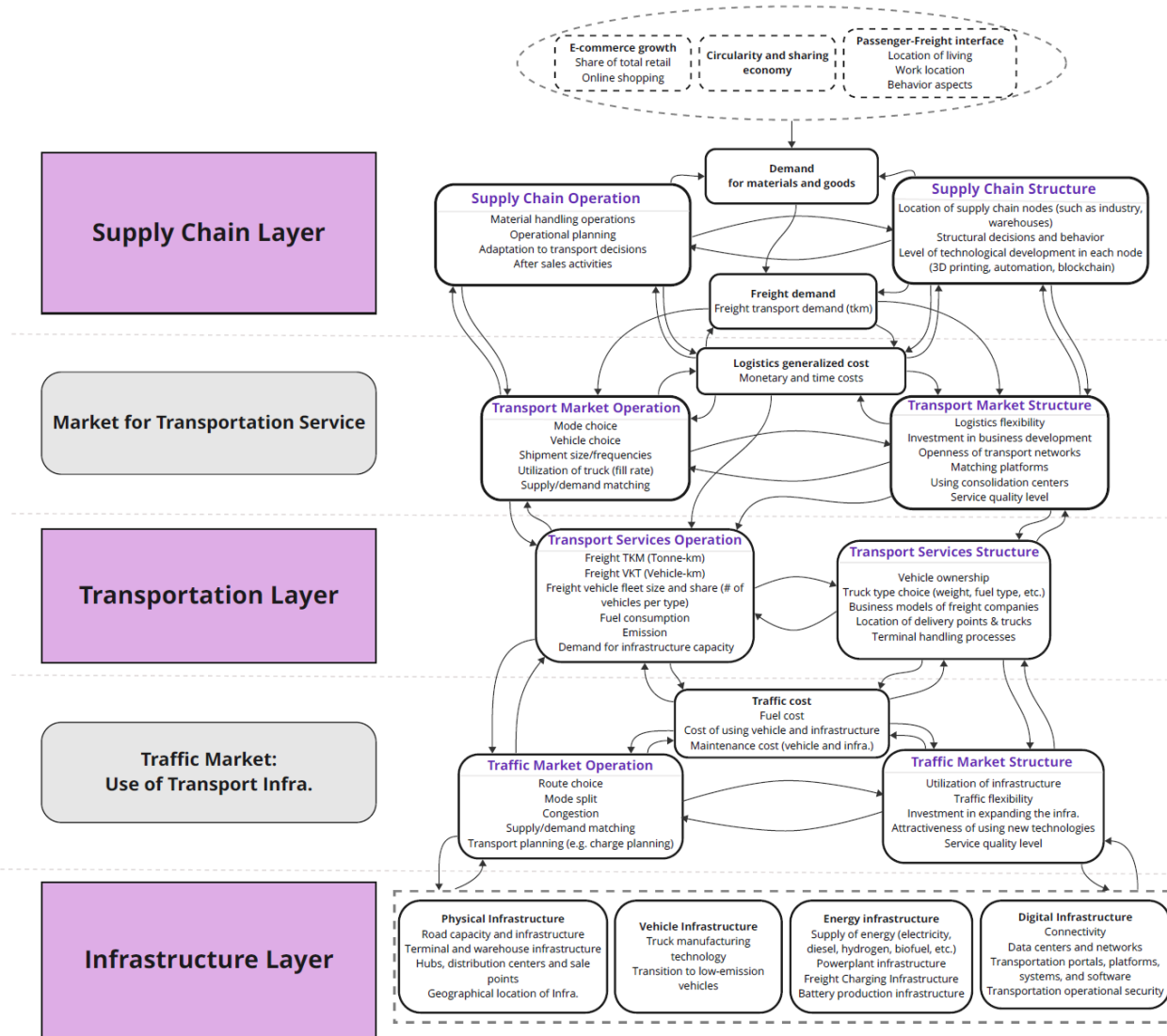
Three-layer model of the freight transport system



Proposed by Wandel et al. (1992) and developed by Browne et al. (2022)

2023-06-14

Conceptual multi-layer model



Systems Engineering needed on several levels



Which technology to bet for?

How to arrange energy / charging infrastructure?

How to design a fleet of vehicles?

How to design the best vehicles?

Wishlist

- Engineering on different levels
- Combine different perspectives



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