Representation of the State of Baden-Württemnberg to the EU

"Automated and Connected Driving for a Successful Mobility Transition:
Why We Need Coordinated Digital Test Fields at the European Level!"

Accelerating the shift: Key business, societal, and policy requirements for transitioning to shared electric automated mobility

Dr. -Ing. Dimitrios Milakis
Senior Researcher, European Research Coordinator, Institute of Transport Research, German Aerospace Center (DLR)
Co-leader CCAM Association Cluster 6 "Societal aspects and people needs"

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DLR

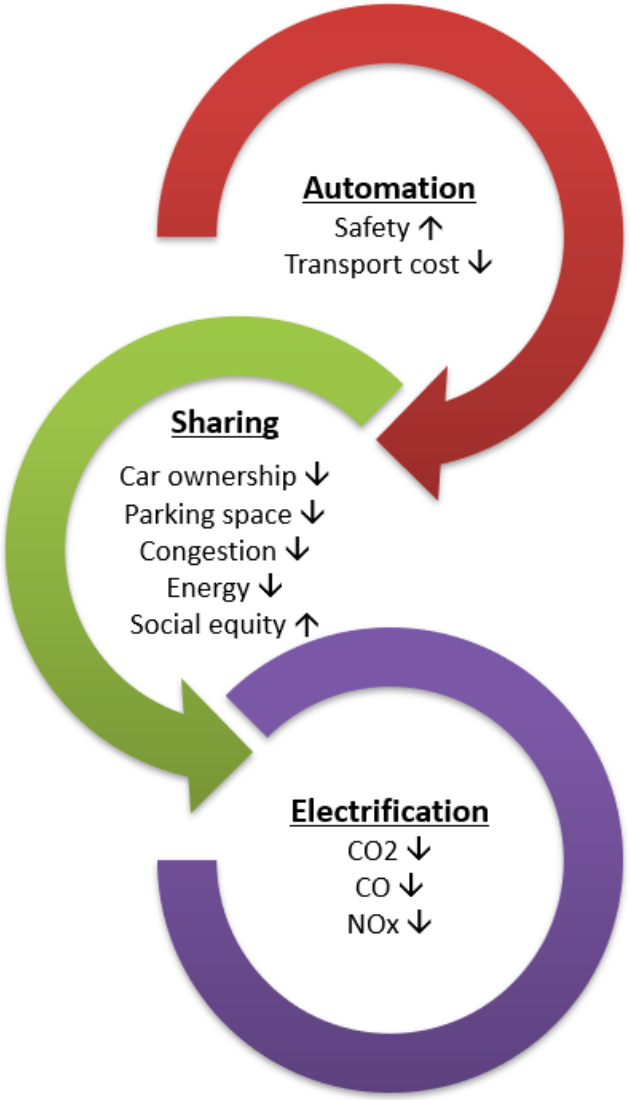
Presentation outline

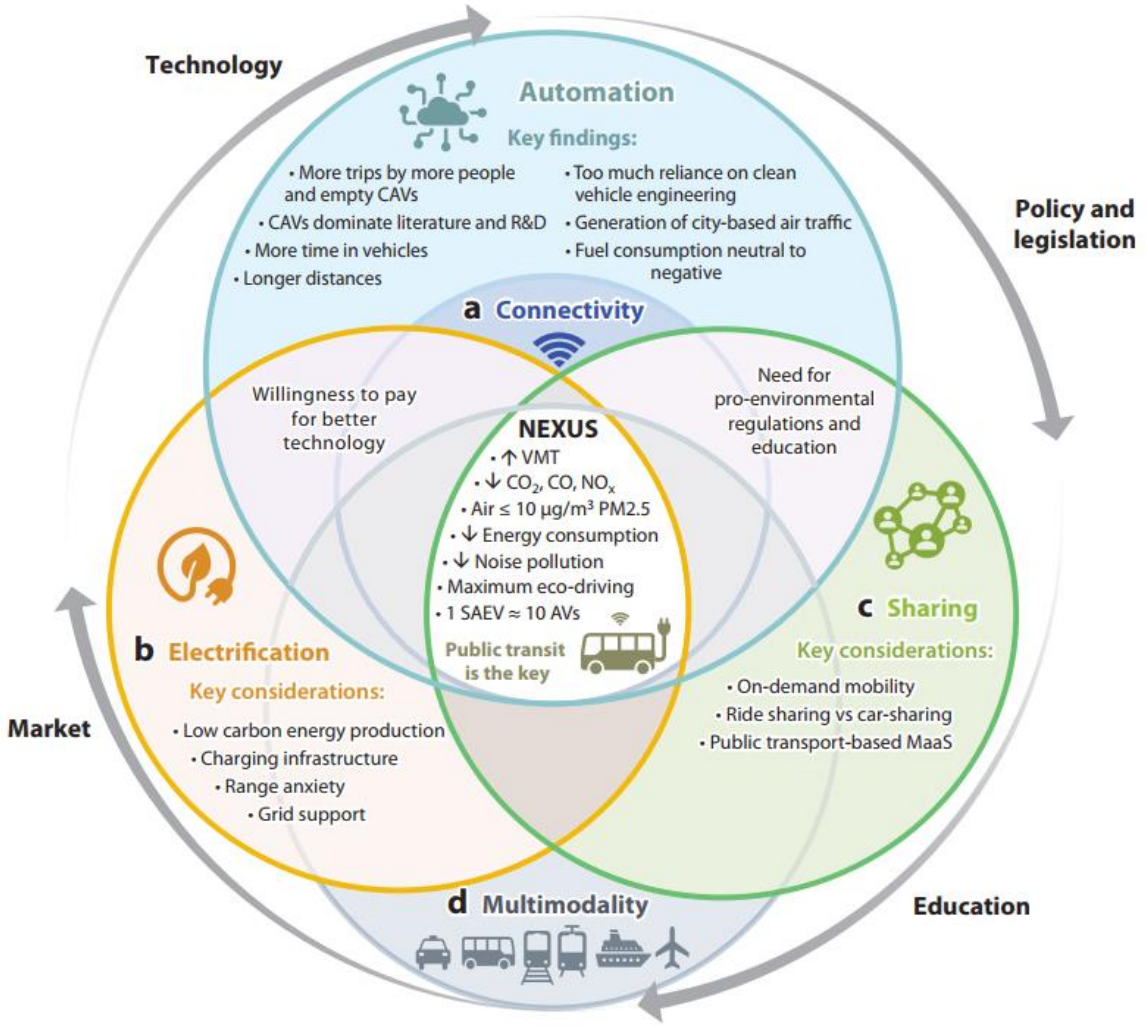
1. **Introduction**
2. **Key questions**
3. **Conceptual model**
4. **SEAM* status analysis**
5. **SEAM acceleration analysis**
6. **Conclusions**

**Shared Electric Automated Mobility*

1. Introduction

Three revolutions of automobility (shared-electric-automated): scientific evidence





Source: Milakis, van Arem, van Wee, 2017; Milakis & Müller, 2021; Nikitas, Thomopoulos, Milakis, 2021

