Interreg

EUROPEAN UNION

Danube Transnational Programme

DIONYSUS

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

D.T3.4.3 - National Infrastructure Master Plans: AT, SK, HU, HR, RS, BG, RO, MD, UA for sustainable development of River Cruise industry

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3 Abbreviations

Abbreviation	Explanation
IWT	Inland water transport
RCI	river cruise industry
DR	Danube region
AT	Austria
BMK	Federal Ministry Republic of Austria

4 Overview

Austria's 2030 Mobility Master Plan

Meet the requirements of the Paris Climate Agreement

The 2030 Mobility Master Plan therefore identifies ways to avoid, shift and improve traffic and transport and significantly increase the share of eco-mobility in total transport – foot and bicycle traffic, public modes of transport, and shared mobility.

Mobility satisfies basic human needs, and goods transport plays a key role in economic progress. At the same time, tackling the climate crisis in the transport sector is especially challenging. We need clear frameworks and dedicated implementation programs to reverse the trend in carbon emissions.

Much has changed since the last strategic planning document for the transport sector, the Austrian Transport Master Plan for 2012, was published. Mainstream society has become more aware of the climate crisis. Even more advancements in digitalization have been made. The pandemic immediately turned our lives upside down, with no timeline for returning to a pre-Covid normal. Yet our priorities now remain the same as they were back then: Transport must be social, safe, environmentally friendly and efficient.

The federal government's target of becoming climate-neutral by 2040, which is consistent with the science, meets the requirements of the Paris Agreement. However, all stakeholders at the European level and in Austria must act in concert if we are to meet this aim. The European Commission's European Green Deal is an opportunity to make this happen. The EU's ambitious climate targets for 2030 and beyond will provide massive support for Austria's mobility transition.

Achieving a climate-neutral transport sector by 2040 is the project of the century. The vision for 2040 outlines our ideal future, which serves as the basis for back casting: planning by starting with our target and working our way back. When we were designing the 2030 Mobility Master Plan, it quickly became clear that we needed a way to connect our vision for 2040 with today's reality. Extrapolating based on past and current trends alone would not be enough to meet the objective of this project of the century: to become climate-neutral by 2040. The necessity of decarbonizing the transport sector by 2040 has made it clear that we need more than just forecasts of how transport will develop. We need clear solutions that will ensure that we meet this target.

The starting point for the 2030 Mobility Master Plan is therefore a back casting model, which is based on a sensible combination of avoiding traffic, shifting traffic and improving the efficiency of each mode of transport. It is backed by a marked increase in the energy-efficiency of the entire transport system within the available carbon budget. We used studies (such as the Transition 2040 project of the Environment Agency Austria, which was commissioned by the Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology), expert assessments and plausibility analyses, for example, to specify traffic and transport services, capacity utilization, final energy consumption and modal split boundaries for the development of transport demand.

We adjusted the three variables of avoiding, shifting and improving to decide on a plausible state for a carbon-free transport system, which we could use as a basis for developing clear measures. The figures provided are intended as indicators of the scope and direction of changes.

Source: BMK_Mobilitaetsmasterplan2030_EN_UA

Extraction of Mobility Master Plan AT:

Inland waterway transport: passengers and freight

Inland vessels and their motors have a long service life, which means that switching technologies on a large scale requires longer transition periods. There are currently different approaches for zero-emission vessels, but the use of new technologies must be carefully coordinated, as vessels will be used in cross-border transport. Renewable fuels could be used in the near term provided they are available in the volume needed and are economically feasible. Electric drive systems are appropriate primarily for small vessels and short distances. Replaceable battery containers are an option for longer distances but they require the right supply infrastructure on land.

Expansion of this infrastructure is being planned for idle vessels and potentially also for charging battery systems. In addition, the power supply on land for inland waterway transport, as a measure for reducing carbon emissions, also needs to be expanded. Hydrogen applications are in the pilot phase. Eventually, liquefied biogas or synthetic methane, provided methane could be prevented from entering the atmosphere (methane slip), could be used. Decisions about technology need to be made based on international research and development projects. Until then, a blending mandate will help reduce carbon emissions in the short term. The mandate will be rolled out with a package of measures consisting of legislative specifications, infrastructure development and incentives. Austria will campaign for fair taxation of marine diesel to steer developments in the right direction.

Action Program Danube of BMK (Austrian ministry) till 2022

The program covers the three subject areas of shipping, ecology and flood protection and includes measures within the competence of the Federal Ministry. The integrative approach reflects the diverse demands on the river. The action program is a strategic framework for projects related to the Danube until 2022. Every two years, the progress is reviewed and the implementation status is reflected.

The "Danube Action Program until 2022" is an integrative strategy for a balanced development of the diverse Danube. For the first time, the objectives of shipping as well as ecology and flood protection apply. New initiatives are bundled in a total of 23 measures, which make it possible to actively shape new developments in the Danube region. The wide range of proposed measures reflects the multifunctional character of the Danube and thus corresponds to the diverse requirements. The action program

focuses on the competencies of the Federal Ministry and can be implemented in its own sphere of activity.

An efficient transport system is an important basis for economic progress and social prosperity. On the one hand, a sustainable transport system causes low emissions and the lowest possible number of accidents, on the other hand it minimizes the consumption of resources, while efficiently handling the increasing volume of traffic. To such a transport system Danube navigation can make a significant contribution, as compared to everyone else it has mode of transport the lowest external costs and a large available transport capacity. This makes them an important element of more sustainable and resource-efficient multimodal transport networks in Europe.

This strategic document focuses on the objectives and desired effects.

Figure 1 Sustainable and secure development of the Danube as a place to live and work.

Objectives shipping

- Customer-oriented waterway management and improved navigation channel of the Danube
- Increasing the competitiveness of Danube shipping in logistics networks
- Increase in traffic safety and safe lock operation

Source: Aktionsprogramm Donau bis 2022

5 PROJECTION OF CRUISE TRAFFIC IN AUSTRIA

5.1 Danube-River Cruise Study 2019-2021

(with particular reference to the impact of the pandemic)

5.1.1 Market shares on the Danube

Around 40% of passenger traffic on the Danube is covered by four river cruise companies. With a share of 17% [with reference to passenger volume] Viking River Cruises is the market leader on the Danube, followed by A'Rosa and nicko cruises with 8% each and Phoenix Travel with 7%.

Main source markets on the Danube are USA/Canada/UK (46%) and the DACH markets Germany, Austria, Switzerland (43%).

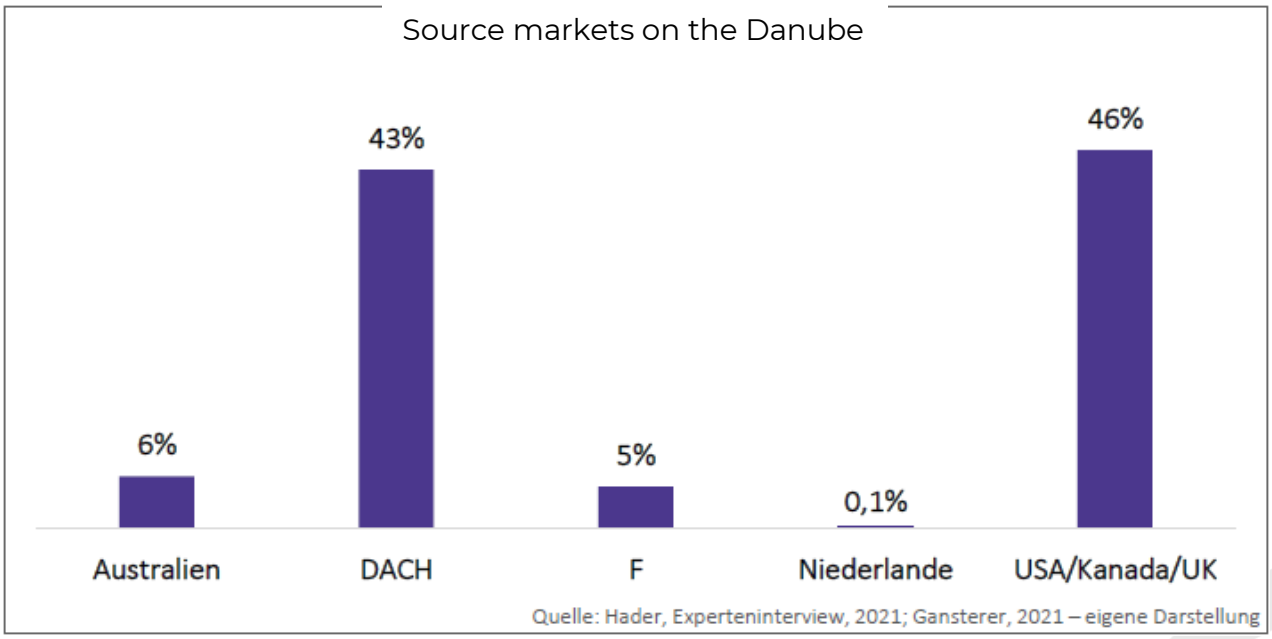

Figure 2 Source markets on the Danube

Source: Hader, Expert interview, 2021; Gansterer, 2021 – own graphics

5.1.2 Value Creation Analyses

With the value creation analysis 2019, an adequate basis for starting points after Corona are created!

2019 was the last season before the pandemic and for the River Cruise Industry an unproblematic season neither high- or low- water level nor other restrictions on the Danube.

Value drivers

- Land services
- Loading

- Port services
- Fuels and lubricants
- Additional expenses of the passengers

Net sales 2019 in Austria per regions

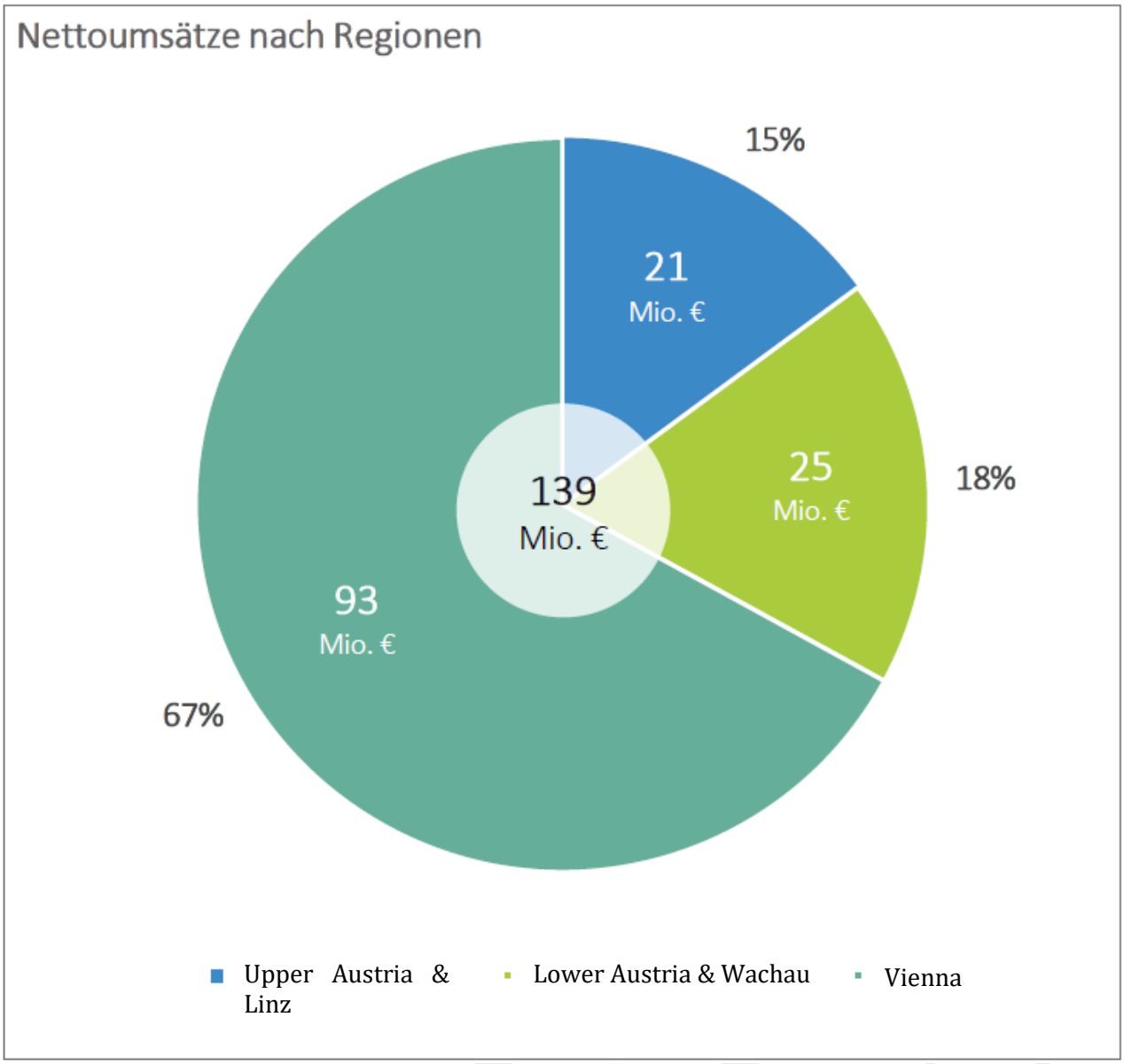

Figure 3 Net sales 2019 in Austria per regions

High frequency at the port of Vienna (Lower Austria)(incl. Wien Nussdorf): In Vienna more or less all ships dock. In addition, stay as good as all ships longer than at the other ports in Austria → More Time for activities including shopping [for comparison: In almost 40% of all journeys on the Danube there is a stop planned in Linz]

Net sales 2019 in Austria per value drivers

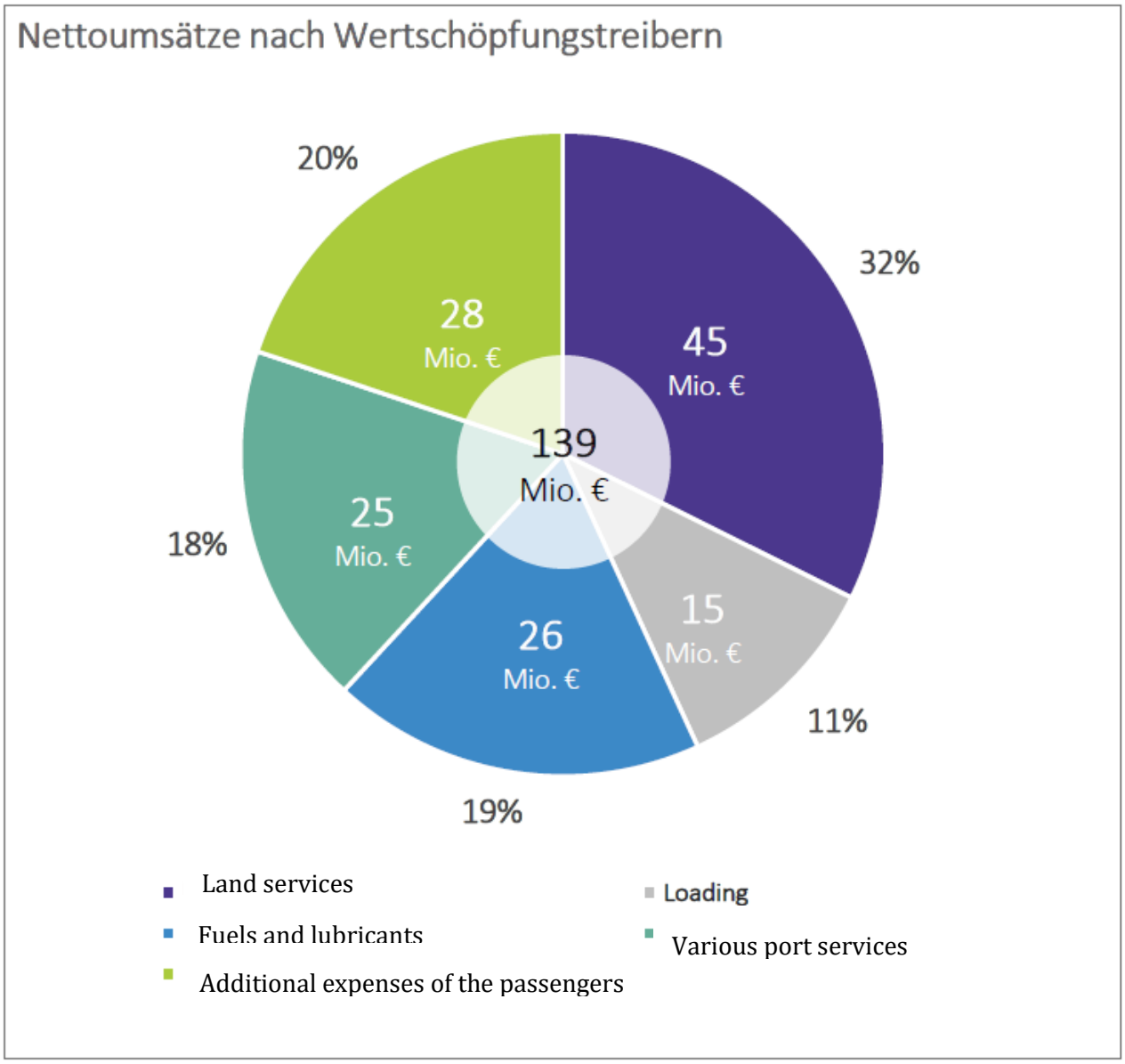

Figure 4 Net sales 2019 in Austria per value drivers

Land services

Sales are recorded that are made through agencies as well as directly with the providers are generated on site.

Important parameters for the extrapolation: Revenues for Viking River land services Cruises (market leader on the Danube), agency sales in the Wachau ("anchor" for the extrapolation), distribution of market shares among the agencies relevant in Austria approximation method.

Loading

- Total turnover main loading = number of passengers x Ø duration of the cruise in days x Ø Net expenses per passenger and day
- Austria Share of total turnover main loading according to experts: ≈ 15%
- Distribution of Austria sales to the regions in Austria according to the Supplier structure of important wholesalers
- Intermediate loading: According to the experts, the main loading takes 90% and that Intermediate loading 10% of the total loading turnover.

Fuels and lubricants

Drive and lubricants in Austria are almost exclusively in demand in Vienna.

Various port services

Docking fees and passage fee in Vienna, water supply and sanitation, waste disposal (municipal & private), shipyard services (especially ÖSWAG shipyard in Linz).

Additional expenses of the passengers

Base: questionnaire of the passengers from 2016

5.1.3 Current travel trends

Local tourism

More and more people want to avoid air travel hence they seek nearby targets.

Effects: Nearby markets are also becoming more important again in the river cruise market and are particularly important in times of Pandemic an important support for the industry. Especially with regard to the development of the overseas markets in the River Cruise Industry within the last few years, the DACH markets should therefore will come more into focus again.

Extension of the length of stay

...to reduce CO_2 footprints per travel day.

Effects: A longer stay means more time for shore leave, i.e. more time for individual exploration, for the Visit to insider tips and more time for purchases/shopping.

Over tourism

...is becoming more and more of a problem for both the locals as well as for the tourists.

Effects: Controlling the flow of visitors avoiding/correcting over tourism or hotspots opportunity for an insider tip offeror.

Slow travel

Desire for deceleration; Experiences want active perceived, not just impressions should be collected.

Effects: As a rule, slow travel cannot be experienced at the hotspots an opportunity for an insider tip offeror.

Authentic tourism

Vacationers want real encounters. Transformation from tourist to “temporary local”.

Effects: chance for an insider tip offeror

Security

Selection of the travel destination depending on the safety at the vacation spot.

Effects: Ensuring high security standards and sovereign action (“emergency management”) on the ship and on land without bringing the topic too much to the fore.

Virtual trips around the world

With the help of virtual technologies, holiday destinations can be be staged in a completely new and particularly effective way.

Effects: produce impressive VR films about the insider tips and market them via a wide variety of channels (Travel agencies, tour operators, product managers in the USA, on the ship,...)

5.1.4 Challenges

- massive slump in sales in 2020 and 2021, loss of sales in particular overseas markets
- difficult to plan - short-term changes in the framework conditions - different requirements in the neighboring countries and partly even within a country (e.g. Germany)
- risk of default by business partners; threatened stakeholders: guides, Shore service provider, shore gastronomy, river cruise Providers (shipping companies, tour operators, service agencies for infrastructure) The market shakeout process is accelerated by the crisis.
- Capacity bottlenecks on intercontinental flights: Difficult arrival from important long-distance markets
- Increasing costs due to various hygiene measures in the course of the Pandemic, some be seen as long-term or permanent measures
- Press reports about Corona outbreaks on ships → harm possibly the image of the industry (professional crisis management)
- There is a shortage of staff both on land (for the guides, in gastronomy), as well as on the river side (crew) There is a risk that the entire demand will no longer be satisfied in the future.

5.1.5 Perspectives

- Despite the current situation, the stakeholders are largely confident and optimistic for the Future. For the 2023 season, an increase in price and demand is mainly expected.

- The DACH markets will be the first to return to the Danube (2022) before demand is lost recovered from overseas markets (2023).
- Basically, the demand for river cruises is high even in times of the pandemic some trips are sold far in advance (the guests are in the “starting blocks”).
- In times of the pandemic, the DACH markets are proving to be an important pillar of the Danube River cruise industry.
- The topic of hotspots will remain an issue even after Corona. Nevertheless, the experts expect one increased demand for insider tip products, pushed by the pandemic and a general change in values. Berth management is becoming more and more important gain in order to rectify the situation on site as best as possible.
- Insider tips and decentralized investors thus get a real chance, especially through the increased demand from end customers demand-induced equalization of hotspots (vs. supply-induced equalization measures before the crisis)
- In general, it is recognized that in the future there will be more intensive cooperation between the river and landside, this will be necessary in order to be prepared for crises in the best possible way.
- More added value for the region by outsourcing "personnel-intensive" services on board: Services such as lunch/dinner, landside organization of cleaning staff on board, cooperation with training companies on land that provide their AZUBIS with added value etc.
- New formats for guest care on land (augmented reality)

Source: Donau-Flusskreuzfahrtstudie 2019-2021 (Centouris)

5.2 Danube Cruise picks up speed again

After two years without or with only a few guests, the first cruise ship from the United States docked in Krems (Lower Austria). Tourism hopes that more guests will come from overseas again in 2022. The forecasts are optimistic.

More than 600 ships, i.e. around 50,000 international guests, are expected again this year in Göttweig Abbey (Krems district). A "necessity", as Eveline Gruber-Jansen, spokeswoman for "Lower Austria's top excursion destinations", says. Before the pandemic, international guests, especially from the USA, often made up more than half of the tourists, especially at the larger destinations such as Melk Abbey and Göttweig Abbey.

“In 2019, 70,000 international visitors, mainly from the USA, were here. In comparison, there were 25,000 group visitors from Germany and Austria, as well as 25,000 individual travelers,” says Gruber-Jansen, who also heads the “Tourism & Culture” department at Göttweig Abbey.

However, the pandemic changed that abruptly: In 2020 no Danube cruise was possible more on this in CoV pandemic changes ship tourism (noe.ORF.at; 07/29/2020). The following year, Danube cruises were carried out on a very limited basis for a few months.

Probably still no guests from Asia

However, the forecasts for this year are optimistic. “It is urgently necessary for international tourists to come back. Because of the foundations, the monasteries own forest and the good price for wood in the last two years was able to compensate for the lack of guests, but in order to be able to retain employees in the long term, it is simply necessary for things to continue again," says Gruber-Jansen.

The war in Ukraine has not yet had any impact on the booking situation. Only guests from Asia are not expected this year. Cruise operators even took their offers in this regard off the market entirely. The situation will only be reassessed for 2023.

Source: noe.orf.at/stories/3148103/ - from 20.03.2022

6 Cruise berth demand in the ports of Austria

6.1 Cruise vessel trends

n.a.

6.2 Traffic data analyses

Following table shows the development of river cruises on the Danube in Austria. Constantly growing of passengers and cruise vessels on the Danube till 2019 before the Corona-crisis and as well an increase after the crises when Danube Cruise industry could start again in 2021.

Year	number of passengers for cruise vessel*	number of locks for cruise vessels at lock Aschach**	number of locks for cruise vessels at lock Freudenau**	share of vessels 135 m length at lock Freudenau**
2010	245.000	2.757	2.841	8%
2011	270.000	3.007	3.073	13%
2012	290.000	2.977	2.981	21%
2013	320.000	2.852	3.054	25%
2014	375.000	3.585	3.642	34%
2015	385.000	3.562	3.794	38%
2016	415.000	3.764	4.156	38%
2017	450.000	4.066	4.382	42%
2018	465.000	4.368	4.289	43%
2019	535.000	4.796	5.219	46%
2020	50.000	748	806	48%
2021	90.000	1.564	1.699	55%

Table 1 development of river cruises on the Danube in Austria

** Source: annual reports danube navigation 2010 - 2021 viadonau. The calculation of the total number of passengers on cabin ships is based on the number of trips by these ships through the Aschach and Freudenau locks. Usually, an average ship utilization of 75% is assumed and estimated with a 30% deduction for double counting. Due to the strict corona requirements, however, only a capacity utilization of 40% is assumed for 2020 and 2021.*

*** Source: Lock diaries locks Aschach and Freudenau*

6.3 Facility/infrastructure demand

In Austria the Ennshafen Port is only having a berth for small passenger vessel only for port cruises with registration of the group in advance, organized by a private company Donauschifffahrt Ardagger. Furthermore Ennshafen offers the quay during wintertime for vessels only for lying in the port (without passengers).

Thus, in this report we include the Port of Vienna in Austria which is having a passenger terminal at Handeslkai, location Reichsbrücke.

