O.5.1. Position Paper

WP5.1 – Analysing existing, re-use and development of new smart technological tools and advanced solutions

5.1 – (O.5.1.) MIMOSA Position paper on info mobility tools and smart solutions

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Table of Contents

Main challenges

Within its general framework of increasing the routes and the multi-modal passenger interconnections between Italy and Croatia, in order to provide feasible alternatives to road transport, promoting greener multimodal solutions for passengers between the two countries, in WP 5 MIMOSA project has addressed the challenge of developing innovative tools and harmonizing services and smart solutions for a sustainable intermodal mobility in the Partners' area.
Additionally, it aimed to improve the accessibility and services for passengers and the interconnections at transport nodes fostering multimodality and modal shift opportunities, putting the users at the centre in order to give them a set of value-added integrated tools and services.

Thanks to the pilot actions developed and tested in Activity 5.1 ("Analysing existing, re-use and development of new smart technological tools and advanced solutions"), it was possible to collect data, analyze and experiment ***new smart and technological tools and advanced methods*** able to innovate and improve public transport policies and plans of the cross-border Regions.

The group of pilot interventions were based primarily on testing devices ranging from safety and security for passengers, to tools for improving info mobility; from monitor traffic and safe access to ports or safety standard for passengers and luggage inspection, security screening, port management application to testing information systems like smart waiting rooms, info-mobility, on-time information system, and digital information.

The above-mentioned pilot tests implemented in Activity 5.1, faced the following main strategic technical political challenges and objectives:

- *Decongest and optimize the passengers' flows defining integrated and autonomous communication systems in emergency situations ensuring smoother and efficient information flows (Ancona area – Marche Region);*

- *Monitor traffic and allow safe access to Port's premises (Vasto area – Abruzzo Region);*

- *Improve security screening in the Port of Split (Split area – Split-Dalmatian Region);*

- *Innovate services for sustainable intermodal mobility related to maritime transport and bike routes (Rovinj Area – Istria Region);*

- *Improve transport connections and facilitate access to health and social services offered by the capital City for residents from remote areas (Gospic Area - Lika-Senj County);*

- *Protect the environment of the coast and the sea from port pollutants especially monitoring waste oil levels in real time (Zadar Area – Zadar Region);*

- *Raise passengers' awareness of arranging journeys by using multimodal possibilities, about the different destinations and connections. Measure meteorological data also to regulate the*

safe transport of passengers ensuring the necessary information and figures available (Šibenik area – Region).

As such, this O.5.1 MIMOSA Position Paper on new smart technological tools and advanced solutions is a **strategic document focused on these different tested results for activating a virtuous process of development of the Ports** were the solutions have been implemented not only as relevant transport nodes in current and future cross-border passenger traffic flows, but as intermodal nodes too, thanks to their direct links with other connected nodes (railway, bus station and airport) in fostering intermodality in the Adriatic Area.

Furthermore, for the purposes of this position paper, it is worthwhile to underline that all tested tools and solutions are bound to be transferred to other ports and nodes of the Programme area.

Current situation and lessons learned

The MIMOSA project has promoted the **development of innovative transport solutions aimed to reduce the environmental impacts of people mobility** between the two Countries, Italy and Croatia. These emissions reduction was related both to providing in a more efficient and sustainable way existing public transport systems and to the ***need to define new effective and attractive innovative transport solutions*** *able to activate smart connections and passengers' communications flows* able to raise their awareness to displace differently[1].

In the context of Activity 5.1, the 11 pilot projects in the 7 Regions' territories were mainly related to innovative and smart solutions aimed at improving passengers' cross-border mobility and focused to overcoming old and underworking systems of communications in the Ports' premises of the piloting areas.

Having analyzed the **current situation and implementation stage** in the following piloting experiences, the main elements can be summarized as follows:

- Ancona has a strategic role in terms of passengers' flow crossing the Adriatic, especially in summer season, and faces the need to better organize and improve the passengers' information flows especially in the peak season to ensure smoothness and efficiency in emergency cases. Current situation reveals an information system which is underworking and operating in a non-efficient way due to age and usury, that can be replaced by 2 innovative LED technology displays aimed at providing real time information to passengers while

[1] The MIMOSA project wants to underline that the technological improvement of transport modes can provide a significant contribution to the reduction of the carbon footprint within the European Commission proposal 'Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality" - Brussels, 14.7.2021 COM(2021) 550 final. This proposal envisages, a series of green transition supports for aviation and shipping fuels, as well as the achievement of a zero emissions target for passenger cars and light-duty vehicles on the market by 2035, the primary goal being to reduce the greenhouse gas emissions by 50% within 2030.

embarking and disembarking to ease the access to real- time information concerning ferry timetables; furthermore, a new wire broadcasting system will be installed at the ticket office to allow a more effective and timely communication, especially in emergencies.

