



The Future of (Road Freight) Transport

SCALA's Annual Supply Chain Debate

David Cebon, 21st June, 2023

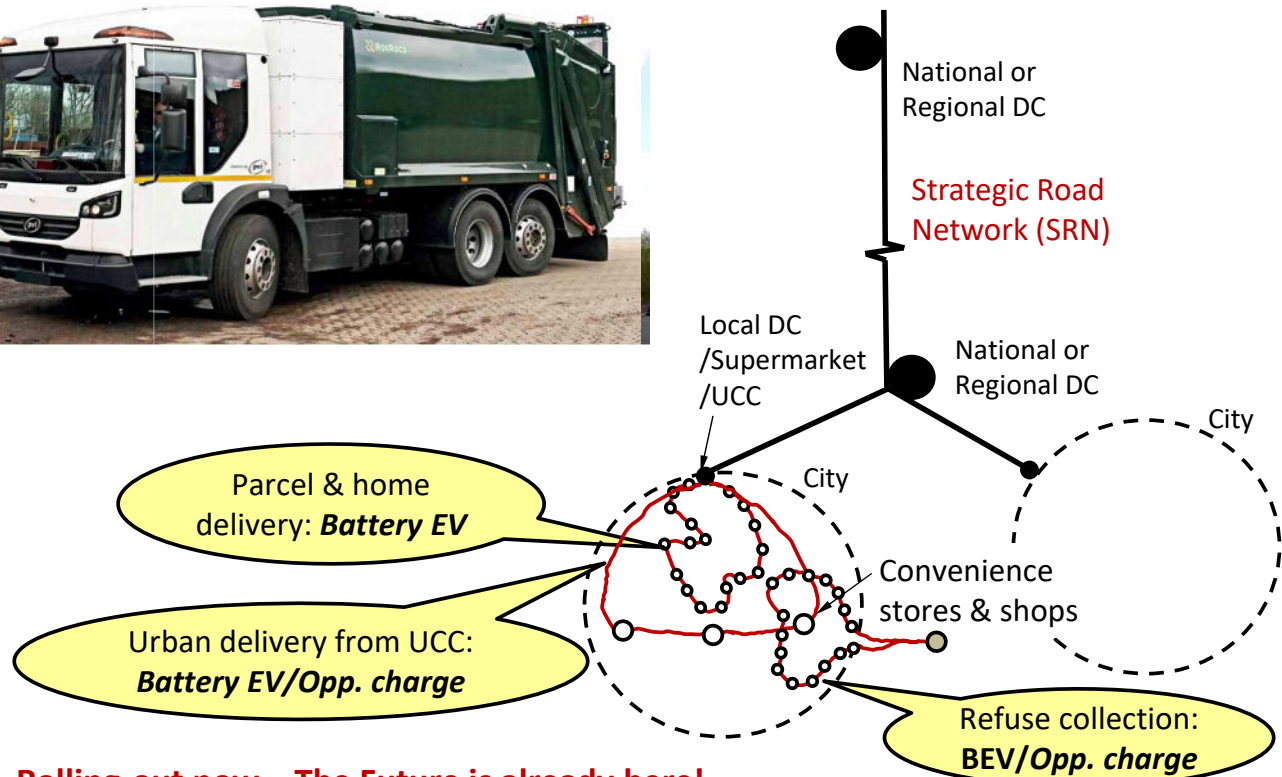
SCALA



The Top Issues

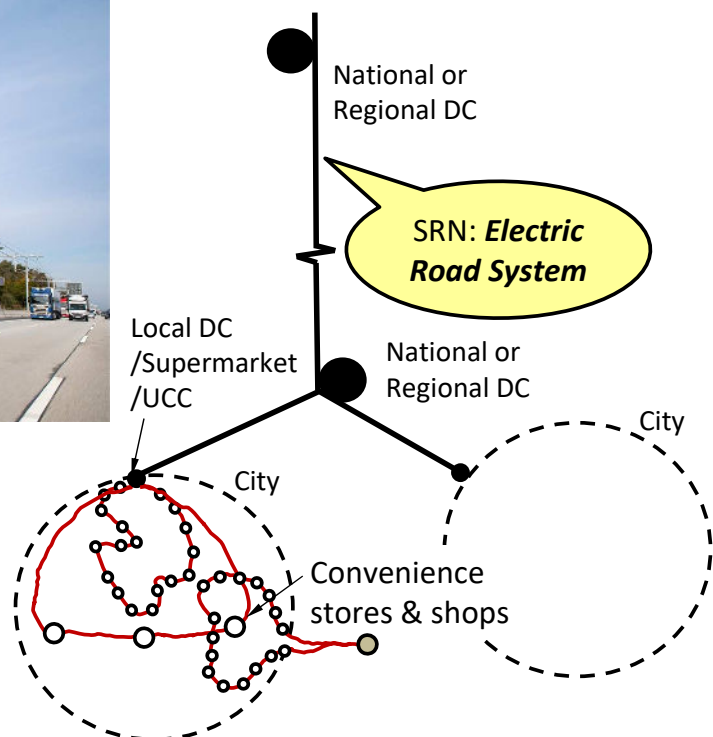
1. Decarbonisation
2. Autonomy
3. Resilience

