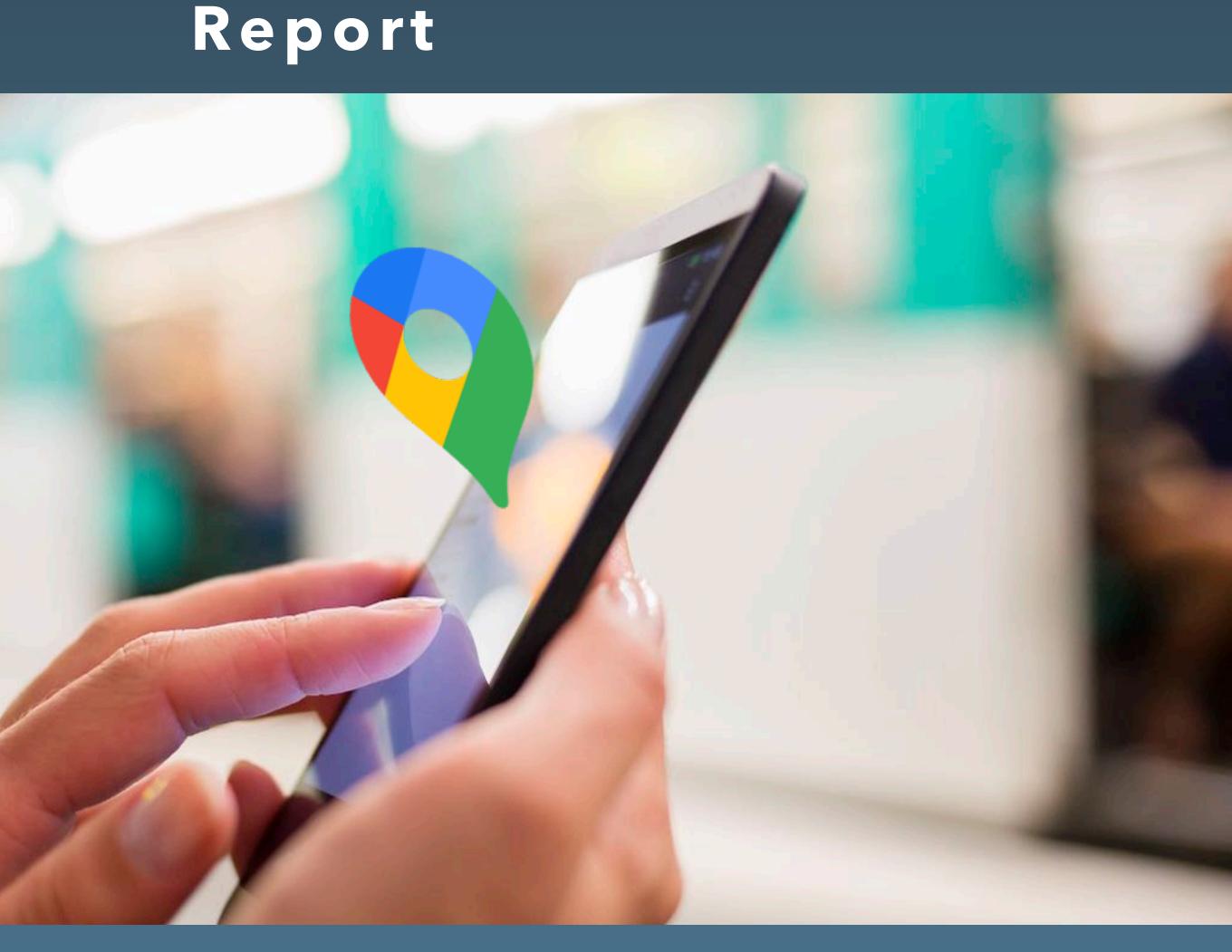


GOOGLE IN MOBILITY Report

FREE ABSTRACT

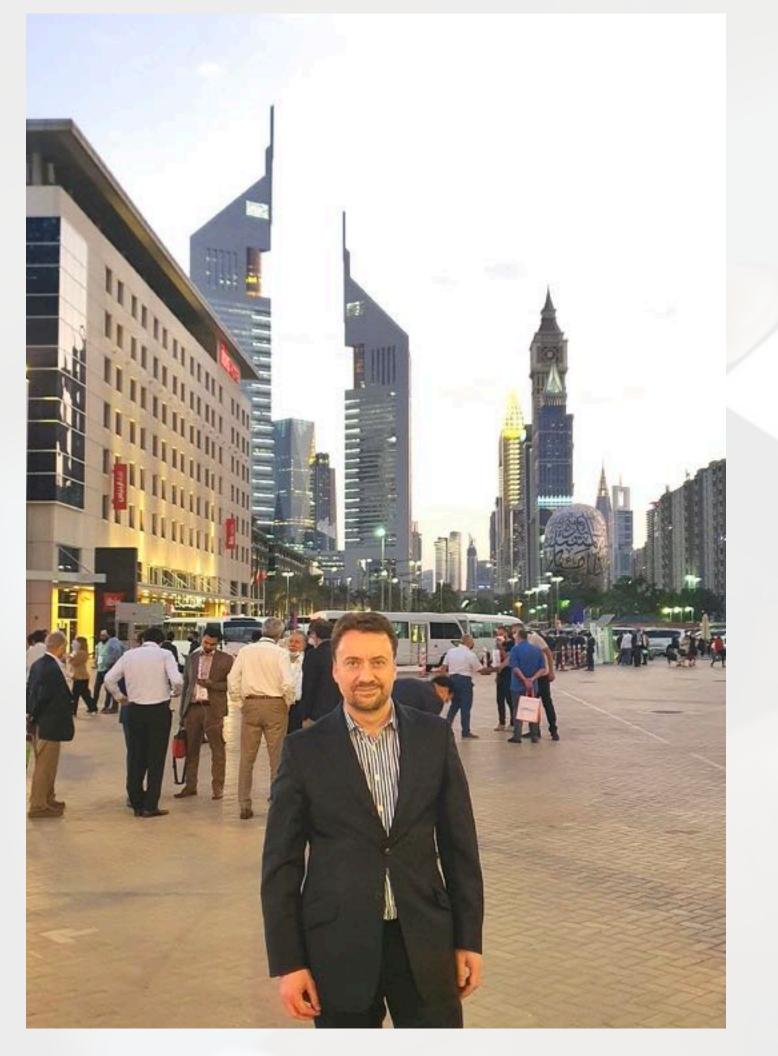
The first analysis of Google's future urban mobility strategy



From Google Maps to Google MaaS Will Alphabet take over mobility?

All rights reserved - April 2023 - www.ptolemus.com

The rumours of Google's death have been greatly exaggerated



Source: PTOLEMUS - Note: MaaS: Mobility-as-a-Service

As a former executive of TomTom, which almost died as a result of Google's move to free navigation on smartphones, I have been always been paying extreme attention to Google's steps in mobility.

Since the launch of Google Maps in 2005, Alphabet has made increasing inroads in the domain of mobility.

Its free, advertising-based model has *de facto* killed or forced the repositioning of many mobility stakeholders, from MiTac, Navigon, TomTom to HERE and many app developers from Maporama, MapQuest, NNG NavNGo to Telenav, Telmap, Sygic, ViaMichelin, etc. RIP.

Is it now the turn of MaaS platforms (CityMapper, Siemens, Whim...) and ticketing providers (Conduent, Cubic, etc.)?

In this research, we tracked Google's every move in urban transport and were impressed to see how close they are now to offer end-toend multimodal mobility services to end-users.

I have often compared Google to the sea level. You can erect barriers but you cannot resist for a long time to rising water levels as it surrounds you. At some point you need to adapt... or die.

Despite the EU's Digital Markets Act, Google has the force of being present in virtually all smartphones in the world (save China) and is the default mapping, routing and navigation app for the planet.

Given that MaaS will come from smartphones and that Google Maps is free, nobody will be able to resist Google for long.

Thus despite its perceived lagging position in AI, Alphabet is ready to make the connection between the digital and the physical transportation world.

Do not believe my words, just read this report! And act fast!



