

Project MILEPORT

Cross-border baseline benchmarking study

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1. Territorial Analysis

1.1. General introduction

1.1.1. LP1 - Port Network Authority of the Eastern Adriatic Sea

Friuli-Venezia Giulia, an autonomous region in northeastern Italy governed by a special statute, spans 7,932 square kilometers and hosts approximately 1,218,000 residents. It borders Austria to the north, Slovenia to the east, and the Italian region of Veneto to the west. The region is geographically diverse, comprising alpine, hilly, flat, and coastal areas. Its municipalities vary significantly in size, and the population density stands at 150.3 inhabitants per square kilometer, below the national average of 194.8.

Economic forecasts predict GDP growth of 1.1 percent in 2023, following a 3.7 percent increase in 2022, with slower growth expected in subsequent years. The region's exports totaled 22.2 billion euros in 2022, a 21.9 percent increase from the previous year, with imports surpassing 12 billion euros, reflecting a 29.1 percent rise. The United States and Germany are key trading partners.

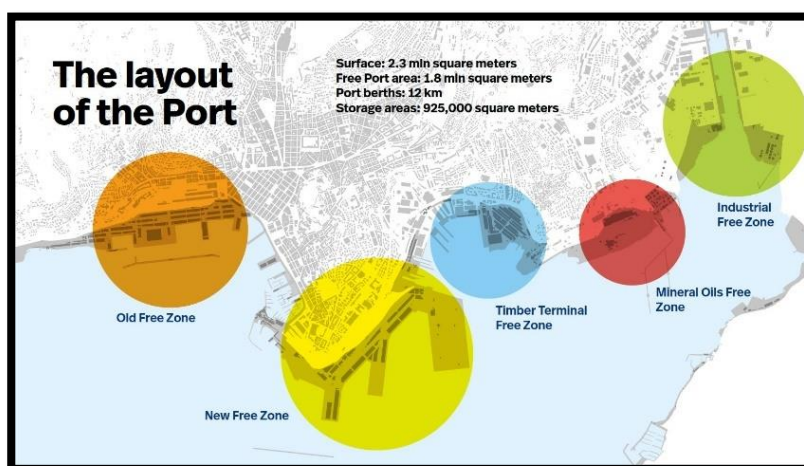
The logistic network includes three ports (Trieste, Monfalcone, and Porto Nogaro) and four intermodal terminals (Gorizia, Cervignano, Pordenone, and Trieste-Ferneti), positioning Friuli-Venezia Giulia as Agriculture is vital in Friuli-Venezia Giulia, with 16,400 farms utilizing 261,000 hectares of agricultural land, including over 20,000 hectares dedicated to organic farming. a pivotal intermodal logistics platform within Europe, bridging the Mediterranean and Central Europe.

Port of Trieste

The Port of Trieste, managed by the Port Network Authority of the Eastern Adriatic Sea, is the principal port, handling diverse traffic. It lies at the convergence of the Baltic-Adriatic and Mediterranean TEN-T core network corridors, making it a critical hub for trade with Central and Eastern Europe. The port supports over 200 trains weekly, connecting with various Central European destinations. Key advantages include a deep seabed (18 meters depth), availability of disused industrial sites for reconversion, high operating margins, multifunctionality, and strategic location. Challenges include insufficient parking areas and limitations within the internal and backbone railway network.



Figure 1 Layout Port of Trieste



The port operates across several distinct areas:

- Old Free Zone: Historical port area now owned by Trieste Municipality.
- New Free Zone: Core "new port" area with Ro-Ro and container terminals.
- Timber Terminal: Set for conversion into a mixed container & Ro-Ro terminal.
- Oil Free Zone: Handles mineral oils transported via pipelines to Central Europe.
- Industrial Free Zone: Managed by the Trieste Economic Development Agency.

A distinctive feature is its Free Port status, exempt from EU customs territory, governed by the Paris Peace Treaty (Annex VIII), affirmed by Italian regulations.



Port of Monfalcone

Located in the northernmost part of the Mediterranean Sea, Monfalcone overlooks the Gulf of Trieste. Its access channel is 4500 meters long and 11.70 meters deep. The Portorosega pier spans 1,460 meters with variable depths. Integrated into the Port Network Authority of the Eastern Adriatic Sea in 2018, Monfalcone handles goods like cellulose, paper, timber, steel products, kaolin, marble, cereals, and cars. It offers excellent road and railway logistics connections and wide availability of yards behind the docks but faces challenges like functional limitations of current structures, the need for maintenance and deepening of channels, and limitations within the railway network.

Railway connectivity to the Venice-Trieste and Tarvisio-Trieste lines is provided via a dedicated railway siding. Additionally, a supplementary railway ring has been constructed, allowing for the formation of trains within the port itself.

Figure 2 Port of Monfalcone

1.1.2. PP2 - North Adriatic Sea Port Authority - Ports of Venice and Chioggia

The North Adriatic Sea Port Authority (NASPA), managing the Ports of Venice and Chioggia, operates as an independent public body under Italian Port Law. NASPA's responsibilities encompass guiding, planning, promoting, and monitoring port activities, maintaining infrastructure, overseeing general interest services, managing the State Maritime Property, and planning port development. The authority generates an average annual revenue of up to €100 million from concession fees and port tariffs.

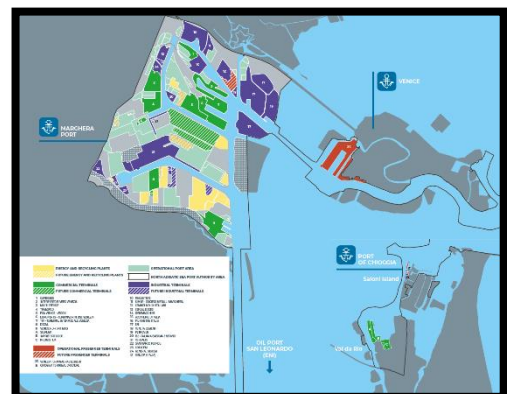
Situated at the northern end of the Adriatic Sea, the Port of Venice is strategically positioned at the crossroads of major European transport corridors and the Motorways of the Sea. It serves as a key gateway for trade flows between Europe and Asia, acting as the primary entry point to central European markets, including North-Eastern Italy, Austria, Bavaria, Eastern Europe, and several dynamic EU markets. The port is part of the Mediterranean Sea Corridor and the Baltic-Adriatic Corridor, providing a vital link between Central Europe, North Africa, and the Middle East.

The Port of Venice covers over 2,045 hectares, with more than 30 kilometers of quays and 163 berths distributed across 27 terminals, supporting commercial, industrial, and passenger traffic. The port is divided into two main areas:

- **Porto Marghera:** Focused on logistics, commercial, and industrial activities.
- **Venice Area:** Primarily for passenger activities, including cruise ships, hydrofoils, and yachts.

Porto Marghera boasts 1,447 hectares of operational areas and 662 hectares of canals, basins, roadways, and railways. It features 12 kilometers of active quays, 40 kilometers of road connections, 135 kilometers of railway tracks, and 7 kilometers of optical fiber.

The Port of Chioggia, located between the islands of Pellestrina and Sottomarina, is Italy's main fishing port and excels in bulk cargo, exceptional loads, and



passenger traffic. Chioggia has a single port entrance with a width of 550 meters and a navigable depth of 8 meters. The port employs approximately 322 companies, contributing to a total of 21,175 employees when combined with Venice.

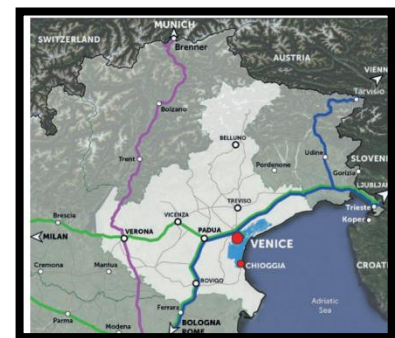
Road accessibility: The Port of Venice is accessible 24/7 and connected to the national railway and highway networks. Key access routes include SR.11, SS.309-E55, A4-E70, and A27. The North Adriatic Sea Port Authority continuously works to improve road accessibility, alleviating heavy vehicle traffic on local roads and enhancing safety.



Nautical accessibility: The Port of Venice has two sea entrances (Malamocco and Lido), while the Chioggia port entrance serves Isola Saloni and Val da Rio. Venice's sections of San Leonardo, Fusina, and Marghera handle merchant ships, while San Basilio, S. Marta, and Marittima cater to passenger traffic.

The ports offer robust intermodal connections, including:

- **Motorways of the Sea:** Daily connections with Greece and weekly connections with Mediterranean destinations.
- **Rail-road connections:** Fast connections with Europe, large yards, covered warehouses, and container trailer services.
- **River-sea connections:** Links to Mantua and Cremona, class V barges for bulk freight and containers, and connected freight villages.



ZLS Porto Marghera-Rodigno

Established under Italy's Ministerial Decree DPCM of October 2022, the simplified Logistics Zone (ZLS) Porto Marghera-Rodigno enhances the competitiveness of the Veneto Port System with tax credits and regulatory simplifications, benefiting the entire region.



1.1.3. PP3 - Port of Ravenna Authority

The Port of Ravenna, the principal maritime port in the Emilia-Romagna region, is strategically located on the Central-North Western side of the Adriatic Sea, benefiting from its position in one of Italy's most economically dynamic regions. Unlike other Italian ports, it is not fully integrated into the urban landscape, allowing for expansive infrastructural and economic development.

Over time, the Port of Ravenna has evolved from primarily industrial activities to a focus on commercial operations, advancing significantly in shipbuilding and solid bulk transport. Today, it ranks among Italy's largest ports for handling solid bulk, playing a critical role in importing raw materials for industries such as ceramics, cereals, fertilizers, and flour. It also serves as a significant hub for general cargo, particularly metallurgical products like coils. The primary traffic basin for the port includes the Eastern Mediterranean Sea and the Black Sea, where it leads in container traffic. The port also supports RO-RO cabotage services connecting Puglia and Sicily and has been designated a "Core port" within the TEN-T Networks by the European Commission.

The Port of Ravenna spans the entire state-owned area along the Candiano Canal, which links the inland town to the sea. The canal, 14 kilometers long with a current maximum depth of 11.5 meters, is undergoing projects to deepen it to 12.5 meters and eventually 14.5 meters. The canal hosts 14.5 kilometers of docks and operational quays, utilized by 27 terminal operators. The port covers a total area of 21 square kilometers, offering over 600,000 square meters of warehouse storage and 1.3 million cubic meters of storage tanks, with port yards spanning 1.35 million square meters.

The terminals in the Port of Ravenna are distributed as follows:

- 54.55% are located on the left side (North) of the Candiano Canal.
- 31.82% are on the right side (South) of the Candiano Canal.
- 13.64% are situated along the Piomboni Canal.

In terms of the total volume of goods, the distribution is nearly even:

- 49.65% of goods are managed by terminals on the left side of the Candiano Canal.
- 50.35% of goods are handled by terminals on the right side of the Candiano Canal.



Truck traffic distribution is also balanced:

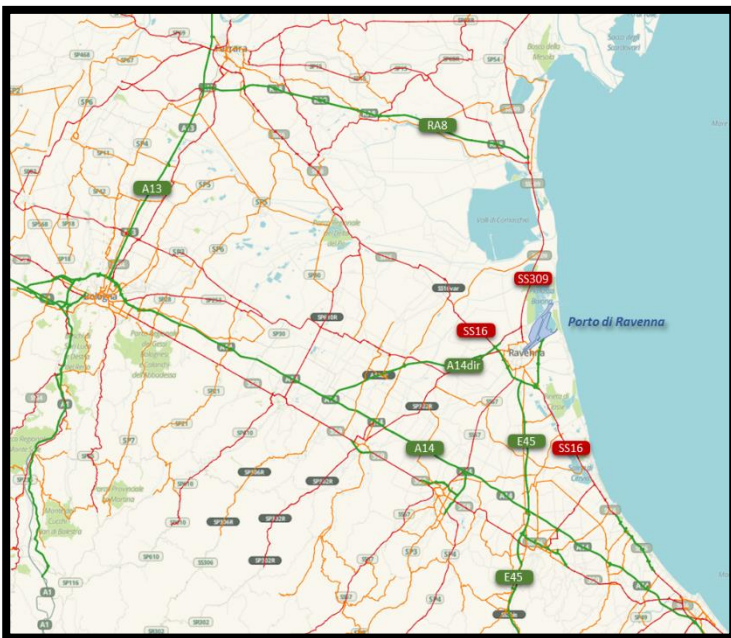
- 48.87% of truck traffic occurs on the left side of the Candiano Canal.
- 51.13% is on the right side of the Candiano Canal (including the Piomboni Canal).

Regarding rail transport:

- 54.87% of the goods transported by rail are on the left side of the Candiano Canal.
- 45.13% are on the right side of the Candiano Canal (including the Piomboni Canal).

The Port of Ravenna is well-integrated into regional and national road networks via the Ravenna ring road, composed of parts of several national highways: SS16 Classicana, SS309 Romea, and SS67, linking the port to the A14dir and E45 motorways. The primary connection roads are Baiona Street on the north side of the canal and the SS67 Romea on the south side, facilitating access to the broader regional and national intercity road networks.

Figure 3 The port of Ravenna and the national road network (Source: Port of Ravenna Authority)



The final stretch of road connectivity from the Port of Ravenna to the national road network is provided by Baiona Street and the final section of the SS67 Romea road. Baiona Street, located on the north side of the canal, is a two-lane carriageway, while the SS67 Romea on the south side features two carriageways, each with two lanes. Both roads directly connect to the urban ring road, facilitating access to the broader regional and national intercity road networks.



Figure 4 The port of Ravenna and the local road network
(Source: Port of Ravenna Authority)



For the northern part of the port, Via Baiona is the primary connection road, serving both commercial traffic and the flow of citizens and tourists heading to seaside villages. Conversely, the southern part of the port is accessed via Classicana and Via Trieste. Typically, vehicles reach Ravenna through the A14 motorway or Via Romea (SS309). A significant challenge for the port's accessibility is

that each side is connected to the town and national road network by a single route, posing risks of bottlenecks, congestion, and potential blockage in the event of an accident.

Figure 5 Territorial road network



Traffic distribution:

- **Via Baiona:** Serves 52.6% of the terminals.
- **Via Classicana:** Serves 47.4%.
- **SS 209 Romea Nord and Via Canale Magni:** Utilized by 10.5% of the terminals.
- **SS309 Romea Sud:** Utilized by 5.3%.

An estimated daily average of approximately 4,500 people works in the

port area. In terms of vehicle traffic, 47.62% of the terminals report between 5,000 and 50,000 vehicles entering or exiting, 38.10% report more than 50,000 vehicles, and 14.29% report fewer than 5,000 vehicles. The annual total vehicle traffic for the port area is about 750,000 vehicles. It is estimated that 50% of the vehicles are directed to the northern part of the port, 33.33% to the southern part, and the remaining 14.29% to the Piombone canal.



1.1.4. PP4 - Central Adriatic Ports Authority

Figure 6 Layout of Ancona and its port



The Port of Ancona is strategically situated in the middle of the Italian Adriatic coast within the Gulf of Ancona, nestled between the hills of Monte Conero, Monte Astagno, and Monte Guasco. This natural position has historically made it a significant point of reference and a safe haven for sailors since Roman times. The city is the main economic and demographic hub of the Marche Region, characterized by a hilly landscape, numerous valleys, and various beaches. It is classified as a medium-high seismicity zone by the Italian civil defence.

In terms of connectivity, Ancona is well-integrated with the main Italian metropolitan areas, particularly the Adriatic ports such as Trieste, Venice, Ravenna, and Bari. The following table outlines the distances between Ancona and these key cities:

Table 1 Distance between Ancona area and the main Italian metropolitan areas

DISTANCE FROM ANCONA	DISTANCE (in a straight line)	DISTANCE (BY ROAD)	DISTANCE (MARITIME)
ROMA	206 km	300 km	/
MILANO	400 km	428 km	/
TORINO	491 km	545 km	/
FIRENZE	183 km	321 km	/
NAPOLI	311 km	417 km	700 NM
VENEZIA	225 km	362 km	125 NM
TRIESTE	230 km	509 km	128 NM
RAVENNA	138 km	163 km	71 NM



DISTANCE FROM ANCONA	DISTANCE (in a straight line)	DISTANCE (BY ROAD)	DISTANCE (MARITIME)
BARI	390 km	461 km	209 NM
GIOIA TAURO	609 km	845 km	519 NM
GENOVA	376 km	506 km	1010 NM

Figure 7 Railway network of Marche Region

The port of Ancona is directly connected to the A14 highway, with the port linked via the national road SS16. It is also part of the national railway network through the Adriatic railway line, with the central station conveniently located near the port along Via Flaminia. The area is served by the Ancona-Falconara airport, connected to the city by bus and airbus services, and linked to the railway network via the Castelferretti-

Falconara Aeroporto station. Road access to the airport is provided by the A14 highway via State Road 76.

As a key terminal for the motorways of the sea in the Adriatic-Ionian basin, the Port of Ancona serves as the northern terminal of the SCANMED corridor in the Adriatic Sea. Regulation 1153/2021 recognizes it as a core node of the Baltic Adriatic corridor, as supported by the Italian Government. The port's current markets focus on passenger and cargo transport, making it a primary logistic hub on the central Adriatic coast and one of Italy's leading ports for international passenger traffic by ferries. The main market segments include Ro-Ro traffic, involving substantial truck and Ro-Ro freight flows, with significant cargo and container traffic to and from ports like Trieste, Gioia Tauro, and Piraeus, and international routes to Igoumenitsa, Patras, Split, Zadar, and Durres.

In summary, the Port of Ancona's current markets mainly include:



- Passenger traffic (ferry and cruise)
- Freight traffic (bulk, general cargo, container)
- Fishing
- Shipbuilding
- Pleasure boating

Figure 8 Layout of the port of Ancona



The port also handles substantial freight traffic to its hinterland, notably the Marche region and central Italy, including areas such as Abruzzo, Umbria, and Romagna. Covering 1.4 million square meters, the port infrastructure includes passenger

and ferry terminals, container and general cargo facilities, with 26 quays for various traffic types. These facilities have an average draft of around 11.80 meters, accommodating ships up to 275 meters in length.

The Port of Ancona features a diverse range of quays tailored to specific maritime activities. RO-PAX facilities include the Wojtyla Pier (Quays 8 and 9) and the Santa Maria Pier (Quays 11, 12, and 13), with lengths ranging from 80 to 150 meters and depths of 8.5 to 10.5 meters. The Repubblica Pier (Quay 14) and XXIX Settembre Pier (Quays 15 and 16) offer additional RO-PAX capacities.

For general cargo, the Sud Pier (Quays 18 to 22) and Darsena Marche (Quays 23 to 29) accommodate lengths of 80 to 320 meters and depths of 8.5 to 14 meters. Service quays include the Lanterna Pier (90 meters, 4 meters deep) and Rizzo Pier (Quay 3, 120 meters, 10 meters deep). The Primiano Pier (Quays 5 and 6), Guasco Pier (Quay 7), Nazario Sauro Pier (Quay 10), and Da Chio Pier (Quay 17) also support various port operations.

Fishing activities are centered at Mandracchio, which spans 1,000 meters with depths of 2 to 4 meters. Historical areas like Molo Clementino and Molo Rizzo serve additional port functions.



This comprehensive layout enables the Port of Ancona to handle a wide range of maritime activities, reinforcing its status as a crucial hub in the Adriatic region.



1.1.5. PP5 - Southern Adriatic Sea Port Authority (Ports of Bari, Brindisi, Manfredonia, Barletta and Monopoli)

The Southern Adriatic Sea Port Authority oversees the ports of Bari, Brindisi, Manfredonia, Barletta, Monopoli, and Termoli, playing a crucial role in Apulia, a region in Southern Italy. Covering 19,345 square kilometers and home to about four million people, Apulia is bordered by the Adriatic and Ionian Seas. The region features 865 km of coastline, 53% flat terrain, 45% hilly areas, and only 2% mountainous regions. This geography supports a vibrant agri-food sector, producing numerous DOP and IGP products, enriched by various Slow Food presidia and historic rural landscapes. The region is also notable for its massive infrastructure system that serves the movement of goods and passengers, including six major ports, four civilian airports, and three military airports.

Over the past decade, global political, economic, and infrastructural changes have transformed the shipping and port system, enhancing the strategic importance of ports like those managed by the Southern Adriatic Ports Authority. The doubling of the Suez and Panama Canals has bolstered maritime traffic, reinforcing the Mediterranean Sea's centrality in global shipping. Additionally, the emergence of 18/20,000 TEU vessels exemplifies "naval gigantism," significantly increasing cargo capacities. These developments, along with favorable conditions for maritime traffic, have made Southern Italy a key player in global transport chains, with the region exceeding the national average in maritime traffic, which constitutes 60% of the entire transport chain.

The Southern Adriatic Ports Authority generates substantial throughput from various fees and tariffs, managing a six-port infrastructure with 60 quays spanning approximately 12 km, all connected to rail and road networks and served by two major international airports. This robust infrastructure supports the diverse and significant movement of goods, including solid and liquid bulk, general cargo, and passenger traffic. The ports under this authority are crucial for regional development and international trade, serving as gateways for imports and exports, connecting Europe to the Balkan Peninsula, the Middle East, and beyond.



The Port of Bari

Figure 9 View of the port of Bari.



The Port of Bari, established around 150 years ago, functions as a multipurpose port with five docks and 27 berths totalling 5,750 meters in length and depths up to 13 meters. It includes operational yards, warehouses, a modern terminal for cruises and ferries, and a maritime station. Current expansions aim to increase dock lengths and depths, enhancing storage and parking capacities. The port, historically a gateway to the Balkan Peninsula and the Middle East, handles diverse traffic types, including conventional goods, Ro-Ro,

cars, steel products, and passengers. The port's strategic location and extensive facilities make it a critical hub for regional and international trade.

The port of Brindisi

Figure 10 Identification of macro functional areas of the Port of Brindisi on an orthophoto map basis



Brindisi, another key port, serves as a natural "gate" for relations with Greece, the Balkans, Turkey, and the eastern Mediterranean. Its three-part composition includes the Inner, Medium, and Outer Ports, each serving military, recreational, commercial, and industrial functions. The Inner Port, with a surface of 750,000 square meters, primarily serves military and recreational functions, including cruise activities. The Medium Port,

with a surface of 1,250,000 square meters, mainly serves commercial functions. The Outer Port, encompassing 3,000,000 square meters, primarily supports industrial activities. The port features 27 berths with a total length of 11,278 meters and depths up to 12.5 meters, making it well-equipped to handle various types of cargo and passenger traffic.



The ports of Barletta, Manfredonia, Monopoli and Termoli

Barletta

Figure 11 View of the port of Barletta



The Port of Barletta, classified as a second-category, first-class port, specializes in trading a wide variety of goods, including solid bulk, chemicals, and liquid products. It features an artificial basin with piers and arms capable of accommodating boats up to 165 meters in length. The port's strategic location and facilities make it a significant point for commercial interchange, supporting the region's industrial activities.

Manfredonia

Figure 12 View of the port of Manfredonia



Manfredonia consists of the Commercial Port (Porto Vecchio) and the Alti Fondali Basin (Port Island). The Commercial Port includes structures for commercial traffic, fishing boats, and service vessels, while the Alti Fondali Basin is adjacent to the vast Industrial Development Area (ASI) of Manfredonia. The port's diverse facilities support various maritime activities, making it a crucial hub for regional development.



Monopoli**Figure 13 View of the port of Monopoli**

Monopoli features a port basin with four inlets or coves, protected by breakwaters against strong storms. The port serves various maritime activities, including fishing, commercial traffic, and recreational boating, contributing to the region's economic development.

Termoli**Figure 14 View of the port of Termoli**

Termoli, which joined the Southern Adriatic Ports Authority in 2022, serves as a passenger, fishing, and tourist port. It features three piers and strategic accessibility via major road and railway networks. The port plays a vital role in regional connectivity and economic activities, supporting passenger and freight traffic.

