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DIONYSUS

Integrating Danube Region into Smart & Sustainable Multi-modal & Intermodal Transport Chains

Port development plans for Călărași, Turnu Măgurele and Orșova Ports

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Abbreviations

Abbreviation	Explanation
C.N. A.P.M	Compania Națională Administrația Porturilor Maritime S.A. Constanța
DR	Danube Region
IWT	Inland Waterway Transport
APDF Giurgiu	River Danube Ports Administration
MTI	Ministry of Transports and Infrastructure
c.m.	cubic meters
ft	force tones
BNS	National Bureau of Statistics
GIFP	Giurgiulesti International Free Port
RM	Republic of Moldova
CIS	Commonwealth of Independent States
EU	European Union
USA	United States of America
CCNR	Central Commission for the Navigation of the Rhine
DC	Danube Commission

1 Scope of the report

1.1 Project framework

WPT 4 - O.T 4.3 - CĂLĂRAȘI, TURNU MĂGURELE, ORȘOVA PORTS

Introduction

This document is developed within the Dionysus project financed by the Interreg Danube program. According to the work plan of the project, the purpose and structure of this project are the following.

a) Dionysus - framework

"In order to support the multimodal and intermodal transport corridors development in the Danube Region (DR), modern & reliable IWT, rail and road infrastructure in ports has to be available to the transport operators of both freight and passengers. The transfers of cargo between modes should be seamless, efficient and cheap.

This is facilitated by having terminals, preferably connecting more than two modes, in the right location, with the right cargo handling facilities, and the right level of capacity.

In this context, an important element of logistics and hinterland connectivity to consider is the link between the multimodal facilities and the location of economic zones and industrial areas. Inland ports and extended gates are important elements in this new development, by functioning as a facilitator for multimodal connections and as a platform for the DR.

At the infrastructure level, apart from missing links in the infrastructure for single modes, the main bottlenecks to be addressed would be at the level of transfer nodes or terminals

The provision of high-quality, smart, efficient infrastructures and transport services for freight transfers and passenger movements are considered among the economic prerequisites for further developing regional Transport Corridors.

Accordingly, DIONYSUS Project will assess the status and requirements of current infrastructures and transport services provision, with a particular focus on the Danube port-related multimodal connectivity infrastructure needs in the DR.

The project will carry out a multi-layered (infrastructure, transport market, and port development /services/ logistics) and multi-disciplinary assessment (infrastructure planning, transport, and cohesion policy, against regional market and trade considerations and realities) with a particular focus on port-related connectivity infrastructure needs (Danube Inland and seaports), market and trade considerations and realities) with a particular focus on port-related connectivity infrastructure needs (Danube Inland and seaports)

b) Objectives of the Project

Structure/Content

Dionysus is divided in 4(four) main working packages:

- WP T1 aims to provide a substantial knowledge basis regarding ongoing and future transport corridor developments in the Danube region as well as regarding their potential connections to transport corridors and networks in the Black Sea region.

The analyses and assessments carried out in this work package shall identify gaps in corridor planning and transport infrastructure of the DR. They also will deliver recommendations on how the Danube ports could gain importance through increased cargo flows thus creating economic prosperity in the DR as well as on the commercial and socio-economic impact on insufficient waterway maintenance.

Special attention will put on the identification and quantification of new markets for the Danube IWT.

Dedicated investigations will be carried out regarding the opportunities and potential threats for Container liner services which are considered as a pre-condition to develop container transport on the Danube of significance. Last but not least, the use of the Danube waterway and the interconnectivity with the corresponding transport corridor in the Black Sea region will be promoted with the help of a dedicated Strategy and an Action Plan.

- WP T2 Facilitating the full integration of Danube ports into the multimodal transport chains of the DR is the main objective of WPT2. The global economy is gradually increasing the demand for efficient cargo transfers. Being a connection point between two or more transport modes, ports are considered as main nodal points of multimodal transport chains. However, to achieve full integration in these transport chains, the connectivity and accessibility of the ports to the local/national, regional, and EU/international transport infrastructure networks are of vital importance. Also, adequate facilities and service provision to cargo & vessels charged according to a competitive and transparent pricing system, including port dues, availability of rail & road hinterland connections, smart coordination and connectivity along the transport chains are equally important. This WP will look into these competitiveness requirements.

- WP T3 Inland ports are recognized as crucial elements for the DR economy. Therefore, port development must be strategically embedded into both the regional economic development and transport policies.

Accordingly, WPT3 is responsible for integrated sustainable infrastructure port development and project capitalization activities supporting the optimal use, development and integration of ports into the DR's economic infrastructure and transport system. It proposes a transnational innovative approach that involves multi-level interdisciplinary assessments aimed at matching regional economic development, transport infrastructure and port planning, in-depth market analyses, infrastructure needs assessment for two distinct IWT market segments: the agricultural products and the river cruise industry.

The findings shall result in dedicated consolidated Strategies at DR level & Recommendations for agricultural product transport and for the sustainable development of the river cruise industry.

- WP T4 Port development is a strong instrument to reach a catalyst function for stimulating economic growth and create jobs in the Danube Region [DR].

The main objective of WPT4 is the elaboration of concrete port development plans as well as operational and business development plans and models for strategically relevant DR ports in order

to facilitate their integration into multi-/intermodal transport chains as well as improve their transport connections/links towards the hinterland. For this purpose, all findings of previously investigated WPs are reflected in this last work unit that delivers state-of-the-art development models and plans contributing to enhanced connectivity and following a transnational (corridor) approach.

All development plans comply with national/regional economic strategies and regional development plans of the related areas and are deployed fully in line with the port owners' long-term strategies and investment plans. The final documents will reflect all collected recommendations and are highly shaped by local economic, environmental and social factors "

In accordance with the work plan mentioned above an important outcome of the project DIONYSUS is the elaboration of concrete Port Development Plans for 3 Romanian ports - Călăraşi, Turnu Măgurele and Orşova in order to facilitate their integration into multi-/intermodal transport chains. (Output T 4.3)

The selection of the ports was based on several decision criteria such as potential in terms of location, operation, trans-shipment infrastructure, hinterland connections as well as on factors such as regional economic development, freight flows outlook, business community profiles.

These Port Development Plans will comply with National or Regional Economic Strategies or Regional Development Plans of the relevant areas and be deployed in line with the Business Strategies of the port owners. The pilot case investigations of these strategic relevant ports shall deliver sound papers which can be the basis for investment decisions.

These plans shall contain particular development projects which have a real chance for execution until 2030. They should be cross-checked with Regional Development Strategies of the respective areas.

Each elaborated plan should be integrated into the normal business papers of the ports and should be prepared in a way that a yearly update is possible.

1.2 Specific aspects

When developing OT 4.3, it is necessary to consider:

- The policy of the European Union regarding IWT, inland navigation and ports;
- The previous projects financed by the Interreg Danube Program related to navigation on the Danube - Dante, Daphne;
- Romanian national legislation regarding inland navigation and ports.

This Output will be based on the elaboration of the following documents:

Port Development Plans of Port of Orşova, Turnu Măgurele and Călăraşi Ports within the WPT4 Pilot Cases. An important outcome of the project DIONYSUS is the elaboration of concrete Port Development Plans for 3 Romanian ports in order to facilitate their integration into multi-/intermodal transport chains. The selection of the ports was based on several decision criteria such as potential in terms of location, operation, trans-shipment infrastructure, hinterland connections as well as on factors such as regional economic development, freight flows outlook, business community profiles, etc. These Port

Development Plans will comply with National or Regional Economic Strategies or Regional Development Plans of the relevant areas and be deployed in line with the Business Strategies of the port owners. The pilot case investigations of these strategic relevant ports shall deliver sound papers which can be the basis for investment decisions. These plans shall contain particular development projects which have a real chance for execution until 2030. They should be cross-checked with Regional Development Strategies of the respective areas. Each elaborated plan should be integrated into the normal business papers of the ports and should be prepared in a way that a yearly update is possible. At the same time, these plans shall be a central element of the yearly SWOT-analyses and budgeting processes of the ports of Orşova, Turnu Măgurele and Călăraşi.

Act. T 4.3: Activity description & Role of PPs according to the AF

This A.T 4.3 will be based on the elaboration of the following port development plans within the pilot casework package of WP4: Port Development Plan of Orşova Port Development, Plan of Turnu Măgurele Port Development and the Plan of Port Călăraşi Development.

Comprehensive industry and literature review conducted in projects such as DAPhNE revealed that despite their favourable location on a major European transport corridor, the actual development capacities of the Romanian ports Orşova, Turnu Măgurele and Călăraşi are by far not exploited at their full potential.

Despite some progress in recent years, underdeveloped port infrastructure and poor hinterland connections fail to attract emerging industries to use IWT as an alternative to other modes of transport.

As such, these development plans will identify main development directions and constitute a solid basis for future middle to long-term investment decisions. The focus will be set on particular development projects which have a real chance for execution until 2030.

Regarding the report O.T 4.3 that must be developed by the AAOPFR, certain clarifications are necessary.

The transport infrastructure in the ports of Călăraşi and Orşova belongs to the public domain of the state and is concessioned by the Romanian Ministry of Transport and Infrastructure to the Danube River Ports Administration (APDF Giurgiu).

APDF Giurgiu has the role of administrator of these ports on behalf of the state.

As regards the port of Turnu Măgurele, the port infrastructure belongs to the public domain of the state and is administered by the Town Hall of Turnu Măgurele.

In accordance with the Romanian legislation, presented below, the port infrastructure development strategy that belongs to the public domain of the state is elaborated by the Ministry of Transport and Infrastructure

The implementation of this strategy, which includes investment projects as well as infrastructure maintenance and modernization works, is the responsibility of the administrators of this infrastructure.

Regarding the development of the port superstructure and the carrying out the port operations of loading, unloading and stacking of goods, it is up to private economic operators' decision.

The private operators carry out their activity on the basis of a lease/concession contract of the infrastructure concluded with the port administration.

Investment projects and port infrastructure modernization works are done on the basis of a Feasibility Study developed by the infrastructure administrators.

In accordance with Government Decision 907/2016 that will be presented below, the Feasibility Study must necessarily contain, among others, the authorizations provided in the Urban Planning Certificate – at least the environmental authorization, the water management, fire protection authorization - and the construction authorization.

Also, the Feasibility Study must contain a technical project, the value of this project and the source of the funds that ensure the implementation of the project.

The authorizations mentioned above and the construction authorization are requested only by the infrastructure administrator and the Feasibility Study is approved by the Ministry of Transport and Infrastructure and by the Ministry of Finance.

The port development plans are drawn up by the port administration and approved by the Administration Council of the administration.

Regarding the business plans, these are those proposed by the private port operators and which include the lease/concession contracts of the port infrastructure.

During the preparation of these report, we had meetings with the representatives of the County Council and the Călăraşi City Hall and with the representatives of the Mehedinţi County Council.

Considering the provisions of Ordinance 22/1999, which states that the port development strategy is the competence of the Ministry of Transport and Infrastructure, the local authorities do not have projects in this regard.

Unlike the other PPs involved in this activity, which are administrators of the ports for which they will prepare the reports, AAOPFR is organised as **NGO,** in accordance with the Romanian legislation, whose members are river carriers and private port operators. In this context, AAOPFR, in accordance with Romanian legislation, cannot prepare a study of feasibility regarding the development of ports, nor to develop a business plan for a port where an operator with which our members are in competition operates.

As part of the T4 Activity, we proposed to develop an assessment of the future potential traffic of goods that could be attracted and operated until the year 2050, an assessment of the technical condition of the infrastructure and to make proposals regarding the works necessary to ensure a functional infrastructure.

The three ports that are the subject of this report are located on the Danube, part of the Rhine-Danube corridor within the general TEN-T network.

Romania has a sector of 1049 km of the navigable sector of the Danube. The Danube is connected to the port of Constanta, the largest port on the Black Sea and one of the largest in Europe, through the navigable Canals Danube - Black Sea and Poarta Alba - Midia – Năvodari.

Through this connection, the port of Constanta has become a hub for goods from the landlocked states bordering the Danube.

Romania also has the largest fleet (capacity and power) on the Danube.

Unfortunately, there are a number of bottlenecks that affect this mode of transport. First of all, there are bottlenecks that create problems regarding the safety and fluency of navigation and port operations.

The lack of the dredging works and the lack of the minimum navigation conditions make the navigation difficult or even blocked for long periods of time. This is especially the case of the sector under the administration of the Bulgarian authorities.

Thus, many ships were blocked for long periods of time, in the sector between Km 375 and Km 610, between 2011 and 2013, recording blockages between 40 and 90 days:

- 2011 27 powered ships - 205 barges - 205,612 tons of cargo;
- 2012 - August 53 powered ships - 139 barges - 68,132 tons of cargo,
  - September 174 powered ships - 380 barges - 314,223 tons of cargo;
  - October 42 powered ships - 98 barges - 81,452 tons of cargo;
- 2013 - July 37 powered ships - 118 barges - 136,477 tons of cargo;
  - August 56 powered ships - 148 barges - 153,190 tons of cargo.

The main categories of goods loaded on the barges were iron ore, coal, products, oil tankers, cereals.

The same situation has repeated in 2022, when no dredging works were carried out, making navigation difficult and even blocked for a period of about 3 months.

These blockages result in significant financial losses for carriers and at the same time the redirecting of large quantities of goods to other means of transport.

Another important cause is the disastrous state of infrastructure in Romanian ports. In the majority of ports, no maintenance work has been carried out for over 10 years. The minimum depths in the operating berths are not ensured. The road and railway connections are degraded or they are completely missing. The supply of water and electricity is not ensured for the vessels.

To the same extent, river transport activity is negatively influenced by the administrative barriers identified in the DANTE project and not solved yet.

Mainly these obstacles are generated by the lack of customs offices in all ports, the fact that the authorities are not connected to the RIS system, the multitude of documents that must be completed and last but not least the high level of port tariffs applied by the port administrations.

2 EU policy framework

The policy of the European Union regarding IWT, inland navigation and ports

Commissioner for Transport, Adina Vălean said: *"**As one of the most CO_2-efficient transport modes available, inland waterways have the potential to play a central role in decarbonising our transport systems. Yet today, our canals and rivers carry just 6% of EU freight. With an inland waterway network of 41,000km spanning 25 Member States, there is scope to do a lot more; both along our TEN-T corridors and in inner cities, where inland waterways can help to green the last mile of city logistics."***

Every year, these inland waterways serve to transport around 150 billion tonne-kilometres of cargo, carried by about 15,000 cargo vessels, while some 3,000 day-trip passenger vessels and 430 cruise vessels (>12 passengers) are in operation.

At the level of the Union, the amount of goods transported on inland waterways is approx. 250 million tons annually, of which approx. 210 million tons in the Rhine/Switzerland area. The rest of approx. 40 tons are transported on the Danube, of which approx. 20- 25 million tons on the Romanian sector of the Danube

The already high modal share of inland waterway freight transport in some countries such as the Netherlands (42.7%), Romania (28.1%) or Bulgaria (31.8%) , as well as the increasing use of inland waterway transport in urban logistics in some of the EU's most congested cities , highlight the great potential of the sector where the conditions are right.

The European Green Deal called for decisive action to shift a substantial part of the freight transported by road (currently accounting for 75% of inland freight) to inland navigation and rail, namely through measures to increase the capacity of inland waterways from 2021. Similarly, the Sustainable and Smart Mobility Strategy adopted on 9 December 2020, which lays the foundation for how the EU transport system can achieve its green and digital transformation and become more resilient to future crises, underlined the need to increase the use of more sustainable transport modes, and indicated that inland waterway transport and short-sea shipping should increase by 25% by 2030 and by 50% by 2050.

In 2021, the Commission published the NAIADES III Communication - Boosting future-proof European inland waterway transport, which establishes a set of measures for the implementation of the European Green Deal and the Sustainable and Smart Mobility Strategy.
The measures mentioned above incorporate transport, environmental, digital, energy and fiscal policies, backed up with financial incentives.

The main goals are:

- **Fit-for-future infrastructure for optimised navigation**
To achieve this goal, it must be taken into account that the use of the EU's inland waterway network is currently not optimised due to the lack of coherent infrastructure and fairway quality assurance. First and foremost, river navigation depends on precipitation and adequate water levels for its operations. Droughts and floods can severely disrupt transport activities by: temporarily blocking waterway sections, imposing restrictions on the amounts of loads transported, and requiring additional vessels to compensate reduced load factors, or even a

shift to other modes. Such disruptions significantly hinder the capacity of inland waterway transport to attract more freight volumes away from road transport. And as a consequence of climate change, such weather-related disruptions will occur more often, with waterborne transport services and infrastructure on the front line.
In 2021 The Commission adopted a legislative proposal for the revision of Regulation (EU) 1315/2013 – Union guidelines for the development of the trans-European transport network (TEN-T)
In the art 22 of the proposal the Good Navigation Status is defined:
"2. Member States shall ensure that the inland waterway network, including connections referred to in Article 20(1), point (e), is maintained to enable efficient, reliable and safe navigation for users by ensuring minimum waterway requirements and levels of service and by preventing the deterioration of these minimum requirements or any of its defined underlying criteria (Good Navigation Status).
…

6. The Commission shall ensure a coherent approach on the application of the good navigation status in the Union and may adopt guidelines thereto. When establishing minimum requirements for paragraphs (e) and (f), the Commission shall ensure that the interoperability between river basins is not compromised."

- Seamless integration into multimodal mobility and logistics systems
Making inland waterways more reliable as a means of transport requires action beyond the waterways. By 2030, the European inland waterway network can and must be connected as much as possible – both physically and digitally – to other transport modes. Yet today, interoperability between inland ports and hinterland connections remains an issue, and the number of multi-modal platforms and transhipment nodes is insufficient.
The Combined Transport Directive is currently the only EU legal instrument that directly supports intermodal transport. The Commission will use its upcoming revision to fully integrate inland waterways as an essential component of intermodal transport. The existing regulatory framework should be turned into an effective tool to support multimodal freight operations involving rail, inland waterway transport and short-sea shipping.

- Greening inland waterways infrastructure and ports
An integrated approach is therefore essential when considering future inland waterway transport infrastructure developments, taking into account transport needs but also environmental and societal concerns, as well as the multiple functions of waterways and ports in terms of regional economic development, water supply, energy generation and biodiversity.
In 2021, the European Commission will adopt technical guidance on climate-proofing to help promoters take into account climate and environmental objectives when investing in transport infrastructure. Furthermore, as part of this integrated approach, the Adaptation Support Tool may support the development of climate change adaptation strategies and plans for inland waterways. The European Commission also supports a better integration between the Water Framework Directive and navigation policies, by providing support for integrated planning of inland waterways and a better implementation of the environmental legislation.

Another goal is to develop inland ports as multimodal alternative fuels infrastructure hubs.

The Commission will propose a revision, in 2021, of the **Directive 2014/94/EU on the deployment of alternative fuels infrastructure**, with the aim of ensuring that the necessary

recharging and refuelling infrastructure for zero-emission vessels is deployed in inland ports by 2030. As part of this revision, the Commission will assess how air quality in ports can be further improved, for instance, by making on-shore power supply available so that vessels are able to turn off their engines while at berth, with positive knock-on effects for the health of nearby residents and workers. It will also consider how inland ports can become crucial alternative fuels infrastructure hubs for multiple modes of transport.

- More attractive and sustainable jobs in inland waterway transport.

Approximately 44,000 people work on inland vessels, of which 60% in goods transport and 40% in passenger transport. Like other modes of transport, the inland waterway transport sector suffers from a lack of attractiveness, in particular for young people and women. A typical working conditions and lack of information appear to be among the main causes.

The current and future workforce needs to be equipped with the right skills to deal with the green and digital transitions, cyber-security, synchro - modality and the automation of vessels and infrastructure. Policies for lifelong learning need to be developed so that new technology can be introduced in a smooth and safe manner. Digitalisation and automation in the sector could also create new opportunities.

In 2017 the Directive (EU) 2017/2397 on the recognition of professional qualifications in inland navigation was approved.

This Directive lays down the conditions and procedures for the certification of the qualifications of persons involved in the operation of a craft navigating on Union inland waterways, as well as for the recognition of such qualifications in the Member States.

CESNI works on the draft standards of future European Manning Regulations.

- Transitioning to zero-emission inland waterway transport

Given the age structure of the fleet, considerable investment will be needed to ensure that vessels meet environmental, climate and safety requirements in line with the increased ambition of the European Green Deal. However, the predominance of small owner-operators, the vast diversity of shipping solutions and hydro-morphological conditions across EU inland waterways, the lack of market-ready low-carbon alternative fuels, as well as the challenging economic situation mean that the sector faces numerous barriers to investing and organising itself to implement sector-wide innovative solutions.

The greening of the inland waterway fleet should also be promoted through regulatory and financial incentives to ensure and speed up the deployment of affordable zero-emissions vessels and related low-carbon fuels and infrastructure.

- Smart inland waterway transport

It is imperative for the inland waterway transport sector to keep up with digital developments to improve the sector's competitiveness and ensure that it becomes an active part of broader multimodal chains 57. Further digitalisation can play a significant role in improving the efficiency and reliability of navigation and traffic management, better integrating inland

waterway transport in logistics processes and multimodal chains, and reducing the administrative burden and costs of complying with and enforcing legislation 58 .

Since 2005, steps have been taken to support the deployment of harmonised river information services (RIS) to enable seamless transport and traffic management on European inland waterways 59 . The RIS Directive has been one of the main drivers of digitalisation in the inland waterway transport sector through the introduction of information and communication technologies. The evaluation of Directive 2005/44/EC on RIS found that the Directive has provided a strong impulse to standardise and harmonise river information services across Europe and improve safety.

The Commission has started preparations for a possible revision of the RIS Directive in 2022. In order to complete RIS deployment by 2030, the Commission is also calling on Member States to further implement smart traffic and transport management solutions in inland waterway transport, with a specific focus on harmonised corridor management based on RIS.

- Governance

The main governing structures relevant for the EU inland waterway transport sector are the European Union, the CCNR, the Danube Commission, and the United Nations Economic Commission for Europe (UNECE). International river commissions, such as CCNR or the Danube Commission, have enabled, for more than a hundred years, free navigation on their own respective basins, including with non-EU countries.

This governance setup is complex and its simplification could lead to further harmonisation of EU policy and reduce the administrative burden at EU and Member States level, thus increasing the sector's efficiency. The European Commission will continue to work with the CCNR, the Danube Commission and the Permanent Secretariat of the Transport Community to ensure, where appropriate, the coordination between the EU policies and the policies of these international organisations and indicate the possibilities for support through CEF.

Set up in 2015, the European Committee for drawing up common standards in the field of inland navigation (CESNI) has helped to the internal market through the development of technical standards for vessels and crew. While CESNI will continue developing technical standards, the governance framework should further be addressed and enhanced through the various Member States' and stakeholders' expert groups that the Commission set up in 2017.

The Commission will continue supporting CESNI through the Connecting Europe Facility in order to develop harmonised EU technical standards for inland waterway transport.

3 Romanian policy framework

ROMANIAN LEGISLATION REGARDING IWT

The main laws governing IWT in Romania are:

3.1 GOVERNMENT ORDINANCE 42/1997 on naval transport

This ordinance establishes the specific rules applicable to maritime transport and inland waterways, the way of organizing the institutional system in this field and the bodies that are part of this system, the specific rules regarding the safe conduct of navigation, as well as the specific rules applicable to ships, their personnel and the personnel who carry out naval transport activities, related activities and their auxiliary activities.

3.2 GOVERNMENT ORDINANCE 22/1999 regarding the administration of ports and waterways, the use of naval transport infrastructures belonging to the public domain, as well as the conduct of naval transport activities in ports and on inland waterways

- This ordinance regulates the administration and use of the naval transport infrastructure, the way of organization and operation of port and/or inland waterways administrations, as well as the way of authorization and carrying out of naval transport activities.

- The provisions of this ordinance apply in ports and on inland waterways to all ships and all naval transport and related activities that take place in these areas.

For this report O.T 4.3, the following articles from O.G. 22/1999 are important:

> ***Art. 4****. (1) The Ministry of Transport, hereinafter referred to as the ministry, is the state authority in the field of naval* ***transport that elaborates and coordinates the policy and development programs of the naval transport system*** *and, as a regulatory authority, elaborates and promotes the normative acts and specific norms regarding navigation safety, administration , the use and concession of the naval transport infrastructure, the carrying out of naval transport activities in the ports and navigable national waters of Romania and ensures the fulfilment of the obligations of the state from the international agreements and conventions to which Romania is a party.*
>
> *(2) The Ministry fulfils its duties provided for in paragraph (1) directly or through the direction that coordinates the naval transport activity, hereinafter referred to as the direction, or, by delegation of competence, as the case may be, through public institutions, autonomous administrations and national companies or companies subordinated or under its authority.*
>
> *(3) The Directorate coordinates the public institutions, autonomous administrations, national companies and commercial companies in the field of naval transport provided for in paragraph*

(2) and controls the port and/or inland waterway administrations regarding the application of the provisions of this ordinance.

Art. 5. - Ensuring the administration of ports and inland waterways**, tracking or ensuring the provision of security services provided for in art. 19 para. (1) lit. b) point 1 and ensuring the performance of the auxiliary activities provided for in art. 19 para. (1) lit. c) point 1 **are made by port and/or inland waterway administrations, hereinafter referred to as administrations.

***Art. 7.** - (1) Ports are areas delimited from the national territory, located on the shore of the sea or an inland waterway, built and equipped in such a way as to allow the reception and accommodation of ships, the carrying out of the naval transport activities provided for in art. 19, as well as other regulated activities.*

(2) The port includes infrastructure elements and port superstructure.

(2¹) Constitutes elements of port infrastructure: port lands, hydrotechnical constructions intended for mooring ships and/or related to ports, port basins inside ports, access channels to ports, railways, technological roads, installations and equipment located in the port perimeter and which are intended for the supply of utilities, the water bodies.

(2²) Constitutes elements of the port superstructure: the installations and equipment necessary for the handling of goods, the constructions intended for the storage and processing of goods, other special buildings and constructions, the port platforms, the installations and equipment for taking over waste, including that generated by ships, the systems of directing traffic from the port perimeter, as well as any other goods that by their nature or destination serve any of the naval transport activities provided for in art. 19.

(3) Ports are classified as follows:

a) from the point of view of the form of ownership of the port lands:

1. ports whose lands belong to the public domain of the state;

2. ports whose lands belong to the public domain of the administrative-territorial units;

3. ports whose lands are private property;".

***Art. 12. -** (1) **The development of ports whose lands belong to the public domain of the state or of the administrative-territorial units is carried out in accordance with the policy and development programs developed by the ministry or by the administrative-territorial units, as the case may be, with the prior consultation of port and/or inland waterway administrations and representative** and legally established employer and professional associations.*

*(2) **New investments, modification and modernization works and any other intervention works regarding the existing naval transport infrastructure in the ports provided for in art. 7 para. (3) lit. a) point 1 is approved by the ministry.***

*(3) **New investments, modification and modernization works and any other intervention works regarding the existing naval transport infrastructure in the ports provided for in art. 7 para. (3) lit. a) point 2 is approved by the councils of the administrative-territorial units, only after obtaining the approval of the ministry.***

Art. 22. - *The port administrations provided for in art. 5 can be public institutions, autonomous administrations, national companies or societies.*

Art. 23. - *(1) In the ports where the port infrastructure belongs to the public or private domain of the state, the port administrations are established by decision of the Government as units operating under the subordination or authority of the ministry.*

(2) In the ports where the port infrastructure belongs to the public or private domain of the administrative-territorial units, the port administrations are established by decisions of the deliberative local public administration authorities and are subordinate or under the authority of the respective local public administration authorities.