We gave Google a chance to respond

Despite numerous attempts to talk to Google representatives, we were not able to obtain comments from the Alphabet Group for this investigation.

This behaviour, which contrasted with our previous relationships with the firm, indicates that the company prefers to remain silent on the topic of mobility.

For obvious regulatory reasons (cf the Digital Markets Act) but also because we believe it prefers to progress silently in this market to avoid attracting the attention of Public Transport Operators, Cities and ultimately regulators.

. . .

Source: PTOLEMUS - Note: MaaS: Mobility-as-a-Service

Alphabet Google



The first investigation of whether, how and when Google will take over the urban mobility market

- A 130-page analysis of Google's current and future strategy in the urban mobility market, based on:
 - **10** years of constant market surveillance
 - PTOLEMUS' mobility experience with nearly **200** consulting assignments across the transportation ecosystem
 - 8 months of research and analysis
 - Interviews with 22 transport stakeholders in Europe and North America
- An in-depth analysis of Alphabet's successes in mobility to date
- An analysis of Google's partnerships and actions in urban mobility
- An assessment of Google's strategy and initiatives in the mobility field, including
 - An analysis of its key mobility assets: Google Maps, Google Wallet, Waze and Waymo
 - A review on how Google Maps has integrated payments

- revenues
- mobility partners programme
- (MaaS)
- services market based on
- strategy alternatives

- An analysis of Google Maps' key sources of

- An assessment of how companies integrate and what are the benefits of Google Maps to the

• A detailed analysis of 4 strategy alternatives that Google could adopt to enter the urban mobility market, including booking and ticketing & payment for Mobility-as-a-Service

• An evaluation of the future MaaS evolution scenarios, including customers' segments needs and future drivers of demand and supply

• An assessment of the future role, position and strategy of Google in the urban mobility

- The 3 main evolution options we identified and their respective likelihood to transpire

- A forecast until 2030 of Google's EBITDA generated by MaaS in Europe in the 3 main PTÓLEMUS Consulting Group Report

FULL EDITION

The first analysis of Google's future urban mobility strategy



From Google Maps to Google MaaS

Will Alphabet take over mobility?

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





Today, no mobility player offers Mobility-as-a-Service on a large scale but we believe Google will within the next 2 years

MaaS has not taken off...

- Alternatives to the use of private vehicles in urban areas are rapidly gaining traction due to increased traffic congestion and the need to reduce emissions and pollution in general
- Because it unifies all other modes of transport, MaaS is seen as one of the most prominent alternatives and almost every big city has launched an initiative to make it happen
- Still, more than 7 years after the ITS World Congress in Bordeaux where the MaaS concept was invented, the market has not taken off
 - To date, the supply remains limited as no player offers a fully integrated solution* across multiple regions and transport modes
 - Efforts remain regional depending on the structure of the transportation sector in each country / region / city
 - Due to the lack of multi-modal / multi-operator integration, the demand remains subdued, which makes the champions of the concept, e.g. Whim and CityMapper fragile
- However, the technology has never been so mature for mobility to become cleaner, safer and more accessible
 - Smartphones are becoming ubiquitous for mobile access to online platforms and now for payments in the physical world

... but this is largely a supply issue that Google could solve

- Digital platforms leveraging cloud computing and AI are integrating connected transport modes to offer real-time advice on the best route to reach a destination
- Emerging battery-powered micro-vehicles are becoming the preferred mobility mode for first/last mile and short trips, notably in urban areas
- So far, **Public Transport Operators (PTOs)**, supported by platform suppliers such as Siemens, have created the most relevant initiatives regarding multi-modal integration, but **lack international scalability and often offer a poor customer experience**
- There are many successful examples of mobility delivered as a service for a single transport mode
 - Players like Moovit, Uber and FreeNow have been able to create scalable international solutions but still struggle to integrate public transport
 - However, we have not yet seen scalable MaaS platforms integrating public transportation with shared mobility in multiple countries
- Based on its continuous progress in the last 20 years, Google appears as the best positioned player to deliver such a proposition

This report is the first one to analyse whether Google will take over the urban mobility market by delivering a mobility service globally



In this report, we respond to 12 questions that are absolutely crucial to understand the future of Google in urban mobility

Why is MaaS so relevant?

How is MaaS built and delivered?

What has Google achieved in mobility so far?

> What's Google's formula to thrive in mobility?

What is Google's competitive advantage in MaaS?

> What are the most likely evolution scenarios of MaaS?

Source: PTOLEMUS - Note: MaaS: Mobility-as-a-Service

How players should react to Google's actions?

> What are the most likely scenarios for Google to move ahead in mobility?

What are Google's risks and opportunities of each alternative?

When will Google's roll out its MaaS service?

What are Google's incremental profits under 3 MaaS positioning options?

What are Google's regulatory challenges?







Google will dominate the city mobility market by integrating ticketing & payment, enabling the end-to-end mobility experience in 1 app

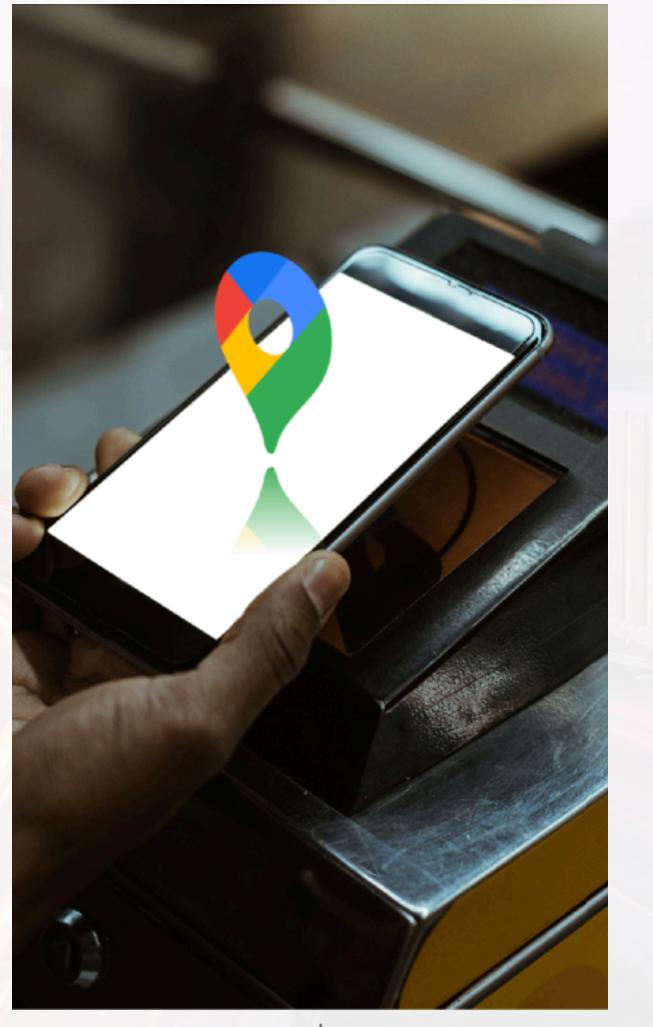
• Google has become the number 1 digital mobility services providers in the world

- Google has built the number 1 franchise in digital mobility, Google Maps
- It has *de facto* killed competition by offering its services for free and acquiring its most threatening competitor, Waze*
- It has aggregated the largest static and dynamic data related to urban mobility and public transport
- It has managed to make all largest mobility providers dependent on its APIs
- It is gradually creating a natural duopoly (with Apple) in our cars through Android Auto and GAS
- Fundamentally Google is one of the very few operators that has found a sustainable business model in digital urban mobility services
 - Thanks to its advertising model and its APIs, Google has an economic model today
 - Given Alphabet's opaque financial statements, it is not possible to ascertain whether its mobility services are profitable

- Thanks to the commission model on Google Pay, any transport payment will generate commissions for Google
- In any case, Google has understood the vital importance of catching users / eyeballs to feed its advertising machine
- Today none of Apple, Didi, Uber, Lyft, Moovit and Via / CityMapper is profitable in its urban mobility business
- PTOs are operating under low or negative margins and are generally subsidised
- Alibaba, with its Alipay unit, could have been a major contender but it is now split into 6 units - Today, Google Maps has the most comprehensive global app to commute in all transport modes

- In European cities, it will focus on the integration of public transport and shared mobility
- In North American cities, it will focus on car-related services including parking, tolls, etc.

