OCTO

The European House
Ambrosetti

Connected Mobility 2025

The Italian way to connected mobility

edition 2022

1. MISSION AND OBJECTIVES OF THE INITIATIVE "THE ITALIAN WAY TO CONNECTED MOBILITY

This Report collects and summarises the evidence emerging from the Strategic Study "The Development of the Italian Way to Connected Mobility", carried out by The European House - Ambrosetti in partnership with OCTO Telematics.

OCTO Telematics and The European House - Ambrosetti have launched the Connected Mobility Initiative whose mission is to identify an "Italian Way" towards connected mobility through three objectives:

- **To gather the attention and interest of an increasing number of stakeholders** around the issues and opportunities of connected mobility;

- Involve a growing number of stakeholders in the **design and implementation of multiple pilot projects** that demonstrate the application potential of connected mobility and the benefits that can be obtained;

- To give continuity to OCTO Telematics' path of **positioning and visibility as a thoughtful leader and a responsible and positive actor for the country's growth and innovation**, as well as a key partner in the process of modernising mobility systems.

The Strategic Study benefited from the contribution of an Advisory Board composed of **Nicola Veratelli** (CEO, OCTO Group), **Valerio De Molli** (Managing Partner & CEO, The European House - Ambrosetti) and two scientific advisors: **Francesco Bonfiglio** (CEO, Gaia-X; Co-Founder, FOOLFARM - Venture Capital in Innovation; former Vice-President, Confindustria Valle d'Aosta; former CEO, Engineering D. HUB) **and Franco Fenoglio** (Board Member, ITALFERR; former CEO, Italscania; former President, UNRAE Industrial Vehicles Section).

Andreas Heindl (Director of Mobility Data Spaces, Acatech; Full Professor, University of Heidelberg; former Deputy Director of Platform System, Acatech), Florinda Boschetti (Head of the City Club, EIT Urban Mobility; Member of the Coordination Group of the European Sustainable Urban Mobility Plan, SUMP; former Senior Project Manager, Polis Network) and Paolo Zaccardi (Co-founder and CEO, fabrick) also contributed to the Advisory, according to a logic of 'variable geometry', i.e. as external guests.

The initiative entailed **seven thematic working groups** involving 46 of the main private and public stakeholders of the Italian mobility ecosystem.

The main results of the analyses were summarised in a Report organised to cover the 4 key themes: Smart and Connected Mobility as Smart City enabler, Mobility-as-a-Service,

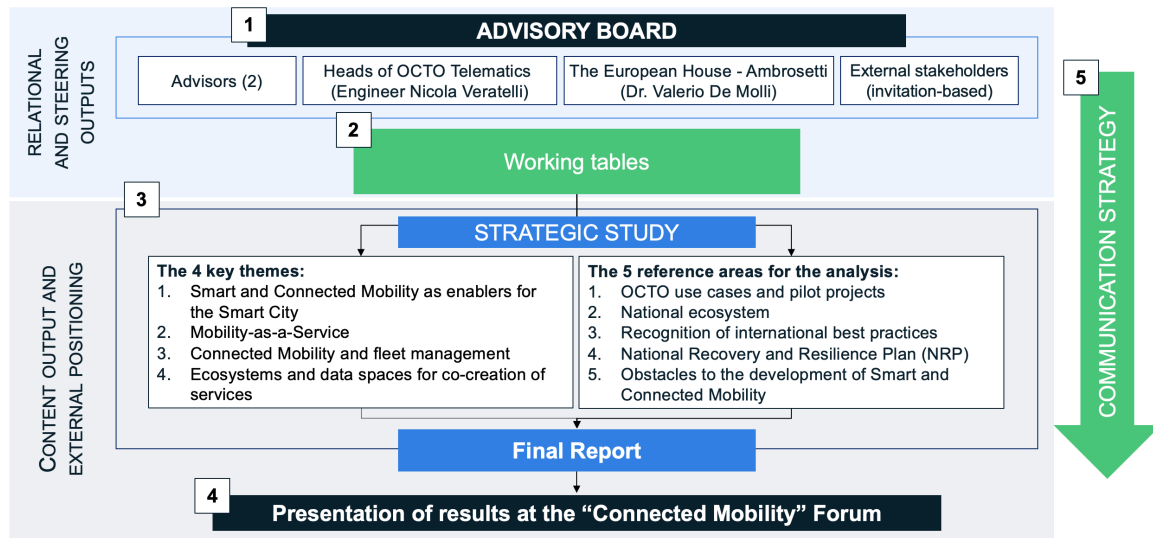Connected Mobility and Fleet Management, and Ecosystems and Data Spaces for the co-creation of services.

Figure 1 Structure and activities of the Connected Mobility initiative**.**
Source: elaboration The European House - Ambrosetti, 2022

The results of the analysis and the stakeholder engagement activities are the main subject of the "OCTO Connected Forum" presentation, the final stage of the annual pathway of the initiative "The Italian Way to Connected Mobility".
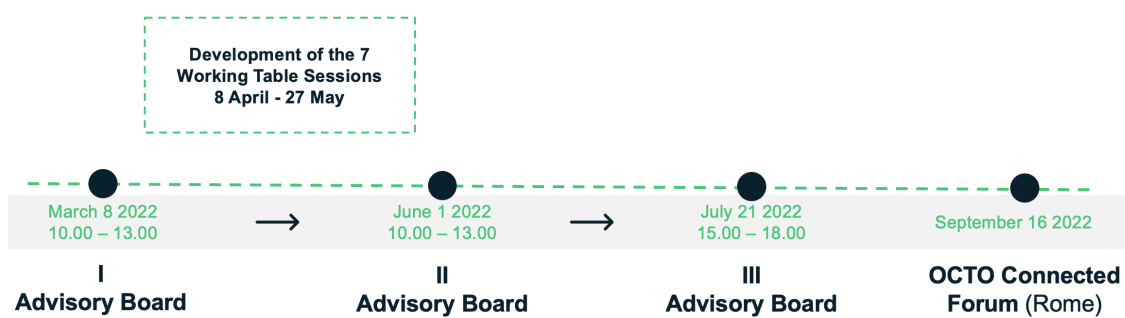

Figure 2 The pathway of the initiative "The Italian Way to Connected Mobility", 2022

OCTO | **The European House Ambrosetti**

The key elements of the Strategic Study

Before introducing the single components of the Report, it is necessary to indicate the three key elements of the Strategic Study that inspired its structure:

- **Italy is the second European country in terms of motorisation rate, with about 663 vehicles per 1,000 inhabitants**, second only to Luxembourg (681 vehicles/1,000 inhabitants) and with a much higher value compared to the other main European countries (Germany 574, Spain 513, France 482, United Kingdom 473). This result is significant of how dependent our country is on the car, which alone accounts for 80% of total passenger traffic. Looking ahead, **an increase in population density in urban centres poses ever greater challenges for the ecosystem and mobility players** (public and private).

