

D.5.1.8 SET OF DEVICES FOR THE REGULATION OF SAFE PASSENGER TRANSPORT AT THE PORT OF ŠIBENIK

Working Package n:	WP5 – Developing tools and harmonizing services for a sustainable intermodal mobility
Activity (n. and description):	A 5.1 – Analyzing existing, re-use and development of new smart technological tools and advanced solutions
Deliverable (n. and description):	D.5.1.8 – No. 1 Set of devices for the regulation of safe passenger transport at the Port of Šibenik
Responsible Partner:	PP17 – Port of Šibenik Authority
Status:	Final
Deadline (as from the original AF):	11/2022
Finalized on:	06/2023

1. Background, scope and description of the pilot action

Within the MIMOSA project, innovative solutions to improve sustainable multimodal transport were piloted.

By creating the basic infrastructure prerequisites for accepting ships on cruises, the port of Šibenik began its development on the cruise tourism market. The intensification of the number of cruise ship arrivals and the increase in the number of cruise tourists has influenced the need to improve the possibilities of the passenger part of the port of Šibenik. The purpose of pilot activities in the MIMOSA project is to improve services in passenger traffic in order to meet higher safety standards, improve the level of port service for cruise ships and their passengers, and increase the total capacity of the passenger part of the port of Šibenik.

After smart waiting stations and info kiosks, the third pilot activity of the Port of Šibenik Authority consists of installation of two smart buoys with a sensor system for data collection and a meteorological station at the Vrulje pier, which are used to measure various meteorological data needed to regulate the safe transport of passengers in the port. In addition, the set meteorological station will ensure that the necessary information and data are available to passengers.

Except meteorological data, sensors on the buoys can also detect pollutants and predict the possible geographical spread of pollution. The testing of buoys was held as a simulation of pollution, taking into account the sea currents and wind direction.

Buoys with sensors will significantly increase the level of passengers' safety but will also increase the level of the overall maritime safety standards and the safety of the port of Šibenik area.

2. Implementation of the pilot action (including a description of the externalized services/supplies/works)

The market research and tender started to be prepared in the spring 2021, but, due to internal reasons and some changes in the Port of Šibenik Authority business, it was postponed for the end of the 2021. In that time the market research was prepared and almost all specifications were defined, but due to COVID-19 reasons that strongly hit the overall business of the Port of Šibenik Authority, the completely definition of the specifications and tender procedure were postponed. During March and April 2022, a very detailed market research was in progress, and the specifications for the tender procedure were finalized. The specialists for the tender procedures were involved in preparation of technical specifications and overall tender conditions, in order to prepare quality tender based on Port of Šibenik Authority needs for the project realization, and later for regular business activities. In the meantime, the internal staff structure in the Port of Šibenik Authority has been changed, which caused slight slowdown of the tender preparation. After the confirmation of the Steering Council, the tender procedure started in August 2022. The tender for the pilot was realized in December 2022, and the contract was signed on December 22, 2022.

The entire public procurement procedure, including the contract, was signed within the framework of the MIMOSA and FRAMESPORT projects (FRAMEwork initiative fostering the sustainable development of Adriatic Small Ports). The MIMOSA project co-financed the purchase of a buoy and sensors for meteorological and hydrological data, while the FRAMESPORT project co-financed the purchase of sensors for pollutant detection in the port of Šibenik.

Two buoys with sensors were acquired. Buoys consist of sensors of sea currents and sea temperature at depths of 1 to 25 meters; meteo sensors of wind speed and direction, air temperature and humidity, pressure and dew point temperature; sensor of sea pollution with hydrocarbons. These bouys are connected with its land base, which consists of terrestrial meteo sensor of wind speed and direction, air temperature and humidity, pressure and dew point temperature; two wifi antennas (min RX 200Mbps and TX 200Mbps), poe distribution with 8 inputs (12-24-48v with voltage regulation), T1w/5m coaxial cable, metal cabinet dim. (300x300x250) ±5%. Land sensors and sensors on buoys are connected by a web application for mutual data integration.

In May 2023, the buoys were completely installed, but, as the location permits were still missing, could not be situated in the sea. Finally, in June 2023, the buoys were installed in the sea, on the planned location in order to give the information from the optimal sea location. Buoys are placed at the entrance to the port of Šibenik, in the channel of St. Ante, through which about 1.800

vessels pass daily during the summer season. In addition, the entrance to the port of Šibenik is a protected natural landscape.

On June 29, 2023, the Port of Šibenik Authority and the contracting party signed the handover record, which stated that all items and the entire process and installation of the equipment were performed in accordance with the Contract.