1. Introduction

Three revolutions of automobility (shared-electric-automated): business evidence

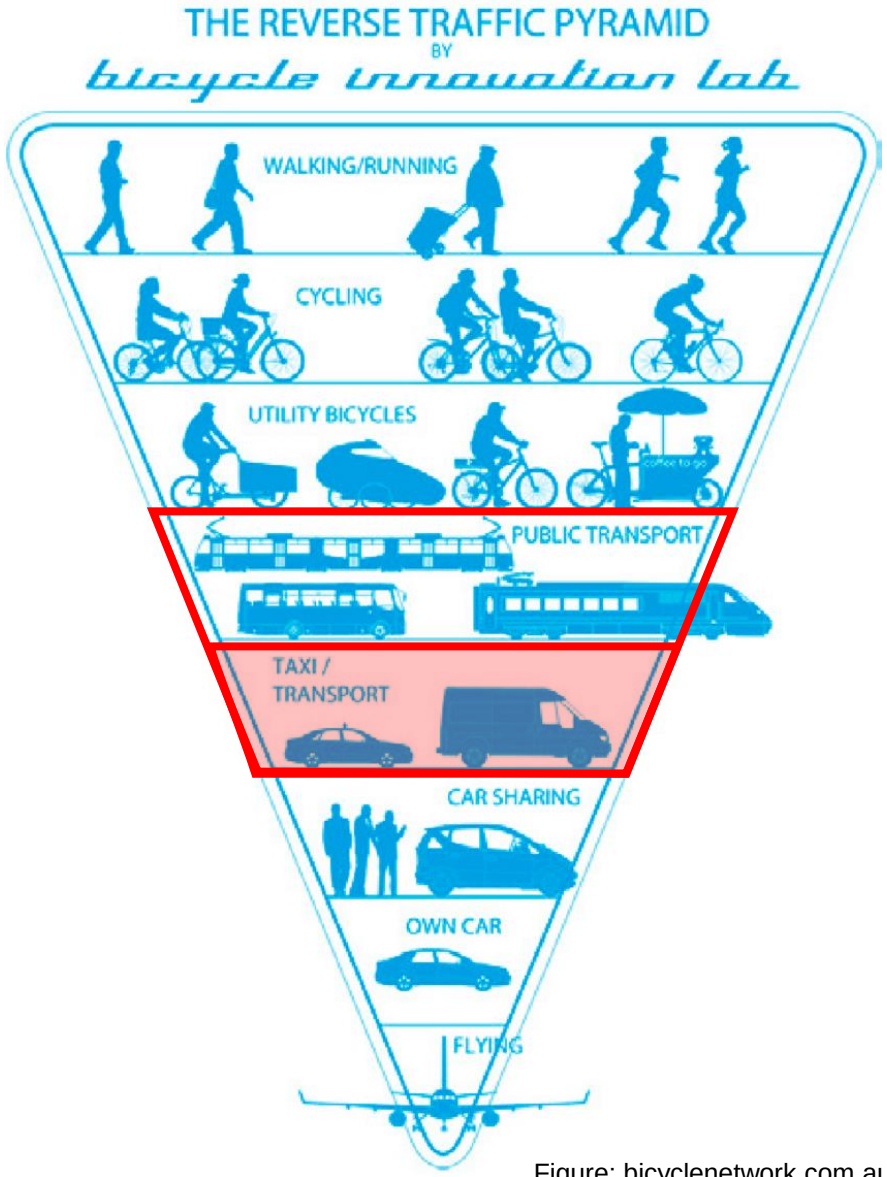


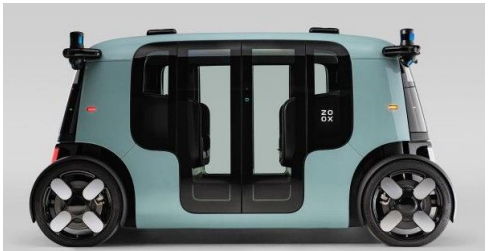
Figure: bicyclenetwork.com.au

Waymo
San Francisco, Phoenix, LA, Austin
(Pilot - Commercial)

Baidu
Beijing, Wuhan, Chongqing, Sahngai
(Pilot - Commercial)

Cruise
San Francisco, Austin, Phoenix
(Pilot)

MOIA
Hannover, Hamburg
(Pilot - Commercial)



Zoox
Foster city, Las Vegas, Austin, Miami
(Pilot)

Photos: Waymo, Cruise, Baidu, MOIA, Zoox

1. Introduction

Three revolutions of automobility (electric-shared-automated): next-gen concepts U-SHIFT

Concept

- Flexible and modular design: Pods easily swapped to change functionality (e.g., passenger shuttle, last-mile delivery).

Benefits

- Cost-effectiveness and scalability: Round-the-clock operation, increased usability and efficiency across different needs and times.
- Urban adaptability and integration: linked to infrastructure sensors and a central traffic control system (passenger shuttles, mobile sales, medical units).
- Enhanced accessibility and user experience: low-floor entry, appealing interior design.

