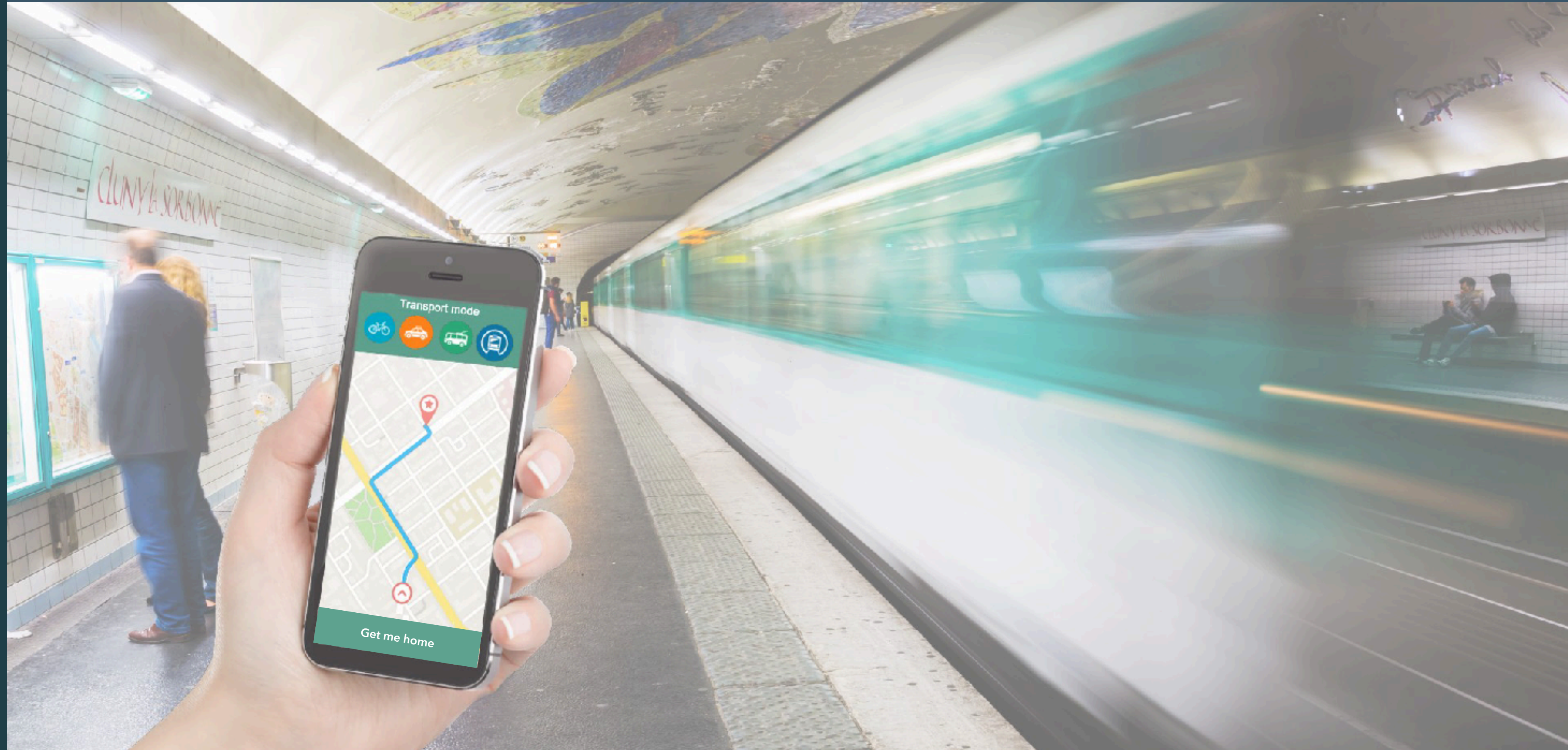


# MOBILITY-AS-A-SERVICE

## Market Report

### FREE ABSTRACT

The first in-depth  
analysis of the  
European MaaS  
markets



*Has the MaaS market growth reached its inflection point?  
When and how can it take off?*



# The European MaaS market is finally getting traction...

Dear reader,

I am sure you have experienced “bus bunching”. After waiting for your bus for 30 minutes, you then see 3 buses show up at the same time...

Could it be that MaaS follows the same pattern?

In the last 2 decades, multi-modal mobility has generated much activity in Europe but the **emergence of MaaS has been slow**, with supply that generally remained at city level and pilot stage.

Most MaaS initiatives have remained local.

**Suppliers have offered either public MaaS, corporate MaaS or private B2C MaaS, with most of their trips happening in just 1 transport mode.**

Key Mobility Service Providers (MSPs) have not built a real full-scale\* solution.

No legislation has forced stakeholders to open up. In particular, public transportation ticketing & payment, the biggest market, has largely remained closed to third parties.

**So the supply could have been the main roadblock to a MaaS success.**

**Our 8-month research has found that almost all leading PTOs have integrated multimodal offers into their apps** (cf. Bonjour RATP, Renfe’s dōcō, Hochbahn’s hvv switch), and some of them are finding the right formula to beat private MSPs at the national level. For example, Rejseplanen in Denmark has more downloads and better reviews than Google Maps.

Meanwhile, **leading mobility service providers such as FreeNow, Moovit and Uber, are rapidly integrating multiple modes, notably public transportation.**

The **22 selected MaaS providers profiled** have all **expanded their offer to include**, on average, **9 mobility services** in their MaaS platforms with some including up to 14 mobility services. Furthermore, **50% of the private MaaS suppliers profiled have expanded to more than 20 European countries.**

Thus, **in this post-COVID period, MaaS is finally taking off, driven by increasing competition, national and EU legislation, and the emergence of new transport modes and mobility models.**



# ... but who will be left to provide MaaS at scale?

Several initiatives pushed by European transport ministries will ease broader integrations and cooperation among the different players in the value chain.

**In 2022, Germany launched *Deutschlandticket*, a nationwide single ticket for public transport, and France is also in the process of launching its own.**

Other European countries are also moving in this direction. In **Italy, authorities started to fund ambitious MaaS initiatives in the country's 3 largest cities. Belgium has created an inter-regional vision of MaaS to foster its implementation**, which among others considers that PTOs must comply with competition rules and include the possibility to re-sell tickets through MaaS subscriptions.

In addition, recent EU-level actions are accelerating the trend.

**The European Commission's MaaS4EU** project provided frameworks and tools to remove the barriers and enable a cooperative and interconnected EU single transport market for the MaaS.

In addition, the Commission is amending **Directive 2010/40/EU, which extends the scope for deploying Intelligent Transport Systems (ITS) to include emerging services** and further opening multimodal information and ticketing & payment.

Among the goals, the new ITS framework foresees multimodal integration to facilitate modal shift and improve efficiency and accessibility to transport modes.

**As ticketing & payment are opening up, competition getting fiercer, and authorities removing cars from urban areas, we expect MaaS-enabled transaction revenues to grow from €22 to €105 billion between 2021 and 2030.**

However, **while multi-modal transport is taking off, end-users will not pay anything for it!**

MaaS is rapidly becoming an hygiene factor for all MSPs and platform vendors will need to aim for scale, not margins.

Which means, that, beyond local PTOs, we expect **only a few players to subsist to serve the mass market**. The acquisition of CityMapper by Via could be the sign of things to come...

This will push towards concentration on the supply side too.

**The MaaS market take off could be the result of this commoditisation.**

Sincerely,

Alberto Lodieu

Project Director



# This in-depth market analysis is the first decision-making tool for mobility stakeholders to design a successful MaaS strategy

- A **260-page** analysis of the current and future state of the MaaS market in Europe, based on:
  - **10** years of constant market surveillance
  - PTOLEMUS' experience of almost **200** client assignments across the mobility ecosystem
  - **10** months of research and analysis, including interviews with **22** key MaaS stakeholders
  - **118** MaaS deployments & pilots analysed
  - More than **150** figures presented in the report
  - More than **85** companies mentioned
- **An examination of the regulatory, business and technological context behind MaaS**
- **An in-depth analysis of the MaaS supply and demand:**
  - The building blocks of a MaaS solution
  - The different MaaS business models
  - The most relevant European public MaaS initiatives, including 10 case studies
  - The MaaS value chain
- **An assessment of 22 MaaS stakeholders including 10 PTOs and 10 platform vendors**
- **An evaluation of the future MaaS market, including evolution scenarios, analysis of the segments' needs, and current and future drivers of supply and demand**
- **Bottom-up 2022-2030 MaaS market forecasts**
  - Volume of trips for **8** mobility modes in **10** major European countries
  - MaaS-enabled transport revenues for **8** mobility modes in **10** major European countries
- **Short and long-term recommendations to key industry stakeholders, including:**
  - Public Transport Authorities (PTAs)
  - Public Transport Operators (PTOs)
  - Billing & ticketing systems providers
  - Mobility Service Providers (MSPs)
  - MaaS platform providers



*More than just market research.*

*In-depth strategic analysis and a complete tool to help your organisation make the right decision in the MaaS market*



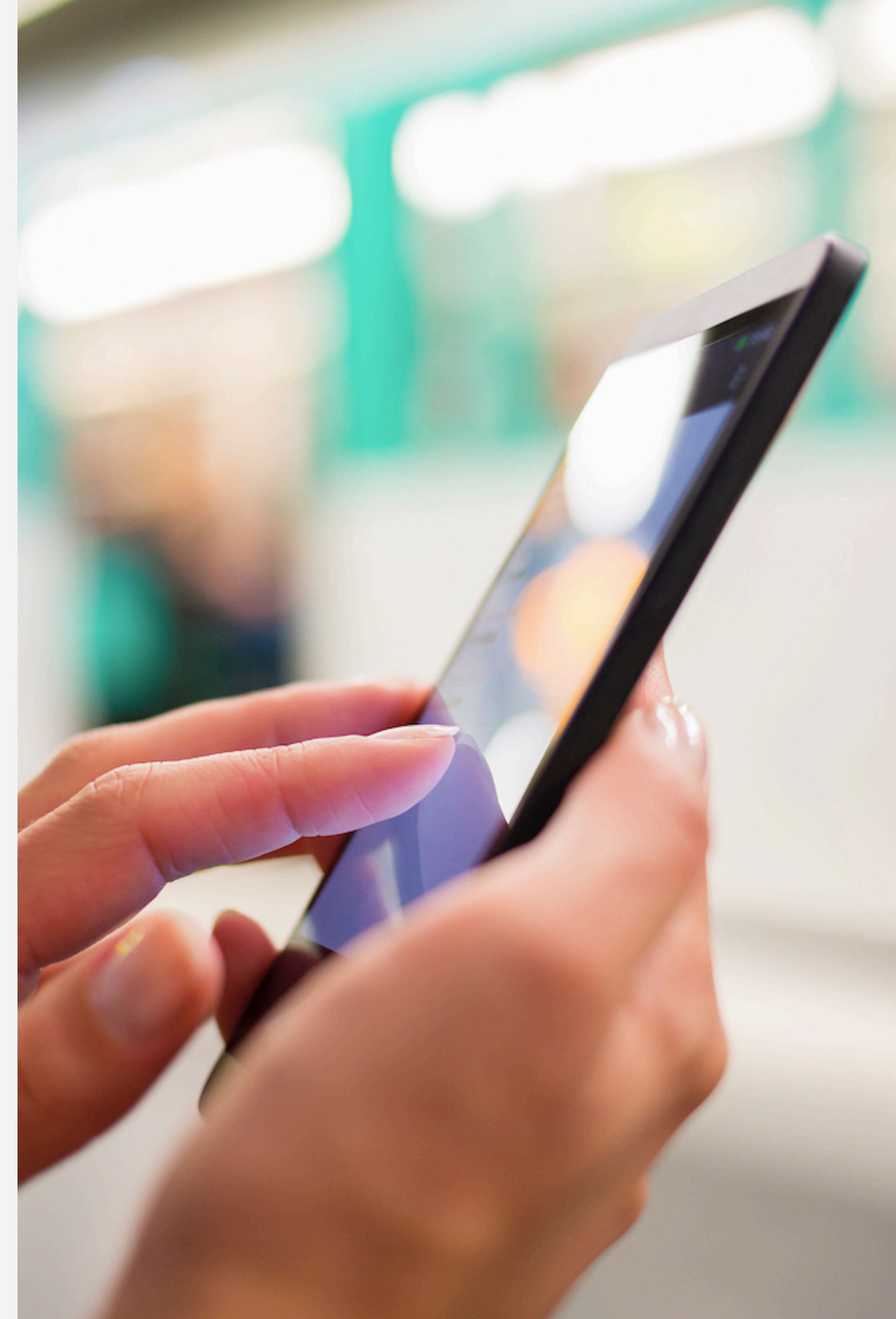
# In this report, we respond to 14 questions that are absolutely crucial for the future of mobility





