

THE ROLE OF PUBLIC ENTITIES IN PROMOTING AND REGULATING THE DEVELOPMENT OF THE MOBILITY AS A SERVICE LANDSCAPE

František Kasl / Pavel Loutocký / Adam Jareš /
Veronika Příbaň Žolnerčíková / Martin Erlebach

František Kasl, Ph.D., postdoctoral researcher, Masaryk University, Faculty of Law, Institute of Law and Technology, Veveří 158/70, 611 80 Brno, CZ, e-mail: frantisek.kasl@muni.cz

Pavel Loutocký, Ph.D., postdoctoral researcher, Masaryk University, Faculty of Law, Institute of Law and Technology, Veveří 158/70, 611 80 Brno, CZ, e-mail: loutocky@muni.cz

Adam Jareš, Ph.D., postdoctoral researcher, Masaryk University, Faculty of Law, Institute of Law and Technology, Veveří 158/70, 611 80 Brno, CZ, e-mail: 518466@muni.cz

Veronika Příbaň Žolnerčíková, Ph.D., postdoctoral researcher, Masaryk University, Faculty of Law, Institute of Law and Technology, Veveří 158/70, 611 80 Brno, CZ, e-mail: 477105@muni.cz

Martin Erlebach, researcher, Masaryk University, Faculty of Law, Institute of Law and Technology, Veveří 158/70, 611 80 Brno, CZ, e-mail: 480066@muni.cz

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Abstract: *The emerging European mobility as a service landscape is subject to a complex set of regulatory frameworks and the interaction of multiple layers of public as well as private stakeholders. The versatility of the particular local mobility systems is high, however, common patterns can be established and categorized, in particular with regard to the development of the role of mobility as a service in such systems. These then are suitable for reflection and discussion with regard to strategic support or European collaboration and regulatory coordination. In our contribution, we focus on the role of public entities at European as well as national levels, with the aim to identify, how to best utilize their particular link to the mobility as a service landscape in support of suitable development and promotion of this innovative approach to solve the future challenges of municipal mobility.*

1. Introduction¹

Mobility as a service (MaaS) is an area that falls within a complex regulatory framework² where stakeholders from the public and commercial sphere interact on multiple layers. As we dove deeper into this landscape during our research, we identified a need to clearly identify and delineate the role of the various public sphere entities (i.e., ministry, regulatory authority, municipality or public transport company), which play a stakeholder role in the development and regulation of this nascent sector. In this pursuit, we first drafted a typology of models of MaaS development, in order to subsequently link the most suitable involvement of the considered public entities in promoting and managing the boom and bloom of these services.

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² We provided a mapping of this landscape in our previous contribution, see KASL/LOUTOCKÝ/JAREŠ/PŘIBAŇ ŽOLNERČIKOVÁ/ERLEBACH, The regulatory landscape for mobility as a service in a Europe fit for the digital age, *Jusletter IT. Die Zeitschrift für IT und Recht*. Bern: Weblaw, Issue 30. März 2023, 2023, ISSN 1664-848X, doi:10.38023/7b84368f-ee19-4b8d-b7df-a1354a47e9ab.

2. Typology of approaches to MaaS development

Based on our research and experience with the MaaS regulatory landscape, we perceive three typical approaches to the emergence and establishment of these services in the municipal mobility environment.

- **Bottom-up development:** This was the initial approach during the early emergence of MaaS as a new business model and mobility possibility. It links to the fact that pioneering of new technologies and services is often unregulated or underregulated due to their innovative nature, which often does not sit neatly with the existing regulatory landscape and either circumvents or fully misses the focus of the existing regulation. This is often perceived as a business model advantage and fully utilized by the pioneers. This regulatory gap is subsequently gradually decreased, as the new sector matures and the impact of the new service or product is better studied and understood. The regulation then primarily aims at curbing the excesses of the new sector, drawing the innovative business model into the more standard structure of regulation and extending related or analogous rules to this new activity. The regulatory environment is primarily developed through the market success of commercial entities, their use cases and emerging best practices.
- **Top-down development:** When a new sector emerges in some jurisdiction and gains traction, there can subsequently be political or regulatory interest in creating a similar sector or segment of the market in the domestic jurisdiction. For this purpose, regulatory sandboxes can be employed and innovation and start-up subsidies or other incentives and forms of support can be established and promoted. The sector is then primarily grown within the structure and boundaries of the government-level strategies and policies. Success is, however, not guaranteed and the new entities can be challenged by the restrictive nature of the regulatory framework or additional costs incurred through promotion of adjacent policies. In the case of MaaS, these can involve policies on emissions, preferred mode of municipal mobility, transportation optimisation, or limits on the shift from public to private-based transport.
- **Guided development:** The regulatory approach between the above-described extremes often emerges as the most suitable compromise for the stakeholders. It utilizes the innovative drive of the commercial sphere and the structure of the regulatory framework that allows embedding into the sectoral practices and business models the necessary reflection of externalities and broader values (cybersecurity, municipal mobility planning, etc.). The regulation is primarily locally established and predominantly reactive to the development in the local landscape of the sector. This allows to fully consider local specifics and promotes local pioneers in their strengths without unnecessary limitations caused by a prescribed business model or mode of operation stemming from a top-level regulatory or legislative strategy.

