Project deliverable D4.5

Île-de-France - Detailed Implementation Plan Part A

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Legal disclaimer

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Project executive summary

The establishment of a common European mobility data space (EMDS) aims to accelerate the digital and green transformation of the European mobility and transport sector. The deployEMDS project contributes to the further development of the common European mobility data space as announced in the European Strategy for Data and the Sustainable and Smart Mobility Strategy. It builds on PrepDSpace4Mobility, a Coordination and Support Action funded under the Digital Europe Programme and is the first deployment action foreseen under the EMDS initiative.

The deployEMDS project advances EU policy priorities by developing a technical infrastructure for an operational data space in the mobility sector. It aligns with the European Data Strategy's goal to facilitate data access, pooling, and sharing. The project supports the European Green Deal's aim to accelerate sustainable and smart mobility, thereby contributing to a reduction in transport emissions. Additionally, it aligns with the Sustainable and Smart Mobility Strategy, ITS Directive, and the NAPCORE project. The diverse consortium of partners implements 16 use cases across nine European cities and regions, aiming to create and deploy an operational data space with a common technical infrastructure. The project aims to make data available in machine-readable format, while facilitating innovative services and applications and contributing to the development of a European mobility data sharing ecosystem.

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Deliverable executive summary

Key words

Use case; Implementation approach; Implementation plan

Mobility as a Service, Mobility credit, Mobility policies, Commuting to workplace, Public transport, Traffic information

Executive Summary

This document details the approach of the deployEMDS local use cases in Île-de-France, France. Use case IDF_01, titled “MaaS for Companies” and use case IDF_02, titled “Optimisation environment for journey planner providers”, are implemented under the leadership of Clémence Castell, responsible for innovation partnerships at Instant System.

This deliverable comprises the first of two iterations.

List of abbreviations and acronyms

Acronym	Meaning
EMDS	Common European mobility data space
KPI	Key Performance Indicator
WP	Work Package
MVP	Minimal Viable Product
SUMP	Sustainable Urban Mobility Plan
FMD	Forfait mobilités durables
PT	Public Transit
PTA	Public Transport Authority
PTO	Public Transport Operators

1 Purpose of the deliverable

This document is one of nine deliverables produced in deployEMDS detailing the local use cases proposed and to be implemented by the nine local implementation sites of the action. These Detailed Implementation Plans are developed in two waves: This first wave of reports, titled Detailed Implementation Plan Part A, are published in Month 6 of the project (April 2024). They focus on the ideation and refinement of the overall use case objectives, scope and context as well as providing a first description of the approach to be taken in the local implementation project.

In combination with the efforts of WP2 ("Development of an operational data space across borders"), in particular the ongoing analysis of technical requirements for the use cases, this report will lay the foundation for the Detailed Implementation Plan Part B. In Part B, the overall steps, responsibilities, and timelines of the local implementation projects relative to the overall development of the EMDS technical and governance building blocks will be defined in detail. Part B will be published in autumn of 2024.

1.1 Intended audience

The detailed elaboration of the objectives, context, scope, and approach of the use cases proposed and implemented by the local implementation sites in deployEMDS aims to establish a common and clear understanding of these local projects across the sites and inform horizontal actions in deployEMDS. Part A of the Detailed Implementation Plan allows for this understanding by providing necessary contextual information regarding the technical characteristics and requirements of the use cases analysed in WP2, and addressing governance-related aspects elaborated in WP3 (“Development of common governance mechanisms across borders”).

For interested stakeholders outside the consortium, this series of reports offers an initial understanding of the real-world challenges and objectives in the field of urban mobility data sharing, that the EMDS may address.

1.2 Structure of the deliverable and links with other work packages/deliverables

This first set of reports, titled Detailed Implementation Plan Part A, summarise the use case ideation and refines the overall approach considerations of the use cases proposed by the local implementation sites in deployEMDS. For each use case, the reports provide general information, an analysis of the use case context, the definition of the use case objective, and a delineation of pathways to the use case implementation. Based on these analyses, the primary implementation product, or minimum viable product (MVP) of the use case, as well as potential subsequent implementation products, is defined. Each local implementation site chooses an approach: either “cascading” with a more comprehensive MVP or more agile iterations with a simpler MVP to start with. The report also provides a preliminary reflection on the subsequently elaborated Part B of the Detailed Implementation Plan.

This deliverable describes the use cases IDF_01 and IDF_02 developed in Île-de-France.

The Detailed Implementation Plan Part A, along with the use case ideation outlined in this document, draws from the technical analysis of local use cases conducted in WP2 and the insights outlined in Deliverable D2.1, which specifies the technical infrastructure requirements for deployEMDS. D2.1 is accessible on the deployEMDS project website and outlines essential technical, functional, and operational capabilities necessary to establish a data space to support the various mobility use cases, aiming to standardise mobility data and facilitate interoperability.

The Implementation Plan builds on this foundation, directly referencing information from D2.1, particularly in defining the implementation products for the use cases.

2 Implementation approach for use case IDF_01

2.1 General Information

The following sections provide general information about the use case and introduce the consortium partners forming the local implementation project consortium.

Use case title	
MaaS for companies – A MaaS platform that facilitates the attribution of mobility credit for employees.	
Mobility themes addressed in the use case	
Mobility as a Service, mobility credit, mobility policies, commuting to workplace, public transport, traffic information	
Use case cluster	
Multimodality	
Roles	
Use case implementation lead	**Clémence Castell** is responsible for innovation partnerships at Instant System.
Consortium partners involved in the implementation	**Instant System** is a MaaS provider company, offering digital solutions for mobility for cities and regions.
	EONA-X is an operational data space for the mobility, transport and tourism sector. Its technical platform is compliant with Gaia-X principles.
	enRoute provides data management solutions for public transit and shared mobility.

2.2 Analysis of the use case context

The following sections summarise the overall use case context by reflecting on the current situation at the implementation site and the challenges or opportunities for value creation related to the use case.

2.2.1 Overall context and geographical scope

The use case will cover the Île-de-France region where commuting to and from work contributes significantly to greenhouse gas emissions. Governments and public transport providers are therefore deploying efforts to encourage more employees to use public transport or adopt alternative modes such as bicycles or e-scooters. For example, the French government has established the “Forfait mobilités durables” (FMD) to incentivise companies to positively influence their employees’ commuting patterns. Through this programme, employees can receive up to a 50% reduction on their public transport subscriptions or mileage allowances for using bicycles or e-scooters.

Despite these initiatives, an increasing number of employees continue to rely on their personal vehicles. Many companies and employees do not take advantage of these benefits due to the cumbersome and time-consuming application process.

The primary objective of this use case is to offer a solution for companies to configure and manage commute packages in alignment with their mobility policies. Additionally, this use case will introduce a mobile app for employees to monitor and utilise their mobility packages efficiently.

2.2.2 Current situation

Many companies in Île-de-France subsidise their employees' mobility, reimbursing them based on declarations and proofs of payment. However, this has resulted in fraud, errors, high administrative costs, and limited incentives since employees still need to cover the costs upfront and then seek reimbursement later.

Payment card solutions (such as Edenred, Betterway...) or specific mobility providers (like Uber, Lime...) can enhance this situation but lack integration for multimodal and intermodal itineraries or streamlined payment across various systems.

