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MaaSolutions

FOUNDATION STUDY

— *for the selection of domestic MaaS good practices in the MaaSolutions project*

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Introduction

The concept of Mobility as a Service (MaaS) is a key element in transforming urban and regional transport. Its fundamental aim is to ensure that travel is no longer tied to individual vehicle-based services, but becomes a complex, integrated travel experience. MaaS represents a digitally supported mobility ecosystem that unites different modes of transport—such as public transport, micromobility services (bike-, scooter-, and car-sharing), taxi, and parking services—within a single, user-centred platform.

A well-functioning MaaS system enables passengers to plan, book, and pay for their journey in one place, regardless of the modes of transport they use. The objective is therefore not merely the development of infrastructure or vehicles, but the transformation of travel itself into a complex, personalised, and sustainable service.

This foundational study was prepared within the framework of the MaaSolutions project, as part of the professional tasks specified in the service contract. The study aims to select and present two domestic good practices by 31 October 2025, based on the Interreg Europe Good Practice template, which most closely reflect the MaaS approach under Hungarian conditions.

Since a fully developed MaaS system covering all levels of integration does not yet exist in Hungary, the research is not a comparison of complete, mature solutions, but rather an assessment of development directions and MaaS maturity levels. The objective is to use the analysis to justify, both professionally and methodologically, the selection of the two Hungarian examples that best reflect the core principles of MaaS and have the most significant potential to be further developed into integrated mobility systems.

The methodology applied in the study is based on a maturity-level comparison, evaluating the development stage of Hungarian cities and systems along technological, institutional, service-related, payment, and sustainability dimensions. This enables the identification of subsystems, development paths, and existing examples which, while not yet complete MaaS solutions, already implement innovations that point toward MaaS principles.

Thus, the foundational study serves not only to describe the current situation, but also to support future development: it aims to contribute to defining the strategic directions of MaaS initiatives in Hungary and to support the presentation and justification of the two selected good practices as potential “pilot” or “benchmark” models within the project.

1. MaaS Maturity Analysis

1.1 Level 4–5 MaaS Model

A fully mature, Level 4–5 MaaS model achieves not only technological integration but also institutional, legal, financial, and social integration, creating a unified and coherent system. While the lower maturity levels focus primarily on information or ticketing integration between individual transport modes, the most advanced models operate the entire mobility ecosystem as a single service.

In such systems, the user can plan their journey dynamically through a single interface, access the full range of mobility options, choose the optimal route, and pay for all services in a single integrated payment—even via subscription-based mobility packages.
Based on international literature (Jittrapirom et al., 2017; Hietanen, 2019; Fehér et al., 2020), mature Level 4–5 MaaS systems are characterised by the following key features:

- **Technological integration**

Real-time, interoperable data exchange among service providers (public transport, micromobility, car-sharing, parking, etc.) through a unified digital platform.
Different systems communicate with each other via APIs using standardised data formats.

- **Service and ticketing integration**

The user accesses the complete mobility offer through a single application and can purchase combined tickets or travel packages in a single transaction.
The platform can dynamically manage time-based, zone-based, or distance-based pricing structures.

- **Institutional and legal coordination**

Transparent allocation of roles and responsibilities exists between the various operators and authorities, supported by an established data-sharing framework.
Regulation enables integrated ticketing, shared data access, and collaborative business models.

- **Financial and business integration**

The platform manages clearing, revenue sharing, and fare coordination across multiple service providers.
Subscription-based mobility packages ("mobility bundles") may be available to users, while providers can optimise utilisation through dynamic pricing mechanisms.

- **Social and user integration**

The system responds to real mobility needs: it offers personalised recommendations, considers user preferences, and supports inclusive and accessible mobility (e.g., for disadvantaged groups, seniors, or tourists).
Through data-driven feedback, the platform also enables flexible adjustment of mobility policies.
In summary, a mature MaaS model is not just a digital mobility application but a collaborative, data-driven, and socially embedded mobility system in which public- and private-sector actors jointly create the new paradigm of "travel as a service."

1. Table: Dimensions of the Ideal MaaS Model

Dimensions	Main caractheristics	Examples / Notes
1. Technological integration	• **Unified digital platform** (app or web interface) where all mobility modes are accessible. • **Real-time data integration** among all service providers. • **Multimodal route planning** (suggesting combined transport modes).	The user can plan, book, pay, and provide ratings all within a single application.
2. Service integration	• - **All mobility modes** (public transport, car/bike/e-scooter sharing, taxi, parking) are available on a single interface.	The user purchases a "mobility package" rather than individual tickets.

	• **Options for combined or dynamic tickets and packages** (e.g., monthly mobility subscription).	
3. Ticketing integration	**A single payment system** is used for all services. • **Centralised or automated settlement** between service providers (revenue sharing). • **Possibility for dynamic pricing and discounts.**	A smooth and transparent revenue-sharing mechanism operates in the background.
4. Institutional and legal icoordination	• **Clearly designated "MaaS integrator"** organisation. • **Standardised data sharing** (API, open data). • **Common regulatory framework** for service providers. • **Cooperation between municipalities and market actors.**	The integrator may be a public entity (e.g., a municipal transport authority) or a private company.
5. Social and user integration	• **Simple, intuitive interface.** • **Full accessibility** (barrier-free design, multilingual support). • **Personalised recommendations, gamification, loyalty programmes.**.	The system provides a "one-stop shop" experience..
6. SDG integration	• **Environmental, social, and economic goals** are integrated into the operation. • The system **encourages low-emission modes** (walking, cycling, public transport). • **Data-driven urban mobility planning.**	MaaS is not only a service but also a tool of sustainable urban mobility policy..
7. Spatial and social inclusivity	• It is accessible not only for inner-city users, but also for suburban and disadvantaged groups. • Both **digital and physical access** are ensured.	Inclusive MaaS reduces transport exclusion.

Table 2 presents international examples of "fully functioning" Mobility as a Service (MaaS) systems that offer guidance for developing sustainable, integrated urban Mobility. The featured cities—Helsinki, Vienna, and Singapore—have implemented the principles of MaaS through different organisational and technological approaches. However, they all share key characteristics: an integrated mobility platform, user-centred design, and data-driven operation.

Helsinki (Whim) is one of the world's first fully operational, subscription-based MaaS systems, where multiple modes of transport—from public transport to taxis, car- and bike-sharing—are accessible through a single application (Jittrapirom et al., 2017).

Vienna's example (Smile → WienMobil) is built on strong municipal involvement, creating a multimodal mobility ecosystem that integrates public transport, micromobility, and taxi services (Kamargianni & Matyas, 2017).

Singapore (Beeline, SimplyGo) serves as a model for state-led regulation and data-driven mobility planning: platforms such as Beeline and SimplyGo effectively coordinate urban transport through dynamic fare systems and a centralised mobility data platform (Ho et al., 2018; Wong et al., 2020).

These examples demonstrate that the key to successful MaaS implementation lies in close cooperation among mobility providers, transparent data sharing, and the strengthening of user experience and trust—regardless of whether the public or private sector drives the model.

Table 2: International Best Practices — MaaS Systems Operating at Levels 3–4

City	Modell	Key caractheristic
Helsinki (Whim)	Fully operational, subscription-based MaaS	**One application – multiple transport modes – integrated billing**
Bécs (Smile → WienMobil)	A multimodal application operating with municipal integration	Integration of public transport, micromobility, and taxi services
Szingapúr (Beeline, SimplyGo)	Strong state regulation and data-driven service	Central MaaS data platform, dynamic tariff system

1.2 Level 1–3 MaaS Models

Level 1–3 MaaS models are typically not integrated mobility systems; instead, they operate as standalone digital services linked to individual modes of transport.

Although some aspects of the MaaS concept already appear in these solutions—such as online ticket purchasing, journey planning, or real-time passenger information—the services are still not connected to other transport modes, neither technologically nor organisationally.

Hungarian examples clearly reflect this level of maturity: in several cities and regions, digitally supported systems have been developed around a single mode of transport, for example:

- in public transport, e-ticket and mobile app–based solutions,
- in micromobility, bicycle- and scooter-sharing services,
- In urban parking, digital payment platforms,
- in car-sharing, user applications and fleet-management systems.