Art. 24. - *(1)* ***The port administrations provided for in art. 23 mainly have the following obligations:***

a) to make the port infrastructure available to all users, freely and non-discriminatory;

b) ***maintain, repair, modernize, develop and maintain the minimum technical characteristics of the port infrastructure****, as established by the design plans or technical books related to each infrastructure element or groups of elements representing a functional unit, located in their management or ownership;*

3.3 GOVERNMENT DECISION no. 907 / 2016 - regarding the elaboration stages and framework content of the technical-economic documentation related to the investment objectives/projects financed from public funds

This ordinance regulates the stages and documents related to making investments or modernization works of port infrastructures

Chapter I General provisions

Article 1 (1) This decision regulates the stages of development and the framework content of the technical-economic documentation for the realization of new investment objectives/projects in the field of construction, intervention works on existing constructions and other investment works, hereinafter referred to as investment objectives, whose expenses, intended for the realization of fixed assets of the nature of the public domain...

(*2) The documentation provided for in para. (1) is elaborated, in stages, as follows:*

a) in stage I:

(i) conceptual note;

(ii) design theme;

b) in stage II:

(i) the pre-feasibility study, as appropriate;

(ii) ***the feasibility study or the approval documentation of the intervention works, as the case may be****;*

c) in stage III:

(i) project for the authorization/cancellation of the execution of the works;

d) in stage IV:

(i) the technical execution project.

The documents that must be included in the feasibility study are presented in Annex 1 of GD 907/2016

" FEASIBILITY STUDY

*- frame-content*1) -*

*Note: *1) The framework content of the feasibility study can be adapted, depending on the specifics and complexity of the proposed investment objective.*

A. WRITTEN PLAYS

***1.** General information regarding the investment objective*

1.1. Name of the investment objective

1.2. Principal loan officer/investor

1.3. Credit orderer (secondary/tertiary)

1.4. The beneficiary of the investment

1.5. The developer of the feasibility study

***2.** The existing situation and the need to achieve the objective/investment project*

2.1. The conclusions of the pre-feasibility study (if it was prepared beforehand) regarding the current situation, the need and opportunity to promote the investment objective and the technical-economic scenarios/options identified and proposed for analysis

2.2. Presentation of the context: policies, strategies, legislation, relevant agreements, institutional and financial structures

2.3. Analysis of the existing situation and identification of deficiencies

2.4. Analysis of the demand for goods and services, including medium- and long-term forecasts regarding the evolution of demand, in order to justify the need for the investment objective

2.5. Objectives expected to be achieved by making the public investment

***3.** Identification, proposal and presentation of at least two technical-economic scenarios/options for achieving the investment objective*2)*

*Note: *2) If a pre-feasibility study was developed prior to this study, at least two technical-economic scenarios/options will be presented from those selected as feasible at the pre-feasibility study phase.*

For each technical-economic scenario/option, the following will be presented:

3.1. Particularities of the site:

a) description of the site (location - intra-urban/extra-urban, land area, plan dimensions, legal regime - nature of the property or title, easements, right of pre-emption, public utility area, information/obligations/constraints extracted from urban planning documents, as the case);

b) relations with neighbouring areas, existing accesses and/or possible access ways;

c) proposed orientations towards the cardinal points and towards the natural or constructed points of interest;

d) pollution sources existing in the area;

e) climatic data and relief features;

f) the existence of:

– building networks in the location that would require relocation/protection, to the extent that they can be identified;

– possible interference with historical/architectural monuments or archaeological sites on the site or in the immediately adjacent area; the existence of specific conditions in the case of the existence of protected or protection areas;

– lands belonging to institutions that are part of the defence system, public order and national security;

g) geophysical characteristics of the land in the location - extracted from the geotechnical study prepared according to the regulations in force, including:

(i) seismic zoning data;

(ii) preliminary data on the nature of the foundation land, including conventional pressure and maximum water table;

(iii) general geological data;

(iv) geotechnical data obtained from: plans with the location of boreholes, complex sheets with the results of laboratory determinations, groundwater analysis, geotechnical report with recommendations for foundations and consolidations, geotechnical zoning maps, accessible archives, as appropriate;

(v) being in risk areas (earthquake, landslides, floods) in accordance with the technical regulations in force;

(vi) characteristics from a hydrological point of view established on the basis of existing studies, documentation, indicating the sources of information stated bibliographically.

3.2. Description from a technical, constructive, functional-architectural and technological point of view:

- technical characteristics and parameters specific to the investment objective;

- the constructive variant of making the investment, with the justification of its choice;

- equipment and equipment specific to the proposed function.

3.3. Estimated investment costs:

– the estimated costs for achieving the investment objective, taking into account the costs of similar investments, or cost standards for similar investments relative to the technical characteristics and parameters specific to the investment objective;

– the estimated operating costs during the standard lifetime/depreciation of the public investment.

3.4. Specialized studies, depending on the category and importance class of the constructions, as the case may be:

– topographic study;

– geotechnical study and/or analysis and land stability studies;

– hydrological, hydrogeological study;

– study on the possibility of using alternative high efficiency systems to increase energy performance;

– traffic study and circulation study;

- preliminary archaeological diagnostic report for expropriation, for investment objectives whose locations are to be expropriated for reasons of public utility;

– landscape study in the case of investment objectives that refer to landscaping and green spaces;

– study on the value of the cultural resource;

- specialized studies required depending on the specifics of the investment.

3.5. Indicative graphs for making the investment

***4.** Analysis of each proposed technical-economic scenario/option(s)*

4.1. Presentation of the analysis framework, including specification of the reference period and presentation of the reference scenario

4.2. Analysis of vulnerabilities caused by risk factors, anthropogenic and natural, including climate change, that may affect the investment

4.3. Utilities situation and consumption analysis:

– the need for utilities and relocation/protection, as the case may be;
- solutions for ensuring the necessary utilities.

4.4. Sustainability of achieving the investment objective:
a) social and cultural impact, equal opportunities;
b) estimates regarding the labour force employed by making the investment: in the realization phase, in the operation phase;
c) the impact on environmental factors, including the impact on biodiversity and protected sites, as appropriate;
d) the impact of the investment objective in relation to the natural and human context in which it is integrated, as appropriate.

4.5. Analysis of the demand for goods and services, which justifies the dimensioning of the investment objective
4.6. Financial analysis, including the calculation of financial performance indicators: cumulative flow, net present value, internal rate of return; financial sustainability
*4.7. Economic analysis*3), including the calculation of economic performance indicators: net present value, internal rate of return and cost-benefit ratio or, as appropriate, cost-effectiveness analysis*
*4.8. Sensitivity analysis*3)*

Note **3) As an exception to the provisions of points 4.7 and 4.8, in the case of investment objectives whose estimated total value does not exceed the threshold for which the technical-economic documentation is approved by a Government decision, according to the provisions of Law no. 500/2002 on public finances, with subsequent amendments and additions, the cost-effectiveness analysis is elaborated.*

4.9. Risk analysis, risk prevention/reduction measures
***5.** Optimum technical-economic Scenario/Option, recommended*
5.1. Comparison of the proposed scenarios/options, from a technical, economic, financial, sustainability and risk point of view
5.2. Selection and justification of recommended optimal scenario/option(s)
5.3. Description of the recommended optimal scenario/option(s) regarding:
a) obtaining and arranging the land;
b) ensuring the utilities necessary for the operation of the objective;
c) the technical solution, including the description, from a technological, constructive, technical, functional-architectural and economic point of view, of the main works for the basic investment, correlated with the qualitative, technical and performance level resulting from the proposed technical-economic indicators;
d) technological samples and tests.

5.4. The main technical-economic indicators related to the investment objective:
a) maximum indicators, respectively the total value of the investment object, expressed in lei, with VAT and, respectively, without VAT, of which construction-assembly (C+M), in accordance with the general estimate;
b) minimum indicators, respectively performance indicators - physical elements/physical capacities that indicate the achievement of the investment objective target - and, as the case may be, qualitative, in accordance with the standards, norms and technical regulations in force;
c) financial, socioeconomic, impact, result/operation indicators, established according to the specifics and target of each investment objective;
d) the estimated duration of the investment objective, expressed in months.

5.5. Presentation of the way in which compliance with the regulations specific to the intended function is ensured from the point of view of ensuring all the fundamental requirements applicable to the construction, according to the level of detail of the technical proposals
5.6. Nomination of sources of financing of the public investment, as a result of the financial and economic analysis: own funds, bank loans, allocations from the state/local budget, external loans guaranteed or contracted by the state, non-refundable external funds, other legally constituted sources.
***6.** Town planning, agreements and consents*
6.1. The urban planning certificate issued in order to obtain the building permit
6.2. Extract from the land register, except for special cases, expressly provided by law
6.3. The administrative act of the competent authority for environmental protection, measures to reduce the impact, compensation measures, the way to integrate the provisions of the environmental agreement into the technical-economic documentation
6.4. Compliant notices regarding utility insurance
6.5. Topographic survey, targeted by the Cadastre and Real Estate Advertising Office
6.6. Specific approvals, agreements and studies, as appropriate, depending on the specifics of the investment objective and which may condition the technical solutions
***7.** Implementation of the investment*
7.1. Information about the entity responsible for implementing the investment
7.2. The implementation strategy, including: the implementation duration of the investment objective (in calendar months), the execution duration, the investment implementation schedule, the phasing of the investment by years, the necessary resources
7.3. Operation/Operation and Maintenance Strategy: Stages, Methods and Resources Required
7.4. Recommendations on ensuring managerial and institutional capacity
***8.** Conclusions and recommendations*
B. DRAWN PIECES
Depending on the category and importance class of the investment objective, the drawn pieces will be presented at relevant scales in relation to its characteristics, including:

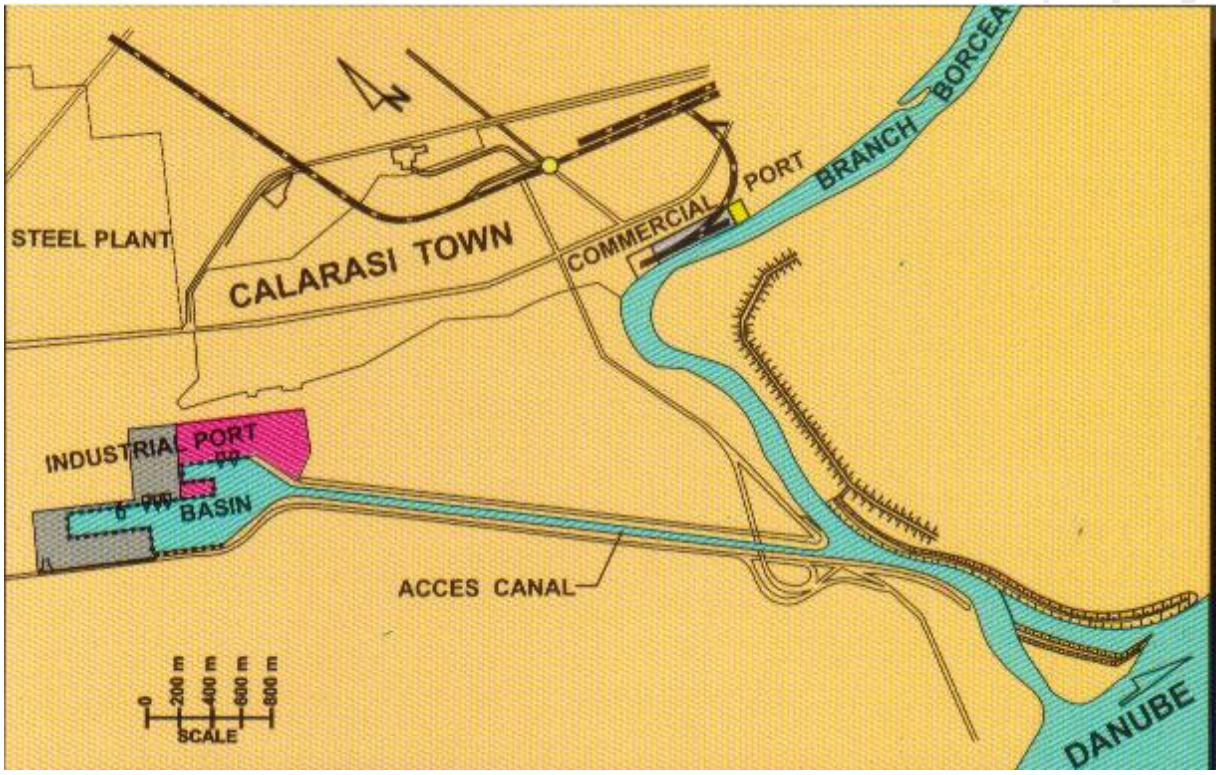
1. location plan in the area;
2. situation plan;
3. general plans, facades and characteristic sections of dimensioned architecture, principal schemes for resistance and installations, volumetrics, functional, isometric schemes or specific plans, as appropriate;
4. general plans, characteristic longitudinal and transversal profiles, dimensions, specific plans, as appropriate.

4 Analysed PORTS

4.1 Călăraşi Port

GENERAL DATA:
The limits of the port/place of operation: Km 91- Km 99, Borcea Branch, left bank.
The area of the port territory administered by CN-APDF-SA GIURGIU is 81,505.00 square meters.
The length of the walled quays/vertical/natural embankment is 828 m.
Operative berths: - 100 ml berth for passengers;
- 2 cargo operation berths; 250 ml
- 1 grain operation berth100 ml
Waiting berths: - 200 ml 2 berths;
On Braţul Borcea at km 97, a berth is built; - the wall is founded on prism anchorages with L=45 m, crown elevation +7 m, operating depth at the berth = -1.50 m. The operating capacity of the Călăraşi port located on the Borcea arm could be of 450,000.00 tons/year.
Conections: Road: via DN 21 has access to A3 Bucharest - Constanta
DN 3 Bucharest - Călăraşi
Railway: – fully deteriorated no link of the port with the hinterland!!!

Figure 1: Layout of Calarasi port



Historical Data:

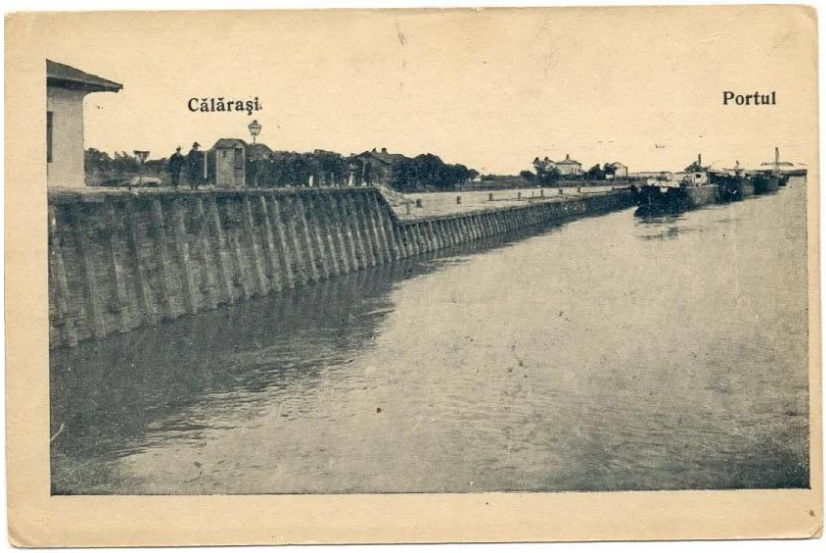
The first port facility in the area dates back to the 1700s. It was used for grain trade that was transported to Istanbul due to the status of the Romanian principalities vis-à-vis the Ottoman Empire.

By Royal Decree no. 706 of March 21, 1879, the Port of Călăraşi is officially established and dredging works begin at the mouth of the Borcea branch, which will allow larger tonnage vessels to dock in the port. A 91 m high wooden quay and a lower wooden quay, 222 m long, are being built.

Another important moment for the development of the Port of Călăraşi and port activity was the commissioning of the railway Slobozia - Călăraşi line, with the terminus Station in the Port. On November 17, 1886, the first train arrived at the Station in Port.

Throughout that period, the main assortment of goods was cereals.

Figure 2: Photo Calarasi port



4.1.1 TRAFFIC 2016 / 2021

Table 1: FREIGHT TRAFFIC CALARASI 2016

FREIGHT TRAFFIC CALARASI 2016

No.	Freight category	Total	Of which:					
			Loading			Unloading		
			Export	Transit	Cabotage	Import	Transit	Cabotage
0	**Total (1+2+...+25)**	**1136770**			**524531**	**155901**		**456338**
1.	Cereals	**285043**			**285043**			
2.	Fresh fruits and vegetables							
3.	Live animals, sugar beet							
4.	Food, beverages, tobacco and animal feed							
5.	Oilseeds (nuts), oils and fats	**58912**			**58912**			
6.	Wood, firewood	**35566**			**3466**	**650**		**31450**
7.	Fertilizers (natural and chemical)	**6485**						**6485**
8.	Raw mineral products (quarry and ballast, plaster, sulphides, slag, chalk, salt, etc.)	**750164**			**177110**	**155251**		**417803**
9.	Iron ores, scrap metal							
10.	Non-ferrous ores							
11.	Textiles, synthetic and artificial products; other raw materials of animal or vegetable origin (skins, furs, rubber)							
12.	Pulp and waste paper	**600**						**600**
13.	Solid fuels (coal, coke, etc.)							
14.	Crude oil							
15.	Oil and gas products							
16.	Tars derived from coal and natural gas							
17.	Chemical products							
18.	Lime, cement, manufactured construction materials							
19.	Glass, glassware, ceramic products							
20.	Metals (ferrous and non-ferrous)							
21.	Articles made of metal							
22.	Cars, transport material							
23.	Various items (fabrics, clothing, footwear, furniture)							
24.	Other products							
25.	Containers							

Total Operated vessels: 911
Of which:
Romanian: 800
Foreign: 111

Table 2: FREIGHT TRAFFIC CALARASI 2017

FREIGHT TRAFFIC CALARASI 2017

No.	Freight category	Total	Of which:					
			Loading			Unloading		
			Export	Transit	Cabotage	Import	Transit	Cabotage
0	**Total (1+2+...+25)**	**1057728**			**354691**	**272973**		**430064**
1.	Cereals	**288131**			**288131**			
2.	Fresh fruits and vegetables							
3.	Live animals, sugar beet							
4.	Food, beverages, tobacco and animal feed							
5.	Oilseeds (nuts), oils and fats	**68140**			**63330**			**4810**
6.	Wood, firewood	**24315**			**1397**			**22918**
7.	Fertilizers (natural and chemical)	**8145**				**943**		**7202**
8.	Raw mineral products (quarry and ballast, plaster, sulphides, slag, chalk, salt, etc.)	**668322**			**1833**	**272030**		**394459**
9.	Iron ores, scrap metal	**625**						**625**
10.	Non-ferrous ores							
11.	Textiles, synthetic and artificial products; other raw materials of animal or vegetable origin (skins, furs, rubber)							
12.	Pulp and waste paper							
13.	Solid fuels (coal, coke, etc.)							
14.	Crude oil							
15.	Oil and gas products							
16.	Tars derived from coal and natural gas							
17.	Chemical products							
18.	Lime, cement, manufactured construction materials							
19.	Glass, glassware, ceramic products							
20.	Metals (ferrous and non-ferrous)							
21.	Articles made of metal							
22.	Cars, transport material	**50**						**50**
23.	Various items (fabrics, clothing, footwear, furniture)							
24.	Other products							
25.	Containers							

Total Operated vessels: 760
Of which:
Romanian: 561
Foreign: 199

Table 3: FREIGHT TRAFFIC CALARASI 2018

FREIGHT TRAFFIC CALARASI 2018

No.	Freight category	Total	Of which:					
			Loading			Unloading		
			Export	Transit	Cabotage	Import	Transit	Cabotage
0	**Total (1+2+...+25)**	**158581**			**6208**			**152373**
1.	Cereals	**154729**			**2356**			**152373**
2.	Fresh fruits and vegetables							
3.	Live animals, sugar beet							
4.	Food, beverages, tobacco and animal feed							
5.	Oilseeds (nuts), oils and fats	**3852**			**3852**			
6.	Wood, firewood							
7.	Fertilizers (natural and chemical)							
8.	Raw mineral products (quarry and ballast, plaster, sulphides, slag, chalk, salt, etc.)							
9.	Iron ores, scrap metal							
10.	Non-ferrous ores							
11.	Textiles, synthetic and artificial products; other raw materials of animal or vegetable origin (skins, furs, rubber)							
12.	Pulp and waste paper							
13.	Solid fuels (coal, coke, etc.)							
14.	Crude oil							
15.	Oil and gas products							
16.	Tars derived from coal and natural gas							
17.	Chemical products							
18.	Lime, cement, manufactured construction materials							
19.	Glass, glassware, ceramic products							
20.	Metals (ferrous and non-ferrous)							
21.	Articles made of metal							
22.	Cars, transport material							
23.	Various items (fabrics, clothing, footwear, furniture)							
24.	Other products							
25.	Containers							

Total Operated vessels: 149
Of which:
Romanian: 128
Foreign: 21

Table 4: FREIGHT TRAFFIC CALARASI 2019

FREIGHT TRAFFIC CALARASI 2019

No.	Freight category	Total	Of which:					
			Loading			Unloading		
			Export	Transit	Cabotage	Import	Transit	Cabotage
0	**Total (1+2+...+25)**	**219126**					**119101**	**100025**
1.	Cereals							
2.	Fresh fruits and vegetables							
3.	Live animals, sugar beet							
4.	Food, beverages, tobacco and animal feed							
5.	Oilseeds (nuts), oils and fats	**0**					**0**	
6.	Wood, firewood	**7812**					**6118**	**1694**
7.	Fertilizers (natural and chemical)							
8.	Raw mineral products (quarry and ballast, plaster, sulphides, slag, chalk, salt, etc.)	**211314**					**112983**	**98331**
9.	Iron ores, scrap metal							
10.	Non-ferrous ores							
11.	Textiles, synthetic and artificial products; other raw materials of animal or vegetable origin (skins, furs, rubber)							
12.	Pulp and waste paper							
13.	Solid fuels (coal, coke, etc.)							
14.	Crude oil							
15.	Oil and gas products							
16.	Tars derived from coal and natural gas							
17.	Chemical products							
18.	Lime, cement, manufactured construction materials							
19.	Glass, glassware, ceramic products							
20.	Metals (ferrous and non-ferrous)							
21.	Articles made of metal							
22.	Cars, transport material							
23.	Various items (fabrics, clothing, footwear, furniture)							
24.	Other products							
25.	Containers							

Total Operated vessels: 142
Of which:
Romanian: 120
Foreign: 22

Table 5: FREIGHT TRAFFIC CALARASI 2020

FREIGHT TRAFFIC CALARASI 2020

No.	Freight category	Total	Of which:					
			Loading			Unloading		
			Export	Transit	Cabotage	Import	Transit	Cabotage
0	**Total (1+2+...+25)**	**139599**					**139599**	
1.	Cereals							
2.	Fresh fruits and vegetables							
3.	Live animals, sugar beet							
4.	Food, beverages, tobacco and animal feed							
5.	Oilseeds (nuts), oils and fats							
6.	Wood, firewood	**9315**					**9315**	
7.	Fertilizers (natural and chemical)							
8.	Raw mineral products (quarry and ballast, plaster, sulphides, slag, chalk, salt, etc.)	**130284**					**130284**	
9.	Iron ores, scrap metal							
10.	Non-ferrous ores							
11.	Textiles, synthetic and artificial products; other raw materials of animal or vegetable origin (skins, furs, rubber)							
12.	Pulp and waste paper							
13.	Solid fuels (coal, coke, etc.)							
14.	Crude oil							
15.	Oil and gas products							
16.	Tars derived from coal and natural gas							
17.	Chemical products							
18.	Lime, cement, manufactured construction materials							
19.	Glass, glassware, ceramic products							
20.	Metals (ferrous and non-ferrous)							
21.	Articles made of metal							
22.	Cars, transport material							
23.	Various items (fabrics, clothing, footwear, furniture)							
24.	Other products							
25.	Containers							

Total Operated vessels: 124
Of which:
Romanian: 103
Foreign: 21

Table 6: FREIGHT TRAFFIC CALARASI 2021

FREIGHT TRAFFIC CALARASI 2021

No.	Freight category	Total	Of which:					
			Loading			Unloading		
			Export	Transit	Cabotage	Import	Transit	Cabotage
0	**Total (1+2+...+25)**	**107055**					**107055**	
1.	Cereals							
2.	Fresh fruits and vegetables							
3.	Live animals, sugar beet							
4.	Food, beverages, tobacco and animal feed							
5.	Oilseeds (nuts), oils and fats							
6.	Wood, firewood	**11230**					**11230**	
7.	Fertilizers (natural and chemical)							
8.	Raw mineral products (quarry and ballast, plaster, sulphides, slag, chalk, salt, etc.)	**95825**					**95825**	
9.	Iron ores, scrap metal							
10.	Non-ferrous ores							
11.	Textiles, synthetic and artificial products; other raw materials of animal or vegetable origin (skins, furs, rubber)							
12.	Pulp and waste paper							
13.	Solid fuels (coal, coke, etc.)							
14.	Crude oil							
15.	Oil and gas products							
16.	Tars derived from coal and natural gas							
17.	Chemical products							
18.	Lime, cement, manufactured construction materials							
19.	Glass, glassware, ceramic products							
20.	Metals (ferrous and non-ferrous)							
21.	Articles made of metal							
22.	Cars, transport material							
23.	Various items (fabrics, clothing, footwear, furniture)							
24.	Other products							
25.	Containers							

Total Operated vessels: 115

Of which:

Romanian: 91

Foreign: 24

4.1.2 Port Traffic Potential Analyses

4.1.2.1 Methodology

The methodology is based on the following elements:

- Collection and analysis of freight transport data for the base year 2019 and the period 2015-2020.
- Establish the freight flows for 2019.
- Establish the project scenario.
- Forecast of freight flows for a time horizon of 25 years and estimation of the potential for the Călăraşi port.

Project implementation impact identification: volume of goods by category of goods, time gain/journey, emissions reduction: CO_2 equivalent.

4.1.2.2 Data collection and analysis of the basic conditions

In the analysis of the current situation, the following information regarding freight transport flows for the base year 2019 was taken into account:

- The database of the Port of Constanta for the year 2019;
- Romania's imports/exports with EU and non-EU countries, in tons/year, by commodity category, Comext 2019
- Romanian imports/exports by county, in Euros, by product category, 2019
- MNT – Romania's National Transport Model.

