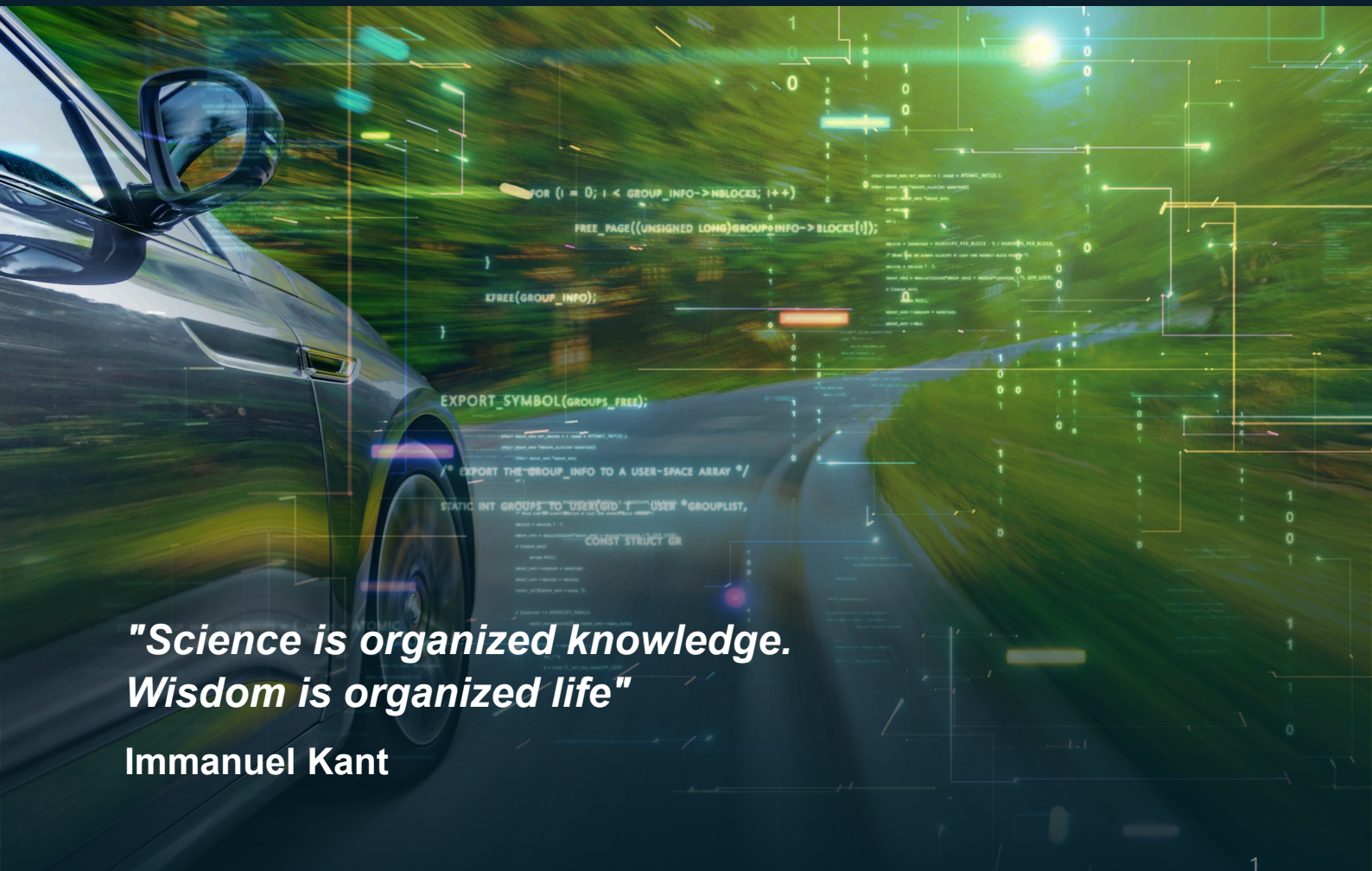
Building the Smart Mobility Future: From Vehicle Power to Data Power



"Science is organized knowledge. Wisdom is organized life"

Immanuel Kant

The Paradigm Shift to Smart Mobility: AI-Driven Innovation and Behavioral Change

Throughout history, mobility has undergone multiple paradigm-shifts.

A pivotal moment was Henry Ford's introduction of the **Model T**, the first mass-produced car using assembly line techniques, which significantly reduced production costs and made automobiles more affordable revolutionizing personal transport by making cars accessible to the masses.

The shift from horses to automobiles reshaped cities, industries, and society.

Ford famously remarked, "*If I had asked people what they wanted, they would have said a faster horse*," emphasizing the need for visionary innovation over mere improvement.

Today, we face a similar revolution with **IoT** technologies and **AI** not just improving mobility but reimagining it. These technologies go beyond simply advancing existing models; they introduce entirely new ways to think about mobility, integrating real-time data, predictive analytics, and autonomous systems.

Since the introduction of the first cars on the rough roads of the early 20th century, **Generative AI and a new generation of Intelligent, Interoperable Internet of Thing (3IoT)** are now leading the next revolution of "**digital roads**" which are redefining the smart mobility age.

Witnessing the rise of this new market shift, our goal in this e-book is to provide a comprehensive overview of the current landscape, highlighting key achievements at the core of business transformation driven by a surge in data and insights derived from it. We also outline the path to the next level of innovation, where **collective wisdom from stakeholder collaboration** will be crucial in advancing **Generative AI**.

This progress will not only enhance the mobility sector, which plays a significant role in contributing to the worldwide economy and GDP (the **automotive industry alone** is one of the key pillars of Europe's economy, accounting for roughly **7 percent of the EU's GDP** and employing more than **14 million people** directly and indirectly) but also improve operational efficiency and the livability of public spaces, **paving the way for the development of smart cities**.

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The content presented in this eBook reflects OCTO Telematics' direct experience in their respective market and their consolidated expertise. OCTO Telematics retains full ownership of the intellectual property contained herein. While every effort has been made to ensure the accuracy and reliability of the information provided, it should be noted that the content is intended for informational purposes only.

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The Transformative Power of Smart Mobility: Connecting Technologies People and Places

Defined as “The integrated user-oriented transport systems and services that can make travelling safer, smarter and greener using innovative technologies,”[1] Smart Mobility is the result of a profound transformation in mobility, fueled by the convergence of **big data**, **artificial intelligence (AI)**, and the **Internet of Things (IoT)**. These technological advancements have shifted traditional, siloed transport systems towards interconnected, data-driven ecosystems, where every aspect of mobility is monitored, optimized, and automated in real-time. Furthermore, Smart Mobility serves as the catalyst for digital transformation, embedding intelligence into vehicles and physical infrastructure to support enhanced decision-making and adaptability to different environments.

The benefits of smart mobility extend beyond transportation efficiency, acting as a strategic tool to advance multiple industries and address critical challenges of the society such as urban congestion, environmental degradation, and road safety. By leveraging predictive analytics and machine learning applications, stakeholders across the mobility ecosystem can gain insights that not only enhance their operations but also contribute to reducing associated problems in emissions, traffic accidents, and infrastructure failures.

A key aspect of this evolution is the shift from reactive to proactive management.

Real-time data from vehicles, business systems, and infrastructure provide actionable insights, predicting high-risk areas, optimizing routes, and dynamically adjust transport networks. Technologies like digital twin are invaluable for simulating mobility scenarios, enabling planners to visualize the impact of changes and make data-driven decisions that enhance the flow of mobility and improves sustainability.

complex transformation creates numerous opportunities for the convergence between traditionally distinct industries, unlocking new business models. Possibilities can be fully realized with an **'open-to-collaborate' mindset**, fostering cross-sector innovation and dynamic partnerships.

Insurance companies, fleet operators, automotive manufacturers and logistics managers are increasingly integrating smart mobility technologies into their operations. For example, fleet managers use telematics to optimize vehicle utilization and maintenance, while insurers leverage connected car data to create dynamic risk models, streamline claims management, and ultimately improve loss ratios. At the same time, energy providers are also playing a crucial role by collaborating with transport planners to develop scalable electric vehicle (EV) infrastructures. In utilizing mobility data, they can better understand and balance energy demands, which is also creating new business models for selling energy back to the grid. Realizing the full potential of smart mobility requires long-term investments in infrastructure, technology, and human capital with a strong cooperation between private and public entities. This is essential to create a virtuous cycle of data generation, and when processed can create new value for all the stakeholders. On the other side, the integration of diverse systems—from AI-driven applications to IoT-connected vehicles—requires standardized communication protocols and robust cybersecurity frameworks to protect sensitive data and ensure system reliability while safeguarding customer privacy.

(1) Source: United Nations
https://www.unescap.org/kp/2022/increasing-use-smart-mobility-approaches-improve-traffic-conditions-urban-areas-south-east

Forces Driving the Growth of Smart Mobility

The growth of smart mobility is a conglomerate effect of several key forces, each contributing to a change in the daily personal and collective mobility.