# What is Mobility-as-a-Service (MaaS)?

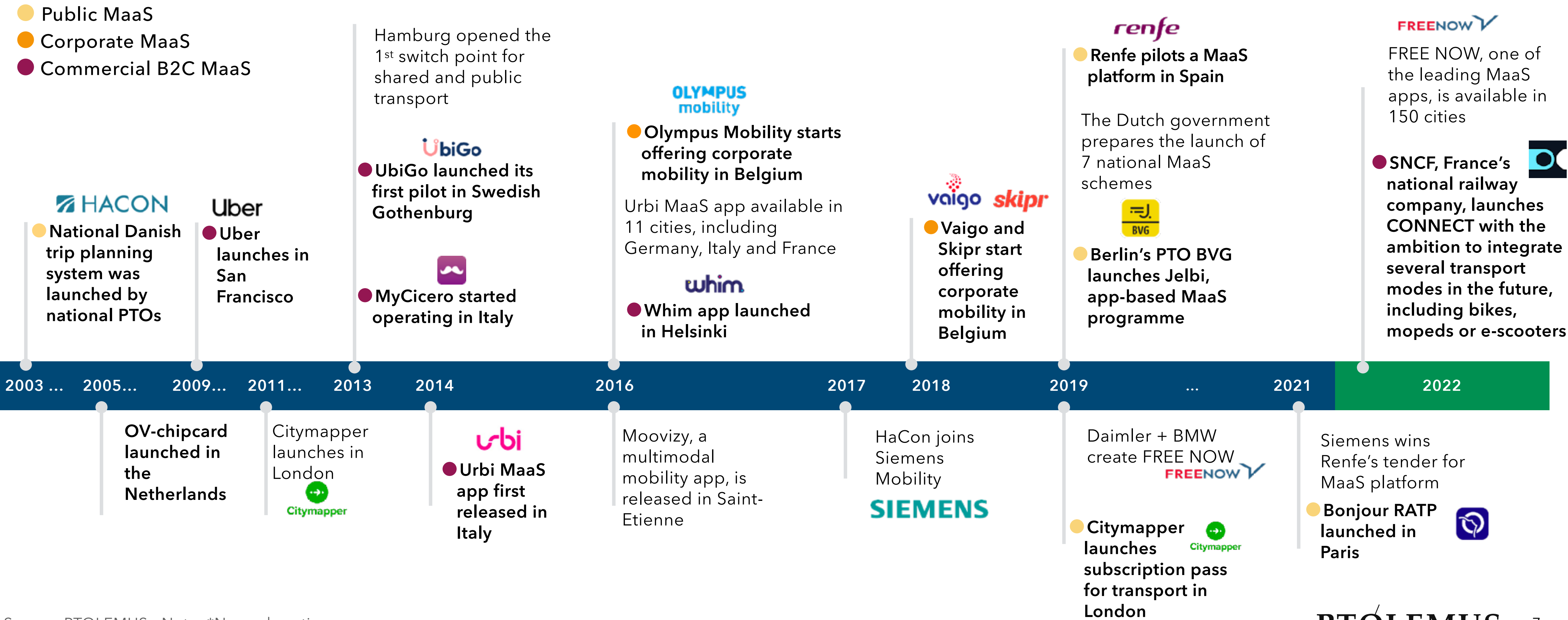
- A service offered to travellers that enables access to a **seamless, unified, multi-modal transportation experience by combining routing information, booking, payment and ticketing from multiple transport operators**
- It can also integrate vehicle services such as tolling, parking, fuelling, electric charging and repair
- It can be offered as a subscription or in a pay-per-use model **through a smartphone application**
- **By making multi-modal, multi-operator mobility seamless**, MaaS enables users to make **more sustainable choices**, shifting from private vehicles to public transport and **integrating the fragmented mobility market**





# The first examples of MaaS appeared 20 years ago, and yet, the MaaS market remains very small

Timeline of MaaS events and initiatives\*















Source: PTOLEMUS - Note: \*Non exhaustive



# MaaS bring enormous social benefits in terms of accessibility, emissions, congestion reduction and cost

- MaaS can integrate all existing and new transport modes and technology developments including:
    - Public transportation
    - Shared mobility
    - Micro-mobility
    - Autonomous vehicles
    - Electric vehicles
    - eVTOL
  - For car owners, it can incorporate navigation, routing and payment services such as:
    - Parking
    - Electronic tolling
    - EV charging
    - Fuelling
    - Access to other transport modes
- The more transport alternatives commuters have, the better their ride is as they:
    - **Reduce time spent**
      - Avoid disruptions such as strikes or congestion by switching to other transport modes
      - Avoid searching for parking
      - Better time management thanks to routing prediction tools
    - **Reduce cost**
      - Choose the most cost efficient mode
      - Save on the cost of buying, insuring and maintaining a car
    - **Increase comfort**
      - Time to do other things than driving
      - Combining mobility services smoothly
      - Different transport modes to reduce time
- Improve health by shifting to cycling or walking
  - MaaS allows commuters to plan, move using different transport services and pay in a smooth manner
    - All integrated into a single planning and payment platform
    - Accessible through smartphones
  - A broad implementation of MaaS would support solutions to reduce transport externalities and other urban mobility issues:
    - Inefficient use of transport infrastructure
    - Congestion
    - Emissions
    - Lack of accessibility
    - Lack of coverage

Services offered by selected MaaS suppliers

MaaS supplier		1	2	3	4	5	6	7	8	9	10	11	12
	Trains	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Metro	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Buses	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Bike services	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	e-Scooters	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	Moped Sharing	✓	✓	✓	✓	✓	✓	✓	✓				
	Ride hailing	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓
	Taxi	✓	✓	✓	✓	✓			✓	✓	✓		✓
	Infrastructure*	✓	✓	✓			✓	✓		✓		✓	✓
	Car sharing	✓	✓		✓	✓		✓	✓			✓	✓
	Car rental			✓			✓		✓			✓	✓
	Car pooling				✓						✓		✓

Source: PTOLEMUS - Note: \*EV and fuel charging stations, parking, tolling, ferry;



# MaaS will disrupt the mobility ecosystem, generating €105 billion in revenues in Europe in 2030

- Like video & music streaming, MaaS can be seen as a disruptive proposition as it is:
  - On demand
  - User-centric
  - Based on real-time information
  - Comparing alternatives
  - Optimised according to users' preferences
  - Traceable and rechargeable
  - Delivered through a cloud platform
  - Accessible with a click
- Still, MaaS faces major barriers, including:
  - The need to ensure the provision of the services (e.g. maintaining the fleet of bikes or mopeds) and build a robust digital platform
  - Multiple developments need to happen to integrate tracking, routing, payment and ticketing into a single platform
  - In most cities, the incumbent public transport operators keep the transport service delivery closed to other private or public stakeholders
- Service providers need to establish:
  - **Partnerships** for multi-modal integration and agreement on contractual responsibilities
  - **Rules for revenue share**
  - Agreements on the **rules to manage information rights and privacy**
  - Methods to protect the **security of digital transactions**
- Insurers need to develop new behaviour-based (vs. only asset-based) **policies for users and suppliers**
- Several **uncertainties** remain on MaaS' future development, including the following:
  - **The success of the subscription model**
  - **The pace of adoption**
  - **The winning model for each user segment**
  - **The dominant player(s)**
- Once service providers fully replicate the end-to-end journey, **commuters will have access to all mobility services with a single click**
- **We expect transport revenues from MaaS platforms to generate €105 billion in 2030**

“ The true added value of MaaS is the strong integration of multiple apps into a single one: you know the options and you can pay for them directly.

Thus it becomes much more than a map, it helps in promoting healthy mobility choices, it gently re-shapes the way cities look. ”





# Europe offers the ideal conditions for the take off of MaaS

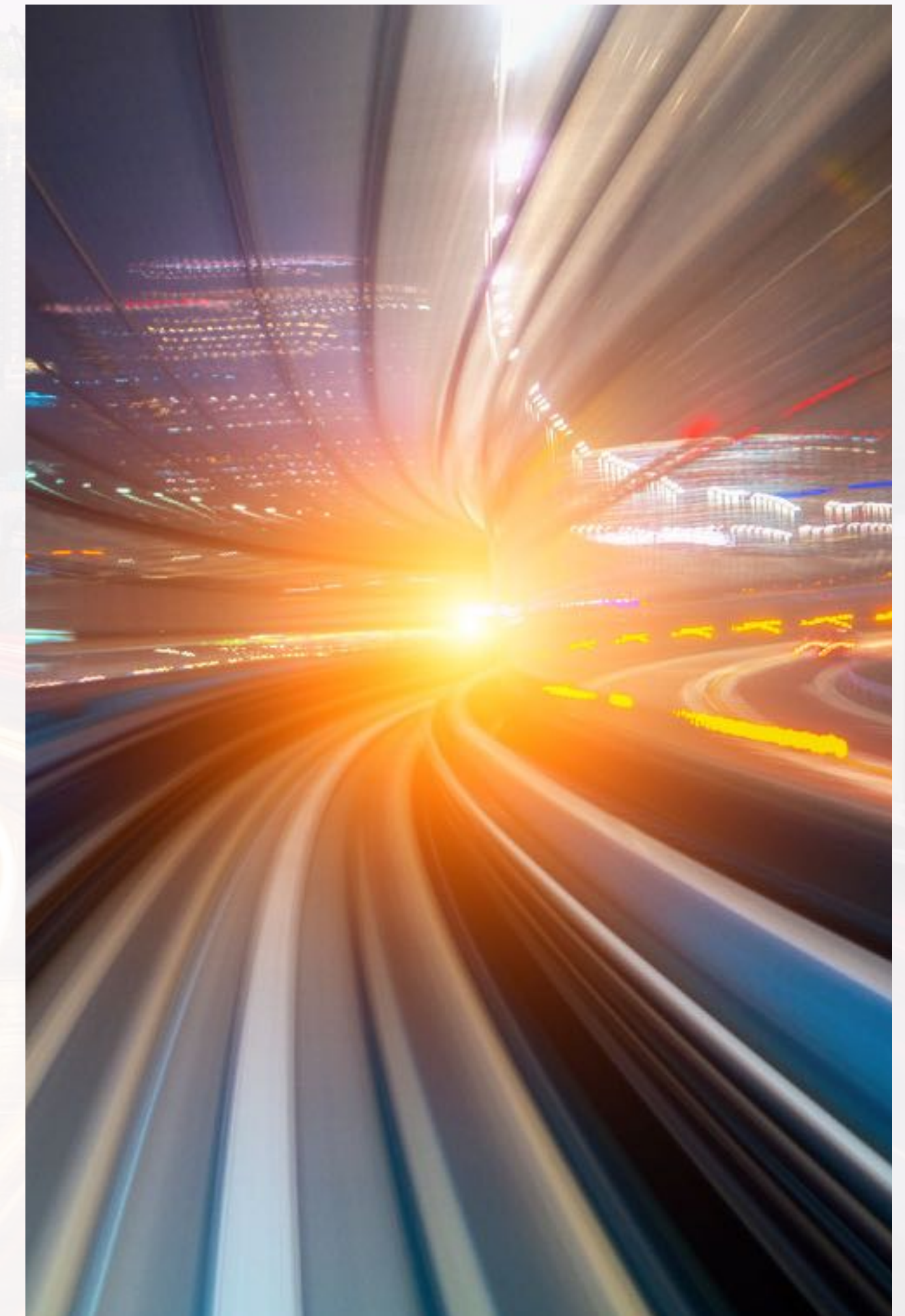


- Europe offers the **ideal conditions** as a testbed for MaaS because of its broad range of transport alternatives
  - Europe is the continent with the **highest rail density**
  - It has one of the **highest ratios of vehicles per capita**, resulting in large traffic jams in urban areas
  - Leading micro-mobility providers such as TIER, LIME and Dott have their largest fleets in Europe
  - Compared to Q2 2021, in Q2 2022, **the shared mobility ridership increased by 48% in several western European countries\*\***
  - **Google Maps** covers transit most of European cities and **Citymapper** offers access to **76 cities**
- **EU institutions actively promote a new approach towards urban mobility**, based on access to **reliable public transport**, widely supported by multimodal travel
  - **MaaS** is among the solutions the European Commission has listed in its New Urban Mobility Framework
  - Regulation, pilot projects, and research funding address the **transition to new forms of mobility around EU cities**
- **The EU leads in the proactive regulation against the dominance of tech giants in the digital domain:**
  - The **Digital Markets Act** avoids the creation of monopolies by digital 'gatekeepers' and ensures technology neutrality
- **The upcoming Data Act is expected to force all connected device producers to give access to relevant user datasets**
  - This could greatly facilitate the access to connected car, connected bus, connected coach data



