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Danube Ports Network

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1 A. WRITTEN DOCUMENTS

1. General information on the investment project

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2. The Existing Situation and the Need to Achieve the Investment Objective

2.1. Presentation of the Context: Policies, Strategies, Legislation and Relevant Agreements, Institutional and Financial Structures

Summary

The shipping system has two components, maritime and river transport.

The shipping system has the advantage that naval ships can carry capacities between a few thousands of tons and several hundred thousand tons, including people, on very long distances. Also, a major advantage is that it does not depend on an organization chart as in the case of rail transport.

The shipping system supposes a regular or irregular navigation which is or is not linked to a particular route, to fixed shipping and destination ports. In order to use the ships as efficiently as possible, their operating in ports should be as short as possible, i.e. the loading - unloading activity has to be as short as possible. For this to be feasible, ports must have means of loading - unloading and handling the cargo as performant as possible. Hence there must be a correlation between the ships parameters and the technical equipment of the ports.

This project supports in fact this correlation, by trying to improve, as far as possible, the technical means of the 3 ports, namely the management and control system.

Management of the Water Transport Infrastructure in Romania

In Romania, according to the Government Decision no. 598/2009, the water transport infrastructure is managed by the Ministry of Transports. According to the same Decision, the National Company "Administraţia Porturilor Dunării Maritime" - S.A. Galaţi *("Maritime Danube Ports Administration" – S.A.)* is the legal entity which manages the water transport infrastructure, based on the signed concession contract. The company acts as port authority in the ports of which the infrastructure was assigned to it by the Ministry of Transports and it has the following main responsibilities:

a) maintenance, repair, modernization and development of the water transport infrastructure assigned to it;
b) make available this infrastructure to all the users freely and without discrimination;
c) monitor or ensure, as appropriate, of the provision of security services in ports;
d) permanently assure a minimum depth in docks and berths and the signalling of the fairways and ports;
e) maintain the records of harbour workers performing specific works in ports;

f) carry out, by delegation of competences, of obligations incumbent to the Romanian state from the agreements and conventions to which Romania is a party.

According to Article 6, paragraph 1, the CN *[National Company*] APDM SA Galati has the following duties and responsibilities:

a) applies the port policies as developed by the Ministry of Transports;
b) draws up plans for ports development in line with development policy and programs as developed by the Ministry of Transports and the port regulations;
c) implements development programs of port infrastructures;
d) develops or approves of studies and projects for the development or modification of port infrastructures and of development and modernization projects of port superstructures as proposed by economic operators carrying out their activity in ports;
e) develops annual programs of maintenance and repair, signalling and dredging so as to ensure minimum depths, after consultation with port operators;
f) coordinates activities taking place in ports;
g) grants approvals or permits for activities of shipping or work licenses and access permits to the free zone, as appropriate, in accordance with the law;
h) approves the carrying out of activities in ports, other than those subject to authorization;
i) ensures the functionality, management, maintenance, repair and development of the water transport infrastructure that was assigned to it as well as of its own assets and the maintaining of their minimum technical characteristics and makes them available to users, without discrimination, in accordance with the regulations;
j) determines the order of entry of ships in ports and allocates the berths;
k) tracks and takes necessary actions so that the traffic of goods in ports and their storage do not affect the safety of port infrastructure, port security and operation of ships;
l) coordinates the port traffic in busy periods as a result of government orders and in such situations, establishes together with port operators' programs for loading to/ unloading from ships and priorities in the order processing of ships;
m) tracks the vessel and freight traffic in ports, centralizes data on the processed freight volume, the port of cargo loading/unloading, the number of processed ships and data on the processing rules, as well as the annual publication of such data;
n) provides for the carrying out of activities concerning:
    i. the coastal and floating signalling on the access fairways and in ports;
    ii. takes over waste and sewage, garbage and household garbage from ships;
o) provides assistance in order to prevent pollution from processing of ships with petroleum products;
p) monitors or, where appropriate, provides for a permanent supply of safety services in accordance with the law;
q) maintains dredging to ensure the minimum navigation depths in ports on access fairways to them, in docks and berths;
r) provides services for tour boats and nautical tourism and services to passengers and tourists;

s) maintains the records of the port workers performing specific works in ports and releases port work permits in accordance with the laws in force;
t) provides services with its own vessels;
u) provides services, operations and works in order to fulfil certain obligations incumbent to the Romanian arising from international agreements and conventions to which Romania is a party by delegation of competence;
v) represents the Ministry of Transports in relations with the concessionaires of the water transport infrastructure of the safety services, within the limits of the mandate granted by the Ministry in this regard, according to the laws;
w) any other activities necessary to achieve the purpose for which it was established.

Policies, strategies, legislation and relevant agreements

As his is an area of vital interest for development in general and for the development of Romania in particular, the following policies and strategies took shape in time at national and European level:

- ✓ Action Plan for the Development of the Port of Galati;
- ✓ Strategic Plan for the Development of the Port of Galati;
- ✓ Development Program for the Internal Management Control System in 2018.
- ✓ Intermodal transport strategy in Romania in 2020 (http://mt.gov.ro/web14/documente/strategie/strategii_sectoriale/strategie_de_transport_intermodal_text.pdf)
- ✓ General Transports Master Plan 2016 (http://www.kristofer.ro/wp-content/uploads/2016/09/master-plan-general-transport-2016-guvern-aprobat.pdf)
- ✓ EU transports policy (https://europa.eu/european-union/topics/transport_ro)

The implementing of the present project by APDM will provide an opportunity to strengthen the cooperation with other port administrations, port authorities and decision makers along the Danube, on the one hand, and with key actors interested in the development of the Danube ports, new industrial sites and/or logistics warehouses in port areas directly or closely related to them, on the other hand.

As an administrator of the main Romanian s APDM could improve its management processes and business strategy as a result of this project, taking into account the work experience of other project partners and the recommendations of the consortium, namely the Development Strategy of the Danube Ports and the Action Plan for its further implementation. Ecological improvement of the Danube areas and port activities is another goal of APDM, which is permanently interested in creating, maintaining and enhancing ecologic environments for the ports and the IWT activities, given its experience and successfully completed previous projects.

The development of its connections with the continent, the implementing of new procedures and innovative operational processes and the exploration of new market opportunities for the movement of cargo along the Danube by IWT are other methods which could help APDM improve its economic efficiency and become more competitive. This will have a positive impact on its business partners, on the whole SE region of Romania and on the entire Danube Community, interested in strengthening the cooperation between public and private sector representatives.

2.2. Analysis of the existing Situation and Identification of Weaknesses

The National Company "ADMINISTRAŢIA PORTURILOR DUNĂRII MARITIME" SA (CN APDM SA) ("*MARITIME DANUBE PORTS ADMINISTRATION*" *SA* acts as a port authority and exerts the role of port administration in the ports located on the Romanian river - sea sector of the Danube.

Maritime Danube ports are located at the intersection of two transport modes, inland water and maritime ways, ensuring the opening to the Black Sea and the North Sea, by their positioning on Corridor VII of the TEN-T network, Rhine – Main - Danube.

The ports placed under the administration of the National Company CN APDM SA are the following:

Ports	Ports Limits
Galati	Km 160 – Mm 76 Danube, both banks
Braila	Km 175 – Km 167 Danube, both banks
Tulcea	Mm 42- Mm 34 Danube, both banks
Macin	Km 15 – Km 12 Danube, Măcin arm, both banks
Isaccea	Mm 56.5 mm - 53 Mm Danube-right bank
Mahmudia	Km 90 km – Km 86 Danube, Sfântul Gheorghe (*St. George*) arm, both banks
Chilia Veche	Km 46 – Km 43 Danube Chilia arm, right bank
Hârşova	Km 255 km – Km 251 Danube, both banks
Smârdan	Km 0 - Km 1 Danube, Măcin arm, right bank
Gura Arman	Km 30 - 32 km Danube, Măcin arm, both banks
Turcoaia	Km 35 - 37 km Danube, Măcin arm, both banks

Of these, the ports of interest in this study are:

The Galati Port is the largest river and sea port on the Danube and the second largest Romanian port. Located in the city of Galati, the port is an important source of income for the city because it attracted many national and international companies operating from here.

These include:

- ✓ The Dutch company Damen Group, which owns the shipyard Galati, being active in shipbuilding;
- ✓ ArcelorMittal, the largest integrated works of the country and leader in the manufacture of steel products;
- ✓ Metaltrade - port operations through the companies Port Bazinul Nou SA and Docuri SA.


Port Bazinul Nou


Port Docuri


Port Mineralier

The key features of this port are:

- ✓ Total area: 864,131 sqm;
- ✓ Number of port docks: 2 (Docuri/Docks) (Bazinul Nou / New Basin)
- ✓ Length of piers: vertical = 4,675 m; revetment = 2,390 m;
- ✓ Number of operating berths: 56;
- ✓ Facilities for stationing ships during winter;
- ✓ Rail connection: length = 12,348 m (European gauge);
- ✓ Broad-gauge railway - along the operating berths;
- ✓ Railway toll gate;
- ✓ Connection to the national road system;
- ✓ Parking for lorries provided;
- ✓ Goods storage facilities (open platforms and closed storages);
- ✓ Port equipment for ship operation;
- ✓ Grain silo;
- ✓ Ship waste management: garbage, sewage and bilge water;
- ✓ Bunkering facilities;
- ✓ Facilities for ships maintenance;
- ✓ Free zone;
- ✓ Customs checkpoint;
- ✓ "DAMEN" Shipyard;
- ✓ Grain terminal;
- ✓ Container terminal;
- ✓ Oil terminal;
- ✓ Safety in accordance with the ISPS code.

The **Port of Braila** is one of the largest Romanian River and Sea ports. Located in the city of Braila on the Danube between km 175 and km. 167 of the Danube, on both banks, the port is an important source of revenue for the city, because many large international companies are operating here.

The characteristics of the Port of Braila are:

- ✓ Total area: 864,131 sqm;
- ✓ Number of port docks: 1
- ✓ Length of piers: vertical = 797 m; revetment = 2,506 m;
- ✓ Number of operating berths: 25;
- ✓ Facilities for stationing ships during winter;
- ✓ National railway connection;
- ✓ Broad-gauge railway - along the operating berths;
- ✓ Railway toll gate;
- ✓ Connection to the national road system;
- ✓ Goods storage facilities (open platforms and closed storages);
- ✓ Port equipment for ship operation;
- ✓ Grain silo;
- ✓ Bunkering facilities;
- ✓ Facilities for ships maintenance;
- ✓ Free zone;
- ✓ Customs checkpoint;
- ✓ STX RO Offshore Braila SA Shipyard;
- ✓ Grain terminal;
- ✓ Cleaning of the storage sheds and areas on the vessels;
- ✓ Cleaning and degassing of fuel tanks.

The **Port of Tulcea** is one of the largest and most important Romanian River and Sea ports. Located in the city of Tulcea, between Mm 42 and Mm 34 of the Danube on both banks. The Port of Tulcea has vertical operational quays with a length of 330 meters and revetment of 2225 m. The port has a Ro-Ro river terminal on the relation Tulcea - Reni and return.

The Industrial Port of Tulcea is located at Mm 39+1352 – Mm 1022+39 on the right bank of the Danube, its building started in 1974 in order to provide the necessary raw materials for the metallurgical platform of Tulcea. The main activities of the industrial port are:

- ✓ Unloading of the imported raw materials such as manganese, limestone, quartzite, bauxite, chromium, iron and coke from maritime ships;
- ✓ Quarry ballast products unloading from barges;
- ✓ Loading of raw materials exported as ferric alloys, iron scrap and alumina.

The Commercial Port of Tulcea is located between Mm 39 - Mm 38+1530 on the Danube, being destined for passenger traffic. It fully covers the Danube Delta area.

The main features of the port are:

- ✓ Total area: 82.762 sqm;
- ✓ Length of piers: vertical = 330 m; revetment = 2,225 m;
- ✓ Number of operating berths: 41;
- ✓ National railway connection: length = 320 m (European gauge);
- ✓ Connection to the national road system;
- ✓ Passenger terminal
- ✓ Goods storage facilities (open platforms);
- ✓ Port equipment for ships operation;
- ✓ Ship waste reception facilities;
- ✓ Grain silo;
- ✓ Customs checkpoint;
- ✓ "AKER" Shipyard;
- ✓ Facilities for ships maintenance;
- ✓ Cleaning of the storage sheds and areas on the vessels;
- ✓ Facilities for passenger transport in the Danube Delta.

As we can see, the 3 largest ports are able to operate numerous activities and to accommodate a large number of ships with multiple functions and requirements.

However, an optimization of these activities can only be achieved with sustained investments to address current constraints.

Current constraints on infrastructure

Following the implementation of the Strategic Program for the Development of the Port of Galati, after consultation with the main actors in the Port Community, a number of constraints have resulted. It is worth noting that these constraints also apply for the other ports, including Galati and Tulcea. These constraints are:

Constraint # 1: Port infrastructure demand and inadequate maintenance of freight traffic conditional

One of the main constraints the ports are facing is related to the port infrastructure which is not currently adapted to demand. The sources of funding for the modernization of the port infrastructure in order to adapt to market requirements concerning the type of goods and ships are only provided from the state budget and from non-repayable European funds.

One of the problematic issues in ensuring the economic feasibility of the investments of APDM CN in the port infrastructure is the limited involvement of the port operators in carrying out investment projects to support the increase of the shipping traffic. So far, the only operators who have made investments are Port Bazinul Nou SA, Trans Europa Port SA and Docuri SA, investments which do not yet have a significant impact on the maritime shipping. Given that freight traffic in the Port of Galati has declined in recent years, CN APDM currently provides maintenance and dredging as required only for quays where traffic flows are sufficient to cover

the costs. The dredging program to ensure the minimum depth is conducted annually in consultation with the port operators, based on the historic data.

Opportunity # 1: Implementing an IT management system will allow a forecast of the revenues to be obtained, thereby improving the possibility of scaling the investments needed in the ports.

An IT management system can provide information about ships which will moor in the port, from the very moment they leave on their voyage. Depending on the distance between the port of departure and the port of destination (Galati, Tulcea, Braila), this information can be received even a few months in advance.

Constraint # 2: Connections (road and rail) inadequate

Although the port of Galati is a central node of the TEN-T network, hinterland connections are considered inadequate to attract a significant increase in traffic flows:

- ✓ There are no motorways / expressways to ensure an easy, fast and safe access to the city of Galati. Most access roads to Galati are single carriageway roads. Such types of roads are considered among the most dangerous and have a low capacity to accommodate traffic.
- ✓ The technical condition of the access roads from the A2 motorway, DN1, DN2, Northern Moldova and Constanta to Galati is classified as mostly "Mediocre - Good" according to CESTRIN ratings.
- ✓ The current detour route of the city has one carriageway in each direction and passes through residential areas.
- ✓ The railway connections with the major European corridors (Rhine-Danube and the extension to Ukraine and Moldova, the former Pan-European Corridor IX) have technical characteristics below the level required by Regulation 1315/2013 of the European Parliament and of the Council concerning the European transport network TEN-T.
- ✓ Railway marshalling yards are below the present standards applying to freight traffic by rail in order to effectively operate 750-meters long trains and their technical condition is precarious, this being due to the lack of timely maintenance works, current and capital repairs.
- ✓ There are many berths without railway connections. For example, in the Ore Port, only 3 of 11 berths are connected to the railway.

Opportunity # 2: Implementing an IT management system will provide a possibility to track and collect information on the port activity. When making investments, including in intangible assets (software systems), which will lead to an improvement of the ports activities, these statistics can be used to justify the need for allocating larger amounts of money for tangible investments by the Government of Romania through the Ministry of Transports.

Constraint # 3: Lack of Facilities for Electricity Supply to the moored Ships

This problem was highlighted in the Rhine-Danube Corridor Study as a "conditional" roadblock. According to Directive 2014/94/EU on the installation of infrastructure for alternative fuels, the Port of Galati, being a port situated on the TEN-T core network, it will have as a priority the installation of facilities to supply electricity on shore.

Opportunity # 3: System IT Port Community System will contribute to a better definition, need and estimate of future investment projects by analysing the collected data.

Current Operational Constraints

Constraint # 4: Operational Tools not Adapted to the New Market Requirements

Most cargo-handling facilities are physically and morally outdated, a fact which affects the time and cost of operation. Also, there are no facilities to operate intermodal flows.

Opportunity # 4: System IT Port Community System will be used including for inter-ports cooperation and for a better management of operational means. In other words, knowing in advance the needs of ships and making a timeline of these needs, will be combined, for example, with the repair programme of operational resources, thus optimizing the global business.

Constraint # 5: For a long time required for customs clearance

The documentation processing time for freight varies greatly loads (between 1 and 4 hours). About 50% of the controls take more than 2 hours.

One cannot form more than one control commission at the same time and therefore one cannot perform more controls simultaneously.

The Regional Customs Directorates and hence the customs offices, operate within the regional directorates of public finances as established within ANAF, according to the HG (GD) 520/2013. The staff of the National Customs Authority (*Autoritatea Națională a Vămilor*), and therefore that of the regional customs directorates and customs offices was taken over by NAFA within the number of approved positions. The assessment of the staffing needs for each customs office also took into consideration the volume of freight covered by the customs statements processed by the respective customs offices. For example, given that at this time the number of employees of the Galati customs office is insufficient only during periods of high traffic, only an increase of the traffic of imported and/or exported goods can lead to a rethinking of the jobs' status. Therefore, the measures should be directed primarily towards a simplification of the customs procedures.

Opportunity # 5: Using an IT system will lead to a reduction of the processing time of documents and to an optimization of those procedures, with positive effects on inter-institutional collaboration.

Constraint # 6: Management Information Systems of the Port Traffic

- ✓ Data flows between the members of the port community are not computerized;

- ✓ There is no coherent statistical database accessible to the port community members or to other stakeholders in this field;
- ✓ Both CN APDM and the Galati Customs Office are currently experiencing problems in accessing the RoRIS system, this being a major impediment for a smooth cooperation between providers of basic services and the port supervision and control authorities.

Opportunity # 6: The IT System Port Community System will be implemented in order to solve these constraints.

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

Summary

The methodology used for maritime shipping results from the character of maritime traffic in the analysed region. As already known, maritime traffic in Galați, Brăila and Tulcea is irregular, which means there are no line links.

Due to the irregular traffic in the analysed region, it is difficult to identify all ships calling at the ports and to provide detailed specifications for them. Moreover, it may prove unnecessary, since most of them call for a port only once a year. Therefore, the total calculation is not based on special ships, but the total number of calls made to the 3 ports of the analysed region (Galați, Brăila and Tulcea).

A similar methodology was adopted for inland waterways. Here, too, we have no regular traffic. Thus, the overall calculation is based on total number of calls of internal ships at three ports of the analysed region (Galați, Brăila and Tulcea). Based on this analysis, the total traffic depends strictly on the industrial activity in the region, particularly the steel industry. It is difficult to predict with high probability how the industry will operate in the coming decades; Thus, it is difficult to predict the number of calls per ship.

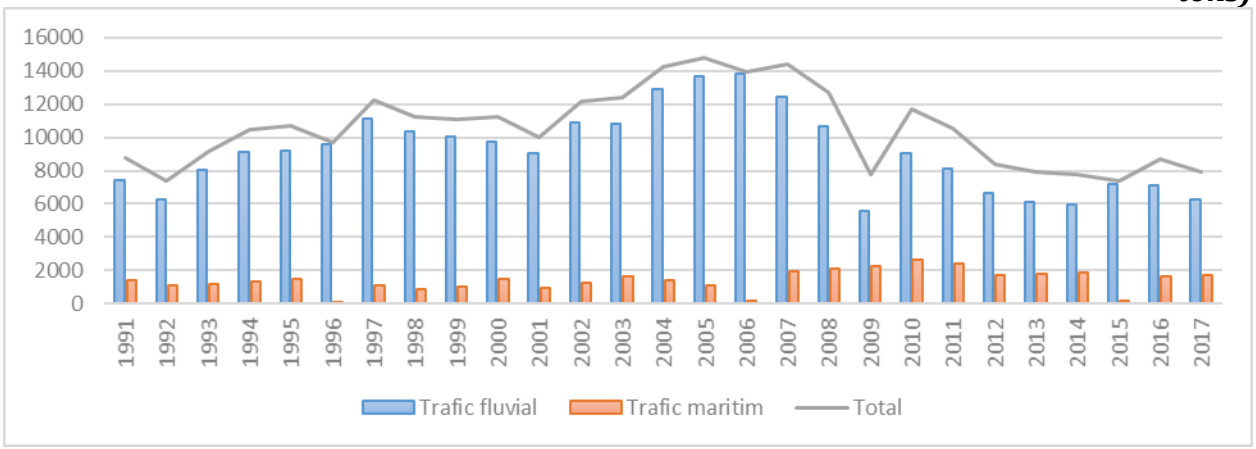
Sea and River Navigation Sector in the Danube Area

This part of the analysis will focus on three river ports located in the maritime area of the Danube, namely: Galați, Brăila and Tulcea. All these ports have handled nearly 8 million tons of cargo in 2013 (http://www.romanian-ports.ro/html_nou/traficapdm.php#). Approximately 76% of this volume consisted in river freight, while 26% was maritime freight. Among the three ports, the larger is Galati, which handled over 3.5 million tons, of which 63% was river freight, the rest being maritime freight. In Galati, most of the maritime traffic is served in an international export relationship, while in the case of the river traffic, most handled goods are served in an international import relationship. The second port, Tulcea, mainly managed inland waterway

traffic (96%), almost all of which was served in a national import relationship. In Brăila, most of the cargo load was river freight (60). Of the total traffic of 2.3 million tons, 1.8 million represent river traffic while the maritime traffic is only 0.5 million tons.

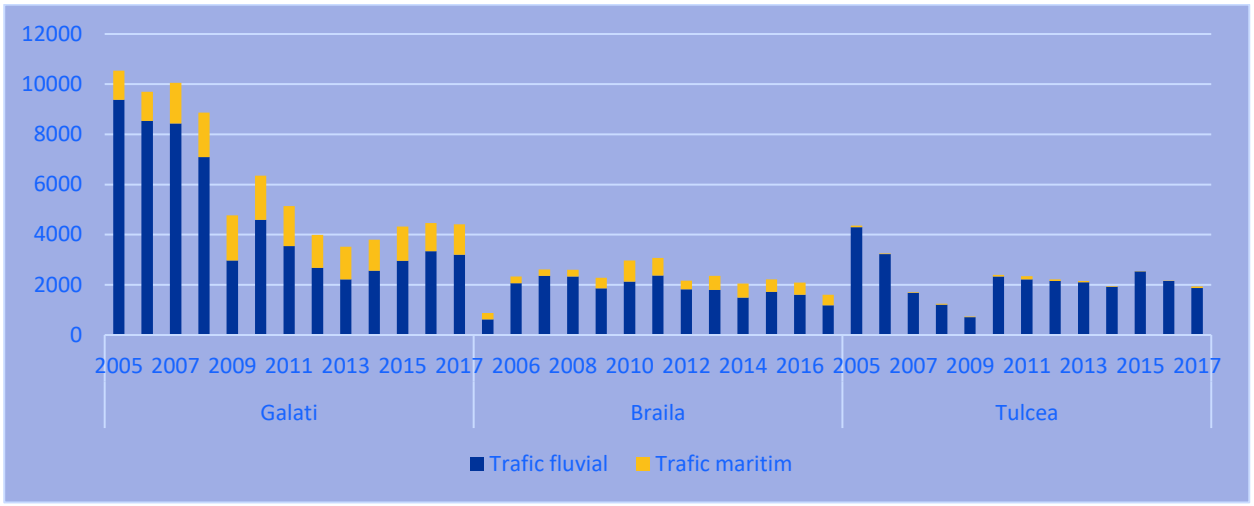
As shown in the figure below, in 2009 there was a significant decrease in the volume of goods handled in Galati and ever since the traffic volumes remained at much lower levels than they were before 2009. This is mainly due to the decrease of the quantity of the iron ore handled through an import relationship in the river traffic. The decrease of the iron ore volumes is the result of the closing of production lines and of the reduction of steel production during the 2008-2009 crisis period by ArcelorMittal Galati, the largest steel plant in Romania. ArcelorMittal Galati used to manufacture more than 3 million tons of steel every year. However, during the crisis period, production fell to 1.6 - 1.7 million tonnes per year and remained at this level in recent years.