Figure 1. The process of preparing the buoys for transport to the anchoring location



Figure 2. The process of placing and securing the buoy for transport to the anchoring location



Figure 3. The process of placing and securing the buoy for transport to the anchoring location (photo made by air drone)



Figure 4. Taking the buoy to the anchoring place 1 (photo made by air drone)

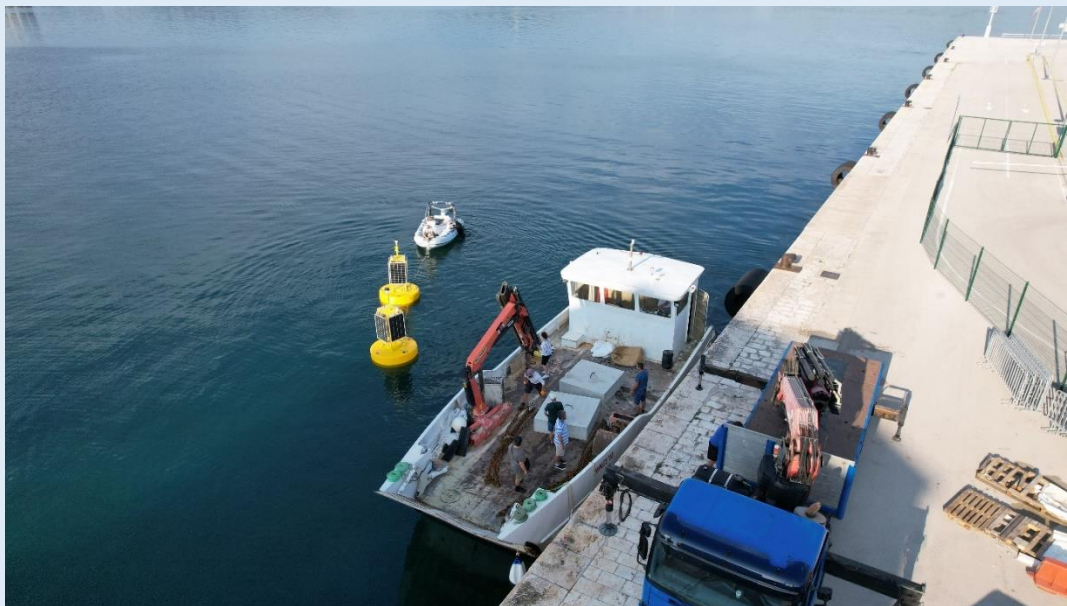


Figure 5. Taking the buoy to the anchoring place 2 (photo made by air drone)



Figure 6. Delivery of buoys to anchoring locations (photo made by air drone)



Figure 7. Anchoring preparation procedure 1 (photo made by air drone)



Figure 8. Anchoring preparation procedure 2



Figure 9. Anchoring preparation procedure 3



Figure 10. Installed buoy



Figure 11. Installation of second buoy on the other side of the entrance in a channel of St Ante (photo made by air drone)



Figure 12. Installed second buoy on the other side of the entrance in a channel of st. Ante



Figure 13. The position of the buoy in relation to the coast (photo made by air drone)



Figure 14. Land sensors for receiving information from buoys 1 (photo made by air drone)



Figure 15. Land sensors for receiving information from buoys 2 (photo made by air drone)



3. Information about stakeholders role/involvement

Šibenik Port Authority - the main actor responsible for implementing the pilot projects and ensuring their success.

Croatian and Italian experts - these experts will contribute their knowledge and experience to the study to ensure that the technologies and lessons learned from the project are applicable in all ports in Croatia and Italy and can hopefully become standard in the Adriatic.

Local communities - the stakeholders who stand to benefit from the improvement of quality standards for passengers and the overall protection of the Adriatic Sea, which is a very sensitive area.

Furthermore, the Port of Šibenik Authority regularly consults with industry-relevant stakeholders, such as shipping companies, cruise operators, and port service providers, to ensure that their needs and concerns are addressed in the development of future projects. The authority plans to hold one or two more stakeholder meetings in the near future to discuss the results and potential implications of the pilot actions, and to gather feedback for future projects.

4. Lessons learnt and conclusions

After the installation of buoys, the testing phase was held. During the simulations, the analysis involved meteo data (wind direction and strength), two different types of pollutants and time. The simulation included movement of the winds and currents, or oceanographic and hydrometeorological data collected in real time from various sensor systems, together with oil spill, including the location, amount, duration of the spill, type of substance and other data. Data read from the buoy is used to determine air temperature, dew point, water temperature, sea changes, wave height and period, wind direction and speed, visibility and barometric pressure. All these data are significant in order to improve the level of passengers' safety, as well as the overall port area safety. The data collected in this way can be useful also for predicting the impact of stormy weather on navigation in the coastal area, managing in crisis conditions and protecting a certain coastal zone from environmental or physical disturbance.

5. Problems found and adopted solutions

Problem 1.

Delay in the implementation of public procurement caused by internal difficulties in the Port of Šibenik Authority (lack of staff and increase in workload). The procurement was carried out several months late, but in the end the procedure itself was successfully carried out.

Problem 2.

Long-term wait for the location permit for the installation and testing of the buoys. Although the wait dragged on, the permit finally arrived at the end of June 2023, and the buoys could finally be installed in the sea and tested.

6. Expected follow up (after project closure)

The most important goal of this project is to improve the level of integration of the port of Šibenik into international passenger traffic and significantly improve the port capacities and performance of the passenger part of the port of Šibenik. In this way, the Port of Šibenik Authority becomes an active stakeholder in the social and economic development of the coastal area in the central Adriatic.

A broader social perspective is reflected in the integration into the wider transport network through the improvement of the management and safety of (passenger) traffic, through better passenger services through a new offer of sustainable and modern services and the improvement of the ecological component in the Šibenik archipelago.