# Based on our research, we expect a car-centric MaaS development to be the dominant model across most European cities in this decade

- **Urban mobility services are now rapidly being digitalised and are becoming:**
  - User-centric
  - Based on real-time information
  - Capable to offer multiple options
  - Optimised according to users' preferences
  - Traceable and rechargeable
  - Delivered through a cloud platform
  - Accessible with a click
  - On-demand
- **MaaS platforms will disrupt the market**
  - Improve how we move by integrating different transport modes into 1 app, making it a seamless user experience
  - It increases the value and practicality for users
  - Thanks to smartphone payments, reduces cost and improves efficiency for transport operators
  - Routing capabilities and integration of multimodal mobility reduces road traffic and congestion in cities
  - Improves the match of commuters with transportation alternatives
- **Ticketing & payment will now shape the future of MaaS**
  - While planning and routing has been the cornerstone of MaaS, as platforms evolve, payment & ticketing is becoming the most important building block
  - Players with the best planning and routing platform benefit from a unique positioning, but those providing ticketing & payment will control the market
- **We foresee 3 evolution scenarios as the most likely to happen in the European MaaS market**
  - (1) ***Car-centric MaaS development***
  - (2) ***MaaS dominated by PTOs slowly emerges***
  - (3) ***Multi-modal, multi-operator MaaS flourishes***
- **We expect that a car-centric MaaS development will be the dominant model in Europe, still each city will follow a different evolution depending on the characteristics of its existing mobility ecosystem and the national regulatory actions**





# This report's 7 sections cover both qualitative and quantitative aspects

<b>1 Introduction</b>	<b>21</b>	<b>4 Value chain and leading MaaS platform suppliers</b>	<b>94</b>
1. Definitions		1. The MaaS value chain	
2. Context		2. MaaS platform suppliers' profiles	
<b>2 Understanding MaaS</b>	<b>41</b>	<b>5 MaaS evolution scenarios</b>	<b>159</b>
1. The 5 levels of MaaS		1. 5 factors influencing transport choices	
2. MaaS business models		2. The perceived value of MaaS	
3. The case of Dutch Maas deployments		3. MaaS drivers and inhibitors	
		4. Future MaaS scenarios	
<b>3 Most relevant PTO and government initiatives</b>	<b>58</b>	<b>6 MaaS market forecast</b>	<b>210</b>
1. Bonjour RATP		1. Overview	
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4. Hvv switch		4. Taxis	
5. Jelbi		5. Ride hailing	
6. Ov-chipkaart and 9292		6. Shared mobility	
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		1. Short and long-term goals, challenges and recommendations	
		2. Conclusions	

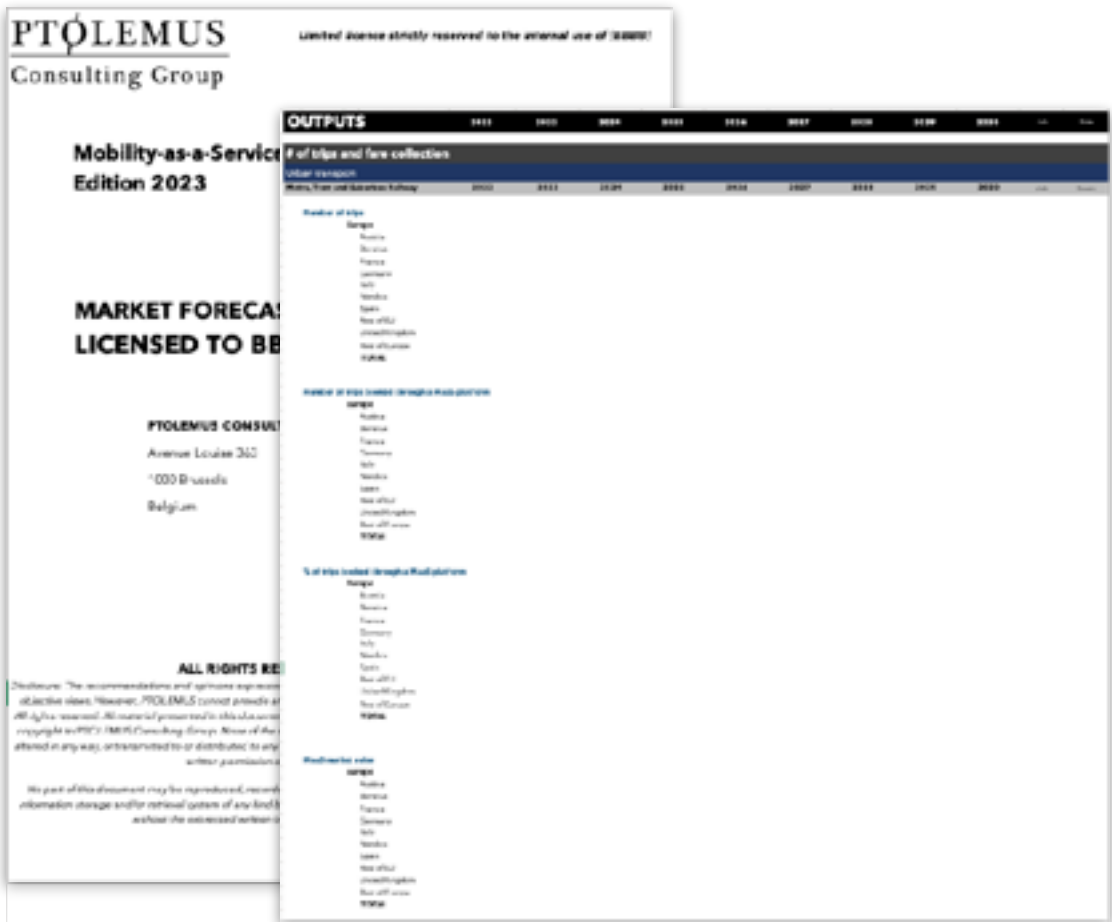


# The report is the first to provide bottom-up volume and revenue market forecasts for 10 European regions and 8 mobility modes

## MaaS market forecast



- **Excel file with 2022-2030 market forecast, including:**
  - Volume of trips
  - Volume of trips enabled by MaaS platforms
  - Revenues of transactions enabled by MaaS platforms
- **Covering 8 mobility modes:**
  - Metro, tram & suburban railway
  - Bus
  - Taxi
  - Ride hailing
  - Shared mopeds
  - Shared bikes
  - Shared scooters
  - Shared cars
- **For 10 regions:**
  - Austria
  - Benelux
  - France
  - Germany
  - Italy
  - Nordics
  - Spain
  - Rest of EU
  - UK
  - Rest of Europe





# The report mentions 130+ MaaS stakeholders, including...

Company	Type	Company	Type	Company	Type
Conduent	Billing & ticketing systems providers	Breng	Mobility Service Providers	Helbiz	Mobility Service Providers
Cubic		Brixlane		Hochbahn	
Init		Cabify		HTM	
IVU traffic		Cambio		Imbric	
Logpay		Check		INRIX	
Scheidt & Bachmann		Citymapper		Jelbi	
Skyss		Cityscoot		Karhoo	
Thales		Cooltra		Keolis	
Trapeze		Cozy car		Kinto	
Luminus	Energy suppliers	Donkey Republic		Kolumbus	
TotalEnergies		Dott		Lime	
Metromile	Insurers	DR		Lyft	
Nationwide		DSB		Lyko	
Amaze	Mobility Service Providers	Emmy		Mile	
Arriva		Entur		Miles	
Avocargo		Europcar		Mobiflow	
BerlKönig		Freenow		Mobileeee	
Bip&Drive		Fynbus		mobilleo	
Bird		Gaiyo		MOIA	
BlaBlaCar		Gett		Moovit	
Blue-bike		Google		Move About	
Bolt		Hacon		Moves	



# The report mentions 130+ MaaS stakeholders, including...

Company	Type	Company	Type	Company	Type
Movitaxi	Mobility Service Providers	Uber	Mobility Service Providers	ATM	Public Transport Authorities
myCicero		Urbi		Île-de-France Mobilités	
Nabogo		Vaigo		Ruter	
Octo Telematics		Velib		Transport for London	
Pony		Voi		VY	
Poppy		Waymo		9292	Public Transport Operators
Qarin		Waze	Parking Solutions Providers	BVG	
Qbuzz		Wegfinder		DeLijn	
Reby		WeShare		EMT	
Rivier		WienMobil		Hochbahn	
ShareNow		Yego		MEL	
Sigo		BePark	Parking Solutions Providers	NS	
Sixt		EasyPark		OBB	
Skipr		Inrix		RATP	
SNCF		Passport	Platform Vendors	Rejseplanen	
TaxiBerlin		Fluidtime		Renfe	
Telepass		Here Maps		Rheinbahn	
Tier		Mapbox		STAS	
Trafi		Mappy		Transdev	
Travis		OpenStreetMap		VBB	
Troopy		Siemens		VRR	
Turnn		TomTom			
		Whim			



# We would like to thank these forward-looking organisations for sharing their views with us!

**ATEC ITS FRANCE**

**BEMOBILE**  
a revolution in traffic

**citygo**

**ENTUR**

  
Fluidtime

**REGION H**  
The Capital Region  
of Denmark

 **instant system**

**Lyke**

**MIVB STIB**

  
**NSGO**

**OCTO**

  
**RTA**  
هيئة الطرق والمواصلات  
ROADS & TRANSPORT AUTHORITY

**SIEMENS**

  
**STAD ANTWERPEN**

**Parkopedia**

**TIER**

 **transportapi**

 **universität  
wien**

  
**vaigo**

**voi.**

  
WhereIsMyTransport



# The report leverages PTOLEMUS' mobility experience and the expertise of 8 consultants and researchers (1/2)



**Frederic Bruneteau**

Managing Director



**Alberto Lodieu**

Senior Manager



**Andrew Jackson**

Research Director



**Svetlana Tvorogova**

Research Consultant

## Experience

**27 years**

The founder of PTOLEMUS, Frederic has accumulated 25 years of experience of the mobility and transport domain.

He has become **one of the world's foremost experts of connected mobility** and is interviewed on the subject by publications such as the *Financial Times*, *Forbes*, the *Wall Street Journal* and *The Economist*.

He has **led over 180 consulting projects and helped many world leaders define their strategy and implement it.**

Clients he has served include A-to-Be, Abertis Mobility Services, AGC Automotive, Allianz, Axxès, AXA, Baloise, Bombardier, BP, Bridgestone, HERE, the European Commission, Hitachi, Octo Telematics, Orange, Société Générale, ST Engineering, Telepass, TomTom, Toyota, Transurban, wejo and WEX.