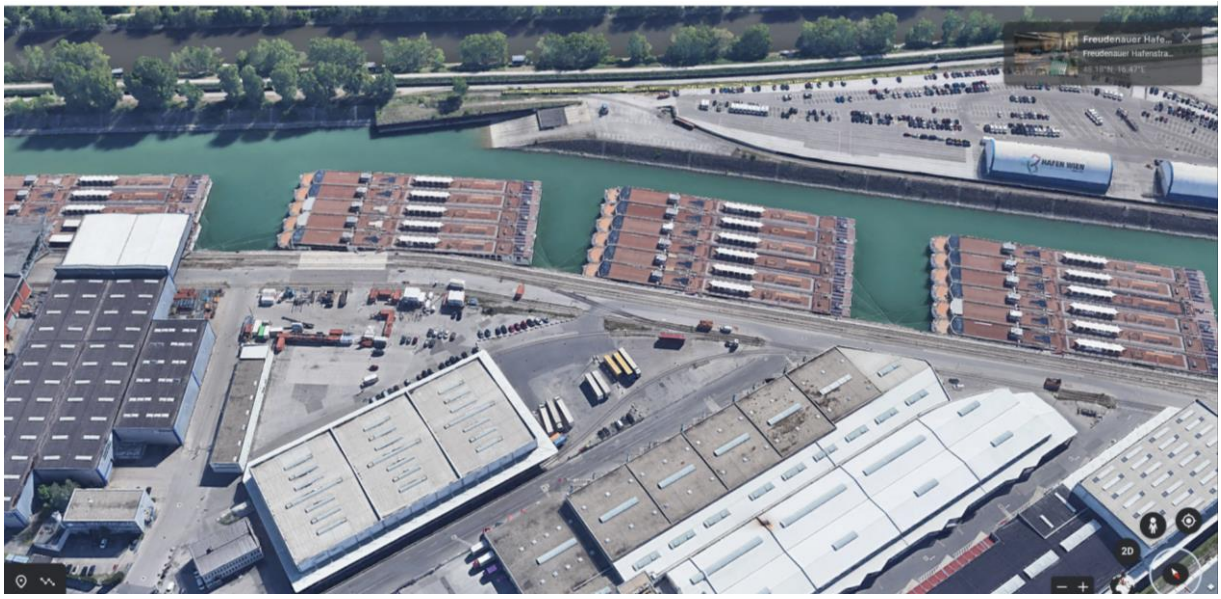

Figure 5 Cruise terminal/berth layout at Port of Vienna

Cruise terminal/berth layout at Port of Vienna

- Up to 25 ships possible (before were 30 - due to land reclamation water areas fall away),
- Access to ships via own access system - fence was erected (to prevent theft)
- People from outside the company have their own parking space

Areas:

- Waterside:
  - space for 25 Ships
- Landside:
  - 4x 20 TEU Container Office Space
  - Parkinglots
  - Passenger shipping entry and exit possible (extra price calculated)

Electricity is organized by the customer. The Port of Vienna takes care of the provision of water. Here the past consumption is from 400 cubic meters to 2500 cubic meters. In addition, the Port of Vienna organizes the waste management by means of skips. The respective company has its headquarters at the Port of Vienna, whereby the necessary distances are very short. Depending on the consumption, the skips are organized by the Port of Vienna.

Passenger shipping entry and exit possible

Offered only in special cases. Should not become a standard service of the Port of Vienna. For this purpose, there is a passenger terminal at Handelskai, location Reichsbrücke. A special case is for example: If an appointment in the city of Vienna is no longer reached in time, example visit to the opera. The Port of Vienna can be used as an exit point. This saves a considerable amount of time, as there is no need to lock the ship to reach the passenger terminal at Reichsbrücke.

7 Cruise development plans in the Austria

Cruise development plans at the Port of Vienna

In this point the Port of Vienna would like to discuss the creation of the business case. It began with initial talks concerning a winter port. Ships were only to be on site in winter to carry out appropriate maintenance and restoration work on the ships. This cooperation arose in the current year, before Corona.

It worked very well; all the actors involved were satisfied. The Corona pandemic forced our customer to suspend operations, and the Port of Vienna was also accommodating special Corona tariffs.

At the end of the year 2021 the Port of Vienna agreed on a long-term cooperation, as the business relationship is and has been a full success story so far. Thus, a 5-year contract was created, which can be extended as often as desired. The Port of Vienna guarantees a parking space for 25 ships plus the necessary parking and office space, as well as handling areas for the external companies that maintain and restore the ships. Plans for a large central warehouse at the Port of Vienna to guarantee the availability of parts were paused due to Corona.

The Port of Vienna plans to fill in its harbour basin and create a logistics area. For this reason, no more than 25 ships can find a safe and high-quality place in the port. At the beginning of the business relationship there were more.

7.1 Cruise terminal/berthing layout in the [port]

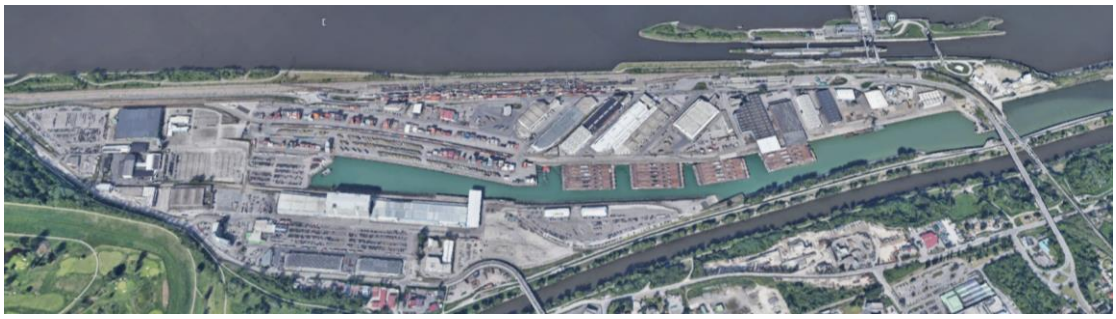

Figure 6 Terminal Layout Port of Vienna

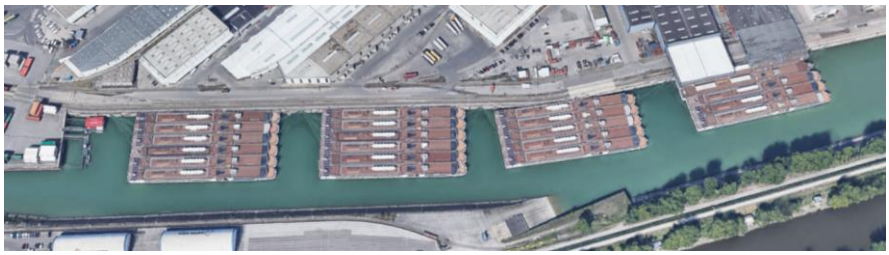

Figure 7 Terminal Layout Port of Vienna

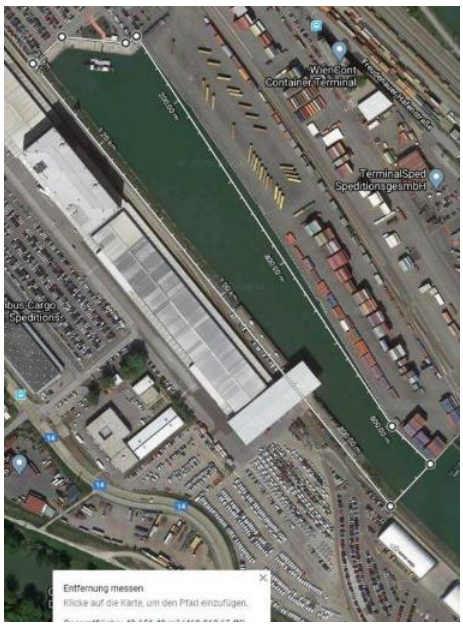

Figure 8 land reclamation 2023

7.2 Alternative development plans presented [2 alternatives presented and the recommended one]

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7.3 List of proposed investment projects. Recommendations

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D.T3.4.3 - National Infrastructure Master Plans: AT, SK, HU, HR, RS, BG, RO, MD, UA for sustainable development of River Cruise industry - SK

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3 Abbreviations

Abbreviation	Explanation
IWT	Inland water transport
RCI	river cruise industry
DR	Danube region
VPAS	Verejné prístavy, a.s. / Public ports, JSC

4 Overview

National Infrastructure Master Plan of Slovakia defines a long-term concept of the Bratislava public port development by respecting the specifications that result from the current situation in the port.

Passenger water transport in the ports of Slovakia is an area that currently shows higher potential growth but at the same time, its output still stays behind competing passenger ports located near Bratislava. This represents a highly urgent need to solve the current situation in the passenger port which achieves its capacity limits during the peak season. If the passenger port capacity is not tackled, it is probable that despite the dynamic development of this mode of transport, the port will not be able to exploit the resulting development opportunities.

The importance of the cruise segment is based on the fact that the cruise ships currently transit up to three-quarters of the total number of passengers carried in the Port Bratislava. The expected growth in the number of cruise ship passengers is also supported by the fact that the cruise ships become an increasingly attractive form of tourism. They combine adventure tourism with other active forms of relaxation. The opportunity that the port has not been able to exploit effectively yet is its location in a tourist area in close proximity to two international airports.

Besides the international tourism, there is an opportunity to increase the use of water transport by residents. It is assumed that if the Slovak consumers achieved the similar parameters of expenditures for passenger water transport services as they are in neighbouring Central European countries, it would lead to a massive expansion of the current level. Similarly, with conservative estimates, the planning launch of regular passenger water transport service in Bratislava region can lead to growing number of passengers currently transported by inland water transport in Slovakia and this number can be 4 or 5 times higher. The majority of inland water transport is realized in the Port Bratislava.

5 PROJECTION OF CRUISE TRAFFIC IN THE SLOVAKIA

In the Port Bratislava, the passenger water transport activities are currently less developed compared to other geographically close ports on the Danube (e.g. Vienna or Budapest). The starting base is so low that even a small growth would lead to the multiplication of baseline performance. Still, the existing potential for growth can only transfer itself into real demand once the conditions for real supply materialize.

VPAS is not the owner of the infrastructure in passenger ports and does not transport passengers. For that reason, it is not possible to calculate the assumption of the number of passengers from our position, other than from existing statistics from passenger operators.

6 Cruise berth demand in the ports of Slovakia

6.1 Cruise vessel trends

In the Port Bratislava, the passenger water transport activities are currently less developed compared to other geographically close ports on the Danube (e.g. Vienna or Budapest). The starting base is so low that even a small growth would lead to the multiplication of baseline performance. Still, the existing potential for growth can only transfer itself into real demand once the conditions for real supply materialize.

The activities related to passenger water transport in other Slovak ports, such as Komárno or Štúrovo, or cruises on various water reservoirs, are marginal in size. The data in following table show a clear increase in the number of landings of passenger ships at the Port Bratislava.

Number of passengers	Bratislava	Komárno	Štúrovo	SUM
2019	623 804	17 129	6 506	647 439
2020	59 339	4 926	2 076	66 341
2021	109 947	4 644	2 397	116 988
2022*	350 701	10 300	2 037	363 038

Figure 1 Number of Passengers

Number of landings	Bratislava	Komárno	Štúrovo	SUM
2019	3 164	126	77	3 367
2020	698	51	45	794
2021	1 188	42	19	1 249
2022*	2 739	89	15	2 843

Figure 2 Number of landings

The nature and equipment of the passenger port seem to be problematic and limiting further growth in performance. During the peak season, the landing positions in the Staré Mesto location are fully used, sometimes even above the expected limits for capacity. The result is the need to tie up even three ships side by side to one floating device which does not allow for further growth and may create an obstacle in the waterway. Therefore, one of the bottlenecks of this sector is evident: The sail of cabin passenger ships is the most dynamic segment of water

transport on the Danube, on the other hand, there are no further capacities available in Bratislava to benefit from this trend.

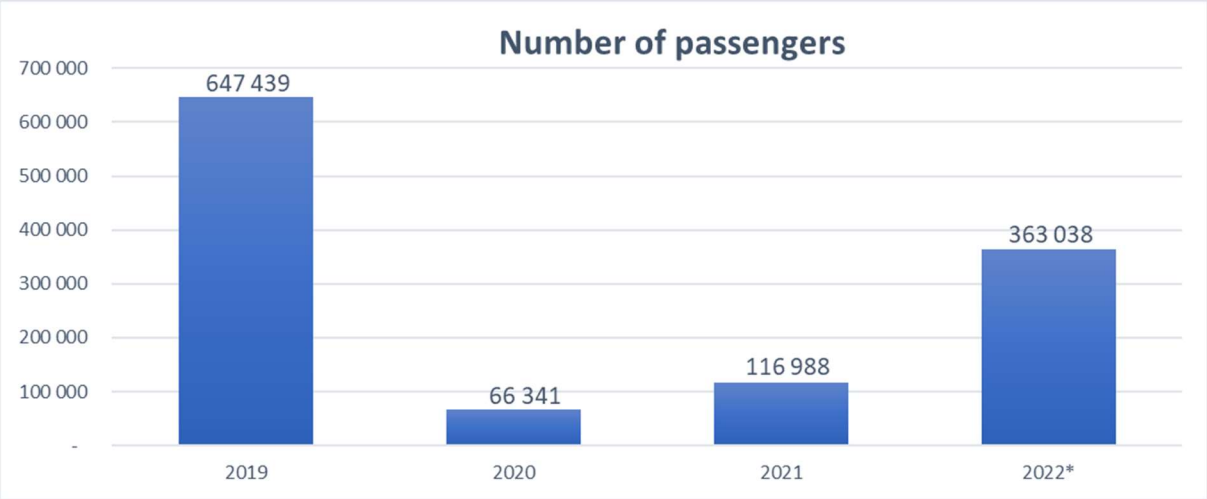


Figure 3 Chart of number of passengers

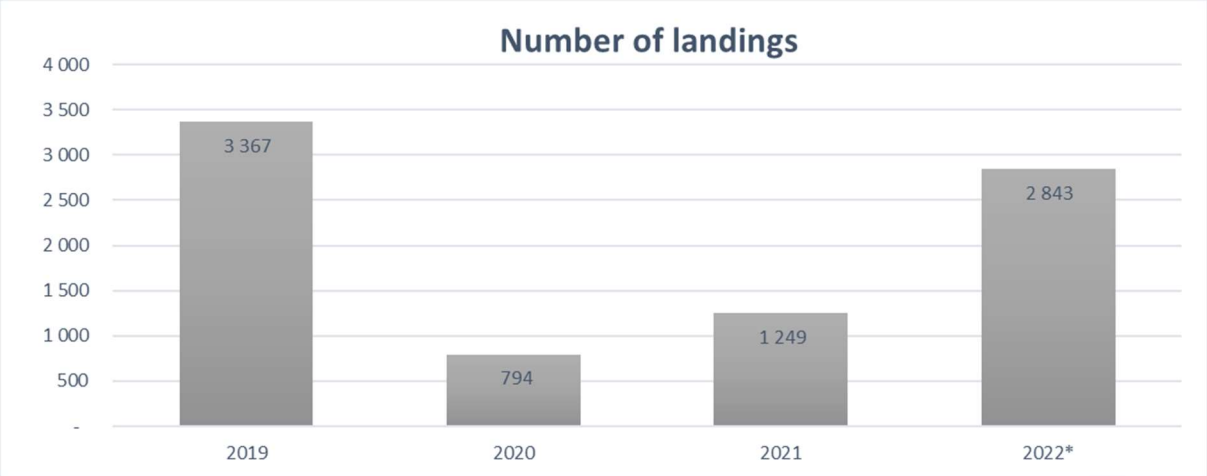


Figure 2 Chart of number of landings

6.2 Traffic data analyses

VPAS is not the owner of the infrastructure in passenger ports and does not transport passengers. The VPAS company does not record detailed statistics regarding vessels moored at locations leased by private operators of passenger shipping.

6.3 Facility/infrastructure demand

In the case of relocalization of transshipment activities from the Zimný prístav to the Pálenisko basin, large areas will release in the attractive part of the city. Direct access to the Danube waterway or to the north and south basin aquariums will be available. An important advantage of the site is relatively extensive transport infrastructure, which is to a large extent obsolete. Only some parts of the banks in the north and south basins have quay walls; however, the storage areas do not meet current requirements of logistics. Due to the high age of the port infrastructure and superstructure of the Zimný prístav, maintenance of transshipment activities would require high investment in modernization. The proposed option envisages rebuilding of cargo port in the part of the Zimný prístav into the terminal of passanger water transport and the port designed for sport and leisure transport. Consequently, it will require the investments in removal of old buildings, reconstruction of existing infrastructure (reinforced surfaces, fastening elements, perimeter edges, roads, railway track) as well as investments in new technical equipment that is needed for the operation of modern passenger terminal and marina. To determine the details of these investments and technical solutions for passenger terminal and marina should be the subject of a feasibility study.

7 Cruise development plans in Slovakia

The mission of VPAS is to ensure and operate the public ports in Slovakia and to participate in the preparation and implementation of construction and modernization of public ports, including the processing of short and long term conceptions of their development. The company should ensure the operation, registration, maintenance and repair of objects and facilities in the territorial districts of public ports. The aim is to become a competitive port in the Danube region, which provides a modern portfolio of port services. The company's commitment is to create an attractive investment space for operators in order to meet the EU's environmental objectives in the field of transport and contribute to reducing greenhouse gas emissions and increasing the share of environmental transport modes in the region.

VPAS also establishes activities in order to develop passenger and recreational water transport. The Port Bratislava should use its potential provided by the Danube River. Development activities in passenger water transport will contribute to the increase of the Slovak economy.

The activities should aim at the development of the missing infrastructure for passenger and sport-recreational navigation.

VPAS as the manager of public ports in the Slovak Republic, is burdened with a number of long-term lease contracts concluded in the past. Existing trade relations, together with ensuring sufficient funds, are therefore one of the main obstacles to the further development of the Port Bratislava and Komárno.

In terms of the Port Bratislava and Komárno, it means a non-standard division of ownership rights between VPAS. company as the owner of the land and Slovenská plavba a prístavy company, as a dominant operator and the owner of the fleet, infrastructure, and superstructure. The land on which the Slovenská plavba a prístavy company, operates is leased by a long-term fixed contract with VPAS. The agreement on the ownership and access to the infrastructure between these companies determines the future development or stagnation of the port.

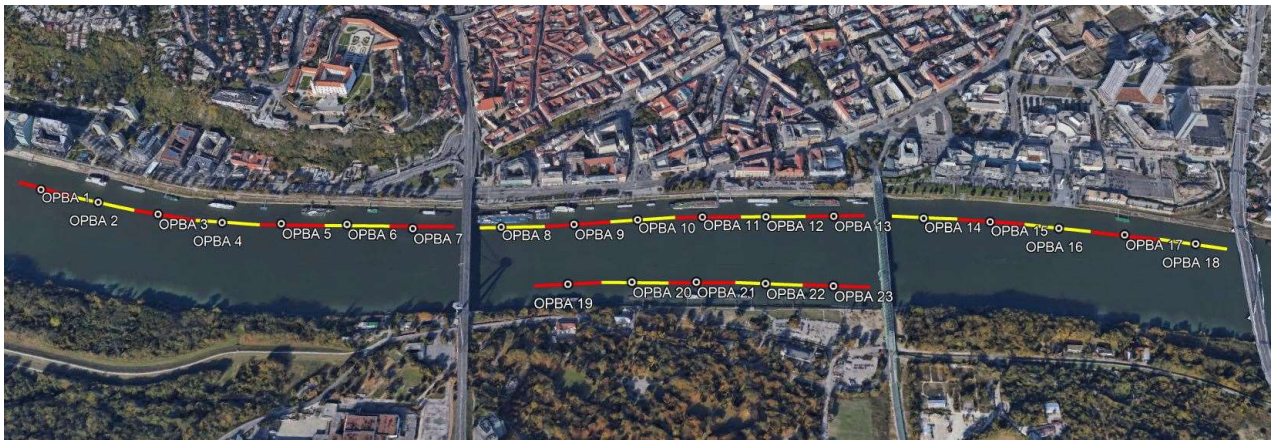
Based on this, we may conclude that:

- **River cruises have become an interesting new kind of tourism bringing additional tourists to the country.**
- **The type of activities carried out on river cruises is changing with a strong emphasis on adventure tourism, more demanding port services and wellness activities.**
- **In recent years, the demand for river cruises has experienced an unprecedented boom. That leads to the exhaustion of capacity limits for the Port Bratislava.**

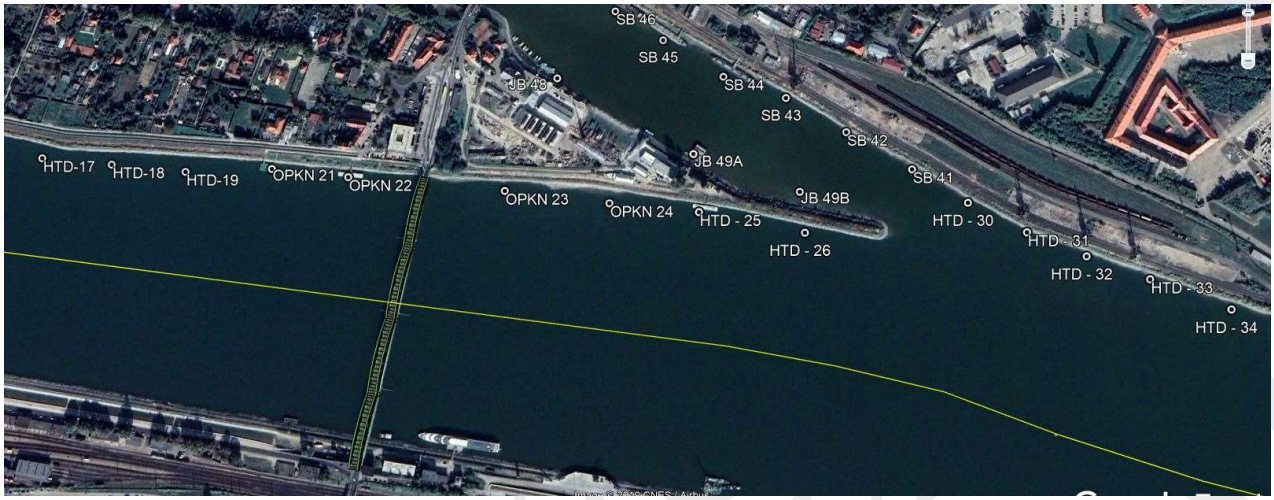
- **The continuous growth of this transportation segment is estimated with an annual growth rate between 5 – 8 %.**
- **Bratislava is geographically located in the most interesting part of the river with great potential for further development.**
- **Potential customers for river cruises are not limited to geographically close countries. The growing demand for this transportation segment is present also in more distant, even in overseas countries.**
- **The launch of regular passenger water transport service in the Bratislava region will lead to multiple increases in the number of transported passengers. Currently, the port is not optimally prepared to handle such an increase.**
- **The convergence in the expenditure structure of households to the other Central and Eastern Countries would represent a strong expansion of additional demand.**
- **The optimal solution for the estimated growing demand for passenger water transport in the Port Bratislava lies in increasing the port capacity by reconstruction and expansion of current location or in dislocation of the port into few locations by required port services (short landing, overnight stays or home port for cruise ships).**

The arguments listed above point to the fact that there is a great potential for the Bratislava passenger port. However, its current spatial arrangement with the majority of activities carried out in Staré Mesto location is gradually reaching its upper limits of capacity. If the increasing trend in passenger volumes continues and regular passenger water transport service is launched, its capacities will be exhausted and alternative options for passenger port expansion need to be addressed. In identifying the potential, several factors have been pointed out, predicting that the growth of passenger water transport is still in the early stage and is likely to continue in the coming years. If this capacity expansion is not addressed, the capacities will be reached soon and will create an obstacle to further growth. Eventually, that would lead to lagging behind in the performance compared to geographically close ports on the Danube river which Bratislava wants to catch up.

7.1 Cruise terminal/berthing layout in the port of Bratislava



7.2 Cruise terminal/berthing layout in the port of Komárno



7.3 Alternative development plans presented [2 alternatives presented and the recommended one]

The alternatives of passenger port arrangement concentrate in the locality of the current delimited area of the Port Bratislava as well as in the Zimný prístav.

Option 1 – Both Banks of the Danube

The first option for the passenger port is the extension to the Eurovea site and to the right bank of the Danube - Petržalka. The option envisages the modernization of port positions in the locality Staré Mesto (Old Town) and the construction of floating facilities in the locality Tyršovo nábrežie.

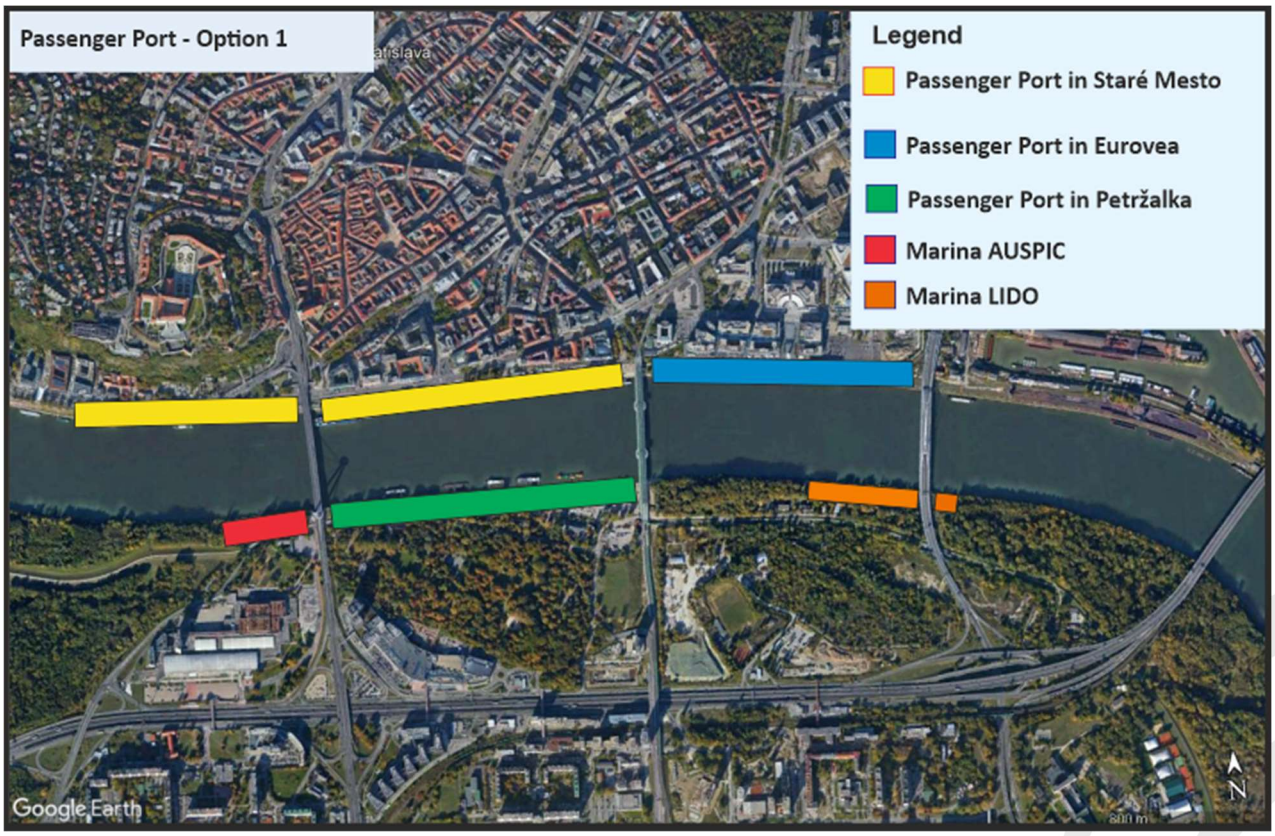


Figure 3 Option 1 – Passenger Port

The alternative to extend the passenger port also envisages the completion of the capacity for regular passenger water transport that provide services in the surroundings of Bratislava.