- **In Italy, the number of deaths per million inhabitants in 2021 is higher than that of European peers and the European average**: 48 deaths per million inhabitants vs. 45 in France vs. 32 in Spain vs. 31 in Germany vs. 24 in the UK. At European level, 92 per cent of recorded deaths occur on urban and rural roads. It is therefore crucial to act to promote both active and passive safety by ensuring rapid response times to emergencies. Connected technologies are a key 'ally' as they enable the collection of timely data that can be used to understand 'error factors', prevent and correct human error and manage emergencies quickly.

- **In Europe, the transport sector is the only one that has increased its emissions since 1990 (+24%), while average emissions have decreased by 26%** over the same period. Now more than ever, consumers are moving towards green choices: 46% of them are ready to switch to more sustainable vehicles.

The value deriving from the application potential of connected vehicles and the combination of mobility development drivers are at the base of the 'Vision Zero', reinterpreted by OCTO in a broader perspective – compared to the initial objective limited to the reduction of road accidents, and taking into account the need to implement a more inclusive sustainability model that includes objectives related to zero harmful emissions on the one hand, and to solving the problem of traffic congestion in urban centres on the other.

Vision Zero is therefore configured as the basis on which guidelines for a smarter and more sustainable mobility should be developed, and, specifically, it is divided into three guidelines:

- **Zero Crash**: the detection of accidents and their dynamic reconstruction thanks to the evolution of telematics systems - already present in mobility since 2005 with after-market telematics device solutions - can guarantee timely intervention and reduce the damage caused by road accidents. In addition, they make it possible to 'learn' from circumstances and thus progressively provide useful information for accident prevention. Further advances in ADAS (Advanced Driver Assistance Systems) for active safety and the evolution towards autonomous driving vehicles will enrich the virtuous cycle of 'learning' the vehicle-driver system towards a progressive zeroing of road accidents.

- **Zero Pollution**: connected mobility systems make it possible to estimate the effects of traffic pollution and provide indicators (eco scoring) to steer the driving style of users towards a reduction in emissions and consumption; the same applies with reference to the spread of autonomous and connected driving vehicles, for which zero or near-zero-emission vehicles are expected to be on the road. The goal of reducing pollution - which is closely linked to the reduction of road traffic - can also rely on mobility solutions that are optimised based on needs deduced from travel data.

- **Zero Congestion**: connecting cars with the surrounding infrastructure system will make it possible to make journeys more efficient, provide real-time alerts to reduce congestion and waiting times in queues, time wasted searching for a parking space, etc., resulting in a drastic reduction in traffic. In addition, new business models will make mobility less tied to the private vehicle by freeing up space within cities.

Strategic development areas of the "Italian Way to connected mobility"

OCTO Telematics and The European House - Ambrosetti felt that the above-mentioned topics could be framed within the concept of **smart and connected mobility**, **whereby data and digital vehicle technologies play a central role to enable new management models for urban infrastructures, means of transport and cities.**

Based on this information, four strategic areas have been identified on which the 2022 path of the initiative 'The Italian Way to Connected Mobility' has been set. **The strategic areas identified are important drivers for the realisation of Vision Zero**, set as a valuable objective for the convergence of collective and private interests.

The strategic areas identified are:

- **Smart and Connected Mobility as enablers for the Smart City** - connected mobility and all the digital technologies that are transforming the world of

transport (smart mobility) are at the basis of new forms of interaction between physical and digital spaces that are also redefining the active role of citizens as contributors and facilitators of the transformation.

- **Mobility-as-a-Service** - in its most standardised definition, the MaaS (Mobility as a service) paradigm is understood as the integration of different modes of transport and different operators, carried out through shared platforms, to provide end-users with a variety of services, from journey planning to booking and payment in a holistic manner. This objective requires considering the need for new business models based on the cooperation of different public and private operators that can interoperate to grant citizens access to services, overcoming the organisational complexities of transport and connections, in an 'as a service' approach that simplifies the use and user experience for citizens.

- **Connected Mobility and Fleet Management** - addresses all topics related to applications for passenger and freight transport, in order to define a framework for the integrated development of the sector that enables the achievement of several objectives: identifying elements for the management of the transition towards environmental sustainability, fostering the development of new types of services to optimise the transport and transfer of people and goods, improving management indicators to optimise the TCO (total cost of ownership) of public and private transport fleets, also fostering the overall efficiency of mobility and new operational processes enabled by connected vehicle data.

- **Ecosystems and data spaces for the co-creation of services** - all the above areas require, as a prerequisite, the exchange and sharing of data, generated by connected vehicles and their interactions with the surrounding environment, and which can only take place through the creation of ecosystems and data spaces. The collection, sharing and processing of data are enablers for the generation of new mobility services and business models. In this sense, this last strategic area is transversal to all the previous ones.

Within the strategic areas specified above there are **14 pilot projects** that refer to the use cases identified and communicated by OCTO and The European House - Ambrosetti during the OCTO Connected Forum in 2021. These pilot projects were a key element during the 2022 initiative to **launch and substantiate the vision and mission of the Italian way to connected mobility**.