River and maritime traffic in the Ports of Galati, Braila and Tulcea 1991- 2017 (thousands tons)



River Traffic Maritime Traffic

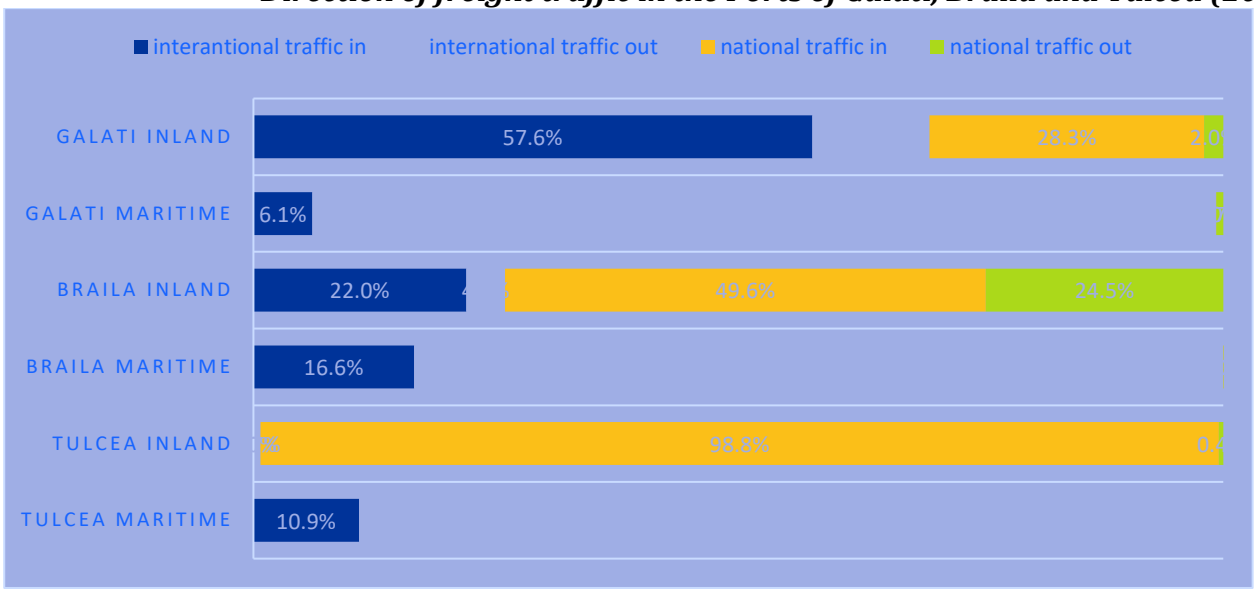
Maritime and river Transport in the Ports of Galati, Braila and Tulcea 2005-2017 (thousands tons)



River Traffic Maritime Traffic

It may be noted that the level of maritime transport is lower than that on inland waterways.

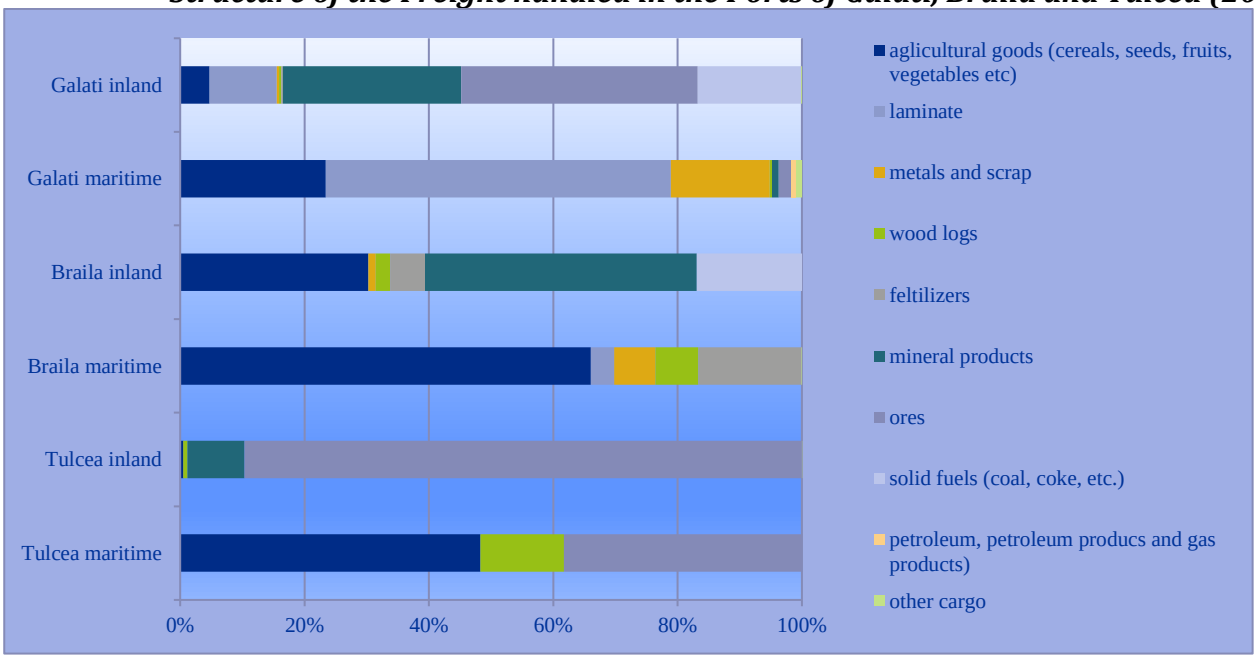
Direction of freight traffic in the Ports of Galati, Braila and Tulcea (2013)



Galati, Braila and Tulcea specialize in the handling of bulk goods, in particular dry bulk goods. Currently, in Galati, the main cargo served in a maritime relationship consists in rolled steel, agricultural commodities, metals and scrap. In an internal relationship, Galati mainly deals in ore, mineral products, solid fuels (coal) and rolled steel products. In Braila, the dominant maritime shipments consist in agricultural goods, whereas internal freight consists in mineral products. In

Tulcea, the main maritime goods are agricultural goods, ore and wooden logs, while in the national traffic the dominant goods are ores, as can be seen in the following figure.

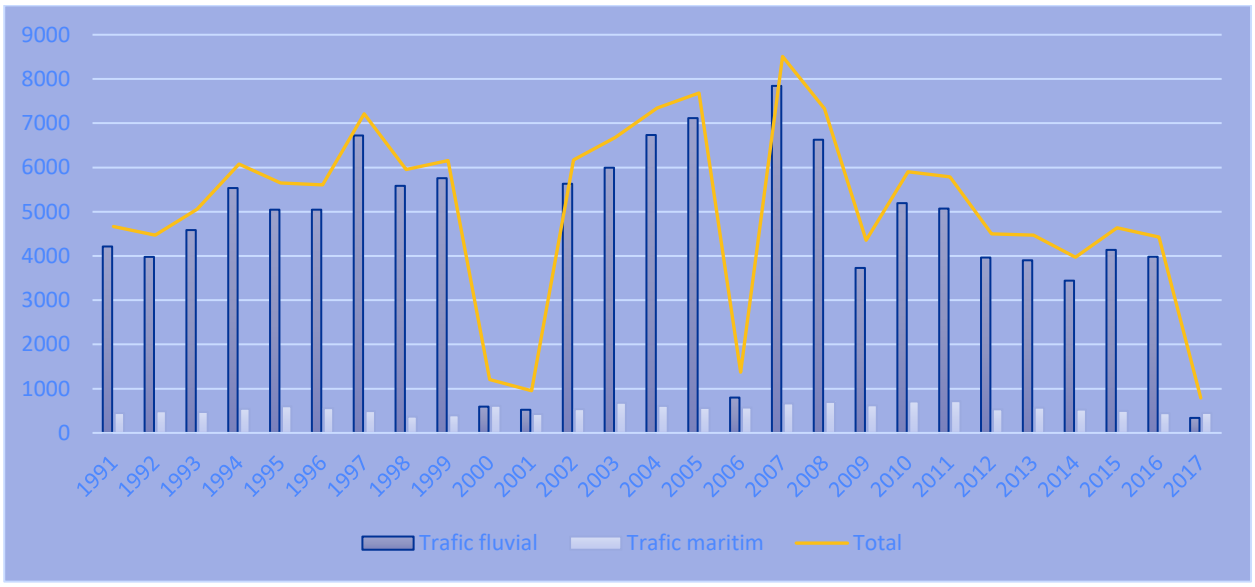
Structure of the Freight handled in the Ports of Galati, Braila and Tulcea (2013)



Such a structure of the handled freight determines the types of shipping traffic served in the ports. Bulk transport is irregular, which means there are no connection lines in this type of maritime shipping and ships call at ports in an irregular manner.

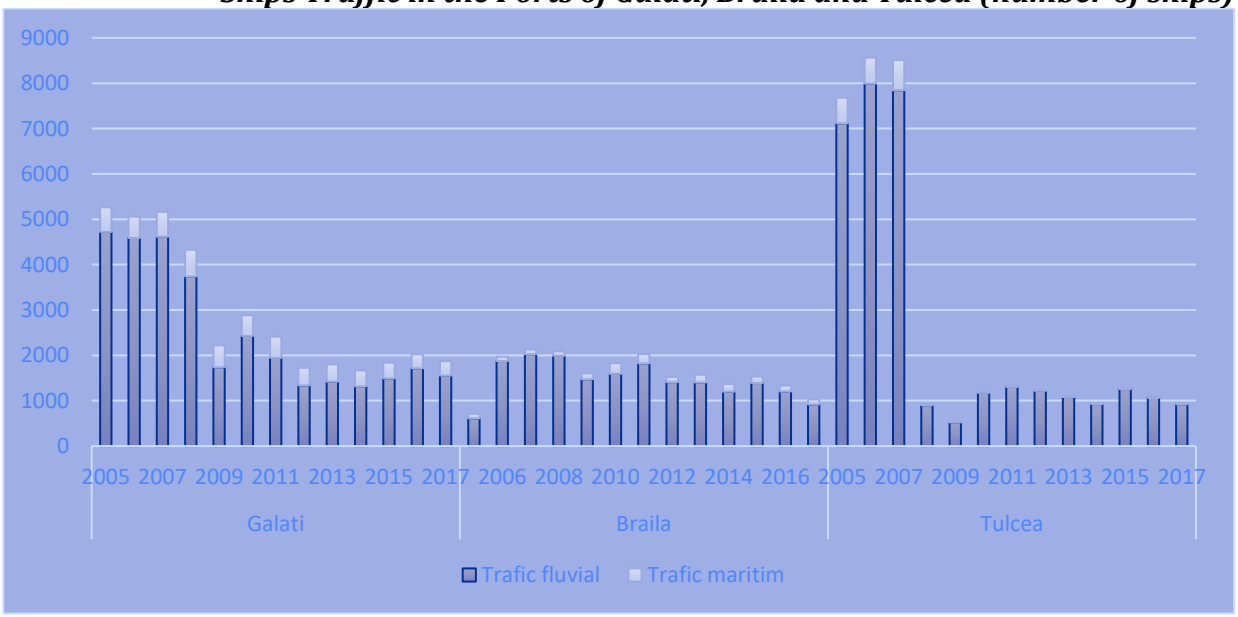
In all three ports, the total number of vessels required in 2013 was 4,472, of which 570 were maritime ships. Analysing the past decade, the most intense traffic in the region was in the period 2004-2008. Since 2009, ship traffic was at a level of 4,000 - 5,000 calls per year. Galati serves the largest number of vessels, both in the river and maritime relations (1420 river ships and 380 maritime ships in 2013). Tulcea mainly serves domestic traffic, from the 1100 ships served in 2013, only 20 were maritime ships. In Braila there were 1402 calls of inland ships and 170 calls by maritime ships. In the next picture we can also see a significant decrease in the ship traffic of Galati, which is related to the low volume of iron ore handled in the port, as described above. The evolution of the number of ships can be seen in the chart below.

River and Maritime Traffic in the Ports of Galati, Braila and Tulcea (no. of ships)



River Traffic Maritime Traffic

Ships Traffic in the Ports of Galati, Braila and Tulcea (number of ships)



River Traffic Maritime Traffic

It is important to indicate the maximum parameters of the ships which can be served in the Ports of Galati, Braila and Tulcea. Generally, the parameters of a ship depend on the access parameters of the Sulina channel. The weight of the largest vessels that can enter the Sulina channel is about 25,000 DWT. In the maritime sector of the Lower Danube from Braila to the Sulina River, all maritime and river/maritime ships sail at a freshwater flow of 7.01 m. Under normal circumstances, this sector allows the navigation of ships with a maximum length of 180 m or of floating structures up to 40 m wide. In some cases, the Administration may approve navigation of vessels longer than 180 m but not longer than 225 m.
Nevertheless, each port also has its own conditions (depth at quay, length of quays) which can limit the above-mentioned parameters. The Port of Galati is divided into three main parts: industrial ore (raw materials), Docuri (Docks) Port Galati and Bazinul Nou Galati / New Basin (Port of Galati). All areas of these ports specialize in handling various bulk commodities. In all areas, the maximum draft of the vessels depends on the maximum allowable draft at the entrance of the Sulina channel. The maximum capacity of vessels that can operate in the Industrial Ore Port is of 25,000 DWT. The Port of Galati Docks can take vessels of up to 8,000 DWT. The New Basin Port Galati allows access to barges, river and maritime ships of up to 15,000 DWT. The maximum capacity of ships which can enter the Port of Tulcea is 25,000 DWT, while the maximum capacity allowed in Braila is about 8,500 - 9,000 DWT.

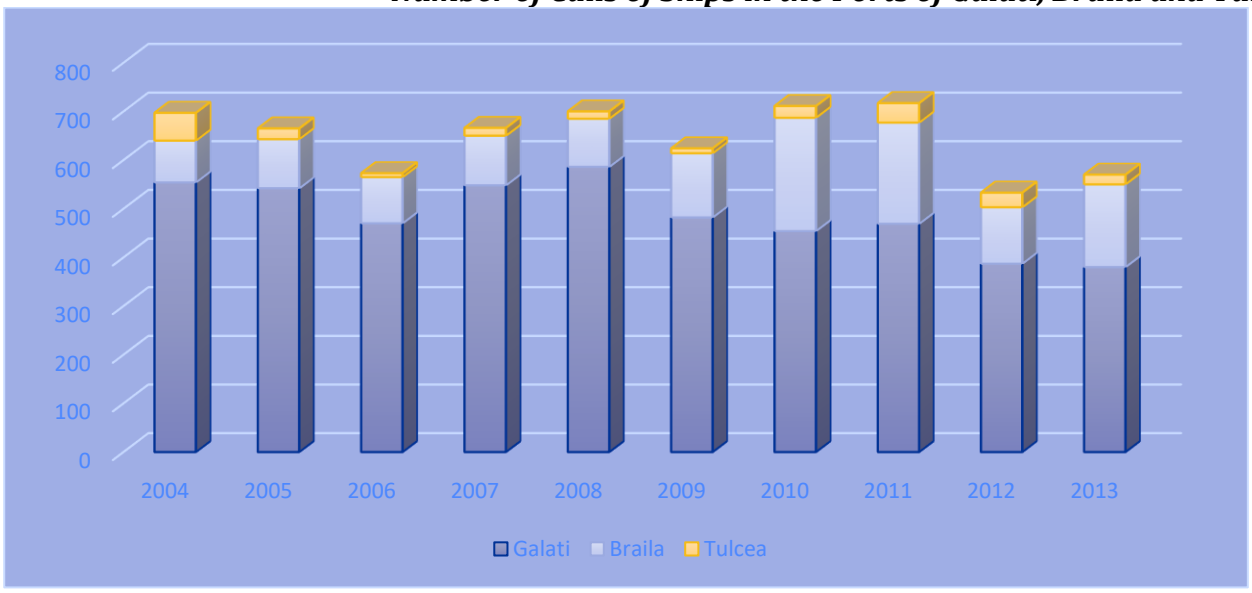
The Current Situation of Shipping in the Maritime Danube

Looking closely at the maritime traffic of vessels, one may point out that most of it is processed in two ports, Galati and Braila, as you can see in the picture below. The main type of ships served in the ports are general cargo vessels adapted to carry various types of goods, including bulk goods. In all three ports, the total number of ship calls in 2013 was 570, most of these calls went to Galati (67%).

About 30% of this traffic went to Braila, while only 3% went to Tulcea. In the last decade, the highest number of ship calls were recorded in 2011 (717), and the lowest in 2012 (533). If we analyse the maritime traffic in all three ports in general, there is no noticeable trend in the number of ship calls at sea. However, some observations can be made. In Galati, since 2009 a decreasing trend was noted (Figure 20), and in the last two years the lowest number of ship calls was recorded. Braila recorded a significant increase in 2010 and 2011.

However, in 2012 the shipping traffic increased and increased again in 2013. In Tulcea the highest traffic was noted in 2004 but has since declined significantly; visible positive changes took place in 2011, but the downward trend resumed.

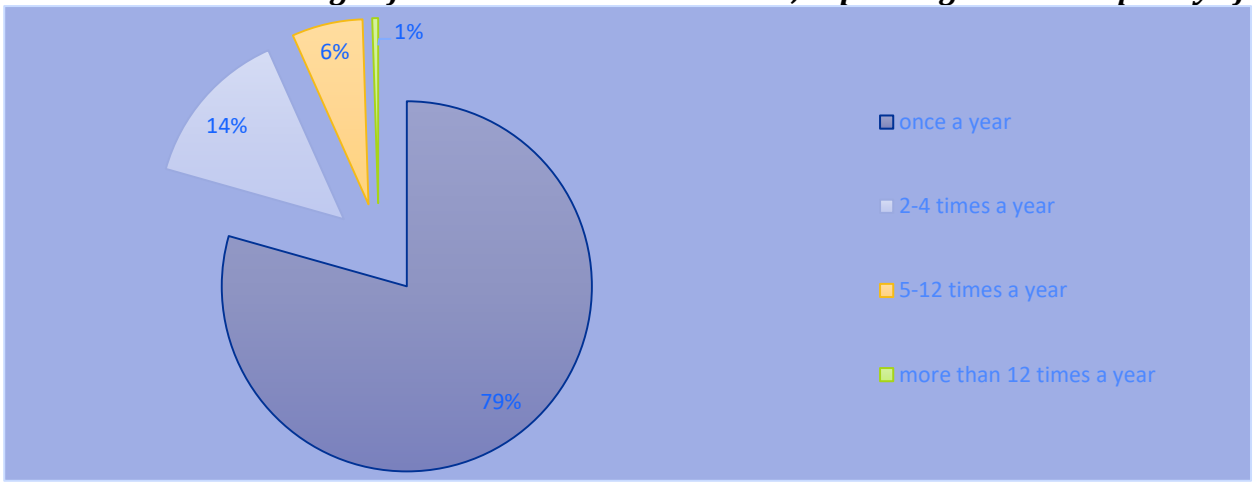
Number of Calls of Ships in the Ports of Galati, Braila and Tulcea



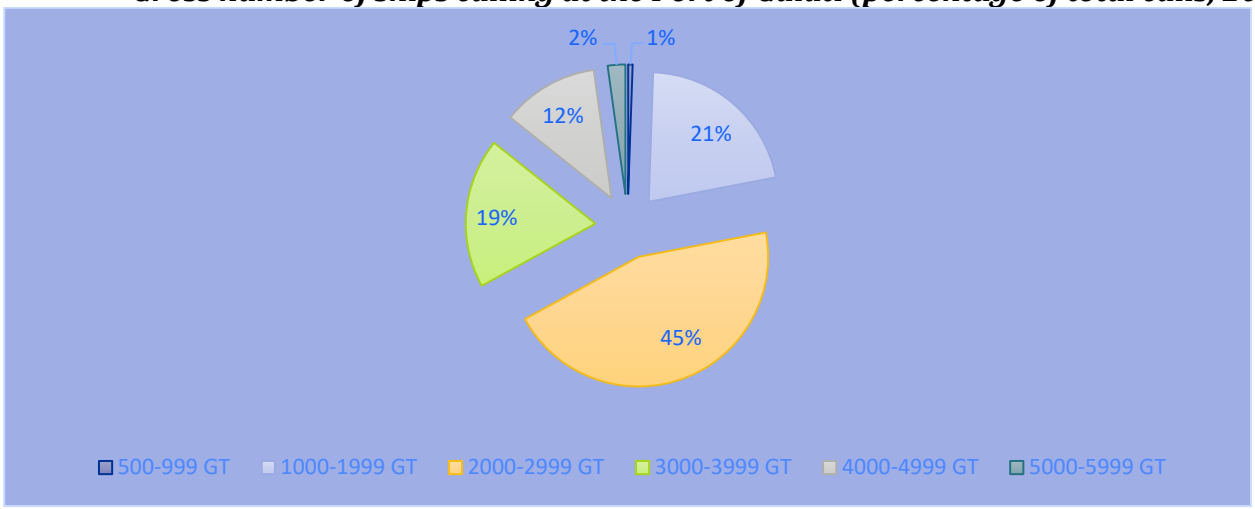
Due to the data availability, a more detailed analysis of maritime traffic will be provided only for the Port of Galati. Nevertheless, considering the similar types of goods handled in the three ports and the comparable waterways conditions, one can assume that the character of vessel traffic (typical ships calling at ports, frequency of calls, etc.) is not significantly different in all the three ports and that it is comparable.

According to estimates based on data from the Maritime Danube Ports Administration, during a given year, Galati called about 250 different ships. Approximately 79% of these vessels were calling at the port only once during the year, 14% of ships called about 2-4 times a year, 6% of ships called between 5-12 times a year and only 1% once a month (see chart below). This clearly shows the irregular nature of the traffic in the Port of Galati.

Percentage of Vessels which call at Galati, depending on the Frequency of Call



Gross number of ships calling at the Port of Galati (percentage of total calls, 2013)

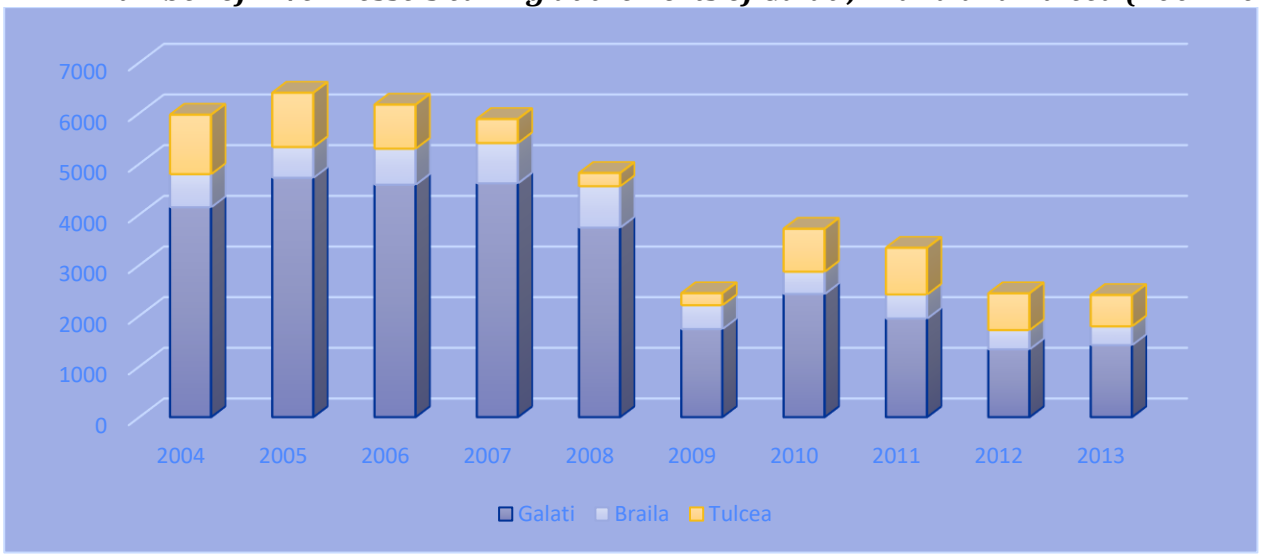


The Current Situation of Inland Waterways Traffic in the Maritime Danube Area

In all the three ports, the total number of calls for inland vessels in 2013 was 3.902, of which most calls have been served in Galati (36.4%). About 36% of this traffic was served in Braila, and the rest of 27.6% in Tulcea. In the last ten years, all ports recorded significant negative changes in shipping traffic. The last decade can be divided into two periods.

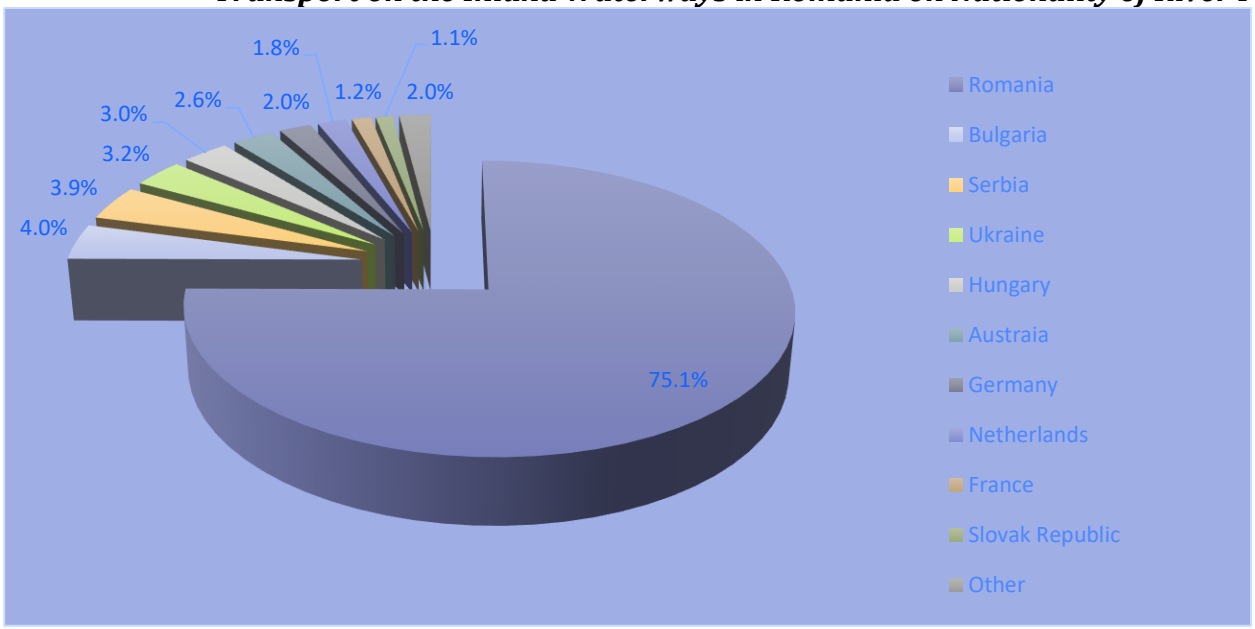
The first period between 2004-2008, when the average number of ship calls per year was about 7,200 (http://www.romanian-ports.ro/html_nou/traficapdm.php#) and the second (2009-2013), when the average number of calls totalled 5,000 ships a year. In absolute terms, the highest changes were recorded in Galati. In Galati, during the period 2004-2008, the average annual number of ship calls reached 4,361, but between 2009-2013 the average number of ship calls was at a level of 1,774. In Tulcea there was a significant negative trend in the period 2004-2009 and in 2010 there was an increase in the total number of calls. Nevertheless, in the last two years, the port recorded a decrease in the vessel traffic. For Braila, the best years were 2004-2008, when the average number of annual calls was 1,500, but since 2009 the number of ship calls declined.

