

Automation in Goods Mobility: Expectations and Prospects

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Autonomous Vehicles in Freight Transportation
Florida Atlantic University
Port of West Palm Beach
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Dr Debbie Hopkins





Human transport is dividing into two forms: lifestyle mobility and commodity mobility.

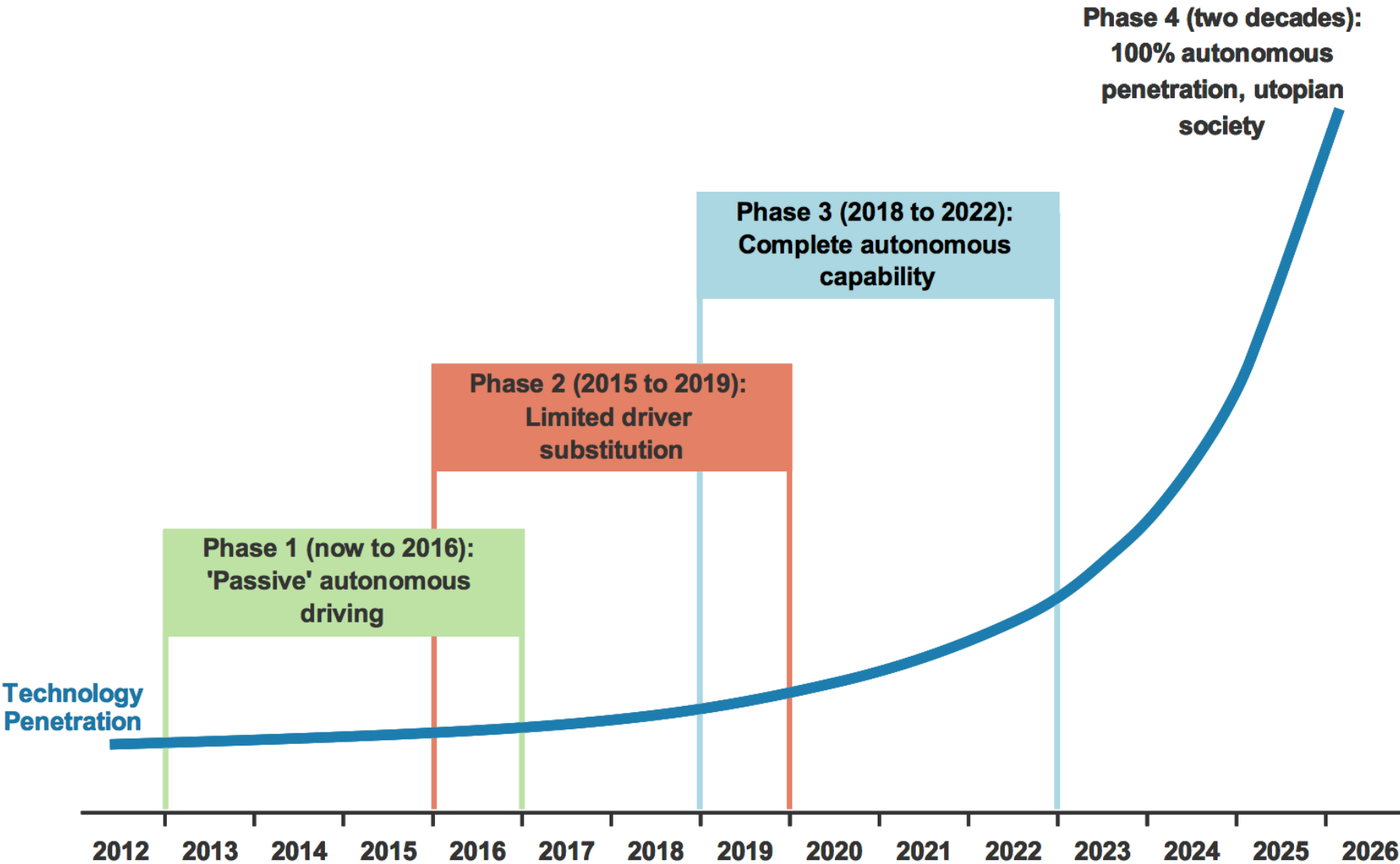
Lifestyle mobility is where individual vehicle ownership and driving will remain. People will own vehicles that fulfill a lifestyle and facilitate activities like skiing, biking, kayaking or boating.

Commodity mobility will encompass much of human transport. This could be walking or biking to work, taking public transit, Uber or driving a basic Toyota Corolla. Commodity mobility is where we see the **roll out of autonomous vehicles**. But it will happen first in endeavors where there's an economic payback for the operator, such as freight and logistics.

Source: Hirsch, Feb 28, 2018, www.truck.com



Timeline for Adoption



Source: Company data, Morgan Stanley Research



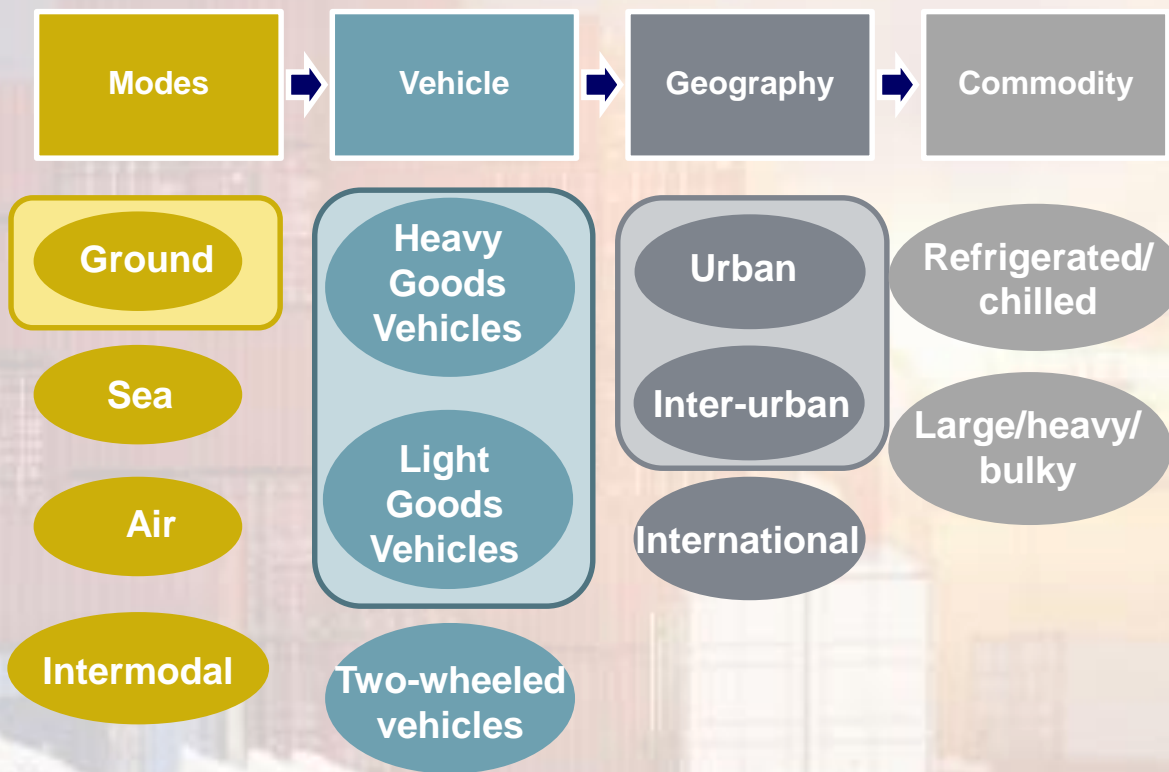
40+ stakeholder interviews in UK

Much more nuanced & divergent
views:

