The Forever Open Road

Asphalt – What's around the corner?

Presented by Bob Collis

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Contents

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- AIT with TUW
- BRRC
- CIRTNENS
- IGH
- CDV
- DRD
- TECER
- IFSTTAR
- BAST
- KEDE with NTUA
- KTI
- ICERA
- NRA with UCD & TCD
- ANAS with UNIFI
- LVCELI
- RRI
- PCH
- NPRA w. NTNU & SINTEF
- RWS-DVS with TNO &TUD
- IBDIM
- LNEC
- CESTRIN
- IP
- KGM
- VUD with U. Zilinia
- ZAG
- CEDEX
- VTI
- LAVOC
- Derzhdor
- TRL
- ARRB
- INRC
- CSIR
- FHWA

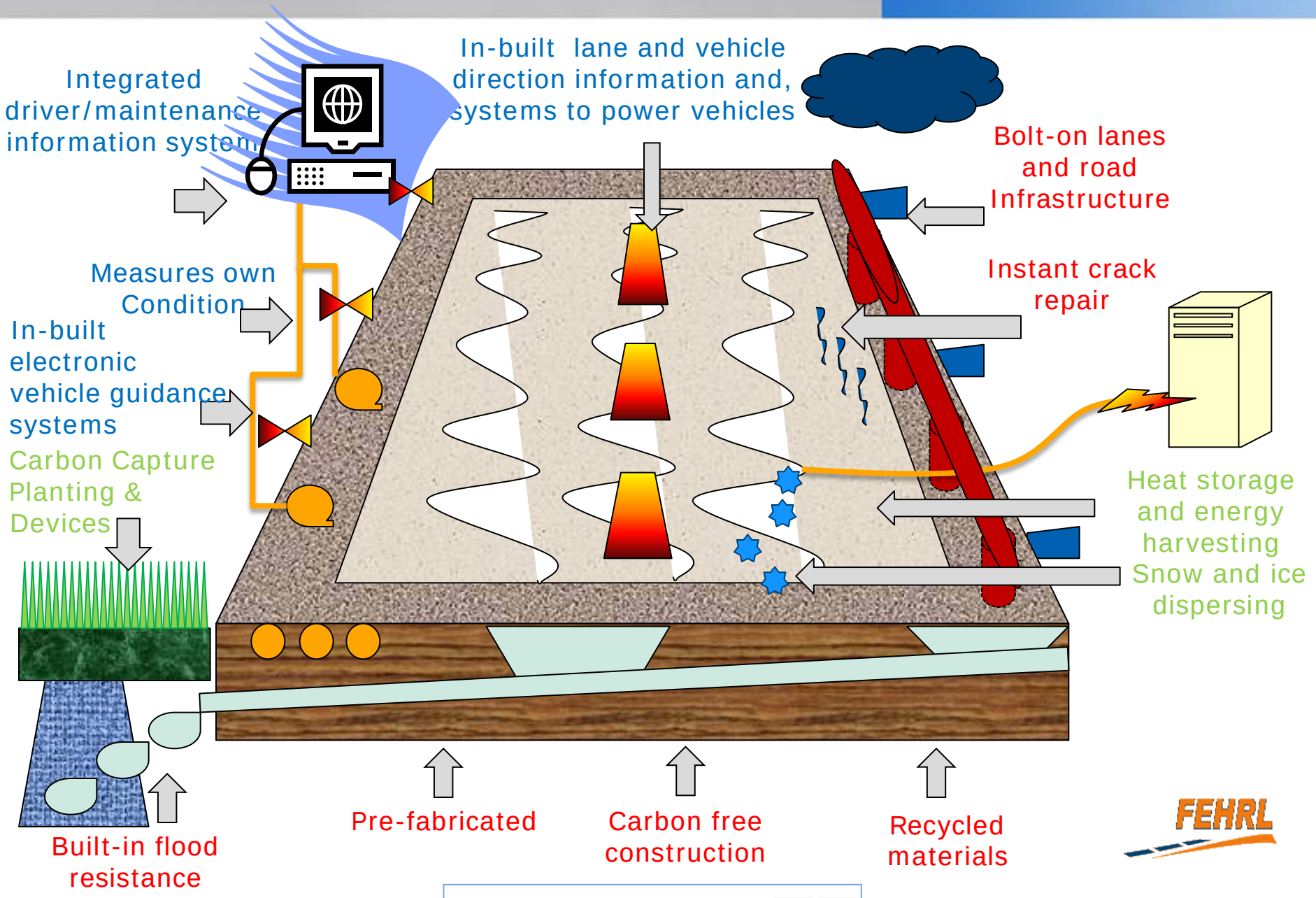
Where's the WOW in Roads?