- In the Port of Vasto in Abruzzo Region, where transport of national and international traffic and in cross-border relations is crowded and characterized by strong congestion, possible risks need to be mitigated in order to allow safe access to people and goods to the Port area. To this aim technological devices such as automatic bars and gate are installed to monitor port's traffic and secure passengers and travelers.

- Split presents the need of modernization of the technical protection system in the Port area upgrading the technical instruments for monitoring purposes (video surveillance, burglary and access control, passage control, video archiving and integral protection of the local central monitoring point) in cases such as movements in the protected area and individually protected premises; in particular firstly developing a study to meet the requirements of safety standard and then installing access bars protection control, video surveillance system and access IT equipment.

- In Rovinj, current status of the action focuses on the importance of information to passengers based on mobility needs in the Region's areas, near the centre and the train station[2] and new bike routes upgrading equipment's technologically advanced with one LED Information panel equipped with several functionalities as charging option, anti-vandal protection, fast charger, WI FI hotspot, hybrid module, SIM connection and LCD display.

- Lika-Senj County is experiencing problems in transport connections - especially in regards to public transportation, lacking and often times non-existent, and in the availability of essential health and social services offered only in the County capital Gospić. The ICT mobile app traffic solution proposed for users and drivers is of help for local population and improve their access to health and social services necessary for their daily lives;

- Zadar port reveals the real need for the protection of the coast and the sea from port pollutants and waste oil management by placing thanks for vessel oil residue in nautical areas and specific digitalized monitoring equipment to supervise the environment preservation.

- The port of Šibenik faces the necessity to innovate the port's old style communication strategy as a whole proposing renovated waiting stations for passengers in terms of equipment and commodity in domestic maritime transportation with complete functionalities of meteo sensors, information displays, LED screen and LED lights, rechargers, and WIFI connection; information kiosk with multimedia content about travel destinations in domestic and international passengers' transport to ensure quality, safe, smart and sustainable offer for travelers especially in surrounding areas; finally, at the Vrulje pier, two smart buoys with a

[2] The nearest train stations are Kanfaran and Pula. the railway line between Kanfaran and Rovinj is disused and no train services are currently operated;

sensor system for data collection and a meteorological station are installed, in order to measure various meteorological data needed to regulate the safe transport of passengers to ensure linear traffic.

Based on the current situation and the actual implementation stage, **main MIMOSA lessons learned** are perfectly in line with the STRIA (Strategic Transport Research and Innovation Agenda) priorities, in particular, the *Connected and Automated Transport Roadmap (CAT), the Network and Traffic Management System Roadmap (NTM) and the Smart Transport and Mobility Services Ropadmap (SMO)*[3].

They can be listed below:

- There is a clear need in port's areas and premises to **upgrade Information Technological Systems, software, devices, equipment, facilities with high quality smart new solutions** in order to guarantee passengers, travelers and goods' the relevant travel data, smooth movement and circulation in a total security and safe framework.
  Digital technologies and the emergence of the connected traveller can influence real time demand by encouraging off peak travel and use of alternative routes through intelligent applications and user information services[4].

- Implementing intermodality and innovation in traffic **management requires new communication systems, integrating local end users' and stakeholders' direct experience** for a common social sustainability of the process. Connected and automated transport technologies[5] can contribute to increasing the efficiency and safety of the transport system. They can improve traffic flows, optimise infrastructure and public transport use, and foster multimodal transport solutions.

- The activation of such innovative transport solutions or monitoring of mobility traffic in marine areas and Adriatic coasts can reduce **environment pollution and gain positive impact for cross-border people life**. Smart mobility systems and services can contribute to the decarbonisation of the European transport sector[6].

- Foreseeing all possible risks for passengers flows in port's areas entails **smart legal administrative procedures by regional Public Authorities** in order to realize all the correspondent solutions and implement the proposed new smart and technological tools and advanced methods.

Proposed Solutions and Recommendations

[3] "Towards clean, competitive and connected mobility: the contribution of Transport Research and Innovation to the Mobility package", Brussels, 31.5.2017 SWD (2017) 223 final

[4] NTM *(Network and traffic management systems)*

[5] CAT *(Connected and Automated Transport technologies)*

[6] SMO (*Smart Transport and Mobility Services Ropadmap)*

Thanks to the MIMOSA Activity 5.1 pilot actions, the following key strategic recommendations can be drawn, with the aim of extending their application to other territorial contexts of the Programme area and also within other Cooperation Programmes:

- **Information & Communication Systems**: advanced technological tools and smart technological devices (mobile apps, LED screens, info kiosk, and similar) are of fundamental importance for information smooth flows and passengers' increased awareness on moving either in crowded port's areas or in remoted smaller counties in order to reach the correct destination or needed service.