4.1.2.2.1 Port of Constanta database 2019

Table 7: Port of Constanta Freight Traffic 2019

TRAFFIC TYPE		QUANTITY
Catbot	Various articles	120
	Cereals	2818561
	Cement, lime, prefabricated materials for construction	2732
	Solid mineral fuels	145251
	Equipment, machines, etc..	4530
	Fertilizers (natural and chemical)	94553
	Minerals, raw or processed	10851

TRAFFIC TYPE		QUANTITY
	Iron ores, scrap iron and steel, furnace slag	1281371
	Ores and non-ferrous waste	1585601
	Other chemical products	2001
	Metallic products	67979
	Petroleum products	57549
	Oily seeds, oily fruits and fats	309175
	Total	6380274
Export	Live animals, sugar beet	54110
	Different articles	3159884
	Articles made of metal	7404
	Cereals	12025216
	Cement, lime, prefabricated materials for construction	445
	Solid mineral fuels	366032
	Equipment, machines, etc..	230459
	Fertilizers (natural and chemical)	102616
	Wood and cork	283842
	Minerals, raw or processed	297022
	Iron ores, scrap iron and steel, furnace slag	1045690
	Ores and non-ferrous waste	1440
	Crude oil	49481
	Leather, textile and clothing	1608
	Food and feed for animals	15634
	Other chemical products	176437
	Chemicals derived from coal and tar	7149
	Metallic products	443479
	Petroleum products	1206895

TRAFFIC TYPE		QUANTITY
	Oily seeds, oily fruits and fats	1471840
	Total	20946683
Import	Different articles	3124266
	Articles made of metal	3406
	Potatoes, other vegetables and fresh and frozen fruits	3227
	Cellulose and paper waste	35739
	Cereals	651892
	Cement, lime, prefabricated materials for construction	249932
	Solid mineral fuels	1015895
	Equipment, machines, etc..	55842
	Fertilizers (natural and chemical)	1001487
	Wood and cork	4500
	Minerals, raw or processed	60378
	Iron ores, scrap iron and steel, furnace slag	1148409
	Ores and non-ferrous waste	1650156
	Crude oil	2974869
	Food and feed for animals	141067
	Other chemical products	153354
	Chemicals derived from coal and tar	92273
	Metallic products	1274396
	Petroleum products	2293280
	Oily seeds, oily fruits and fats	25860
	Total	15960228
Transit	Different articles	277163
	Articles made of metal	90
	Cellulose and paper waste	13062
	Cereals	5815752

TRAFFIC TYPE		QUANTITY
	Solid mineral fuels	2307768
	Equipment, machines, etc..	84388
	Fertilizers (natural and chemical)	2703302
	Wood and cork	1207
	Minerals, raw or processed	242652
	Iron ores, scrap iron and steel, furnace slag	1714337
	Ores and non-ferrous waste	620779
	Food and feed for animals	192843
	Other chemical products	141181
	Metallic products	724041
	Petroleum products	113687
	Oily seeds, oily fruits and fats	331334
	Glass, glassware and ceramic products	11755
	Total	15295341
Total	Live animals, sugar beet	54110
	Different articles	6561433
	Articles made of metal	10900
	Potatoes, other vegetables and fresh and frozen fruits	3227
	Cellulose and paper waste	48801
	Cereals	21311421
	Cement, lime, prefabricated materials for construction	253109
	Solid mineral fuels	3834946
	Equipment, machines, etc..	375219
	Fertilizers (natural and chemical)	3901958
	Wood and cork	289549
	Minerals, raw or processed	610903
	Iron ores, scrap iron and steel, furnace slag	5189807

TRAFFIC TYPE	QUANTITY
Ores and non-ferrous waste	3857976
Crude oil	3024350
Leather, textile and clothing	1608
Food and feed for animals	349544
Other chemical products	472973
Chemicals derived from coal and tar	99422
Metallic products	2509895
Petroleum products	3671411
Oily seeds, oily fruits and fats	2138209
Glass, glassware and ceramic products	11755
Total	58582526

It is observed that the grain traffic is 21.3 million tons per year, that of metal products is 2.5 million tons per year, and that of chemical products is 473 thousand tons per year. Fertilizer traffic is 3.9 million tons per year.

It is specified that the goods that are transported in the hinterland with the inland navigation mode of transport are registered both as naval traffic and as maritime traffic.

Thus, it can be seen that the potential for these categories of goods is important.

4.1.2.2.2 Imports/exports Romania with EU and Non-EU countries

The following shows Romania's imports and exports with EU and non-EU countries by category of goods and mode of transport. It is mentioned that in the case of trade with non-EU countries, the mode of transport is the one registered at the EU border.

4.1.2.2.2.1 Romania's imports/exports with EU countries

Romania's imports from EU countries by category of goods and mode of transport are presented below.

Table 8: Imports NSTR0 Agricultural products from EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	0	0	138059	107650	0	0	**245709**
Belgium	1	33	110	82031	145	0	**82320**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Bulgaria	26443	522007	6407	137914	23	285843	**978637**
Cyprus	0	11	0	1237	0	0	**1248**
Czech Republic	0	1323	260036	93448	0	0	**354807**
Germany	4	350	86194	261564	0	0	**348112**
Denmark	2	0	0	9081	7	0	**9090**
Estonia	0	0	0	362	0	0	**362**
Spain	0	6940	12	68340	3	0	**75295**
Finland	0	0	0	684	0	0	**684**
France	0	19700	779	116682	1	0	**137162**
United Kingdom	0	5547	22	6902	1	0	**12472**
Greece	0	186	120	245754	4	0	**246064**
Croatia	0	3509	0	9169	0	0	**12678**
Hungary	1	375104	35866	231462	107	96611	**739151**
Ireland (Eire)	0	284	0	329	0	0	**613**
Italy	9	5148	25	98309	23	0	**103514**
Lithuania	0	0	0	3268	0	0	**3268**
Luxembourg	0	0	0	163	0	0	**163**
Latvia	0	0	21	997	0	0	**1018**
Malta	0	0	0	352	0	0	**352**
Netherlands	5	61	197	204917	217	0	**205397**
Poland	118	162	91362	225853	3517	0	**321012**
Portugal	0	0	0	1615	0	0	**1615**
Romania	0	0	0	0	0	0	**0**
Sweden	0	0	0	2964	0	0	**2964**
Slovenia	0	0	0	13333	0	0	**13333**
Slovakia	0	0	79257	103490	0	0	**182747**
All	**26583**	**940365**	**698467**	**2027870**	**4048**	**382454**	**4079787**

Imports of agricultural products are 4.08 million tons per year, of which 940 thousand tons are transported by sea.

Table 9: Exports NSTR0 Agricultural products in EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	0	2613	54063	132789		10184	**199649**
Belgium	0	50566		5835			**56401**
Bulgaria	0	15492	25992	37505	3	3796	**82788**
Cyprus	0	81149	4480	28960			**114589**
Czech Republic	0		38570	24972			**63542**
Germany	0	92101	119897	293803	0		**505801**
Denmark	0	34836		4096	21		**38953**
Estonia	0			136			**136**
Spain	0	1454303	1	6294			**1460598**
Finland	0			1066			**1066**
France	0	141736		19202	21		**160959**
United Kingdom	0	142970		17971			**160941**
Greece	0	253237	853	56952	20	12032	**323094**
Croatia	0	8	11	17305			**17324**
Hungary	0	867	41537	202388	146		**244938**
Ireland (Eire)	0	111462	1313	875			**113650**
Italy	0	642224	220823	317978	70		**1181095**
Lithuania	0			894			**894**
Luxembourg	0			0			**0**
Latvia	0			284			**284**
Malta	0	9649		17			**9666**
Netherlands	0	678194	2703	11275	0		**692172**
Poland	0		2875	28130	0		**31005**
Portugal	0	148872		933			**149805**
Romania							**0**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Sweden	0			1968			**1968**
Slovenia	0		15674	12822	46		**28542**
Slovakia	0		5974	24884			**30858**
All	**0**	**3860279**	**534766**	**1249334**	**327**	**26012**	**5670718**

Exports of agricultural products are 5.7 million tons per year, of which 3.86 million tons are transported by sea.

Table 10: Imports NSTR5 Metal products from EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	22	2219	15054	58354	1	92574	**168224**
Belgium	56	6764	9269	66641	3	190	**82923**
Bulgaria	0	15480	52644	292870	25	1006	**362025**
Cyprus	0			92		2012	**2104**
Czech Republic	32	58	12	79652	64		**79818**
Germany	14	2692	34937	240657	36	1078	**279414**
Denmark	0	0		926	0		**926**
Estonia	0			2			**2**
Spain	0	23306	33	23441	15		**46795**
Finland	0	4527		12539	6		**17072**
France	1	653	344	136600	300		**137898**
United Kingdom	1	2	0	15150	21	6	**15180**
Greece	0	164212	1566	90597	425		**256800**
Croatia	0		5474	4642			**10116**
Hungary	3	691	5	70640	20		**71359**
Ireland (Eire)	1			5944	0		**5945**
Italy	60	133934	22913	433942	172	1487	**592508**
Lithuania	0			182	68		**250**
Luxembourg	0		7233	10114	0		**17347**
Latvia	0			356			**356**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Malta	0			94			**94**
Netherlands	1	24	49	46597	8	5204	**51883**
Poland	27	48	25626	163729	10		**189440**
Portugal	0			350	0		**350**
Romania							**0**
Sweden	0		0	37963	0		**37963**
Slovenia	0	3		6769	1		**6773**
Slovakia	37		94080	180314	5		**274436**
All	**255**	**354613**	**269239**	**1979157**	**1180**	**103557**	**2708001**

Imports of metal products amount to 2.71 million tons per year, of which 355 thousand tons are transported by sea.

Table 11: Exports NSTR5 Metal products in EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	2	442	2298	36325	0	14106	**53173**
Belgium	0		224	12587	0		**12811**
Bulgaria	0	115	42764	166861	0	113862	**323602**
Cyprus	0	690		84			**774**
Czech Republic	0		17821	100415	0		**118236**
Germany	0	114	18310	245953	14		**264391**
Denmark	0	12		14062	0		**14074**
Estonia	0			1150			**1150**
Spain	0	11680	545	21218	0		**33443**
Finland	0			10800	0		**10800**
France	0	34		31975	0		**32009**
United Kingdom	9	6216		20516	5		**26746**
Greece	0	101767		13570	5		**115342**
Croatia	0			17196		13525	**30721**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Hungary	0	92	10894	224190	0	5523	**240699**
Ireland (Eire)	0	713		1780			**2493**
Italy	8	85420	14295	227998	15		**327736**
Lithuania	0			9029	0		**9029**
Luxembourg	0			598	0		**598**
Latvia	0			542			**542**
Malta	0			5			**5**
Netherlands	0	518	1	44713	0		**45232**
Poland	0	3	60671	202462	22		**263158**
Portugal	0	240	24	4098			**4362**
Romania							**0**
Sweden	1			22887	0		**22888**
Slovenia	0			35605		763	**36368**
Slovakia	2		6569	62126	0		**68697**
All	**22**	**208056**	**174416**	**1528745**	**61**	**147779**	**2059079**

Exports of metal products are 2.06 million tons per year, of which 208 thousand tons by sea transport.

Table 12: Imports NSTR8 Chemical products from EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	11	3	11805	137904	22		**149745**
Belgium	10	513	615	175891	253		**177282**
Bulgaria	20	21639	37876	314786	29	4014	**378364**
Cyprus	0			611	4		**615**
Czech Republic	77	56	17121	161790	51		**179095**
Germany	134	2205	2451	525595	216	1199	**531800**
Denmark	11	0		9821	4		**9836**
Estonia	0			3078	0		**3078**
Spain	7	41399	58	69691	20		**111175**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Finland	0	11258	19	7367	44		**18688**
France	29	37983	2675	126437	68	5359	**172551**
United Kingdom	39	1308	380	62761	119		**64607**
Greece	39	2917	5	121458	2		**124421**
Croatia	5	1312	1199	7128	27		**9671**
Hungary	39	153	73857	527109	139	699	**601996**
Ireland (Eire)	2		0	5189	7		**5198**
Italy	26	19010	634	272023	41		**291734**
Lithuania	0	22		19433	1		**19456**
Luxembourg	0	55	0	4970	0		**5025**
Latvia	0		2094	2676	0		**4770**
Malta	0	40		866	2		**908**
Netherlands	16	16644	29286	154633	36		**200615**
Poland	520	85	26170	211040	137		**237952**
Portugal	0	643		5652	0		**6295**
Romania							**0**
Sweden	2		910	22235	4		**23151**
Slovenia	0	1	15	21500	4		**21520**
Slovakia	0	5107	7489	111014	58		**123668**
All	**987**	**162353**	**214659**	**3082658**	**1288**	**11271**	**3473216**

Imports of chemical products are 3.47 million tons per year, of which 162 thousand tons by sea transport.

Table 13: Exports NSTR8 Chemical products in EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	0	9	40349	37494	1		**77853**
Belgium	0	43943		15172	0		**59115**
Bulgaria	1	302	32620	226848	1		**259772**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Cyprus	0	879		1047	0		**1926**
Czech Republic	0	59	23	63858	0		**63940**
Germany	0	14	88389	132352	13		**220768**
Denmark	0		0	2629	0		**2629**
Estonia	0			2125	0		**2125**
Spain	0	19556	23	9104	1		**28684**
Finland	0			1826	1		**1827**
France	0	5522	0	19526	1		**25049**
United Kingdom	0	149	210	17754	2		**18115**
Greece	0	0	1575	63805	8		**65388**
Croatia	0		14679	7603	0		**22282**
Hungary	4	2	34349	225470	8	4122	**263955**
Ireland (Eire)	0	22		522	3		**547**
Italy	3	67294	0	69181	0		**136478**
Lithuania	0			8903	0		**8903**
Luxembourg	0			114			**114**
Latvia	0			2000	0		**2000**
Malta	0	7167		36	1		**7204**
Netherlands	1		0	12517	0		**12518**
Poland	3	4	6980	114535	5		**121527**
Portugal	0	5599	5	2415	0		**8019**
Romania							**0**
Sweden	6			938	0		**944**
Slovenia	0	0		23658	0		**23658**
Slovakia	0	26	6258	32323	0		**38607**
All	**18**	**150547**	**225460**	**1093755**	**45**	**4122**	**1473947**

Exports of chemical products are 1.47 million tons per year, of which 150 thousand tons by sea transport.

4.1.2.2.2.2 Romania's imports/exports with non-EU countries

Romania's imports/exports in relation to Non-EU countries are presented below, cumulatively.

Table 14: Romania's imports/exports in relation to Non-EU countries, agricultural products, tons/year, 2019

Agricultural products	
Import	
Transport mode	***Tons/year***
0 - Unknown	
1 - Sea	200134
2 - Rail	171058
3 - Road	605211
4 - Air	420
5 - Post	0
7 - Fixed Mechanism	
8 - Inland Waterway	29254
9 - Self Propulsion	
All modes	**1006077**

Export	
Transport mode	***Tons/year***
0 - Unknown	
1 - Sea	9979450
2 - Rail	16439
3 - Road	104148
4 - Air	304
5 - Post	37
7 - Fixed Mechanism	
8 - Inland Waterway	
9 - Self Propulsion	
All modes	**10100378**

Imports of agricultural products represent 1 million tons per year, of which 200 thousand tons are transported by sea.
Exports of agricultural products are 10.1 million tons per year, of which 9.98 million tons are transported by sea.

Table 15: Romania's imports/exports in relation to Non-EU countries, metal products, tons/year, 2019

Metal products	
Import	
Transport mode	***Tons/year***
0 - Unknown	
1 - Sea	1349166
2 - Rail	184655
3 - Road	332961
4 - Air	1605
5 - Post	0
7 - Fixed Mechanism	
8 - Inland Waterway	101898
9 - Self Propulsion	11954
All modes	**1982239**

Export	
Transport mode	***Tons/year***
0 - Unknown	
1 - Sea	856992
2 - Rail	18115
3 - Road	164719
4 - Air	855
5 - Post	
7 - Fixed Mechanism	
8 - Inland Waterway	214000
9 - Self Propulsion	
All modes	**1254681**

Imports of metal products represent 1.98 million tons per year, of which 1.35 million tons are transported by sea.
Exports of metal products amount to 1.25 million tons per year, of which 857 thousand tons are transported by sea.

Table 16: Romania's imports/exports in relation to Non-EU countries, chemical products, tons/year, 2019

Chemical products	
Import	
Transport mode	***Tons/year***
0 - Unknown	
1 - Sea	442565

2 - Rail	131175
3 - Road	399631
4 - Air	1419
5 - Post	5
7 - Fixed Mechanism	
8 - Inland Waterway	11152
9 - Self Propulsion	
All modes	**985947**

Export	
Transport mode	***Tons/year***
0 - Unknown	
1 - Sea	309491
2 - Rail	57560
3 - Road	383079
4 - Air	693
5 - Post	469
7 - Fixed Mechanism	
8 - Inland Waterway	1531
9 - Self Propulsion	
All modes	**752823**

Imports of chemical products represent 986 thousand tons per year, of which 443 thousand tons are transported by sea.

Exports of metal products amount to 753 thousand tons per year, of which 309 thousand tons are transported by sea.

The shipping mode is highlighted because it represents a potential for shipping.

4.1.2.2.3 Romanian imports/exports by county, in Euros

INSSE publishes Romania's imports and exports by county, in Euros, as shown below. The cargo categories are different from NSTR1, but they are compatible.

Next, Romania's imports and exports in Euros for 2019 are presented, by category of goods, for the categories of goods considered.

Table 17: Romania's Imports in thousands of Euros, by county, 2019

Romanian county	Agricultural products	Chemical products	Metal products
Alba	85270	47186	214710
Arad	163600	65940	635266
Argeş	89192	279955	487046
Bacău	55163	75100	201699
Bihor	166037	206497	164515
Bistriţa-Năsăud	15999	10854	128010
Botoşani	17579	827	5374
Braşov	125310	223377	601260
Brăila	11511	6002	29966
Buzău	48435	26207	79420
Caras-Severin	25153	2413	16412
Călăraşi	14863	14833	87984
Cluj	74025	177476	334490
Constanta	96186	119657	106513
Covasna	48641	9051	18006
Dâmboviţa	13274	93585	207106
Dolj	30866	37488	118816
Galati	43227	66473	248079
Giurgiu	4590	11698	27087
Gorj	3574	2664	6152
Harghita	28690	16504	89194
Hunedoara	34556	51848	41151
Ialomiţa	43437	44078	13495
Iaşi	34744	70564	151980
Ilfov	549582	831917	498100
Maramureş	38538	55598	137099
Mehedinţi	317	2533	12528
Mureş	149947	377971	167097
Neamţ	18923	27528	42017
Olt	11719	102401	154745
Prahova	406127	94970	304369
Satu Mare	65133	46910	97621
Sălaj	32576	12619	118402
Sibiu	39451	60252	304517
Suceava	43469	68476	71897
Teleorman	4088	40536	21059

Timiş	219951	458610	520439
Tulcea	7401	6194	48866
Vaslui	18549	1485	15603
Vâlcea	69332	17301	48627
Vrancea	10835	8618	21360
Municipiul Bucureşti	1467467	4541552	1965965
Not specified	68455	172194	184050
Total	**4804216**	**2367854**	**5943979**

Table 18: Romania's Exports in thousands of Euros, by county, 2019

Romanian county	Agricultural products	Chemical products	Metal products
Alba	46386	18921	27001
Arad	82847	1484	365752
Argeş	27650	5234	229993
Bacău	21949	79435	9350
Bihor	147363	11111	71404
Bistriţa-Năsăud	16017	22	46873
Botoşani	16853	68	3594
Braşov	56010	23282	437488
Brăila	62951	267	10321
Buzău	63171	9800	169863
Caras-Severin	3564	125	4114
Călăraşi	67393	2429	109238
Cluj	50029	26661	189591
Constanta	698746	7860	47796
Covasna	51077	264	10786
Dâmboviţa	3707	27846	204265
Dolj	75862	9732	47614
Galati	67027	7514	785199
Giurgiu	373	33	32938
Gorj	6767	0	1950
Harghita	13458	189	20097
Hunedoara	15374	7975	81122
Ialomiţa	21870	4615	7370
Iaşi	5331	59424	106737
Ilfov	109373	141461	233755
Maramureş	22074	8412	70028

Mehedinţi	730	484	2056
Mureş	15774	210657	52962
Neamţ	909	2003	56789
Olt	2142	445	737856
Prahova	33626	135276	78268
Satu Mare	52474	11607	61347
Sălaj	22501	8420	397318
Sibiu	31544	3343	166610
Suceava	17553	239	5250
Teleorman	3489	470	16752
Timiş	145627	271887	114523
Tulcea	65258	36731	176339
Vaslui	11798	17824	952
Vâlcea	9090	65867	41224
Vrancea	1235	1062	10634
Municipiul Bucureşti	2294140	980139	642082
Unspecified	343104	167236	58778
Total	**4804216**	**2367854**	**5943979**

It is mentioned that at least for agricultural products the registrations are in the Municipality of Bucharest, but in reality the exports are actually made from the production counties.
Thus, the exports of agriculture goods of Bucharest and Non-specified have been redistributed to all other counties based on the share of each county in total production.

4.1.2.2.4 MNT – Romania's National Transport Model

Within the MNT, the forecasted increases for the 2050-time horizon are taken into account.

4.1.2.3 Establishing potential by market segment

To establish the potential, the following methodology was taken into account:

- Estimation of imports and exports in tons per county and the selection of counties with high accessibility to the port of Călăraşi;
- Estimation of transport costs to/from the port of Constanta for two possible routes, namely with direct road transport and with transshipment in the port of Călăraşi;

• Estimation of the potential for Calarasi port based on the comparative analysis of the two considered routes.

First of all, the potential for the base year 2019 is estimated, as summarized below.

The following tariffs were taken into account:

- Road transport 20 tons, 2.42 Euro/km;
- Naval transport, 10 Euro/ton Călăraşi – Constanta
- Cargo loading Calarasi port, 2 Euro/ton

It is also mentioned that the estimated potential is maximum, and is not restricted by the port operating capacity.

For exports, the agricultural products related to the municipality of Bucharest were distributed to each individual county.

Depending on the difference between the transport cost for each individual transport mode, a transfer potential in % from the direct road transport mode to the road - inland navigation combination is considered. Moreover, a performance coefficient is applied for each category of goods separately, as follows:

- For agricultural products: 0.95;
- For chemical products: 0.90;
- For metal products: 0.85.

Thus, the potential obtained is a total of 549,355.00 tons per year, as shown in the tables below for each cargo category and per direction

Table 19: Potential for imports, by county of Destination of goods, 2019

2019											Potential			
IMPORTS	**Agric**	**Chemical**	**Metal**	**Dist. road to Cta**	**Dist. road to Calarasi**	**Loading cost**	**IWT cost**	**Direct road cost 20t**	**IWT +road feeder cost**	**Potential IWT**	**Agric**	**Chemical**	**Metal**	**Total**
Calarasi	16814	7702	47172	**144**	**0**	**40**	**200**	**357**	**240**	70%	7715	1553	8701	17969
Ialomita	49138	22887	7235	**136**	**45**	**40**	**200**	**337**	**290**	30%	9663	1977	572	12212
Ilfov	621716	431961	267053	**222**	**131**	**40**	**200**	**551**	**384**	10%	40753	12440	7037	60231
Prahova	459432	49312	163186	**290**	**197**	**40**	**200**	**719**	**457**	5%	15058	710	2150	17918
Municipiul Bucuresti	1660076	2358134	1054041	**224**	**131**	**40**	**200**	**556**	**384**	1%	10882	6791	2777	20451
											84071	23472	21237	128780
								% maritime			69%	32%	31%	
														549355

Table 20: Potential for exports, by county of Origin of goods, 2019

2019											Potential			
EXPORTS	Agric	Chemical	Metal	Dist road to Cta	Dist. road to Calarasi	Loading cost	IWT cost	Direct road cost 20t	IWT +road feeder cost	Potential IWT	Agric	Chemical	Metal	Total
Calarasi	575979	2284	60900	144	0	40	200	357	240	70%	264288	461	11233	275981
Ialomita	517469	4340	4109	136	45	40	200	337	290	30%	101760	375	325	102460
Ilfov	412820	31	18363	222	131	40	200	551	384	10%	27060	1	484	27545
Prahova	261874	127216	43634	290	197	40	200	719	457	5%	8583	1832	575	10990
Municipiul Bucuresti	0	921739	357960	224	131	40	200	556	384	1%	0	2655	943	3598
											401691	5323	13560	420574
								% maritime			69%	32%	31%	
TOTAL IMPORTS AND EXPORTS POTENTIAL														549355

The table below shows the growth coefficients for imports/exports by category of goods for the hinterland of the port of Constanta.

Table 21: Growth coefficients for imports/exports by category of goods for the hinterland of the port of Constanta

Imports – flows from Constanta port	Agricultural products	Chemical products	Metal products
2024	1.20153	1.14405	1.14718
2030	1,51150	1,35365	1,36201
2040	1.63279	1.83022	1.71205
2050	1.75408	2.30680	2.06210

Export - flows to Constanta port	Agricultural products	Chemical products	Metal products
2024	1.16197	1.14651	1.14776
2030	1.40181	1.36020	1,36355
2040	1.85671	2.11647	1.64203
2050	2.31162	2.87275	1.92051

Thus, the tables below show the potential per direction and in total, and per category of goods, for the time horizons 2024, 2030, 2040 and 2050, in tons/year.

Table 22: Potential per direction and in total, and per category of goods, for the time horizons, in tons/year

Imports	Agricultural products	Chemical products	Metal products	Total
2024	101015	26853	24363	**152231**
2030	127074	31773	28925	**187772**
2040	137271	42959	36359	**216589**
2050	147468	54145	43793	**245406**

Export	Agricultural products	Chemical products	Metal products	Total
2024	466753	6103	15563	**488420**

2030	563094	7240	18489	**588824**
2040	745825	16884	23814	**786523**
2050	928557	15291	26042	**969890**
Total Import and Export	**Agricultural products**	**Chemical products**	**Metal products**	**Total**
2024	567768	32956	39926	**640651**
2030	690168	39013	47414	**776596**
2040	883095	59843	60173	**1003112**
2050	1076025	69437	69835	**1215296**

4.1.2.4 Establishing the impact on road traffic

The estimated impact on the reduction of HGV heavy trucks, expressed in number of trucks - km per year, for the road transport mode is presented below, on a time horizon.