Where's the WOW in Roads!

- What will be the Next Generation Road?
  - The track
  - The paved road
  - The smooth road
  - Motorways
  - **What's next?**

- A BIG Leap forward for 'the road'!
  - Solves existing and future problems
  - Achievable through existing and new technology
  - A 'Smart', 'Intelligent', 'Dynamic' Solution with a **WOW!**
- The 5th Generation Road!
  - Long-term pan-European solution
  - Applied to maintenance of existing and building of new roads
  - Many costs savings and benefits

The Forever Open Road Concept



FOREVER OPEN ROAD
Redefining Road Transport for the 21st Century

FEHRL

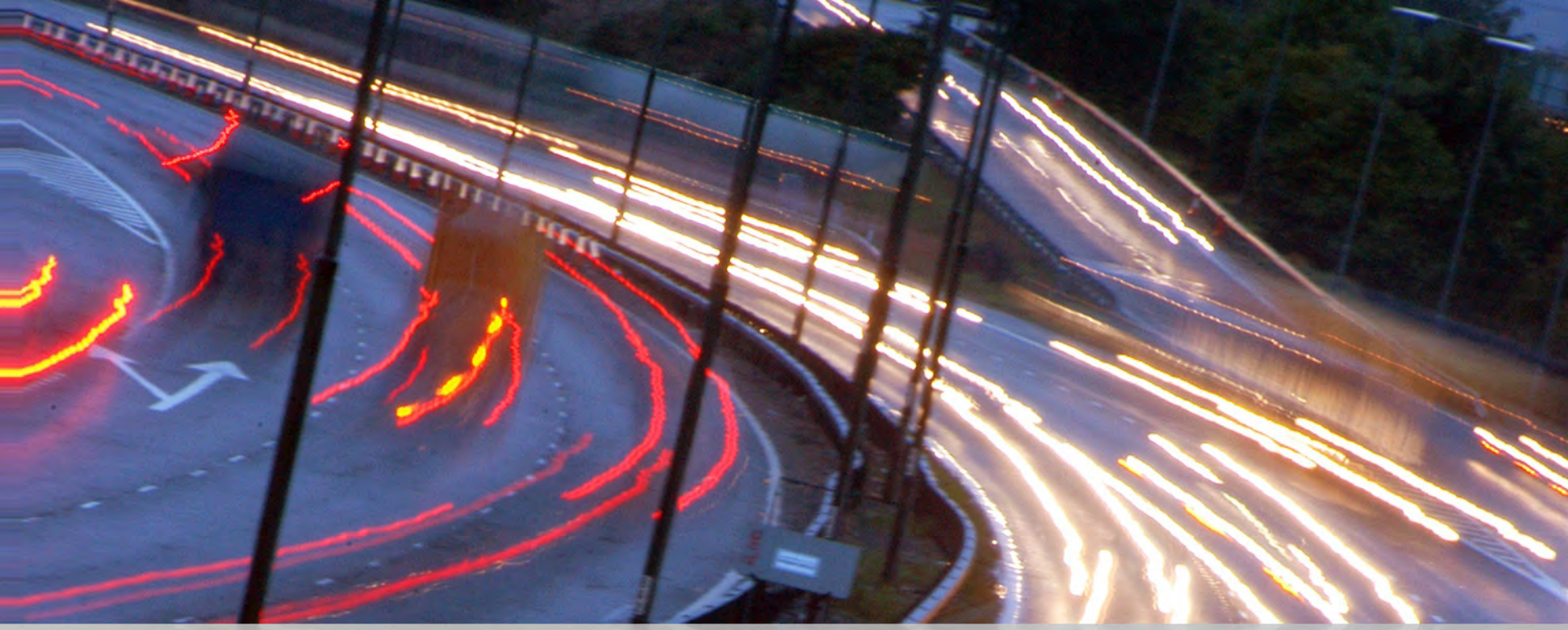
TRL

The Forever Open Road

- Takes all our existing ideas and makes one solution to provide the strategy for developing and improving our road network
- Will produce a new generation of road comprising:

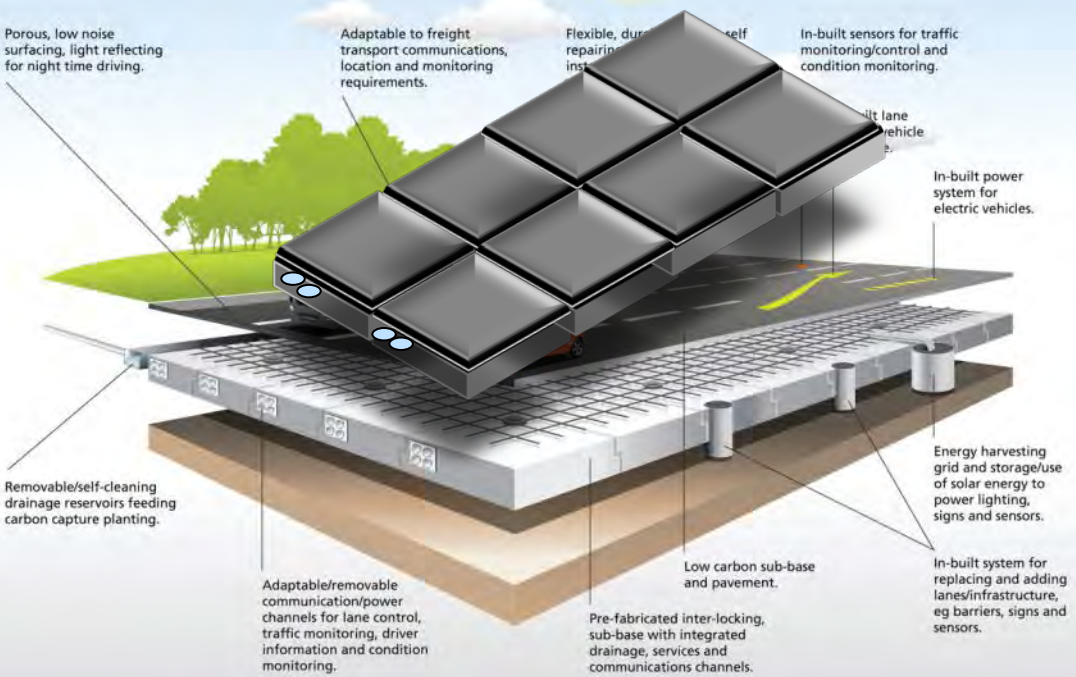
  - the Adaptable Road 
  - the Automated Road 
  - the Resilient Road 

- Integrates innovation in infrastructure, vehicle technology and intelligent transport systems