Technological Advancements: The development of connected vehicles and drivers, facilitated by the Internet of Things (IoT), is revolutionizing mobility services. Technologies such as telematics, real-time data analytics, and autonomous systems are enabling a diverse range of services like ride-hailing, shared cars and micromobility. These services, accessed through integrated reservation and payment platforms, offer users greater convenience and flexibility. The integration of multiple transport modes into unified digital platforms simplifies navigation and enhances the user experience, potentially lowering costs and carbon footprints, while increasing convenience.

Evolving Consumer Mobility Demands: Consumer preferences are shifting towards real time, personalized and on-demand services. This shift emphasizes the need for flexible transportation options, which challenge traditional systems to evolve. However, gaining consumer trust is crucial, as providing tailored services requires access to personal data. Companies must balance innovation with data privacy to meet these new expectations.

Transformation of the stakeholders' ecosystem: The digital transformation is driving companies to adopt a more interconnected and collaborative framework, where traditional industry boundaries are fading. This shift enables the creation of integrated solutions and partnerships across diverse sectors such as insurance, automotive, telecommunications, energy, and logistics, to name a few.

Regulatory Influence and ESG Goals: Regulations and environmental, social, and governance (ESG) objectives play a significant role in shaping the smart mobility landscape. Governments and local authorities promote sustainable mobility solutions through carbon taxes, subsidies, and investments in infrastructure. Regulatory frameworks are also evolving to keep pace with rapid technological advancements, particularly in disruptive AI applications, which often outpace traditional regulatory processes. Regulators, as key drivers of change, can significantly impact progress by adopting an agile approach and enacting flexible policies that foster innovation while ensuring safety and compliance with fundamental rights. Regulatory sandboxes accelerate innovation by providing controlled environments where new technologies can be tested without compromising consumer protection. This approach gives valuable insights into emerging technologies, enabling them to adapt policies that responsibly support growth and development.

2.1 Technology

Everyday objects are becoming connected and equipped with sensors, creating an immersive digital space that expands service possibilities through smart interactions. This massive data network, growing at an annual rate of 40 percent, is analyzed and processed to drive new levels of intelligence and innovation across traditional industries. This trend has far-reaching implications for organizations, industries, and economies worldwide.

By the end of 2024, more than 207 billion devices are projected to be connected to the global IoT network. This vast network includes not only traditional devices like computers and smartphones but also an ever-growing array of everyday tools equipped with connectivity capability[2]. As IoT evolves, it is enabling a new era of connectivity where devices can communicate, learn, and make autonomous decisions, marking the emergence of what we define the "**Intelligent Interoperable Internet of Things" (3IoT)**.

The power of the new 3IoT generation lies in its ability to transform the human experience trough daily active interactions with a multitude of connected and smart objects, which are reshaping our lifestyles, businesses, and cities.

This transformation is particularly significant in mobility, where connected devices and real-time data are key to managing increasing population densities and mitigating negative impacts on health and sustainability. Smart mobility, driven by connected vehicles, stands at the forefront of the IoT revolution. IoT systems for cars have become an integral part of vehicle design: by 2030 it is expected that more than 60 percent of vehicles on the road and 95 percent of new vehicles sold[3] will be natively equipped with advanced connectivity systems.

The integration of IoT in smart mobility is not just about connecting vehicles but about creating a dynamic, intelligent ecosystem that improves the quality of life. With IoT, devices serve as gateways to new digital spaces, enabling a fluid interaction between the physical and digital realms. For example, in-car payments allow drivers to conveniently pay for services through their connected car. In a recent survey, 56 percent of respondents said that making in-car payments for food, tools, fuel, and parking is an essential feature when it comes to connected car services[4].

2.2 Consumers' Mobility demands

Consumer needs are constantly evolving and new consumption models, new lifestyles (increasingly connected) and greater attention to environmental sustainability issues are emerging. With the changing landscape of coexisting generations, each with profoundly different needs and preferences, the generational evolution is accompanied by a change in the composition of society. Furthermore, global events like the COVID-19 pandemic have accelerated societal differences in the users' travel preferences.

While it is increasing composed of more options lead by the trend in micro-mobility, many countries remain highly dependent on cars. Italy has the second highest motorization rate in Europe, with around 663 vehicles per 1,000 inhabitants, second only to Luxembourg (681 vehicles/1,000 inhabitants) and much higher than the other main European countries (Germany 574, Spain 519, France 482, United Kingdom 473).

(2) https://www.forbes.com/sites/bernardmarr/2023/10/19/2024-iot-and-smart-device-trends-what-you-need-to-know-for-the-future/

(3) https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/unlocking-the-full-life-cycle-value-from-connected-car-data

(4) https://www.mastercard.com/gateway/customers/industries/in-car-commerce.html

The ability of a vehicle to collect an increasing amount of data, while respecting privacy requirements, has allowed third parties to develop **new services for the consumers and disrupt traditional business models**. In recent years Vehicle-as-a-Service (VaaS) has become more popular as consumers shift from 'ownership' to 'usership' and seek more flexible mobility models. In Europe's five core markets, by 2025, 10 percent of new vehicle registrations for private and corporate customers are expected to be subscription-based[5] . To keep customers engaged, data and strong data analytics is key to generating the kind of insights needed to offer the right subscription discounts, upgrades, and extras at the right time on the right channel.

In a recent consumer study, only 6 percent of Italians surveyed would not be willing to share vehicle data, with a higher reluctance in the UK (14 percent) and US (14 percent). Most respondents have no concerns, or no concerns as long as they are confident about data protection. Approximately one-third have concerns, but would be willing to share data in return for benefits[6].

In an insurance context, consumers are motivated to share additional personal data for a range of different benefits. In Europe, 42 percent would do so for cheaper premiums, 33 percent for more personalized services and 27 for an enhanced claims process[7]. North Americans are more motivated across the board, with 47 percent for cheaper premiums, 37 percent for more personalized services and 35 percent for an enhanced claims process. This exchange of "data for benefits" is evident in the growth of Usage-Based-Insurance (UBI), estimated to have a 5 percent penetration in Europe and 7 percent in North America[8].

2.3 Transformation of the stakeholders' ecosystem

The rapid evolution of the digital technologies is fundamentally transforming the core processes of mobility stakeholders, impacting everything from IT architectures to required skill sets. **This change demands more than just deploying new applications; it requires new operational models redefining daily workflows to align with economic sustainability and a competitive positioning, evolving** expectations, and stringent regulatory frameworks. As new mobility paradigms are entering like Mobility as a Service (MaaS), flexible rental models ("from 3 minutes to 3 years") challenging the mobility landscape, industry boundaries are rapidly blurring. Sectors such as insurance, automotive, telecommunications, energy, and logistics are increasingly interconnected, creating a dynamic ecosystem where collaboration is essential.

A meaningful example of this can be found in the automotive industry evolving from traditional car manufacturing to becoming a provider of mobility and insurance services. Companies like Stellantis's Drivalia, Renault and BMW now offer integrated solutions such as car subscriptions, ride-sharing, and autonomous driving features. Others like Nissan have integrated smart mobility technologies into their operations, allowing customers to access their courtesy car quickly and easily through the new "Promessa Nissan" mobile app. Another example is Tesla's Full Self-Driving (FSD) subscription service which allows customers to access advanced autonomous features without purchasing them outright. Similarly, GM not only provides emergency assistance but also telematics-based insurance, using driving data to offer personalized insurance policies with premiums that directly reflect the drivers' risk profile.

This convergence fosters the development of integrated solutions that address evolving consumer demands and regulatory requirements, while also enhancing competitiveness in the face of disruptive innovations. The shift towards a more connected and collaborative framework is transforming how businesses operate and deliver value in the smart mobility space.

(5) https://www.deloitte.com/global/en/Industries/automotive/perspectives/vehicle-as-a-service.html

(6) Frost & Sullivan

(7) Capco Global Insurance Survey 2023 (capco.com)

(8) Berg Insight

2.4 Regulations: Privacy, Security, and ESG

Regulations are pivotal for the development of the smart mobility market as they provide a structured framework that balances innovation with public safety, privacy, and environmental goals.

Effective regulations help create a trusted business environment, encouraging investment and fostering technological advancements. By establishing clear standards, they ensure that new technologies are implemented responsibly and sustainably, which is essential for gaining public trust and achieving long-term market growth. European regulations like the **GDPR, Data Act, and AI Act** are essential for promoting innovation while safeguarding data privacy and ethical standards. In car connectivity and smart mobility, these regulations ensure secure data sharing and responsible AI use. To foster market growth, clear rules and mandates are now crucial, providing a stable framework for businesses to innovate confidently and for users to trust in new technologies, enabling seamless integration of connected vehicles, autonomous driving, and smart city solutions within well-defined regulatory boundaries. In addition, the growth of the sector is also influenced by the **European Green Deal** and the **ESG objectives.** The European Green Deals aims for climate neutrality by 2050 with a significant 2030 interim target to cut greenhouse gas emissions by at least 55 percent compared to 1990 levels.