• We expect Google to integrate booking, ticketing and payment for most transport modes in the next 3 years, initially in Europe and North America





Moving into ticketing & payments represents for Google an additional EBITDA from now until 2030 of 2 to 3.4 billion

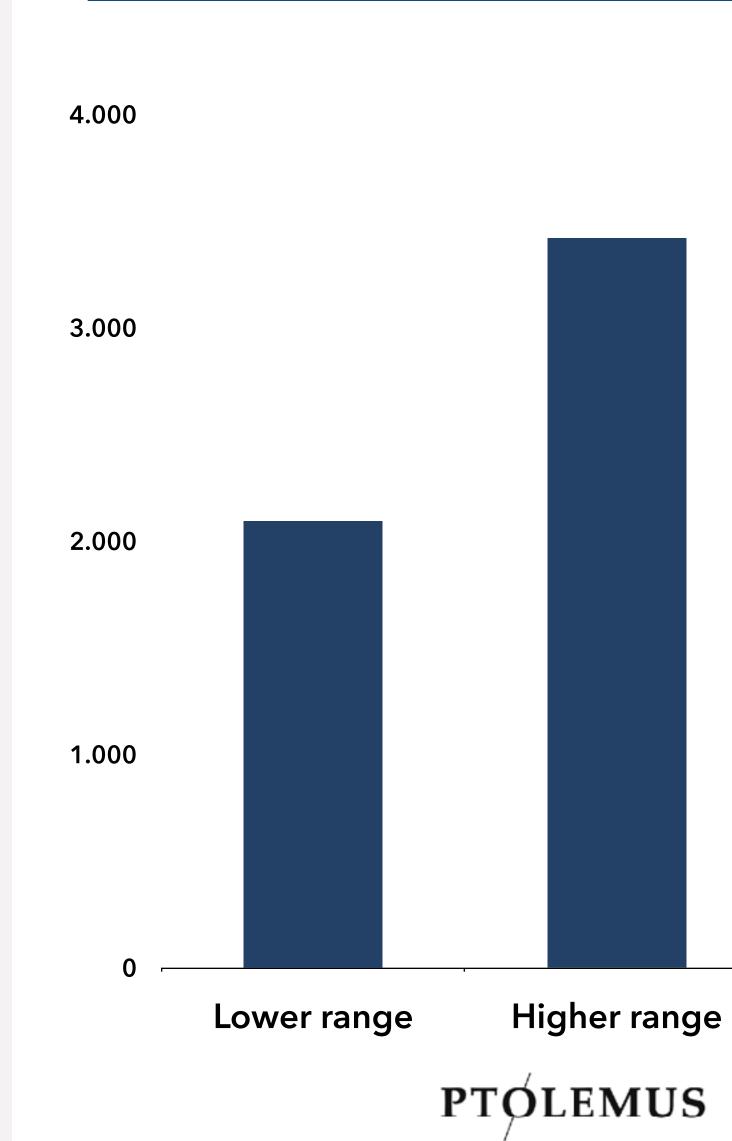
- Google has already achieved what any mobility operator would love
 - The largest customer base that actively uses the app to search for options to reach its destination
 - It has integrated real-time information on the most relevant mobility operators in almost all geographies
- By integrating ticketing & payment into Google Maps, Google would further develop its position in the urban mobility market
- We estimate that by integrating ticketing & payment, Google would generate an **accumulated** EBITDA from €2 billion to over €3.4 billion between 2023 and 2030

- It would generate direct revenues via commissions paid by users to PTOs or Mobility Service Providers when using transport modes in their respective areas
- The scale of the transport and mobility services industry is enormous
 - In Europe, it accounts for more than 5% of the total value added and represents approximately 10.5 million employments*
- Thanks to the fast adoption of mobile payments and the scalability of cloud-based processing platforms, Google could benefit from high margins

Source: PTOLEMUS - Note: *Study on new mobility patterns in European Cities; **GSMA; ***does not include potential income from the transactions of car services such as parking, tolling, EV charging

- Through the cloud, Google can quickly deploy its services across multiple regions
- With 1.6 billion mobile money accounts, mobile transactions represented \$1.26 trillion in 2022**
- It would also generate indirect revenues through cross-selling (i.e. advertising), which is not included in this estimate
- Such movement will make Google a Gatekeeper in one more market, and thus it will be subject to Digital Markets Act in the transport digital payments market

Estimation of Google's potential accumulated EBITDA generated with MaaS ticketing & payment in Europe*** (2023-2030, € million)





With Google's silent integration, MaaS operators and PTOs will need to redefine their strategy and decide whether to cooperate or collide

- Google integrating ticketing and payment will have an immense impact on the urban mobility market:
 - MaaS operators such as Cogo, FREE NOW, Lyko, Moovit, Siemens, SkedGo, Skipr, Telepass, Uber, Vaigo, Via / Citymapper and Whim will be heavily impacted by Google's vertical integration in the MaaS market, losing market share to Google Maps and Google Pay
 - Many users will switch from PTOs or mobility service providers apps to Google Maps to plan and pay their trips
 - On the other hand, **on-demand mobility operators**, who focus on service provision, **will benefit** from the additional traffic generated to their platforms by Google Maps
 - EU institutions and national ministries of transport will be pressured by MaaS operators and PTOs to regulate the role of Google in the value chain



| yer | | Actions |
|---|---|--|
| n demand I ity operators* t start surfing the wave | Allocate budget for adStrongly focus on oper | tter rank in Google's map recommendation vertising in Google Maps ations efficiency cs to determine how to better position fleet |
| aS operators ed to quickly o either scale- or specialise | • Find the right partners to scale up substantially and create a competing MaaS platform | Specialise in operating specific mobil modes, no longer on building a Maas platform Specialise in niche MaaS markets suc Corporate MaaS or regions where Go will struggle to enter |
| PTOs can operate or collide | Partner with Google to have 1 single app and integrate ticketing & payment APIs | Create partnerships with other mapp (e.g. HERE, TomTom, OpenStreetMap and MaaS (e.g. Cogo, Freenow, Moor platform providers to produce a competitive alternative Partner with multiple PTOs from othe regions to create a European mobility |
| stitutions and Fransport stries have the wer to make aaS flourish | Regulate the payments Open the transport pay | hone-based payments ecosystem s ecosystem to avoid monopolies yments ecosystem, which will push players t e in different steps of the value chain, impro- sers |
| | | , |



This report is divided into 6 sections

1 Introduction

- 1. Definitions
- 2. Context
- 3. The 5 levels of MaaS

2 Google's initiatives in mobility

- 1.What has Google been doing so far?
- 2. Alphabet and Google
- 3. Zoom in to Google Maps
- 4. Waymo
- 5. Google Wallet
- 6. Waze

3 Mapping Google's strategy in urban mobility

- 1. Cross-selling & synergies
- 2. Competition in the mobility market
- 3. EU regulations
- 4. Alignment with the corporate strategy

4 The future of the MaaS market 18

- 1. MaaS divers and inhibitors
- 2. Future MaaS scenarios

5 The future role of Google in the urban mobility 35 market

- 1. Google's current position
- 2. Return and risk assessment
 - 2.1. Potential revenues
 - 2.2. Cross-selling and synergies
 - 2.3. Competition

63

- 2.4. Regulation and relationship with the EU
- 2.5. Alignment with the corporate strategy
- 3. Google's future alternatives
- 4. Google's future position in the urban mobility ecosystem

Conclusion and recommendations to stakeholders 130

PTÓLEMUS¹⁰









We would like to thank those organisations for sharing the knowledge and insights with us!















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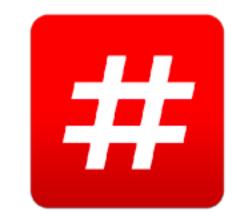
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Where Is My Transport





Lyko-













The report leverages PTOLEMUS' mobility experience and the expertise of 8 consultants and researchers of 7 nationalities (1/2)



Experience

0

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 Bruneteau

Managing Director

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



Alberto Lodieu

Senior Manager

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, locationbased 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.

