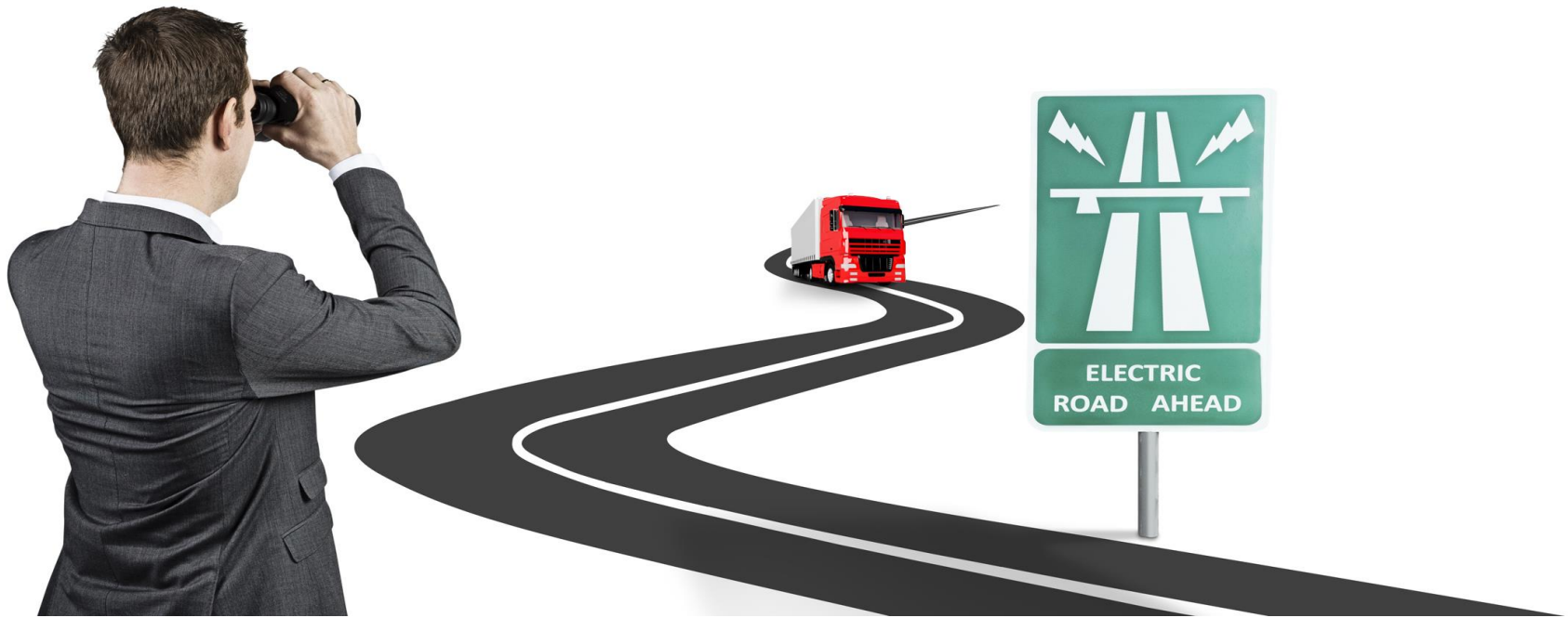


ELECTRIC ROADS AROUND THE WORLD



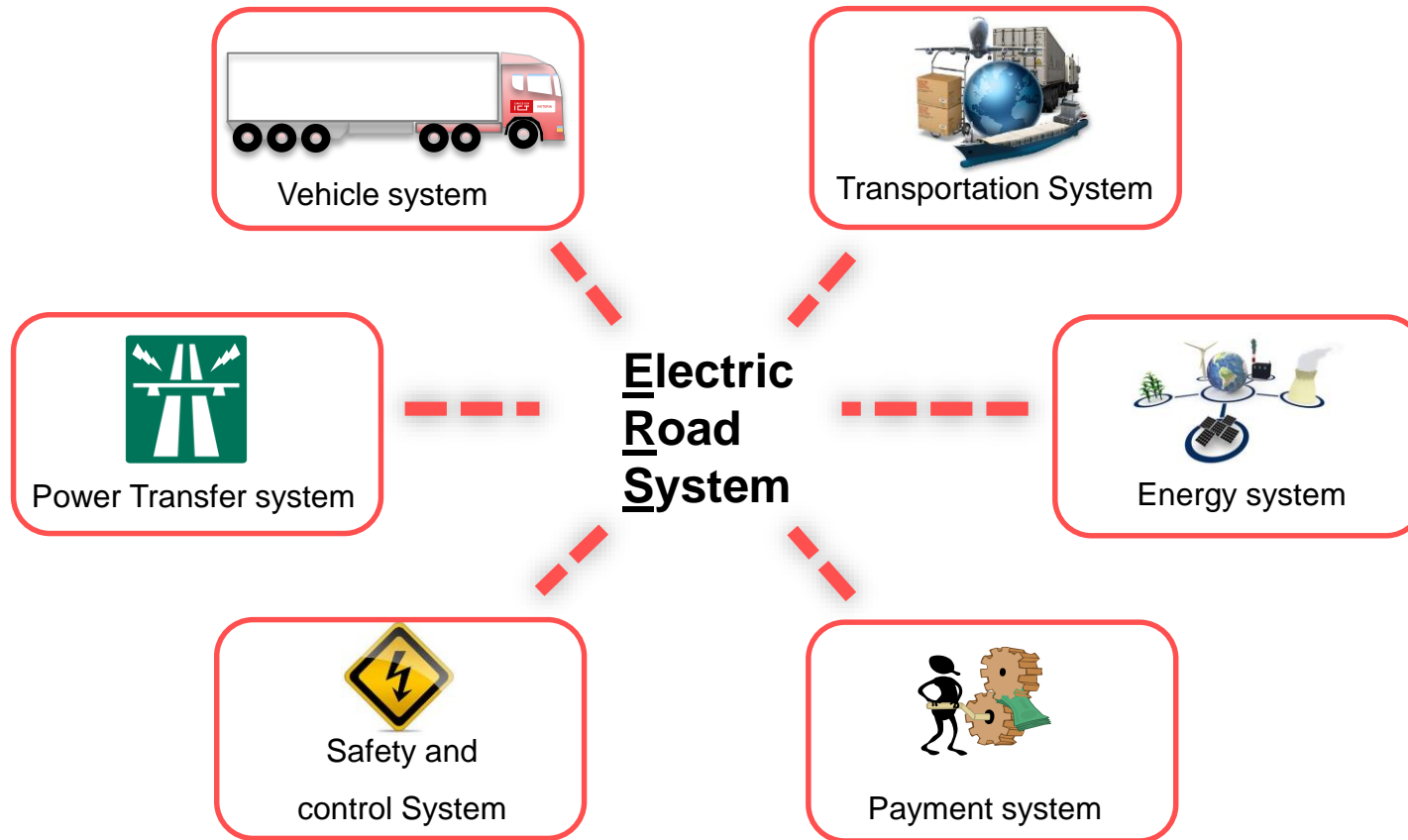
Håkan Sundelin, Conny Börjesson
Senior Researchers

VIKTORIA SWEDISH ICT

- Sustainable Mobility enabled by ICT
- Non-profit research institute
- Owned by industry and Swedish government
- Around 70 persons and growing
- Approximately half PhD's or higher degree
- Five application areas
 - **Electromobility**, Cooperative Systems, Sustainable Business, Sustainable Transports, Digitalization strategy
- 5 years of activity within electric roads