This framework is driving cities and industries across Europe to adopt sustainable practices and innovate towards low-emission transportation solutions. As part of this effort, over 100 European cities are committed to achieving the goal by 2030.

ESG has even more challenging goals to drive companies towards more sustainable (for the environment, for the Society and for the governance) business practices. Organizations must proactively implement ESG themes, with transparency and a culture of continuous improvement. According to Gartner, by 2025, 50 percent of CIOs will have adopted sustainability metrics to track and enhance their organization's environmental impact with the goal to measure sustainability[9].

By doing so, businesses can support sustainable growth while contributing to the broader goals of the European Green Deal and other Global Sustainability objectives. **By 2029, most business operating in the EU will have to comply with the Corporate Sustainability Reporting Directive (CSRD) that modernizes and strengthens the rules concerning the social and environmental information that companies must report.**

(9) https://www.gartner.com/en/articles/are-you-thinking-too-small-about-sustainable-technology

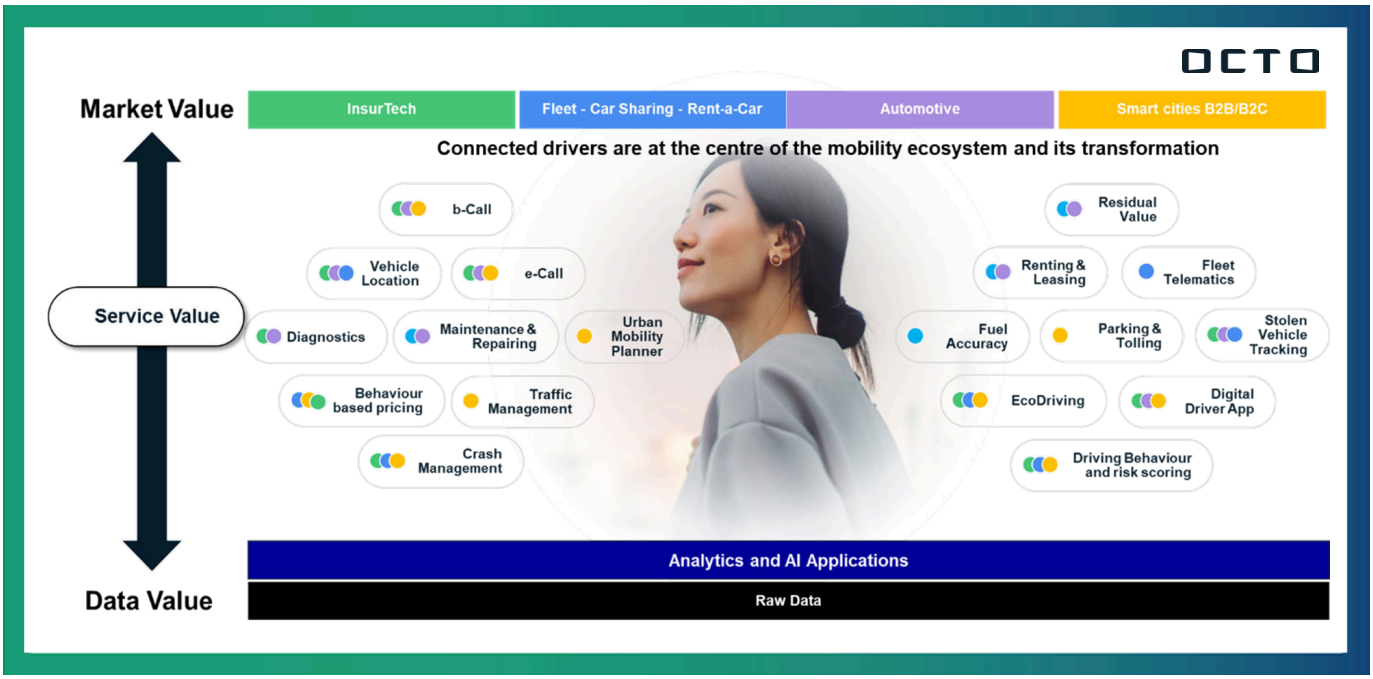


Fig. 3-1: The data value chain: from raw information to business Value

The fluid exchange of data and cross-industry integration paves the way for a future that prioritizes not just the single vertical efficiency but contributing to the goals of sustainability and social well-being.

As smart mobility leverages digital data and analytics, it facilitates a continuous cycle of measurement, action, and improvement, ensuring transparency and accountability for all stakeholders. This capability aligns with ESG goals by reducing environmental impact through eco-friendly driving, enhancing safety by decreasing traffic congestion and road fatalities, and combating fraud. By offering a comprehensive understanding of mobility's effects on society and the environment, smart mobility helps companies advance their sustainability and social responsibility initiatives.

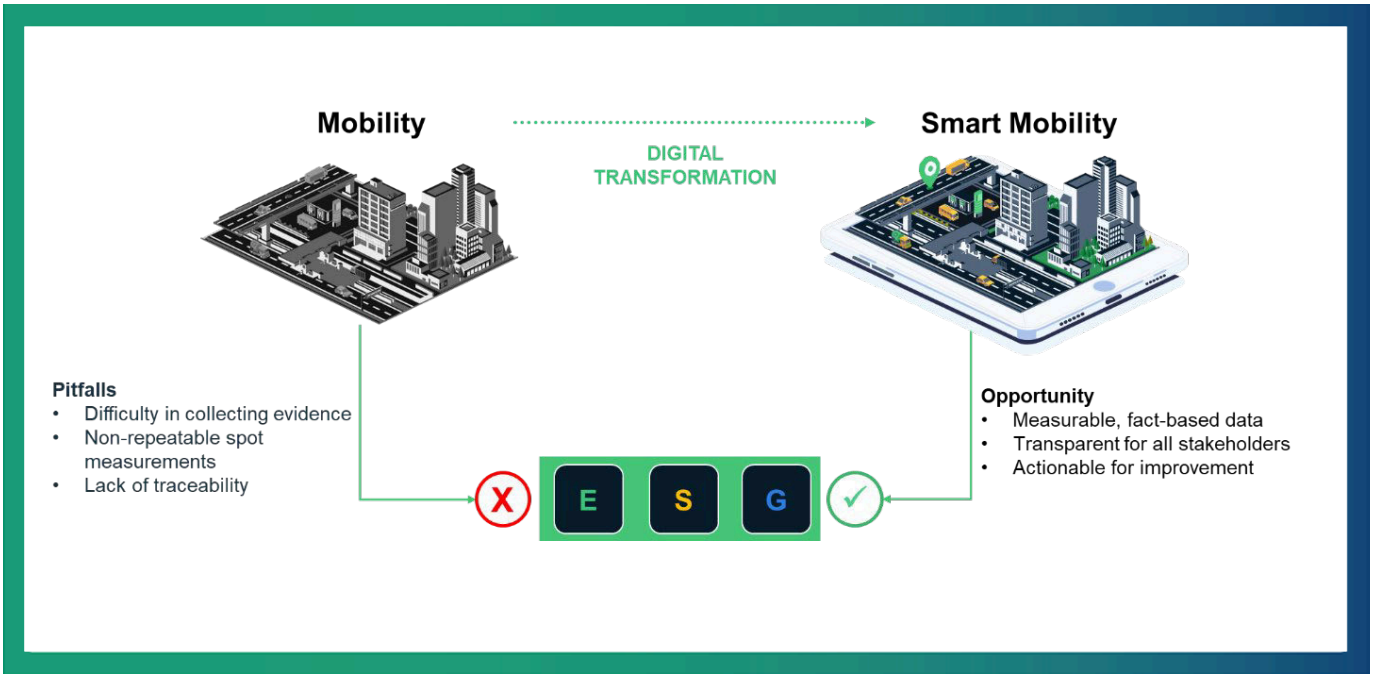


Fig. 3-2: The Digitalization as enabler of ESG goals in smart mobility

3.1 Main achievements in the private and public sectors

A survey conducted by OCTO with Claims Managers and Adjusters revealed that 81 percent of respondents stated that OCTO's data is essential for making informed decisions. Over 70 percent of respondents reported that OCTO's data enabled them to reduce the claims processing time by up to 50 percent. This demonstrates how the OCTO claims management solution, a technological innovation based on telematics and AI Applications, helped digitalize the claims processes and provide a collaborative engagement with process stakeholders. This significantly enhanced the efficiency of claims handling, adding value to the entire ecosystem and embracing the ESG rules for compliance.

This example, shows how solutions well proven in a sector, such as the claims management for Insurance, are also benefitting the overall safety of drivers and their surroundings, and in a fleet context, helping to reduce downtime and manage the total cost of ownership (TCO) - creating a cross-industry benefit.

