ACTION PLAN FOR FOSTERING COORDINATED MULTIMODAL FREIGHT TRANSPORT THROUGH ICT SYSTEMS – VERONA

DELIVERABLE D.T3.2.3

Version 1

3 2022

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1. Executive summary

Located in the heart of Europe, the Verona freight village is at the intersection of the Scan-Med and Mediterranean TEN-T core network corridors so in a strategic position for the traffic of goods exchanged from the north and the south of Europe.

The effects of the globalization phenomena are provoking a significant increase of traffic volumes in the Central Europe area, resulting in new development opportunities for the Verona freight village.

In this context, Verona is one of the key nodes to connect the Mediterranean market to the Central Europe area that represents the main trade area for the goods arriving in the inland terminal.

Therefore, the use of the multimodal transport is crucial to diminish the level of congestion in the road network and at the same time to decrease the level of pollution and of greenhouse gasses.

Nevertheless, there is a capacity limit of the network that prevents to absorb a significant increase of rail traffic despite the works in progress to strengthen the line.

An improvement of the ICT system is the sole solution to allow an increase of rail traffic using the available infrastructure.

The strategy outlined within the COMODALCE project “Strategy for fostering coordinated multimodal freight transport through ICT systems” (D.T1.3.2-10) involves the objectives and the priorities to achieve as well as some means of verification to be tested in the pilot action.

This document includes the action plan for fostering coordinated multimodal freight transport through ICT systems in the Verona freight village. Considering the results of the pilot action, it reached the foreseen goals in the strategy, providing a precise description of the actors involved and of the necessary resources.

The pilot action implemented an ICT system to exchange data between the Verona freight village and La Spezia Port Authority, automatically generating the cargo manifest with the aim to enhance the efficiency in the multimodal sector.

The pilot action has shown the benefits coming from the implementation of an ICT corridor in a multimodal chain such as the integration of processes among ports and inland terminals as well as significant improvements in terms of cybersecurity.

2. The strategy and the pilot action

The "Strategy for fostering coordinated multimodal freight transport through ICT systems" defined in the D.T1.3.3 highlighted the following goals:

Medium term (5 years):

1. Goal #1 – Creation of a paperless system to ease the access to the terminal gates
2. Goal #2 – Develop a smart handling tool to optimize the arrangement of the loading units in the buffer area

Long term (10 years):

1. Goal #3 – Activation of a Freight Village Community System (FVCS) similar to the PCS in the ports
2. Goal #4 – Creation of an ICT fast corridor between the Verona freight village and the main Italian and European ports

Since the definition of these goals in D.T1.3.3 (February 2020), we have monitored the progress made in the technology field to understand if the evaluation made in 2020 is coherent with the current situation. The result is a modified scenario with a consequent redefinition of the strategy previously defined. It was noticed that there is the need of other additional IT improvements like:

a) a "digital connection between the national and the foreign operators"
b) a "dashboard able to monitor the loading units in real-time"
c) a "shared data base used by all the operators of the last mile chain".

These three platforms are necessary to further enhance the level of operability among the players operating in the terminal. Specifically, the digital connection to the foreign operators allows a fast exchange of data with a significant reduction of the communication mistakes as well as a prompt transmission of the mandatory information before the departure of the trains. Then, a dashboard to check the status of the loading units in real-time permits a better arrangement of the space in the buffer area besides a steady communication to the shipping company that needs a continuous track and trace of the goods. Lastly, a shared data base used by the operators of the last mile chain can reduce the inefficiencies caused by the administrative procedures and increase the level of security of the information.

In the tables below are shown the goals set on the strategy document while in the following wish list there are the updated goals.