Each of them refers to the resolution of a specific need related to a use context and thus represents a key element of a broader ecosystem model that contributes to defining a complete framework where shared data is the common denominator.
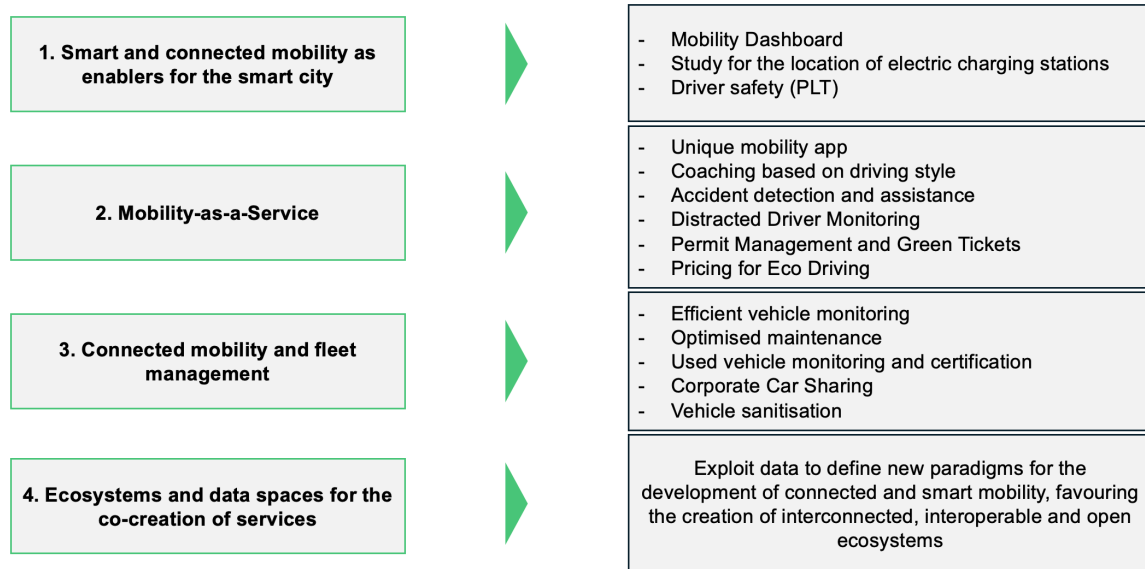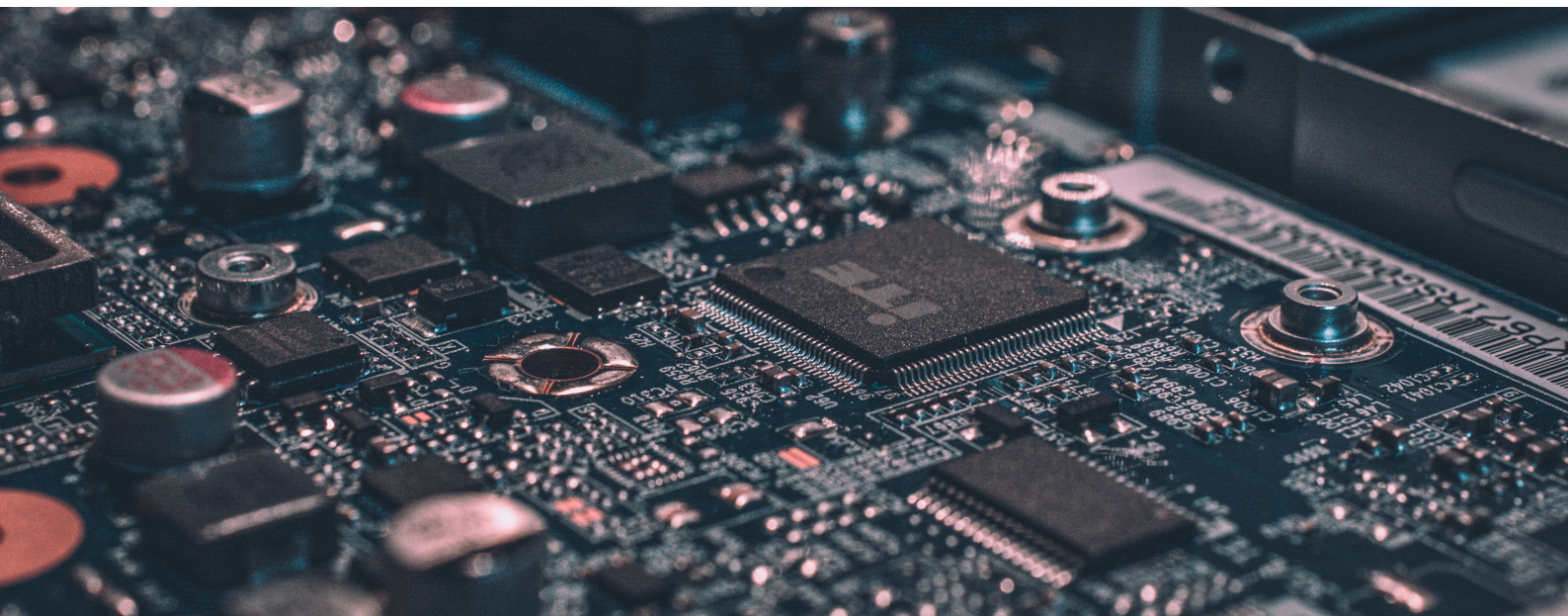
1. Smart and connected mobility as enablers for the smart city	▶	- Mobility Dashboard - Study for the location of electric charging stations - Driver safety (PLT)
2. Mobility-as-a-Service	▶	- Unique mobility app - Coaching based on driving style - Accident detection and assistance - Distracted Driver Monitoring - Permit Management and Green Tickets - Pricing for Eco Driving
3. Connected mobility and fleet management	▶	- Efficient vehicle monitoring - Optimised maintenance - Used vehicle monitoring and certification - Corporate Car Sharing - Vehicle sanitisation
4. Ecosystems and data spaces for the co-creation of services	▶	Exploit data to define new paradigms for the development of connected and smart mobility, favouring the creation of interconnected, interoperable and open ecosystems

Figure 3 The four strategic areas and their related pilot projects.
Source: elaboration The European House - Ambrosetti, 2022

The realisation of this initiative, in fact, requires as a prerequisite the definition of a systemic approach to the topic of smart mobility, which can allow for the integrated and synergic development of the various stakeholders, who have heterogeneous needs that are constantly changing, but who are required to have an ever-increasing capacity for interaction to define a convergent roadmap of projects.

Therefore, **seven working tables** were organised in 2022 as an opportunity to share the 14 pilot projects identified in 2021 with the different mobility stakeholders and to observe them from different angles. The seven working tables - Urban Planning, Road Safety, Mobility as a Service, Behavioural-based Pricing, Fleet Efficiency Monitoring, Transition to Green, Data Exchange Ecosystems - refer to the four strategic areas, as described in the following figure.
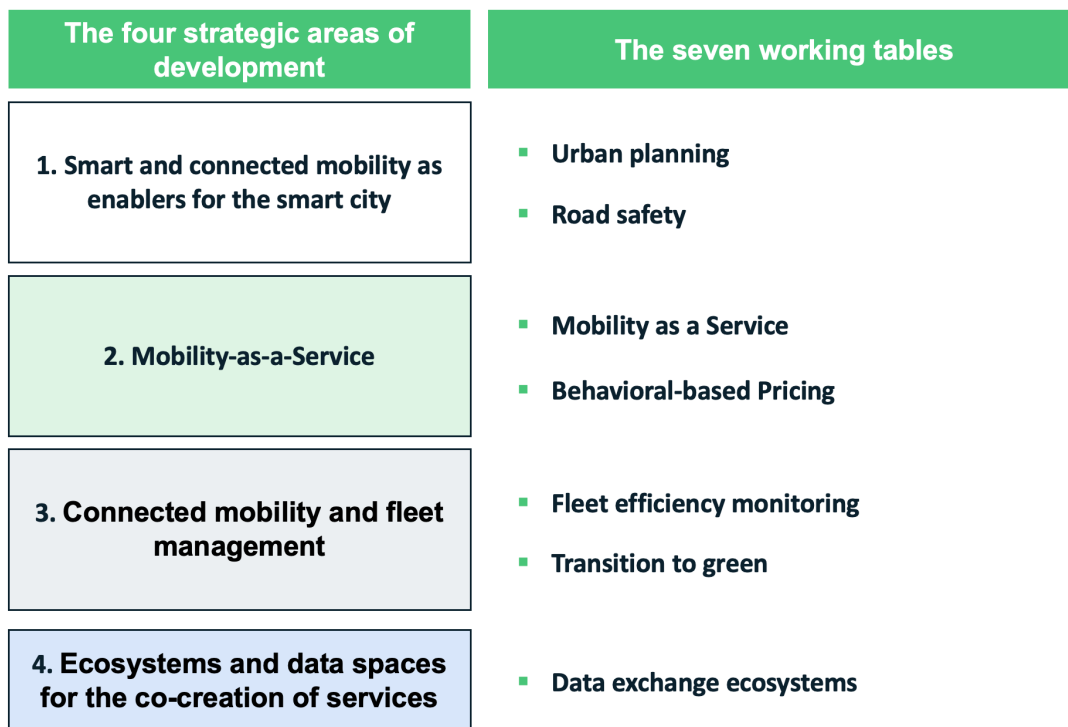
The four strategic areas of development	The seven working tables
1. Smart and connected mobility as enablers for the smart city	▪ **Urban planning** ▪ **Road safety**
2. Mobility-as-a-Service	▪ **Mobility as a Service** ▪ **Behavioral-based Pricing**
3. Connected mobility and fleet management	▪ **Fleet efficiency monitoring** ▪ **Transition to green**
4. Ecosystems and data spaces for the co-creation of services	▪ **Data exchange ecosystems**