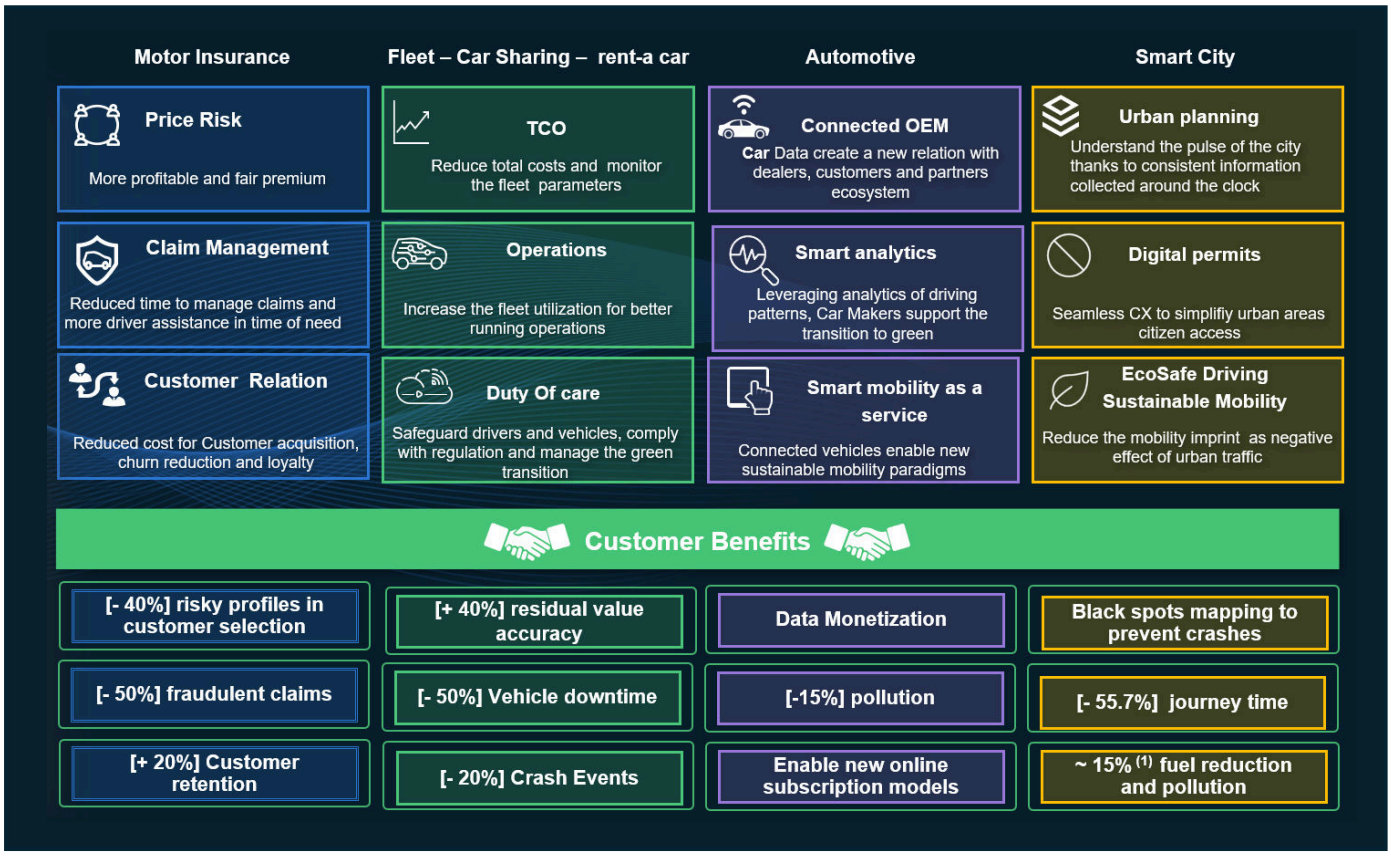


Fig. 3-3: The data value chain: from raw information to business Value

In the following we report some details of the main mobility stakeholders and consolidated benefits.

Insurance Companies

Insurance is one of the first verticals adopting connected vehicles technology, today Usage-Based Insurance (UBI) has spread across the world, with a global penetration of 5 percent, led by Italy with a penetration of 18 percent. UBI models powered by telematics, allow insurers to assess risk based on real-time driving data. This shift encourages safer driving behavior and allows for more personalized premiums, benefiting both insurers and customers by reducing accidents and claims.

OCTO DriveAbility® Advanced Score, an AI application for the driver risk prediction, has been filed and approved in 48 US States and is available in more than 19 countries. The score has the best LIFT indicator of 10, where LIFT is a measure of how model is able to differentiate higher risks from lower risks – the higher this number, the better the model is able to provide segmentation.

Other important areas for improving the combined ratio include claims management and fraud detection. The FNOL (**First Notification of Loss**), which initiates the claims process, can be significantly accelerated through telematics that automatically detects accidents, reducing reporting time from days to real-time. Early FNOL enables insurers to handle claims proactively and efficiently, while also providing better customer support with assistance and faster settlements. Collision data collected during the incident, when compared with the claim report, demonstrates that **telematics data increases fraud detection by 250 percent**, according to evidence gathered and assessments carried out by OCTO, compared to traditional processes (with the same company's operators involved).

Insurance companies are also increasingly using telematics to certify their **ESG policies** due to the fact that the telematics policy encourages and rewards safer, greener driving behaviors by tracking driving patterns, promoting fewer kilometers driven, and fostering a more responsible approach to driving. By aligning driving incentives with sustainability goals, insurers can offer benefits to customers who adopt eco-friendly practices, thereby reinforcing their commitment to environmental and social responsibility.

Fleet Management

By leveraging IoT and telematics, Fleet operators can optimize their TCO, improving the fleet operations, reduce fuel consumption, and minimize emissions. Real-time data collection allows fleet managers to monitor vehicle performance, plan for maintenance, and integrate eco-friendly vehicles into their operations, improving both sustainability and efficiency.

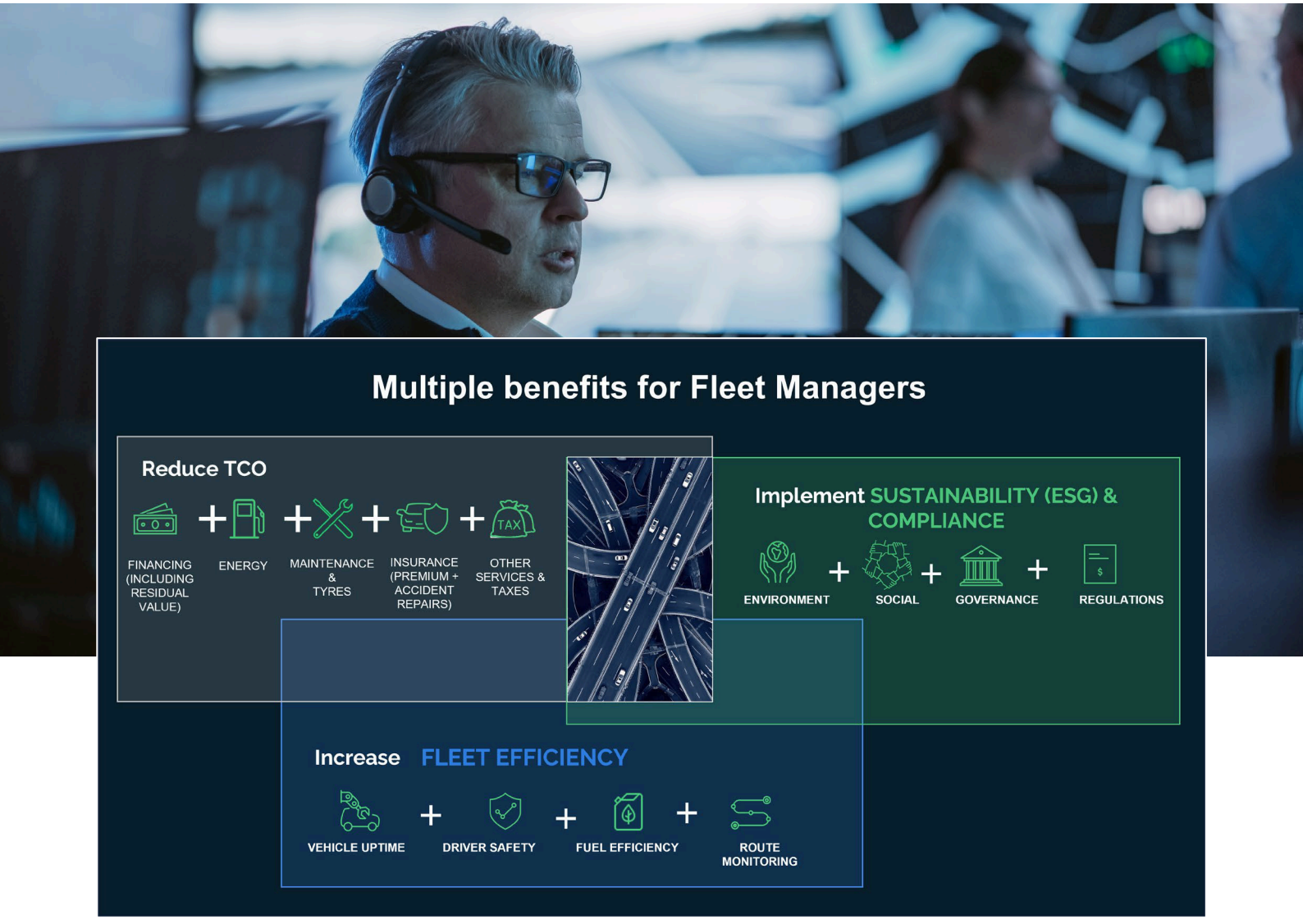


Fig. 3-4: The value of telematics for multiple Fleets goals

Based on OCTO's experiences and market references, a number of business processes benefits can be achieved:

40% Improvement residual value accuracy: Incentivize a low risk driving style to reduce crashes and vehicle stress by monitoring and scoring the habits and behavior behind the wheel.