Number of River Vessels calling at the Ports of Galati, Braila and Tulcea (2004-2013)



An important issue regarding the further analysis is represented by the features of the fleet entering the Ports of Galati, Braila and Tulcea. However, there are no detailed data available on inland waterway vessels calling at these ports. Therefore the authors decided to describe the Romanian and Bulgarian river fleets. This choice results from the structure of the national fleet serving the freight traffic in Romania. As can be seen in the figure below, most of the goods served in the Ports of Romania (75.1%) are transported by the Romanian fleet. The fleets of other countries represent several percent points, of which the following nationalities can be mentioned: Bulgaria, Serbia, Ukraine, Hungary, Austria, Germany, Holland, France and Slovakia.

Transport on the Inland Waterways in Romania on Nationality of River Fleet



Current Situation of the Total Traffic on the Maritime Danube

The traffic analysis in the above-presented three ports would be incomplete without an analysis of the total traffic.

Administratia Fluviala a Dunarii de Jos R.A. *(The Lower Danube River Administration)* Galati published the data on this situation since 2001 until now. The data on the vessel traffic on the Maritime Danube are the following:

Name
Year
Total ships incoming–outgoing
Incoming ships
Outgoing ships

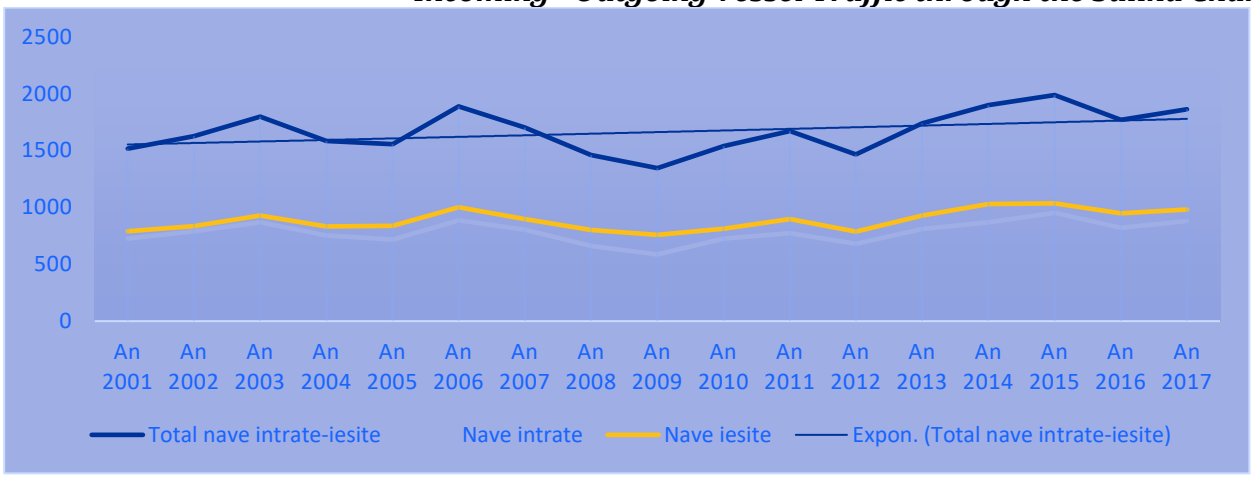
Denumire	An 2001	An 2002	An 2003	An 2004	An 2005	An 2006	An 2007	An 2008	An 2009	An 2010	An 2011	An 2012	An 2013	An 2014	An 2015	An 2016	An 2017
Total nave intrate-iesite	1516	1626	1798	1585	1558	1889	1704	1461	1346	1541	1672	1467	1739	1900	1989	1771	1863
Nave intrate	725	791	870	753	719	887	806	660	587	727	775	680	810	871	953	823	880
Nave iesite	791	835	928	832	839	1002	898	801	759	814	897	787	929	1029	1036	948	983

Name
Year

Total goods in tons
Entered goods (tons)
Dispatched goods (tons)

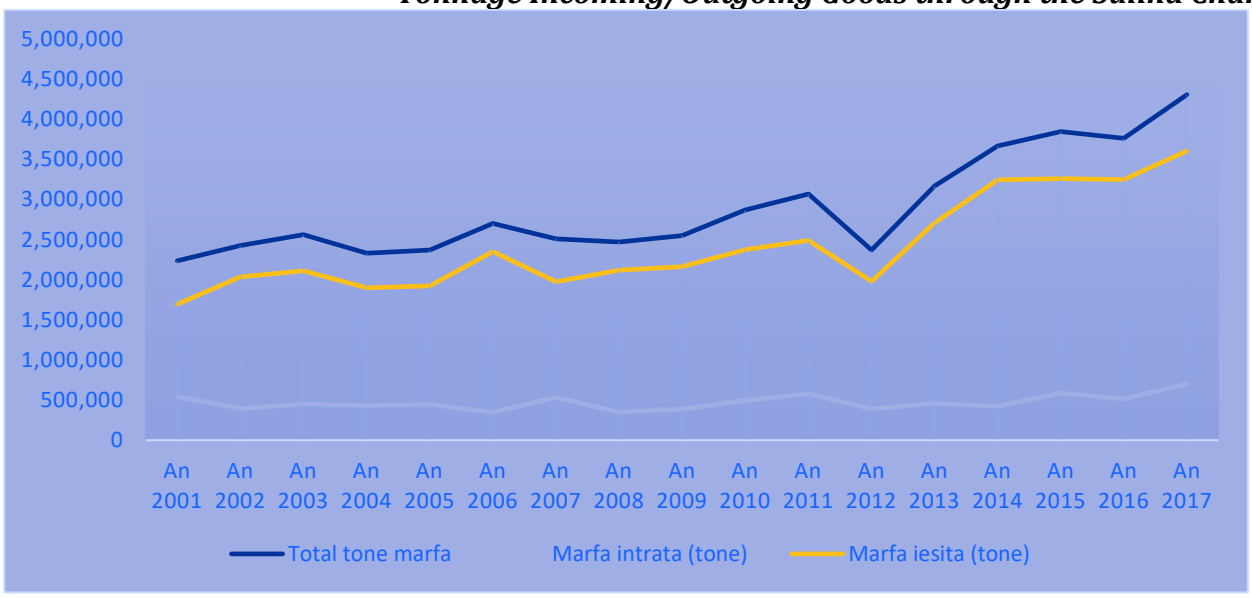
Denumire	An 2001	An 2002	An 2003	An 2004	An 2005	An 2006	An 2007	An 2008	An 2009	An 2010	An 2011	An 2012	An 2013	An 2014	An 2015	An 2016	An 2017
Total tone marfa	2,236,439	2428627	2562695	2331993	2370414	2700308	2510365	2469876	2551374	2870047	3067529	2372441	3168339	3668096	3847872	3763900	4306987
Marfa intrata (tone)	541,084	394359	450842	432207	448129	347797	533443	350419	387419	496614	578271	391212	458799	422899	585222	513461	701332
Marfa iesita (tone)	1,695,355	2,034,268	2,111,853	1,899,786	1,922,285	2,352,511	1,976,922	2,119,457	2,163,955	2,373,433	2,489,258	1,981,229	2,709,540	3,245,197	3,262,650	3,250,439	3,605,655

Incoming - Outgoing Vessel Traffic through the Sulina Channel



Total Incoming - Outgoing Vessels Incoming Vessels Outgoing Vessels Expon. Total Incoming - Outgoing Vessels

Tonnage Incoming/Outgoing Goods through the Sulina Channel



Total Tonnage Goods Incoming Goods (tons) Outgoing Goods (tons)

According to the previous two graphs, one can see an ascending trend, enabling thus the improvement of the economic, financial and operating results of the three ports.

2.4. Objectives expected to be achieved through public investment

The use of computer systems through its applications in the operational and managerial areas ensures the creation of a competitive advantage from the organization at local, internal level (in

the collaboration between departments, between hierarchical levels) to the forms of electronic commerce, information exchange using the Internet, etc. Information systems play a vital role in the success of an organization.

Thus, they can provide the internal (via Intranets) and the external information infrastructure (via extranets) for the business needs in:

- ✓ Ensuring the operational efficiency;
- ✓ Ensuring of an efficient management;
- ✓ Providing a competitive advantage.

A successful system must not be measured only by its effectiveness (in minimizing costs, time or the use of information resources) but also by the support it provides in:

- ✓ Developing business strategies;
- ✓ Unfolding of business processes;
- ✓ Improving organizational structure and corporate culture;
- ✓ Increasing turnover and the company value in a dynamic and competitive environment.

In individual - management terms the information system represents:

- ✓ an important means to ensure the functionality of activity:
- ✓ a key factor influencing operational efficiency, employee productivity and customer relationship;
- ✓ a basic amount of information that ensures the making of correct decisions;
- ✓ a means to develop new products (services) that provide a competitive advantage;
- ✓ one of the most important resources of the organization and for the activity cost analysis.

The increasingly rapid changes in the business environment have caused computer systems to reach a critical component of the organization in fulfilling its purpose (essentially making a profit). Thus, the use of information technology has become an indispensable aspect of the activity of an organization, especially today when new trends emerge in the evolution of organizations such as:

- ✓ use of Internet at a local or global organizational level;
- ✓ the emergence of Internet organizations which perform their business only in this area;
- ✓ globalization;
- ✓ reformulation of the business process.

The role of the port as a hub of the transport chain largely depends on the location and level of economic and technical development of the respective port and therefore, modern production processes determine the use of appropriate transport systems. This process of specialization of transport systems already started two decades ago (in western countries), and today it is continued in the new markets.

As seen from the ports, the diversification of port services generates an increase in economic performance, making them much more attractive to potential or existing customers while improving and maintaining the market position of the ports.

When assessing the feasibility of developing of new port services, it is important to consider the potential added value of the respective services, which vary from product to product and from activity to activity. Thus, many port activities can be classified as "value-added port services"

Value added port activity may result in the expression of two dimensions, i.e. directly from the operation of the **value-added port logistics services (SLVA)** or indirectly as a result of the exploitation of **value added port facilities (FVA)**. Value-added port logistics services comprise two major components, namely: (1) general logistic port services (SLG) and (2) port services integrated in the logistics chain (SILL).

General port logistic services include, among other activities, also the loading/unloading, filling/ discharge, storage, stocking and distribution; these activities are traditional logistics operations and do not affect the nature of the goods transiting the port. In addition to these traditional activities integrated supply chain port services are also developed, among them we mention the assembly, quality control, packaging, repair and reuse. Nevertheless, the SILL may be useful only for certain types of products such as household appliances, pharmaceuticals, chemicals (except those carried in bulk), clothing, cosmetics and body care, food, machine parts, etc.

The second component of value-added port services, the value-added port facilities, is represented by a wide range of activities. These types of services cannot be attributed to a particular product or goods flow thus one can consider as "potential FVA" dry and liquid bulk cargo, general cargo and containerized Roll-on/Roll-off cargo. Therefore, the handling of significant quantities of such goods requires the creation of reception facilities, maintenance and even repair, where appropriate, of the goods. For example, the handling of large quantities of chemicals requires the existence of goods reception facilities, and a substantial Ro-Ro traffic leads to the need of carrying out tractors maintenance operations and construction of repair workshops. Figure 3 describes the FVA and SLVA activities for the various types of goods.

Containerized and general goods have the highest SLVA potential, while for the Ro-Ro goods this potential is limited. These goods require operations such as repair, cleaning, parking, security, leasing, etc. Dry and liquid bulk goods have the lowest potential both for SLVA and FVA.

This project will lead directly to the improvement of port facilities with added value and indirectly, it is one of the prerequisites for the development of value-added port logistics services.

3. Identifying and presenting possible technical and economic scenarios/options for the achievement of the investment object

3.1. Features of the site

a) description of the site (location – intramural / extramural, land area, dimensions on the map, legal regime - nature or title of ownership, easements, pre-emption right, public utility area, information/requirements/constraints extracted from the town planning documentation, as appropriate);

This project involves the development of the implementation of a Port Community System [PCS] IT system in the maritime area of the Danube respectively in the ports Galati, Tulcea, Braila, and the optimization of port processes by:

- ✓ digitization of processes aimed at the port management (instantaneous providing of the required information);
- ✓ re-use of data already available in the system (to avoid unnecessary repetitive filling in of forms);
- ✓ smart and secure data exchange (where only port stakeholders have access to each of the available data fields).

In this context, the system development will be done and it will operate from the APDM headquarters, which is why the physical location of the project and its situation do not affect the creation of the IT system.

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

Not applicable

c) proposed orientation towards the cardinal points and to the natural or built points of interest;

The development of the IT system will enable both the communication between the 3 ports, and communication with the ships and other stakeholders. Therefore, the proposed orientation towards the cardinal points is not important.

d) existing pollution sources in the area;

Not applicable

e) Climate data and relief characteristics;

The Galati County, with an area of 4466.3 km2, representing 1.9% of the territory of Romania, is part of the area of peri-Carpathian, Danube counties as it is located relatively close to the Black Sea, at the confluence of three major rivers - the Danube, the Siret and the Prut and at the crossing of major trade routes.

The geographical position of the county – projected on the background of the history of the Romanian people - summed up a complex of factors, causes and consequences, this ancient Moldavian earth borders with Dobrogea and Walachia (Muntenia). It is a place of interference of facts, people, ideas, resources and trade routes.

Placed in the southeast part of the country, between 45°25' and 46°10' northern latitude, 27°20' and 28°10' eastern longitude, it borders to the north with the Vaslui and Vrancea Counties, to the south with the Braila and Tulcea county, to the east with the Republic of Moldova and to the west with the Vrancea county.

The natural conditions of the territory of the Galati County bears on its landscape the imprint of influences due to the European geographical entities that interfere on the territory of Romania.

The climate – the territory of the Galati county totally belongs to the area with a continental climate (the southern and central part covering more than 90% of the area, it is situated in the plain climate area and the northern edge, accounting for 10% of the territory in the hills climate area). In both climate areas, summers are very hot and dry and winters are frosty, marked by strong blizzards, but also by frequent interruptions caused by the advections of hot and humid air from the S and SW that cause intervals of warming and melting of snow layer. Against the general climate background, the Siret, Prut and Danube meadows generate changes in the values

regime of the main weather elements, which lead to the creation of a specific local meadow climate, wetter and cooler in summer and wetter and less cold in winter.

The general circulation of the atmosphere is mainly characterised by a relatively high frequency of slow advections of temperate-oceanic air from the W and NW (especially in the warm half-year), an equally high frequency of advections of temperate continental air from the NE and E (especially in the cold season), as well as less common air arctic advections from the N and tropical marine air from the SW and S.

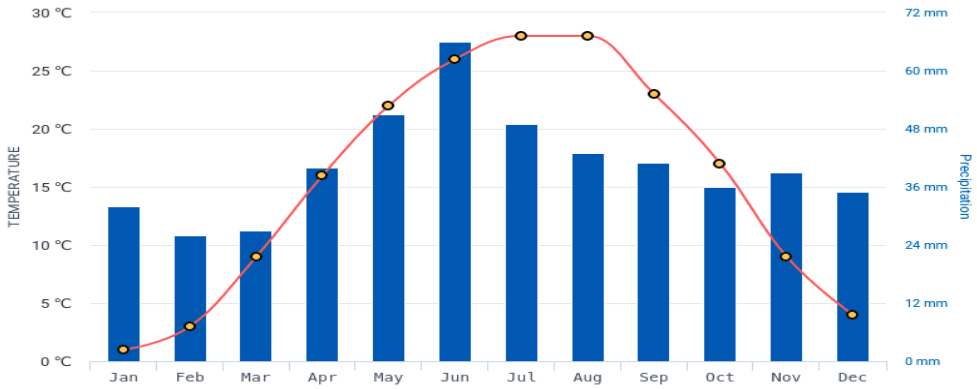
The relief - by its position outside the Carpathian arch, Galati County occupies an interference area of the borders of the physical - geographical Eastern European, Southern European and partly Central European provinces, which is faithfully reflected he in climatic conditions, in the vegetation and soils as well as in the geological structure of the relief. The latter provides a landscape with low heights ranging from 310 m to the north and 5 -10 m to the south.

The Galati County itself has a tabular relief, more fragmented to the north than to the south. Considering the altitude, position and particular relief, one can distinguish five geomorphological units: the Covurlui Plateau, the Tecuci Plain, the Covurlui Plain, the Lower Siret Valley and the Lower Prut Meadow.

Old geological formations are of little importance in terms of mineral resources. Hydrocarbons were identified and are exploited - oil and gas in areas: Schela – Independenta, Munteni - Berheci and Brateş. Recent and especially quaternary geological formations, composed of common clay, sand and gravel – exploited in Galati, Tecuci, Braniştea and in the lower channel of the Prut River, are very important for the building materials industry.

The annual average climate data for Galati are:

Rainfall - Months with higher rainfalls are June, May, July with 166 mm rainfall. Most rainfall occurs in June, with an average rainfall of 66 mm. The annual amount of rainfall in Galati is 485 mm. The difference between the highest rainfall (June) and lower rainfall (February) is 40 mm.

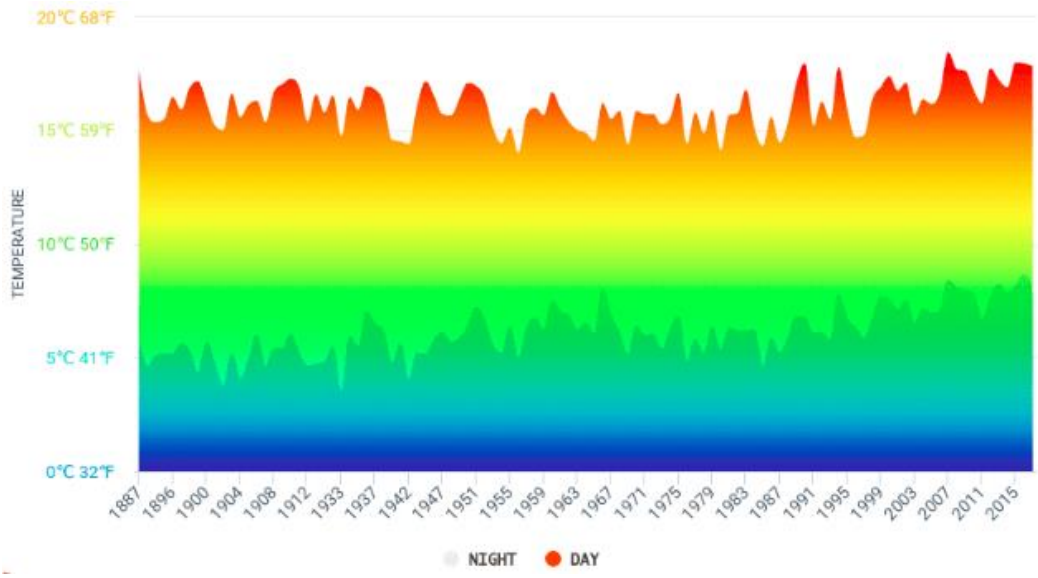


Temperature - the annual average temperature in Galati is 16 °C. The warmest months of the year are July, with an average temperature of 28 °C. Usually January is the coldest month in Galati,

the average temperature being 1 °C. The difference between the hottest month (July) and the coldest month (January) is of 27 °C.

		Ianuarie	Februarie	Martie	Aprilie	Mai	Iunie	Iulie	August	Septembrie	Octombrie	Noiembrie	Decembrie
Temperature	Temperatura	1°C	3°C	9°C	16°C	22°C	26°C	28°C	28°C	23°C	17°C	9°C	4°C
Rainfall	Precipitații	32mm	26mm	27mm	40mm	51mm	66mm	49mm	43mm	41mm	36mm	39mm	35mm

Historically we note an increase of the average annual temperature, as can be seen in the graph below.



f) the existence of:

- ✓ city utility networks that would require relocation / protection, in so far as they can be identified – NOT APPLICABLE.
- ✓ possible interference with historical/architectural monuments or archaeological sites on site or in the immediate area; the existence of specific conditionings in case of protected areas - NOT APPLICABLE.
- ✓ Areas of land belonging to institutions that are part of the defence, public order and national security system - NOT APPLICABLE.

g) Geophysical characteristics of the terrain of the site - extract from the preliminary geotechnical survey, comprising:

(I) data on seismic zoning;

With regard to seismology, the Galati municipality and therefore the investigated location, fall within a macro-seismic intensity of the 8th degree, as it is located on the major fracture zone Focsani - Nămoloasa - Galati. For this reason, earthquakes originating from the Vrancea epicentre are strongly felt in the city of Galati. The Galati Municipality is classified in the described seismic risk within the horizontal acceleration top of the land, ag = 0.24 g (projected land acceleration) determined for the mean reference recurrence interval (ARI), which corresponds to the ultimate limit state. The value of the spectrum control response period (corner) Tc is = 1.0 s.

This feature will be considered for the project development, i.e. for the strength and resilience of the IT infrastructure against disasters.

(ii) preliminary data on the nature of the foundation soil, including conventional pressure and the maximum level of groundwater;

The hydrostatic level of the shallow groundwater (infiltration) is vertically variable according to the season, depending on the amount of rainfall next to the site, the drainage capacity of natural emissaries as well as the surface water levels near the site (Danube River). Groundwater have a strong oil odour.

(iii) general geological data;

From a geological point of view, Galati is located in the southern part of the Moldavian Platform in the area that intersects with the North Dobrogea type of platform. The sedimentary soil covering the rigid soil of the platform, with thicknesses of more than 3000 m, consists in Palaeozoic and Neozoic formations. In the southern part of the Covurlui plain we encounter the carbonate black earth, formed in the driest area of the steppe on xerophile meadows with gramineous plants.

This subtype of black earth (chernozem) is known as the light chestnut coloured chernozem or chocolate brown carbonated black earth (chernozem). In the Covurlui Plateau and in the Covurlui plain leached chernozem appears on the loess deposits.

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

NOT applicable.

(v) classification in risk areas (earthquake, landslides, flooding) in accordance with the technical regulations;

According to the environmental study conducted for the updating of the PUG of the Galati Municipality, the identified hazards are the following:

Seismic hazard

According to the norms and state standards (STAS) in force, the administrative territory of the municipality belongs to the seismic hazard area described by the peak value of the horizontal ground acceleration ag = 0.24 g (land acceleration for design purposes), determined for the reference mean recurrence interval (ARI) corresponding to the ultimate limit state. The value of the control period (corner) of the response spectrum for this area is Tc = 1.0 s.

Geotechnical risk

Geotechnical risk depends on two sets of factors:

- ✓ factors related to the land, of which the most important are the conditions of the ground and underground water;
- ✓ factors related to the structure and its vicinities.

The yellow macroporous loess layer, sensitive to wetting, which forms the foundation soil on the medium and low terraces of the Siret River, and also on the slope areas, belongs to the category of "difficult foundation" soils. Also in the category of difficult foundation soils belongs the earth with a high content of organic matter (mud, silt, peat) found both in areas of the Danube and Prut floodplains and in the Danube – Brateş interfluve. In conclusion, the entire foundation soil belonging to the administrative territory of the Galati municipality belongs to the category of difficult foundation soils.

Risk of flooding

In the summer of 2010, on May 29th ÷ 31st (mainly) and on the 16th of June, very high rainfall amounts (exceptional) fell during short periods of time. Due to the relatively high energy of the relief of the slope area connecting the terraces of the Siret Rivers, rainwaters which fell and went down the slopes could not be taken over by the sewage systems, they accumulated and flooded the area, the stalled and infiltrated both in the soil at the base of the slope and in underground accidents affecting this land – e.g. the intersection of the I.L. Caragiale street with the Columb street.

As a result, they caused significant damages to the buildings in the area, this being aggravated by the existence of underground accidents under the buildings, relatively thick heterogeneous fillings, loose and with empty subterranean spaces, which generally favour the penetration of water to the foundations of the buildings, all this leading to land subsidence and loss of stability of the buildings.

Risk of instability

In the analysis of the factors helping to determine the phenomena of instability we mention the following:

Lithologic factor – this is represented by the difficult foundation soil throughout the territory of the municipality, namely - yellow loess sensitive to wetting - Group B earths, sensitive to wetting with a thickness of up to 22.0 m and which by wetting are subject to subsidence under their own weight of up to 87 cm.

This value was obtained in the unique experimental polygon on such lands, created in Galati during the 1980's. However, research has demonstrated and established that in the case of consolidation of wetting sensitive soil with earth columns, the protection area for constructions is of 33% of the thickness of the wetting-sensitive layer. In Galati, at the beginning of activities in the geotechnical field, due to the insufficient knowledge and experience with such soils, works were also performed with negative effects in time on buildings and these behaved poorly.

Geomorphological Factor – this is represented by the slope and embankment areas. In areas where they are not prepared for the collection and discharge of rainwater leaking chaotically on the slope and accumulating at the base, phenomena ale likely to occur such as those mentioned in the risk of flooding.