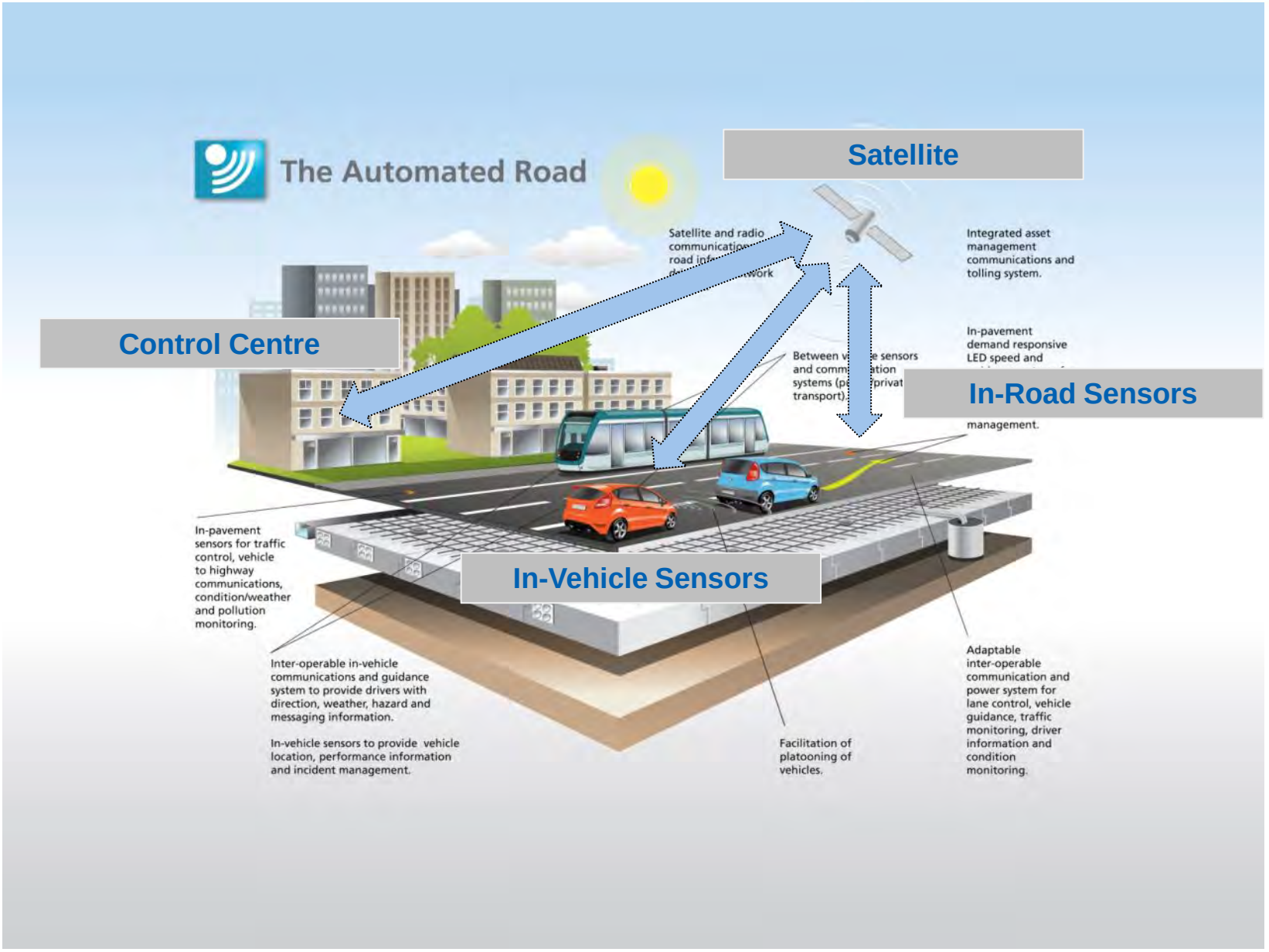
Making The Journey Happen

The Adaptable Road



ModieSlab Prefabricated Road

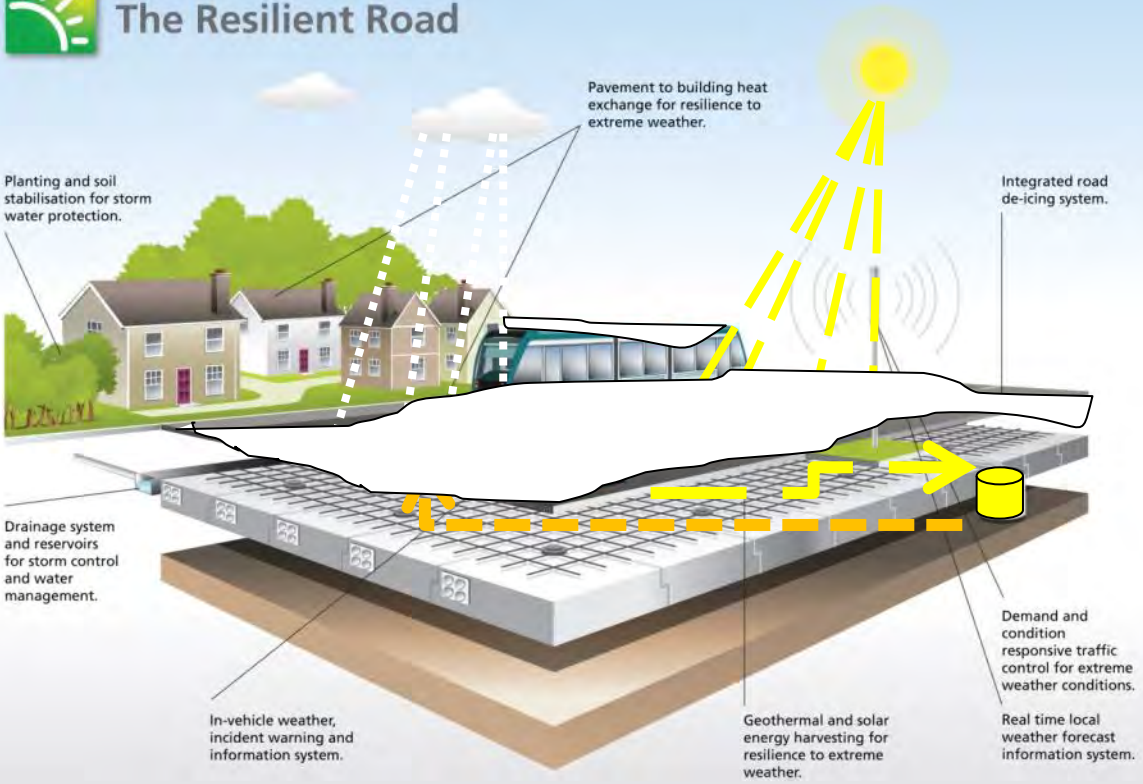
Road on a Roll, Netherlands


The Automated Road
Satellite
Control Centre
In-Road Sensors
In-Vehicle Sensors
Satellite and radio
Integrated asset management communications and tolling system.
In-pavement demand responsive LED speed and
management.
In-pavement sensors for traffic control, vehicle to highway communications, condition/weather and pollution monitoring.
Inter-operable in-vehicle communications and guidance system to provide drivers with direction, weather, hazard and messaging information.
In-vehicle sensors to provide vehicle location, performance information and incident management.
Facilitation of platooning of vehicles.
Adaptable inter-operable communication and power system for lane control, vehicle guidance, traffic monitoring, driver information and condition monitoring.