Option 1 - SWOT Analysis

Strengths	Weaknesses

• Reconstruction of the most attractive passenger port, which will improve the quality of services provided and improve the environmental situation • Expansion of port capacity at the area with the highest demand for landings - near the Staré Mesto (Old Town) • Increasing the flow of tourists directly in Eurovea • Establishment of port capacities for regular inland water transport • Making the right bank of the Danube more attractive and extending services to the population	• Port facilities and passenger ships at the Eurovea area would visualy separate the Eurovea complex from river access • The problem of inadequate coastal road infrastructure, especially of static traffic • Conflict with the opinion of the main architect of Bratislava in regard to the landing of vessels on the Eurovea wharf • The necessity of the reconstruction of the riverside edges and mooring elements
Opportunities	**Threats**
• Future spatial capacities for the expansion of other passenger water transport and sport - recreational cruise services • Providing sufficient space for regular passenger water transport on both banks of the Danube	• Due to the wide range of Danube embankments, it is difficult to monitor and organize the port area • Interventions in several city districts with similar type of traffic may create undesirable demands from city districts to build downstream infrastructure • Increasing the intensity of road transport in the mentioned development locations. • The reluctance of Eurovea owners to participate in the design of infrastructure projects

Option 2 – Both Banks of the Danube + Zimný prístav

The second option of the port layout suggests the reconstruction of the passenger port in the Staré Mesto (Old Town), the construction of berths for sports and recreational vessels and the installation of floating facilities in the Tyršovo nábrežie. The passenger terminal and the marina will be in Zimný prístav.

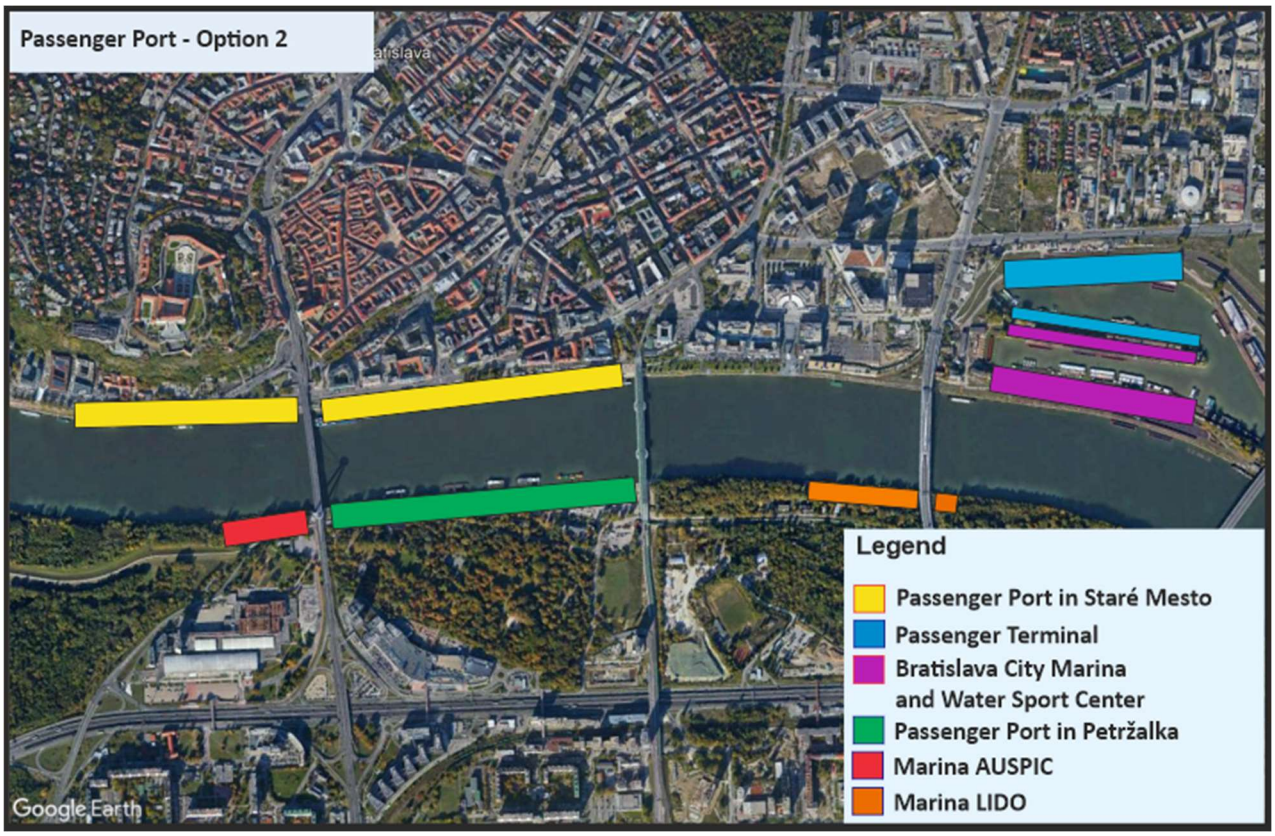


Figure 4 Option 2 – Passenger Port

This alternative has proposed to use the Zimný prístav for passenger water transport and sport and recreational cruises. In the northern basin of the Zimný prístav, we propose a new passenger terminal, which will relieve the congested location of the port in Staré Mesto (Old Town), provide the infrastructure for growing passenger transport and facilities for passenger vessels with longer landings in Bratislava.

We propose to use the Southern basin of the Zimný prístav to build the lack of sports and recreational infrastructure for the rapidly evolving demand for this kind of service. This location would suitably fit into the expanding city center and create space for a new sports and leisure zone. At the same time, there will be a space for long-term landings of recreational vessels and floating facilities.

Option 2 - SWOT Analysis

Strengths	Weaknesses

• Reconstruction of the most attractive passenger port, which will improve the quality of services provided and improve the environmental situation • Possibility to use existing infrastructure in the Zimný prístav • The construction of infrastructure for sport and recreational cruises will provide new business for VP a. s., which the company provided in a limited way. • Making the right bank of the Danube more attractive and extending services to the population • Better protection of passenger vessels in the Zimný prístav	• Cost-intensive option in terms of the reconstruction and extension of the existing Staré Mesto Port • Greater distance from the city centre in comparison with the Staré Mesto location • The need for an efficient road link between the Zimný prístav and the Staré Mesto (Old Town) • In some projects the connection to the riverside infrastructure is not sufficiently solved • Environmental burden in the Zimný prístav • The necessity of the reconstruction of the riverside edges and mooring elements
Opportunities	**Threats**
• Possibilities for further development of passenger water transport and sport-recreational cruises • Possibility to provide other additional services of passenger water transport and sport-recreational cruises • The new location for the passenger terminal will make the city district more attractive and at the same time relieve the Staré Mesto (Old Town)	• Possible inconsistency of the development plans of the Staré Mesto district with the development plans of VP, a. s. • Increasing the intensity of road transport in the mentioned development locations

The preferred option is Option 2, achieving the highest weighted score among the considered options. This option represents a solution of the spatial arrangement of the passenger port utilizing the potential of Zimný prístav location. It would become available by the transfer of bulk material transshipment operations to the Pálenisko location. It also ensures the development of sports and recreational cruises by the construction of a city marina in the same location. Moreover, the construction of AUSPIC marina and Lido lagoon by private investors on the right bank of the river is included in the preferred option.

The demand analysis for passenger water transport (regular and seasonal) on the Danube river has pointed out to the long-increasing demand for these types of

transport. The contemplated project of regular passenger water transport between Bratislava and the catchment area of the south-east part from the capital (Dunajbus) assumed the multiplication of users of passenger water transport. At the same time, cruise ships docked in the passenger port overnight must be tied side-by-side at the same docking position due to the lack of capacities. Based on this fact, they may form a barrier in the waterway as the demand for passenger transport increases. The solution is the implementation of Option no.2 which propose the allocation of the passenger terminal in the northern basin of the Zimný prístav. It would provide sufficient capacities for overnight landings, more efficient waste management and sufficient parking places for vehicles used by domestic port users and city visitors. Moreover, the location of the passenger terminal in the Zimný prístav will ease the congested Staré Mesto port which would also be a welcomed change for local government officials.

Construction of a city marina in the southern basin of the Zimný prístav would allow the creation of a new type of activities, which has lagged significantly behind other (comparable) river ports – sport and recreational cruises. At the same time, the development of this type of activities would represent a new type of income for VP a.s., which these operations have not covered yet.

However, this option is complicated from the legal-property point of view and assumes a successful deployment of the cargo port from the Zimný prístav location to the Pálenisko location. If these settlements could not be achieved within a reasonable time horizon, Option no. 1 would become the preferred one. It deals with the port extension in Staré Mesto location on the left bank of the river. However, the implementation of this option is limited by other real estate projects and water structures built near it or limited space for parking required for passenger port operation. The development of recreational and sports cruises should be supported by the construction of floating facilities within the EUROVEA promenade. However, its owners are not interested in pursuing this kind of activities.

A necessary requirement for the revitalization of the Zimný prístav is to maintain the function of this site as a protective port i.e. the port where the vessels are protected in the caset of an emergency on the waterway.

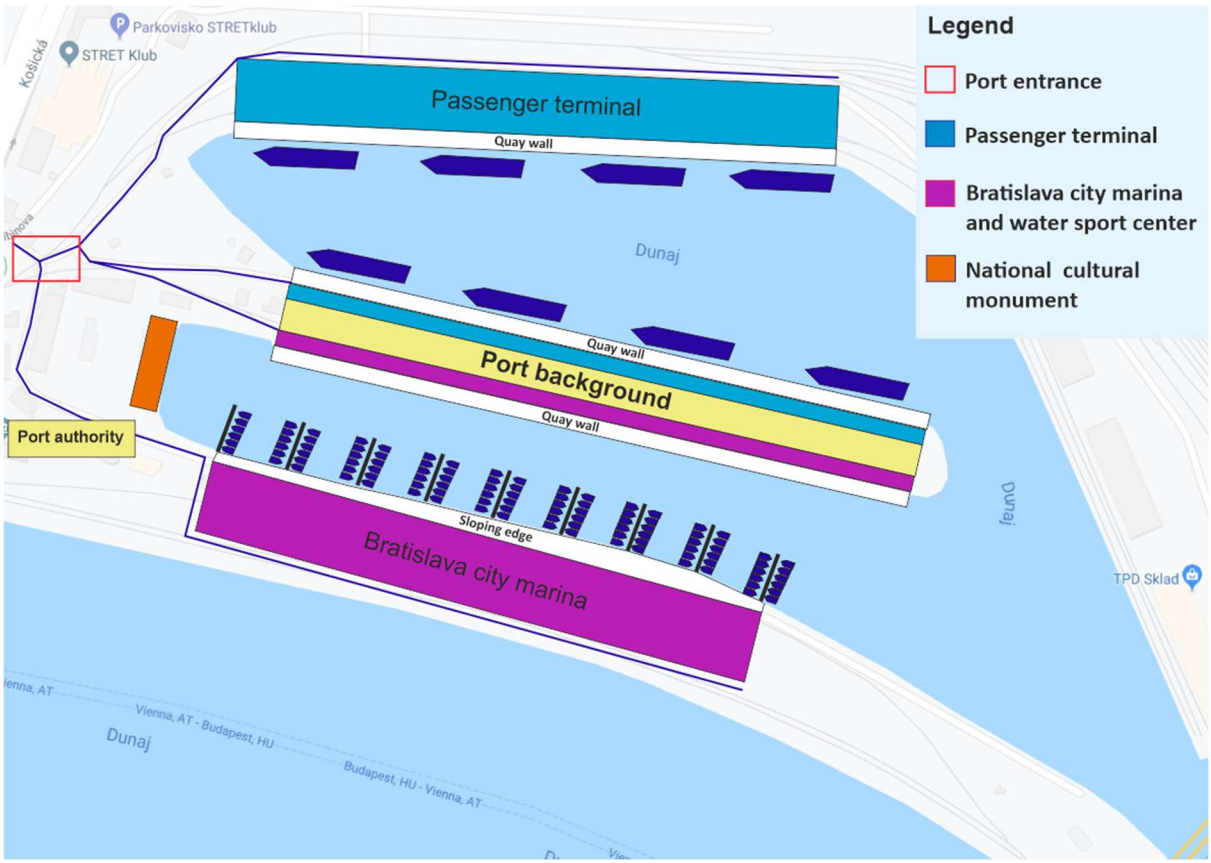


Figure 5 Layout of the Passenger Terminal

7.4 List of proposed investment projects. Recommendations

At present, the port operations for passenger water transport help to ensure pontoons concentrated between the Lafranconi Bridge and the New Bridge., besides the part of the passenger port between the SNP bridge and the Starý bridge.

Within the Bratislava Passenger Port, which plays a significant role in passenger transportation, it is necessary to reconsider its current capacity and functional layout. It is also inevitable to cosider the location of the port in the city center. Passenger water transport is primarily linked to tourism, but at the same time the proximity of the historic center limits the possibility of further development of the port in the the Staré Mesto (Old Town). In terms of passenger service, the basic problem is the insufficient parking capacity (especially bus capacity) that is necessary in order to ensure the subsequent transport of passengers from the Staré Mesto port (Old Town port).

For this reason, it is possible to think about extending of the port capacity for passenger transport in the Zimný prístav. All locations of the passenger port are privately owned. They are rented from the landlord and are primarily required to arrange the landing of passenger cabin vessels. At the passenger port there is also located a privately owned building with the identical name "Passenger Port".

The cabin passenger and cruise ships are currently landing at this location. Due to the convenient location near the city center and Bratislava Castle and the great interest of cabin passenger vessels operators in landing, this landing position is maximized in the peak season. As a result, it is necessary to tie up to three vessels side by side in the same berth. A passenger port provides vessels limited range and level of basic port services, that result in the creation of environmental burdens in the city. Some pontoons are outdated with difficult access for disabled visitors and emergency medical assistance. Transport infrastructure on the shore does not meet modern standards expectations, road access to pontoons is limited, bus parking and passenger access is possible in a nearby parking lot that is not built for this purpose.

Based on the unsatisfactory infrastructure in the passenger port of Bratislava, immediate measures must be adopted in order to ensure the safety of passengers. The level of infrastructure capacity needs to be adjusted to the current needs. It is necessary to diversify another increase in transport performance into other locations in the Port Bratislava.

The following projects emerged as the most suitable development projects from the demand analysis in the area of passenger water transport development in the Port Bratislava:

Modernization of berths in passenger port

Within the modernization of Bratislava passenger port in the Staré Mesto locality, several steps have to be realized in order to increase the traffic flow and level of services.

Among the most important belongs:

- **Installation of modern port facilities capable to manage an increase in number of cruise ships, with imposed limit of maximal daily traffic,**
- **construction of port facilities providing basic services such as drinking water, waste disposal, power connection (Lockers),**

- **on-shore infrastructure solutions that will respect uninterrupted pedestrian promenade on a bank of the river and at the same time allow short-term access of vehicles for pick up and drop-off the passengers,**
- **build a public pier for regular public passenger water transport,**
- **resolution of transparent parking policy for the passenger port.**

New passenger terminal

This terminal with specialization in passenger water transport would provide complex passenger services as well as technical-service services for vessels that relate to the supply of fresh drinking water, food, consumer goods and waste disposal.

Location of a new passenger terminal should reflect an increase in infrastructure requirements that would provide sufficient space for land transport and direct access to buses and service vehicles.

The advantage of the Port Bratislava is its proximity to two airports, Schwechat and Bratislava. The passenger terminal can provide a boarding and disembarkation services for the international passengers, which is the dominant part of the cabin crew.

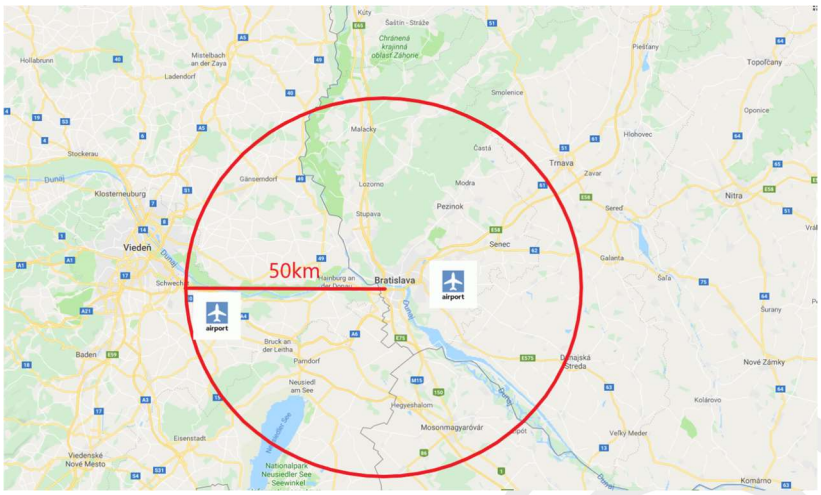


Figure 6 The catchment area of the port Bratislava

Besides above-mentioned services, the Port Bratislava could offer additional services that relate to technical maintenance and repairs of vessels.

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DIONYSUS

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

D.T3.4.3 - National Infrastructure Master Plans: AT, SK, HU, HR, RS, BG, RO, MD, UA for sustainable development of River Cruise industry – HU

[Version 2]

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3 Abbreviations

Abbreviation	Explanation
IWT	Inland water transport
RCI	river cruise industry
Nts	Notices to Skippers
DC	Danube Commission
CCNR	Central Commission for the Navigation of Rhein
RSOE	National Association of Radio Distress-Signalling and Infocommunications
NNS	National Navigation Strategy (2012)
Strategy	National Transport Development Strategy
Concept	*2030 Budapest Long Term Urban Development Concept.*
Plan	Balázs Mór Plan
Study	Budapest's riverside development study
Program	Transport development and investment program

4 Overview

4.1 Master Plans

Hungary has no government approved specific IWT strategy. What it has is the National Transport Development Strategy (hereinafter the Strategy) dated back to 2014. It was approved by the government. However, there is a National Navigation Strategy (2012), but it has no approval on behalf of any organization of state administration, it is rather the wish list of the IWT sector. The Strategy has been developed as a result of extensive consultation under the control of the Ministry for National Development and the Hungarian Transport Administration incorporating the conclusions of public consultation too. The ultimate goal of the Strategy for 2014-2050 is to have a transport infrastructure in place that fully strengthens the competitiveness of Hungary by effectively supporting economic processes. The strategic goal is to ensure the mobility needed for the economy and the prosperity of the society.

IWT has a minor role both in freight traffic and public transportation on national level. On the other hand, it satisfies certain specific needs, like River Cruising Industry (RCI) and cereal export. Because of its relative insignificance IWT got only a small consideration within the Strategy. So small in fact, that it is practical to quote the entirety of the part considering RCI:

"Although the Danube runs across the city as a natural travel route, it's hardly used for public transport. Currently and in the medium term "longitudinal" passenger transport on the river will primarily serve tourism. International boat traffic uses both the northern and southern section of the Danube. There are currently 78 public piers in Budapest serving boat lines, with 7 additional piers catering for stationary vessels and 8 utility ports. The potential of passenger transport on the river strengthens as the land transport network becomes increasingly congested and tourism and local demand continue to grow. Travel by boat is expected to increase both in public transportation and tourism, but does not represent a significant transport performance. There is a demand for further local or regional riverboat lines – similar to the one in Budapest – in cities such as Győr and Szeged. It is in Hungary's best interest to ensure that tour operators continue to regard Budapest as one of the main attractions along the Danube. ***The city must continue to allow boats to moor in its downtown area and the infrastructure needs to be improved to provide better service. However, the boats should anchor, change passengers, and take supplies***

on board in less frequented designated areas (between the city limits and the downtown area), where these tasks could be accomplished more easily owing to a better supporting infrastructure."

(Quote: National Transport Development Strategy, 2.1.2. Functional region and comprehensive analysis of the transport system)

So far, the Strategy's predictions on public transportation increasement did not become reality; on the contrary: the Budapest Public Transport Company (BKK) reduced the level of its passenger boat related services since then. Recently it is rather a city tour boat service which cannot be used with the standard single ticket and departures only every two hours.

As for the RCI and companies offering local river sightseeing cruises the predictions worked out, and the number of their passengers are continuously growing, apart from the period of the COVID pandemic.

Under Strategy's chapter 4.2 "Development measures" there is a measure concerning RCI infrastructure, although lessening its significance that it is to be found under "*Measures with limited feasibility and medium social utility*", within "*Measures requiring preparation efforts"*:

"DEVELOPMENT AND ESTABLISHMENT OF PASSENGER TRAFFIC BOARDING PIERS INTERCONNECTION OF BOAT SERVICE, MODERNISATION OF PASSENGER SHIPS

New passenger traffic piers, the development of existing conditions, the establishment of good pedestrian access from the bank to the ships in the ports offer more possibilities for cruises and local tourism, improve the cityscape. *The possibility of new combined traffic in the agglomeration of big cities – for the commuter traffic – would reduce congestions of urban public roads and would improve accessibility on water. By maintaining and strengthening the role of ferry service in regional public transport and by the modernization of its assets as well as the establishment of new ferry crossings would largely improve city transport connections. The replacement and modernization of the ship fleet will result in better service quality of passenger transport.*

The phrase "cruise" in the bold part of the quote stands for "river cruising ship" in the Hungarian text of the Strategy.

The Strategy lightens the well-known fact that Budapest is the most important port for RCI, and rural ports has only marginal traffic compared to it. Therefore, this overview concentrates primarily on the capital.

Naturally the municipality of Budapest has also prepared numerous concepts and strategies concerning many functions of the capital. There is a good reason to investigate details when it comes to municipality papers: except for some insignificantly small proportion the whole Danube bank in the city is owned by the municipality, therefore nothing – including ports - may be implemented against its will and its legislation.

There are two of these documents which contains remarkable conceptions on the future of RCI infrastructure in Budapest.

The first document is the *2030 Budapest Long Term Urban Development Concept*. (hereinafter: Concept). It was adopted by the General Assembly under Decision Number 767/2013 of 24 April 2013. For the General Assembly of Budapest, the concept serves as a guiding tool along which short and medium-term plans and decisions can be developed. As such, the Concept has significant influence on the circumstances of people living and working in Budapest, and on all players within the economy.

The first relevant subpoint to be quoted:

*"**8.7. Differentiated mooring regulations for hotel ships***

Installation of floating platforms. The most spectacular sights of navigation in Budapest are the international hotel ships mooring mainly along the banks near the inner city, highly attractive to tourists. In addition to the hotel ships, restaurant ships have also become constant features of the cityscape. The steadily increasing demand generated by the hotels ships in the past years is to be met by creating an up-to-database. Besides their protection, the prominent cityscape characteristics of the natural and built environment of the city must also be adapted so as to become its worthy reception points. ***Disorderly or at best ad hoc bank utilisation along the entire length of the city should give way to differentiated and rationalised use. Potential general means of implementation:***

- ***Construction of new, decentralised hotel ship mooring facilities;***
- ***Regulation of the use of the banks.***

8.8. Better use of the Danube as a waterway

Potential general means of implementation:

- *Vehicle procurement;*
- *Deployment of transfer connections;*
- *Development of port infrastructure.*

Service to the hotel ships needs to be aligned with the traffic conditions of the receiving environment and the location of safe pedestrian access sites. The range of mooring sites suitable for receiving hotel ships can be extended on both sides of the Danube, but stationary mooring should be allowed on one side only in each riverside section*. The installation of floating platforms is to be regulated in consideration primarily of the cityscape and environmental protection, shipping, infrastructural and safety criteria involved."*

The second subpoint.

*"**11.5. Development of city navigation Within Budapest,***

the Danube River offers a north-south transport option. A more efficient and environmentally friendly water transport system should be made an integral part of traditional urban community transport, even though it represents a substantially smaller factor for travel needs than other types of transport. Navigation within the city will be viable primarily for transport needs between the north and south. Scheduled water transport within the city and between the city and other settlements near the city border located next to the river should be created in an integrated manner (2.8. Launching interurban navigation). Navigation needs across the Danube are actually substitutes for a bridge, so they should be satisfied between parts of the Suburban Zone (where bridges are further apart), along the northern and southern bank sections of Budapest. The success of water transport is determined by transfer possibilities to land community transport networks, the evolution of riverbank areas, the port infrastructure and quality standard of transport offered by navigation (speed, intervals between boats, comfort) to a significant extent. As regards cargo transport within the city (and the region), navigation cannot play a substantial role due to the short transport distances and the need to reload cargo. Its significance arises only in national and international shipping (4.13. Port development in international passenger transport and cargo shipping).

Last quote from the Concept.

"***4.13. Port development for international passenger and goods transport***

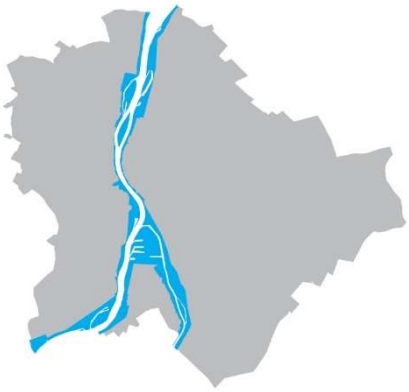

Fig. 1. Danube zone

The international port in the inner city (as main port) does not presently provide high standard passenger traffic services: it should be developed at a new location, associated with more comprehensive solutions for operational functions.

