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Resetting the Mobility-as-a-Service Idea
Global status and recommended next steps

Executive summary

This report explores the transformative potential of Mobility as a Service (MaaS) and the complex pathways to building successful and sustainable MaaS ecosystems. Through a comprehensive analysis, supported by AI-driven data research, it highlights the need for a systemic reset to overcome the barriers to adoption and profitability of MaaS solutions.

The concept has attracted interest over the past decade for its promise of sustainable and integrated urban mobility solutions. By bringing together different services on a single digital platform, MaaS aims to provide seamless mobility with societal (better access to mobility) and environmental (lower CO_2 emissions) benefits. However, despite its potential, widespread adoption MaaS faces several challenges, including high upfront investment, limited profitability, and a gap between consumer demand and supply.

The analysis conducted for this study shows that while nearly half of the 27,000 consumers surveyed globally question the need for personal vehicle ownership, only a small fraction have used or are aware of MaaS services. This suggests a strong latent demand that is not being met by the current market. However, successful MaaS implementation requires complex coordination between multiple stakeholders, including cities, public and private transport providers, and asset owners. The lack of highly integrated MaaS ecosystems globally highlights the need for a robust partnership framework to drive this integration. Our study introduced an AI-based MaaS index that combines dimensions of external interest (hype) and internal ecosystem readiness. Over the past eight years, the index shows a stagnation in ecosystem maturity, despite fluctuating external interest.

MaaS represents a paradigm shift in urban mobility, aiming for greater flexibility and lower environmental impact. While it won't completely replace private car ownership, it complements different modes of transport to create a balanced, multimodal approach. For automotive players, the focus should shift from selling more cars to maximizing the value of fewer vehicles through services such as over-the-air updates.

The urgency of resetting MaaS ecosystems is clear. By addressing the challenges identified and leveraging the strategic recommendations, stakeholders can help drive the successful adoption of MaaS solutions. This reset is critical not only for contributing to environmental goals, but also for enabling vibrant and mobile urban spaces in the future.

**Three key points that are likely to contribute to building successful MaaS ecosystems:**

1. Develop beyond an app
Effective MaaS ecosystems should go beyond mere app-based solutions. Investments in advertising, asset ownership and comprehensive user engagement strategies can become critical to changing consumer behavior and generating economic value.

2. Incorporate personalized services
Diversifying revenue streams through commercial partnerships and personalized services can drive user engagement and platform traffic, which is essential for scale and profitability.
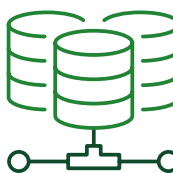
3. Enhance public-private partnerships
Increased collaboration between public and private entities is essential to navigate regulatory landscapes, resource allocation and data governance. Standardized data exchange formats and innovative financing models are needed to promote interoperability and facilitate ecosystem growth.

Introduction: Getting MaaS off the ground. Why do we need a reset?

Over the past decade, MaaS has become an increasingly important part of the urban mobility conversation. The premise of combining different services into a cohesive solution with significant societal and environmental impacts, delivered through a single technical platform, has attracted much attention from stakeholders around the world. However, despite the potential of MaaS, there are significant challenges preventing its widespread adoption and the successful establishment of profitable MaaS offerings.

However, the new normal cannot be stopped. Changes in consumer behavior and environmental imperatives may be dampened for a while by a well understood shift in (geo)political priorities, but good management practice suggests using this period of external security crisis to prepare for the future. This has been the case for some time with many environmental challenges (e.g., energy, CO_2, biodiversity, etc.), e.g., in the automotive industry, and should continue to be the case with mobility. The drivers behind the growing importance of

MaaS, such as decarbonization, urbanization and digitalization, are each present today and expected to continue to strongly influence consumers in the coming years.

Therefore, MaaS is not a nice to have option. The need for transformation is urgent, and when private players are able to form functioning partnerships with the public sector, we expect to experience speed of implementation. Shifting profit pools and new sources of business valuation are the basis for private players to move quickly – but they are not moving into MaaS. Even though the players – who are responsible for the supply – are not keen on it due to high upfront investments and limited profitability potential, the demand side is eager to get started (see Figure 1). Almost half (48 percent) of 27,000 consumers globally question themselves if the use of shared transportation will still justify owning a car in the future. This indicates that the combination of MaaS and personal vehicle ownership will be an important topic going forward, driving the conversation on how to transform the mobility mix.

MaaS will therefore not only be a topic for public institutions like city authorities or public transport providers but be also of great interest for car manufacturers, their future products and services, and for the automotive industry overall.

But at the same time, only around four out of ten consumers globally (39 percent) today have heard about MaaS and less than two out of ten (18 percent) have already used such a service. This speaks volumes for the awareness challenges and current penetration of MaaS, and calls for a joint effort to make such offers profitable and thus a reality.

Moreover, we need to be sensitive to demographic developments and individual mobility needs, such as the growing proportion of people of retirement age in regions such as Asia and Europe (UNECE, 2023), and to behaviors that can only be changed over time. And we need to keep our cities vibrant, and vibrant means mobile. But how do we do that?

Fig. 1 – Consumer perception on MaaS - Percentage of respondents globally that answered positively ("Yes") to the questions below.
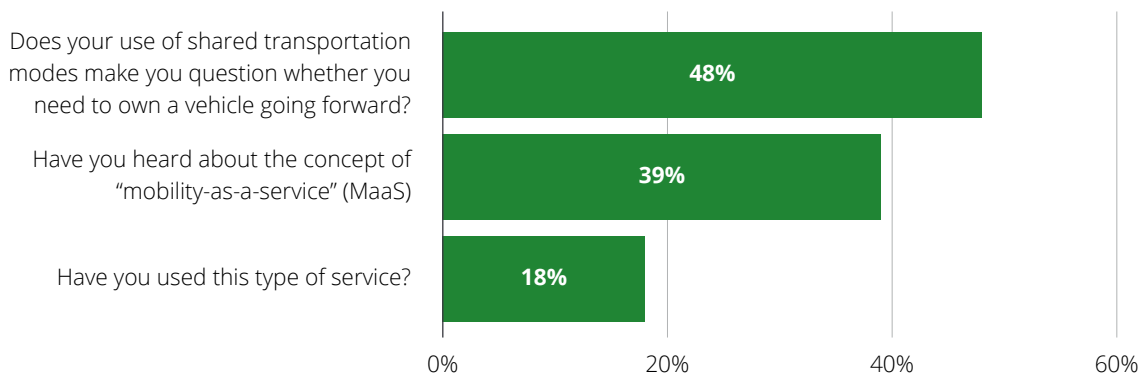
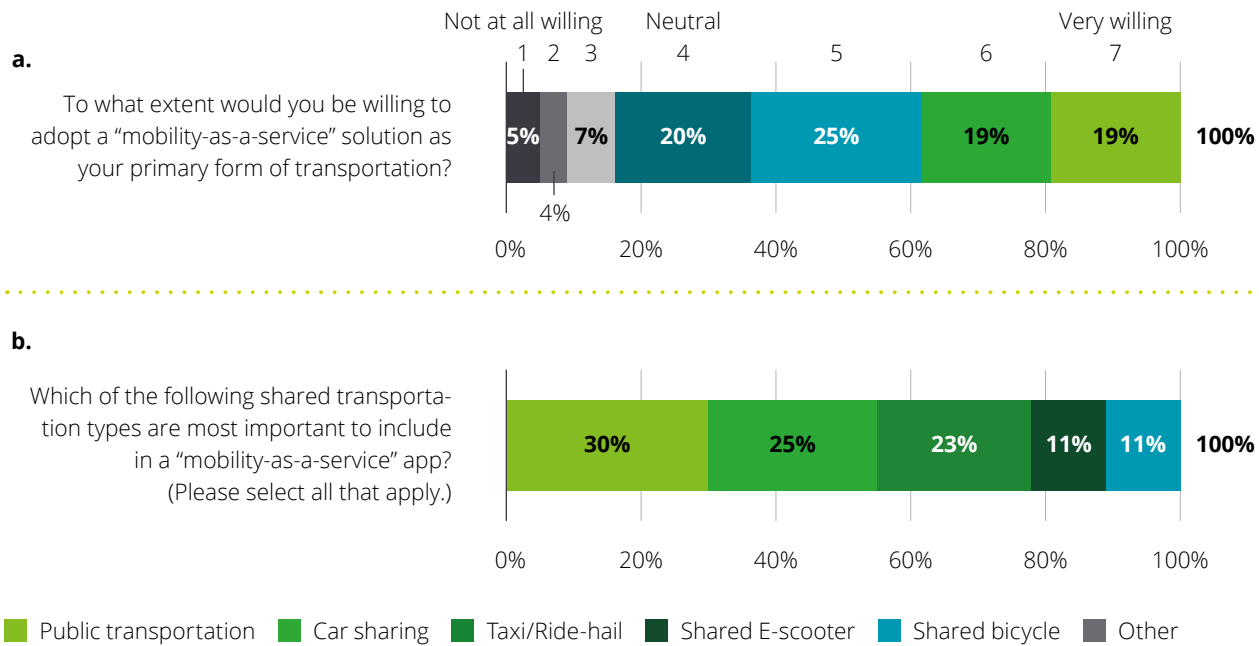Source: Deloitte Global Automotive Consumer Study 2024