These developments are high-quality and forward-looking from a digitalisation perspective, yet neither ticketing, data integration, nor a unified user interface exists between them.

In other words, current Hungarian examples are vertically advanced but horizontally non-integrated—meaning that within each transport mode complex services operate, but there is no interoperability between modes.

The MaaS maturity levels illustrate how the transport system progresses from fragmented services toward an integrated, self-sustaining mobility ecosystem (Sochor et al., 2018; UITP, 2022).

Entry-level solutions—such as BudapestGO—primarily rely on information integration. In contrast, more advanced systems, such as Helsinki's Whim or Vienna's WienMobil, already offer subscription-based models that unite multiple service providers.

At the highest maturity level, as demonstrated by Singapore or Helsinki, complete technological, institutional, and regulatory integration enables the creation of a complete and sustainable MaaS ecosystem.

Table 3: Levels of MaaS Maturity with Examples

Level	Description	Key caractheristics	Examples / Notes
Level 0 – Fragmented System	Completely fragmented, independent transport services.	No data integration, no shared platform, and no cooperation.	Traditional transport model; separate applications for each service provider.
Level 1 – Information Integration	Passengers can already access timetable and traffic information from multiple providers through a single interface..	Integrated journey planning, real-time passenger information, integrated information layer.	BudapestGO (journey planning and real-time data), Google Maps Transit, IDŐKÉP transport module.
Level 2 – Booking and Payment Integration	The application already allows the simultaneous purchase and payment of tickets from multiple providers.	Combined tickets, e-payment, mobile ticketing, basic fare coordination.	BudapestGO – purchase of public transport tickets and passes; partial integration of BKK, MÁV, and Volán.
Level 3 – Service Integration	Multiple mobility services operate together within a single platform in the application.	Combined packages, subscriptions ("mobility bundles"), unified user experience.	Helsinki – Whim, Antwerpen – Smart Ways to Antwerp.
Level 4 – Policy and Institutional Integration	Cooperation between service providers and authorities has been established, with a shared regulatory and data-sharing framework.	Standardised API connections, unified data platform, coordinated governance.	Bécs – WienMobil, Szingapúr – SimplyGo / Beeline, Helsinki – Whim.
Level 5 – Fully Functioning, Self-Sustaining MaaS Ecosystem	All dimensions (technological, financial, institutional, and social) are integrated, and the system is self-sustaining and adaptive.	A sustainable, data-driven, commercially viable system that responds in real time to demand and environmental targets..	Singapore serves as a reference model; Helsinki and Vienna are progressing toward full implementation.

Table 3 illustrates how MaaS evolves from separate transport services to a fully integrated, self-sustaining system. At the lower levels (0–2), technological connectivity is the primary characteristic, while at the higher levels (3–5), institutional cooperation, financial integration, and user acceptance become the defining factors. **BudapestGO** is an example of Level 2: it enables digital ticket purchasing and payment, but it does not yet integrate micromobility or car-sharing systems. To progress further, real-time, standardised data connections (API-based data sharing) between service providers are needed, along with the development of the regulatory environment and the introduction of subscription-based mobility packages.

2. The Place of MaaS in the Smart City Framework

The smart city concept is built on six closely interconnected dimensions:

smart governance, smart economy, smart environment, smart people, smart living, and smart mobility (Lopez-Carreiro & Monzon, 2023).

Mobility as a Service (MaaS) is closely linked to the smart mobility dimension, yet its operations influence all six areas.

- In the field of smart governance, MaaS requires new regulatory, data-sharing, and governance models that support cooperation between the public and private sectors.
- In the smart economy dimension, it promotes innovation and the development of a service-based economy, creating new business models and entrepreneurial opportunities.

- From the perspective of smart environment, multimodal transport and data-driven journey planning contribute to reducing emissions and noise, as well as increasing energy efficiency.
- In the smart people and smart living dimensions, MaaS develops digital competencies, strengthens social inclusion, and improves quality of life by making mobility decisions easier and more informed.
- At the core of smart mobility are multimodality, network management, and sustainability, which are also the fundamental principles of MaaS.

Research (e.g., Lopez-Carreiro & Monzon, 2023) emphasises that MaaS is not merely a technological development, but an institutional and cultural transformation that requires active collaboration among the public sector, market actors, and citizens. Successful implementation, therefore, demands not only advanced digital infrastructure but also trust, data sharing, and coordinated governance.

3. Challenges and Requirements for Developing MaaS

The development of Mobility as a Service (MaaS) is a complex process that simultaneously involves technological, institutional, economic, social, and environmental challenges. Recent studies (Ho & Tirachini, 2024; Mátrai & Esztergár-Kiss, 2020; Tóth et al., 2022) highlight that creating successful MaaS systems requires multi-stakeholder cooperation, reliable data management, and a user-friendly service environment.

At the institutional level, the most significant challenge is coordinating and regulating data sharing among public and private actors. Trust and cooperation among transport operators, municipalities, technology companies, and regulatory authorities are essential prerequisites for an integrated system to function. In addition, developing sustainable business models is crucial, as MaaS can only be viable in the long term if it is economically self-sustaining.

From a technological perspective, establishing data integration and real-time information flow is indispensable for multimodal journey planning and dynamic traffic management. Cybersecurity and data protection also play a central role, as handling users' personal and location data is sensitive and directly affects trust in the service.

Among social factors, user trust and the development of digital competencies are key. The introduction of MaaS is not only a technological innovation but also a cultural shift: people must accept the transition from private car use to service-based mobility. Furthermore, accessibility must be ensured for all social groups so that MaaS can become a truly inclusive system.

From an economic standpoint, designing sustainable financing structures and revenue-sharing models poses a significant challenge. Defining pricing and commission mechanisms between different service providers is essential to make the system attractive for all actors.

Finally, the environmental dimension is one of MaaS's most important target areas: by reducing emissions and energy use and promoting active modes of transport (e.g., walking, cycling), MaaS contributes to sustainable urban mobility.

Overall, the success of MaaS development depends on whether technological innovations can be aligned with institutional flexibility, social acceptance, and environmental awareness (see Table 4).

Table 4: Key Challenges in Developing MaaS by Category

Category	Key Challenges / Requirement
Institutionali	Coordination among actors, regulation of data sharing, development of business models
Technologicali	Data integration, real-time information, data protection and cybersecurity
Social	User trust, accessibility, digital skills
Economic	Sustainable financing, pricing, revenue sharing
Environmentali	Reducing emissions and energy use, promoting active modes

4. The Budapest Pilot and National Experiences

The MaaS4EU project (2019–2021) was the first comprehensive Hungarian initiative aimed at the practical implementation of the Mobility as a Service (MaaS) concept in Budapest. The pilot programme was carried out in cooperation between the Centre for Budapest Transport (BKK), the Budapest University of Technology and Economics (BME), and T-Systems Hungary (Mátrai & Esztergár-Kiss, 2020).

The project aimed to test an integrated mobility system supported by a private MaaS operator, bringing together public transport services, shared bicycles (MOL Bubi), car-sharing (MOL Limo, GreenGo), and taxi services on a single digital platform. This system enabled users to plan, book, and pay for their journeys through a single application — corresponding to MaaS maturity levels 2–3 in the international literature.

From a technological perspective, the pilot proved successful: digital integration across different transport modes and real-time data exchange were achieved, demonstrating that the necessary technological infrastructure exists in Hungary as well. However, the programme also revealed numerous institutional, legal, and data management challenges. After the project ended, issues related to data access and data-sharing regulation, cooperation among service providers, and the lack of revenue-sharing mechanisms remained unresolved.

On the user side, research showed that the mobility habits and trust-related attitudes of the Hungarian public are not yet favourable for fully integrated, subscription-based mobility models. In Hungarian mobility culture, strong attachment to car use and individual freedom of choice persists, slowing the spread of service-based mobility.

Building on the experience gained from MaaS4EU, the BudapestGO application was developed under BKK's coordination, transforming the pilot's results into a functioning city-level platform. Through real-time passenger information, digital ticket purchasing, and the partial integration of micromobility services (MOL Bubi, car-sharing, taxi), BudapestGO represents a maturity level between MaaS 2 and 3.