Danube zone International and national transport connections: The zone along the Danube is the only area for water transport. Potentials in transport modes resulting in low environmental burdens should be exploited as fully as possible.

- ***Relocation of the international ship station with high standard operational functions;***
- *Development of road and rail connections to Csepel Free Port;*
- *Establishment of DILC (Danube Intermodal Logistic Centre, subject to adequate transport demand).*

However, during the elaboration of the Concept the legal environment which regulates settlement planning changed notably, and so the technical content of the settlement structure plan and settlement regulations were decreased significantly. Hence the detailed outcomes of the Concept could not have been incorporated in those legally binding papers, although the new location for international passenger port is in the settlement structural plan (see fig 15.).

The other document worth considering was created in connection with "*Balázs Mór Plan*" (hereinafter: Plan). It's title is *Budapest's riverside development study,* (hereinafter Study, consists of two volumes: Study_1, Study_2) and it was prepared in 2012 on the basis of the Plan's updated situation analysis.

Before investigating the Study, the Plan's importance must be emphasized. The Plan is Budapest's Transport Development Strategy for the 2014-2030 period. The Plan was adopted by the Assembly of Budapest first in 2015, and second time it approved on the revised Plan in 2019. The revised Plan's title is "*Budapest Mobility Plan 2030*". The plan and the revised plan only consider the waterborne public transport and do not pay attention to RIC infrastructure development specifically, although it deals with the

development of the lower and upper quays on both banks of the Danube. Details of quay development plans are investigated in chapter 7.2.

The Study investigates the best possible locations for river cruise ship ports from many aspects, which is unique compared to the prior and later studies, not to mention ad hoc decisions made on custom and historical heritage. The study's only weak point is that it does not consider the possibility of shore power, but supposedly this does not affect the consequences it derives.

Although detailed outcomes of the Study have not been incorporated in the Plan and revised Plan it still worth to consider the Study's relevant chapter because it will surely be one of the fundamental inputs for future infrastructure development decisions. This is further affirmed by the fact that the Concept and the settlement structural plan is in coherence with the Study, yet the latter is much more detailed. To make the point the map of suggested international port location of the Study and the settlement structural plane may be compared in chapter 7.3. (Fig 15 and Fig. 17.).

The new location of the international passenger port between the Rákóczi and Petőfi bridges, on the left bank. The port building is intended to be an already existing edifice, the Bálna, which recently functioning as a poorly utilized mall. The Study states that this building can facilitate the port related services, and it has significant bus parking capacities (both under- and aboveground). Yet ports on Belgrade quay may operate uninterruptedly after the implementation of the new international passenger port.

4.2 Existing infrastructure

On the Hungarian stretch of the Danube there are no dams, therefore the range of water level changes is several meters. Therefore, river cruising ships cannot moor directly on vertical walls of quays, only to a pontoon, which is connected to the shore with a footbridge.

As stated before, port operators usually hire the bank for their pontoons. These contracts may be altered on the whim of the owner of the real estate, which is the municipality in most cases[1] (it happened in 2012 to several ports which were situated on the right riverbank, in the vicinity of Lánchíd bridge[2]). This risk is further elevated by

[1] https://mkogy.jogtar.hu/jogszabaly?docid=a1300074.TV

[2] https://index.hu/belfold/budapest/2012/08/10/kitiltottak_a_szallodahajokat_az_i._keruletbol/

water surface lease contract which is to be concluded with the trustee of the Danube riverbed. These risks do not encourage port operators to invest more than enough to ensure the minimal technical requirements for ships to berth. Aside from a few ports (international port on Belgrade quay, Vigadó square) there are no premises to facilitate port related services. The reason is simple, there is no free suitable real estate to build them in downtown. Most of the ports are connected to riverside where the elevation of the bank is lower than the height of the flood, which also do not favour permanent buildings. Therefore, most of the ports cannot offer services beyond getting on and off the ship. There is also a scarcity of bus parking lots. Lower quays are dominated by public roads, and typically offering inconvenient conditions for passengers to get on a bus.

Demand for downtown ports exceeds the supply for many years on. The practical solution is that two, or even three ships are moored side by side to one pontoon. It means inconvenience for the passengers, as the side of ships are at different height above water surface, therefore they must get over stairs and ramps while landing through other ships.

Nowadays there is no port in Hungary which can offer proper shore power for river cruising ships. Port operators and inhabitants also understood its importance (noise- and air pollution are actual issues at some ports), unfortunately calculations shows that the cost of developing the city's electrical system to endure such a big load is enormous, not to mention technical difficulties (such as find adequate location for transformer stations). Permanent port locations and hire contracts are basic conditions for shore electricity developments.

Fortunately, in the last few years new kind of services were introduced for river cruising ships. In downtown ports there is no possibility to serve out ships from the shore, hence garbage is taken away on a service boat. It is capable to serve out seven to eight river cruise ship one day. Refuelling happens likewise, and there are already two ships operates to this end.

Sewage takeover is poorly facilitated in Budapest. There is no port where sewage (black water) could be discharged right into the city's sewerage system. The city has only one port, the so-called *Green Island Port* where ships can discharge sewage and bilge water into the bunkerage's of the pontoon. The pontoon discharges the gathered impurities into tank-cars, which is getting more and more cumbersome with increasing trade.

It must be mentioned that unlike on the Rhein there is no international solution on the issue of bilge water and oily, greasy waste handling. On the Rhein the fee of free discharge of those wastes is built in the price of gasoline. Waste collecting enterprises are getting compensation on terms of the quantity of the material they gather. In Hungary there is no national, or international solution on that issue, hence these services must be paid by the ships which does not motivate them not to jettison different kind of waste materials. Danube Commission is concerned with the problem as the most competent international organization, nonetheless solution does not seem to get closer for years.

4.3 Navigation conditions

Although navigation conditions do not appertain strictly to port infrastructure development, they effect the utilisation, method of use.

Major factors affecting RCI in Budapest:

- Riverbed grow narrow in the downtown compared to down- and upstream sections, density of ports is high.
- Local city sightseeing boats generates heavy traffic in the first few hours after sunset – illuminated city is still the most attractive spectacle.
- Most of the local sightseeing boats turns around on the same two places – upstream to Petőfi bridge, and downstream to Margit bridge.
- All ships must keep right, which makes difficult to cast off from the right bank, moor to a pontoon on the left bank when there is heavy traffic.
- River cruising ships are also doing city sightseeing tours after sunset.
- Local city sightseeing boats have strict schedule; hence skippers tend to undertake risky traffic situations, manoeuvres and/or lesser infringements to be on time.
- Typical traffic situations for instance when two-four passenger ship navigates downstream next to each other. Other typical situation is when ship navigates through Margit bridge in downstream direction, and another (passenger) ship turns around to downstream direction directly downstream to Margit bridge, right in the path of the first ship.
- The radio communication between ships is not flowless at least. There are Hungarian skippers who does not speak/understands German adequately, hence speaking Hungarian, or not transmitting at all. The consequence is that

the communication could be troubled between local boats and river cruising ships. Navigation authority perceived this communication problem and issued a recommendation in the form of Notices To Skippers (003/Taj/2018 Nts). It also contains a small German-Hungarian vocabulary of professional and often used phrases, and names of certain riparian places alongside the riverbanks of the city.

The navigation authority issued the first Nts to resolve the above detailed problems containing rules concerning specifically river cruising ships in 2015. The regulation was revised in 2018 and 2021 on the grounds of the prior period's experiences.

It became sophisticated and short over times, and the most recent version (61/Du/2021 Nts) contains only three rules:

Following rules mut be applied on the Danube stretch between 1654,50-1642,00 rkm sections, between 18:00 and 24:00:

1. *Turnaround is forbidden for passenger **ships longer than 80 meters** between 1652,8-1642,00 rkm sections (Árpád and Petőfi bridges).*
2. *Passenger ships longer than 80 meters must execute turnaround in the following fashion:*
    - *navigating downstream the turnaround must be started alongside the right bank into the direction to the left bank,*
    - *navigating upstream the turnaround must be started alongside the left bank into the direction to the right bank.*
3. *It is forbidden except for hydrofoils to make a turnaround between Erzsébet bridge (1646,0 rkm) and Szabadság bridge (1645,3 rkm).*

The tragic accident of the Hableány passenger boat happened in 2019 must be mentioned, as it was the most severe since Pajtás passenger boat sinked at lake Balaton seven decades ago. Many demanded the introduction of further rules on passenger ship traffic – especially on river cruising ships - after the waves of shock and grief settled. However, the results of the investigation have not revealed any unregulated contributing factor. It was solely up to carelessness of the skippers. Navigation authority wisely has not modified or added rules to the existing ones although fair pressure had been put on it. However, this does not mean that traffic cannot reach such a density where navigation authority will not intervene. It is very clear to all parties that one of the major risks which must be addressed – and it is already taken care of for the time being – is that river cruising ships and comparatively small

passenger boats are navigating at great number on this relatively narrow Danube section after dusk. City lights makes little boats hard to be sighted, radar proximity alert gives signal so frequently that it loses its significance (proximity alert was also switched off on the river cruising ship which hit ms Hableány), and ships crossing the fairway all the time while they are heading to berth or turning around after casting off. It may be wise to be braced, or even better be prepared for the time when river cruising ships will not be allowed to make evening city sightseeing tours.

4.4 Miscellaneous

4.4.1 Mosoni-Danube

The recently finished dam at the mouth of Mosoni-Danube is fully operational. The navigation authority issued a Nts to inform skippers on the order of operation (32/DuM/2022). The lock's length is 90 meters, breadth is 12 meters, water depth at Navigational Low Water is 3 meters. The dam compensates the unfavourable effects of Danube's riverbed degradation. From now on water levels on Mosoni-Danbe resembles they used to be decades ago, when navigation was possible for freight ships up until Győr. Hopefully RCI will utilize the opportunity to present the spectacles and rich historical heritage of Győr. The Győr-Gönyű National Public Port could ensure ideal conditions for the necessary infrastructure development. The inner city is only 14 kilometers away from the dam which may be covered in 15 minutes on a hydrofoil or water jet ship (see Fig 18.).

4.4.2 Navigability of Tisza

Tisza is a tributary river of the Danube with the biggest unexploited shipping potential; due to several reasons this potential has not been utilised by RCI. A small and shallow draught river cruising ship managed to navigate upstream until Tokaj with passengers onboard several times, although not every time without difficulties. These attempts show that Tisza ha a certain attractiveness for RCI. Although all three dams were reconstructed in the near past (Tiszalök, Kisköre, Tiszabecse (the latter in Serbia) the main burden – the missing dam at Csongrád - still hinders navigation.

4.4.3 Navigability of Danube

The navigability of the Hungarian Danube section does not fit the needs of RCI entirely. There is no problem with the horizontal dimensions of the fairway - far longer and wider freight ships navigating through the Hungarian section of the Danube every day, even

during low water periods. Water depth in certain sections of the fairway (in fords) does not sufficient for deep draught river cruising ships when water level of the Danube is decreases to, or below Navigational Low Water. Practically the ship must stop afore the ford and may only navigate through it when the water level increases to a sufficient height. Unfortunately, not all fords can be eliminated by fairway maintenance works (which practically means dredging), only big scale river regulation works can solve the problem of insufficient water depth.

The *Kvassay Jenő Masterplan (National Water Strategy)* contains a very important statement which sheds light on what to expect in terms of river regulation on the Hungarian section of the Danube:

"Danube riverbed deepens constantly; low water levels and related ground water levels are lowering. This process already caused significant ecological damages; therefore, the mitigation of these damages will enforce technical interventions regardless of the goals of navigation."

And to top it all, climate change impact on Danube's water discharge and water regime will worsen navigation hindrances caused by riverbed degradation. The Kvassay Jenő Masterplan predicts decreasing discharge and more and more extreme water regime.

On the other hand, the draught of river cruising ships increased proportional to the increasement of their horizontal dimensions. Further increasement of their size would result even deeper draught. The consequence is that the larger ships will be forced to stop even more often in absence of proper river regulation.

5 PROJECTION OF CRUISE TRAFFIC IN HUNGARY

5.1 Passengers

The majority of Danube cruises are made up of short trips that last 5 - 8 days on the routes Passau-Vienna-Bratislava-Budapest-Passau and Vienna-Bratislava - Budapest, as well as trips to and from Rhine and Main ports. Cruise vessel traffic from Passau to the Danube Delta, with a duration of 14 -16 days, are in general less frequent than the shorter trips between Passau or Vienna and Budapest.

Budapest, situated in the middle of Middle Danube is the typical downstream end of Upper Danube cruises, and a stopping-place for Danube Delta cruises, also a preferred place for passenger exchange.

The Danube Commission (hereinafter: DC) publishes passenger data derived from the reports of Gabcikovo lock and the border crossing point of Mohács in publications named "*Market observation for Danube navigation*". The 2020 issue contains data for the period 2014-2021, displayed in figure 2. Estimated data for 2022 could be added to the figure as *National Association of Radio Distress-Signalling and Infocommunications* submitted the related data gathered from the operation of the Hungarian River Information Services (HURIS). The owner and financer is the Hungarian state, the operator of the system is RSOE. The HURIS receives the data of all AIS transponders within the range of the antennas of the system, and it does record all AIS transmitted data, unfortunately storage time is a way too short for this analysis. On the other hand, all passenger ships must file a report via VHF radio, email, or telephone when the ship crosses the Hungarian border[3], and when any of the reported data changes. The report contains the number of passengers as well; however, submitted data only contains the monthly sum of reported passengers for 2022's first half-year. The data of the second half-year was extrapolated using 2019's observed traffic distribution. DC and RSOE data are gathered in a different way, therefore there is a small discrepancy between them caused by the ships which only file a report once, when crossing the border. However, this observed discrepancy is still less than the margin of estimation's error.

[3] Notices to Skippers nr. 21/Du/2019.

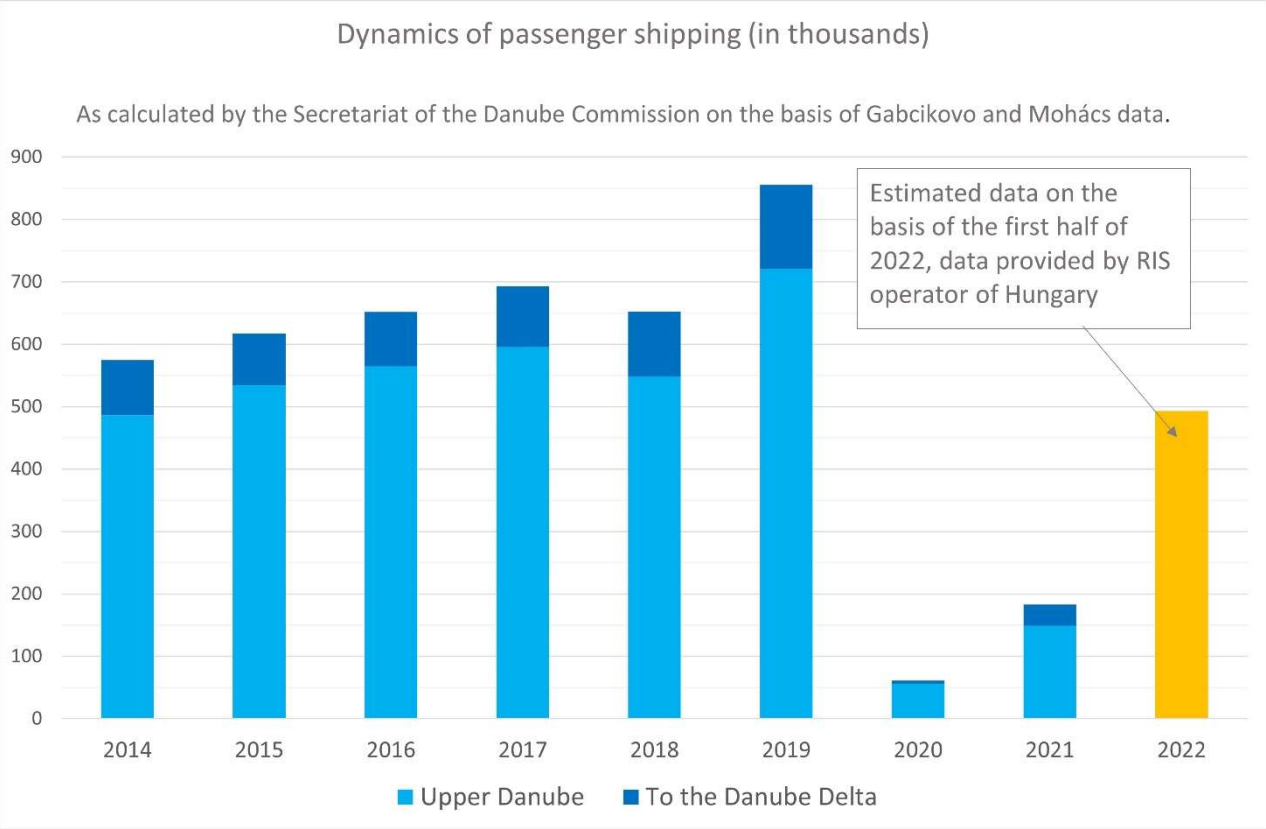

Fig. 2. Sum of inbound and outbound number of passengers, Hungary, data source: DC, RSOE

The public data of DC and submitted data of RSOE made it possible to calculate the annual average utilization of beds. The procedure is identical to the estimation of passenger's number, Fig. 3. shows the outcome.

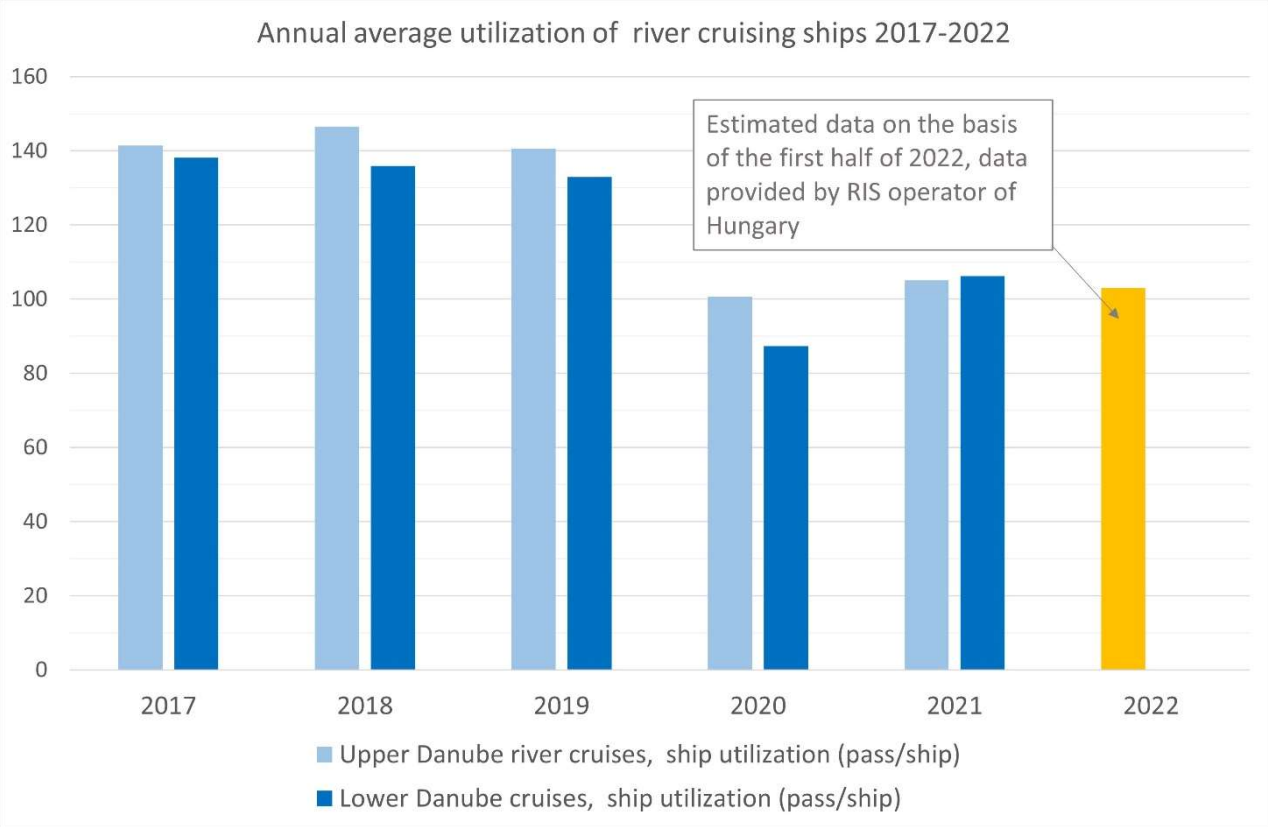

Fig. 3. Average annual utilization of river cruising ships on the Hungarian section of the Danube, data source: DC, RSOE

5.2 The fleet

The 2021 market observation of Central Commission for the Navigation of Rhein (hereinafter: CCNR) contains valuable information on the size of the Danube fleet – as it is the part of the European cruising fleet.

The European fleet has increased continuously since 2005. In nearly two decades, it grew by 150%, with the highest growth recorded between 2013 and 2015 (when Viking River Cruises heavily invested in new river cruise vessels). Today, both American and European passengers drive the growth of the European fleet, while the number of Chinese guests also grew fast before Covid.[4]

[4] CCNR, ANNUAL REPORT INLAND NAVIGATION IN EUROPE MARKET OBSERVATION, chapter 7

FIGURE 1: **NUMBER OF RIVER CRUISE VESSELS IN THE EU BY REGION OF OPERATION** (2004-2021) *

Fig. 4. Size of EU river cruising fleet, source: CCNR Market observation 2021

However, some ships of the Rhein/Main-Danube Canal/Danube region never enter the Danube, therefore Fig. 4. does not represent the actual number of ships operating on the Danube. Fortunately, there is a private Hungarian website which seems to contain more accurate information on the number of ships visiting Hungary. Kalmár Dániel gathers, processes, and publishes available public information on river cruising ships since 2002 on his website https://folyamhajo.hu/. The published data is consistent with CCNRS'.

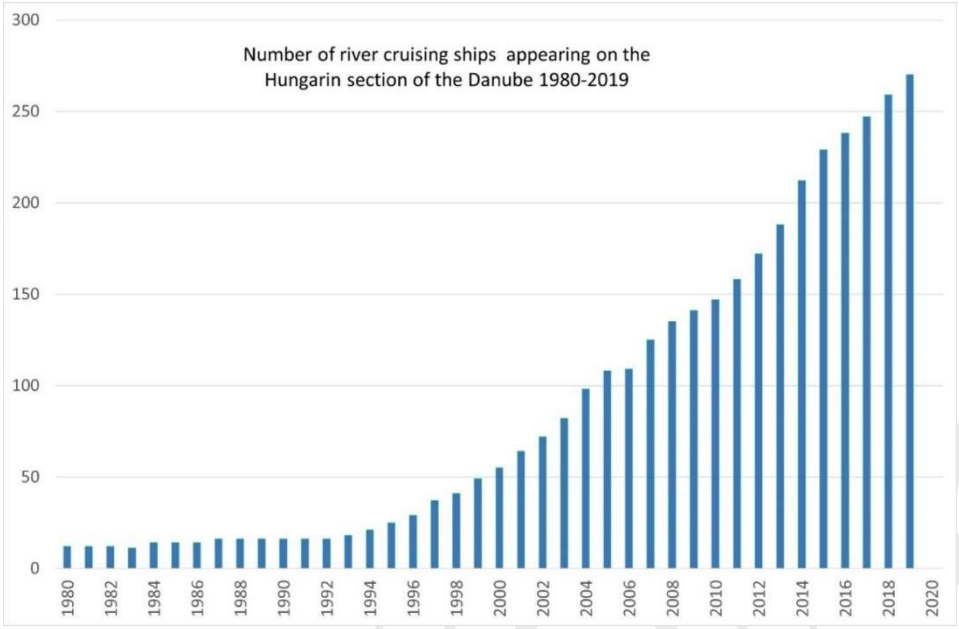

Fig. 5. Number of active river cruising ships appearing at least once on the Hungarian section of the Danube since 1960, data source: https://folyamhajo.hu/

As for the future, the CCNR predicts a downward trend in the rate of new buildings for river cruise vessels in the next years. The 2021 Market Observation states:

"All the vessels planned for 2020 were ready, or in a late phase of building, when the Covid pandemic struck in March 2020. Some were commissioned on time, others with some delay. In the same period, several vessels had already been on order for delivery in 2021. It is difficult to provide a definite number of cancellations in 2021. However, it is observed that some delivery dates were postponed and that the number of new building contracts signed since 2020 is extremely small. The 11 new buildings which will be joining the market in 2021 are expected to operate in the following regions: eight on central European waterways, two on the Danube, and one on the Rhône. In 2021, one more vessel will join the market after a long conversion phase and two vessels will be removed from the market as they went out of service. The downward trend in new building orders is expected to continue in 2022 as only one new order, and one or two postponements, are currently recorded in order books. This is directly linked to the Covid pandemic. It is also very unlikely that any overseas travel operator will order new capacities in the near future. Indeed, while most companies survived the first Covid season, the year 2021 is likely to be decisive for many operators. The order book of most river cruise vessels builders is also empty as regards the near future."

