# LOW CARBON ROAD OPERATION – ELECTRIC ROAD SYSTEM (ERS)

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# Challenges or the ERS

- To ensure a continuous energy supply on the equipped road network
- Reliability and efficiency of the system
- Resilience to the weather, traffic and infrastructure conditions
- Safety of other divers/users
- Affordable transformation of vehicles, electricity/fuel in parallel
- Infrastructure electrification : technical issues and business model
- System operation
- IRU recommends 40-45% of long haul road transport on ERS by 2050

# ERS Technologies

- Catenary solution
- Ground conductive solution
- Ground inductive solution

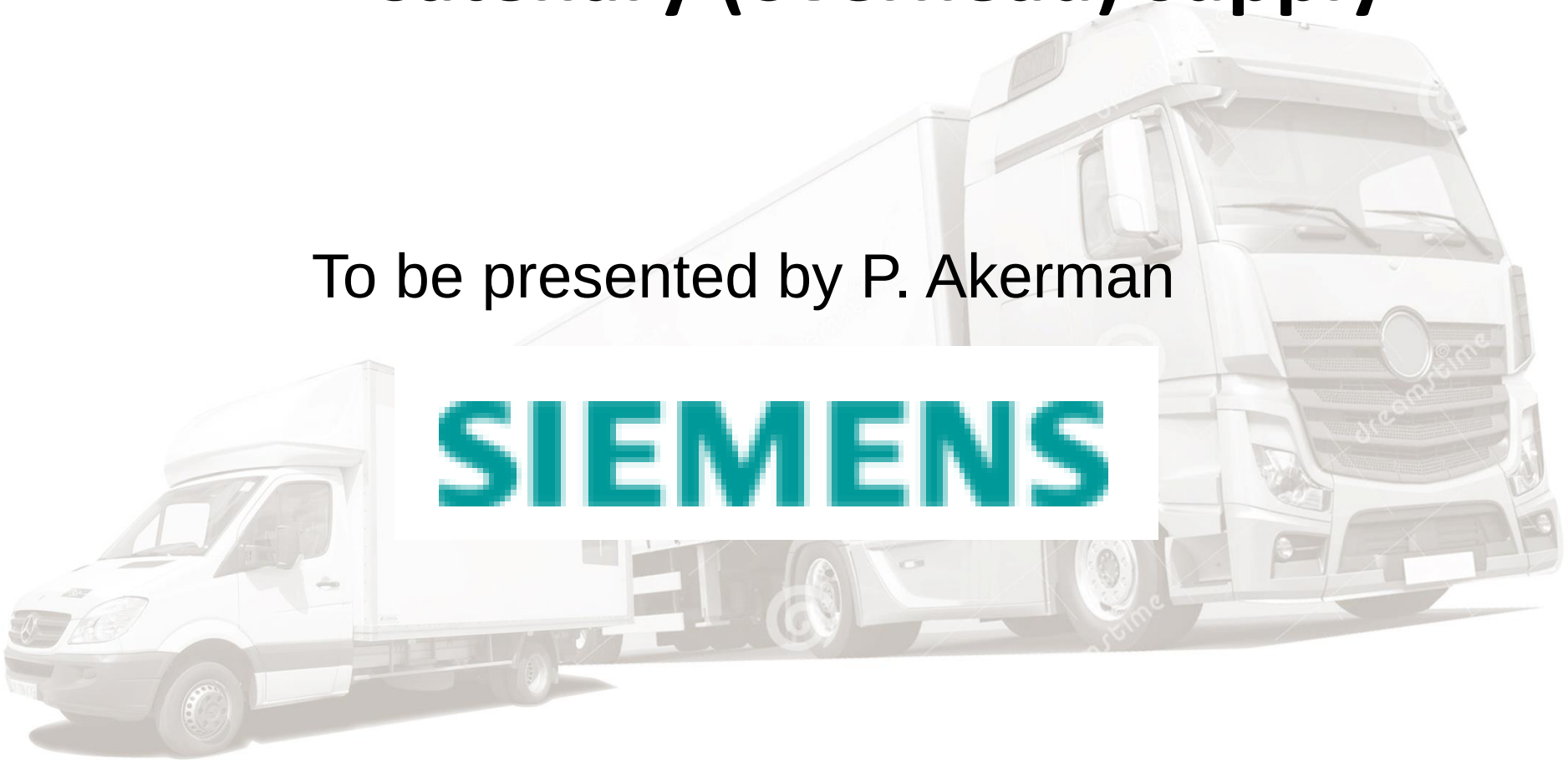





# Catenary (overhead) supply

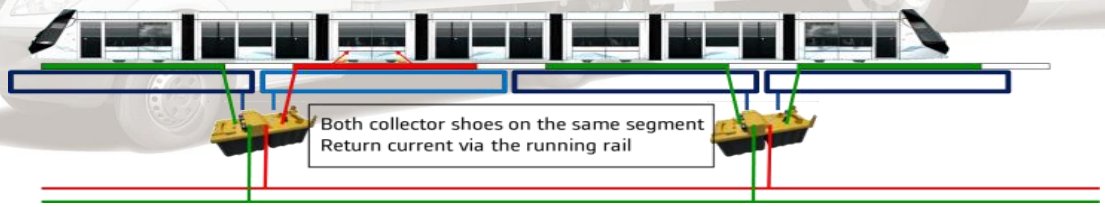
To be presented by P. Akerman

SIEMENS

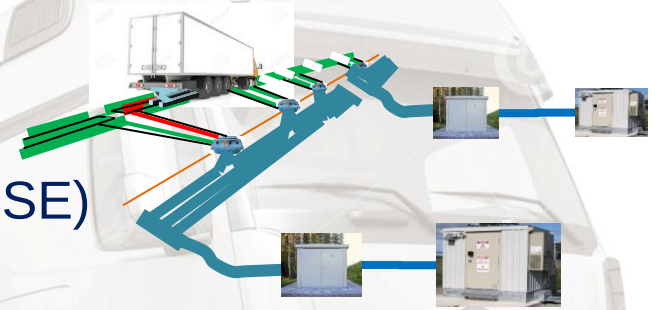