The Southern Adriatic Sea Port Authority's ports are critical to Apulia's and Southern Italy's economic infrastructure, supporting significant maritime and intermodal freight flows, passenger traffic, and regional development. The ongoing and planned infrastructural improvements will further enhance their capabilities and contributions to regional and international trade. These ports serve as vital gateways, facilitating the movement of goods and people, and driving economic growth and development in the region.



1.1.6. PP6 - Port of Rijeka Authority

The Port of Rijeka Authority is responsible for the port of Rijeka, which is a development-oriented port with port basins specialized in types of cargo. The port includes a number of port basins: Rijeka, Sušak, Bakar and Omišalj (island of Krk) and Raša in Istria, which makes it the largest and most important national port.

Port of Rijeka belongs to the Mediterranean transport corridor, an important transport route connecting the port of Rijeka with the European rail and road network. Equally important is Corridor X connecting to Zagreb by connecting Austria (Salzburg and Graz) to the port of Rijeka. Along with road and rail connections, oil pipeline is important, which enables connecting refinery capacities in Croatia, Hungary, Austria, Bosnia and Herzegovina, Serbia, Czech Republic and Slovakia. The international airport is located near Rijeka, on the island of Krk.

Port of Rijeka is connected to the Trans-European Road Network (TEN-T) by road and rail infrastructure which is part of the Mediterranean Corridor of the TEN-T Basic transport network. This corridor connects the south of the Iberian Peninsula, passes through the Spanish and French Mediterranean coast through the Alps in northern Italy, then enters Slovenia and goes further, towards the Hungarian-Ukrainian border. An integral part of the Mediterranean Corridor is the route Rijeka-Zagreb-Budapest (rail and road). Port of Rijeka j.s.c. is one of a key port on the Mediterranean Corridor (TEN-T Core ports), and in order to improve the infrastructure of the port area, the Port of Rijeka Authority used CEF (Connecting Europe Facility) funds to modernize railway infrastructure and build new intermodal capacities in the port of Rijeka, reconstruction of the port for general cargo and implementation of the Port Community system information system. Ultimately, the main goal is to develop the port of Rijeka into one of the important transit ports in the northern Adriatic for European markets. Its ongoing connection to the Baltic-Adriatic TEN-T network corridor will also contribute to this.

As the port of Rijeka is part of the northern Adriatic port cluster (Rijeka, Koper, Trieste, Venezia, Ravenna, Monfalcone and Chioggia), its gravitational area is represented by Italy, Switzerland, Germany, Austria, Croatia, Slovenia, Bosnia and Herzegovina, Serbia, Hungary, Slovakia, Czech Republic and Poland.

Also, the "Rajna-Majna-Dunav" Canal, which is the largest European inland waterway, passes through the gravitational area. For traffic passing through the Suez Canal, the northern Adriatic route has a significant advantage over the North Sea (e.g. ships heading in the direction of Europe travel shorter by 2,000 Nm).



Current state of port infrastructure and superstructure

Maritime passenger terminal

The maritime passenger terminal at Rijeka breakwater has undergone significant improvements to enhance passenger services for both domestic and international maritime traffic. The project included the demolition of outdated infrastructure, construction of a new road bridge, and the establishment of a new maritime passenger terminal building. Additionally, a 260-meter pedestrian area was developed, a 200-meter coastal wall was reconstructed, and a floating ramp for vehicle loading/unloading was installed. The terminal is now equipped with modern water, sewage, and electrical networks, enhancing its operational efficiency.¹



Zagreb Deep Sea Container Terminal

Declared a strategic project by the Croatian government, the Zagreb Deep Sea Container Terminal is the largest capital project of the Port Authority of Rijeka. The terminal's first phase was completed under the Rijeka Traffic Route Renewal Project, financed by the World Bank. Completed in May 2019, the terminal is now connected to the Croatian highway network and TEN-T corridors via the new state road D-403. The terminal's concession, awarded to the APM TERMINALS / ENNA LOGIC consortium, is set for 50 years, with an estimated value of over 20 billion HRK. This development ensures the terminal's integration into European transport networks, enhancing its strategic importance.



¹ <https://www.portauthority.hr/pomorsko-putnicki-terminal/>



Adriatic Gate Container Terminal

The Adriatic Gate Container Terminal, operational since 1977, has seen substantial upgrades, including the addition of a new berth and expanded storage areas. With a minimum sea depth of 14.2 meters, it accommodates container ships up to 370 meters in length and has a capacity of 600,000 TEUs. Recent investments, including those funded by the Connecting Europe Facility (CEF), aim to enhance the terminal's intermodal capabilities and increase rail transport's share in container traffic.



The terminal, managed by Adriatic Gate d.d., offers a range of services, including container transshipment, storage, and additional logistics support. The Adriatic Gate Container Terminal, operational since 1977, has seen substantial upgrades, including the addition of a new berth and expanded storage areas. With a minimum sea depth of 14.2 meters, it accommodates container ships up to 370 meters in length and has a capacity of 600,000 TEUs. Recent investments, including those funded by the Connecting Europe Facility (CEF), aim to enhance the terminal's intermodal capabilities and increase rail transport's share in container traffic. The terminal, managed by Adriatic Gate d.d., offers a range of services, including container transshipment, storage, and additional logistics support.²

Liquid Cargo Terminal

Located in Omišalj Bay, the Liquid Cargo Terminal is part of the JANAF system, designed for international oil transport. It features a pipeline capacity of 34 million tonnes per year and storage facilities for oil and petroleum products. The terminal can accommodate tankers up to 350,000 DWT, with high loading and unloading capacities. Managed by Janaf d.d., this terminal plays a crucial role in regional energy logistics.³



² <https://www.portauthority.hr/kontejnerski-terminal-jadranska-vrata/>

³ <https://www.portauthority.hr/terminal-za-tekuci-teret/>



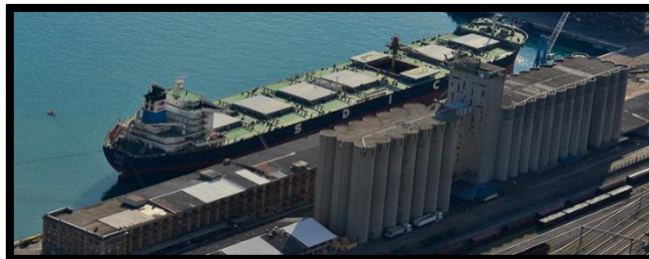
Bulk Cargo Terminal

Situated in the Bay of Bakar, the Bulk Cargo Terminal is equipped for transshipment and storage of iron ore, coal, and other bulk materials. With an operational coastline of 18 meters depth, it can handle vessels up to 150,000 DWT and has an annual capacity of 4 million tonnes. The terminal is operated by Luka Rijeka d.d.⁴



Grain Terminal

The Grain Terminal, located in the Rijeka Basin, handles wheat, soybeans, and other cereals. It features facilities for drying, aeration, weighing, and disinsection, with a quay depth accommodating ships up to 60,000 DWT. The terminal is managed by Luka Rijeka d.d.⁵



Bršica General Cargo, Livestock and Wood Terminal

The Bršica Terminal specializes in general cargo, wood, and livestock. It offers moorings for ships and stables for 1,000 cattle, ensuring smooth transitions for live animals. The terminal, under constant veterinary supervision, has a sea depth of 7 meters and storage capacity of 510,000 m². It is operated by Luka Rijeka d.d., Exportdrvo d.d., and Šerif export-import d.o.o.



⁴ <https://www.portauthority.hr/terminal-za-rasute-terete/>

⁵ <https://www.portauthority.hr/terminal-za-zitarice/>



Bakar Goranin Ro-Ro Terminal

Under the Rijeka Port Authority since 2007, the Bakar Goranin Ro-Ro Terminal was integrated into the port area following government amendments. It includes part of the plateau of the former Coke Plant, now managed as maritime property by the Rijeka Port Authority.⁶



General Cargo Terminal

Located in Rijeka's old port core, the General Cargo Terminal has 11 berths and various cranes, allowing it to handle ships up to 30,000 DWT. It includes facilities for transshipping general cargo, paper, wood, metallurgical products, hazardous cargo, and refrigerated goods. The terminal is managed by Luka Rijeka d.d. under a concession.



The Port of Rijeka is advancing through digital transformation, enhancing efficiency with advanced vehicle booking and port community systems that streamline data flow and coordination. Committed to sustainability, the port integrates renewable energy and emission-reducing technologies, meeting international environmental standards. Robust collaborations with governmental bodies, private entities, and international organizations facilitate the sharing of best practices. Active participation in projects like MILEPORT allows the port to influence maritime policies and promote innovative solutions. These strategic initiatives position the Port of Rijeka as a leading maritime hub, ready to meet future logistical challenges with a focus on efficiency, sustainability, and collaborative development.

⁶ <https://www.portauthority.hr/ro-ro-terminal-bakar-goranin/>



1.1.7. PP7 - Port of Zadar Authority

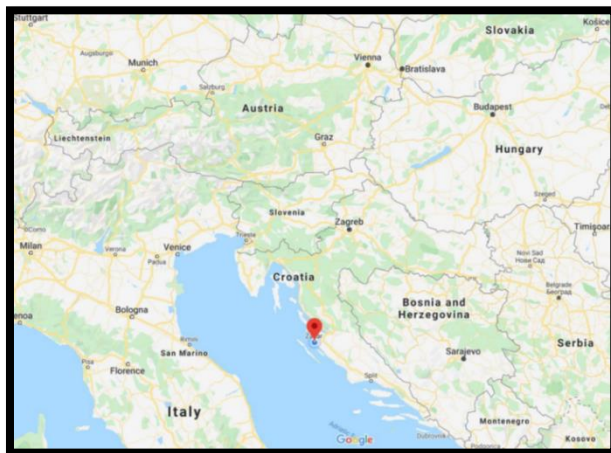
Zadar County is a region in Croatia encompassing northern Dalmatia and southeastern Lika, with its administrative center in the city of Zadar. The county covers an area of 7,854 square kilometers, including 3,646 square kilometers of land, accounting for 6.4% of Croatia's territory. The sea area is 3,632 square kilometers (around 12% of Croatia's territorial waters), and the insular area includes 580 square kilometers, with more than 300 islands making up the Zadar Archipelago. The coastline, including the islands, extends 1,300 kilometers.

Major towns in Zadar County include Zadar, Benkovac, Bibinje, Biograd, Nin, Obrovac, and Pag. The county comprises several significant islands such as Dugi Otok, Ugljan, Pašman, Molat, Lavdara, Zverinac, Vir, and most of Pag, along with numerous smaller islands.

Port of Zadar

The Port of Zadar is centrally located in Zadar city, serving primarily smaller passenger ships. A new passenger terminal was officially opened on April 24, 2019, at Zadar Cruise Port - Terminal Gaženica, which operates five piers close to the Old Town Zadar. The port can accommodate the world's largest cruise ships, with dedicated piers for regional ferry and ro-ro lines.

The exact location is 44°05'23.4"N 15°16'04.4"E.



Key road distances from Zadar include:

- Zagreb: 286 km
- Belgrade: 675 km
- Budapest: 627 km
- Vienna: 639 km
- Sarajevo: 366 km
- Munich: 740 km



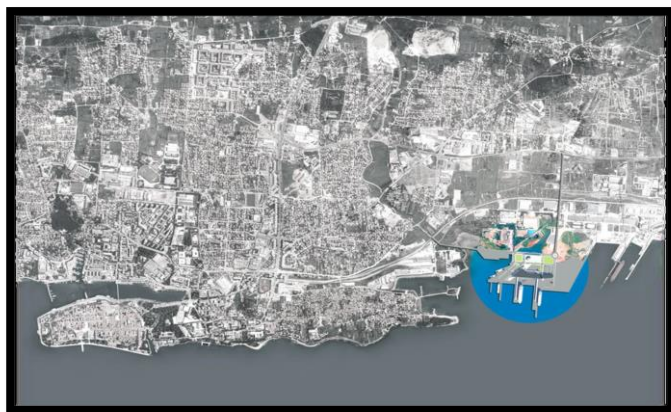
Port and maritime transport and connections

Croatia's central position is pivotal for linking Western and Southeastern Europe, facilitating connections between Central Europe and the Adriatic and Mediterranean seas. Zadar has direct access to the highway network via a 17 km expressway from the Zadar 2 (A1 highway) access point directly to the Port of Gaženica. Rail connections include links via Knin to the main Zagreb-Split line, with significant future investments planned for Croatian railways. Zadar Airport, located just 5 km from the Port of Gaženica, has seen substantial investment, with passenger numbers increasing dramatically from 65,000 in 2006 to over 1.1 million in 2022.

The Zadar Port Authority manages several ports, including the passenger ports of Zadar and Gaženica, the cargo port of Gaženica, and the fishing port of Vela Lamjana. The New Port of Gaženica, opened in phases from 2015 and fully operational by 2018, includes a 24,000 square meter terminal building and 12 berths for both domestic and international traffic. This modern facility supports ferry and cruise ship operations, significantly increasing port capacity and enabling the accommodation of larger vessels.

Passenger port

Figure 15 New Passenger Port of Gaženica, Zadar – 12 berths, 3000m length, 3km distance to city centre



The berths at Gaženica are designated for specific purposes:

- Berths 1-7: Domestic passenger ships
- Berths 8-12: International passenger ships, with berths 8 and 9 for liner international shipping
- Northern port area: Fishing boats loading and unloading (210m length)
- Gas station: Refueling of vehicles and vessels



Draft depths in the new ferry port range from 6 meters at the island terminal up to 13 meters at the cruiser berths of the international terminal. Ferries on both domestic and international lines arrive at the New Port of Gaženica, while high-speed shipping lines are directed to the City Port Zadar.

Cargo port - capacity

The cargo port spans 250,000 square meters, with 150,000 square meters of open storage and 30,600 square meters of closed warehouses. Liquid cargo storage tanks have a capacity of 75,000 cubic meters. The port includes 4,631 meters of railway tracks and 34,000 square meters of roads. Equipment includes harbor mobile cranes (20-ton capacity), mobile cranes (32t, 40t, and 50t), and a Liebherr LHM420 crane (124-ton capacity).



Specific Berth Details

- **Berth 1:** Ships up to 190m, oil and petrol cargo, depth 10.3-12m, fuel tanks 75,000m³.
- **Berth 2:** Mooring for tugs, maintenance vessels, total quay length 180m, depth 4.8-7.1m, storage area 20,000m².
- **Berth 3:** Dry bulk carriers, soybeans, wheat, total quay length 140m, depth 12m, capacity 80,000 tons, conveyor belt system 150t/h.
- **Berth 4:** General cargo, total quay length 135m, depths 7-11.4m.
- **Berth 5:** General and specialized cargo, total quay length 160m, depth 5.5-8.7m, storage 150,000m², warehouses 30,600m².
- **Berth 6:** General and specialized cargo, total quay length 150m, depth 8.7-10.2m, RO-RO ramp 24m.

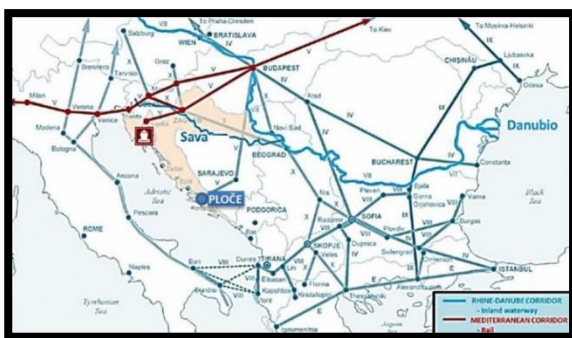
The Port of Zadar, through its modern infrastructure and strategic initiatives, plays a crucial role in enhancing regional maritime connectivity, supporting both passenger and cargo traffic effectively.



1.1.1.8. PP8 - Port of Ploče Authority

The Port of Ploče, as outlined in the Maritime Development Strategy and Integral Maritime Policy of the Republic of Croatia (2014-2020), is recognized as one of the nation's six principal ports of international economic importance. It ranks as the second most critical cargo port after the Port of Rijeka. While located in Croatia, the port significantly influences the economy of Bosnia and Herzegovina, handling approximately 90% transit traffic. It serves as the main maritime access point for Bosnia and Herzegovina and acts as the terminal for the Pan-European Corridor Vc within the TEN-T Comprehensive Network. The full development of Corridor Vc will enable the port to expand its services further into Western and Central Europe, notably Hungary.

Figure 16 Geographic location and connectivity of the Port of Ploče



The Territorial Analysis of the Port of Ploče examines its geographical, infrastructural, and organizational dimensions, providing insights into its operational and strategic strengths. This analysis is vital for understanding the port's interaction with its environment, the regional economy, and its role in broader European and global transport networks. With initiatives like the

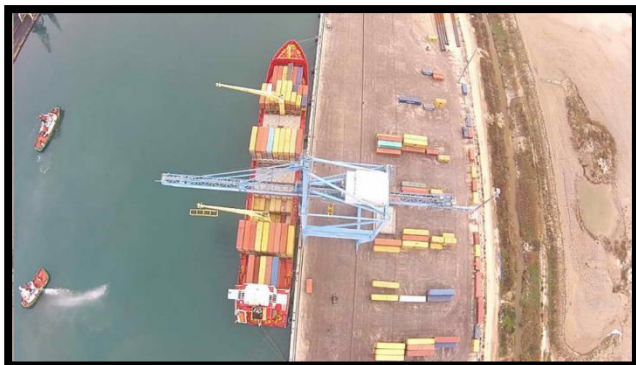
MILEPORT project, the analysis identifies key areas for development and collaboration to enhance multimodal transport efficiency and integrate sustainable practices. The port's strategy focuses on meeting Bosnia and Herzegovina's economic needs while expanding its services to Central Europe through modern inland infrastructure.

The Port of Ploče is situated on the eastern Adriatic coast (coordinates 43° 03' N, 17°26' E), 25 km from Bosnia and Herzegovina, and serves as a key connection for Serbia-Montenegro, Hungary, and other Central European nations. Its bay, protected by the Pelješac peninsula, forms a natural breakwater. The port is directly connected to Bosnia and Herzegovina, northeastern Croatia, and further to Central Europe via railway and the E-73 road. This route is set to become a crucial part of the Fifth Pan-European Corridor, enhancing connectivity between Venice, Trieste, Budapest, Uzhgorod, and Lvov, and forming a vital link in the TEM/TER project connecting the Baltic to the Adriatic.



Current state of port infrastructure and superstructure

Figure 17 Container Terminal



Completed in 2010 with an investment of 38.5 million euros, this terminal includes a 280-meter-long quay, Ro-Ro ramp, and a 60,000 TEU annual storage capacity. Future expansions aim to increase capacity to 500,000 TEU.

Figure 18 Bulk Terminal



With a construction investment exceeding HRK 400 million, the terminal aims to handle over 6 million tons annually, enhancing transshipment technology and environmental standards. The first phase includes a 317.5-meter-long pier, accommodating ships up to 180,000 dwt.

Figure 19 Liquid cargo terminal



Operated by Adriatic Tank Terminals Ltd., it has a total storage capacity of 35,000 m³, with plans to expand to 250,000 m³ by 2023.



A modern complex built to enhance port competitiveness, it integrates advanced IT systems for optimized business processes and centralizes key entities like customs and police. The construction cost exceeded HRK 85 million.

Figure 20 Entrance terminal, Inbound terminal



Aligned with Croatia's National Plan for Port Development, the Port of Ploče is committed to becoming a 'green' port. It adheres to port environmental management standards (PERS) and the Quality Management System certified by ESPO. Initiatives include incentivizing low-sulfur emissions, preparing for low-sulfur areas in the Adriatic by 2020, exploring clean fuel storage (potentially LNG), and transitioning from road to rail transport. Feasibility studies on "Cold Ironing" technology and clean energy solutions are underway. Comprehensive environmental impact studies and management plans ensure environmentally friendly operations with rigorous monitoring and measures in place.

Through these strategic and infrastructural developments, the Port of Ploče is poised to enhance its role as a critical node in European and global transport networks, supporting economic growth and sustainability in the region.



1.2. Supply and demand analysis

1.2.1. LP1 - Port Network Authority of the Eastern Adriatic Sea

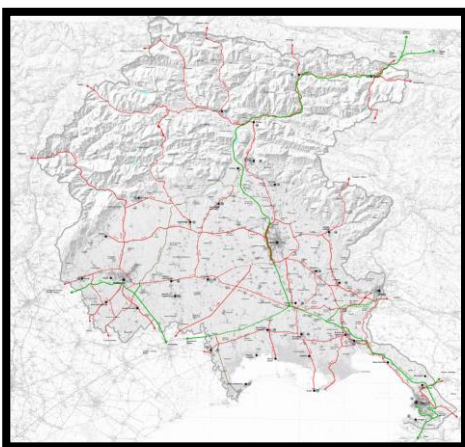
The Port Network Authority of the Eastern Adriatic Sea encompasses the region of Friuli-Venezia Giulia, which is strategically located along two core TEN-T network corridors: the Mediterranean Corridor and the Baltic-Adriatic Corridor. Despite its small size, the region hosts three ports and four intermodal terminals, making it a vital logistics hub.

Regional road networks

The regional road network includes motorways and main ordinary roads. The motorways are managed by different entities:

1. ANAS S.p.A. manages:
 - RA13 Lisert - Cattinara link with RA14 Opicina - Ferneti branch in Trieste.
2. Autovie Venete S.p.A. manages:
 - A4 Mestre – Lisert
 - A23 Palmanova – Udine
 - RA17 Villesse – Gorizia
 - A28 Portogruaro – Pordenone – Sacile
3. Autostrade per l'Italia S.p.A. manages:
 - A23 Udine – Tarvisio

Figure 21 Friuli-Venezia Giulia Region: motorway (green) and main ordinary roads (red) network



Friuli-Venezia Giulia Strade S.p.A., a regional company, manages 650.214 km of former state roads, with the state directly managing 160.244 km.



The regional railway networks

The regional railway network in Friuli-Venezia Giulia currently comprises 670 km of tracks, 480 km of which are electrified and 190 km are non-electrified, including also freight lines and sidings to ports and industrial areas:

1. Core double-track lines:
 - a. (Mestre) – Latisana – Cervignano – Monfalcone – Trieste
 - b. Monfalcone – Gorizia – Udine
 - c. Aurisina – Villa Opicina
 - d. Udine – Pordenone – Sacile – (Mestre)
 - e. Udine – Tarvisio
2. Secondary single-track lines:
 - a. Udine – Cervignano
 - b. Gemona – Sacile
 - c. Casarsa – Cordovado – (Portogruaro)
 - d. Gorizia – state border (Nova Gorica)
 - e. Udine – Cividale
3. Freight lines and sidings:
 - a. Trieste Centrale – Trieste Campo Marzio
 - b. Bivio Aurisina – Bivio Viadotto
 - c. Trieste Campo Marzio – Villa Opicina
 - d. Trieste Campo Marzio – Aquilinia
 - e. Udine Parco – Bivio Vat
 - f. Monfalcone – Porto Rosega
 - g. San Giorgio di Nogaro – Porto Nogaro

The railway network, excluding the Udine - Cividale line, is managed by Rete Ferroviaria Italiana S.p.A. (Italian Railway Network), while various railway undertakings operate freight services in a competitive system. The Region owns Società Ferrovie Udine - Cividale s.r.l., which manages the Udine - Cividale line.



Figure 22 European railway network: loading gauge of the main lines



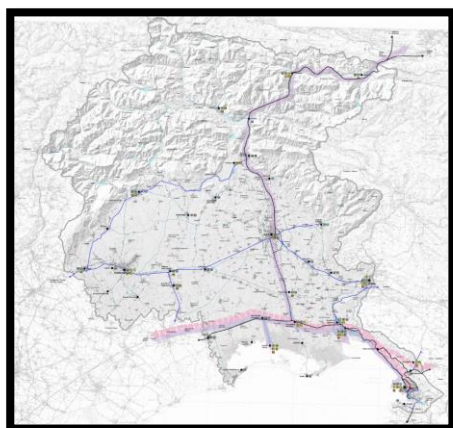
The railway accessibility from the Port of Trieste to key Italian and foreign markets is highly qualified. All tracks feature the maximum possible loading gauge (P/C 80) for all types of intermodal transport. The recent map of railway loading

gauges in Europe shows that lines serving the Ports of Trieste and Monfalcone, connecting to Central and Northern Europe, are characterized

by the P/C 80 loading gauge (dark blue). Tracks serving the hinterland of the foreign ports of the upper Adriatic basin range between P/C 32 and P/C 50, while those serving Tyrrhenian ports range between P/C 25 and P/C 45.