Overall, the Budapest pilot and its further development, BudapestGO, served as an important learning process: they demonstrated that technological conditions are in place, but without stable regulatory frameworks, strong institutional cooperation, and enhanced user trust, a fully functional and self-sustaining MaaS system cannot be realised. The Hungarian experience underscores that successful MaaS implementation is not primarily a technological challenge, but an institutional and cultural one.

5. Comparison of Hungarian Cities in Terms of MaaS

In Hungarian cities, the concept of Mobility as a Service (MaaS) is currently in an early, fragmented stage of development. Although the idea increasingly appears in municipal strategies and innovative city programmes, a fully integrated, multimodal, one-stop mobility service model is not yet operational anywhere in the country.

Below, the national situation is analysed through four dimensions:

Conceptual alignment, institutional conditions, technological background, and business model.

5.1 MaaS Conceptual Alignment

The essence of a MaaS system is a platform that provides multimodal access, booking, and payment integration through a single interface (Hietanen, 2019; Sochor et al., 2018).

In Hungary, this level has so far been approached only in **Budapest**, within the MaaS4EU project (2019–2021), where BKK, BME, and T-Systems Hungary operated an integrated system as a pilot.

In regional cities, only partial components have been implemented — such as digital timetables, mobile tickets, and traffic information — but there is no unified platform or shared payment system.

Below is the overview of maturity levels across Hungarian cities:

- **Szeged (Level 1)**

The *Menetrend Szeged* application (menetrend.app) provides basic information (routes, stops, traffic updates), while ticket purchases are handled separately via the *National Mobile Ticket* platform.

- **Debrecen (Level 1–2)**

The *DKV Zrt.* The app provides real-time traffic data, journey planning, and supports mobile ticketing (dkv.hu).

- **Győr (Level 1)**

The *Győri Menetrend* app (menetrend.app) and *the MenetRendes* system include local bus routes, stops, and public bike data, but there is no integrated ticketing.

The *MenetRendes* strategy sets integration goals, yet a working MaaS platform is not available.

- **Pécs (Level 0–1)**

The *Pécsi Menetrend* (menetrend.app) offers informational services (routes, stops), but no digital integration or payment functionality.

- **Sopron (Level 1)**

The *Soproni Menetrend* and *Volán mobile ticket* systems (menetrend.app and MenetRendes) provide partial payment integration; the MaaS concept appears only at the strategic level.

- **Kaposvár (Level 1)**

The *IMCS – Integrated Mobility Hubs* system offers physical and informational integration, but lacks a digital platform.

- **Békéscsaba (Level 1)**

The *Menetrend.app* and *MÁV app* together provide partial information and payment integration, but do not form a unified MaaS system.

- **Veszprém (Level 1–2)**

The *V-BuszON+* application (vbusz.hu) offers real-time bus tracking, stop search, and mobile ticket purchase.

City tickets are also available via the *MÁV app* and at ticket machines (mavcsoport.hu).

Although information and payment integration are partially implemented, multimodal integration (bus–rail–public bike) is not yet operational.

5.2 Organisational and Institutional Conditions

Hungarian experience shows that designating a MaaS integrator is a key prerequisite for the system's operational viability. In Budapest, during the MaaS4EU pilot, the Centre for Budapest Transport (BKK) and its research consortium partners, the Budapest University of Technology and Economics (BME) and T-Systems Hungary, temporarily fulfilled this role. However, a permanent, city-level governance model has not yet been established (BKK, 2020; CORDIS, 2022).

In regional cities, the role of the integrator is typically either missing or informal.

- **In Szeged, Debrecen, and Győr**, local transport operators (e.g., SZKT Szegedi Közlekedési Társaság Zrt., DKV Zrt., Volánbusz Zrt.) partially fulfil the role of integrator. However, no formal cooperation framework — especially regarding data and revenue sharing — has yet been established.
- **In Pécs and Kaposvár**, mobility integration is included in strategic documents (e.g., climate strategies, "NetZero" or "Smart City" programmes), but there is currently no operational institutional cooperation.
- **In Sopron and Békéscsaba**, some coordination exists between local mobility management and national service providers, particularly regarding data and service-level cooperation. However, no designated MaaS integrator organisation is in place.
- **In Veszprém**, V-Busz Kft. is the primary transport operator and already runs its own application (V-BuszON+) and mobile ticketing system.
- However, MaaS-like integration has not yet been formalised at the institutional level, and no city- or region-level coordinating role has been established.

- – For example, since 1 October, V-Busz products have also become available for purchase through the MÁV START Zrt. Railway ticket vending machines and the MÁV app.

The lack of long-term data-sharing and revenue-sharing agreements remains one of the most significant obstacles to cooperation among service providers. This issue hinders the practical implementation of MaaS systems in virtually all regional cities, as there is no unified governance structure or stable financial foundation to support the operation of shared digital platforms.

5.3 Technological Conditions

In terms of technological integration, **Budapest is the most advanced**. Within the MaaS4EU pilot project (2019–2021), a prototype system was already operational that supported real-time data sharing, as well as booking and payment processes. Although it did not reach a whole citywide operational level, it was capable of coordinating the data exchange among several mobility providers — including BKK, MOL Bubi, MÁV, and various car-sharing operators (BKK, 2020; CORDIS, 2022).

The **BudapestGO** application, launched in 2022, is the most advanced Hungarian example of MaaS-related developments. However, it does not fully meet international MaaS technological criteria (Hietanen, 2019; Sochor et al., 2018).

The system provides real-time integration of information (vehicle tracking, traffic data, digital journey planning) and enables ticket and pass purchases through the National Mobile Ticket platform.

At the same time, **booking integration** (e.g. for car-sharing, public bike services, taxis) and **complete payment unification** are still missing, as service providers outside BKK use separate applications.

Thus, from a technological perspective, BudapestGO corresponds to **MaaS Level 2**: it offers partially integrated information and payment functions, but it is not a fully multimodal platform.

In regional cities, developments typically remain limited to **information integration**: timetable data, digital maps, and e-ticket systems are available, but there is no shared back-end capable of handling ticketing, clearing, and data exchange across multiple service providers.

In **Debrecen** and **Győr**, smart city developments — such as the *menetrend.app* system and the *GreenMob* module, which can calculate the environmental impact of trips (e.g. CO_2 emissions) — already include sustainability and data-management components, as well as real-time traffic information and journey planning. However, integrated booking and payment functions are still absent.

In **smaller cities** — such as Sopron, Békéscsaba, Kaposvár, and Veszprém — infrastructure development continues to dominate, while digital MaaS back-end systems have yet to be established.

- **Sopron**: the *Soproni Menetrend* and *Volán* mobile ticket service offer partial payment integration.

- **Békéscsaba**: *Menetrend.app* and the *MÁV app* can be used together, but there is no unified platform.
- **Kaposvár**: the *Integrated Mobility Hubs (IMCS)* system focuses on physical and informational integration, without a digital back-end.
- **Veszprém**: the *V-BuszON+* application provides real-time tracking, stop search, and mobile ticket purchase; tickets are also available via the MÁV app and ticket machines (MÁV Group, 2023). However, multimodal integration (bus–rail–public bike) and a shared data architecture have not yet been implemented.

5.4 Business Model and Pricing

In terms of MaaS business models and pricing structures, Budapest is currently the most advanced. Within the MaaS4EU pilot project, a subscription-based, package model was experimentally tested. This model aimed to provide access to various transport services (BKK, MOL Bubi, car-sharing) through a single platform under an integrated fare structure. However, the model was not introduced on a broader scale and thus remains in a research and prototype phase (BKK, 2020).

In regional cities, MaaS-related business models exist only at a conceptual level.