Comprehensive MaaS (Mobility-as-a-Service) solutions (such as Skipr) exist but are still underperforming in terms of coverage and integration of local mobility services. These services are primarily controlled by mobility providers such as Uber, whose practices often disregard workers' rights and environmental concerns. Municipal authorities express a strong interest in collaborating with more ethical mobility providers, a component currently absent in existing systems' integration.

The innovative approach implemented in this use case offers significant cost savings by automating HR validation of employees' expenses through integrated digital payment cards. Additionally, it utilizes a pioneering technology platform that connects various mobility systems into a unified hub. This enables engagement with a diverse range of mobility service providers (MSPs) and builds upon a successful track record of collaboration with municipal authorities. By addressing challenges related to comprehensive integration, this approach ensures customer adoption and empowers ethical MSPs to compete against dominant companies.

Since 2023, expenses linked to e-mobility modes such as EV-charging are also covered by the FMD. However, there is a strong need for access and harmonisation of EV-charging infrastructure data, and this is where this use case comes into play.

2.2.3 Current challenges or opportunities for value creation

The scenario of managing and utilising mobility packages for commuting within a MaaS platform for companies presents both challenges and opportunities.

One significant challenge lies in simplifying the management of mobility packages for companies while ensuring minimal effort. Companies require a solution that seamlessly integrates with their existing systems and processes, allowing them to efficiently allocate and monitor mobility benefits for their employees. Similarly, employees require user-friendly tools that facilitate easy access to and utilisation of these mobility packages for their daily commute.

To address these challenges, the MaaS framework relies on collaboration with external Mobility Service Providers (MSPs) to access essential data on various transportation options. This includes real-time information on the availability and location of free-floating vehicles like e-bikes, schedules for public transport services such as buses and trains, and the availability of charging stations for electric vehicles. However,

interoperability with these external platforms poses a significant challenge, requiring robust integration mechanisms to ensure seamless data exchange and service coordination.

Despite these challenges, the scenario also presents exciting opportunities for innovation within MaaS platforms. By leveraging advanced data analytics, machine learning algorithms, and user feedback mechanisms, MaaS frameworks can develop dynamic routing and trip optimisation capabilities. These advanced features can adapt to real-time demand fluctuations and user preferences, enhancing the efficiency of commuting trips.

For example, the MaaS platform could analyse historical usage patterns and current traffic conditions to suggest the most efficient route and mode of transportation for each commute. Additionally, machine learning algorithms can learn from user feedback to continuously improve route recommendations and optimise resource allocation.

In summary, while challenges related to interoperability and data integration with external mobility services exist, the MaaS platform for companies also presents opportunities for innovation through advanced analytics and optimisation techniques. By addressing these challenges and leveraging innovative solutions, MaaS platforms can play a crucial role in promoting sustainable commuting practices and enhancing mobility experiences for employees.

2.3 Objective of the use case

2.3.1 Objective statement

The main objectives of the solution are to enable companies to define and manage mobility packages for employees and to monitor their usage. For employees, the objectives include paying for mobility using these packages, accessing information on transport services through them, and evaluating carbon footprints.

The primary objective of this use case is to develop and implement a MaaS application tailored for companies and their employees. This application will serve as a comprehensive platform designed to efficiently manage and utilize mobility packages offered by employers. Through the MaaS application, both companies and employees will have access to tools and features aimed at optimizing commute options, tracking usage, and maximizing the benefits of mobility packages.

To facilitate the users' (employers and employees) journey, the integration of new data sets would be of high added-value, such as EV-charging infrastructure, traffic data, new mobility services e.g., shared mobilities, carpooling solutions, etc. MaaS developers require access and harmonisation of such data. The collection and standardisation of EV charging infrastructure data is a significant ongoing effort. This use case aims to contribute to the creation of new data products in this domain complying with needs for interoperability and accessibility within the EMDS framework and linking it to European standardisation efforts.

2.3.2 Overall use case narrative

It is common practice for companies to offer mobility packages to their employees, either for daily commuting or for business-related travel. In France, employers can subsidise up to 50% of their employees' public transport subscriptions. Additionally, some companies may extend supplementary mobility benefits tailored to specific employee roles, such as access to car rentals or e-scooters. However, effectively managing these diverse mobility packages presents challenges for both employers, striving for optimal utilisation, and employees, navigating access to FMD-eligible services.

The concept of MaaS for companies aims to address these challenges by providing a unified platform for managing and utilising mobility packages. This comprehensive solution streamlines the entire process, from package definition to employee engagement.

The journey begins with the company establishing a range of mobility packages and defining the associated usage guidelines. This includes determining eligibility criteria, usage restrictions (such as time and location parameters), and the scope of eligible mobility services (such as public transit, e-bikes, ridesharing, etc.).

Once the mobility packages are defined, employees gain access to a dedicated mobile application designed to facilitate various mobility-related tasks. Some of the key functionalities include:

- **Commute trip planning**: Employees can effortlessly plan their daily commute by entering their origin and destination locations. The application provides convenient options for exploring different transportation modes and routes.
- **Payment integration**: The application features a built-in mobility wallet, allowing employees to seamlessly pay for their commute trips within the app. This streamlines the payment process and ensures a hassle-free experience.
- **Carbon footprint monitoring**: A crucial aspect of sustainable mobility is understanding its environmental impact. Employees can track their carbon footprint directly within the application, providing valuable insights into their transportation choices and encouraging eco-friendly alternatives.
- **Additional features**: Depending on the company' preferences and the application's capabilities, additional features may include real-time transit updates, trip expense management, or personalised recommendations for optimising commute routes and modes.

By centralising mobility management and providing employees with user-friendly tools, MaaS for companies empowers organisations to promote sustainable transportation practices while enhancing employee satisfaction and productivity.

2.4 Elaboration of implementation pathways

The following sections explore the actions and interactions required for successful implementation of the use case.

The pathway elaboration begins with the exploration of the most ideal implementation in an idealised, fictional scenario where all circumstances for implementation are favourable. Subsequently, the idealised pathway is adjusted to real-world circumstances at the implementation site by identifying potential barriers induced by this context and requiring alternate actions to address them. This chapter also explores how specific, realistic aspects, initially outside the scope of the use case, may influence its design or serve as subsequent development steps. This ensures the use case's longevity by considering potential additions during the initial implementation.

2.4.1 Ideal implementation pathway

enRoute contributes to the preparation of Île-de-France Mobilités (IDFM) public transit data through the integration of its tool in the data processing chain: it is used to import, control, aggregate, enhance, and publish its schedule data. The integration consists in handling various types of data and a large number of transit operator datasets, making sure they are consistent and compliant with IDFM quality standards. It also involves making the aggregated data available to relevant data consumers, starting with the IDFM Open Data Portal. The data is then retrieved by Chouette for use by EONA-X, as shown in the diagram below.

Instant System will be able to discover data sources useful for Emy, the application allowing consumption and management of mobility budgets, in a federated catalogue provided by the EONA-X data space. Subsequently, Instant System will be able to access data products through smart contracts concluded peer-to-peer and then consume data at its source (data-mesh architecture) providing the appropriate credentials.