Hydrological and Climatic Factor – This is highlighted and strongly influenced by the situation of the Galati municipality at the confluence of the Danube River with two large surface waters - Siret and Prut as well as the existence of the water pools Cătuşa şi Mălina and Lake Brateş.

Hydrogeological Factor – this is pointed out by the chaotic oscillations of the groundwater level accumulated in excess in some areas, leading to the formation of "water bells" as mentioned above.

Seismic Factor – this includes the administrative territory of the municipality in seismic hazard area as described by the peak value of the horizontal ground acceleration ag = 0.24 g (earth acceleration for design purposes), determined for the reference mean recurrence interval (ARI) corresponding to the ultimate limit state. The value of the control period (corner) of the response spectrum for this complex is Tc = 1.0 s.

(vi) Hydrological characteristics established under existing studies and documentations, indicating the sources of bibliographic information.

Not applicable.

3.2. Technical and Functional Data of the Investment Object:

a) Purpose and Functions

The "**Danube Ports Network - DAPhNE**" fall within the **Specific Objective no. 3.1** *"Improving the planning, coordination and practical solutions in order to provide a safer environment and transport network, facilitating accessibility"* in close correspondence with **Priority Axes 1a and 1b** of the Strategy of the European Union for the Danube Region whose **coordination** is ensured at institutional level by **Romania** and **Austria**.

The project has a duration of approx. **30 months**, a total of **23 partners** [15 partners in EU countries and 8 partners from non-EU countries] in **9 Danube countries** [AT, SK, HU, HR, SRB, RO, BG, MD, UA] and a **total budget of 2,985,406.00 Euros** for the activities intended to be developed in the project.

The National Company „Administratia Porturilor Dunarii Maritime" S.A. Galati [**CN APDM SA Galati**] *["Maritime Danube Ports Administration" S.A. Galati]* as ERDF 4 Partner participates to the Project and coordinates as a leader, the Works Package no. 3 - WP 3 referring to Port Legislation and State Aid Schemes, but is involved in activities related to all work packages.

This project, part of the Daphne project, aims to analyse the opportunity to optimize port processes by:

- ✓ digitization of processes aimed at the port management (instantaneous provision of required information)
- ✓ re-use of data already available in the system (to avoid unnecessary repetitive filling in of forms)
- ✓ smart and secure data exchange (where only port stakeholders have access to each of the available data fields).

PCS is an electronic platform that connects several systems operated by a variety of organizations in a port area. Port actors usually exchange information by fax, e-mail, telephone, etc., this reducing the efficiency of the port operation due to factors such as different message formats, paper management, double filing of data, loss of data, etc. PCS manages, optimizes and automates port and logistics processes through data transmission and connecting the transport and logistics chains. PCS will allow a smart and secure exchange of information between the members of the port community.

This platform will allow a step by step approach, customized to individual ports within this project also after the lifetime of this project, allowing also all the other ports in the Danube region to use this specification due to its modular approach, reducing development costs and supporting the sustainability of the project results. Some of the modules for which the model architecture will be delivered are: traffic monitoring, automatic load type and quantity, berth detection and allocation, warehouse allocation, automated billing, automated statistics, interfaces with other modes of transport. The pilot implementation of the Daphne project in the 4 European ports will include the development, the implementation and operation of the monitoring module of the

traffic of PCS modules, the allocation of nodes / statistics. During the demo phase, which will take at least three months, users in these ports will use the system and collect the analytical operational data.

b) deliverable characteristics, parameters, equipment and endowment level, specific technical data;

The implementation of the system at APDM will meet the functional requirements and will consider the requirements for the data to be handled, the services offered by the 3 ports, the number of employees and external users of the system. Functionalities defined in the Danube Ports Network - DAPhNE project will also be considered, in conjunction with the necessary functionalities as identified by APDM.

c) minimum operating duration, estimated corresponding to the proposed destination/functions;

The minimum duration of operation in the of the IT system is 5 years, taking into account the normal functional lifetime of IT equipment as well as the functionalities of the solution that will be developed. Also, one must bear in mind that normally the operational activities of APDM cannot change substantially in the coming years, which may lead to a longer lifetime than expected, supported by reinvestment in the case of equipment suffering physical or moral wear and tear.

d) specific functional needs / requests as the case may be.

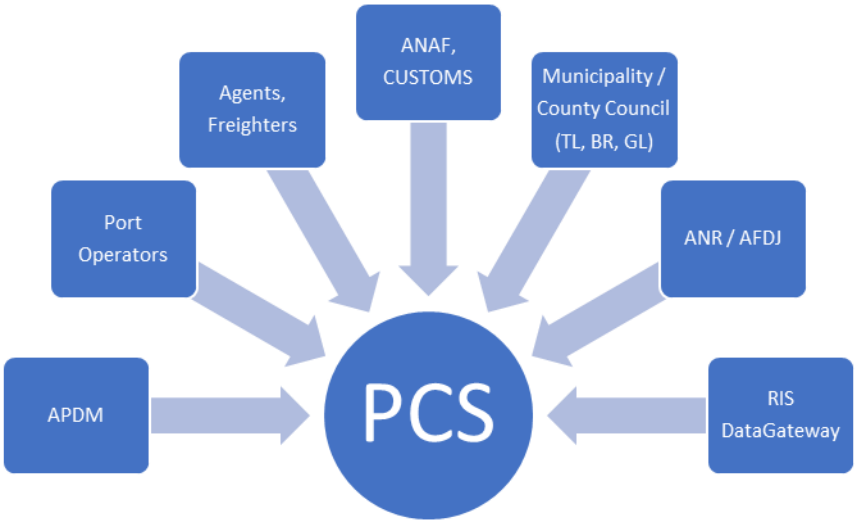
Within the contract the opportunity is considered to create a "Port Community System" for the Ports of Braila, Galati and Tulcea.

The concept must be similar to the one of the commercial Maritime ports, only adapted to the needs and reality of these river ports.

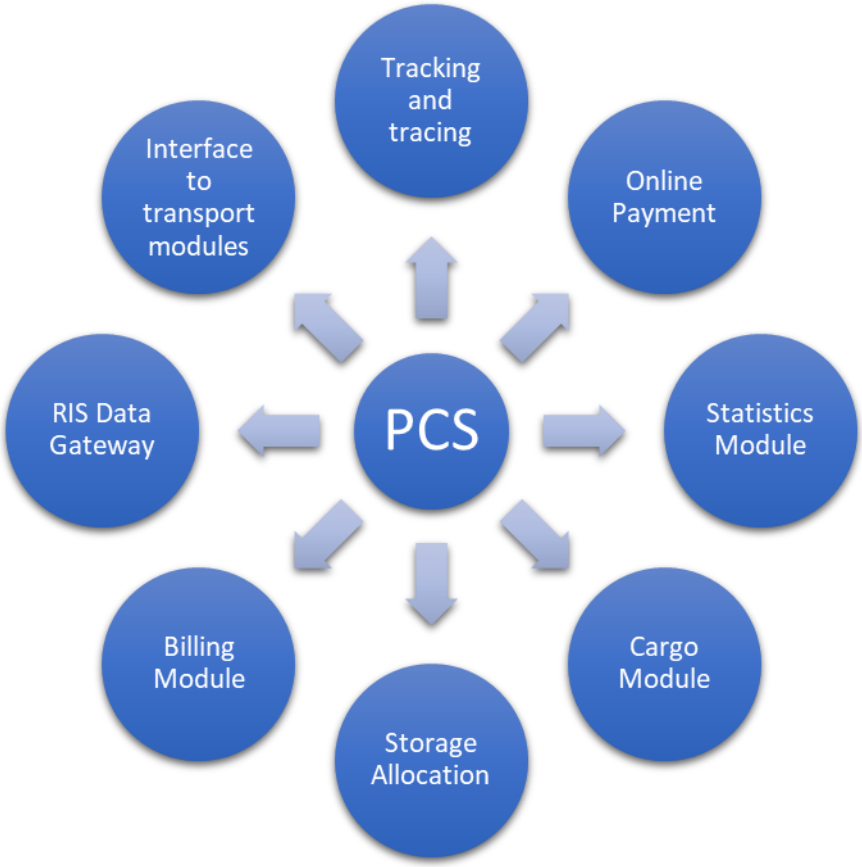
At present the main processes carried out by APDM in the port are:

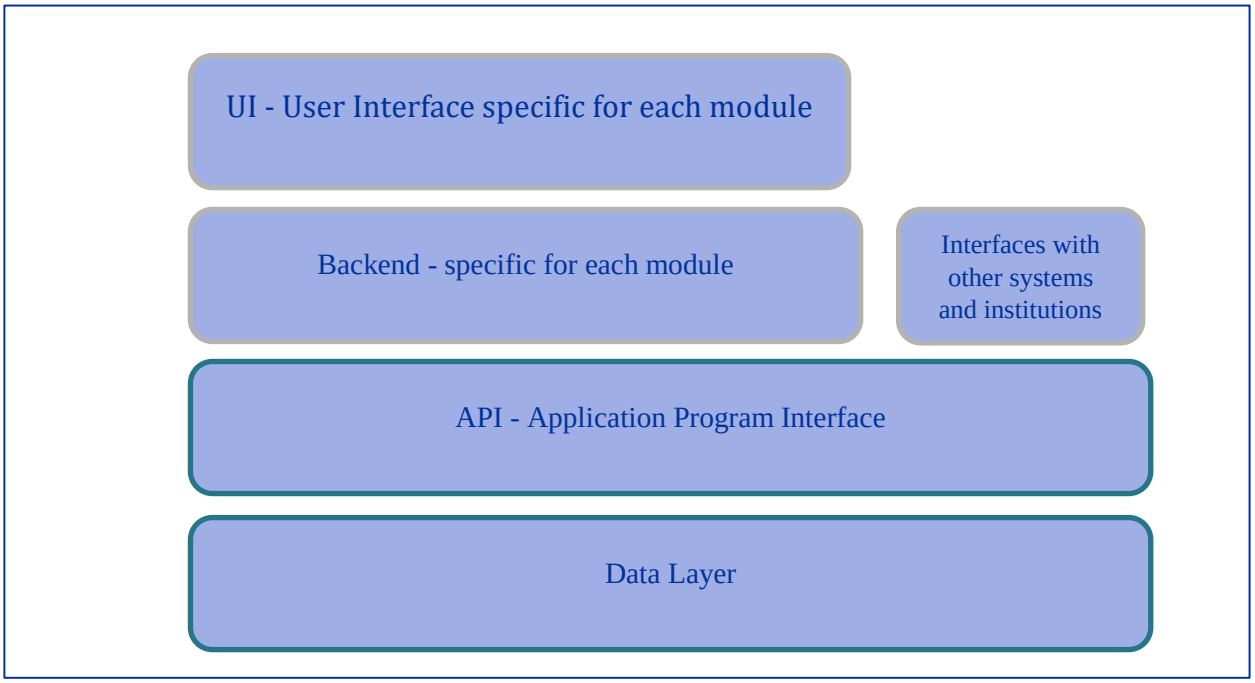
1. Processes that can be included in the use of the water transport infrastructure:
    a. Stay at the quay or natural shore of pontoon
    b. Loading / unloading of ship
    c. Providing storage space depending on the type of load
    d. Loading / unloading of goods at the road terminal
    e. Loading / unloading of goods at the railway terminal
2. Processes related to environmental services
    a. Collection and treatment of household wastewater of ships
    b. Takeover of household waste from ships
    c. Assistance for transfer / bunkering of oil and petrochemical products
    d. Takeover of hydrocarbon residues
    e. Collection, packaging, transport and disposal of hazardous waste

Main PCS Users / Operators



Main PCS Modules





PCS logic architecture and its modules overview

The purpose of implementing a PCS type system in the 3 ports is to offer the involved parties a single and easy interface to the data associated with the goods they carry. The goods are the main action around which all the involved actors build different processes with economic result. Time is an essential criterion in the unfolding of processes and data access in real-time helps the involved parties to optimize time and therefore the costs of operating / unfolding of processes. As we can also see on the APDM webpage, most tariffs are on a time unit so traders pay attention to the manners in which they can optimize such times so as to lower costs and increase their profits.

Digitization of the main processes involving interaction between the involved parties in port operations will provide a new growth opportunity for both operators and port authorities. Such data collection in a form as easy as possible and the delivery of electronic services associated to them will grant a new dimension to processes and operations at the level of ports. The expectations of the economic operators are to enter only once the data associated with a process and then all the actions associated with these data are to be performed automatically / manually in PCS depending on other input / output parameters.

3.2.1. Cargo Module

The module allows all actors with access to PCS to provide details on cargo and ship data. The data entered in this module will be re-used in the system whenever necessary. The

module allows us to enter the following data sets and their processing in graphical interface:

- Entry Report (time of entry)
- Information about the ship and the voyage (vessel name, length, width, draft, port of departure, port of destination, etc.)
- Cargo Manifest / type and amount of cargo, cargo owners, etc.
- Departure Report (Time of departure)

The module must be connected to the national ERI system (existing at ANR), so all the data already available in the ERINOT messages may be automatically retrieved from the ship / cargo related messages. A connection to the AIS system will be used for the automatic detection of the vessel entry and exit to / from the port area.

3.2.2. Tracking and Tracing

The module will allow a user to view the AIS data from the AIS source to which it is connected. It shall offer an overview of the traffic situation in the port area. The information will be presented in table form as well as in the ECDIS system. The module will have at least the following features:

- Display of AIS targets on the map (e.g. ECDIS, world map)
- List the ships – basic data posted for each target, displayed by clicking on it the map is centred on the AIS target
- Show all AIS data – by clicking on a ship a balloon opens that contains all AIS data available for the selected target
- Detection and logging of arrival / departure - detecting of AIS equipped vessels entering or leaving the port area.
- Support for the recovery of relevant AIS data to pre-fill in other entry forms by using existing data
- Voyage Data visualization system taken over from the ERI (data exchange) system on the ECDIS map.
- Integration of IP CCTV system if available

The module will allow the issuance of notifications referring to critical depths in the harbour so that navigators may be informed in time about the status of navigation in the harbour.

3.2.3. Statistics Module

The Statistics Module will provide users with various reports. Statistics Module will use all the data in the data layer and will process them to relevant statistics. Available data for each user depend on the access rights of the user and on their role.

Reports calculated from the available data will include the following parameters:

- Total number of ships visiting the port
- Average duration of the ship's visit
- Total amount of cargo which passed through the port
- Total amount of goods unloaded in the port
- Total amount of goods loaded in the port
- Total amount of goods / specific goods which passed through the port
- Total amount of goods / specific goods unloaded in the port
- Total amount of specific goods / type of goods loaded in port
- The number of vessels from a given country
- The total amount of dangerous goods which passed through the port
- The total amount of dangerous goods which were unloaded in the port
- The total amount of dangerous goods which were loaded in the port
- The percentage of occupied berths available in the harbour (during office hours)
- Total time spent with a berth over 75% occupied
- Total water supplied to ships
- The total amount of energy supplied to vessels
- Total amount of rail freight
- Total amount of road freight
- Total amount of water-route
- The total amount of water-way
- The total amount of water-water.

Daily / weekly / monthly / annual reports can be issued with the listed parameters. The user can report data by selecting parameters which are available to him (to which he has access rights) selecting a period for the report to be made. It must be possible for reports to be exported in PDF, XLS and CSV formats.

3.2.4. Billing Module

The Billing Module must allow the retrieval of relevant information from the data layer (time at berth, type of load, type of vessel, total quantity of electricity and water used) and automatically create invoices and send them the respective users.

It must be possible for the following parameters to be set by the administrator (using the GUI):

- flat rate
- energy price per kW / h
- water flat rate
- water price per m3
- standard flat rate
- anchor price per meter of ship length
- anchor price per kW
- fastening price per metric ton of transport capacity
- quay fees per tonne or cubic meter
- barge handling per hour of tug operation
- loading of barge / vessel being cleaned
- cover opening / closing of the container
- Pilot services
- Fuel - bunkering per ton of fuel
- handling fee per tonne of cargo
- storage fee per tonne or cubic meter of cargo
- measuring the cargo weight
- diversion price per meter per day

- Value Added Tax (VAT)

All information must be integrated with the existing ERP system at APDM and once data are introduced in PCS they must also be transported automatically to the ERP system.

3.2.5. Storage allocation module

The module is supporting APDM so as to be able to define several storage areas, each with its own identity. In each storage area a cargo may be added with an assigned storage batch number. Authorized users (operator of the storage area) should be able to see an overview of the complete storage area as a table of the storage places with all cargos listed therein. The cargo owner must be able to view only their own cargo here.

Each article must be assigned the type of cargo, quantity (tonnage, number of units, etc.) and the shipping code.

Each lot must allow an association with the active contract with all its values.

Different alarms will be configured to send notifications to the APDM staff.

3.2.6. Interface to transport modes

An interface where the users of road and railway modes can request and enter information about their incoming and outgoing cargo:

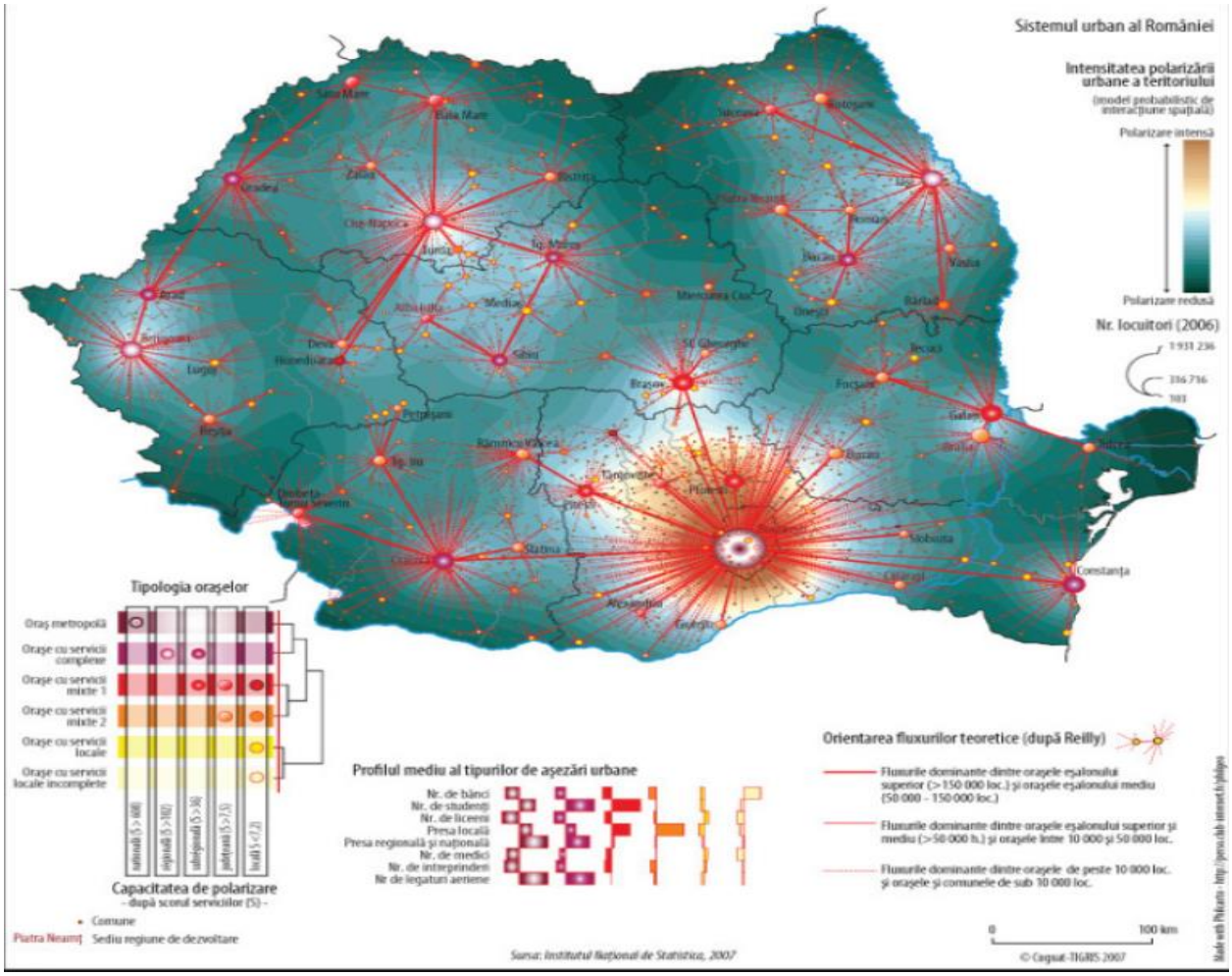
- type of load
- transport means
- quantity (tonnage, number of units, etc.)

3.2.7. Online Payment Module

An interface that provides system operators card payment for services. The module must transmit the payments data to ERP so as to facilitate the process of closing of open / paid / unpaid invoices.

3.3. Social and Environmental Aspects

At the level of Romania, the urban system is not highly developed. However, the three cities where the ports mentioned in this study are situated, are part of the urban system and have the great advantage of the presence of the Danube. This duality is beneficial both for the 3 municipalities, and for the 3 ports.



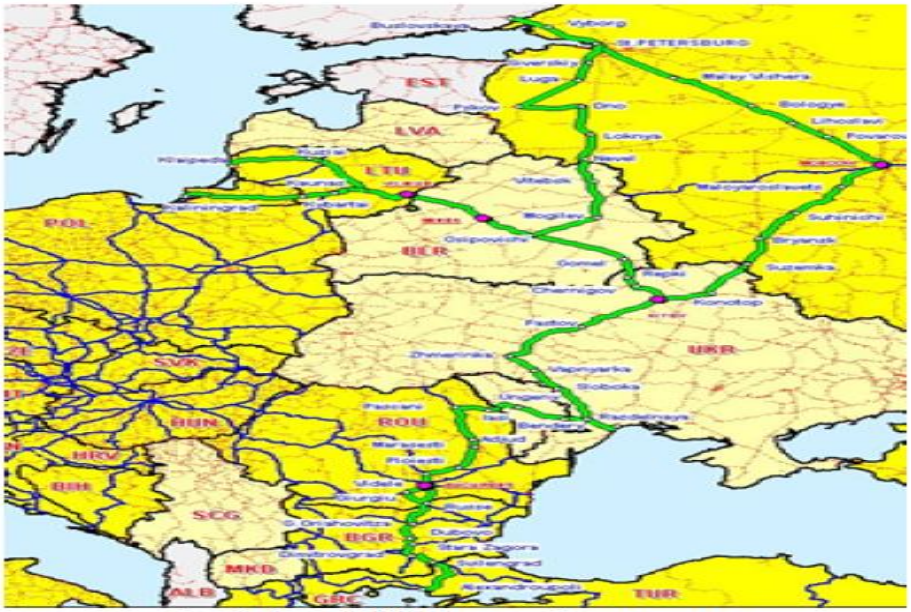
In the case of this project, social and environmental aspects must be considered in terms of the 3 cities where the ports of this project are situated, namely Galati, Tulcea and Braila.

Social and Environmental Aspects in the Galati Municipality

The Galati County occupies a position close to the two main transport arteries of Eastern Europe, the so-called Helsinki or Pan-European Corridors. Thus, the county is crossed by the Pan-European Corridor VII, which corresponds to the route of the Danube River (Nuremberg - Vienna - Budapest - Bratislava - Belgrade - Drobeta Turnu Severin - Vidin / Calafat - Giurgiu / Ruse - Galati - Black Sea). This corridor is connected with the Rhine - Main Canal and represents the main river infrastructure artery of the European Union.

Coridorul VII Pan – European
Sursa: http://infrastructura-romania.blogspot.ro/

The county is also close to the Pan-European Corridor IX, providing for the road and rail infrastructure of Europe on the North-South relation, starting from the Baltic (Lithuania) and the Gulf of Finland - St. Petersburg towards Moscow - Kiev - Chisinau - Romania - Bulgaria - Greece. This corridor passes about 115 km from Galati, through the neighbouring county - Vrancea.



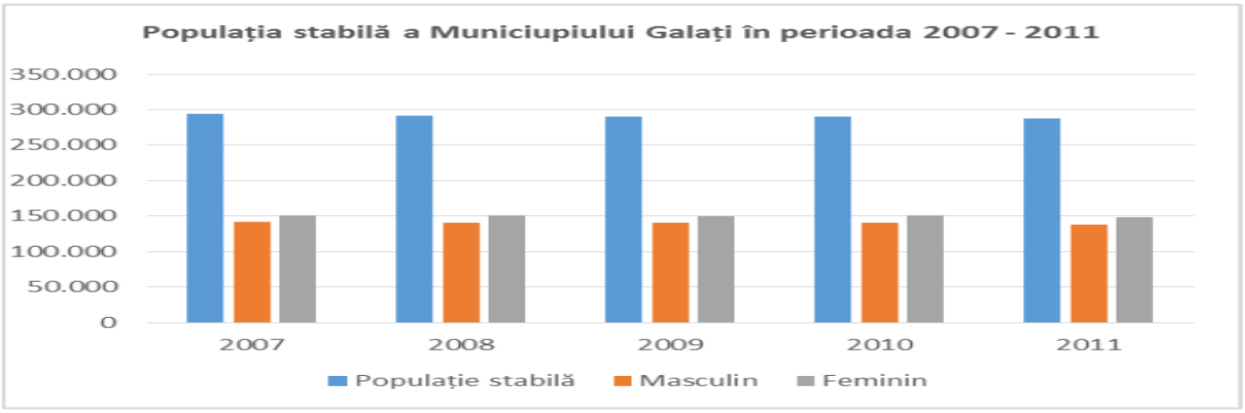
Coridorul IX Pan – European
Sursa: http://infrastructura-romania.blogspot.ro/

The Sustainable Development Strategy of the Municipality of Galati 2016 - 2025 sets as the main objective for Galati the turning of the city into ***a regional centre of competitiveness, science, research and social-economic opportunities, regional cooperation with a tourist infrastructure oriented towards the regional poles of attraction and the Danube, a friendly***

environment for residents and visitors, a city with responsible and open local authorities, active citizens and a dynamic and involved business community.