New Communications Systems?

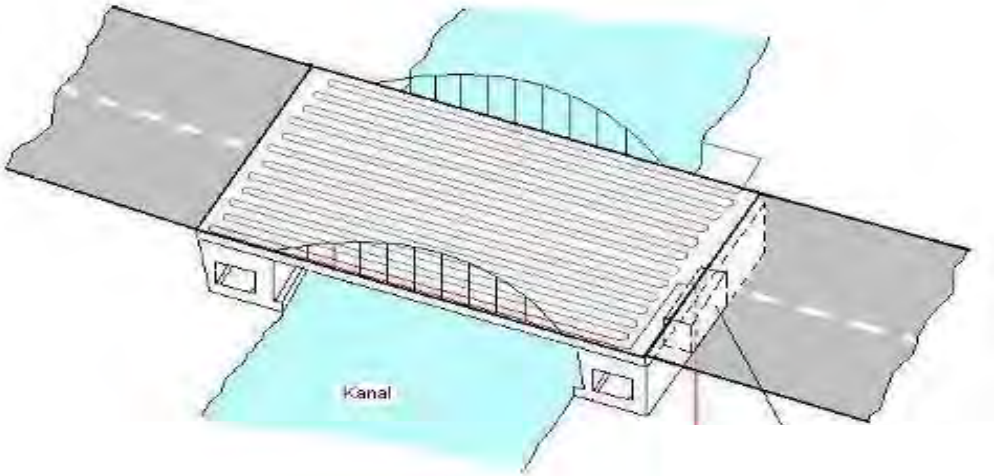
Contactless Charging of Electric Vehicles

The Resilient Road



Floor Heating on Bridge Decks: BASt, Germany

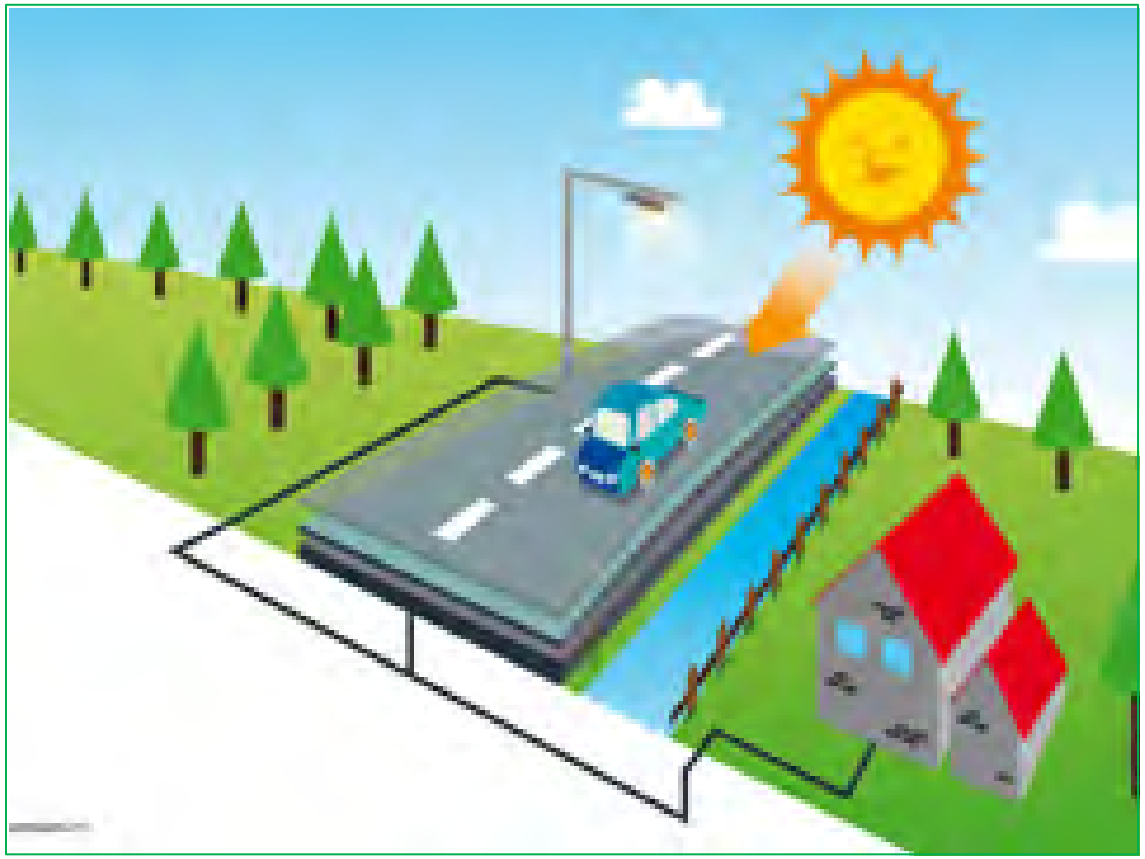
- using geothermal energy to reduce the impact on bridge decks of icing and extreme high in winter and surface temperatures in summer
- reduce of winter maintenance / prevent additional winter maintenance