Regarding the discoverability of these datasets' metadata, data providers could choose to make them visible to the EMDS federated catalogue and other data spaces through the EONA-X data space.

In accordance with the established workflows of data providers such as EONA-X (or those of a future EMDS), Instant System will develop a specialised connector in close alignment with the project's work package 2, developing a common technical infrastructure for deployEMDS. This connector will serve the purpose of seamlessly integrating and retrieving data from these providers. Once this data is gathered, Instant System will undertake the task of restructuring it to align with the internal framework of the Emy platform. This process ensures that the data collected can be effectively utilized within the Emy ecosystem.

Moreover, as part of this seamless integration, Instant System will also develop dedicated connectors in line with upcoming WP2 specifications to facilitate the transmission of usage data generated by Emy's end-users. These connectors will serve as conduits, enabling the smooth flow of data from the platform to the designated data space. By implementing these connectors, Instant System ensures the efficient exchange of information between Emy and external data providers, enhancing the overall functionality and utility of the platform.

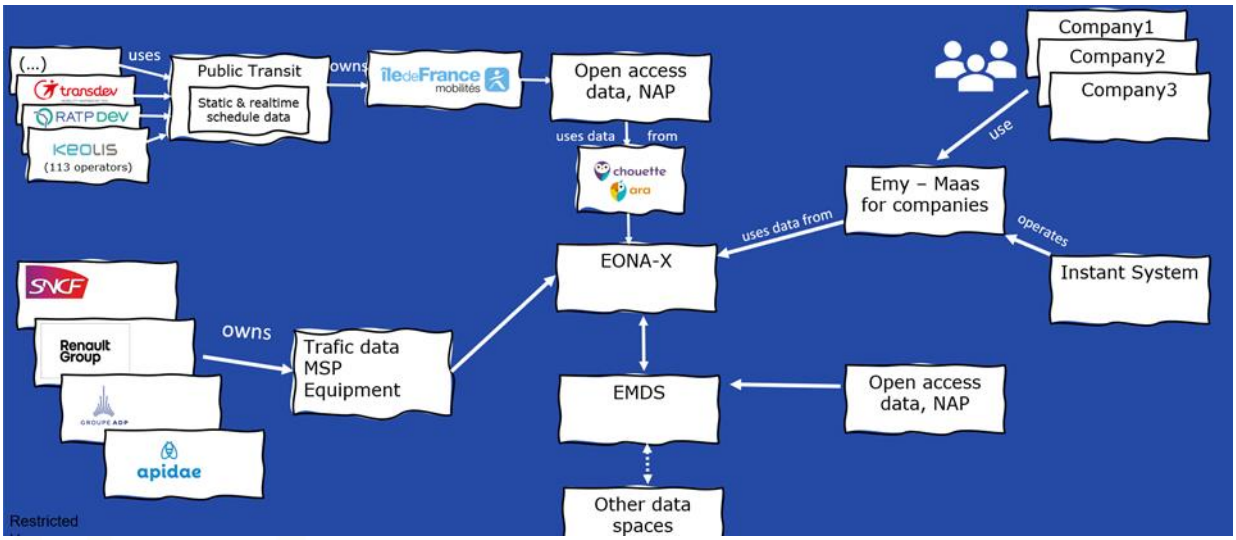


Figure 1 – Overview of the IDF_01 use case in the scenario of the ideal pathway

2.4.2 Alternate pathways to implementation

In the alternate pathway, open access data and private data would be provided separately to Instant System. If there's no technical distinction in the EONA-X dataspace between open data and private data sources, the business model for providing open data in the dataspace might not be easily sustainable for EnRoute. Consequently, EnRoute might opt not to bear the additional costs of implementing a connector to the EONA-X dataspace. To address this, in the alternate pathway, the discoverability of open access data could be integrated into the EONA-X dataspace, to which Instant System is connected through the connection between EONA-X and the EMDS. This approach would eliminate the need for Instant System to search multiple catalogues to find the datasets it requires for its solution.

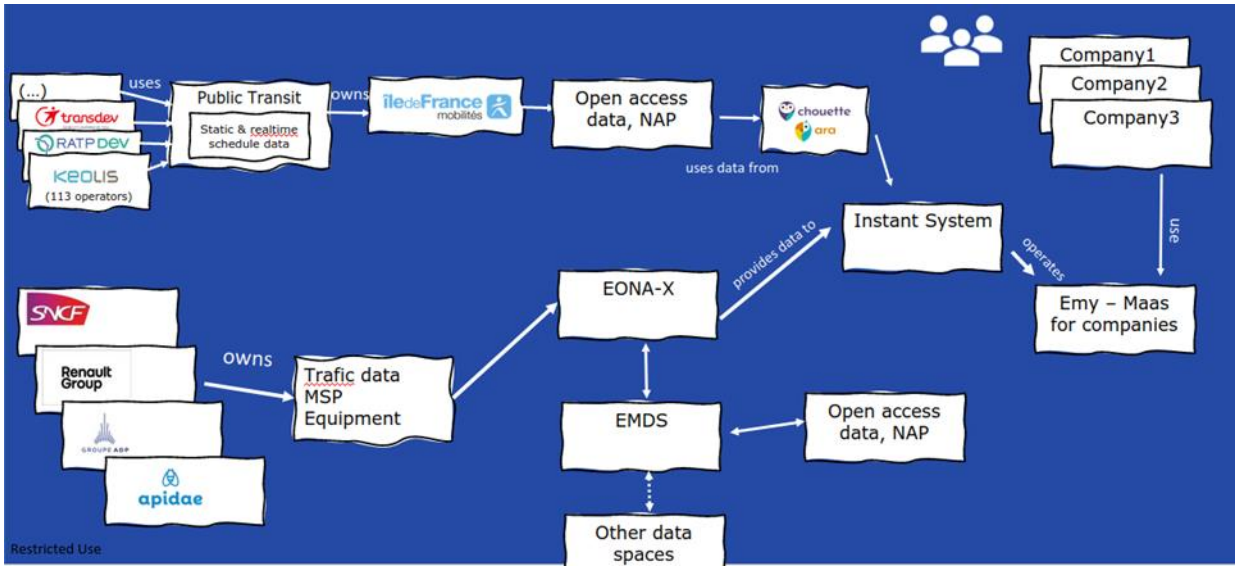


Figure 2 – Overview of the IDF_01 use case use case system in the alternate pathway scenario

2.4.3 Additional pathways to amend the use case implementation

Integrating an additional feature, the MaaS platform for companies can include ridesharing and carsharing trips, either as standalone options or combined with other transportation modes such as public transit, free-floating vehicles, or private cars. Ridesharing data can be ingested in the following ways:

- **Standardised integration within the EONA-X Ecosystem**: Ridesharing data can be standardised and seamlessly integrated into the broader EONA-X ecosystem. This approach ensures compatibility and consistency across various data sources, enhancing interoperability and ease of access for users within the ecosystem.
- **Direct integration within the MaaS platform**: Alternatively, ridesharing data can be directly integrated into the MaaS platform.