Perspectives	Goal #1 – IT platform to book the train slots	Measurement
1. Environmental and safety perspective	The internal policy can foresee a priority access to the trucks using a digital reservation instead of a document.	The terminal managers have to prepare an environmental report measuring the level of CO2 emissions produced at the terminal gates and in the surrounding roads.
2. Internal processes perspectives	It is important to define a dedicated procedure for the vehicles that use only the IT platform to book the slots on the train. In this way, the entire procedure (access to the terminal, handling of the loading unit and exit) will be managed automatically by the IT system, permitting to re-allocate the workers previously involved in the booking process moving them to more productive activities (e.g. train handling).	Measurement of the number of the heavy vehicles entering into the terminal gates after the introduction of the IT procedure.
3. Innovation and growth perspective	It is possible to re-arrange the shifts of the workers previously involved in the administrative process, exploiting better their skills to handle more trains and increase the traffic of the terminal.	Number of bookings to the priority fast lane (paperless system).
4. Customer / Partner perspective	A general communication sent to each partner can inform them about the existence of this upcoming paperless technology. In this way, the players of the chain are aware of the advantages given by this technology and can decide to exploit it to reduce the waiting time of their truckers.	Number of customers that will choose to move from the current procedure (wait at the terminal gates for the control of the delivery note) to the paperless system.
5. Financial perspective	Take advantage of the funds coming from European projects like COMODALCE to reduce the inefficiencies in the transport field. In addition, the local authorities (e.g. Municipality) could allocate some incentives in order to decrease the traffic jams in congested areas like the terminal gates.	Percentage of European funds received to improve the ICT system.

VISION:

The vision of the Verona freight village is to become the gateway of Italian ports through the development of an ICT platform able to put in communication ports and freight villages, increasing the exchange of information and goods.

Perspectives	Goal #2 – Terminal smart handling tool	Measurement
1. Environmental and safety perspective	The implementation of a smart handling tool will permit to reduce the number of gantry lifts and their daily movement, producing a decrease of the energy consumption.	The amount of energy used by the handling equipment (gantry cranes, reach stackers or slave tractors) after the implementation of the ICT tool.
2. Internal processes perspectives	Creation of a priority system of the loading units that will be managed directly by the software. In this way, the loading units that must be shipped with a high priority will be placed close to the departing train, clearing the area quickly in order to use that space for other units.	Number of operations necessary to handle a loading unit.
3. Innovation and growth perspective	The increased space available in the buffer areas thanks to a better arrangement will permit to accept more trucks (and their loading units) in the terminal, enhancing the overall potential capacity.	Fill rate of the buffer area after the implementation.
4. Customer / Partner perspective	A direct communication to each customer is necessary to describe the advantages of the handling tool, providing a comparison between the previous and the future handling time for a loading unit.	Percentage of customers interested to take advantage from the benefits resulting from the IT implementation
5. Financial perspective	The funds can come from European projects like COMODALCE which aim is to reduce the inefficiencies in the transport field. In addition, the terminal manager could invest a part of the terminal resources after the preparation of a business plan showing the increasing profits coming from the deployment of this IT tool.	Percentage of European funds received to improve the ICT system.
VISION: The vision of the Verona freight village is to become the gateway of Italian ports through the development of an ICT platform able to put in communication ports and freight villages, increasing the exchange of information and goods.		

Perspectives	Goal #3 - Freight village community system	Measurement
1. Environmental and safety perspective	The design and activation of a Freight Village Community System (FVCS) following the existing PCS deployed in some ports will allow a reduction of the overall environment impact. This result will be achieved thanks to the cooperation of the players using this portal that will permit to coordinate their actions, avoiding waste and useless operations.	Pollutants percentage detected in the freight village area after the implementation of the freight village community system.
2. Internal processes perspectives	Identification of an impartial subject to manage all the information provided by the partners and able to give the priority to the urgent operations.	Number of operations necessary to handle a loading unit.
3. Innovation and growth perspective	The increase of the communications and of data exchanged will permit to raise the traffic volumes, exploiting the savings of time produced by the system.	Number of new connections activated after the implementation of the IT system.
4. Customer / Partner perspective	The communication to the partners to involve must be carried out through B2B meetings in order to reach an agreement about the data to share and of the actions to perform.	Number of operators involved in the freight village system after its activation.
5. Financial perspective	The funds can come from European projects like COMODALCE which aim is to reduce the inefficiencies in the transport field. In addition, the infrastructure manager of the freight village could invest a part of its own resources after the elaboration of a detailed analysis of the FVCS impacts based on specific forecasts.	Percentage of European funds received to improve the ICT system.
VISION: The vision of the Verona freight village is to become the gateway of Italian ports through the development of an ICT platform able to put in communication ports and freight villages, increasing the exchange of information and goods.		