FIGURE 2: **NEW RIVER CRUISE VESSELS FOR THE EUROPEAN MARKET 2004-2022**
(NUMBER OF CRUISE VESSELS) *

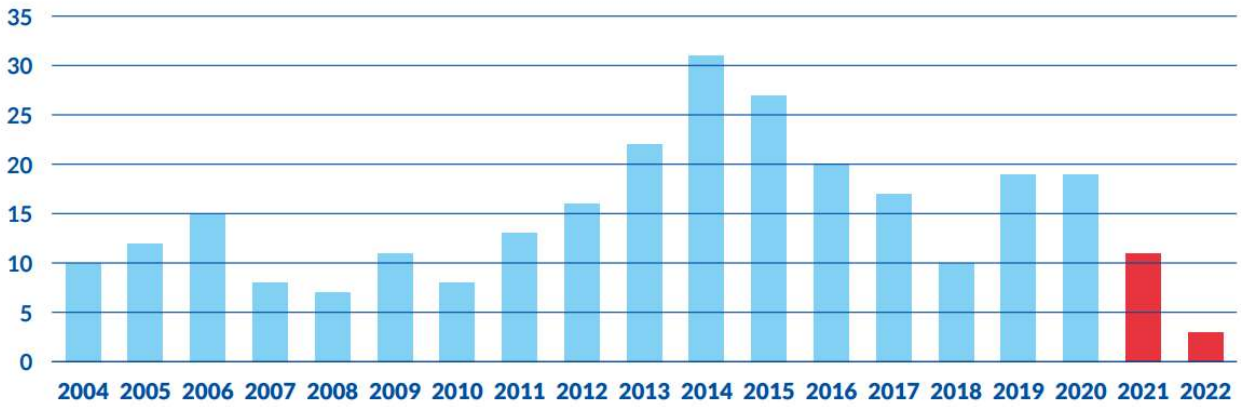

Fig. 6. New river cruise vessels for the European market 2004-2022, source: CCNR Market observation 2021

The ship database of https://folyamhajo.hu/ made it possible to create a figure showing the length and passenger capacity of the ships cruising Hungarian waters over time. Figure 6. shows these data as a function of ships' construction year. Two drops are identifiable in capacity/length ratio: the first starts around 2008, the second around 2016 (moving average trendlines following actual trends with a few years delay). However, the length seems to be settled at 135 meters, while average capacity crawling back to around 180 passengers lately.

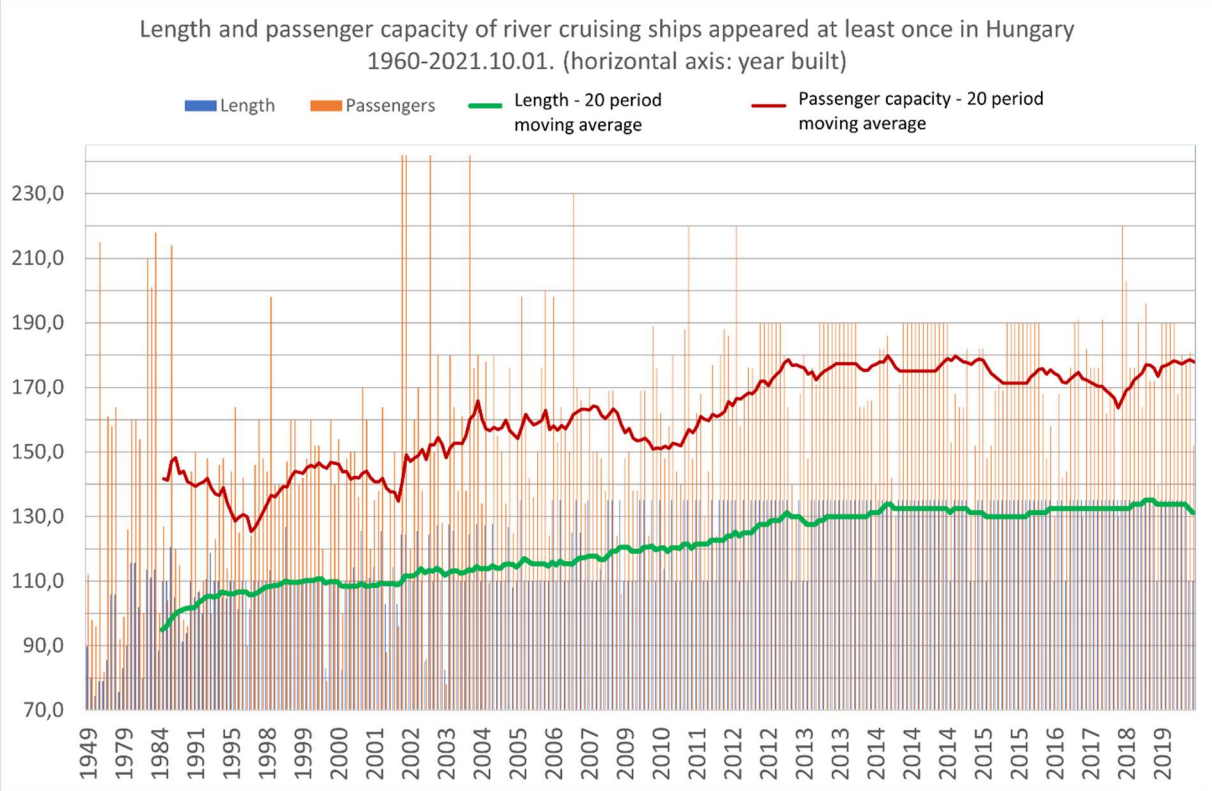

Fig. 7. Length and passenger capacity of river cruising ships appeared at least once in Hungary since 1960, data source: https://folyamhajo.hu/

5.3 Conclusions

- Number of passengers recovering fast after COVID pandemic restrictions were mostly eliminated, although it is happening at a lower capacity utilization level.
- Continual growing of the Danube fleet will slow for the next few years along with the whole European fleet.

RCI seems to recover fast, although there is still a chance for COVID travel restrictions in the future, and the incidental escalation of the war in Ukraine may affect future passenger preferences, particularly on the part of overseas guests.

Europe's future has not been more unpredictable since RCI started it's ever since growth in the mid 2000's. In the current situation (COVID, (economic) consequences of the Ukrainian war), it would be improvident to provide long term predictions on RCI's performance, especially up to 2040. On the other hand, the speed of recover shows great potential in the RCI, which can be only influenced by events of global importance.

6 Cruise berth demand in the ports of Hungary

6.1 Cruise vessel trends

The recent trends of newly built river cruising ships are already displayed in Figure 7. Length of vessels used specifically on the Danube is seems to settle on 135 meters, although for some unknown reason several 110-meter-long vessels was also built in the last decade (17 unit, with average capacity of 149 beds). Ships' breadth is restricted by 12-meter lock width; therefore, it will not increase unless specific ship must not navigate upstream to the Middle-Danube. Capacity has increased since the minor drop in the 2014-2018 period, and the new standard for 135-meter-long ships is 190 beds recently.

6.2 Cruise vessels size-split

The public database of https://folyamhajo.hu/ contains the essential data of the active river cruising ships which navigated on the Hungarian section of the Danube at least on one occasion since 1960. The last update of the database was on 2021-10-01. The data includes ship length, breadth, and capacity as well. The following figures display the fleet-splitting of the specific dimension:

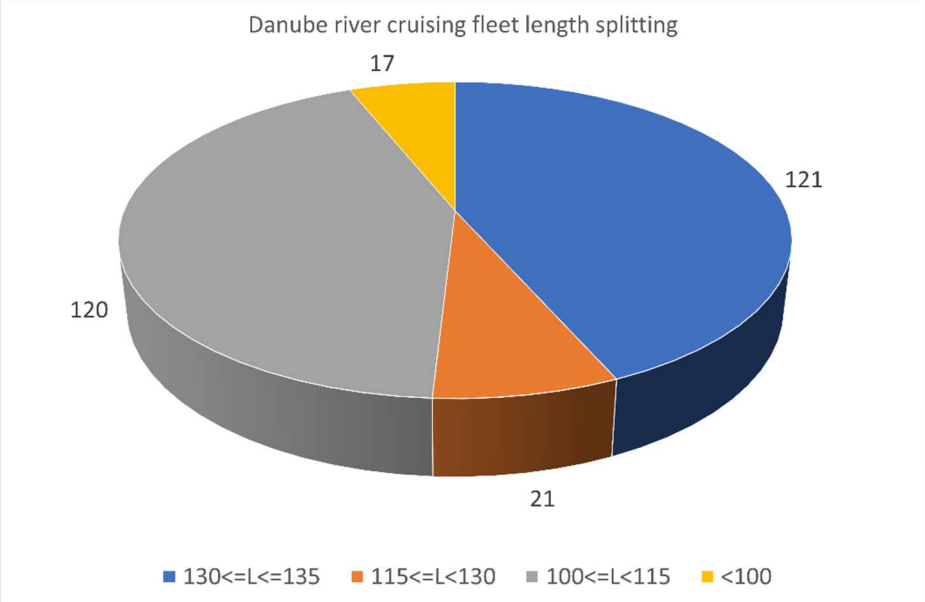

Fig. 8. Danube fleet length-split, data source: https://folyamhajo.hu/

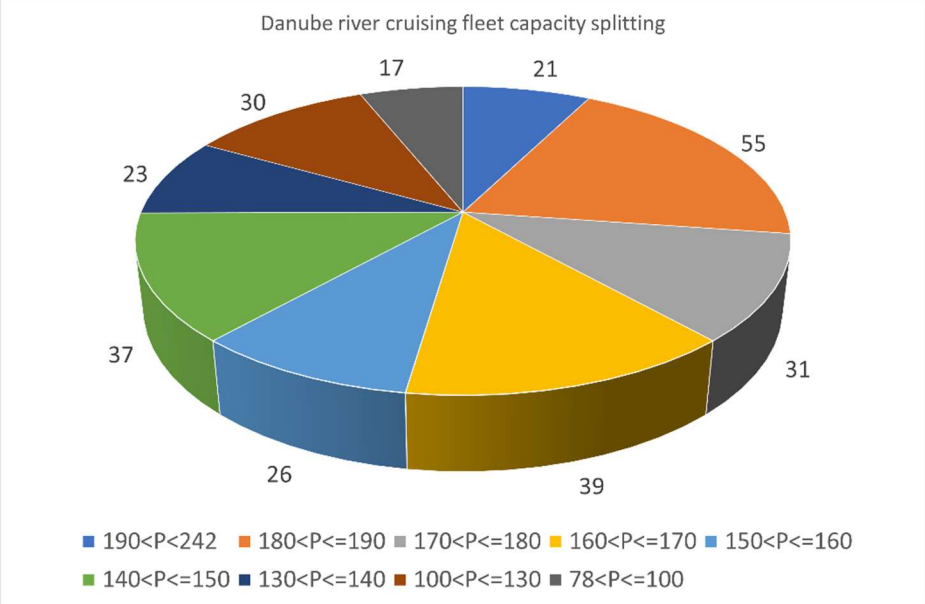

Fig. 9. Danube fleet capacity-split, data source: https://folyamhajo.hu/

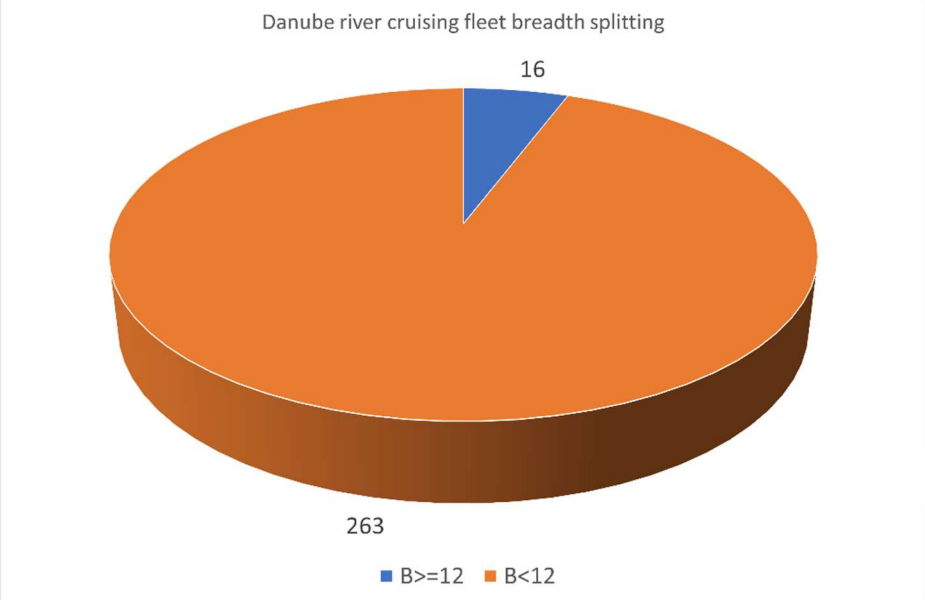

Fig. 10. Danube fleet breadth-split, data source: https://folyamhajo.hu/

6.3 Traffic data analyses

6.3.1 Applied traffic data

The source of data used for analysis are the publications of the Danube Commission, namely the annual Market observation of the Danube[5]. Unlike other ones, Market observation 2021 has relevant length and capacity utilization data:

"In total in 2021, out of 1,419 passages of passenger ships recorded through the Gabcikovo lock,

the following was registered:

- *vessels with the length of 110 m: 676 (in 2019 – 1,655, in 2020 - 343) passages;*
- *vessels with the length of 135 m: 700 (in 2019 – 2,567, in 2020 – 181) passages,*

out of them 575 vessels flying flags of countries that are not members of the DC.

Average capacity utilization in September was for the vessels with the length of:

- *110 m: 114 - 115 passengers (in 2019 – 130);*
- *135 m: 100 - 120 (in 2019 – 158) passengers."*

The river cruising ships dedicated to the Danube traffic are designed and built with a length of 135 meters since 2012 according to the National Association of Radio Distress-Signalling and Infocommunications (RSOE), which is the operator of National River Information Services (HURIS). However, quoted 2021 observational data published by DC, and the length-split of Danube fleet (Fig. 8.) seems to be coherent with each other, and reconfirm that half of the traffic is carried out by 110 m long ships.

6.3.2 Interpretation of the displayed data

Data displayed in Fig. 11. shows the number of in- and outbound ships at Gabcikovo and Mohács. River cruising ships are making a stop at Budapest almost without exception, regretfully number of Budapest port calls cannot be extrapolated. Nevertheless, rule of thumb is two border crossing makes one port call at Budapest. Significant portion of ships makes more than one stop in Hungary, but there is no collected public data on that issue. The trends and annual fluctuations are still obvious in terms of Budapest port calls. Data was not available to display daily fluctuations.

[5] https://www.danubecommission.org/dc/en/danube-navigation/market-observation-for-danube-navigation/

Diagrams:

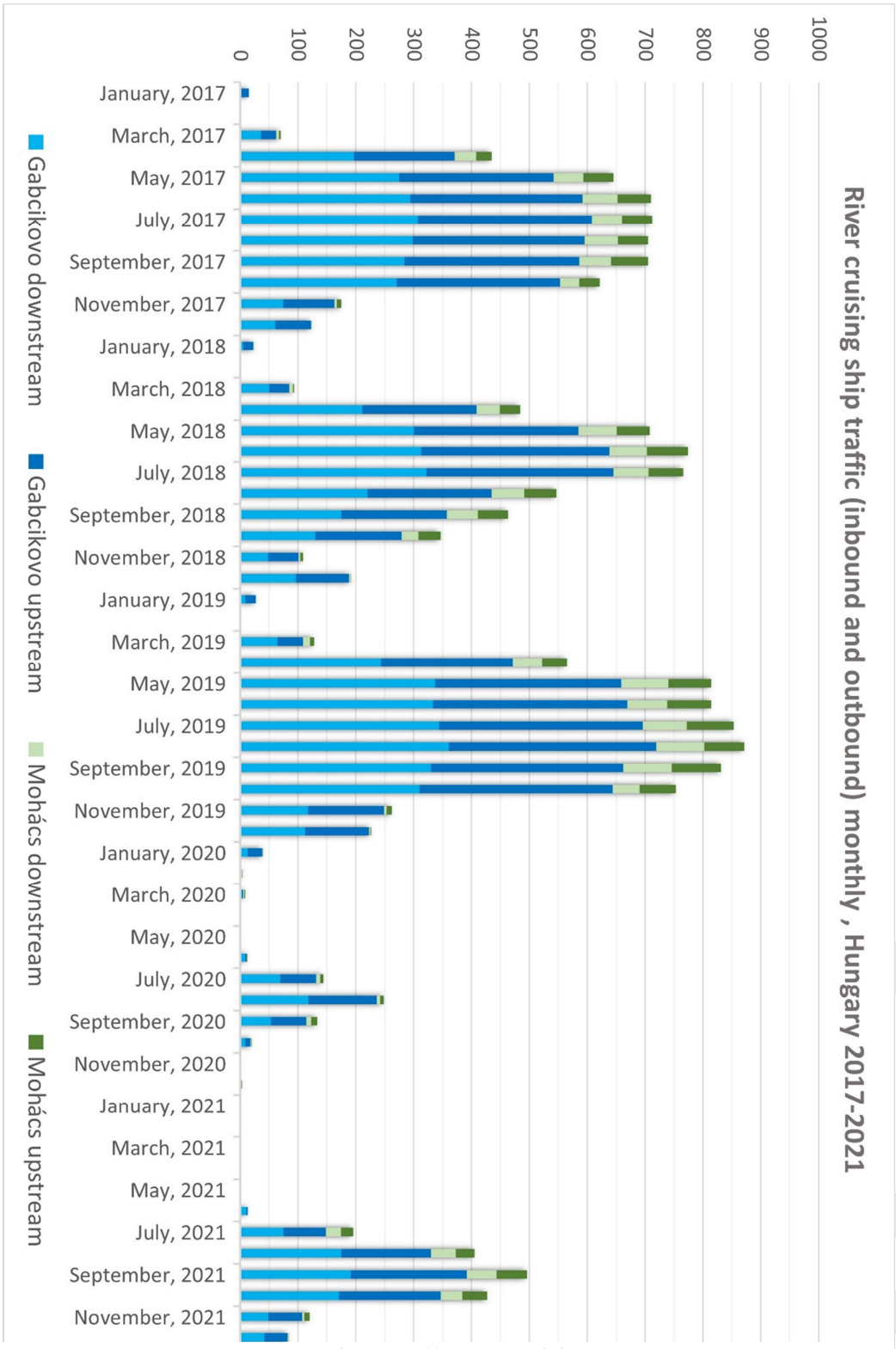

Fig. 11. River cruising ship traffic, monthly, Hungary 2017-2021, source: DC

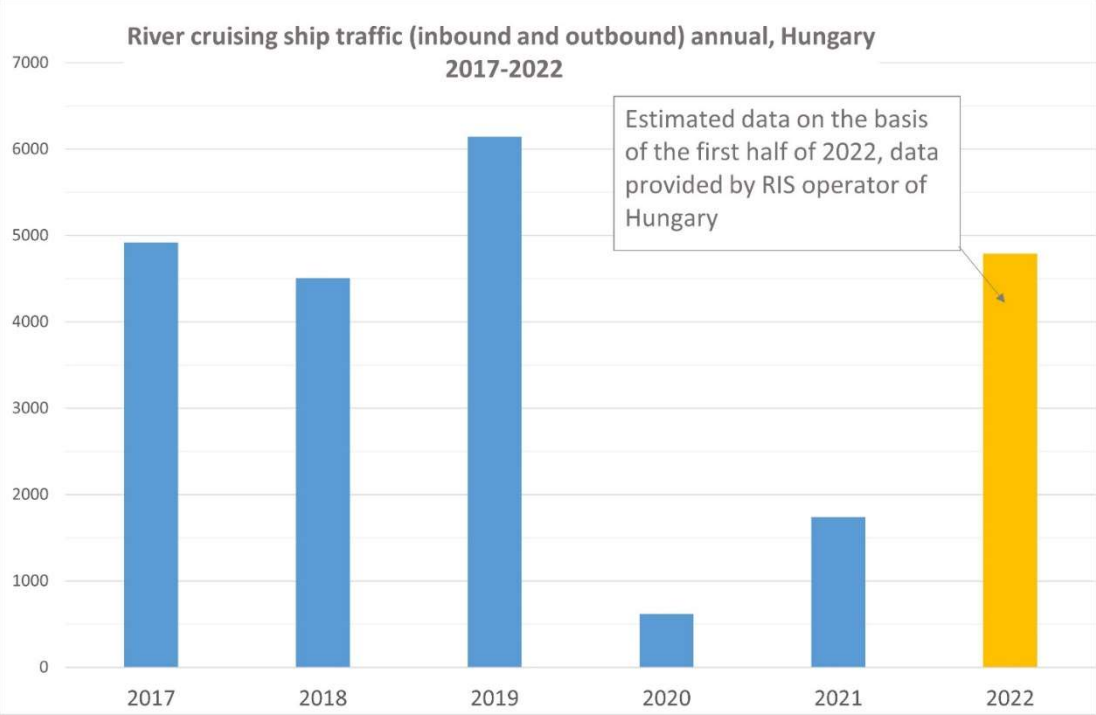

Fig. 12. River cruising ship traffic, annual, Hungary 2017-2022, source: DC, RSOE

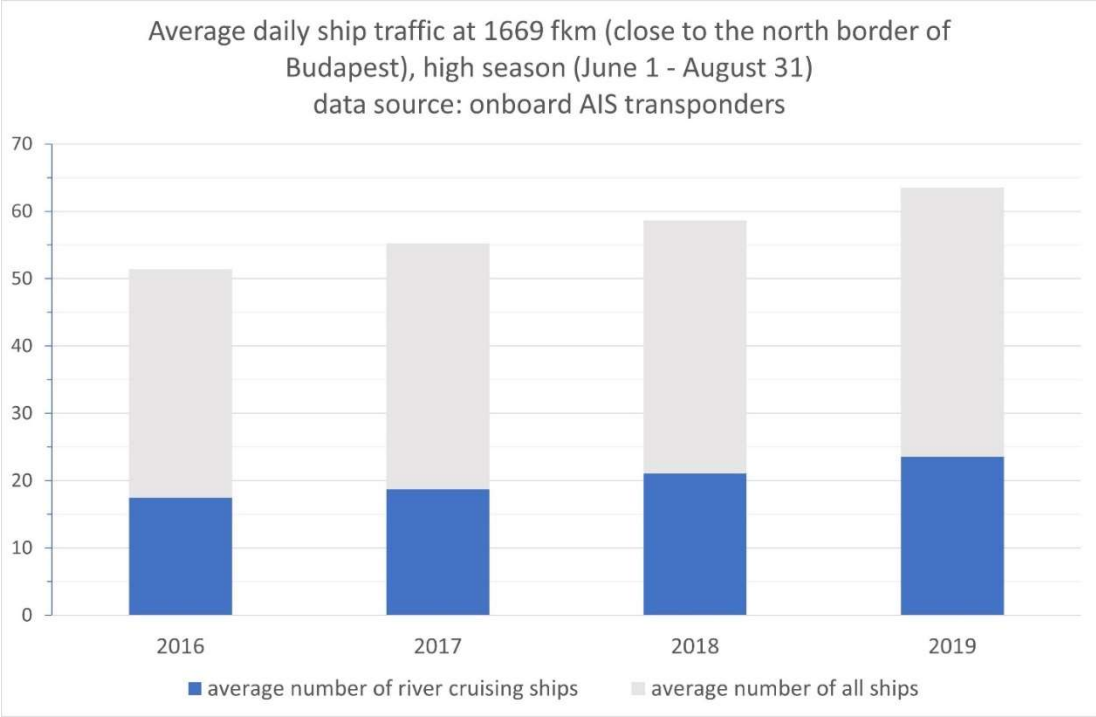

Fig. 13. Average high season river cruising ship traffic at 1669 rkm, 2016-2019, source: https://folyamhajo.hu/

6.4 Facility/infrastructure demand

At present there are about 17 ports in Budapest, which were capable to handle monthly 400 to 450 arriving river cruising ships between May and September 2019. Regretfully the number of the ports are already insufficient; two, sometimes three ships must share the same pontoon and all the inconvenience this situtaion generates. The number of inbound river cruising ships is not sufficient to calculate berth demand even for the existing traffic, not to mention demand forecast.

In Budapest downtown ports are most valuable because of their location. The policy papers and settlement structural plans put restraint to downtown port locations, there are three-four existing port on such locations where municipality of Budapest would not like to see any river cruising ship in the medium term. Therefore, it can be stated that there is a scarcity of berths already in Budapest. Recent years proved that demand forecasts have never been more imaginary since RCI industry has started to conquer the Danube, no matter how many factors are considered in different and numerous models.

It is quite clear, that there is no appropriate location for a port which could accommodate every river cruising ship, on the other hand downtown location is most valuable for berth. Therefore, there is no real alternative to keep (most of) the existing ports and building new ones proportionally to foreseen demands; this approach is explained in detail in chapter 7.5. The Study mentioned in chapter 4.1 analysed carefully possible port locations and proposed 12[6], among them the planned site of Budapest's new international passenger port (see Fig. 15.).

[6] Study vol 1., pages 147-154.

Nr.	Location	Number of berths in port (two ships per pontoon)
1.	Rév utca	2
2.	Népsziget	4
3.	Dagály strand	8
4.	Carl Lutz rakpart (Dráva utca)	6
5.	Carl Lutz rakpart (Szent István park)	8
6.	Angelo rotta rakpart	6
7.	Belgrád rakpart	8
8.	Salkaházi Sára rakpart	8
9.	Infopark	8
10.	VITUKI	10
11.	Budafok – downtown	4
12.	Budafok – Háros	8
	Sum:	**80**

Table 1. Port location proposed by the Study's first volume.

Regretfully only Belgrád rakpart (Table 1., row 7.) is the only truly downtown location, although 5.,6., and 8. are still in the close vicinity of it.

7 Cruise development plans in Hungary

7.1 Budapest city development plans

Although there are no specific plans on RCI port infrastructure development, the above-mentioned strategic papers and already effective settlement structure plan lay down the major rules and gives a clear concept of it. As the Concept puts it in chapter 8.7:

"Disorderly or at best ad hoc bank utilization along the entire length of the city should give way to differentiated and rationalized use."

Major rules of RCI infrastructure development in Budapest based on the papers referred in chapter 4.1:

- River cruising ships may berth in certain riverside sections of the downtown, at the same time port functions requiring significant area on the bank should be realized between the city limits and the downtown area.
- The international port in the inner city (as main port) does not presently provide high standard passenger traffic services. Therefore, Municipality of Budapest appointed the riverside between Szabadság bridge and Petőfi bridge for the purpose of the new international passenger port. Comprehensive solutions for operational functions to be facilitated by the "Bálna".
- River cruising ships are not to berth on the banks of world heritage sites, beyond that they may even berth on both banks within the city limits.
- Besides their protection, the prominent cityscape characteristics of the natural and built environment of the city must also be adapted so as to become its worthy reception points (for river cruising ships). On the lower quays parking lots will be only built to serve river cruising ships.
- Although the Study is not built in its entirety in the city-planning measures it is in coherence with them and contains detailed information on proposed-, and forbidden area for river cruising ship ports. The Municipality of Budapest can block any attempt to establish port on not proposed areas by reason it is the owner of the banks.