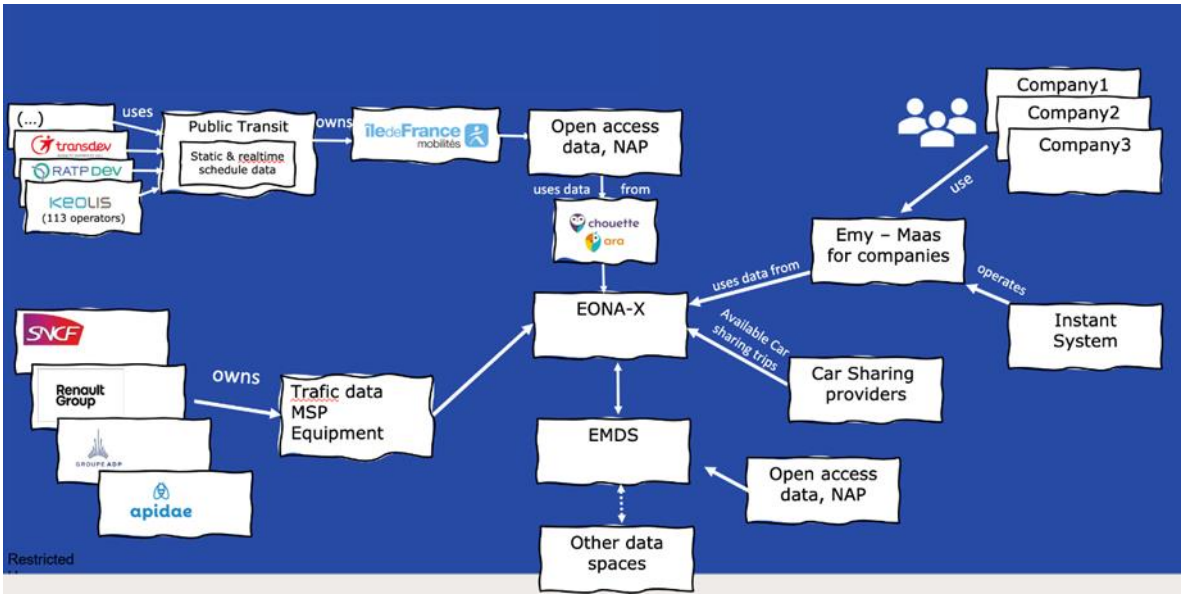


Figure 3 – Overview of the IDF_01 use case including additional pathways

2.5 Primary use case implementation products

The following sections define the primary use case product or the minimal viable product design, to be implemented in the first iteration of the implementation project.

2.5.1 Description of the primary use case product (MVP)

The MVP will be implemented in three phases. The first step will be the integration of the IDF transit data provided by EnRoute in the Emy product base, including the following features:

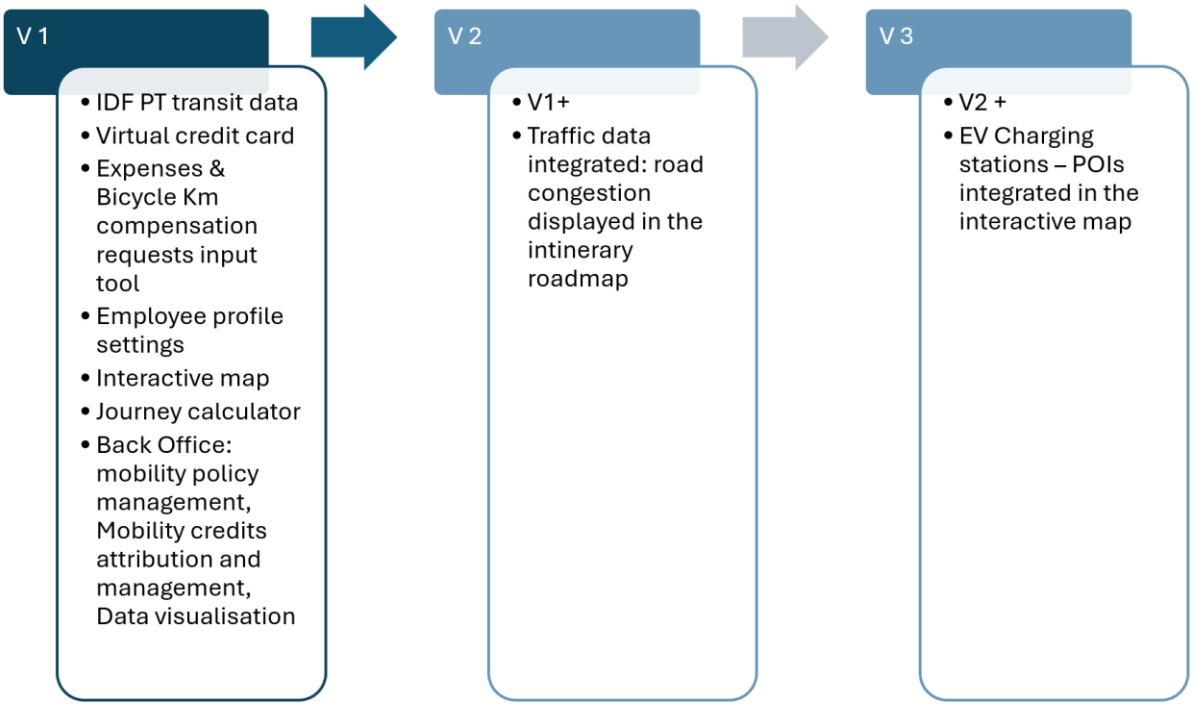
- Interactive map
- Journey calculator
- Virtual credit card
- Expenses & bicycle km compensation requests input tool
- Employee profile settings
- Back office: mobility policy management, mobility credits provision and management, data visualisation.

The second phase of the MVP development consist in the integration of a first data product available through EONA-X. Traffic data (road congestion will be displayed in the itinerary roadmap), provided by Renault Software Group.

A third iteration will consist in the integration of the EV charging stations points of interest (POIs) in the interactive map, thanks to new data products provided by Renault Software Group and APIDAE.

This MVP will be commercialised by Instant System, provider of the solution. Regarding the new data products integrated, sustainable business models will need to be identified among the providers and Instant System through EONA-X for long-term exploitation.

2.5.2 Steps of the primary use case implementation



2.5.3 Participants in the primary use case product

2.5.3.1 Data providers

Data provider 1	**enRoute**	
Type of organisation:	Mobility Software Provider	
Project partner:	Yes	
Data product 1A	**Aggregated IDFM Referential**	
Data type:	Static	
Access:	Open data	
Conditions:	No specific conditions to meet to access readily available data	
Components:	<u>Data sources/Data points</u>	<u>Data model/specification</u>
	Aggregated referential (110+ data points & 80+ data providers)	GTFS
	Aggregated referential (110+ data points & 80+ data providers)	NeTEx
Data product 1B	**IDFM Realtime Transit Data**	
Data type:	Real-time	

Access:	Open data
Conditions:	Confirmation is still pending regarding the complete availability of real-time data across the entire IDFM scope. However, main services in one or both data formats described below are available for major transport networks.

Components:	Data sources/ Data points	Data model/specification
	IDFM Realtime Transit Data [GTFS-RT]	GTFS-RT [Services: Trip Updates Vehicle Positions]
	IDFM Realtime Transit Data [SIRI]	SIRI [Services: General Message Vehicle Monitoring Stop Monitoring Estimated Timetable]

Data provider 2	**RENAULT**
Type of organisation:	Company group (member of dataspace)
Description:	RENAULT Group is member of the Eona-X dataspace. In the different brands it manages it disposes of static information on infrastructure and dynamic information on usage of its products.
Project partner:	No
Motivation to participate:	Test / demonstrate the use of a dataspace in mobility and participate in more usage of electric vehicles.