- In some cities — such as Szeged — options for usage-based or distance-based pricing structures have been discussed, but these remain at a planning stage.
- In Debrecen and Győr, smart city developments (e.g. GreenMob, menetrend.app) serve sustainability and data-sharing objectives, without a commercial or subscription model.
- In Sopron, Kaposvár, and Békéscsaba, mobility systems operate primarily through municipal or state funding, with pricing guided by public-service logic rather than market mechanisms.
- In Veszprém, the system is operated by V-Busz Kft. Integrates mobile ticket purchasing and sales through the MÁV app, but no standalone revenue-sharing-based business model has been established. Revenues are not distributed among service providers via a digital platform; instead, traditional settlement mechanisms are used (MÁV Group, 2023).

Thus, the business viability of MaaS in Hungary currently rests not on market conditions but on research-oriented or municipally funded project frameworks. Existing applications — such as BudapestGO, menetrend.app, or V-BuszON+ — primarily provide informational and technological services, rather than an integrated business ecosystem based on revenue sharing and risk sharing.

Comparing Hungarian cities, it can be concluded that while the MaaS concept has appeared at the theoretical level in urban policies and smart city strategies, practical implementation has occurred only in Budapest, in pilot form.

In regional cities, developments are currently focused on information services and infrastructure, with no unified governance, technological, or financial integration.

For further development of MaaS systems in Hungary, it is essential to create:

- a national regulatory and financing framework, and
- The designation of a central or regional MaaS integrator, capable of ensuring the long-term conditions for data sharing, revenue sharing, and coordinated service delivery.

Without such a framework, the business sustainability of MaaS systems cannot be achieved, and developments will remain experimental and project-based.

Table 5 summarises MaaS maturity levels, the key digital solutions, and short justifications.

Table 5: Comparison of Hungarian Cities by MaaS Maturity Level

City	MaaS-level	Rövid indoklás / jellemzés
Budapest	**Level 2–3.(pilot)**	Within the MaaS4EU project, booking–payment integration and multimodal data sharing (BKK, MOL Bubi, MÁV, car-sharing) were operated on a pilot basis. BudapestGO provides real-time data and digital ticket purchasing, but full booking and payment integration is still lacking.
Szeged	**Level 1.**	The Menetrend Szeged application provides basic information integration (routes, stops, traffic updates). Ticket purchasing is carried out separately through the National Mobile Ticket system; no payment integration is in place..
Debrecen	**Level 1–2.**	The DKV app offers real-time traffic data, multimodal route planning, and mobile ticket purchasing. The GreenMob module incorporates sustainability features (CO_2 calculation), but provider-level payment integration is missing.
Győr	**Level 1.**	The Győri Menetrend application includes data on local routes, stops, and bike-sharing stations. The MenetRendes strategy sets integration goals, but there is currently no functioning unified payment platform.
Pécs	**Level 0–1.**	The Pécsi Menetrend provides only informational services (routes, stops). No digital or payment integration is in place, and the application is functionally limited..
Sopron	**Level 1.**	The Soproni Menetrend and the Volán mobile ticket system provide partial payment integration. The MenetRendes concept appears at a strategic level, but no multimodal integration is in place.
Kaposvár	**Level 1.**	The development of the Integrated Mobility Hubs (IMCs) created physical and informational integration, but no digital (payment/booking) platform is in operation..
Békéscsaba	**Level 1.**	The Menetrend.app and the MÁV app together offer partial information and payment integration. A unified, multimodal system is not in place..
Veszprém	**Level 1–2.**	The V-BuszON+ application offers real-time vehicle tracking, stop search, and mobile ticket purchasing. Tickets are also available through the MÁV app and ticket machines (MÁV Group, 2023). Information and payment integration is only partial. megvalósult, de multimodális (busz–vasút–közbringa) integráció nincs.

Table 6 provides a summarised overview of the MaaS maturity level of Hungarian cities across the main evaluation dimensions — conceptual, institutional, technological, business, user-related, and sustainability aspects — using iconic markers (✅ ⚠ ❌) to indicate the level of progress, partial compliance, or lack of development.

Table 6: Icon-Based Evaluation of Hungarian Cities' Compliance with MaaS Maturity Levels

Criteriont	Budapest	Szeged	Debrecen	Győr	Pécs	Sopron	Kaposvár	Békéscsaba	Veszprém
Compliance with MaaS definition	⚠	⚠	⚠	⚠	✗	⚠	⚠	⚠	⚠
Institutional background	⚠	⚠	⚠	⚠	⚠	⚠	⚠	⚠	⚠
Technological integration	⚠	⚠	⚠	⚠	✗	⚠	⚠	⚠	⚠
Business modell	⚠	✗	✗	✗	✗	✗	✗	✗	✗
User side (app)	✓	⚠	✓	⚠	⚠	✓	⚠	⚠	✓
SDGs	✓	⚠	✓	⚠	⚠	⚠	✓	⚠	✓

Legend: ✓ = strong compliance / ⚠ = partial compliance / ✗ = not present

6. Interpretation and Recommendations

Among Hungarian cities, Budapest, Debrecen, and Veszprém have the most advanced practical experience in Mobility as a Service (MaaS).

All three demonstrate a commitment to digital integration, have supportive institutional foundations, and show signs of user-centred mobility planning. While Budapest remains the national benchmark in technological integration, Debrecen advances primarily in sustainability and data-management solutions, and Veszprém shows progress in information and payment integration.

6.1 Budapest – The National Benchmark

Through the MaaS4EU pilot project, Budapest has already demonstrated strong technological and service integration capabilities. The experimental system integrated public transport, car- and bike-sharing, and taxi services onto a single platform with real-time data exchange and experimental booking and payment functionalities.

Thus, Budapest has proven that data and payment integration are technologically feasible. However, the permanent business and regulatory frameworks — such as mechanisms for revenue sharing, data-sharing standards, and licensing procedures — remain incomplete.

Since its introduction in 2022, the BudapestGO application corresponds to MaaS Level 2 (Sochor et al., 2018):

- It provides real-time information integration,
- it achieves partial payment integration (BKK + National Mobile Ticket),
- However, booking and multimodal payment integration are still absent.

The next development step would be to create a stable governance model and a long-term revenue-sharing system, which could move the capital closer to a “fully developed MaaS” model.

6.2 Debrecen – The Most Promising Regional Example

In Debrecen, cooperation between the Smart City Programme and DKV Zrt. Already provides the institutional and professional foundation needed for further MaaS development. Although this partnership does not formally fulfil the role of a “MaaS integrator,” it does so functionally through coordinating data management, digital services, and sustainability-related projects (e.g., GreenMob).

The GreenMob module represents an important step toward sustainable urban mobility: it calculates a user’s journey's CO_2 emissions, opening new dimensions for conscious travel planning.

Based on MaaS maturity models (Sochor et al., 2018; Fehér et al., 2020), Debrecen sits at the 1–2 maturity boundary (“MaaS 1.5”): it goes beyond basic information integration, as timetable, environmental, and traffic data are combined into a single system. However, ticketing, booking, and service integration still require development.

6.3 Veszprém – The Emerging Digital Integrator

In recent years, thanks to developments by V-Busz Kft., Veszprém has become one of the domestic pioneers in digital public transport systems.

The V-BuszON+ application provides real-time bus tracking, stop search, and mobile ticket purchasing, integrated with the MÁV app and ticket machines. This solution corresponds to MaaS Levels 1–2, as partial information and payment integration have already been achieved.

The city benefits from having a single service provider (V-Busz Kft.) responsible for local mobility, which creates favourable conditions for further integration (e.g., rail, public bike systems).

Future development directions include strengthening multimodal connections (bus–rail–bike) and opening the regional data architecture to support deeper cooperation with MÁV and Volán systems.

6.4 Why Not the Other Cities?

- **Szeged**: strong conceptual foundations and development directions (SZKT, Smart Szeged), but no functioning digital platform or unified ticketing system.
- **Győr**: basic informational integration through menetrend.app and the MenetRendes strategy, but service-level and payment integration are missing.
- **Sopron and Békéscsaba**: partial Volán–MÁV ticket integration exists, but the service range is limited, and no shared back-end system is in place.
- **Kaposvár:** the Integrated Mobility Hubs (IMCS) project created physical integration, but lacks digital and business-level interconnections.

