

Multifaceted Impacts of Mobility as a Service in Japan: A Catalyst for Local Stakeholder Engagement

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Abstract. Many regions worldwide have launched Mobility as a Service (MaaS) initiatives to integrate diverse transport modes into seamless travel experiences. In Japan, over 150 pilot projects have emerged since 2019 under the government’s “Smart Mobility Challenge” subsidy program. Traditionally led by private operators, Japan’s mobility services now witness growing cooperation among transport providers, local governments, and commercial entities. This study investigates the multifaceted impacts of MaaS by analysing responses from a 2024 questionnaire survey targeting 28 municipalities involved in MaaS trials. The findings reveal that MaaS initiatives foster stakeholder collaboration, broaden perspectives in transport planning, and enhance mutual understanding. Regions with pre-existing communication cultures among stakeholders reported greater improvements, suggesting that MaaS can amplify existing collaborative foundations. Moreover, MaaS acts as a catalyst for organisational capacity building and inter-organisational linkages, contributing to long-term governance transformation. While financial and operational challenges persist, the study highlights the importance of evaluating MaaS beyond short-term metrics, recognising its role in shaping regional mobility ecosystems and facilitating shared visions among diverse actors.

Keywords: Mobility as a Service, Public Transport, Multifaceted Impact, Social impact

1 Introduction

The concept of Mobility as a Service (MaaS) was first proposed in Europe in 2014 and gained international attention following its initial implementation in Finland [1]. Research on MaaS has expanded rapidly, with various studies addressing markets, users, data, and technology, as well as the transformation of existing transportation systems.

Yet, there is room for further research on governance and business models, data governance, the positioning of public transport, and the broader impacts of MaaS [2].

Japan has piloted various MaaS initiatives. Since 2019, the national government has supported over 150 pilot projects through the "Smart Mobility Challenge" subsidy program. While they include diverse initiatives, their evaluations have predominantly relied on quantitative indicators such as the number of users, MaaS app downloads, and ticket sales [3]. Several factors can explain this emphasis on metrics directly linked to financial viability. First, the evaluation of these pilot projects is on a single-year basis, which favours easily measurable indicators. Second, it reflects the characteristics of Japan's public transportation system, particularly in the railway sector, where operators have historically sustained operations under the "full-cost principle," relying primarily on fare revenues [4]. Consequently, assessments of MaaS investments have tended to focus on business-oriented outcomes such as revenue increases.

However, MaaS initiatives do not always yield immediate financial returns, and such cases are relatively rare. As a result, many pilot projects have struggled with continuity and implementation difficulties [5]. In high-level MaaS, the focus is not only on integrating the elements that constitute mobility services (e.g., information, payment) but also on integrating societal goals [6]. When we consider MaaS as part of a broader societal infrastructure platform, its assessment should extend beyond narrow business metrics to encompass broader societal benefits. Yet, this framework has not been fully realised in Japan, highlighting a critical gap in current MaaS policy and practice.

International evidence, such as rural MaaS pilots in Finland, has revealed impacts from the perspectives of users, service providers, and society as a whole [7]. Reported benefits include the promotion of public-private collaboration, the expansion of data-sharing practices, and the emergence of new business opportunities. These results suggest that MaaS has the potential to generate value across individual, organisational, and societal levels. At the organisational level, for instance, improvements in collaboration and data sharing were observed as specific outcomes of the pilot implementations. However, as the study focused only on two cases within a specific context, further empirical research across diverse geographic and institutional settings is required.

In Japan, the sustainability of mobility services has become increasingly challenging under the full-cost principle, which has historically relied on fare revenues, particularly amid population decline, shrinking demand, and labor shortages. In response, there is a growing need for collaborative efforts among diverse regional stakeholders, and MaaS shall work as a platform that facilitates such co-creation.

Accordingly, the evaluation of MaaS should encompass not only user-side benefits such as improved accessibility and behavioural change, but also the multidimensional value it provides to the ecosystem of stakeholders supporting regional mobility. Nevertheless, as previously discussed, evaluations in Japan have primarily focused on narrow business metrics directly tied to financial performance. This study therefore explores the multifaceted impacts of MaaS on regional stakeholders in Japanese cases by analysing subjective assessments and highlighting broader societal and organisational effects beyond conventional business indicators.