**Frederic supervised the research of the Mobility Platform Suppliers Handbook in 2018 and fully reviewed this report.**

**14 years**

Alberto has 14 years of experience in strategy consulting, and has participated to over 60 consulting assignments.

He has specialised in connected mobility, location-based services, electronic toll collection, road usage charging, autonomous vehicles, and usage-based insurance.

He has assisted 40+ organisations in defining their mobility strategies, launch new services, perform commercial due diligence

Alberto has been leading our work to build a global picture and forecast of mobility trends: new players, new vehicle types, new business models, smart city initiatives, etc.

Alberto is a regular speaker at mobility, location-based services and fleet conferences.

**He led the research and writing of our landmark 750-page Global Mobility Roadbook (2019)**

Alberto coordinated the research, writing and review of the report.

**15 years**

With a career in market research spanning 15 years, Andrew has over 11 years of experience working in the automotive and industrial sectors.

Andrew has led and participated in many automotive and telematics market research projects:

Provided forecasts for the growth of EVs in the UK, to a leading automotive media company;

Provided insights to a major telematics technology provider regarding the future of connected vehicles

Led the global research and created 5-year sales forecasts for a major geospatial data analysis company's go-to-market strategy;

Provided insight and analysis on the automotive aftermarket for some of Europe's key tier-1 suppliers.

As PTOLEMUS' Research Director, Andrew supervised and contributed to the research and writing of this report.

**20 years**

Svetlana has gained experience with a very large set of organisation such as Arthur D. Little, Bamberg University (Germany), Erasmus University Rotterdam, the Higher School of Economics of Moscow, EuroWejo and the World Bank.

For more than 10 years, Svetlana taught at the Research University - Higher School of Economics (Moscow, Russia), which nominated her for the Nation's best lecturer, and at Bamberg University, Germany.

Some key projects Svetlana completed include:

Helped a vehicle data hub understand fleets' use of telematics and interest for vehicle data services in Europe and North America;

Helped a private equity firm evaluate the future demand from insurance companies for UBI solutions in Europe and North America;

Svetlana led the primary research, and participated to the writing and review of the report.

## Biography



# The report leverages PTOLEMUS' mobility experience and the expertise of 8 consultants and researchers (2/2)



**Laura Pájaro**  
Research Analyst



**Damien Orsoni**  
Business Analyst



**Nan Chu**  
Research Analyst



**Claudia Lozano**  
Senior Business Analyst

## Experience

### 4 years

An architecture, transportation and mobility technologies enthusiast, Laura holds a master degree in Urbanism from the VUB and ULB, Brussels.

Since Laura joined PTOLEMUS she conducted first and secondary research on Mobility-as-a-Service and User-Based Insurance.

She participated fragmenting regional research reports and creating case studies.

Key projects she completed include:

Suggested possible functionalities and case uses for a master mobility centre operating in Flanders and Brussels, Belgium

Helped to understand the likelihood to choose specific tracking technologies for the implementation of RUC in Brussels

Revised business plan to consider opportunities to expand architectural services to the middle east market

Laura participated in the research, writing and review of the report.

### 3 years

A passionate of strategy consulting and new technologies, Damien Orsoni has studied in France, the Netherlands and Italy. Within PTOLEMUS he has developed an expertise on Usage-Based Insurance (UBI), Telematics and Connected Mobility.

Damien's most important consulting assignments include:

For a major US telecommunication operator, he helped defining its entry strategy into European and Asian emergency services markets,

For a major European assistance group, he designed their connected vehicles strategy, value proposition, MVP and implementation roadmap,

He participated in the research and writing of PTOLEMUS' Connected Auto Insurance Global Study, an in-depth analysis of the connected auto insurance industry, and contributed to the design of the 2020-2030 market forecast.

Damien participated in the research, writing and review of the report.

### 3 years

Before joining PTOLEMUS, Nan has worked in marketing research covering China & Europe, enabling stakeholders in industries such as ICT, logistics and biopharmaceutical, to identify, explore and leverage business opportunities.

Nan's recent projects include:

For a European telecoms company, he helped identify the top Chinese companies in the mobility business that require cellular connectivity.

For a human resources consulting firm in Europe, he helped organising a major advertising campaign targeted for Chinese speaking clients.

Within PTOLEMUS, Nan has contributed to our new Commercial Fleet Telematics Global Study.

Nan participated in the research and writing of the report.

### 6 years

A Toulouse Business School alumnus, Claudia worked at Accenture on strategy consulting assignments for the mobility sector:

For a multinational car manufacturer, she helped determining the User Recognition technologies to implement on the connected vehicle.

For several User Recognition technologies, Claudia performed benchmarking analysis including OEMs and OESs, identified relevant use-cases.

For a leading railway company, she supported the definition of a governance structure for the infrastructure projects.

Claudia has also worked on business transformation out of the mobility sector.

Claudia also acquired experience during her internship at IBM as a Junior Consultant on a business transformation project.

Claudia participated in the research and writing of the report.

## Biography

# Mobility-as-a-Service Market Report

Report purchase options and pricing





# The report comes with a single, worldwide company licence, market forecasts and an introductory workshop



For more information about the report, email [contact@ptolemus.com](mailto:contact@ptolemus.com)



You can purchase the report by requesting an invoice or buy online\*\* (Visa or MasterCard) on our website

	Report	Market forecast	Introductory workshop
Contents	<ul style="list-style-type: none"><li>• A <b>260-page analysis</b> in pdf format of the relevance, evolution and main dynamics of the MaaS market</li><li>• An examination of the <b>value chain of the MaaS market and its main power players</b>, with <b>12 company profiles</b> and <b>multiple use cases</b></li><li>• A detailed <b>forecast of the number of trips in Europe</b>, and the corresponding <b>total addressable market for MaaS operators</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Excel file with 2022-2030 market forecast outputs for 10 regions:</b><ul style="list-style-type: none"><li>- Austria</li><li>- Benelux</li><li>- France</li><li>- Germany</li><li>- Italy</li><li>- Nordics</li><li>- Spain</li><li>- Rest of EU</li><li>- UK</li><li>- Rest of Europe</li></ul></li><li>• <b>Covering 8 mobility modes:</b><ul style="list-style-type: none"><li>- Metro, tram &amp; suburban railway</li><li>- Bus</li><li>- Taxi</li><li>- Ride hailing</li><li>- Shared mopeds</li><li>- Shared bikes</li><li>- Shared scooters</li><li>- Shared cars</li></ul></li></ul>	<ul style="list-style-type: none"><li>• The full report presented to your board or strategy team</li><li>• 2-hour workshop*</li></ul>
Group-wide	€3,995		Included

# The report's licence can be purchased together with the Google in Mobility Report



+



	Mobility-as-a-Service	Google in Mobility
Contents	<ul style="list-style-type: none"> <li>• A <b>260-page analysis</b> of the relevance, evolution and main dynamics in the MaaS market</li> <li>• An examination of the <b>value chain of the MaaS market and its main power players</b>, with <b>12 company profiles</b> and <b>multiple use cases</b></li> <li>• A detailed <b>forecast of the number of trips in Europe</b>, and the corresponding <b>total addressable market for MaaS operators</b></li> <li>• <b>Excel file with a 2022-2030 market forecast for 10 regions and 8 mobility modes</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>A 140-page investigation of the current and future Google’s strategy in the urban mobility market</b> <ul style="list-style-type: none"> <li>- An in-depth analysis of Google’s successes to date</li> <li>- An analysis of Google’s partnerships and actions in urban mobility</li> <li>- An overview of Google’s strategy and initiatives in the mobility field, including</li> <li>- A detailed analysis of 4 strategy alternatives that Google could adopt in MaaS, including booking and ticketing &amp; payment</li> <li>- An evaluation of the future MaaS evolution scenarios, including customers’ segments needs and future drivers of demand and supply</li> <li>- An assessment of Google’s future role, position and strategy in the market based on                             <ul style="list-style-type: none"> <li>• The 3 main evolution options we identified and their likelihood to happen</li> <li>• A forecast of Google’s EBITDA generated by MaaS in Europe in the 3 main strategy options</li> </ul> </li> </ul> </li> </ul>
Group-wide licence	€4,495	



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# The 260-page report is structured in 7 sections

1. Introduction
2. Understanding MaaS
3. Most relevant PTO and government initiatives
4. Value chain and leading MaaS platform suppliers
5. MaaS evolution scenarios
6. MaaS market forecast
7. Conclusions and recommendations for stakeholders