Figure 4 The four strategic development areas and the seven working tables

Simultaneously with the development of the working tables, **other activities were launched to disseminate the main evidence that emerged, with the aim of stimulating an open discussion to deepen and discuss the development opportunities of the 14 pilot projects** and identify systemic needs and possibilities for collaboration. Altogether, more than 40 mobility actors participated in the stakeholder engagement activities, coming from different sectors and fields - e.g., universities, public administration, technology actors, urban mobility managers, insurance companies.

Furthermore, the working tables were an opportunity to discuss some reference cases identified as relevant by The European House - Ambrosetti at the national and international level, with reference to both the strategic areas and the use cases of the 14 pilot projects. In fact, a national and international mapping of benchmark cases was carried out to identify examples of contexts in which the development of connected mobility initiatives and the creation of new Smart Mobility ecosystems has already been promoted.

The mapping of 160 case studies (10 at the national level and 150 at the international level) made it possible to deepen the feasibility conditions of the 14 pilot projects, identifying the critical success factors that must be taken into consideration to promote the development of the Italian Way to Connected Mobility.
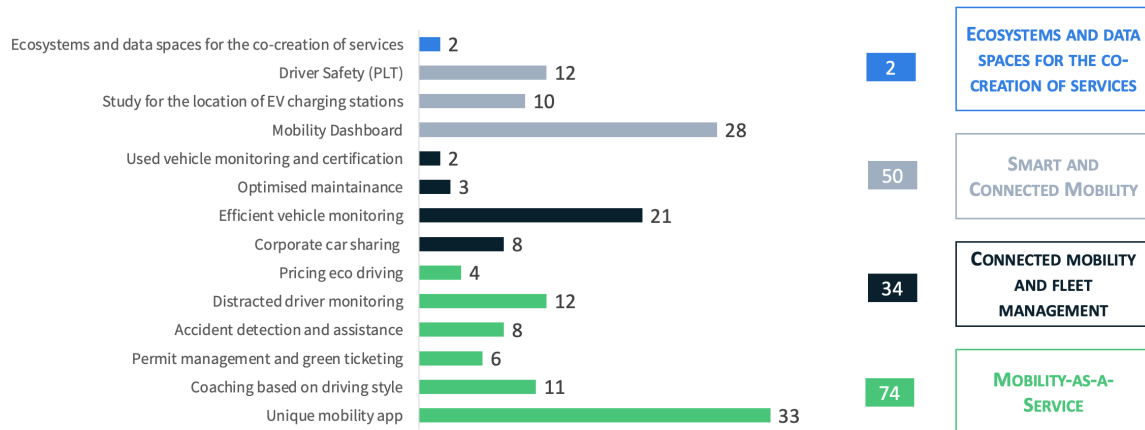
Figure 5 Thematic distribution of the 160 mapped case studies (absolute value)
Source: elaboration The European House - Ambrosetti, 2022

From the overall experience, some key points can be derived:

- It does not seem possible to implement all 14 pilot projects in a single city at the same time because the adoption path is the result of a synergy with a roadmap of 'local' priorities. It is crucial to **target the initial development with a specific project scope customised to the needs of the individual stakeholder**.

- It is fundamental to **address awareness needs with respect to the possibility of using digital technologies for mobility**. To this end, it is crucial to promote tailor-made development paths, engaging technical structures, bringing in plug-and-play, ready-to-use and proven solutions.

- The introduction of innovation projects is not favoured by formal and streamlined mechanisms regulating the public-private relationship and this leads in many cases to delays in the experimentation and subsequent realisation of projects.

To date, all 14 pilot projects identified by OCTO and The European House - Ambrosetti are in the process of start-up and/or development with local public bodies and private companies.

Smart and Connected Mobility as an enabler for the Smart City

The strategic area "Smart and Connected Mobility as an enabler for the Smart City" investigates how connected mobility technologies can contribute to the pursuit of the goals of sustainability, resilience, and attractiveness of cities. Two use-cases have been

identified in this area: **urban planning** and **road safety**, which find in connected mobility technologies an enabler and a strong innovation factor. Moreover, this first strategic area encompasses three of the 14 pilot projects, as shown in the following figure.
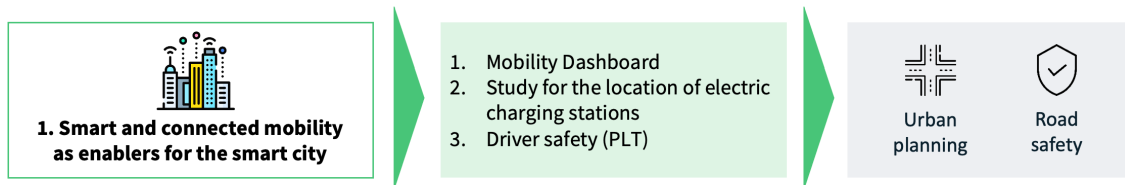

Figure 6 The first strategic area, the related pilot projects and working tables.
Source: elaboration The European House - Ambrosetti, 2022

The themes related to the strategic area 'Smart and Connected Mobility as an enabler for the Smart City' were shared and debated with those who are called upon daily to provide answers on these issues in two of the seven working tables, namely Urban Planning and Road Safety.

- **Urban Planning** - The focus was on organisational issues and process changes. Researchers from the University of Pisa provided an overview of mobility data-based applications and their use in combination with connected mobility technologies to support the processes of 'rethinking' the city towards paths that enable sustainability, resilience and attractiveness. Five key messages emerged from this round table:

  o **The use of data generated by connected vehicles or GSM data not only enables a dynamic and 'flexible' management of the city, but also allows new forecasting and planning approaches to be defined through ex-ante estimation of possible impacts**. Indeed, vehicles make it possible to watch the movements of cities to improve their use for the benefit of time, occupied space and, therefore, with an impact on reducing pollution and traffic;

  o **Re-appropriation of shared urban spaces is one of the main challenges for the liveability of cities**. City mobility has often forced the deletion or occupation of green spaces that now need to be reclaimed based on urban-residential concepts such as the 'city in 15 minutes', where most residents' needs and access to services can be met by walking from their homes;

o At the city level, **a unified governance capable of managing mobility as a transversal element in different areas and in different contexts is crucial**, where data is a fundamental lever to ensure the coordination and success of actions;

o **There is a need to introduce models that foster innovation through public-private collaboration**, which would be particularly effective in the area of mobility, where private sector expertise can act as a boost for innovation;

o **Small and medium-sized Italian cities have specific needs that cannot be addressed with solutions created for larger metropolitan contexts**. For this reason, experiments aimed at small and medium-sized cities should also be promoted.