Decarbonising Urban Freight

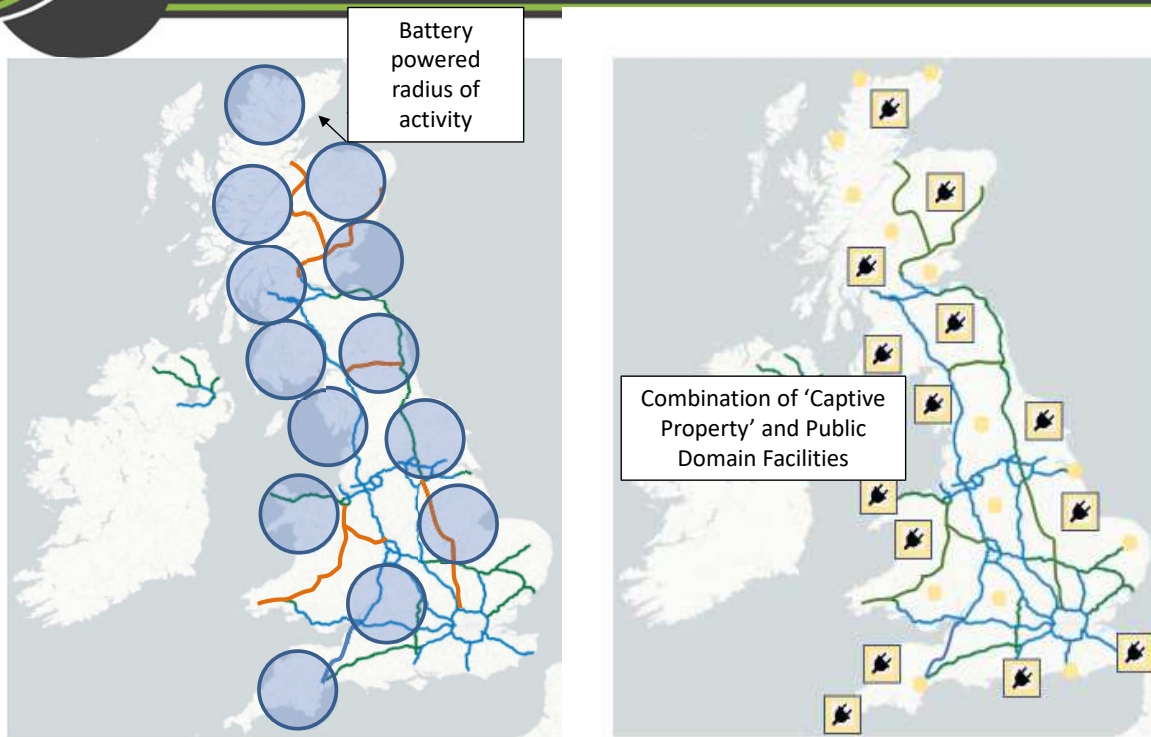


- **Rolling-out now... The Future is already here!**
- **Building technologies and supply chains for higher capacity BEVs**

Electrification of Long Haul



The Network Design Challenge



- Overall network requires **ERS + static chargers** in depots, warehouses and truck stops
- Longer ERS: **smaller batteries on 200,000 trucks**; fewer static chargers & grid connections

Big Batteries vs ERS

Big Batteries

Pros

- Simple, intuitive
- **No government intervention** needed

Cons

- **High cost** vehicles, **loss of payload**, bad for mass-limited loads
- **Warehouse charging** is essential – expensive grid connections
- Benefits are damaged by automation and autonomy

Dynamic Charging (ERS)