6.5 General Conclusion

Consistent with academic literature (Sochor et al., 2018; Hietanen, 2019; Ho & Tirachini, 2024), fully functioning MaaS systems are scalable only when three pillars are strengthened simultaneously:

1. Digital integration – real-time data, open APIs, interoperable platforms.
2. Institutional and business governance – a designated integrator, transparent revenue sharing and data-sharing mechanisms.
3. Sustainability orientation – embedding green mobility goals into pricing schemes and public-space priorities.

Summary:

- **Budapest** remains the national benchmark due to technological and service integration.
- **Debrecen** is the most mature regional MaaS laboratory in terms of information, data management, and sustainability integration.
- **Veszprém** is rapidly advancing in payment and information integration and is well-positioned to become a regional MaaS pilot city in the coming years.

Table 7 presents the MaaS maturity levels of Hungarian cities across five core dimensions: information integration, booking and payment integration, breadth of service modes, institutional capacity, and sustainability embeddedness.

A 0–2-point scale indicates the level of development within each dimension, with higher scores reflecting stronger integration. The table thus summarises where Hungarian cities currently stand in MaaS development and highlights areas of progress or lagging on the path toward integrated, multimodal mobility solutions.

Table 7: Decision Logic (MaaS Maturity – 5 Dimensions, 0–2 Points per Dimension)

Dimensionó	***Budapest***	***Debrecen***	***Szeged***	***Győr***	***Sopron***	***Békés-csaba***	***Kaposvár***	***Vesz-prém***
Information integration	2	2	1	1	1	1	1	2
Booking/payment integration	1	0	0	0	1	1	0	1
Service breadth (number of modes)	2	1	1	1	0	0	0	1
Institutional background (integrator / partnership)	1	1	1	1	1	1	1	1

Sustainability embedding	2	2	2	1	1	1	1	2
Total points (0–10)	**8**	**6**	**5**	**4**	**3**	**3**	**3**	7

According to the MaaS maturity model (Sochor et al., 2018; Hietanen, 2019), the score between 0 and 10 reflects the level of digital and institutional integration within urban mobility.

A "fully developed" MaaS system requires the simultaneous presence of technological, service-related, payment, institutional, and sustainability integration.

- **Budapest** stands out significantly from other Hungarian cities in terms of MaaS maturity: its total score of 8 is not only the highest nationally, but also approaches the medium-high maturity level typical of international examples. While regional cities reach a maximum of 6–7 points with only partial integration, Budapest is the only Hungarian city where service breadth, sustainability embedding, and information integration are all achieved at a high level.
- **Veszprém** achieves the highest score among regional cities (7/10) due to the successful integration of information and payments (V-BuszON+, MÁV app).
- **Debrecen** follows closely behind (6/10) thanks to Smart City – GreenMob solutions, which already incorporate sustainability aspects.
- The **other cities** have generally reached only basic information integration, without operational booking, payment, or multimodal functions.

7. The MaaSolutions Project in Szombathely as a "Good Practice" – Linkages to Hungarian MaaS Developments

7.1 What Does "Interreg Europe – Good Practice" Mean?

The Interreg Europe programme is a non-profit EU initiative based on regional cooperation, aiming to help European regions learn from each other by transferring and adapting proven solutions ("good practices").

According to the Interreg Europe definition, a *good practice* is an initiative or project that:

- has already been proven successful and operates sustainably in a given region;
- It is documented and transparent, meaning it records resources, costs, results, and lessons learned so that other regions can learn from it.
- It is transferable and adaptable to other contexts, meaning it is not solely location-specific and can also serve as a model (Interreg Europe Help Centre, n.d.).

Thus, a project or service can be considered a good practice from Interreg Europe's perspective if it is not only innovative but also functional, well-documented, and adaptable to other environments.

7.2 The Aim of the MaaSolutions Project

The Interreg Europe MaaSolutions project (2024–2028) aims to "apply digital solutions for sustainable urban mobility" within a partnership involving eight countries (Vas County Municipality, n.d.).

The project is based on the Interreg "good practice" approach: it seeks to identify, map, and systematise digital mobility and MaaS good practices already in operation across various countries, and to assess transfer possibilities.

The Hungarian partner — Vas County Municipality — is responsible for identifying and presenting domestic good practices based on the Interreg Europe Good Practice Template (2025), particularly those related to digital and sustainable urban mobility.

7.2.1 Szombathely's MaaS as a "Good Practice"

Szombathely's mobility system offers several complementary services that together already form the foundations of a Mobility as a Service (MaaS) system.

- GYSEV railway services and MÁV's online ticketing platform (mavcsoport.hu) are fully available digitally.
- BLAGUSS Szombathely's bus company provides an online journey planner (blaguss-szombathely.hu) offering timetable information and digital trip planning.
- The city also hosts Lime e-scooters, providing a micromobility option that complements public transport.
- The P+R car park and taxi stand are located next to the railway station, ensuring physical intermodality.

However, these services are not available through a single integrated interface, nor is there a unified ticketing, booking, or payment system like BudapestGO.

Assessment: Szombathely can be placed between MaaS Levels 1–2: information integration and online ticketing already exist, but multimodal booking and payment integration are still missing.

7.2.2 Organisational and Institutional Conditions

Transport actors (GYSEV, MÁV, BLAGUSS, Lime, taxis, municipality) operate independently, with partial coordination.

Within the MaaSolutions project, stakeholder consultations and data-collection processes have already taken place to develop multimodal mobility. However, no dedicated MaaS integrator organisation (like BKK in Budapest) has yet been established.

Institutional conditions are therefore partially in place: partnership cooperation has begun, but operational governance structures and revenue- and data-sharing agreements are still lacking.

7.2.3 Technological Conditions

From a technological perspective, Szombathely is in the midst of a digital transition.

- GYSEV and MÁV systems offer full online ticketing, real-time timetable information, and journey planning.
- BLAGUSS operates a local information platform.
- Railway station development is ongoing and will later strengthen physical and digital integration (e.g., smart parking, unified passenger information).

However, a multimodal back-end system capable of handling booking, payment, and data exchange across modes does not yet exist.

7.2.4 Business Model and Pricing

Szombathely currently operates with separate pricing systems, depending on the service provider:

- railway and bus tickets through national online platforms;
- Lime usage fees within the Lime app;
- taxi and parking tariffs set by local regulation.

No subscription-based package model or revenue-sharing mechanism exists.

7.2.5 User Experience and Sustainability Goals

In Szombathely, public transport, micromobility, and the P+R system together offer a real alternative to car use. Several modes are available to users in digital formats:

- online ticketing and journey planning via MÁV and GYSEV platforms,
- BLAGUSS Szombathely timetable and information platform,
- Lime e-scooters as a sustainable micromobility option,
- P+R parking at the railway station provides convenient transfers.

The comprehensive redevelopment of the railway station not only strengthens physical intermodality but also improves user experience: accessibility, modern passenger information, secure bicycle storage, and renewable-energy-based infrastructure all contribute to a more convenient and greener mobility environment.

Szombathely's Sustainable Urban Development Strategy (FVS) and Integrated Territorial Programme (ITP) prioritise:

- enhancing the attractiveness of public transport,
- developing cycling and micromobility infrastructure,
- intermodal upgrading of transport hubs (e.g. railway station),

- expanding data-driven, digital mobility services.

The data collection and stakeholder engagement carried out in the MaaSolutions project align well with these objectives and reinforce user-centred, sustainability-oriented urban mobility planning.

Overall, improving the user experience and integrating sustainability goals appear as mutually reinforcing processes. Physical developments (e.g. station, P+R), digital services (ticketing, timetables, micromobility), and strategic planning (FVS, ITP) jointly support Szombathely's transition toward MaaS-like complexity while meeting European green mobility and climate-neutral development standards.

7.2.6 Szombathely's MaaS Maturity

The table below provides a consolidated MaaS maturity assessment that compares Szombathely's development level with the previously examined Hungarian cities (Budapest, Debrecen, Szeged, Győr, Sopron, Kaposvár, Békéscsaba, Veszprém) across five dimensions.

The table is based on data from earlier chapters (Sections 5–7) and the most recent Szombathely-specific information (GYSEV, BLAGUSS, Lime, P+R, FVS, ITP).