Table 23: Reduction of HGV heavy trucks, expressed in number of trucks - km per year

Year 2024

Exports (loaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Calarasi	16026	2307.71	1290.01
Ialomita	5952	541.66	302.79
Ilfov	1600	145.60	81.39
Prahova	637	59.21	33.10
Municipiul București	206	19.19	10.73
Total	24420.98	3073.36	1718.01
Imports (unloaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Calarasi	1051	151.40	84.63
Ialomita	726	66.11	36.95
Ilfov	3564	324.29	181.28
Prahova	1069	99.38	55.55
Municipiul București	1202	111.74	62.46
Total	7611.55	752.92	420.88

Both imports and exports	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Calarasi	17077	2459	1375
Ialomita	6679	608	340

Ilfov	5164	470	263
Prahova	1705	159	89
Municipiul Bucureşti	1408	131	73
Total	32033	3826	2139

Year 2030

Exports (loaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Calarasi	19321	2782.25	1555.28
Ialomita	7180	653.39	365.24
Ilfov	1930	175.60	98.16
Prahova	765	71.18	39.79
Municipiul Bucureşti	245	22.77	12.73
Total	29441.19	3705.19	2071.20
Imports (unloaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Calarasi	1281	184.42	103.09
Ialomita	903	82.18	45.94
Ilfov	4401	400.51	223.88
Prahova	1332	123.92	69.27
Municipiul Bucureşti	1471	136.82	76.48
Total	9388.60	927.85	518.67
Both imports and exports	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Calarasi	20602	2967	1658
Ialomita	8083	736	411
Ilfov	6331	576	322
Prahova	2098	195	109
Municipiul Bucureşti	1716	160	89
Total	38830	4633	2590

Year 2040

Exports (loaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Calarasi	25506	3672.90	2053.15
Ialomita	9513	865.71	483.93
Ilfov	2552	232.23	129.82
Prahova	1038	96.52	53.96
Municipiul Bucureşti	358	33.33	18.63

Total	38967.80	4900.70	2739.49
Imports (unloaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Calarasi	1517	218.41	122.09
Ialomita	1019	92.71	51.83
Ilfov	5068	461.18	257.80
Prahova	1478	137.49	76.85
Municipiul Bucureşti	1748	162.53	90.85
Total	10829.43	1072.32	599.43
Both imports and exports	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Calarasi	27023	3891	2175
Ialomita	10532	958	536
Ilfov	7620	693	388
Prahova	2516	234	131
Municipiul Bucureşti	2106	196	109
Total	49797	5973	3339

Year 2050

Exports (loaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Calarasi	31691	4563.57	2551.03
Ialomita	11847	1078.04	602.62
Ilfov	3174	288.86	161.47
Prahova	1310	121.86	68.12
Municipiul Bucureşti	472	43.88	24.53
Total	48494.51	6096.21	3407.78
Imports (unloaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Calarasi	1753	252.41	141.10
Ialomita	1135	103.24	57.71
Ilfov	5735	521.85	291.72
Prahova	1624	151.05	84.44
Municipiul Bucureşti	2024	188.24	105.22
Total	12270.30	1216.79	680.19

Both imports and exports	HGV's reduction per year	Reduction of HGV-km per year, thousand	Reduction of road emissions, 10^3 tons CO_2/year
Calarasi	33444	4816	2692
Ialomita	12981	1181	660
Ilfov	8909	811	453
Prahova	2935	273	153
Municipiul București	2496	232	130
Total	60765	7313	4088

4.1.2.5 Conclusions

As can be seen above, in the project scenario the following potential is estimated per direction and per category of goods, for the time horizons 2024, 2030, 2040 and 2050, in tons/year, as presented below:

Table 24: Estimated potential per direction and per category of goods, for the time horizons, in tons/year

Imports	Agricultural products	Chemical products	Metal products	Total
2024	101015	26853	24363	**152231**
2030	127074	31773	28925	**187772**
2040	137271	42959	36359	**216589**
2050	147468	54145	43793	**245406**

Exports	Agricultural products	Chemical products	Metal products	Total
2024	466753	6103	15563	**488420**
2030	563094	7240	18489	**588824**
2040	745825	16884	23814	**786523**
2050	928557	15291	26042	**969890**

Total Imports and Exports	Agricultural products	Chemical products	Metal products	Total
2024	567768	32956	39926	**640651**
2030	690168	39013	47414	**776596**
2040	883095	59843	60173	**1003112**
2050	1076025	69437	69835	**1215296**

Thus, the total potential is between 640 thousand tons in 2024 and 1.21 million tons in 2050.

The effects of the implementation of the project, especially regarding the reduction of road traffic, are presented below.

Table 25: Effects of the implementation of the project

Time horizon	HGV's reduction per year	Reduction of HGV-km per year, thousand
2024	32033	3826
2030	38830	4633
2040	49797	5973
2050	60765	7313

Thus, there is a reduction in the journey of heavy trucks by 3,826 thousand HGV-Km in the year 2024 and by 7,313 thousand HGV-km in the year 2050.

The above highlights the beneficial effects of the implementation of the project, in line with the European and national transport policy, promoting the modal transfer from the road transport mode to the alternative naval and rail transport modes.

4.1.3 Assessment of port infrastructure

The length of the port platform is considered to be 828 m, of which 200 m is a walled (inclined) quay, 250 m is a vertical quay, the rest being the natural shore to which the pontoons are tied.

- Walled quay

The revetment is made of stone masonry. A concrete berm (platform) is made halfway up. From place to place there are access stairs to the base of the wall. Bollards have been placed on the platform in some places.

The revetment has many cracks, both slopes (below and above the platform) being invaded by vegetation (fig. 3).

Figure 3: Vegetation on the revetment

- Vertical quay

It consists of a vertical wall of reinforced concrete, founded on concrete piles. The lowering of the water table over time, combined with periods of drought, led to the development of vegetation between the wall and the water bed, necessitating its cleaning (fig. 4). The zone of alluvium and vegetation does not allow ships to dock adjacent to the quay.

Figure 4: Vegetation at the base of the vertical quay

Due to the lowering of the water level, the foundation of the quay reached above the water (fig. 5), and there is a risk of erosion of the material under the concrete body at the elevations and velocities of the water in periods of high flow.

Figure 5: The foundation of the vertical pier

The face of the vertical quay presents a lot of cracks and vegetation (fig. 6).

Figure 6: Cracks and exfoliations on the face of the vertical pier

- The running path of the cranes

There is a taxiway (rails) for cranes only in the area of the vertical quay (the central sector of the port).

It is partially blocked by deposits (fig. 7), being necessary to be cleaned and checked the condition (settlement, rust, missing segments).

Figure 7: Rails covered by deposits

There are no cranes in the grain silo area (upstream sector of the port).

- Port platform
  Currently, the platform is in a very advanced state of degradation with in some places abnormal paving stones and broken stone, which negatively influences the circulation and manoeuvres of vehicles operating in the site. This platform which shows many areas where pavers are missing

- Utilities at the quay
  The utilities are non-existent. The electrical network does not work. There is no possibility of supplying the ships with electricity. There are no ecological sources of electricity. There is no fresh water installation. There are no hydrants and possibilities to supply ships with fresh water (fig 8).

Figure 8: Non-functional electric switch box

- The fairway

Currently, the water depth is insufficient for mooring loaded ships. The nominal minimum depth of 2.80 m is not achieved during periods of low water.

- Railway

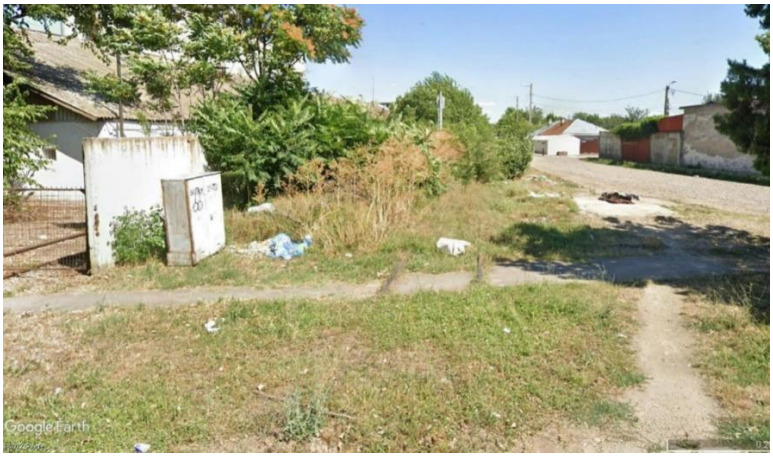
It is abandoned, blocked by cargo deposits, partially covered by vegetation.

There is no railway in the area of the grain silo (upstream sector of the port).

Figure 9: The railway in the inclined quay area

Figure 1 –

Figure 10: The railway parallel to Bobâlna Street



4.1.4 Investments and repairs proposal

The main objectives of the development project should be:

- **dredging the entrance on the Borcea branch;**

There are necessary dredging works to improve the navigation conditions on the Borcea branch of Danube where Călăraşi Port is situated. The maintenance of the fairway to deepen it at about 2,5 m, is an important precondition for attracting a consistent traffic.

- **the consolidation and modernization of hydrotechnical constructions**;
  - **walled quay**

It is necessary the removal of vegetation and the filling of cracks with cement mortar. The stairs must be cleaned and repaired

  - **vertical quay**

It is necessary to clean and remove the alluvium from revetment. , To berth the ships it will be strictly necessary to mount shock absorbers on the quay face, chosen according to the dimensions and displacement of the ships which will come alongside .
To avoid the risk of erosion of the material under the concrete body at the elevations and velocities of the water in periods of high flow it is necessary to make a protection. A short pile planking is recommended in front of the wall.
The face of the quay must be cleaned, the vegetation removed (fig. 4). The cracks must be filled (injected) with cement mortar.

  - **the running path of the cranes**

The taxiway (rails) for cranes it is necessary to clean, modernize and upgrade the missing sections.
The rehabilitation of the track consists of the complete replacement of the existing superstructure with a new system
The fastening of the rail to the metal plates is done with special shoes that allow small movements of the rail in both directions. Special rubber plates are provided between the rail and the metal plates.
Simultaneously with the replacement of the superstructure, the alignment and gauge of the track and the upper level of the rail mushroom will be "corrected" by pouring a high-strength, fast-setting mortar under the metal plates.
Stoppers will be mounted at the ends of the runway tabs (one stop at each end of the tab – 4 pcs). The stops are metal constructions that will be mounted on the existing concrete beams with the help of bolts inserted into drilled holes and fixed with epoxy resin.
The system will allow to install a mobile installation for loading grain into ships on this roadway, which will ensure the loading of a barge without moving it along the quay.

  - **port platform**

This platform, which has many areas where pavers are missing, will be replaced by a 25 cm thick concrete dressing platform and a ballast and crushed stone foundation with a total thickness of min. 30 cm.

The platforms will have drain slopes for the water collected from its surface towards the rainwater drainage system, which will consist of the following: roadable concrete channels (with a total length of approx. 220m) that lead the water to two hydrocarbs separators, located at the eastern and western ends of the enclosure

- **electricity network**

- Placement of a transformer substation in the concrete envelope (PTAB) 20/0.4kV, 2x1000kVA
- Making the routes and laying the new low-voltage electricity cables from the transformer station to each consumer in the premises;
- Connecting consumers directly from the new transformer station and putting them into operation;
- Demolition of existing electrical installations.

The main electricity consumers will be:

- The Cereal Terminal (elevators, conveyor belts, installations for loading grain into barges, car scale and laboratory, social group) existing.
- Existing quay cranes.
- The lighting of the premises.
- A grain loader (ship loader).
- Charging sockets for electrical handling equipment.
- Sockets for feeding mobile conveyor belts, etc.
- Sockets for connecting the ships to the electricity network

Currently, the port platform lighting is non-existent.
The activity in the port will also take place at night, and for this it is necessary to provide lighting for the premises.
The following works are proposed:

- Perimeter lighting of the premises by means of street lighting poles with 2 (two) 8m high arms equipped with 150W LED lamps.
- The lighting of the premises will be achieved by mounting some 15.0m high metal pillars with a work platform for changing the projectors.
  Each pillar will be equipped with 6 (six) 1000W LED projector lighting devices.
  Part of the electrical energy required for the operation of the electrical network will be provided by the production of a system of photovoltaic panels.

- **water network**

A new fresh water network shall be built. A pumping station shall be built that will collect used water and pump it to the building (the last one) on the existing network. Four water supply points for ships will be built. Currently there is no actual hydrant network. It is necessary to provide a network of firefight hydrants. The hydrants will ensure a total flow of 20 l/s.

- **railway**

Removal of vegetation and deposits is required, followed by a check of the condition of the track and foundation. The entire length of the track outside the port, from the station to the port, must be cleaned.
The rehabilitation of the railway consists in the replacement of the respective infrastructure and superstructure
The sleepers will be covered with reinforced concrete slabs to ensure traffic on the line area as well.
The embankment shall be arranged by cleaning the existing one and adding a new layer of approx. 10÷15cm thickness to bring it to level.
A new railway track shall be built in the silo area.

- **buildings**

The old police station and port railway station should be repaired as historical buildings of the port.

Figure 11: Ex- water police station 2022

Figure 12: Ex- port railway station 2022

4.2 Turnu Măgurele Port

GENERAL DATA:

The port of Turnu Măgurele is located on the left bank of the Danube at Km 597.

The length of the water front is about 924 m. It is the fourth river port of Romania, the annual operating capacity being about 800,000 tons annually.

The port is situated 5 km from the town of Turnu Măgurele. The port infrastructure is administrated by the City Hall of Turnu Măgurele.

In the place where the port is located today, it was a crossing point and a commercial transactions area from ancient times.

The stone quay of the port was built in 1906, and the river navigation building in the 1910s. In the 1920s, an imposing silo was built - for those times - for the grains that "flowed from the valley of the Danube, Olt and Călmătuiului, far from Roşiori, Slatina and Piteşti" according to the plans of the engineer Anghel Saligni.

In 1892, the railway between the city and the port was built. Until 1960, port activity at Turnu Măgurele was little significant. With the construction of the Chemical Fertilizer Plant, the port experienced a spectacular renaissance, being equipped with modern loading-unloading facilities and a building that housed the river station.

Today, Turnu Măgurele port is Romania's fourth river port in terms of cargo transit capacity – 800.000 to/year. The port territory has an area of 8.6 ha. The port has specialized berths for the operation of chemical goods, construction materials, grain and berths for passenger ships.

4 cranes (2 x 16 ft and 2 x 5 ft) are mounted on the wharf, not all of them are functional.

Access to the quay is made directly from the Danube. Barges of 1000 ton and 2000 ton can be moored at the wharf, the required depth being at least 3.0 m. At the moment, due to the deposits of alluvium, this depth is not ensured. The port has no lighting installation and does not have utilities - water, electricity.

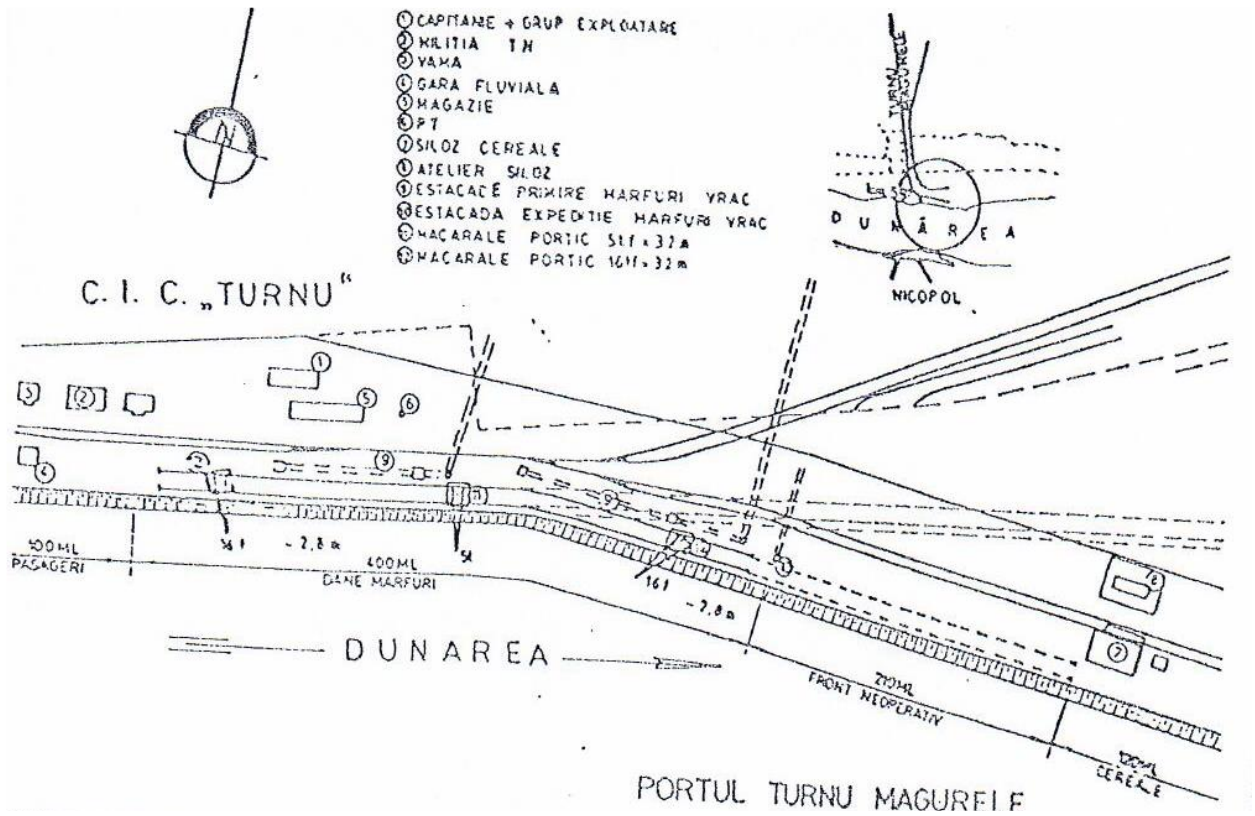
The last repair of the port infrastructure was done in 1989.

The port is connected to the national road network - DN 51A, DN 54 and DN65A - and to the national railway network, specifying that in recent years, goods from railway wagons have not been operated in the port.

In Turnu Măgurele port area, the Turnu Măgurele – Nikopol ferry border crossing point between Romania and the Republic of Bulgaria, is operational since April 2010.

There is no customs control office in the port.

Figure 13: Sketch of Turnu Măgurele Port



Historical Data:

In the place where the port is located today, it was a crossing point and also of commercial transactions from ancient times. In 1910, Turnu Măgurele port was considered the fourth Romanian port on the Danube. The stone quay of the port was built in 1906.

In the 1920s, an imposing silo for those times was built according to the plans of the engineer Anghel Saligni. In 1892, the railway between the city and the port was built. With the construction of the Chemical Fertilizer Plant in 1960, the port experienced a spectacular development.

A system of above-ground conveyor belts was installed and runways for gantry cranes were built.

In the Turnu Măgurele port area, the Turnu Măgurele – Nikopol ferry border crossing point between Romania and the Republic of Bulgaria, operational since April 2010, is set up.

Figure 14: View of Turnu Măgurele Port from the Danube

4.2.1 TRAFFIC 2016 - 2021

Table 26: FREIGHT TRAFFIC TURNU MAGURELE

No.	Freight category	2016	2017	2018	2019	2020	2021
	Total Freight	**149,360**	**180,712**	**191,333**	**271,208**	**100,000**	**100,000**
1.	Cereals	**103,300**	**105,762**	**117,813**	**175,577**	**50,000**	**50,000**
2.	Fresh fruits and vegetables						
3.	Live animals, sugar beet						
4.	Food, beverages, tobacco and animal feed						
5.	Oilseeds (nuts), oils and fats						
6.	Wood, firewood						
7.	Fertilizers (natural and chemical)	**42,560**	**71,200**	**69,320**	**90,231**	**50,000**	**50,000**
8.	Raw mineral products (quarry and ballast, plaster, sulphides, slag, chalk, salt, etc.)						
9.	Iron ores, scrap metal						
10.	Non-ferrous ores						
11.	Textiles, synthetic and artificial products; other raw materials of animal or vegetable origin (skins, furs, rubber)						
12.	Pulp and waste paper						
13.	Solid fuels (coal, coke, etc.)						
14.	Crude oil						
15.	Oil and gas products						
16.	Tars derived from coal and natural gas						
17.	Chemical products						
18.	Lime, cement, manufactured construction materials	**2,100**	**2,200**	**2,400**	**3,200**	**-**	**-**
19.	Glass, glassware, ceramic products						
20.	Metals (ferrous and non-ferrous)						
21.	Articles made of metal						
22.	Cars, transport material						
23.	Various items (fabrics, clothing, footwear, furniture)						

24.	Other products	**1,400**	**1,550**	**1,800**	**2,200**	**-**	**-**
25.	Containers						

4.2.2 Ports Traffic Potential Analyses

4.2.2.1 Methodology

The methodology is based on the following elements:

- Collection and analysis of freight transport data for the base year 2019 and the period 2015-2020.
- Establish the freight flows for 2019.
- Establish the project scenario.
- Forecast of freight flows for a time horizon of 25 years and estimation of the potential for the Turnu Măgurele port.
- Project implementation impact identification: volume of goods by category of goods, time gain/journey, emissions reduction: CO2 equivalent.

4.2.2.2 Data collection and analysis of the basic conditions

In the analysis of the current situation, the following information regarding freight transport flows for the base year 2019 was taken into account:

- The database of the Port of Constanta for the year 2019;
- Romania's imports/exports with EU and non-EU countries, in tons/year, by commodity category, Comext 2019
- Romanian imports/exports by county, in Euros, by product category, 2019
- MNT – Romania's National Transport Model.

4.2.2.2.1 Port of Constanta database 2019

Below is the summary of the analysis of the database of the Port of Constanta regarding the traffic of goods in 2019, by category of goods.

Table 27: Port of Constanta Freight Traffic 2019

TRAFFIC TYPE		QUANTITY
Catboat	Various articles	120
	Cereals	2818561
	Cement, lime, prefabricated materials for construction	2732
	Solid mineral fuels	145251
	Equipment, machines, etc..	4530
	Fertilizers (natural and chemical)	94553
	Minerals, raw or processed	10851
	Iron ores, scrap iron and steel, furnace slag	1281371
	Ores and non-ferrous waste	1585601
	Other chemical products	2001
	Metallic products	67979
	Petroleum products	57549
	Oily seeds, oily fruits and fats	309175
	Total	6380274
Export	Live animals, sugar beet	54110
	Different articles	3159884
	Articles made of metal	7404
	Cereals	12025216
	Cement, lime, prefabricated materials for construction	445
	Solid mineral fuels	366032
	Equipment, machines, etc..	230459
	Fertilizers (natural and chemical)	102616

TRAFFIC TYPE		QUANTITY
	Wood and cork	283842
	Minerals, raw or processed	297022
	Iron ores, scrap iron and steel, furnace slag	1045690
	Ores and non-ferrous waste	1440
	Crude oil	49481
	Leather, textile and clothing	1608
	Food and feed for animals	15634
	Other chemical products	176437
	Chemicals derived from coal and tar	7149
	Metallic products	443479
	Petroleum products	1206895
	Oily seeds, oily fruits and fats	1471840
	Total	20946683
Import	Different articles	3124266
	Articles made of metal	3406
	Potatoes, other vegetables and fresh and frozen fruits	3227
	Cellulose and paper waste	35739
	Cereals	651892
	Cement, lime, prefabricated materials for construction	249932
	Solid mineral fuels	1015895
	Equipment, machines, etc..	55842
	Fertilizers (natural and chemical)	1001487
	Wood and cork	4500
	Minerals, raw or processed	60378

TRAFFIC TYPE		QUANTITY
	Iron ores, scrap iron and steel, furnace slag	1148409
	Ores and non-ferrous waste	1650156
	Crude oil	2974869
	Food and feed for animals	141067
	Other chemical products	153354
	Chemicals derived from coal and tar	92273
	Metallic products	1274396
	Petroleum products	2293280
	Oily seeds, oily fruits and fats	25860
	Total	15960228
Transit	Different articles	277163
	Articles made of metal	90
	Cellulose and paper waste	13062
	Cereals	5815752
	Solid mineral fuels	2307768
	Equipment, machines, etc..	84388
	Fertilizers (natural and chemical)	2703302
	Wood and cork	1207
	Minerals, raw or processed	242652
	Iron ores, scrap iron and steel, furnace slag	1714337
	Ores and non-ferrous waste	620779
	Food and feed for animals	192843
	Other chemical products	141181
	Metallic products	724041

TRAFFIC TYPE		QUANTITY
	Petroleum products	113687
	Oily seeds, oily fruits and fats	331334
	Glass, glassware and ceramic products	11755
	Total	15295341
Total	Live animals, sugar beet	54110
	Different articles	6561433
	Articles made of metal	10900
	Potatoes, other vegetables and fresh and frozen fruits	3227
	Cellulose and paper waste	48801
	Cereals	21311421
	Cement, lime, prefabricated materials for construction	253109
	Solid mineral fuels	3834946
	Equipment, machines, etc..	375219
	Fertilizers (natural and chemical)	3901958
	Wood and cork	289549
	Minerals, raw or processed	610903
	Iron ores, scrap iron and steel, furnace slag	5189807
	Ores and non-ferrous waste	3857976
	Crude oil	3024350
	Leather, textile and clothing	1608
	Food and feed for animals	349544
	Other chemical products	472973
	Chemicals derived from coal and tar	99422
	Metallic products	2509895

TRAFFIC TYPE	QUANTITY
Petroleum products	3671411
Oily seeds, oily fruits and fats	2138209
Glass, glassware and ceramic products	11755
Total	58582526

It is observed that the grain traffic is 21.3 million tons per year, that of metal products is 2.5 million tons per year, and that of chemical products is 473 thousand tons per year. Fertilizer traffic is 3.9 million tons per year.

It is specified that the goods that are transported in the hinterland with the inland navigation mode of transport are registered both as naval traffic and as maritime traffic.

Thus, it can be seen that the potential for these categories of goods is important.

4.2.2.2.2 Imports/exports Romania with EU and Non-EU countries

The following shows Romania's imports and exports with EU and non-EU countries by category of goods and mode of transport. It is mentioned that in the case of trade with non-EU countries, the mode of transport is the one registered at the EU border.

4.2.2.2.2.1 Romania's imports/exports with EU countries

Romania's imports from EU countries by category of goods and mode of transport are presented below.

Table 28: Imports NSTR0 Agricultural products from EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	0	0	138059	107650	0	0	**245709**
Belgium	1	33	110	82031	145	0	**82320**
Bulgaria	26443	522007	6407	137914	23	285843	**978637**
Cyprus	0	11	0	1237	0	0	**1248**
Czech Republic	0	1323	260036	93448	0	0	**354807**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Germany	4	350	86194	261564	0	0	**348112**
Denmark	2	0	0	9081	7	0	**9090**
Estonia	0	0	0	362	0	0	**362**
Spain	0	6940	12	68340	3	0	**75295**
Finland	0	0	0	684	0	0	**684**
France	0	19700	779	116682	1	0	**137162**
United Kingdom	0	5547	22	6902	1	0	**12472**
Greece	0	186	120	245754	4	0	**246064**
Croatia	0	3509	0	9169	0	0	**12678**
Hungary	1	375104	35866	231462	107	96611	**739151**
Ireland (Eire)	0	284	0	329	0	0	**613**
Italy	9	5148	25	98309	23	0	**103514**
Lithuania	0	0	0	3268	0	0	**3268**
Luxembourg	0	0	0	163	0	0	**163**
Latvia	0	0	21	997	0	0	**1018**
Malta	0	0	0	352	0	0	**352**
Netherlands	5	61	197	204917	217	0	**205397**
Poland	118	162	91362	225853	3517	0	**321012**
Portugal	0	0	0	1615	0	0	**1615**
Romania	0	0	0	0	0	0	**0**
Sweden	0	0	0	2964	0	0	**2964**
Slovenia	0	0	0	13333	0	0	**13333**
Slovakia	0	0	79257	103490	0	0	**182747**
All	**26583**	**940365**	**698467**	**2027870**	**4048**	**382454**	**4079787**

Imports of agricultural products are 4.08 million tons per year, of which 940 thousand tons are transported by sea.