1. The concept of MaaS ecosystems – a quick overview

Having been simmering for almost a decade now, MaaS has the potential to revolutionize the way society approaches mobility. The concept brings together a wide range of services through a stream-lined interface, offering great potential in terms of mobility behavior and envi-ronmental benefits. MaaS, as a concept, has been around for almost a decade (Hietanen, 2014) and has attracted atten-

tion, especially in urban areas, as it pro-vides consumers with one-stop access or mobility and integrates important steps like routing and payment. However, despite the numerous social and envi-ronmental benefits, major challenges associated with establishing a functioning MaaS system still exist today, and only a few have achieved a profitable operation (Deloitte, 2023).

However, consumers are demanding more flexible and sustainable solutions to their mobility needs. Almost two-thirds of the 27,000 survey participants would be willing to use MaaS as their main means of trans-port (see Figure 2, a.).

Fig. 2 – Share of respondents globally willing to adopt MaaS as primary transportation mode (a) and view on which transportation types should be included in a MaaS ecosystem (b).

Source: Deloitte Global Automotive Consumer Study 2024

But this fundamental willingness does not always translate into actual behavior. The bias between stated intention and real behavior can be big in mobility, where convenience and habituated behavior are important factors. But it again gives a good overall picture of how people desire a more flexible and sustainable mobility. When asked about specific modes that should be included in a MaaS system, public transport is clearly perceived as the backbone, with car sharing in second place, followed by ride-hailing and micromobility at the end. Each of these modes are important to consumers and should be considered by MaaS providers (see Figure 2, b.).

MaaS is likely to be more successful when several mobility providers collaborate to create a customer solution together in a new network. When in such a provider network more than two players create a value proposition for the customer by linking their offerings (e.g., mobility services) via an exchange platform, with which they jointly create value, this network structure can also be referred to as a (structural) ecosystem (Adner, 2017). MaaS offerings specifically require transaction ecosystems (Rochet & Tirole, 2003) with transaction platforms as a multi-sided marketplace that enables the reuse of shared resources, and not innovation ecosystems as a place for joint innovations via innovation platforms (Cusumano et al., 2019). However, there are just a few of such highly integrated MaaS ecosystems in operation globally, and many pilots that almost never reach the implementation stage (Karlsson et al., 2020).

Building a profitable MaaS ecosystem is not an easy task, as it requires complex relationships between cities/regulators, (public) transport companies, private transport providers and asset owners. However, through extensive research and ongoing dialogue with industry experts and vendors, we identified four different modules of such relationships and of interactions between the parties involved as a rough blueprint of a MaaS operating model (see Figure 3)[1]:

• The demand interactions of the MaaS orchestrator with the private and corporate customers (demand module).

• The platform interactions of the MaaS orchestrator with a potential third-party platform provider or (IT) solution owner, mainly on data, governance and AI.

• The asset interactions of the MaaS orchestrator with the asset owners, asset managers and investors.

• The public-private interactions of the MaaS orchestrator with the cities, regulators, or state governments.

[1] For more information, visit Mobility-as-a-Service | Deloitte Global

Fig. 3 – Exemplary blueprint of a MaaS operating model
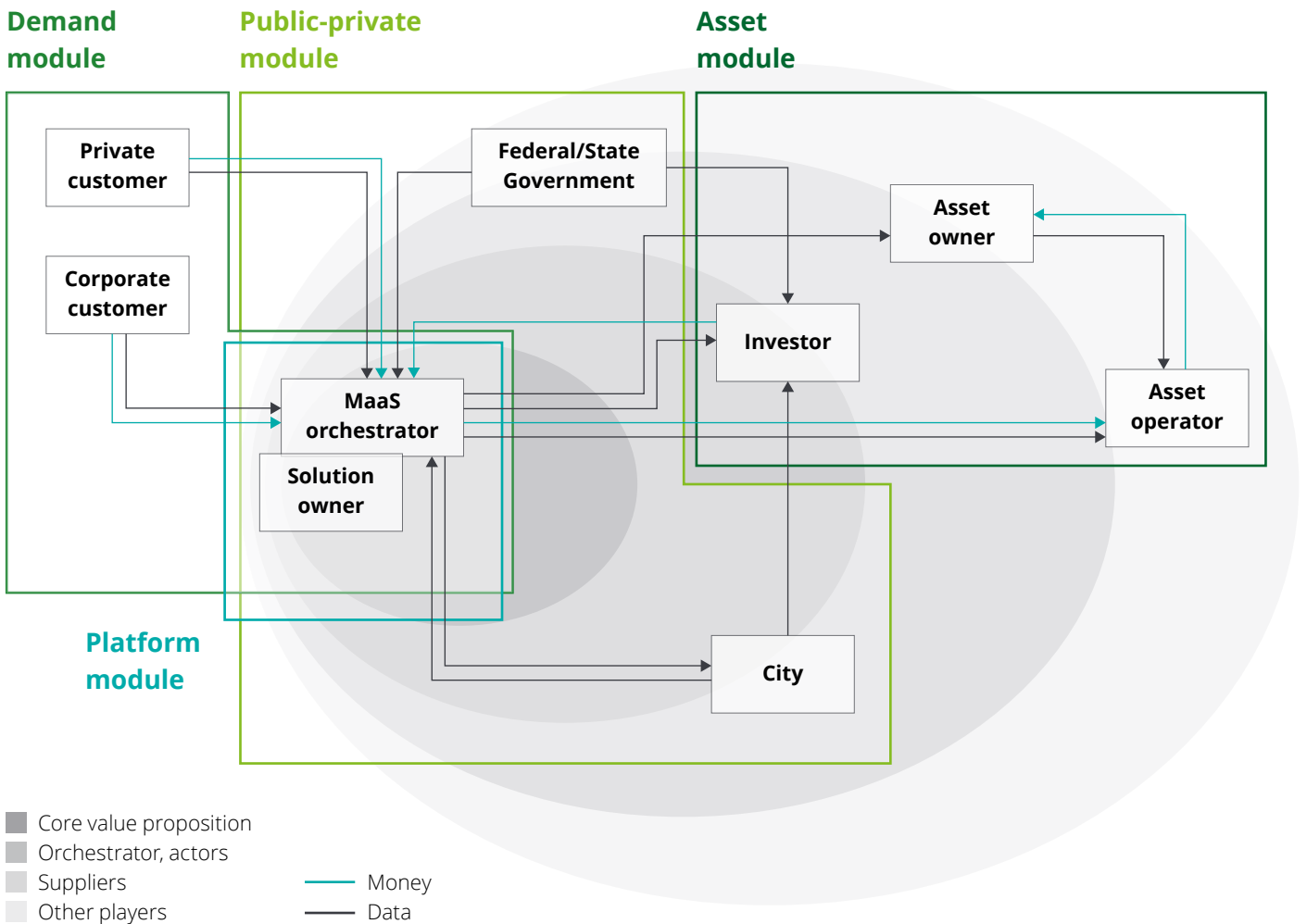
Source: Deloitte & University of Duisburg-Essen MaaS Index 2024