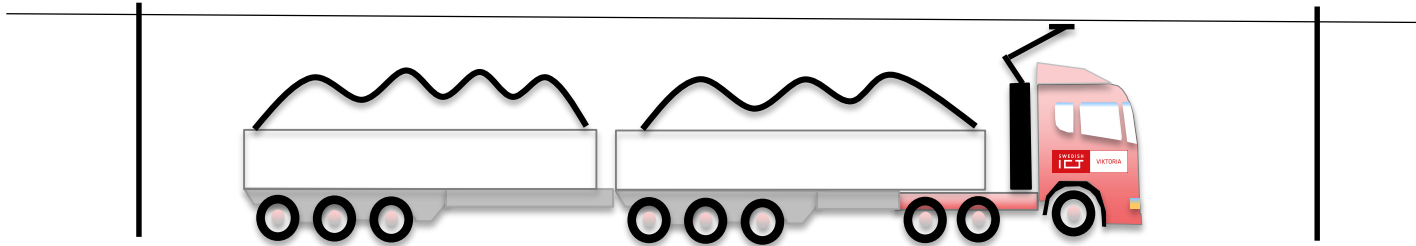
ELECTRIC ROAD SYSTEM

A SYSTEM-OF-SYSTEMS



DIFFERENT SOLUTIONS

Conductive, overhead line



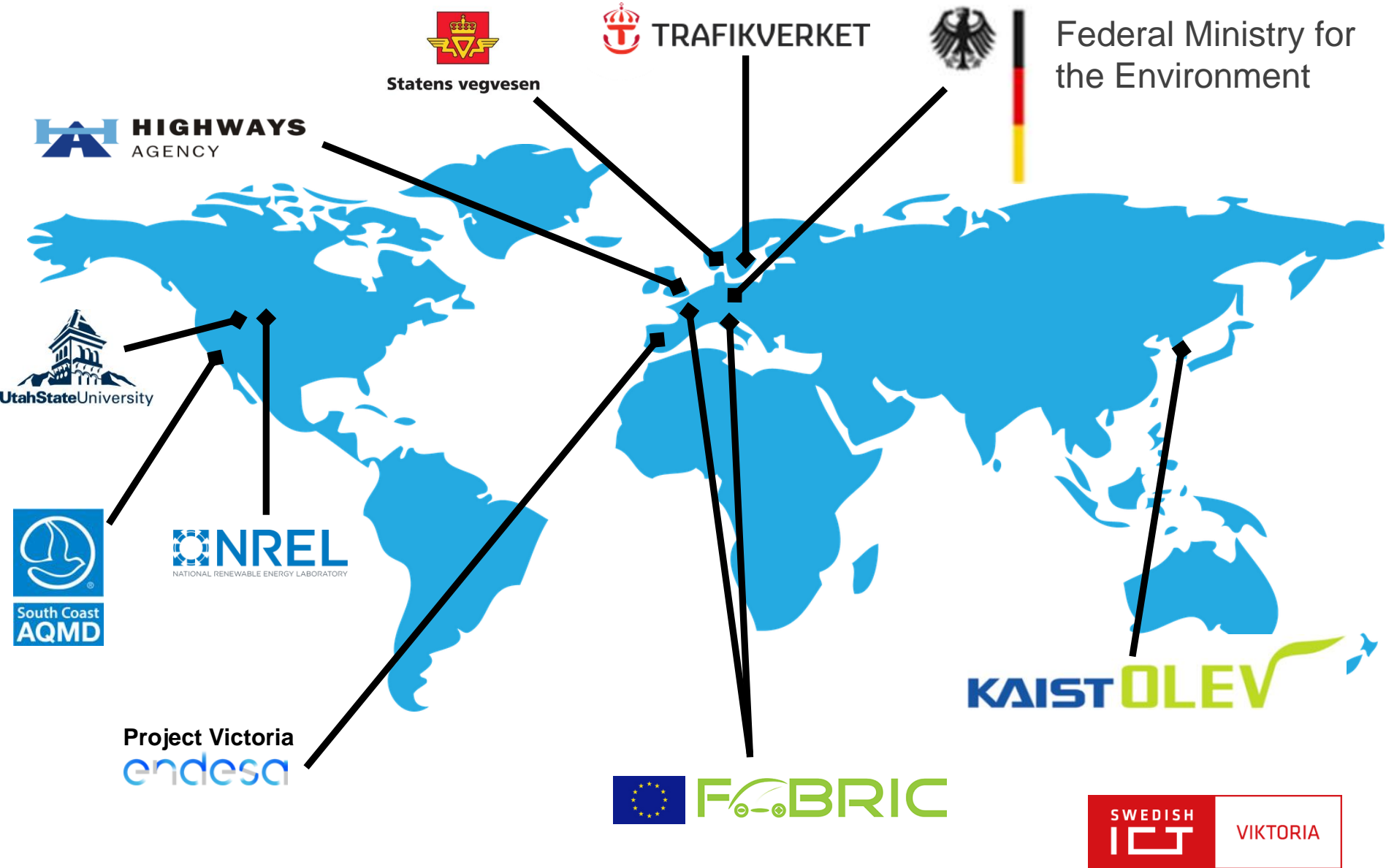
Conductive, rail



Inductive, wireless

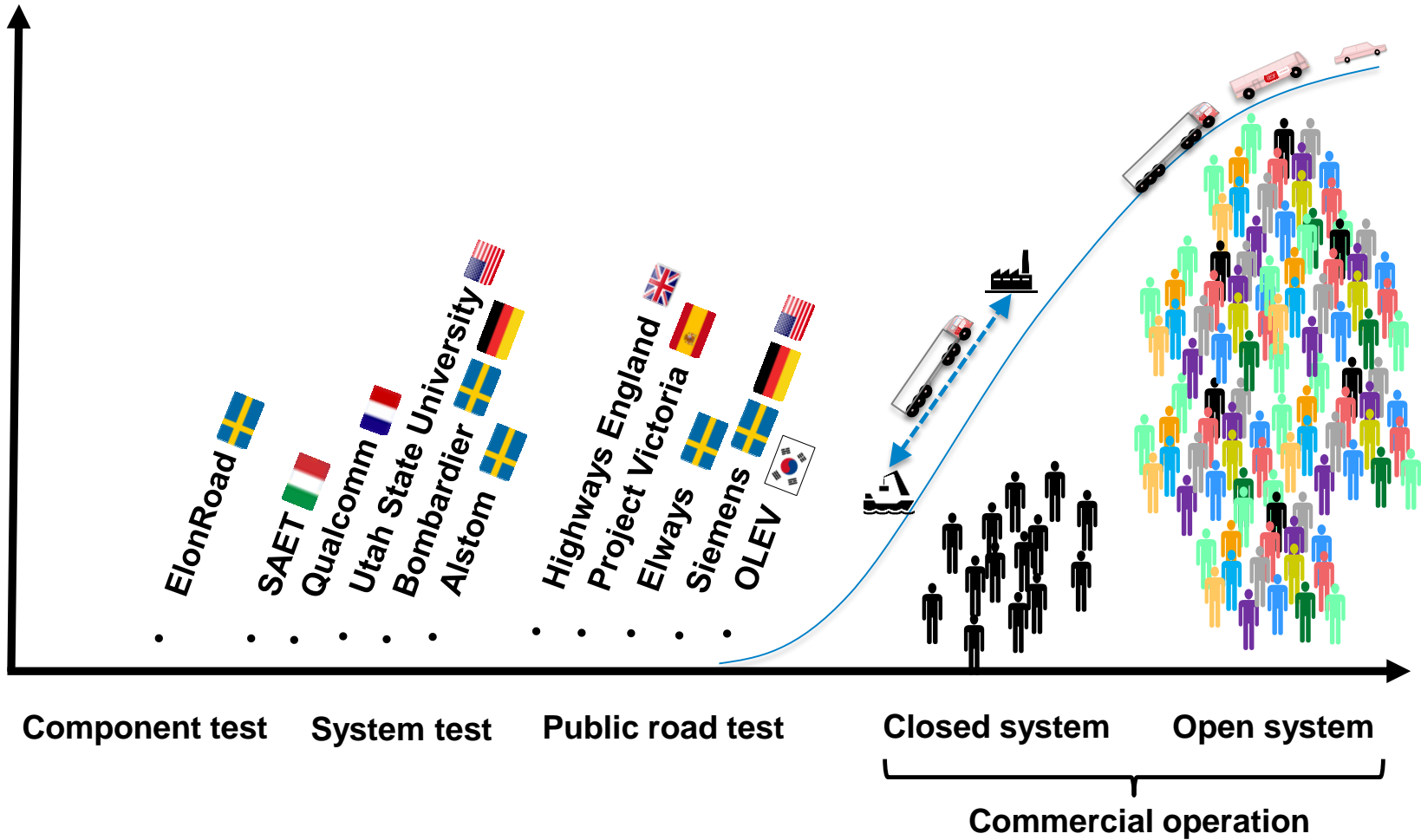


A TECHNOLOGY GAINING MOMENTUM



EXPECTED STATE OF THE ART - 2017

Extent of use





Håkan Sundelin

Senior Researcher, PhD, Electromobility

Conny Börjesson

Senior Researcher, Electromobility

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DYNAMIC POWER TRANSFER