Table 29: Exports NSTR0 Agricultural products to EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	0	2613	54063	132789		10184	**199649**
Belgium	0	50566		5835			**56401**
Bulgaria	0	15492	25992	37505	3	3796	**82788**
Cyprus	0	81149	4480	28960			**114589**
Czech Republic	0		38570	24972			**63542**
Germany	0	92101	119897	293803	0		**505801**
Denmark	0	34836		4096	21		**38953**
Estonia	0			136			**136**
Spain	0	1454303	1	6294			**1460598**
Finland	0			1066			**1066**
France	0	141736		19202	21		**160959**
United Kingdom	0	142970		17971			**160941**
Greece	0	253237	853	56952	20	12032	**323094**
Croatia	0	8	11	17305			**17324**
Hungary	0	867	41537	202388	146		**244938**
Ireland (Eire)	0	111462	1313	875			**113650**
Italy	0	642224	220823	317978	70		**1181095**
Lithuania	0			894			**894**
Luxembourg	0			0			**0**
Latvia	0			284			**284**
Malta	0	9649		17			**9666**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Netherlands	0	678194	2703	11275	0		**692172**
Poland	0		2875	28130	0		**31005**
Portugal	0	148872		933			**149805**
Romania							**0**
Sweden	0			1968			**1968**
Slovenia	0		15674	12822	46		**28542**
Slovakia	0		5974	24884			**30858**
All	**0**	**3860279**	**534766**	**1249334**	**327**	**26012**	**5670718**

Exports of agricultural products are 5.7 million tons per year, of which 3.86 million tons are transported by sea.

Table 30: Imports NSTR5 Metal products from EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	22	2219	15054	58354	1	92574	**168224**
Belgium	56	6764	9269	66641	3	190	**82923**
Bulgaria	0	15480	52644	292870	25	1006	**362025**
Cyprus	0			92		2012	**2104**
Czech Republic	32	58	12	79652	64		**79818**
Germany	14	2692	34937	240657	36	1078	**279414**
Denmark	0	0		926	0		**926**
Estonia	0			2			**2**
Spain	0	23306	33	23441	15		**46795**
Finland	0	4527		12539	6		**17072**
France	1	653	344	136600	300		**137898**
United Kingdom	1	2	0	15150	21	6	**15180**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Greece	0	164212	1566	90597	425		**256800**
Croatia	0		5474	4642			**10116**
Hungary	3	691	5	70640	20		**71359**
Ireland (Eire)	1			5944	0		**5945**
Italy	60	133934	22913	433942	172	1487	**592508**
Lithuania	0			182	68		**250**
Luxembourg	0		7233	10114	0		**17347**
Latvia	0			356			**356**
Malta	0			94			**94**
Netherlands	1	24	49	46597	8	5204	**51883**
Poland	27	48	25626	163729	10		**189440**
Portugal	0			350	0		**350**
Romania							**0**
Sweden	0		0	37963	0		**37963**
Slovenia	0	3		6769	1		**6773**
Slovakia	37		94080	180314	5		**274436**
All	**255**	**354613**	**269239**	**1979157**	**1180**	**103557**	**2708001**

Imports of metal products amount to 2.71 million tons per year, of which 355 thousand tons are transported by sea.

Table 31: Exports NSTR5 Metal products in EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	2	442	2298	36325	0	14106	**53173**
Belgium	0		224	12587	0		**12811**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Bulgaria	0	115	42764	166861	0	113862	**323602**
Cyprus	0	690		84			**774**
Czech Republic	0		17821	100415	0		**118236**
Germany	0	114	18310	245953	14		**264391**
Denmark	0	12		14062	0		**14074**
Estonia	0			1150			**1150**
Spain	0	11680	545	21218	0		**33443**
Finland	0			10800	0		**10800**
France	0	34		31975	0		**32009**
United Kingdom	9	6216		20516	5		**26746**
Greece	0	101767		13570	5		**115342**
Croatia	0			17196		13525	**30721**
Hungary	0	92	10894	224190	0	5523	**240699**
Ireland (Eire)	0	713		1780			**2493**
Italy	8	85420	14295	227998	15		**327736**
Lithuania	0			9029	0		**9029**
Luxembourg	0			598	0		**598**
Latvia	0			542			**542**
Malta	0			5			**5**
Netherlands	0	518	1	44713	0		**45232**
Poland	0	3	60671	202462	22		**263158**
Portugal	0	240	24	4098			**4362**
Romania							**0**
Sweden	1			22887	0		**22888**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Slovenia	0			35605		763	**36368**
Slovakia	2		6569	62126	0		**68697**
All	**22**	**208056**	**174416**	**1528745**	**61**	**147779**	**2059079**

Exports of metal products are 2.06 million tons per year, of which 208 thousand tons by sea transport.

Table 32: Imports NSTR8 Chemical products from EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	11	3	11805	137904	22		**149745**
Belgium	10	513	615	175891	253		**177282**
Bulgaria	20	21639	37876	314786	29	4014	**378364**
Cyprus	0			611	4		**615**
Czech Republic	77	56	17121	161790	51		**179095**
Germany	134	2205	2451	525595	216	1199	**531800**
Denmark	11	0		9821	4		**9836**
Estonia	0			3078	0		**3078**
Spain	7	41399	58	69691	20		**111175**
Finland	0	11258	19	7367	44		**18688**
France	29	37983	2675	126437	68	5359	**172551**
United Kingdom	39	1308	380	62761	119		**64607**
Greece	39	2917	5	121458	2		**124421**
Croatia	5	1312	1199	7128	27		**9671**
Hungary	39	153	73857	527109	139	699	**601996**
Ireland (Eire)	2		0	5189	7		**5198**
Italy	26	19010	634	272023	41		**291734**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Lithuania	0	22		19433	1		**19456**
Luxembourg	0	55	0	4970	0		**5025**
Latvia	0		2094	2676	0		**4770**
Malta	0	40		866	2		**908**
Netherlands	16	16644	29286	154633	36		**200615**
Poland	520	85	26170	211040	137		**237952**
Portugal	0	643		5652	0		**6295**
Romania							**0**
Sweden	2		910	22235	4		**23151**
Slovenia	0	1	15	21500	4		**21520**
Slovakia	0	5107	7489	111014	58		**123668**
All	**987**	**162353**	**214659**	**3082658**	**1288**	**11271**	**3473216**

Imports of chemical products are 3.47 million tons per year, of which 162 thousand tons by sea transport.

Table 33: Exports NSTR8 Chemical products in EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	0	9	40349	37494	1		**77853**
Belgium	0	43943		15172	0		**59115**
Bulgaria	1	302	32620	226848	1		**259772**
Cyprus	0	879		1047	0		**1926**
Czech Republic	0	59	23	63858	0		**63940**
Germany	0	14	88389	132352	13		**220768**
Denmark	0		0	2629	0		**2629**
Estonia	0			2125	0		**2125**
Spain	0	19556	23	9104	1		**28684**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Finland	0			1826	1		**1827**
France	0	5522	0	19526	1		**25049**
United Kingdom	0	149	210	17754	2		**18115**
Greece	0	0	1575	63805	8		**65388**
Croatia	0		14679	7603	0		**22282**
Hungary	4	2	34349	225470	8	4122	**263955**
Ireland (Eire)	0	22		522	3		**547**
Italy	3	67294	0	69181	0		**136478**
Lithuania	0			8903	0		**8903**
Luxembourg	0			114			**114**
Latvia	0			2000	0		**2000**
Malta	0	7167		36	1		**7204**
Netherlands	1		0	12517	0		**12518**
Poland	3	4	6980	114535	5		**121527**
Portugal	0	5599	5	2415	0		**8019**
Romania							**0**
Sweden	6			938	0		**944**
Slovenia	0	0		23658	0		**23658**
Slovakia	0	26	6258	32323	0		**38607**
All	**18**	**150547**	**225460**	**1093755**	**45**	**4122**	**1473947**

Exports of chemical products are 1.47 million tons per year, of which 150 thousand tons by sea transport.

4.2.2.2.2.2 Romania's imports/exports with non-EU countries

Romania's imports/exports in relation to Non-EU countries are presented below, cumulatively.

Table 34: Romania's imports/exports in relation to Non-EU countries, agricultural products, tons/year, 2019

Agricultural products	
Import	
Transport mode	***Tons/year***
0 - Unknown	
1 – Sea	200134
2 – Rail	171058
3 - Road	605211
4 – Air	420
5 - Post	0
7 - Fixed Mechanism	
8 - Inland Waterway	29254
9 - Self Propulsion	
All modes	**1006077**

Export	
Transport mode	***Tons/year***
0 - Unknown	
1 – Sea	9979450
2 – Rail	16439
3 - Road	104148
4 – Air	304
5 - Post	37
7 - Fixed Mechanism	
8 - Inland Waterway	
9 - Self Propulsion	
All modes	**10100378**

Imports of agricultural products represent 1 million tons per year, of which 200 thousand tons are transported by sea.
Exports of agricultural products are 10.1 million tons per year, of which 9.98 million tons are transported by sea.

Table 35: Romania's imports/exports in relation to Non-EU countries, metal products, tons/year, 2019

Metal products	
Import	
Transport mode	***Tons/year***
0 - Unknown	
1 – Sea	1349166

2 – Rail	184655
3 - Road	332961
4 – Air	1605
5 - Post	0
7 - Fixed Mechanism	
8 - Inland Waterway	101898
9 - Self Propulsion	11954
All modes	**1982239**

Export	
Transport mode	***Tons/year***
0 - Unknown	
1 – Sea	856992
2 – Rail	18115
3 - Road	164719
4 – Air	855
5 - Post	
7 - Fixed Mechanism	
8 - Inland Waterway	214000
9 - Self Propulsion	
All modes	**1254681**

Imports of metal products represent 1.98 million tons per year, of which 1.35 million tons are transported by sea.
Exports of metal products amount to 1.25 million tons per year, of which 857 thousand tons are transported by sea.

Table 36: Romania's imports/exports in relation to Non-EU countries, chemical products, tons/year, 2019

Chemical products	
Import	
Transport mode	***Tons/year***
0 - Unknown	
1 – Sea	442565
2 – Rail	131175
3 - Road	399631
4 – Air	1419
5 - Post	5
7 - Fixed Mechanism	
8 - Inland Waterway	11152
9 - Self Propulsion	

All modes	**985947**

Export	
Transport mode	***Tons/year***
0 - Unknown	
1 – Sea	309491
2 – Rail	57560
3 - Road	383079
4 – Air	693
5 - Post	469
7 - Fixed Mechanism	
8 - Inland Waterway	1531
9 - Self Propulsion	
All modes	**752823**

Imports of chemical products represent 986 thousand tons per year, of which 443 thousand tons are transported by sea.

Exports of metal products amount to 753 thousand tons per year, of which 309 thousand tons are transported by sea.

The shipping mode is highlighted because it represents a potential for shipping.

4.2.2.2.3 Romanian imports/exports by county, in Euros

INSSE publishes Romania's imports and exports by county, in Euros, as shown below. The cargo categories are different from NSTR1, but they are compatible.

Next, Romania's imports and exports in Euros for 2019 are presented, by category of goods, for the categories of goods considered.

Table 37: Romania's Imports in thousands of Euros, by county, 2019

Romanian county	Agricultural products	Chemical products	Metal products
Alba	85270	47186	214710
Arad	163600	65940	635266
Argeş	89192	279955	487046
Bacău	55163	75100	201699

Bihor	166037	206497	164515
Bistrița-Năsăud	15999	10854	128010
Botoșani	17579	827	5374
Brașov	125310	223377	601260
Brăila	11511	6002	29966
Buzău	48435	26207	79420
Caras-Severin	25153	2413	16412
Călărași	14863	14833	87984
Cluj	74025	177476	334490
Constanta	96186	119657	106513
Covasna	48641	9051	18006
Dâmbovița	13274	93585	207106
Dolj	30866	37488	118816
Galati	43227	66473	248079
Giurgiu	4590	11698	27087
Gorj	3574	2664	6152
Harghita	28690	16504	89194
Hunedoara	34556	51848	41151
Ialomița	43437	44078	13495
Iași	34744	70564	151980
Ilfov	549582	831917	498100
Maramureș	38538	55598	137099
Mehedinți	317	2533	12528
Mureș	149947	377971	167097
Neamț	18923	27528	42017
Olt	11719	102401	154745
Prahova	406127	94970	304369
Satu Mare	65133	46910	97621
Sălaj	32576	12619	118402
Sibiu	39451	60252	304517
Suceava	43469	68476	71897
Teleorman	4088	40536	21059
Timiș	219951	458610	520439
Tulcea	7401	6194	48866
Vaslui	18549	1485	15603
Vâlcea	69332	17301	48627
Vrancea	10835	8618	21360
Municipiul București	1467467	4541552	1965965
Not specified	68455	172194	184050
Total	**4804216**	**2367854**	**5943979**

Table 38: Romania's Exports in thousands of Euros, by county, 2019

Romanian county	Agricultural products	Chemical products	Metal products
Alba	46386	18921	27001
Arad	82847	1484	365752
Argeş	27650	5234	229993
Bacău	21949	79435	9350
Bihor	147363	11111	71404
Bistriţa-Năsăud	16017	22	46873
Botoşani	16853	68	3594
Braşov	56010	23282	437488
Brăila	62951	267	10321
Buzău	63171	9800	169863
Caras-Severin	3564	125	4114
Călăraşi	67393	2429	109238
Cluj	50029	26661	189591
Constanta	698746	7860	47796
Covasna	51077	264	10786
Dâmboviţa	3707	27846	204265
Dolj	75862	9732	47614
Galati	67027	7514	785199
Giurgiu	373	33	32938
Gorj	6767	0	1950
Harghita	13458	189	20097
Hunedoara	15374	7975	81122
Ialomiţa	21870	4615	7370
Iaşi	5331	59424	106737
Ilfov	109373	141461	233755
Maramureş	22074	8412	70028
Mehedinţi	730	484	2056
Mureş	15774	210657	52962
Neamţ	909	2003	56789
Olt	2142	445	737856
Prahova	33626	135276	78268
Satu Mare	52474	11607	61347
Sălaj	22501	8420	397318
Sibiu	31544	3343	166610
Suceava	17553	239	5250
Teleorman	3489	470	16752
Timiş	145627	271887	114523

Tulcea	65258	36731	176339
Vaslui	11798	17824	952
Vâlcea	9090	65867	41224
Vrancea	1235	1062	10634
Municipiul Bucureşti	2294140	980139	642082
Unspecified	343104	167236	58778
Total	**4804216**	**2367854**	**5943979**

4.2.2.2.4 MNT – Romania's National Transport Model

Within the MNT, the forecasted increases for the 2050-time horizon are taken into account.

4.2.2.3 Establishing potential by market segment

To establish the potential, the following methodology was taken into account:

• Estimation of imports and exports in tons per county and the selection of counties with high accessibility to the port of Turnu Măgurele;

• Estimation of transport costs to/from the port of Constanta for two possible routes, namely with direct road transport and with transshipment in the port of Turnu Măgurele;

• Estimation of the potential for Turnu Măgurele port based on the comparative analysis of the two considered routes.

First of all, the potential for the base year 2019 is estimated, as summarized below.

The following tariffs were taken into account:

- Road transport 20 tons, 2.42 Euro/km;

- Naval transport, 21 Euro/ton Turnu Măgurele – Constanta

- Cargo loading Turnu Măgurele port, 2 Euro/ton

It is also mentioned that the estimated potential is at the maximum level and is not restricted by the port operating capacity.

For exports, the agricultural products related to the municipality of Bucharest were distributed to each individual county.

Depending on the difference between the transport cost for each individual transport mode, a transfer potential in % from the direct road transport mode to the road - inland navigation combination is considered. Moreover, a performance coefficient is applied for each category of goods separately, as follows:

- For agricultural products: 0.95;
- For chemical products: 0.90;
- For metal products: 0.85.

Thus, the potential obtained is a total of 1,048,035.00 tons per year, as shown in the tables below for each cargo category and per direction

Table 39: Potential for imports, by county of Destination of goods, 2019

2019											Potential			
IMPORTS	**Agric**	**Chemical**	**Metal**	**Dist. road to Cta**	**Dist. road to Turnu Magurele**	**Loading cost**	**IWT cost**	**Direct road cost 20t**	**IWT +road feeder cost**	**Potential IWT, % of the total**	**Agric**	**Chemical**	**Metal**	**Total**
Dolj	185073	34238	340594	463	128	40	420	**1148**	**777**	50%	60658	4930	44873	110461
Olt	248820	238127	279030	406	112	40	420	**1007**	**738**	50%	81551	34290	36762	152603
Teleorman	28454	1253	8799	690	30	40	420	**1711**	**534**	70%	13056	253	1623	14932
											155265	39473	83259	277996
								% maritime			69%	32%	31%	

Table 40: Potential for exports, by county of Origin of goods, 2019

2019											Potential			
EXPORTS	**Agric**	**Chemical**	**Metal**	**Dist road to Cta**	**Dist. road to Turnu Magurele**	**Loading cost**	**IWT cost**	**Direct road cost 20t**	**IWT +road feeder cost**	**Potential IWT**	**Agric**	**Chemical**	**Metal**	**Total**
Dolj	742081	9152	26545	463	128	40	420	**1148**	**777**	50%	243217	1318	3497	248032
Olt	400810	418	411354	406	112	40	420	**1007**	**738**	50%	131366	60	54196	185622
Teleorman	464029	442	9339	690	30	40	420	**1711**	**534**	70%	212920	89	1723	214731
											587502	1467	59416	648385
								% maritime			69%	32%	31%	
TOTAL IMPORTS AND EXPORTS POTENTIAL														**926.382,00**

The table below shows the growth coefficients for imports/exports by category of goods for the hinterland of the port of Constanta.

Table 41: Growth coefficients for imports/exports by category of goods for the hinterland of the port of Constanta

Imports – flows from Constanta port	Agricultural products	Chemical products	Metal products
2024	1.20153	1.14405	1.14718
2030	1,51150	1,35365	1,36201
2040	1.63279	1.83022	1.71205
2050	1.75408	2.30680	2.06210

Export - flows to Constanta port	Agricultural products	Chemical products	Metal products
2024	1.16197	1.14651	1.14776
2030	1.40181	1.36020	1,36355
2040	1.85671	2.11647	1.64203
2050	2.31162	2.87275	1.92051

Thus, the tables below show the potential per direction and in total, and per category of goods, for the time horizons 2024, 2030, 2040 and 2050, in tons/year.

Table 42: Potential per direction and in total, and per category of goods, for the time horizons, in tons/year

Imports	Agricultural products	Chemical products	Metal products	Total
2024	186556	45160	95513	**327229**
2030	234683	53433	113399	**401515**
2040	253515	72245	142543	**468302**
2050	272347	91056	171687	**535091**

Export	Agricultural products	Chemical products	Metal products	Total
2024	682660	1682	68195	**752538**
2030	823565	1996	81016	**906577**
2040	1090821	3105	97562	**1191489**
2050	1358080	4215	114108	**1476404**

Total Import and Export	Agricultural products	Chemical products	Metal products	Total
2024	869216	46842	163709	**1079767**
2030	1058248	55429	194415	**1308092**
2040	1344336	75350	240105	**1659791**
2050	1630427	95272	285796	**2011495**

4.2.2.4 Establishing the impact on road traffic

The estimated impact on the reduction of HGV heavy trucks, expressed in number of trucks - km per year, for the road transport mode is presented below, on a time horizon.

Table 43: Reduction of HGV heavy trucks, expressed in number of trucks - km per year

Year 2024

Exports (loaded freight)	HGV's reduction per year	Reduction of HGV-km per year, thousand	Reduction of road emissions, 10^3 tons CO_2/year
Dolj	14407	4826.28	2697.89
Olt	10746	3159.27	1766.03
Teleorman	12474	8233.02	4602.26
Total	**37627**	**16218.57**	**9066.18**
Imports (unloaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO2/year**
Dolj	6500	2177.52	1217.23
Olt	8969	2637.03	1474.10
Teleorman	892	588.67	329.07
Total	**16361**	**5403.22**	**3020.40**
Both imports and exports	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO2/year**
Dolj	20907	7004	3915
Olt	19715	5796	3240
Teleorman	13366	8822	4931
Total	**53988**	**21622**	**12087**

Year 2030

Exports (loaded freight)	HGV's reduction per year	Reduction of HGV-km per year, thousand	Reduction of road emissions, 10^3 tons CO_2/year
Dolj	17375	5820.70	3253.77
Olt	12907	3794.51	2121.13
Teleorman	15047	9931.10	5551.48
Total	**45329**	**19546.32**	**10926.39**
Imports (unloaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Dolj	7974	2671.22	1493.21
Olt	10988	3230.35	1805.77
Teleorman	1114	735.47	411.13
Total	20076	6637.04	3710.11
Both imports and exports	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Dolj	25349	8492	4747
Olt	23894	7025	3927
Teleorman	16161	10667	5963
Total	**65405**	**26183**	**14636**

Year 2040

Exports (loaded freight)	HGV's reduction per year	Reduction of HGV-km per year, thousand	Reduction of road emissions, 10^3 tons CO2/year
Dolj	23006	7706.93	4308.17
Olt	16651	4895.49	2736.58
Teleorman	19917	13145.46	7348.31
Total	**59574**	**25747.88**	**14393.06**
Imports (unloaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Dolj	9245	3096.91	1731.17
Olt	12943	3805.14	2127.07
Teleorman	1228	810.45	453.04
Total	**23415**	**7712.50**	**4311.29**
Both imports and exports	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Dolj	32250	10804	6039
Olt	29594	8701	4864

Teleorman	21145	13956	7801
Total	**82990**	**33460**	**18704**

Year 2050

Exports (loaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Dolj	28636	9593.18	5362.59
Olt	20396	5996.48	3352.03
Teleorman	24788	16359.85	9145.16
Total	**73820**	**31949.51**	**17859.78**
Imports (unloaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, th. tons CO_2/year**
Dolj	10515	3522.61	1969.14
Olt	14898	4379.93	2448.38
Teleorman	1342	885.43	494.96
Total	**26755**	**8787.97**	**4912.48**
Both imports and exports	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Dolj	39152	13116	7332
Olt	35294	10376	5800
Teleorman	26129	17245	9640
Total	**100575**	**40737**	**22772**

4.2.2.5 Conclusions

As can be seen above, in the project scenario the following potential is estimated per direction and per category of goods, for the time horizons 2024, 2030, 2040 and 2050, in tons/year, as presented below:

Table 44: Estimated potential per direction and per category of goods, for the time horizons, in tons/year

Imports	**Agricultural products**	**Chemical products**	**Metal products**	**Total**
2024	186556	45160	95513	**327229**
2030	234683	53433	113399	**401515**
2040	253515	72245	142543	**468302**
2050	272347	91056	171687	**535091**

Export	Agricultural products	Chemical products	Metal products	Total
2024	682660	1682	68195	**752538**
2030	823565	1996	81016	**906577**
2040	1090821	3105	97562	**1191489**
2050	1358080	4215	114108	**1476404**

Total Import and Export	Agricultural products	Chemical products	Metal products	Total
2024	869216	46842	163709	**1079767**
2030	1058248	55429	194415	**1308092**
2040	1344336	75350	240105	**1659791**
2050	1630427	95272	285796	**2011495**

Thus, the total potential is between 1.08 million tons in 2024 and 2.01 million tons in 2050.

The effects of the implementation of the project, especially regarding the reduction of road traffic, are presented below.

Table 45: Effects of the implementation of the project

Time horizon	HGV's reduction per year	Reduction of HGV-km per year, thousand
2024	**53988**	**21622**
2030	**65405**	**26183**
2040	**82990**	**33460**
2050	**100575**	**40737**

Thus, there is a reduction in the journey of heavy trucks by 21,622 thousand HGV-Km in the year 2024 and by 40,737 thousand HGV-Km in the year 2050.

The above highlights the beneficial effects of the implementation of the project, in line with the European and national transport policy, promoting the modal transfer from the road transport mode to the alternative naval and rail transport modes.

4.2.3 Assessment of port infrastructure

Figure 15: Partial view of Turnu Magurele Port

Figure 16: Turnu Magurele – port platform

The port does not have systems for supplying ships with electricity and drinking water.

There is no port lighting system at night.

The port infrastructure is damaged for the most part. The quay has sectors where the crowning is destroyed and sectors where the crowning is collapsed.

The port platform is made of cubic stone. It is 90% destroyed and in certain sectors there are very large settlements.

The access road to the port is in a critical condition. There is only one functional building in the port, the Port Authority office.

The last infrastructure maintenance works were carried out in 1989.

4.2.4 Investments and repairs proposal

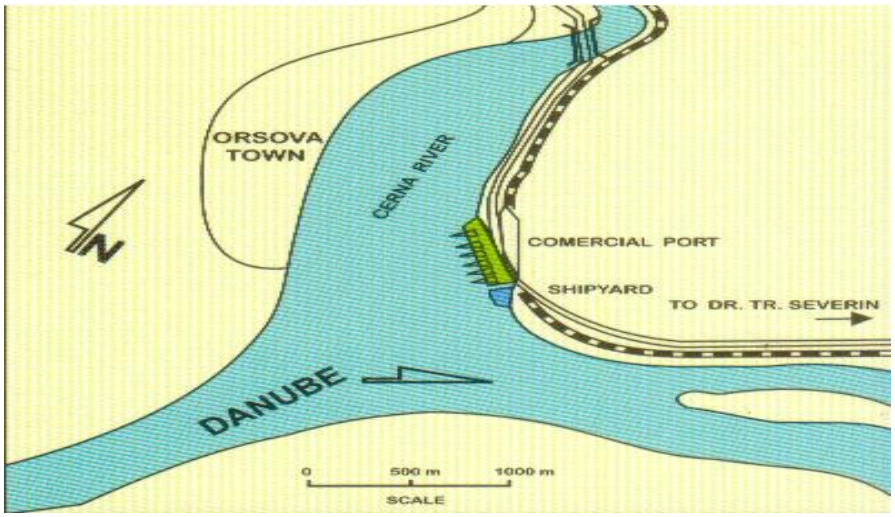
The main objectives of the project are:

- Modernization of hydrotechnical constructions - walled wharves - installation of new systems for tying ships to the wharf;
- Rehabilitation of the port platform;
- Introduction of the water and sewage system consisting of
  - drinking water network in the port;
  - installation of water supply for ships;
  - modernization of the water supply installation of the firefighting system;
  - rainwater drainage system for the quay precipitation water.
- Modernization of the electricity supply system:
  - modernization of the port electricity supply system;
  - installation of lighting systems of the port platforms, the access road to the port and the quay area; the lighting systems will consist of poles with a height between 8 and 12 m powered by solar batteries and with the lighting source based on LEDs;
  - 9 sockets will be installed to supply the ships with electrical energy;
  - Installation of a 5 kwp photovoltaic system.

