



Adaptive Regulation Roadmap 2040

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LIST OF ACRONYMS

CCAM - Connected and Cooperative automated mobility

EU - European Union

ITF - Intelligent Transport Forum

MaaS - Mobility as a Service

SUMP - Sustainable Urban Mobility Plan

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1. EXECUTIVE SUMMARY

This paper is the result of the work carried out under WP4 New Regulatory approaches to devise new regulatory schemes, frameworks and governance models, task 4.2 Adaptive Roadmap 2040.

It provides the results of the assessment carried out by the partners of evolving technologies, use of innovations in the field of mobility systems in view of decarbonisation. It shows the challenges identified (where we are now) to move towards efficient, competitive and sustainable mobility systems looking at different levels: data level, regulation and governance level, public and private cooperation level, society/sustainable and safety level as well as deployment level. It then gives a roadmap of what are the objective to reach by 2040 and finally presents the priority challenges and actions to be put in place to reach the objective.



2.ABOUT GECKO

The rapid proliferation of new technologies and disruptive innovations are taking the world by storm, threatening well established players across many sectors. Regulators and decision-makers at different levels of government are overwhelmed by the challenge, acknowledging that existing frameworks may be inadequate in terms of protecting society, fostering business development and achieving integrated, sustainable mobility.

GECKO's main goal is to support authorities with tools and recommendations for new regulatory frameworks to lead the transition to the new mobility era of cooperative, inclusive, competitive, sustainable and interconnected mobility across all modes, through evidence-based research.

GECKO provides a holistic approach with innovative concepts, methodologies and forward-looking tools to enable this transition to take place, leading to new, adaptive and anticipatory regulatory schemes and balanced governance.

The project aims to build on the strong networks of its partners to ensure solutions are co-designed and validated. Several key indicators and cooperation models will help to develop the Regulatory Frameworks Dashboard (a tool being developed within the framework of GECKO), through which the maturity of given regulations can be judged with respect to emerging mobility solutions.

GECKO will outline an implementation plan including actions required up to 2040 for policy makers to devise regulatory approaches for disruptive innovations and new regulatory frameworks streamlining uptake. GECKO will advise policy makers on challenges and policies that need to be addressed to move towards integrated, accessible and sustainable mobility across modes for both passenger and freight transport.

The project will provide recommendations to policy makers to enable adaptive and anticipatory regulatory schemes and governance with novel policies that contribute to sustainable mobility goals.

3. INTRODUCTION

Most trips today take place in urban regions, and their number is projected to continue to grow in line with cities' population and gross domestic product (GDP). This combination of metropolitan expansion and rapid innovation will inevitably drive both constraints and opportunities with respect to mobility. The limits of the current mix of transport solutions will be most strongly felt in cities. On the other hand, urban areas are fertile ground for new mobility solutions¹.

Within the GECKO project it has been crucial that regulation is adjusted to manage the rapid proliferation of new technologies and disruptive innovations. Change across the wide range of urban settings worldwide will not be uniform. Different policies, business models, mobility needs, or geographical contexts means regulation will play out differently in different urban settings. A regulation that works well in Berlin and Paris may be less impactful in Ljubljana and Tallin. The timing and duration of regulation may differ from city to city and country to country. The covid-19 crisis will accelerate existing trends².

This deliverable outlines an implementation plan with **actions up to 2040 needed to devise adaptive and anticipatory regulatory approaches and identify new regulatory frameworks** streamlining uptake. The central aim of the roadmap is “**fostering adaptive and anticipatory regulation for new mobility**”.

Figure 1 Adaptive Regulation Roadmap 2040

ADAPTIVE REGULATION ROADMAP 2040



¹ [International Transport Forum, Transport Outlook, 2019](#)

² [Arthur D. Little, UITP, The Future of Mobility post-COVID, 2020](#)

4. WHERE ARE WE NOW

The hereunder section describes the challenges, vision and actions identified during task 4.2 by the consortium and the stakeholders. They summaries the results of different actions carried out throughout the project: 1. a survey which objective was to list the different challenges faced by authorities and new mobility services in terms of regulation needs for new mobility services, 2. 2 white board sessions to go further on the challenges analysis and contribute to build the vision 2040, 3. a wrap-up workshop to present the results. The members of the consortium have conducted a series of discussion to priorities the key challenges and actions to put in place.