25% Reduction in maintenance costs: Perform maintenance on vehicles to keep them in good condition while minimizing damages and intervention costs. At the same time, it maximizes vehicles' utilization to reduce downtime.

25% Reduction in fuel consumption: Prevent fuel frauds by monitoring refueling processes through info on fuel level, location and time of refuel. Perform consistency check on actual mileage. Receive alert for fuel syphoning with engine off and check the car's health status to guarantee optimal conditions (tire pressure, Diagnostic Trouble Codes).

25% Reduction in vehicle idle time: Perform regular maintenance on vehicles, timely plan and monitor the vehicle's usage to reduce downtime.

20% Reduction in insurance costs: Incentivize a low risk driving style to decrease the possibility of crashes and vehicles overused through monitoring and scoring drivers' habits and behavior. Speed up claim process through a reconstruction of the crash's dynamics. Protect against cloned licenses and plates, or wrongly attributed violations of the road code. Reduce frauds.

8% Reduction in driven miles: Monitor current and historical vehicle localization, list of trips traveled. For better planning and prevention, be promptly alerted in case the vehicle enters or exits the area of interest.

Vehicle Rental and Leasing Firms

Vehicle rental and leasing companies are utilizing smart technologies to improve customer experiences and operational efficiency. Keyless rental systems, fleet tracking, and real-time vehicle availability enable more flexible and eco-friendly options. These innovations have helped rental companies align with the sustainability goals of municipalities by promoting the use of EV. Improved sustainability is further helped with the advent of carsharing services, with every shared vehicle estimated to take 23.5 private cars off the road. Furthermore, car sharing vehicles emit 25.5 percent fewer emissions than the average car.

An example of the shift in people's mindset from car ownership to car sharing is the rise of operators like Enjoy, which, with a fleet of about 3000 vehicles across the major urban areas in Italy, is enabled by OCTO end to end technology.

With the increased pressure of shorter lifecycles before customers can switch to alternative service providers if they are not content, US based company Flexcar, offers a smart alternative to car ownership through a subscription model. In partnership with OCTO, they have prioritized the customer by elevating the user experience.

(10) Overall savings reported are based on market independent analysts as F&S

(11) Zipcar https://www.zipcar.com/en-gb/press/car-sharing-statistics

Automotive Manufacturers

Automotive companies are redefining their role in smart mobility by transforming cars from being hardware-centric and owned assets, into "connected spaces on the wheels" equipped with native digital services. Through V2X (Vehicle-to-Everything), these connected vehicles are able to seamlessly integrate with infrastructure, enhancing traffic management, reducing accidents, and cutting emissions. The shift towards electric and autonomous vehicles is accelerating this evolution, turning cars into dynamic platforms for software solutions, better known as the software-defined vehicle (SDV).

To better leverage the future opportunity that surrounds smart mobility, a number of automakers have formed dedicated business entities and business units. One example is the Mobilisights business unit of Stellantis, which will leverage data from the groups' connected vehicles. Operating as an independent business unit, they will collaborate with data partners and license data to a wide range of customers. With Mobilisights as a key contributor, Stellantis expects to generate €20 billion in incremental annual revenues from software-related services by 2030. Another example is the automotive software company CARIAD, a wholly owned subsidiary of the Volkswagen Group that aims to build a unified technology and software platform, including a vehicle operating system, vehicle cloud platform and a new unified architecture for all Volkswagen Group brands.

As automakers mature their business models in data, software and services, OCTO continues to build partnerships with multiple brands to support their efforts in building new customer value. To date, multiple use cases in insurance and analytical services have integrated insurers and their policyholders with highly predictive pricing based upon driving data collected from consenting customer vehicles fitted with embedded connectivity.

Smart Cities

Smart cities are leveraging data and analytics to optimize transportation planning, operations, and management. Advanced technologies, such as IoT sensors, GPS tracking, and predictive analytics, provide real-time insights into traffic patterns, demand forecasting, and infrastructure performance. By harnessing the connected vehicles and AI-driven models, cities can improve traffic flow, enhance safety, and optimize resource allocation in urban mobility systems with more informed decisions. Cities are also leveraging cutting-edge tools like digital twins, allowing city planners and industry stakeholders to shape urban spaces that are safer, greener, and more efficient for generations to come. As the use of technology become more prevalent, this transformation also requires new governance models that can effectively manage and harness the benefits.

One of the most effective applications in urban mobility planning is traffic rerouting to reduce congestion during roadworks or extraordinary events. In Fig. 3-5, the example is based on the city of Rome, in which OCTO provides an analysis of road flows before, during and after the construction site, with the aim of assessing their impact on multiple routes in terms of:

- Travel times
- Average speed
- Length of the routes

In providing an objective and transparent source of information, stakeholders are able to quickly and effectively define the rerouting of traffic that has minimal disruption for the city. In addition, this approach also helps cities gain insights into managing and preserving green areas in alignment with their sustainability goals.

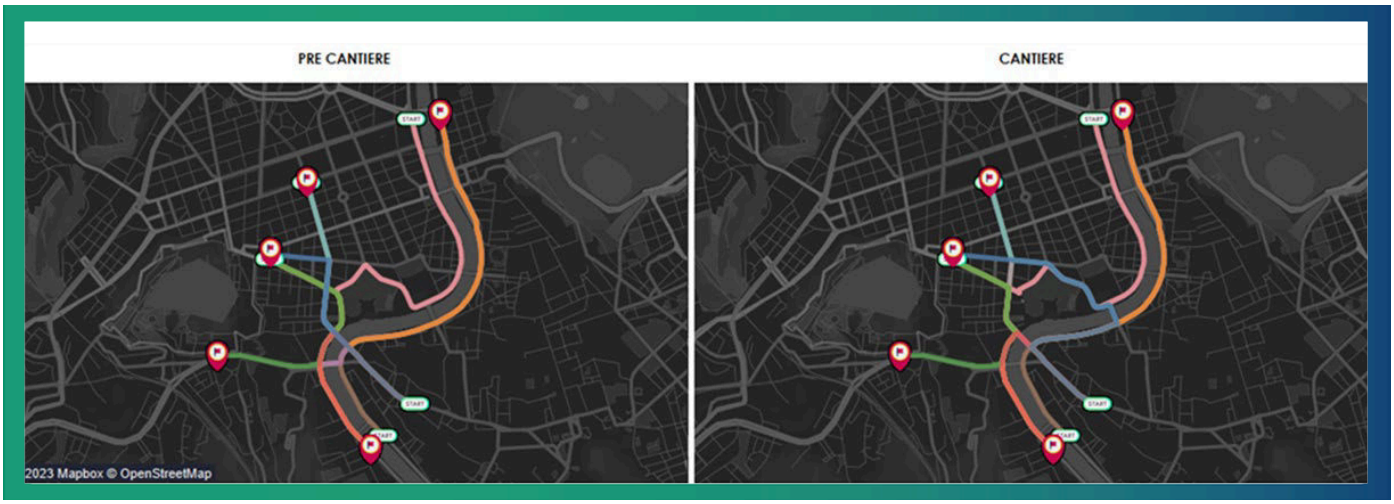


Fig. 3-5: Analysis of a list of itineraries and impacts due to working site on traffic.