- a) Recognition of potential cost-savings
- b) A lot of scepticism

Objectives

- a) Explore discrepancies in expectations between broader discourse and views of stakeholders in the sector
- b) Explore potential development trajectories for automation in goods mobility



Classifying good mobilities

The background of the slide features a large, light blue, semi-transparent circular logo. Inside the circle, the letters 'TU' are prominently displayed in a stylized font, with 'OXFORD' written in a smaller font below them.

DISCREPANCIES IN EXPECTATIONS



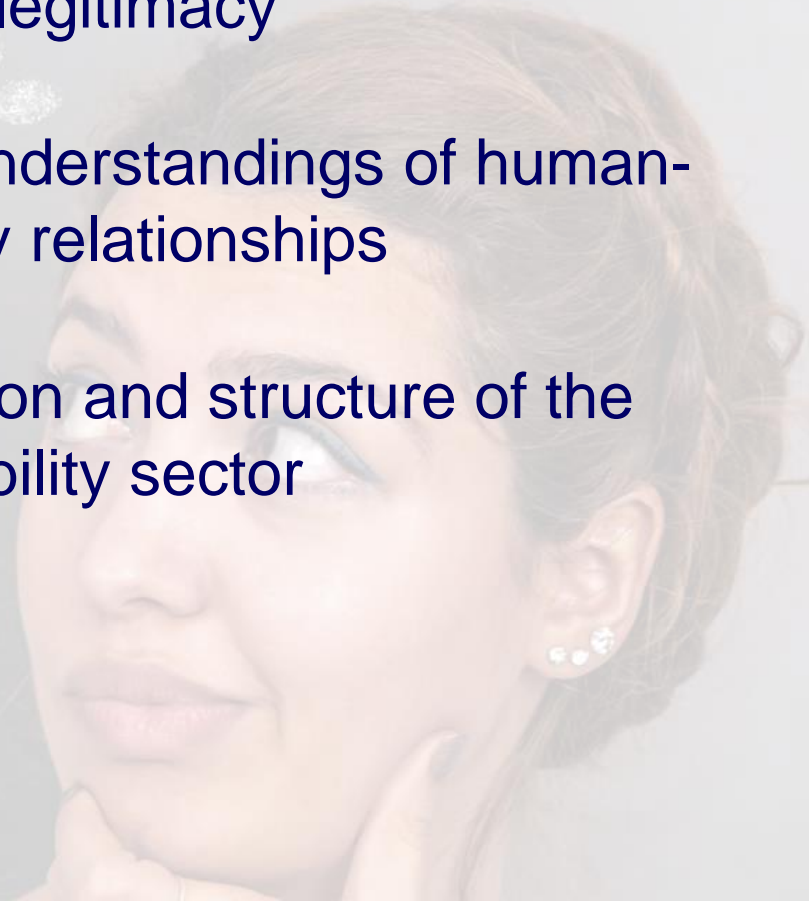
Future

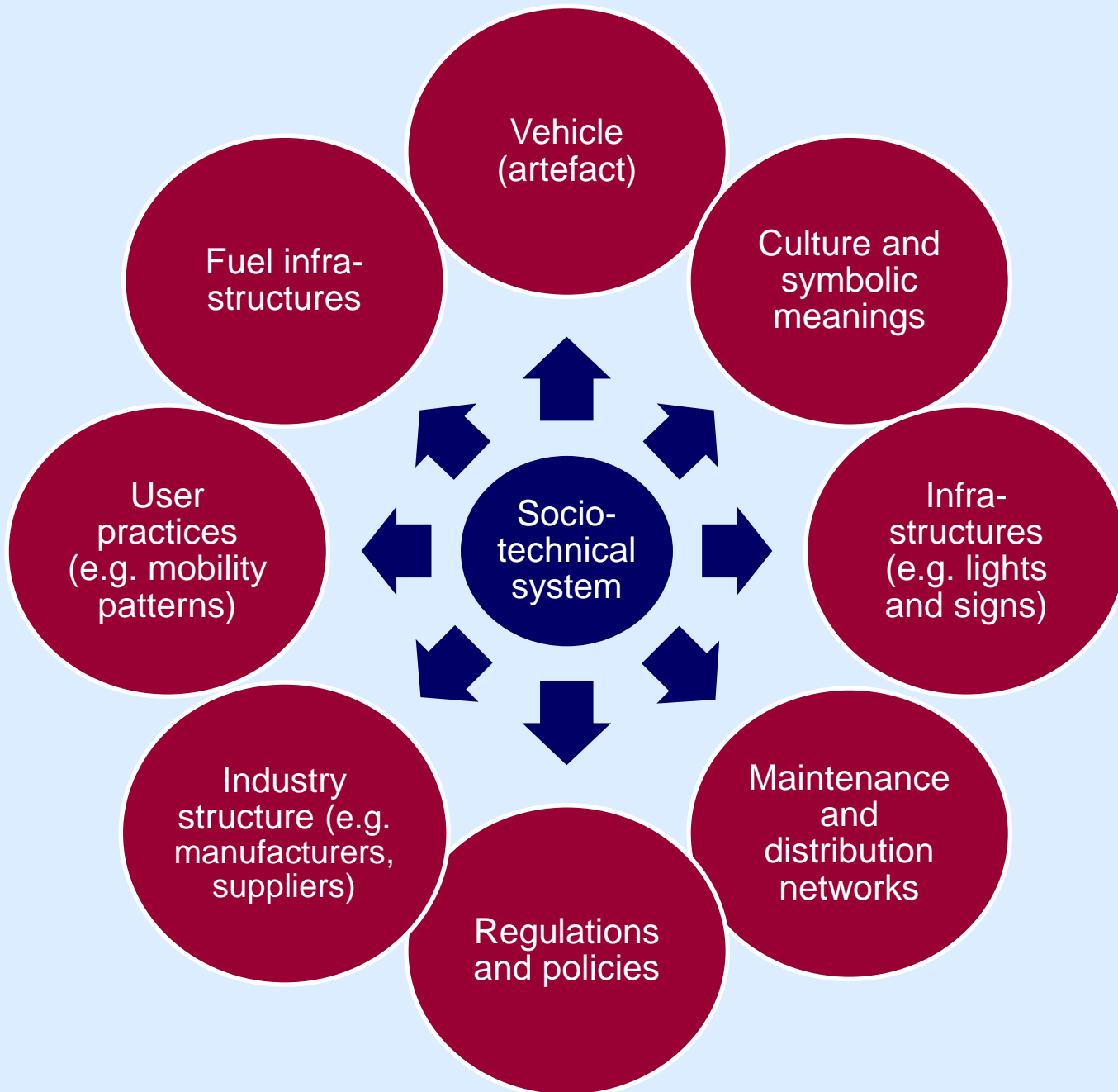
Explanations

Performative discourse: create support & legitimacy

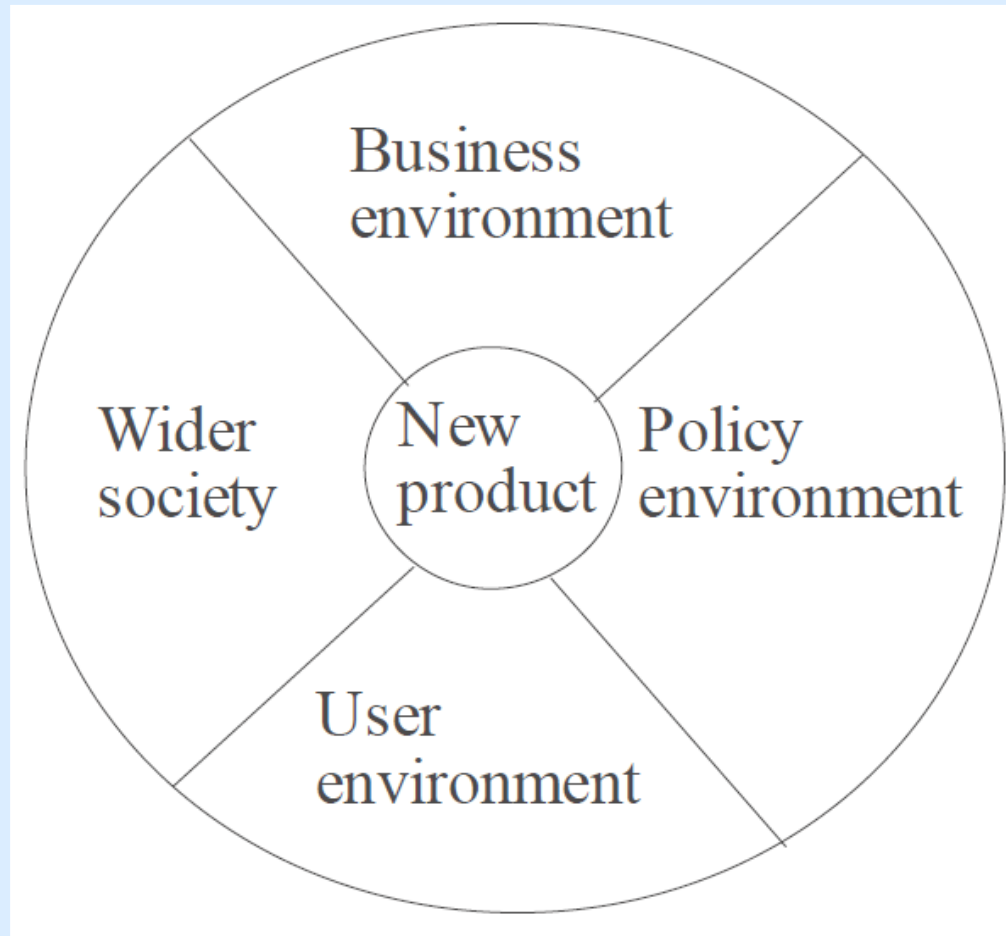
Broader understandings of human-technology relationships

Organisation and structure of the goods mobility sector



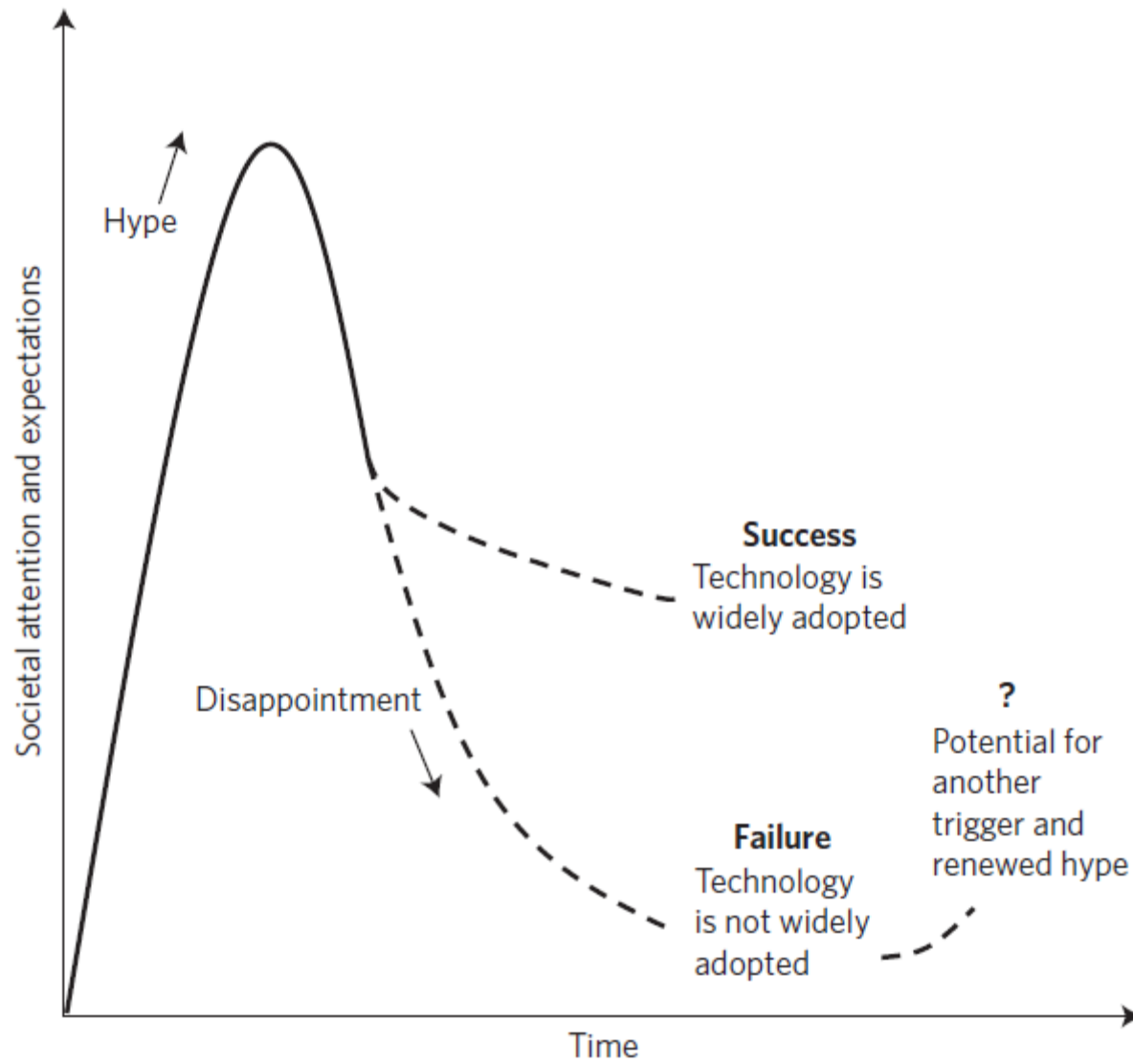


Source: based on Geels et al. (2017:465)