Understanding and addressing demand is foundational to a successful MaaS ecosystem as it shapes the types of services offered and determines the asset types needed. Demand management has different implications for private and corporate customers. To initiate a self-reinforcing effect to increase traffic on a platform, the focus should be on both individual and corporate users. Furthermore, the range of services offered plays a significant role in attracting users. Beyond mobility, catering, information on leisure activities, and other optional services have the potential to generate additional revenue streams and make the system more appealing, and therefore increase the chances of profitability. The MaaS orchestrator commonly receives commissions from the mobility providers for additional private and corporate customers, while corporate customers typically pay set-up and maintenance fees.

The technical platform is the digital interface where demand meets supply. A well-designed platform should seamlessly integrate various assets and services while offering a user-friendly experience. It serves as the operational hub, crucial for data analysis, payment processing, and overall system management. Therefore, in successful ecosystems, platform functionality is of above-average importance – unlike platform technology, which is largely already in place. A MaaS ecosystem demands a robust, highly efficient, and securely integrated platform that can connect the set of components required to provide a sustainable journey when combining the mobility modes. Individuals expect seamless experiences, as with most day-to-day consumption habits, providing, for example, real-time information to optimize routes and enable easy, reliable use of sustainable modes of transport. The MaaS platform should provide a mobility account across operators – account-based ticketing – with personal/corporate information and integrated digital fare products. The account-based ticketing concept allows travelers to combine in the same account the payments and tokens used to access different mobility services: transit, parking, tolls, bike sharing, electrical vehicle (EV) charging stations and others.

Assets form the backbone of MaaS operations. MaaS ecosystems enrich their offerings through relationships with asset operators or owners. This can allow for a more diversified and efficient use of resources, from vehicles to parking spaces, contributing to the ecosystem's success and resilience. But also, the importance of asset management and refinancing is becoming increasingly pronounced. Yet, traditional methods like asset-backed securities are nearing their limits, accelerating the need for innovative financing models. MaaS orchestrators, including cities, are encouraged to explore new collaboration strategies and concepts for the refinancing of future mobility assets. It is likely unrealistic to believe that the cities have enough capital to quickly invest in missing transportation modes and routes. In addition, it is questionable whether they can bear and manage the residual value risks of the assets. In this context, a separate (private) investor could be useful, converting existing funds into investment vehicles. Stable returns, rental fees and asset rent agreements would need to be managed.

Public-private collaboration is vital to navigating complex regulatory landscapes and the implementation of large-scale projects that have the potential to benefit the public. Transportation is heavily regulated to reduce risks to users. Many transport operators have licensing agreements with public agencies in place that determine how their tickets can be sold. And organizations allocate resources for complying with these agreements. Public-private collaborations are the cornerstone of MaaS ecosystems. The development of MaaS solutions could greatly benefit from the participation of public entities, and at the same time public entities are likely to encounter challenges without the support and investments that private enterprises can likely deliver. Hence, cooperation between public and private enterprises is a key contributor for the success of the MaaS model. A key aspect is the standardization of data exchange formats. This involves defining common data structures and protocols for sharing transportation-related information. When

data is consistently formatted it could become easier for MaaS service providers to access and use this data effectively. The emphasis on common standards and data formats fosters interoperability between different transportation systems and services. This interoperability is a fundamental requirement for the successful implementation of MaaS solutions. When data is open and accessible in a consistent way, it becomes easier for MaaS providers to create integrated services that combine various modes of transportation.