2 Methodology

2.1 Questionnaire Survey

This study conducted a questionnaire survey in Japanese regions that have implemented MaaS-related initiatives. The survey captures subjective evaluations of the multidimensional value generated by these initiatives. It consisted of six questions covering: projects outline and their current status (Q1), regional circumstances at the time when they started MaaS-related initiatives (Q2), actors involved in and driving the initiatives (Q3), current stage of the initiatives (Q4), multifaceted effects arising from the initiatives (Q5), and insights and lessons learned from the initiatives (Q6). Particularly, this study focuses on Q2 and Q5 to examine the multidimensional effects perceived by each region as a result of MaaS initiatives.

Q2 is based on the hypothesis that the regional context and recognition of challenges at the time of MaaS implementation influence how the effects of such initiatives are perceived. Respondents were asked to assess the extent of change in the following nine conditions, using a three-point scale (“improved/completed”, “stable”, and “worsened/weakened”). These conditions included: the status of regional transport planning (Administrative plan); the existence of a stakeholder communication culture (Stakeholders’ culture); prior collaboration among transport operators and other businesses (Business collaboration); the presence of both daily life and transport service providers (Wide-ranging business); technological readiness in the region (New technologies); prior experience with integrated ticketing (Existing tickets); consideration of cashless or updated ticketing systems (Ticketing updates); driver shortages (Driver shortage); and the need to reorganise public transport due to financial or operational challenges (Financial issues).

Q5 posits that MaaS initiatives, involving multi-stakeholder collaboration and digital infrastructure, can generate a wide range of effects beyond financial outcomes, including functioning as a platform. To capture these broad effects, respondents were asked to assess the extent to which the following twelve outcomes applied to their region, using a five-point Likert scale (5 = strongly agree, 1 = strongly disagree):

1. Stakeholder collaboration – MaaS deepened collaboration among stakeholders
2. Broad perspectives – It widened perspectives in urban or mobility policy discussions
3. Increased strategic orientation – It increased the strategic orientation of initiatives
4. Policy initiatives – It accelerated urban and mobility policy initiatives
5. Awareness of issues – It increased the stakeholders’ awareness of regional issues
6. Collaboration with outside – It deepened collaboration across sectors
7. Stakeholders’ understanding – It improved the understanding of mobility issues
8. Digitalisation – It accelerated the digitalization
9. Human resources – It fostered human resource development in mobility projects
10. Residents’ interest – It increased residents’ interest in mobility issues
11. Governmental interest – It increased governmental interest in mobility issues
12. Business interest – It increased the business community’s interest in mobility issues

2.2 Data Collection and Analysis

The Japanese government has promoted various MaaS-related pilot projects under the "Smart Mobility Challenge" subsidy program. This study targeted projects that were selected for this program between 2019 and 2023. From the official list of subsidized projects, we identified one representative organisation for each project, including organisations whose projects had already been completed at the time of the survey.

Because this study focuses on regional contexts and local impacts, municipalities were prioritized as the primary subjects of the survey. In cases where private companies acted as project leaders, we also included them as survey targets. For projects that received subsidies across multiple years, only one survey was distributed in principle. To encourage participation, the survey was administered under the name of the Japan Society of Civil Engineers.

Through this screening process, 118 organisations were selected as survey targets. A paper-based questionnaire was mailed in October 2024, and 28 organisations returned completed responses. Among the 28 responses, 39% were located in Japan's three largest metropolitan areas (Tokyo, Osaka, and Nagoya area), while the remaining 61% were from other regions, indicating no substantial urban–rural imbalance in the sample. The following presents the results for Q2 (Section 3.1) and Q5 (Section 3.2).

3 Results

3.1 Regional Circumstances at the Start of MaaS-related Initiatives

Q2 examined whether the regional context and recognition of challenges at the time of MaaS implementation influenced how their effects were perceived.

As described earlier, respondents were asked to indicate whether each regional condition applied at the time when they started pilot projects, and, if applicable, to assess subsequent changes on a three-point scale: 'improved/completed' (A), 'stable' (B), and 'worsened/weakened' (C).