The municipality of Budapest is owner of the banks within the limits of the city but has no port for the accommodation of river cruise ships. Recently most of such ports are possessed and operated by the 51% Hungarian state owned Mahart Passnave Kft. As

mentioned before, there are no concrete and detailed RCI infrastructure development plans beyond the Concept and the settlement structure plan, so these must be created first.

The following conclusions may be drawn for the plans to be made:

- There are three, maybe four existing ports between Lánchíd bridge and Margit bridge where the Study and the Concept would not let them to be. These capacities must be built up on proposed locations since the municipality will not renew existing lease contracts if it is insisting to realize the Concept.
- There is a scarcity of berths in downtown. Three river cruising ships berthing alongside one pontoon is not a rare sight in Budapest, which is inconvenient not only for the passengers, but for the ship and port crew also. Therefore, particular attention must be paid for capacity planning. Practically the plan should contain all ports necessary to satisfy the forecasted traffic, on the other hand implementation timing must follow the demand to avoid extra costs of unexploited capacities. RCI enterprises must be interviewed what do they prefer: second or third place on a downtown pontoon, or solo between downtown and city limits.
- Defining new, and finalizing existing port locations as soon as possible has utmost importance, as the municipality must prepare the lower and upper quay's development plans accordingly to ensure adequately sized bus parking lots, proper pedestrian, and cycle approachability for the ports. In absence of port allocation plan the municipality will not have a chance to satisfy the needs of RCI, and reconstructed quays may will not be suitable to build port on (some of) the desired locations.

The Concept and settlement structural plan contain numerous measures which likely to improve the conditions on the quays for the benefit of river cruiser ship's passengers:

- Traffic calming on the lower quay of Pest (other road section's also may be considered).
- Increasing the size of green areas on the riverside.
- Building new promenades (e.g., Belgrád quay).
- Increasing the area of the dedicated infrastructure for pedestrians and cyclist on the riverside.

The Concept also sets great store on waterborne public transport services. As it was stated in chapter 4.1, Budapest Public Transport company's recent boat service is rather a city sightseeing boat tour service, it is unsuitable for public transport for several reasons. Major reason is that the passenger boats are anachronistic, they are too slow to be competitive, they are not wheelchair accessible, and some of the stopping places are not properly attached to other means of public transport. The Concept and the Plan recognized that waterborne public transport would be competitive only if it had proper infrastructure, and proposed a reginal boat service as well (Plan chapter 1.18):

"Extension of the waterborne transport network and service infrastructure development

New piers must be constructed both within and outside the administrative boundaries of Budapest that are able to support scheduled services and new routes to create the conditions of regional (metropolitan area) boat services in order to reach Szentendre (or even Visegrád and Vác) in the north and Százhalombatta in the south. On-shore facilities must be positioned at easily accessible locations, near public transport stops and quality mode switching options (P+R car parks and 44 B+R storage facilities depending on the site). The construction of new inner city piers (Vigadó tér, Kossuth Lajos tér, Várkert Bazár) should be coordinated with public space developments in the area, improving the conditions of pedestrian access. Tourist attractions on the river Danube should also be made accessible by boat, which requires better cooperation between commuter and touristic boat services."

It was explained in chapter 4.3 that there is a certain probability of further restriction of river cruising ship traffic. On one hand the implementation of regional and local waterborne public transport services would increase boat traffic, hence increase the chance of further restrictions, on the other hand they would be a precious substitute service to river cruise ship sightseeing tours among other services.

7.2 Recent activities and planned projects

There are signs that the process of converting Bálna to a port building has already started in accordance with the Concept and the Study.

The General Assembly of Budapest approved of the sale of the municipality owned Bálna to the government in 2017. In 2019 the government appointed the Hungarian Tourism Agency (MTÜ) to be the trustee of the edifice. In 2020 Mr. Guller Zoltán, the

Managing Director of the MTÜ announced it is their intention to convert Bálna into the departure building for river cruising ships, discussion already going on with the municipality[7]. According to Mr. Guller the building will have similar functions as an airport has. River cruising ships will arrive-, and departure from there, nevertheless the building may also accommodate conference room, permanent exhibition, restaurant, and tourist information centre as well. Mr. Guller stated that river cruising ships are bringing hundreds of thousands of tourists annually to Budapest, out of which alone American tourists amounted to half a million in 2019. Coronavirus pandemic set back the sector, what gives time to make the changes, which includes conversion of the Bálna.

Unlike other transport development documents the *Budapest Mobility Plan 2030* contains a Transport development and investment program (hereinafter: Program) which was approved by the general assembly of Budapest on the 29th May, 2019. The Program identifies 146 projects, with a total value of 6500 billion Forint (ca. 20.5 billion Eur).

The Program defines three types of projects:

1. *Decided project*: funds already assured, or it is already in the implementation phase.
2. *Task-type project*: derived from a legal obligation, as well as maintenance, and amortization replacement activities that do not contain substantial development (e.g.: road renovation).
3. *Ranked projects* proposed for implementation within the authority of Budapest municipality's administration.

The program contains three projects regarding RCI infrastructure development, all of them belonging to the 3. class of projects. Three scenarios had been developed within the Program to accommodate future financing possibilities. The good news is that the three RCI related projects are chosen to be implemented even in the worst-case scenario (scenario for most unfavourable financing conditions). Short introduction of the projects:

[7] https://hvg.hu/ingatlan/20200626_mtu_balna_szallodahajok

1. **Procurement of passenger boats and development of urban and suburban service facilities**

The aim of the project is to integrate the Danube into Budapest's transport system. Development of public transport services are in the focus, nevertheless it contributes to the city sightseeing- and freight shipping infrastructure development as well.

New urban and suburban passenger transport services are planned to be introduced instead of the inappropriate existing one. New ships are to be procured instead of outdated and inadequate existing boats, and new up-to-date ports to be implemented. Construction of a new port for boat berthing and maintenance facility is also planned.

2. **Reconstruction of the riverside areas between Kossuth tér and Fővám tér (left bank).**

Four affected locations:

- snr. József Antall quay: creation of a coastal pedestrian axis rich in green areas
- Jane Haining Quay: the creation of an intensively used townish promenade
- Széchenyi Square: creating a better use of space
- Belgrade quay: construction of a new promenade, abundant in catering establishments

The aim of the project is to increase the pedestrian surfaces in all action areas and the connections between the lower and upper quays improving it, creating an image that matches the world heritage environment, renovating outdated infrastructure elements, rational design of excessive parking surfaces, renewal of green surfaces in poor condition.

Completion of construction was expected by September 2019, yet no information on status of the implementation plans.

3. **Renovation of Buda's downtown riverside areas (right bank)**

Major aims of the project are:

- to increase the pedestrian surfaces of the upper quays, and the related public spaces along the bank
- to ensure the passability of riverside areas

- to improve the technical level of bicycle traffic infrastructure
- rationalization of traffic areas and the development of the green areas

The planning program designates four spatially separated action areas; Újlaki-, Felhévíz-, Vízivárosi-, and Lágmányos action area.

7.3 Cruise terminal/berthing layout in Hungary and Budapest

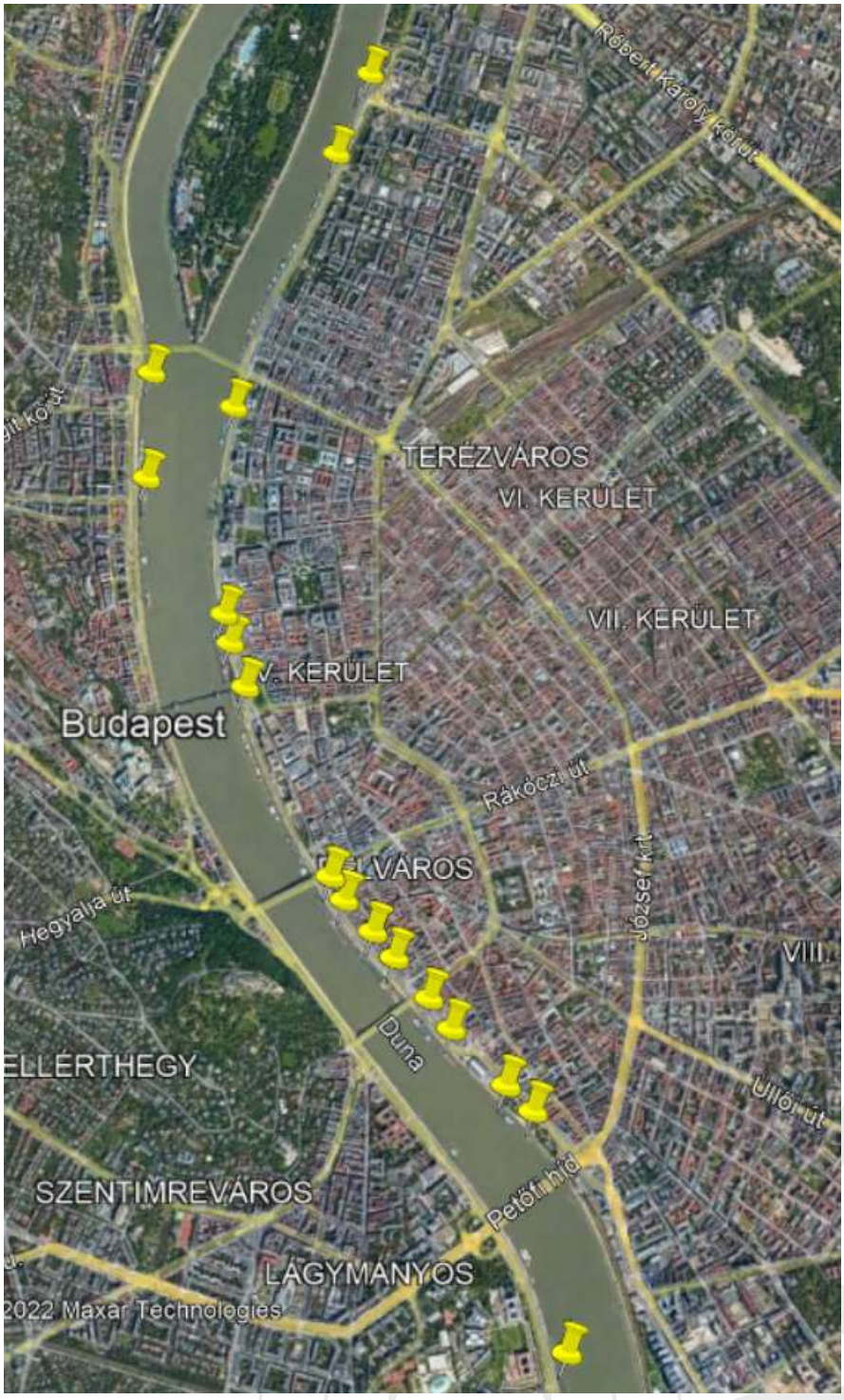

Fig. 14. Existing RCI related ports in Budapest

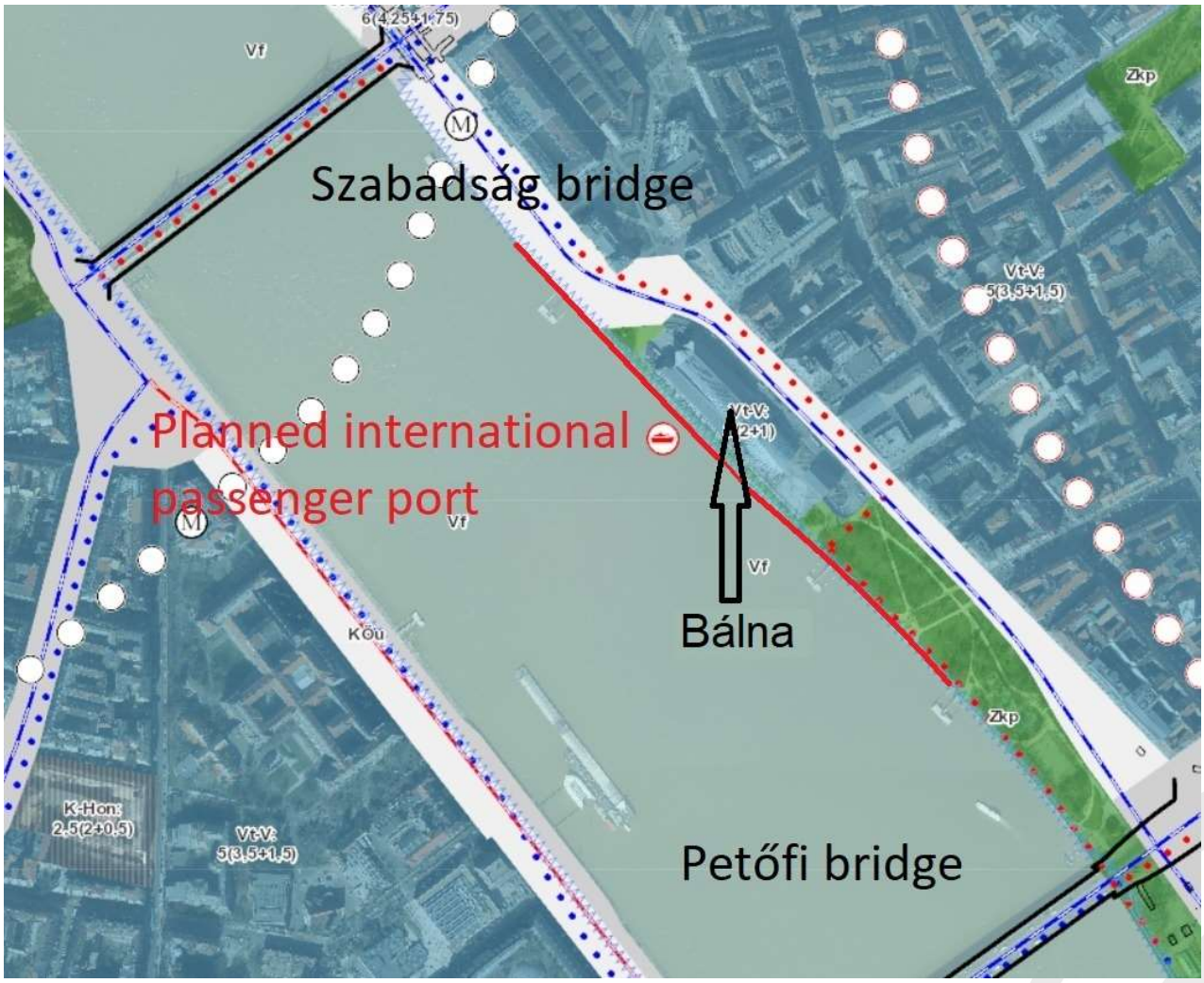

Fig. 15. Appointed location for the new international passenger port in the settlement structural plan of legal force (labels added)

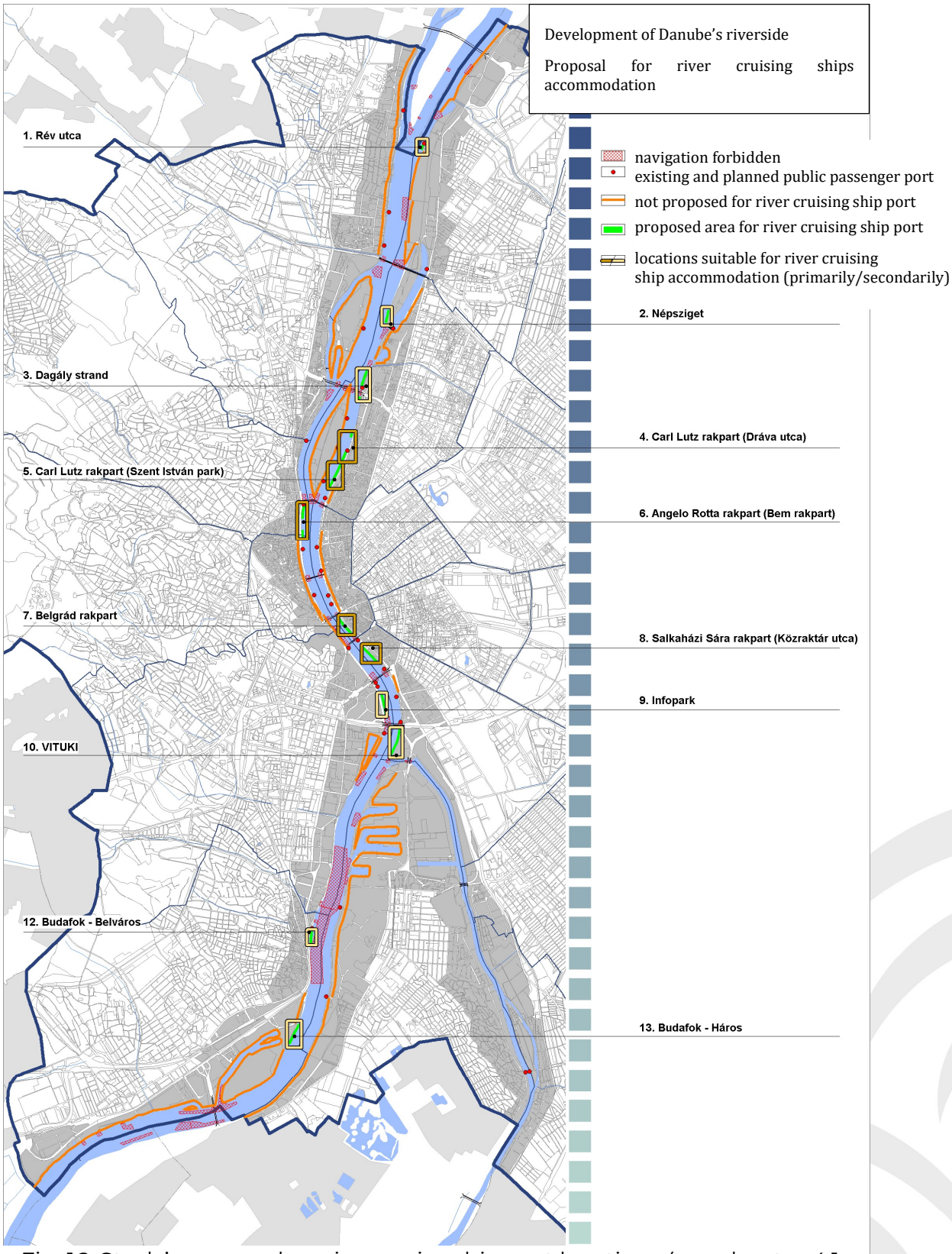

Fig. 16. Study's proposal on river cruise ship port locations (see chapter 4.1 and Table 1.) in Budapest

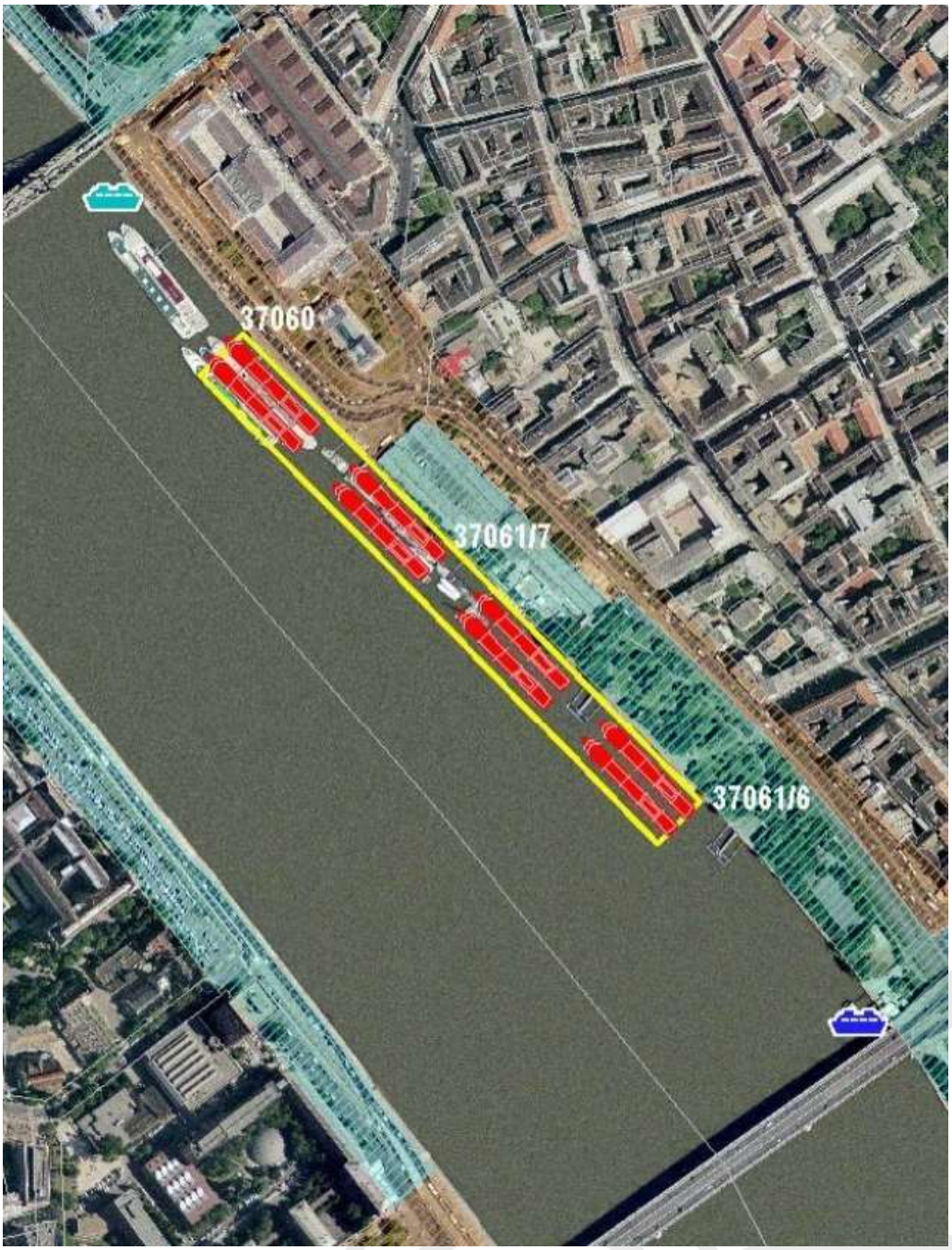

Fig. 17. General plan for the international passenger port in the Study (see 4.1)

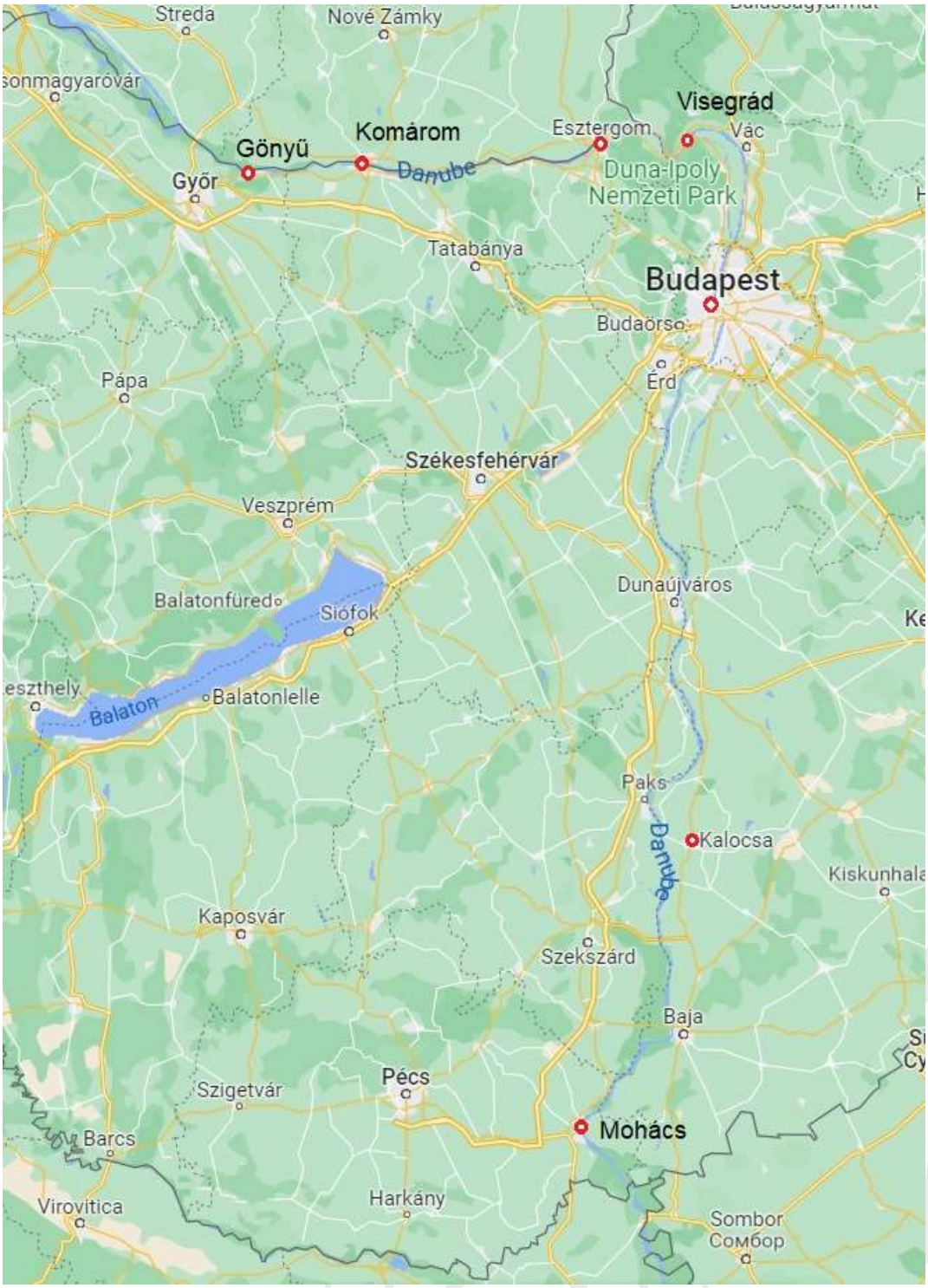

Fig. 18. Geographical position of recent stopping places of RCI ships, and Gönyű, where a newly commissioned dam makes Győr accessible on Mosoni-Danube (see 4.4.1)

7.4 Alternative development plans

There are no official alternatives to the concept of the municipality of Budapest, however there are two concepts which are popular in the world of Hungarian inland navigation.