4.3 Orşova Port

GENERAL DATA:
The limits of the port/place of operation: Km 954, left bank of Cerna Golf, on the accumulation lake of Iron Gates I Dam, next to the Orşova Town .
The area of the port territory administered by APDF Giurgiu is 50,439.54 sm.
The length of the walled quays/vertical/natural embankment is 1060 m.
Operative berths: - 200 ml berth for passengers;
- 5 cargo operation berths; 500 m.
The operating capacity of the Orşova port is 1.2 mil. tons/year.
Connections: Road: via DN 6/E 94 Bucureşti - Orşova (364 Km) - Timişoara (194 Km)
DN 57 Orsova - Moldova Veche (111 km)
Railway: Bucureşti - Orşova (347 Km) - Timişoara (136 Km)

Figure 17: Layout of Orşova port

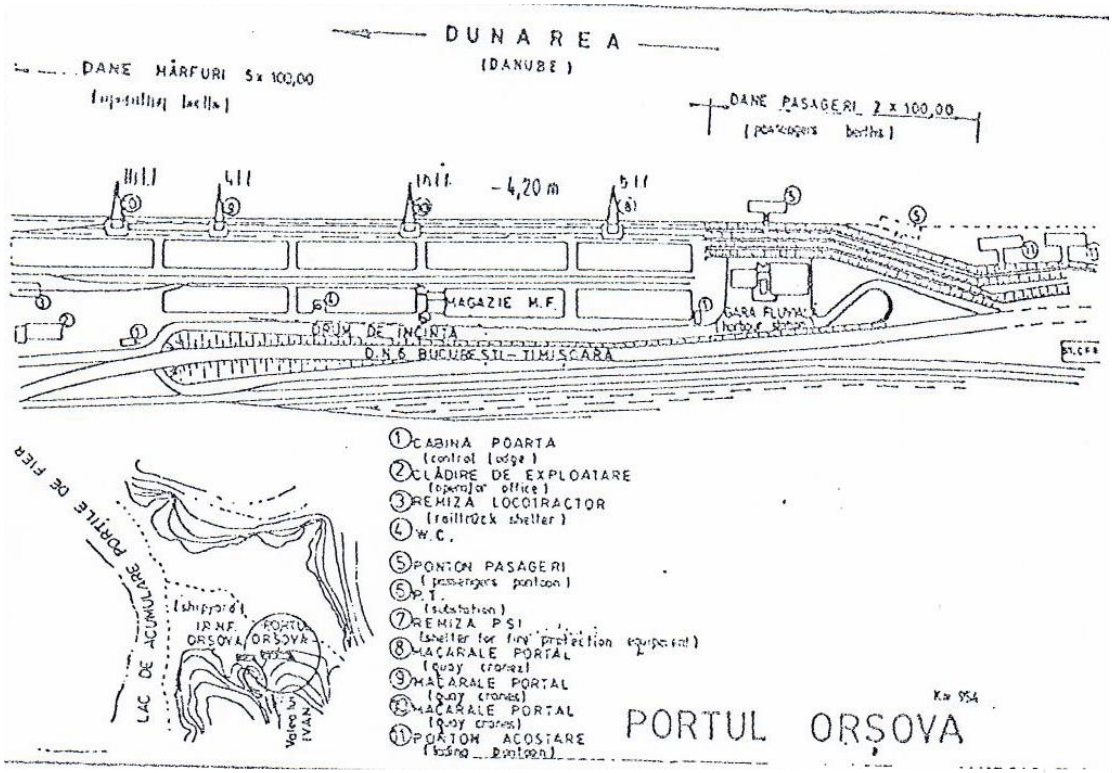


Historical Data:

Orşova is historically dated since the time of the Roman Empire, being known as Dierna.

The municipality of Orşova can be considered an old city full of history, but at the same time, Orşova is a newly built town in the years (1966-1971). The old city of Orşova disappeared under the waters of the Danube, due the construction of the Iron Gates I and II dams.
The current city of Orşova is located on the shore of the reservoir of the Iron Gates 1 dam.

Figure 18: Sketch of Orşova Port



4.3.1 Traffic 2016 - 2021

Table 46: FREIGHT TRAFFIC ORSOVA 2016

FREIGHT TRAFFIC ORSOVA 2016

No.	Freight category	Total	Of which:					
			Loading			Unloading		
			Export	Transit	Cabotage	Import	Transit	Cabotage
0	**Total (1+2+...+25)**	**89909**	**11410**		**8069**	**52187**		**18243**
1.	Cereals	**10497**			**6410**			**4087**
2.	Fresh fruits and vegetables							
3.	Live animals, sugar beet							
4.	Food, beverages, tobacco and animal feed							
5.	Oilseeds (nuts), oils and fats	**7045**			**1659**			**5386**
6.	Wood, firewood	**1738**	**1738**					
7.	Fertilizers (natural and chemical)	**52770**				**45503**		**7267**
8.	Raw mineral products (quarry and ballast, plaster, sulphides, slag, chalk, salt, etc.)							
9.	Iron ores, scrap metal							
10.	Non-ferrous ores							
11.	Textiles, synthetic and artificial products; other raw materials of animal or vegetable origin (skins, furs, rubber)							
12.	Pulp and waste paper	**6684**				**6684**		

13.	Solid fuels (coal, coke, etc.)	**11175**	**9672**					**1503**
14.	Crude oil							
15.	Oil and gas products							
16.	Tars derived from coal and natural gas							
17.	Chemical products							
18.	Lime, cement, manufactured construction materials							
19.	Glass, glassware, ceramic products							
20.	Metals (ferrous and non-ferrous)							
21.	Articles made of metal							
22.	Cars, transport material							
23.	Various items (fabrics, clothing, footwear, furniture)							
24.	Other products							
25.	Containers							

Total Operated vessels: 91
Of which:
Romanian: 35
Foreign: 56

Table 47: FREIGHT TRAFFIC ORSOVA 2017

FREIGHT TRAFFIC ORSOVA 2017

No.	**Freight category**	**Total**	**Of which:**					
			Loading			**Unloading**		
			Export	**Transit**	**Cabotage**	**Import**	**Transit**	**Cabotage**
0	**Total (1+2+...+25)**	**113408**	**24105**		**3638**	**77925**		**7740**
1.	Cereals	**3328**			**3328**			
2.	Fresh fruits and vegetables							
3.	Live animals, sugar beet							
4.	Food, beverages, tobacco and animal feed							
5.	Oilseeds (nuts), oils and fats	**13413**	**11482**		**310**	**583**		**1038**
6.	Wood, firewood							
7.	Fertilizers (natural and chemical)	**46851**				**46851**		
8.	Raw mineral products (quarry and ballast, plaster, sulphides, slag, chalk, salt, etc.)							
9.	Iron ores, scrap metal							
10.	Non-ferrous ores							
11.	Textiles, synthetic and artificial products; other raw materials of animal or vegetable origin (skins, furs, rubber)							
12.	Pulp and waste paper	**15400**				**15400**		
13.	Solid fuels (coal, coke, etc.)	**21172**	**12623**			**2837**		**5712**
14.	Crude oil							
15.	Oil and gas products							
16.	Tars derived from coal and natural gas							
17.	Chemical products							
18.	Lime, cement, manufactured construction materials							
19.	Glass, glassware, ceramic products							

20.	Metals (ferrous and non-ferrous)							
21.	Articles made of metal	**990**						**990**
22.	Cars, transport material							
23.	Various items (fabrics, clothing, footwear, furniture)							
24.	Other products	**12254**				**12254**		
25.	Containers							

Total Operated vessels: 103
Of which:
Romanian: 42
Foreign: 61

Table 48: FREIGHT TRAFFIC ORSOVA 2018

FREIGHT TRAFFIC ORSOVA 2018

No.	**Freight category**	**Total**	**Of which:**					
			Loading			**Unloading**		
			Export	**Transit**	**Cabotage**	**Import**	**Transit**	**Cabotage**
0	**Total (1+2+...+25)**	**123170**	**1207**		**2939**	**90417**		**28607**
1.	Cereals							
2.	Fresh fruits and vegetables							
3.	Live animals, sugar beet							
4.	Food, beverages, tobacco and animal feed							
5.	Oilseeds (nuts), oils and fats	**2939**			**2939**			
6.	Wood, firewood							
7.	Fertilizers (natural and chemical)	**35902**				**31133**		**4769**
8.	Raw mineral products (quarry and ballast, plaster, sulphides, slag, chalk, salt, etc.)							
9.	Iron ores, scrap metal							
10.	Non-ferrous ores							
11.	Textiles, synthetic and artificial products; other raw materials of animal or vegetable origin (skins, furs, rubber)							
12.	Pulp and waste paper	**10925**				**10925**		
13.	Solid fuels (coal, coke, etc.)	**12069**	**1207**			**10174**		**688**
14.	Crude oil							
15.	Oil and gas products							
16.	Tars derived from coal and natural gas							
17.	Chemical products							
18.	Lime, cement, manufactured construction materials	**37742**				**37742**		
19.	Glass, glassware, ceramic products							
20.	Metals (ferrous and non-ferrous)							
21.	Articles made of metal	**23593**				**443**		**23150**
22.	Cars, transport material							
23.	Various items (fabrics, clothing, footwear, furniture)							
24.	Other products							
25.	Containers							

Total Operated vessels: 124

Of which:
Romanian: 45
Foreign: 79

Table 49: FREIGHT TRAFFIC ORSOVA 2019

FREIGHT TRAFFIC ORSOVA 2019

No.	Freight category	Total	Of which:					
			Loading			Unloading		
			Export	Transit	Cabotage	Import	Transit	Cabota
0	**Total (1+2+...+25)**	**119565**				**94218**		**253**
1.	Cereals							
2.	Fresh fruits and vegetables							
3.	Live animals, sugar beet							
4.	Food, beverages, tobacco and animal feed							
5.	Oilseeds (nuts), oils and fats							
6.	Wood, firewood							
7.	Fertilizers (natural and chemical)	**75133**				**75133**		
8.	Raw mineral products (quarry and ballast, plaster, sulphides, slag, chalk, salt, etc.)							
9.	Iron ores, scrap metal							
10.	Non-ferrous ores							
11.	Textiles, synthetic and artificial products; other raw materials of animal or vegetable origin (skins, furs, rubber)							
12.	Pulp and waste paper	**10408**				**10408**		
13.	Solid fuels (coal, coke, etc.)							
14.	Crude oil							
15.	Oil and gas products							
16.	Tars derived from coal and natural gas							
17.	Chemical products							
18.	Lime, cement, manufactured construction materials							
19.	Glass, glassware, ceramic products							
20.	Metals (ferrous and non-ferrous)	**2550**				**2550**		
21.	Articles made of metal	**31474**				**6127**		**253**
22.	Cars, transport material							
23.	Various items (fabrics, clothing, footwear, furniture)							
24.	Other products							
25.	Containers							

Total Operated vessels: 107
Of which:
Romanian: 46
Foreign: 61

Table 50: FREIGHT TRAFFIC ORSOVA 2020

FREIGHT TRAFFIC ORSOVA 2020

No.	Freight category	Total	Of which:					
			Loading			Unloading		
			Export	Transit	Cabotage	Import	Transit	Cabota
0	**Total (1+2+...+25)**	**145341**			**2853**	**136607**		**58**
1.	Cereals							
2.	Fresh fruits and vegetables							
3.	Live animals, sugar beet							
4.	Food, beverages, tobacco and animal feed							
5.	Oilseeds (nuts), oils and fats							
6.	Wood, firewood							
7.	Fertilizers (natural and chemical)	**105158**				**105158**		
8.	Raw mineral products (quarry and ballast, plaster, sulphides, slag, chalk, salt, etc.)	**27975**				**27975**		
9.	Iron ores, scrap metal	**6088**			**2420**	**960**		**270**
10.	Non-ferrous ores							
11.	Textiles, synthetic and artificial products; other raw materials of animal or vegetable origin (skins, furs, rubber)							
12.	Pulp and waste paper							
13.	Solid fuels (coal, coke, etc.)							
14.	Crude oil							
15.	Oil and gas products							
16.	Tars derived from coal and natural gas							
17.	Chemical products							
18.	Lime, cement, manufactured construction materials							
19.	Glass, glassware, ceramic products							
20.	Metals (ferrous and non-ferrous)							
21.	Articles made of metal	**2772**			**433**			**23**
22.	Cars, transport material							
23.	Various items (fabrics, clothing, footwear, furniture)							
24.	Other products	**3348**				**2514**		**83**
25.	Containers							

Total Operated vessels: 109
Of which:
Romanian: 24
Foreign: 85

Table 51: FREIGHT TRAFFIC ORSOVA 2021

FREIGHT TRAFFIC ORSOVA 2021

No.	Freight category	Total	Of which:					
			Loading			Unloading		
			Export	Transit	Cabotage	Import	Transit	Cabotage
0	**Total (1+2+...+25)**	**128182**			**19791**	**107720**		**671**
1.	Cereals	**2892**			**2892**			
2.	Fresh fruits and vegetables							
3.	Live animals, sugar beet							
4.	Food, beverages, tobacco and animal feed							
5.	Oilseeds (nuts), oils and fats							
6.	Wood, firewood							
7.	Fertilizers (natural and chemical)	**69090**				**69090**		
8.	Raw mineral products (quarry and ballast, plaster, sulphides, slag, chalk, salt, etc.)	**27510**				**27510**		
9.	Iron ores, scrap metal	**16899**			**16899**			
10.	Non-ferrous ores	**9085**				**9085**		
11.	Textiles, synthetic and artificial products; other raw materials of animal or vegetable origin (skins, furs, rubber)							
12.	Pulp and waste paper							
13.	Solid fuels (coal, coke, etc.)							
14.	Crude oil							
15.	Oil and gas products							
16.	Tars derived from coal and natural gas							
17.	Chemical products							
18.	Lime, cement, manufactured construction materials							
19.	Glass, glassware, ceramic products							
20.	Metals (ferrous and non-ferrous)	**930**				**930**		
21.	Articles made of metal							
22.	Cars, transport material							
23.	Various items (fabrics, clothing, footwear, furniture)							
24.	Other products	**1776**				**1105**		**671**
25.	Containers							

Total Operated vessels: 127
Of which:
Romanian: 43
Foreign: 84

4.3.2 Port Traffic Potential Analyses

4.3.2.1 Methodology

The methodology is based on the following elements:

- Collection and analysis of freight transport data for the base year 2019 and the period 2015-2020.

- Establish the freight flows for 2019.
- Establish the project scenario.
- Forecast of freight flows for a time horizon of 25 years and estimation of the potential for the Orşova port.
- Project implementation impact identification: volume of goods by category of goods, time gain/journey, emissions reduction: CO2 equivalent.

4.3.2.2 Data collection and analysis of the basic conditions

In the analysis of the current situation, the following information regarding freight transport flows for the base year 2019 was taken into account:

- The database of the Port of Constanta for the year 2019;
- Romania's imports/exports with EU and non-EU countries, in tons/year, by commodity category, Comext 2019
- Romanian imports/exports by county, in Euros, by product category, 2019
- RNTM – Romania's National Transport Model.

4.3.2.2.1 Port of Constanta database 2019

Below is the summary of the analysis of the database of the Port of Constanta regarding the traffic of goods in 2019, by category of goods.

Table 52: Port of Constanta Freight Traffic 2019

TRAFFIC TYPE		QUANTITY
Catboat	Various articles	120
	Cereals	2818561
	Cement, lime, prefabricated materials for construction	2732
	Solid mineral fuels	145251
	Equipment, machines, etc..	4530
	Fertilizers (natural and chemical)	94553
	Minerals, raw or processed	10851

TRAFFIC TYPE		QUANTITY
	Iron ores, scrap iron and steel, furnace slag	1281371
	Ores and non-ferrous waste	1585601
	Other chemical products	2001
	Metallic products	67979
	Petroleum products	57549
	Oily seeds, oily fruits and fats	309175
	Total	6380274
Export	Live animals, sugar beet	54110
	Different articles	3159884
	Articles made of metal	7404
	Cereals	12025216
	Cement, lime, prefabricated materials for construction	445
	Solid mineral fuels	366032
	Equipment, machines, etc..	230459
	Fertilizers (natural and chemical)	102616
	Wood and cork	283842
	Minerals, raw or processed	297022
	Iron ores, scrap iron and steel, furnace slag	1045690
	Ores and non-ferrous waste	1440
	Crude oil	49481
	Leather, textile and clothing	1608
	Food and feed for animals	15634

TRAFFIC TYPE		QUANTITY
	Other chemical products	176437
	Chemicals derived from coal and tar	7149
	Metallic products	443479
	Petroleum products	1206895
	Oily seeds, oily fruits and fats	1471840
	Total	20946683
Import	Different articles	3124266
	Articles made of metal	3406
	Potatoes, other vegetables and fresh and frozen fruits	3227
	Cellulose and paper waste	35739
	Cereals	651892
	Cement, lime, prefabricated materials for construction	249932
	Solid mineral fuels	1015895
	Equipment, machines, etc..	55842
	Fertilizers (natural and chemical)	1001487
	Wood and cork	4500
	Minerals, raw or processed	60378
	Iron ores, scrap iron and steel, furnace slag	1148409
	Ores and non-ferrous waste	1650156
	Crude oil	2974869
	Food and feed for animals	141067
	Other chemical products	153354
	Chemicals derived from coal and tar	92273

TRAFFIC TYPE		QUANTITY
	Metallic products	1274396
	Petroleum products	2293280
	Oily seeds, oily fruits and fats	25860
	Total	15960228
Transit	Different articles	277163
	Articles made of metal	90
	Cellulose and paper waste	13062
	Cereals	5815752
	Solid mineral fuels	2307768
	Equipment, machines, etc..	84388
	Fertilizers (natural and chemical)	2703302
	Wood and cork	1207
	Minerals, raw or processed	242652
	Iron ores, scrap iron and steel, furnace slag	1714337
	Ores and non-ferrous waste	620779
	Food and feed for animals	192843
	Other chemical products	141181
	Metallic products	724041
	Petroleum products	113687
	Oily seeds, oily fruits and fats	331334
	Glass, glassware and ceramic products	11755
	Total	15295341
Total	Live animals, sugar beet	54110

TRAFFIC TYPE	QUANTITY
Different articles	6561433
Articles made of metal	10900
Potatoes, other vegetables and fresh and frozen fruits	3227
Cellulose and paper waste	48801
Cereals	21311421
Cement, lime, prefabricated materials for construction	253109
Solid mineral fuels	3834946
Equipment, machines, etc..	375219
Fertilizers (natural and chemical)	3901958
Wood and cork	289549
Minerals, raw or processed	610903
Iron ores, scrap iron and steel, furnace slag	5189807
Ores and non-ferrous waste	3857976
Crude oil	3024350
Leather, textile and clothing	1608
Food and feed for animals	349544
Other chemical products	472973
Chemicals derived from coal and tar	99422
Metallic products	2509895
Petroleum products	3671411
Oily seeds, oily fruits and fats	2138209
Glass, glassware and ceramic products	11755
Total	58582526

It is observed that the grain traffic is 21.3 million tons per year, that of metal products is 2.5 million tons per year, and that of chemical products is 473 thousand tons per year. Fertilizer traffic is 3.9 million tons per year.

It is specified that the goods that are transported in the hinterland with the inland navigation mode of transport are registered both as naval traffic and as maritime traffic.

Thus, it can be seen that the potential for these categories of goods is important.

4.3.2.2.2 Imports/exports Romania with EU and Non-EU countries

The following shows Romania's imports and exports with EU and non-EU countries by category of goods and mode of transport. It is mentioned that in the case of trade with non-EU countries, the mode of transport is the one registered at the EU border.

4.3.2.2.2.1 Romania's imports/exports with EU countries

Romania's imports from EU countries by category of goods and mode of transport are presented below.

Table 53: Imports NSTR0 Agricultural products from EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	*0*	0	138059	107650	0	0	**245709**
Belgium	1	33	110	82031	145	0	**82320**
Bulgaria	26443	522007	6407	137914	23	285843	**978637**
Cyprus	0	11	0	1237	0	0	**1248**
Czechia	0	1323	260036	93448	0	0	**354807**
Germany	4	350	86194	261564	0	0	**348112**
Denmark	2	0	0	9081	7	0	**9090**
Estonia	0	0	0	362	0	0	**362**
Spain	0	6940	12	68340	3	0	**75295**
Finland	0	0	0	684	0	0	**684**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
France	0	19700	779	116682	1	0	**137162**
United Kingdom	0	5547	22	6902	1	0	**12472**
Greece	0	186	120	245754	4	0	**246064**
Croatia	0	3509	0	9169	0	0	**12678**
Hungary	1	375104	35866	231462	107	96611	**739151**
Ireland (Eire)	0	284	0	329	0	0	**613**
Italy	9	5148	25	98309	23	0	**103514**
Lithuania	0	0	0	3268	0	0	**3268**
Luxembourg	0	0	0	163	0	0	**163**
Latvia	0	0	21	997	0	0	**1018**
Malta	0	0	0	352	0	0	**352**
Netherlands	5	61	197	204917	217	0	**205397**
Poland	118	162	91362	225853	3517	0	**321012**
Portugal	0	0	0	1615	0	0	**1615**
Romania	0	0	0	0	0	0	**0**
Sweden	0	0	0	2964	0	0	**2964**
Slovenia	0	0	0	13333	0	0	**13333**
Slovakia	0	0	79257	103490	0	0	**182747**
All	**26583**	**940365**	**698467**	**2027870**	**4048**	**382454**	**4079787**

Imports of agricultural products are 4.08 million tons per year, of which 940 thousand tons are transported by sea.

Table 54: Exports NSTR0 Agricultural products in EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	0	2613	54063	132789		10184	**199649**
Belgium	0	50566		5835			**56401**
Bulgaria	0	15492	25992	37505	3	3796	**82788**
Cyprus	0	81149	4480	28960			**114589**
Czech Republic	0		38570	24972			**63542**
Germany	0	92101	119897	293803	0		**505801**
Denmark	0	34836		4096	21		**38953**
Estonia	0			136			**136**
Spain	0	1454303	1	6294			**1460598**
Finland	0			1066			**1066**
France	0	141736		19202	21		**160959**
United Kingdom	0	142970		17971			**160941**
Greece	0	253237	853	56952	20	12032	**323094**
Croatia	0	8	11	17305			**17324**
Hungary	0	867	41537	202388	146		**244938**
Ireland (Eire)	0	111462	1313	875			**113650**
Italy	0	642224	220823	317978	70		**1181095**
Lithuania	0			894			**894**
Luxembourg	0			0			**0**
Latvia	0			284			**284**
Malta	0	9649		17			**9666**
Netherlands	0	678194	2703	11275	0		**692172**
Poland	0		2875	28130	0		**31005**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Portugal	0	148872		933			**149805**
Romania							**0**
Sweden	0			1968			**1968**
Slovenia	0		15674	12822	46		**28542**
Slovakia	0		5974	24884			**30858**
All	**0**	**3860279**	**534766**	**1249334**	**327**	**26012**	**5670718**

Exports of agricultural products are 5.7 million tons per year, of which 3.86 million tons are transported by sea.

Table 55: Imports NSTR5 Metal products from EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	22	2219	15054	58354	1	92574	**168224**
Belgium	56	6764	9269	66641	3	190	**82923**
Bulgaria	0	15480	52644	292870	25	1006	**362025**
Cyprus	0			92		2012	**2104**
Czech Republic	32	58	12	79652	64		**79818**
Germany	14	2692	34937	240657	36	1078	**279414**
Denmark	0	0		926	0		**926**
Estonia	0			2			**2**
Spain	0	23306	33	23441	15		**46795**
Finland	0	4527		12539	6		**17072**
France	1	653	344	136600	300		**137898**
United Kingdom	1	2	0	15150	21	6	**15180**
Greece	0	164212	1566	90597	425		**256800**
Croatia	0		5474	4642			**10116**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Hungary	3	691	5	70640	20		**71359**
Ireland (Eire)	1			5944	0		**5945**
Italy	60	133934	22913	433942	172	1487	**592508**
Lithuania	0			182	68		**250**
Luxembourg	0		7233	10114	0		**17347**
Latvia	0			356			**356**
Malta	0			94			**94**
Netherlands	1	24	49	46597	8	5204	**51883**
Poland	27	48	25626	163729	10		**189440**
Portugal	0			350	0		**350**
Romania							**0**
Sweden	0		0	37963	0		**37963**
Slovenia	0	3		6769	1		**6773**
Slovakia	37		94080	180314	5		**274436**
All	**255**	**354613**	**269239**	**1979157**	**1180**	**103557**	**2708001**

Imports of metal products amount to 2.71 million tons per year, of which 355 thousand tons are transported by sea.

Table 56: Exports NSTR5 Metal products in EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	2	442	2298	36325	0	14106	**53173**
Belgium	0		224	12587	0		**12811**
Bulgaria	0	115	42764	166861	0	113862	**323602**
Cyprus	0	690		84			**774**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Czech Republic	0		17821	100415	0		**118236**
Germany	0	114	18310	245953	14		**264391**
Denmark	0	12		14062	0		**14074**
Estonia	0			1150			**1150**
Spain	0	11680	545	21218	0		**33443**
Finland	0			10800	0		**10800**
France	0	34		31975	0		**32009**
United Kingdom	9	6216		20516	5		**26746**
Greece	0	101767		13570	5		**115342**
Croatia	0			17196		13525	**30721**
Hungary	0	92	10894	224190	0	5523	**240699**
Ireland (Eire)	0	713		1780			**2493**
Italy	8	85420	14295	227998	15		**327736**
Lithuania	0			9029	0		**9029**
Luxembourg	0			598	0		**598**
Latvia	0			542			**542**
Malta	0			5			**5**
Netherlands	0	518	1	44713	0		**45232**
Poland	0	3	60671	202462	22		**263158**
Portugal	0	240	24	4098			**4362**
Romania							**0**
Sweden	1			22887	0		**22888**
Slovenia	0			35605		763	**36368**
Slovakia	2		6569	62126	0		**68697**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
All	**22**	**208056**	**174416**	**1528745**	**61**	**147779**	**2059079**

Exports of metal products are 2.06 million tons per year, of which 208 thousand tons by sea transport.

Table 57: Imports NSTR8 Chemical products from EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	11	3	11805	137904	22		**149745**
Belgium	10	513	615	175891	253		**177282**
Bulgaria	20	21639	37876	314786	29	4014	**378364**
Cyprus	0			611	4		**615**
Czech Republic	77	56	17121	161790	51		**179095**
Germany	134	2205	2451	525595	216	1199	**531800**
Denmark	11	0		9821	4		**9836**
Estonia	0			3078	0		**3078**
Spain	7	41399	58	69691	20		**111175**
Finland	0	11258	19	7367	44		**18688**
France	29	37983	2675	126437	68	5359	**172551**
United Kingdom	39	1308	380	62761	119		**64607**
Greece	39	2917	5	121458	2		**124421**
Croatia	5	1312	1199	7128	27		**9671**
Hungary	39	153	73857	527109	139	699	**601996**
Ireland (Eire)	2		0	5189	7		**5198**
Italy	26	19010	634	272023	41		**291734**
Lithuania	0	22		19433	1		**19456**
Luxembourg	0	55	0	4970	0		**5025**
Latvia	0		2094	2676	0		**4770**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Malta	0	40		866	2		**908**
Netherlands	16	16644	29286	154633	36		**200615**
Poland	520	85	26170	211040	137		**237952**
Portugal	0	643		5652	0		**6295**
Romania							**0**
Sweden	2		910	22235	4		**23151**
Slovenia	0	1	15	21500	4		**21520**
Slovakia	0	5107	7489	111014	58		**123668**
All	**987**	**162353**	**214659**	**3082658**	**1288**	**11271**	**3473216**

Imports of chemical products are 3.47 million tons per year, of which 162 thousand tons by sea transport.