Perspectives	Goal #4 – ICT fast corridor to connect ports and freight villages	Measurement
1. Environmental and safety perspective	The creation of an ICT fast corridors among the Verona freight village and the main Italian and European ports will permit to reduce significantly the dwell time of the goods in the port areas, carrying out only the essential steps to move them from the point A (that can be the port or the freight village according to the origin of the cargo) to the point B. Therefore, this corridor is able to decrease the number of useless operations and the environmental impact, optimizing the entire process.	Pollutants percentage and transit time detected in the area after the implementation of the freight village community system.
2. Internal processes perspectives	It is necessary to define a merged procedure to coordinate all the actors operating in the corridor with the aim to create a logical sequence to follow in order to enhance the overall efficiency.	Number of operations necessary to handle a loading unit.
3. Innovation and growth perspective	The ICT fast corridor will intensify the traffic flows among the ports and the freight villages, exploiting the savings of time (currently necessary to make the controls on the goods inside port's area and other administrative operations) to activate new freight connections.	Number of new connections activated after the implementation of the IT system.
4. Customer / Partner perspective	Some technical meetings among the partners of the chain are essential to explain the features of the ICT fast corridor, showing the advantages of this system.	Number of operators involved in the ICT fast corridor after its activation.
5. Financial perspective	The funds can come from European projects like COMODALCE which aim is to reduce the inefficiencies in the transport field. In addition, all the nodes involved in the ICT fast corridor route can participate in its implementation covering a part of the budget necessary through their own resources.	Percentage of European funds received to improve the ICT system.

VISION:

The vision of the Verona freight village is to become the gateway of Italian ports through the development of an ICT platform able to put in communication ports and freight villages, increasing the exchange of information and goods.

After an updated evaluation of the Verona terminal needs, we have prepared a new wish list that is different from the one described in the strategy document.

The COMODALCE Pilot Action developed in the corridor between Verona e La Spezia helped us to test the wish list:

Wish list of ICT measures			
Title	**Short description**	**Link to the strategic goal**	**Link to the pilot action**
1.	Digital connection between the national and the foreign operators	Goal #1 – Creation of a paperless system	Measure implemented in pilot action. Correct data exchange between systems will be checked.
2.	Dashboard able to monitor the loading units in real-time	Goal #2 –Develop a smart handling tool to optimize the arrangement of the loading units in the buffer area	Measure implemented in pilot action. Correct data exchange between systems will be checked.
3.	Shared data base used by all the operators of the last mile chain	Goal #3 – Other dry ports Activation of a Freight Village Community System (FVCS) similar to the PCS in the ports	The measure has not been implemented in the pilot action, but it was foreseen at the beginning of its design phase. However, the operators disagreed on its implementation since they have not perceived the potential of its development.

Verona freight village combined digitalization and sustainability together to build a resilient dry port and logistics hub able to face the new challenges in multimodal sector. For this reason, the Port Authority managing the Verona freight village improved the digital collaboration with all the logistics actors, strengthening the interoperability between their IT systems and those of the others public and private administrations.

The pilot action allowed to eliminate the errors caused by the manual data entry, through the automatic exchange of the train composition for trains between the Port of La Spezia and the Verona freight village, automatically generating digital document for inbound trains.

Through the systems implemented, the Customs Corridor can be managed in an automated and full digital way, pursuing criteria of interoperability between the actors, digitalization and standardization of flows, security of information and procedures, full visibility and monitoring of processes.

From its monitoring dashboard, the Terminal manager can monitor in real time the status of its own customs temporary storage warehouse, through the indication of the remaining consignments, and an articulated series of information about the latter.

These results confirmed the importance to focus on ICT systems to allow the multimodal freight transport becoming more and more efficient in the next future.

3. Identification of the actions

3.1. Mapping the actions

The use of an ICT corridor between the players operating on the La Spezia - Verona railway section has ensured a more efficient and effective information exchange, and a greater added value to the intermodal corridor. The objective is to expand the exchange of information among the intermodal players to include the intermodal service nodes of the region and thus, in perspective, the main rail routes (traffic corridors).