# Ground-level feeding: from rail to road

- **Segmented ground feeding system**
- **APS in operation since 2003 in Bordeaux**
  - In 10 cities (in operation or under construction)
  - More than 30 000 000 km run in APS
  - Total: 334 tramways and 141 km of track
  - APS provides same performances than OCS
  - Intrinsic safety and compatible with mixed traffic (crossroads)

# Ground-level feeding

- APS for road: proof of concept (Slide-In project, SE)
- Demonstrator (350 m) built on Volvo test track
- Proof of concept validated
- Improved solution answering road needs under development

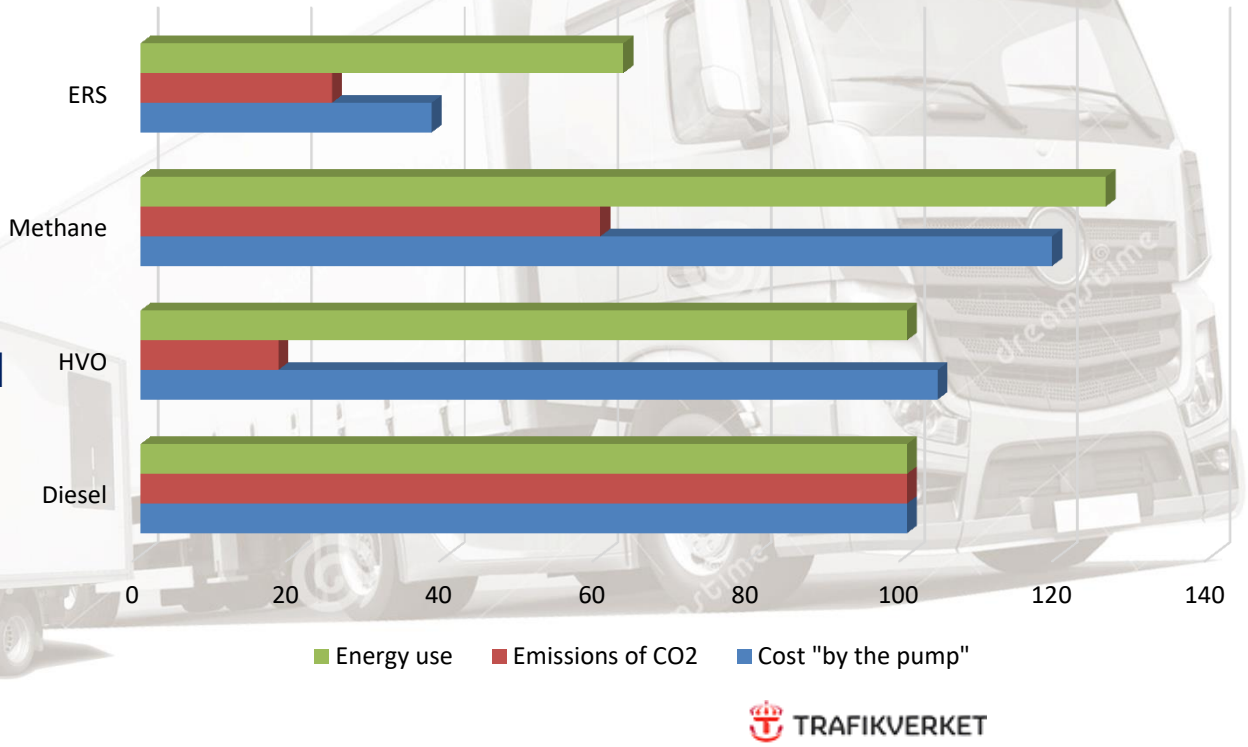
| Current collection test | Result |
|---|---|
| 126kWatts 180Amps 690VDC transfer | ✓ |
| Truck speed more than 80km/h | ✓ |
| 20km of continuous power transfer | ✓ |
| Rainy conditions | ✓ |
| Short circuits tests | ✓ |
| Track adherence tests | ✓ |