7.4.1 Csepel international passenger port

The National Navigation Strategy (2012) (hereinafter: NNS) suggests to relocate the international passenger port of Budapest to Csepel freeport and the relocating Csepel Freeport downstream to the M0 ring, onto the right bank of Danube. Furthermore, it recommends:

"The area of the Freeport mostly should be developed as a dockland – like in several Western European waterfront cities. The current Csepel port could be transformed into a high-end institutional, touristic, cultural, and partially residential area. The Freeport can be converted into an international passenger port that meets all requirements, for which most of the necessary infrastructure (built shores, utilities, roads, car parks) are already available, the area only needs renovation and modernization."[8]

The NNS was issued by the *Ministry for National Economy* for discussion, it was only a concept paper without aftermath or approval by any organization of the state administration. However, since 2012 Csepel freeport undergone large scale developments, and there is also an actual reconstruction project under implementation[9]. These investments lead to the reconstruction of the outdated basic infrastructure. Roads and railway had been/will be renovated in the territory of the port, new logistic warehouses, factories, and other facilities had been built. On the other hand, there is indeed a planned new freight port downstream to the south M0 bridge, on the right bank pf the Danube. The DILK (Danube Intermodal Logistics Centre) is real planned project, although there is no recent information whether it has passed project plan phase at all. DILK is a project plan of the *Coordinated development of Danube's riparian areas, Thematic Development Program (2014)*. The program was ordered by the municipality of Budapest. Csepel freeport thrives and has steadily increasing

[8] Dionysus, Analysis of the existing infrastructure & the investment needs at DR ports level for River Cruise Industry Hungary National report, chapter 7.3

[9] https://www.origo.hu/gazdasag/20220517-tovabbi-fejlesztes-csepeli-szabadkikoto.html

turnover[10] since the publication of the NNS, albeit it has unsolved railway connection issues for sure. Still, it is most unlikely that the NNS's suggestions on the relocation of Csepel freeport will be considered in the recent situation

7.4.2 Óbudai island[11]

Another proposed location for future international passenger port was Óbudai island (Hajógyári island in common language). The buildings of the oldest (1835-1991) Hungarian shipyard are still in use at the southern part of the island. The channel of the shipyard is utilized recently as a pleasure boat port. Ship berthing is possible alongside the southern part, on the side of the main branch of the Danube, and the shipyard channel could be adapted as a quay as well. The flood protection of island's southern part could be ensured with mobile flood protection walls.[12] However, the Study (volume 1., page 145.) states, that the island is not proposed for river cruising ship berthing for environmental protection reasons.

7.4.3 Budapest municipality's concept

As it has been presented in chapter 7, the capital's concept is to reconstruct the already existing mall, the Bálna to facilitate the shore services of Budapest's new international passenger port. Pontoon ports would be implemented to facilitate ship berthing between Szabadság bridge and Petőfi bridge. The Study's site plan contains four pontoons, which can accommodate eight ships. This capacity obviously insufficient for the whole city, therefore properly located existing downtown ports are to be developed to meet recent and future demands. Should river cruising ship traffic increase further new ports must be implemented correspondently to the Study. As it stated afore, the municipality of Budapest plans to reconstruct the downtown quays on each bank of the Danube. Therefore, identifying and finalizing existing and future port locations has utmost importance, as per available information this is not done yet, and quay reconstruction planning likely will not include port arrangement establishing study.

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10 https://www.ksh.hu/stadat_files/sza/hu/sza0011.html

11 https://index.hu/belfold/budapest/2019/07/12/hableany_budapest_dunai_hajozas_forgalom_kikotok_szabalyozas/

12 https://budapest.hu/telepulesrendezesitervek/TSZT/D%C3%89SZ%20V.%20%C3%BCtem/III_kotet_alatamaszto.pdf pages 36-37.

7.5 List of proposed investment projects. Recommendations

Future investments are heavily needed primarily in Budapest to raise the standards for port services. Every port should be able to provide shore power, connection to the city's sewer system and drinking water at least, while recently all ports are without shore power and sewer connection. It is quite costly to build up these services at the capacity needs of a river cruising ship, therefore the location of the ports must be agreed and finalized between all concerned parties. Shore power connection cannot be relocated easily unlike pontoons. Likewise, quay reconstruction does not occur every other year to suit the erratically changed port locations. The location of the ports – inclusive city sightseeing boat ports and public transport ports - should be finalized within the framework of a study. The acceptance of the outcome and decision-making procedure must be guaranteed and agreed by all involved stakeholders at the very start of the study, otherwise probability of success will be infinitesimal. Only such a strong fundamentum can assure that interdependent future investments will not impair (each) other's feasibility and serviceability. It is vital to complete this study before final quay reconstruction planning starts to assure its consideration. Other task within the study should be determining development phases for port capacities, which can serve as a guiding line for new port implementations. Another issue is the pontoons. They are various in shape and dimensions. It would be advantageous to set standards for new pontoons in several aspects (accessibility, storage capabilities (e.g., bicycles), design, appearance). The study should also set minimum standards for the shore area of the port (size of bus parking lot, maximum distance to the parking lot, other possible services, and facilities). It would be most convenient to put these standards in force by the municipality.

The most important stakeholders are the municipality of Budapest and the government. The municipality is the owner of the riverbanks within the city, and it has many related spheres of actions. On the other hand, the government is the majority owner of Mahart Passnave Kft. and has much stronger financial power. Mahart Passnave Kft. is the biggest passenger shipping company in Hungary, and it rules the river cruising ship berthing market, not only by owning and operating overwhelming majority of the ports, but it also provides bunkering and municipal waste collecting services for river cruising ships. The chance of successful cooperation between the municipality and the government is hanging in the balance at the present since the political opposition leads the capital's municipality for several years now.

Proposed investments:

1. **Building new international passenger port at the location proposed by the Concept and the Study and converting Bálna into port building.**
2. **Install shore power, connection to the city's sewer system and drinking water supply at the port locations finalized by the study.**
3. **New city sightseeing and public transport boats procurement.** It is necessary to elevate gradually the standards of public transport- and city sightseeing services. The existing passenger boat fleet is outdated and old, most of them are not even wheelchair accessible. Competent public transport services need dedicated high speed and reliable boats, which cannot be said of the actual city sightseeing boats fulfilling public transport purposes. As it was mentioned afore, river cruising ships may will not be allowed to make evening city sightseeing tours if traffic increases notably.
4. **Implementation of a winter port, boatyard, and ship repair facility.** There were intentions to invest in a winter port specifically designed for river cruising ships, two locations were preferred: Győr-Gönyű National Public Port, and Pilismaróti bay[13]. The port would not serve only for increasing number of river cruising ships, but also for other ships and boats. At present there are boatyards at Budapest and Baja, but they can handle ships only up to 90 meters. Hungarian ship repair facilities are using the remains of former ship building factories, which is not favorable in terms of maintenance costs and modernity.

[13] https://goo.gl/maps/SxXyNo7HAqJngreP8

Interreg

EUROPEAN UNION

Danube Transnational Programme

DIONYSUS

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

D.T3.4.3 - National Infrastructure Master Plan for sustainable development of River Cruise industry in Republic of Serbia

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3 Abbreviations

Abbreviation	Explanation
IWT	Inland water transport
RCI	river cruise industry
DR	Danube region
PGA	Port Governance Agency
IPT	International passenger terminal
RS	The Republic of Serbia

4 Overview

PGA have elaborated strategical and planning base for the development of the RCI in the Republic of Serbia. Roadmap for the establishment ICT network was created through the Action plan of the Strategy, which PGA is delivering in close coordination with all relevant institutions.

To support further development of nautical tourism and RCI, major efforts from the public side are put in projects of the infrastructure development. IPTs ongoing development projects were described in previous reports, also giving the expected period of redness to receive first cruise ships.

Following the competition of the IPTs network, PGA will focus on environmental protection and ecology issues, such as further extension of possibilities for waste disposal from cruise ships, onshore power supply, alternative fuels etc.

On the other hand, all services in RCI are provided by companies, without the interference of the state or EU, under the free market conditions. In order to keep stakeholders informed about ongoing projects, present the results and receive feedback on possible problems, PGA is organising regular yearly consultations and workshops with all relevant parties (shipping agents, port operators, tour operators, local authorities, etc.). Last year, RCI workshop was organized on Webex platform with the specific subject, effects of the pandemic on the RCI. All participants agreed that this period of traffic closure should be used for all necessary activities in the preparation of the operations continuance.

Within the scope of the project, regional workshop (Hungary, Croatia and Serbia) – RCI in the middle Danube region, was organised by PGA as we were approaching to the season down. Joint conclusion was that number of dockings and boarded passengers are coming close to pre-Covid results, so it can be expected that RCI wil continue further growth.

5 PROJECTION OF CRUISE TRAFFIC IN THE REPUBLIC OF SERBIA

Nautical season 2022 showed signs of recovery of RCI in RS, after the suspension of cruising due to pandemic. The results are close to the ones achieved in 2019. This shows us the fast recovery of the RCI and it is expected that industry will continue its growth.

Enabling access to tourist attractions, enriching of the touristic offer, and opening of new river cruise dedicated terminals will encourage the market for creation of new products in terms of thematic cruises, or new tours, or even target different clients. In these conditions, it is expected that the density of the network and readiness of terminals will be crucial for the tempo of further growth of the RCI in RS.

Following this trend, and past results, the precaution scenario was adopted according to which expected increase of birth demands and number of passengers on all IPTs in RS is set at approximately 5 percent, annually, which is shown on the figures below:

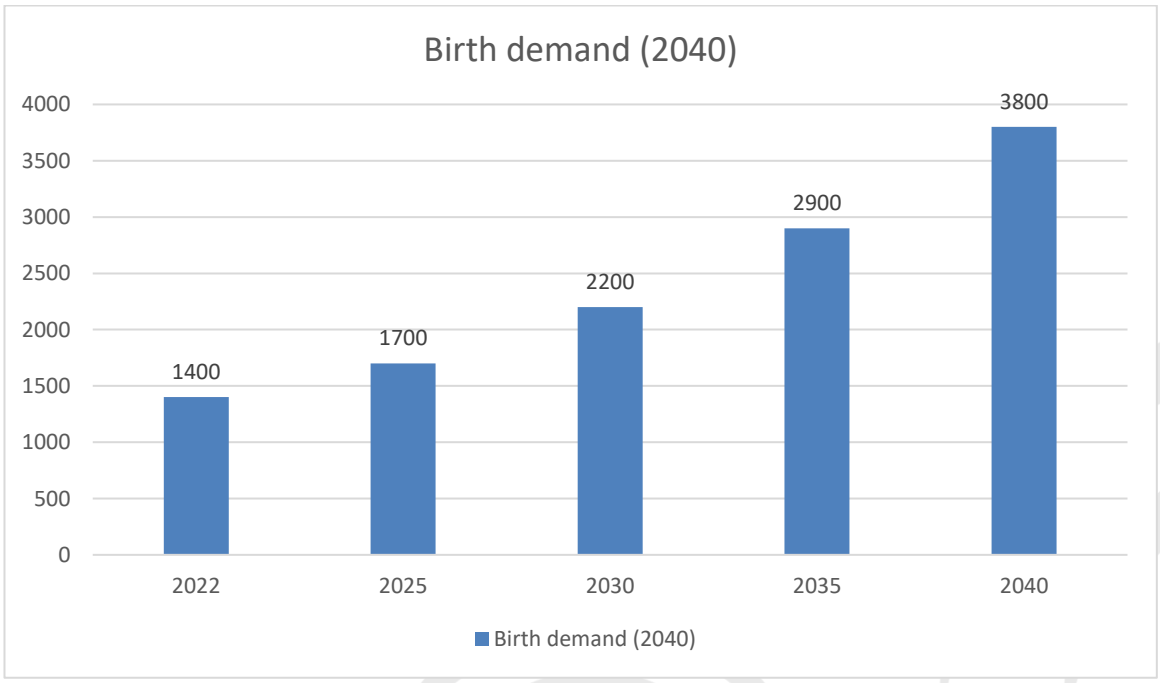

Figure 1 - Forecast for berth demand in RS (2040)

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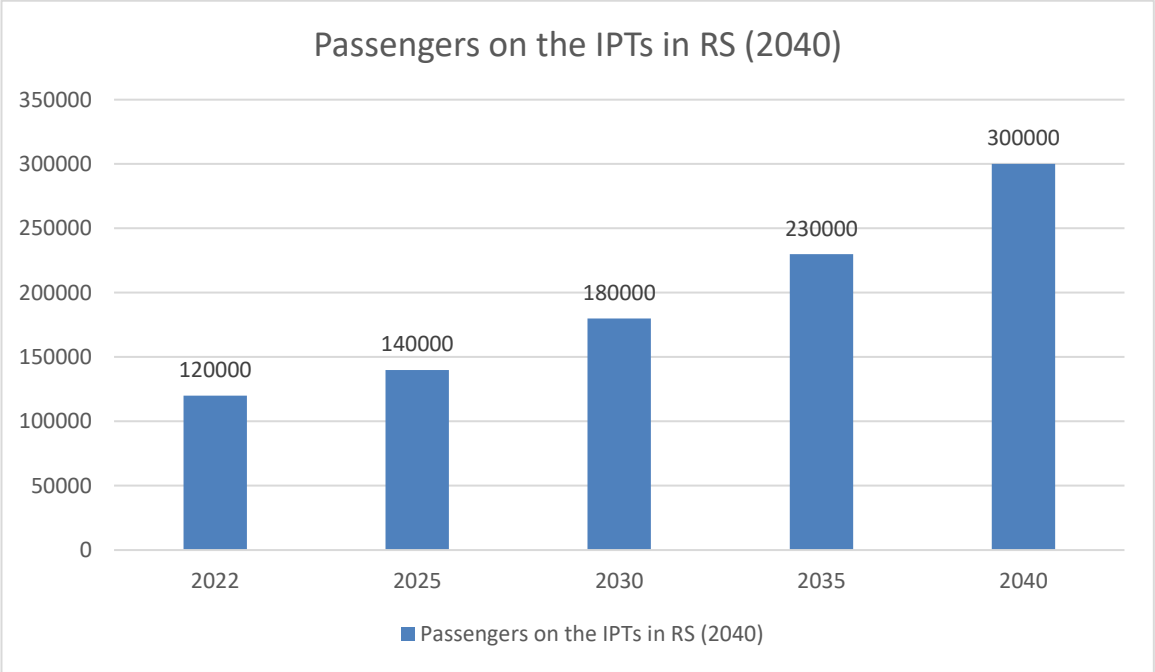


Figure 2 - Passengers on IPTs in RS (2040)

6 Cruise berth demand in the ports of the Republic of Serbia

6.1 Cruise vessel trends

To forecast the infrastructure and facilities requirements to meet the projections, it is important to take into account the anticipated trends in ship construction and their deployment.

Currently there are no Serbian flagged cruise ships, though there is a shipyard in Mačvanska Mitrovica, part of the Vahali group, involved in major part of shipbuilding process of cruise ships (hull construction).

On the other hand, major shipping companies engaged in RCI are represented in the Republic of Serbia by their shipping agents.

The most important tour operators maintaining cruise lines calling ports of the Republic of Serbia are Viking River Cruises, Tauck, Uniworld River Cruises, Grand Circle Travel, Nicko cruises, Crystal Cruises, Avalon Waterway.

Fleet management is rather flexible category and is subject to adaption to market conditions. The most used vessels are with a length between 110m and 135 m and a width between 11m and 15m. The average age of vessels is 8 years. The number of passengers on cruisers ranges from 80 to 200.

Due to the size of the locks, it is not expected that ships length will further grow, but several double-width vessels appeared on the market recently. The biggest and most recent one is AmaMagna which is 22m wide and designed to sail exclusively on the river Danube.

Data on the technical and transport characteristics (length, width, max draft, max passenger capacity) of the most frequent vessels calling IPTs in the Republic of Serbia are shown in the following tables.

'MS River Princess'	
	
- **Information**	
Owner:	'Uniworld River Cruises'
Flag:	Switzerland
Year built:	2001., reconstruction in 2011.
Length (LOA):	110 m
Beam (width):	11,4 m
Max draft:	1,3 m
Passengers (max)	138
Crew (max)	44

Table 1. MS River Princess data table

'MS Prinzessin Sisi[1]	
	
- **Information**	
Owner:	'Riseday Holding'
Flag:	Malta
Year built:	2000, reconstruction in 2015/16.
Length (LOA):	111 m
Beam (width):	11,4 m
Max draft:	1,5 m
Passengers (max)	156
Crew (max)	38

Table 2. MS Prinzessin Sisi data table

[1]http://www.cruisemapper.com/ships/MS-Prinzessin-Sisi-1367

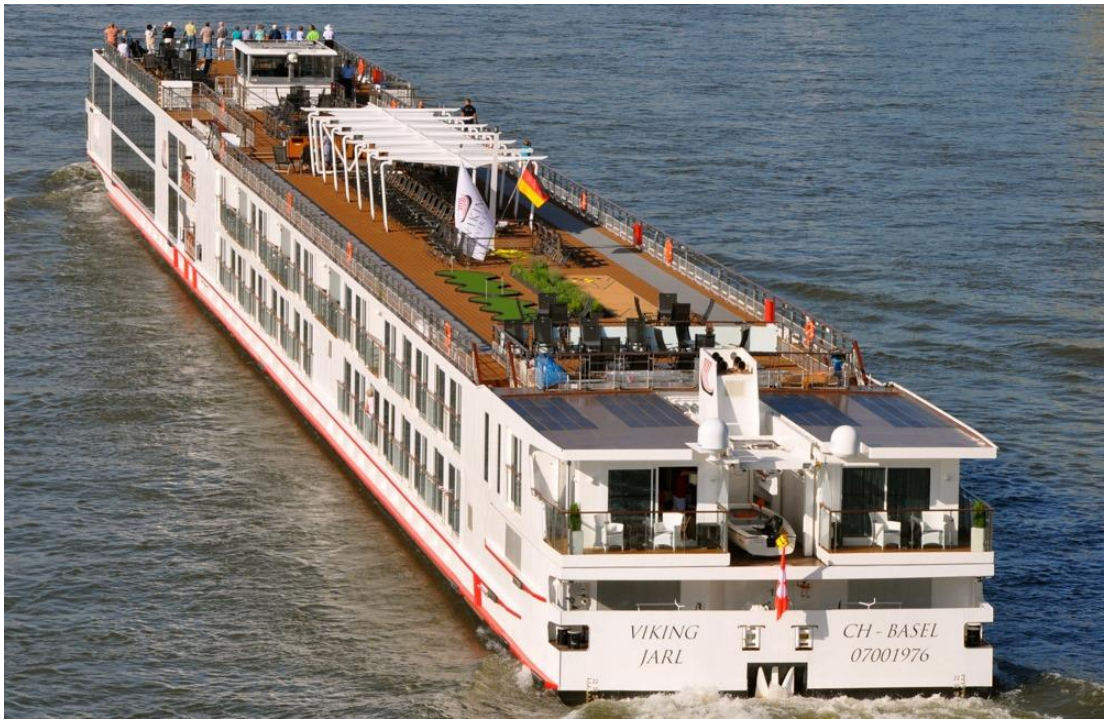
Viking Jarl	
	
- **Information**	
Owner:	'Viking Cruises'
Flag:	Switzerland
Year built:	2013.
Length (LOA):	135 m
Beam (width):	11,4 m
Max draft:	1,8 m
Passengers (max)	190
Crew (max)	50

Table 3. Viking Jarl data table

Viking Embla	
	
- **Information**	
Owner:	'Viking Cruises'
Flag:	Switzerland
Year built:	2012.
Length (LOA):	134,83 m
Beam (width):	11,45 m
Max draft:	2,1 m
Passengers (max)	190
Crew (max)	50

Table 4. Viking Embla data table

MS A Rosa Silva	
	
- **Information**	
Owner:	'Riseday Holding'
Flag:	Malta
Year built:	2000.
Length (LOA):	135 m
Beam (width):	11,4 m
Max draft:	2 m
Passengers (max)	186
Crew (max)	40

Table 5. MS A Rosa Silva data table

MS AMA MAGNA	
	
- **Information**	
Owner:	'AmaWaterways'
Flag:	Switzerland
Year built:	2019.
Length (LOA):	135 m
Beam (width):	22 m
Max draft:	2 m
Passengers (max)	198
Crew (max)	70

Table 6. MS Ama Magna data table

6.2 Traffic data analyses

Today, seven passenger terminals are in use for RCI in the Republic of Serbia: Belgrade, Novi Sad, Donji Milanovac, Kostolac, Golubac, Smederevo and Kladovo.

Figure 3 - International Passenger terminals in RS

River cruise lines

River cruise is very dynamic market. Despite the complexity and demanding organization of such cruises, Major tour operators are constantly trying to introduce new destinations, innovate existing tours and organize thematic ones for different age categories, interests, and affinity of their clients.

Some cruise lines calling IPTs in Serbia, currently offered by tour operators are listed below. More detailed information, itinerary, dates and prices are available on their websites.

Viking River Cruises (https://www.vikingrivercruises.com/) in its offer currently have two cruises with stops in Belgrade and Golubac:

- Passage to Estern Europe, 11-day cruise covering 5 countries starts in Bucharest (Giurgiu) and ends in Budapest;

- European Sojourn, 23-day cruise covering 8 countries starts in Amsterdam and ends in Bucharest (Giurgiu);

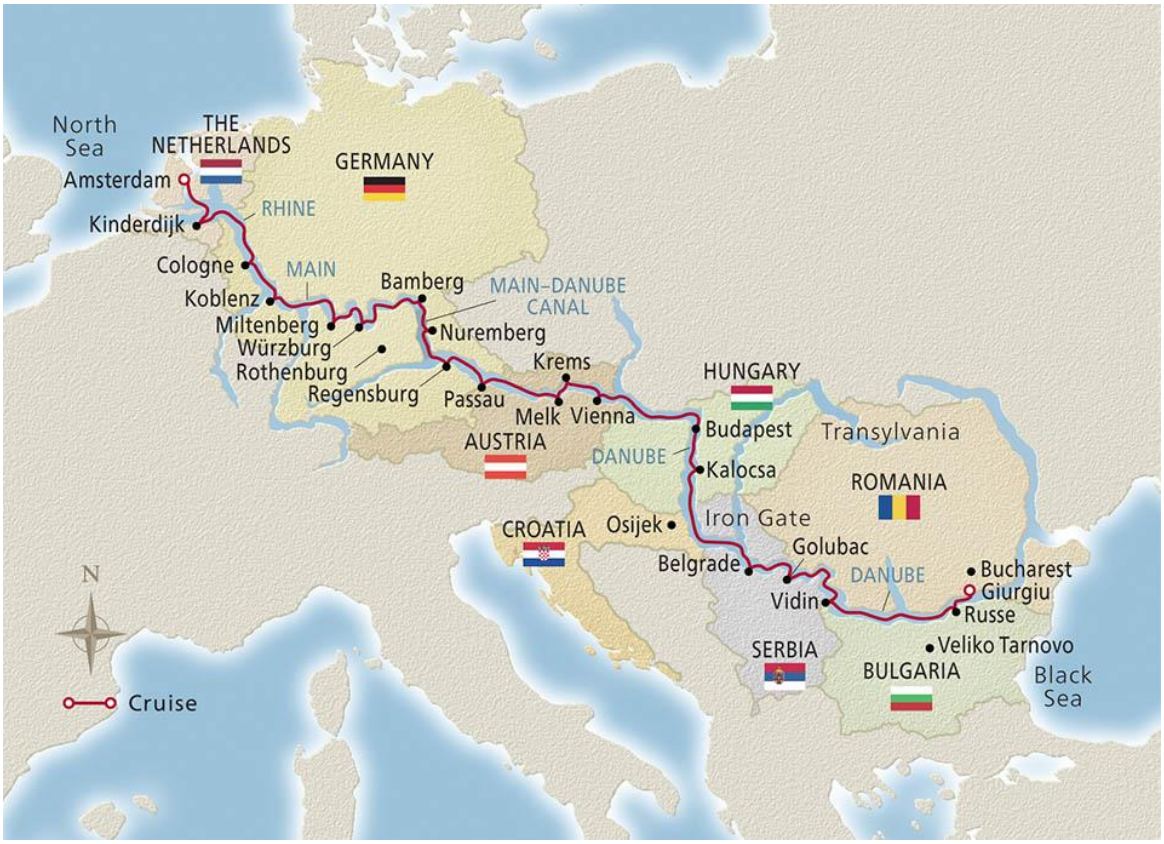


Figure 4 - Viking's European Sojourn itinerary map

Tauck (https://www.tauck.com/) has also two cruise offers covering visits in Belgrade and Novi Sad:

- Grand European Cruise, 25-day experience trough the hart of Europe, from Amsterdam to Constanza and Bucharest;
- Budapest to Black Sea, 13-day cruise through romantic lower Danube, from Budapest to Constanza and Bucharest;

Uniworld (https://www.uniworld.com/eu) sell three tour programs with stops in Belgrade, Golubac and Donji Milanovac:

- Ultimate European Journey, 25 days from Amsterdam to Bucharest (Giurgiu);
- Portraits of Eastern Europe, 19 days from Prague to Bucharest (Giurgiu);
- Highlights of Eastern Europe, 10 days from Budapest to Bucharest (Giurgiu);

Figure 5 - Uniworld's Portraits of Eastern Europe itinerary map

Grand Circle Travel (https://www.gct.com/) in its offer currently have two cruises with stops in Belgrade and Novi Sad:

- Grand European Cruise, 29 days cruise covering 8 countries and 22 cities starts in Amsterdam and ends in Bucharest (Constanza);
- Eastern Europe and the Black Sea, 14 days cruise covering 7 countries and 10 cities starts in Budapest and ends in Bucharest (Constanza);

Nicko Cruises (https://www.nicko-cruises.de/en/) has four cruise offers calling IPTs in Serbia:

- Majestic beauty, 15 days cruise from Passau to Danube delta (Tulcea) and back, including stops in Belgrade and Novi Sad;
- Cities and Nature's spectacle, 12 days cruise from Passau to the Iron Gate and back, including stops in Novi Sad, Belgrade and Golubac;
- Experiences along the entire length, 15 days cruise from Passau to the Black Sea and Back, including stops in Novi Sad and Belgrade;
- All the way to kilometer 0 through 10 countries, 17 days cruise from Passau to Ukrainian Danube delta and back, including stops in Belgrade and Novi Sad;

Avalon Waterways (https://www.avalonwaterways.com/) offers a variety of cruises of different length, thematic and starting/ending places:

- Balkan discovery, 9/10/11/12 days cruise from Budapest to Bucharest, with stops in Novi Sad, Belgrade, Golubac and Donji Milanovac;

- The Danube from Croatia to the Black Sea, 9/11 days cruise from Zagreb (Osjek) to Constanta and Bucharest, with stops in Belgrade, Golubac and Donji Milanovac;
- The Danube from the Black Sea to Budapest, 11/12/13/14 days cruise from Bucharest (Cernavoda, St. Gheorghe) to Budapest, with stops in Donji Milanovac, Golubac, Belgrade and Novi Sad;
- The Danube from Germany to the Black Sea, 16/18/20/22 days cruise from Deggendorf to Bucharest (Oltenita), with stops in Novi Sad, Belgrade, Golubac and Donji Milanovac;

Trafic data

Before the pandemic, PGA recorded constant increase of port calls and passengers. For example, results achieved in 2019 have been foreseen for year 2025 in the Strategy on waterborne transport development (RS). Most of the port calls were made in Belgrade, Novi Sad, Donji Milanovac and since 2018 in Golubac.