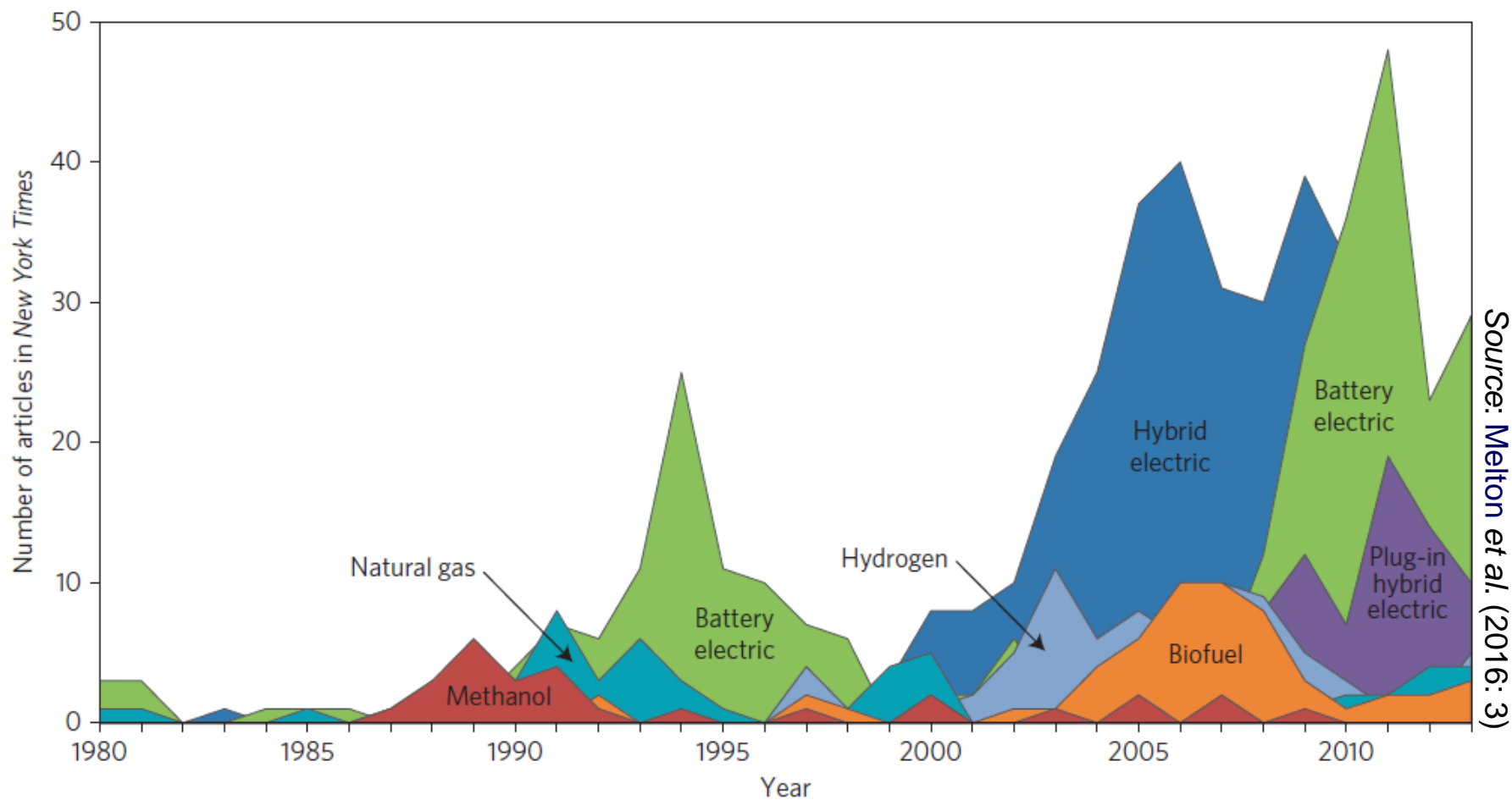


Source: Geels & Johnson (2018: 142)