Planned interventions by the Italian Railways Network (Rete Ferroviaria Italiana S.p.A.) Programme Contract and the related plan, agreed with the Ministry of Infrastructure and Transport, aim to achieve the PC/80 standard across the entire North East before the EU deadline.

Figure 23 Friuli-Venezia Giulia overall network of intermodal logistics infrastructures



Supply and demand analysis

The Port of Trieste is currently the first Italian port for volume of goods in transit and concentrates 92% of regional maritime traffic:

Table 2 Regional maritime statistics 2023

Port	2023 throughput (tons)	Share (%)
Trieste	55,624,925	92%
Monfalcone	3,829,721	6%
Porto Nogaro	1,014,527	2%
Total	60,469,173	100%

In particular, the table below shows the statistics referred to the last three years (2021 - 2023):

Table 3 Statistics of the Ports of Trieste and Monfalcone 2021-2023

Port	2021	2022	2023	Δ% 2021-2023	Δ% 2022-2023
Trieste	55,361,694	57,591,733	55,624,925	0%	-3%
Monfalcone	3,279,833	3,844,489	3,829,721	17%	0%
Total	58,641,527	61,436,222	59,454,646	1%	-3%

Statistics indicate a slight overall increase in traffic over the last three years, mainly due to double-digit growth at the Port of Monfalcone. Conversely, the Port of Trieste has experienced a traffic decline due to global crises, including the Russian-Ukrainian war and conflicts in the Middle East. Unlike other Italian ports, Trieste primarily serves Central and Eastern European markets, with minimal regional and national focus. Monfalcone, however, serves as an import/export hub for a highly industrialized region with minimal international traffic.

The Port Network Authority of the Eastern Adriatic Sea and the terminal operators at the Port of Trieste have identified rail transport as the most suitable means to reach these markets. Rail transport helps limit terminal congestion, road traffic, and emissions of pollutants and greenhouse gases. The figure below shows the railway services map connecting the Port of Trieste to its catchment area.



Figure 24 Port of Trieste - railway traffic connections

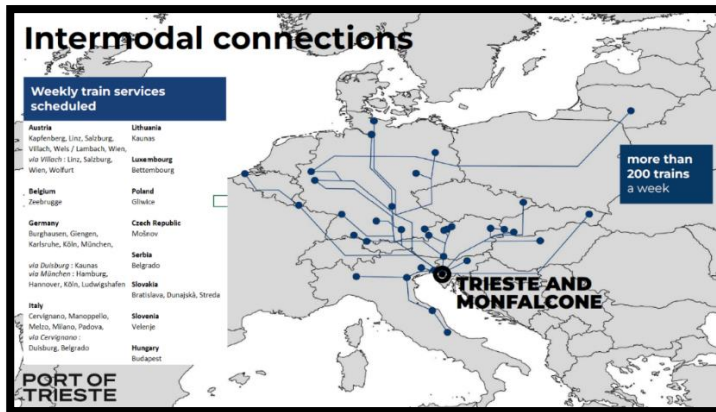
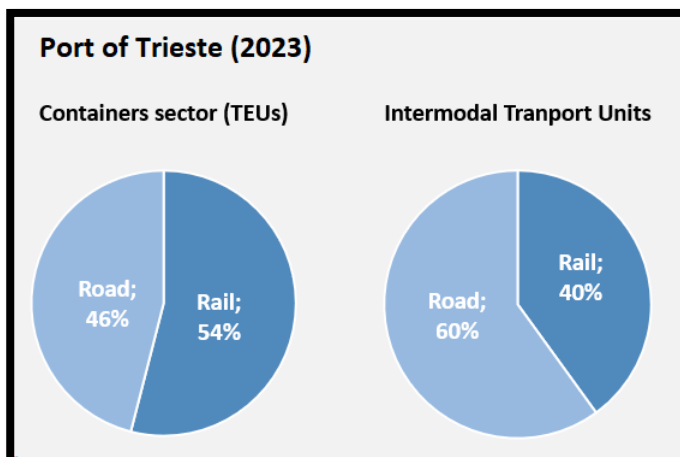


Figure 25 Port of Trieste: modal share 2023



Rail transport is identified as the most efficient means to reach Central and Eastern European markets from the Port of Trieste, helping to limit terminal congestion, road traffic, and emissions. The port has established a solid network of railway services, resulting in a significant modal share for rail transport.

Despite the positive modal share for rail, some traffic to and from the Port of Trieste still occurs by road, especially for destinations within the region that are too close for profitable railway service. These areas include the provinces of Trieste, Gorizia, Udine, and Pordenone.



1.2.2. PP2 - North Adriatic Sea Port Authority - Ports of Venice and Chioggia

The North Adriatic Sea Port Authority (NASPA) oversees the ports of Venice and Chioggia, both of which are fully multimodal, incorporating maritime, rail, road, and river transport. The Veneto Port System is multipurpose, with a balanced focus across various sectors and supply chains, including agri-food, steel, chemical, energy, commercial, and tourism, along with a

NASPA is dedicated to improving road accessibility throughout the port system, aiming to alleviate secondary and urban traffic from heavy vehicles. This effort facilitates the direct flow of traffic to the ports and enhances road safety.

All major container companies operate at the Port of Venice, providing global connections driven by the region's strong export orientation. The primary markets include the Mediterranean Sea, Black Sea, Gulf Area, and Far East. Additionally, Venice offers integrated RO-RO services with daily connections to Greece and weekly connections to other Mediterranean destinations.

Venice and Chioggia are among Italy's leading ports for solid bulk cargo, serving the production districts in Northeast Italy and handling significant agri-food traffic due to high hinterland demand. Venice handles thousands of project cargoes annually, facilitating the transportation of large industrial components to destinations such as the Middle East, Russia, and the Americas.

The Port of Venice is a crucial hub for steel products, serving manufacturing centers in Northern Italy and handling significant iron traffic flows. It is also a European hub for the chemical sector, offering specialized areas, facilities, and sub-services such as tanks, pipelines, and conduits, backed by high safety standards and extensive know-how.

The Ports of Venice and Chioggia are well-connected to the national and European road network, including the Baltic-Adriatic and Mediterranean corridors. They offer rail and intermodal services to destinations in Central Europe, Northern Europe, Scandinavia, and the UK. The Port of Venice features over 65 kilometers of internal railway network and its own freight terminal, linking to important European railway corridors. In 2023, the port generated



approximately 4,400 trains, equating to 2 million tons of freight, with expectations to increase to about 3.5 million tons and 10,000 trains per year in the coming years.

Unique among Italian ports, Venice and Chioggia also function as river ports, enabling the forwarding of goods through the inland navigation network along the Po Valley. This network connects Venice to Lombardy and serves Northern Italy's steel industries and Veneto Region's main feed mills. The Inland Waterways (IWW) link Venice to Mantua year-round through the Fissero-Tartaro-Canalbianco navigable canal, with further connections to Cremona and Piacenza.

The Ports of Venice and Chioggia under NASPA provide a comprehensive and balanced multimodal transport system that supports a wide range of industries and maintains robust connections to both national and European networks, making them critical hubs for trade and logistics in the region.



Port Authority
 Port of Chioggia
 Porto di Chioggia

PORT OF CHIOGGIA – THROUGHPUT STATISTICS

January – December 2021 (final)

	ESP0					ESP1			
	MT	MT	MT	TOTAL	%	MT	MT	TOTAL	%
TOTAL THROUGHPUT	100	100	100	100	100	100	100	100	100
LIQUID BULK									
of which:	0	0	0	0,00	0	0,00	0,00	0,00	0
Crude oil	0	0	0	0	0	0	0	0	0
Petroleum derivatives products	0	0	0	0,00	0	0,00	0	0	0
Refined oil or compressed petroleum products	0	0	0	0	0	0	0	0	0
petroleum products and natural gas chemical products	0	0	0	0	0	0	0	0	0
Other liquid bulk	0	0	0	0	0	0	0	0	0
DRY BULK									
of which:	398,00	100,00	298,00	298,00	298,00	375,00	100,00	275,00	275,00
Grain	1,562	0	1,562	0,523	0	2,032	0	2,032	0,74
Other	396,438	0	396,438	21,41	0	21,967	0	21,967	8,26
POSSIBLY DANGEROUS OR HAZARDOUS	0	0	0	0	0	0	0	0	0
Crude oil	402,102	0,001	424,363	142,13	0	142,13	0,001	142,13	0,51
Other dangerous goods	138,182	0	138,182	46,37	0	46,37	0	46,37	0,17
Mineral products	0	0	0	0	0	0	0	0	0
Ironing iron	0	0	0	0	0	0	0	0	0
Chemical products	0	0	0	0	0	0	0	0	0
Other dry bulk	0	0	0	0	0	0	0	0	0
TOTAL DANGEROUS									
of which:	403,664	0,001	425,925	142,65	0	142,65	0,001	142,65	0,52
Crude oil	0	0	0	0	0	0	0	0	0
Other dangerous goods	0	0	0	0	0	0	0	0	0
Crude oil	0	0	0	0	0	0	0	0	0
Other dangerous goods	0	0	0	0	0	0	0	0	0
ADDITIONAL INFORMATION									
Number of Calls	249	0	249	0	0	249	0	249	0
Crude Oil Tonnage	0	0	0	0,00	0	0	0	0	0
Number of berths and barge possessions									
of which:	0	0	0	0	0	0	0	0	0
Crude Oil	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
Locals (0-20 miles journey)	0	0	0	0	0	0	0	0	0
Foreign passengers	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0
Domestic	0	0	0	0	0	0	0	0	0
Number of containers per Year									
of which:	0	0	0	0					

[illegible]

PORT OF VENICE – THROUGHPUT STATISTICS
January – December 2022 (final)

	ESPO				2022-2023				CMT
	2022-2021	January-December	2022-2021	January-December	2022-2021	January-December	2022-2021	January-December	
TOTAL TONNAGE	2,794,000	2,842,000	2,842,000	2,842,000	2,794,000	2,842,000	2,842,000	2,842,000	0.00
LIQUID BULK									
Of which:	0	0	0	0	0	0	0	0	0.00
Crude oil	0	24,000	24,000	0	0	0	0	0	-100.00
Refined petroleum products	0	0	0	0	0	0	0	0	0.00
Gases, liquefied or compressed	0	0	0	0	0	0	0	0	0.00
Chemical products	0	0	0	0	0	0	0	0	0.00
Other liquid bulk	0	0	0	0	0	0	0	0	0.00
DRY BULK									
Of which:	0	0	0	0	0	0	0	0	0.00
Cereals	0	0	0	0	0	0	0	0	0.00
Fertilizers/Feedstuffs/seeds	0	0	0	0	0	0	0	0	0.00
Coal and lignite	0	0	0	0	0	0	0	0	0.00
Development/Industrial products	0	0	0	0	0	0	0	0	0.00
Metallurgical products	0	0	0	0	0	0	0	0	0.00
Chemical products	0	0	0	0	0	0	0	0	0.00
Other dry bulk	0	0	0	0	0	0	0	0	0.00
GENERAL CARGO									
Of which:	0	0	0	0	0	0	0	0	0.00
Containerized	0	0	0	0	0	0	0	0	0.00
Ro-Ro	0	0	0	0	0	0	0	0	0.00
Other general cargo	0	0	0	0	0	0	0	0	0.00
ADDITIONAL INFORMATION									
Number of Calls	0	0	0	0	0	0	0	0	0.00
Crane Tonnage	0	0	0	0	0	0	0	0	0.00
Number of local and ferry passengers	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Local (< 20 miles journey)	0	0	0	0	0	0	0	0	0.00
Ferry passengers	0	0	0	0	0	0	0	0	0.00
Crane passengers	0	0	0	0	0	0	0	0	0.00
Home Port	0	0	0	0	0	0	0	0	0.00
Transit (to be counted once)	0	0	0	0	0	0	0	0	0.00
Number of Containers (in TEU)	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Containerized	0	0	0	0	0	0	0	0	0.00
Ro-Ro	0	0	0	0	0	0	0	0	0.00
Other general cargo	0	0	0	0	0	0	0	0	0.00
ADDITIONAL INFORMATION									
Number of Calls	0	0	0	0	0	0	0	0	0.00
Crane Tonnage	0	0	0	0	0	0	0	0	0.00
Number of local and ferry passengers	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Local (< 20 miles journey)	0	0	0	0	0	0	0	0	0.00
Ferry passengers	0	0	0	0	0	0	0	0	0.00
Crane passengers	0	0	0	0	0	0	0	0	0.00
Home Port	0	0	0	0	0	0	0	0	0.00
Transit (to be counted once)	0	0	0	0	0	0	0	0	0.00
Number of Containers (in TEU)	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Containerized	0	0	0	0	0	0	0	0	0.00
Ro-Ro	0	0	0	0	0	0	0	0	0.00
Other general cargo	0	0	0	0	0	0	0	0	0.00
ADDITIONAL INFORMATION									
Number of Calls	0	0	0	0	0	0	0	0	0.00
Crane Tonnage	0	0	0	0	0	0	0	0	0.00
Number of local and ferry passengers	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Local (< 20 miles journey)	0	0	0	0	0	0	0	0	0.00
Ferry passengers	0	0	0	0	0	0	0	0	0.00
Crane passengers	0	0	0	0	0	0	0	0	0.00
Home Port	0	0	0	0	0	0	0	0	0.00
Transit (to be counted once)	0	0	0	0	0	0	0	0	0.00
Number of Containers (in TEU)	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Containerized	0	0	0	0	0	0	0	0	0.00
Ro-Ro	0	0	0	0	0	0	0	0	0.00
Other general cargo	0	0	0	0	0	0	0	0	0.00
ADDITIONAL INFORMATION									
Number of Calls	0	0	0	0	0	0	0	0	0.00
Crane Tonnage	0	0	0	0	0	0	0	0	0.00
Number of local and ferry passengers	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Local (< 20 miles journey)	0	0	0	0	0	0	0	0	0.00
Ferry passengers	0	0	0	0	0	0	0	0	0.00
Crane passengers	0	0	0	0	0	0	0	0	0.00
Home Port	0	0	0	0	0	0	0	0	0.00
Transit (to be counted once)	0	0	0	0	0	0	0	0	0.00
Number of Containers (in TEU)	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Containerized	0	0	0	0	0	0	0	0	0.00
Ro-Ro	0	0	0	0	0	0	0	0	0.00
Other general cargo	0	0	0	0	0	0	0	0	0.00
ADDITIONAL INFORMATION									
Number of Calls	0	0	0	0	0	0	0	0	0.00
Crane Tonnage	0	0	0	0	0	0	0	0	0.00
Number of local and ferry passengers	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Local (< 20 miles journey)	0	0	0	0	0	0	0	0	0.00
Ferry passengers	0	0	0	0	0	0	0	0	0.00
Crane passengers	0	0	0	0	0	0	0	0	0.00
Home Port	0	0	0	0	0	0	0	0	0.00
Transit (to be counted once)	0	0	0	0	0	0	0	0	0.00
Number of Containers (in TEU)	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Containerized	0	0	0	0	0	0	0	0	0.00
Ro-Ro	0	0	0	0	0	0	0	0	0.00
Other general cargo	0	0	0	0	0	0	0	0	0.00
ADDITIONAL INFORMATION									
Number of Calls	0	0	0	0	0	0	0	0	0.00
Crane Tonnage	0	0	0	0	0	0	0	0	0.00
Number of local and ferry passengers	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Local (< 20 miles journey)	0	0	0	0	0	0	0	0	0.00
Ferry passengers	0	0	0	0	0	0	0	0	0.00
Crane passengers	0	0	0	0	0	0	0	0	0.00
Home Port	0	0	0	0	0	0	0	0	0.00
Transit (to be counted once)	0	0	0	0	0	0	0	0	0.00
Number of Containers (in TEU)	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Containerized	0	0	0	0	0	0	0	0	0.00
Ro-Ro	0	0	0	0	0	0	0	0	0.00
Other general cargo	0	0	0	0	0	0	0	0	0.00
ADDITIONAL INFORMATION									
Number of Calls	0	0	0	0	0	0	0	0	0.00
Crane Tonnage	0	0	0	0	0	0	0	0	0.00
Number of local and ferry passengers	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Local (< 20 miles journey)	0	0	0	0	0	0	0	0	0.00
Ferry passengers	0	0	0	0	0	0	0	0	0.00
Crane passengers	0	0	0	0	0	0	0	0	0.00
Home Port	0	0	0	0	0	0	0	0	0.00
Transit (to be counted once)	0	0	0	0	0	0	0	0	0.00
Number of Containers (in TEU)	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Containerized	0	0	0	0	0	0	0	0	0.00
Ro-Ro	0	0	0	0	0	0	0	0	0.00
Other general cargo	0	0	0	0	0	0	0	0	0.00
ADDITIONAL INFORMATION									
Number of Calls	0	0	0	0	0	0	0	0	0.00
Crane Tonnage	0	0	0	0	0	0	0	0	0.00
Number of local and ferry passengers	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Local (< 20 miles journey)	0	0	0	0	0	0	0	0	0.00
Ferry passengers	0	0	0	0	0	0	0	0	0.00
Crane passengers	0	0	0	0	0	0	0	0	0.00
Home Port	0	0	0	0	0	0	0	0	0.00
Transit (to be counted once)	0	0	0	0	0	0	0	0	0.00
Number of Containers (in TEU)	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Containerized	0	0	0	0	0	0	0	0	0.00
Ro-Ro	0	0	0	0	0	0	0	0	0.00
Other general cargo	0	0	0	0	0	0	0	0	0.00
ADDITIONAL INFORMATION									
Number of Calls	0	0	0	0	0	0	0	0	0.00
Crane Tonnage	0	0	0	0	0	0	0	0	0.00
Number of local and ferry passengers	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Local (< 20 miles journey)	0	0	0	0	0	0	0	0	0.00
Ferry passengers	0	0	0	0	0	0	0	0	0.00
Crane passengers	0	0	0	0	0	0	0	0	0.00
Home Port	0	0	0	0	0	0	0	0	0.00
Transit (to be counted once)	0	0	0	0	0	0	0	0	0.00
Number of Containers (in TEU)	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00
Containerized	0	0	0	0	0	0	0	0	0.00
Ro-Ro	0	0	0	0	0	0	0	0	0.00
Other general cargo	0	0	0	0	0	0	0	0	0.00
ADDITIONAL INFORMATION									
Number of Calls	0	0	0	0	0	0	0	0	0.00
Crane Tonnage	0	0	0	0	0	0	0	0	0.00
Number of local and ferry passengers	0	0	0	0	0	0	0	0	0.00
Of which:	0	0	0	0	0	0	0	0	0.00

1.2.3. PP3 - Port of Ravenna Authority

The analysis of traffic flows at the Port of Ravenna reveals that its catchment area extends well beyond the borders of the Emilia-Romagna region. It encompasses numerous provinces in neighboring regions, particularly Lombardy (Bergamo, Brescia, Cremona, Lodi, Mantua, Milan, Monza and Brianza, Pavia), Veneto (Rovigo, Verona), and Marche (Ancona, Pesaro-Urbino). The port provides extensive maritime and intermodal freight services connecting to its hinterland and broader catchment area.

The "foreign catchment area" of the Port of Ravenna includes various countries with which the port regularly interacts. These countries import goods from Italian provinces and produce goods demanded by economic operators in those provinces.

Figure 26 National catchment area of the port of Ravenna (Source: elaboration by ITL Foundation on TCR information)

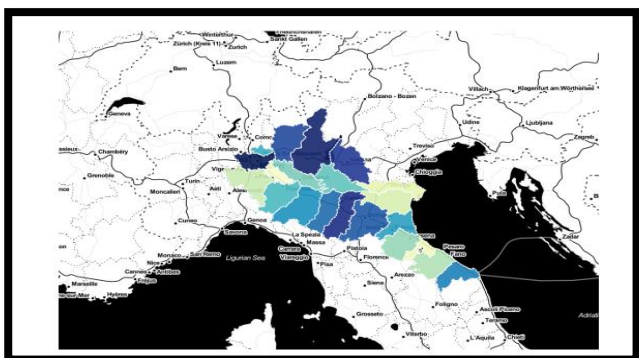
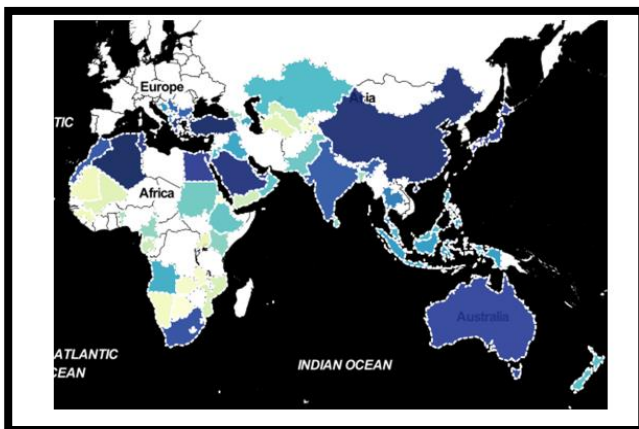


Figure 27 Foreign catchment area of the port of Ravenna (Source: elaboration by ITL Foundation on TCR information)



In regional transport planning document, the territory of the Emilia-Romagna is identified as a large area that joins national flows of people and goods, with a strategic role in the Italian economic and infrastructural system, not only road but also rail.

The Emilia-Romagna region is the core of the main corridors between the north and south of the Country, below briefly described (Prit 2025, Technical Report, p.12⁷):

- 1) The Central Dorsal Corridor:
 - Consists of the A1 motorway, the Bologna ring road junction, and the new high-speed rail network.
- 2) The Adriatic Corridor:
 - Comprises the A14 motorway, the SS16 Adriatic national road (with southern branches towards Orte-Civitavecchia and northern branches towards Mestre near Venice), integrated with the Port of Ravenna for Mediterranean transport.
- 3) The Tyrrhenian-Brenner Route:
 - Includes the Brenner railway axis, the Parma-La Spezia railway line, the A22 Brenner motorway, and the A15 Cisa motorway.

In Emilia Romagna the main nodes of these corridors are: the airport of Bologna, the railway station of Bologna, the Medio Padana station of Reggio Emilia, the **port of Ravenna**; for logistics: the freight villages of Bologna and Parma, the railway freight stations of Marzaglia-Dinazzano and the rail terminal of Le Mose at Piacenza.

The Port of Ravenna, along with its catchment area, holds a central position in the transport and logistics landscape of the region. Strategic planning emphasizes the need to enhance port accessibility and improve intermodal connections with its catchment area and hinterland.

The primary interventions focus on improving infrastructure within the port node rather than on the corridors themselves. The most significant planned improvements at the Port of Ravenna involve:

- Enhancing rail connections
- Upgrading last mile road accessibility
- Streamlining processes related to the entry and exit of vehicles

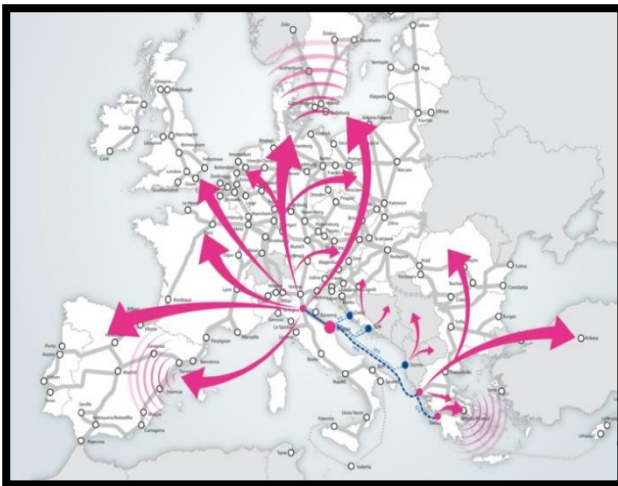
These improvements aim to boost efficiency and ensure seamless integration with the broader transport network, reinforcing the port's role as a key logistics hub in the region.