17 out of the 28 regions indicated that either (i) a regional transportation plan or similar administrative plan was scheduled, under development, or had been published within the past three years, or (ii) there was already a local culture for information exchange and discussion among mobility service stakeholders. These findings suggest that more than half of the surveyed regions had an existing community for stakeholder engagement and dialogue.

In addition, many respondents highlighted challenges for sustainable mobility services — particularly due to financial and human resource issues. Japan is facing a growing shortage of drivers alongside an ageing and decreasing population, while COVID-19 further reduced the travel demand and exacerbated these issues. These factors have raised concerns about the sustainability of transport services, with some regions already experiencing service reductions or closures. The result reflects a widespread recognition among municipalities of the urgent need to address the sustainability of transport services.

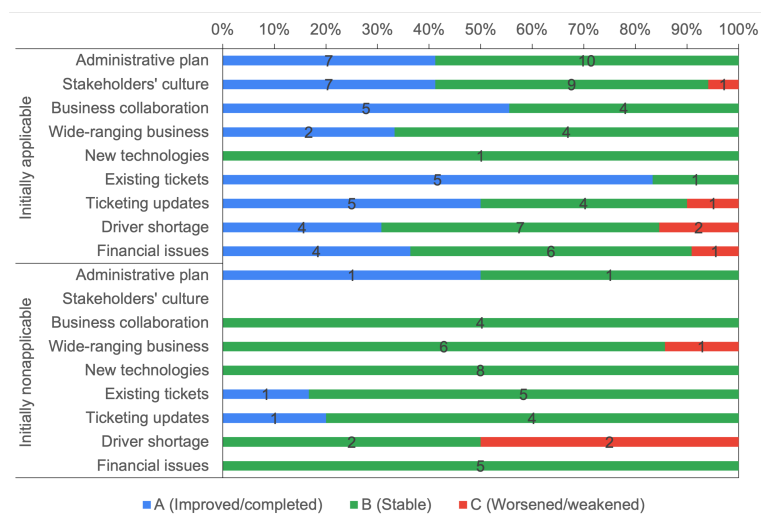


Fig. 1. A comparison of changes after MaaS implementation by initial conditions

The subsequent analysis focused on reported changes in each circumstance following the implementation of MaaS initiatives (see Fig. 1). In many cases, regions where a given circumstance initially applied reported some improvements after MaaS initiatives were introduced. However, the differences are not uniformly substantial, and few showed clear distinctions.

Two relatively notable trends were observed: (i) regions where regional stakeholders had already established a culture of exchanging information and engaging in discussions with one another (stakeholders' culture), and (ii) where stakeholders had already been selling combined tickets of several transport services or other related services (existing tickets). In both cases, these regions were more likely to show subsequent improvements in the respective areas following the MaaS-related efforts.

These findings suggest that pre-existing relationships and communication channels among transport operators and related entities may have served as a foundation for the successful implementation of MaaS initiatives. In other words, regions with established collaborative practices are potentially better positioned to leverage MaaS as a platform for further development.

3.2 Multifaceted Impacts of MaaS for Local Stakeholders

As indicated in the previous section, for issues such as driver shortages and financial sustainability, a majority of respondents reported that the implementation of MaaS initiatives had not improved those problems. This suggests that MaaS does not always provide immediate solutions to operational or financial issues directly related to mobility services.

At the same time, the findings imply that regions with a pre-existing foundation—particularly in terms of communication among transport operators and related stakeholders—may be better positioned to realise the potential benefits of MaaS. Most

MaaS initiatives cannot be executed by a single operator alone; instead, they require collaboration among multiple transport providers, local governments, and non-transport entities.

In light of this, it is essential to evaluate the benefits of MaaS not only in terms of direct financial outcomes, such as profitability or increased ridership, but also in terms of its contribution to stakeholder communication and community building. Q5 of the survey addresses this broader perspective. As noted earlier, respondents were asked to assess the extent to which various multifaceted effects of MaaS were observed, using a five-point Likert scale from 5 (strongly agree) to 1 (strongly disagree) (see Fig. 2).