Pros

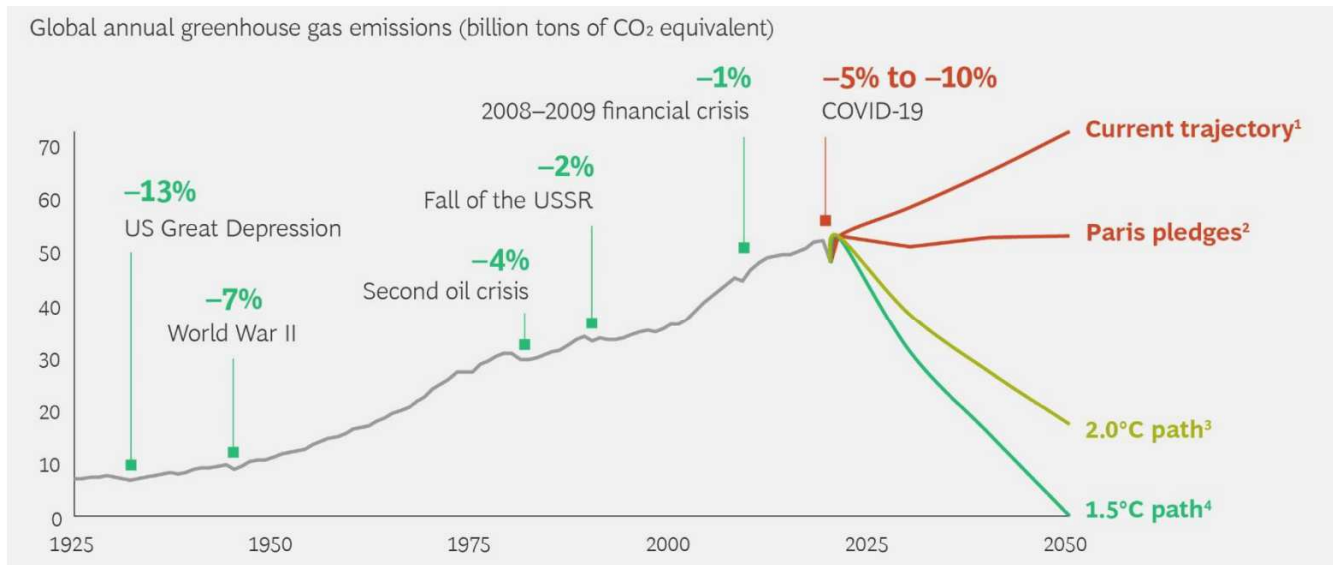
- **Lowest cost** vehicles, **highest payload**, good for mass-limited loads
- Min **energy** consumption, Min **CO₂**, Small batteries
- Benefits enhanced by automation and autonomy
- **Minimal warehouse charging**
- Privately financeable

Cons

- **Requires government support** (not subsidies)
- Requires Highway Authorities to learn about electricity
- **Doesn't look nice** (to some people)!



Can the world avoid climate disaster?



Source: Boston Consulting Group (2020)

<https://on.bcg.com/31Vw9A1>



Future Logistics Challenges (Lessons from Humanitarian Logistics)

1. Deliver aid and essentials to sustain lives:
 - Food
 - Water
 - Medicines
 - Waste Management
2. Access and accessibility (effects of extreme events)
 - Natural disasters and conflicts destroy transport infrastructure
 - Security issues due to conflicts
 - Vehicles suitable for repair in the field
3. Logistics needs
 - Resilient and robust supply chains and technologies
 - Mode choice?
 - Planning and preparation (data, models):
 - Ability to forecast weather, climate events, logistics problems
 - Ability to re-route and re-position
 - Avoid Supply Chain choking



Conclusions

1. The Future of Road Freight will be Electric
 - Remaining questions around **charging strategies** and **infrastructure**
2. Future logistics priorities may have to change:
 - From **Service/Cost/Carbon** to **Humanitarian Aid** at all costs
 - From **Rapid response, minimum inventory** to **robust and resilient**
3. **Data** and **predictive models** will be even more important
4. The logistics industry may be at the frontline sooner than we think. → **Preparation!**



Questions for Audience

1. (After Slide 5) Have you considered whether electric vehicles with suitable charging infrastructure can do your logistics?
 - **Yes/No**
2. (After Slide 9) Who is responsible for preparing for future climate disasters?
 - a. **Governments (National/Local)**
 - b. **The Military**
 - c. **Emergency Services**
 - d. **Logistics Industry**
 - e. **Aid organisations**
 - f. **Academia**