Table 58: Exports NSTR8 Chemical products in EU countries, tons/year, 2019

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Austria	0	9	40349	37494	1		**77853**
Belgium	0	43943		15172	0		**59115**
Bulgaria	1	302	32620	226848	1		**259772**
Cyprus	0	879		1047	0		**1926**
Czech Republic	0	59	23	63858	0		**63940**
Germany	0	14	88389	132352	13		**220768**
Denmark	0		0	2629	0		**2629**
Estonia	0			2125	0		**2125**
Spain	0	19556	23	9104	1		**28684**
Finland	0			1826	1		**1827**
France	0	5522	0	19526	1		**25049**
United Kingdom	0	149	210	17754	2		**18115**

	Unknown	Sea	Rail	Road	Air	IWT	All modes
Greece	0	0	1575	63805	8		**65388**
Croatia	0		14679	7603	0		**22282**
Hungary	4	2	34349	225470	8	4122	**263955**
Ireland (Eire)	0	22		522	3		**547**
Italy	3	67294	0	69181	0		**136478**
Lithuania	0			8903	0		**8903**
Luxembourg	0			114			**114**
Latvia	0			2000	0		**2000**
Malta	0	7167		36	1		**7204**
Netherlands	1		0	12517	0		**12518**
Poland	3	4	6980	114535	5		**121527**
Portugal	0	5599	5	2415	0		**8019**
Romania							**0**
Sweden	6			938	0		**944**
Slovenia	0	0		23658	0		**23658**
Slovakia	0	26	6258	32323	0		**38607**
All	**18**	**150547**	**225460**	**1093755**	**45**	**4122**	**1473947**

Exports of chemical products are 1.47 million tons per year, of which 150 thousand tons by sea transport.

4.3.2.2.2.2 Romania's imports/exports with non-EU countries

Romania's imports/exports in relation to Non-EU countries are presented below, cumulatively.

Table 59: Romania's imports/exports in relation to Non-EU countries, agricultural products, tons/year, 2019

Agricultural products	
Import	
Transport mode	***Tons/year***
0 - Unknown	
1 - Sea	200134
2 - Rail	171058
3 - Road	605211
4 - Air	420
5 - Post	0
7 - Fixed Mechanism	
8 - Inland Waterway	29254
9 - Self Propulsion	
All modes	**1006077**

Export	
Transport mode	***Tons/year***
0 - Unknown	
1 - Sea	9979450
2 - Rail	16439
3 - Road	104148
4 - Air	304
5 - Post	37
7 - Fixed Mechanism	
8 - Inland Waterway	
9 - Self Propulsion	
All modes	**10100378**

Imports of agricultural products represent 1 million tons per year, of which 200 thousand tons are transported by sea.

Exports of agricultural products are 10.1 million tons per year, of which 9.98 million tons are transported by sea.

Table 60: Romania's imports/exports in relation to Non-EU countries, metal products, tons/year, 2019

Metal products	
Import	
Transport mode	***Tons/year***
0 - Unknown	
1 - Sea	1349166
2 - Rail	184655
3 - Road	332961
4 - Air	1605
5 - Post	0
7 - Fixed Mechanism	
8 - Inland Waterway	101898
9 - Self Propulsion	11954
All modes	**1982239**

Export	
Transport mode	***Tons/year***
0 - Unknown	
1 - Sea	856992
2 - Rail	18115
3 - Road	164719
4 - Air	855
5 - Post	
7 - Fixed Mechanism	
8 - Inland Waterway	214000
9 - Self Propulsion	
All modes	**1254681**

Imports of metal products represent 1.98 million tons per year, of which 1.35 million tons are transported by sea.

Exports of metal products amount to 1.25 million tons per year, of which 857 thousand tons are transported by sea.

Table 61: Romania's imports/exports in relation to Non-EU countries, chemical products, tons/year, 2019

Chemical products	
Import	
Transport mode	***Tons/year***
0 - Unknown	
1 - Sea	442565
2 - Rail	131175
3 - Road	399631
4 - Air	1419
5 - Post	5
7 - Fixed Mechanism	
8 - Inland Waterway	11152
9 - Self Propulsion	
All modes	**985947**

Export	
Transport mode	***Tons/year***
0 - Unknown	
1 - Sea	309491
2 - Rail	57560
3 - Road	383079
4 - Air	693
5 - Post	469
7 - Fixed Mechanism	
8 - Inland Waterway	1531
9 - Self Propulsion	
All modes	**752823**

Imports of chemical products represent 986 thousand tons per year, of which 443 thousand tons are transported by sea.

Exports of metal products amount to 753 thousand tons per year, of which 309 thousand tons are transported by sea.

The shipping mode is highlighted because it represents a potential for shipping.

4.3.2.2.3 Romanian imports/exports by county, in Euros

INSSE publishes Romania's imports and exports by county, in Euros, as shown below. The cargo categories are different from NSTR1, but they are compatible.

Next, Romania's imports and exports in Euros for 2019 are presented, by category of goods, for the categories of goods considered.

Table 62: Romania's Imports in thousands of Euros, by county, 2019

Romanian county	Agricultural products	Chemical products	Metal products
Alba	85270	47186	214710
Arad	163600	65940	635266
Argeș	89192	279955	487046
Bacău	55163	75100	201699
Bihor	166037	206497	164515
Bistrița-Năsăud	15999	10854	128010
Botoșani	17579	827	5374
Brașov	125310	223377	601260
Brăila	11511	6002	29966
Buzău	48435	26207	79420
Caras-Severin	25153	2413	16412
Călărași	14863	14833	87984
Cluj	74025	177476	334490
Constanta	96186	119657	106513
Covasna	48641	9051	18006
Dâmbovița	13274	93585	207106

Dolj	30866	37488	118816
Galati	43227	66473	248079
Giurgiu	4590	11698	27087
Gorj	3574	2664	6152
Harghita	28690	16504	89194
Hunedoara	34556	51848	41151
Ialomița	43437	44078	13495
Iași	34744	70564	151980
Ilfov	549582	831917	498100
Maramureș	38538	55598	137099
Mehedinți	317	2533	12528
Mureș	149947	377971	167097
Neamț	18923	27528	42017
Olt	11719	102401	154745
Prahova	406127	94970	304369
Satu Mare	65133	46910	97621
Sălaj	32576	12619	118402
Sibiu	39451	60252	304517
Suceava	43469	68476	71897
Teleorman	4088	40536	21059
Timiș	219951	458610	520439
Tulcea	7401	6194	48866
Vaslui	18549	1485	15603
Vâlcea	69332	17301	48627
Vrancea	10835	8618	21360
Municipiul București	1467467	4541552	1965965
Not specified	68455	172194	184050
Total	**4804216**	**2367854**	**5943979**

Table 63: Romania's Exports in thousands of Euros, by county, 2019

Romanian county	Agricultural products	Chemical products	Metal products
Alba	46386	18921	27001
Arad	82847	1484	365752
Argeş	27650	5234	229993
Bacău	21949	79435	9350
Bihor	147363	11111	71404
Bistriţa-Năsăud	16017	22	46873
Botoşani	16853	68	3594
Braşov	56010	23282	437488
Brăila	62951	267	10321
Buzău	63171	9800	169863
Caras-Severin	3564	125	4114
Călăraşi	67393	2429	109238
Cluj	50029	26661	189591
Constanta	698746	7860	47796
Covasna	51077	264	10786
Dâmboviţa	3707	27846	204265
Dolj	75862	9732	47614
Galati	67027	7514	785199
Giurgiu	373	33	32938
Gorj	6767	0	1950
Harghita	13458	189	20097
Hunedoara	15374	7975	81122
Ialomiţa	21870	4615	7370
Iaşi	5331	59424	106737
Ilfov	109373	141461	233755
Maramureş	22074	8412	70028
Mehedinţi	730	484	2056
Mureş	15774	210657	52962
Neamţ	909	2003	56789
Olt	2142	445	737856
Prahova	33626	135276	78268

Satu Mare	52474	11607	61347
Sălaj	22501	8420	397318
Sibiu	31544	3343	166610
Suceava	17553	239	5250
Teleorman	3489	470	16752
Timiş	145627	271887	114523
Tulcea	65258	36731	176339
Vaslui	11798	17824	952
Vâlcea	9090	65867	41224
Vrancea	1235	1062	10634
Municipiul Bucureşti	2294140	980139	642082
Unspecified	343104	167236	58778
Total	**4804216**	**2367854**	**5943979**

4.3.2.2.4 RNTM – Romania's National Transport Model

Within the MNT, the forecasted increases for the 2050 - time horizon are taken into account.

4.3.2.3 Establishing potential by market segment

To establish the potential, the following methodology was taken into account:

- Estimation of imports and exports in tons per county and the selection of counties with high accessibility to the port of Orşova;
- Estimation of transport costs to/from the port of Constanta for two possible routes, namely with direct road transport and with transshipment in the port of Orşova;
- Estimation of the potential for Orşova port based on the comparative analysis of the two considered routes.

First of all, the potential for the base year 2019 is estimated, as summarized below.

The following tariffs were taken into account:

- Road transport 20 tons, 2.42 Euro/km;

- Naval transport, 21 Euro/ton Orşova – Constanta ;

- Cargo loading Orşova port, 2 Euro/ton.

It is also mentioned that the estimated potential is at the maximum level, and is not restricted by the port operating capacity.

For exports, the agricultural products related to the municipality of Bucharest were distributed to each individual county.

Depending on the difference between the transport cost for each individual transport mode, a transfer potential in % from the direct road transport mode to the road - inland navigation combination is considered. Moreover, a performance coefficient is applied for each category of goods separately, as follows:

- For agricultural products: 0.95;
- For chemical products: 0.90;
- For metal products: 0.85.

Thus, the potential obtained is a total of 1,048,035.00 tons per year, as shown in the tables below for each cargo category and per direction

Table 64: Potential for imports, by county of Destination of goods, 2019

2019											Potential			
IMPORTS	**Agric**	**Chemical**	**Metal**	**Dist road to Cta**	**Dist road to Orsova**	**Loading cost**	**IWT cost**	**Direct road cost 20t**	**IWT +road feeder cost**	**Potential IWT, % of the total**	**Agric**	**Chemical**	**Metal**	**Total**
Arad	185073	34238	340594	**815**	**232**	**40**	**420**	**2021**	**1035**	60%	72789	5916	53848	132554
Timis	248820	238127	279030	**782**	**195**	**40**	**420**	**1939**	**944**	40%	65241	27432	29410	122083
Caras Severin	28454	1253	8799	**690**	**90**	**40**	**420**	**1711**	**683**	30%	5596	108	696	6399
Mehedinti	359	1315	6717	**573**	**50**	**40**	**420**	**1421**	**584**	30%	71	114	531	715
Hunedoara	39092	26921	22063	**640**	**190**	**40**	**420**	**1587**	**931**	30%	7687	2326	1744	11757
Gorj	4043	1383	3298	**515**	**115**	**40**	**420**	**1277**	**745**	30%	795	120	261	1175
											152178	36016	86489	274683
								% maritime			69%	32%	31%	

Table 65: Potential for exports, by county of Origin of goods, 2019

2019											Potential			
EXPORTS	**Agric**	**Chemical**	**Metal**	**Dist road to Cta**	**Dist. road to Orsova**	**Loading cost**	**IWT cost**	**Direct road cost 20t**	**IWT +road feeder cost**	**Potential IWT**	**Agric**	**Chemical**	**Metal**	**Total**
Arad	634549	1396	203906	815	232	40	420	**2021**	**1035**	60%	249568	241	32238	282047
Timis	1238226	255687	63846	782	195	40	420	**1939**	**944**	40%	324663	29455	6729	360847
Caras Severin	276376	118	2294	690	90	40	420	**1711**	**683**	30%	54349	10	181	54541
Mehedinti	163261	455	1146	573	50	40	420	**1421**	**584**	30%	32105	39	91	32235
Hunedoara	91779	7500	45225	640	190	40	420	**1587**	**931**	30%	18048	648	3575	22271
Gorj	108434	0	1087	515	115	40	420	**1277**	**745**	30%	21324	0	86	21410
											700058	30394	42900	773351
								% maritime			69%	32%	31%	
TOTAL IMPORTS AND EXPORTS POTENTIAL														**1048035**

The table below shows the growth coefficients for imports/exports by category of goods for the hinterland of the port of Constanta.

Table 66: Growth coefficients for imports/exports by category of goods for the hinterland of the port of Constanta

Imports – flows from Constanta port	Agricultural products	Chemical products	Metal products
2024	1.20153	1.14405	1.14718
2030	1,51150	1,35365	1,36201
2040	1.63279	1.83022	1.71205
2050	1.75408	2.30680	2.06210

Export - flows to Constanta port	Agricultural products	Chemical products	Metal products
2024	1.16197	1.14651	1.14776
2030	1.40181	1.36020	1,36355
2040	1.85671	2.11647	1.64203
2050	2.31162	2.87275	1.92051

Thus, the tables below show the potential per direction and in total, and per category of goods, for the time horizons 2024, 2030, 2040 and 2050, in tons/year.

Table 67: Potential per direction and in total, and per category of goods, for the time horizons, in tons/year

Imports	Agricultural products	Chemical products	Metal products	Total
2024	182848	41204	99219	**323272**
2030	230018	48753	117799	**396570**
2040	248475	65917	148074	**462466**
2050	266933	83081	178349	**528364**

Export	Agricultural products	Chemical products	Metal products	Total
2024	813446	34847	49239	**897532**
2030	981346	41342	58496	**1081184**

2040	1299804	64328	70443	**1434574**
2050	1618266	87314	82390	**1787969**

Total Import and Export	Agricultural products	Chemical products	Metal products	Total
2024	996294	76051	148459	**1220803**
2030	1211364	90095	176295	**1477753**
2040	1548279	130245	218517	**1897040**
2050	1885199	170395	260739	**2316333**

4.3.2.4 Establishing the impact on road traffic

The estimated impact on the reduction of HGV heavy trucks, expressed in number of trucks - km per year, for the road transport mode is presented below, on a time horizon.

Table 68: Reduction of HGV heavy trucks, expressed in number of trucks - km per year

Year 2024

Exports (loaded freight)	HGV's reduction per year	Reduction of HGV-km per year, thousand	Reduction of road emissions, 10^3 tons CO_2/year
Arad	16363	9540	5333
Timis	20937	12290	6870
Caras Severin	3169	1901	1063
Mehedinti	1873	979	548
Hunedoara	1291	581	325
Gorj	1244	498	278
Total	**44877**	**25789**	**14416**
Imports (unloaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Arad	7800	4547	2542
Timis	7176	4212	2355
Caras Severin	382	229	128
Mehedinti	41	22	12

Hunedoara	695	313	175
Gorj	70	28	16
Total	**16164**	**9351**	**5227**
Both imports and exports	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Arad	24163	14087	7875
Timis	28113	16502	9225
Caras Severin	3551	2131	1191
Mehedinti	1914	1001	560
Hunedoara	1986	894	500
Gorj	1313	525	294
Total	**61040**	**35140**	**19643**

Year 2030

Exports (loaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Arad	19707	11489	6422
Timis	25218	14803	8275
Caras Severin	3822	2293	1282
Mehedinti	2259	1182	660
Hunedoara	1553	699	391
Gorj	1500	600	335
Total	**54059**	**31066**	**17366**
Imports (unloaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Arad	9569	5578	3118
Timis	8790	5160	2884
Caras Severin	478	287	160
Mehedinti	49	26	14
Hunedoara	857	386	216
Gorj	86	34	19
Total	**19828**	**11471**	**6412**

Both imports and exports	HGV's reduction per year	Reduction of HGV-km per year, thousand	Reduction of road emissions, 10^3 tons CO_2/year
Arad	29275	17067	9541
Timis	34008	19963	11159
Caras Severin	4300	2580	1442
Mehedinti	2308	1207	675
Hunedoara	2410	1085	606
Gorj	1586	635	355
Total	**73888**	**42536**	**23778**

Year 2040

Exports (loaded freight)	HGV's reduction per year	Reduction of HGV-km per year, thousand	Reduction of road emissions, 10^3 tons CO_2/year
Arad	25841	15065	8422
Timis	33810	19846	11094
Caras Severin	5061	3037	1698
Mehedinti	2992	1565	875
Hunedoara	2038	917	513
Gorj	1987	795	444
Total	**71729**	**41225**	**23045**
Imports (unloaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Arad	11093	6467	3615
Timis	10354	6078	3398
Caras Severin	526	316	177
Mehedinti	62	32	18
Hunedoara	990	445	249
Gorj	98	39	22
Total	**23123**	**13378**	**7478**
Both imports and exports	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Arad	36934	21533	12037

Timis	44164	25924	14492
Caras Severin	5588	3353	1874
Mehedinti	3054	1597	893
Hunedoara	3027	1362	762
Gorj	2085	834	466
Total	**94852**	**54603**	**30523**

Year 2050

Exports (loaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Arad	31976	18642	10421
Timis	42402	24890	13913
Caras Severin	6301	3780	2113
Mehedinti	3725	1948	1089
Hunedoara	2522	1135	635
Gorj	2473	989	553
Total	**89398**	**51384**	**28724**
Imports (unloaded freight)	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Arad	12618	7356	4112
Timis	11918	6996	3911
Caras Severin	575	345	193
Mehedinti	74	39	22
Hunedoara	1122	505	282
Gorj	110	44	25
Total	**26418**	**15285**	**8545**
Both imports and exports	**HGV's reduction per year**	**Reduction of HGV-km per year, thousand**	**Reduction of road emissions, 10^3 tons CO_2/year**
Arad	44594	25998	14533
Timis	54320	31886	17824
Caras Severin	6876	4125	2306
Mehedinti	3799	1987	1111
Hunedoara	3645	1640	917

Gorj	2583	1033	578
Total	**115817**	**66670**	**37268**

4.3.2.5 Conclusions

As can be seen above, in the project scenario the following potential is estimated per direction and per category of goods, for the time horizons 2024, 2030, 2040 and 2050, in tons/year, as presented below.

Table 69: Estimated potential per direction and per category of goods, for the time horizons, in tons/year

Imports	Agricultural products	Chemical products	Metal products	Total
2024	182848	41204	99219	**323272**
2030	230018	48753	117799	**396570**
2040	248475	65917	148074	**462466**
2050	266933	83081	178349	**528364**

Export	Agricultural products	Chemical products	Metal products	Total
2024	813446	34847	49239	**897532**
2030	981346	41342	58496	**1081184**
2040	1299804	64328	70443	**1434574**
2050	1618266	87314	82390	**1787969**

Total Import and Export	Agricultural products	Chemical products	Metal products	Total
2024	996294	76051	148459	**1220803**
2030	1211364	90095	176295	**1477753**
2040	1548279	130245	218517	**1897040**
2050	1885199	170395	260739	**2316333**

Thus, the total potential is between 1.22 million tons in 2024 and 2.32 million tons in 2050.

The effects of the implementation of the project, especially regarding the reduction of road traffic, are presented below.

Table 70: Effects of the implementation of the project

Time horizon	HGV's reduction per year	Reduction of HGV-km per year, thousand
2024	61040	35140
2030	73888	42536
2040	94852	54603
2050	115817	66670

Thus, there is a reduction in the journey of heavy trucks by 35,840 thousand HGV-Km in the year 2024 and by 66,670 thousand HGV-Km in the year 2050.

The above highlights the beneficial effects of the implementation of the project, in line with the European and national transport policy, promoting the modal transfer from the road transport mode to the alternative naval and rail transport modes.

4.3.3 Assessment of port infrastructure

The port has walled quays with a length of 200 m and vertical quays with a length of 500 m.

- Walled quay

It is made of concrete, bordered towards the water by a concrete platform.

It is used only for passenger traffic, ships mooring at pontoons. It is in good condition, no repairs needed.

The port has a modern passenger terminal with a river station to European standards.

Figure 19: Orşova walled quay – passengers

- Vertical quay

It is made of a continuous reinforced concrete wall. It has stairs (concrete) that allow access to the surface of the water.

Currently, vertical wooden beams are embedded in the wall as shock absorbers (fig. 20).

Figure 20: Orşova vertical quay

There are exfoliated areas on the facing, with the reinforcement visible (fig. 21), which need to be repaired.

Figure 21: Exfoliated zone

- The port platform

It must be cleaned of debris, for the full length of the crane runway to be put back into operation. Similarly, the railways must be cleaned and possibly repaired (currently only one line is functional, with restrictions). It is recommended to redevelop the platform to simultaneously allow road and rail access in the area of action of the cranes.

Figure 22: Railway in the southern zone

Figure 23: Railway in the northern zone

- Utilities at the quay

The cranes are supplied with electricity in precarious conditions (fig. 24). It is necessary to restore the electricity network and a new water network (with hydrants).

Figure 24: Degraded electric switch box

4.3.4 Investments and repairs proposal

The main objectives of the repairs/investment should be:

- Modernization of hydrotechnical constructions - walled wharves - installation of new systems for tying ships to the wharf;
- Rehabilitation of the port platform;
- Introduction of the water and sewage system consisting of
  - Drinking water network in the port;
  - Installation of water supply for ships;
  - Modernization of the water supply installation of the firefighting system;
  - Rainwater drainage system for the quay precipitation water.
- Modernization of the electricity supply system:
  - Modernization of the port electricity supply system;
  - Installation of the lighting systems of the port platforms, the access road to the port and the quay area; the lighting systems will consist of poles with a height between 8 and 12 m powered by solar batteries and with the lighting source based on LEDs;
  - sockets will be installed to supply the ships with electrical energy;

Installation of a brand-new photovoltaic system.

5 FINANCING Programs / Means

In 2015, the Ministry of Transport developed the **National Transport Master Plan for Romania**.

Romania's General Transport Master Plan (MPGT) presents the development priorities of Romania's transport system for all modes of transport.

The Master Plan is embodied in a list of projects prioritized by means of transport and time horizons.

The Master Plan analyses the major objectives of the national transport system. Therefore, it constitutes a strategic tool for planning major interventions (projects and other actions) that are significant for transport objectives on a national scale.

The prioritization of the projects took into account the following sequence of stages:

- Definition of strategic objectives
- Identification of existing problems at the level of the transport system
- Definition of operational objectives that address the identified problems
- Definition of interventions
- Testing interventions using the National Transport Model and Cost-Benefit Analysis
- Prioritization of projects, using a multi-criteria analysis
- Recommendation of the optimal strategy for the development of transport in Romania.

Finally, the Master Plan recommends investments in the development of the transport network and services in Romania, taking into account:

- Prioritization of projects on each mode of transport (road, rail, sea, multimodal and air)
- Existing budget restrictions
- Belonging to the TEN-T network (Core and Comprehensive) which insure the eligibility for the EU funds

Large Infrastructure Operational Program 2014-2020

In 2014, the Large Infrastructure Operational Program (POIM) was approved. The POIM strategy is oriented towards the objectives of the Europe 2020 Strategy, focusing on sustainable growth by promoting an economy based on low carbon consumption through energy efficiency measures and the promotion of green energy, as well as by promoting environmentally friendly modes of transport and a more efficient use of resources.

Considering the high degree of correlation and complementarity, as well as the experience of the period 2007-2013, the promotion of investments in the field of infrastructure and resources will be financed within a single program with the global objective: "Development of transport infrastructure, environment, energy to European standards, in order to create the premises of a sustainable economic growth, in safe conditions and efficient use of natural resources."

POIM addresses the development needs of four sectors: transport infrastructure, environmental protection, risk management and adaptation to climate change, energy and energy efficiency, contributing to the Union Strategy for a smart, sustainable and inclusive growth, by financing 4 of the 11 thematic objectives from Regulation no. 1303/2013.

Within the POIM, the following actions and projects were established to be financed:

- eligible actions under OS 1.3:

  New projects to improve the navigation conditions on the Danube and on the navigable channels of the Danube, as well as inside the ports, including the acquisition of equipment and multi-functional vessels to ensure navigability on the Danube with the following types of sub-actions:

  • Improving the navigation conditions on the Danube and on the navigable channels of the Danube;

  • Acquisition of equipment and multifunctional vessels to ensure navigability on the Danube;

  • Dredging on the Danube, the navigable channels of the Danube and in the Romanian maritime and inland (river) ports located on the TEN-T CORE network.

  Projects to modernize and develop the capacity of ports located on the central TEN-T network with the following types of sub-actions:

  • Modernization and development of the port infrastructure in the Romanian maritime and inland (river) ports located on the TEN-T CORE network

  • Construction/modernization of the access infrastructure in the Romanian maritime and inland (river) ports located on the TEN-T CORE network

  • Modernization and development of the port superstructure in the Romanian maritime and inland (river) ports located on the TEN-T CORE network

- eligible actions under OS 2.4 - ports:

  Port infrastructure modernization and development projects in ports, both those located on the TEN-T network and those located on other networks, in order to provide optimal conditions for the maritime transport of goods, including the acquisition of port facilities and other equipment with the following types of sub-actions:

  • Modernization and development of the port infrastructure in the Romanian maritime and inland (river) ports located on and outside the TEN-T network;

  • Construction/modernization of the access infrastructure in the Romanian maritime and inland (river) ports located on and outside the TEN-T network;

  • Modernization and development of the port superstructure in the Romanian maritime and inland (river) ports located on and outside the TEN-T network;

  • Dredging in the Romanian maritime and inland (river) ports located on and outside the TEN-T network.

Until 2019, the Ministry of Transport and Infrastructure, Port and Waterway Administrations and Local Authorities were eligible for the use of European funds.

Starting with 2019, as a result of the steps taken by the AAOPFR, private port operators were also accepted as eligible.

As the three ports that are the subject of this report are located on the Danube, part of the Rhine-Danube corridor within the general TEN-T network.

Călăraşi and Orşova ports are administrated by APDF Giurgiu.

Turnu Măgurele port is administrated by the City Hall of Turnu Măgurele.

APDF Giurgiu has three projects which are proposed to be financed through POIM - Giurgiu port, Corabia port and Calafat port.

Turnu Măgurele City Hall submitted to the Ministry of Transport the project regarding the modernization of the port of Turnu Măgurele in order to obtain financing through the POIM program.

The Sustainable and Smart Mobility Strategy 2020 recognises the need to improve the sector's access to financing. It is estimated that it will cost some EUR 27 billion just to complete the TEN-T core network for inland waterways. But one of the key challenges for the sector's modernisation will be to increase financial support for the transition to a zero-emission fleet.