Beyond this conceptual view of a MaaS ecosystem, publicly available information is mostly scarce and often unstructured, as they either consist mostly of small partner companies that are not required to disclose corporate data or only publish very limited information on the topic (Reyes Garcia et al., 2020). Finding patterns on MaaS ecosystems requires targeted research. Thus, in the next sections, we present what we believe to be the current state of the world's MaaS landscape via our proprietary AI-based MaaS index.
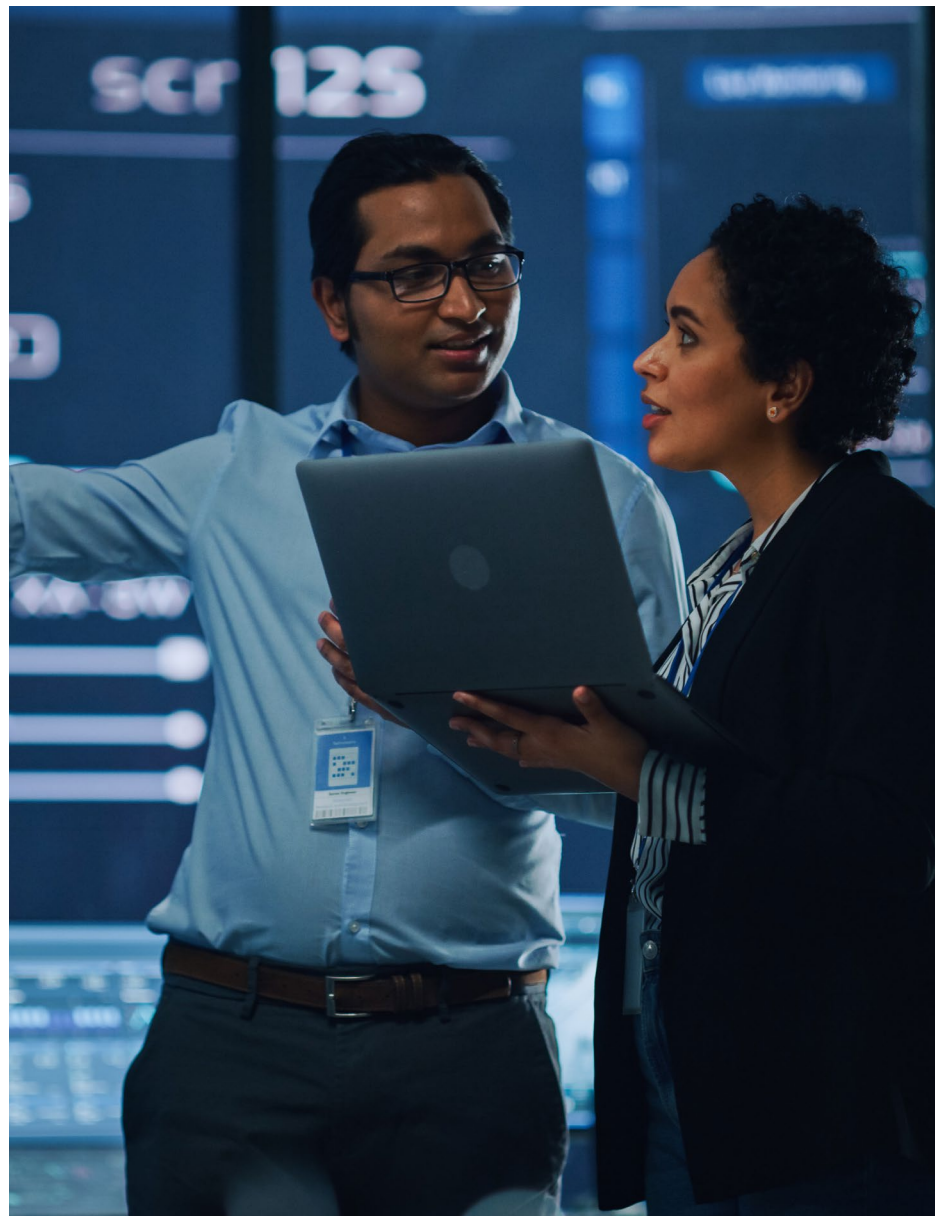
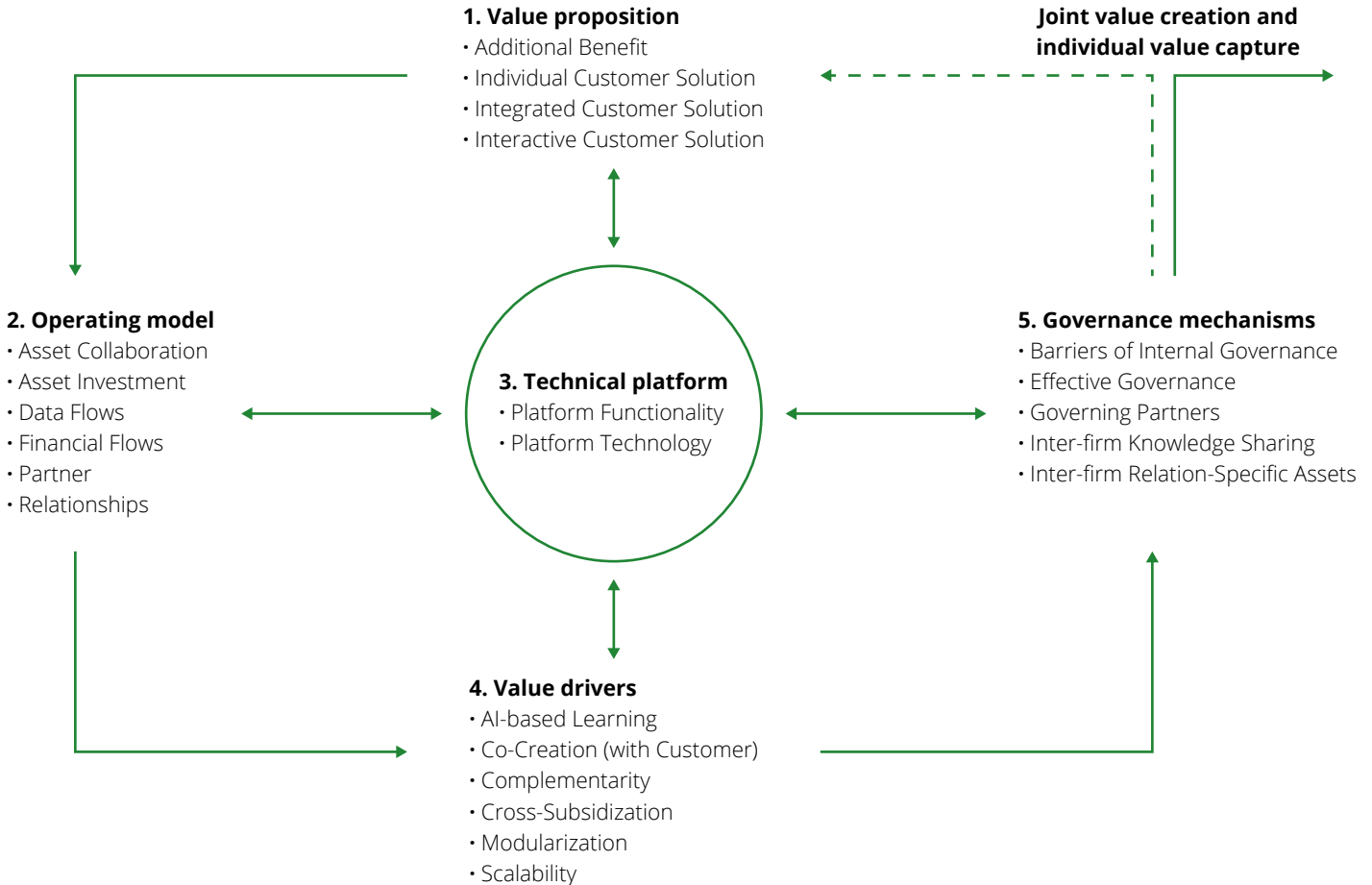# 2. An NLP examination as a database for a reset

Due to the organizational structure of MaaS and the scarce information available, an analysis of the status quo was conducted by employing an AI-based methodology with data sourced from news and blogs, supplemented by annual reports of existing players and analyst reports covering the industry. This provided a broad picture of which providers are more active, which cities appear to have the most advanced ecosystems (based on the methodology presented below), and most importantly, what the likely differentiators

are when it comes to successful ecosystems. This analysis served as the basis for the key takeaways outlined at the end of this report.

The methodological approach was designed and implemented between February 2023 and April 2024 within a collaboration project involving Deloitte Germany, Deloitte Portugal, the Chair of International Automotive Management at the University of Duisburg-Essen (UDE) and the LocosLab GmbH. To evaluate the status quo and development

of MaaS ecosystems, a conceptual model of ecosystems design was utilized (Jaspers et al., 2023; Kraus et al., 2023 and Jeppe et al. forthcoming, Figure 4). In extension of the theory of biform games in ecosystems (Brandenburger & Stuart, 2007), five key constructs were employed: 1. the focal and overarching value proposition, 2. the operating model, 3. the technical platform, 4. the value drivers and 5. the governance mechanisms. A total of 23 variables to capture ecosystem-building activities were considered.

Fig. 4 – Conceptional model to build up an ecosystem with the analyzed key constructs and variables

1. Value proposition
· Additional Benefit
· Individual Customer Solution
· Integrated Customer Solution
· Interactive Customer Solution

Joint value creation and individual value capture

2. Operating model
· Asset Collaboration
· Asset Investment
· Data Flows
· Financial Flows
· Partner
· Relationships

3. Technical platform
· Platform Functionality
· Platform Technology

5. Governance mechanisms
· Barriers of Internal Governance
· Effective Governance
· Governing Partners
· Inter-firm Knowledge Sharing
· Inter-firm Relation-Specific Assets

