EVS32
A world of E MOTION
MAY 19 22 2019
INTERNATIONAL
ELECTRIC VEHICLE SYMPOSIUM & EXHIBITION
EVS 50th anniversary 1969-2019

PEDELEC

Pedal Electric

Coventry University | ntdc national transport design centre

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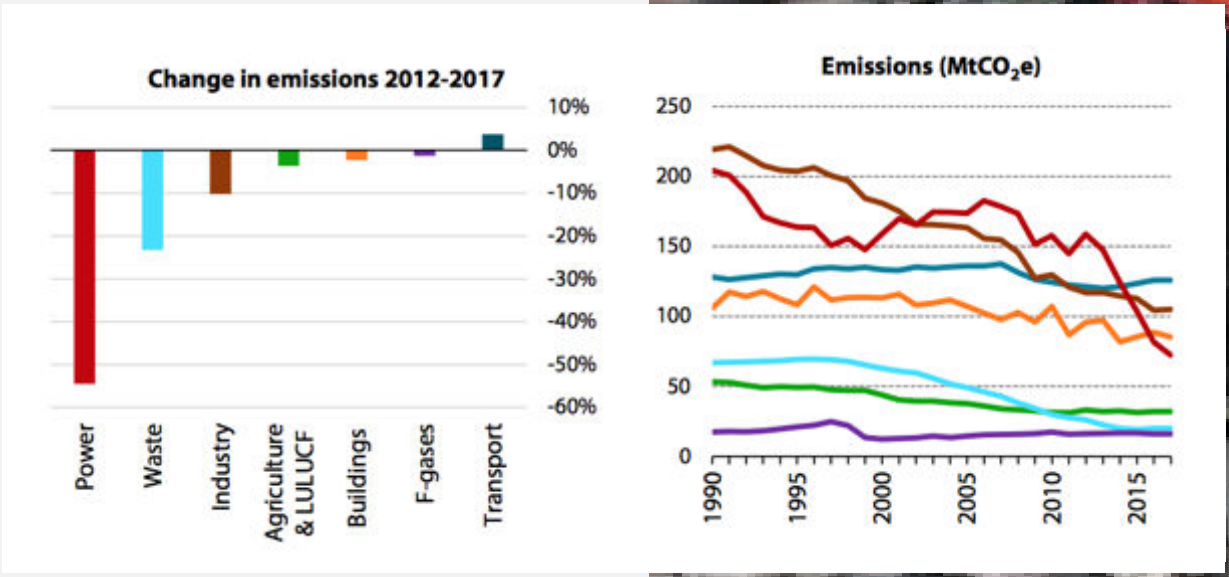
What is Ped-elec?

- Non-polluting lightweight Velomobile EV
- Efficient Pedal-Electric Hybrid
- Operating in a ‘dockless’ shared usage system
- A comfortable, accessible mobility alternative
- Designed for our evolving urban environments