Biography



Andrew Jackson

Research Director



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.



Svetlana Tvorogova

Research Consultant

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.





The report leverages PTOLEMUS' mobility experience and the expertise of 8 consultants and researchers of 7 nationalities (2/2)



Laura Pájaro

Research Analyst

Experience

0

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.



Damien Orsoni Business Analyst

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.

Biography



Nan Chu

Research Analyst

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.



Claudia Lozano

Senior Business Analyst

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.





Google in MaaS

Report purchase options and pricing

PTÓLEMUS Consulting Group



The report comes with a single, worldwide company licence



Contents

- A 130-page investigation of the current and future Google's strategy in the urban mobility market
- An in-depth analysis of Google's successes to date
- An analysis of Google's partnerships and actions in urban mobility
- An overview of Google's strategy and initiatives in the mobility field, including
- A detailed analysis of 4 strategy alternatives that Google could adopt in MaaS, including booking and ticketing & payment
- An evaluation of the future MaaS evolution scenarios, including customers' segments needs and future drivers of demand and supply
- An assessment of the future role, position and strategy of Google in the MaaS market based on
 - The 3 main evolution options we identified and their likelihood to happen
 - A forecast of Google's EBITDA generated by MaaS in Europe in the 3 main strategy alternatives

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Disclosure

The recommendations and opinions expressed in this abstract reflect PTOLEMUS' independent and objective views. However, PTOLEMUS cannot provide any guarantee as to the accuracy of the information provided or the reliability of its analyses and forecasts.

Belgium

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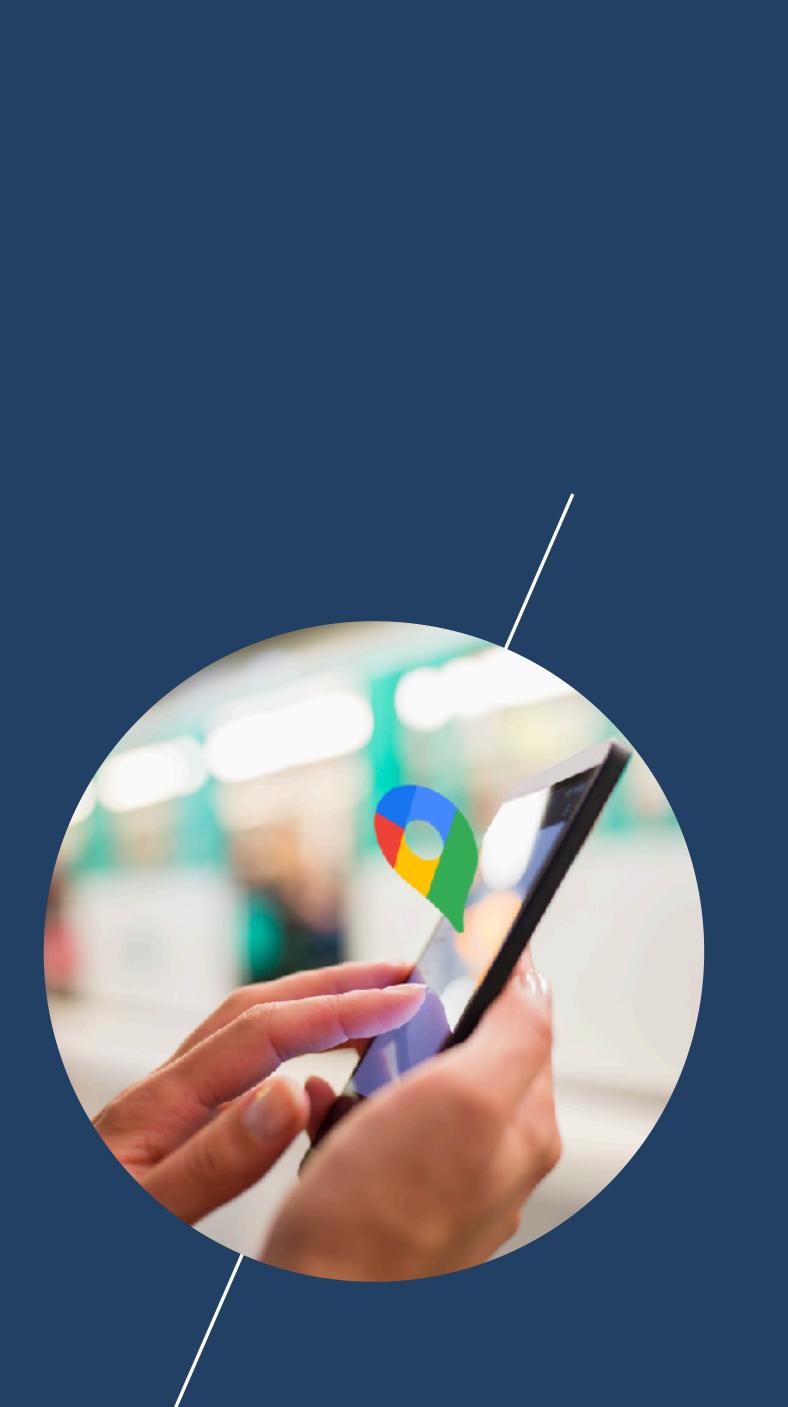


The report is structured in 6 sections

- 1. Introduction
- 2. Google's initiatives in mobility
- 3. Mapping Google's strategy in urban mobility
- 4. The future of the MaaS market
- 5. The future role of Google in the MaaS market
- 6. Conclusion and recommendations to stakeholders

PTÓLEMUS Consulting Group





In section 1, we explain what MaaS is and the rationale for the report, including why we chose to focus on Google



- It describes Google's history and successes in mobility
- It analyses Alphabet's current capabilities and resources
- It explains why we chose to analyse Google

processes around 0.5 billion searches per day globally

Source: Exfort Languages, Business of Appa, Forbas, GAB PTOEDNUS

Innovative and daring, Google has revolutionised the way we live our lives

Google's loyal customers Cl.2 billion users for Geogle Chrome and 1 billion users for Google Maps in 2021) mayed into the world of

internet search, the company other dureality, where search

growing revenue streams most of them generated To maximize the pool of uppers in its reach, the company keeps generating

new services almed at expanding its already large user base

Large investment in R&D ensures high quality and innonative focus of the

company's services

 Baogle is able to law; initiatives globally, in acquiring high visible user feedback

Con al

PTÓLEMUS

• This first section includes 15+ slides

 It defines MaaS and describes its importance in the development of mobility

Google!

Multiple tech giants are well positioned to launch a super mobility app, but Google is the best positioned to do so