4. Value drivers
· AI-based Learning
· Co-Creation (with Customer)
· Complementarity
· Cross-Subsidization
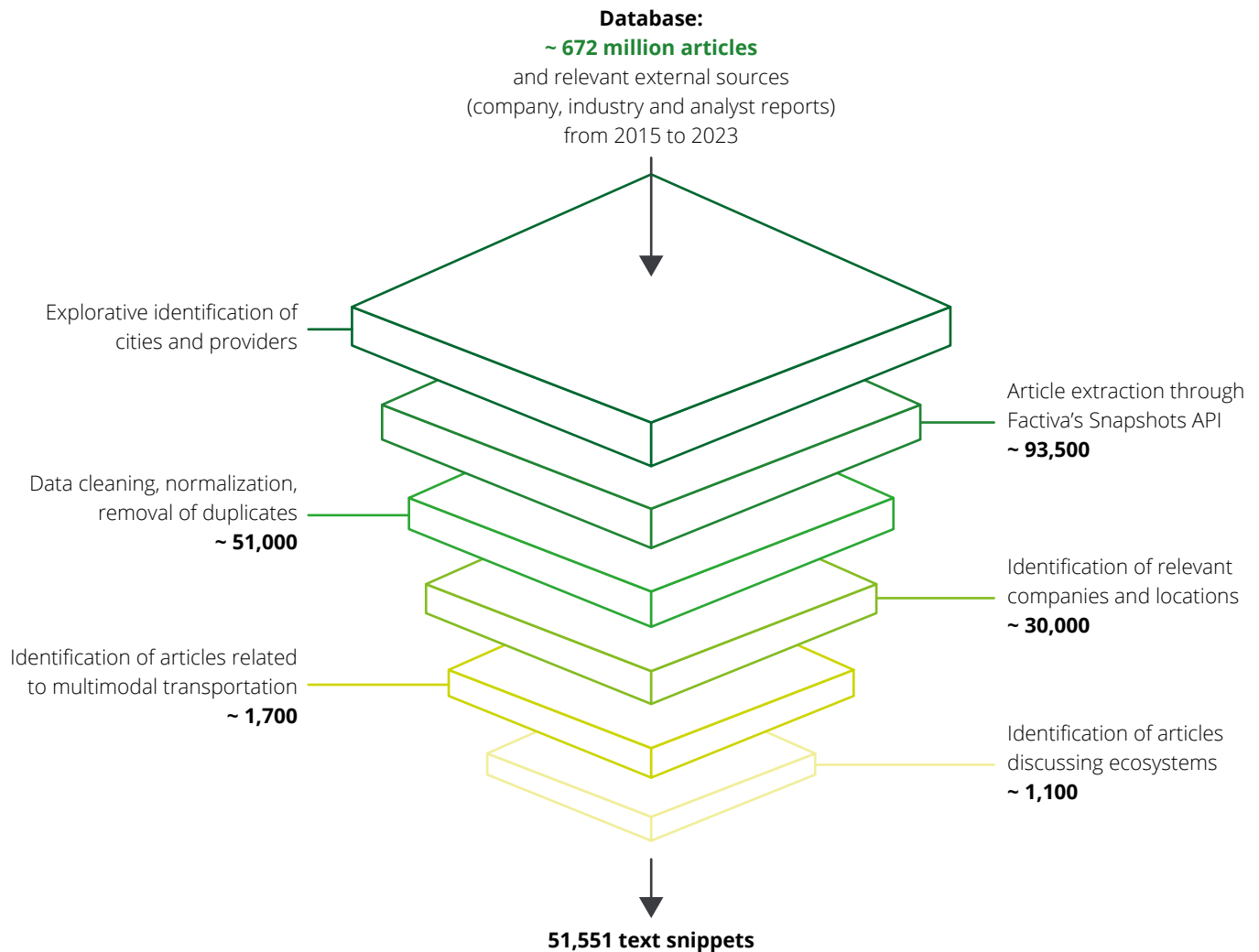· Modularization
· Scalability

Source: Deloitte & University of Duisburg-Essen MaaS Index 2024 (Own design based on Kraus et al., 2023).

Then, the tool accessed a global news database as well as annual and analyst reports and scanned for eligible datapoints. Out of 672 million relevant articles identified, we conducted several filtering steps and selected a total of 51,551 fitting text snippets (see Figure 5). From this selection we reviewed the number of mentions and the discussion of the selected key constructs and variables for ecosys-tems and considered the period from 2015 to 2023. This period was selected, as the concept of MaaS was only articulated in 2014 (Hietanen, 2014) and 2023 was the last available full data year. We focused on English and German sources, as these were the only languages we could validate, knowing this may lead to a certain bias in the results across regions.

Fig. 5 – Methodology for the data gathering process

Database:
~ 672 million articles
and relevant external sources
(company, industry and analyst reports)
from 2015 to 2023

Explorative identification of
cities and providers

Article extraction through
Factiva's Snapshots API
~ 93,500

Data cleaning, normalization,
removal of duplicates
~ 51,000

Identification of relevant
companies and locations
~ 30,000

Identification of articles related
to multimodal transportation
~ 1,700

Identification of articles
discussing ecosystems
~ 1,100

51,551 text snippets

Source: Deloitte & University of Duisburg-Essen MaaS Index 2024

To extract the key constructs and variables from the articles, we applied an iterative process using a customized NLP pipeline, leveraging state-of-the-art AI models. Starting with a credible large language model (LLM), we defined a series of entailments and applied natural language inference (NLI) at the sentence and paragraph level to classify the article contents and to identify the occurrences of the variables that allow us to infer the presence of key constructs. To achieve precision and recall, the pipeline was defined and repeatedly optimized by LocosLab GmbH in collaboration with the domain specialists from Deloitte and UDE. During the iterative refinement process, the domain specialists manually validated more than 250 documents and identified a broad spectrum of positive and negative instances from all variables. These variables were then used to fine-tune the NLI parameters, and the underlying Artificial Neural Networks until the NLP pipeline delivered the required performance. Figure 6 shows the methodological steps in the analysis of the selected MaaS data leading to the Index and the starting points for resetting MaaS (Proff et. al., 2025 and Jeppe et al. forthcoming).

The mentions could then be allocated to MaaS activities in the global marketplace, identified as a combination of a MaaS orchestrator – which integrates different transport modes in a seamless MaaS solution – and the city mentioned in the respective datapoint. This allowed the analysis of the high-impact practices of specific city-provider combinations, and the identification of trends. We carried out validation interviews of the results with MaaS managers out of the analyzed cities to find out if the results obtained were in line with their experience and got positive feedback for our results (Proff et al., 2025 and Jeppe et al., forthcoming).

Fig. 6 – AI-based process to identify patterns in the data gathered
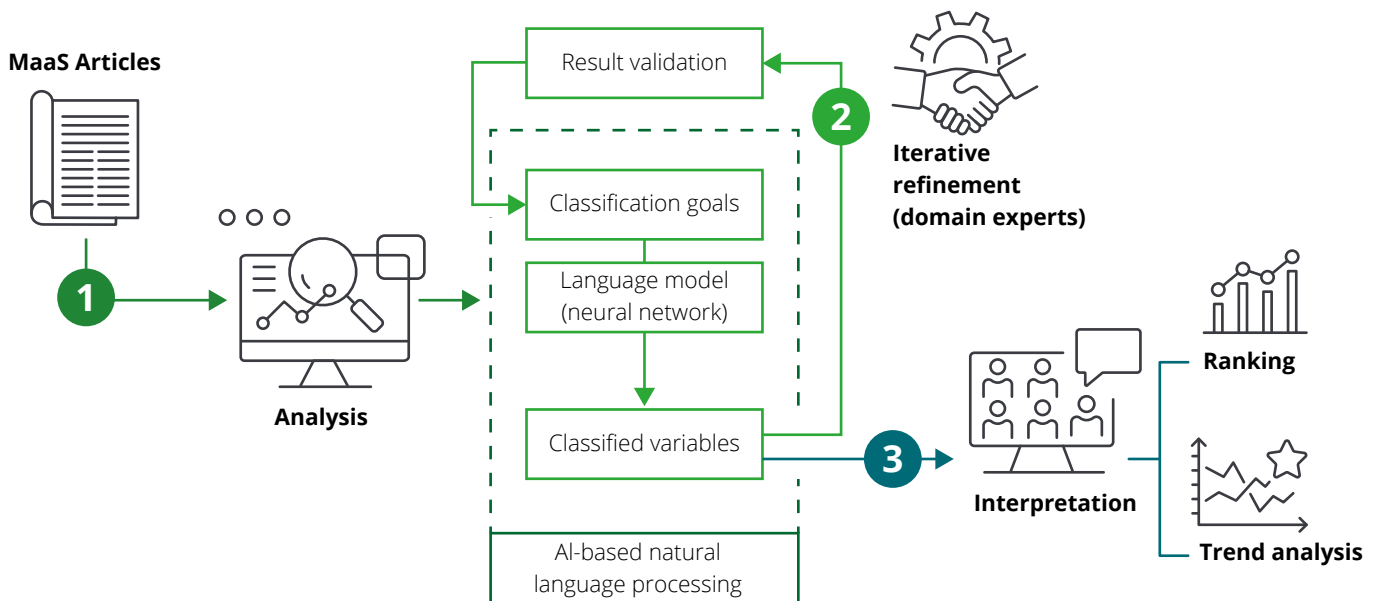
Source: Deloitte & University of Duisburg-Essen MaaS Index 2024