The Freight Village Community System is the starting point of this strategy and its expansion with specific actions is the key to achieve the goals defined in the D.T1.3.3 "Strategy for fostering coordinated multimodal freight transport through ICT systems".

The action plan of the Verona Freight Village (that will be implemented in the next year to reach the key objectives) is summed up in the following tables:

ACTION/MEASURE	ESTIMATED COST	TIME HORIZON
Development of the Freight Village Community System	2.000.000 euros	2025
Digitalization of the last mile connection	500.000 euros	2024
Interoperability of the ICT systems of the players operating in the intermodal chain	550.000 euros	2025
Implementation of an OCR portal	600.000 euros	2025

3.2. Setting the actions

In this section, the actions included in the previous table are detailed with their main data:

Action no. 1: *Development of the Freight Village Community System*	
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	The action will start with the connection of the IT systems of the players operating in the multimodal chain. Then, a shared platform will be created with the aim to align the different systems of the operators. This platform is the Freight Village Community System (FVCS) that will provide an overview of the daily operations occurring in the node. The benefits produced by this implementation will be a reduction queues at the terminal gates, a significant decrease of the pollution and an overall enhancement of the coordination of the terminal operations.

Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	Non-disclosure agreement Platform design Tender Equipment purchase Testing Running phase
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	Verona freight village authority Shippers Road operators Warehousing companies Railway undertakings Shunting company Terminal managers
Timeline *Indicate the time horizon for the implementation of the action*	By 2025
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	2.000.000 €
Sources of financing[1] *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	Verona Freight Village Authority own funds and EU funds.
Impact of the initiative *Describe the expected future economic, social, environmental impacts of this initiative*	Speeding up of the terminal operations through the increase of the amount of information exchanged. Enhancement of the relationships among the intermodal operators and an overall optimization of the last mile connection. The first action will permit to achieve the goal n. 3, fostering the integration of the ICT systems of the different terminal operators.
KPIs *Please identify the KPI to be used for measuring the action's impact*	Average dwell time, number of annual traffic jams in the surrounding viability of the Verona RRT.

Action no. 2: - *Digitalization of the last mile connection*	
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	Currently, in the Verona Freight Village there are several daily operations that are carried out manually (for instance, the control of the documents at the terminal gates). Therefore, the digitalization of all the operations occurring in the Verona terminal is essential. In particular, there are a few procedures that must be digitalized: - the shunting documents that are exchange among the shunting operator, the railway undertakings and the terminal managers; - the last mile operations like the signaling procedures inside the Verona Freight Village area as well as the communication among the different IT platforms of the intermodal operators; - the interaction with the RFI system for a full visibility in real time of railway network.
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	Platform design Tender Equipment purchase Testing Running phase
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	Verona freight village authority Shippers Road operators Warehousing companies Railway undertakings Shunting company Terminal managers
Timeline *Indicate the time horizon for the implementation of the action*	By 2024
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	500.000 euros

Sources of financing[2] *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	Verona Freight Village Authority own funds, private funds and national and EU funds.
Impact of the initiative *Describe the expected future economic, social, environmental impacts of this initiative*	The action will accelerate the exchange of information among the actors of the chain, reducing the number of paper documents and the deriving mistakes occurring in the intermodal process. In fact, the digitalization will solve several administrative issues that currently represent a constrain for the growth of the intermodal traffics. In addition, a paperless system will foster the interoperability among the players, providing an enhanced visibility of the entire terminal process. The benefits will be a reduced number of heavy vehicles waiting outside the terminal gates with a consequent decrease of the pollution in the area as well as a diminish of the bureaucracy.

KPIs *Please identify the KPI to be used for measuring the action's impact*	**N**umber of heavy vehicles entering in the terminal per day, number of digital documents, number digital interactions among the IT systems of the intermodal players.