Status

- Prototype phase and pilot testing: Mannheim, 2023; 10000 passengers, 2800 km

Photos & video: dlr.de

2. Key questions

1. **What is the status of the shared (particularly pooled) electric automated mobility transition?**

2. **How could this transition be accelerated?**

3. Conceptual model

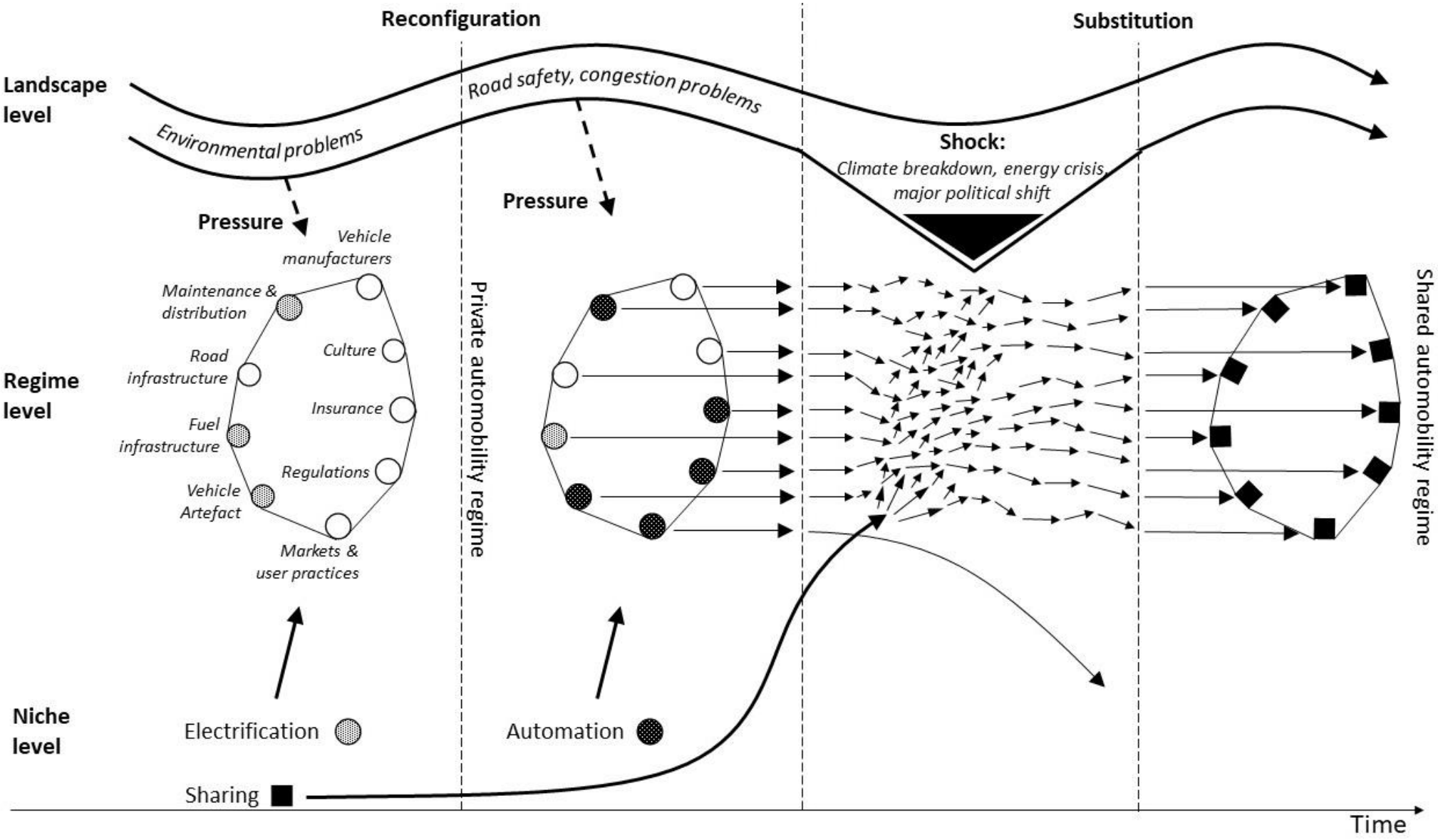


Figure 2: Conceptual model of the possible transition pathways of the private automobility regime.