The stable population of the municipality represents about 43.12% of the county population and 9.5% of that of the region. The ratio of the municipality population on its surface shows a density of 938.33 inhabitants / km2. The 2011 census revealed the following ethnic structure: 90.79% Romanians, 0.6% Roma, 0.07% Russian-Lipovan, 0.06% Greeks, 0.028% Turks, 0.02% Germans, 0.016% Ukrainians, 0.019% Italian, 0.045% Hungarian, 0.019% Hebrew, the difference being represented by other nationalities. The advantages of the coexistence of the different ethnic groups are manifested in the social field (exchanges of experience), the culture and the potential for tourism and sports.

The stable population of the Galati Municipality in 2007-2011 decreased by 6,477 persons i.e. by 2.21%:

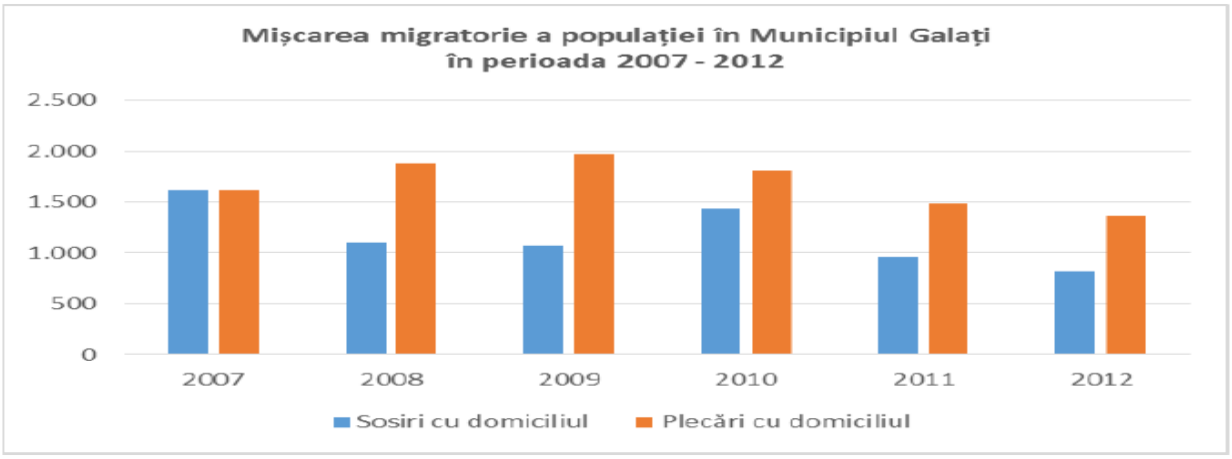


Stable population **Male** **Female**

The variation of the city population is primarily due to:
- the migration of the population (departures / arrivals with establishment of residence)
- natural evolution of the population (births / deaths).

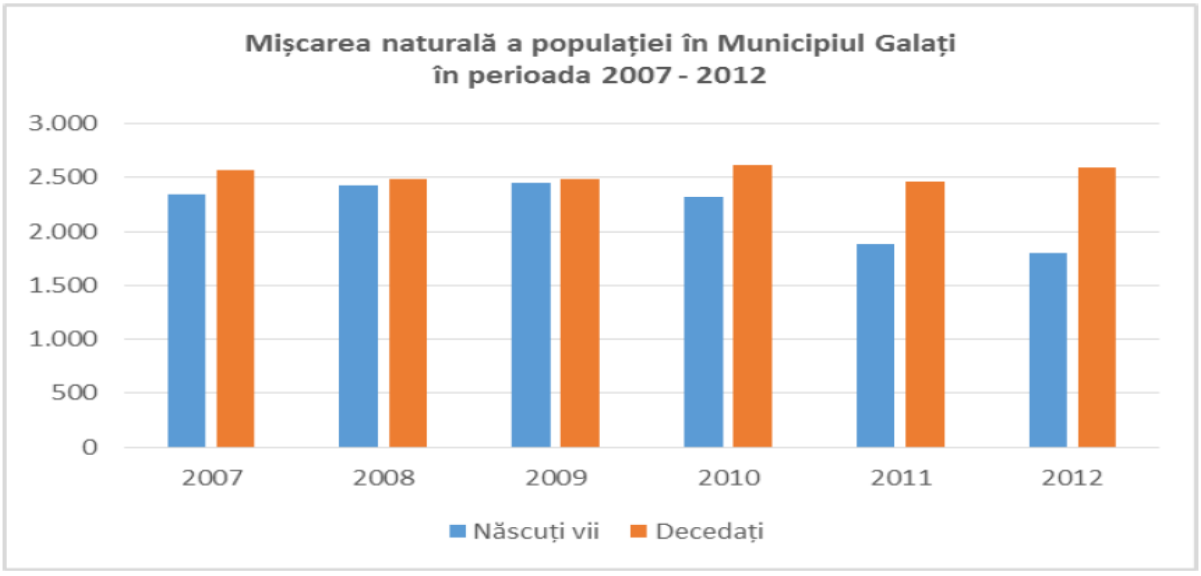
A reflection of the evolution of these factors over the period 2007 - 2012 can be seen in the charts below:

Migratory Movement of Population in the Galati Municipality in the period 2007-2012



Established Residence **Moved Residence**

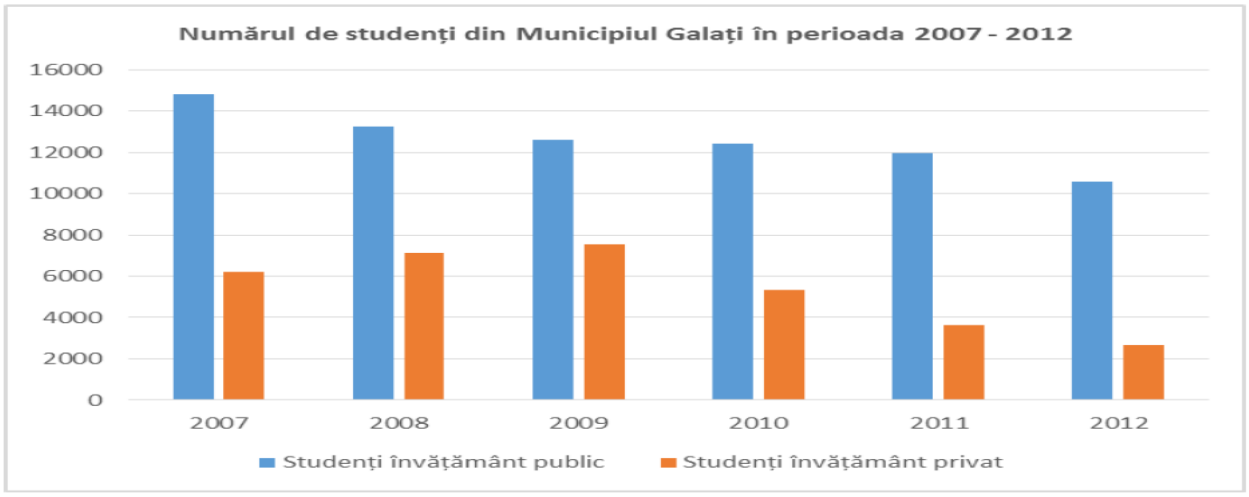
Natural Movement of Population in the Galati Municipality in the period 2007-2012



Live Born **Deceased**

Galati is has university tradition of over 60 years since 1948, when the Land Development Faculty was established, the first of its kind in the country. Currently in Galati there are two universities: The „Dunărea de Jos" *("Lower Danube")* University (public) and the "Danubius" (private) University with a total of 13,258 students, an aspect which can help the future development of the city.

Number of Students in the Galati Municipality in the Period 2007-2012



Public Education Students **Private Education Students**

From the administrative point of view, the Galati Municipality is located in the south-east area of the Galati County, towards the mouth of the Siret and Prut Rivers into the Danube River. The municipal built-up surface covers an area of 5943.44 ha, and the area of the administrative territory is 24,642 ha, including Lake Brateș.
From a geographical point of view, the Galati Municipality is located at the south-east boundary of the territory of Romania, along the left bank of the Danube, near the point where the river sharply changes its course from South-North direction to the West-East direction, being delimited by surface waters, namely:
• To the Northeast and East - Prut River and Lake Brates;
• To the South - the Danube River;
• To the Southwest - the Siret River.
In the West, the intramural area of the Galati Municipality includes the area where the Steel Works are situated, namely the Smardan hills.

The major geographical unit which is found on the administrative territory of the Galati Municipality is the Moldova Plateau, namely the south-eastern end of the Covurlui Plain.

The Galati Municipality is the administrative capital of the Galati County. It is located in the Eastern part of Romania, the southern extremity of the Moldova Plateau at 45° 27 'N and 28° 02' Eastern longitude. Located on the left bank of the Danube, covers an area of 241.5 km2, at the confluence of Siret (west) and Prut (east), near Lake Brateș, the largest body of water in this part of the country.
The existing intramural territory of the municipality has an area of 5,856.43 ha, and the area of the administrative territory is 24363.37 ha, including Lake Brateș.
The neighbourhoods of the Galati Municipality are to the East – the Prut River, to the South, South-East - the Danube, to the South – the Siret River, to the West - Sendreni, Smârdan to the North - Vânători, Tulucești.

The Galati Municipality situated at a distance of 240 km from the Romanian capital according to the indications of the road map of Romania. The Municipality can develop international trade

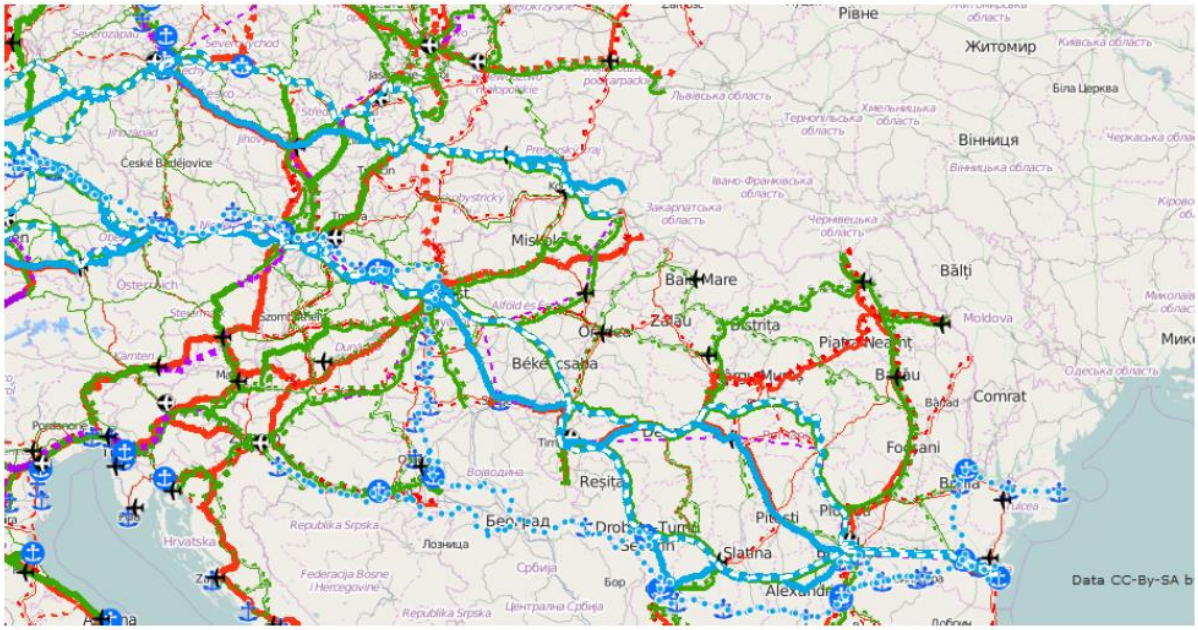
relations due to its situation at about 11 km from the customs checkpoint Giurgiuleşti, at 57 km from the checkpoint at Oancea, connecting with the Republic of Moldova and 88 km from the Ismail checkpoint, connecting with the Ukraine.

The Galati Municipality is one of the two poles of urban development in the Southeast Region, according to GD no. 998/2008 for the designation of national growth poles, with a priority for investments from EU and national funding programs, as amended and supplemented. The classification of urban settlements as development poles and of specific territories as areas of application of the regional policy was made starting from categories as determined by investigations carried out within the European initiatives and programs and from the categories as defined by the national legislation.

The Port of Galati is included in the Trans-European Transport Network (TEN-T), which is due for completion of investments in 2030.

Coridoarele pan-europene

Pan-European Corridors



Coridorul Ten T – Porturi la Dunăre Sursa: http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/main.jsp

Ten T Corridor – Danube Ports. Source: http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/main.jsp

Danube, Europe's second largest river, has been one of the most trafficked roads of Europe ever since ancient times when the Danube was called Hister. The river is the only major navigation route that connects the centre with Eastern Europe and Asia, passing through nine countries and four capital cities while creating a direct water connection between the North Sea and the Black Sea via the Rhine - Main – Danube Canal; union and division are the two functional and psychological coordinates, ubiquitous in the development of the history in this area of the continent, highlighting its strategic importance and influencing at the same time the mainly urban development of the area, not only in its physical appearance but also in the structuring and maintaining of an heterogeneous ethnic and cultural amalgam.
Romania, the Danube country with the longest part of the river crossing its territory, has six county residence cities developed on the Danube banks and the last three, Braila, Galati and Tulcea enjoy the facilities of the Maritime Danube, which allows the access by vessels of medium tonnage deeper into Romania, territories of the Ukraine and the Republic of Moldova being also accessible. The Danube produces a great impression on travellers, especially on the ones seeing it for the first time.

The presence of the Danube is undoubtedly a specific attraction of the Galati area. The Danube is a river with a unique course, with depths between 20 and 36 meters, the width of the minor bed being of 776 meters in this maritime-river sector. The highest level of the Danube in front of Galati was reached in 2010, when the Flood Barrier in Valea Orasului began to crack, the water level measuring 768 cm, the lowest being in 1921 when it measured 48 cm. Galati is in a peninsular position because it is surrounded by water from three sides. All these hydrographic arteries, due to their special characteristics, have contributed to the development of the Ports of

Galati, which were during a certain time in history, the largest and most productive river port structure of Romania.

The Danube represented and represents for the city an important economic resource, a traffic way ensuring commercial relations with other territories, a resource for leisure, a decisive of the configuration of the urban fabric in different periods of its existence, but also a limiting factor. The Port infrastructure, the economic activities, the flow of goods and people, the important work of systematization of the river front, the biodiversity and the urban landscape are specific elements generated by the existence of the watercourse, which support the personality of the Galati Municipality. On the occasion of previously completed consultative studies it was demonstrated that the Danube and its river front promenade are considered as significant milestones of the community, being seen as representative by its members. This geographical situation combined with the huge economic and social potential of the river, permanently raised the interest of Euro-Asian political, economic and military powers. The Danube became an international river. An initiative of the European Union, the current Danube Strategy highlights the perpetual interest for the river and its potential by developing ambitious and comprehensive development strategies and policies.

Social and Environmental Aspects in Tulcea

In the European geography, Tulcea is the area where the waters of the Danube, after having crossed 2,860 kilometres, come to flow into the big reservoir of the Black Sea through the three arms: Chilia, Sulina and Sfantu Gheorghe.

According to the results of the census of the 20th of October 2011, the stable population of the Tulcea County was of 201,500 persons, of which: 191.000 people were present and 10,500 temporarily absent.

Of the total stable resident population, 90,900 people had their domicile/residence in cities and towns (45.1%) and 110,600 people lived in communes (54.9%). From the point of view of the size of the stable population, the Tulcea County is situated on the last place (42nd) in the hierarchy of the Counties.

According to the same data, the stable population of Tulcea is 66,644 people, representing 33.08% of the county total, mostly consisting in Romanians - over 92% of the population. The other ethnic groups living together in the city are Russian Lipovan (2.9%), Roma (1.57%), Ukrainian, Greek, Hungarian, etc.

The city's natural setting is a large amphitheatre facing the Danube, where all roads from the North Dobrogea plateau meet and reach here the Danube, which reaches the old city of Tulcea between the miles 38 and 39, then follows its way towards the sea, through its mouths.

The territory of the city of Tulcea is placed in the concavity formed to the South by a very tight bend of the Danube and framed to the East and West by two promontories, which are the northern termini of extended hill ridges. These two peaks with an alignment of high hills, located to the South (the Tulcea Hills), close on three sides the hydrographic and torrential catchments of small valleys.

The city is bordered by large bodies of water, which form, as one might say, another ring around it, interrupted only in its southern part. Thus, to the North there is the Tulcea bend of the Danube, to the east Lake Zaghen and to the West the Somovei Marshes.

The three or four valleys, tributary to the Danube form together a depression area in steps, looking like an amphitheatre, located somewhat in the extension of the concave Danube River bank. This depression, and the two said side ridges comprise most of the built-up (intramural) area.

The administrative territory of the Tulcea Municipality extends on the surrounding hills, covering some of the ridges and their slopes, as well as on the left bank of the river, on the meadow area inside the bend of the Tulcea arm (the locality Tudor Vladimirescu – a rural settlement located in a floodplain area). The seven hills with low altitudes (100-200 m) which circumscribe the city of Tulcea, are actually some of the oldest geological formations of Europe. Of these, the closest are:

- ✓ Hora Tepe to the NE;
- ✓ Dealul Carierei *(Quarry Hill)* to the SE;
- ✓ Dealul Mare *(Big Hill)* to the South
- ✓ Dealul Taberei *(Camp Hill)*.

The identified non-renewable natural resources at the level of the Tulcea Municipality are those of the perimeter of the Delta Biosphere Reservation: quartz sand for the steel industry, heavy metal ores in coastal sand banks sands, peat. The renewable natural resources are water, soil, forests, fauna and flora, the wind. In the city of Tulcea, they are the following: Water Resources – from a hydrographical point of view the city of Tulcea is dominated by the Danube River, which in this sector flows from the Northwest to the Southeast. The evolution of the Danube's water quality is of particular importance as it is the main source of the drinking water supply system of the Municipality of Tulcea.

The forest fund – the forests, the most complex and comprehensive terrestrial ecosystem with its own development laws, have an economic, social and environmental importance. It is to them that we mostly owe the high degree of stability and quality of the underlying factors of the environment (air, water and soil).

The economic value of forests in the city is provided by the timber which can be exploited for industrialization (construction, furniture, pulp) for household heating, the wildlife fund, vegetation (accessory forest products: medicinal herbs, berries, mushrooms, wicker) and conditions offered to tourism. On the territory of the Tulcea County all forests are included in the national forest fund and they are managed by the National Forest Administration through its Tulcea Forestry Department and attached Forest Districts.

Agriculture plays a small part in the local economy of the Tulcea Municipality. On the other hand, the sectors of fishing and fish processing industries play an important role due to the geographic location and specific area. According to the information collected by official statistics, agriculture, forestry and fishing employed in 2011 a total of 602 employees, up 45% over the number of

employees registered in 2007. Due to the specific characteristics of the area, fishing and fish processing industries sectors hold an important role in the local economy.

Tulcea is still an important industrial centre; the main economic sectors are represented by the construction industry and ship repairs, metallurgy, construction materials processing industry, processing industry

Social and Environmental Aspects in the Municipality of Braila

The Braila Municipality is the capital of the County with the same name and covers an area of approximately 4,392 ha (3,444 ha built-up land).
Braila is an urban development pole 19, thus benefiting from the financing of integrated urban development projects under Axis 1 of the Regional Operational Programme. The Danube port of Braila is part of the TEN-T Global Network 20 (the EU policy concerning the TEN-T network is presented in Annex 3) which is due for completion of investments in 2050.

The stable population of the municipality is about 58.35% of the county population and 7.4% of the region. A ration of the population of the municipality on its surface shows a density of 4695 inhabitants/km2. Comparing this with the density level of the county (497/km2), there is a high concentration of the population in the Braila Municipality at the expense of the other three towns of the Braila County (Făurei, Ianca and Însurăţei).

The 2011 census revealed the following ethnic structure: 90.16% Romanian, Roma 1.12%, 1.07% Russian–Lipovan, 0.96% Greeks, 0.8% Turks, Macedonians 0.02%, 0.019% Italian, Hungarian 0.025%, 0.016% German, Ukrainian 0.016%, 0.014% Hebrew, the difference being represented by other nationalities. The advantages of coexistence of different ethnic groups are manifested in the social field (exchanges of experience), culture and potential for tourism and sports.

The stable population of Braila in 2007-2013 decreased by 9,717 persons or by 4.51%:

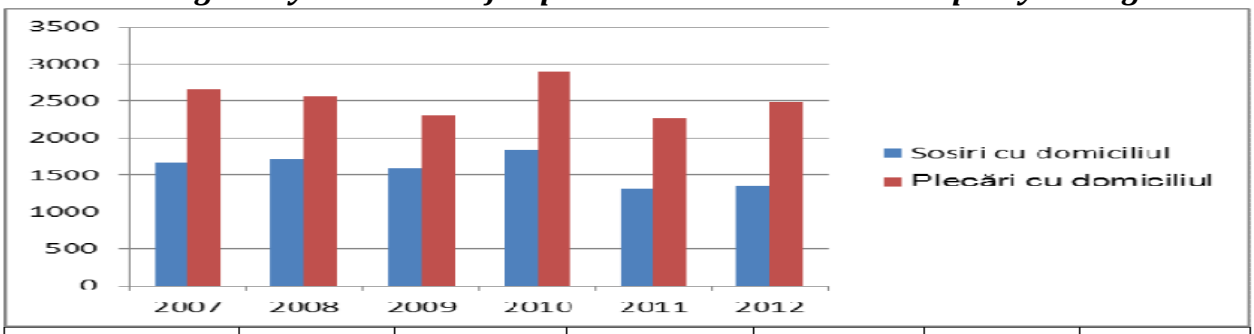
Stable Population of Braila in 2007-2013

The variation of the population of the city is due, primarily to:

- the migration of the population (departures / arrivals with establishment of domicile)
- natural evolution of the population (births / deaths).

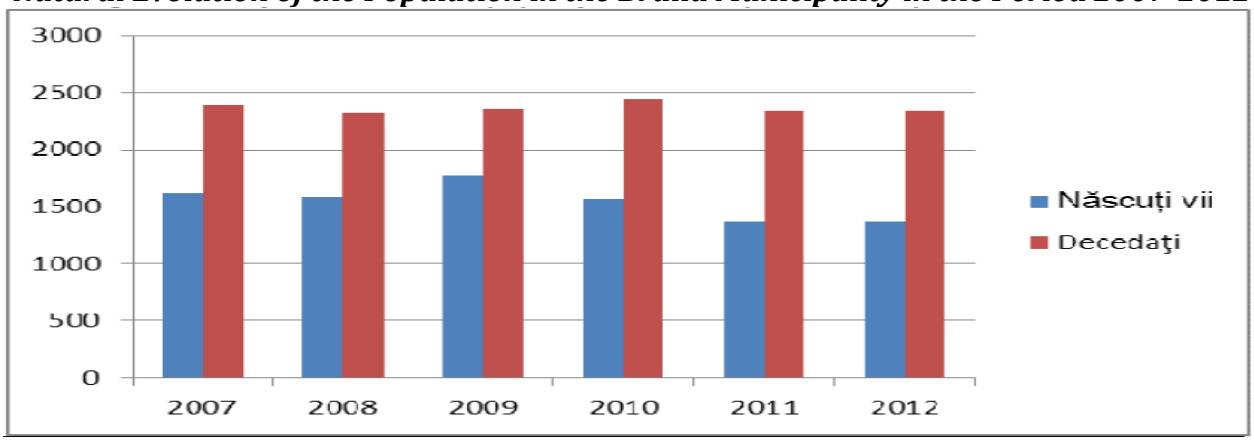
A reflection of the change of these factors in the period 2007-2012 can be seen in the following charts:

Migratory Movement of Population in the Braila Municipality during 2007-2012



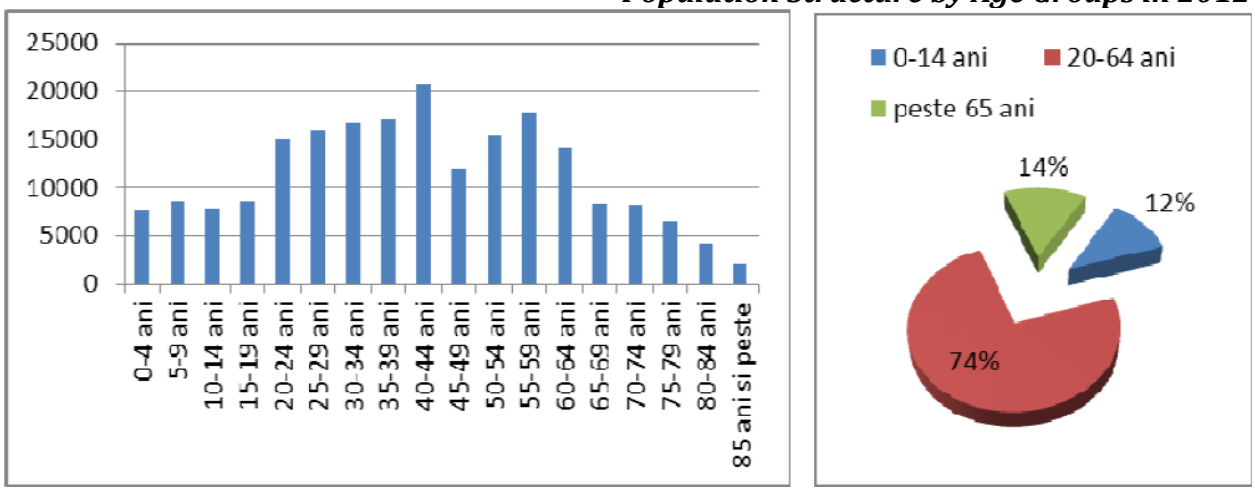
	2007	2008	2009	2010	2011	2012
Sosiri cu domiciliul	1660	1705	1587	1827	1313	1341
Plecări cu domiciliul	2657	2557	2303	2885	2265	2487

Natural Evolution of the Population in the Braila Municipality in the Period 2007-2012



In terms of age groups structure of the population in 2012, as shown in the following charts, one can say that the Braila Municipality has the advantage of a working age population of 74%.