This section lists the challenges identified by the consortium and the stakeholders during the survey and white board sessions. The challenges are here under organised according to their specificity.

4.1 AT THE DATA LEVEL

In order to understand mobility patterns, to understand the way these innovative service work, and to develop regulation to better and integrate them to backbone public transport systems and ensure they meet high level sustainable policy goals, sharing data is a necessary and strategic tool.

However, **challenges** can be identified.

- **First, data sharing** is a difficult topic due to the complexity of the data, the fact that the private sector do not always want to share their data due to business interest and that authorities receive for free a minimum set of real time data.
- **Second, the diversity of transport policies** across areas complexifies the matter.
- **Third**, the main barriers to data sharing include the lack of **standards and methods** for data sharing, collection, and storage as well as the issues around privacy and security of data.
- **Fourth, ethical issues** related to artificial intelligence algorithms have to be addressed in order to deploy new mobility solutions (in particular, autonomous mobility)

4.2 AT THE REGULATION/GOVERNANCE LEVEL

At the regulation level, a **first challenge** identified is first the **faster development of new mobility services compared the speed of development of regulatory tools for an effective regulatory framework**. Regulatory processes are time consuming. The international and national legislations are not always keeping pace on all aspects with the development of breakthrough technologies. Regulations and standards for new mobility services and technologies are usually unclear and there is a lack of well-developed regulatory framework to guide industry practitioners on the introduction of new mobility services and technologies. Additionally, the different governance modes, and the institutional and regulatory silos, regulating across different industries, or the different regulatory approaches, from one city to another pose as well problems for service operators. Service operators and manufacturers also need to be integrated in the regulation discussion from the beginning so facilitate communication and understanding of the different needs.

A **second challenge** that can be faced by authorities and service operators around the deployment of new mobility services is the **conflicting** goals, lack of recommendation and information from the authorities' and the operators' sides.

A **third challenge** relates to the development side. Public authorities might need to ensure these services develop in a way they **fairly complement existing public transport services** and avoid any form of competition and that they meet high level policy goals of sustainable mobility.

A **fourth challenge** pointed out is that many documents are only available in the **local language** which reduces the efficiency of searching and analysing the found documents.

4.3 AT THE SOCIETY, SAFETY, SUSTAINABILITY LEVEL

European cities are currently facing congestion issues and related negative externalities due to demographic change (population growth in some cities or ageing populations in others), urban sprawl and the massive use of private vehicles and motorized transport for all types of services.

The fast growth of new mobility services and technologies may have the power to redefine industries and change users' behaviours with regards to individual and collective mobility, but it remains difficult to encourage the use of shared services against the use of the private car, or electric cars because of its costs.

Several **challenges** have been identified in GECKO, among others, the following ones:

- **First**, the **mentality shift** remains a barrier for the transition.
- **Second**, given the high uncertainties of disruptive innovations, their use could either **improve or worsen the situation** if not properly managed and regulated and pose additional problem in terms of congestion, safety, and sustainability issues.

- **Third**, the introduction of new mobility services can also pose a **problem on space use and balancing pedestrian and shared mobility space** on pavements is necessary but not easy to put in place. In general, the introduction of new mobility services should respond to the highest safety aspects and operate in environments adapted to their use.
- **Fourth**, for the **connected and autonomous vehicles and drones** it will be necessary to check out their **safety aspect in real-world pilots**. New mobility services are also considered more as a technology-push rather than a service-push.
- **Fifth**, another important aspect pointed out lies around the **social and equity aspects** of new mobility services.
 - Depending on their specificity, such as micro-mobility or on-demand transport **may not serve the entire society** but answer the mobility needs of very specific groups. This poses the question of their efficiency to reduce car use.
 - As to what concerns Connected and Cooperative automated mobility (CCAM), although its development has the potential to create a user-centred and all-inclusive mobility and contribute to decarbonisation it might as well have negative effects in terms of sustainability, especially if it pushes for additional car ownership. Moving goods and services without human interaction is becoming a reality, however. Therefore, it should be done keeping in mind that it should be sustainable and meet the general mobility demand as a complement to mass public transport, walking and cycling and not as an individual mobility need.
- **Sixth**, it is key to take into account the **impact of the Covid19 pandemic** on new transport solutions. The pandemic might push for the development of CCAM but the effects of unpredictable events on new transport solutions are difficult to anticipate.