3. The MaaS index

Our work led to the creation of an integral measure to explain the development of activities to build MaaS ecosystems, by combining three different scores in a two-dimensional grid. Based on the data collected – mentions concerning MaaS ecosystems – we developed the following measures:

1. External (hype) dimension
An external view on the fundamental interest (or hype) around the MaaS topic and offerings. For this score, all mentions of the 23 variables of all five key constructs were combined and summed up over the years. This way, we can see how the general interest for MaaS has evolved and where the popularity or "hype" around the topic was the highest or lowest since the beginnings around 2015 (see Figure 7).

2. Internal (ecosystem build-up) dimension, combining
a. Strategic-operational balance score
To build this indicator, we first separated the five key constructs into two categories: the strategic activities (value drivers/governance/value proposition) and the operational activities (operating model and technical platform). We then created a ratio following the premise that during the evolution of ecosystems toward a viable business solution, the variables focused on business-generation (strategic) should have a priority and more weight over the enabling variables (operational).

b. Speed of implementation Score
Finally, our last score deals with those variables of the key constructs value drivers and governance mechanisms, which, according to recent empirical studies of ecosystems (Jeppe, Proff forthcoming, Proff et al., 2025) have a rapid impact on joint value creation (relation-specific assets, cross-subsidies, and complementarity) and divides them by the variables deemed as slow time to impact jointly created value (modularity, value co-creation, scalability, AI-based learning, effective governance and knowledge-sharing routines) in transaction ecosystems. Following the same logic as the second score, when moving toward a viable and mature business solution, quick optimization factors are more strongly used than slower ones.

The internal dimension is built as an average of both internal scores, analyzing the usage of individual indicators relative to each other regarding the internal state of MaaS-related activities. While the external dimension gives an overview about the overall popularity of the concept in the media, the internal dimension focuses on structural shifts toward more and quicker business-building and optimizing activities. Both dimensions are based on the results of analysis of leading practices in ecosystem design in academic literature as well as results from expert interviews conducted by Deloitte. Figure 7 shows the aggregated results (with all values normalized to 100 in 2015).

Fig. 7 – MaaS index development over time (2015–2023)
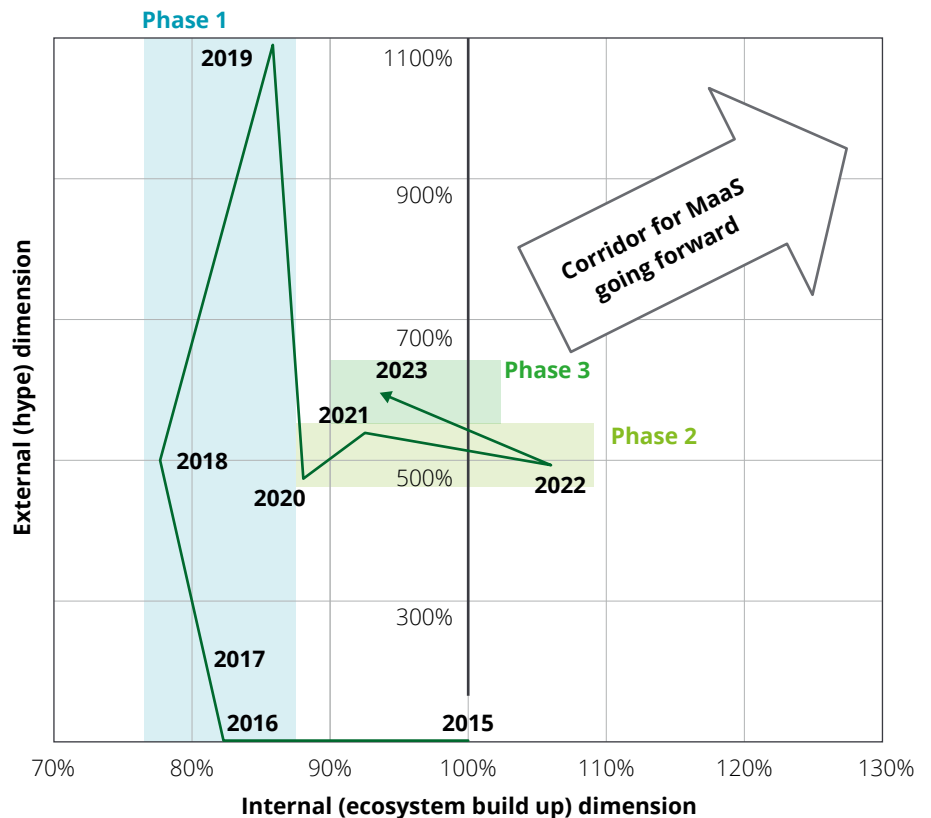
Source: Deloitte & University of Duisburg-Essen MaaS Index 2024

As can be observed above, over the last eight years, MaaS activities have come almost to a stagnation on the internal side and have experienced a hype and de-hype curve on the external side. Thus, no major progress can be observed between 2015 and 2023. This strongly suggests a reset on how we approach these ecosystems. Looking into more detail we can distinguish three phases:

Phase 1: 2015–2019
This phase shows a clear growing interest in the MaaS concept over the years with a strong hype (interest spike) in 2019, before the start of the COVID-19 pandemic. This can be explained as the concept started to gain traction with more and bigger players entering the market and establishing the first ecosystems at scale. But during this time, there is no advancement in the internal dimension, but rather an initial regression in 2016 and a stagnation afterwards until 2019. The increasing interest and number of offerings did not translate into more mature ecosystems or an improvement in buildup and optimization activities.