- **Road safety** - The second table dealt with the possibilities offered by connected systems to increase road safety. Three key messages emerged from this round table:

  o **Given the weight of road accidents on Italy's GDP, it is crucial to act to promote both active and passive safety by ensuring rapid response times to emergencies**. Connected technologies are a fundamental 'ally' in that they make it possible to collect timely data useful for understanding 'error factors', preventing and correcting human error and managing emergency phases quickly.

  o **Analysis of driving styles and correlation with the causes of accidents are a key activity to spread risk awareness and activate driver coaching processes** in addition to support technologies to reduce driving distraction, which is among the most frequent causes of accidents due to the human factor.

  o **The spread of new forms of mobility poses challenges to road safety issues**, which must also increasingly look at cyber-risks arising from the increasing connection and automation of vehicles.

The following key points emerged from the analysis of the pilot projects identified under 'Smart and Connected Mobility as an enabler for the Smart City' and the development activities of the OCTO pilot projects:

- **City Administrations have assumed a central role in supporting the engagement of local mobility actors** and the management of the organisation of private services in the area, encouraging the adoption of certain technologies and/or applications by service operators;

- **In order to start up pilot projects, a clear vision of mobility development by Local Authorities is required**, and it is necessary that the deployment of services takes place according to a logic of widespread collaboration, with the participation of public and private actors both on issues related to the sharing of databases but also of takeaways from technologies already mature and adopted in adjacent sectors;

- Again, according to the logic of ecosystem development, it clearly emerged how **the involvement of the private sector makes it possible to leverage the skills and technologies of a pool of highly specialised actors interested in investing in experimentation**, thus increasing the chances of success of the projects;

- **A widespread difficulty was found in involving private motorists in participating in experimental data collection projects** - all the cases mapped refer to data collected from public transport fleets or vehicles made available to the public. In this sense, the presence of actors in possession of historical mobility databases, which are continuously updated, is a differentiating factor able to enable highly innovative usage functions to support urban planning projects. The possibility of accessing historical data, based on the georeferencing of vehicle routes, makes it possible not only to create descriptive statistics, but above all to simulate the impacts of planning decisions, effectively equipping the Public Administration with a new government tool capable of solving many problems of uncertainty.

Mobility-as-a-Service

The strategic area 'Mobility-as-a-Service' focuses on the identification and study of innovative mobility models and behavioural-based pricing. In the vision of OCTO and The European House - Ambrosetti, the aim of the MaaS paradigm is to meet the needs of citizens by defining a new model capable of integrating different forms of mobility in a digital and smart way. Of the 14 pilot projects identified by OCTO and The European House - Ambrosetti during the 2021 initiative, six refer to the "Mobility-as-a-Service" strategic area, as shown in the figure below. In addition, two use cases were identified pertaining to this area - MaaS models and Behavioral based pricing.
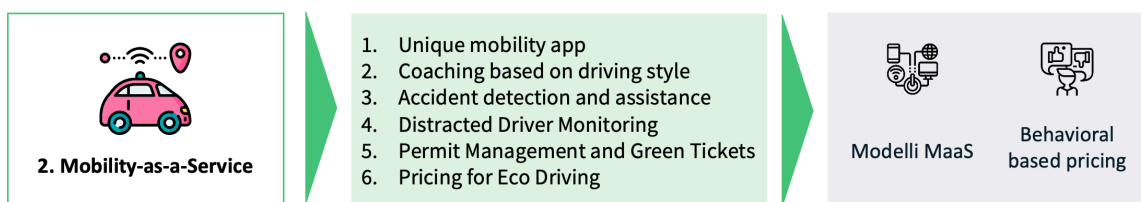

Figure 7 The second strategic area, related pilot projects and working tables. *Source: elaboration The European House - Ambrosetti, 2022*

The strategic area 'Mobility-as-a-service' was deepened through the engagement of leading mobility stakeholders in the third and fourth working tables, respectively:

- **Mobility-as-a-service** - aimed at studying new business models in the field of mobility and assessing the resulting benefits for citizens. Four key messages emerged from the working table:

  o In the development of MaaS solutions, **it is essential to envisage a combination of public service and private mobility** - in the development of this complementarity, the public administration must assume the role of coordinator;

  o **Data make it possible to understand the needs of different territories in order to tailor solutions and related business models** to specific territorial contexts;

  o **MaaS** is not only a model through which to provide mobility offers in an integrated manner, but above all **a tool to rethink the organisation of mobility services in a "demand-driven" logic**;

- Most projects with the objective of **road safety management have a national scope** and are generally promoted and managed by the relevant ministries of central government.

Connected Mobility and Fleet Management

The strategic area 'Connected Mobility and Fleet Management' focuses on the efficient management of both public and private fleets. Management efficiency maintains a focus on the green transition, i.e., the shift towards a system based on a conscious use of resources and the use of renewable energy sources, suitable - in this case - for the mobility context. In particular, the creation and sharing of mobility data can make it possible to improve the quality of monitoring, and thus of information on travel and the state of wear and tear of public and private means of transport (including shared vehicles). Consequently, increasing the quantity and quality of information makes it possible to increase the efficiency of fleets from both an operational and an environmental point of view, as well as to provide services that are closer to the needs of customers and users.

Of the 14 pilot projects identified during the 2021 initiative, five refer to the strategic area of 'Connected Mobility and Fleet Management', as summarised in the figure below. In addition, two use cases were identified related to this area, namely Fleet Efficiency Monitoring and Transition to Green.
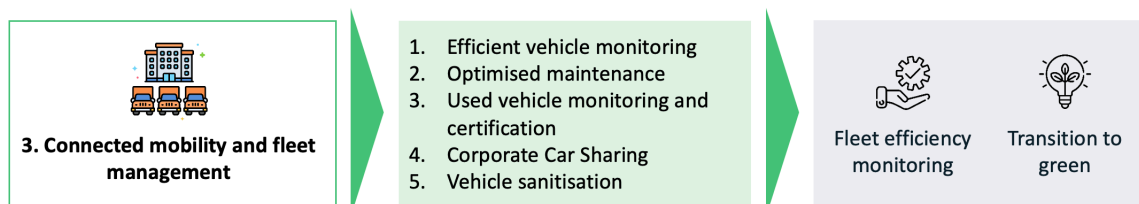

Figure 8 The third strategic area, related pilot projects and working tables.
Source: elaboration The European House - Ambrosetti, 2022

The strategic area of "Connected Mobility and Fleet Management" was also deepened through the engagement of primary stakeholders from the world of mobility in the fifth and sixth working tables, respectively **Fleet Efficiency Monitoring** and **Transition to Green**.