4.4 AT THE PUBLIC PRIVATE COOPERATION LEVEL

Several **challenges** can be identified:

- **First**, the **lack cooperation between the public and private sectors** is one of the main challenges faced by authorities and new mobility players. The difference of goals and objectives from the two sectors (public authorities think local, operators act global);
- **Second**, the **difficulty to define a clear vision of the role that these mobility services** could play in urban mobility systems is key. The unclear tools that regulation provides to authorities on what to develop and how to regulate, are main barriers for a smart integration of these services.
- **Third**, the **time required to develop competencies and understanding** by each other of the public sector and the private operators of innovative services (functioning and the hidden commercial interests) should not be underestimated. Otherwise, this could lead to a limited trust between these stakeholders. On the other side mobility start-ups lack resources for a successful commercialisation and could require some public funding. The lack of understanding or hype around the new technologies create false expectations from them.
- **Fourth**, the **lack of platforms or forums** to engage in collaboration is as well pointed out as a challenge for both sectors to engage in communication and cooperation.

4.5 AT THE DEPLOYMENT LEVEL

There are unclear benefits of using new technologies before any experiments are made and evidence provided of potential positive or negative effects that are difficult to predict. However, **testing is necessary to evaluate the potential of a technology, but its implementation is difficult**. Testing different mobility technologies requires to put in place a differentiated approach, it requires a strong methodology and enough time in order to measure the impact of the service.

New technologies are difficult to integrate to the overall transport offer, through a MaaS for instance, and the lack of experience in integrating the new technologies is blocking suppliers and users. **Transport technology innovations may have poor compatibility** with other systems and the lack of experience on integration is posing another challenge for their deployment and integration. Besides the common challenges of smart mobility solutions, a relevant example to explain specific challenges that might be brought by disruptive infrastructure is the development of hyperloops, which have not been standardized yet.



5. WHERE DO WE WANT TO GO

The below section provides the vision of the urban mobility systems based on three pillars of actions in the sustainable and Smart Mobility Strategy. The vision was identified through desk research with sources from the EU, ITF, Arthur D. Little and GECKO partners. The central aim of the roadmap is to foster adaptive and anticipatory regulation for new mobility. The development of GECKO's Adaptive Regulation Roadmap is focused on the achievement of the EU's objectives for urban mobility, as specified in the 2020 Sustainable and Smart Mobility Strategy, which fits within the European Green Deal target of at least 55% greenhouse gas reduction by 2030 and climate neutrality by 2050.

The Vision of urban mobility systems that has been developed in the GECKO ADAPTIVE REGULATION ROADMAP 2040 is presented below. The vision encapsulates three aspects:

- Sustainable transport modes;
- Sustainable alternatives that are multimodal;
- Incentives to drive the sustainability transition.

5.1. MAKE ALL TRANSPORT MODES MORE SUSTAINABLE

- The switch from internal combustion engine to low- and zero-emission vehicles is accelerated, and the use of private vehicles is gradually reduced.
- Sustainable urban mobility planning includes the freight dimension through dedicated sustainable urban logistics plans that accelerate the deployment of zero-emission solutions for e-commerce.
- Integration of land-use and mobility planning has been strengthened by integrated land-use and transport plans.
- Continuous efforts by international, national, and local authorities, stakeholders, and citizens lead to a goal of zero fatalities from mobility.
- There has been an increase in the number of women in transport professions.
- Following the COVID-19 pandemic, work from home remains encouraged, which reduces transport emissions.

5.2. MAKE SUSTAINABLE ALTERNATIVES WIDELY AVAILABLE IN A MULTIMODAL TRANSPORT SYSTEM

- Transport modes are better integrated resulting in a higher mode share of public transport, walking and cycling.

- Active travel has significantly grown, improving air quality, and providing health benefits for citizens that include positive impacts on diabetes, mental health, obesity and a decreased risk of cardiovascular disease and different types of cancers.
- Public transport is maintained as the backbone of the urban mobility system and new mobility solutions are integrated to support a more sustainable city vision which is less dependent on the private car.
- Mobility-as-a-Service (MaaS) has been successfully rolled out and adopted across various demographic groups.