The MaaS maturity framework used in the national comparison (Table 7) is applied here to Szombathely as well.

Table 8 thus presents the city's current maturity level across the exact five dimensions — informational, payment, service integration, institutional capacity, and sustainability integration — enabling direct comparison with previously assessed Hungarian cities.

Table 8: Szombathely (MaaS Maturity – 5 Dimensions, 0–2 Points per Dimension)

Dimensionó	***Budapest***	***Debrecen***	***Szeged***	***Győr***	***Sopron***	***Békés-csaba***	***Kaposvár***	***Vesz-prém***	***Szombathely***
Information integration	2	2	1	1	1	1	1	2	1
Booking/payment integration	1	0	0	0	1	1	0	1	1
Service breadth (number of modes)	2	1	1	1	0	0	0	1	1
Institutional background (integrator / partnership)	1	1	1	1	1	1	1	1	1
Sustainability embedding	2	2	2	1	1	1	1	2	1

Total points (0–10)	**8**	**6**	**5**	**4**	**3**	**3**	**3**	7	**5**

Interpretation

- **0–2 points**: initial (information-only) level
- **3–5 points:** partial integration (data/institutional integration)
- **6–7 points**: intermediate MaaS maturity (technological and sustainability integration)
- **8–10 points:** high-level MaaS integration (multimodal booking + payment + business model)

7.2.7 Summary and Recommendations

Szombathely's urban mobility system is, in many respects, more advanced than that of most regional cities in Hungary. The presence of several standalone yet advanced digital services (GYSEV, MÁV, BLAGUSS, Lime, taxi, P+R) and the ongoing redevelopment of the railway station create a strong infrastructural and technological foundation for MaaS.

The main challenge today is achieving transactional and organisational integration:

- establishing a joint multimodal booking/payment platform,
- developing data-sharing standards,
- designating a city-level MaaS integrator or coordinator,
- Moreover, in the long term, creating a market-based business model (e.g., subscription packages, revenue sharing).

Szombathely, therefore, represents a second-level maturity within regional MaaS developments (information + partial booking integration), and through the MaaSolutions project, the city has already developed the knowledge and data foundation necessary for further progress.

7.3. The Project's Link to Hungarian MaaS Developments

Within the MaaSolutions project, the evaluation focuses on how the Hungarian cities studied so far meet both:

1. MaaS maturity criteria – the extent to which information, booking, payment, and service integration have been achieved;
2. Interreg Europe "Good Practice" criteria – whether a given initiative is proven, documented, transferable, and relevant for public policy.

Examples:

- **Budapest** meets the "proven solution" and "well-documented" criteria due to the MaaS4EU pilot, making it suitable for presentation as an Interreg-level good practice (Mátrai & Esztergár-Kiss, 2020).

- **Debrecen**, with the menetrend.app and GreenMob ecosystem, meets the "sustainability innovation" and "transferability" criteria, as its real-time data functions offer solutions that other cities can adopt.
- **Veszprém** has become one of the most advanced regional examples of digital public transport development. The V-BuszON+ application integrates real-time tracking, stop/route information, and mobile ticketing supported by the MÁV app and national ticket machines.
- While multimodal integration (bus–rail–public bike) is not yet complete, the system meets Interreg's "transferability" and "working innovation" criteria.
- Thanks to these developments, Veszprém qualifies as one of the most mature regional MaaS laboratories, especially in terms of information and payment integration.
- For the other regional cities (Szeged, Győr, Pécs, Sopron, Kaposvár, Békéscsaba), the main potential lies in developing "learnability" and "transferability."

Documenting the experiences of these cities within the project will help establish the basis for "good practice" qualification and support the development of a national MaaS policy.

7.4 Alignment with the Interreg Europe "Good Practice Template"

The Interreg Europe Good Practice Template (2025) provides a structured guideline for presenting and documenting a good practice.

Its key elements include:

- description of the problem and objectives,
- implementation steps and involved stakeholders,
- measurable results and impacts,
- and explanation of transferability, adaptiveness, and resource requirements.

The goal of the MaaSolutions project is to prepare Hungarian cities to apply this template and to support national MaaS initiatives — especially Budapest, Debrecen, and Veszprém — so they can be identified as European-level good practices.

Among Hungarian cities, Budapest, Debrecen, and Veszprém have already launched initiatives to implement the MaaS concept.

Their levels of MaaS integration differ:

- **Budapest** — through the MaaS4EU pilot and BudapestGO — has reached a high level of booking and payment integration, while also achieving partial integration of public transport, public bikes, and car-sharing services.
    - The city is therefore the most technologically and commercially advanced in implementing a complete MaaS system.

- **Debrecen** — through the DKV–Smart City cooperation and the GreenMob module — stands out due to real-time data services, CO_2 calculation, and integration of sustainability goals.
    - While ticketing and payment integration remain incomplete, the city meets Interreg criteria related to "sustainability innovation" and "adaptability."
- **Veszprém** — one of the most advanced regional examples — offers real-time tracking, stop search, and mobile ticketing via V-BuszON+, integrated with the MÁV app and national machines.
    - Although multimodal (bus–rail–public bike) integration is not yet fully realised, Veszprém meets Interreg criteria for "transferability" and "working innovation."

These developments are well documented (V-Busz, MÁV Group, 2023), municipality-driven, and technologically adaptable for other medium-sized cities.

For this reason, Veszprém is among the strongest regional candidates for the Interreg "good practice" classification, especially regarding information and payment integration.

The following tables (Tables 8–13) summarise how Budapest, Debrecen, and Veszprém meet the MaaS and Interreg Europe Good Practice criteria, focusing on levels of integration, institutional cooperation, and sustainability features.

7.4.1 Budapest – Compliance with MaaS Criteria

In Budapest, the BudapestGO app and BKK's integrated mobility platform represent a higher level of MaaS maturity.

The system — through real-time information, digital ticketing, and integration with public transport, bike-sharing, and car-sharing services — aligns with MaaS Levels 2–3.

Although service-level and payment integration are not yet fully complete, the Budapest model is an excellent demonstration of how an institutionally coordinated, technologically advanced MaaS ecosystem can be implemented.

Table 8: Budapest – Compliance with MaaS Criteria

MaaS dimension	Budapest's status (BudapestGO + BKK integration)	Évaluation
1. Information integration	✓ **Full:** BudapestGO offers real-time schedules, vehicle tracking, journey planning, and mode switching (public transport + MOL Bubi + car-sharing + taxi). API-level data connections operate between BKK and external partners (e.g., Google Maps, Waze).	✅ Developed
2. Booking and payment integration	✓ **Partially implemented:** Ticket and pass purchasing, as well as certain integrated tickets (e.g., BKK + MOL Bubi combinations), are available in BudapestGO. However, payment for car-sharing and	⚠ Partially developed

	micromobility services still requires separate applications.	
3. Service packages / subscriptions	Subscription-based mobility packages (BKK + MOL Bubi + Limo + taxi) were tested at a pilot level in the MaaS4EU project, but they were not introduced permanently.	⚠ Pilot-level
4. Institutional and regulatory integration	BKK fulfils the role of the "MaaS integrator," coordinating data sharing for public transport and related services. However, the regulatory and revenue-sharing mechanisms are not unified across all service providers.	⚠ Partially developed
5. User focus and UX	BudapestGO is intuitive, provides personalised recommendations, and manages real-time traffic, delays, and alternative routes. It offers a multilingual, accessible interface.	✅ Developed
6. Integration of SDGs	The BKK Smart City and SUMP objectives support low-emission transport modes; the integration of MOL Bubi is a key green mobility element.	✅ Good practice
7. Data and system integration	Open data and GTFS/GTFS-RT format data are publicly available, but full payment and service-provider API integration still require further development.	⚠ Has rto be developed

7.4.2 Budapest – Compliance with the Interreg Europe "Good Practice" Criteria

The MaaS integration activities of BudapestGO and BKK represent one of the most advanced Hungarian examples within the Interreg Europe "Good Practice" framework. The platform is a proven, widely used digital mobility system that effectively supports multimodal transport, real-time information services, and electronic ticket purchasing.