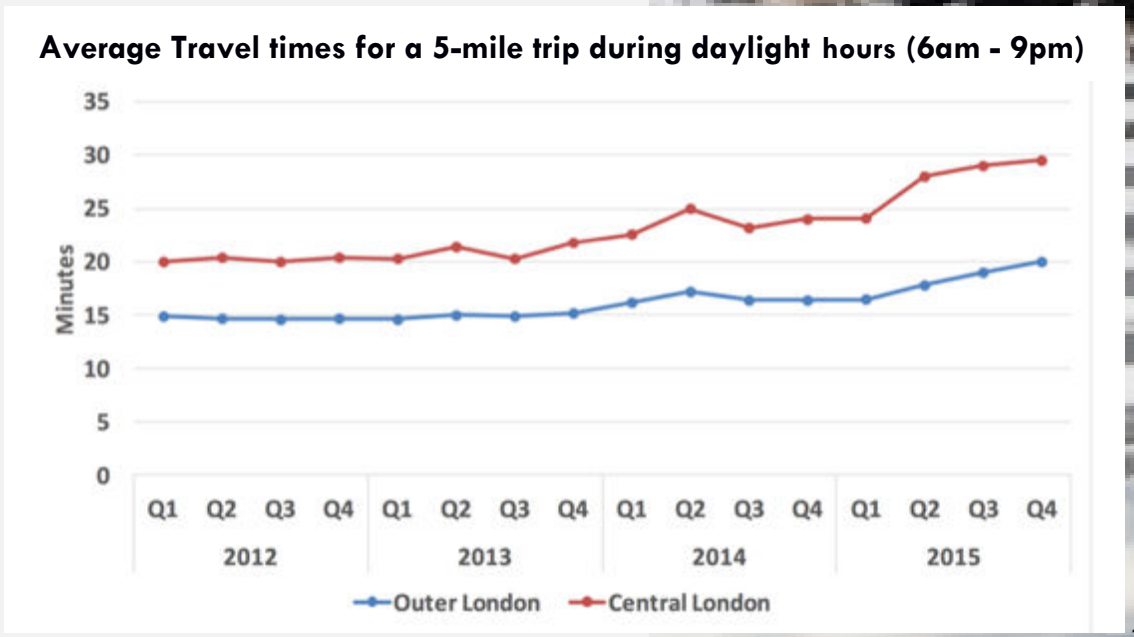
Transport Emissions

- Rising in UK and across Europe
- Behind other sectors
- Now largest emitting sector



Urbanisation & Congestion

- Increasing urban populations
- Increased strain on existing transport infrastructure (roads, trains)



Energy Independence

- Potential energy 'black hole'
- Increase in energy demands from EV's

How are cities responding?

'Green' initiatives to reduce pollution and congestion…

- Increasing pedestrian/cyclist priority & investment
- Low emission zones/charges – (ULEZ started this week)
- Car-less zones (Madrid, Copenhagen, Oslo…)
- Diesel bans (Athens, Paris, Madrid, Germany…)
- Outright banning of CE car sales (2040 in UK)

Noticeable trends…

- Driving licenses decreasing (17-21 yrs)
- Cost of city car ownership increasing
- Emergence of 'sharing' culture (MaaS)