5.3. PUT IN PLACE THE RIGHT INCENTIVES TO DRIVE THE TRANSITION TO ZERO-EMISSION MOBILITY

- Public authorities steer and guide new mobility solutions so as to reach their policy goals.
- The ‘polluter pays’ and ‘user pays’ principles have been implemented in all transport modes, internalising external costs.
- Local and regional collective transport investments have been prioritized as a key accelerator towards a carbon-neutral economy.
- Road charging has increased shared and collaborative mobility services, leading to reduced congestion on roads.
- Parking is regulated more actively to create incentives for space-efficient transport and reduced congestion.
- Higher social standards have contributed to an increased labour attractiveness for transport workers, including the female work force.



6. HOW CAN WE GET THERE?

This section describes the actions set out by the consortium and the stakeholders. The below table presents the list of **challenges and actions** identified by the consortium grouping them according to a degree of priority and a time scale:

- (i) the **priority short-term measures** to be addressed,
- (ii) the **medium-term** priority measures, and
- (iii) the **permanent** measures.

Table 1 Challenges and actions identified by the consortium

Challenges		Actions
<ul style="list-style-type: none"> • Lack of data sharing from many private sectors which hinders cooperation with the public sector; • Regulation that vary from city to city; • Cultural shift away from private car ownership; • Problems on space use and balancing pedestrian and shared mobility space on pavements derived from the introduction of new mobility services; • Impacts of the Covid19 pandemic on new transport solutions. 	 <p>i) TO BE ADDRESSED IN PRIORITY</p>	<ul style="list-style-type: none"> • Build a neutral (European) platform to foster exchange and discussion between the relevant stakeholders involved in regulating, developing and providing innovative and disruptive mobility solutions; • Ensure that new mobility provider to address SUMP's overarching objectives of sustainable mobility.

Challenges		Actions
<ul style="list-style-type: none"> • Legislation moves too slowly for new mobility solutions; • New mobility solutions can change user behaviour positively or negatively; • Difficult to bring autonomous vehicles into use without real-world tests; • Fair (service, fare...) competition between new and existing public transport services; • Lack of openness of the private sector so that the public sector faces difficulties to manage these services; • Lack of technical standards; • Regulations in the local language. 	 ii) TO BE ADDRESSED IN THE MEDIUM TERM	<ul style="list-style-type: none"> • Define standardised way to engage with innovative mobility in the cities; • Ensure that regulation puts policy first, and that technology is an enabler or at the service of the policy; • Ensure that the private sector (innovative and disruptive solutions) demonstrate how to overcome problems, negative externalities, and comply with policy goals of sustainability • Monitor, participate in, and influence international groups that are producing technical standards; • Foster data sharing without any specific or constrained technical standard; • Structured development of regulations can help translation.

Challenges		Actions
<ul style="list-style-type: none"> • Difficulty to define a clear vision of the role that these mobility services could play in urban mobility systems • Diverging goals between the public and private sectors; • Solutions may meet the needs of some end user groups and not those the community as a whole; • New mobility providers are not included in the creation of regulations; • Ethical issues related to artificial intelligence algorithms have to be addressed in order to deploy new mobility solutions (in particular, autonomous mobility). 	 iii) TO BE ADDRESSED CONTINUOUSLY	<ul style="list-style-type: none"> • Promote models that drive cooperation; • Encourage regulators to share best practices on how to deal with new mobility solutions; • Promote data sharing by private operators and a transparent and balanced way; • Consider that Authorities fund city dwellers or users directly towards their best mobility and most sustainable transport mode.

7. CONCLUSIONS

This paper is the result of the work carried out under WP4 New Regulatory approaches to devise new regulatory schemes, frameworks and governance models, task 4.2 Adaptive Roadmap 2040.

- By looking at specific and cutting-edge **challenges** that are relevant to innovative and disruptive services, this paper presents the current situation.
- By looking at a specific **vision of urban mobility systems** that encompasses smoothly these innovative and disruptive mobility services, this paper provides a perspective of where to go.
- The **key takeaways** of this paper are formalised in the last paragraph which aims at defining how to get to the desirable future. These are elements that have been used to formulate the **actions** that will support the definition of recommendations for the GECKO project.



GECKO CONSORTIUM

The consortium of GECKO consists of 9 partners with multidisciplinary and complementary competencies. This includes leading universities, networks and industry sector specialists.



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