⁷<https://mobilita.regione.emilia-romagna.it/allegati/prit/adozione/relazionetecnicaPrit2025.pdf/@download/file/RelazioneTecnicaPrit2025.pdf>.



1.2.4. PP4 - Central Adriatic Ports Authority

Figure 28 Position of the core node of Ancona port in the Adriatic MoS



The ferry lines that regularly call at the Port of Ancona from Greece, Albania, and Croatia serve as a crucial maritime link between Central and Northern Europe and the Southeastern Mediterranean. The goods handled at the port have origins and destinations extending beyond Italy, Greece, Croatia, and Albania. They encompass numerous EU regions northward (including Germany, the Netherlands, Belgium, the UK, France, and Spain) and neighboring countries southward (such as Turkey, Balkan countries,

non-EU territories, the Black Sea region, and the Middle East). The Port of Ancona also accommodates East-West traffic flows through a sea-road modal shift, where freight arriving from Balkan countries and Eastern Mediterranean regions is transported via road to Western Italian ports like Civitavecchia and Livorno for RO-RO services to France and Spain.

Detailed traffic studies conducted in previous European projects (e.g., Intermodadria – IPA program) have highlighted the intensity of RO-RO traffic and the expansive catchment area in the Adriatic basin between Ancona and the Greek port of Igoumenitsa.

Figure 29 O/D twins on the Ancona-Igoumenitsa link with more than 50 travels in 5 months

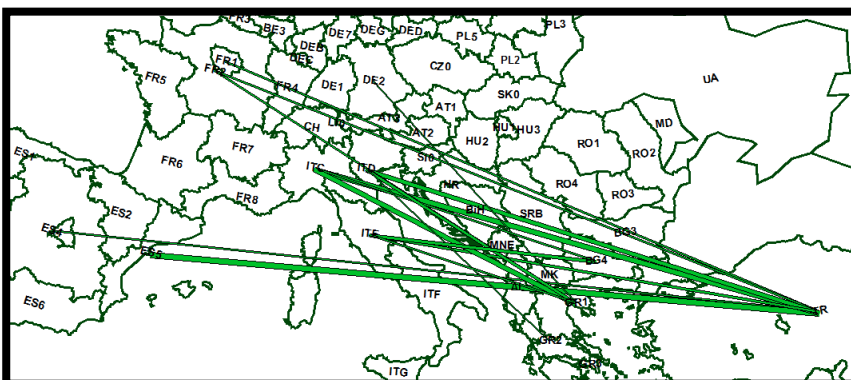
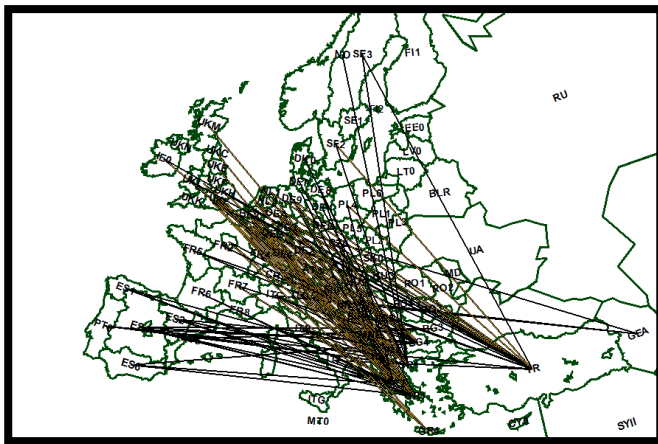


Figure 30 O/D pairs on the Ancona-Igoumenitsa link with 6 to 10 travels in 5 months



The data indicates that the origin/destination pairs along the Ancona-Igoumenitsa Sea bridge encompass East Mediterranean countries, including Turkey, Cyprus, Bulgaria, Georgia, Syria, as well as extending to the Arab Emirates and China. Additionally, Central and Western European countries such as France, Spain, Germany, Denmark, Ireland, the United Kingdom, and Scandinavian destinations are covered.

In terms of statistics, the Port of Ancona handled 9,486,967 tonnes of goods in 2023, showing a slight decrease compared to 10,802,626 tonnes in 2021, primarily due to a downturn in trucks and trailer traffic. However, the number of containers increased from 167,338 in 2021 to 173,152 in 2023, marking a 3% rise. The primary goods transported in containers include chemical and artificial products from agriculture and forestry, food and drink products, and non-ferrous metals. The main reference hub ports for Ancona are Trieste and Gioia Tauro in Italy, the port of Piraeus in Greece, Koper in Slovenia, and Malta.

The intermodal traffic quota amounted to 18,000 tonnes of coils and wheat transported by rail towards Germany and the Czech Republic.

In 2023, overall passenger traffic in the Doric port reached 948,457 travelers, reflecting a nearly 24% increase from 725,000 passengers in 2021. This data includes a significant rise in cruise passengers by 56% compared to the first year of post-COVID traffic, and a 20% increase in ferry passengers within the same period.



1.2.5. PP5 - Southern Adriatic Sea Port Authority (Ports of Bari, Brindisi, Manfredonia, Barletta and Monopoli)

2021					
Ports of ADSPMAM	Bari	Brindisi	Barletta	Manfredonia	Monopoli
throughput	7.304.428	7.626.732	728.657	638.648	521.157
liquid bulk	1.877.708	2.021.960	331.046	127.520	322.774
dry bulk		2.200.662	393.243	470.033	183.347
General cargo	5.426.720	3.404.110	4.368	41.095	15.036
TEU	70.254	-	-	2	-
Ro ro unit	176.850	124.648	-	-	-
calls	2.102	1.693	176	245	112
pax ferries	796.657	312.215	-	-	-
pax cruises	210.785	8.568	-	169	352

2022						
Ports of ADSPMAM	Bari	Brindisi	Barletta	Manfredonia	Monopoli	Termoli
throughput	7.604.090	10.045.121	617.645	705.444	483.229	145.425
liquid bulk	1.730	2.082.207	278.020	119.273	286.788	120.076
dry bulk	1.526.132	4.368.184	324.773	529.251	187.754	-
General cargo	6.076.228	3.594.730	14.852	56.920	8.687	25.349
TEU	65.729	383	-	-	-	-
Ro ro unit	196.452	115.101	-	-	-	7.436 ⁸
calls	2.242	1.647	163	279	116	748
pax ferries	1.067.935	400.245	-	5.496	-	242.182
pax cruises	405.846	87.753	-	107	2.395	-

⁸ *Cumulative data for vans and private cars



2023							
Ports of ADSPMAM	Bari	Brindisi	Barletta	Manfredonia	Monopoli	Termoli	TOTAL
throughput	8.190.962	8.207.555	859.639	767.438	355.614	167.960	18.549.199
liquid bulk	-	1.945.429	303.072	109.503	167.572	117.007	2.642.583
dry bulk	2.117.169	1.970.201	542.051	587.807	180.160	-	5.397.388
general cargo	6.073.793	4.291.925	14.516	70.128	7.882	50.953	10.509.197
TEU	73.948	-	-	-	-	-	73.948
ro ro unit	194.811	141.205	-	-	-	3.204	339.220
calls	2.216	1.795	202	285	107	792	5.397
pax ferries	1.084.575	600.027	-	5.983	-	217.624	1.908.209
pax cruises	417.359	73.639	-	102	2.313	-	493.413



1.2.6. PP6 - Port of Rijeka Authority

Demand analysis

The Port of Rijeka serves a significant economic region, handling diverse cargo types including containers, dry and bulk cargo, and liquid cargo. Over the years, demand for the port's services has been influenced by several factors:

- The port's demand correlates with regional and global economic conditions. Peaks in cargo volumes, such as those in 2007 and 2018, align with periods of economic prosperity, while declines often coincide with economic downturns, including the significant drop during the 2008-2009 global financial crisis.
- Fluctuations in container transshipment, particularly the increase to 520,866 TEUs in 2022, reflect changes in global trade patterns and regional demands. The port's ability to maintain and even increase container traffic during the COVID-19 pandemic underscores its critical role in the supply chain.
- Continued investment in port infrastructure, such as the expansion of container terminals and enhancements in handling capabilities, has likely spurred increased demand from shippers looking for efficient, reliable logistic solutions.

Supply analysis

The Port of Rijeka has developed robust facilities capable of accommodating a wide range of cargo and passenger needs:

- The port features specialized terminals such as the Zagreb Deep Sea Container Terminal and the Adriatic Gate Container Terminal. These facilities have undergone significant upgrades to increase capacity and improve handling efficiency, making them capable of supporting the growing demand for containerized and bulk cargo.
- Implementation of modern IT systems like the vehicle booking system (VBS) and port community systems (PCS) enhances the port's operational efficiency, reducing turnaround times and facilitating smoother cargo flows.
- The port's investment in skilled labour and management expertise ensures that it remains competitive and can efficiently handle the demands placed upon it.



Market dynamics and competitive landscape

The Port of Rijeka operates in a competitive environment with other Adriatic and European ports: The port's strategic location and continuous infrastructure improvements provide it with a competitive edge in attracting maritime traffic away from other regional ports.

Competitive threats include other rapidly developing ports in the Adriatic Sea that also vie for the same international trade routes and cargoes.

Regarding the situation of the HŽ Cargo Ltd. state railway operator, due to reorganization and long inherited inefficiencies, it does not offer the long-term security required by the beneficiaries, meaning the guarantee that rail transport from Rijeka to the interior territories can be carried out in more acceptable and consistent terms. It is a positive fact that the railway services market is liberalized as of 1st July 2013, and that there are several new private rail operators, which has resulted in increased service reliability, price competitiveness, creation of new transport means (block train compositions) and better service provision satisfaction for the customers in multimodal chain.

Further increase of cargo manipulations in port of Rijeka can be expected with introduction of a new concessionaire for the Zagreb Deep Sea Container Terminal, the most important capital project in the Rijeka Gateway Project II, worth 112,5 million Euros, of which 84 million Euros is from a World Bank loan, while 28.5 million Euros is financed by the state.

Port of Rijeka Authority in its strategic documents and current investments has given the biggest emphasis on the development of container transport, which is justified, bearing in mind that containerization is the dominant process in the development of traffic in the world. For this very reason, emphasis will be given on the container transport and handling. Volume of traffic in seaports depends on a number of factors, and the most important are:

- geo-traffic position,
- size of the land gravitational area,
- development of the port (port connection with the world's overseas markets),
- the size of the near (over) marine gravitational area (for transverse traffic),
- the development of land connections (road, rail and river) with the land gravitational area in the hinterland of the port,
- infrastructural port capacity,



- super structural port capacity,
- promotional and sales activities in the gravitational field,
- quality of port services, and
- port service price

The overseas gravitational area of the port of Rijeka is the whole world, and the size of the traffic will depend on the development of ship connections, and especially the established lines, with a large number of overseas ports and countries.

In container transport, the ship's connection can be achieved using two types of line services:

- "End to End", direct service to ships with mother ships (ships connect directly two overseas regions, e.g. China and the North Adriatic port)
- "Hub & Spoke" service: mother ships unload cargo from an overseas region (for example, China) in one of the ports of the Mediterranean (Malta, Gioia Tauro, Piraeus, Damietta), and it can be driven by feeder ships to the final port of landing (for example, Rijeka).

Given the possibility of transshipment traffic with containers in the concept of "hub & spoke" liner service, closer to the overseas gravitational area are the smaller Adriatic out-ports, that are not able to accept large container ships in the direct service. For this reason, large container ships, 2M (Maersk and MSC) and Ocean Alliance (CMA CGM, COSCO, Evergreen, OOCL, APL) deal directly with the port of Rijeka, but not Split, Ploče, Bar, Durres, Ancona and Ravenna. There is a realistic possibility of developing transshipment traffic by charging them from Asia (and for Asia) from shipping hubs to hub ports on feeder ships that would dispose of containers for these out ports.

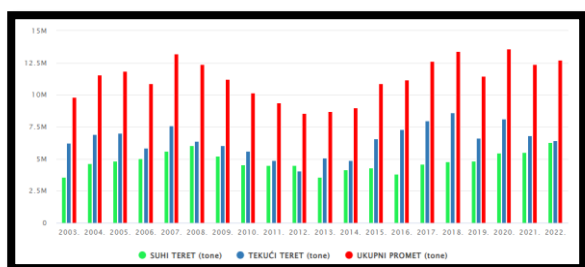
Port traffic concerning geographic and gravitational areas is directly correlated with the type of ship line service and the order of the port in the same line service:

1. National market traffic: Achieved through direct or hub & spoke services, with the port of Rijeka being predominant for Croatian traffic, facing limited competition from ports like Koper.
2. Transit traffic: Competing for wider land-based gravitational areas, where the first port in the region has a significant advantage, crucial for transit traffic for the broader gravitational area.



Statistics

Figure 31 Dry Cargo / Liquid Cargo and Total Cargo in Ton

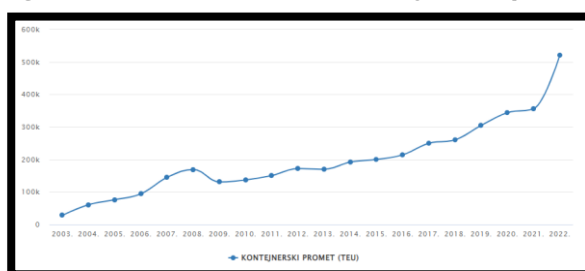


Source 1 <https://www.portauthority.hr/statistike-i-tarife/>

Over the past two decades, the Port of Rijeka has experienced significant fluctuations in total cargo volume. Total cargo steadily increased from 2003 to 2007, peaking at 13.2 million tons in 2007. However, the global economic crisis between 2008 and 2009 significantly impacted cargo volumes, leading to a decline from 2008 to 2009. The total cargo volume continued to

decline in the following years, reaching a low of 8.5 million tons in 2012. In 2013, cargo volumes began to recover, and by 2015, the port had surpassed pre-crisis levels, with a total cargo volume of 10.9 million tons. The following year saw further growth, peaking at 13.4 million tons in 2018. However, in 2019, total cargo volume decreased to 11.5 million tons due to global trade tensions and a slowdown in the European economy. Despite the challenges posed by the COVID-19 pandemic, the Port of Rijeka maintained its cargo volumes in 2020, with a total of 13.6 million tons. In 2021, there was a slight decrease to 12.4 million tons, and in 2022, the total cargo volume slightly increased to 12.7 million tons. Fluctuations in cargo volumes can be attributed to various factors, such as changes in global trade patterns, economic performance, and port competitiveness.

Figure 32 Container Traffic in Rijeka Expressed in TEU-Units



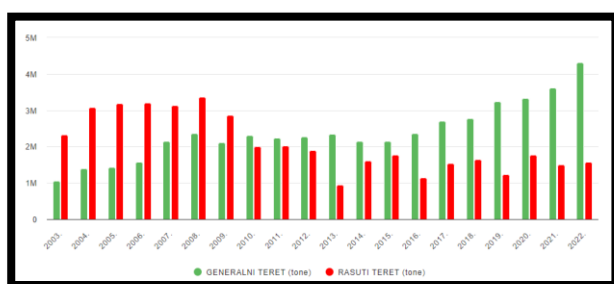
Source 2 <https://www.portauthority.hr/statistike-i-tarife/>

Over the past twenty years, container transshipment at the Port of Rijeka has shown significant growth. The port experienced a steady increase in container transshipment from 2003, with a peak of 145,024 TEUs in 2007. The global economic crisis of 2008-2009 had a limited impact, with a slight decline before increasing again in 2010. Container transshipment continued to grow, reaching 260,375 TEUs in 2018. In 2019, container transshipment significantly increased by 17.2% to 305,049 TEUs, mainly due to growing regional demand and infrastructure improvements. Despite the COVID-19 pandemic,



container transshipment continued to rise, totalling 344,091 TEUs in 2020 and 356,068 TEUs in 2021. In 2022, container transshipment showed an exceptional increase of 46.3%, reaching 520,866 TEUs. This surge can be attributed to the growth in international trade and the recovery of the global economy after the pandemic downturn.

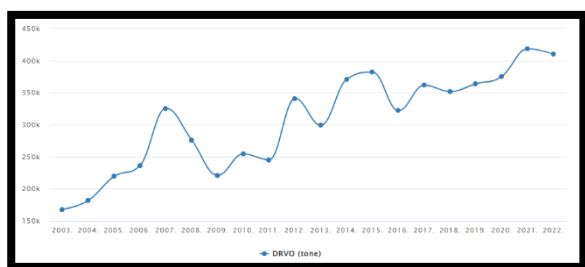
Figure 33 General and Bulk Cargo in the Port of Rijeka Expressed in Tons from 2003 to 2022



Source 3 <https://www.portauthority.hr/statistike-i-tarife/>

Over the last twenty years, the Port of Rijeka has seen fluctuations in general and bulk cargo traffic. Total general cargo traffic increased continuously since 2003, reaching a peak of 4.3 million tons in 2022. A significant decline occurred from 2013 to 2014, due to global trade pattern changes and economic performance. Recovery began in 2015, with gradual growth peaking in 2022. Bulk cargo traffic peaked at 3.4 million tons in 2008, followed by a decline until 2013, largely due to the 2008/2009 economic crisis. Bulk cargo traffic reached a low of 1.1 million tons in 2016 but began to recover in 2017, peaking at 1.8 million tons in 2020. In 2021, bulk cargo decreased by 14.7% to 1.5 million tons, with a slight recovery to 1.6 million tons in 2022.

Figure 34 Timber Cargo in the Port of Rijeka Expressed in Tons from 2003 to 2022

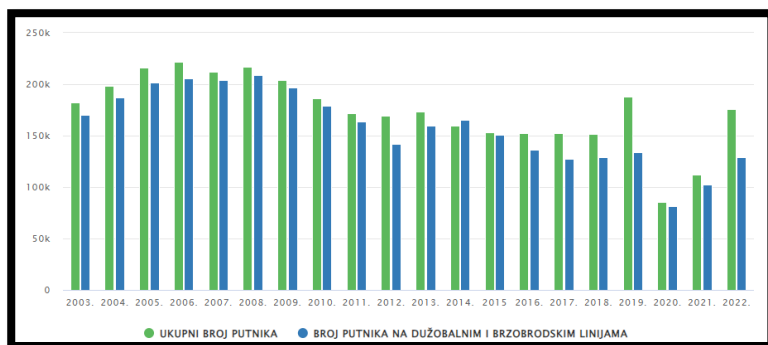


Source 4 <https://www.portauthority.hr/statistike-i-tarife/>

Timber transshipment in the Port of Rijeka has shown a fluctuating trend over the past two decades. Steady growth occurred from 2003 to 2007, peaking at 325,551 tons in 2007. The global economic crisis significantly affected timber volumes, leading to a reduction in 2008 and 2009. Timber transshipment began to recover in 2010, surpassing pre-crisis levels by 2012 with 340,782 tons. Further growth was marked by a peak in 2021 with 418,461 tons. However, timber transshipment slightly decreased to 410,178 tons in 2022. Fluctuations may be due to changes in the shipping industry and timber demand.

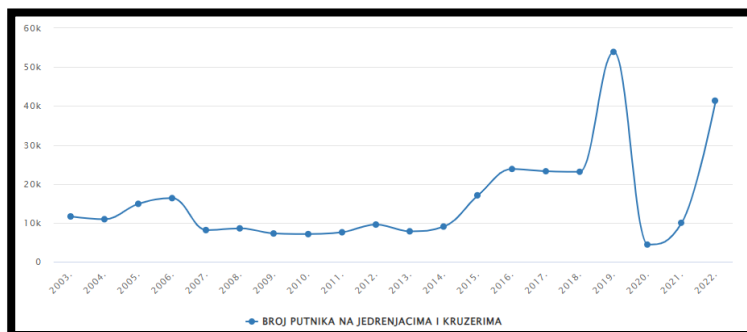


Figure 35 Passenger Numbers in Rijeka (Total / Coastal and High-Speed Lines) – 2003 – 2022



Source 5 <https://www.portauthority.hr/statistike-i-tarife/> Passenger numbers at the Port of Rijeka have shown a fluctuating trend over the past twenty years. The total number of passengers gradually increased from 2003 to 2007, peaking at 221,860 in 2006. The global economic crisis between 2008 and 2009 led to a decline in passenger numbers, reaching a low of 85,883 in 2020 due to the COVID-19 pandemic and associated travel restrictions. Passenger numbers began to recover in 2021, with 112,423 passengers, a 30.7% increase from the previous year. In 2022, passenger numbers increased by 56.3% to 175,961. Coastal transport and high-speed lines also showed a fluctuating trend, peaking at 205,527 passengers in 2006. Numbers began to recover in 2013, peaking at 128,830 passengers in 2022.

Figure 36 Number of Passengers on Sailboats and Cruise Ships in Rijeka from 2003 to 2022



Source 6 <https://www.portauthority.hr/statistike-i-tarife/> The number of passengers on sailboats and cruise ships at the Port of Rijeka has fluctuated over the past two decades. Passenger numbers gradually increased from 2003 to 2006, peaking at 16,333 in 2006. A significant drop occurred in 2007 with only 8,120 passengers. Fluctuations continued, with a peak of 53,898 passengers in 2019. The COVID-19 pandemic caused a significant decrease to 4,402 passengers in 2020. Numbers began to recover in 2021, with 9,996 passengers, and significantly increased in 2022 to 41,357 passengers, due to easing pandemic restrictions and tourism recovery.



1.2.7. PP7 - Port of Zadar Authority

CATCHMENT AREA

Total population 41.2 milion

- Austria 8.8 mil
- Slovakia 5.4 mil
- Hungary 9.8 mil
- Slovenia 2 mil
- Serbia 7 mil
- Croatia 4.1 mil
- Montenegro 0.6 mil
- Bosnia and Herzegovina 3.5 mil

GDP ranging from \$47.289 (Austria) to \$5.148 (Bosnia and Herzegovina)



Domestic lines 2018 - 2023.

Year	2018	2019	2020	2021	2022	2023
Passengers	2.354.127	2.390.575	1.723.512	2.195.864	2.424.244	2.560.647
Vehicles	457.117	484.690	415.429	527.439	574.801	634.368



International lines 2018 – 2023.

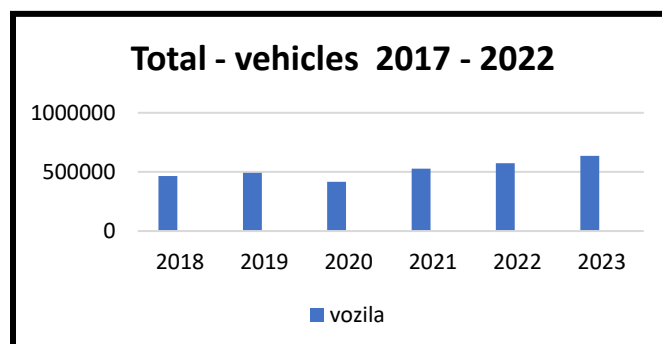
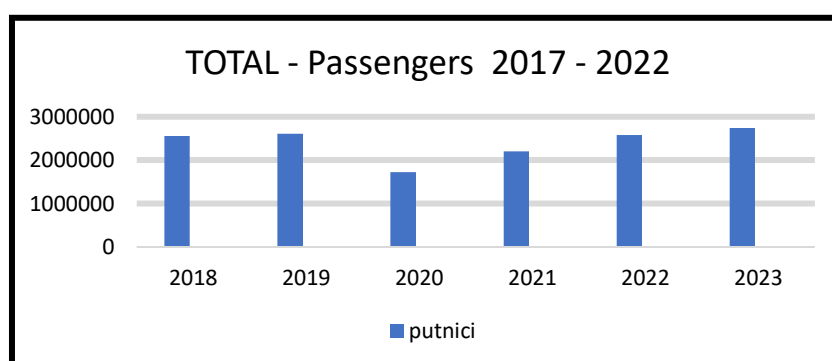
Year	2018	2019	2020	2021	2022	2023
Passengers	38.632	38.335	1.672	0	12.407	6.374
Vehicles	8.116	8.218	7.263	618	3.620	1.919

Cruise ships 2018 - 2023.