Solar Road Concept, USA

www.solarroadways.com

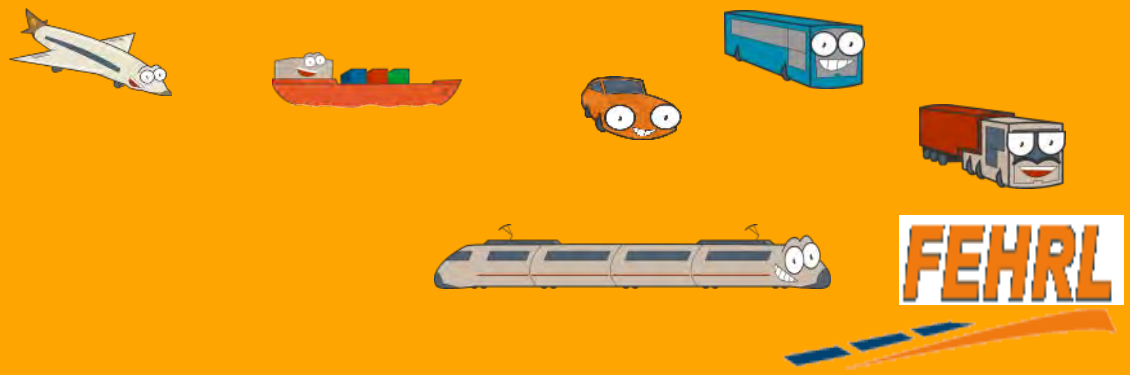
Solar Road Project: TNO, The Netherlands



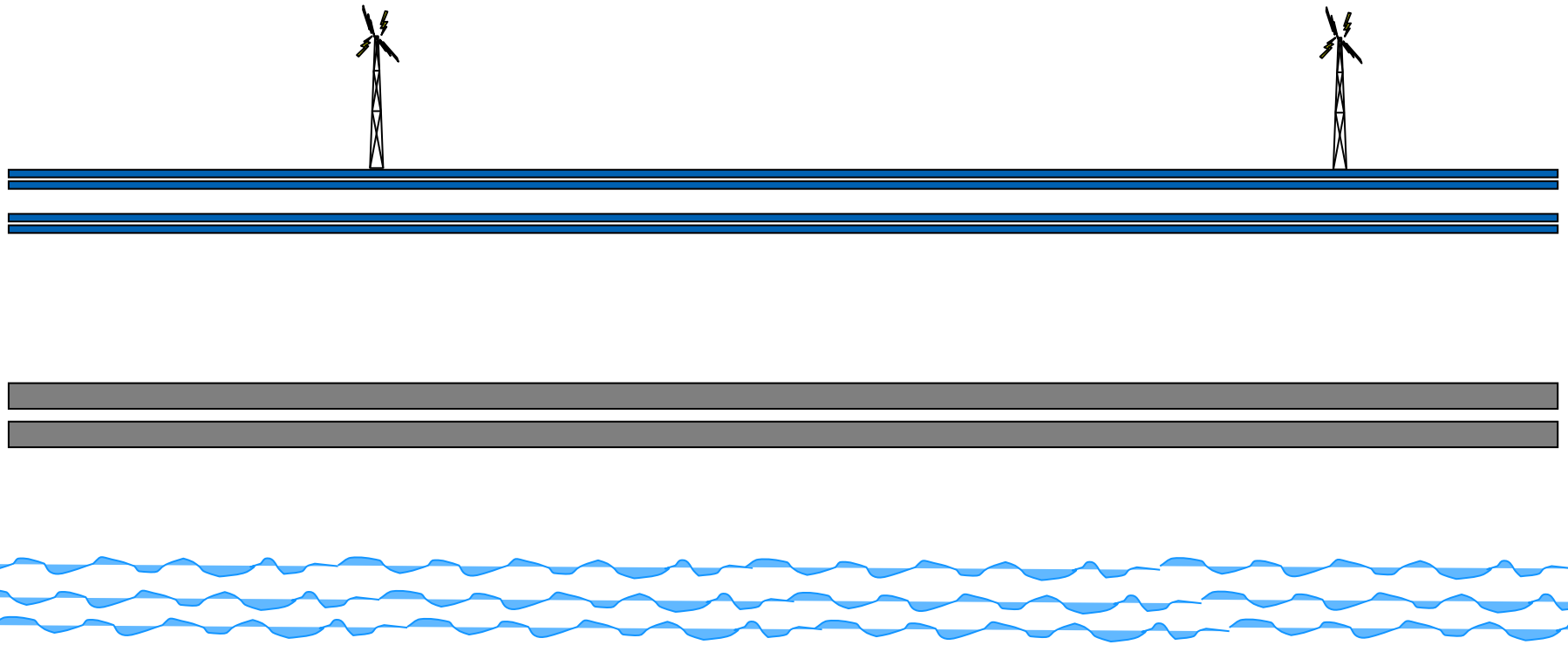
- **Purpose:** Develop a road surface that converts sunlight into electrical energy using integrated solar cells.
- **Outcome:** New road surface designs. Harvested energy to be fed into the power grid.