Data product 2A	**Charging point and usage**	
Data type:	Dynamic	
Access:	Selectively accessible data	
Conditions:	This data can be accessed under conditions provided in the dataspace federated catalogue and made available to the users of the dataspace chosen by the data provider	
Components:	Data Sources/Data points	Data Model/Specification
	Renault Group dataset	Ad hoc data models used.

Data product 2B	**Real-time traffic**	
Data type:	Dynamic	
Access:	Selectively accessible data	
Conditions:	This data could be accessed under conditions provided in the data space federated catalogue and made available to the users of the dataspace chosen by the data owner provided it has the legal authorisation to exploit and share this data.	
Components:	Data sources/Data points	Data model/specification
	Real-time traffic information	Ad hoc data models used.

Data provider 3	**Apidae Tourisme**	
Type of organisation:	SME (member of EONA-X data space)	
Description:	APIDAE Tourisme is a data cooperative active since more than 20 years and representing 50% of French institutional tourism data and private service providers.	
Project partner:	No	
Motivation to participate:	Help disseminate the data collected locally by tourist boards in a variety of users and interfaces.	
Data product 3A	**Location of infrastructure POI**	
Data type:	Static	
Access:	Selectively accessible data	
Conditions:	This data can be accessed under conditions provided in the dataspace federated catalog and made available to the users of the dataspace chosen by the data provider	
Components:	Data sources/ Data points	Data model/specification
	Apidae Tourisme dataset	Ad hoc data models used.

2.5.3.2 Data intermediaries

The IDF_01 use case considers enRoute and EONA-X as data intermediaries in the use case implementation. enRoute will import and update multiple data sets related to Data Product 2A. EONA-X will facilitate sharing of Data Products 2A, 2B and 3A.

2.5.3.3 Data consumers

The IDF_01 use case considers Instant System and the respective company clients of the EMY app as data consumers.

2.6 Subsequent implementation products

The following sections outline (potential) subsequent implementation products that may be introduced in subsequent iterations of the local implementation project.

Incorporating carpooling data for multi-modal routes

Emy, as a comprehensive mobility platform, aims to provide users with efficient and convenient transportation options. By integrating car sharing data into its system, Emy could enhance its multi-modal capabilities. For instance, Emy's algorithm can suggest various transportation modes, including public transit and free-floating

vehicles, to reach the nearest carpool meeting point. This integration not only broadens the range of options available to users but also optimises their routes by combining different modes of transportation.

Advanced integration as a carpooling aggregator and organiser

Building on its existing capabilities, Emy can evolve into a centralised hub for carpooling services. In this capacity, Emy aggregates carpooling data from various providers, including ride-sharing companies and community-based carpool networks. Users can access Emy's platform to find the best carpool offer as well as solution for the first and last kilometres.

Moreover, end-users would benefit from the mobility wallet to pay for their carpool trips which could significantly improve the end-user experience.

3 Initial reflections on Detailed Implementation Plan - Part B for use case IDF_01

The project plan is expected to be finalised during the upcoming months taking into consideration both results of the initial inventory of datasets as well as developments made in other work packages. Preliminary considerations include the following distribution of responsibilities.

Step 1: Identification of relevant third parties (EONA-X)

- Identify and involve the relevant third parties among their members: data providers (EONA-X)
- Identify and involve potential MVP pilot testing end-users among EONA-X members (EONA-X, Instant System)

Step 2: Technical analysis (Instant System)

- Data sources documentation and research (EONA-X)
- Deployment of operational EONA-X infrastructure (EONA-X)
- Technical specification and analysis of data space connectors (EONA-X)

Step 3: Connectors development (EONA-X)

Development of connectors to the data space:

- Instant System to EONA-X (Instant System)
- EnRoute to EONA-X (EnRoute)
- EONA-X to EMDS (EONA-X)
- Data-source providers to EONA-X (EONA-X)

Step 4: Data products integration (Instant System)

- Feed Emy with data products from the data space: transit data, traffic data, EV charging stations
- Front-end development
- BA data analysis – adaptation of data sources to the Emy data structure
- Quality analysis, internal test phase
- Pre-production release for client-test

Step 5: End-user pilot test (Instant System)

- Test of the MVP by end-users and support activities to refine the product based on client feedback (Instant System).

- Release of the app in production for end-user testing (Instant System)

4 Implementation approach for Use Case IDF_02

4.1 General information

The following provides a set of general information of the Use Case and introduces the consortium partners that form the local implementation project consortium.

Use case title	
Journey planner optimisation – Sharing MaaS usage data and improve the itinerary planner with AI models exploiting user's travel's preferences	
Mobility themes addressed in the use case	
Mobility as a Service, data usage, journey planner, optimization, artificial intelligence, SUMP analysis	
Use case cluster	
Multimodality	
Roles	
Use case implementation lead	**Clémence Castell** is responsible for innovation partnerships at Instant System
Consortium partners involved in the use case implementation	**Instant System** is a MaaS provider company, offering digital solutions for mobility for cities and regions.
	Eona-X is an operational data space for the mobility, transport and tourism sector. Its technical platform is compliant with Gaia-X principles.
	There may be an opportunity to include consortium partner **NTT Data** in the implementation of the IDF_02 use case.

4.2 Analysis of the use case context

The following sections summarise the overall use case context by reflecting on the current situation at the implementation site and the challenges or opportunities for value creation related to the use case.

4.2.1 Overall context and geographical scope

The use case will cover the Île-de-France region. It focuses on feeding the dataspace with standardised usage data from a MaaS application, specifically the Emy application (see IDF_01). This data is then used to train AI algorithms, improving the journey planner functionality within the platform.

By feeding standardised usage data into the data space, the MaaS application contributes valuable insights into user behaviours, preferences, and travel patterns. This data serves as a useful resource for various stakeholders, including public transit (PT) providers such as cities, researchers focused on public mobility trends, and developers of journey planning tools.

4.2.2 Current situation

Journey planners/MaaS applications can generate valuable user data, but these are currently underutilised. They may generate substantial “usage” data daily, offering insights into network usage, user behaviour and preferences regarding modes and choices, CO2 savings, and more. When leveraged and analysed, these data provide vital information for Public Transport Authorities/Operators (PTA/PTO), mobility planning, congestion predictions, smart city platforms, digital twins, PT network adjustments, and SUMP reporting.

For MaaS providers, this data can be used to improve PT planning by considering the usage data generated by end-users in the process of generating PT results. For example, PT planners can use this data to train their journey planner algorithms, optimise their results and increase relevance based on user behaviour.

4.2.3 Current challenges or opportunities for value creation

This use case aims to standardise data and make it interoperable, allowing analysis of user behaviour across different cities, while allowing MaaS providers to conduct research and development to enhance journey planner performance.

For PT providers, usage data offers valuable insights into commuter behaviour and demand patterns, enabling them to optimise route planning, scheduling, and resource allocation to better meet the needs of users.