Societal embedding \approx embedding new system in pre-existing environments

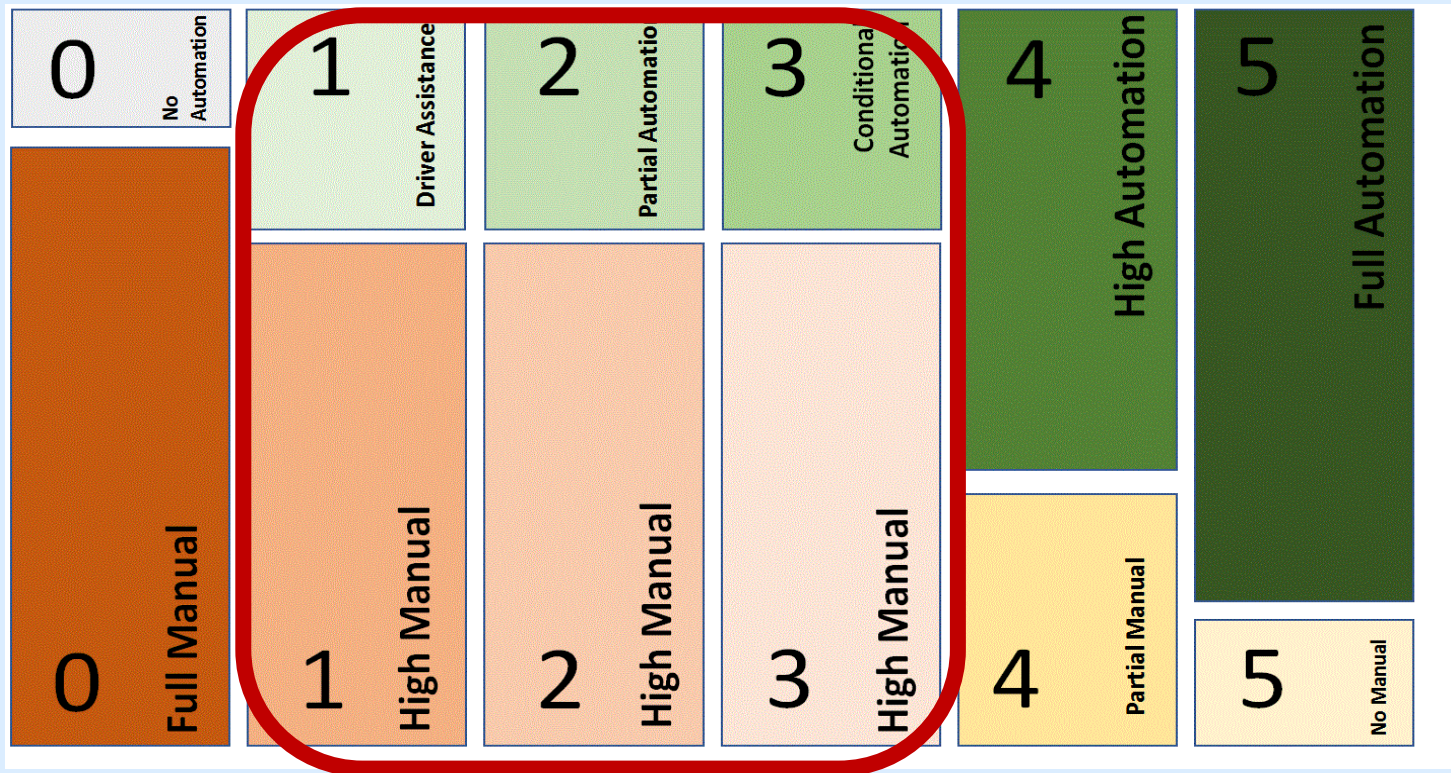


Source: Melton et al. (2016:1)





Source: Gardner (July 2016)



Levels of automation



Simplification and linearization:

- a) Help to make transition imaginable, manageable and even inevitable
- b) Render entanglements of humans and technology invisible

**Level
representations**

Techno-optimism

Rests on an instrumentalist logic: technology solves problems as means to an end – this disregards unanticipated & unintended outcomes

Long history in transportation sector

Amplified by broader discourses about IT, AI, smart, etc. – these are crucial to (neoliberal) capitalism

Improving the **efficiency** with which we use our **road network**

Fewer deaths and injuries



The average driver in England can save up to **6 working weeks** a year driving time



Opens up access to cars for **everyone** increasing social inclusion



31% **women** do not hold a full driving licence



14% **men** do not hold a full driving licence



46% **17-30 year olds** do not hold a full driving licence



Reduce pollution



Department
for Transport

Vehicles *In the year ending March 2017:*

Billion vehicle miles



252.9

% change from
year ending
March 2016
↑ 1.4%



49.6

↑ 4.5%



16.6

↓ -0.8%

Other

5.2

↓ -4.4%

Longer term trends

Index from the year
ending March 2007

Van traffic was stable until 2013,
but has grown rapidly since then



Lorry traffic fell until 2013 but has been the
second fastest growing type of traffic since then

70
2007 Q1

2017 Q1

- Growth in e-commerce & van traffic
- Congestion, parking & road safety
- PM & carbon emissions
- Precarious working conditions



Source: DfT (2017)



Goods mobility sector in UK

Culture of short-termism and risk aversion, in part because of stringent competition

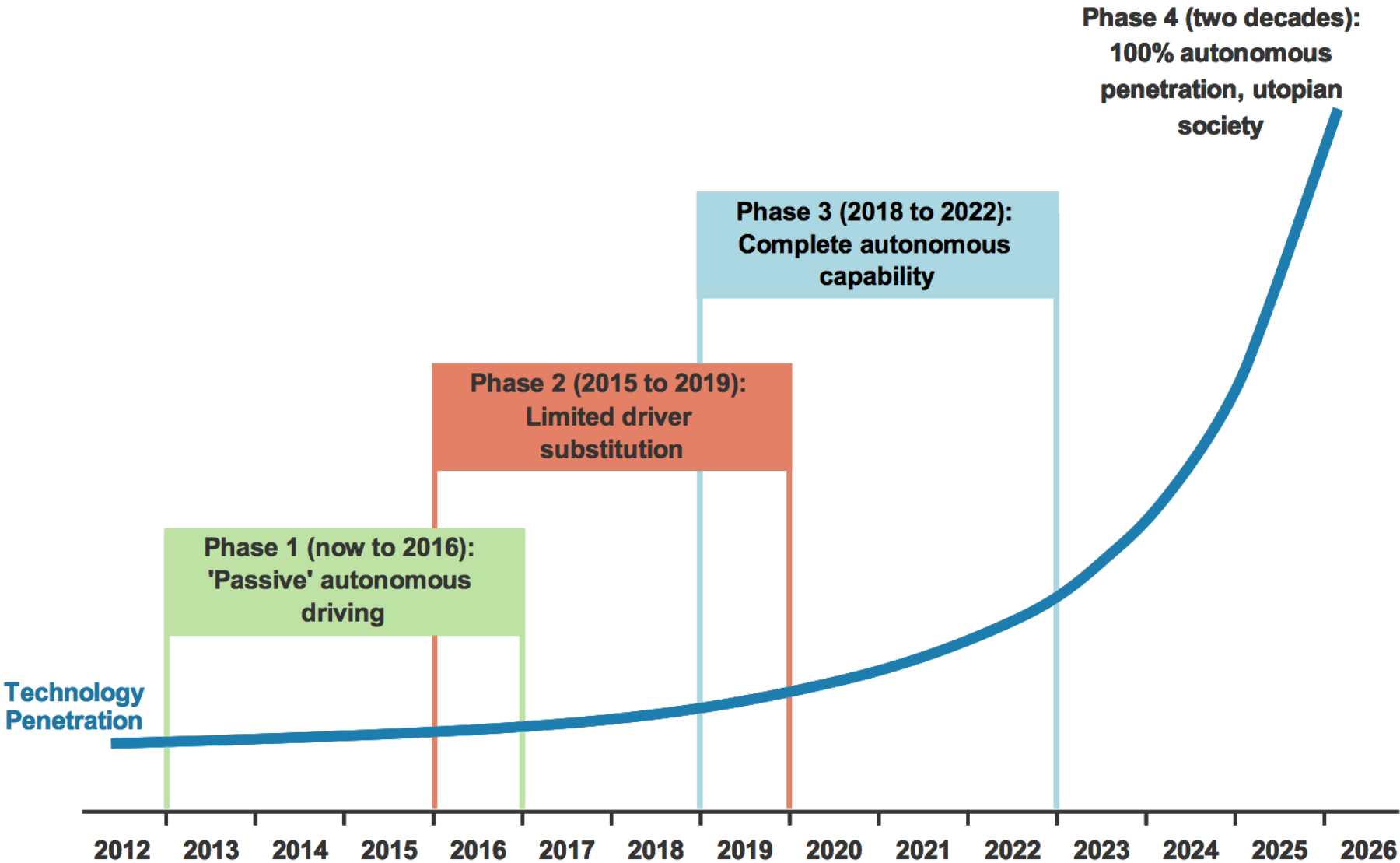
High level of self-employment: owner-operators (interurban) and offering services to companies (urban)