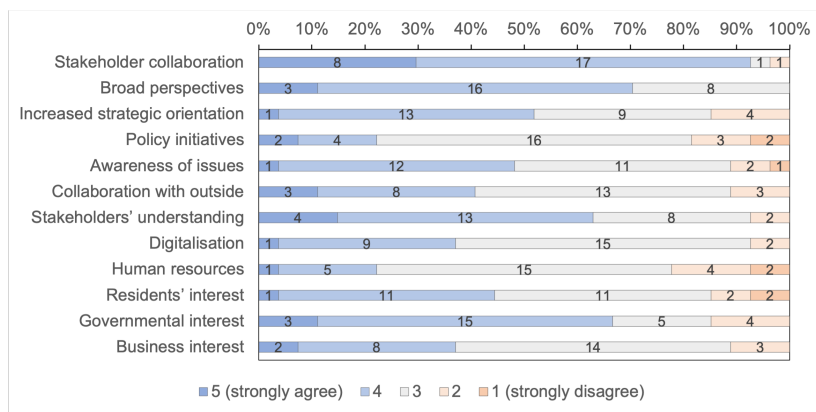


Fig. 2. Stakeholders' Recognition of Multifaceted Impacts of MaaS

Items such as “stakeholder collaboration”, “broad perspectives”, “stakeholder understanding”, and “governmental interest” received relatively high ratings. These items share the keywords of cooperation, interest, and understanding. To realise the concept of MaaS—integrated provision of multiple mobility or other services—a mutual understanding among diverse organisations is essential.

Under the traditional model of transport provision, where a single operator delivers a standalone mobility service, the need for platform-based coordination was minimal. By contrast, MaaS initiatives naturally necessitate dialogue among multiple stakeholders, which in turn fosters deeper collaboration, broader perspectives, and enhanced mutual understanding.

4 Conclusion

This study conducted a cross-project analysis of MaaS-related initiatives in Japan, aiming to clarify the status of projects, the challenges regions faced at project initiation, subsequent changes, and the multifaceted impacts of MaaS on local communities. A questionnaire survey was organised to municipalities and other entities that have implemented MaaS initiatives under central government subsidy programs.

The results suggest a general tendency for regions initially with specific issues to report improvements following MaaS implementation, although the differences were not uniformly substantial across all items. Regions with pre-existing communication channels to relevant stakeholders appeared better positioned to advance MaaS initiatives, suggesting that such foundational relationships have facilitated progress.

In terms of multifaceted impacts, the survey revealed relatively high evaluations for items related to stakeholder collaboration (MaaS deepened collaboration among stakeholders), broad perspectives (it widened perspectives in urban and mobility policy discussions), and stakeholders' understanding (it improved stakeholders' understanding of mobility issues). These findings suggest that MaaS enhances organisational capabilities and inter-organisational relationships. Given that the concept of MaaS involves bundling multiple transport services across different operators, successful implementation inherently requires stakeholder coordination and shared understanding [8, 9, 10]. The results of this study further imply a reciprocal relationship: while stakeholder collaboration enables MaaS, engagement in MaaS initiatives may also foster deeper collaboration and shared vision among regional actors, thereby generating synergistic effects.

This study responded to a notable limitation in Japan, where evaluations of MaaS initiatives have predominantly focused on financial metrics. The findings demonstrate that MaaS generates broader organisational value, as perceived by local stakeholders, complementing international evidence, including Finnish cases [7]. The results reinforce the importance of stakeholder collaboration as both a prerequisite and an outcome of MaaS, and highlight the need for frameworks that capture these dimensions.

Accordingly, the evaluation of MaaS initiatives should not be limited to short-term user benefits or operational profitability. It is also essential to assess the long-term platform formation—namely, the development of inter-organisational linkages and shared visions—as key outcomes. While such effects are often internal and difficult to quantify, they represent a critical dimension of MaaS's impact on regional mobility systems. These aspects have traditionally been under-discussed in practice due to their intangible nature, but evaluations of MaaS initiatives should not overlook them.

Finally, it is essential to note the limitations of this study. The sample size was small, partly because some projects had already concluded or project organisations had been dissolved at the time of the survey. Therefore, the findings may not fully represent the overall picture of MaaS initiatives at the national level. Besides, the survey primarily targeted municipalities, and perspectives from transport operators or other industries may differ. These limitations should be considered when interpreting the results.

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