Researchers can leverage this data to conduct in-depth analyses and studies on public mobility trends, urban transportation dynamics, and commuter behaviour, ultimately informing policy decisions and urban planning initiatives.

Moreover, journey planners can utilise the AI algorithms trained on this usage data to enhance the accuracy and efficiency of their route planning recommendations. By leveraging insights gathered from real-world usage patterns, the journey planner can offer personalised and optimised travel itineraries tailored to individual preferences such as preferred modes. This ultimately enhances the user experience, promotes sustainable transportation choices, and contributes to more efficient urban mobility ecosystems.

Data anonymisation

To guarantee user privacy, usage data will only include aggregated information about the end-user of the MaaS application. The anonymisation process will be performed at two main levels:

To safeguard user privacy effectively, the approach involves two key phases:

- **Within the MaaS application:** This initial phase focuses on ensuring that the usage data generated by the MaaS application undergo thorough anonymisation. Anonymisation involves removing or obfuscating any personal information that could potentially identify individual users. This process aligns with the strict requirements outlined in the General Data Protection Regulation (GDPR), which mandates the protection of personal data. To achieve this, the MaaS application will utilise an ontology, which is a structured way of describing concepts and relationships within a domain, to define and organise the usage data. By leveraging the ontology, the MaaS application can categorise and format the usage data in a manner that strips it of any identifiable personal information while retaining the necessary insights for analysis and optimisation of the service.

- **Connector to the EMDC data space:** In the context of the EMDS, the connector ensures that the anonymised usage data from the MaaS application are properly formatted and transmitted to the data space in accordance with the ontology defined earlier. By enforcing consistency in data formatting and adherence to privacy guidelines, the connector safeguards user privacy throughout the data transmission process.

Together, these measures establish a robust framework for protecting user privacy within the MaaS ecosystem, from data generation within the application to transmission and sharing within the EMDS, for which standard practices will have to be further defined with WP3.

4.3 Objective of the use case

4.3.1 Objective statement

The primary objective of this use case is to leverage data stored within the data space to enhance the functionality of the journey planner. This entails extracting valuable insights from existing data sources and use them to optimise the journey planning process.

Furthermore, the use case seeks to establish a standardised format for the journey planner usage data. Standardisation of the data format is crucial as it streamlines its integration into decision-making tools such as SUMP reporting or AI models. By adopting a standardised format, stakeholders can easily access and utilize the journey planner usage data across various platforms and applications, fostering interoperability and facilitating data-driven decision-making processes.

4.3.2 Overall use case narrative

In an ideal scenario, a user initiates the process by accessing the MaaS application to search for an itinerary, specifying origin (e.g., home) and destination (e.g., work). The journey planner component of the MaaS application then generates a comprehensive set of itineraries that align with the user request. These itineraries are presented to the user, who can then review and evaluate them based on individual preferences.

Upon reviewing the options, end-users have the freedom to select the itinerary that best suits their requirements. For instance, one user may prioritise reaching their destination as early as possible, regardless of the cost involved, while another user may opt for the most cost-effective option, prioritising affordability over travel duration.

Concurrently, in the background, the MaaS platform collects usage data generated by user interactions with the application. This raw usage data is standardised to ensure consistency and compatibility across different datasets. Once standardised, the processed data is pushed into the data space where it becomes readily accessible for various applications, analyses, and decision-making processes.

User consent

The MaaS application will prioritise user privacy by adhering to GDPR guidelines, ensuring that usage data collection occurs only with explicit user consent. During the onboarding process, users will be asked to grant the application permissions to collect usage data. This crucial step empowers users to make informed decisions about their data privacy preferences from the outset.

Additionally, the application will provide a dedicated privacy section where users can revisit and adjust their consent preferences at any time. This approach ensures transparency and user control over their data, aligning with GDPR principles that emphasise the importance of user consent and control over personal information.

4.4 Elaboration of implementation pathways

The following sections explore the actions and interactions required for successful implementation of the use case.

The pathway elaboration begins with the exploration of the most ideal implementation in an idealised, fictional scenario where all circumstances for implementation are favourable. Subsequently, the idealised pathway is adjusted to real-world circumstances at the implementation site by identifying potential barriers induced by this context and requiring alternate actions to address them. This chapter also explores how specific, realistic aspects, initially outside the scope of the use case, may influence its design or serve as subsequent development steps. This ensures the use case's longevity by considering potential additions during the initial implementation.

4.4.1 Ideal implementation pathway

The MaaS provider uses PT data from designated data providers using specialised connectors tailored to the data space's and data providers' defined formats. Subsequently, the acquired data undergoes transformation in an internal structure optimised for integration with the journey planner component. Simultaneously, the MaaS platform actively gathers usage data, which is then disseminated into the data space through EONA-X connectors designed to adhere to a standardised data format. This standardised format ensures compatibility and consistency across various datasets.

Once usage data becomes accessible within the data space, it becomes a valuable asset for various applications in urban mobility. SUMP tools and AI models can use this data for detailed analyses, optimising services, and making informed decisions. In this context, the journey planner plays a pivotal role by utilising usage data to train AI models. By integrating insights from usage data, AI models can better understand user profiles and travel preferences. This enables the journey planner to generate personalised itinerary results tailored to individual users' specific needs and preferences.

In a more advanced version, through continuous learning and refinement, AI models can adapt to evolving user behaviours and preferences, ensuring that itinerary results remain relevant and effective.

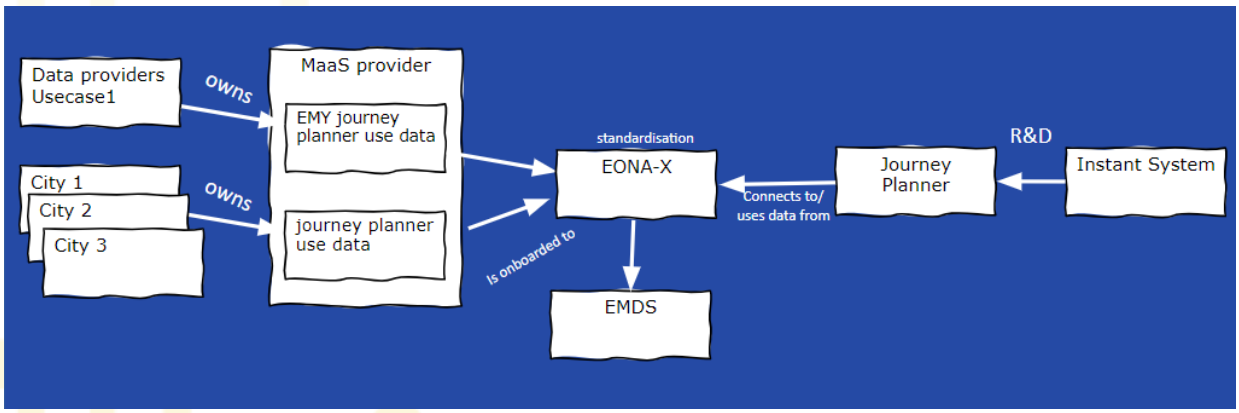


Figure 4 – Overview of the IDF_02 use case system in the scenario of the ideal pathway

4.4.2 Alternate pathways to implementation

As an alternative pathway, rather than publishing usage data through the EONA-X local data space, the MaaS provider can directly publish this data into the EMDS data repository. This alternative flow streamlines the data publishing process by bypassing intermediate steps. By leveraging this direct integration with EMDS, the MaaS provider can simplify the publication processing by limiting extra development by the local data space.