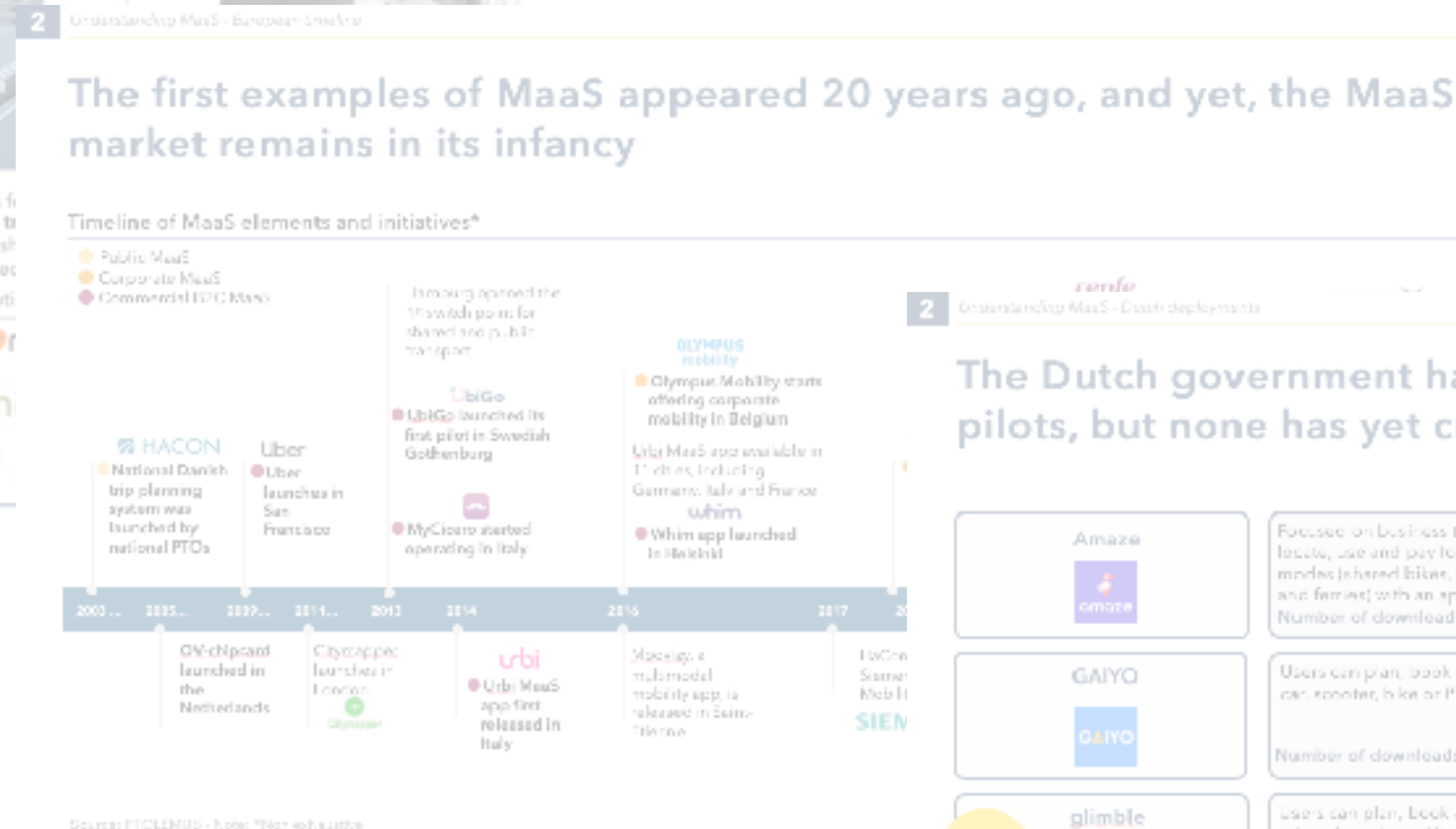
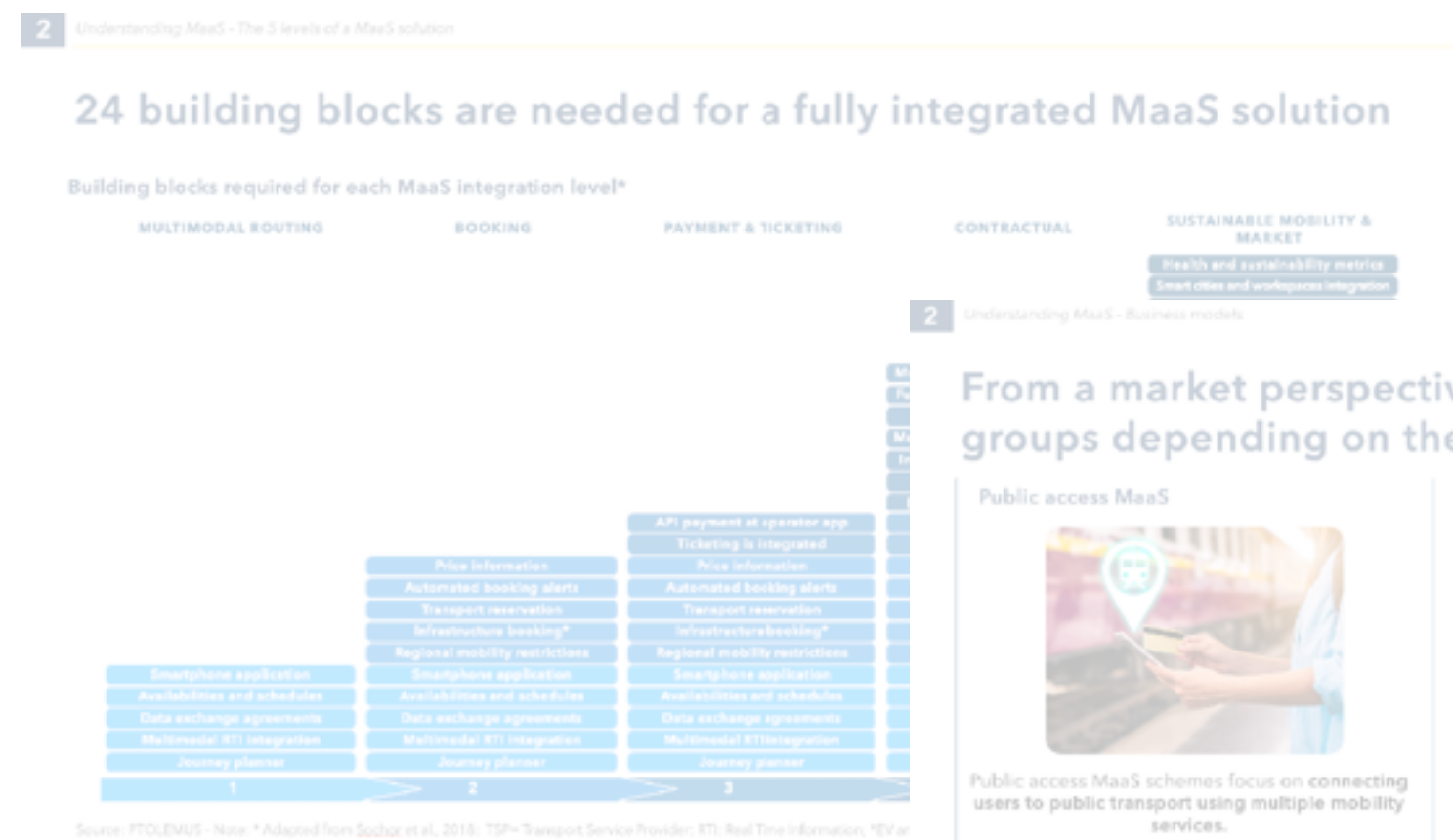
# In section 1, we analyse the key driving factors of the MaaS market

- This first section includes **over 20 slides**
- It **defines MaaS and its key driving factors** and the advanced state of the European market in the MaaS domain

- We chose to focus on Europe for several reasons, including
  - The **broad range of transport alternatives** available in the European market
  - The **promotion of a new approach towards urban mobility** by EU institutions

**In section 2, we analyse the MaaS building blocks, delivery models and 7 Dutch regional pilots**

- This second section includes **over 15 slides**
- It details the **5 levels to climb to build a fully integrated MaaS service**, including the 24 key building blocks required for each MaaS integration level



- We examine the **3 main MaaS business models**: Public access, Commercial and Corporate MaaS
- We present **7 regional pilots in the Netherlands** and compare the transport services they offer



**In section 3, we describe and examine the 10 most relevant PTO and government MaaS initiatives in Europe**

- This third section includes **over 35 slides**
- It dives into **10 European public MaaS initiatives**

- It describes their main characteristics, including their **business model, partners or the transport services they include**
- It compares their **levels of integration** and **assess their position in the market**



# We investigate the success of the leading European MaaS initiatives

## Major MaaS schemes in Western Europe



**Bonjour RATP is Paris' MaaS programme.** Launched in 2021, the app-based programme is run by the City's PTO, RATP. It has reached 10 million downloads.

dōcō is **Spain's national travel plan system**, operated by the state-owned railway company **Renfe**, launched in 2022. dōcō is the first nationwide MaaS programme in Spain, intending to cover all major cities.

**Entur** was founded in 2016 by Norwegian **railway operator VY** to **offer common ticketing solutions for rail services**. Since 2021, its app has integrated shared mobility services, including bicycles, e-scooters and car sharing.

**hvv switch** is **Hamburg's latest MaaS payment app of all integrated TSPs**, introduced in 2020. The app is managed by the city's largest PTO and public transport network association.

**Jelbi**, an app-based MaaS **integrating PTOs and TSPs in Berlin**, was launched in 2019. Jelbi has over 70,000 shared vehicles available.

**OV-chipkaart and 9292** launched a MaaS initiative in early 2000s in the Netherlands to build a **single public transport solution for the country, which now integrates several TSPs**. 9292 was downloaded more than 5 million times.

**Rejsekort and Rejseplanen joint MaaS initiative in Denmark took over Google Maps in terms of users.** Since 2020, the app Rejseplanen has integrated, in addition to public transport, shared mobility services such as bicycles, mopeds and e-scooters.

The **Smart ways to Antwerp initiative was launched in 2016 as the city's route planner**. It is open for MaaS players to incorporate it into their navigation system.

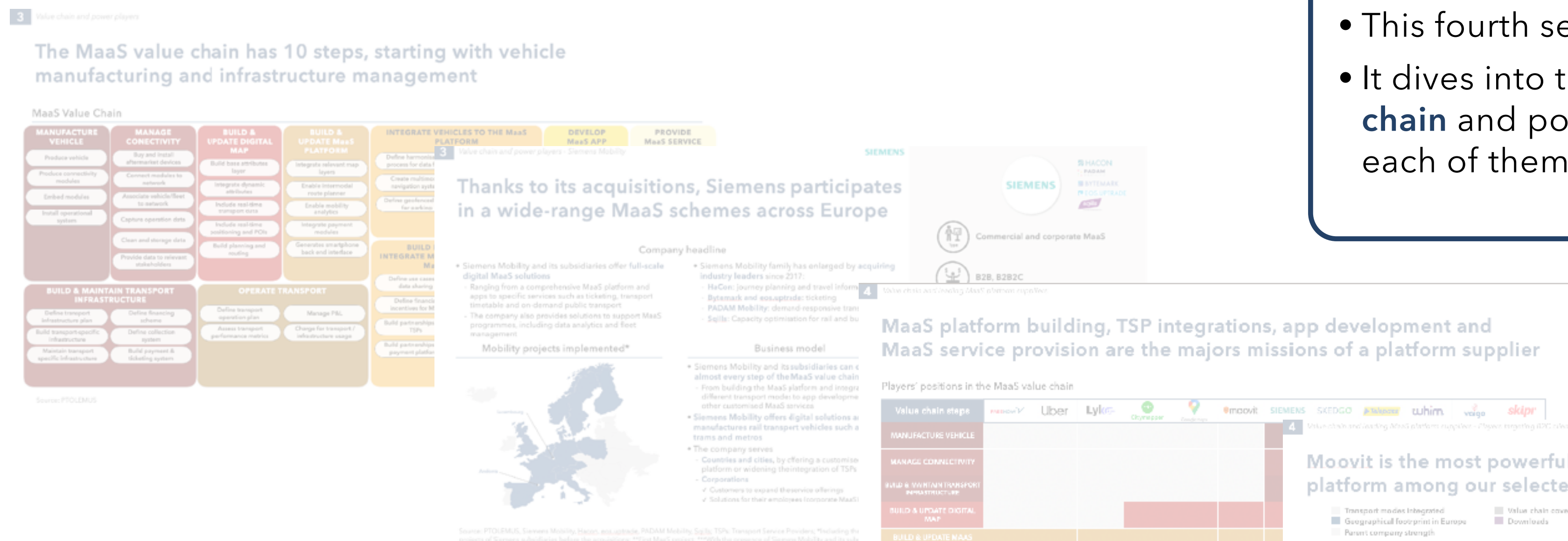
**Travis is the first nationwide MaaS app in Sweden**, launched in 2019. Since 2021, Travis has integrated booking and ticketing for e-scooters.

Launched in 2017, **WienMobil** is one of the earliest **MaaS apps led by the public institutions in Europe**. It has integrated almost all transport modes in Vienna.

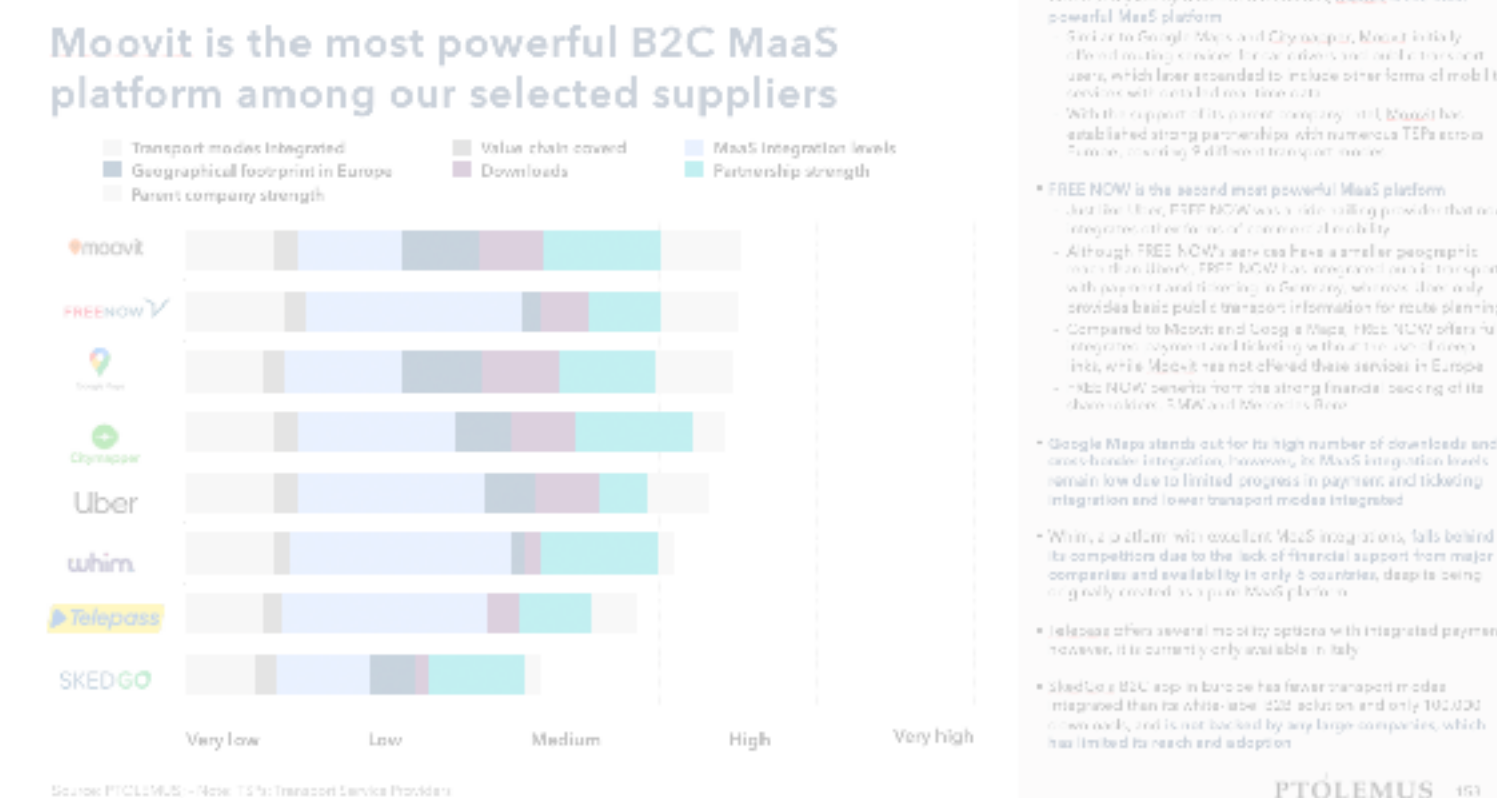


In section 4, we dissect the MaaS value chain and benchmark the key MaaS platform & solution providers in Europe