Year	2018	2019	2020	2021	2022	2023
Calls	120	134	13	30	146	159
Passengers	166.528	182.682	714	10.164	145.095	170.807

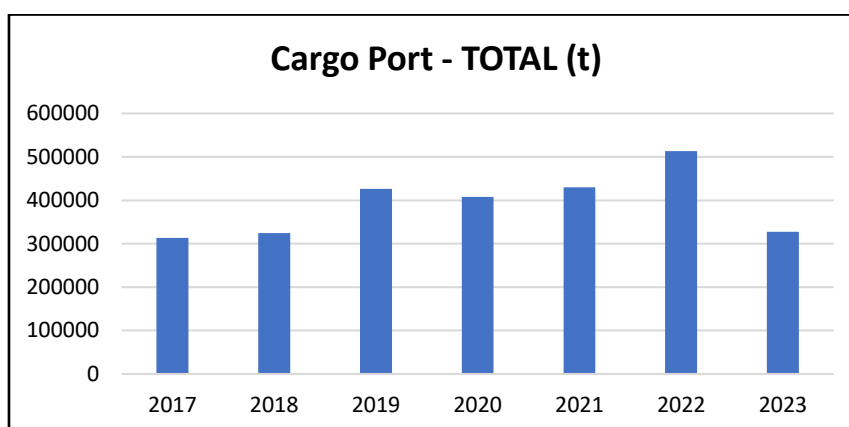
Passenger and vehicle Traffic – TOTAL 2018 - 2023.

Year	2018	2019	2020	2021	2022	2023
Passengers	2.559.287	2.611.592	1.725.898	2.206.028	2.581.746	2.737.828
Vehicles	465.335	491.953	416.047	527.439	574.801	636.557



Cargo Port 2015 – 2023.

Year	Liquids (t)	Bulk (t)	General (t)	TOTAL (t)
2015	1.382	131.679	22.930	155.991
2016	60.908	153.653	18.785	233.346
2017	210.794	68.166	34.200	313.160
2018	230.545	82.371	11.588	324.504
2019	269.925	102.351	53.894	426.170
2020	248.864	74.563	84.382	407.810
2021	267.281	58.858	100.800	426.939
2022	317.028	85.279	111.029	513.336
2023	190.362	36.307	100.648	327.317



1.2.8. PP8 - Port of Ploče Authority

The Port of Ploče holds significant strategic importance for the Republic of Croatia and its neighboring countries, particularly Bosnia and Herzegovina. Designated as one of the main ports of particular international economic interest, the Port of Ploče is pivotal for regional trade and economic activities. About 90% of its operations are transit traffic, primarily serving Bosnia and Herzegovina, which relies heavily on this port for its import and export needs. The Port of Ploče's inclusion in the Pan-European Corridor Vc and its strategic geographic position provide critical connectivity to other countries in Western and Central Europe, notably Hungary. This expands its market reach and operational capabilities, positioning it as a crucial hub in the European transport network.

The Port of Ploče's supply capabilities is underscored by its comprehensive infrastructure, which includes facilities for dry bulk cargo, liquid cargo, and container/general cargo. The container terminal, with a current capacity of 60,000 TEU per year, is set to expand significantly, enhancing the port's role in the intermodal transport network. The bulk cargo terminal, designed to handle over 6 million tons per year, and the liquid cargo terminal, with storage capacities slated to increase to 250,000 m³, further bolster the port's capacity to handle diverse cargo types efficiently. The construction of an advanced entrance terminal, equipped with modern IT capabilities and designed to streamline business processes, exemplifies the port's commitment to enhancing operational efficiency and competitiveness.

Demand for the Port of Ploče's services is driven by its strategic role in facilitating trade for Bosnia and Herzegovina and its potential to serve markets in Central Europe. The completion of infrastructure projects like the Vc corridor will further integrate the port into the European transport network, increasing its attractiveness to international shippers and logistics providers. Additionally, the port's environmental policies, aimed at becoming a 'green' port, align with global trends towards sustainability, potentially attracting eco-conscious businesses.

The port's focus on modernizing its infrastructure and adopting clean energy technologies positions it well to meet the growing demand for sustainable and efficient transport solutions. In conclusion, the Port of Ploče is well-equipped to meet current and future demand through its robust infrastructure and strategic initiatives. Its role as a major transit hub for Bosnia and Herzegovina, coupled with its integration into broader European transport networks, ensures its continued relevance and growth in the international logistics landscape. The port's commitment to environmental sustainability further enhances its appeal, aligning with global market demands for greener logistics solutions.

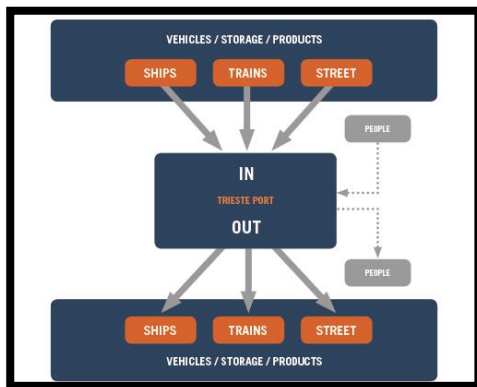


1.3. IT systems currently in use

1.3.1. LP1 - Port Network Authority of the Eastern Adriatic Sea

The Port of Trieste, managed by the Port Network Authority of the Eastern Adriatic Sea, leverages advanced IT systems to optimize its logistics processes. The primary system in use is the Port Community System (PCS) named “Sinfomar.” This system facilitates the seamless exchange of information among various stakeholders involved in port operations, enhancing efficiency and competitiveness.

Figure 37 Movements in the Port of Trieste



Sinfomar: The Port Community System

Sinfomar is an electronic platform that connects multiple ICT-based networks and systems operated by different seaport organizations. This PCS aims to optimize and harmonize all port logistic processes through a single window system, allowing for a single data submission to be used across different stakeholders.

Figure 38 Main stakeholders involved



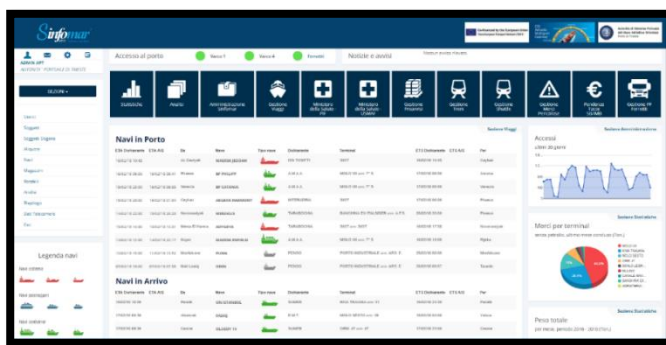
Key Features and Capabilities

1. **Electronic Management:** Sinfomar manages cargo handling, vehicle movements, and port logistics electronically, ensuring traceability and real-time updates.



2. **Single-Window System:** It streamlines administrative and bureaucratic procedures, reducing the need for manual data entry and expediting port traffic processes.
3. **Interoperability:** Sinfomar ensures interoperability with other ICT platforms, such as AIDA (Customs Agency), PMIS2 (Harbor Masters), and various terminal operating systems like NAVIS and SINFOSEC.
4. **Data Standardization:** The system uses international standards (ISO, TARIC, HS, ILU, BIC, UIC) to standardize data, making it comparable across different transport modalities.
5. **Comprehensive Modules:** Sinfomar includes modules for pre-arrival/departure notifications, ships, cargo, vehicles, trains, statistics, people, maritime health authority, dangerous goods, and more.

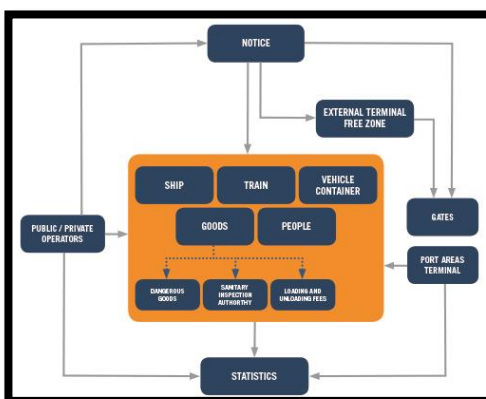
Figure 39 Sinfomar - main screen



The implementation of Sinfomar involved extensive collaboration with local and regional maritime entities, including private operators like shipping agents, freight forwarders, and terminal operators, as well as public institutions such as the Customs Agency, Harbor Masters, and the Finance Police. This

collaboration ensures that the system meets the needs of all stakeholders and aligns with national and EU regulations.

Figure 40 Sinfomar – structure



Architecture: Sinfomar operates as a central orchestration hub with data input via web services or browser interfaces. It supports multiple access roles, ensuring data security and role-based access.

Development: The system is built on free and open-source technologies, using web services and XML for data management.

Continuous development: Sinfomar is constantly updated to adapt to changes in transport systems and



freight volumes, ensuring compliance with current regulations and international guidelines.

Additional functionalities

- Gateway system: A system to manage the identification of people and vehicles entering/exiting the port area, improving access flows and road network management.
- Mobile application: Developed for managing vehicle flows and logistics/customs documentation, with geo-localization and real-time data exchange features.
- Integration with other systems: Sinfomar integrates with ViGate for security information and other platforms for a unified access and traffic management approach.

Benefits and impact

- By digitalizing and automating processes, Sinfomar reduces paperwork, waiting times, and operational costs.
- Real-time data entry and validation by public authorities ensure the reliability of information used for daily operations and strategic decisions.
- The system enhances the competitiveness of the Port of Trieste by providing a reliable, effective, and efficient real-time information management system.
- reduction in manual processes and the optimization of logistics flows contribute to lower emissions and a more sustainable port operation.

Ongoing projects such as MERIDIAN (CEF) and ACCESSMILE (Interreg CE) aim to develop additional modules for managing exit notifications and parking slot bookings. The continuous evolution of Sinfomar is aligned with strategic objectives to support a federated network at the European level and to integrate logistics and customs processes effectively.

Sinfomar, the Port Community System of the Port of Trieste, exemplifies the use of advanced IT systems to enhance port logistics. By providing a seamless, interoperable, and efficient platform for data exchange, it significantly improves the port's operational efficiency, competitiveness, and compliance with international standards. The system's continuous development ensures it remains adaptable to changing needs and regulations, positioning the Port of Trieste as a leading port in the region.



1.3.2. PP2 - North Adriatic Sea Port Authority - Ports of Venice and Chioggia

Port/terminal gates and interoperability among public/private IT systems

Port gates are managed through a software, called AGS (Automated Gate System), owned by the North Adriatic Sea Port Authority, developed by APV Investimenti, an in-house company. AGS allows to control the barriers at the checkpoints. It is operated by security personnel (in charge of security), and by officers of the Guardia di Finanza, financial police that operates on behalf of the Customs Agency (in charge of customs compliance).

The software, that is part of the PCS (Port Community System), exchanges data with the terminals and the Customs Agency.

INBOUND

AGS manages port entry by checking badges of truck drivers, that need to be previously authorized.

OUTBOUND

The following digital gate-out procedure for containerised freight is in place:

1. the container terminals (PSA Vecon and TIV) send information about all the trucks on the way out from terminal: plate, container id and, if the container is full, customs Master Reference Number (MRN) related to the cargo contained within;
2. when the truck arrives at the port gate, the plate is read by an OCR software;
3. the information on the container and its MRN are sent to the customs agency (and are also displayed on a PC used by the Guardia di Finanza to control the gate);
4. the Customs Agency provides (on "PortTracking", a web-based, customs-issued software) to the Guardia di Finanza information about the customs status of the container;
5. (still on "PortTracking") the Guardia di Finanza:
 - a. (if it so wishes) checks any information related to the goods being imported;
 - b. (with one click) gives its nod to the transit of the truck and container out of the port;
6. the Customs Agency relays to AGS the clearance received by the Guardia di Finanza;
7. AGS automatically lifts the barrier to allow the transit of truck and container, with no further intervention.

The gate-in and the gate-out procedures for non-containerised freight still rely on paper documentation.



1.3.3. PP3 - Port of Ravenna Authority

Port Community System

In 2011 the port operators operating in the Port of Ravenna and in particular Shipping Agents and Freight Forwarders solicited the Port Authority to design and realize an IT system that could support the coordination of the different operators involved in the process for the customs formalities and in particular in the preparation and submission of the goods manifests. Thus, the design and fulfilment of the Port Community System for the Port of Ravenna began.

During this time, the system has been implemented with many functionalities related to the logistic processes, the data exchange with the National Maritime Single Window and the formalities that the operators must respect in their relation with the Port Authority.

The main concept has been always the same: the sharing of data and documents in order to realize the “only one submission” objective, according to which the user must communicate the data only once and reuse them sharing and exchanging data and documents with all the other operators and administrations involved in the port processes.

The PCS offer many services for the interoperability with TOSs and the systems of the other competent Authorities (first with Customs and Maritime Authority).

Currently, there isn't a vehicle booking system at the port level but some of the terminals have in place a kind of it, therefore, there are as many procedures (with different levels of digitalization or totally manual) and systems as terminals.

None of the terminals has implemented automatic (or semi-automatic) gates and gates at the port level directly managed by the Port Authority are not in place yet.



1.3.4. PP4 - Central Adriatic Ports Authority

Currently, the Central Adriatic Ports Authority has a Port Community System (PCS) in use that serves two primary functions:

- Statistical data collection of ports (the sole database from which the AdSP draws for billing related to the traffic of vehicles and passengers on ferry ships, and the only system to ensure quality data, also useful for the allocation of resources on a national basis)
- Sharing of customs data among freight forwarders, facilitating the customs clearance process among different entities involved in the import and export cycle.

The system is interoperable with AIDA, the IT system of the National Customs Agency, including version 2.0, PMIS, the IT system of Coast Guard, and ISTAT, national statistics system. It has been adapted to the new functionalities of National Customs Agency that entered into service in 2022 but it is undergoing an updating process into a more performant platform capable of providing additional functionalities and expanded coverage, also in view of the full entry into service of SUDOCO (Single Customs and Control Office).

Furthermore, an Artificial Intelligence system called “Trasferimento in Sicurezza (TinS – Transfer in Security) has been developed, which represents telematic support for the movement of the customs parking area to the Scalo Marotti, outside the customs area of the Port of Ancona.

TinS – Transfer in Security

Since 2020, at the Central Adriatic Ports Authority it is operative an intelligent and autonomous system for tracking and recognizing heavy vehicles boarding and disembarking from the port of Ancona, based on the Artificial Intelligent technology, aimed at ensuring the security of the customs areas and of the main road connections of the port of Ancona.

The system was developed in the framework of the SMART-C project, "Scalo Marotti Virtual Tunnel," funded by the CEF program, No. 2018-IT-TM-0106-S and of the PROMARES project (Italy-Croatia programme) and in cooperation with the National Customs and Monopolies Agency as part of a Memorandum of Understanding signed between the two entities on



October 20, 2020, aimed at promoting the use of advanced technologies to simplify operations for port operators in the ports under the competences of the Central Adriatic Ports Authority.

The SMART-C project is part of a broader global project initiated in 2018, called TINS "Transfer in Security" which aimed to decongest the area of the historic port designated as a customs space where the parking areas for vehicles in the boarding or disembarking phase were located, awaiting customs formalities.



Figure 41 Coverage area of the TinS in the Port of Ancona

The fragmentation of the organization of spaces and functions of port users, including truck drivers, maritime agencies, institutional and control bodies including the Customs Agency, the Finance Guard, and the Border Police, made it necessary to develop a new configuration of customs areas that would optimize customs operations in terms of the actors involved, movements of heavy vehicles within the port, and at the same time relocate vehicle traffic to an area far from the historic port and the urban center.

The solution identified involved transferring truck parking areas to a new temporary storage area in the "Scalo Marotti" site, outside the customs circuit of the port of Ancona, and simultaneously relocating customs and finance guard offices from the Da Chio gate to the former RFI building inside the Scalo Marotti.

Furthermore, the new configuration involves the implementation of an artificial intelligence system that, with the aid of a series of OPT and tracking cameras positioned at the entry and exit gates of the docks and at the Scalo Marotti, enables remote tracking and monitoring of vehicles entering and exiting the port of Ancona.

With the acquisition of usage licenses for the A3IU artificial intelligence system, subject to international proprietary rights, the Port Authority now has an artificial intelligence system that can be used for various functionalities:

- Vehicle traffic control



- Management of calamitous events
- Analysis of vehicle and personnel behaviour are just a few of the possible functionalities.

The artificial intelligence system streamlines customs procedures by directly interoperating with the Customs Agency's AIDA system and monitors vehicles to detect any anomalous behaviours compared to predefined conduct rules, thus assisting in customs control and security activities carried out by the relevant institutions.

The operational artificial intelligence system integrates the following three components:

- the artificial intelligence system (A.I.) employs high-definition IP cameras that transform analogical images into a series of polygons with precise attributes, allowing for the recording and recognition of license plates of heavy vehicles entering and exiting the port of Ancona, tracking their movements, and verifying non-compliant behaviours.
- the dialogue software with the A.I. system receives input traffic data regarding boarding and disembarking vehicles (license plates, vehicle type, nationality) transmitted by port operators such as freight forwarders and maritime agents, as well as information about the customs status of goods transmitted through the AIDA system. The software, following predefined behaviour rules, returns a conformity check regarding the behaviours of tracked vehicles.
- the AIDA system, an information system for transmitting and managing customs data, interoperable with the system mentioned above, exchanges data regarding the customs status of goods transported by heavy vehicles and the customs formalities to be completed.

Currently, the system is configured for real-time monitoring of vehicles passing through the checkpoints of ferry port facilities and the Scalo Marotti.

An interface software has been developed for interaction among the entities involved in the control process built with ADM and for monitoring by security forces.

The work program outlined in the Memorandum with National Customs Agency of 2020 includes extending the TinS system to container traffic to ensure the data flow expected by SUDOCO (i.e., the capacity of the Port Authorities to inform ADM software in real-time about the position of goods, whether incoming to the port, in storage, boarding, or disembarked, in storage, exiting the port).



1.3.5. PP5 - Southern Adriatic Sea Port Authority (Ports of Bari, Brindisi, Manfredonia, Barletta and Monopoli)

The Southern Adriatic Sea Port Authority, which oversees the ports of Bari, Brindisi, Manfredonia, Barletta, and Monopoli, has been utilizing the GAIA Port Community System (PCS) since 2011. GAIA was developed as part of the GAIA project (Generalized Automatic Exchange of Port Information Area) under the European Territorial Cooperation Program (ETCP) Greece-Italy 2007-2013. This multi-port system supports various port activities, particularly enhancing maritime security measures in compliance with the ISPS Code and SOLAS regulations. The system provides a web portal accessible from any internet-connected PC, facilitating seamless management of port operations.

The GAIA PCS plays a crucial role in managing ticketing and boarding processes for ferries, issuing Security Cards, and monitoring the flow of passengers and vehicles through port gates for both Schengen and non-Schengen areas. It efficiently handles high traffic volumes, managing up to 30,000 Security Cards and over 10,000 authorizations daily, and monitoring over 100,000 daily accesses without causing delays. This robust system ensures smooth operations even during peak traffic periods, demonstrating its reliability and efficiency.

Figure 42 PCS GAIA Portal Port of Bari



To ensure the system's optimal functionality, the Development and Technological Innovation Department provides operational support to users through a 24/7 help desk. This department also oversees execution management activities, ensuring that the system meets the needs of all stakeholders. A permanent table of public institutions present in the port area defines the processes managed by GAIA and establishes data usage rules, ensuring that all data, while made available to various users, remains the property of the Maritime Authority.

GAIA allows for the provision of autonomous services at the level of each port area (Bari, Brindisi, Manfredonia, Barletta, Monopoli, and Termoli), while maintaining a unified database structure for management,



maintenance, and evolution. The system serves over 2,000 users, including public bodies, police/security forces, shipping and port operators, and logistics companies. Accessible via the HTTPS communication protocol, GAIA ensures that sensitive information is treated according to legal principles of correctness, lawfulness, transparency, and protection, supported by an internal encryption system. The system's data center, located in the Banchina Massi offices in the port of Bari, is designed to ensure maximum continuity of service with redundant technological and safety systems.

The GAIA-PASS module within the PCS is used to issue Vehicle Passes for accessing the port. This module streamlines the authorization process, requiring users to indicate the entity for which the security area access is needed and ensuring pre-authorization from the competent Operations Department. The system allows gate control via various means, including printed copies, smartphones/tablets, or unique 18-digit codes, ensuring a secure and efficient access process.

Figure 43 Access authorization in the port of Bari (example)



Since 2011, the GAIA-GATE module has been operational in the port of Bari, managing access control for Port Security and Port Facilities gates, and overseeing the control of passengers and vehicles on ferries. This module provides real-time tracking of passengers and vehicles, significantly enhancing security and operational efficiency. The Security Cards issued by the GAIA-GATE system, linked to unique codes for passengers and vehicles, represent a digital advancement in ferry passenger check-in processes. The system's operational dashboard supports Gate Managers by providing real-time data, allowing the Port Authority and Border Police to monitor passenger and vehicle movements effectively.

The boarding process managed by the GAIA-GATE system begins with berth programming by the Maritime Authority, which includes detailed information about departing ships. The Security Cards, issued through an automated process linked to the shipping companies' ticketing systems, eliminate the need for manual issuance by maritime agencies. This process ensures that security cards are accurately linked to passenger and vehicle data, enhancing security and preventing overbooking. The control at port gates involves scanning barcodes on security cards, with the system providing alerts for any discrepancies, thus maintaining high security standards.

The virtual security card system introduced by GAIA brings numerous advantages, including time savings for maritime agencies during check-in, reduced costs for personnel and equipment maintenance, and improved control over boarding processes. The system ensures that the number of passengers and vehicles on board matches those listed, thereby enhancing safety and compliance with maritime security protocols. The Port Authority and public security authorities benefit from simplified identification processes, making it easier to trace travel documents and ensuring a higher level of security.

The processing of data stored by the system complies with the European Regulation on the Protection of Personal Data (GDPR). The Southern Adriatic Sea Port Authority (AdSP-MAM) processes personal data exclusively for organizational objectives and maritime security measures, ensuring that data is handled lawfully and transparently. Data is stored securely within the Authority's Data Centers and is not shared with third parties, except for institutional purposes. The data is regularly updated and kept for as long as necessary to provide requested services. Individuals have the right to access, rectify, delete, or port their data at any time, and the processing is carried out with high security standards, including the use of encryption systems.



Figure 44 CRIO system access portal

In addition to GAIA, the AdSP-MAM operates the CRIO portal, developed in 2011 with funding from the Italian Ministry of the Interior. The CRIO portal allows the Port Authority of Durres to access summary information on ferries arriving from Bari, including ship details, passenger numbers, and vehicle counts. However, due to GDPR restrictions, detailed passenger information cannot be exchanged.

The Entry Exit System (EES) will be implemented at the end of 2024 or early 2025, in compliance with EU Regulation 2017/2226. This system will enhance security by registering entry and exit data for third-country nationals crossing external borders. The EES system will work alongside the SIF (Border Information System) and will be managed by the State Police, interfacing with the European node (Interpol) but not with the PCS GAIA-GATE system. This new system will introduce additional steps for passengers embarking and disembarking at the ports of Bar and Durres, complicating the process but enhancing security.

Through these comprehensive systems, the Southern Adriatic Sea Port Authority has significantly improved its operational efficiency, security, and service quality across its managed ports. The continuous updates and integration with national and European systems ensure compliance and adaptability to evolving maritime security and operational needs, positioning the Southern Adriatic Sea Port Authority as a leader in port community system implementation and management.