# Conditions and barriers

- At least 20-30 km transport distance
- About 60% of the distance needs to be on electric road
- The average daily number of electric transports should be 3 times the length of the mean transport distance in km
- At least 20% (preferable 50%) of the annual distance driven by each electric truck should be on the electric road
- Preferably several operators running on the same electric road
- Elements of shuttle like operation
- High/long-term investments + cost share → Business model !
- Some safety issues to be mitigated + standardization

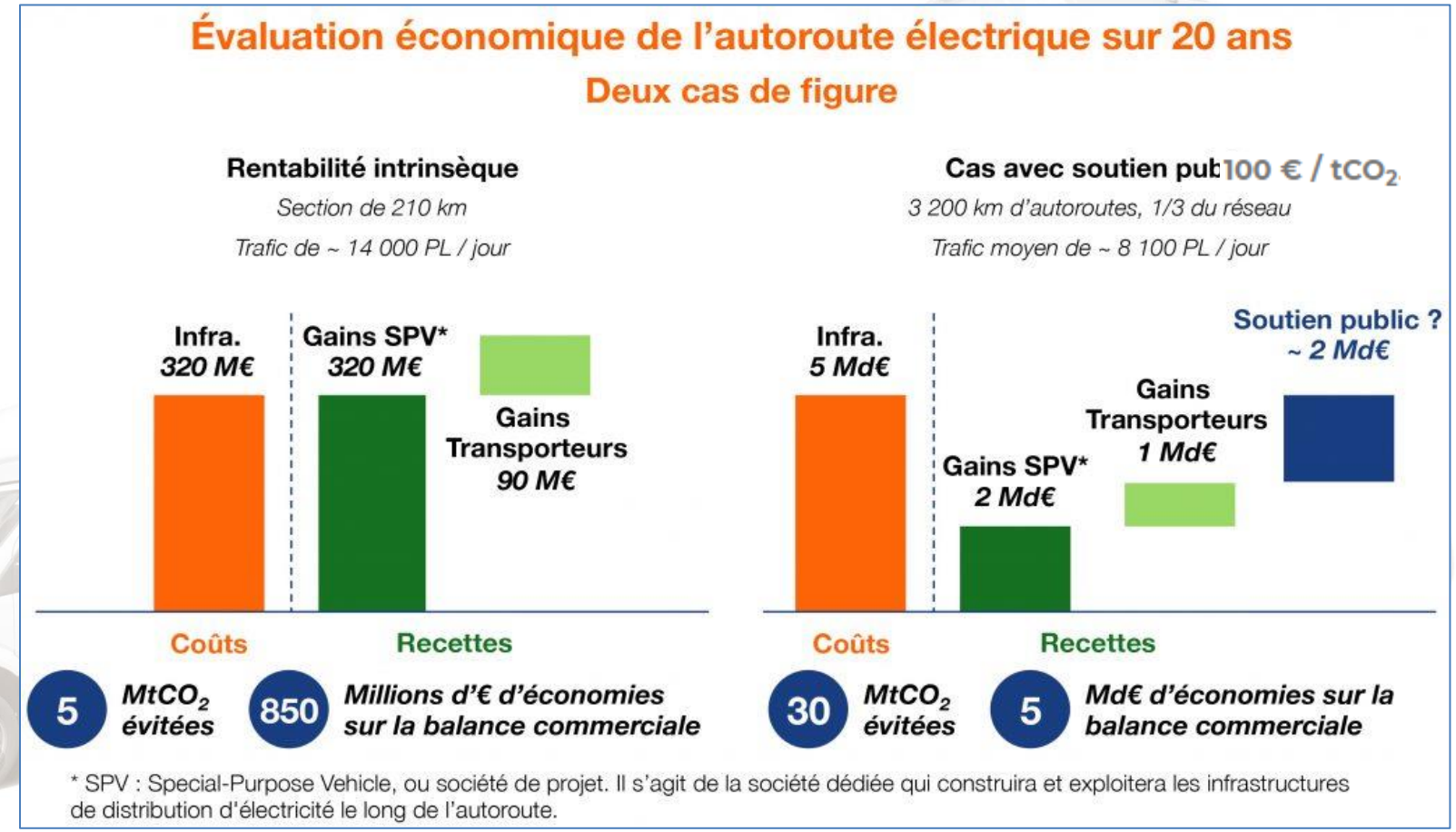
# Benefit of Electric Road System (ERS)