Commercial actors

&

Research activities

BOMBARDIER



MANHEIM, Germany

80m test track

Research project Slide-in

Concept:

Inductive (10cm, 183kW, 89%, +/- 10cm)

OLEV TECHNOLOGY



GUMI, South Korea

Bus in [operation](#) (144m, 2 vehicles)

Research originates from KAIST

Concept:

Inductive (27cm, 20-200kW,
74-83%, +/- 20cm)

SIEMENS



Public road testing in 2016

Carson, California, USA
SCAQMD
\$14,78 ~ 118 MSEK
1 mile and one year testing
TransPower, Mack/Volvo

Gävle, Sweden
Swedish Transport Administration
115 MSEK ~ 14,3 M\$
2 km and 2 year testing (E16)
Scania

Measured or simulated efficiency

	Supply	recuperation
substation efficiency	95 %	94 %
contact line efficiency	95 %	96 %
pantograph efficiency	99 %	99 %
traction engine efficiency	95 %	95 %
traction inverter efficiency	98 %	98 %

Accumulated efficiency 80-85% from input substation to power train

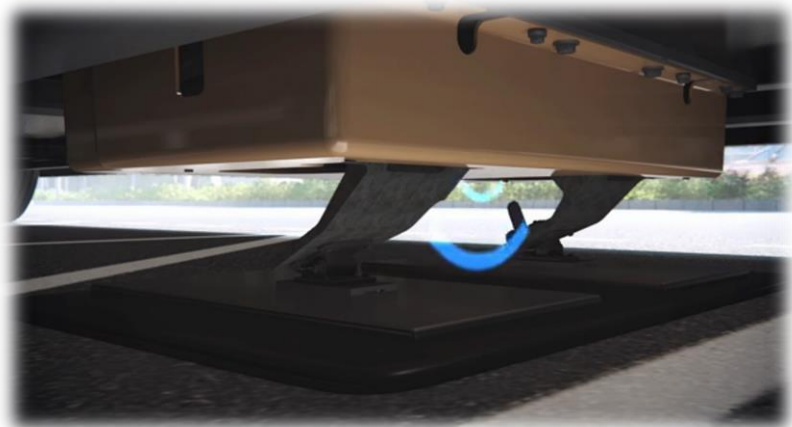
Groß Dölln, Germany

Research project [ENUBA](#)
2km test track

Concept:

Overhead line
Conductive (-400kW, %, +/- 1m)