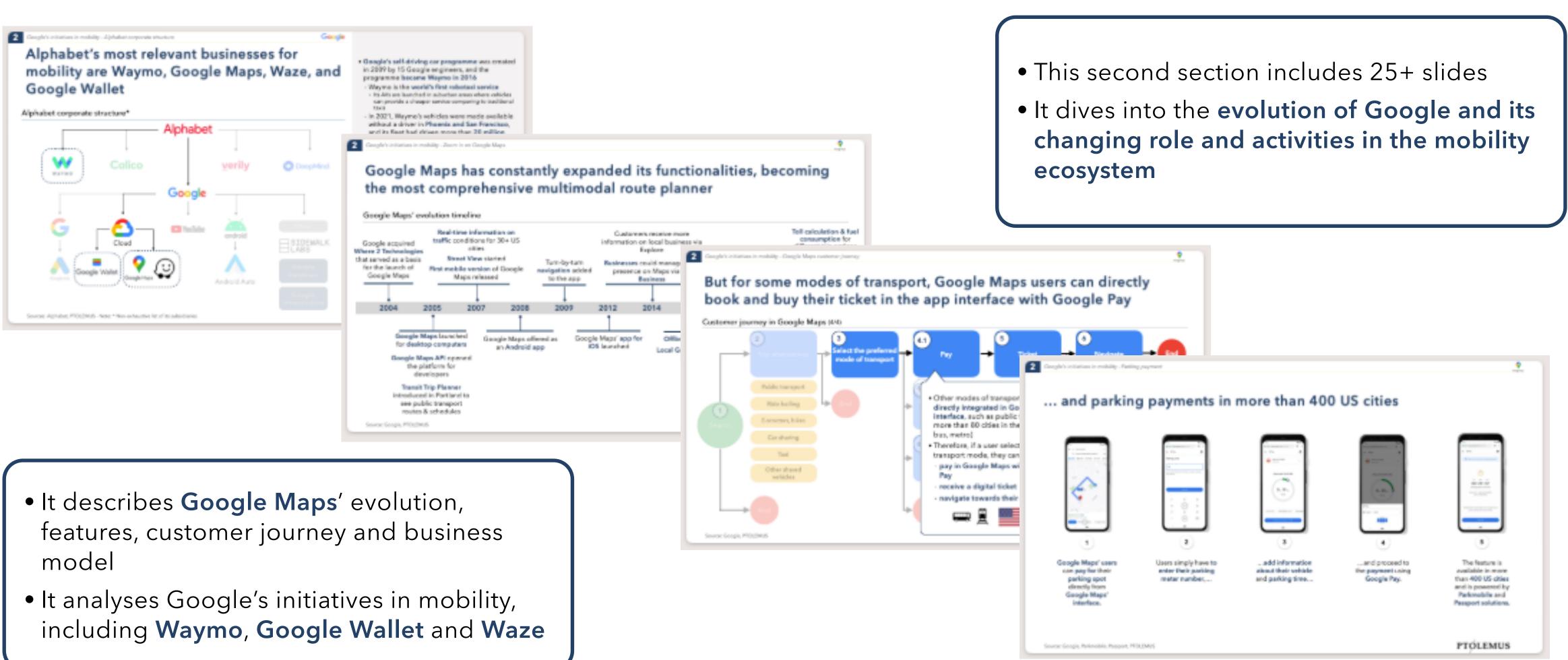
| What's required to build a What can Tech Glasts** bring? | | What makes Google the best positioned? | | |
|--|--|--|--|--|
| Global reach Maits-modal transportation experience, combining routing information, booking, payment and ticketing in some cases, the ability is include nar versions such as toling, parking, fual & electric charging and repair Snambra, antified inclusion of multiple transport operators Kaladonahige with local authorities and miniatries of transport Capabilities to deliver a release Fore-ful customer engagement Strong data exchange capabilities Experience building platforms Financial resources | All tech gizets have a global preservor. All base experience in payments, but not with transport operators. Only Apple, Geogle and Noovit (Intell have experience with routing for matility services. These previding metallity apps have indeded car service, notably electric charging stations, Apple Maps, Moavit and Geogle Maps. Only Geogle and Missain (Intell for souring to far and ticketing. Only Geogle and Missain (Intell for souring to far and ticketing. All companies have vest experience working with smartphanes and insuit patients with matility approximations. Base significant experience ballding digital platforms. All have significant experience ballding digital platforms. Ameson, Geogle and Hassel have that the largest 850 houlget in 3921. | Scoogle Mage is present in alread every country in the world for its mobility businesses So far, only Google and Massel (feam lend) have a fully findged mobility application. Apple is investing in its waps applications, but they are still much less descinance that Geogle's Scoogle Mage includes information for car services such as folling prices and has integrated parking in the US Google has integrated information for most transport operators globally for reading. Booking, payment and tubering are facilitated with over 80 public transport companies Booking, individual tubering are facilitated with over 80 public transport companies Booking, individual table time exchange to several countries and other with multiple transport companies Booking is machine for data exchange to several countries and other with multiple transport authorities Google many distribution propies Already exchanging data with multiple cities and transport operators through Wave and Doogle Mage Ones 2 of the meet popular mobility apps: Google Mage and Wave 2nd largent BAD badget (Aphabet o 10 billion in 2020) | | |





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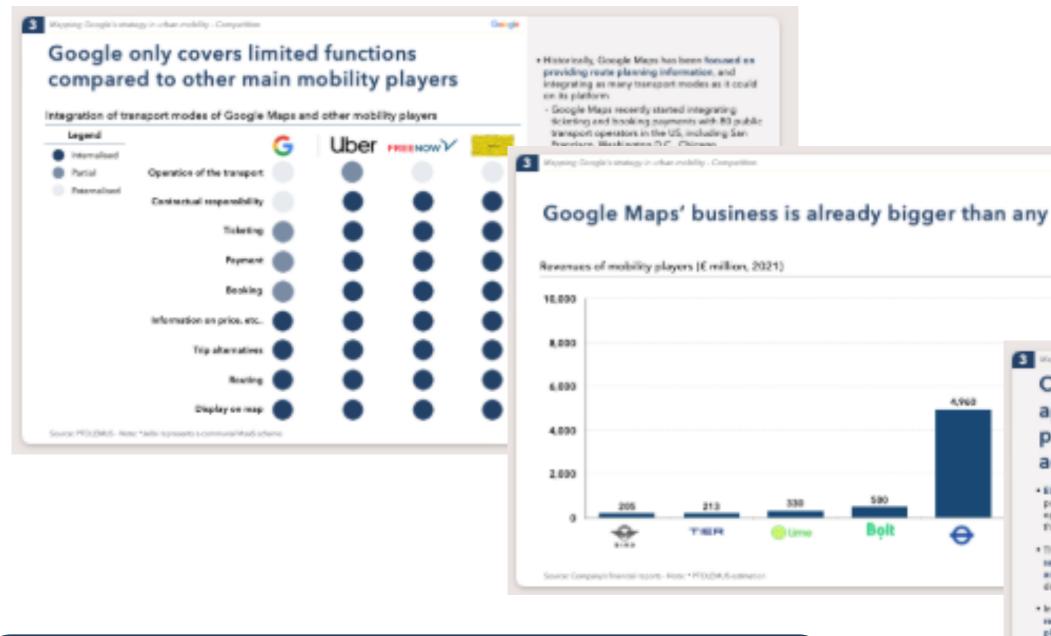
In section 2, we track and examine Google's initiatives in mobility







In section 3, we map Google's strategy in urban mobility



- It describes Google's cross-selling & synergies, competition and corporate strategy in urban mobility
- It describes relevant EU-wide regulations and Google's relationship with EU institutions