Driver shortages – “ticking time bomb” – and precarious & harsh working conditions, yet also appreciation of importance of driver as risk manager and service provider

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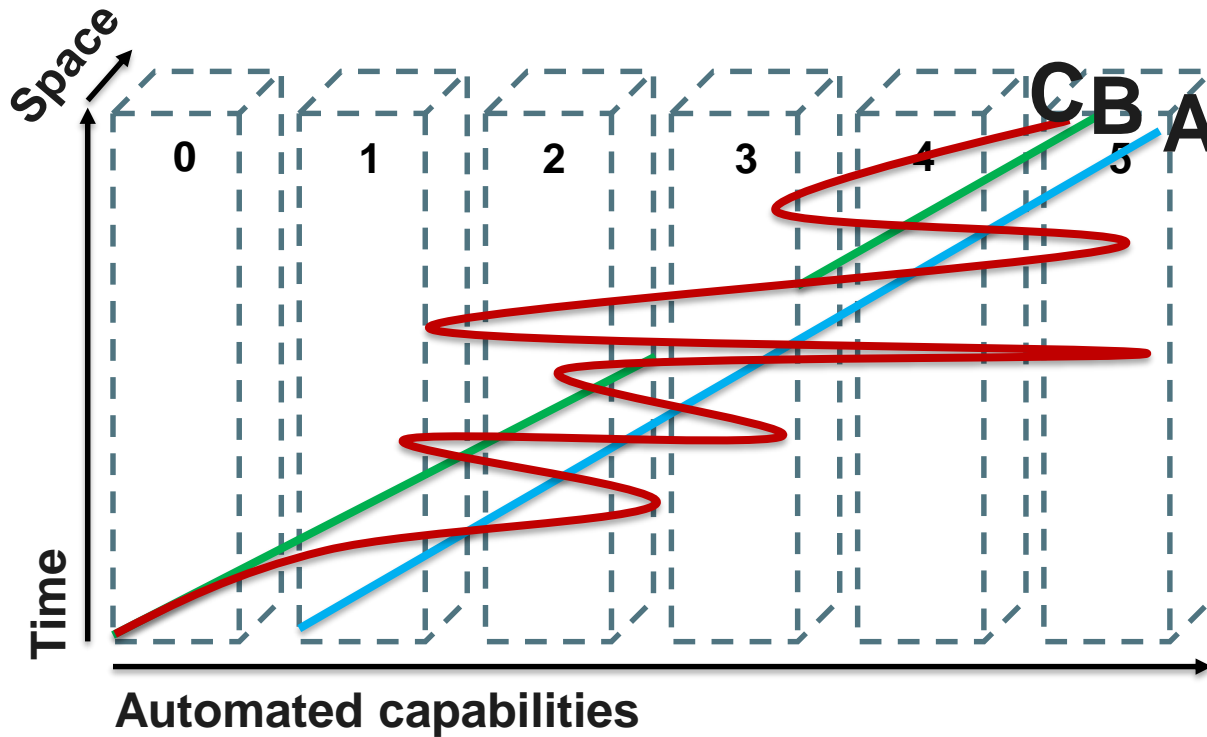
POTENTIAL DEVELOPMENT TRAJECTORIES

Timeline for Adoption



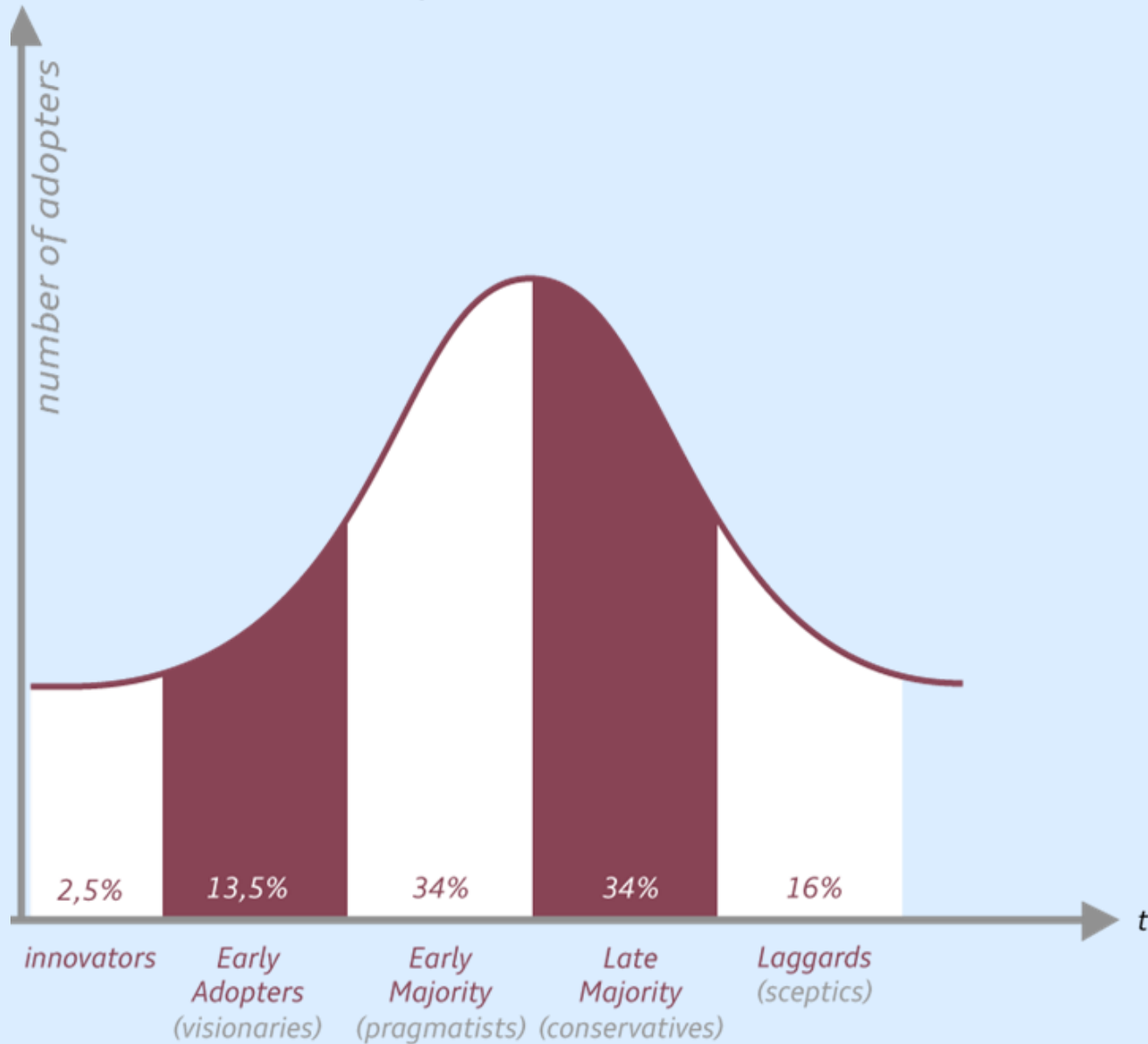
Source: Company data, Morgan Stanley Research