- **Fleet Efficiency Monitoring** - aimed at identifying opportunities for the development of new solutions that can produce benefits in terms of efficiency and

cost-effectiveness for stakeholders. These are the key messages that emerged during the proceedings:

  o The adoption and deployment of **telematics solutions improves fleet management operations**, making them more efficient;

  o **The borderline between different mobility offers is increasingly shrinking, favouring integration that enables new ways of cooperation**. Fleet managers will have to use data to dynamically identify customer needs and make operating models more flexible;

  o **Consumption, emissions and fleet management must be closely monitored** in order to set concrete, measurable and communicable sustainability strategies;

  o **Data will drive the energy transition**: the integration of data with blockchain technologies will enable a major step forward in liability management.

- **Transition to green** - aimed at identifying opportunities for value creation in the transition to new paradigms of sustainable mobility. Five key messages emerged:

  o **Data make it possible to monitor the state of city mobility** and optimise the planning of interventions to reduce environmental impacts;

  o **Data make it possible to influence the choices of each actor on the basis of the specific context** by providing parameters for the objective assessment of achievable improvements;

  o **The penetration of new motorisation must be accompanied by a change of model** that combines the provision of services with vehicle equipment;

  o **Rental operators are taking on the technological risk**. The ability to acquire and manage data from the vehicle is crucial to reduce risks and better manage the transition to new technologies and motorisation;

  o **New models such as Corporate Car Sharing make it possible to make shared services available to a wider audience** (customer base) and accompany the transition to new motorisation.

The following key points emerged from the analysis of the pilot projects identified in the 'Connected Mobility and Fleet Management' area and from OCTO's pilot project development activities:

- **The mapped pilot projects target fleets of work vehicles with high annual mileage where the efficiency of maintenance activities can have an**

important return on investment. Once industrialised, it is conceivable to provide these solutions also to vehicles with lower mileage;

- **Possible areas of development of these services are the integration of information on the maintenance status of vehicles**, with management and planning of operations by fleet managers, as well as the offer of services according to a platform logic;

- **The application of technological solutions in the third strategic area enables a more precise and transparent management of the vehicle's "history"** with an impact on maintaining the financial value of assets.

Ecosystems and data spaces for the co-creation of services

The fourth and final strategic area 'Ecosystems and data spaces for the co-creation of services' relates to the design and implementation of data spaces. The concept underlying this strategic area is the sharing of data and information generated by the aggregation and processing of data and shared within a federation of stakeholders. A fundamental concept underlying the strategic area lies in the fact that the exchange of raw data and information implies neither a sharing nor a transfer of data ownership, which is in fact retained by the initial owner. Furthermore, to ensure the proper functioning of the data and information sharing system, the sharing formats and the authorisation of data use are defined by a specific set of pre-established rules.

As in the previous cases, this last strategic area was deepened through the engagement of primary stakeholders from the world of mobility within a dedicated table, with the aim of identifying new paradigms of connected and smart mobility, through the exploitation of data and in order to foster the creation of interconnected, interoperable and open ecosystems. The following key messages emerged from the working table:

- More and more companies and Public Administrations require **multidisciplinary and data-driven approaches**. Within Smart Cities, different data sources can be aggregated to form **digital twins** where the combined reading of data enables innovative strategies for city management and service delivery;

- The increasing availability of data will enable the **development of increasingly complex forecasting models** that will enable more advanced and precise planning of the dynamics within cities;

- In the future, it will be crucial to **promote greater sharing of applications and experiences between public administrations** in order to maximise opportunities for value creation;

- By leveraging data, it is possible to envisage a **more active role for citizens** through rewarding mechanisms that enhance virtuous behaviour.

The following key points emerged from the analysis of the pilot projects identified under 'Data ecosystems and data spaces for co-creation of services' and from the development activities of the OCTO pilot projects

- The possibility to **exchange data between different actors** enables the co-creation of services according to a federated logic within a shared platform.

- The possibility of **making data available to third party actors** is fundamental to support innovation processes in an open logic, thus enabling the development of new consumer experiences and innovative services. These possibilities are enabled by the gradual penetration of Cloud technologies in companies and Public Administration.

- At the country-system level, it is necessary to **foster a transition of public administrations towards a 'Government-as-a-Platform'** paradigm that allows them to make public databases available for the development of public utility services and to operate on databases that can be integrated with external sources.

Public support for mobility at national and European level: development plans financed by the Next Generation EU programme

In the field of connected mobility, the intervention of the public actor allows for greater involvement and coordination between the various stakeholders, thus favouring the realisation of wide-ranging projects. Particularly in the current European context, one cannot help but emphasise the Next Generation EU and its declinations at national level. For this reason, the Report includes an analysis of public funding in the context of the regulatory framework for connected mobility, both at national and international level. In particular, the analysis focuses on public investment strategies to support mobility in four benchmark countries: Italy, Spain, France and Germany, with the aim of presenting opportunities for the development of mobility - especially connected and smart mobility - linked to the funds of the National Recovery and Resilience Plans (NRPs).

In 2020, the EU launched the largest economic and financial stimulus plan in its history, worth a total of EUR 1,824 billion. Specifically, within the plan three key programmes support the two main components of the twin transition, namely:

- **Connecting Europe Facility** (CEF) - Structural Investment Fund, which allocates €25.8 billion for the period 2021-2027 in non-reimbursable grants

earmarked for the development of sustainable, high-impact infrastructure for the entire territory of the Union (TEN-T network), with main focus on railways, inland navigation (rivers, canals) and the development of smart applications for the digitalisation of transport and mobility;

- **Cohesion Fund** (CF) and European Regional Development Fund (ERDF) - the funds have a total budget of EUR 32.5 billion (CF) and EUR 192.4 billion (ERDF) respectively. As far as mobility is concerned, the key investment areas are aimed at the development of local and regional multimodal urban mobility projects and projects to connect regions to the TEN-T network by 2030;

- **Recovery and Resilience Facility** (RRF) - a facility with a total value of EUR 723.8 billion and consisting of a mix of grant funding (EUR 338 billion) and loans (EUR 385.8 billion), the management of which is entrusted to the Member States through the implementation of National Recovery and Resilience Plans (NRPs).

An analysis of the NRPs of the European benchmark countries (Italy, Spain, France and Germany) shows that a marginal part is allocated to the development of sustainability. With EUR 34.58 billion, Spain ranks first among the benchmark countries in terms of the percentage of funds allocated to the development of mobility (30%), followed by Germany (24%), France (20%) and Italy (18%). **In terms of absolute values, it is Italy that allocates the largest amount to mobility development** (34.58 billion euros), and it is also the only country to distribute resources over three specific missions: "Mobility as a service for Italy", "Green revolution and ecological transition" and "Infrastructure for sustainable mobility".