The advantages of active policy promoting and regulating MaaS are well exemplified by problematic consequences of unregulated MaaS boom that has already taken place (i.e., Uber/Liftago and other cases in a multitude of jurisdictions). Other problems include failures of the regulatory sandboxes to establish healthy local competition. Additionally, the challenges with a restrictive strategy or lack of capacity to affect the sector can include increasing problems with municipal planning, transport infrastructure planning or public transport planning. All these require a broader consideration of dynamic developments and benefit from comprehensive policies and guidelines that reflect local specifics.

3. Public entities that come into play and limits of their capacity

We identified a hierarchical structure of public entities that can be considered stakeholders in the development of MaaS on the general as well as local level. These include:

- **Legislator:** on the EU as well as national level, as these are increasingly intertwined;

- **Ministry:** primarily the Ministry of Transport as the national strategic guarantor of the mobility agenda capable of forming and promoting broad guidance and policies with effect across municipalities, however, with limited capacity to reflect upon local specifics;
- **Municipality:** the local guarantor of the municipal mobility development strategy, capable of considering local specifics, but with limited capacity to directly regulate the MaaS sector. Municipalities are also able to influence the development of MaaS, mainly through spatial planning and other tools discussed below;
- **Regulatory authority:** tasked with a particular role within the legal framework, that touches upon MaaS (e.g., AI, personal data protection or cybersecurity). The regulatory capacity concerning this area allows for specific and expert guidance with regard to the given domain, but its narrow focus requires involvement in cooperation and collaboration networks with other stakeholders to pursue the guidance and strategies effectively;
- **Public transport company:** a local municipality mobility player with possible synergies as well as a competitive position to the emergent MaaS. Often linked to the local municipality and guided by municipal policies, it allows for the most specific interoperability with MaaS operators and benefits from transparent demarcation of the mobility landscape.

Other entities may be considered, such as MaaS sector associations, providing guidance, best practices, possibility of data sharing, etc.³

3.1. Legislator level

MaaS is an area, which already received substantial attention by the EU as well as national legislators and the emergent legislative and strategy frameworks need to be taken into consideration as they set the guidance for activities of other public stakeholders and priorities in the MaaS sector development and promotion.⁴

These frameworks include the European Data Strategy⁵ and the European Mobility Data Space.⁶ There are also broader frameworks aimed at the support and promotion of relevant research⁷ and initiatives that expand the possibilities and benefits of the services while contributing to efficient data sharing and utilization.⁸ For broader mapping of the regulatory framework that is relevant to MaaS, we again refer to our previous contribution.⁹ However, from this perspective, it is crucial to mention that the legislative activity is also related to standardisation approaches that set the overall framework for sharing relevant data, with direct effect on MaaS. It is thus essential to map the standardisation activities and to pursue interoperable systems based on the standardised data exchange.

The standardisation activities relevant for our context are mainly represented by activities within the European standardisation organisation CEN and in particular its Technical Commission CEN/TC 278 Intelligent transport systems.¹⁰ This body focuses, among other things, on traffic monitoring and management and sta-

³ E.g., MaaS Alliance. <https://maas-alliance.eu/> (accessed on 18 December 2023), 2023.

⁴ Cf. Gaia-X, How can dataspace contribute to the development of mobility activities in Europe and better service for travellers? <https://gaia-x.eu/event/how-can-dataspace-contribute-development-mobility-activities-europe-and-better-service/> (accessed on 18 December 2023), 2022.

⁵ Cf. European Commission, European data strategy. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en (accessed on 18 December 2023), 2020.

⁶ Cf. European Commission, Unlocking the potential of mobility data. <https://digital-strategy.ec.europa.eu/en/policies/mobility-data> (accessed on 18 December 2023), 2023.

⁷ Cf. European Commission, Investing in Cloud, Edge and the Internet of Things. <https://digital-strategy.ec.europa.eu/en/policies/iot-investing> (accessed on 18 December 2023), 2023.

⁸ Cf. Gaia-X, About Gaia-X. <https://gaia-x.eu/what-is-gaia-x/about-gaia-x/> (accessed on 18 December 2023), 2023.