Source: Milakis & Seibert, 2024

4. SEAM status analysis

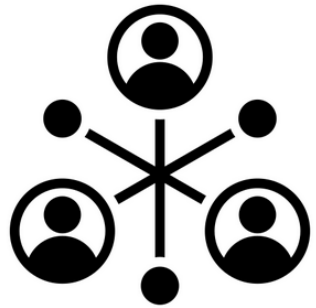
Business development

- **The ride-pooling market:** emerging phase (ca.1000 services running), with B2G projects dominating and B2C projects disappearing (Foljanty, 2024).
- **B2G projects:** USA, Germany and Japan; funded for 12 months; small fleets less than 10 vehicles.

4. SEAM status analysis

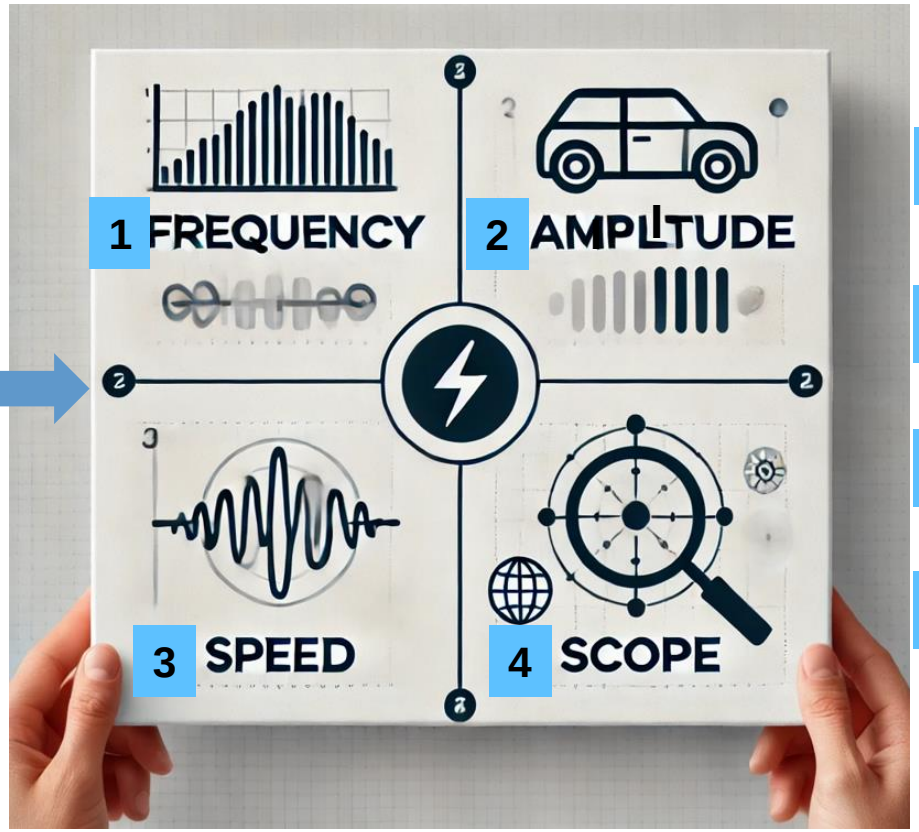
Stakeholders

- **Vehicle manufacturers:** limited plans for shared mobility (decline in vehicle sales, threatening competitors).
- **Users and societal groups:**
  - ✓ Total cost of ownership for private AVs (ca. 0.2 €/Km) is lower than shared AVs (solo & pooled; ca. 0.3 €/Km)
  - ✓ Inherent attractiveness of ownership (convenience, independence, habit/inertia, private space)
  - ✓ Aversion to sharing (inconvenience, privacy concerns, insecurity, discomfort).
  - ✓ Symbolic dimensions of car ownership (socio-economic status, subjective identity, superiority, individuality)
- **Public authorities:**
  - ✓ Loss or reconsideration of transportation-related revenues (sales and property taxes, license plate and registration fees, parking tickets, and traffic fines)
  - ✓ Negotiations with a complex network of new actors and structural changes in administration.