Total Mobility Funds	Allocation of funds for mobility, according to the Missions or Components indicated in each National Plan
🇮🇹 **€34.58bn** *18%*	**€0.04bn** *Mission 1:* Mobility as a service for Italy **€9.41bn** *Mission 2:* Green revolution and ecological transition **€25.13bn** *Mission 3:* Infrastructure for sustainable mobility.
🇪🇸 **€13.19bn** *30%*	**€6.53bn** *Component 1:* Safe and connected sustainable mobility in urban and metropolitan areas. **€6.66bn** *Component 6:* Connected and safe sustainable mobility.
🇫🇷 **€7bn** *20%*	**€7bn** *Component 3:* Green infrastructure and mobility.
🇩🇪 **€6.5bn** *24%*	**€6.53bn** *Component 1.2:* Sustainable mobility in urban and metropolitan areas. **€0.5bn** *Component 2.2:* Digitalization and investment in the railway system.

Figure 9 Allocation of mobility-related funds in the various NRPs of the benchmark countries. *Source: elaboration The European House - Ambrosetti on NRRP data, 2022*

In general, the analysis of public initiatives to support the development of connected mobility within the main European countries showed that the involvement of small and medium-sized urban realities is the fundamental strategy for the development of truly integrated mobility systems.

Regulation as a key factor in the development of new paradigms of connected and smart mobility

Regulations concerning the processing of data in the field of connected mobility are considered as a pivotal and enabling element for the success of any technological experimentation. In fact, even from the development activities of the pilot projects underway with some city administrations and other private actors, the need has emerged to understand how to manage the exchange of data between multiple stakeholders in the context of mobility. For this reason, within the ecosystem model devised by The European - House Ambrosetti and OCTO, data and its exchange are understood as enablers for the development of innovative services focused on mobility in line with OCTO's Vision Zero: zero traffic, zero accidents and zero pollution.

In the vision of OCTO and The European House - Ambrosetti, the exchange of information between different sources and actors enables the entry of new specialised players. The entry of such players makes possible the development of new verticals and service areas or new customer experience models.

The concepts of data sharing and ecosystem models are fundamental to introducing the regulatory topic. Data sharing is indeed an enabler in three key areas of mobility:

- **Connected infrastructures** - data are key to building smart contexts in which infrastructure, vehicles and road users are able to talk to each other;

- **New mobility models** - data enable the definition of new competitive spaces and are an enabling factor for efficient mobility services, built around the MaaS paradigm;

- **Innovative mobility services** - within connected infrastructures and MaaS models, it is possible to foster the co-participation of different actors in the co-creation of new service offers, made possible through the exchange and processing of data.

To identify the development opportunities for the 'Italian Way to Connected Mobility' and define the areas on which to focus attention, the analyses focused on the in-depth study of three regulatory fields:

- **Management of personal data** - regulated, at European level, mainly by the **GDPR** (General Data Protection Regulation), which regulates the management of personal data and their exchange;

- **Management of data exchanged on digital platforms** - managed by the Digital Services Act package, consisting of the **Digital Service Act** (23 April 2022) and the **Digital Market Act** (25 March 2022) and aimed at regulating the exchange and use of data within digital platform ecosystems;

- **User Trust Creation** - regulated by the **Data Governance Act**, which came into force in June 2022 (but applicable from September 2023) and aimed at regulating certain data exchange opportunities (e.g., Open Data collected by Public Administrations) and promoting the creation of Data Spaces at European level in strategic areas, including mobility.

In general, the analysis of these regulations revealed **how complex it is for public administrations to deal with personal data**.

For the purposes of creating a digital platform ecosystem, the analysis of the regulations contained in the Digital Services Act package, i.e., the body of legislation with the aim of generating a secure data space, in which users' rights are protected and businesses are treated equally, is central.

The Digital Services Act package consists of the **Digital Service Act** (23 April 2022), which is intended to regulate digital intermediaries and platforms, and the **Digital Market Act** (25 March 2022), which is intended to regulate the scope of action of platforms that aggregate data collected from users in the first instance. The objectives and scope of the two initiatives promoted by the European Commission are shown in the Figure below.
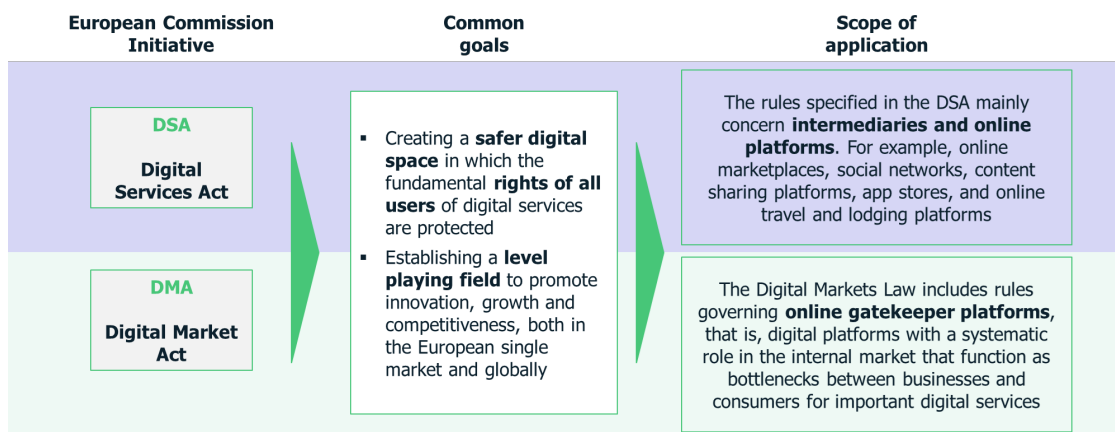

Figure 10 Key elements of the Digital Service Act (DSA) and the Digital Market Act (DMA).
Source: elaboration The European House - Ambrosetti on European Commission report, 2022

o **The organisation of MaaS services can benefit from the integration of different data sources** that help to improve mobility demand forecasting capabilities.

- **Behavioral-based Pricing** - aimed at identifying opportunities for the development of innovative, reward-based pricing solutions based on the behaviour of drivers and users of mobility services. Three key messages emerged from the working table

  o **Mobility models of the future require a rethinking of pricing mechanisms** in order to also consider positive externalities related to user behaviour;

  o **Municipalities have the opportunity to establish rewarding mechanisms** that, in synergy with penalty models, encourage the adoption of virtuous behaviour by citizens on their journeys;

  o **Connected technologies make it possible to rethink insurance mechanisms** by considering preferences towards different forms of mobility, aggregating in risk certificates also the behaviour in the use of different forms of vehicles.

The following key messages emerged from the analysis of the pilot projects identified in the 'Mobility-as-a-Service' area and from OCTO's pilot project development activities:

- **MaaS models refer to a very broad concept** (not limited only to the provision of mobility services in an integrated mode) **that involves the use of a set of connected technologies for the management of efficient, safe, and non-polluting mobility**. In this sense, it is a facilitator towards net zero cities;

- Many of the projects mapped in the benchmarking work carried out include the **creation of open ecosystems that, starting from an initial small core of functionalities and companies involved, envisage a gradual increase in the number of partners and services** that can be provided thanks to the pooling of data according to a platform logic;

- **MaaS models are not 'exclusive' to cities**, but can also be applied to very restricted contexts (business centres, commercial districts, etc.), with expansion to wider perimeters envisaged at a later stage;

- **The promoters of the pilot projects may be the same private companies that gravitate within districts where there are substantial traffic inflows and outflows** (e.g. industrial districts, tech parks, etc.);

The development of the pilot projects

The project path was defined with the aim of launching and concretising the vision and mission of the Italian Way to Connected Mobility. To this end, more than **40 mobility stakeholders were involved**, from public to private actors, with the aim of **raising attention and interest around the issues and opportunities of connected mobility** and, at the same time, **involving the main stakeholders in the design and implementation of a series of pilot projects** that would demonstrate the application potential of connected mobility and quantify the benefits that could be obtained.