Innovation Pathways



- A - linear
- B - leap-frog
- C - Spatially diffused

Autonomous Driving
Adoption Curve



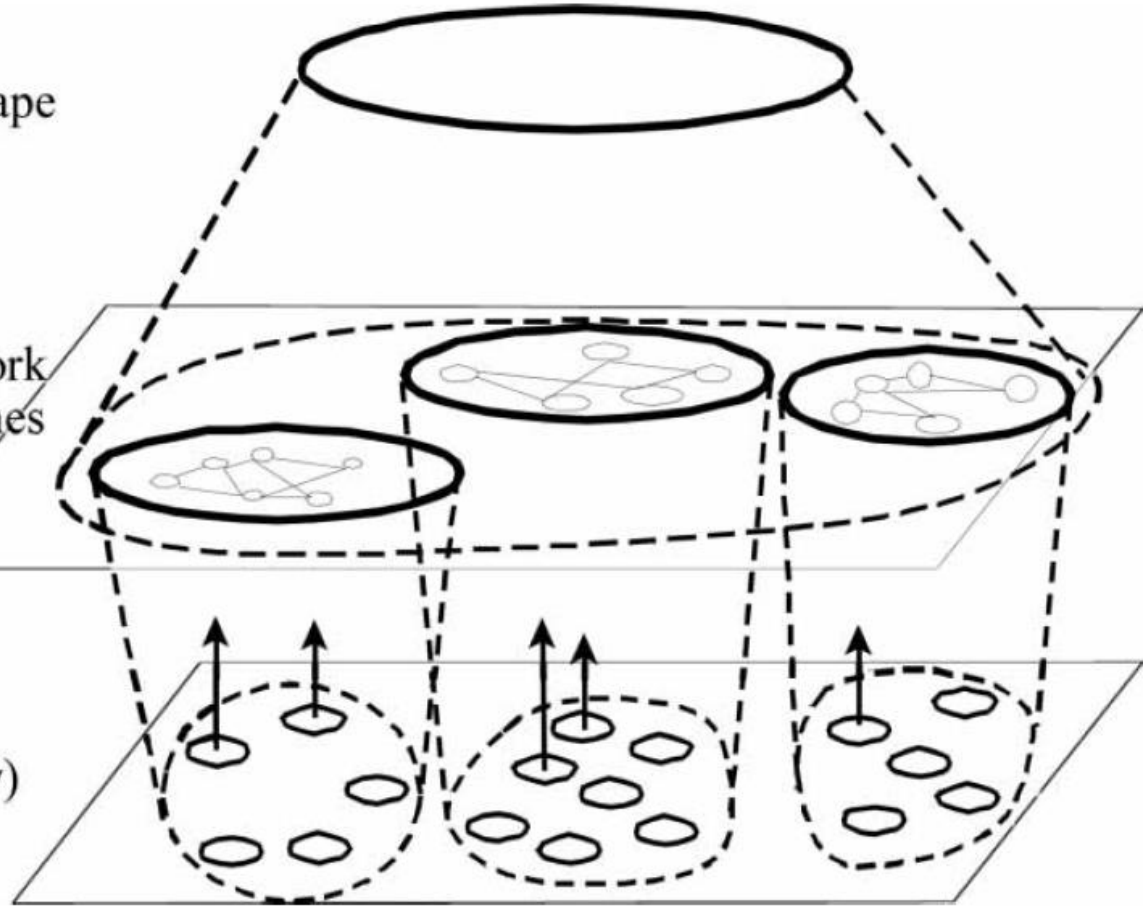
Source: Bartle (2015)

Increasing
structuration
of activities
in local practices

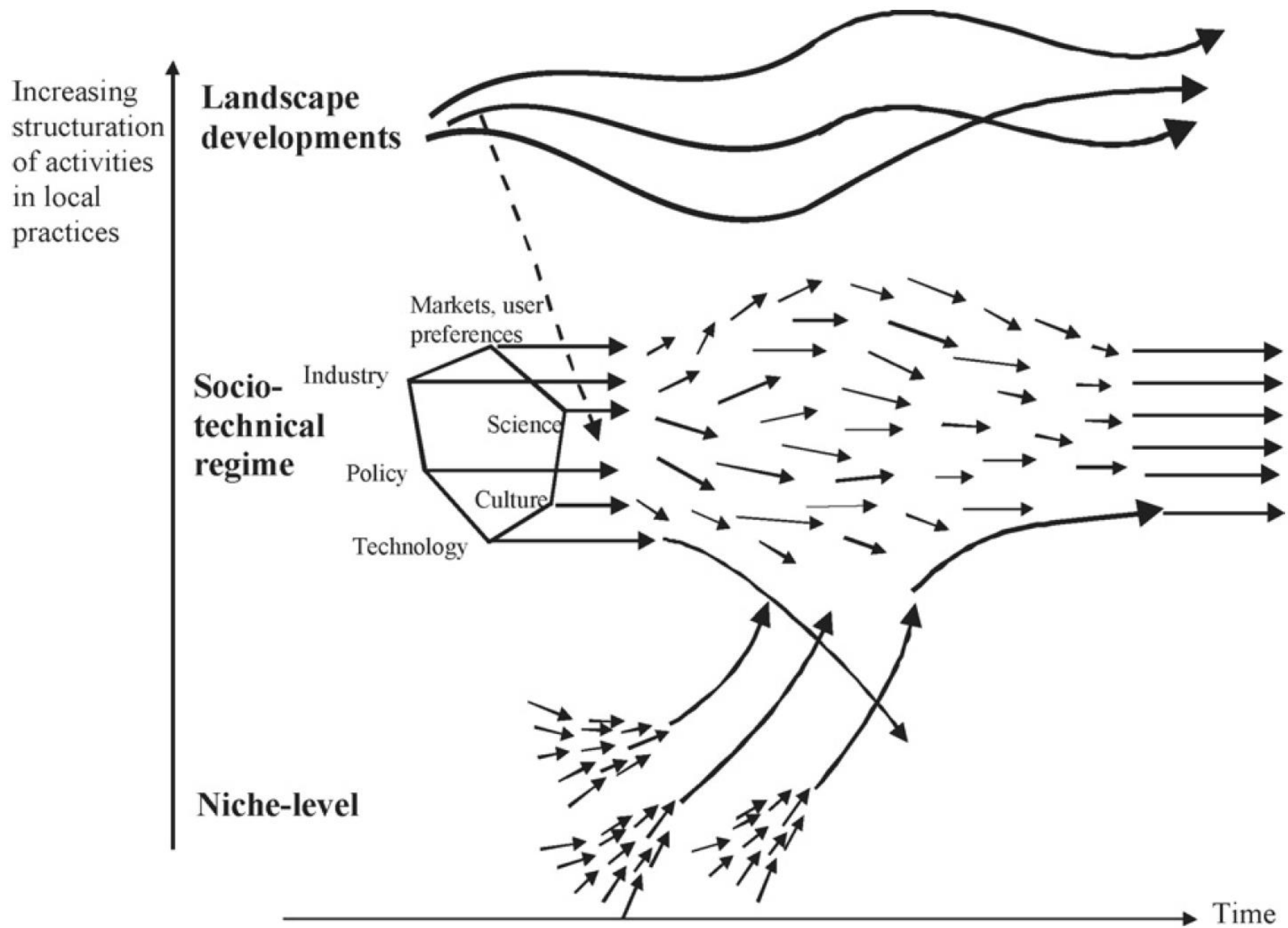
Landscape

Patchwork
of regimes

Niches
(novelty)