    - **Reccommendation:** besides the above mentioned essential intruments, ***specific surveys for the various territorial contexts in the Adriatic area***, to provide information on the relevant variables of the demand for mobility, ***are strongly reccommended***.
      Furthermore, our major hint, on this MIMOSA 5.1 paper, concerning I&C Systems is to ***reinforce the Italy-Croatia interconnected modes of transport and mobility with intelligent cooperative, connected and automated infrastructures and allow users, managers and all the actors involved to share information and use it to coordinate their actions[7].***
      In fact, a massive widespread diffusion of mobile communication devices, the progressive expansion of communication networks and bandwidths with increasingly reduced latencies, allow strong digital integrations between sensors and technologies making the Data-driven Society viable.
      The flow of data combined with the evolution of cloud computing and data analysis tools allows knowledge and sharing in real time of the various mobility flows (vehicles and people) and is of particular importance for the fluidity of information flows and for greater awareness of passengers' movements even in port areas to reach the correct destination or necessary service. ***It is then strategically advisable that this should be coordionated and shared among the two Countries making it possible to carry out the monitoring of mobility by modifying communication flows (from vehicles and people to infrastructures and networks)***[8].

- **Real-time Data**: high quality useful and detailed information must be considered as basic requirements for increasing efficiency and better management of travelers' flows and traffic decongestion or optimization. Data collection, organization and analysis by skilled mobility sector experts' is of great relevance for the attended result.

    - **Reccommendation**: it is warmely suggested to private and public stakeholders ***to consider sustainability in terms of mobility not to be separated from an innovative use of Open Data*** and from that of intelligent infrastructures that contribute themselves to open data growth in practice. The asset of "digitization" ***must be considered by Public Authorities as a pervasive action in the monitoring***

[7] "Cooperative Intelligent Transport Systems" (C-ITS) of 2016

[8] "Strategic Transport Research and Innovation Agenda" (STRIA)

and management systems of vehicles, users, access and control services; in the near future, innovative vehicles will be "connected" for maintenance, entertainment, information, monitoring and management with remote control systems (e.g. robotaxi, light air transport systems, multi-modal, electric and autonomous vehicles, drone technology and on-demand mobility services etc.) guaranteeing protected architectures through secure servers managed by certified operators. As such, ***MIMOSA shares a MaaS approach providing integration functions between users and operators in order to standardize all the operations necessary for mobility planning even in ports areas with digitized and standardized models and with the necessary interoperable data available.***

- **Public & Private Partnership**: it is recommendable to establish a long-term local governance model based on public-private connection and stakeholders' collaboration and integration in the process of definition of traffic policies, new sustainable technical solutions or innovative methods. High level commitment both of policy makers and private end users will guarantee the sustainability of the proposed measures.

    - **Reccommendation**: ***more coordination of transport research and innovation efforts at national and European levels too is needed*** to create synergies and steer joint implementation of research and innovation priorities and new projects among the two Countries (Italy and Croatia). To this end, ***representatives at National Level and relevant transport stakeholders (transport related European Technology Platforms, industry, academia and civil society) need be consulted on a regular basis on the innovation proposals presented in MIMOSA***. This process will, inter alia, address the need to: · Ensure a regular dialogue on innovative solutions for sustainable transport and mobility and discuss joint initiatives, · Allow for synergies, economies of scale and technology transfer through an integrated, cross-modal approach; · Focus financial support on research and innovation, linking EU funding closer to the long-term objectives of EU transport policy and those of other policies, notably energy, climate and industrial policy. ***Monitoring ICT tools could be set up to follow up transport research and innovation actions and provide feedback to policy and decision makers.***[9]

- **Multimodality & Sustainability**: Adriatic areas' coasts and seas ask for protection and conservation. It is important to design innovative monitoring methods for marine areas polluted sites preventing risks for people and animals in land and water. Traffic emissions need to be mitigated by combining intermodal mobility shifting to different ways of transport limiting cars and road transfers in general that need to be induced by the provision of new services leading to users' behavioral changes.

    - **Reccommendation:** ***specific advice is focused on the realization of IT-HR Interoperability Platforms to increase the level of multimobility*** thanks to

[9] STRIA European Strategy, in periphrasis with the Guidelines of the Horizon Europe Programme, among the activities envisaged for the achievement of the 2050 objectives, highlights the need to develop and test governance and regulatory strategies with the aim of integrating indicators and plans and focus on impact assessment on decarbonization of transport and sustainable land use.

different enabling interventions and collaboration models based on support service architectures, which guarantee cyber security between operators. Based on the MaaS paradigm, this could help to rationalize the combination between public transport and private transport and make it more efficient, sustainable, inclusive and digital for the related territories.