- This fourth section includes **over 60 slides**
- It dives into the **9 steps of the MaaS value chain** and positions the **leading players** in each of them

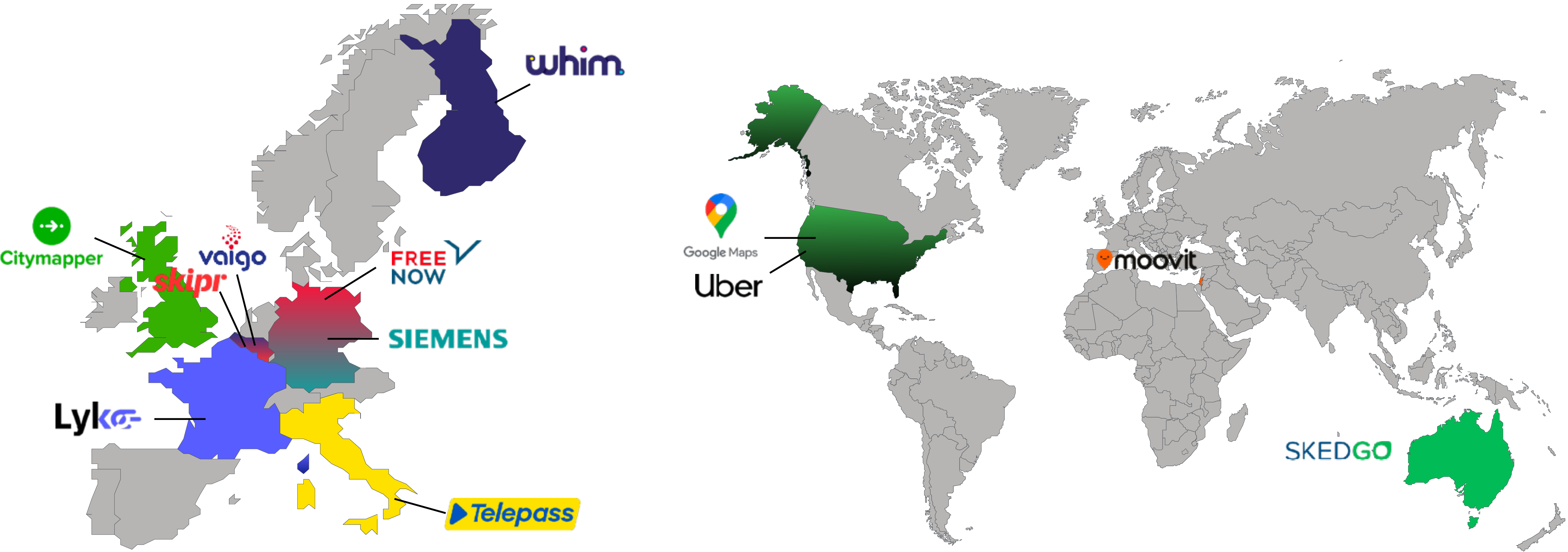


- We profile the 12 leading MaaS suppliers in Europe
- We **compare them based on 7 criteria, including their MaaS integration levels or their geographical footprint**



# We have evaluated all key suppliers operating in Europe

Headquarters of the selected MaaS platform suppliers





# In section 5, we describe and evaluate the 3 main MaaS evolution scenarios

- This fifth section includes **over 50 slides**
- It **lists and analyses the factors affecting commuters' choices** when selecting a mobility mode

- We study the **regulation, market and technology drivers and inhibitors** impacting MaaS in Europe
- We build **future scenarios of MaaS in Europe** and assesses their **respective likelihood**



# In section 6, we estimate and forecast the number of trips in Europe, and the corresponding MaaS addressable market

## 5 MaaS market forecast - Scope, sources and methodology

We have estimated the number of trips for metro, tram, suburban railway, buses and taxis for 10 countries / regions

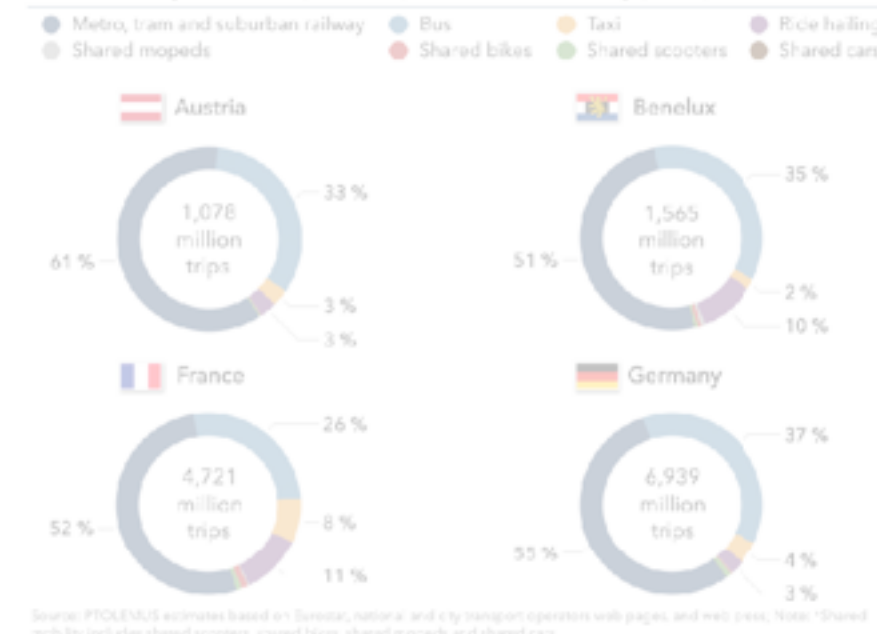
Scope, sources and methodology used for metro, tram & suburban railway, bus and taxis

	Metro, tram & suburban railway	Bus	Taxi
Scope	<ul style="list-style-type: none"> <li>Urban metro and tram</li> <li>Short train (suburban railway) connecting a city with its suburbs</li> <li>Excluded: Long distance train</li> </ul>	<ul style="list-style-type: none"> <li>Urban bus</li> <li>Excluded: Long distance (inter cities)</li> </ul>	
Sources	<ul style="list-style-type: none"> <li>Webpages, reports and press releases of 50+ cities, DOTs, government agencies, UITP and metro operators</li> </ul>	<ul style="list-style-type: none"> <li>Passenger transport reported by Eurostat</li> <li>15+ cities, DOTs, agencies, UITP or webpages and reports</li> </ul>	
Methodology	<ul style="list-style-type: none"> <li>Either: <ul style="list-style-type: none"> <li>Collected country statistics</li> <li>Collected city statistics and add them up to obtain country / regional number of trips</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Collected the number at country level</li> <li>For those countries we added information and bus operators them at country / regional level</li> </ul>	

Source: PTOLEMUS

## Metro, tram and suburban railway trips cover more than half of the number of trips in Austria, Benelux, France and Germany

Number of trips in Austria, Benelux, France and Germany (2021)



Source: PTOLEMUS estimates based on Eurostat, national and city transport operators web pages and web press. Note: \*\*Shared with city includes shared mopeds, shared bikes, shared scooters and shared cars.

Key takeaway

- Austria, Benelux, France and Germany have a similar distribution of the number of trips

5 MaaS market forecast - Taxi and ride hailing

## Ride hailing already prevails over taxis in some countries, such as France and the UK

Number of taxi and ride hailing trips (2021)



Source: PTOLEMUS estimates based on Eurostat, national and city transport operators web pages and web press. Note: \*\*Rest of Europe\*\* refers to all countries in Europe excluding Austria, Benelux, France, Germany, Italy, Nordics and Spain.

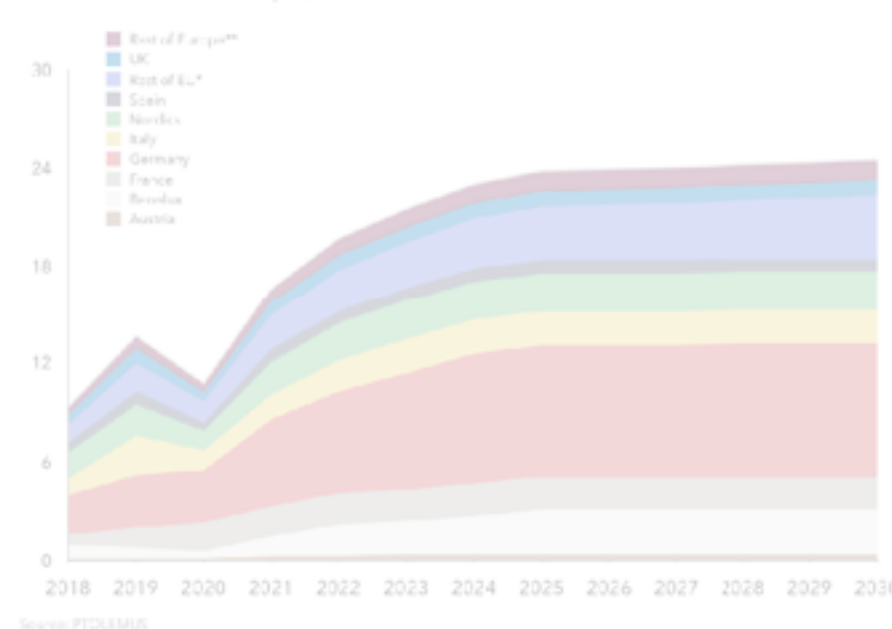
Key takeaway

- Taxis accounted for 2,704 million trips, while ride hailing accounted for 2,590 million trips

5 MaaS market forecast - Shared cars

## The number of shared car trips will keep growing in Europe, but at a decreasing pace

Number of shared car trips (million)



- From 2021 to 2030, we expect the number of trips on shared cars to increase from 16.6 million to 24.5 million, growing at a 4.4% CAGR

- The increase of the number of shared car trips will be driven by the increase on the European shared cars' fleet:
  - 10,000 new shared cars among Germany and Belgium added by MILES Mobility from 2023
  - 300 new shared cars in Vienna added by Wiener Linien and Eloop from 2022 to 2023
  - 200 new shared cars in Milan added by Eol at the end of 2022, with plans to expand the service to Rome
  - 500 new shared cars in Madrid added by Votio (shared car company of Mutua Madrileña) at the end of 2022
  - 2,000 new shared cars in Belgium added by Poppy Mobility starting from 2023