The Forever Open Road, Railway Runway and Riverway!

FORx4
The Transport System of the Future



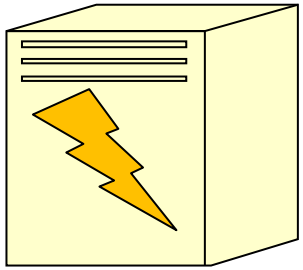
And it Was Built!



But!

The Operating Costs Grew

The Technology Moved On



Energy Costs Were High

The Control Systems Could Not Cope

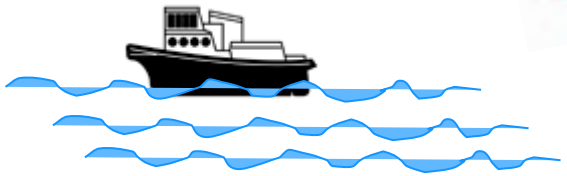
And!

The Trains Were Overcrowded

The European Economy

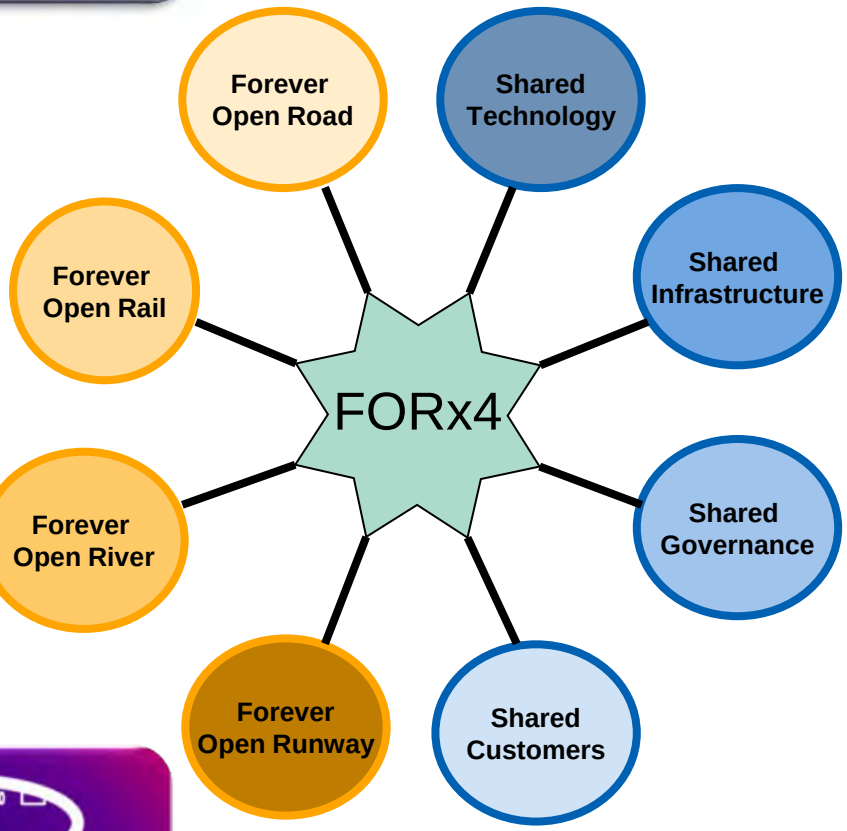
The Road Network Reached Capacity

The Boats and Planes were Inaccessible



FORx4

The Technology Domain – the information, communications, sensor and power systems that will support the future transport network.



The Infrastructure Domain – the transport network formed from Europe's routes and interchanges.