Action no. 3: *Interoperability of the ICT systems of the players operating in the intermodal chain*	
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	Zailog is involved in a pilot action of the FEDeRATED EU project to develop a Terminal Track and Trace system necessary to optimize the management of the terminal yard. The action no. 3 is focusing on the same topic of FEDeRATED that is to put in communication the different ICT systems of the players operating in the intermodal chain through the creation of an interoperable platform.
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	Platform design Tender Equipment purchase Testing Running phase
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	Verona freight village authority Shippers Road operators Warehousing companies Railway undertakings Shunting company Terminal managers
Timeline *Indicate the time horizon for the implementation of the action*	By 2025
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	550.000 euros

Sources of financing[3] *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	Verona Freight Village Authority own funds, private funds and national and EU funds.
Impact of the initiative	The activation of an interoperable platform aims to reduce the inefficiencies arising from a lacking exchange of information among the players. This action will permit to enhance the coordination of the daily terminal operations, generating time savings that can be used to increase the traffic volumes.

Describe the expected future economic, social, environmental impacts of this initiative	
KPIs *Please identify the KPI to be used for measuring the action's impact*	Number of accesses to the interoperable portal

Action no. 4: *Implementation of an OCR portal*	
Description of action/measure *Describe the action foreseen and the expected results from its implementation*	Currently, the detection of the damages on the loading units is carried out manually. This process is very demanding on resources. The activation of an OCR portal will permit to identify in advance the problems affecting the structure of the loading units, preventing their access in the terminal that could cause train departure delays.
Description of the main steps for its implementation *List and describe in detail the main steps for the implementation of the action (i.e. planning phase, tender procedures, etc…)*	Platform design Tender Equipment purchase Testing Running phase
Stakeholders involved *List the stakeholders involved. What is their role in the action? Will they be the direct beneficiaries?*	Verona freight village authority Shippers Road operators Warehousing companies Railway undertakings Shunting company Terminal managers
Timeline *Indicate the time horizon for the implementation of the action*	By 2025
Investment cost *How much will cost the construction/realization of the future initiative/action/technology?*	600.000 euros
Sources of financing[4] *What are the sources of financing? Private capital, public capital, CEF, etc...* *How much is the share covered by each of them?*	Verona Freight Village Authority own funds, private funds and national and EU funds.

Impact of the initiative *Describe the expected future economic, social, environmental impacts of this initiative*	The installation of an OCR portal at the terminal gates of the Verona freight village will permit to speed up the gate-in of heavy vehicles as well as to reduce the delays of departing trains. In fact, if a damaged loading unit is loaded on a train wagon, the train is stopped by the railway undertaking at the departure. This action often provokes an overall internal congestion of the terminal with negative effects on the daily activities (loss of time and money for the actors involved). The OCR portal will allow a prompt detection of the damages at the terminal gate, denying the access to the loading units with problems.
KPIs *Please identify the KPI to be used for measuring the action's impact*	Number of trains stopped at the departure, number of damages detected at the terminal gate

4. Conclusion

Over the years, the Board of Directors of the Verona freight village has modified the investment plan according to the needs of the market. In fact, in the last 20 years the globalization has deeply changed the habits of customers, strengthening the supply chains to ship goods anywhere in the world with a short delivery time. In addition, the last two years were hit hard by the COVID-19 pandemic that has further modified the purchasing activities of people, fostering the reshoring phenomena. This process was essential to place the production sites near to the warehouses, reducing the lack of raw materials caused both by the travelling restrictions and the collapse of many companies settled in the far east.

All these issues raised the awareness that it is essential to make important investments in the digitalization of logistics processes. In fact, the combination of the innovation technology and the logistics is the answer to the challenges of this dynamic market. For this reason, the Verona Freight Village Port Authority has to improve the digital collaboration with the actors operating in the intermodal chain with the aim to enhance the interoperability among the different IT systems. The pilot action developed in the COMODALCE project was concentrated on these aspects to demonstrate the importance of the data exchange in this challenging scenario. In this way, it was increased the flexibility of the process and it was reduced the lack of information to create a reactive system, ready to answer to the new challenges.

This action plan has described the importance of investments in digitalization, identifying the key aspects that must be pursued to improve the intermodal chain:

- integration of process
- digitalization of the time-consuming activities
- interoperability of the different IT systems
- reduction of technical errors
- sustainability

These points are the goals that must be achieved to reach a strong cooperation and data exchange level in the Verona Freight Village system, enhancing the coordination among the players operating in the area.
The results will be an increase both of intermodal traffics in the node and of the overall efficiency.