5. Accelerating SEAM transition

Enhancing forces



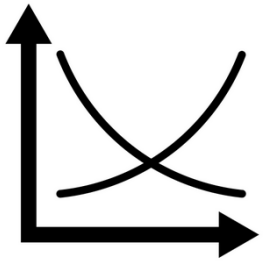
1. Number of flagship legislative/regulatory changes related to SEAM within a period.
2. Magnitude of change in funding or incentives introduced by new policies.
3. Time taken from policy proposal to implementation.
4. Number of sectors activated (e.g., transportation, energy, urban planning)

Photos: iStock.com/PaperFox; DALL-E, OpenAI

5. Accelerating SEAM transition

Supply side (examples)

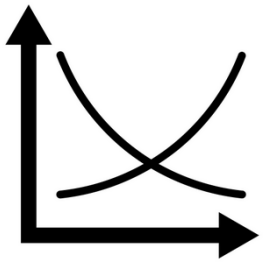
Policy Category	Action/Policy	Benefit	Beneficiaries
Infrastructure	**Install SEAM-only lanes in existing urban roadways**	Reduces congestion for SEAM vehicles, promoting faster transit	SEAM users
	Public-Private partnerships for SEAM infrastructure development	Facilitate collaborative projects to build SEAM infrastructure.	SEAM users, OEMs, Tech companies, local authorities
Technology	**Offer tax incentives for SEAM R&D activities**	Encourages innovation and development of SEAM technologies	OEMs, tech companies, startups
	Urban innovation hubs (large scale, infrastructure integration, continuous engagement, regulatory flexibility)	Establish urban areas as live testing grounds for new SEAM technologies, allowing real-world experimentation and feedback.	SEAM users, citizens, OEMs, tech companies, local authorities
Regulation	**Streamline permitting for SEAM pilot projects**	Facilitates experimentation and quicker deployment	Tech companies, startups local authorities
	Inclusion of SEAM options in all new developments (charging, depots, stops, etc)	Ensures developers adopts SEAM-friendly planning	SEAM users, developers, SEAM service providers, local authorities



5. Accelerating SEAM transition

Demand side (examples)

Policy Category	Action/Policy	Benefit	Beneficiaries
Economic	**Congestion charging for non-SEAM vehicles**	Encourages shift to SEAM to avoid fees, reduces traffic and pollution	SEAM users, citizens, SEAM service providers
	Discounted SEAM fares during off-peak hours	Offers direct financial incentives, reducing costs for users	SEAM users
Social	**Awareness campaigns about SEAM benefits**	Increases public knowledge and acceptance	Citizens, SEAM service providers, local authorities
	Community-based programs to trial SEAM services	Builds community support and practical understanding of SEAM	Citizens, SEAM service providers, local authorities
Legal	**Recognition programs for early SEAM adopters**	Rewards early adopters publicly, encouraging others to follow	SEAM users
	Require SEAM usage for certain government travel	Demonstrates government commitment to SEAM, serving as a role model	SEAM service providers, public sector



6. Conclusions - takeaways

Three revolutions of automobility: socioeconomic benefits can be realized only if electrification, automation and sharing are all introduced to the transport system.

Status of SEAM transition: SEAM faces challenges due to economic (vehicle manufacturers), instrumental, affective, symbolic (users and societal groups), tax-revenue, governance and administrative (public authorities) reasons.

Dual activation approach: Activation of both supply and demand sides is critical.

Importance of policy features: Frequency, amplitude, speed, and scope are critical policy features for accelerating transition to SEAM

Stakeholder engagement: Addressing unique needs and challenges of stakeholders will facilitate a smoother and faster transition.

References

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