As the adoption of electric vehicles increases, more stakeholders such as energy companies are also becoming critical players in smart mobility. They are responsible for developing and maintaining EV charging infrastructure and ensuring the additional energy demands are sustainable. By working closely with municipalities, energy companies help enable the transition to greener, low-emission transportation systems. Solutions already available on field, provide the simulation of electric mobility based on data gathered from connected vehicles. Using a selected sample, and through OCTO's physical electrification model and the parameters associated with it, a number of actionable insights can be identified including:

- **Clustering % of the residual vehicle charge at the parking area**
- **Clustering % of average daily vehicle consumption**

In the Fig. 3-6 the OCTO Mobility Atlas platform provides a wide variety of pre-calculated metrics for the analysis of a specific region to effectively assess the possible location of charging points based on mobility flows (including an origin to destination matrix, parking areas, etc.). In addition, the solution provides additional predefined metrics that simulate the energy needs of EVs based on certain characteristics including:

- Car battery power
- Average residual charge level
- Charging duration
- Distances travelled

Overall, **connected vehicles have the potential to play a significant role in addressing urban mobility challenges, including reducing emissions, alleviating traffic congestion, and improving overall air quality within European cities**. However, widespread adoption of connected vehicle technology and the necessary infrastructure upgrades are essential for realizing these benefits effectively.

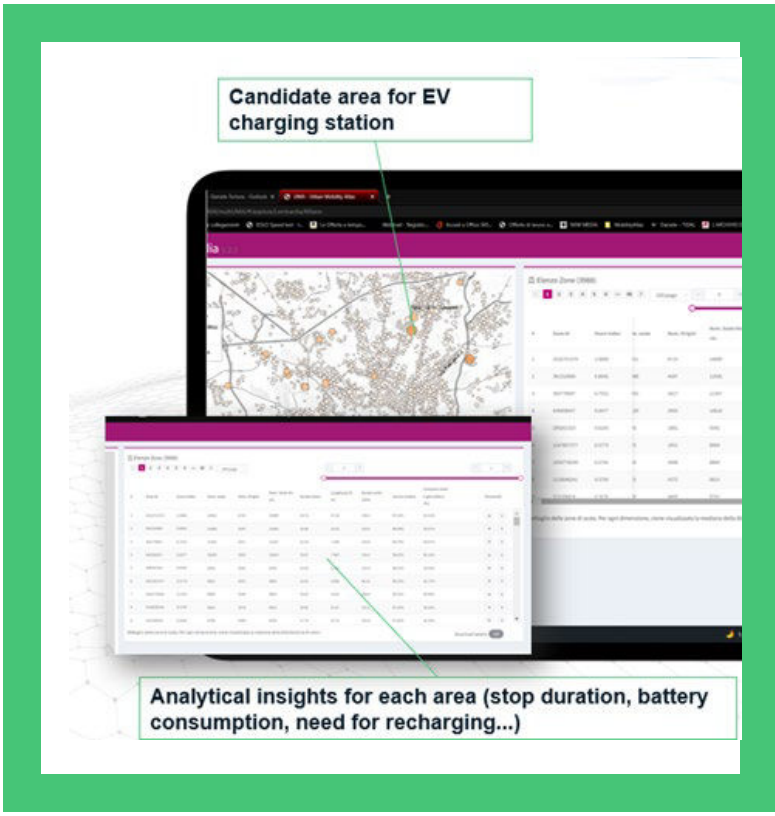


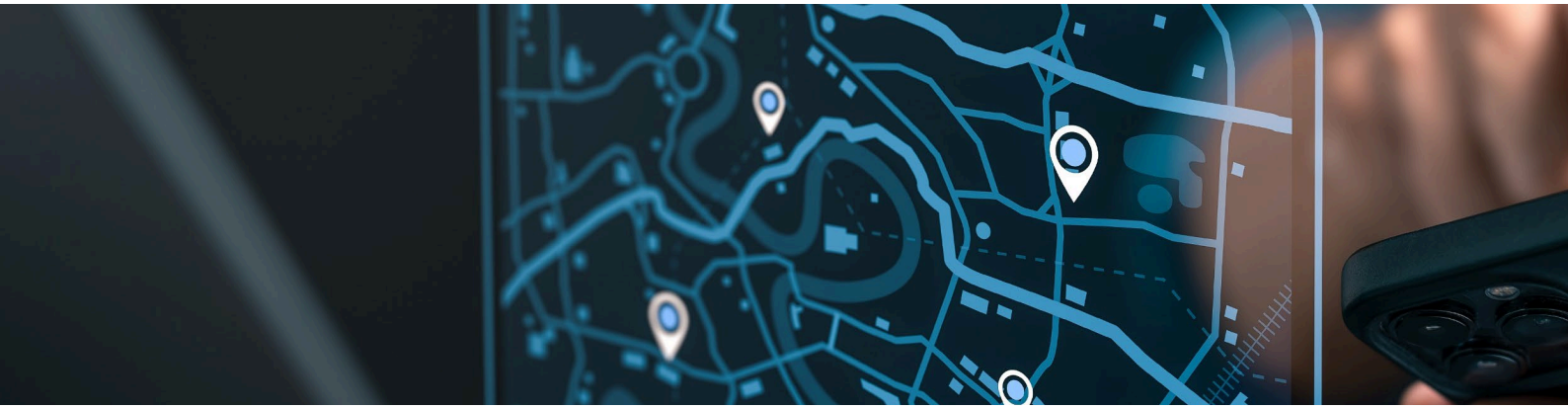
Fig. 3-6: Mobility Atlas – An outlook of the maps for the EV charging points based on the market demand.

3.2 Digital platform to build a mobility ecosystem

A connected ecosystem is best achieved through a platform business model, which promotes collaboration among diverse stakeholders to deliver a seamless, end-to-end customer experience and provide flexibility to adapt to different maturity levels of the companies adopting the digital technology.

Investing in data processing capabilities is critical to enhancing service offerings and AI models require huge quantities of data to ingest before delivering the expected results.

In smart mobility, mobility data serves as a strategic asset, accelerating innovation and helping stakeholders remain competitive in a fast-changing landscape. This ecosystem approach enables each company to advance at its own pace, focusing on core operations without being hindered by digital complexities. It ensures businesses can effectively leverage new digital capabilities while maintaining operational efficiency and agility.



By facilitating data exchange between various actors - such as automotive companies, motor insurance, service providers, and infrastructure operators - platforms enable seamless cooperation, transforming isolated tasks into a cohesive digital network.

Cooperation based on a "platform ecosystem" enables both horizontal and vertical scalability and an effective time to market of the applications. Horizontally, it facilitates the seamless integration of new services. Vertically, it supports market expansion from initial trials to full-scale adoption.

Developing a platform ecosystem yields four significant competitive advantages for participating actors:

1. **Enhanced Data Exchange**: Platforms significantly improve the exchange and sharing of data, enabling better decision-making and service optimization.
2. **Transformation of Value Chains**: Data sharing increase the opportunity to monetize new value from data that reshape the traditional value chain structures, leading to a convergence of actors from diverse sectors. This convergence creates new opportunities for collaboration and innovation.
3. **Integrated User Experience**: The involvement of multiple actors allows for the delivery of a fully integrated, end-to-end experience for users. This comprehensive approach ensures that user needs are met seamlessly across different mobility services.
4. **Accelerated Innovation**: Platform logic facilitates the sharing of assets, enabling broader ecosystems to introduce innovations more rapidly compared to traditional methods. This shared approach accelerates the pace of technological advancements and service improvements.

3.3 OCTO's Business Driven Data Model

A robust data management framework is essential for leveraging the full potential of connected mobility ecosystems. OCTO has developed a standardized data model for AI applications in risk scoring, crash and claims management, fleet solutions and smart cities analytics, ensuring a "service-driven approach" tailored to specific use cases and key performance indicators (KPIs). This model, built on a rich dataset collected from OCTO devices, is also extensible to third-party data sources and involves a thorough evaluation of OEM data—assessing relevance, completeness, frequency, quality, and cost—before integrating it into analytical frameworks for business services. Despite the lack of standardization across OEMs, which often limits data consistency to basic metrics like mileage and Diagnostic Trouble Codes, successful collaborations have demonstrated the benefits of data integration for fleet management and UBI programs. These initiatives enable insurers to deliver consistent predictive risk scoring across all customer bases, resulting in cost savings and a seamless user experience.

To summarize, there are some relevant policies to be applied on data to guarantee the standardized access from various sources as well as connected OEM platforms such as data normalization, data quality assessment, data completeness. Equally important is the focus on consent management and data privacy compliance. With the rise of data protection regulations, ensuring transparent and ethical handling of user data is crucial for building trust and sustaining long-term business growth. Implementing strong consent mechanisms and adhering to privacy standards not only helps organizations comply with legal requirements, but also enhances user confidence in data-driven services.

Aligned data costs, independent of data sources, play a pivotal role in ensuring efficient business ROI. By managing data expenditures strategically, organizations can maximize the value of their data assets while maintaining cost efficiency. This approach not only supports sustainable growth but also enables businesses to scale their data-driven initiatives effectively. In summary, a well-structured data management strategy that balances accessibility, privacy, insight generation, and cost efficiency is fundamental to enable organizations to harness the power of data for innovation, operational excellence, and strategic growth in the evolving landscape of smart mobility.