Cycling & EV limitations…

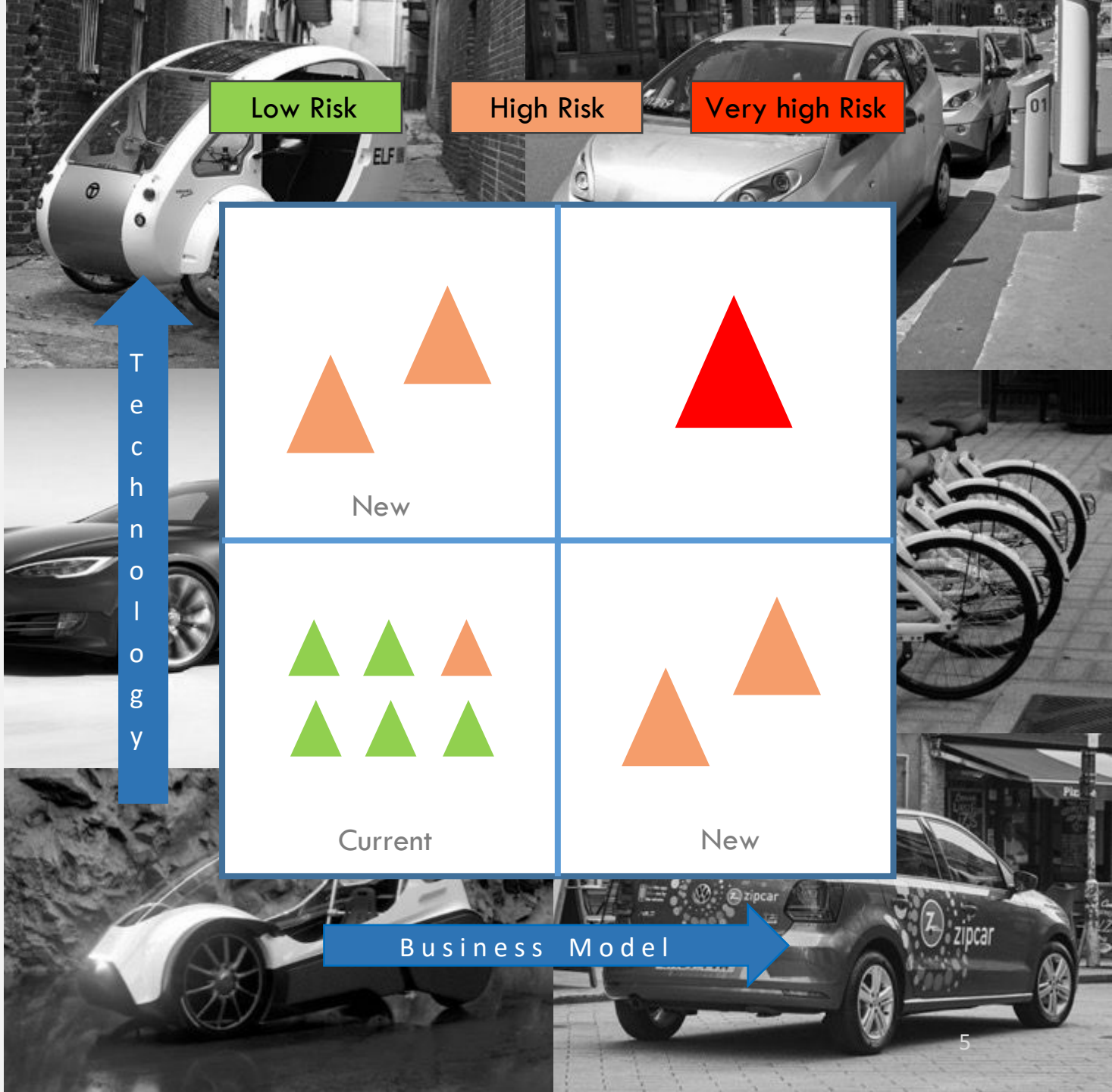
- Bicycles – ill equipped to replace functional and comfort capacity of cars.
- EV's — Energy inefficient, large footprint.

Why are velomobiles an opportunity?

- Bridge gap to car (UX, functionally)
- Energy efficient – (compared to EV's)
- Space efficient – 200% System capacity increase to that of a car or EV.
- Zero emissions at the point of use.
- Safety & protection (compared to bicycle)
- Access to both cycling and road infrastructure

Why haven't they been successful?

- Cost-function stand off (private ownership)
- Unusual UX and unfamiliar form, experience
- None have been brought to market in the right capacity.
- System hasn't suited them yet…

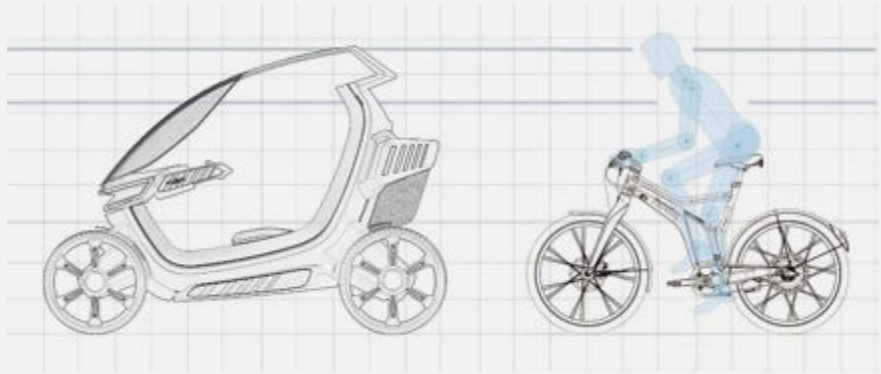


Vehicle Concept | Mobility Concept | Value Chain Concept

- Technology change -

- **Hybrid Powertrain** (efficient)
- **'Factor Four'** (efficiency)
- **Connectivity** (network)