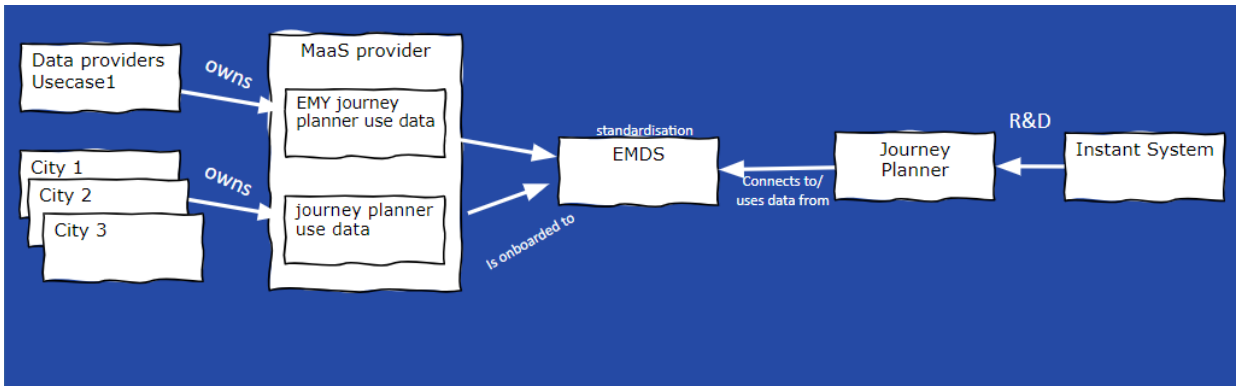


Figure 5 – Overview of the IDF_02 use case system in the alternate pathway scenario

4.4.3 Additional pathways to amend the use case implementation

The major objective of the standardization of the journey planner usage data is the interoperability and the reusability of these data by third players, such as cities for mobility planning matters. If we successfully meet this objective, the additional flow to the use case would be city users – we expect the participation of Ile-de-France Mobilités. The cities would share the journey planner usage data from their mobility app and use the standardized data product from the EMDS for mobility planning activities (integration into a smart city platform, training of digital twin models...).

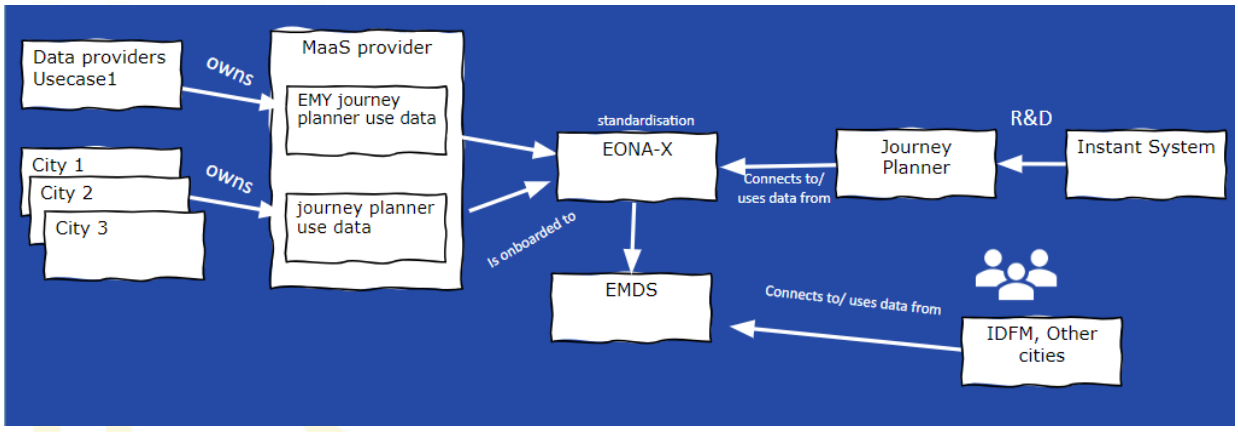


Figure 6 – Overview of the IDF_02 use case system including the additional implementation pathway

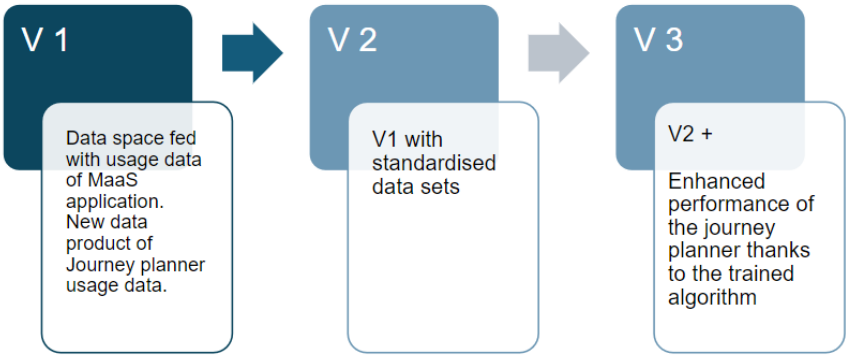
4.5 Primary use case implementation products

The following sections define the primary use case product or the minimal viable product design, to be implemented in the first iteration of the implementation project.

4.5.1 Description of the primary use case product (MVP)

The first step of the MVP implementation will result in journey planner usage data sets forming the new data product. The second step will be the standardisation of the data sets. Finally, the data product will feed Instant System's route calculator to train its algorithm, and result in an enhanced version of the calculator, which will be integrated into the Emy MaaS app (use case IDF_01) for pilot testing.

4.5.2 Steps of the primary use case implementation



4.5.3 Participants in the primary use case product

4.5.3.1 Data providers

Data provider 1	**Instant System IS**
Type of organisation:	SME, MaaS developer
Project partner:	Yes
Data product 1A	**MaaS usage data**
Data type:	Dynamic
Access:	Selectively accessible data
Conditions:	The data published in this product offer are related to the B2B MaaS app owned by Instant System, there are no requirements for access control on these data in the frame of the use case. In case of data sharing by cities, conditions may have to be defined according to their requirements.

Components:	Data sources/Data points	Data model/specification
	Itinerary research and trip results	Standard to be defined
	Itinerary/trips selection	Standard to be defined
	Travel preferences	Standard to be defined
	Mobility credit usage (transportation modes, subscriptions, ??)	Standard to be defined

Data provider 2	**Cities, Île-de-France Mobilités (tbc) (IDFM)**
Type of organisation:	PTA
Description:	Public transport authorities
Project partner:	No
Motivation to participate:	Cities motivation in sharing their MaaS usage data in the frame of this usecase is the opportunity to result in a standardised data product which would meet their needs of re-usability for mobility planning activities.
Data product 2A	**MaaS usage data**
Data type:	Dynamic
Access:	selectively accessible data
Conditions:	Conditions may have to be defined according to the cities' requirements.