⁹ Cf. KASL/LOUTOCKÝ/JAREŠ/PŘÍBAŇ ŽOLNERČIKOVÁ/ERLEBACH, The regulatory landscape for mobility as a service in a Europe fit for the digital age, *Justletter IT. Die Zeitschrift für IT und Recht*. Bern: Weblaw, Issue 30. März 2023, 2023, ISSN 1664-848X, doi:10.38023/7b84368f-ee19-4b8d-b7df-a1354a47e9ab.

¹⁰ Cf. CEN/TC 278 ITS standardization, About us. <https://www.itsstandards.eu/aboutus/> (accessed on 18 December 2023), 2023.

tistics related to the subject. The activities are divided into several working groups,¹¹ which focus mainly on standardisation in the field of intelligent transport systems, covering services and techniques to achieve road safety, environmental sustainability, transport efficiency and improving the travel experience. The different working groups are also responsible for updating standards. Other key standardization activities are represented by the International Organization for Standardization (ISO). Intelligent transport systems are the focus of the technical committee ISO/TC 204: Intelligent Transport Systems.¹² It has already developed more than 220 standards relevant for this context.

As we focus in our research on the Czech Republic, there are also significant ongoing activities on the national level. Two pieces of Czech legislation are worth mentioning, one being the proposal for an Act on the Digital Economy¹³ by the Ministry of Industry and Trade and the second the proposal for an Act on Public Sector Data Management¹⁴ by the Ministry of the Interior. The Act on the Digital Economy reflects the European Data Governance Act¹⁵ and revises the current framework on intermediaries providing information society services. The Act on Public Sector Data Management promotes the sharing of information kept in public registries and other records that can have an economic value and a life cycle of their own. The aim is to have both passed and published in 2024.

3.2. Ministry level

The ministry is often the core stakeholder in the setup of the tone and approach to the MaaS sector development and regulation. The mobility strategy and promoted concept of MaaS use cases have national-level impact and set constraints or encourage local municipal approach to MaaS. The recent study by the International Transport Forum provided a comprehensive look at best practices and crucial elements to be considered during drafting of the strategies aimed at balanced and systematic promotion of MaaS development. These in short include the following basic tenets:

- Think of mobility data as infrastructure
- Develop a cross-sectoral vision for data governance
- Establish minimum data-sharing requirements for participants in MaaS ecosystems
- Link data-sharing requirements and incentives to licensing
- Public authorities should provide basic data-sharing functionality
- Improve data skills and digital governance capacity within public administrations¹⁶

Cooperation with regulatory authorities for areas such as personal data protection and cybersecurity is an important aspect in setting the framework of the sector development in line with the broader interest of ensuring data privacy and security. MaaS is highly data-driven and involves extensive and potentially sensitive data of large groups of persons. The privacy of users and the security of the data generated and processed should be protected by setting clear guidelines for data collection, storage and sharing. Policymakers should further adequately involve the feedback from the technology providers and transport operators to ensure that user data is pseudonymised/anonymised, encrypted and protected from unauthorised access. The involvement of

¹¹ The subject focus of each working group, including links to the ISO working groups, can be seen below on the page CEN/TC 278 ITS standardization, About us. <https://www.itsstandards.eu/aboutus/> (accessed on 18 December 2023), 2023.

¹² Cf. ISO, Technical Committees ISO/TC 204 Intelligent transport systems. <https://www.iso.org/committee/54706.html> (accessed on 18 December 2023), 2023.

¹³ In Czech “*Návrh zákona o digitální ekonomice*”.

¹⁴ In Czech “*Návrh zákona o správě dat veřejného sektoru*”.

¹⁵ Regulation (EU) 2022/868 of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act) <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32022R0868> (accessed on 18 December 2023).

¹⁶ Cf. International Transport Forum, Mix and MaaS: Data Architecture for Mobility as a Service. <https://www.itf-oecd.org/mix-and-maas-data-architecture-mobility-service> (accessed on 18 December 2023), 2023.

the regulatory authorities should ensure adequate supervision and enforcement of compliance with these requirements and guidelines.

3.3. Municipality level

Municipality is most directly involved in guiding or nursing the MaaS sector on local level. Its activities need to be aligned with the broader strategies and frameworks set by the legislator and ministry, even though these still often allow for significant flexibility. In this context, the above-described tenets of a good broad strategy can be further expanded by more concrete recommendations and elements of strategic approach to the sector development. Primarily, clear policy objectives should be set with clear and measurable goals that are consistent with the broader mobility objectives of the city or region. Policy objectives should be based on a comprehensive assessment of the existing transport system, the needs of different user groups and the potential benefits for innovation in the transport network.