BKK, acting as an institutional integrator, plays a key role in coordinating data and partnership cooperation among various service providers (e.g. MOL Bubi, GreenGo, MOL Limo, Bolt, BME, T-Systems). This enables continuous expansion and innovation of the system.

The Budapest model has **high transferability** to other cities and regions, as its technological and organisational structure can be readily adapted to other European mobility systems.

However, further development is required to establish a sustainable, long-term business model — particularly regarding revenue sharing and subscription-based mobility packages — to enable the Budapest practice to become fully self-sustaining and fully aligned with all "Good Practice" criteria.

Table 9: Budapest – Compliance with the Interreg Europe "Good Practice" Criteria

Criteria	**Budapest's Situation (BudapestGO + MaaS4EU Experiences)**	**Evaluation**
Functional, Proven Success	BudapestGO is an integrated mobility platform with more than one million active users. The MaaS4EU pilot successfully demonstrated data and payment integration across multiple service providers.	✅ Proven functionality

Transferability / Adaptability	The technological and organizational logic of the Budapest model can be applied in other Central European cities as well (e.g., BKK API, open data, central ticketing system).	✅ High transferability
Sustainability Alignment	The project aligns with the objectives of the EU Green Deal, the SUMP, and the Digital Mobility Strategy, particularly through the promotion of active modes.	✅ Strong alignment
Policy Embeddedness	The BKK strategy, the Metropolitan SUMP, and the Smart Budapest program integrate MaaS directions, including the digital mobility data platform..	✅ Full embeddedness
Institutional Partnership	BKK provides coordination, in cooperation with MOL Limo, GreenGo, MOL Bubi, Taxify (Bolt), as well as research partners (BME, T-Systems).	✅ Extensive partnership
Sustainable Business Model	Still under development: the revenue-sharing and subscription package model have not yet been stabilized.	⚠ Needs further development

7.4.3 Debrecen – Compliance with MaaS Criteria

Table 10 evaluates the City of Debrecen's MaaS maturity across the main integration dimensions. Debrecen is one of the most advanced regional cities, particularly in **integrating information** and **sustainability**, supported by the MyDKV system, the menetrend: app platform, and the GreenMob module.

However, further development is needed in **booking and payment systems**, as well as in the creation of **multimodal service packages**, to enable the city to reach higher MaaS maturity levels.

Table 10: Debrecen – Compliance with MaaS Criteria

MaaS dimension	Situation of Debrecen	Evaluation
1. Information integration	Implemented: MyDKV and menetrend.app offer live timetables, vehicle tracking, multimodal route planning, and real-time traffic information. The GreenMob module provides CO_2 feedback to the user.	✅ Developed
2. Booking and payment integration	There is no unified back-end or combined ticket purchasing; MyDKV and menetrend.app use separate payment systems.	⚠ Partialy developed
3. Service packages / subscriptions	There is no subscription-based or combined package (e.g., PT + e-scooter).	❌ Missing
4. Institutional and regulatory integration	A Smart City–DKV partnership exists, coordinating data and developments, but the role of a formal “MaaS integrator” has not yet been designated..	⚠ Partially developed
5. User focus and UX	Strong, as the CO_2 module and real-time information support informed travel decisions.	✅ Developed
6. Integration of SDGs	GreenMob project → sustainable mobility and environmental feedback; it aligns with the objectives of the EU Green Deal.	✅ Developed

7. Data and system integration	Partial; expansion of open-standard (GTFS-RT) formats is required.	⚠ Has to be developed

Debrecen is positioned at the **boundary between Levels 1 and 2 ("MaaS 1.5")**: its information integration is advanced, and its institutional and sustainability components are strong, but the lack of ticketing and payment integration limits further progress.

Debrecen – Compliance with the Interreg Europe "Good Practice" Criteria

Table 11 evaluates how Debrecen's mobility and Smart City initiatives meet the "Good Practice" requirements expected by the Interreg Europe programme.

The city's strengths lie in integrating information and **sustainability** components, as well as in promoting **CO_2-conscious mobility**.

However, the measurement and documentation components related to **long-term operability** and **transferability** require further development to enable the city to meet the Interreg "Good Practice" criteria fully.

Table 11: Debrecen – Compliance with the Interreg Europe "Good Practice" Criteria

Criterion	Debrecen situation	Evaluation
Proven, Demonstrated Success	The apps and the GreenMob project are fully operational and accessible at the city level.	⚠ Partial – long-term operational statistics are missing
Documented Resources and Results	The Smart City portal and GreenMob communication materials include relevant data.	⚠ Partial – cost and impact data are not public
Transferability / Adaptability	The timetable + CO_2 + multimodality model is technologically transferable to other cities.	✅ Yes, good transfer potential
Sustainability Alignment	Strong alignment due to CO_2 feedback and the promotion of green mobility.	✅ Yes
Policy Embeddednes	It aligns with the Debrecen Smart City strategy and European SUMP objectives.	✅ Yes
Institutional Partnership	DKV + Smart City coordination exists, but a formal MaaS integrator is missing	⚠ Has t obe developed

7.4.4 Veszprém – Compliance with MaaS Criteria

Table 12 presents the City of Veszprém's MaaS maturity across the main integration dimensions. In recent years, the city has made rapid progress in developing digital public transport. Through the V-BuszON+ application and its integration with the MÁV system, **real-time information integration** and **partial payment integration** have already been achieved.

Although the system is not yet a fully developed MaaS platform, Veszprém represents **the most forward-looking example among smaller regional cities** in Hungary.

Table 12: Veszprém – Compliance with MaaS Criteria

MaaS dimension	Veszprém helyzete	Evaluation
1. Information Integration	Implemented: the V-BuszON+ application provides real-time vehicle tracking, stop search, and a digital timetable, partly harmonized with MÁV app data.	✅ developed
2. Booking and Payment Integration	Partial: city tickets can be purchased through the MÁV app and ticket machines, but there is no unified back-end or integrated payment system yet.	⚠ partially developed
3. Service Integration / Mobility Packages	No subscription-based or combined public mobility package (bus + rail + bike-sharing).	❌ Missing
4. Institutional Integration	V-Busz Ltd. operates the local public transport system and cooperates with the MÁV Group in ticket sales; however, no formal MaaS integrator has been designated yet.	⚠ Partly developed
5. User Focus	The V-BuszON+ app is user-friendly and supports decision-making with real-time information; user feedback is positive.	✅ Developedt
6. Sustainability Integration	Developments align with Veszprém's climate strategy and sustainable mobility goals; the digitalization of public transport reduces car use.	✅ Good direction
7. Data Integration and Interoperability	Partial: data connection already exists between V-Busz and MÁV systems, but further interoperability development is still in progress.	⚠ Has to be developed

Veszprém is positioned **between MaaS Levels 1 and 2**: information integration and partial payment integration are already in place, yet full multimodal and institutional integration still requires further development. However, the city has a strong digital infrastructure and significant potential for institutional cooperation, making it well-positioned to achieve a higher MaaS maturity level in the short term.

7.4.5 Veszprém – Compliance with the Interreg Europe "Good Practice" Criteria

Table 12 presents Veszprém's assessment according to the main criteria of the Interreg Europe *Good Practice Template*.

Through the V-BuszON+ application and its integration with the MÁV system, the city has already demonstrated a functioning digital public transport system that partially meets the requirements for **operational viability** and **transferability**.

Although the initiative does not yet constitute a fully developed MaaS system, Veszprém provides a clear example of how a sustainable, digital mobility ecosystem can be gradually built in a regional city.