Source: Geels (2002)



Source: Geels & Schot (2007)

Article

Automated Mobility Transitions: Governing Processes in the UK

Debbie Hopkins *  and Tim Schwanen

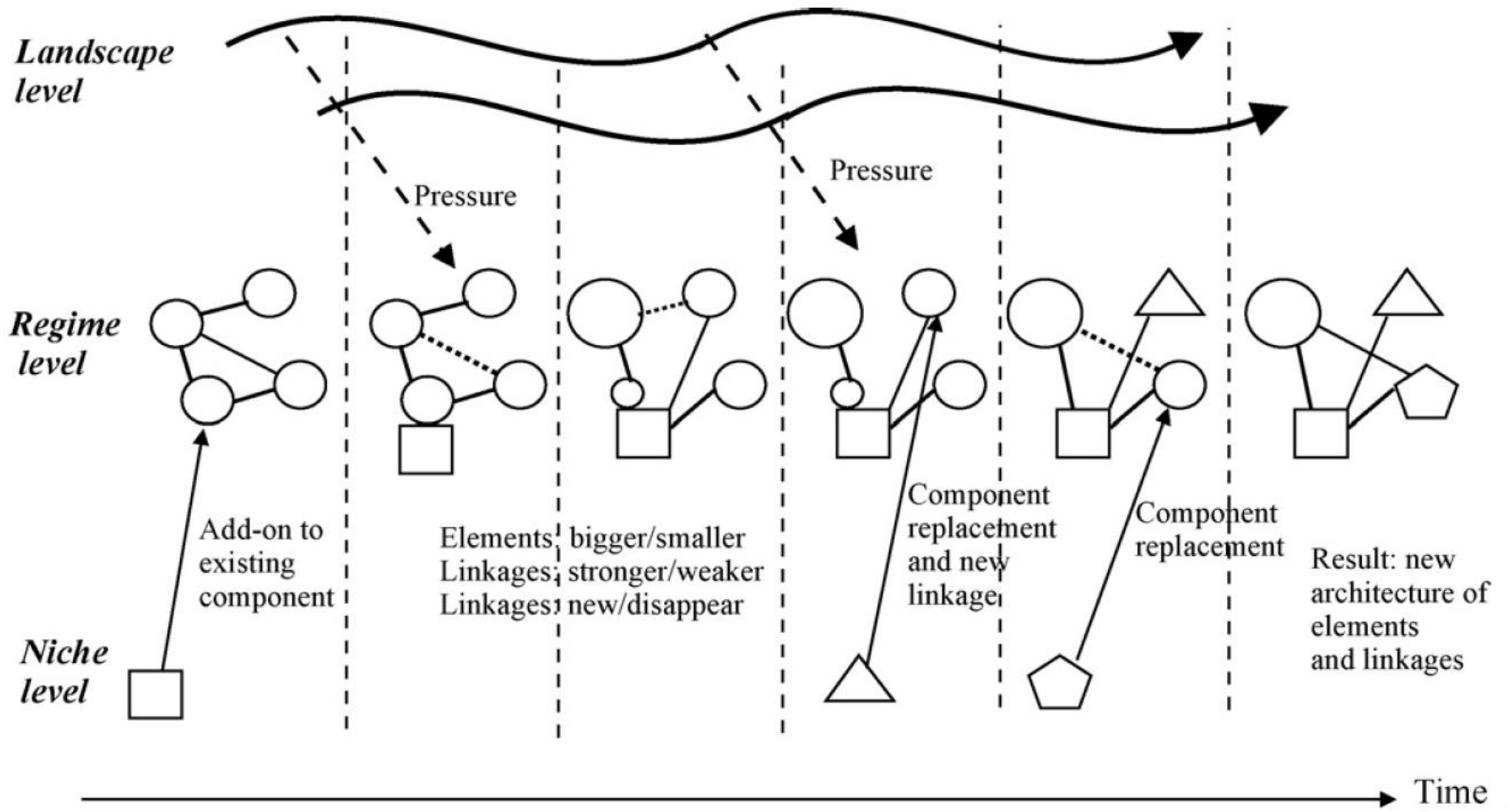
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Abstract: Contemporary systems of mobility are undergoing a transition towards automation. In the UK, this transition is being led by (often new) partnerships between incumbent manufacturers and new entrants, in collaboration with national governments, local/regional councils, and research institutions. This paper first offers a framework for analyzing the governance of the transition, adapting ideas from the Transition Management (TM) perspective, and then applies the framework to ongoing automated vehicle transition dynamics in the UK. The empirical analysis suggests that the UK has adopted a reasonably comprehensive approach to the governing of automated vehicle innovation but that this approach cannot be characterized as sufficiently inclusive, democratic, diverse and open. The lack of inclusivity, democracy, diversity and openness is symptomatic of the post-political character of how the UK's automated mobility transition is being governed. The paper ends with a call for a reconfiguration of the automated vehicle transition in the UK and beyond, so that much more space is created for dissent and for reflexive and comprehensive big picture thinking on (automated) mobility futures.



Source: Geels & Schot (2007)

Continuing micro- automations



A woman with dark hair is sitting in the driver's seat of a truck. She is looking down at a tablet computer that she is holding in her hands. The truck's interior, including the steering wheel and dashboard, is visible. The background outside the window is blurred.

From ‘*King of the Road*’ to ‘*Captain of the Ship*’?

“A truck driver will become more like the captain of a ship who continually monitors a ship’s function but is not required to be at the wheel”

- Reduce regulations on drivers hours
- Improved work conditions and recruitment?



**Potentially
relevant
developments
(‘landscape’)**

Shocks/surprises:


High profile accidents/hacks, ???

Pressures:

labour regulation, environmental
regulation, public resistance, ???

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FINAL THOUGHTS



Expectations about automation in goods mobility are divergent

Understanding goods mobility as socio-technical system and focusing on its political economy tempers optimism

Conclusions

Gradual and selective incorporation of automation seems likely in many places, though there will be spatial variations and surprises/shocks should not be underestimated

The background of the slide features a large, light blue, semi-transparent logo of the Technical University of Oxford (TU Oxford). The logo consists of the letters 'TU' in a stylized font, with the word 'OXFORD' written in a smaller font below them, all enclosed within a circular border.

Thank you

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