- Bridge gap to car (UX, functionally)
- Smaller, lighter, more efficient
- Designed for purpose in 'shared network'
- Integrates into both road and cycling infrastructure

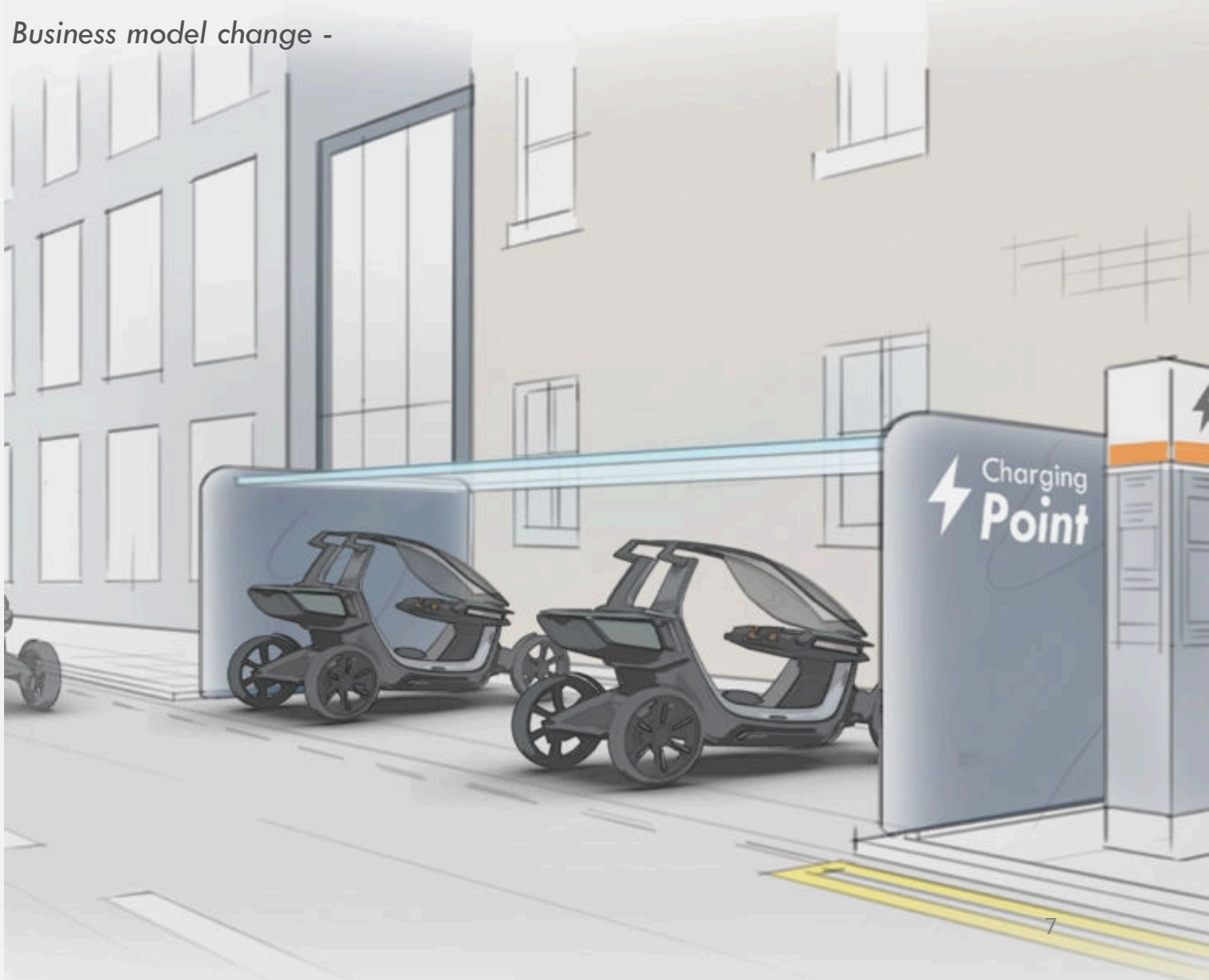


Vehicle Concept | **Mobility Concept** | Value Chain Concept

- Business model change -

- **Capacity Increase** (congestion)
- **Air Quality** (environment)
- **Societal Benefits** (health)

- Improve environment by removing pollutants from transport
- Greater user engagement through ‘dockless’ rental model.
- Accessible, clean and healthy transport.