MaaS is, due to its nature, in effect a networking service and as such, even the approach to regulation of this sector should be based on cooperation and involvement of stakeholders. It is valuable to seek cooperation and involvement of different stakeholders, including public transport providers, private mobility companies, technology providers and civil society organisations in considering the local mobility landscape specifics and most efficient involvement of MaaS into this set-up. If not already established on national level, municipal policymakers should aim to create and promote platforms for dialogue and cooperation between stakeholders to ensure that policy objectives are aligned and effectively implemented. Such platforms should allow to fully take local specificities into account. Promoting integration and interoperability between different modes and service providers to create a seamless passenger experience is essential. Only in such setup, the benefits and innovative potential of MaaS can be fully utilized. Local policymakers should work with transport providers and technology companies to align the used data standards, APIs and other technical specifications that enable different services to work together.

Available incentives and regulations should be used to shape, but not constrain the market. Municipal transport policies can shape the market by providing incentives that encourage the adoption of sustainable and equitable modes of transport. Policymakers can incentivise the use of low-emission vehicles, public transport and active modes such as walking and cycling, while regulating the use of single occupancy vehicles in congested areas. In this way, MaaS regulation and planning intertwines with other modes of mobility and a comprehensive approach to municipal mobility is highly encouraged.

MaaS is a dynamic phenomenon and setting of the municipal strategy must be similarly dynamic and reactive. Monitoring and evaluation of the outcomes of the existing policies is crucial in this as well as the observation of approaches and policies chosen in other similar municipalities. Policies should be regularly evaluated to assess their effectiveness and to identify areas for improvement. For this purpose, clear metrics for success should be defined, such as increased use of sustainable modes of transport, reduced congestion and improved air quality. The use of data analytics to track progress towards these goals is also recommended.

Furthermore, the municipal strategy must be considered in a broader context in relation to spatial planning of the municipality area. MaaS will work best, if there is a good urban infrastructure that connects the different downstream modes of transport from the train from the wider area, P+R parking around the station within the agglomeration or on the outskirts of the city, public transport in the city, scooters and bikes for last mile travel, parking and other infrastructure (such as charging stations) for cars. These are just some of the issues that need to be addressed in land use planning as well. Not only does the city itself, which is the centre of the agglomeration, but also its surroundings need to be taken into account in the spatial planning. For example, if the MaaS works well and transport is accessible, convenient and fast, then denser development throughout

the agglomeration shall be considered, not just in the immediate vicinity of the city forming the centre of the agglomeration.¹⁷

3.4. Public transport company

The use cases for optimal integration of public transport with MaaS are important inputs into the municipal mobility strategy and development. This includes technical aspects, such as what data are or can be collected and how the data can be shared between MaaS and a public transport company to be potentially utilized for further optimisation. Public transport companies need to develop their own strategies for short-term or long-term investments and development of their stake concerning smart mobility. These can conflict with the MaaS sector developments or even national or local level incentives, if not communicated and coordinated appropriately. Without communicating and being aware of the current position and future aims of these entities, efficient and relevant strategic planning at the municipal level is hard to achieve. After all, the most suitable use of MaaS seems to be as the last-mile transport closely linked and coordinated with the core public transport elements. Public transport companies will most likely retain their backbone role in municipal mobility, but only through efficient connection with MaaS on a data level as well as a spatial level. This way the real positive impact of MaaS on municipal mobility can be achieved.

4. Conclusion

In our contribution, we provided a typology of approaches to MaaS development from the perspective of public entities. Based on this, we identified as most suitable the coordinated approach of the guided development, where the regulation is primarily locally established and predominantly reactive to the development in the local landscape of the sector. This should best allow local pioneers to establish in the sector, while taking broader context and strategies on national as well as local level adequately into consideration. However, to achieve such approach, close and synchronized coordination across the public sector stakeholders is required. We categorized the key stakeholders as Legislator, Ministry, Municipality, Regulatory authority and Public transport company. To highlight the role of Legislator in development and regulation of MaaS, we then provided insight into relevant European strategies, pursuit of MaaS standards as well as specific Czech legislation currently discussed. When discussing the Ministry level, we highlighted the need to establish mobility strategies in line with the best practices, such as those provided by International Transport Forum. Furthermore, cross-sectoral vision for data governance should be embraced and close cooperation with the Regulatory authorities established. Feedback from the technology providers and transport operators is also important aspect. At the Municipality level, the activities need to align with the national Maas framework as well as broader municipal transportation development strategy, but it should still allow for adequate flexibility and regular evaluation of impact. If not provided on the national level, platforms for broad stakeholder dialogue and cooperation should be pursued locally. Additionally, the perspective of the public transport company should not be overlooked. The development strategies for MaaS should be coordinated with its plans in order to establish optimal public-private transport environment and achieve synergies that the MaaS can offer.

¹⁷ Cf. MOURATIDIS/PETERS/VAN VEE, Transportation technologies, sharing economy, and teleactivities: Implications for built environment and travel, *Transportation Research Part D*. Issue 92. März 2021, ISSN 1361-9209, doi: 10.1016/j.trd.2021.102716.