Population Structure by Age Groups in 2012



3.4. Institutional and Implementation Aspects

General Aspects at Local Level

The Galati Municipality, formerly a city with international commercial vocation where the most diverse goods were traded by water and destined not only for Romania but also for the neighbouring countries, became an industrial city in the 1960s. After 1990, the municipality went through the most abrupt decline of from the Level 1 municipalities (decrease by more than 50% of the number of employees and of industrial production), as a result of the decline of the heavy industry, which had a very high share of the local economy.

Currently in the city there are more than 19,000 registered economic agents, of which 15,000 trading companies. The level of entrepreneurship and the number of SMEs is significantly lower compared to other 1st level municipalities in Romania.

The Galati Municipality is the second economic hub of South-East region, after Constanta and ranks 7th at national level by total turnover.

Galati is characterized by the dominant presence of metallurgical industry represented by ArcelorMittal Galati, Galfinband S.A., Profiland Steel SA but also the shipbuilding industry – the DAMEN Shipyards Galati, Menarom and the Naval Research and Design Institute Galati - ICEPRONAV, river navigation and port activities and various companies in the food, textile and construction areas, etc. A high percentage of the industrial production in Galati is represented by the manufacturing for export, mainly steel products, maritime and river vessels, fuel oil, textiles and clothing, metal accessories, metal structures and others.

Between 2007-2011, the number of active economic agents established in Tulcea recorded a varied evolution. In 2008 the total number of active companies in Tulcea increased by 8%, and between 2009 to 2011 it marked a decline. In the dynamics of 2007 - 2011, the total number of active enterprises decreased by 11.53%, which were affected demographically by the onset of the economic crisis.

On the whole, in the dynamic of 2011/2007, the cumulative turnover increased by +69% in agriculture, in constructions by +33%, respectively +25% in the trade sector, defying the effects of the economic crisis. In the studied period companies have conducted active restructuring programs and investment projects leading to increased competitiveness on domestic and foreign markets.

In the dynamics of 2007/2011 the total number of employees decreased by 18.88%, the worst affected by the economic crisis being the employees in industrial sectors (-34.10%), agriculture (-33.15%) and constructions (- 23.78%). On size classes, the largest number of redundancies was noted in the medium-sized enterprises.

In the Braila County, the recorded nominal GDP per capita recorded in amounted to 19,765 lei / capita, approximately 14% more than in the previous year (17.330 Lei/capita in 2010). Galaţi recorded in 2011 a lower level than Braila i.e. 18,526 lei / capita while the 2010 indicator was 17,989 lei / capita.

Economic entities in the industry, trade, construction sectors and other services active in the Braila County, recorded in 2012 a turnover of 9,323 million lei, which placed the county in 4th place in the hierarchy of the South-East Region, Galaţi positioning itself 2nd with 21,070 million lei in 2012.

In the Braila Municipality, the representative economic sectors are metal constructions and structures, machinery and equipment, ship repairs and building, tourism, manufacturing and

distribution of electricity, production and distribution of food and beverages, furniture and articles of furniture.

One notes that, locally, there are elements in favour of investments in shipping; the three ports have the opportunity to become key elements on a national and especially international level, in the context of Romania's economic development.

Institutional Aspects

The National Company "ADMINISTRAŢIA PORTURILOR DUNĂRII MARITIME" SA (CN APDM SA) *["Maritime Danube Ports Administration" SA]* acts as a port authority and port administration in ports located on the Romanian sector of the Maritime and River Danube. In this capacity, despite of the negative impacts of economic, demographic and social changes, APDM managed in recent years to make a profit from the performance of its activity, in this context being a successful company.

The positive results are due to the privileged position of port authority, but also the company management, which led it to these results.

In its activity, the company cooperates with numerous partners, among which:

Port operators in Galati

1. ORE PORT

NAME OF OPERATOR	WWW
ROMPORTMET SA	www.arcelormittal.com/romportmet/

2. DOCKS PORT (DOCURI)

NAME OF OPERATOR	WWW
TTS PORTURI FLUVIALE SRL	www.ttsfluvial.ro
DOCURI SA	www.metaltrade.ro

3. PORT BAZINUL NOU *[NEW PORT BASIN]*

NAME OF OPERATOR	WWW
BRISE GROUP SRL	www.brisegroup.ro
DOCURI SA	www.metaltrade.ro
PBN LOGISTICS	www.metaltrade.ro

UNICOM OIL TERMINAL SA	www.unicom-group.ro/oilterminal/

Port operators in Braila

1. BRĂILA

NAME OF OPERATOR	WWW
ADM LOGISTICS ROMANIA SRL	www.adm.com
HERCULES SA	www.hercules-braila.ro
TTS PORTURI FLUVIALE SRL	www.ttsfluvial.ro
ROMNAV SA	www.romnav.ro/
DANUBTRANS SMARDAN SRL	www.danubtrans.ro

2. MĂCIN

NAME OF OPERATOR	WWW
AMEROPA GRAINS SA	www.ameropa.ro
HERCULES SA	www.hercules-braila.ro

Port operators in Tulcea

1. Tulcea

NAME OF OPERATOR	WWW
DELTANAV	www.deltanav.ro/

2. ISACCEA

NAME OF OPERATOR	WWW
CNFR NAVROM SA	www.navrom.ro
NAVROM BAC SRL	www.navrom.ro

River Transport companies

NAME OF OPERATOR	WWW	AREA OF OPERATION
CNFR NAVROM GALATI	www.navrom.ro	Galati / Braila / Tulcea
NAVROM DELTA TULCEA	www.navrom.ro	Galati / Braila / Tulcea
NAVROM PORT SERVICE SA	www.navrom.ro	Galati / Braila / Tulcea
ROMNAV SA BRAILA	www.romnav.ro	Braila
TRANSEUROPA PORT SA GALATI	www.teu-group.ro	Braila
NAVROM BAC SA GALATI	www.navrom.ro	Galati
DANUBTRANS SMIRDAN	www.danubtrans.ro	Tulcea
HERCULES SA BRAILA	www.hercules-braila.ro	Braila
KARPATEN TURISM BUCURESTI	www.karpaten.ro	Tulcea
AGRICOST SRL IASI	-	Braila
AGRIRUM-AGROPORT BUCURESTI	-	Braila
COJAR GALATI	-	Galati / Braila / Tulcea
CORAL TULCEA	-	Tulcea
DANUBE TRANSPORT LINE DROBETA	-	Galati / Braila / Tulcea
INTERNAV SHIPPING GALATI	-	Galati / Braila / Tulcea
LUFADORI EXTRACT OVIDIU	-	Galati / Braila / Tulcea
MAYA SD TRANS BUCURESTI	-	Galati / Braila / Tulcea
TREMULA NAV SA CONSTANTA	-	Galati / Braila / Tulcea

APDM also cooperates with many international shipping companies, such as:

NAME OF OPERATOR	WWW
ARCHER DANUBE & BROTHERS	-

ARIES SHIPPING AGENTY CONSTANȚA	www.aries-shipping.ro
ARUAMAR GALATI	-
BROKER MARITIME TULCEA	-
BEST MARINE SHIPPING GALATI	www.best-marine.eu
DAMARO GALATI	-
IDU SHIPPING CONSTANTA	www.idu.ro
INADRIA TRANS BRAILA	-
KARPATEN LOGISTICS BUCUREȘTI	www.karpaten.ro
KARPATEN TURISM BUCURESTI	www.karpaten.ro
LIVAMEX TULCEA	-
MARIO SANTALENA GALATI	-
MGM MARINE SHIPPING CONSTANȚA	www.mgmmarine.ro
NAVLOMAR MARITIME CONSTANȚA	www.navlomar.com
ORCA SHIPPING CONSTANTA	www.orcashipping.ro
RANGE TRANS SRL BRAILA	www.range-trans.ro
SABIN SHIPPING TULCEA	-
SANARA GALATI	www.sanara.ro
SEAHORSE MARITIME CONSTANȚA	www.maritime.ro
SIGMA SHIPPING GALATI	www.sigmashipping.ro
SVAD SHIPPING CONSTANȚA	-
SYROM SHIPPING GALATI	-

APDM also carried out many projects to date, which demonstrates its ability to start and implement projects, as well as its management performance. These include:

- ✓ Intermodal ecological goods transport - GIFT

- ✓ Waste management for the inland navigation on the Danube - CO-WANDA
- ✓ LNG Masterplan-Liquefied Natural Gas - Fuel & Cargo for Inland Navigation
- ✓ Danube Inland Harbour Development - DAHAR
- ✓ System for collecting waste from ships in ports along the Maritime Danube - CODENAV
- ✓ Infrastructure works port on quay of berth 23 and partially 25 in the Port of Braila
- ✓ Strategic development program of the Port of Galati
- ✓ Quality and Productivity through Continuous Training - CAPRICO

By the developed projects, and by the ones in progress at present, APDM demonstrates that it wants to develop activities on the 3 strategic areas, i.e. human resources, port infrastructure and improvement of operational activity.

Thus, the investment projects in IT and communications infrastructure come to complete the directions set so far and offer a modern, efficient and effective framework for further development.

Aspects of Implementation

The current project must identify and provide a method of effective communication between APDM and all the involved stakeholders, as defined by APDM, respectively as previously presented, ships and ship owners, internal staff.

At present the data flow is not supported by an integrated IT system and the interaction between Ship owners / Agents, APDM and Ships talks place mainly by direct telephone communication and email. Thus, the integration of invoicing data and the analysis requires an additional effort from APDM and is also an element which generates technical errors.

Currently, the information flow in the case of a ship due to arrive in one of the ports managed by APDM is as follows

1. The Agent records the voyage in the departure port system.
2. The Agent notifies APDM by direct communication on the arrival
3. A daily meeting defines on paper a plan covering the ships and movements due to take place within the next 24 hours.
4. The Port Dispatcher tracks in the RoRIS system and through the VHF station finds out when the ship arrives in the harbour and where. He/she enters this information in the registry.

The information flow in case of a ship due to leave one of the ports managed by APDM is as follows:

1. The Agent records the voyage in the RORIS system.
2. APDM Dispatcher is also notified of this departure.

Information flow at the level of port authority on the services offered to a ship:

1. Port authority receives a service request from the Agent;
2. Through the fleet exploitation service the date and time are planned when the Service will be supplied or when the service supply is due to begin;
3. After the service is supplied, the pontonnier signs the supply document;
4. Information is entered into the computer system;
5. The service is invoiced by the responsible department.

Human resources involved in the project implementation

The implementation of the project includes all activities for the actual completion of the project consisting in:

- ✓ Initiating and planning of the project;
- ✓ Analysis;
- ✓ Logical design;
- ✓ Physical design;
- ✓ Implementation

The main person responsible for the implementation of the activities is the Project Director. The project implementation will use an Agile methodology. This methodology will allow an adaptation on the fly and a continuous improvement of the process. During implementation, the Project Director will establish at the beginning of each stage the manner of following the specific tasks for the next period. He/she, together with the Project Manager and, as necessary, with other people from the team, will collect information, for the purpose of their approval and subsequent reporting by means of Progress Reports.

The implementation of activities will be managed primarily by the Project Director. He/she, based on the specific tasks set at the beginning of each activity, will follow periodically the progress in their achievement. Also, the Project Manager will track the status of the project implementation. At the work meetings, the Project Director, or a person designated by him/her, shall submit the status of the activities, in operational and management terms. The Procurement Officer will report the status of procurement at each monthly meeting or whenever necessary. Any situation that does not comply with the planning will be notified to the Project Manager. The latter, together with the Project Director, will establish remedies for the occurred situation.

The processes of coordination, organization and management of interrelated activities and allocated resources are aimed at achieving the objectives set at the required quality standards, if there are any time, resources and costs constraints.

Project Management Methodology

Project management will be a permanent activity, which will run for the entire period of the project, consisting of the following:

- ✓ Project inception activities (premises organization and workflow and mobilizing the project team from the applicant;
- ✓ Informing the stakeholders about the project start, the set objectives and the expected results and requesting support for the project);
- ✓ General project management activities (planning, organization and coordination, monitoring and control, reporting, project completion).

Within the general activities of project management (planning, organization and coordination, monitoring and control, reporting, project completion) specific activities for the European projects are also embedded: financial management, procurement activities, activities to ensure the project visibility and its quality.

In the planning stage of the activities, the following plans will be created: Activities plan, milestones plan, procurement plan, information and publicity plan, risk registry and their management plan, etc.

The working procedures, roles and limitations, the manner of communication, monitoring and reporting will also be established from the outset.

Although this is an initiation activity, nevertheless, changes are acceptable during the project in order to optimize the unfolding of the project.

Monitoring, control and evaluation of activities – these are aimed at identifying and solving any issues related to the organization and coordination of the project.

Project Information and Publicity – these will be made in accordance with the rules specified in the Applicant Guide.

The ensuring of the project quality will be achieved through effective systems of checking and maintaining the technical and financial documentations of the project, to ensure safety and an easy access to these documentations, in the event of monitoring visits and audits.

The main project management activities are as follows:

Procurement - Responsible: Finance and Procurement Officer – He/she will manage the entire procurement process, consisting of: preparation of the tender documentation, launching and implementation of the procurement procedure and contracting of suppliers. The procedures will be carried out in strict compliance with the applicable law and the provisions of the Applicant's Guide.

Financial Management – Responsible: Finance and Procurement Officer. He/she will provide for an effective management of the budget allocated until the repayment of the requested amounts The Finance Officer will prepare a record of expenses for the chronological recording of all expenditures, broken down into eligible and ineligible costs and details of supporting documents and payment data. In addition, claims for reimbursement will be drafted as well as the project's financial reports. The reimbursement file shall be prepared in accordance with the requirements

specified in the contract and will contain all the documents needed to verify the eligibility of expenditures made.

Drafting of Progress Reports- Responsible: Project Manager, Financial and Procurement Officer, Project Manager. The drafted reports will fully comply with the requirements of the Applicants' Guidelines and the grant agreement will be signed and submitted within the deadlines as set under the contract, together with other documents specifically requested in the grant agreement.

Archiving of project related documents - Responsibility: Project Manager, Assistant Project Manager. The information flows, tasks and responsibilities related to them will be established and the archiving of the complete supporting documentation for all stages of carrying out of an action will take place, which should also enable the reconstruction of operations from the total amount down to individual details and vice versa. An adequate audit trail will be prepared and provided by measures storage and archiving of documents so that these cannot be altered by human or time factors.

Thus, the following measures will be taken:

- ✓ original copies of the invoices and documents proving payments will be kept at the project location;
- ✓ documents produced during the project will be kept as follows: 1 original and one copy at least in electronic form;
- ✓ reports, reimbursement requests and other official documents required by the investor will be prepared in original and the number of copies set out in the grant agreement, which will be handed over to the Intermediary Body, a copy thereof being kept at the project location;
- ✓ archiving will be done on completion of the project, the complete file with the original documents will be kept in a protected space with all scanned documents on electronic media, all of these remaining at the project location during the legal archiving and storage period (3 years post-implementation).

Ensuring project visibility - Responsible: Assistant Project Manager. The information and publicity will follow the EU regulations.

Monitoring of project activities - Responsible: Project Manager. Monitoring will be done throughout the project and will include: monitoring of the performance of project activities, tracking of use of project resources; financial monitoring, which will track the correct use of funds, manner of payment, compliance with the provisions of project expenditure budget chapters. The effectiveness of expenditures will be constantly monitored; project diagnosis to see, in the event of implementation issues, what are the necessary new solutions in order to continue implementing.

Specifically, the monitoring procedure shall comprise the following:

- ✓ Conducting of monthly meetings with the project team members to verify the status of fulfilment of the action plan and its continuous updating, completed by an official report;

- ✓ Budget analysis at least once a month. In the event of differences compared to the planned budget, causes will be identified and error corrections will be decided;
- ✓ Check the documentations prepared by the project team members before submission to the investor;
- ✓ Organizing of ad-hoc meetings of the project team members - in case of unforeseen problems and situations during the project and which require urgent solution;

The management team will consist of at least the following persons:

Project Manager

- ✓ Coordinates, monitors and evaluates the actions necessary to implement the activities and achieve the project results;
- ✓ Mobilizes and coordinates experts from the implementation team for the activities he/she coordinates;
- ✓ Approves reporting documents on actions implemented by experts in the implementation team that coordinates the activities;
- ✓ Ensures the appropriate information flow in performing the activities they coordinate;
- ✓ Plans and coordinates the organization of working meetings with experts from the implementation team;
- ✓ Participates to working meetings of the management team and / or other experts from the implementation team;
- ✓ Ensures the fulfilment of the tasks needed to carry out a technical and financial performance management to achieve results and objectives for activities it coordinates;
- ✓ Provides for communication with project partners and the observance of contractual obligations arising from partnership agreements;
- ✓ Monitors in time the progress achieved against the proposed objectives;
- ✓ Ensures the solving of problems occurring during the project and informs the team management on time about the occurred problems.
- ✓ Identifies ways to improve their work style to maximize efficiency to achieve objectives.
- ✓ Is responsible for managing human and material resources according to project planning and the proper allocation of their project activities.
- ✓ Is responsible for the compliance with the specific general work procedures (working hours, punctuality in drafting and delivery of reports, etc.)

Expertise of Project Manager

Experience in project / program management, holding skills in:

- ✓ Meeting contractual obligations or as provided in the project by delivering products and services within the allotted time and budget;
- ✓ Participation to pre-contracting activities as well as the identifying of opportunities during the project implementation, generating additional contracts and acquisitions;
- ✓ Drafting of specific documents (project charter, scope statement, etc.);
- ✓ Execution of the project;
- ✓ Identifying objectives, coverage, planning of activities (WBS, list of activities, nomination and allocation of team, Gantt), cost and budget execution planning, as well as actions to determine quality
- ✓ Identifying risks
- ✓ Obtaining approvals for the project plan from sponsors and stakeholders;
- ✓ Implementation of the project plan by monitoring planned activities, achieving demand for change, ensuring optimal communication within the team
- ✓ Tracking risks and drafting of impact mitigation plans;
- ✓ Monitor the progress and execution of the project, reports, activities and planned costs vs. achieved costs, implementing preventive / corrective actions, closing of incidents;
- ✓ Obtaining deliverable acceptances.

Assistant Project Manager

- ✓ Assistance in organizing and implementing project activities;
- ✓ Elaboration of the document archiving system;
- ✓ Assistance in developing applications for reimbursement;
- ✓ Provide assistance in developing of specifications and tender documentation as necessary during project implementation
- ✓ Provides for relationship with suppliers of equipment and services and supervises the implementation of contracts
- ✓ Responsible for the implementation of information and publicity activities;
- ✓ Provides assistance to the Project Manager for any other specific requests;
- ✓ Assistance in organizing and implementing the project activities;

Expertise of Assistant Project Manager

Holds professional experience skills in:

- ✓ Drafting and editing documents and situations as requested by the project manager
- ✓ Keeping in due order all documents and specific correspondence
- ✓ Summoning participants to occasional meetings
- ✓ Continuous tracking of changes in legislation on the project domain
- ✓ Information and publicity

Financial and Procurement Officer

- ✓ monitors the financial performance of the project
- ✓ prepares the documentation as necessary to achieve the financial audit of the project;
- ✓ audits transactions and appropriate supporting documents, certified as true and legal: contracts and documentation attached thereto, as well as all documents with financial implications (checks all contracts, payments, documentations attached to the contract, the presence of signatures and visas required for the payments, amounts written on financial documents, the existence of supporting documents, validity of documents, compliance of payment documents with the contract terms, compliance of the assessment report with the projects and compliance with eligibilities, preparation of payments formalities and of the payment orders, monitoring the contracts, categories of expenditures);
- ✓ provides control of the financial management of the project;
- ✓ is involved in preparing the budgets and plans for future business conduct;
- ✓ prepares reports and other materials summarizing the work done in terms of financial resources;
- ✓ solves the accounting issues that arise during the project implementation;
- ✓ makes payments within the project;
- ✓ makes separate accounts related to project implementation;
- ✓ prepares funding applications for investors;
- ✓ ensures the compliance with the procurement rules;
- ✓ drafts the documentation for the awarding of public contracts;
- ✓ coordinates the carrying out procurement procedures;
- ✓ performs the procurement procedures according to the procurement plan;
- ✓ cooperates with the auditor in carrying out the financial audit of the project;
- ✓ monitors the financial performance of the project and proposes possible solutions / corrections;
- ✓ prepares the documentation necessary to perform the financial audit of the project;
- ✓ checks the financial operations and the respective supporting documents,
- ✓ Makes payments within the project

Expertise:

Experience in financial management - accounting, holds skills in:

- ✓ budget management;
- ✓ drafting of financial reports;
- ✓ drafting / registration of deeds / accounting documents;
- ✓ preparation of payrolls;
- ✓ drafting of technical reports;
- ✓ validating the eligibility of expenses incurred in the project.

The implementation team will be composed of the following experts:

Expert business analyst

The responsibilities of the expert business analyst include the following specific activities:

- ✓ Functional analysis of the technical requirements of the Purchaser;
- ✓ Participation in data modelling and functional design and reports;
- ✓ Developing information flows and specifications for interconnection;
- ✓ Support in defining the user screens;
- ✓ Documenting the activities;
- ✓ Cooperation with technical teams;
- ✓ Support (as the case may be) in the integrated test sessions of the Information System.

Software Development Coordinator

The responsibilities of the Software Development Coordinator include the following specific activities:

- ✓ Coordinates the stages of development, configuration and internal testing;
- ✓ Participates in the design, implementation and testing in the production environment with view to the acceptance;
- ✓ Develops detailed development specifications, configuration and implementation (deployment);
- ✓ Cooperates with the Project Manager, Business Analyst and the technical teams - whenever necessary;
- ✓ Documents the activities;
- ✓ Participates to the training of the users;
- ✓ Supports (as the case may be) the integrated test sessions of the Information System.

Software Developer (2 experts)

The responsibilities of the Software Developer include the following specific activities:

- ✓ Active participation in the stages of the development work, configuration and internal testing;
- ✓ Participation in the design, implementation and testing in the production environment with view to the acceptance;
- ✓ Participation in drafting of detailed development specifications, configuration and implementation (deployment);
- ✓ Cooperation with the software development coordinator, with the testing and quality assurance expert and the technical teams - whenever necessary;
- ✓ Documents the activities;
- ✓ Supports (as the case may be) the integrated test sessions of the Information System.

Expert Database Administrator

The responsibilities of the Database administrator include the following specific activities:

- ✓ Develops detailed specifications on instances / database schemes;

- ✓ Develops procedures to manage and monitor databases;
- ✓ Installation and development of project databases;
- ✓ Works with technical teams;
- ✓ Documents the activities;
- ✓ Participation in the test phase of the system;
- ✓ Participates to the training of the users;
- ✓ Supports (as the case may be) the integrated test sessions of the Information System.

Testing and Quality Expert

The responsibilities of the testing and quality expert include the following specific activities:

- ✓ Planning and coordinating of test activities
- ✓ Identifying, documenting and reporting software errors in the system testing phase
- ✓ Works with technical teams in order to monitor the implementation of corrective actions
- ✓ Documents the activities
- ✓ Participates (as the case may be) to the training of users.

Hardware Infrastructure Expert

The responsibility of the infrastructure hardware expert includes the following specific activities:

- ✓ Commissioning, installation and configuration of equipment (hardware) of the project including servers,
- ✓ Networking / security, etc. (remaining hardware equipment);
- ✓ Documentation of performed activities;
- ✓ Preparation of technical management and participation documentations, if any, in the training sessions of the APDM administrative staff;
- ✓ Participation in individual testing sessions of equipment as well as
- ✓ Unitary test sessions of the Information System.

Information Security Expert

The responsibilities of the information security expert include the following specific activities:

- ✓ Defining the acceptable risk levels per field / area of the integrated information system function;
- ✓ Implementing the most advanced Information security trends in the work areas of the project;
- ✓ Auditing of the Information System in terms of information security;
- ✓ Drafting of related security reports;
- ✓ Cooperates with the business analyst expert;
- ✓ Participates to the test phase of the system;
- ✓ Participation to the training of the users.

System Architect

The System Architect's responsibilities include the following specific activities:

- ✓ Responsible for the macro architecture of the Information System;
- ✓ Provides support in defining data models, information flows, user screens, security needs, defining of reports;
- ✓ Cooperates with the business analyst expert;
- ✓ Implements the most advanced trends in enterprise architecture in the work areas of the project;
- ✓ Documentation of the performed activities;
- ✓ Provides support in testing the Information System;
- ✓ Provides support, if necessary, in the training sessions of the APDM administrative staff;

Expert in the Protection of Personal Data

- ✓ Collaborates with the implementation team to identify the data flows and data requiring protection measures
- ✓ Advises the implementation team on the GDPR Regulation
- ✓ Establishes, together with the software development coordinator, the system expert and the hardware expert, the technical measures to be implemented for the protection of personal data;
- ✓ Drafts, together with the implementation team, the regulation on information security.