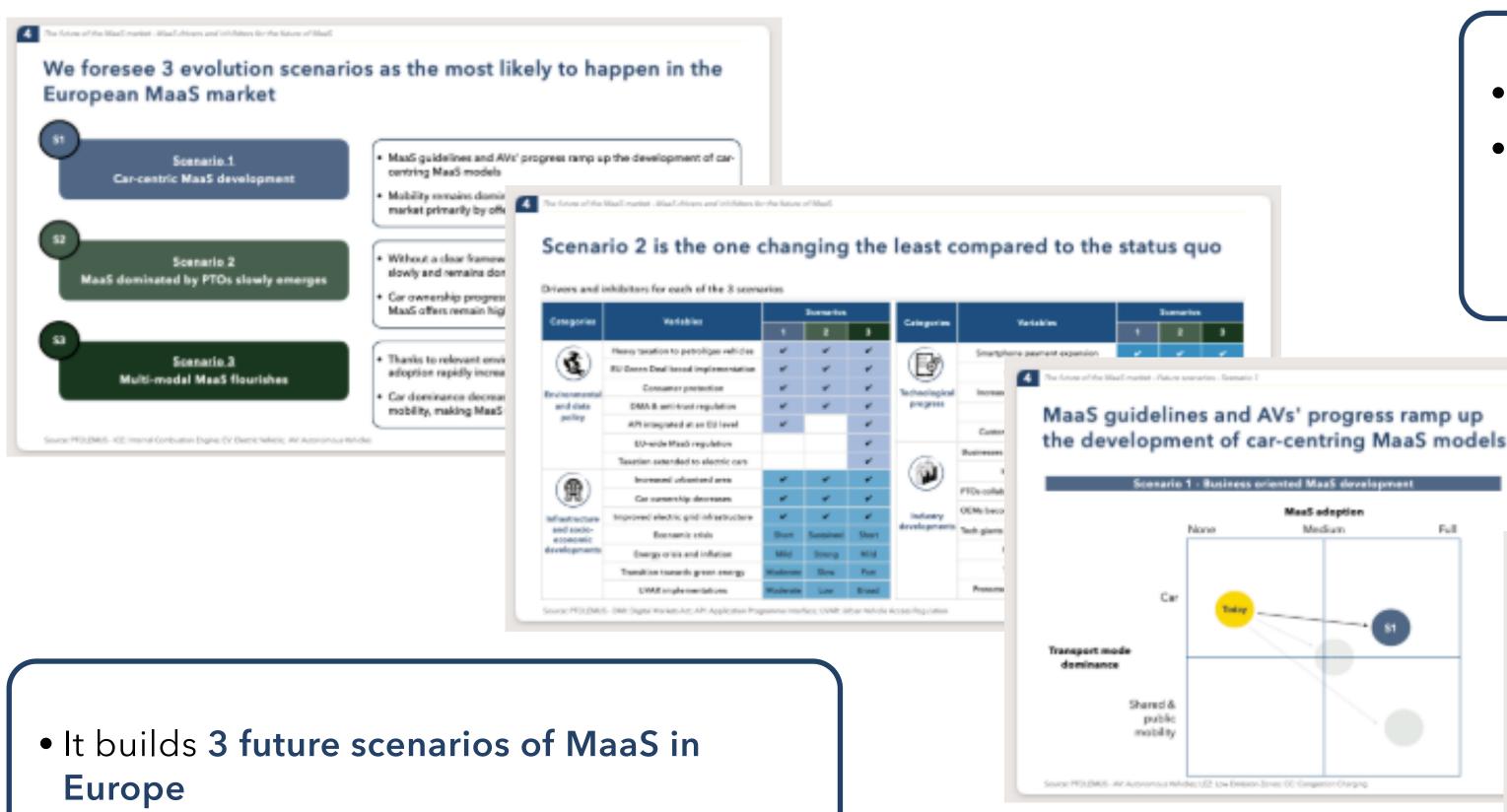
| city PTO's | • | _ | section includes 20+ slides to Google's strategy in urba | n |
|--|--|-------------------------------------|--|----------|
| Competition regulators are pplying stricter rules on digital layers, impacting Google's ctivities Ungelatory authorities have the over to heavily impact Coogle's providers, revenues and fature in the European digital eccepters weight time, they have imposed inctions to punish Google's times, with several multibilities offer frees | Ar | | Migs - Expedience and relationships and the EU arkets Act is aimed at fostering competition in di The Digital Markets Act (DMA) | igital |
| a response, Google Increased | C4 The acceleration contents and the created a situal large platforms acceptions in t | Ø ₩het? Ø ₩hy? | A gatekeeper is a platform service that: Significantly impacts the internal market due to its size Controls access of business users to final consumers Enjoys an entrenched and dusable position in its operations Protect customers and promote free competition Aesid possible misuse of the position | |
| s lobbying expenses and its staff embers in Europe roc PR0204/5 | | C How? | In case of roles' violation, a fine up to 10% of total worldwide turnover Repeated offence leads a fine up to 20% of total worldwide turnover Gatekeepers are not allowed to: Over-promote their own products Cover-promote their own products Encase personal data for other services Impose unfair conditions on business users Pro-install certain software Use certain bundling precises | TÓLEMUS |
| | | Storte, Dropen-Dennission, PROCIMIN | FI | CULENCE. |







In section 4, we build 3 main future MaaS evolution scenarios



• It assesses their respective characteristics and likelihood

• This fourth section includes 15 slides

• It uses the most important technological, market and regulation drivers and inhibitors to build future scenarios of MaaS

Scenario description

- · Environmental and data policy European Commission's efforts to create DJwide MasS guidelines facilitate international MaaS operators, making it easier for tech glants to enter national markets
- Infrastructure and socio-economic development Car owners use Meaß to pay for infrastructure e.g. tailing, parking, access to LED/CC Incentives to make MasS substantially more Royclable than driving attract car users also b

Under scenario 2, MaaS develops only slowly and remains dominated by PTOs

- Without national or EU-wide guidelines and/or initiatives to foster the market, MaaS is likely become a platform for infrastructure booking. available as a value added functions within other applications, such as banking and tolling, rather than a platform for mobility
- Under this scenario, without adequate regulations by governments and EU elines, PTOs have limiter incentives to open their platforms to MSPs

Source PED, BMU

 Hence, payment and ticketing access is not fully evailable for TSPs at EU level and therefore PTOs keep control over data corning. from trips made using public transport infrastructure

- MaaS initiatives remain. restricted to the regional level, as PTOs take a conservative approach to transport provision
- remain fragmented, impeding the building of a profitable business case for smaller TSPs



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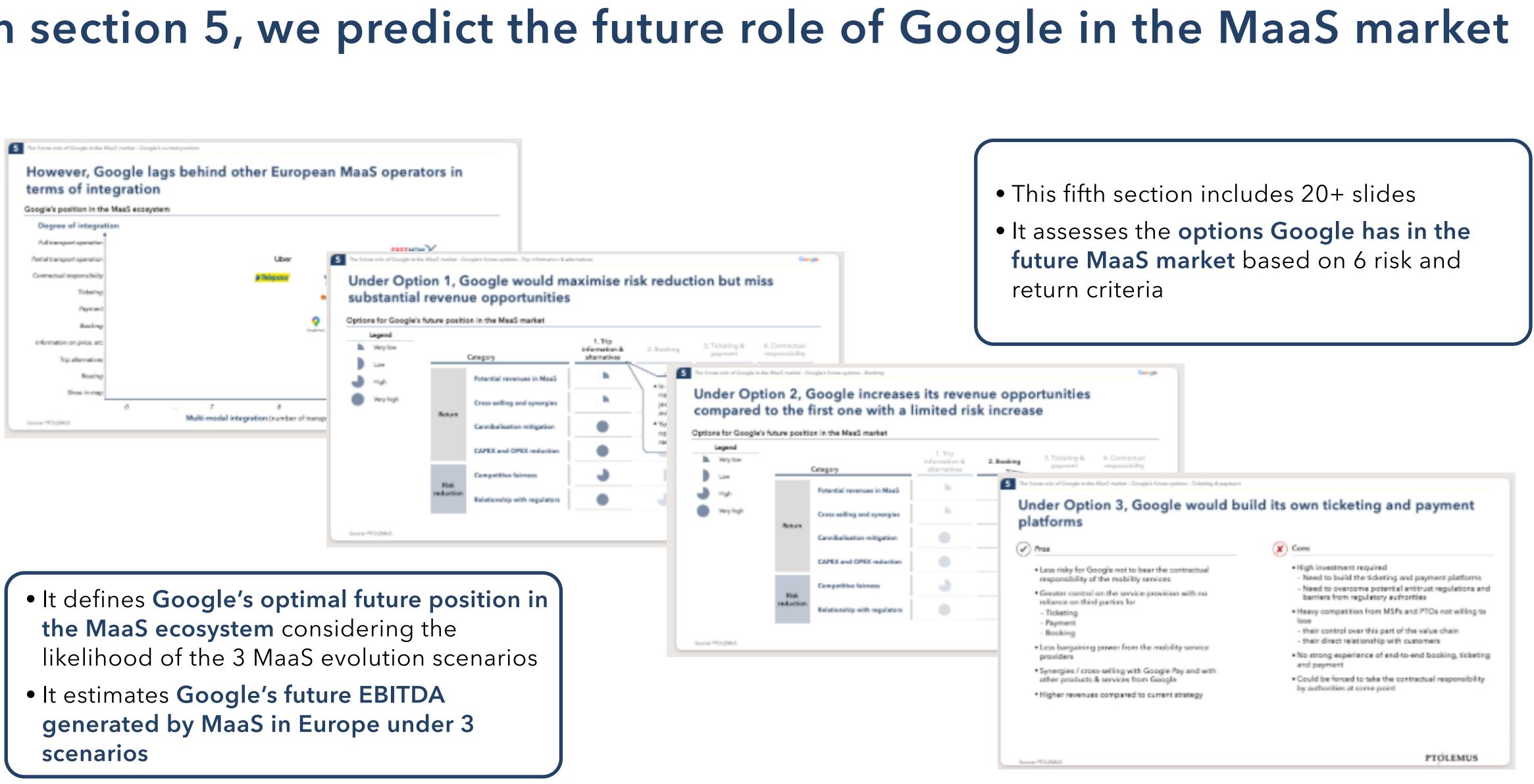