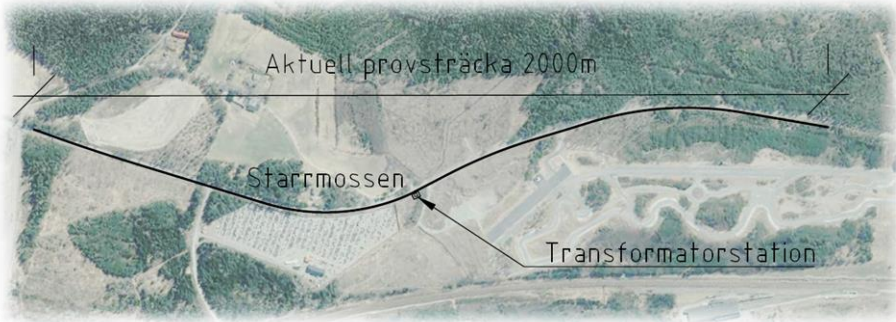
ALSTOM



HÄLLERED, Sweden
400m test track
Research project Slide-in

Concept:
Conductive (120kW, 93,3%, +/- 50 cm)

ELWAYS



ARLANDA, Sweden

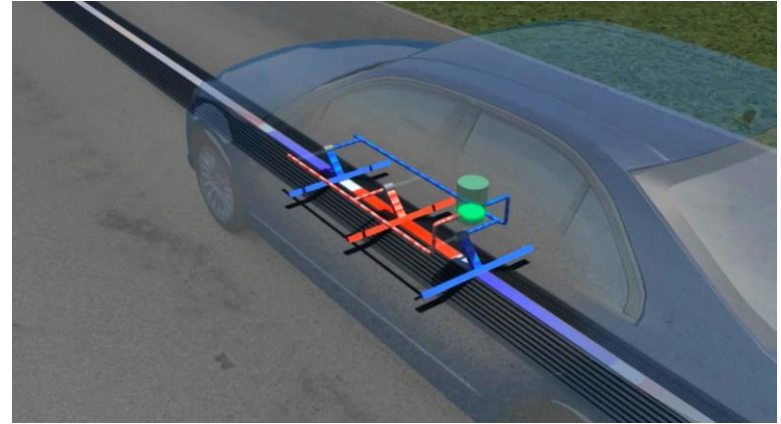
350m existing test track

2km public demo (Q3 2017)

Concept:

Conductive

ELONROAD



LUND, Sweden

Test and demonstration track
ready autumn 2016

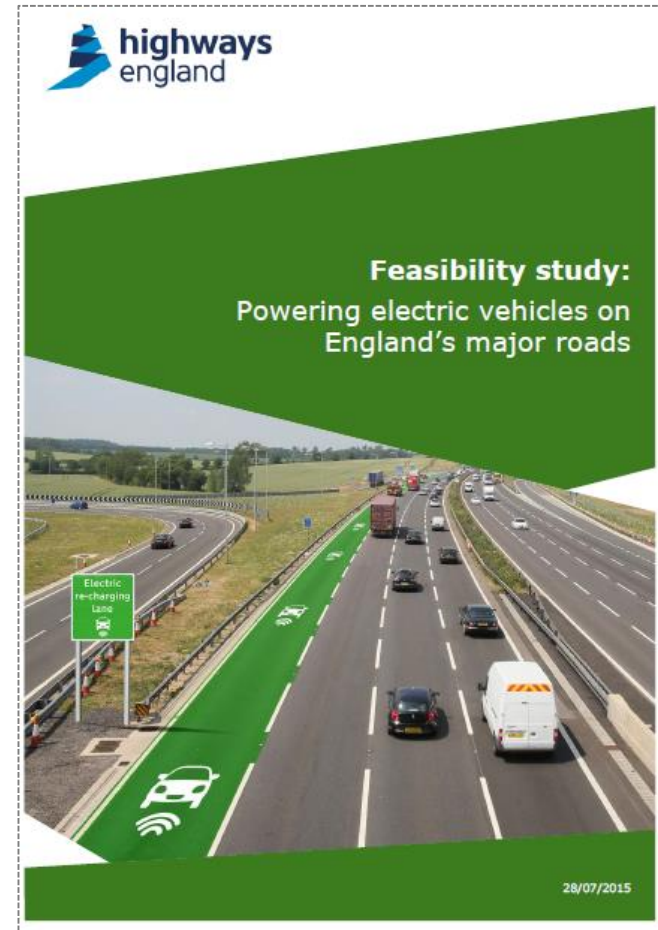
Concept:
Conductive

HIGHWAYS ENGLAND (TRL)

FEASIBILITY STUDY OF INDUCTIVE ERS

GOAL

”To identify a dynamic Wireless Power Transfer system that sits beneath the motorway surface that will provide a continuous power transfer to the electric vehicle, whether it is a car, LGV/HGV or coach whilst moving on the strategic road network.”



DEMONSTRATION PROJEKT - GERMANY

"Field trial of electric propulsion of heavy-duty vehicles with energy supply via overhead contact lines, on public roads."



Federal Ministry for the
Environment, Nature Conservation,
Building and Nuclear Safety

NORWAY



Statens vegvesen



Electric Infrastructure for Goods Transport

May 2016 – May 2018



E39 – "The road of the future"

Concept:

Electric road for both light and heavy-duty vehicles

GOAL

SWEDISH
ICT

VIKTORIA

FABRIC



Feasibility analysis and development of on-road charging solutions for future electric vehicles



TORINO, Italy

260m test track under development

Testing planned to start Q2 2016

SAET (Inova lab) and POLITO, FIAT

Concept:

Inductive (25cm, 20-100kW,
70-80%, +/- 50cm?)

GOALS

France



SATORY, France

100m test track under development

Qualcomm (Halo IPT), Renault

Concept:

Inductive (12,5-17,5cm, 20-40kW,
80%, +/- 20cm)

GOALS

VICTORIA



Static/Static on route inductive charging

100 m Dynamic inductive charging

Static/Static on route inductive charging



MALAGA, Spain

100 m dynamic with 8 coils (80cm)

12.5m between each coil

Test starting in Q1 2016

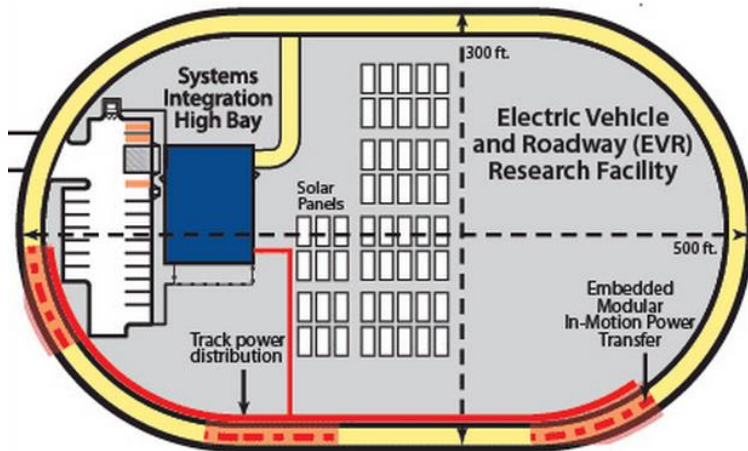
Part of "Smart City Malaga" led by Endesa

Concept:

Inductive (15-25cm, 50kW, 85%, +/- 30%)

GOALS

UTAH STATE UNIVERSITY



LOGAN, UTAH, USA

Demo 20-passenger bus, 2016 Q2

New research facility (2-3 M\$)

Concept:

Inductive (25-35cm, 25-40kW, 90%, +/- 20cm)

GOALS

WWW.VIKTORIA.SE

PART OF
**RI
SE**