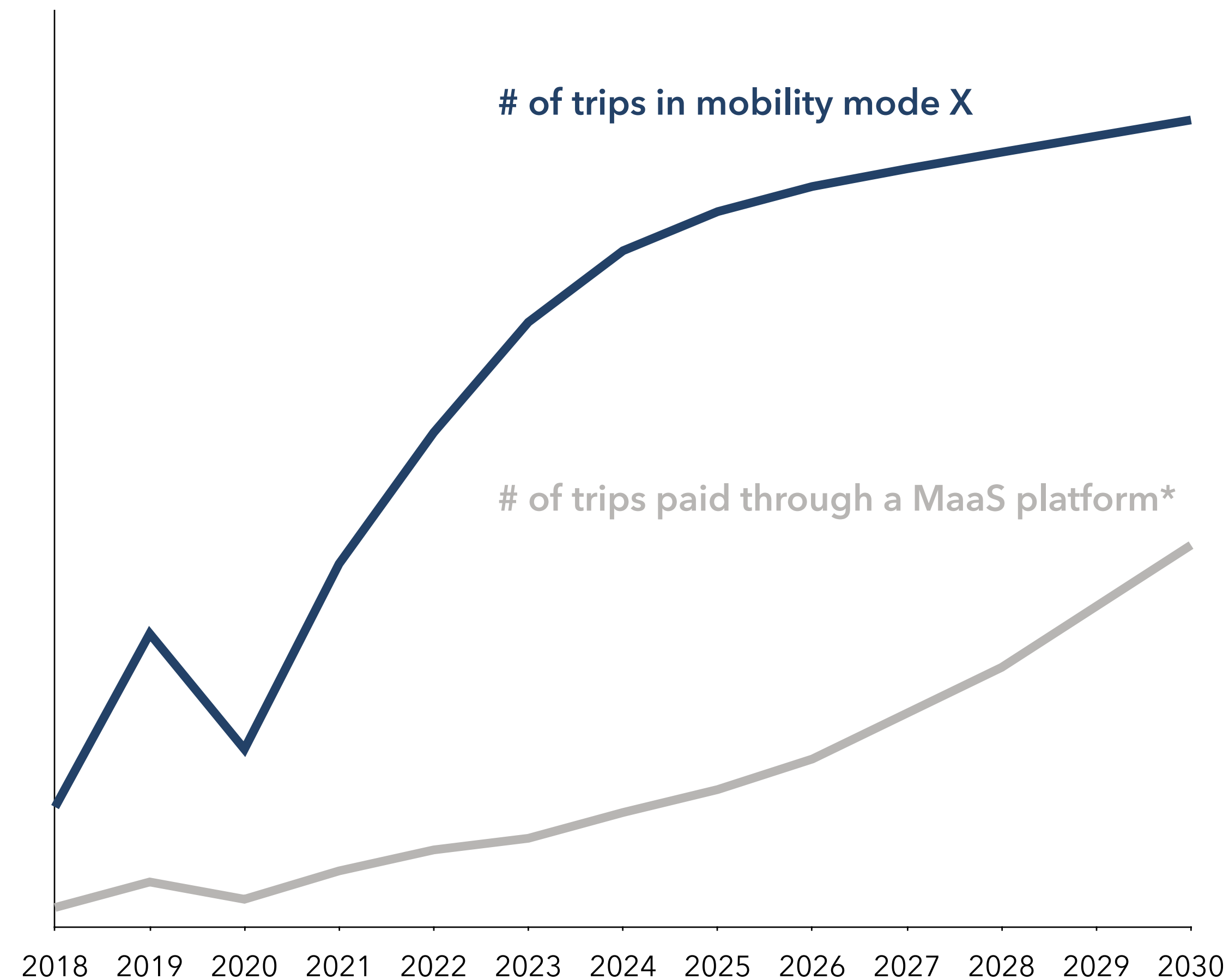
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- We study the **regulation, market and technology drivers and inhibitors** impacting MaaS in Europe
- We build **future scenarios of MaaS in Europe** and assesses their **respective likelihood**

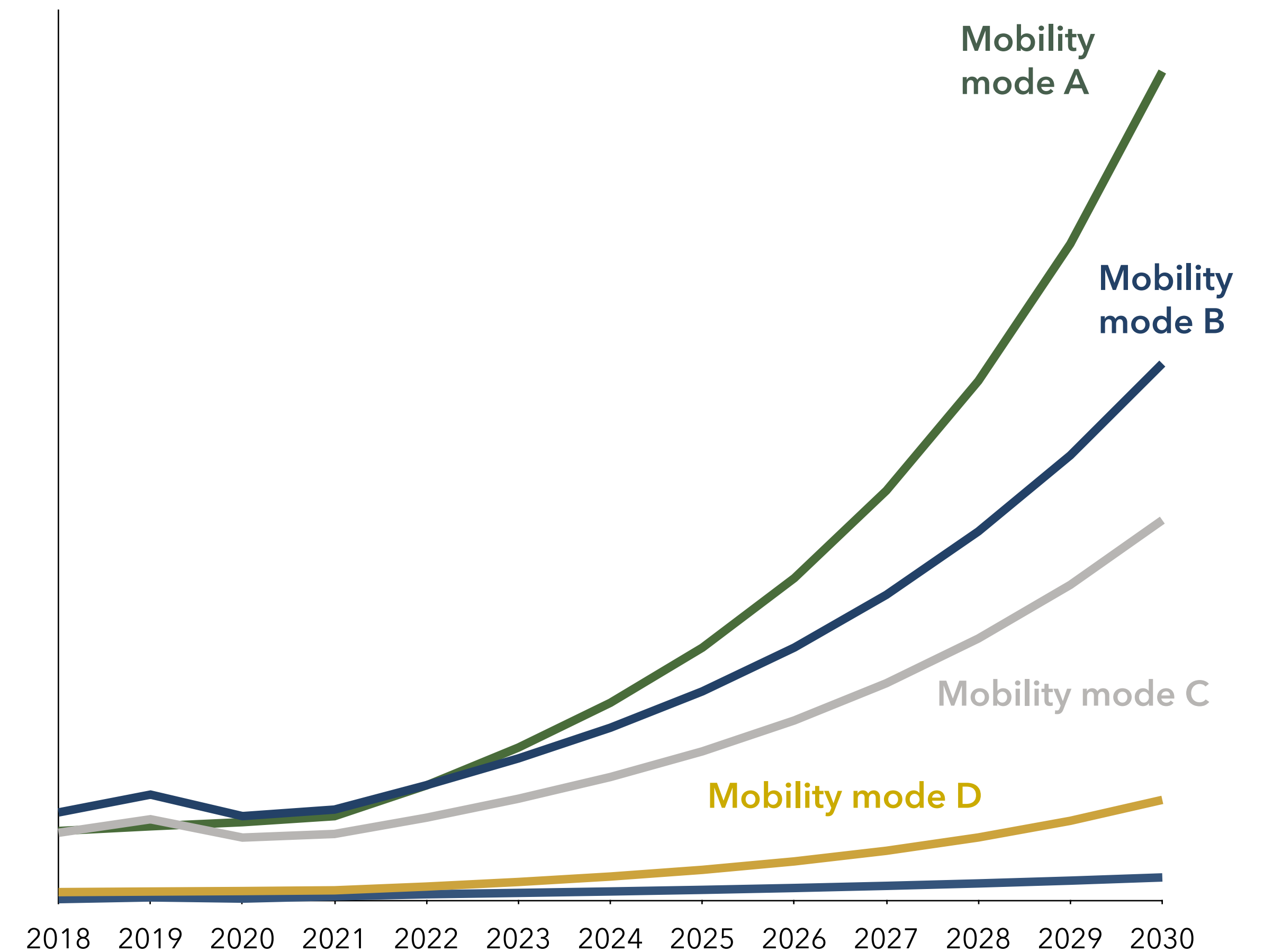


# We expect that XX% of shared mobility trips will be payed via MaaS platforms by 2030

Number of shared mobility trips and MaaS penetration (million)



MaaS revenues in Europe by mobility mode (€ million)



# In section 7, we provide our conclusions and recommendations to the key MaaS players

- This seventh section includes **15+ pages**
- It **classifies MaaS players into 6 different groups**

**7** Conclusions and recommendations for players - Introduction

## We have evaluated short and long-term challenges and recommendations for MaaS players

- Whilst more companies in the MaaS ecosystems keep entering and exiting cities around Europe, we see all players face multiple challenges in the short and long-term to address a market that remains volatile
- Based on the value chain in Section 3, we classified players of the ecosystem into 6 different groups:
  1. Transport Governance: governments behind the legislation of transport in cities and regions
  2. Citizens: people living in cities using transport services
  3. Back-end and systems players: companies building the back-end MaaS platform e.g. Lyko, Google Maps, City Mapper, and building the application e.g. Via, Whim
  4. MaaS providers: user-facing companies, which are the ones who provide the application users interact with e.g. Skipr, Uber, Whim
  5. Transport Service Providers (TSPs): companies providing commercial transport services e.g. Tier, Lime, Donkey Republic
  6. Public Transport Operators (PTOs): agencies providing public transport services e.g. RATP, DeLijn, EMT
- These players do not exclusively belong to one group and they can offer services in different non-consecutive parts of the value chain
- Based on interviews and commercial data, PTOLEMUS identified some of their long-term goals
- In addition, for each one of these goals, we analysed their main challenges and gave recommendations to stakeholders
- With this section, we trace final conclusions on how players can foster MaaS implementation and how governments, TSPs and PTOs can improve their services while securing their operations

Source: PTOLEMUS

**7** Conclusions and recommendations for players - National executives & regional councils of transport

## Governments should increase efforts to identify the right KPIs to measure the success of MaaS and shared mobility programmes

Goals	Challenges	Recommendations
<b>Short term</b> <b>Transport governance</b> <ul style="list-style-type: none"><li>• Unify the transport network</li><li>• Maintain accessible pricing</li><li>• Reduce number of accidents</li><li>• Maintain and create infrastructure</li><li>• Increase digitalisation of transport services</li><li>• Decrease the friction to shift between transport services</li></ul>	<ul style="list-style-type: none"><li>• Define the optimal allocation of resources to improve weaker parts of the transport network</li><li>• Ensure new platforms can smoothly enter the market</li><li>• Provide infrastructure and guidelines to increase safety levels for micromobility modes</li><li>• Improve the distribution of floating vehicles in public spaces</li><li>• Manage unexpected events caused by forces outside of the transport realm e.g. demographic trends including changes on mobility</li></ul>	<ul style="list-style-type: none"><li>• Decreased quality of the service from TSPs and PTOs working in silos and unwilling to open their ticketing and payment systems to third parties</li><li>• Develop infrastructure and regulation for emerging shared micromobility vehicles</li><li>• Create a resilient economic structure to handle with inflation and energy crisis</li></ul>

Source: PTOLEMUS Notes "Points Of Interest"

**7** Conclusions and recommendations for players - Transport service providers

## In the long term, TSPs should push national and EU institutions to enforce strict car restriction regulations

Goals	Challenges	Recommendations
<b>Long term</b> <b>Transport Service Providers</b> <ul style="list-style-type: none"><li>• Build a robust and sustainable business model</li><li>• Ensure sustainability across their operations</li><li>• Maximise user satisfaction</li><li>• Improve people's life by providing best-in-class mobility</li><li>• Become a prominent TSP in the region of operation</li></ul>	<ul style="list-style-type: none"><li>• Identify a robust and sustainable business model</li><li>• Create financial plans allowing them to incorporate new services to business lines</li><li>• Remain competitive against PTOs, OEMs and mobility integrators expanding to share mobility and adding new services to their platforms</li><li>• Lobby for regulations that allow expansion of commercial mobility</li><li>• Secure carbon neutral cycle from manufacture to service provision</li></ul>	<ul style="list-style-type: none"><li>• Establish loyalty from customers for current</li><li>• Devise strategies to lead customer to explore new services within the brand</li></ul>