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In section 5, we predict the future role of Google in the MaaS market





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In section 6, we provide our conclusions and recommendations to the key stakeholders of the MaaS ecosystem



- It evaluates their respective **challenges** regarding Google's 3 main alternatives in mobility
- Finally, it gives **concrete recommendations** to these players

| EU institutions and Transport Ministries | 🧭 Adventages | 🖲 Disadvantages | | action recommendations | | |
|--|--|---|---|--|---|--|
| Option 2 - Booking | Distributes the demand among different mobility services Additional communication channel with high reach | Thesetens notional players, notably small mobility service providers and PTDs | While the most impacted are clearly MaaS providers, the winners are on-demand mobility | | MasS service providers would lose clients to Coople - if it decides to become a direct competitor - and will thus be obliged to: | |
| Option 3 - Ticketing & payment | Distributes the demand among different mobility services Improves payment operations of the full mobility ecosystem | Threatens notional players, notably small mobility service providers and PTOs Georgie could become a monopoly for transport payments | Net and total impact of Google's move into Maas on key stakeholders International International Sort International Mass International Mass International Sort International International International Sort International International International Sort International International International | | | |
| Option 4 - Contractual responsibility | Brings competition and forces existing PTDs and mobility operators to improve service | Theostens the investments tracke in PTOs and MaaS initiatives Google could become a manopely for transport services distribution | | * Maa5 service providers On-demand mobility operators* | and mobility operators# | Creats a big partnership ecceyatem to competa er Find siche markets / segments and deliver specialised services Public Transport Operators would not be threatened on the operational side by Google |
| x H0.046 | MI(5. | Total impact | PTOs EU & Taxesport Ministries* | | as Google will not get into public transport operations, but could lose the customer relationship to Google and pay consequent referral and transaction fees to Google • EU institutions and national transport ministrier need to open the market to ensure that users are offered best in class services while marking sum to player becomes too powerful to control the market | |
| | | | | Negative Net in | mpact Highly positive | |
| | | | Sever | HOLDMUS | | PTÓLEMUS |







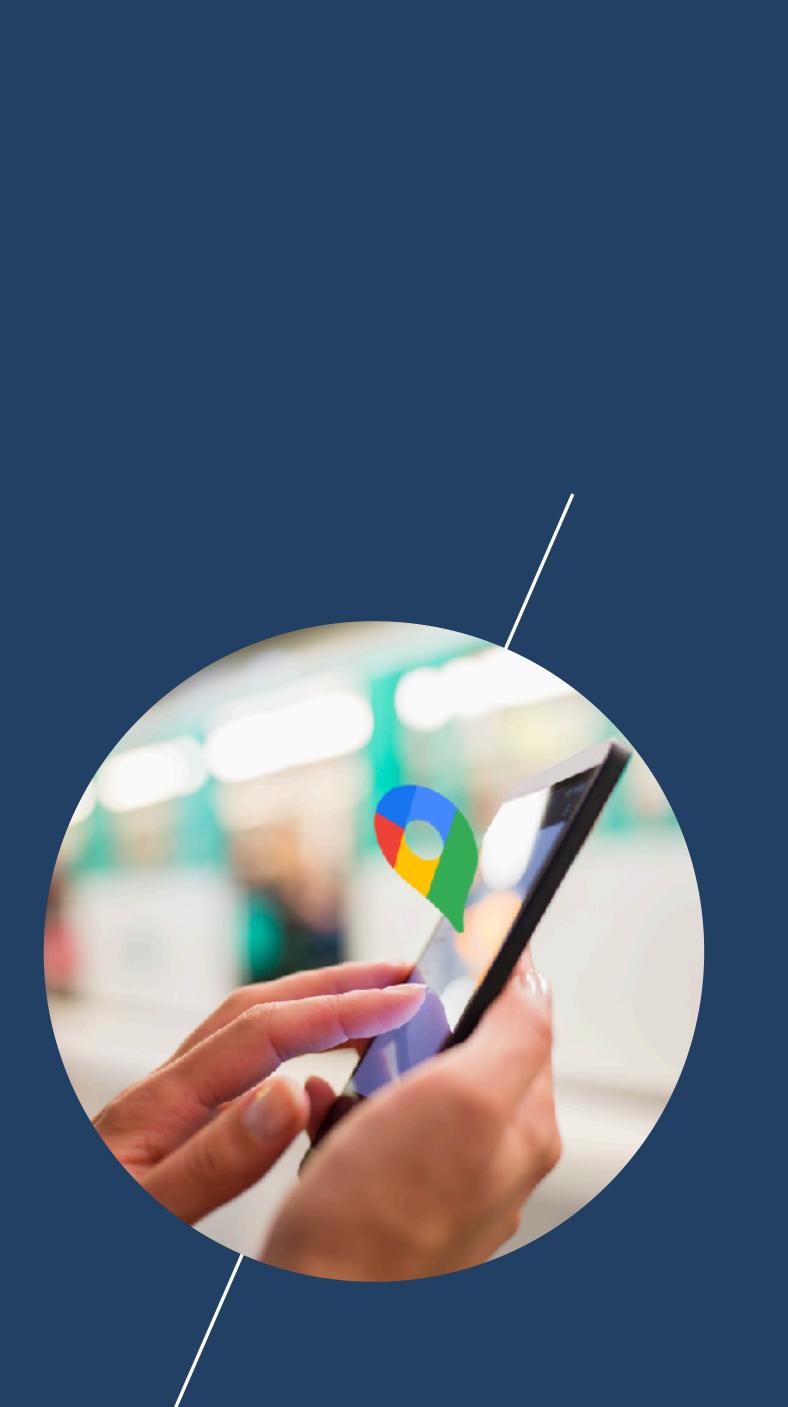




Google in MaaS report

About PTOLEMUS

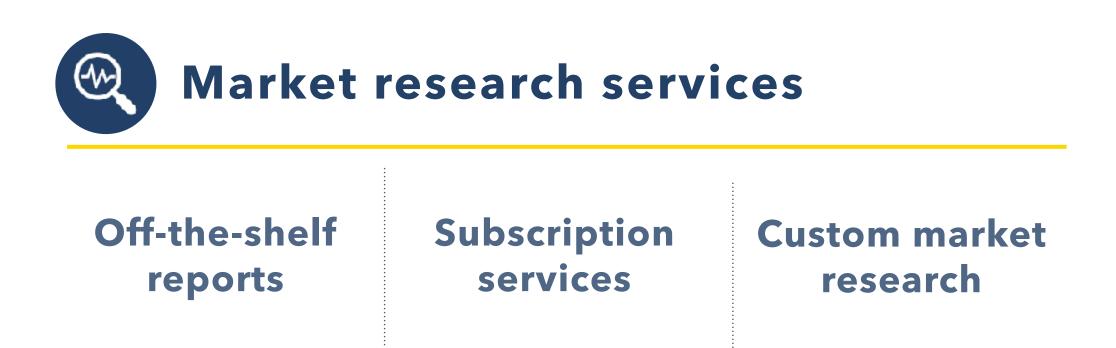
PTÓLEMUS Consulting Group



PTOLEMUS is the first strategy consulting and research firm entirely focused on connected mobility and smart infrastructure

| Strategy consulting services |
|------------------------------|
|------------------------------|

| Strategy definition | M&A advisory | Growth strategy | |
|------------------------|--------------|--------------------|--|
| Innovation | Partnership | Procurement | |
| management | strategy | strategy | |