With a total budget of EUR 672.5 billion, the Recovery and Resilience Facility can benefit all sectors of the EU economy, including inland waterway transport. Unfortunately, in Romania's proposal for the Recovery and Resilience Facility projects regarding naval transport were not included.

For 2021-2027, the Connecting Europe Facility will have a EUR 21.8 billion budget to support the completion of an interconnected, multimodal, sustainable, interoperable, smart, safe and secure TEN-T network, strengthening social, economic, environmental and territorial cohesion in the Union . The programme will impactfully target modernisation of the inland waterway TEN-T infrastructure, for example by supporting RIS deployment, a network of alternative fuels infrastructure or multimodal platforms in inland ports along the TEN-T network.

On 13 September 2022 was published the 2022 CEF transport call. The deadlines 18 January 2023.

The 2022 CEF Transport call for proposals makes **EUR 5.12 billion** available for projects targeting new upgraded and improved European transport infrastructure.

Projects funded under this call will help to increase the sustainability of the transport network, putting the EU on track to meet the European Green Deal objective of cutting transport emissions by 90% by 2050.

The indicative total budget of the call is available to support infrastructure projects on the Core and Comprehensive TEN-T networks in the following areas:

- railways
- inland waterways
- maritime and inland ports
- road safety
- rail-road terminals
- multimodal logistics platforms
- multimodal passenger hubs
- smart and interoperable applications for transport
- safe and secure mobility
- infrastructure resilience

The objective for IWT is to develop inland waterways transport infrastructure projects on the Comprehensive Network of the TEN-T.

Scope - studies and / or works on inland ports, related to:

- access, including safe access through navigational aids, of inland ports to inland waterways;

- basic and water-side infrastructure in inland ports, including shore-side electricity supply;
- port reception facilities for oil and other waste (including residues from exhaust gas cleaning systems) and infrastructure for degassing vessels to meet environmental requirements;
- providing or improving road/rail access and connections within inland ports;
- ensuring year-round navigability by means of e.g. hydrological services, ice-breaking facilities and dredging of the port and port approaches.

Water-side infrastructure development projects shall mean infrastructure that enhances the navigability capacity in the meaning of Articles 15 and 16 of Regulation (EU) No 1315/2013 or improves the multimodal connection of waterborne transport operations. This excludes infrastructure that does not directly benefit waterborne transport operations.

Waterside infrastructure development projects that improve the navigability capacity and the multimodal connection of waterborne transport can include elements of storage and transhipment facilities and equipment. However, these are only eligible if they are fully integrated in, and a minor part of, an inland waterborne infrastructure project. In other words, proposals that focus on storing and transhipment facilities and equipment rather than on infrastructure will not be considered eligible. Moreover, facilities and equipment that are not used specifically for transhipment from/to inland waterway transport will also not be considered eligible.

Support will not be given to infrastructure dedicated to cruise ships, except as regards shore-side electricity supply.

Hinterland connections to the inland ports are covered by the respective transport mode priorities but may be part of a single project (for instance a project improving the rail access both within and outside the port area).

Facilities and infrastructure supported under CEF must be accessible for use by all operators on a non-discriminatory basis.

In 2022, the Romanian Ministry of Transport and Infrastructure elaborated the "Investment Program for the development of transport infrastructure in the period 2021-2030

In the context of the European policy in the field of transport, which provides for the creation of an integrated European network, oriented towards the development of a central network, with a completion date of 2030 (TEN-T Core) and a global network that will support the central network, with a completion date of 2050 (TEN-T Comprehensive), Romania must increase the efficiency of investments in transport infrastructure of both European and national interest oriented towards the development of national and international connectivity, as well as increasing the accessibility of all regions of Romania to the opportunities of the Single Market.

The lack of coherence in planning at the national level represents an obstacle that prevents investment in transport infrastructure in Romania, therefore the development of a stable strategic framework in the transport sector is a necessity to which this Program aims to respond adequately and efficiently through a road map with clear objectives.

Considering the transition period between the two multi-annual financial years 2014-2020 and 2021-2027 respectively, considering the fact that the General Transport Master Plan and the related Implementation Strategy were adopted in 2016, as well as analysing the need to correlate the relevant public policies in in order to achieve the necessary infrastructure objectives at the national level, this document has a triple role of:

- prioritization of investments constituting a favourable condition in view of the new multiannual financial framework,

- update of the implementation strategy of the General Transport Master Plan of Romania,

- reference framework document for the relevant public policies and for all institutions involved in achieving the national transport infrastructure objectives.

In essence, this Investment Program aims at a paradigm shift in the sense of focusing Romania's political, institutional and financial efforts on a clear set of priorities, in line with national and European interests, which will lead to the creation of a network at the end of the 2021-2030 decade national transport networks that represent the backbone of the development of the national economy.

Once the European and national political framework is set, this Program describes for each transport sector the existing situation, the main development needs, the identification of investment projects, the prioritization methodology, budgets and implementation calendar, as well as aspects related to sector governance, operation and maintenance newly created infrastructure, safety and traffic management technologies, as well as, last but not least, aspects of environmental protection and climate adaptation.

Regarding the naval field, the most important strategic objectives are:

- Ensuring minimum navigation depths on the Danube;
- Development and modernization of navigable canals,
- The development and modernization of Constanța Port to reach new cargo flows and increase its competitiveness,
- Creating a primary network of Romania's river ports and focusing investments for its development,
- Promoting transport on inland waterways.

The strategic vision for the field of naval transport in Romania in the next 10 years is developed starting from the elements identified in the analysis of the current situation presented and the MPGT objectives presented above:

1. Ensuring the reliability of waterways, in particular the Danube and its waterways, by ensuring navigation depths of 2.5 m on the Danube throughout the year, as well as strengthening/defending the banks and modernizing lock equipment. At the same time, based on synergies with other economic sectors, the completion of the works on the Danube-Bucharest Canal and the realization of (pre)feasibility studies for new sections of waterways, in particular on the Prut and Siret rivers.

2. In the case of maritime ports, in the next 10 years, Constanța Port will remain the main port and will have to increase its volume of processed goods 4 times (including RO-RO and containerized transport) reaching 200 million tons of cargo operated in 2030. For this, in compliance with state aid rules, the necessary investments to develop operating capacity will be developed, as well as administrative capacity measures to attract new freight flows. The ports of Midia and Mangalia remain secondary and will develop in correlation with the Port of

Constanța (they will not compete, but complement each other). All these ports remain ports of national interest.

Constanța Port, together with the Danube, rail and road connections, must become the central point of Romania's transport strategy according to the General Transport Master Plan in order to position Romania as a transport hub between Europe and Asia:

3. River ports will be systematized so as to create a primary network of ports whose service area (hinterland) corresponds to an economic potential, as well as a secondary network of ports that ensure the accessibility of specialized goods. Ports on the primary and secondary network retain their national importance. The other ports/jobs will be transferred to local authorities/activities (including tourism and leisure) or abolished. Ports in the primary and secondary network will be supported, in accordance with state aid rules, for the development of infrastructure and the capacity to provide port services.

Definition of primary and secondary network

The ports on the primary network are: Constanţa, Sulina, Tulcea, Galati, Brăila, Cernavodă, Călăraşi, Oltenița, Giurgiu, Corabia, Calafat, Dr. Tr. Severin, Orşova, Moldova Noua.

As for the secondary network, it is proposed to be established based on the recorded traffic volumes, as well as the analysis of the type of cargo operated and the economic potential of the area.

The ports in the secondary network are: Bechet, Turnu Măgurele, Zimnicea, Feteşti, Medgidia, Basarabi, Ovidiu, Luminița, Măcin, Hârşova, Isaccea, Mahmudia, Chilia Veche.

Considering the multiplicity of aspects of shipping, covering both waterways and hydrotechnical infrastructures, as well as freight and passenger services, together with aspects of traffic safety and digitization, a much more thorough investigation of the state of the sector is required and the development potential in the form of a Naval Transport Development Strategy, which once completed, will complete the provisions of this Investment Program.

The Naval Transport Development Strategy will present the problems and needs faced by the naval sector, methods of approach and solution, development priorities, actions for their fulfilment and allocated resources.

The strategy will include:

- analysis of the current situation of Romanian waterways (both inland and maritime waterways) and the situation of Romanian ports in terms of infrastructure;
- analysis of projects from the Romanian naval sector;
- analysis of the database for the base year of the National Transport Model for river transport and for ports in Romania;
- economic analysis and territorial development plans of UAT in the area of influence of the ports;
- analysis of future trends and scenarios for 2027, 2030, 2035 and 2050 and development of short-term (2027), medium (2035) and long-term perspective scenarios (2050);
- carrying out related forecasts regarding transport demand and traffic for river transport and for ports in Romania;

- evaluation of the way of organization and operation of port and waterway administrations, made concrete by proposals for improvement regarding the legal and institutional framework. Relevant examples of good practice within the EU;
- analysing the way EU funds are used. Proposals regarding the improvement/efficiency of the use of these funds and the impact of state aid regulations to facilitate the development of ports;
- analysing the economic and financial impact as a result of the implementation of the measures proposed within the "Strategy for the Development of Naval Transport" in Romania.

The analysis will focus on how Romania can improve the environmental performance of ships and ports, taking into account the requirements at EU level, while importance should be given to the provision of green fuels to ships (especially through shore power), the strategy should consider measures to green all port operations (emissions, noise, pollution, etc.).

To encourage navigability of the Danube in a sustainable way, an approach combining sustainable infrastructure, alternative fuels and digitalisation is needed, taking into account the ecological sensitivity of the Danube.

Proposals to amend the legal and institutional framework regarding the management of the maritime transport infrastructure with the objectives of integrating water transport with other modes of transport, the preparation of intermodal port development plans and the increase of freight transport on the Danube by 15% until 2026 in a sustainable manner.

The strategy will establish:

- development directions, investment programs, projects specific to inland waterways and specific to each individual port;
- transport policy measures, including trade policies, in the short, medium and long term;

The general objective of the POT 2021-2027 is to ensure the realization of the investments that meet the development needs of Romania identified in the Partnership Agreement 2021-2027 in accordance with the Country Report and the Country Specific Recommendations, but also with the strategy developed by Romania for the recovery in sustainable way of the gaps in the development of the transport infrastructure, respectively the Investment Plan for the development of the transport infrastructure for the period 2020-2030 (PI).

The POT 2021-2027 strategy was developed at the intersection of the European transport policy highlighted by the TEN-T Regulation (EU) no. 1315/2013, the EU Strategy for sustainable and intelligent mobility, the European Ecological Pact (Green Deal) and the national needs for the development of transport infrastructure and services, as well as road safety, as presented in the updated Strategy for the implementation of the General Master Plan of Transport of Romania, part of the Investment Plan for the development of transport infrastructure for the period 2020-2030 (PI).

The main challenge that POT 2021-2027 will have to solve is the recovery of the development gap of Romania's transport infrastructure, ensuring, at the same time, the achievement of the European objectives of reducing carbon emissions and the transfer towards a sustainable and safe mobility.
For naval transport the following actions will be financed through POT:

- Hydrotechnical works to eliminate critical points for navigation on the Danube and increase the efficiency of naval transport on its navigable channels
- Improving navigation on the Danube and its navigable channels, including navigation safety measures, in particular at the Bala critical point;

• Completion of the Danube - Bucharest Canal;
• Development / modernization of strategic Danube ports / located on the primary network and the TEN-T network, including alternative fuel facilities;
• Ensuring optimal navigation conditions in port basins through dredging;
• Supporting, in compliance with state aid requirements, the modernization of the means of propulsion of ships used by Romanian carriers on inland waters for naval cargo transport,
• Development of installations, equipment and loading/unloading facilities in the ports of Romania's primary port network, in compliance with state aid regulations;
• Development/Modernization of Constanța Port, including alternative fuel facilities;
• Development of SSS Services (Short sea shipping) in Constanţa Port;
• Elaboration of the necessary documents for the preparation of navigation improvement projects from the eligibility area of the priority axis;
• Carrying out pre-feasibility studies for new waterways according to the Investment Plan;
• Elaboration of feasibility studies for port infrastructure, in compliance with state aid requirements.

6 Summary / Executive REPORTS

6.1 Executive Report – Călăraşi Commercial Port

Călăraşi port is located at km 94 Borcea branch, on the left bank.

The first port facility in the area dates back to the 1700s. It was used for grain trade that was transported to Istanbul due to the status of the Romanian principalities vis-à-vis the Ottoman Empire.

By Royal Decree no. 706 of March 21, 1879, the Port of Călăraşi is officially established and dredging works begin at the mouth of the Borcea branch, which will allow larger tonnage vessels to dock in the port. A 91 m high wooden quay and a lower wooden quay, 222 m long, are being built.

Another important moment for the development of the Port of Călăraşi and port activity was the commissioning of the railway Slobozia - Călăraşi line, with the terminus Station in the Port. On November 17, 1886, the first train arrived at the Station in Port.

Throughout that period, the main assortment of goods was cereals.

The area of the port territory is 81,505 square meters.
The total length of the walled quays/vertical/natural embankment is 828 m, of which:

- 1 operative berths of 100 ml for passengers;
- 2 berths 250 ml for cargo operation;
- 1 berth100 ml for grain operation;
- 1 waiting berth of 200 ml.

The operating capacity of the Călăraşi port is 450,000 tons/year.
Port connections: road: via DN 21 has access to A3 highway Bucharest - Constanta
DN 3 Bucharest - Călăraşi
railway: does not exist.

Two very old gantry crane (one type Bocşa of 16 ft and one of 5 ft) are installed in the port.

The port does not have systems for supplying ships with electricity and drinking water. There is no port lighting system at night.

The port infrastructure is damaged in the most part of it.

The revetment has many cracks, both slopes (below and above the platform) being invaded by vegetation.

Due to the lowering of the water level, the foundation of the quay reached above the water level and there is a risk of erosion of the material under the concrete body at the elevations and velocities of the water in the periods with high flow.

The running path of the cranes is partially blocked by deposits, being necessary to be cleaned and checked it technical condition (settlement, rust, missing segments).

Utilities in the port, fresh water network (with hydrants) and electricity practically do not exist anymore.

At the entrance from the Danube on the Borcea branch there are large deposits of alluvium, approx. 100,000.00 c.m. which prevents the access of ships to the port for long periods of time.

The last infrastructure maintenance works were carried out in 1995.

From an organizational point of view, the port infrastructure (port land, quays, platforms) is state property and are administered by the River Danube Ports Administration (APDF Giurgiu).

In accordance with the Romanian legislation, the global strategy regarding the port infrastructure development that belongs to the public domain of the state is elaborated by the Ministry of Transport and Infrastructure.

The implementation of this strategy, which includes investment projects as well as infrastructure maintenance and modernization works, is the responsibility of the APDF Giurgiu Investment projects and port infrastructure modernization works are done on the basis of a Feasibility Study developed by the infrastructure administration.

At the moment, for the financing of infrastructure projects, the administrators of this infrastructure can use several financial instruments:

- Large Infrastructure Operational Program 2014-2020 – European funds

In 2014, the Large Infrastructure Operational Program (POIM) was approved. The POIM strategy is oriented towards the objectives of the Europe 2020 Strategy, focusing on sustainable growth by promoting an economy based on low carbon consumption through energy efficiency measures and the promotion of green energy, as well as by promoting environmentally friendly modes of transport and a more efficient use of resources;

- CEF - on 13 September 2022 was published the 2022 CEF transport call. The deadline is 18 January 2023.The 2022 CEF Transport call for proposals makes **EUR 5.12 billion** available for projects targeting new upgraded and improved European transport infrastructure;

- The Transport Operational Program (POT) will be approved and can be used starting from January 2023
The general objective of the POT 2021-2027 is to ensure the realization of the investments that meet the development needs of Romania identified in the Partnership Agreement 2021-2027 in accordance with the Country Report and the Country Specific Recommendations, but also with the strategy developed by Romania for the recovery in sustainable way of the gaps in the development of the transport infrastructure, respectively the Investment Plan for the development of the transport infrastructure for the period 2020-2030 (PI).

Currently APDF Giurgiu has signed financing contracts with the Ministry of Transport and Infrastructure through the POIM program for the modernization of a number of only three ports under its administration.

In 2022, the Romanian Ministry of Transport and Infrastructure elaborated the "Investment Program for the development of transport infrastructure in the period 2021-2030. In this program mentioned above, it is provided among others that river ports will be systematized so as to create a primary network of ports whose service area (hinterland) corresponds to an economic potential, as well as a secondary network of ports that ensure the accessibility of specialized goods.

The ports on the primary network are: Constanța, Sulina, Tulcea, Galați, Brăila, Cernavodă, **Călărași,** Oltenița, Giurgiu, Corabia, Calafat, Dr. Tr. Severin, **Orșova,** Moldova Noua.

Considering the above, it is expected that APDF Giurgiu will prepare a Feasibility Study regarding the development of Călăraşi port, following that the financing of the works will be done through the POT program.

The main objectives of the project should be:

- dredging the entrance on the Borcea branch;
- the consolidation and modernization of hydrotechnical constructions;
- the implementation of water and electricity networks, including ship supply systems.

As part of the WT 4 activity, a study was developed regarding the traffic evolution of the main categories of goods (cereals, chemical products, construction materials, metal products) in the Călăraşi port area and the volumes of goods that could be taken through the port over a horizon were estimated of time until 2050.

In the analysis of the current situation, the following information regarding freight transport flows for the base year 2019 was taken into account:

- The database of the Port of Constanta for the year 2019;
- Romania's imports/exports with EU and non-EU countries, in tons/year, by commodity category, Comext 2019;
- Romanian imports/exports by county, in Euros, by product category, 2019;
- RNTM – Romania's National Transport Masterplan.

It is estimated that, in the case of the implementation of an infrastructure modernization project through the port of Călăraşi, a volume of cargo between 640,000.00 tons in 2024 and 1.21 million tons in 2050 could be attracted.

6.2 Executive Report - Turnu Măgurele Port

Turnu Măgurele Port is located on the left bank of the Danube at Km 597. The port is located at a distance of 5 km from the town of Turnu Măgurele and, in terms of operating capacity, it is the fourth river port in Romania (the ports of Braila, Galati, Tulcea are not taken into account)

In the place where the port is located today, it was a crossing point and also of commercial transactions from ancient times. In 1910, Turnu Măgurele port was considered the fourth Romanian port on the Danube. The stone quay of the port was built in 1906.

In the 1920s, an imposing silo for those times was built according to the plans of the engineer Anghel Saligni. In 1892, the railway between the city and the port was built. With the construction of the Chemical Fertilizer Plant in 1960, the port experienced a spectacular development.

A system of above-ground conveyor belts was installed and runways for gantry cranes were built.

In the Turnu Măgurele port area, the Turnu Măgurele – Nikopol ferry border crossing point between Romania and the Republic of Bulgaria, operational since April 2010, is set up.

The port territory has an area of 8.2 ha and the length of the quay front is about 924 m

Ships of 1500 and 2000 tons can be moored and operated at the wharf, the ship's access is made directly from the Danube.

The port is connected to the national road network (DN 51 a, DN 54, DN 65A).

In the past, the port was connected to the national railway network, a part of the operated goods was transported by railway. After 1990, the railway connection of the port with the national railway network was closed.

Four gantry cranes (2 x 5 ft and 2 x 16 ft) are installed in the port, but they are not functional.

The port does not have systems for supplying ships with electricity and drinking water. There is no port lighting system at night.

The port infrastructure is damaged for the most part. The quay has sectors where the crowning is destroyed and sectors where the crowning is collapsed

The port platform is made of cubic stone. It is 90% destroyed and in certain sectors there are very large settlements.

The access road to the port is in a critical condition. There is only one functional building in the port, that of the Port Authority.

The last infrastructure maintenance works were carried out in 1989.

From an organizational point of view, the port infrastructure (port land, quays, platforms) is state property and are administered by the local authority (Turnu Măgurele City Hall).

In accordance with the Romanian legislation, the global strategy regarding the port infrastructure development that belongs to the public domain of the state is elaborated by the Ministry of Transport and Infrastructure.

The implementation of this strategy, which includes investment projects as well as infrastructure maintenance and modernization works, is the responsibility of the administrators of this infrastructure. Investment projects and port infrastructure modernization works are done on the basis of a Feasibility Study developed by the infrastructure administrators.

Regarding the development of the port superstructure and the carrying out of port operations of loading, unloading and stacking of goods, it is up to private economic operators.

The private operators carry out their activity on the basis of a lease/concession contract of the infrastructure concluded with the port administration.

At the moment, for the financing of infrastructure projects, the administrators of this infrastructure can use several financial instruments:

- Large Infrastructure Operational Program 2014-2020 – European funds

In 2014, the Large Infrastructure Operational Program (POIM) was approved. The POIM strategy is oriented towards the objectives of the Europe 2020 Strategy, focusing on sustainable growth by promoting an economy based on low carbon consumption through energy efficiency measures and the promotion of green energy, as well as by promoting environmentally friendly modes of transport and a more efficient use of resources.

- CEF - on 13 September 2022 was published the 2022 CEF transport call.

The deadline is 18 January 2023.The 2022 CEF Transport call for proposals makes **EUR 5.12 billion** available for projects targeting new upgraded and improved European transport infrastructure

- The Transport Operational Program (POT) will be approved and can be used starting from January 2023
The general objective of the POT 2021-2027 is to ensure the realization of the investments that meet the development needs of Romania identified in the Partnership Agreement 2021-2027 in accordance with the Country Report and the Country Specific Recommendations, but also

with the strategy developed by Romania for the recovery in sustainable way of the gaps in the development of the transport infrastructure, respectively the Investment Plan for the development of the transport infrastructure for the period 2020-2030 (PI).

In 2021, the City Hall of Turnu Măgurele submitted to the Ministry of Transport and Infrastructure a request for the allocation of European funds for the modernization of the infrastructure in the port of Turnu Măgurele.
The request was approved and a financing contract was signed through the POIM program.
The works will start in December 2022 and be completed in 2023.
The main objectives of the project are:

- Modernization of hydrotechnical constructions - walled wharves - installation of new systems for tying ships to the wharf;
- Rehabilitation of the port platform;
- Introduction of the water and sewage system consisting of
  - Drinking water network in the port;
  - Installation of water supply for ships;
  - Modernization of the water supply installation of the firefighting system;
  - Rainwater drainage system for the quay precipitation water.
- Modernization of the electricity supply system:
  - Modernization of the port electricity supply system;
  - Installation of the lighting systems of the port platforms, the access road to the port and the quay area; the lighting systems will consist of poles with a height between 8 and 12 m powered by solar batteries and with the lighting source based on LEDs;
  - 9 sockets will be installed to supply the ships with electrical energy;
  - Installation of a 5kwp photovoltaic system

6.3 Executive Report - Orşova Port

The port is located on the left bank of the bay formed at the confluence of the Cerna River with the Danube, at Km 954, (reservoir Iron Gates 1) in the immediate vicinity of the city of Orşova.

Orşova is historically dated since the time of the Roman Empire, being known as Dierna.

The municipality of Orşova can be considered an old city full of history, but at the same time, Orşova is a newly built town in the years (1966-1971). The old city of Orşova disappeared under the waters of the Danube, due the construction of the Iron Gates I and II dams.
The current city of Orşova is located on the shore of the reservoir of the Iron Gates 1.

The surface of the port territory is 50,439.54 square meters.
The length of the walled quays/vertical/natural shore is 1,060.00 m of which operative front 600 m:

- 100 m - 1 passenger berths;
- 500 m - 5 berths operating goods at the vertical quay.

Four very old gantry cranes (two type Bocşa of 16 ft and two of 5 ft) are installed in the port.
Operating capacity 1,200,000 to/year
Fresh water supply - missing
Onshore power supply - missing
Connections: - road DN 6/ E 94 Bucharest - Orşova (364 Km) - Timişoara (194 Km)
DN 57 Orşova - Old Moldova (111 km)

- railroad Bucureşti - Orşova (347 Km) - Timişoara (136 Km)

The port infrastructure – the vertical quay and the platform - is damaged in the most part.

The last infrastructure maintenance works were carried out in 1997.

From an organizational point of view, the port infrastructure (port land, quays, platforms) is state property and is administered by the APDF Giurgiu.

In accordance with the Romanian legislation, the global strategy regarding the port infrastructure development that belongs to the public domain of the state is elaborated by the Romanian Ministry of Transport and Infrastructure.

The implementation of this strategy, which includes investment projects as well as infrastructure maintenance and modernization works, is the responsibility of the APDF Giurgiu Investment projects and port infrastructure modernization works are done on the basis of a Feasibility Study developed by the infrastructure administration.

At the moment, for the financing of infrastructure projects, the administrators of this infrastructure can use several financial instruments:

- Large Infrastructure Operational Program 2014-2020 – European funds

In 2014, the Large Infrastructure Operational Program (POIM) was approved. The POIM strategy is oriented towards the objectives of the Europe 2020 Strategy, focusing on sustainable growth by promoting an economy based on low carbon consumption through energy efficiency measures and the promotion of green energy, as well as by promoting environmentally friendly modes of transport and a more efficient use of resources.

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The general objective of the POT 2021-2027 is to ensure the realization of the investments that meet the development needs of Romania identified in the Partnership Agreement 2021-2027 in accordance with the Country Report and the Country Specific Recommendations, but also with the strategy developed by Romania for the recovery in sustainable way of the gaps in the development of the transport infrastructure, respectively the Investment Plan for the development of the transport infrastructure for the period 2020-2030 (PI).

Currently APDF Giurgiu has signed financing contracts with the Ministry of Transport and Infrastructure through the POIM program for the modernization of a number of three ports under its administration.

In 2022, the Romanian Ministry of Transport and Infrastructure elaborated the "Investment Program for the development of transport infrastructure in the period 2021-2030. In this program mentioned above, it is provided among others that river ports will be systematized so as to create a primary network of ports whose service area (hinterland) corresponds to an economic potential, as well as a secondary network of ports that ensure the accessibility of specialized goods.

The ports on the primary network are: Constanţa, Sulina, Tulcea, Galati, Brăila, Cernavodă, Călăraşi, Oltenița, Giurgiu, Corabia, Calafat, Dr. Tr. Severin, Orşova, Moldova Noua.

Considering the above, it is expected that APDF Giurgiu will prepare a Feasibility Study regarding the development of Orşova port, following that the financing of the works will be done through the POT program.

The main objectives of the project should be:

- the modernization of hydrotechnical constructions and the port platform;
- the modernization of the water and electricity networks, including ship supply systems;
- the modernization of the internal port railway.

As part of the WT 4 activity, a study was developed regarding the traffic evolution of the main categories of goods (cereals, chemical products, construction materials, metal products) in the Orşova port area and the volumes of goods that could be taken through the port over a horizon were estimated of time until 2050.

In the analysis of the current situation, the following information regarding freight transport flows for the base year 2019 was taken into account:

- The database of the Port of Constanta for the year 2019;
- Romania's imports/exports with EU and non-EU countries, in tons/year, by commodity category, Comext 2019
- Romanian imports/exports by county, in Euros, by product category, 2019
- MNT – Romania's National Transport Masterplan.

It is estimated that, in the case of the implementation of an infrastructure modernization project through the port of Orşova, a volume of cargo between 1,22 million tons in 2024 and 2,32 million tons in 2050 could be attracted.

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