3.4 OCTO delivery models

In addition to the data model, OCTO has designed its platform architecture to support various operational models (e.g. Fig. 3-7) enabled by its technological infrastructure. This flexibility allows for quick adaptation to different customer environments and varying levels of digital readiness

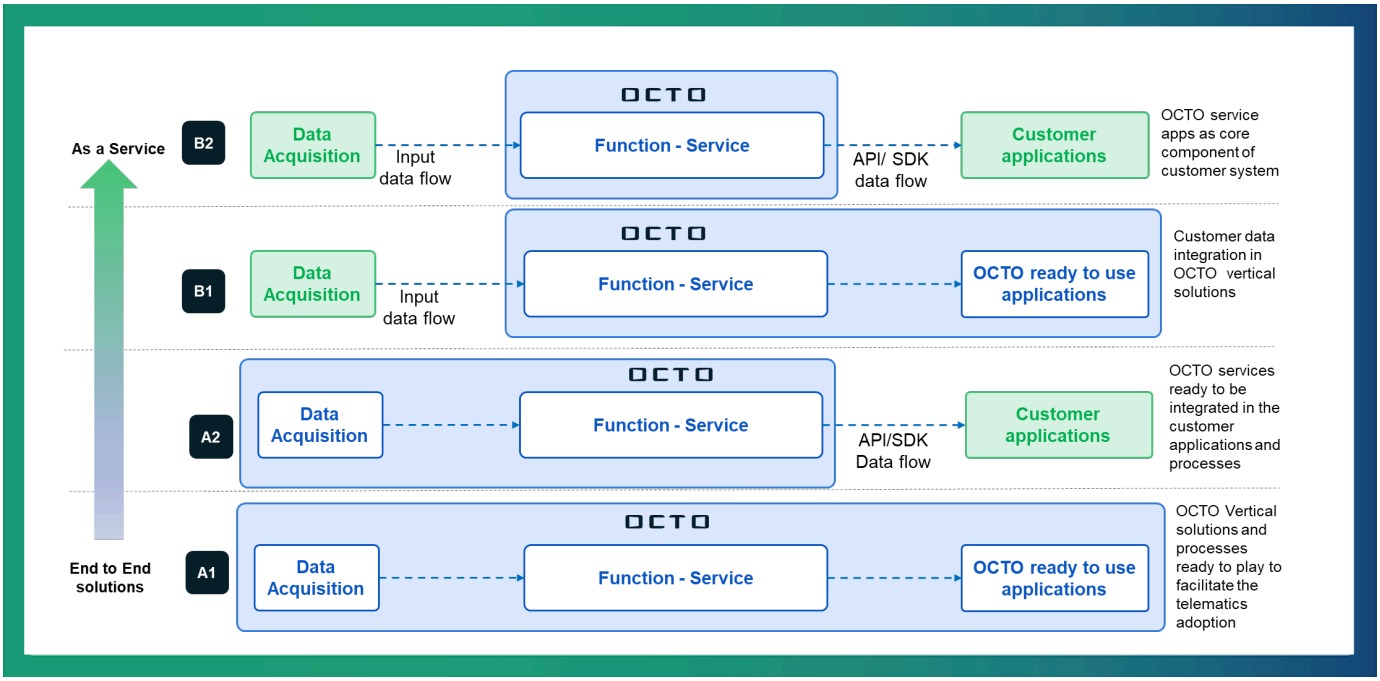


Fig. 3-7: Platform delivery model

This architecture showcases OCTO's capacity to support scalable solutions, allowing businesses to easily integrate new services and expand their market presence while focusing on core competencies.

The diagram illustrates how OCTO's platform facilitates data acquisition and service delivery through a layered approach, enabling flexible integration for diverse use cases from the end-to-end model that include a full service offered from collecting and processing data within OCTO's infrastructure. The processed data is then made available to either OCTO's own applications or customer applications, depending on the requirements to a more 'as a service' approach where the higher layers highlight direct data integration and service delivery to customer applications. This demonstrates OCTO's capability to adapt and scale its platform for varying complexities and operational needs.

This framework is easily adaptable to customer environments allowing:

End-to-End (E2E) Model:

- Data is acquired from OCTO devices or even additional sources and third-party inputs. This data is processed within the OCTO domain, integrating functions and services, and then made available for OCTO-ready applications.

As a Service Model:

- Similar to E2E, but with added flexibility, allowing data to be used in customer applications through APIs/SDKs. This model supports third-party integration, providing data outputs in a predefined format.

Models where data must be collected from different external sources require data quality review and standardized protocols for data exchange as well as data taxonomy to allow an open and interoperable system.

As a result of collective data inputs, the model creates an ecosystem able to transform data value into business value with the right flexibility for the business companies to integrate at the right level of its digital maturity. The most "independent" solution is where OCTO can provide the AI application, already trained and with predefined service-level agreement (SLA), such as the **DriveAbility® Advanced Score**, allowing the customer to run it based on its own data. In this case, OCTO supports the customer to check the data quality and the protocol, ensuring the input generates the right service level output.

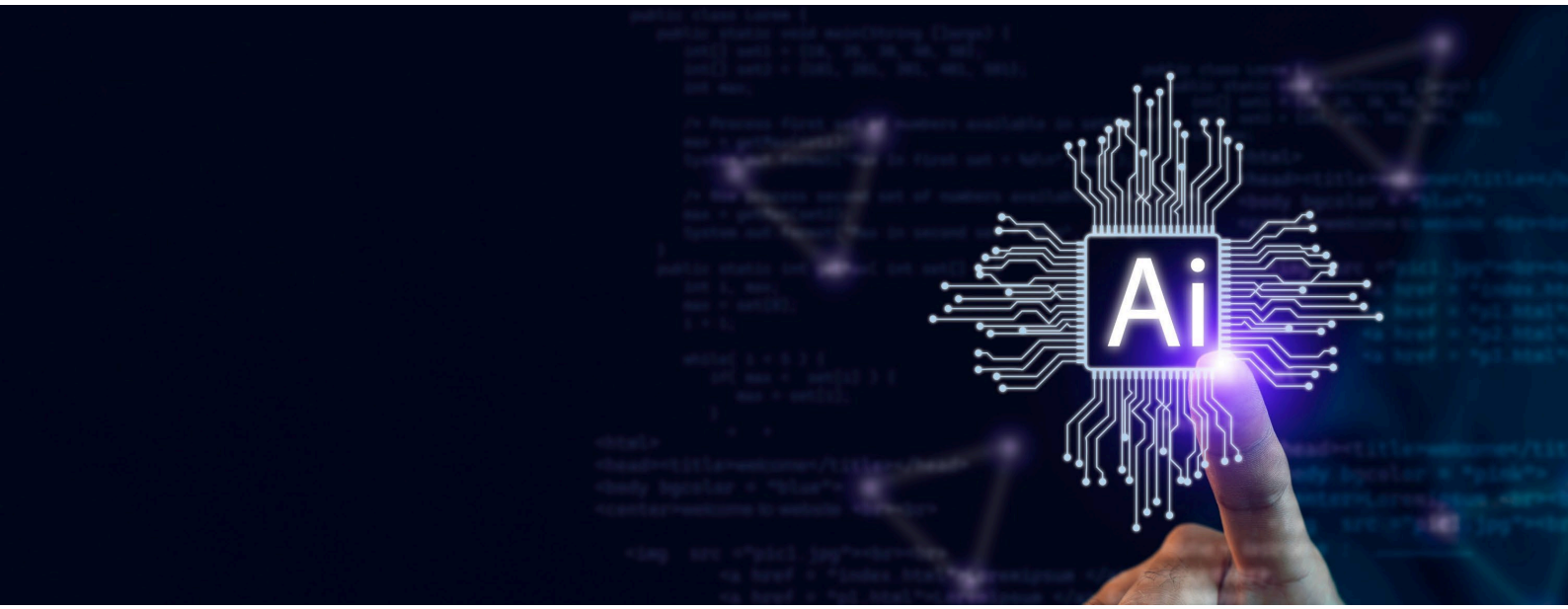
The next frontier of Smart Mobility: from AI to generative AI

OCTO's extensive Data Lake, which includes over **610 billion kilometers of driving data**, **92 billion recorded trips**, and **525,000 validated crashes**, serves as a goldmine of insights for developing advanced mobility solutions. This extensive data supports various methods and analyses, including descriptive purposes and data classification, as well as models for decision-making and data driven forecasts.

This extensive data supports various methods and analyses, including descriptive purposes and data classification, as well as models for decision-making and data driven forecasts. It focuses on recognizing patterns, optimizing processes, and is widely applied in problem-solving, and automation, particularly in areas like customer behaviour prediction and data classification. Applications such as **ecodriving** are derived by the driver's style and the vehicle usage, accident forecasting, traffic pattern and dynamic environmental monitoring are based on cluster analysis. By integrating third-party data like weather and traffic information, OCTO enhances its capabilities to provide comprehensive insights into road safety, pollution, and vehicle energy demand.