Components:	Data sources/ Data points	Data model/specification
	Itinerary research and results	Standard to be defined

Ticketing validations	Standard to be defined
Free-floating vehicles	Standard to be defined
Itinerary/trips selection	Standard to be defined
Travel preferences	Standard to be defined

4.5.3.2 Data intermediaries

The IDF_02 use case considers EONA-X as data intermediary providing data access control through smart contracts and EMDS linkage.

4.5.3.3 Data consumers

The IDF_02 use case considers Instant System as data consumer interested in their own data offering described in Data product 1A and the MaaS usage data from additional sources described by data product 2A. Instant System is expected to take a role of data prosumer (in connection with the IDF_01 use case, delivering usage data from the EMY application to the data space for the utilization in this use case.

4.6 Subsequent implementation products

The following sections outline (potential) implementation products that may be introduced in subsequent iterations of the local implementation project.

A potential secondary implementation of the product involves leveraging the dataset by PT regulators and providers. The usage data can be integrated in SUMP analysis tools to offer valuable insights for PTA/PTO to better comprehend travel preferences and patterns of PT users, including origin/destination flows.

By analysing the usage data, cities can gain a deeper understanding of how residents and visitors use public transportation services. This analysis facilitates an assessment of the coverage and effectiveness of the transportation network in meeting the needs and preferences of end-users. For instance, Île-de-France Mobilitiés can use the dataset to analyse the traveller's preferences in terms of transportation modes including PT, carpooling or the usage of free-floating vehicles.

Insights derived from the data can inform strategic decisions regarding service optimisation, route planning, and infrastructure investments to enhance the overall quality and accessibility of public transportation options within the city.

5 Initial reflections on Detailed Implementation Plan - Part B for use case IDF_02

The project plan is expected to be finalised during the upcoming months taking into considerations both results of the initial inventory of datasets as well as developments made in other work packages. Preliminary considerations include the following distribution of responsibilities.

Step 1: Connectors development (EONA-X)
In parallel to use case IDF_01:

- Deployment of operational EONA-X infrastructure (EONA-X)
- Technical specification and analysis of data space connectors (EONA-X)
- Development of connectors to the data space:
  - Instant System to EONA-X (Instant System)

- EONA-X to EMDS (EONA-X)

Step 2: Data collection mechanism (Instant System)
In parallel to step 4 of IDF_01:

- Implementation of data collection mechanism, Definition of data structures (Instant System)
- Publication of data sets into EONA-X data space (Instant System, EONA-X)

Step 3: Standardisation (Instant System)

- Collaboration with potential end-users and mobility data experts to identify a standardised structure, technological watch (Instant System, EONA-X, NTT data?)
- Standardisation of data sets according to the identified structure. (Instant System)

Step 4: Route calculator improvement (Instant System)

- Feeding data collected from Emy usage (usage data generate by use case 1) into the journey planner algorithm
- Use of AI to improve the route calculator with the new data product (Instant System).

Step 5: Exploitation of the optimised algorithm Instant System)

- Integration of the optimised algorithm in the MaaS app (Emy)
- Pilot test with end-users and feedback collection (Instant System).

6 Conclusions

This report provides a detailed understanding of the local context of Île-de-France and summarises the objective, scope and preliminary implementation approach of use cases IDF_01 and IDF_02, as envisioned and proposed by the local project consortium of the Île-de-France implementation site.

The contextual information outlined in Part A of the Detailed Implementation Plan for each of the nine implementation sites offers a comprehensive understanding of the local projects for all consortium members and interested external parties. In combination with the ideation and elaboration process carried out by the respective local project consortia leading up to this refined summary of the use cases, these reports establish a clear agenda for deployEMDS to address in the upcoming months.

To pave the way for the Detailed Implementation Plan – Part B series, which will outline in detail the project plans for the EMDS deployment within (local use cases) and across (transversal use cases) the nine implementation sites, the following factors have been identified as particularly challenging and will be addressed by autumn 2024:

- **The lack of clarity in conceptualising the common EMDS**
  The prevailing heterogeneity among the Implementation Plans - Part A largely stems from the lack of clarity surrounding the EMDS concept and the technical possibilities offered by the European data sharing framework. While some implementation sites, experienced in decentralised data sharing within mobility or other locally significant sectors, view their use cases as facilitated by this common data sharing framework, others see the EMDS as an auxiliary tool. In these instances, the relevant data sets for the use cases are made available but without an immediate need for data space components. This question closely relates to the missing European or cross-border harmonisation dimensions in the deployEMDS use cases, as outlined in Deliverable D2.1 describing the technical requirements. This will be addressed during the development of the transversal use case frameworks in WP4 and in the project's strategic alignment process. Alignment with SIMPL, the Data Spaces Support Centre (DSSC) and other sectorial data space deployment actions will support this process.

- **The challenge of sustaining the common EMDS beyond project lifespan**
  The use case products proposed by local implementation sites do not merely pilot actions but rather address real-world mobility challenges in a sustainable manner. This underscores the need to ensure the sustainability of the implemented data exchange solutions beyond project end. However, implementation sites may hesitate to fully embrace the EMDS as the facilitating data sharing framework for their use case products due to uncertainties regarding its long-term viability and pathway. This is exacerbated by the overall ambiguity surrounding the EMDS conceptualisation. To tackle this issue, the strategic alignment process and WP3 on governance will define development scenarios for the EMDS beyond project end, taking into account initiatives such as the EMDS technical support study funded under CEF.

- **The missing or unclear link between the EMDS and existing common mobility data frameworks**
  The greatly varying levels of awareness for European (mobility) data legislation among local and regional stakeholders lead to a missing or unclear link between deployEMDS use cases and existing frameworks like the National Access Points (NAPs) mandated under the ITS Directive. Several data sets required for the use cases are already published in the NAPs by mandate of the MMTIS and RTTI delegated regulations. However, uncertainty surrounding the connection to the NAPs exists and is reinforced by the overall lack of clarity in conceptualising the common EMDS. The collaboration effort with NAPCORE (the National Access Point coordination effort), coordinated within WP3 of the action, will identify how these missing links can be established to ensure complementarity.

- **The lack of understanding regarding capabilities of data space components and technical governance to tackle data sharing challenges**
  The use cases proposed by the nine implementation sites tackle real-world mobility challenges that can be addressed with data-driven solutions or data-enriched products. Many data sharing challenges for these use cases could be resolved with technologies less powerful than a data space but the scaling of these solutions cross-border is potentially limited without a truly European framework. The question of technological choice and refining local use cases for EMDS deployment, while ensuring their real-world relevance to the co-funding cities, regions, and project partners will be addressed through the strategic alignment process within WP4, WP2 on technical infrastructure, and WP3 on governance. Further workshops and trainings will provide a better understanding of data space components and their concrete application in specific future-oriented use cases, especially for scalable data sharing ecosystems and sharing of non-public data where trust and compliance by design may play an important role.

In summary, both the reports and the elaboration process of the Detailed Implementation Plans - Part A have yielded valuable insights for strategic alignment in deployEMDS. Specifically, this report offers a clear and comprehensive initial description of the approach for the local implementation project in Île-de-France and the eight other sites across Europe. By autumn 2024, the Detailed Implementation Plan - Part B series will detail the final use case definitions and the detailed steps for their implementation, marking the first step toward deploying common infrastructure, governance and use cases as part of the common European mobility data space.