Vehicle Concept | Mobility Concept | **Value Chain Concept**

- **Remanufacture** (recycling)
- **Flexible** (scalability)
- **Shared usage** (retail)

- Focus on managing Cost
- Integrated manufacturing/retailing model
- Flexibility in production volumes - closer alignment to market requirements and higher value product.
- Greater localisation leading to local employment opportunities

Summary - What we want to achieve

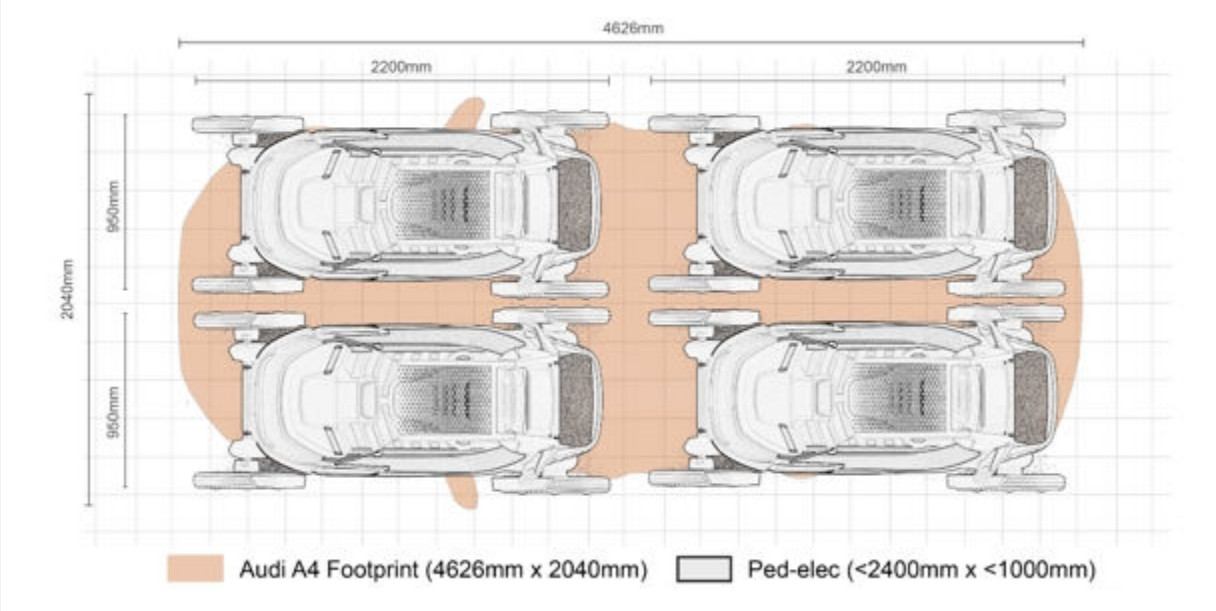
- Step change in Urban mobility
- Eradicate cities urban Emissions
- Drive system transformation.
- Create genuine competitor to cars in urban environments

How?

- Development of an efficient vehicle concept.
- Responsive to user - delivering functionality.
- Develop a business model that manages cost across whole value chain.

Nest Step……

- Development & realisation of full size prototype



Green House Gas (GHG) emissions, urban pollution and congestion, and a dependency on fossil fuels are key problems associated with our current mobility choices. These choices are, in turn, associated with the established practices of a given system. Hence, to change our mobility choices requires system change.

Thank you for listening

Let me know if you have any questions…

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Or visit us on the SMMT/UK Pavilion

A given mobility system, or regime, depends on inter-relationships between the various components. However, as opposed to creating a dynamic system, whereby change at component level can reorganise the system, these inter-relationships have the opposite effect and create resistance to change.

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