**7** Conclusions and recommendations for players - Introduction

## A citizen-first approach to platform design and TSPs integration to PT network can help to move MaaS forward

- Our analysis shows that all players must comprehensively engage an citizen's research to understand people's choice of transport:
  - From the research results, players can articulate a demand-based offer that relies on user segmentation to avoid underserving areas or increasing chaos in spaces where multiple transport modes co-exist
  - Engagement with users will help to build a more realistic business case for commercial providers, besides helping to establish a community for long-term engagement
  - A good way to engage with citizens is to create bottom-up approach to platform design
- For all players, it is key to understand their user cases to collectively design the ecosystem of MaaS platforms:
  - For this, multilevel and multi-stakeholder partnerships can help to strengthen relationship between commercial and public providers
- On one hand, governments and regulatory authorities should put more focus on choosing the right KPIs (e.g. improved accessibility to POs, increased last-mile connections, to streamline resources into achieving priority goals)
- On the other hand, they cannot rely on one-sided measures i.e. only integrating transport in digital platforms, but they need to offer visibility to TSPs through safe infrastructure
- Back-end and system players have clear opportunities for expansion:
  - As frontend developers and backend providers, they will need to navigate in the political and economic landscape of cities
  - In particular, changes of administration are a real challenge when providing services that include public transport or infrastructure
  - As shown in the chapter before, Google and other apps in the mapping and integration realm are likely to stay in the back-end (suppliers) instead of becoming an official city MaaS
  - Thus, smaller players in systems and back end need to focus on making coalitions to compete against tech giants with international TSPs, and lobby for protection and funding to local ecosystem players
- PTOs are increasingly more open to collaborate with TSPs:
  - Given that business models for shared micromobility providers are under construction, a fully two-ways cooperative model between commercial and public is not likely to materialise in the short term

Source: PTOLEMUS



- It analyses their respective **short and long-term goals**, and their **corresponding challenges**
- Finally, it gives **concrete recommendations** to these players



# Mobility-as-a-Service Market Report

About PTOLEMUS



PTOLEMUS Consulting Group

# PTOLEMUS is the first strategy consulting and research firm entirely focused on geo-connected mobility and automation



## Strategy consulting services

Strategy definition	M&A advisory	Procurement strategy
Partnership strategy	Business development	Market forecasting



## Market research services

Off-the-shelf reports	Subscription services	Custom market research
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## Fields of expertise

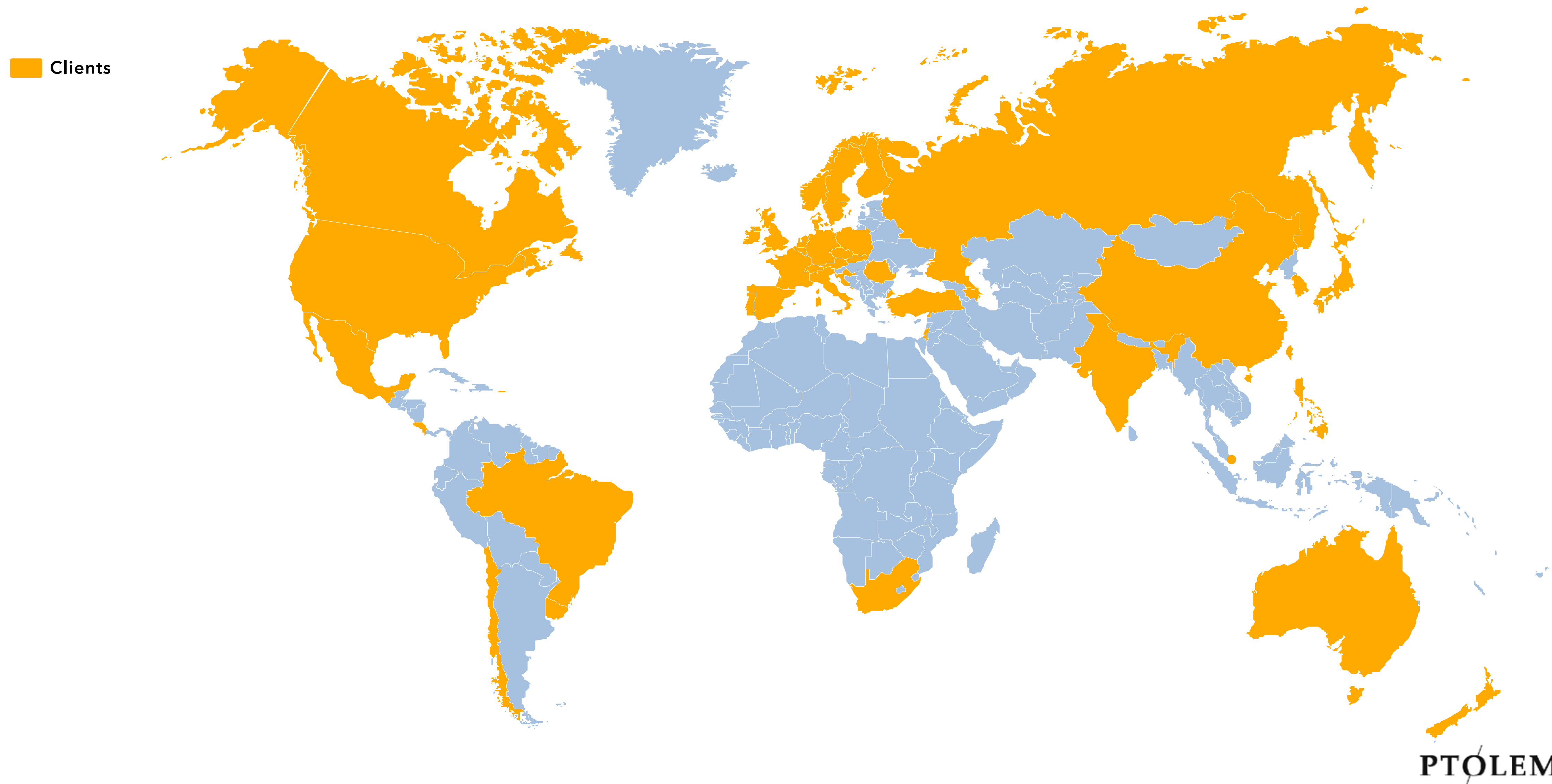
Mobility services	Motor insurance	Vehicle data and analytics
IoT & connectivity	Electrification	Connected vehicle services
RUC and tolling	Vehicle automation	Emergency services



# We serve over 350 clients across the mobility ecosystem

Business area	Clients	Business area	Clients
Analytics, maps & apps providers		Insurers, aggregators & assistance providers	
Automotive OEMs & suppliers		Tolling & ITS	
Banks & private equity investors		Telematics solution providers	
Device & location suppliers			
Mobile telecom players			

**Our team of consultants, experts and analysts serve our clients in 41 countries**





# PTOLEMUS can help your organisation make MaaS a reality

## • Strategy definition

- Mobility strategy assistance
- Scenario planning, simulation & analysis
- MaaS strategy development
- Multimodal mobility design and planning
- Connected vehicle payment integration
- Strategy orientation workshops
- Connection to city congestion charging & access management scheme

## • Innovation strategy

- Vertical market assessments
- Product definition
- Consent management

- Data collection & analytics strategy
- App strategy & use cases
- Stakeholder consultation & engagement
- Pricing strategy

## • Innovation delivery

- Proof of concept design & launch
- Architecture definition
- Data strategy
- Project management

## • Investment assistance

- M&A strategy
- Commercial due diligence
- Technology due diligence
- Feasibility studies
- MaaS market sizing
- Business case development

- Cost benefit analyses
- Post-merger integration

## • Procurement

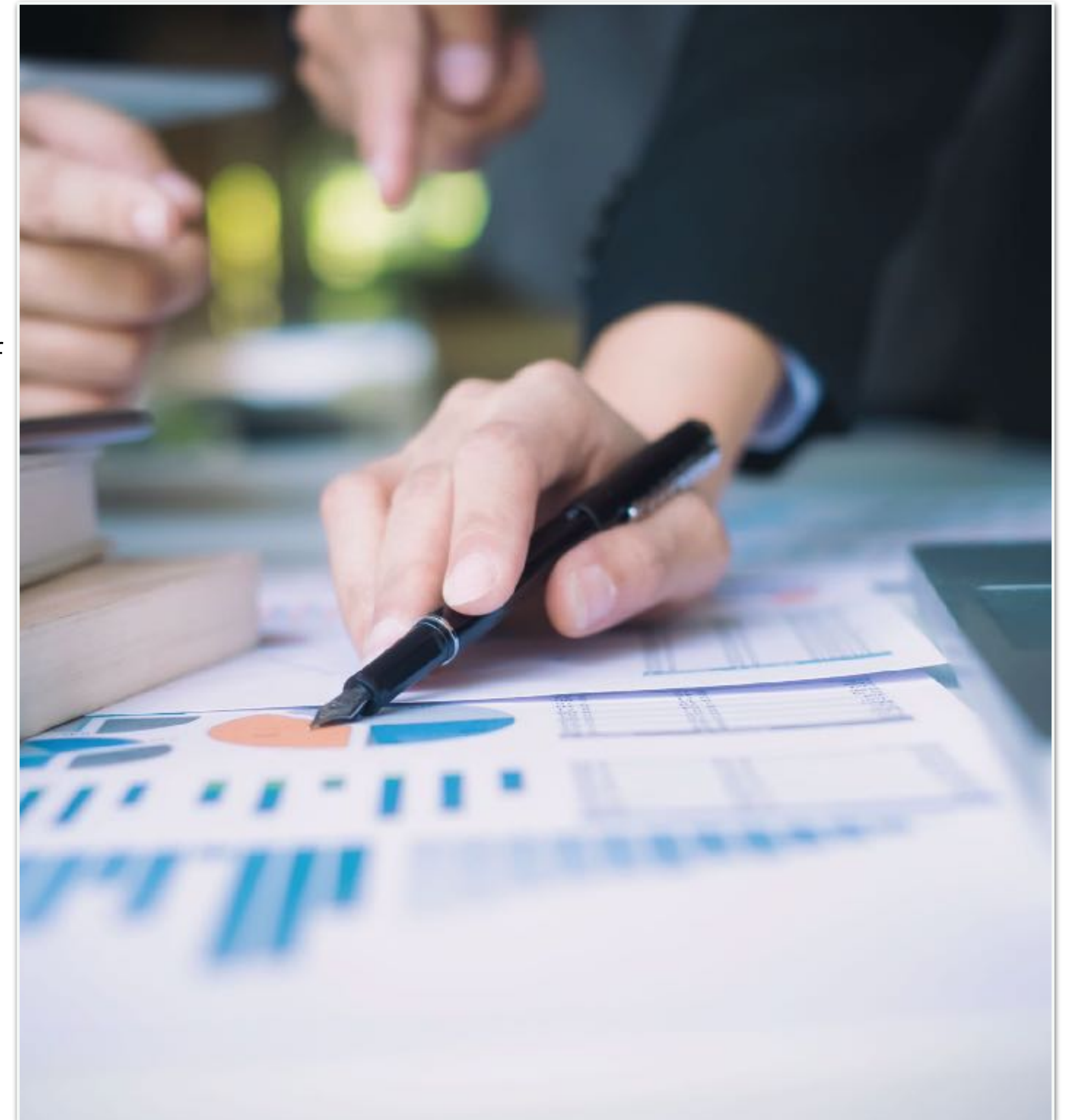
- Definition of MaaS platform requirements
- Assistance to tenders
- Selection and sourcing of MaaS platform vendor

## • Partnership strategy

- Partnership strategy definition
- Assistance to tender response

## • Project management

- Assistance in management of MaaS project implementation
- End-to-end quality monitoring





# PTOLEMUS has published 30 landmark reports and market forecasts on mobility markets

### AUTONOMOUS DRIVING

### CONNECTED VEHICLE

### ELECTRIFICATION

### ROAD INFRASTRUCTURE FUNDING

### FLEET MANAGEMENT

### INSURANCE

### MOBILITY

Notes: 1. Most of our reports come with bottom-up market forecasts for 18 regions for 10-year timeframe,  
2. To receive all our reports & other research, a subscription model exists

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