- reduces energy use
- reduces CO2 emissions
- utilizes existing infrastructure
- creates new field of knowledge and industrial branch
- is a field for cooperating between the political, administrative and industrial entities

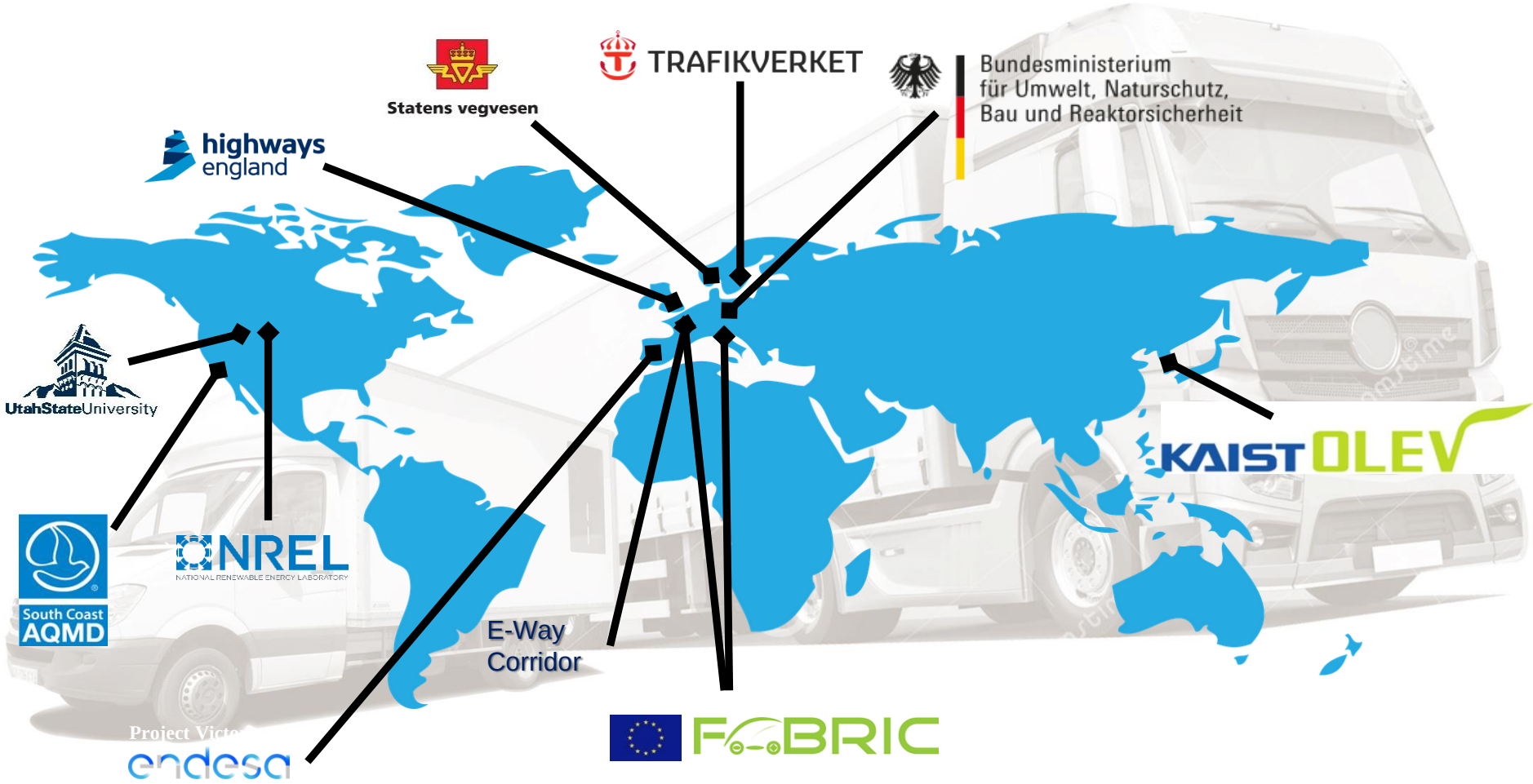



TRAFIKVERKET

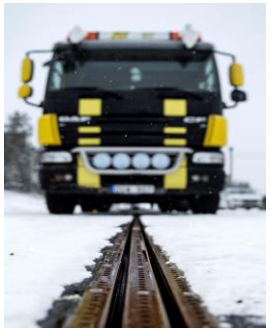
# Assessment by Carbone 4

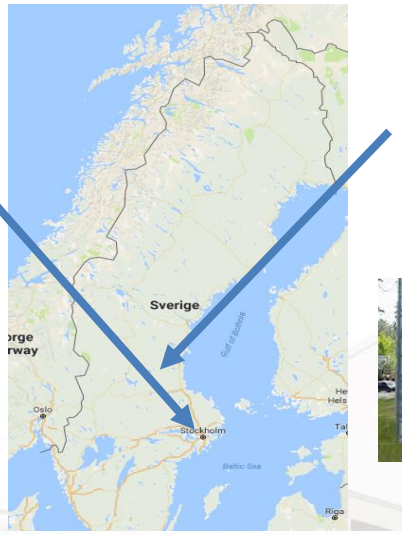