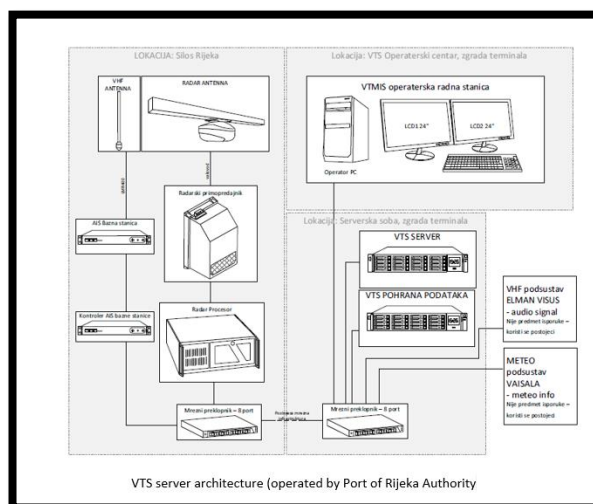


1.3.6. PP6 - Port of Rijeka Authority

The Port of Rijeka Authority and its stakeholders utilize a robust network infrastructure comprising standard Ethernet 10/100/1000 MBps and Wi-Fi for connectivity in both office and operational areas. Access, authentication, information security, and identity management are governed by Microsoft Windows server Group Policies and Active Directory. Data sharing within the port is facilitated through shared network storages and the SharePoint document management system, ensuring seamless information exchange. These systems are regularly updated under maintenance contracts, ensuring they remain current and secure.

The IT architecture at the Port of Rijeka employs a mix of on-premise, hybrid cloud, and cloud solutions. The development and management of these systems are handled through a combination of internal resources and external IT subcontracting and consulting, often as part of co-financed projects and initiatives. The port maintains a dedicated IT department with full-time employees and a head of department who oversees initiatives, budgets, and project management, escalating issues to the Board of Directors when necessary.

One of the critical systems in use is the Vessel Traffic Service (VTS) system, which underwent its latest upgrade in 2015. This system integrates various components including radar processors, a VTS server program package, and operator workstations, all of which contribute to the port's ability to monitor and manage maritime traffic efficiently. The VTS system includes legacy systems from Kongsberg Norcontrol IT for AIS, Consilium for radar, Elman for VHF, and Vaisala for meteorological data. The integrated system uses a 3D VTS aggregator component to process radar images, detect and track objects, and manage radar antenna operations.

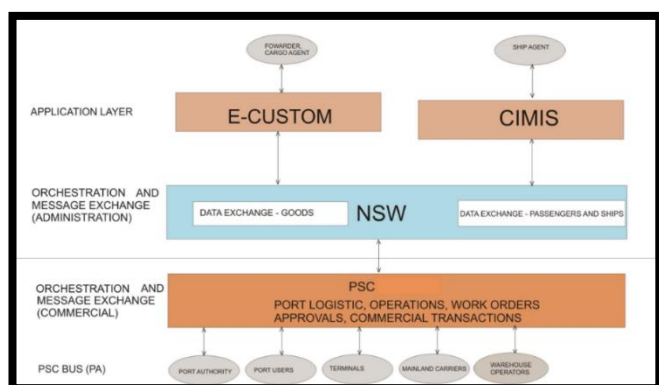


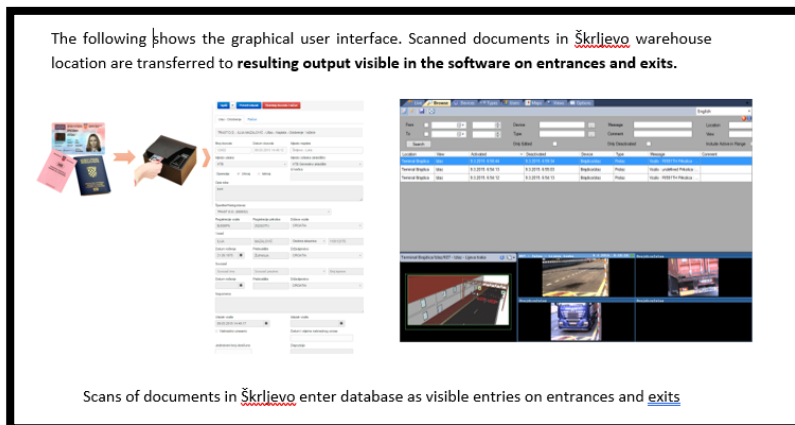
The Port Community System (PCS) at Rijeka is a digital platform designed for smart data exchange between public and private port operators. This system aims to improve efficiency at all stages of port operations, from manifesting to vessel discharge and loading, customs clearance, and health and phytosanitary control. The PCS helps reduce procedure time, minimizes paper document usage, and enhances port competitiveness. It also supports electronic data exchange with surrounding systems such as the Croatian Integrated Maritime Information System (CIMIS) and the Customs system of the Republic of Croatia.

The PCS implementation at the Port of Rijeka has shown significant improvements in operational efficiency. Scientific research in Croatia has demonstrated that reengineering administrative processes and implementing a PCS can lead to labor savings of up to 48.5% for ship processing tasks. The PCS is connected to CIMIS and other systems to avoid multiple data entries and facilitate smooth data exchange between stakeholders. The "Project of Setting Up a Single National Port Community System" is currently underway, with the Ministry of the Sea, Transport, and Infrastructure leading the initiative. This project aims to provide all Croatian port authorities with a fully functional PCS adaptable to each port's unique characteristics.

The stakeholders and users of the PCS system at Rijeka are categorized into two groups: those controlling the entered data and commercial data users and providers. The supervisory part includes agencies like the Harbor Master's Office, Port Authority, Border Police, Phytosanitary and Veterinary Inspections, Sanitary Inspection, and Customs Office. Commercial users providing data include waste disposal concessionaires, mooring, piloting and tug service providers, ships' agents, freight forwarders, cargo terminal concessionaires, and land transport companies.

The feasibility of new proposed operations in the Port Authority of Rijeka's PCS includes handling structured and unstructured documents, nominating cargo agents, and managing ship-generated waste. The PCS also facilitates the distribution of national CIMIS code





registers and incorporates digital signature capabilities for various document types. The digital signature process ensures secure and verifiable electronic document handling, enhancing the overall efficiency and reliability of port operations.

Access control within the Port of Rijeka is managed using the Siemens Granta access control system, which has been in use since 1992 and is widely implemented in high-security environments like hospitals, universities, and government buildings. This system supports various access technologies including proximity, smart card, magnetic stripe, and biometric readers. It integrates with digital video management systems, CCTV, and intruder alarms, all accessible through the port's internal network.

A specialized system for controlling vehicles, drivers, and containers entering the Port of Rijeka/AGCT container terminal is also in place. Drivers must check in at a designated terminal where their information is recorded and associated with an ID card. This system ensures secure and efficient access control, with all data integrated into the Port Rijeka ISPS application.

In summary, the Port of Rijeka Authority has developed a comprehensive and integrated IT infrastructure that supports efficient and secure port operations. By leveraging advanced technologies and maintaining robust systems, the port ensures high standards of operational efficiency, security, and data management, positioning itself as a key player in the regional maritime industry.



1.3.7. PP7 - Port of Zadar Authority

Currently Port Authority of Zadar (PAZ) relies exclusively on manual tracking of port operations lacking both central port management system as well as systems needed for feeding data into such system.



1.3.8. PP8 - Port of Ploče Authority

In the last decade, the Port of Ploče Authority has witnessed significant changes driven by fluctuations in energy prices, evolving global cargo structures, and advancements in maritime and transshipment technologies. These changes have necessitated substantial capital investments but have also led to long-term reductions in operating costs. The broader application of information technologies has played a crucial role in enhancing transparency, efficiency, and speed of port operations. Consequently, the Port Authority of Ploče has invested significantly in information assets, including the Port Community System (PCS), which optimizes the exchange of official documents and data among port community members.

IT in the port of Ploče area

To meet its strategic objectives, the Port Authority of Ploče has undertaken numerous initiatives aimed at facilitating port processes, reducing operational costs, and increasing competitiveness. The complexity of the port's information ecosystem necessitates a detailed study of the IT systems used by all port community members before defining strategic plans and guidelines. This study must account for the diverse nature of the port community in terms of size, business type, and information maturity.

As-is IT environment in the port of Ploče

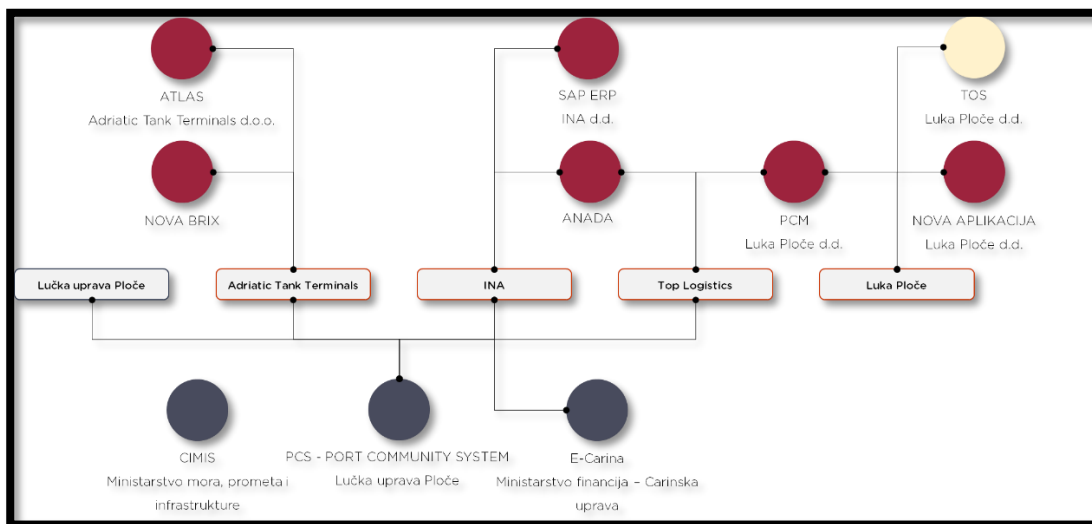
The current IT environment at the Port of Ploče consists of a mix of systems categorized by ownership:

- **Government systems:** Owned by government agencies or ministries, mandated by regulations.
- **Commercial systems:** Developed and owned by third-party vendors, licensed for use by port participants.
- **Internal systems:** Developed exclusively for stakeholder needs and not available outside the organization.

These systems often overlap functionally. For instance, vessel call processes are implemented across multiple systems like CIMIS, PCS, PCM, and Brix. The technological landscape includes older client/server architectures and modern web-based systems. Despite varying technology generations, newer systems are generally more scalable, error-resistant, and easier to integrate.



Figure 45 AS-IS environment

**Key systems in use:**

Anada: Supports EU customs operations with modules for customs documents (TLM), customs warehouse management (aCS), and intra-EU trade statistics (INTRASTAT).

Atlas: Used by VTTI terminals for warehouse and terminal operations, shipping, forwarding, and customs intermediation. Currently adapting for use in Croatia.

Nova Brix: A comprehensive solution for handling customs and excise goods, supporting import, export, transit, and safety declarations.

CIMIS: The Croatian Integrated Maritime Information System, connecting all maritime transport operators and continuously delivering data to EU central databases.

E-Carina: A system aimed at replacing paper customs procedures with a more efficient, secure, and modern electronic environment.

Nova Aplikacija (PCM): An internal system supporting various business processes at Luka Ploče d.d., with plans to expand to terminal operations.

PCS: A modular platform facilitating digital document exchange among port community members, supporting operational planning, and integrating with other IT systems.

SAP: Used by Ina d.d. for managing liquid cargo terminal operations, leveraging SAP ERP's comprehensive business process support.



PCS module types

PCS is a modular platform and as such currently consists of several modules of different purposes and functionality. PCS can be expanded with new modules that are classified into four categories:

- **Core modules:** Essential for digital document distribution, mandatory for all port community members.
- **Operational modules:** Support specific business processes like TOS, invoicing, and HR management, available but not mandatory for port community members.
- **Administration modules:** Internal to the Ploče Port Authority, supporting its services.
- **Integration modules:** Facilitate automatic integration between PCS and other IT systems in the port community.

PCS Integration options

PCS serves as a hub for electronic document exchange and business data aggregation, enabling two-way communication with external IT systems to automate port business processes. Integration can be achieved through:

- **ESB integration (Enterprise Service Bus):** Facilitates the exchange of digital documents via web services.
- **API integration (Application Programming Interface):** Allows for document generation within PCS through external system calls and supports large data exports/imports via specialized API platforms and services.



2. Stakeholder mapping and management

Starting from the definition of stakeholder:

“An individual, group or organization who may affect, be affected by, or perceive itself to be affected by a decision, activity or outcome of the project” (PMBOK Guide, 5th Edition),

The key stakeholders related to inbound/outbound road cargo of the PP’s ports have been identified and monitored adequately in order to ensure smooth project implementation and facilitate communication, paving the way for deliverables D.1.2.2 and D.1.3.2. For the objectives of the project the main stakeholders are listed below.

The following tables report their role and contribution to the project and the foreseen management level for each.

The level of attention due to stakeholders are defined as:

Keep satisfied: Stakeholders who have a relatively high level of influence but lower interest. Maintaining their satisfaction is key to preventing potential issues.

Manage closely: These stakeholders have high interest and influence over the project. Active management and close collaboration are essential to ensure their needs and expectations are met.

Monitor: Stakeholders with relatively low interest and influence. They should be monitored to ensure they are not overlooked if their influence or interest changes.

Keep informed: Stakeholders who are interested but lack significant influence over the project. Regular updates and transparent communication are essential to maintain their support.

2.1. LP1 - Port Network Authority of the Eastern Adriatic Sea

Name	Role	Benefits	Contribution	Conflicts	Current support	Strategies to improve support
Associations of road haulers of	Operators	Main end users of the IT tools	Feeding the implementation of project activities	Fear for privacy of commercial data	High	Continuous and regular meetings



the FVG Region		foreseen within the project				and feedbacks
Terminal Operators	Operators	Reliability and continuity of data exchange.	Commitment to exchanging data	Possible filtering data	High	Showing the added value of data exchange.
Freight Forwarders	Operators	Reliability and continuity of data exchange.	Commitment to exchanging data	Fear for privacy of commercial data.	High	Showing the added value of data exchange
Customs Agency	Public Authority	IT integration for smooth port entry/exit	Support in the implementation of pilot implementation	Not implementing IT components	High	Continuous and regular meetings and feedbacks

Due to their role in the port ecosystem and activities performed within the PCS, each stakeholder has been considered and involved in the implementation and maintenance of Sinfomar, with different attentions:

Keep satisfied	Manage Closely
- Freight Forwarders - Road hauliers	- Customs Agency
Monitor	Keep informed
-	- Terminal Operators



2.2. PP2 - North Adriatic Sea Port Authority - Ports of Venice and Chioggia

Name	Role	Benefits	Contribution	Conflicts	Current support	Strategies to improve support
Custom Agency	Processes customs declarations	Real-time information on freight leaving/entering the customs area	Real-time data exchange with the PCS	Limitation of data availability	High	Continuous and regular meetings and feedback
Guardia di Finanza (financial police)	Controls entry/exit to/from customs area	Digital help with controlling the customs area gates	Cooperation in adopting the new technologies	Possible resistance to change	High	Continuous and regular meetings and feedback
Road haulers	Bring to/carry out of the port the freight by road	Seamless flow through the port gates	Willingness to book a slot for freight collection/delivery	Possible resistance to change	Not yet fully involved	Showing the added value of data exchange
Terminals	Charge/discharge freight from the ships	Real-time information on freight leaving/entering the customs area	Real-time data exchange with the PCS	Fear for privacy of commercial data	High	Continuous and regular meetings and feedback
Freight forwarders	Arrange the logistics of international trade	Improved services	Commitment to exchanging data	Fear for privacy of commercial data	Not yet fully involved	Showing the added value of data exchange

Keep satisfied	Manage Closely
- Customs Agency - Truck drivers	- Guardia di Finanza - Terminals
Monitor	Keep informed
- Truck drivers	- Freight forwarders



2.3. PP3 - Port of Ravenna Authority

As MILEPORT Project examine the last mile connections for road transport process considering the following main phases related to the vehicles visiting the port area:

1. Booking of the arrive/announcement of the operations to be done
2. entrance/exit in port and tracking
3. gate in / gate out

We must consider as stakeholders all the subjects involved. We list the stakeholders considering them on the base of the activity carried out thus identifying categories of stakeholders.

Below, are identified the stakeholders on the basis of their relevance by using two variables:

- power of influence: that is, how much the stakeholder is able to influence, formally or not, the reaching of the project's objectives
- interest: that is, how much the project can affect the objectives and activities of the stakeholder

Name	Role	Benefits	Contribution	Conflicts	Current support	Strategies to improve support
Truck Companies	Services	The stakeholder is directly involved in the entrance/exit in port so, his effective and real involvement is crucial for the success of the project. Moreover, is one of the main	Assessment and direct involvement in the test of the pilot.	If the stakeholder will be uncooperative or if there will be any obstacles in their involvement, the project cannot reach its objectives.	Currently the stakeholder is not involved in this specific topic.	Face to face meetings and cooperative design of the pilot.



		users of a vehicle booking system				
Terminals	Services	The stakeholder is directly involved in the management of gates in port and in the logistic process so, its effective and real involvement is crucial for the success of the project.	Assessment and direct involvement in the test of the pilot.	If the stakeholder will be uncooperative or if there will be any obstacles in their involvement, the project cannot reach its objectives.	Currently the stakeholder is not involved in this specific topic.	Face to face meetings and cooperative design of the pilot.
Freight Forwarders	Services	The stakeholder is directly involved in the logistic process so, its effective and real involvement is crucial for the success of the project. Moreover, is one of	Assessment and direct involvement in the test of the pilot.	If the stakeholder will be uncooperative or if there will be any obstacles in their involvement, the project cannot reach its objectives.	Normally we have a good collaboration.	Face to face meetings and cooperative design of the pilot.



		the main users of a vehicle booking system				
Customs Agency	Authority	The support of the stakeholder is one of the main opportunities for the positive development of the pilot.	The stakeholder is directly involved as recipient of the data for tracking of the process and is the supplier of the data about the clearance of the goods.		Normally we have a good collaboration.	Face to face meetings
PCS Operator	Services	Is the only responsible for the development of the pilot.	Is the only responsible for the development of the pilot.		Normally we have a very good collaboration.	

Keep satisfied	Manage Closely
- Truck companies - Terminals - Freight forwarders	- PCS operator - Truck companies - Terminals - Freight forwarders - Customs Agency
Monitor	Keep informed
- Terminals - Port infrastructures operators	- Road infrastructures operators - Police - GdF



2.4. PP4 - Central Adriatic Ports Authority

Name	Role	Benefits	Contribution	Conflicts	Current support	Strategies to improve support
Maritime agencies	Operator	Main user of the IT systems	Feeding the implementation of project activities	Resistance to new procedures; fear for privacy of commercial data	high	Continuous and regular meetings and feedbacks
Freight forwarders	Operator	Main user of the IT systems	Feeding the implementation of project activities	Resistance to new procedures; fear for privacy of commercial data	high	Continuous and regular meetings and feedbacks
National customs office	Public Authority	IT interoperability for smooth port entry/exit	Commitment to exchange data	IT modules updating	high	Showing the added value of data exchange.
Financial corps	Public Authority	Real time IT system monitor security issues	Commitment to cooperate on security issues	Resistance to new procedures; IT system not compatible with internal procedures	high	Continuous and regular meetings and feedbacks



Harbour Master	Public Authority	IT interoperability for smooth port entry/exit	Commitment to exchange data	Resistance to new procedures; IT system not compatible with internal procedures	high	Showing the added value of data exchange.
Truck drivers	Operator	Main end users of the IT system	Feedbacks on the efficiency of the system	Resistance to new procedures; fear for delays in entry/exit procedure	high	Ensure smoothness of the system

Keep satisfied	Manage Closely
- maritime agencies - freight forwarders - National Customs agency (local office) - Finance corps - Border Police - Harbour Master	- Software companies in charge of the maintenance and evolution of the system
Monitor	Keep informed
- truck drivers	- Public institution such as Italian Ministry of Transport, Regional and local authorities



2.5. PP5 - Southern Adriatic Sea Port Authority (Ports Of Bari, Brindisi, Manfredonia, Barletta And Monopoli)

Name	Role	Benefits	Contribution	Conflicts	Current support	Strategies to improve support
Municipalities	Public	Reduction of Co2 emissions - increased traffic and tourism	-	-	-	-
Chamber of Commerce	Local Public authority	increased traffic and tourism	-	-	-	-
Apulia region	Regional Public Authority	Reduction of Co2 emissions - increased traffic and tourism				
Maritime Agencies	Private	Reduction of waiting time at the gates				
Transport enterprises	Private	Reduction of km travelled by trucks in the port areas	-	-	-	-
Coast guard	Public	Better organization in the port areas and Reduction of waiting time at the gates	-	-	-	-



Keep satisfied	Manage Closely
- Apulia region - coast guard - Maritime agencies	- coast guard - Maritime agencies - Transport enterprises
Monitor	Keep informed
- Apulia region - coast guard - Maritime agencies	- Apulia region - coast guard - Maritime agencies



2.6. PP6 - Port of Rijeka Authority

Name	Role	Benefits	Contribution	Conflicts	Current support	Strategies to improve support
Harbormaster's office	Inspection of navigation safety, inspection of the maritime domain	Pronounced increase of port efficiency and safety. No conflict.	Inspection and regulatory compliance.	None	High	Continuous and regular meetings and feedback.
Ministry of the Internal Affairs (Maritime police)	Port and operations security assessment and oversight	Pronounced increase of port efficiency and safety. No conflict	Security oversight and emergency response coordination .	None	High	Continuous and regular meetings and feedback.
Port operator	Harmonizing administrative procedures, optimization of terminal efficiency	Pronounced increase of port efficiency and safety. No conflict	Operational management and efficiency improvements.	None	High	Continuous and regular meetings and feedback.
Association of road carriers	Optimisation of terminal efficiency	Improvement of administrative procedures and financial savings for	Transport logistics and coordination .	None	High	Continuous and regular meetings and feedback.



		members. No conflict.				
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Keep satisfied	Manage Closely
- Forwarders	- Ministry of the Interior (Maritime police)
- Association of road carriers	- Harbour Master
Monitor	Keep informed
	- Terminal operators



2.7. PP7 - Port of Zadar Authority

Name	Role	Benefits	Contribution	Conflicts	Current support	Strategies to improve support
Terminal Operators	Operators	Reliability and continuity of data exchange.	Commitment to exchanging data	Possible data filtering	Medium	Showing the added value of data exchange.
Customs Agency Maritime Police Harbor Master Office Ministry of the Sea, Transport and Infrastructure	Public Authority	IT integration for smooth port entry/exit	Support in the implementation of pilot activities	Not implementing IT components	High	Continuous and regular meetings and feedbacks
Port Agents/Freight Forwarders, Ship Supply Agencies Shippers	Users	Reliability and continuity of data exchange.	Commitment to exchanging data	Fear for privacy of commercial data. Not implementing IT components	High	Continuous and regular meetings and feedbacks. Showing the added value of data exchange
End users	Users	Traffic info	-	-	None	Information availability

Keep satisfied	Manage Closely
- End users	- Customs Agency - Maritime Police - Harbor Master Office - Ministry of the Sea, Transport and Infrastructure



Monitor	Keep informed
- End users	- Port Agents - Freight Forwarders - Terminal Operators - Shippers



2.8. PP8 - Port of Ploče Authority

Name	Role	Benefits	Contribution	Conflicts	Current support	Strategies to improve support
Ministry of the Sea, Transport, and Infrastructure of the Republic of Croatia	Observational; They will be involved in dissemination	Development of the Port of Ploče and related activities	Adopted strategies and strategic plans of the Government of the Republic of Croatia	None	Indirect	Getting acquainted with the needs of The Port of Ploče for the purpose of their inclusion in future strategic decisions and plans
Luka Ploče d.d.	Main Concessionaire	Interest in energy and environmentally efficient solutions	Support in project implementation	None	Support in project implementation	Communication with port authority and dissemination of information
City of Ploče	Observational; Included in dissemination	Interest in energy and environmentally efficient solutions	None	None	None	Communication with port authority and dissemination of information
Dubrovnik-Neretva County	Observational; Included in dissemination	Interest in energy and environmentally efficient solutions	None	None	None	Communication with port authority and dissemination



						n of information
Dubrovnik-Neretva County Regional Development Agency – DUNE	Observational; Included in dissemination	Interest in energy and environmentally efficient solutions	None	None	None	Communication with port authority and dissemination of information
Ministry of Economy and Sustainable Development of the Republic of Croatia	Observational; Interest in sustainable (economic) development of the port	Interest in energy and environmentally efficient solutions	None	None	None	Communication with port authority and dissemination of information
Harbormasters Office	None; It is in the port authority building	They are in the port authority building and will benefit directly from the activities applied	Support in project implementation	None	Support in project implementation	Communication with port authority and dissemination of information
Police (Maritime & Border)	None; It is in the port authority building	They are in the port authority building and will benefit directly from the activities applied	Support in project implementation	None	Support in project implementation	Communication with port authority and dissemination of information
Carina	None; It is in the port authority building	They are in the port authority building and will benefit	Support in project implementation		Support in project implementation	Communication with port authority and dissemination



		directly from the activities applied				n of information
HEP Grupa	National energy company	Return of surplus produced el. energy to HEP Group	None	None	None	Communication with port authority and dissemination of data
Intermodal Transport Cluster	Project partner	Experienced	Support in project implementation	None	Support in project implementation	Communication with port authority and dissemination of information
Adriatic tank terminals d.o.o.	None; Concessionaire at liquid cargo terminal	Interest in energy and environmentally efficient solutions	Support in project implementation	None	Support in project implementation	Communication with port authority and dissemination of information
Media	None; Dissemination of information	Interest in energy and environmentally efficient solutions	None	None	None	Communication with port authority and dissemination of information
General Population	None; Dissemination of information	Interest in energy and environmentally efficient solutions	None	None	None	Communication with port authority and dissemination of information



Keep satisfied	Manage Closely
- Government agencies (transport, environment) - Shipping and cargo agencies - Associations - Local community	- Port of Ploče Authority - Terminal operators (Port of Ploče, ATT, NTF etc.) - Port Security - Customs - Freight forwards - Truck companies - Local logistics organizations
Monitor	Keep informed
- Government agencies (transport, environment) - Regional logistic organizations - Neighbouring ports - Nonprofit organizations	- Media - Local business



3. SWOT analysis

SWOT analysis serves to identify key internal and external factors perceived as important to achieving project objectives as they stem from previous project activities. All relevant elements are divided into two main categories:

- Internal factors — Strengths and Weaknesses
- External factors — Opportunities and Threats

Analysis may view the internal factors as strengths or as weaknesses depending upon their effect on the project objectives. Factors are derived from the previous steps of territorial need assessments, such as the examination of the respective port, future scenarios, stakeholder involvement and their feedback. The external factors may include stakeholders, technology, regulations and policies, cultural aspects, infrastructure, market demands.