Table 12: Veszprém – Compliance with the Interreg Europe "Good Practice" Criteria

Criteria	Veszprém situation	Evaluation

Proven, Demonstrated Success	A **V-BuszON+** applikáció és a **MÁV-integrált jegyvásárlás** városi szinten működő digitális szolgáltatás; stabil felhasználói bázissal.	✅ Igen – működő, bizonyított rendszer
Documented Resources and Results	he V-BuszON+ application and MÁV-integrated ticket purchasing function as city-level digital services with a stable user base. The vbusz.hu website and the MÁV Group's pages present the service rollout, but detailed impact assessments (e.g., ridership, CO_2 reduction) are not yet available.	⚠ Partially developed
Transferability / Adaptability	The digital timetable and ticketing system are technologically transferable to other medium-sized cities (e.g., Eger, Zalaegerszeg).	✅ High transfer potential
Sustainability Alignment	The project aligns with Veszprém's climate strategy and EU SUMP objectives, supporting the increase of public transport use.	✅ Strong
Policy Embeddedness	V-Busz development is part of Smart City Veszprém and the Green Veszprém 2030 program, supported by the municipality.	✅ Yes
Institutional Partnership	Cooperation between V-Busz Ltd. and the MÁV Group provides the basis for integration, but a formal MaaS integrator organization has not yet been established	⚠ Has to be developed

Veszprém already meets the Interreg "Good Practice" requirements in terms of **proven functionality** and **transferability**.

The next step would be to regularly document **results** and strengthen **formal institutional cooperation**, enabling Veszprém to become one of Hungary's model cities in digital public mobility.

Summary

Among Hungarian cities, **Budapest, Debrecen, and Veszprém** are the most advanced in implementing the Mobility as a Service (MaaS) concept. For this reason, we recommend presenting these three cities as **"good practices"** within the MaaSolutions project.

Budapest

Through the MaaS4EU pilot and the **BudapestGO** platform, Budapest has already demonstrated the feasibility of technological, informational, and partial payment integration.

The city benefits from a strong institutional and governance background (BKK acting as the MaaS integrator), which provides the foundation for long-term, sustainable operations and further development.

Budapest's model is **adaptable at the international level** and meets Interreg Europe's "good practice" criteria: it is functional, documented, and transferable to other cities.

Debrecen

Although Debrecen is at an earlier maturity stage, the **Smart City – DKV partnership** and the **GreenMob** project demonstrate the integration of multimodal information and sustainability.

Debrecen is positioned at **MaaS Level 1.5** and, due to its strong, data-driven, environmentally conscious mobility approach and practical cooperation between the municipality and service providers, serves as an exemplary regional model.

Veszprém

Among medium-sized cities, Veszprém showcases the most advanced example of digital public transport integration.

Through the **V-BuszON+ application** and its collaboration with the MÁV Group, the city has already achieved **real-time information integration** and **partial payment integration**, laying the foundation for future multimodal expansion.

Veszprém's developments align with its **Smart City** and **Green Veszprém 2030** programmes, making it an adaptable, sustainability-oriented good practice from the Interreg Europe perspective.

A Complementary Trio of Good Practices

The three cities together offer complementary models:

- **Budapest** – the most mature in technological and service integration
- **Debrecen** – leading in institutional and sustainability innovation
- **Veszprém** – a digital integration model for medium-sized cities

Their joint presentation allows the MaaSolutions project to represent the three core dimensions of MaaS development simultaneously:

1. **Technological integration**
2. **Institutional cooperation**
3. **Sustainability orientation**

These constitute credible, adaptable, and internationally relevant Hungarian good practices.

References

Fehér, K., Sági, J., & Kiss, G. (2020). Integrált mobilitási szolgáltatások és a „Mobility as a Service" koncepció Magyarországon. *Közlekedéstudományi Szemle, 70*(4), 38–47. https://doi.org/10.24228/KTSZ.2020.4.4

Hietanen, S. (2019). Mobility as a Service: Concept and practice. In M. Finger & M. Audouin (Eds.), *The governance of smart transportation systems: Towards new organizational structures for the development of shared, automated, electric and integrated mobility* (pp. 223–238). Springer. https://doi.org/10.1007/978-3-319-96526-0_12

Ho, C. Q., Mulley, C., & Hensher, D. A. (2018). Public preferences for mobility as a service: Insights from stated preference surveys. *Transportation Research Part A: Policy and Practice, 118,* 481–493. https://doi.org/10.1016/j.tra.2018.09.015

Ho, C., & Tirachini, A. (2024). Policy and governance challenges for scaling up Mobility as a Service (MaaS). *Transport Policy, 148,* 93–105. https://doi.org/10.1016/j.tranpol.2024.02.006

Jittrapirom, P., Caiati, V., Feneri, A.-M., Ebrahimigharehbaghi, S., Alonso González, M. J., & Narayan, J. (2017). Mobility as a service: A critical review of definitions, assessments of schemes, and key challenges. *Urban Planning, 2*(2), 13–25. https://doi.org/10.17645/up.v2i2.931

Kamargianni, M., & Matyas, M. (2017, January). The business ecosystem of mobility-as-a-service (MaaS). In *Transportation Research Board 96th Annual Meeting* (No. 17-01911). Washington, D.C.

Lopez-Carreiro, I., & Monzon, A. (2023). Integrating MaaS into the smart city framework: Governance, sustainability and user engagement perspectives. *Sustainable Cities and Society, 92,* 104488. https://doi.org/10.1016/j.scs.2023.104488

Mátrai, T., & Esztergár-Kiss, D. (2020). Opportunities and challenges of integrating Mobility as a Service in urban transport systems. *Transportation Research Procedia, 51,* 26–33. https://doi.org/10.1016/j.trpro.2020.11.004

Mátrai, T., & Esztergár-Kiss, D. (2020). MaaS framework realization as a multimodal service in Budapest. In *Proceedings of the IEEE 8th International Conference on Models and Technologies for Intelligent Transportation Systems (MT-ITS)* (pp. 1–7). IEEE. https://doi.org/10.1109/MT-ITS49943.2020.9265194

Mátrai, T., & Esztergár-Kiss, D. (2020). Integrated framework for Mobility as a Service in Budapest – Experiences from the MaaS4EU pilot. In *International Forum on Integrated Mobility and Transport Systems (IFFK 2020) Proceedings* (Paper 06).

Sochor, J., Arby, H., Karlsson, I. C. M., & Sarasini, S. (2018). A topological approach to Mobility as a Service: A proposed tool for understanding requirements and effects, and for aiding the integration of societal goals. *Research in Transportation Business & Management, 27,* 3–14. https://doi.org/10.1016/j.rtbm.2018.12.003

Tóth, J., Holló, A., & Varga, I. (2022). Challenges of introducing Mobility as a Service in Central and Eastern Europe. *Periodica Polytechnica Transportation Engineering, 50*(4), 311–319. https://doi.org/10.3311/PPtr.18737

UITP. (2022). *Mobility as a Service (MaaS) Report 2022: The benefits of integrating mobility services.* International Association of Public Transport. https://www.uitp.org/publications/mobility-as-a-service-maas-report-2022/

Wong, Y. Z., Hensher, D. A., & Mulley, C. (2020). Mobility as a service (MaaS): Charting a future context. *Transportation Research Part A: Policy and Practice, 131,* 5–19. https://doi.org/10.1016/j.tra.2019.09.030

Online resources

Whim. (n.d.). *Whim – Mobility as a Service platform (Helsinki)*. Whimapp. Retrieved November 12, 2025, from https://whimapp.com

WienMobil. (n.d.). *WienMobil – Smart City multimodal transport service (Vienna)*. WienMobil. Retrieved November 12, 2025, from https://wienmobil.at

Land Transport Authority Singapore. (n.d.). *SimplyGo & Beeline – Integrated mobility platforms (Singapore)*. Retrieved November 12, 2025, from https://simplygo.com.sg and https://beeline.sg

V-Busz Kft. (n.d.). *V-BuszON+ – Veszprém public transport application*. Retrieved November 12, 2025, from https://vbusz.hu

MÁV Zrt. (n.d.). *MÁV – Hungarian State Railways digital ticketing and services*. Retrieved November 12, 2025, from https://mavcsoport.hu

Menetrend.app. (n.d.). *Menetrend – Public transport route planner and mobile ticketing*. Retrieved November 12, 2025, from https://menetrend.app

Budapesti Közlekedési Központ (BKK). (n.d.). *BudapestGO – Integrated transport application and API services*. Retrieved November 12, 2025, from https://bkk.hu and https://budapestgo.hu

GreenMob. (n.d.). *GreenMob – Sustainable urban mobility ecosystem (Debrecen)*. Retrieved November 12, 2025, from https://greenmob.hu