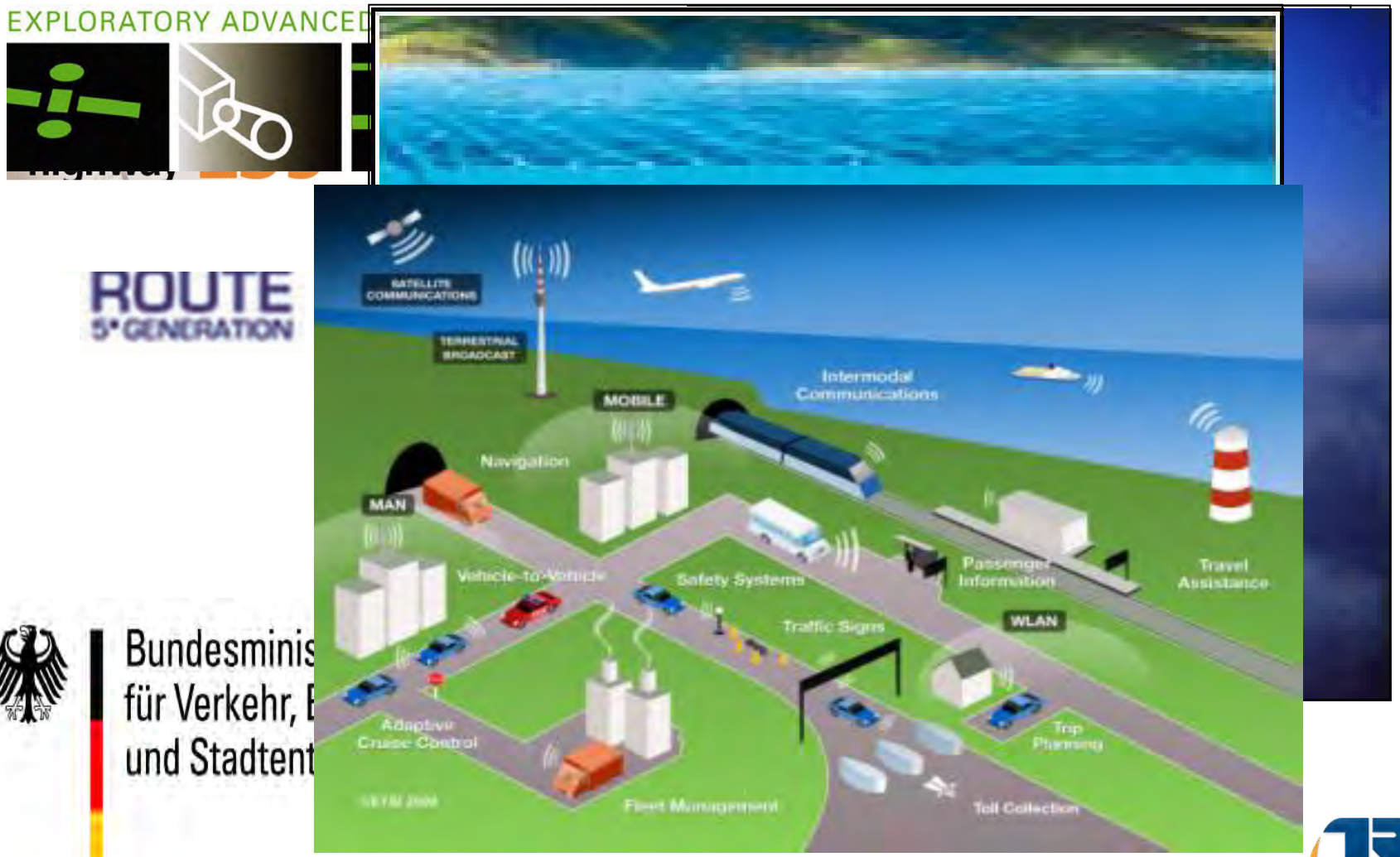
The Governance Domain – the management, operations, investment and appraisal of the network.

The Customer Domain – fare paying public transport users, freight shippers, train operating companies and road and bridge users paying by tolls or taxes.

Stimulating Other Programmes

Straßen im 21. Jahrhundert

Exploratory Advanced Research Program – USA



Bundesminis
für Verkehr, E
und Stadtent

HORIZON 2020

- **European Commission 2014 Call**
- **Next Generation of Transport Infrastructure**
- Advanced, quick, cost-effective and **flexible (modular) design**.
- **Retrofitting systems**/techniques and materials.
- **Self-monitoring**, self-reporting, non-intrusive inspection and testing methods.
- Reuse and recycling methods for **low energy construction**.
- Innovative concepts and methods for **alternative fuels** infrastructure
- **Energy harvesting** infrastructure
- **Cross-Modal!**


FOREVER OPEN ROAD
Redefining Road Transport for the 21st Century
FEHRL's Flagship Programme
Thank You
Bob Collis
bcollis@trl.co.uk