Focus is to be placed on the accessibility of the respective port and the role played by current practices/procedures/IT tools.



3.1. LP1 - Port Network Authority of the Eastern Adriatic Sea

Strengths	Weaknesses
- FVG Region boasts the presence of several multimodal logistics platforms (3 ports and 4 RRTs), a consistent infrastructural endowment for a region of only 1.2 people. - Overall, the level of the infrastructure is good without criticalities in terms of operation and maintenance. - The level of cooperation among institutional players and private operators is generally good with a constant exchange and sharing of opinions and experience. - Advanced modular Port Community System (Sinfomar) already connected with interoperability with several external systems.	- The governance of the regional logistics infrastructure is still fragmented. - The road last mile connection to the port is the weakest part of the supply chain, also due to increasing volumes of traffic. - High costs for last mile connections among nodes.
Opportunities	Threats
- Increase of the volumes of traffic in the next fifteen years. - Strong interest expressed by major international investors interested in investing in the infrastructure of the Port of Trieste. - Availability of European and national funds for the strengthening of port and inland port infrastructure. - Increased safety in navigation. - Increase of port efficiency. - Extension of Sinfomar PCS with integration and full data exchange with hinterland dry-ports and the port of Monfalcone, in order to evolve it to a "Hinterland Community System" - Extend communication capabilities of Sinfomar with systems used by terminal operators. - Extend land side monitoring of incoming trucks with OCR systems.	- Strong competition at national and international level in the field of maritime and intermodal transport. - Geopolitical uncertainties. - Cyber security threats. - Safety of navigation issues.



3.2. PP2 - North Adriatic Sea Port Authority - Ports of Venice and Chioggia

Strengths	Weaknesses
- Gate-out procedures already partially digitalised	- Physical constraints due to the layout of the port gates
Opportunities	Threats
- Being the first port in Italy to provide a fully digitalised gate-in/gate-out service - Integration of data with other digitalised systems (e.g. motorways, local/regional traffic providers)	- Limited success in correctly reading the container ID number, due to the gate's layout



3.3. PP3 - Port of Ravenna Authority

Strengths	Weaknesses
- Port Community System implemented and daily used with all the functions related to the import and export processes. - Project for the development of a network of virtual gates at port level ongoing. - Active involvement of the Customs Agency - Port Community System implemented with functions for the management of the gate-in and gate-out of goods	- Lack of awareness about the relevance of an integrated ICT tool like the one proposed by the project - Level of computerization of the terminals - Tricky process of involvement of terminals and trucks companies
Opportunities	Threats
- New projects for the general accessibility of the port - The Port Community System will be implemented with some functionalities devoted to the gate management for the bulk and general cargoes - Good relationship with some of the main terminals (e.g. container terminal) - Very high maturity of the technologies and solutions available at national and international level	- Need of investments for the development of specific services for Terminal Operating Systems. - Complexity of the management of the involvement of the main stakeholders - Low level of interoperability of the IT systems of the terminals



3.4. PP4 - Central Adriatic Ports Authority

Strengths	Weaknesses
- availability of a highly digitalized system for the tracking and tracing of vehicles traffic flows, integrated with the national customs IT systems, AIDA - high potential for future integration of the IT system with road operators (ANAS) and rail operators to manage and monitor the vehicles traffic flow in the connection with the road infrastructure	- low propension to change habits and behaviours among the operators may lead to difficulties in introducing new procedures and IT systems
Opportunities	Threats
- financial opportunities from RRF and other national sources to further develop the current system and ensure its integration with other IT systems - possibility to exchange best practices and adopt solutions already tested in other port authorities	- Ever evolving IT tools and system may lead to an early obsolescence of the adopted systems; - New binding legislations at European or national level when the implementation of new procedures or IT systems is ongoing may lead to delays and not clear situations.



3.5. PP5 - Southern Adriatic Sea Port Authority (Ports of Bari, Brindisi, Manfredonia, Barletta and Monopoli)

Strengths	Weaknesses
- Strategic position - Presence of relevant production chains - Strong presence of international operators on the Ro-Ro - Strong tourist attraction of the territory - Multi-purpose identity - Incidence of maritime trade towards the Mediterranean - Continuous increase in freight, vehicles and passenger traffic	- Inefficiencies on intermodal trade - Diversity of ship services costs - Saturation of spaces for ferries - Insufficient intermodal connections - draft seabed - Absence in the TOP ranking - Inefficiencies on intermodal trade - Neighboring spaces - Long time for checking goods in transit - the Gaia gate functionality of the GAIA PCS is not available for all ports of the Southern Adriatic Ports Authority. - vehicle entry-exit management
Opportunities	Threats
- Corridor Scan - Med - Mediterranean strategy - Establishes Special Economic Zones - High speed Naples Bari - Development of the Sea Ways - Short Sea Shipping - Cooperation with the local University	- High number of competitors - Possible openings of new intercontinental routes - Development of alternative transport sectors - Traffic reduction - instability Ukraine, Black Sea, Middle East and North Africa zones - Decreased cruise flows in the Mediterranean - Industrial underdevelopment of the south Italy



3.6. PP6 - Port of Rijeka Authority

Strengths	Weaknesses
- A key port in the integration of the Croatian transport system and inclusion in international traffic flows, core TEN-T port - The most important intermodal center and the main cargo port of entry and exit for Central and Eastern Europe in the Republic of Croatia - Status of a port as a port of special (international) economic interest for the Republic of Croatia - Exceptional position on the Mediterranean and Baltic-Adriatic TENT corridor - Port of Rijeka Authority, instituted by Ministry of Sea, Traffic and Infrastructure, is a key solicitor of infrastructural and organizational changes in the port of Rijeka, including core and commonly used ICT systems - The port of Rijeka is connected by European road, rail transport corridors and common navigation and information systems - Proven record of inclusion of Port of Rijeka Authority in partnerships related to EU funded project execution, along with successful project completion - Ongoing project of PCS implementation using latest technologies, detailed study of port concessionaire's needs and cybersecurity / business continuity requirements, is at the time of TNA creation execution on time and within budget - Competent and flexible ICT implementation team	- Focus on operative tasks and lack of quality analysis and study of port concessionaires needs for commonly used ICT services - Caused by lack of funds and limited time available according to CEF funding rules, implementation of the new PCS system does not foresee a wholesome solution for access control and permits issuing - Port of Rijeka basin is very distributed geographically, covering many locations, several terminals and entry/exit locations, increasing complexity and implementation costs - Condition of electricity and other infrastructure and the need for certain modifications, upgrades and renovations (due to the frequency of the land network of 50 Hz, low transmission capacity of existing power lines) - Possible questionable availability of space for necessary modifications /upgrades, etc. - Many different port concessionaires (among which are also terminal operators), and other stakeholders, some of whom need access to port areas only occasionally, along with different modalities and duration of access permits, additionally complicates access control - A number of buildings in the status of protected cultural heritage (impossibility of implementation of measures and / or significant investment costs) - Possible insufficient general capacity to implement complex port sustainability development
Opportunities	Threats



- Permit issuing is a commercial process yielding revenue, increasing liquidity and solvency of Port of Rijeka Authority - Increase of revenue by introduction of new means of payment (prepaid, PayPal, credit card, SMS) - Modern system for permit issuing and access control enhances ISPS adherence for all stakeholders through traceability and analytics - Improving the state of the environment at the site level and beyond (reducing noise, emissions of pollutants and greenhouse gases into the air, light pollution, waste, etc.) - Continuation of further development of multidirectional dialogue - Reduction of operating costs, especially on the basis of reduced energy consumption - Proximity to the LNG terminal on the island of Krk - Increase in the quality of the offer - Modern equipment of the whole port (mechanization, infrastructure, etc.) - Promotion and development of a port as sustainable and green that advocates the public interest and the common good - Expansion of port capacities and opportunities in response to the increase in demand in maritime transport, including cruising tourism - Increase navigation safety	- Coordination and lack of cooperation of all participants, depending on current focus - Public procurement process for IT system implementation and upgrade may be lengthy and subject to revisions depending on appeals - Environmental pollution - Faster development of other ports - Slowness of administrative processes required during the implementation of projects / measures - Possible conflicts with other users or contenders for the same space and / or resources and / or infrastructure, etc. - General crises of various origins, especially those that may have an impact on the development of demand in the transport sector
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3.7. PP7 - Port of Zadar Authority

Strengths	Weaknesses
- Overall, the level of the infrastructure is good without criticalities in terms of operation and maintenance. - The level of cooperation among institutional players and private operators is generally good with a constant exchange and sharing of opinions and experience. - The road last mile connection to the port is excellent part of the supply chain	- central management system doesn't exist - The governance of the regional logistics infrastructure is fragmented.
Opportunities	Threats
- Increase of traffic and cargo volume. - Strong interest expressed by investors interested for expanding the infrastructure of the Port of Zadar. - Availability of European and national funds for the strengthening of port and inland port infrastructure. - Increased safety in navigation. - Increase of port efficiency. - implementation of centralised port management system - Extend land side monitoring of incoming vehicles with traffic video surveillance system.	- competition at national and international level in the field of maritime and intermodal transport. - Geopolitical uncertainties. - Cyber security threats.



3.8. PP8 - Port of Ploče Authority

Strengths	Weaknesses
- Larger port stakeholders are a part of parent global or regional organizations, and have inherited modern information systems that they use locally - Compared to the period when PCS was originally put into production, IT literacy and data culture have been significantly elevated - PCS currently covers a larger scope of functionality than the one conceived at the beginning of the design phase - Ploče Port Authority continuously participates in discussions with other stakeholders on the further development of PCS - Most port stakeholders invest some resources in improving internal IT systems that support port business activities - There is solid momentum in PCS adoption, where existing users intend to continue actively using PCS and others plan to become PCS users - PCS users in general have confidence in the support provided by the Ploče Port Authority when using PCS, and consider the Ploče Port Authority a reliable partner - The Ploče Port Authority fosters long-term and productive relationships with expert suppliers of port community systems	- The internal IT capacities of smaller members of the port community cannot meet all their business needs - The business needs of different categories of port community members vary widely from operational, functional, technological, financial and other aspects - PCS does not bring equal benefits to all users or users do not perceive benefits in the same way - Not all port community member organizations use PCS - Some PCS functionalities are not intended for widespread use, but are user-specific - There are divergencies in understanding the role of PCS in the port community - The internal capacities of the Ploče Port Authority are insufficient to independently lead numerous planned projects to improve the port IT
Opportunities	Threats
- Government agencies have access to EU funds financing mechanisms and are actively using them to develop and improve the port community IT landscape - At the national level, there is strong support and there are clear plans for national and local PCS as mandatory tools to optimize port business activities	- Changes in funding priorities from national or European financial mechanisms may adversely affect the dynamics of the realization of planned IT system improvement activities - Insufficient coordination in planning the development of relevant and dependent IT systems may lead to waiting times and delays in the development of internal IT functions



- It is necessary to take advantage of the available positive and negative experiences, as well as specific project results from other ports in Croatia and the Adriatic - There are options to commercialize individual modules and functionality of PCS, which could serve as an additional source of financing for further development of the system	- Some technologies used in the development of IT systems in port community member organizations are outdated, so support, documentation and human resources will soon not be available - Lack of active participation of the local and wider port community in making decisions on the development of IT systems could have a negative impact on adoption and use of these systems - Unless the portfolio of port IT system suppliers is diversified, significant delays in planned IT activities may occur
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4. Conclusions

LP1 - Port Network Authority of the Eastern Adriatic Sea

In assessing the current state of the last mile accessibility and IT systems of the respective ports involved in this project, several key themes have emerged from the detailed territorial, supply and demand, and IT systems analyses. This chapter synthesizes these findings, highlighting tools and practices that improve last mile accessibility, as well as identifying bottlenecks and potential areas for enhancement.

The ports within the scope of this analysis exhibit varying levels of traffic and connectivity infrastructure. The Port of Trieste, a major player in the region, handles the majority of the regional maritime traffic, with significant throughput in 2023 (over 55 million tons). The Port of Monfalcone, while smaller, shows a consistent increase in traffic, underscoring its role as an important regional hub. Both ports are strategically located along key TEN-T network corridors, enhancing their accessibility to Central and Eastern European markets through robust road and rail networks.

Availability and use of port connections:

- The Port of Trieste supports over 200 trains weekly, establishing itself as a critical rail hub. The significant modal share for rail transport highlights the port's emphasis on efficient, low-emission transport solutions. However, some regional traffic still relies on road transport due to proximity issues.
- Regional road networks, managed by entities like ANAS S.p.A. and Autovie Venete S.p.A., facilitate last mile connections. However, increasing traffic volumes pose challenges, indicating a need for continuous infrastructure upgrades.
- The presence of four intermodal terminals (Gorizia, Cervignano, Pordenone, and Trieste-Ferneti) further bolsters the region's logistic capabilities, enhancing the intermodal transport options available.

Technological solutions and ICT tools

Port Community Systems (PCS): The implementation of PCS across different ports showcases a significant move towards digitalization and operational efficiency:

- **Sinfomar (Port of Trieste):** This advanced PCS enables seamless data exchange among stakeholders, optimizing port logistics through electronic management of cargo handling, single-window systems, and interoperability with other ICT platforms. Continuous updates ensure compliance with evolving regulations and operational needs.



- **GAIA (Port of Bari):** Serving multiple ports, GAIA facilitates maritime security, ticketing, and passenger flow management. The system's comprehensive functionalities, including the issuance of security cards and integration with public security authorities, exemplify effective digitalization efforts.

Automated and integrated systems:

- **VTS and AIS systems:** Upgraded systems like the VTS in Rijeka enhance situational awareness and operational efficiency, integrating radar, AIS, and meteo data for comprehensive port management.
- **Customs and security systems:** Tools like the E-Carina system streamline customs procedures, enhancing security and efficiency at the external borders of the EU.

Ports like Trieste and Bari have well-developed PCS systems that manage pre-arrival notifications, cargo handling, and real-time data exchange. These systems reduce paperwork, enhance operational efficiency, and lower emissions by optimizing logistics flows. The integration of PCS with customs and security systems further streamlines port operations, making these ports highly competitive and efficient.

Ports with smaller throughput or regional focus, such as Monfalcone and those under the Southern Adriatic Sea Port Authority, are actively developing and enhancing their digital infrastructure. Projects funded by European and national initiatives are crucial for these ports to improve their operational capabilities and integration with larger logistic networks.

The comparative benchmarking study identifies best practices from the larger, more advanced ports that could be adapted by smaller ports. Key recommendations include:

- Smaller ports should prioritize the development and expansion of PCS to improve data exchange, operational efficiency, and stakeholder collaboration.
- Improving last mile connectivity through strategic investments in rail and road infrastructure can alleviate congestion and enhance the competitiveness of smaller ports.
- Access to European and national funding opportunities can support infrastructure upgrades and digital transformation initiatives, ensuring ports remain competitive in a rapidly evolving market.

The analysis highlights significant strides in the digitalization and operational efficiency of ports in the region. By leveraging advanced PCS systems, improving last mile connectivity, and embracing continuous technological advancements, these ports are well-positioned to enhance their competitiveness and meet future logistical challenges. The identified best practices and strategic



recommendations provide a roadmap for further improvements, ensuring sustainable growth and efficiency across the regional port network.

PP2 - North Adriatic Sea Port Authority - Ports of Venice and Chioggia

The North Adriatic Sea Port Authority (NASPA), encompassing the Ports of Venice and Chioggia, plays a pivotal role in the regional and international logistics network due to its strategic location and comprehensive multimodal transport capabilities. This analysis has highlighted several key areas regarding infrastructure, IT systems, and the port's operational environment, revealing a sophisticated yet continuously evolving logistics hub.

NASPA operates at the intersection of significant European transport corridors, notably the Mediterranean Sea Corridor and the Baltic-Adriatic Corridor. This strategic positioning enhances its role as a gateway for trade flows between Europe and Asia, supporting extensive connections to Central Europe, North Africa, and the Middle East. The unique access to inland waterways through the Po Valley further strengthens its logistics capabilities by supporting freight transport by barge.

The Port of Venice, covering over 2,045 hectares, features a robust infrastructure including over 30 kilometers of quays, 163 berths, and a dense network of road and rail connections. The port supports diverse cargo, including containerized freight, solid bulk cargo, and project cargo, facilitating trade in agri-food, steel, chemical, and energy sectors. The increasing railway traffic at the port, with around 4,400 trains in 2023 and projections for further growth, underscores its critical role in regional and international logistics.

NASPA employs advanced IT systems to enhance port operations, particularly through the Automated Gate System (AGS), which manages port gate operations and integrates with the Port Community System (PCS). The AGS facilitates seamless inbound and outbound logistics by automating truck and container processing, thereby enhancing efficiency and security. The PCS supports real-time data exchange among stakeholders, including customs, terminals, and freight forwarders, ensuring smooth and transparent operations.

Effective stakeholder management is crucial for NASPA's operations. Key stakeholders such as the Customs Agency, Guardia di Finanza, road haulers, terminals, and freight forwarders play vital roles in the port's logistics ecosystem. Continuous engagement and feedback mechanisms have been established to address potential conflicts, such as privacy concerns and resistance to change, ensuring smooth implementation of digital systems and processes.



SWOT summary

- NASPA boasts a strategic geographic location, advanced multimodal transport capabilities, and partial digitalization of gate-out procedures. The integration of a dense rail network enhances its connectivity to key European markets.
- The potential to be the first Italian port offering fully digitalized gate-in/gate-out services present a significant opportunity. Additionally, integrating data with other digitalized systems, such as motorways and local traffic providers, can further enhance operational efficiency.
- Physical constraints due to the layout of port gates and limited success in accurately reading container IDs highlight areas needing improvement.
- Strong competition at national and international levels, geopolitical uncertainties, and cybersecurity threats poses significant challenges. Ensuring the safety of navigation and maintaining robust IT security are critical for sustaining operational integrity.

Ports like Venice exemplify the benefits of advanced PCS and automated systems, which streamline operations, reduce manual processes, and enhance data transparency. These systems facilitate efficient handling of diverse cargo types and integration with hinterland transport networks. Smaller ports within NASPA's jurisdiction, such as Chioggia, are actively developing their digital infrastructure. Leveraging lessons from larger ports, these smaller entities can focus on expanding their PCS capabilities and improving last mile connectivity to enhance their competitiveness.

Recommendations

- Investing in the full digitalization of gate-in/gate-out procedures and expanding PCS functionalities can significantly enhance operational efficiency. Ensuring interoperability with other digital systems and continuous stakeholder engagement are key to successful implementation.
- Improving road and rail infrastructure to address bottlenecks and enhancing inland waterway transport can further solidify NASPA's role as a logistics hub. Strategic investments and leveraging EU and national funds will be crucial in this regard.
- Maintaining high standards of cybersecurity and navigation safety, coupled with regular updates to IT systems, will mitigate risks and ensure compliance with international regulations.

The North Adriatic Sea Port Authority stands out as a critical logistics hub with advanced digital capabilities and strategic multimodal connections. By addressing existing challenges and leveraging opportunities for digital and infrastructural enhancements, NASPA can continue to drive regional and international trade efficiently and sustainably.



PP3 - Port of Ravenna Authority

The Port of Ravenna Authority, overseeing one of Italy's most significant maritime ports, exemplifies a dynamic and evolving port environment. Situated strategically in the Central-North Western Adriatic Sea, the port benefits from its location in the economically vibrant Emilia-Romagna region. This analysis has underscored several key aspects of the port's infrastructure, IT systems, and stakeholder engagement, illustrating a comprehensive approach to enhancing port operations and connectivity.

The Port of Ravenna, distinctively positioned outside the urban landscape, allows for extensive infrastructural development. Spanning 21 square kilometers, the port boasts significant warehousing and storage capacities, with 14.5 kilometers of operational quays utilized by 27 terminal operators. The ongoing projects to deepen the Candiano Canal further enhance its capacity to accommodate larger vessels, underscoring its strategic importance in importing raw materials for regional industries.

The port is well-integrated into regional and national road networks through the Ravenna ring road, facilitating efficient access to the A14dir and E45 motorways. The port's balanced distribution of truck traffic and robust rail connections, with 54.87% of goods transported by rail on the north side of the canal, highlight its multimodal capabilities. This integration is crucial for maintaining seamless connectivity to its extensive catchment area, which includes various provinces in Lombardy, Veneto, and Marche, as well as international markets.

Port Community System (PCS) at Ravenna, developed in response to the needs of shipping agents and freight forwarders, is a cornerstone of the port's digital infrastructure. The PCS facilitates the coordination of customs formalities, ensuring data and document sharing under the "only one submission" principle. Despite the absence of a port-level vehicle booking system, the PCS supports interoperability with Terminal Operating Systems (TOS) and other competent authorities, enhancing the efficiency of import and export processes.