A key feature of OCTO's platform is its use of-proprietary indicators to create a sustainability ranking based on real-world mobility data. For example, its models show that targeting the most polluting one percent of vehicles can have the same environmental impact as restricting 10 percent of vehicles through less precise methods like odd/even license plate restrictions.

The platform also leverages machine learning to predict accident risks by analyzing factors such as driving behavior, road conditions, routes, and travel times, offering valuable insights to mitigate individual risk by recommending behavior changes.



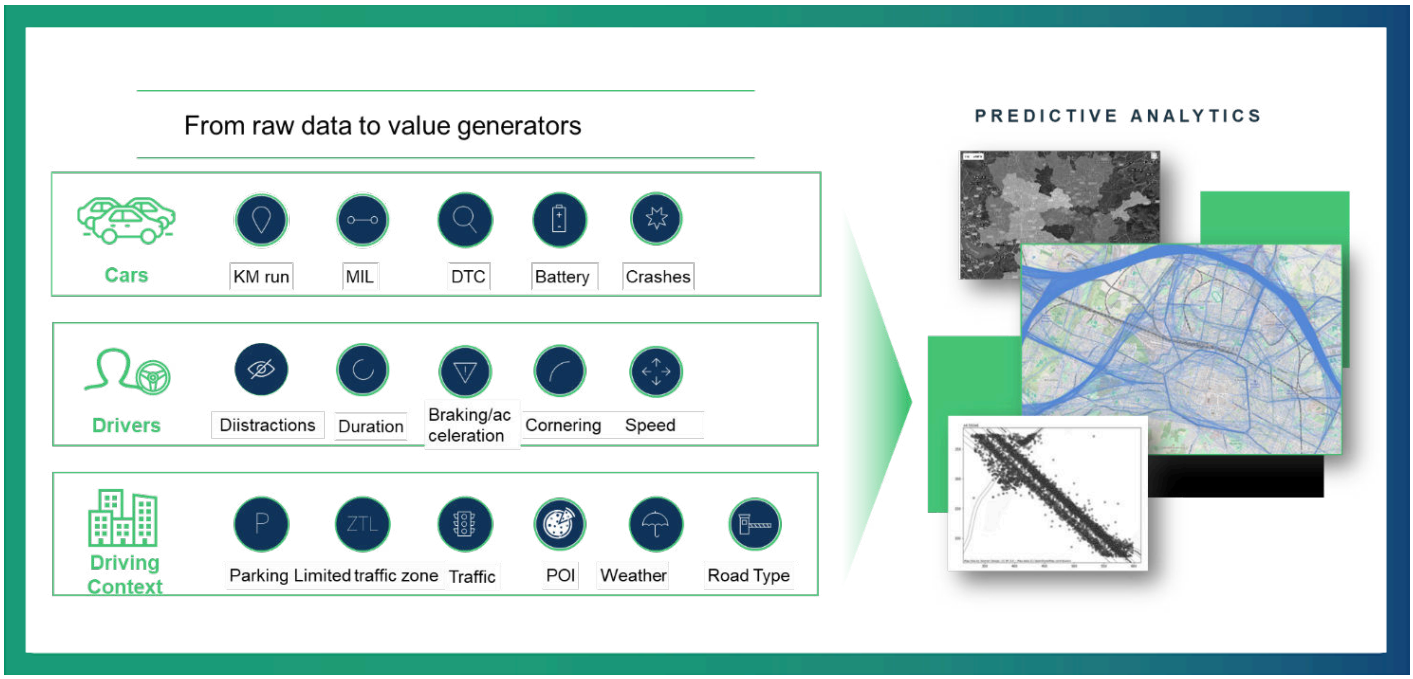


Fig. 4-1: Multiple data sources increase the range of applications for Analytics and AI

As AI applications are evolving in telematics and adoption is growing wider with every use case, new models like **Large Language Models (LLMs)** and generative AI are emerging to create new content that wasn't part of its original training data. In contrast, non-generative AI focuses on analyzing existing data to find patterns, make predictions, and guide decision-making. Non-generative models are excellent for providing accurate results based on historical data but don't produce new information.

These advancements in AI, combined with the growing digital processes in smart mobility, are opening the door for generative AI applications to enhance the user experience. By building on established successes in smart mobility, generative AI has the potential to create even more dynamic and personalized digital experiences opening new roads to the mobility experience.

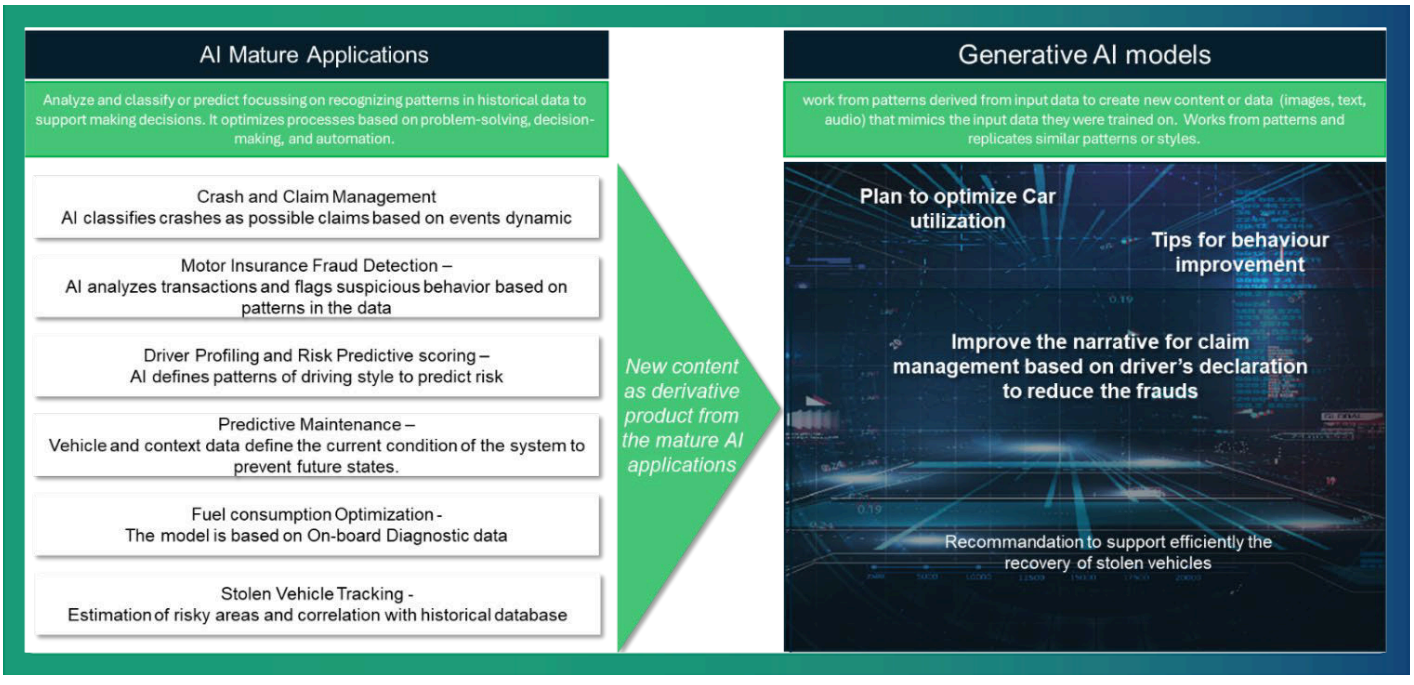


Fig. 4-2: From AI Mature Applications to new generated content

OCTO Takeaway

The smart mobility journey continues to evolve with new iterations of innovation. It continues to be more integrated and complex, with a growing number of stakeholders. It is increasingly impacted by regulation and governance, yet provides the very solutions needed to meet global targets for improved safety and sustainability.

With this in mind, OCTO has drawn on its experience of over two decades to make a meaningful contribution towards the smart mobility evolution and continues to support its partners as we enter a new era of **3IoT and generative AI**.

ABOUT OCTO

For over 20 years, OCTO has been developing integrated solutions that allow us to partner with our customers, supporting them in seizing the opportunities outlined by intelligent mobility and digital transformation. Artificial Intelligence, IoT, and Data Analytics are the key elements used to develop services and products capable of addressing the challenges of Smart Cities and Smart Mobility operators.

Our scalable analytics platform enables insurers, automakers, rental companies and public administrations, to increase productivity and improve safety, while enhancing the vehicle usage and user experience.

Finally, a clear Environmental, Social and Governance (ESG) strategy guides our market proposition towards the development of solutions focused on energy transition and data-driven smart urban planning.
OCTO currently has over 6 million connected users and holds the largest global database of telematics data derived from over 610 billion kilometres of driving and over 525,000 certified insurance claims.

Discover more at **octotelematics.com**