# ERS Technologies and Projects

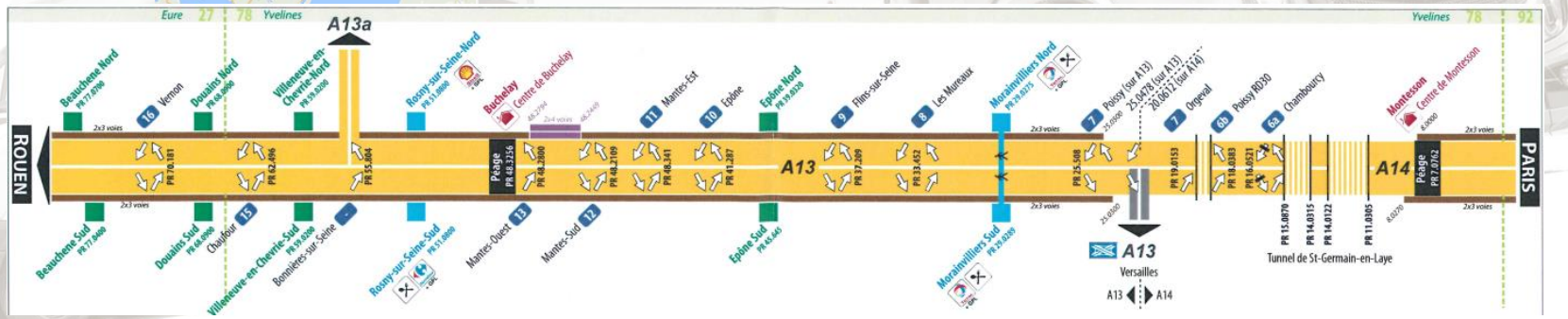


# Projects






- Paris-Le Havre (A13)
- Feasibility study
- Multi-technology
- Techno-economical
- ADEME: “Road of the future”
- OIE, IFSTTAR, SANEF, SPIE, AFNOR, Accenture…



# Thank you very much for your attention!

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