OCTO and The European House - Ambrosetti have therefore launched several pilot projects in collaboration with **8 Italian cities** - Florence, Modena, Bari, Rome, Milan, Turin, Parma, and Varese - and **4 private stakeholders** - Tecno, Arriva Italia, Società Autobus Servizi d'Area (SASA) and Agenzia Mobilità Piemontese (AMP), where the focus is on the co-creation of new services involving the pooling of technologies and databases.

In addition, projects have been launched with some **Innovation Leaders**, i.e., private companies - Mercedes Benz Italia, Nissan, Sara Assicurazioni, Fondazione Ania, Dell'Orto and Enel-X Way – which have started a series of projects with OCTO that leverage both technological innovations and innovations in operating models with the aim of improving the services offered to customers.

The importance of promoting pilot projects at a national level has had some preponderant effects: sharing the technological innovation already available for the benefit of smart cities, discussing implementation barriers related to the extended involvement process and how public and private entities can collaborate, identifying the use cases considered a priority by the stakeholders of connected mobility and also their replicability across the country on the basis of local projects (PUMS).

In addition, the use cases provide indications on how, also in the field of mobility, co-opetition between different actors is a key element in order to create value within the new ecosystems of the Data Economy.

The stakeholder engagement activities for project development are a demonstration of how the pooling of technologies and databases from different sources and actors can enable innovative solutions for different mobility challenges, so that it can come closer to OCTO's Vision Zero.

In addition, the results generated by the use case development activities will be disseminated and will increase the dissemination of knowledge of the benefits of adopting technologies supporting the development of new connected and smart mobility

ecosystems, thus favouring the acceleration of the digitisation pathway of cities, the only ones that can guarantee the mass adoption of technologies and, consequently, effective results for society.

Proposals for the development of the "Italian Way to Connected Mobility"

The main evidence that emerged during the year of work and the first results obtained from the experimentations aimed at concretising the Italian Way to Connected Mobility have allowed The European House - Ambrosetti and OCTO to formulate the following four proposals for concretising the development of the "Italian Way to Connected Mobility".

Proposal 1

Public bodies may have a legal obligation to collect and process personal data on mobility, but this obligation must be enshrined in an ad hoc law in which the nature and purpose of the processing of personal data must be clear. In the absence of such a specific legal obligation, the collection and processing of data may nevertheless be justified when it is necessary 'for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller'.

At the Italian level, it is noted that, within the "Smart Roads" Decree of 2018, a clear rule on the protection and possibility of use of personal data (by Public Bodies) within connected mobility ecosystems is still missing.

Define the cases in which the public interest for Public Authorities to use data collected within connected mobility ecosystems will be recognised, to foster the development of new services for citizens.

In developing regulations, it will be crucial to identify and classify the types of data: data generated by people vs. data generated by vehicles. For each type of data, it will be important to define ad hoc processing rules, involving all the stakeholders concerned (e.g. for data generated by vehicles, OEMs, telematics service providers, etc.). In defining regulations, it will also be important to identify the role and scope of action of the public actor which, as demonstrated by the recent "MaaS for Italy" calls for proposals, will have to assume a central role in defining new paradigms of connected and smart mobility.

Proposal 2

Like what has happened in the financial sphere, OCTO and The European House - Ambrosetti see in the creation of a data exchange market, initially promoted by

legislation, the possibility of defining a new co-opetitive ecosystem between incumbent mobility stakeholders and the new players that will be created.

Introducing a Mobility Service Directive, inspired by the Payment Service Directive 2 (PSD2) in the financial sphere, which would introduce data exchange obligations to promote competition, the emergence of new market players and the creation of new high value-added services also in mobility.

In this sense, the "Data Act", proposed by the European Commission at the beginning of 2022, is to be considered, in the vision of OCTO and The European House - Ambrosetti, a key first step in the development of a Mobility Service Directive. In fact, the Data Act aims to foster the sharing of data in an equitable manner, also involving smaller players such as Small and Medium Enterprises (SMEs), start-ups and public bodies.

Proposal 3

The Italian NRP devotes EUR 34.58 billion to supporting mobility, divided into three different missions - Mission 1 - Digitalisation, Innovation, Competitiveness and Culture; Mission 2 - Green Revolution and Ecological Transition; Mission 3 - Infrastructure for Sustainable Mobility -, as described in the chapter on public funding for the development of initiatives in the context of mobility.

In addition to promoting the development of quick and rapid implementation initiatives that make it possible to achieve the milestones and objectives of the NRP and thus gain access to the resources made available by the European Commission, it is considered important to ensure that the resources of the NRP go to favour investments in innovative technologies applied to mobility.

Provide, within the calls for tenders for the implementation of PNRR investments in transport, appropriate guidelines for the implementation of connected mobility technologies with rewarding mechanisms for projects based on innovative technologies (e.g., Connectivity, Artificial Intelligence, High Performance Computing, Advanced Cloud, Internet of Things, etc.).

This proposal intends to encourage the creation of guidelines and mechanisms to incentivise the development of innovative projects - i.e., with high technological content and based on an ecosystem operating model - in the context of mobility.

Proposal 4

Collaboration between public and private actors is crucial for public administrations to be able to achieve their goals of reducing traffic, pollution and road accidents in line with OCTO's Vision Zero. At the same time, the collaboration between private actors and public administrations is more than essential to define a smart mobility system. Indeed,

on the one hand private actors can help generate innovative technological solutions, while on the other hand public actors can foster their dissemination and integration within urban mobility ecosystems.

Since there is a lack of dedicated structures within public offices, and there is insufficient regulatory clarity regarding the ability to create partnerships involving the exchange and use of data, to achieve the development of a connected and smart mobility system, it is deemed necessary to

Define new modes of relationship between public and private actors for the development of new connected and smart mobility services, envisaging the possibility of setting up regulatory sandboxes (e.g., on traffic code, public and legitimate interest, public procurement/public-private partnership models) that encourage the experimentation of new mobility systems and new services in application environments.

It is important that standard schemes are identified that can clearly and precisely regulate the scope of action of private actors and the public administration. Specifically, this action must aim to consistently define the relationship modalities and regulations for the management of procurement and data exchange.

In this regard, an example of how the regulator can foster the experimentation of innovative solutions is given by regulatory sandboxes, i.e., **simplified regulatory regimes in which market players can operate in a context of regulatory exemption for a given time frame within a given perimeter**.