- **Security & Safe flows in Port's areas**: security in Port's premises is crucial especially in the peak seasons for passengers' entrance and circulation before embarking and in the disembarking operations too. Focus must be maintained on access and movement control management to emphasize a complete safety of the ambience to achieve a balanced free fruition of the areas.

    - **Reccommendation:** ***it is certainly reccommended by the MIMOSA 5.1 Paper to address to the issues such as data collection and legislative topics related to privacy management and cyber security of passengers*** **-** especially on the recent pervasive introduction of artificial intelligence (GPT) - through a comprehensive and appropriate framework in line with European-level standard, to ensure a safe circulation in the Port's areas.
      In particular, in the Marine Areas of the Adriatic Basin which are facing important innovation challenges from the ***ecological transition*** with non-climate-changing systems as electrification of docks, to ***the digital transition***, which affects Ports' procedures and control systems affected by increasing automation.
      There is ***a clear need to create a good understanding of cyber security in transport, identify related risks, define and implement adequate levels of security against attacks for today's and future products***. Acceptable levels of and principles for cybersecurity and data protection, which are critical in the broader issue of data access, must be developed and regular updates ensured. The development of guidelines and measures to prevent unauthorized access to data from vehicles/vessels and infrastructure should be developed at Adriatic PA level and more research is needed to provide the highest possible robustness against cyber-attacks.

Conclusions and relevance for the EUSAIR area

As described in the previous sections, Action 5.1 of MIMOSA project presented two groups of piloting experiences: from one side testing devices for promoting security, monitor traffic and safe access to ports, safety standard for passengers and security screening, port management application; and to the other side, the trials focused on testing information systems like smart waiting rooms, info-mobility, on-time information system, digital information (information panels and mobile APP).

These pilot projects directly contribute to the implementation of **EUSAIR Action Plan**, particularly to **Pillar 1 "Blue Growth", Pillar 2 "Connecting the Region" and Pillar 3 "Environmental Quality"** of the Flagship Initiatives addressing the challenge of developing innovative tools, harmonizing services and smart solutions for a sustainable intermodal mobility in the Partners' area with the aim to find an alternative way of moving besides cars.

Concerning **Pillar 1, Topic 3 - Maritime and marine governance and services**, the 5.1 implemented pilot projects contribute to supporting "governance of maritime space for a sustainable and transparent use of maritime and marine resources" and spatial planning policies.

As for **Pillar 2, Topic 1 - Maritime transport**, action 5.1 developing and optimizing port infrastructures and information procedures, is strengthening maritime safety and security and developing a competitive regional intermodal port system supporting multimodal cross border connections; Topic 2 - Intermodal connections to the hinterland, MIMOSA WP5 pilots suggests to improve the accessibility of the coastal areas and islands, besides working for offering health services to remote areas too.

Finally, **Pillar 3, Topic 1 - The marine environment**, by promoting innovative information systems and technologies for traffic monitoring and smart flows and by suggesting multimodal and sustainable transport solutions or pollutants' prevention in the port's sea basins, 5.1 pilots are relevant as they address the need of deacrease pollution with particular attention to the ecological connectivity of blue and green corridors/infrastructure.

The replicability of the results obtained in MIMOSA WP5.1 pilot actions, is ensured by the commitment of stakeholder groups that aim at transferring the realized experiences and exchanging the practical obtained solutions. In particular, in the long term, the smart technological applications and the advanced tools linked to mobility info and social device, have a great potential of capitalization and these pilots actions enable to spread the Permanent cross-border Network and the EUSAIR stakeholder platform.

References

- (D.5.1.1) No. 1 Set of devices and information system to promote smart and efficient traffic flows for all typology of passengers in the port of Ancona.
- (D.5.1.2) No. 1 Set of devices to monitor traffic and allow safe access to Ports in Abruzzo Region (Port of Vasto).
- (D.5.1.3) No. 1 Study on the requirements for meeting the safety standard for passenger and luggage inspection in the Port of Split.
- (D.5.1.4) No. 1 Set of devices for border and port security screening in the Port of Split.
- (D.5.1.5) No. 1 Port management application.
- (D.5.1.6) No. 2 Smart waiting rooms for passengers.
- (D.5.1.7) No. 1 Set of devices for info-mobility.
- (D.5.1.8) No. 1 Set of devices for the regulation of safe passenger transport at the Port of Šibenik.
- (D.5.1.9) No. 1 Upgrading on-time information system in the Port of Ancona.
- (D.5.1.10) No. 1 Set of devices for digital information and advanced solutions to enable better harmonization of services for sustainable intermodal mobility (No. 1 information panel for gathering all relevant information and electrical distribution pedestals - enchantment of maritime transport).
- (D.5.1.11) No. 1 Set of devices for digital information (No. 1 mobile APP).