Phase 2: 2020–2022
The second period shows a decline in external hype – or a de-hype as the mobility sector worldwide experienced a shakeup due to the pandemic and following geopolitical challenges. Experts asked at the Smart City Expo World Congress in Barcelona 2022 and 2023 also suspect the end of a MaaS hype cycle. The demand for mobility, and therefore the interest for the topic, declined during this period, and MaaS ecosystems received a more pragmatical look. Buildup activities from the internal dimension started a relative recovery driven by the speed of implementation score. This can be attributed to an observed phase of consolidation were players opted to combine forces to survive in a difficult market with scarce profitability. This situation required MaaS ecosystems to react quicker and thus, the speed of implementation (third score) rose.
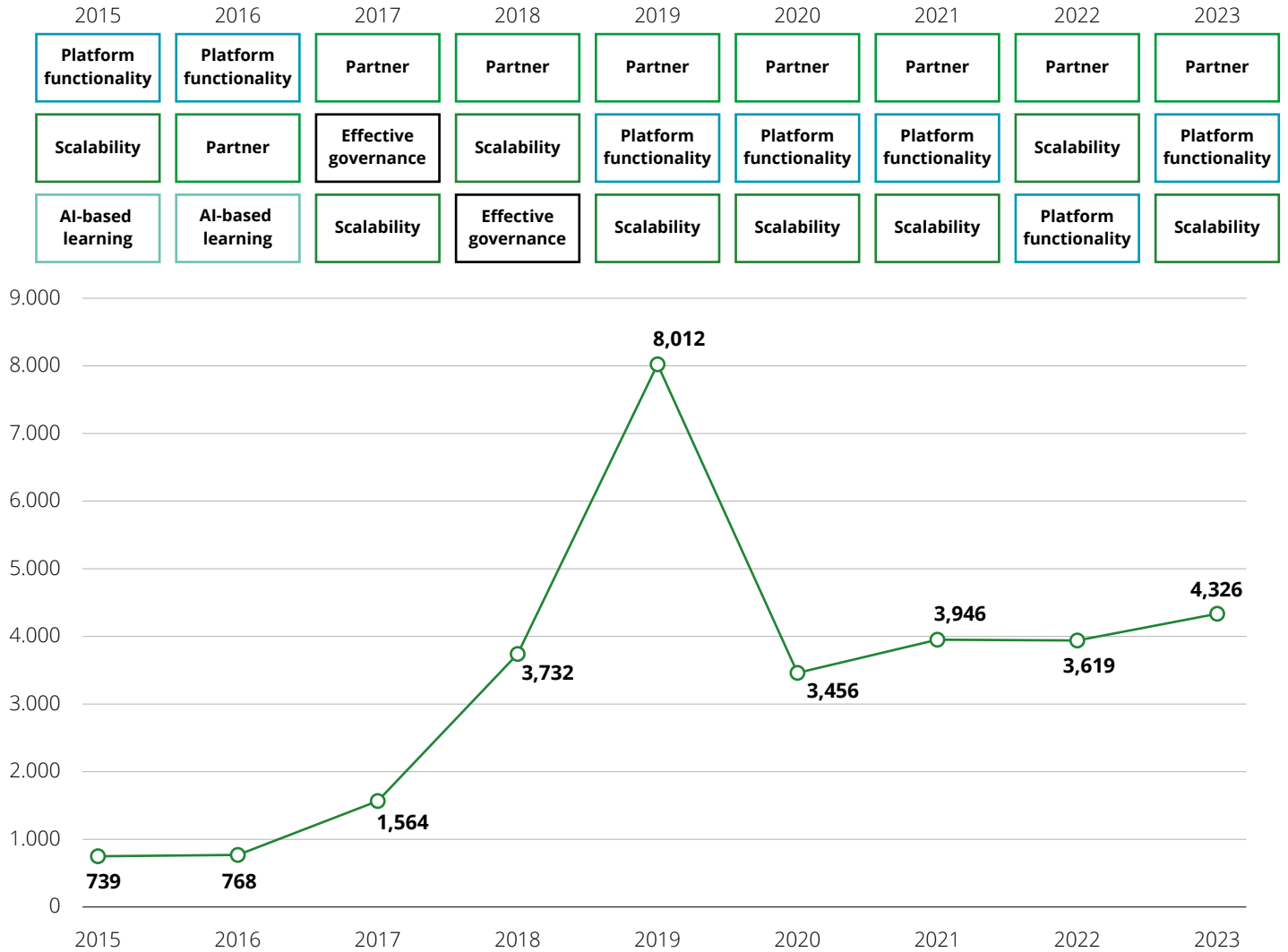
Phase 3: 2023–today
Thanks to new technology developments, advancements in sectors like AI, smart cities and autonomous driving, and the environmental imperatives, the external interest on MaaS is going up again. But this positive trend on the external dimension is contrary to the decline from the internal scores. Even after a consolidation phase, remaining players have still not been able to establish ecosystems mature enough to endure shifting demand and achieve sustainable profitability. It is still to be seen if the future will bring a more stable movement from our index in the right direction, the desired corridor for MaaS going forward. This corridor combines positive external and internal development (see Figure 7).

A reset can help steer ecosystems toward this corridor: In the direction of increased general external interest – relating to both political and consumer interest – but also aiming at improving the internal measures toward the build-up of viable, mature ecosystems. This is the direction that players need to strive for.

There are certainly many additional factors that play a role here. For example, a comparison over the life span of MaaS or regional differences that would be beyond the scope of this report. However, in general the differences between "good" and "average", between European and Asian MaaS ecosystems, or the differences over the life cycle of a MaaS ecosystem are astonishingly small. In Figure 8, the top three variables by mentions (out of the 23 variables used) over time are displayed. They show surprisingly small changes in the analyzed timeframe although implementation did not take place as hoped and new MaaS offerings came on the market along the years: Platform functionality, partners and scalability are among the most frequently mentioned variables almost every year, while effective governance and AI-based learning were also important only twice each at the beginning of the MaaS journey when the hope for large dataflows was still there.

Fig. 8 – MaaS lifecycle analysis – Top three ranking variables by absolute number of mentions per year

2015	2016	2017	2018	2019	2020	2021	2022	2023
Platform functionality	Platform functionality	Partner	Partner	Partner	Partner	Partner	Partner	Partner
Scalability	Partner	Effective governance	Scalability	Platform functionality	Platform functionality	Platform functionality	Scalability	Platform functionality
AI-based learning	AI-based learning	Scalability	Effective governance	Scalability	Scalability	Scalability	Platform functionality	Scalability

Chart — Absolute number of mentions per year:

- 2015: 739
- 2016: 768
- 2017: 1,564
- 2018: 3,732
- 2019: 8,012
- 2020: 3,456
- 2021: 3,946
- 2022: 3,619
- 2023: 4,326

Source: Deloitte & University of Duisburg-Essen MaaS Index 2024

There is currently a high level of global agreement on the essential variables of a (MaaS) ecosystem – the same approaches are being used everywhere. Approaches that seem to have reached stagnation and now need to be changed, if the goal of organizing a viable MaaS offerings are to be achieved.

4. How to reset MaaS ecosystems

There is no single strategy to reset the MaaS ecosystems; it is a complex matter that requires entrepreneurial spirit to move from a somewhat boring, rational approach to an emotional customer experience that makes customers dream. For this, we derive certain strategic courses of action that different industry players can follow that may help successfully reset the MaaS concept and increase revenues along the way.

Based on the results presented, we have outlined a strategic corridor for a reboot, essentially by increasing both the internal and external dimensions of the index presented and moving to the upper right corner of Figure 7. The vague buzzword MaaS needs to be filled with real, implementable solutions. This requires a significant change in the way we approach the mobility ecosystem. The existing broker model does not appear to be sufficient to drive

the necessary value creation for operational profitability and to change consumer behavior. Based on the NLP analysis, validation interviews and additional expert discussions at the Barcelona Smart City World Congress in 2022 and 2023, we have identified three key directions that both public and private actors should consider as they move forward.

1. Boost presence beyond an app.
MaaS providers should go beyond mere app presence to change the habitual mobility behavior of potential users, where there is a significant gap between stated attitudes (especially toward sustainability and private car ownership) and actual behavior, which is often driven by convenience or habit. An effective presence through different forms of promotional material in the different modes of transport, urban media and customer acquisition channels is crucial to drive this

behavioral change. A much bigger push is needed than just another app. Bigger than an app also means more than the typical broker model (Wong & Hensher, 2021), where the value created is far too small to generate attractive economic prospects for private investors. As profits are part of the value creation, this value creation needs to be extended by a greater involvement in the mobility space, including the (at least partial) management of the mobility assets, to cover most elements of the MaaS operating model shown in Figure 3 and not just a thin layer. This will require a reset in the existing MaaS setup, but the results of our index indicate that continuing in the traditional way is not sufficient to meet the existing demand given the environmental urgency. Analysis indicates this change would simultaneously increase the overall interest in MaaS and increase the external and internal dimensions of our index.