3.5. Expected Results

The implementation of this project will bring about the following results:

- ✓ Improvement of the management of operational activity on the plots/premises rented by operators;
- ✓ Improvement of forecasting of requests from vessels which will arrive in ports;
- ✓ A clear situation of the documents;
- ✓ Systematization of information flows;
- ✓ Reducing the time to create internal documents, with positive effects on labour productivity
- ✓ Improve the communication and collaboration with institutions involved in shipping (e.g. Port Authority)
- ✓ Improving of global business management of APDM

3.6. Investment Costs estimated by Reference to the Similar Investment Objectives

In order to analyse the technical solutions on the project implementation, two possible scenarios were considered:

Scenario # 1: **Development of IT Solution and its Operation on the Premises**

The solution development will be achieved by integrating all needs related to hardware, basic software, antivirus, peripherals, services development and preparing of the data centre.

In terms of operating costs, since APDM has currently an underestimated IT service, additional costs were considered for 1 new employee, electricity and maintenance costs and repairs after the 3rd year of operation.

Scenario # 2: **Development of IT Solution and its Operation in the Cloud**

In this scenario, the investment costs would consist in the development costs for the technical solution, the same as in Scenario 1, minus the installation and configuration services for the equipment, estimated at 50% in scenario 1. Also, the operating licenses, the basic software, the hardware (servers, storage and UPS) will not be necessary, nor will be any racks and specific connection elements. Also, the data centre will not be created anymore.

Instead, the operating costs in the cloud imply the existence of a monthly payment. These costs were taken from one of the cloud providers, taking into account the number of users of the IT system of the 3 ports, which involve about 100 employees.

The financial costs of the scenarios were estimated according to GD 907/2016, based on the technical descriptions of each scenario and the unit costs based on past experiences and similar projects.

The estimated investment, operating and maintenance (repair) costs for the two scenarios are given below.

Scenario # 1 Development of IT Solution and its Operation on the Premises

List of quantities

Nr. crt.	Echipament / Serviciu	Cant.	Valoare unitara [euro fara TVA]	Valoare totala [euro fara TVA]	TVA [euro]	Valoare totala [euro cu TVA]	Valoare totala [lei fara TVA]	TVA [lei]	Valoare totala [lei fara TVA]
I	**Software, hardware, alte echipamente**								
1	Software de baza, licente SO Server (buc)	2	1,450.00	2,900.00	551.00	3,451.00	13,630.00	2,589.70	16,219.70
2	Software de baza, licente baza de date (buc)	2	8,600.00	17,200.00	3,268.00	20,468.00	80,840.00	15,359.60	96,199.60
3	Software de baza, Software Antivirus ptr. intreg systemul (buc)	1	3,000.00	3,000.00	570.00	3,570.00	14,100.00	2,679.00	16,779.00
4	Echipamente hardware tip Server (buc)	2	15,000.00	30,000.00	5,700.00	35,700.00	141,000.00	26,790.00	167,790.00
5	Echipamente hardware tip Storage (buc)	1	26,000.00	26,000.00	4,940.00	30,940.00	122,200.00	23,218.00	145,418.00
6	Echipament hardware tip UPS, 5KVA (buc)	1	3,500.00	3,500.00	665.00	4,165.00	16,450.00	3,125.50	19,575.50
7	Echipament de protectia a retelei tip firewall (buc)	2	2,450.00	4,900.00	931.00	5,831.00	23,030.00	4,375.70	27,405.70
8	Echipament de comunicatii tip switch 1-10GB (buc)	2	2,560.00	5,120.00	972.80	6,092.80	24,064.00	4,572.16	28,636.16
9	Rack si conectica specifica (buc)	1	3,000.00	3,000.00	570.00	3,570.00	14,100.00	2,679.00	16,779.00
10	Furnizare echipamente TIC (statii de lucru) (buc)	100	650.00	65,000.00	12,350.00	77,350.00	305,500.00	58,045.00	363,545.00
11	Echipamente TIC - Mobile (buc)	20	850.00	17,000.00	3,230.00	20,230.00	79,900.00	15,181.00	95,081.00
12	Echipament hardware AIS (base station, GPS antena, VHF antena) (buc)	1	3,850.00	3,850.00	731.50	4,581.50	18,095.00	3,438.05	21,533.05
II	**Achizitie Servicii Dezvoltare Port Community System**								
13	Servicii de instalare si configurare a echipamentelor (zile om)	44	350.00	15,400.00	2,926.00	18,326.00	72,380.00	13,752.20	86,132.20
14	Analiza detaliata a cerințelor si realizarea specificatiilor functionale (zile om)	240	320.00	76,800.00	14,592.00	91,392.00	360,960.00	68,582.40	429,542.40
15	Dezvoltarea si configurarea functionalitatilor cf. specificatiilor (zile om)	540	350.00	189,000.00	35,910.00	224,910.00	888,300.00	168,777.00	1,057,077.00
16	Testarea functionalitatilor (zile om)	180	300.00	54,000.00	10,260.00	64,260.00	253,800.00	48,222.00	302,022.00
17	Instruirea personalului in vederea exploatarii sistemului (zile om)	40	300.00	12,000.00	2,280.00	14,280.00	56,400.00	10,716.00	67,116.00
18	Punere în funcțiune a sistemului (zile om)	120	300.00	36,000.00	6,840.00	42,840.00	169,200.00	32,148.00	201,348.00
19	Activitati de audit tehnic (zile om)	40	320.00	12,800.00	2,432.00	15,232.00	60,160.00	11,430.40	71,590.40
20	Servicii de mentenanta - 2 ani	132	300.00	39,600.00	7,524.00	47,124.00	186,120.00	35,362.80	221,482.80
III	**Amenajare data center**								
21	Servicii de compartimentare si amenajare camera tehnica (buc)	1	8500	8,500.00	1,615.00	10,115.00	39,950.00	7,590.50	47,540.50
22	Echipament de control al temperaturii (buc)	2	800.00	1,600.00	304.00	1,904.00	7,520.00	1,428.80	8,948.80
IV	**TOTAL GENERAL**			**627,170.00**	**119,162.30**	**746,332.30**	**2,947,699.00**	**560,062.81**	**3,507,761.81**

General Estimate

Nr. Crt.	Denumirea capitolelor şi subcapitolelor de cheltuieli	Valoare fără TVA (lei)	TVA (lei)	Valoare cu TVA (lei)
1	2	3	4	5
CAPITOLUL 1. Cheltuieli pentru obţinerea şi amenajarea terenului				
1.1	Obţinerea terenului	0.00	0.00	0.00
1.2	Amenajarea terenului	0.00	0.00	0.00
1.3	Amenajări pentru protecţia mediului şi aducerea terenului la starea iniţială	0.00	0.00	0.00
1.4	Cheltuieli pentru relocarea/protecţia utilităţilor	0.00	0.00	0.00
Total capitol 1		**0.00**	**0.00**	**0.00**
CAPITOLUL 2. Cheltuieli pentru asigurarea utilităţilor necesare obiectivului de investiţii				
Total capitol 2		**0.00**	**0.00**	**0.00**
CAPITOLUL 3 Cheltuieli pentru proiectare şi asistenţă tehnică				
3.1	Studii	0.00	0.00	0.00
	3.1.1. Studii de teren	0.00	0.00	0.00
	3.1.2. Raport privind impactul asupra mediului	0.00	0.00	0.00
	3.1.3. Alte studii specifice	0.00	0.00	0.00
3.2	Documentaţii-suport şi cheltuieli pentru obţinerea de avize, acorduri şi autorizaţii	0.00	0.00	0.00
3.3	Expertizare tehnică	0.00	0.00	0.00
3.4	Certificarea performanţei energetice şi auditul energetic al clădirilor	0.00	0.00	0.00
3.5	Proiectare	872,420.00	165,759.80	1,038,179.80
	3.5.1. Temă de proiectare	5,000.00	950.00	5,950.00
	3.5.2. Studiu de prefezabilitate	40,000.00	7,600.00	47,600.00
	3.5.3. Studiu de fezabilitate/documentaţie de avizare a lucrărilor de intervenţii şi deviz general	135,000.00	25,650.00	160,650.00
	3.5.4. Documentaţiile tehnice necesare în vederea obţinerii avizelor/acordurilor/autorizaţiilor	0.00	0.00	0.00
	3.5.5. Verificarea tehnică de calitate a proiectului tehnic şi a detaliilor de execuţie	60,160.00	11,430.40	71,590.40
	3.5.6. Proiect tehnic şi detalii de execuţie	632,260.00	120,129.40	752,389.40
3.6	Organizarea procedurilor de achiziţie	135,000.00	25,650.00	160,650.00
3.7	Consultanţă	247,000.00	46,930.00	293,930.00
	3.7.1. Managementul de proiect pentru obiectivul de investiţii	200,000.00	38,000.00	238,000.00
	3.7.2. Auditul financiar	47,000.00	8,930.00	55,930.00
3.8	Asistenţă tehnică	0.00	0.00	0.00
	3.8.1. Asistenţă tehnică din partea proiectantului	0.00	0.00	0.00
	3.8.1.1. pe perioada de execuţie a lucrărilor	0.00	0.00	0.00
	3.8.1.2. pentru participarea proiectantului la fazele incluse în programul de	0.00	0.00	0.00
	3.8.2. Dirigenţie de şantier	0.00	0.00	0.00
Total capitol 3		**1,254,420.00**	**238,339.80**	**1,492,759.80**
CAPITOLUL 4 Cheltuieli pentru investiţia de bază				
4.1	Construcţii şi instalaţii	39,950.00	7,590.50	47,540.50
4.2	Montaj utilaje, echipamente tehnologice şi funcţionale	241,580.00	45,900.20	287,480.20
4.3	Utilaje, echipamente tehnologice şi funcţionale care necesită montaj	858,079.00	163,035.01	1,021,114.01
4.4	Utilaje, echipamente tehnologice şi funcţionale care nu necesită montaj şi echipamente de transport	0.00	0.00	0.00
4.5	Dotări	79,900.00	15,181.00	95,081.00
4.6	Active necorporale	108,570.00	20,628.30	129,198.30
Total capitol 4		**1,328,079.00**	**252,335.01**	**1,580,414.01**
CAPITOLUL 5 Alte cheltuieli				
5.1	Organizare de şantier	0.00	0.00	0.00
	5.1.1. Lucrări de construcţii şi instalaţii aferente organizării de şantier	0.00	0.00	0.00
	5.1.2. Cheltuieli conexe organizării şantierului	0.00	0.00	0.00
5.2	Comisioane, cote, taxe, costul creditului	0.00	0.00	0.00
	5.2.1. Comisioanele şi dobânzile aferente creditului băncii finanţatoare	0.00	0.00	0.00
	5.2.2, Cota aferentă ISC pentru controlul calităţii lucrărilor de construcţii	0.00	0.00	0.00
	5.2.3. Cota aferentă ISC pentru controlul statului în amenajarea teritoriului, urbanism şi pentru autorizarea lucrărilor de construcţii	0.00	0.00	0.00
	5.2.4. Cota aferentă Casei Sociale a Constructorilor - CSC	0.00	0.00	0.00
	5.2.5. Taxe pentru acorduri, avize conforme şi autorizaţia de construire/desfiinţare	0.00	0.00	0.00
5.3	Cheltuieli diverse şi neprevăzute	0.00	0.00	0.00
5.4	Cheltuieli pentru informare şi publicitate	55,000.00	10,450.00	65,450.00
Total capitol 5		**55,000.00**	**10,450.00**	**65,450.00**
CAPITOLUL 6 Cheltuieli pentru probe tehnologice şi teste				
6.1	Pregătirea personalului de exploatare	56,400.00	10,716.00	67,116.00
6.2	Probe tehnologice şi teste	253,800.00	48,222.00	302,022.00
Total capitol 6		**310,200.00**	**58,938.00**	**369,138.00**
TOTAL GENERAL		**2,947,699.00**	**560,062.81**	**3,507,761.81**
din care: C + M (1.2 + 1.3+1.4 + 2 + 4.1 +4.2 + 5.1.1)		**281,530.00**	**53,490.70**	**335,020.70**

Also, reinvestment costs were considered, equal to the amount of investment in the equipment of 894,712.21 lei, in the 5th year of operation.

Scenario # 2: IT solutions and its operation in the Cloud

List quantities

Nr. crt.	Echipament / Serviciu	Cant.	Valoare unitara [euro fara TVA]	Valoare totala [euro fara TVA]	TVA [euro]	Valoare totala [euro cu TVA]	Valoare totala [lei fara TVA]	TVA [lei]	Valoare totala [lei fara TVA]
I	**Software, hardware, alte echipamente**								
1	Software de baza, licente SO Server (buc)	0	1,450.00	0.00	0.00	0.00	0.00	0.00	0.00
2	Software de baza, licente baza de date (buc)	0	8,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3	Software de baza, Software Antivirus ptr. intreg systemul (buc)	1	3,000.00	3,000.00	570.00	3,570.00	14,100.00	2,679.00	16,779.00
4	Echipamente hardware tip Server (buc)	0	15,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Echipamente hardware tip Storage (buc)	0	26,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6	Echipament hardware tip UPS, 5KVA (buc)	0	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
7	Echipament de protectia a retelei tip firewall (buc)	2	2,450.00	4,900.00	931.00	5,831.00	23,030.00	4,375.70	27,405.70
8	Echipament de comunicatii tip switch 1-10GB (buc)	2	2,560.00	5,120.00	972.80	6,092.80	24,064.00	4,572.16	28,636.16
9	Rack si conectica specifica (buc)	0	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
10	Furnizare echipamente TIC (statii de lucru) (buc)	100	650.00	65,000.00	12,350.00	77,350.00	305,500.00	58,045.00	363,545.00
11	Echipamente TIC - Mobile (buc)	20	850.00	17,000.00	3,230.00	20,230.00	79,900.00	15,181.00	95,081.00
12	Echipament hardware AIS (base station, GPS antena, VHF antena) (buc)	1	3,850.00	3,850.00	731.50	4,581.50	18,095.00	3,438.05	21,533.05
II	**Achizitie Servicii Dezvoltare Port Community System**								
13	Servicii de instalare si configurare a echipamentelor (zile om)	22	350.00	7,700.00	1,463.00	9,163.00	36,190.00	6,876.10	43,066.10
14	Analiza detaliata a cerințelor si realizarea specificatiilor functionale (zile om)	240	320.00	76,800.00	14,592.00	91,392.00	360,960.00	68,582.40	429,542.40
15	Dezvoltarea si configurarea functionalitatilor cf. specificatiilor (zile om)	540	350.00	189,000.00	35,910.00	224,910.00	888,300.00	168,777.00	1,057,077.00
16	Testarea functionalitatilor (zile om)	180	300.00	54,000.00	10,260.00	64,260.00	253,800.00	48,222.00	302,022.00
17	Instruirea personalului in vederea exploatarii sistemului (zile om)	40	300.00	12,000.00	2,280.00	14,280.00	56,400.00	10,716.00	67,116.00
18	Punere în funcțiune a sistemului (zile om)	120	300.00	36,000.00	6,840.00	42,840.00	169,200.00	32,148.00	201,348.00
19	Activitati de audit tehnic (zile om)	40	320.00	12,800.00	2,432.00	15,232.00	60,160.00	11,430.40	71,590.40
20	Servicii de mentenanta - 2 ani	132	300.00	39,600.00	7,524.00	47,124.00	186,120.00	35,362.80	221,482.80
III	**Amenajare data center**								
21	Servicii de compartimentare si amenajare camera tehnica (buc)	0	8500	0.00	0.00	0.00	0.00	0.00	0.00
22	Echipament de control al temperaturii (buc)	0	800.00	0.00	0.00	0.00	0.00	0.00	0.00
IV	**TOTAL GENERAL**			**526,770.00**	**100,086.30**	**626,856.30**	**2,475,819.00**	**470,405.61**	**2,946,224.61**

General estimate

Nr. Crt.	Denumirea capitolelor şi subcapitolelor de cheltuieli	Valoare fără TVA (lei)	TVA (lei)	Valoare cu TVA (lei)
1	2	3	4	5
CAPITOLUL 1. Cheltuieli pentru obţinerea şi amenajarea terenului				
1.1	Obţinerea terenului	0.00	0.00	0.00
1.2	Amenajarea terenului	0.00	0.00	0.00
1.3	Amenajări pentru protecţia mediului şi aducerea terenului la starea iniţială	0.00	0.00	0.00
1.4	Cheltuieli pentru relocarea/protecţia utilităţilor	0.00	0.00	0.00
Total capitol 1		**0.00**	**0.00**	**0.00**
CAPITOLUL 2. Cheltuieli pentru asigurarea utilităţilor necesare obiectivului de investiţii				
Total capitol 2		**0.00**	**0.00**	**0.00**
CAPITOLUL 3 Cheltuieli pentru proiectare şi asistenţă tehnică				
3.1	Studii	0.00	0.00	0.00
	3.1.1. Studii de teren	0.00	0.00	0.00
	3.1.2. Raport privind impactul asupra mediului	0.00	0.00	0.00
	3.1.3. Alte studii specifice	0.00	0.00	0.00
3.2	Documentaţii-suport şi cheltuieli pentru obţinerea de avize, acorduri şi autorizaţii	0.00	0.00	0.00
3.3	Expertizare tehnică	0.00	0.00	0.00
3.4	Certificarea performanţei energetice şi auditul energetic al clădirilor	0.00	0.00	0.00
3.5	Proiectare	872,420.00	165,759.80	1,038,179.80
	3.5.1. Temă de proiectare	5,000.00	950.00	5,950.00
	3.5.2. Studiu de prefezabilitate	40,000.00	7,600.00	47,600.00
	3.5.3. Studiu de fezabilitate/documentaţie de avizare a lucrărilor de intervenţii şi deviz general	135,000.00	25,650.00	160,650.00
	3.5.4. Documentaţiile tehnice necesare în vederea obţinerii avizelor/acordurilor/autorizaţiilor	0.00	0.00	0.00
	3.5.5. Verificarea tehnică de calitate a proiectului tehnic şi a detaliilor de execuţie	60,160.00	11,430.40	71,590.40
	3.5.6. Proiect tehnic şi detalii de execuţie	632,260.00	120,129.40	752,389.40
3.6	Organizarea procedurilor de achiziţie	135,000.00	25,650.00	160,650.00
3.7	Consultanţă	247,000.00	46,930.00	293,930.00
	3.7.1. Managementul de proiect pentru obiectivul de investiţii	200,000.00	38,000.00	238,000.00
	3.7.2. Auditul financiar	47,000.00	8,930.00	55,930.00
3.8	Asistenţă tehnică	0.00	0.00	0.00
	3.8.1. Asistenţă tehnică din partea proiectantului	0.00	0.00	0.00
	3.8.1.1. pe perioada de execuţie a lucrărilor	0.00	0.00	0.00
	3.8.1.2. pentru participarea proiectantului la fazele incluse în programul de	0.00	0.00	0.00
	3.8.2. Dirigenţie de şantier	0.00	0.00	0.00
Total capitol 3		**1,254,420.00**	**238,339.80**	**1,492,759.80**
CAPITOLUL 4 Cheltuieli pentru investiţia de bază				
4.1	Construcţii şi instalaţii	0.00	0.00	0.00
4.2	Montaj utilaje, echipamente tehnologice şi funcţionale	205,390.00	39,024.10	244,414.10
4.3	Utilaje, echipamente tehnologice şi funcţionale care necesită montaj	556,809.00	105,793.71	662,602.71
4.4	Utilaje, echipamente tehnologice şi funcţionale care nu necesită montaj şi echipamente de transport	0.00	0.00	0.00
4.5	Dotări	79,900.00	15,181.00	95,081.00
4.6	Active necorporale	14,100.00	2,679.00	16,779.00
Total capitol 4		**856,199.00**	**162,677.81**	**1,018,876.81**
CAPITOLUL 5 Alte cheltuieli				
5.1	Organizare de şantier	0.00	0.00	0.00
	5.1.1. Lucrări de construcţii şi instalaţii aferente organizării de şantier	0.00	0.00	0.00
	5.1.2. Cheltuieli conexe organizării şantierului	0.00	0.00	0.00
5.2	Comisioane, cote, taxe, costul creditului	0.00	0.00	0.00
	5.2.1. Comisioanele şi dobânzile aferente creditului băncii finanţatoare	0.00	0.00	0.00
	5.2.2, Cota aferentă ISC pentru controlul calităţii lucrărilor de construcţii	0.00	0.00	0.00
	5.2.3. Cota aferentă ISC pentru controlul statului în amenajarea teritoriului, urbanism şi pentru autorizarea lucrărilor de construcţii	0.00	0.00	0.00
	5.2.4. Cota aferentă Casei Sociale a Constructorilor - CSC	0.00	0.00	0.00
	5.2.5. Taxe pentru acorduri, avize conforme şi autorizaţia de construire/desfiinţare	0.00	0.00	0.00
5.3	Cheltuieli diverse şi neprevăzute	0.00	0.00	0.00
5.4	Cheltuieli pentru informare şi publicitate	55,000.00	10,450.00	65,450.00
Total capitol 5		**55,000.00**	**10,450.00**	**65,450.00**
CAPITOLUL 6 Cheltuieli pentru probe tehnologice şi teste				
6.1	Pregătirea personalului de exploatare	56,400.00	10,716.00	67,116.00
6.2	Probe tehnologice şi teste	253,800.00	48,222.00	302,022.00
Total capitol 6		**310,200.00**	**58,938.00**	**369,138.00**
TOTAL GENERAL		**2,475,819.00**	**470,405.61**	**2,946,224.61**
din care: C + M (1.2 + 1.3+1.4 + 2 + 4.1 +4.2 + 5.1.1)		**205,390.00**	**39,024.10**	**244,414.10**

Also, reinvestment costs were considered equal to the amount of equipment investment of 536,200.91 lei, 5th year of operation.

3.7. Operating and maintenance costs estimated by reference to similar investment objectives

Scenario # 1: Development of IT Solution and its Operation on the Premises

Salary costs were estimated for 1 additional employee with a net salary of 3,500 lei / month. Hiring will take place in the 3rd operation year, taking into account the warranty and maintenance services provided by most vendors, of 2 years.

Name	No. of persons	No. of Months	Net monthly salary	Total monthly labour cost	Annual wage costs
System Administration	1	12	3,500.00 lei	6,118.00 lei	73,416.00 lei

Energy costs were estimated based on the types of equipment to be purchased and installed as mentioned, the result was the following annual cost for electricity

Local Level	Q est. (W / h)	No. of Equip	No. Hours / day	Number of days / year	Q total kWh	Price / Kwh	Total price
Server type hardware (pc)	150	2	24	365	2628	0.56 lei	1471.68 lei
Server type hardware (pc)	250	1	24	365	2190	0.56 lei	1226.40 lei
UPS type hardware, 5KVA (pcs)	400	1	24	365	3504	0.56 lei	1962.24 lei
Firewall network Protection equipment (pcs)	55	2	24	365	963.6	0.56 lei	539.62 lei
1-10 GB switch communication type equipment (pc)	20	2	24	365	350.4	0.56 lei	196.22 lei
Supply of TIC equipment (workstations) (pcs)	141	100	8	270	30 456	0.56 lei	17055.36 lei
TIC equipment - Mobile (pcs)	0	20	8	365	0	0.56 lei	0.00 lei
AIS hardware (base stations, GPS antenna, VHF antenna) (pcs)	600	1	24	365	5256	0.56 lei	2943.36 lei
Temperature control equipment (units)	100	2	24	365	1752	0.56 lei	981.12 lei
Total expenditure on power							26,376.00 lei

Costs for repairs and maintenance

These were estimated at 1% of the estimated value of hardware and temperature control equipment, which amounts to 894,712.21 lei, including VAT.

Thus, the cost of repairs and maintenance was estimated at 8,947.12 lei starting with the 3rd year of operation.

Scenario # 2: **Development of IT Solution and its Operation in the Cloud**

The implementation of this scenario will not require any additional labour costs, the system operation taking place in the cloud.

Although the solution will operate in the cloud, the solution implementation involves making certain investments, both hardware and software, so there will be additional costs for electricity as follows:

Local Level	Q est. (W / h)	Nr. Equip	Nr. Hours / day	Number of days / year	Q total kWh	Price / Kwh	Total price
Server type hardware (pc)	150	0	24	365	0	0.56 lei	0.00L
Storage type hardware (pc)	250	0	24	365	0	0.56 lei	0.00L
UPS type hardware, 5KVA (pcs)	400	0	24	365	0	0.56 lei	0.00L
Firewall network protection equipment (pcs)	55	2	24	365	963.6	0.56 lei	539.62 lei
1-10GB switch communication type equipment (pc)	20	2	24	365	350.4	0.56 lei	196.22 lei
Providing TIC equipment (workstations) (pcs)	141	100	8	270	30 456	0.56 lei	17055.36 lei
TIC equipment - Mobile (pcs)	0	20	8	365	0	0.56 lei	0.00 lei
AIS hardware (base stations, GPS antenna, VHF antenna) (pcs)	600	1	24	365	5256	0.56 lei	2943.36 lei
Temperature control equipment (units)	100	0	24	365	0	0.56 lei	0.00 ei
Total spending power							20,734.56 lei

These were estimated at 1% of the estimated value of hardware and temperature control equipment, which amounts to 536,200.91 lei VAT.

Thus, the cost of repairs and maintenance was estimated at 5362.01 lei staring with the 3rd year of operation.