Fields of expertise

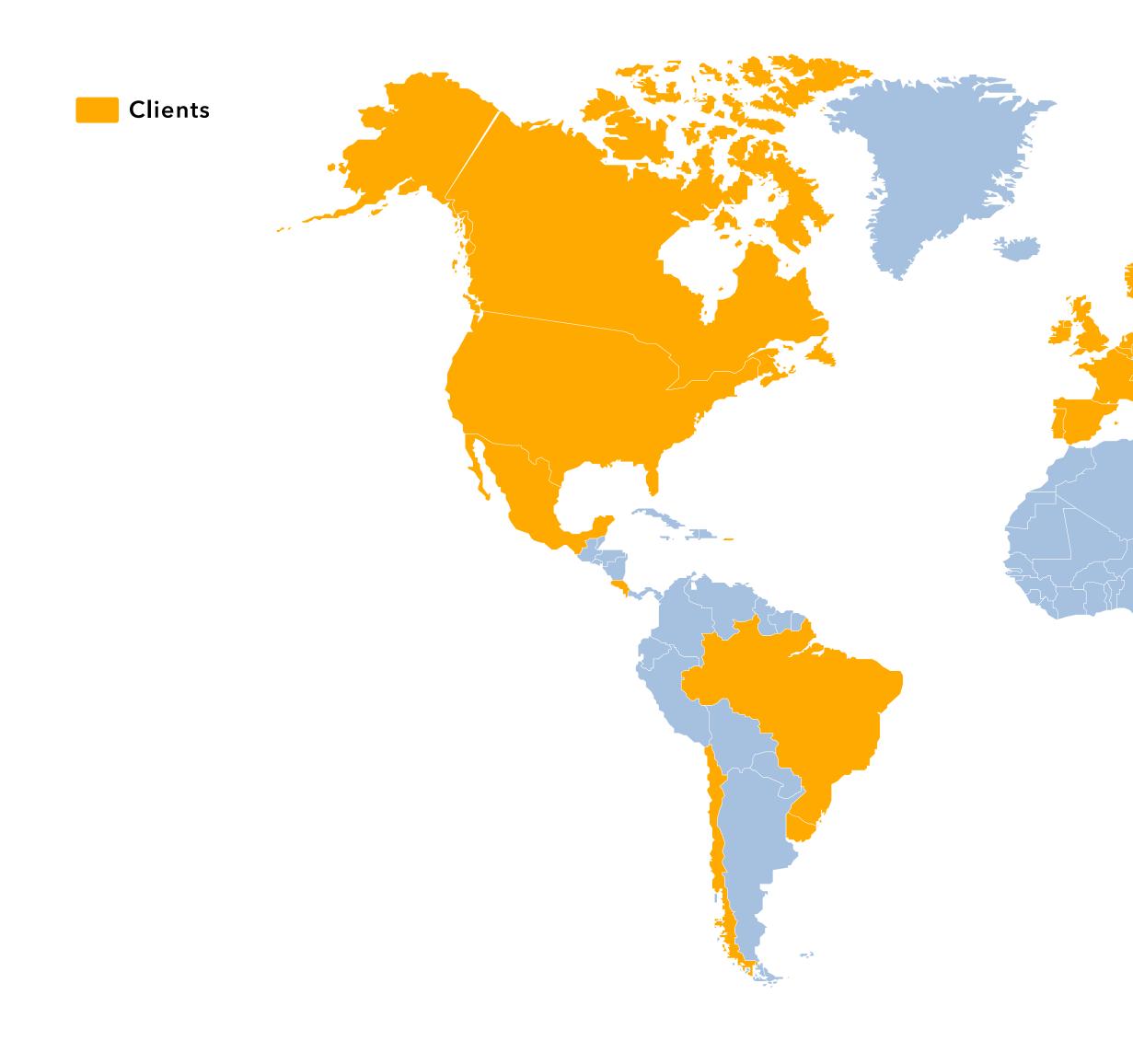
| Autonomous Vehicles | Connected Vehicles | Connected Moto Insurance | |
|--------------------------|--|-----------------------------|--|
| Electric Vehicles | Electronic Toll Collection | Emergency Services | |
| Fleet Telematics | Intelligent Transportation Systems | Location-based Services | |
| Mobility Payments | Mobility-as-a- Service | Road Usage Charging | |



PTOLEMUS has completed nearly 200 consulting assignments, serving over 350 clients across the mobility ecosystem



Our team of consultants, experts and analysts with 12 nationalities, serves our clients in 41 countries



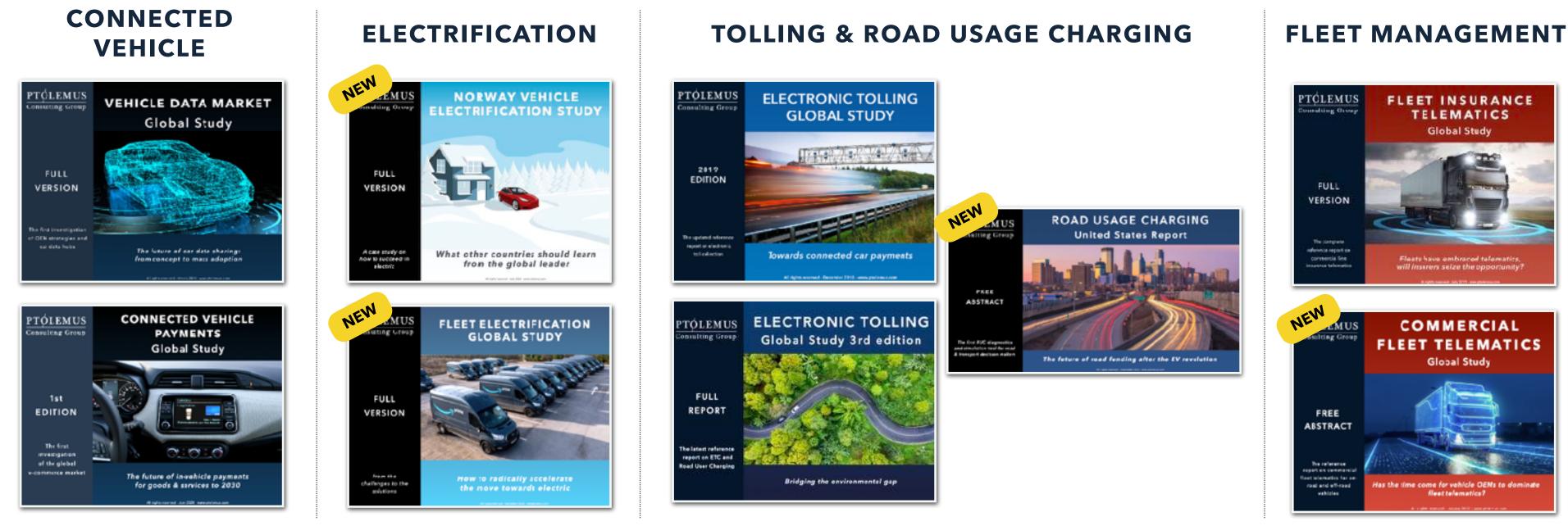




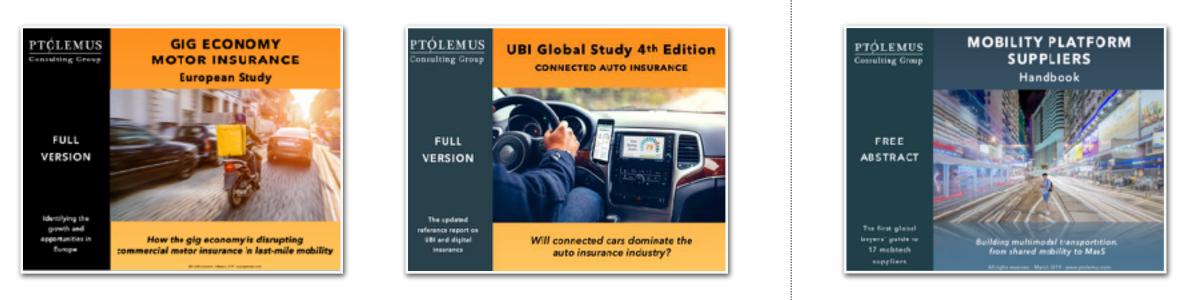
PTOLEMUS has published nearly 30 landmark reports and market forecasts on mobility markets

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INSURANCE



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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