2. Include the commercial sector and personalized services.

Most successful ecosystems focus on scaling the traffic on their platforms – many of the existing MaaS ecosystems are still large pilot applications with very limited scale. To overcome this, there is a need to diversify the potential sources of additional traffic for the core value proposition (mobility) and to add features that generate user interest and excitement. As platform traffic is a critical success factor in the MaaS ecosystem, it is also important to focus on the commercial sector and offer mobility budgets to corporate customers. Corporate mobility is increasingly under scrutiny for CO_2 reporting and is a key feature for attracting new and especially younger talent to an organization (Institute of Sustainability Studies, 2024). The commercial sector is therefore looking for solutions that can generate a large amount of additional traffic on the platforms in a short period of time. Additional interest in the MaaS solution and subsequent additional revenue streams may be created through personalized services. In Europe and Asia, there are many countries with ageing societies with individuals (UNECE, 2023) who could have a strong willingness to pay for individualized mobility, but also for combined event and mobility tickets, individualized food delivery or critical information such as weather, available parking, etc.

Private customers should be offered a simple and efficient but holistic mobility experience that can be complemented by other services. Both approaches (commercial sector and personalized services) could increase the external and internal dimensions of the index.

3. Enhance public-private partnerships.

Increased value creation by MaaS providers requires stronger public-private partnerships (PPPs), as the public sector plays a key role in regulating urban mobility and data governance. Building trust, power and transparency between stakeholders is essential for effective collaboration, which is what the 'relationship-specific assets' variable, which drives the score in the internal dimension of the MaaS index, is about. But for such partnerships to work, a robust governance framework is likely also required. There are several ways to do this, two of the most discussed being road pricing regulation to shift profitability from private to MaaS mobility, and data transfer regulation to facilitate data sharing. Even if we assume a (redefined) cooperation between MaaS and private mobility, it is obvious that some profit shift from private mobility to MaaS is needed. This is, of course, a difficult social challenge, as the total mobility that an individual wants to have must remain within reach of the entire population. Otherwise, city centres that may only be populated by one age or income group in the evening could become boring or even empty. There is a lot of experience with road pricing and other profit shifting instruments that should be reviewed to create economic value within the MaaS ecosystem that could be invested, for example, in the personalized solutions. This kind of regulation can be led by the public sector, but needs the input of the private sector, best in a new format of PPP. In addition to profit shifting, data transfer rules are also crucial. The entire operating model in Figure 3 assumes free data flows between partners in a

MaaS ecosystem. However, this is not the case today, given the complexity of data regulations. These rules go beyond the scope of individual cities and are defined at national, if not supranational, level. But exactly these national and supranational levels are defining environmental targets and roadmaps and need to deal with the barriers to implement these changes.

Besides regulation, new forms of public-private initiatives to get MaaS implemented, financed, managed via special purpose vehicles should be further elaborated. This would take the selection and management of partners within the operating model, the most frequently mentioned variable of MaaS ecosystems between 2015 and 2023, to a completely new level and expand its content.

Outlook

MaaS will not be the only form of urban transport in the future, but it addresses key customer demands for flexibility and smart mobility, suggesting that a multimodal solution may be the most optimal approach. Owning or subscribing to a private car could gain traction but will be complemented by other forms of mobility to varying degrees in different regions and countries. As a result, car companies should shift their focus from simply selling more cars and traditional (financial) services to maximizing the value of fewer vehicles over longer lifecycles through innovative services such as over-the-air updates.

The urgency of resetting MaaS ecosystems cannot be overstated. By addressing the challenges identified, stakeholders can drive the successful adoption of MaaS solutions that are critical to achieving environmental goals and ensuring vibrant, mobile urban spaces. This transition to MaaS will require robust PPP, innovative financing models and a relentless focus on user engagement. The integration of commercial and personalized services will catalyze the necessary scale for profitability, enabling both public and private entities to work together to build a sustainable and user-centric urban mobility future.

By pioneering these changes, industry players and policymakers can unlock the full potential of MaaS and pave the way for a more efficient and environmentally responsible mobility ecosystem.
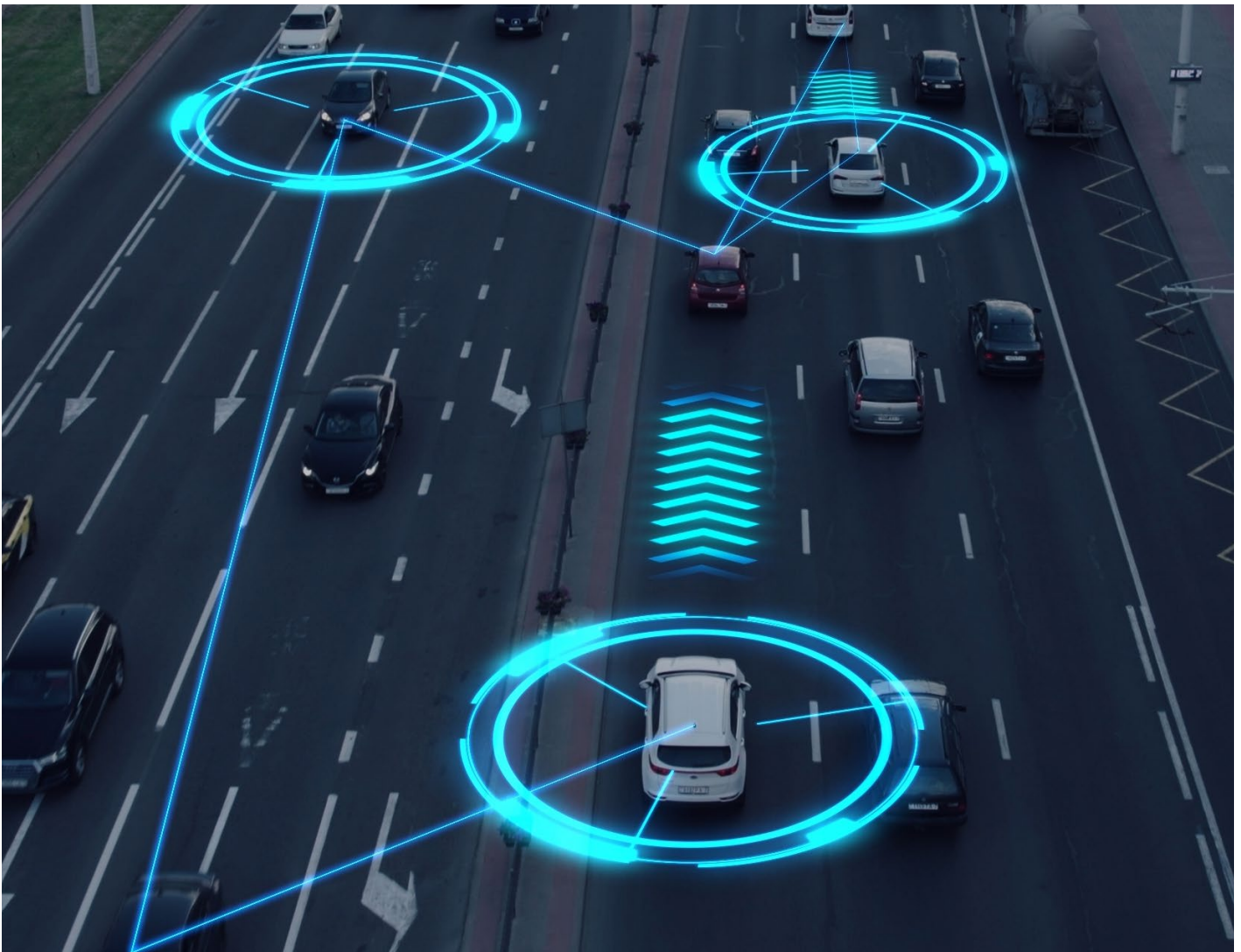
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