In addition to the costs mentioned above, the cloud hosting solution involves costs for the cloud provider. Considering the needs of this project, the costs of providing cloud services, according to estimates provided by Microsoft for the Azure Cloud Solution are:

Microsoft Azure Estimate				
Your Estimate				
Service type	Region	Description	Estimated Cost (USD)	Costuri estimate (RON)
App Service	West Europe	Standard Tier; 2 S3 (4 Core(s), 7 GB RAM, 50 GB Storage) x 730 Hours; Windows OS	$846.80	3,480.35 lei
Azure SQL Database	West Europe	Single Database, vCore Purchase Model, General Purpose Tier, Gen 4, 1 8 vCore instance(s), 1 year reserved, 100 GB Storage	$1,787.59	7,346.99 lei
Virtual Network		100 data transfer from West Europe region to West Europe region	$2.90	11.92 lei
Application Gateway	West Europe	Web Application Firewall tier, Medium Instance size: 1 Gateway hours instance(s) x 730 Hours, 100 GB Data processed unit(s), 100 GB Zone unit(s)	$161.36	663.19 lei
Support		Support	$0.00	0.00 lei
		Licensing Program	Microsoft Online Services Program (MOSP)	
		Monthly Total	$2,798.65	11,502.45 lei
		Annual Total	$33,583.79	138,029.36 lei
Disclaimer				
All prices shown are in US Dollar ($). This is a summary estimate, not a quote. For up to date pricing information please visit https://azure.microsoft.com/pricing/calculator/				
This estimate was created at 11/27/2018 4:12:51 PM UTC.				

3.8. Preliminary Analysis on Economic and Financial Aspects

In case of additional operating revenues, these will occur due to the optimization of the operational activity as a whole, both as a result of a modernization of the used IT solutions, of further investments and as a result of a global improvement of the maritime and river traffic situation in Romania, thus factors outside the 3 ports. Also the turning into account of the described opportunities, and others, will improve the overall port activity, thus increasing the revenues or profitability of the ports.

Currently, APDM obtains incomes from the activities listed below. Prices do not include VAT.

A. Port charges - use of water transport infrastructure

1. Romanian and Foreign River Ships

TARIFF NAME	U / M	TARIFF lei
Quay Tariff		
a) staying under operations at quay *		
- traffic up to 500,000 TM	Lei / TM	0.249
- traffic between 500001-1500000 TM		0.239
- traffic between 1500001-3000000 TM		0,228

- traffic between 3000001-5000000 TM		0.218
- traffic between 5000001-6000000 TM		0.208
- traffic over 6,000,000 TM		0.198
b) staying with no operations at quay	Lei / ship / day	14.932
c) natural bank staying under operations	Lei / TM	0,125
d) natural bank staying without operations	Lei / ship / day	7466
Access to port infrastructure	Lei / ship / day	9007

2. Romanian and Foreign Ships

TARIFF NAME	U / M	TARIFF lei
Quay Tariff		
a) stay under operation at dockside		
- general cargo, bulk, live animals, petroleum products	Lei / TM / animal head	1872
- containerized goods	Lei / TEU	15.098
b) stay at quayside without operations	Lei / ship / day	160.207
Access to port infrastructure	Lei / ship / day	122.574

3. Mooring pontoons

TARIFF NAME	U / M	TARIFF lei
Rate stationary pontoon APDM		
a) cruise ships *	Lei / ship / hour	102.121

b) passenger ships	Lei / ship / day	407.999
c) other ships that do not fit into the categories specified under point a) and point b)	Lei / ship / hour	26.246
Tariff permanent stay at mooring pontoon quay for third parties (including mooring as a whole) - Areas: Galati, Braila, Tulcea and Hârsova.	Lei / ml quay / day	2284
Tariff stay at natural bank pontoon third parties	Lei / lm bank / day	1142

B. Port charges - Environmental Services

TARIFF NAME	U / M	TARIFF lei
Tariff for collection and treatment of household wastewater from ships	RON / cbm	128.363
Tariff assistance for transfer / bunkering oil products and petrochemicals	Lei / hour	223.658
Tariff for taking over waste from ships		
a) course with specialized ship	Lei / course	310.822
b) course by specialised road vehicle	Lei / course	51.111
c) garbage collection and transport	Lei / bag	10.201
d) empty plastic bags	Lei / bag	5229
Tariff acquisition for oil residues from ships		
a) specialized ship course	Lei / course	310.822
b) collection and treating waste oil	RON / cbm	285.845
Tariff collection, packaging, transport and disposal of hazardous waste from ships		

a) slam, bilge from inland navigation	Lei / kg	10.572
b) absorbents, textiles, filter materials, wiping cloths and protective clothing containing dangerous substances	Lei / kg	10.572
c) metallic packaging contaminated with hazardous substances	Lei / kg	10.572
d) oil filters, batteries and fuels	Lei / kg	10.572

C. Port Charges - other Services

TARIFF NAME	U / M	TARIFF
Drinking water supply areas: Galati, Braila, Tulcea and Harsova:		
a) drinking water supply	RON / mc	water supplier price
b) maintenance of drinking water networks		2167
Electricity supply areas: Galati, Braila, Tulcea and Harsova		
a) power supply	Lei / KVH	energy supplier price
b) maintenance of electrical networks		0.226
Tariff for issuing a port worker card		
a) issuing a port worker card	Lei / notebook	50.188
b) annual visa, operation of changes: specialized port worker, identification data of port agent, other changes	Lei / visa	10.035
ISPS Tariff		
a) external ISPS audit	Lei / external audit ISPS	2080.604
b) Evaluation - approval	Lei / assessment-notice	983.259

Tariffs for issue of approvals and authorizations		
a) Release of agreements for investment works and modernization of port infrastructure	Lei / opinion	358.178
b) Release of approvals for investment works and modernization of port infrastructure	Lei / opinion	1065.398
Tariffs for Pilot Services		
a) Piloting of ships		
- up to 100 TRB	Lei / maneuver	587.683
- from 101 TRB to 3000 TRB		730.648
- from 3001 TRB to 5000 TRB		873.623
- from 5001 TRB to 7500 TRB		1016.588
- from 7501 TRB to 10,000 TRB		1231.046
- over 10001 TRB		1213.377
a) Mooring – Unmooring		
- up to 100 TRB	Lei / operation	47.276
- from 101 TRB to 3000 TRB		94.552
- from 3001 TRB to 5000 TRB		141.818
- from 5001 TRB to 7500 TRB		189.094
- from 7501 TRB to 10,000 TRB		236.369
- over 10001 TRB		236.369

D. Tariff for providing services of hydrographic measurements

TARIFF NAME	U / M	TARIFF lei
Performance of measurements		
a) single beam	Lei / ha	73.475
b) multi beam	Lei / ha	65.423
Processing of Measurements	Lei / ha	372.410

E. Tariff for providing services with own property

TARIFF NAME	U / M	TARIFF lei
Tariff for use motorboat RAZA		
a) stationary	Lei / hour	111.723
b) march	Lei / hour	235.524
Tariff for use motorboat ZARNESTI		
a) stationary	Lei / hour	96.625
b) march	Lei / hour	219.420
Tariff for use tug Sălceni		
a) stationary	Lei / hour	126.821
b) march	Lei / hour	250.622
Tariff for use multifunctional ship ECODUNAREA		
a) stationary	Lei / hour	217.407
b) march	Lei / hour	566.667
Tariff Tariff for use multifunctional ship ECOEXPRES		
a) stationary	Lei / hour	212.374
b) march	Lei / hour	411.664

Tariff for use of motorboat		
a) stationary	Lei / hour	43.280
b) march	Lei / hour	88.573
Tariff for use of minibus MERCEDES		
a) stationary	Lei / hour	55.548
b) drive	Lei / km	2754
Tariff of use for FORD van		
a) stationary	Lei / hour	58.509
b) drive	Lei / km	2547
Tariff for use port platform – parking destination		
Tariff for use port platform – parking destination	Lei / day / parking lot	6502
Tariff for use port platform – parking destination	Lei / year / parking lot	1508.000

The financial results were:

Year	Fiscal value	Net income financial year
2018[1]	12,871,146	1,087,994
2017	14,540,808	1,840,545
2016	14,765,778	1,575,233
2015	13,630,411	1,318,645
2014	13,776,609	1,393,965
2013	14,700,967	1,424,782

[1] Estimate based on documents of quarterly accounting reports

2012	12,074,479	1,205,798

In view of the financial analysis, the additional profit was estimated at 10% of the average net income over the past seven years, these **140,670.89** lei. This result is the same in both analysed scenarios, the purpose of the project is the same regardless of the technical solution adopted.

VAT was not considered in this preliminary analysis, because (1) it represents a transfer and (2) it artificially influences the results of the financial analysis.

The analysis presents in this study only the additional expenses incurred by this investment without making a detailed economic-financial analysis, affecting the financial-accounting results of APDM. The cost-benefit analysis will be carried out in the stage of drafting of the feasibility study.

The preliminary analysis was performed using the following assumptions:

Assumption	**Value used**
Implementation Period	2 years, costs distributed equally
Operating Period[2]	5 years
Investment, operation and maintenance costs	According to the above
Updating rate	5%, as recommended by the European Commission
NPV Formula	According to Excel
IRR Formula	According to Excel

[2]The reference period did not take into account the ACB Guideline for investment projects in 2014-2020. These recommendations will be considered in the stage of the feasibility study.

The results of the preliminary analysis are as follows:

Scenario # 1: IT solution development and operation of its on-premises

Nr. crt.	Denumire	An 1	An 2	An 3	An 4	An 5	An 6	An 7
I	CHELTUIELI INVESTITII SI REINVESTITII							
1	Cheltuieli investitie	1,473,849.50 lei	1,473,849.50 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei
2	Cheltuieli reinvestitii	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	894,712.21 lei
3	Costuri totale investitie	1,473,849.50 lei	1,473,849.50 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	894,712.21 lei
II	CHELTUIELI OPERATIONALE							
4	Cheltuieli salariale	0.00 lei	0.00 lei	52,440.00 lei	52,440.00 lei	52,440.00 lei	52,440.00 lei	52,440.00 lei
5	Cheltuieli utilitati (energie)	0.00 lei	0.00 lei	26,376.00 lei	26,376.00 lei	26,376.00 lei	26,376.00 lei	26,376.00 lei
6	Cheltuieli cu reparatii si mentenanta	0.00 lei	0.00 lei	0.00 lei	0.00 lei	8,947.12 lei	8,947.12 lei	8,947.12 lei
7	Cheltuieli servicii terti	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei
8	Costuri totale operationale	0.00	0.00	78,816.00	78,816.00	87,763.12	87,763.12	87,763.12
III	VENITURI OPERATIONALE							
9	Venituri din imbunatatirea activitatii operationale	0.00 lei	0.00 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei
10	Venituri nerambursabile	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei
11	Total venituri	0.00 lei	0.00 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei
IV	FLUX DE NUMERAR	-1,473,849.50 lei	-1,473,849.50 lei	61,854.89 lei	61,854.89 lei	52,907.77 lei	52,907.77 lei	-841,804.44 lei

Net Present Value (NPV)	**-3,153,489.87 lei**
Internal rate of return (IRR)	**#NUM!**
Benefit-cost ratio (R b/c)	**0.16**

Scenario # 2: IT solutions and its operation in the Cloud

Nr. crt.	Denumire	An 1	An 2	An 3	An 4	An 5	An 6	An 7
I	CHELTUIELI INVESTITII SI REINVESTITII							
1	Cheltuieli investitie	1,237,909.50 lei	1,237,909.50 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei
2	Cheltuieli reinvestitii	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	536,200.91 lei
3	Costuri totale investitie	1,237,909.50 lei	1,237,909.50 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	536,200.91 lei
II	CHELTUIELI OPERATIONALE							
4	Cheltuieli salariale	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei
5	Cheltuieli utilitati (energie)	0.00 lei	0.00 lei	20,734.56 lei	20,734.56 lei	20,734.56 lei	20,734.56 lei	20,734.56 lei
6	Cheltuieli cu reparatii si mentenanta	0.00 lei	0.00 lei	0.00 lei	0.00 lei	5,362.01 lei	5,362.01 lei	5,362.01 lei
7	Cheltuieli servicii terti	0.00 lei	0.00 lei	138,029.36 lei	138,029.36 lei	138,029.36 lei	138,029.36 lei	138,029.36 lei
8	Costuri totale operationale	0.00	0.00	158,763.92	158,763.92	164,125.93	164,125.93	164,125.93
III	VENITURI OPERATIONALE							
9	Venituri din imbunatatirea activitatii operationale	0.00 lei	0.00 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei
10	Venituri nerambursabile	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei
11	Total venituri	0.00 lei	0.00 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei
IV	FLUX DE NUMERAR	-1,237,909.50 lei	-1,237,909.50 lei	-18,093.03 lei	-18,093.03 lei	-23,455.04 lei	-23,455.04 lei	-559,655.95 lei

Net Present Value (NPV)	**-2,765,913.64 lei**
Internal rate of return (IRR)	**#NUM!**
Benefit-cost ratio (R b/c)	**0.18**

At a first analysis, the Cloud scenario obtains better financial results than On the Premises-scenario, this being due primarily to the lower investment value, and the lower reinvestment costs.

However, considering the financial aspects, we note that, on the level of estimated revenues, the Cloud scenario is not sustainable for the operating period while the On the Premises-scenario contributes to obtaining additional incomes.

Because the implementation of the actual project is done with non-refundable European financing through the Transnational Danube Grant Program 2014 - 2020, the financial analysis was made also taking into account this financing. The non-refundable financial aid in this case is 98% of the investment costs. The results are:

Scenario # 1: IT solution development and operation on the premises

Nr. crt.	Denumire	An 1	An 2	An 3	An 4	An 5	An 6	An 7
I	CHELTUIELI INVESTITII SI REINVESTITII							
1	Cheltuieli investitie	1,473,849.50 lei	1,473,849.50 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei
2	Cheltuieli reinvestitii	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	894,712.21 lei
3	Costuri totale investitie	1,473,849.50 lei	1,473,849.50 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	894,712.21 lei
II	CHELTUIELI OPERATIONALE							
4	Cheltuieli salariale	0.00 lei	0.00 lei	52,440.00 lei	52,440.00 lei	52,440.00 lei	52,440.00 lei	52,440.00 lei
5	Cheltuieli utilitati (energie)	0.00 lei	0.00 lei	26,376.00 lei	26,376.00 lei	26,376.00 lei	26,376.00 lei	26,376.00 lei
6	Cheltuieli cu reparatii si mentenanta	0.00 lei	0.00 lei	0.00 lei	0.00 lei	8,947.12 lei	8,947.12 lei	8,947.12 lei
7	Cheltuieli servicii terti	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei
8	Costuri totale operationale	0.00	0.00	78,816.00	78,816.00	87,763.12	87,763.12	87,763.12
III	VENITURI OPERATIONALE							
9	Venituri din imbunatatirea activitatii operationale	0.00 lei	0.00 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei
10	Venituri nerambursabile (98%)	1,444,372.51 lei	1,444,372.51 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei
11	Total venituri	1,444,372.51 lei	1,444,372.51 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei
IV	FLUX DE NUMERAR	-29,476.99 lei	-29,476.99 lei	61,854.89 lei	61,854.89 lei	52,907.77 lei	52,907.77 lei	-841,804.44 lei

Net Present Value (NPV)	**-467,808.56 lei**
Benefit-cost ratio (Rb / c)	**0.84**

Scenario # 2: Development of IT Solution and its Operation in the Cloud

Nr. crt.	Denumire	An 1	An 2	An 3	An 4	An 5	An 6	An 7
I	CHELTUIELI INVESTITII SI REINVESTITII							
1	Cheltuieli investitie	1,237,909.50 lei	1,237,909.50 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei
2	Cheltuieli reinvestitii	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	536,200.91 lei
3	Costuri totale investitie	1,237,909.50 lei	1,237,909.50 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	536,200.91 lei
II	CHELTUIELI OPERATIONALE							
4	Cheltuieli salariale	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei
5	Cheltuieli utilitati (energie)	0.00 lei	0.00 lei	20,734.56 lei	20,734.56 lei	20,734.56 lei	20,734.56 lei	20,734.56 lei
6	Cheltuieli cu reparatii si mentenanta	0.00 lei	0.00 lei	0.00 lei	0.00 lei	5,362.01 lei	5,362.01 lei	5,362.01 lei
7	Cheltuieli servicii terti	0.00 lei	0.00 lei	138,029.36 lei	138,029.36 lei	138,029.36 lei	138,029.36 lei	138,029.36 lei
8	Costuri totale operationale	0.00	0.00	158,763.92	158,763.92	164,125.93	164,125.93	164,125.93
III	VENITURI OPERATIONALE							
9	Venituri din imbunatatirea activitatii operationale	0.00 lei	0.00 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei
10	Venituri nerambursabile (98%)	1,213,151.31 lei	1,213,151.31 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei	0.00 lei
11	Total venituri	1,213,151.31 lei	1,213,151.31 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei	140,670.89 lei
IV	FLUX DE NUMERAR	-24,758.19 lei	-24,758.19 lei	-18,093.03 lei	-18,093.03 lei	-23,455.04 lei	-23,455.04 lei	-559,655.95 lei

Net Present Value (NPV)	**-510,167.44 lei**
Benefit-cost ratio (R b/c)	**0.82**

Conclusion of the Preliminary Analysis

Considering all the financial variables, we note that the implementation of the project in the Scenario # 1 On-premises is one which leads to the best economic and financial results. This recommendation took into account the following considerations:

- ✓ Developing the IT Port Community System [PCS] ports Galati, Tulcea, Braila using hardware and software installed at the APDM will allow future new developments which may use the acquired information infrastructure;
- ✓ The On the premises scenario is the alternative which also allows for a pessimistic approach, i.e. it remains financially sustainable even if the additional revenues obtained after implementing the system are below the estimate in this study;
- ✓ The development of the PCS system in On the premises-scenario is financially sustainable during the operation, given the revenues estimated in this study;
- ✓ The development of the PCS system in the recommended scenario allows APDM to control and maintain the operating costs at an acceptable level;
- ✓ The financial results of the implementation of this project can be improved by identifying future new sources of grants, enabling new investments in hardware or investments in clean energy sources such as photovoltaic panels that may reduce overall operating costs.

4. Feasible solutions to achieve the investment objective

4.1. Proposing a limited number of scenarios / options of those identified to be considered during the stage of feasibility study

In future, the information flow in case of a ship due to arrive in one of the ports managed by APDM will be:

1. The Agent registers the voyage in the system, in the port of departure.
2. Once registered in the port of departure by the European voyage transmission system ERI *Messages,* information will be distributed to all authorized authorities
3. The PCS system, by its interface for data exchange with other RIS centres, will automatically receive the data from the *European ERI* system and complete the data in the APDM PCS System.
4. The system will alert the Port Dispatcher, the Agent and the Operator when the AIS / ECDIS system identifies the ship in the harbour or in the area defined in this application.
5. The system will suggest the Dispatcher where to dock the ship depending on the cargo on board, information it will take from the ERI-NOT message and according to the information on the operator and on which unloading location is available for operation.
6. Depending on the choice of the Dispatcher and depending on alerts entered into the system, the ship will dock at the location as determined by the port authority.

7. Depending on the type of ship (maritime or river) the collaborating ANR and AFDJ authorities will also be announced automatically so as to perform together the piloting operations, if necessary.
8. Once the Ship Operator receives the warning message that the ship is in the harbour, it will be able to request port services from the port authority (water, energy and waste).
9. The concerned authorities will be notified by the PCS system on the mooring and location, namely the CUSTOMS, ANAF and other local authorities according to need / importance

Information flow in case of a ship about to leave one of the ports managed by APDM:

1. The agent registers the voyage in the PCS.
2. Once the voyage is automatically registered, through the data exchange interface with ANR the voyage is entered in the RoRIS system of ANR. Depending on the type of the ship AFDJ will also be announced.
3. Once the voyage is approved in the RoRIS system, the PCS system will be automatically updated.
4. The departure record will be sent to the *ERI Messages,* the European system of voyage transmission.
5. The Dispatcher will supervise the ship movements in the harbour by the ECDIS application helped by the AIS system.

Information flow at the port authority on the services offered to a ship:

1. The Port Authority will receive a service request from an Agent
2. The PCS system will electronically transmit the request to the operators / employees of the Port Services and Environmental Protection Office.
3. Operators will plan the service and announce the agent through the system on the date and time when the service will be provided.
4. Once the planned service is approved, the agent is informed by the system on the status and the operators will send it to the exploitation service the notification of performance
5. After the service is provided, the pontonner will agree with the person designated at the ship (captain or agent) the provided volume or level of service. They will electronically sign the level of the service on a tablet-type device.
6. Once the level of service is agreed, the system will automatically forward to the port and environmental protection services the agreed information.
7. The service operators will issue through the system the invoice associated with the services using the services tariff list from the ERP system.
8. The PCS system will provide through its modules reports associated with these operations or services.

Data flow on renting land for operators

The PCS system by its module "Management of Premises" will make available to end users an interactive interface so that they can define on a GIS map the locations under APDM management. The module will provide the data and information necessary for the contracting, the freight volume passing through these areas from land to ship and vice - versa. The PCS system by its module "Management of Premises" will provide operators with an interface through which they can define what types and quantities of goods can be loaded and unloaded in the leased areas. Below there is a summary of the main flows:

1. Some Premises are entered in the module (plot of land) which can be rented or a leased area comes to the end of its lease contract
2. The system automatically issues to the specialised services an alarm on the location, area and historical data referring to this area for lease.
3. The system also provides the standard contract defined by the legal service to make the negotiation and lease the premises
4. After completing the lease, operators will save this module the data on the new lease period, the volume of cargo and other data that operators have defined as required.
5. Periodically/monthly or yearly, the system will automatically issue invoices to those who rent premises from APDM so that the invoicing process can be transparent and efficient.
6. On every loading and unloading the module will operate the quantity and type of cargo processed by the operator.

Collecting the above data, the module can regularly provide, on a monthly or yearly basis through the BI reporting module statistics which can help the management of APDM in negotiating and effectively managing those leased premises.

BI Reports

Business Intelligence Reports are the dome of the PCS system that centralize and submit the data of various operators depending on their rights and needs. Thus, like most systems, the system will have a set of predefined reports for each module but also separately for each stream and will also provide a user interface to draft new reports according to the needs of APDM.

Thus from the total number of existing computer PCS applications the implementation will use the following:

	PCS - General Framework	**APDM**
Cargo module	X	X
Tracking and tracing	X	X
Billing modules	X	X-Partial

Statistics modules	X	X
Berth management modules	X	N / A
Storage allocation	X	X-Partial
Interface to transport modules	X	X-Partial
Core modules	X	X

Legend: X – yes, the module is needed in the system; X - Partially – the module is necessary but with a specific implementation on the APDM flows, NA - Not applicable.

4.2. Identify the potential sources of financing of the public investment: equity, bank loans, budget allocations from state / local budget, foreign loans guaranteed or contracted by the state, external grants, and other legally formed sources

APDM now has all the possible sources of financing of public investments. With positive financial results, it can obtain loans or credits from commercial banks. Positive financial results allow it to make investments including from its own budget.

Also, being a company of national interest, it can benefit from allocations from the state/local budgets.

Last but not least, the company can benefit from grants through:

- ✓ Danube Transnational Program
- ✓ Romania-Bulgaria Program
- ✓ Europe Interconnection Mechanism
- ✓ Operational Infrastructure Program Sea

4.3. Conclusions

The project **IT SYSTEM PORT COMMUNITY SYSTEM [PCS]** will contribute to the further development of CN APDM Galati SA, by creating a modern tool for monitoring and implementing the operational and managerial activity.

The project will contribute indirectly to the creation of new development opportunities, both nationally and internationally, the ability to communicate in an efficient and effective manner with all the stakeholders.

While the revenue generated by such a project is difficult to estimate, we can say with certainty that the project will have a positive impact on both the future financial income, as well as on operational cost control.

In view of future developments, we recommend implementing the project using the hardware installed at the offices of APDM (on-premises).

The adoption of a new IT system by the internal staff will be difficult. It is desirable to establish a period of training of the staff in order to use the new system and to plan a period of adjustment to the new system, during which it should be operated in parallel with the current one (printed documents);

The new IT system will allow the improvement of labour productivity, which is why it is recommended to identify new activities that can be performed by its own staff, with positive economic and financial effects on the company.

4.4. Recommendations on the development of scenarios / feasible technical-economic economically options selected to be studied later in the feasibility study

It is recommended that the implementation be carried out using modern methodologies for the development of computer applications. Considering that PCS is a set of software modules that require interconnection with each other and with various other systems, the implementation approach, even within a single contract, must be based on a methodology of the Scrum type. Thus in several iterations of training and implementation of a module, the latter can be tested and presented to the beneficiary and also tested by the different actors. The classic waterfall implementation (methodology used in constructions) would lead to a certain failure of the implementation.

It is recommended that its implementation be done with a company that has an implementation and configuration team in Romania. Also it would be recommended for it to have cooperated in the RIS or naval domains so as to complete the project within maximum 12 months.

The support for the system must be provided constantly, including the signing of a maintenance and support contract as a necessity, considering the legislative changes, integrations with various institutions and the exchange of data between institutions. Once such a system is commissioned, there will be new institutions and interconnection opportunities which cannot currently be discussed as there is no database for such information.

At the level of port authority processes should be adjusted so that the electronic flow the PCS modules be authorised and sufficient for the carrying out of daily activities. This would eliminate physical registers (records) and any written communication within the institution, thus encouraging the use of an electronic processing and of the PCS system.