Effective stakeholder management is integral to the port's operations. Key stakeholders include truck companies, terminals, freight forwarders, and the Customs Agency. Continuous engagement and collaborative design of pilot projects are essential strategies to address potential conflicts and ensure the success of digital initiatives. The port's efforts in maintaining good relationships with stakeholders and the active involvement of the Customs Agency are pivotal for operational efficiency.



SWOT overview

- The Port of Ravenna has a well-implemented PCS used daily for import and export processes. Ongoing projects aim to develop a network of virtual gates at the port level, enhancing the management of gate-in and gate-out operations. The active involvement of the Customs Agency further strengthens the port's digital ecosystem.
- New projects to improve port accessibility and the implementation of gate management functionalities for bulk and general cargoes present significant growth opportunities. The availability of advanced technologies and solutions at national and international levels offers a pathway for continuous improvement.
- Challenges include a lack of awareness about the importance of integrated ICT tools, varying levels of computerization among terminals, and the complexity of stakeholder involvement. The low level of interoperability of IT systems across terminals poses additional challenges.
- The need for investments in specific TOS services, the complexity of stakeholder management, and the potential for low interoperability among terminal IT systems are critical threats that require strategic attention.

Ports like Ravenna demonstrate the benefits of having a comprehensive PCS that supports a wide range of port operations, from customs formalities to logistics coordination. The integration of such systems with TOS and other authoritative bodies ensures a seamless flow of operations and data exchange.

Smaller ports or those with emerging digitalization projects can learn from Ravenna's approach to stakeholder engagement and continuous system enhancement. The collaborative design of pilot projects and the integration of new functionalities into existing systems are best practices that can be adopted to improve operational efficiency and stakeholder satisfaction.

Recommendations

Investing in the further development of the PCS and the implementation of automated gate systems can significantly enhance the port's operational efficiency. Ensuring interoperability among various IT systems within the port community is crucial for seamless data exchange and process optimization.

Enhancing rail and road connections to address bottlenecks and improve last mile accessibility is essential. Strategic investments and leveraging available funds can facilitate these improvements, reinforcing the port's role as a key logistics hub.



Maintaining continuous and collaborative engagement with stakeholders, particularly through face-to-face meetings and cooperative pilot designs, is vital for the successful implementation of digital initiatives. Addressing potential conflicts and fostering a cooperative environment will ensure smoother project execution.

The Port of Ravenna Authority stands out as a dynamic and evolving port with robust infrastructure and advanced digital capabilities. By addressing existing challenges and leveraging opportunities for digital and infrastructural enhancements, the port can continue to drive regional and international trade efficiently and sustainably.

PP4 - Central Adriatic Ports Authority

The Central Adriatic Ports Authority, overseeing the Port of Ancona, stands out as a crucial hub in the Adriatic region, leveraging its strategic location and advanced digital systems to enhance port operations and connectivity. This analysis highlights the port's significant infrastructure, IT systems, and stakeholder management, emphasizing its role in regional and international trade.

The Port of Ancona, situated in the middle of the Italian Adriatic coast, benefits from its natural harbor and historical significance as a maritime hub. The port's strategic location makes it a critical point of reference for trade flows between Central and Northern Europe and the Southeastern Mediterranean. The port infrastructure spans 1.4 million square meters, with comprehensive facilities for passenger, ferry, container, and general cargo operations, featuring 26 quays with varying depths to accommodate different ship sizes.

Ancona's connectivity is enhanced by direct links to the A14 highway and the national railway network through the Adriatic railway line. The Ancona-Falconara airport further boosts its connectivity. As a key terminal for the motorways of the sea in the Adriatic-Ionian basin, the port facilitates significant RO-RO traffic, connecting to major European and Mediterranean destinations. Detailed traffic studies reveal extensive origin/destination pairs, highlighting the port's expansive catchment area and its role in facilitating East-West traffic flows.

The Central Adriatic Ports Authority employs a sophisticated Port Community System (PCS) that serves dual purposes: statistical data collection and sharing customs data among freight forwarders. The PCS is interoperable with national IT systems such as AIDA and PMIS, ensuring efficient customs clearance and data management. The introduction of the TinS – Transfer in Security system, based



on AI technology, further enhances the tracking and security of heavy vehicles entering and exiting the port, demonstrating the port's commitment to leveraging advanced technologies.

Effective stakeholder management is integral to the port's operations. Key stakeholders include maritime agencies, freight forwarders, the National Customs Agency, the Finance Corps, Border Police, and software companies responsible for system maintenance and evolution. Continuous engagement and collaboration with these stakeholders are essential for the successful implementation of digital initiatives and the smooth operation of port activities.

SWOT overview

- The availability of a highly digitalized system for tracking and tracing vehicle traffic flows, integrated with national customs IT systems, is a significant strength. The port's potential for future integration with road and rail operators enhances its capability to manage and monitor traffic flows effectively.
- Financial opportunities from the Recovery and Resilience Facility (RRF) and other national sources offer prospects for further system development and integration with other IT systems. The possibility to exchange best practices and adopt tested solutions from other port authorities presents additional growth opportunities.
- A low propensity to change habits and behaviors among operators may pose challenges in introducing new procedures and IT systems. Ensuring smooth transitions and stakeholder buy-in is crucial for successful implementation.
- The rapidly evolving nature of IT tools and systems may lead to early obsolescence of adopted systems. New binding legislations at European or national levels during ongoing implementation may cause delays and create ambiguities.

Ports like Ancona demonstrate the benefits of having a comprehensive PCS that supports a wide range of port operations, from customs formalities to logistics coordination. The integration of such systems with other national and international IT platforms ensures a seamless flow of operations and data exchange.

Smaller ports or those with emerging digitalization projects can learn from Ancona's approach to stakeholder engagement and continuous system enhancement. The collaborative design of pilot projects and the integration of new functionalities into existing systems are best practices that can be adopted to improve operational efficiency and stakeholder satisfaction.



In further development of the PCS and the implementation of advanced tracking and monitoring systems like TinS can significantly enhance the port's operational efficiency. Ensuring interoperability among various IT systems within the port community is crucial for seamless data exchange and process optimization.

Rail and road connections to address bottlenecks and improve last mile accessibility is essential. Strategic investments and leveraging available funds can facilitate these improvements, reinforcing the port's role as a key logistics hub.

Maintaining continuous and collaborative engagement with stakeholders, particularly through face-to-face meetings and cooperative pilot designs, is vital for the successful implementation of digital initiatives. Addressing potential conflicts and fostering a cooperative environment will ensure smoother project execution.

The Central Adriatic Ports Authority, particularly the Port of Ancona, exemplifies a well-integrated and advanced port system. By addressing existing challenges and leveraging opportunities for digital and infrastructural enhancements, the port can continue to drive regional and international trade efficiently and sustainably.

PP5 - Southern Adriatic Sea Port Authority (Ports of Bari, Brindisi, Manfredonia, Barletta and Monopoli)

The Southern Adriatic Sea Port Authority (AdSP-MAM), overseeing the ports of Bari, Brindisi, Manfredonia, Barletta, Monopoli, and Termoli, demonstrates the significant role of integrated port systems in enhancing regional and international trade efficiency. This analysis highlights the port authority's strategic initiatives, infrastructure, IT systems, and stakeholder engagement, which collectively contribute to its operational success.

The Southern Adriatic Sea Port Authority manages ports that are crucial gateways for regional and international trade, particularly with the Balkan Peninsula, the Middle East, and beyond. The ports benefit from extensive infrastructure, including 60 quays spanning approximately 12 km, and are well-connected to rail and road networks, supported by two major international airports. These ports handle diverse types of cargo and passenger traffic, reinforcing their significance in global maritime routes.



Port-Specific Developments:

- **Port of Bari:** A multipurpose port with significant expansion projects aimed at increasing dock lengths and depths, enhancing its capacity to handle various types of goods and passenger traffic.
- **Port of Brindisi:** Known for its strategic position as a natural gateway to Greece, the Balkans, and the eastern Mediterranean, Brindisi's port infrastructure supports a mix of military, recreational, commercial, and industrial activities.
- **Ports of Barletta, Manfredonia, Monopoli, and Termoli:** Each of these ports has unique features supporting diverse maritime activities, from commercial traffic and fishing to tourism, contributing to the region's economic development.

Technological advancements

The GAIA Port Community System (PCS), operational since 2011, is a cornerstone of the Southern Adriatic Sea Port Authority's digital strategy. Developed under the European Territorial Cooperation Program (ETCP) Greece-Italy 2007-2013, GAIA enhances maritime security and operational efficiency across the ports. Key functionalities include:

- **GAIA-PASS Module:** Facilitates the issuance of Vehicle Passes, streamlining access authorization and ensuring security.
- **GAIA-GATE Module:** Manages access control for Port Security and Port Facilities gates, providing real-time tracking of passengers and vehicles, significantly improving security and operational efficiency.
- **CRIO Portal:** Allows the Port Authority of Durres to access summary information on ferries arriving from Bari, although GDPR restrictions limit detailed passenger information exchange.

The GAIA system ensures seamless management of port operations, handling high traffic volumes efficiently even during peak periods. It supports over 2,000 users, including public bodies, police/security forces, shipping and port operators, and logistics companies, ensuring data security and compliance with GDPR.

Effective stakeholder engagement is vital for the success of the Southern Adriatic Sea Port Authority. Key stakeholders include municipalities, chambers of commerce, regional authorities, maritime agencies, transport enterprises, and the Coast Guard. Continuous collaboration and regular feedback mechanisms are essential to address potential conflicts and enhance support for digital initiatives.

Overview:



- The ports' strategic position, robust infrastructure, strong presence of international operators, and multi-purpose identity contribute to their competitiveness. The continuous increase in freight, vehicles, and passenger traffic underscores their growing importance.
- Initiatives such as the Corridor Scan-Med, Mediterranean strategy, establishment of Special Economic Zones, and the development of Sea Ways and Short Sea Shipping present significant growth opportunities. Cooperation with local universities can further drive innovation and development.
- Challenges include inefficiencies in intermodal trade, diversity of ship service costs, saturation of ferry spaces, insufficient intermodal connections, and the unavailability of GAIA gate functionality across all ports. Addressing these issues is crucial for maintaining operational efficiency.
- High competition, potential new intercontinental routes, instability in the Ukraine, Black Sea, Middle East, and North Africa regions, and decreased cruise flows in the Mediterranean pose significant risks. Industrial underdevelopment in Southern Italy also remains a concern.

Ports like those managed by the Southern Adriatic Sea Port Authority illustrate the advantages of having a comprehensive PCS that supports a wide range of port operations. The GAIA system's integration with national and international IT platforms ensures seamless data exchange and process optimization.

Smaller ports or those with emerging digitalization projects can learn from the Southern Adriatic Sea Port Authority's approach to system implementation and stakeholder engagement. The collaborative design of digital solutions and the integration of new functionalities into existing systems are best practices that can enhance operational efficiency.

Investing in the further development of the GAIA PCS and expanding its functionalities to all ports under the Southern Adriatic Sea Port Authority's management is essential. Ensuring interoperability among various IT systems within the port community will facilitate seamless data exchange and process efficiency.

Enhancing rail and road connections to address bottlenecks and improve last-mile accessibility is crucial. Strategic investments and leveraging available funds can facilitate these improvements, reinforcing the ports' role as key logistics hubs.

Maintaining continuous and collaborative engagement with stakeholders through face-to-face meetings and cooperative pilot designs is vital for the successful implementation of digital initiatives.



Addressing potential conflicts and fostering a cooperative environment will ensure smoother project execution.

The Southern Adriatic Sea Port Authority exemplifies the effective use of integrated port systems to enhance regional and international trade. By addressing existing challenges and leveraging opportunities for digital and infrastructural enhancements, the authority can continue to drive economic growth and development in the region.

PP6 - Port of Rijeka Authority

The Port of Rijeka Authority has established itself as a pivotal maritime hub in the Mediterranean and Baltic-Adriatic TEN-T corridors, leveraging its strategic location, robust infrastructure, and advanced technological implementations to enhance its competitive edge in the regional and global maritime industry. This analysis encapsulates the port's infrastructure, IT systems, market dynamics, stakeholder engagement, and strategic initiatives, highlighting its role in fostering regional economic growth and improving operational efficiency.

The Port of Rijeka, as the largest national port in Croatia, plays a crucial role in connecting the Mediterranean transport corridor with European rail and road networks. The port comprises specialized basins including Rijeka, Sušak, Bakar, Omišalj, and Raša, each tailored to different types of cargo, thereby enhancing its operational capabilities. Significant infrastructure developments, such as the Zagreb Deep Sea Container Terminal and the Adriatic Gate Container Terminal, have bolstered the port's capacity to handle increasing cargo volumes and large container ships.

Port of Rijeka has made substantial progress in digital transformation, particularly through the implementation of the Port Community System (PCS). This system facilitates smart data exchange between public and private port operators, enhancing efficiency in manifesting, vessel discharge and loading, customs clearance, and health and phytosanitary control. The PCS reduces procedural time, minimizes paper document usage, and improves port competitiveness. The integration of the PCS with the Croatian Integrated Maritime Information System (CIMIS) and other national systems ensures seamless data flow and coordination.

The Port of Rijeka Authority maintains robust collaboration with key stakeholders including the Harbormaster's office, Ministry of Internal Affairs (Maritime police), port operators, and the



Association of Road Carriers. Regular meetings and feedback mechanisms ensure continuous improvement in port operations and security, fostering a cooperative environment crucial for successful project implementation.

SWOT overview:

- The port's strategic position on major transport corridors, integration into the European road and rail network, status as a core TEN-T port, and ongoing PCS implementation using advanced technologies are significant strengths. The port's competent and flexible ICT implementation team further enhances its operational efficiency.
- The port has numerous growth opportunities including the introduction of new payment methods for permit issuing, proximity to the LNG terminal on the island of Krk, and the potential for expanding port capacities to meet increasing demand. The port's commitment to sustainability and environmental improvements also presents opportunities for enhanced public interest and the common good.
- Challenges include the geographical distribution of the port basins, the condition of existing infrastructure, the complexity of access control for various stakeholders, and the presence of protected cultural heritage buildings. These factors complicate infrastructure upgrades and the implementation of new systems.
- The port faces threats such as faster development of competing ports, environmental pollution, and the potential for general crises affecting the transport sector. Coordination challenges among stakeholders and lengthy public procurement processes for IT system upgrades also pose risks.

The Port of Rijeka exemplifies the benefits of a comprehensive PCS in enhancing port efficiency and competitiveness. The PCS at Rijeka has led to significant labor savings and streamlined administrative processes, serving as a model for other ports aiming to implement similar systems.

For ports with emerging digitalization projects, the Port of Rijeka's approach to system implementation and stakeholder engagement offers valuable insights. Collaborative design of digital solutions and integration with national and international systems are best practices that can be emulated to improve operational efficiency.

Continued investment in the development of the PCS and its integration with other IT systems is crucial. Ensuring comprehensive access control and permits issuing capabilities across all port basins will further enhance operational efficiency and security.



Enhancing rail and road connections to address bottlenecks and improve last-mile accessibility is essential. Strategic investments in infrastructure upgrades and leveraging available funds can facilitate these improvements, reinforcing the port's role as a key logistics hub.

Maintaining continuous collaboration with stakeholders through regular meetings and feedback mechanisms is vital for the successful implementation of digital initiatives. Addressing potential conflicts and fostering a cooperative environment will ensure smoother project execution.

The Port of Rijeka Authority has demonstrated significant advancements in enhancing port operations through strategic infrastructure developments and technological implementations. By addressing existing challenges and leveraging opportunities for digital and infrastructural enhancements, the port is well-positioned to continue driving regional economic growth and improving its competitive edge in the global maritime industry.

PP7 - Port of Zadar Authority

The Port of Zadar Authority plays a vital role in the maritime and economic landscape of Zadar County and Croatia at large. This analysis encapsulates the port's strategic importance, infrastructure, market dynamics, stakeholder engagement, and the need for modernization in its operational systems.

The Port of Zadar, located in Zadar County, is a key maritime gateway in Croatia, serving both passenger and cargo traffic. The port's strategic location on the Adriatic coast and its direct connections to major European transport networks, including road, rail, and air, enhance its significance as a logistics hub. The port's infrastructure includes a modern passenger terminal at Gaženica, multiple berths for domestic and international traffic, and a comprehensive cargo port with significant storage and handling capacities.

The port has seen consistent growth in both passenger and vehicle traffic over the past years. The New Port of Gaženica has enhanced the port's capacity to handle larger vessels and increased passenger and cargo volumes. The proximity to Zadar Airport and direct access to the highway



network further strengthen the port's connectivity, making it a crucial link between Central Europe and the Adriatic and Mediterranean seas.

Despite having good infrastructure, the Port of Zadar currently lacks a central port management system and relies heavily on manual tracking of operations. This presents an opportunity for significant improvements in efficiency and data management through the implementation of a Port Community System (PCS) and other IT solutions. Such advancements would streamline operations, enhance data exchange, and improve overall port efficiency.

The Port of Zadar operates in a competitive environment, facing competition from other regional and international ports. However, its strategic location, modern facilities, and the potential for further infrastructure development position it well to attract more traffic and cargo volume. The port's catchment area includes several Central and Eastern European countries, offering substantial market potential.

Effective stakeholder engagement is crucial for the Port of Zadar's operations. Key stakeholders include terminal operators, customs agencies, maritime police, the Harbor Master Office, and the Ministry of the Sea, Transport and Infrastructure. Regular meetings and feedback mechanisms are essential to maintain cooperation and ensure smooth implementation of any new systems or processes.

Overview

- The port boasts robust infrastructure, excellent last-mile road connections, and a cooperative environment among institutional players and private operators.
- There is significant potential for increasing traffic and cargo volumes, attracting investments, and leveraging European and national funds for infrastructure development. The implementation of a centralized port management system and traffic monitoring systems can further enhance port efficiency and safety.
- The lack of a central management system and fragmented governance of regional logistics infrastructure are key challenges. These gaps hinder the port's ability to fully optimize its operations and data management.
- The port faces competition at both national and international levels, geopolitical uncertainties, and cybersecurity threats. These factors could impact the port's ability to maintain and grow its market share.



Ports like the Port of Rijeka and other advanced ports in the region provide a benchmark for the Port of Zadar in terms of implementing comprehensive PCS systems. These systems have demonstrated significant improvements in operational efficiency and stakeholder collaboration, offering valuable lessons for Zadar.

For ports in the early stages of digital transformation, the Port of Zadar's initiative to implement centralized management and monitoring systems serves as a model for leveraging technology to enhance port operations.

Recommendations

- Investing in a PCS will streamline data exchange, improve operational efficiency, and enhance the port's competitiveness. This system should integrate with existing national and international systems to ensure seamless data flow and coordination.
- Further investments in rail and road infrastructure will improve last-mile connectivity and support the port's role as a logistics hub. Leveraging available European and national funds can facilitate these enhancements.
- Implementing robust cybersecurity protocols is essential to protect the port's IT infrastructure and data. Regular assessments and updates to security measures will mitigate potential threats.
- Maintaining continuous engagement with stakeholders through regular meetings and feedback mechanisms is vital for successful system implementations and operational improvements. Addressing stakeholder concerns and demonstrating the benefits of new technologies will foster cooperation.
- The port should capitalize on its strategic location and market potential by promoting its facilities and services to attract more traffic and cargo volumes. Enhancing marketing and promotional efforts will help in achieving this goal.

The Port of Zadar Authority, with its strategic location, modern infrastructure, and potential for technological advancements, is well-positioned to enhance its role in the regional maritime industry. By addressing existing challenges and leveraging opportunities for digital and infrastructural improvements, the port can drive regional economic growth and improve its competitive edge in the global maritime sector.

PP8 - Port of Ploče Authority



The Port of Ploče Authority plays a significant role in the Croatian and regional maritime economy, acting as a critical hub for international trade, particularly for Bosnia and Herzegovina. This analysis details the port's infrastructure, operational dynamics, stakeholder engagement, and IT landscape, highlighting its strengths, weaknesses, opportunities, and threats.

The Port of Ploče is recognized as one of Croatia's main ports of international economic importance, serving as a critical gateway for Bosnia and Herzegovina and other Central European countries. The port's strategic location on the Adriatic coast and its inclusion in the Pan-European Corridor Vc enhance its connectivity and market reach. The port's infrastructure includes modern facilities for dry bulk, liquid cargo, and container handling, with significant investments aimed at expanding capacities and improving operational efficiency.

The port handles a substantial volume of transit traffic, primarily serving Bosnia and Herzegovina. Its connectivity via railway and the E-73 road to Central Europe positions it as a vital link in the European transport network. The development of the Corridor Vc will further integrate the port into broader European logistics chains, enhancing its attractiveness to international shippers and logistics providers.

The Port of Ploče has made significant strides in adopting advanced IT systems, such as the Port Community System (PCS), to enhance operational efficiency and transparency. However, the complexity of its IT ecosystem necessitates continuous upgrades and integration efforts to meet the diverse needs of port community members. Smaller port stakeholders often lack the internal IT capacities to fully leverage these systems, highlighting the need for ongoing support and development.

The port operates in a competitive environment, facing challenges from other regional ports. However, its strategic location, modern infrastructure, and focus on sustainability provide a competitive edge. The port's role as a major transit hub for Bosnia and Herzegovina and its integration into European transport networks ensure its continued relevance and growth potential.

Effective stakeholder engagement is crucial for the Port of Ploče's operations. Key stakeholders include government agencies, terminal operators, logistics providers, and local communities. Continuous communication and collaboration are essential to align strategic goals and ensure successful implementation of new systems and processes.



SWOT overview

- The port benefits from modern infrastructure, strategic location, and strong support from government and international funding mechanisms. It has a robust IT system in place with significant adoption among stakeholders.
- There is potential for further expansion of port capacities, leveraging European and national funds for infrastructure development. The port's focus on sustainability and green initiatives aligns with global trends, enhancing its appeal to eco-conscious businesses. Commercializing individual modules of the PCS could provide additional funding for further development.
- Smaller port stakeholders often lack sufficient IT capacities, and there is variability in the perceived benefits of the PCS. Divergencies in understanding the role of PCS and insufficient internal capacities for leading IT projects are notable challenges.
- Changes in funding priorities, insufficient coordination in IT development, and outdated technologies pose risks to the port's operational efficiency and growth. Lack of active participation from the local and wider port community in decision-making could negatively impact the adoption and use of new IT systems.

Ports like Rijeka, which have successfully implemented comprehensive PCS systems, provide valuable insights and best practices for Ploče. Learning from their experiences can guide the Port of Ploče in optimizing its PCS implementation and integration efforts.

For ports in the early stages of digital transformation, Ploče's initiatives serve as a model for leveraging technology to enhance port operations and stakeholder collaboration.

Recommendations

Further investments in the PCS and integration with other IT systems will streamline operations, improve data exchange, and enhance overall port efficiency. Tailoring PCS functionalities to meet the diverse needs of different stakeholders will maximize its benefits.

Continued investments in infrastructure, particularly in rail and road connectivity, will enhance the port's role as a logistics hub. Leveraging available European and national funds can facilitate these enhancements.

Providing ongoing support and resources to smaller port stakeholders will ensure they can fully leverage IT systems, contributing to overall operational efficiency. Training programs and technical assistance can help bridge the IT capacity gap.



Maintaining continuous engagement with stakeholders through regular meetings and feedback mechanisms is vital for successful system implementations and operational improvements. Addressing stakeholder concerns and demonstrating the benefits of new technologies will foster cooperation.

The port's commitment to becoming a 'green' port aligns with global trends towards sustainability. Promoting and expanding these initiatives will attract eco-conscious businesses and enhance the port's reputation as a sustainable logistics hub.

Implementing robust cybersecurity protocols is essential to protect the port's IT infrastructure and data. Regular assessments and updates to security measures will mitigate potential threats.

The Port of Ploče Authority, with its strategic location, modern infrastructure, and focus on technological advancements, is well-positioned to enhance its role in the regional and international maritime industry. By addressing existing challenges and leveraging opportunities for digital and infrastructural improvements, the port can drive regional economic growth and improve its competitive edge in the global logistics sector.