Weather conditions (dry periods in 2018 and 2022) didn't affect nautical seasons. On the other hand, current geopolitical situation and COVID-19 affected the number of passengers in 2022, whereas vessel capacities weren't full. For the first 9 nomnths of 2022, there were 5% less dockings than in same period 2019, which represents fast post covid recovery.

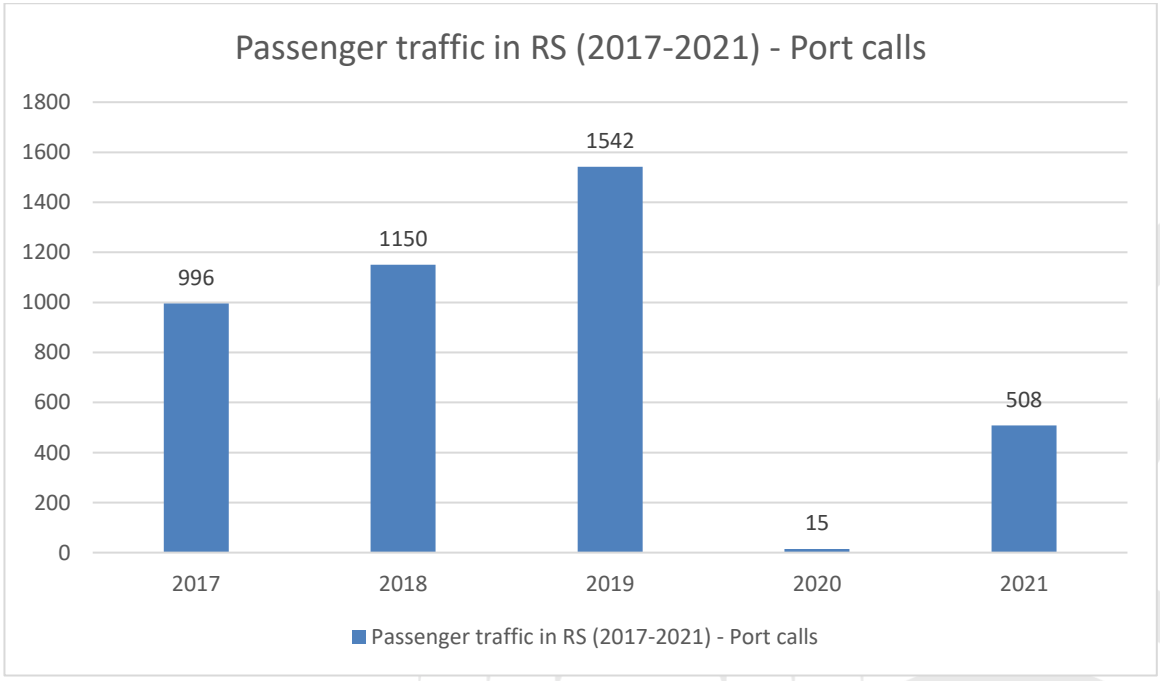


Figure 6 - Passenger traffic in RS - number of port calls

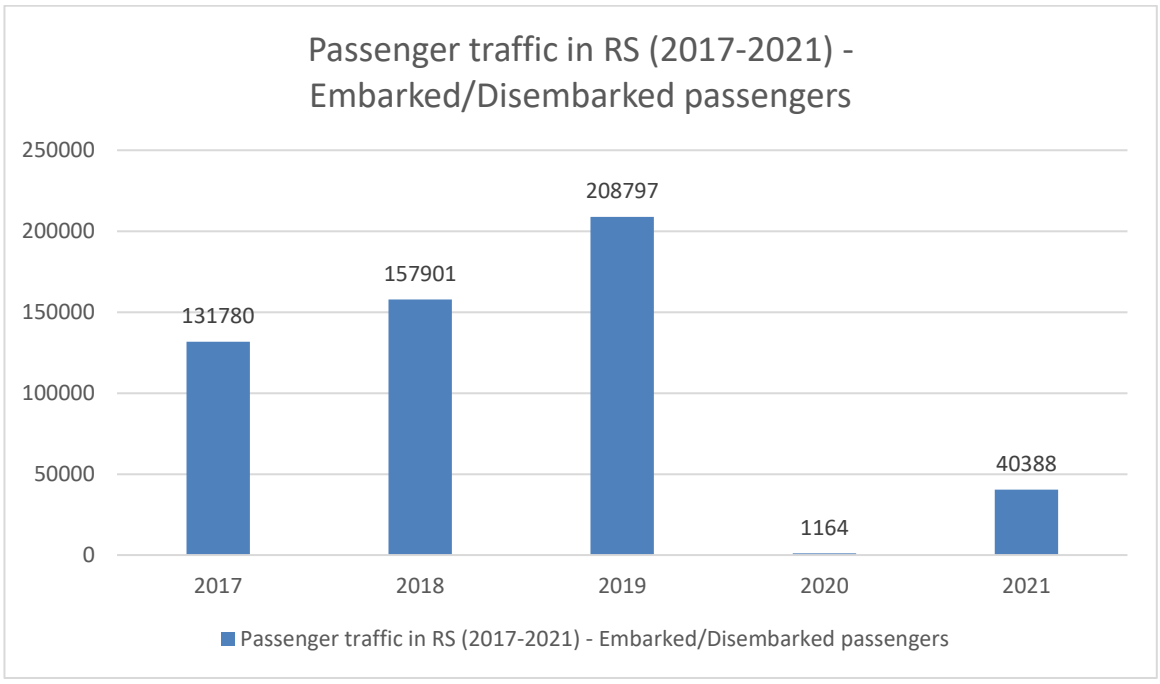


Figure 7 - Passenger traffic in RS - number of Embarked/Disembarked passengers

6.3 Facility/infrastructure demand

Translating cruise passenger traffic assessment and forecasts into berth or facility/infrastructure demand over the projection period (2040) is an essential element in the overall master planning process.

This process looks to identify the facility need over time and, more specifically, to focus on the timing of the facilities/infrastructure required to accommodate future traffic demand.

Infrastructure-demand forecasting relies on identifying cruise deployment patterns, establishing future vessel sizes, and forecasting vessel calls.

Development of new locations with adequate touristic offer in the hinterland can stimulate creation of new patterns and contribute to the further growth of RCI.

Having in mind that most cruses are sold a year in advance, companies are preparing their operational plans (berthing schedule) even for a few years ahead. So, these patterns are very hard to change and introducing new terminals should start at the right time.

On the other hand, if there is a market interest and a need for a new terminal on the certain location, and respond is waited too long, there is serious risk that market will "forget" this location and even when the project is completed huge efforts would be needed to attract interest of the market again.

Optimum berth demand is between 80 to 90% based upon daily or weekend utilization. However, even before this is achieved, an additional berth is possibly needed to be able to meet the demand and allow for peak use on weekends and key days.

Having in mind the above, further expected growth of RCI on the Danube river could have following impact on international passenger terminals in RS.

Belgrade, as the state capital and largest city laying on two rivers (Danube and Sava), naturally has the biggest number of dockings. Newly made 200m floating dock is berth for cruise vessels since 2006 (old dock of the smaller size used before). Even dough six cruise ships can be berthed at the time, in past years lack of capacities has been noted in season peaks. For the season 2023 Zemun terminal will be open and cover the increased market need, but another location and additional berthing places are necessary for the capital. PGA commenced planning activities with the city authorities.

Novi Sad is following with numbers. Currently there are three floating docks alongside the city quay which are operational, and there is a possibility for the fourth one which is already included in spatial plans. However, nautical conditions (narrow stretch of the river, bridges, curve, fairway relatively close to the shoreside) do not allow more then one or two berthing places on each dock. Decisions on future development will be based on the observation of the trends, especially frequency and time spent on berth. It is expected that these could change with the opening of nearby Sremski Karlovci terminal.

Golubac. Interest has increased largely since opening. Even though limited with the capacity of the main attraction in the hinterland- Golubac fortress, there are often inquires for the overnight on the berth due to the quiet surrounding and spectacular

view. Though, one floating dock with up to three berthing places is becoming tight for the future needs. PGA has commenced with planning activities for the extension of capacities in near future.

Donji Milanovac, has tripled number of dockings in last five years. With the opening of Golubac terminal, it was enabled to combine tours and terminals, i.e tourists visiting Golubac continue by busses to the nearby Lepenski vir archeological site and bord on the ship again in Donji Milanovac, or vice versa. Quiet surrounding of the Djerdap national park also contributed to the increased interest in this passenger terminal. During this season often peaks were spotted, so the port operator will have to act promptly with planed project for the extension of capacities (contractual obligation).

Kostolac is newly open passenger terminal with the very important archeological site in the hinterland, Viminacium. Activities of the introduction to the market are planned for 2023.

Smederevo and *Kladovo* passenger terminals are open but without significant traffic. More promotional activities are needed from the local tourist organisations.

Ram Fortress in Veliko Gradište. This location is still under development. Majority of construction works are already done or are prepared. Expected to be ready by mid-season 2023 or beginning of 2024.

Sremska Mitrovica and *Šabac* projects are foreseen to enable the extension of RCI to the river Sava. Due to some navigational restrictions, it is more convenient for smaller vessels (length up to 110m and lower draft). Terminal in Sremska Mitrovica is expected to be completed soon and opening is planned for the season 2023. Terminal in Šabac is still under construction and expected to be completed in 2023.

Sremski Karlovci, undoubtable important location for the RCI. Project was on hold due to some administrative reasons, but it is planned to continue and finish all activities in period 2023/2024.

Apatin. Even though the dock has been already constructed and almost completed, due to some property and legal issues the project is on hold.

7 Cruise development plans in the Republic of Serbia

Historically, the cruise ports develop its cruise facilities organically as the need has arisen. However, since the industry is very fast growing today, it is necessary to have the consistent planning. This means that decisions when and where to place the terminal can and should be made in advance, in order to be able to start the project on time and be ready when the need arises.

As mentioned before, the Strategy on waterborne transport development of the Republic of Serbia, 2015 – 2025 defined tentative network of IPTs, suitable for further elaboration through the spatial planning and technical documentation.

The Strategy aim to enlarge the scope of tourism offer, and thus define a network of passenger terminals open to international traffic. Strategy foreseen development of the following 16 passenger terminals for RCI: Apatin, Bačka Palanka, Novi Sad, Sremski Karlovci, Belgrade, Smederevo, Kostolac, Veliko Gradište (Ram), Golubac, Lepenski Vir, Donji Milanovac, Kladovo, Neogtin, Šabac, Sremska Mitrovica and Kanjiza.

PGA is continuing IPTs development projects. With the diversified tourist offer and newly open IPTs it will contribute to the further development and increase of the RCI market on the Danube stream.

Zemun

Government has declared the port area in 2014. Municipality prepared technical documentation, while PGA has obtained construction permit in 2018. Jointly financed by Ministry of tourism, PGA and Municipality of Zemun, works were finalized in 2021. New operator has to be selected through the public call, which PGA will launch at the beginning of the 2023. IPT in Zemun will be ready to welcome first cruises in nautical season 2023.

Figure 8 - IPT in Zemun, Belgrade

Veliko Gradište (Ram)

Along with its reconstruction, Ministry of tourism has financed procurement of the 70 meters long barge adapted to the passenger dock. In 2019 Government has determined port area along the right bank of the river Danube at approximate rkm 1078.

PGA is financing infrastructure works on dock positioning with steel pilings as well as additional works on the equipment of the IPT. In parallel, PGA will perform the procedure for the selection of port operator. It is expected that IPT in Veliko Gradište (Ram) will be ready during the season 2023 or the biggening of the season 2024.

Figure 9 - Ram Fortress

Sremska Mitrovica

Although placed on the Sava river 139km from the confluence with the Danube, this antient city, birthplace of seven roman imperators, is certainly place of interest for RCI.

In 2020 PGA has completed technical documentation necessary for the determination of the port area, while local authorities prepared corresponding spatial planning documentation.

Construction of necessary infrastructure (passenger dock) are financed by PGA and started in 2021. Works are nearly completed and PGA has selected port operator through the public call. The plan is to complete all works by the end of 2022, and open the IPT in Sremska Mitrovica by the beginning of the nautical season 2023.

Šabac

Another location on the Sava river with great potential for development of RCI. Šabac is a modern, elegant town, with cultural and historical landmarks.

In 2021 PGA has completed technical documentation necessary for the determination of the port area. Upon the determination of port area by the Government, PGA will perform the procedure for the selection of port operator.

The Agency in 2022 launched investment into the construction of necessary infrastructure, and the plan is to complete all works and open the IPT in 2023.

7.1 Cruise terminal/berthing layout in the [port]

Not available at the moment.

7.2 Alternative development plans presented [2 alternatives presented and the recommended one]

Apatin

Project started some time ago when local authorities attempted to build a IPT facility with floating concrete dock. Unfortunately, due to the heavy nautical and weather conditions the structure was hit and submerged by the floating ice. This proved that concrete dock is not appropriate solution for given conditions.

In 2020 PGA has prepared part of the technical documentation necessary for the determination of the port area at the left bank of the river Danube at approximate rkm 1401+400, while local authorities prepared corresponding spatial planning documentation. Financially supported by the Ministry of tourism, local authority has completed reconstruction of the facility. Steel pilings and the access bridge were repaired, along with new dock made of steel. Two dolphins with floating bollards are assuring conditions for safe berthing of passenger ships.

Unfortunately, some unsolved land property issue is an obstacle for the competition of the project

Sremski Karlovci

Located very close to Novi Sad, Sremski Karlovci have already proved to be point of interest for RCI. During the last decade, this small town with rich cultural heritage became one of the must-see attractions for all tour operators of cruise ships who stops in Novi Sad.

In 2017, Government declared the port area of IPT in Sremski Karlovci on the right bank of the river Danube at approximate rkm 1244. PGA has selected Public utility company “Belilo” for the port operator, and local authority with the financial support of the Ministry of tourism started with construction of the IPT. Access road has been completed as well as 42 meters long floating part of the dock.

Unfortunately, positioning of the dock with steel pilings and construction of the access bridge were not completed yet, and port operator and local community have stuck with administration.

Most likely, PGA will have to take over and finish the project.

7.3 List of proposed investment projects. Recommendations

Since the function of PGA is the regulatory body and government agency, it has the public side point of view. Crucial activity, bearing this in mind, is making appropriate environment for the development of fair market conditions which will lead to the RCI expansion.

As a central port authority, PGA has the ability to coordinate, finance and execute projects identified in the Strategy for the development of waterborne transportation in the Republic of Serbia and Action Plan.

Identified projects have been listed in previous chapters (Zemun, Ram/Veliko Gradište, Sremska Mitrovica, Šabac, Apatin, Sremski Karlovci).

Further elaboration of each project went in correspondence with the legislation and procedures (spatial planning, preparation of technical documentation, financing, construction permit, use permit, licencing of port operator...).

So far, more than 2 million euros has been invested in technical documentation and works on the development of these IPTs. With the ongoing works and the ones expected to be executed for completing all the projects, total amount will exceed 4 million euros. For the further expansion of capacities of existing IPTs (Belgrade, Golubac, Donji Milanovac), feasibility studies should give the answer on the financial level of necessary investments in the infrastructure.

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

D.T3.4.3 - National Infrastructure Master Plan: AT, SK, HU, HR, RS, BG, RO, MD, UA for sustainable development of River Cruise industry

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3 Abbreviations

Abbreviation	Explanation
IWT	Inland water transport
RCI	river cruise industry
DR	Danube region

4 Overview

The Danube flows for a distance of approximately 1,075 km on Romanian territory, so it is considered an important transport corridor. The Danube - Black Sea Canal makes a direct connection between Romania's most important port, Constanța, and the Danube.

Between Porțile de Fier and Brăila, the Danube is more than 2 km wide and has numerous islands. Due to the currents, the navigation channel is moved several times a year, so maintenance work is required to keep the water depth at a minimum of 2.5 m.

There may also be problems with the width of the navigation channel, on which sometimes it is necessary to drive only in one direction (as opposed to times when it drives in both directions). Weather phenomena such as drought, floods or ice make navigation difficult and affect traffic flow.

In May 2015, the General Transport Masterplan for Romania regarding the short, medium and long term period was adopted. Here the importance of the Danube as a transport artery is highlighted.

The strategic vision for Romania's waterways is represented by a network that provides 24/7 access for all waterway users. This will ensure a consistent high standard of service, giving operators, passengers and freighters the confidence to use the waterways.

This can be achieved by improving and maintaining the navigable channel at the required depth of 2.5 m and by investing in elements that will reduce or eliminate the impact of any avoidable circumstances that may lead to reduced navigability; for example, dedicated icebreakers can be purchased.

The general problem identified was the need to modernize the port infrastructure.

The governing program for the period 2018-2020 included among the objectives the promoting water transport (navigable canals, rivers) through the rehabilitation of sea and river ports and ports of tourist interest (Orșova, Old Moldova, Constanța, Tulcea, Brăila).[1]

[1] *Romania's Tourism Development Strategy Volume 2 – Strategy and Action Plan*, February 2019, http://sgg.gov.ro

The tourism development strategies of the Romanian regions connected to Danube area include every time aspects of cruise tourism.

One example of the interest in cruise tourism in the area is the inclusion of the *Roman Emperors* and *Danube Wine Routes* on the list of cultural circuits of the Council of Europe (2015) (Priority Area 3 Culture, tourism, people-to-people).

5 Projection of cruise traffic in Romania

Shipping companies are the first market players in the Danube River Industry. They are dealing with large investments, the ships with their increased facilities and staff, compared with a cargo vessel and plays in a field with many actors involved (infrastructure providers, authorities involved in the safety for navigation and border control, service providers).

Infrastructure providers in Romania are public and private. Related to the public infrastructure, passenger terminals are located in Orsova, Tulcea, Galati and Constanta. Vessels can berth, theoretically, in all Romanian ports, quality of infrastructure being different from port to port. In Rumanian Danube ports ships berth to pontoons, due to the fact that the water levels vary. Not all the ports present interest for cruise vessels, for tourists, and just several locations are chosen based on criteria like: tourist attractions in the area or larger cities, quality of road connections and infrastructure, links with airports, services available. The public port infrastructure is administrated by national companies (APDM and APDF) which are under the authority of the Ministry of Transport and Infrastructure. Private investments in basic infrastructure were done to accommodate cruise ships.

Service providers are all private and offer touristic programs.

Ministry of Entrepreneurship and Tourism of Romania is specialized body of the central public administration, subordinated to the Government, which implements the strategy and the Government Program in the fields of entrepreneurship, small and medium enterprises, foreign investment, business environment, tourism and foreign trade, in accordance with the requirements of the market economy and for stimulating initiative of economic operators. The Government program stipulates the establishment of destination management organizations (DMOs), internal and external promotion of tourism.

According to the analyses of the Program Transport Connectivity 2021 – 2027 the main risks for navigation on the Danube are the unsatisfactory parameters of the waterway and the poor navigation conditions (fog, low water levels, etc.), and the process of improving the parameters of the fairway and increasing the safety of navigation on the Romanian sector on Danube River has not been completed so far. Under the Programme Transport Connectivity there are investments planned for the development of information systems which will upgrade the existing ones. There is also funding for supply of multifunctional vessels, modernization and construction of facilities for

improving transport safety and environmental protection, including port facilities for safe, efficient and secure inland waterway and sea transport.

Compared with other modes of transport, the transport of passengers on inland waterway in Romania is quite small, under 0.05%.

Table 1 The cruising lines which call Romanian ports

Germany	• *Nicko Cruises* • *Phoenix Reisen* • *1 AVista* • *Komm Mit* • *Leitner* • *Plantours*
Switzerland	• *Mitthelthurgau* • *Thurgau Travel* • *Cruiseaway* • *Viva Cruises* • *Rivage Fluss*
Austria	• *Lüftner Cruises* • *Amadeus River Cruise* • *GTA Skyways* • *Papageno Touristik* • *Klug Touristik*
Great Britain	• *Riviera Travel* • *Arena Travel* • *SAGA Travel*
Denmark	• *Quality Tours*
Spain	• *Crucemundo*
France	• *Croisi Europe* • *Rivages du Monde*
USA	• *Viking Cruises* • *AVALON* • *AMA Waterways* • *Uniworld* • *AHI Travel*
Australia	• *Scenic* • *Australian Pacific Tours* • *Emerald Cruises*

Large cruise ships are operated and registered by foreign companies, bringing tourists from all over the world.

Cruises last between 8 and 13 days and most of them includes destinations in Romania, Bulgaria, Serbia, Croatia and Hungary.

It is difficult to make a projection of passenger traffic until 2040 considering the global events of recent years. According to the reported data, Romania did not suffer a

decrease in the number of passengers on the Danube in 2020, the year of the COVID-19 pandemic, but at the European level a drastic decrease was felt.

Passenger traffic on the Danube will recover, but it is difficult to estimate when this will happen.

Considering the concern for the development of tourism and the programs that will be implemented in this direction, it is expected that the cruises will become more attractive.

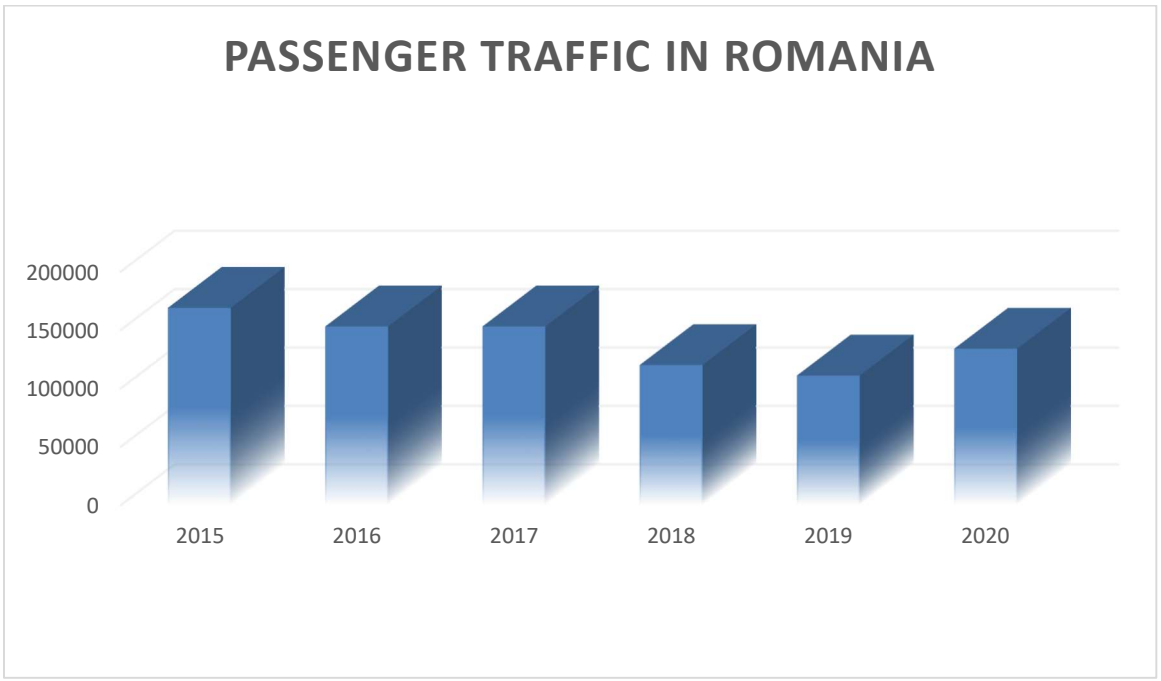

Figure 1 The evolution of the number of passengers on the Danube in Romania

According to the data presented in the graph, passenger traffic on the Danube in Romania decreased from 2015 to 2019, but increased by 20% in 2020.

There are plans to develop the port of Tulcea to improve intermodal connections and to develop logistics platforms to meet the need for road transport to neighboring regions. There is also potential to develop the harbor for recreational activities, including cruise ships and pleasure craft. Tulcea Port is the main gateway to the Danube Delta and is part of the comprehensive TEN-T network.

The Tulcea Seafront area has a mooring front of 1,557 ml, intended for ships that ensure the transport of passengers and goods between the towns of the Danube Delta - subsidized transport for tourist cruise and leisure ships, as well as for supplying ships

with water and energy. In this area there is a passenger terminal that serves both national and international flows.

If the interested parties will invest in the port infrastructure and implement cruise tourism development strategies, the number of passengers on the Danube will increase, similar to other European countries.

6 Cruise berth demand in the ports of ROMANIA

6.1 Cruise vessel trends

Since 1997 number of river cruise vessels and capacity increased with approximatively 1000%.

Romania have huge potential and opportunities for cruise tourism for Danube ports and the region of Constanta. Cruise Liners are looking to innovative schedules combining different ports on the Danube River.

Table 2 Number of passenger vessels by age & structure in Romania

Romania	Year of construction by certificate		
	< 1995	1995 < 2006	>2006
Number of Vessels:			
Number of River Cruisers ≤50 berths/beds	**0**	1	0
Number of River Cruisers > 50 berths/beds	3	0	0
Number of Day-trip vessels ≤ 50 passengers	14	-	12
Number of Day-trip vessels > 50 passengers	18	4	5

Source: Romanian Naval Authority

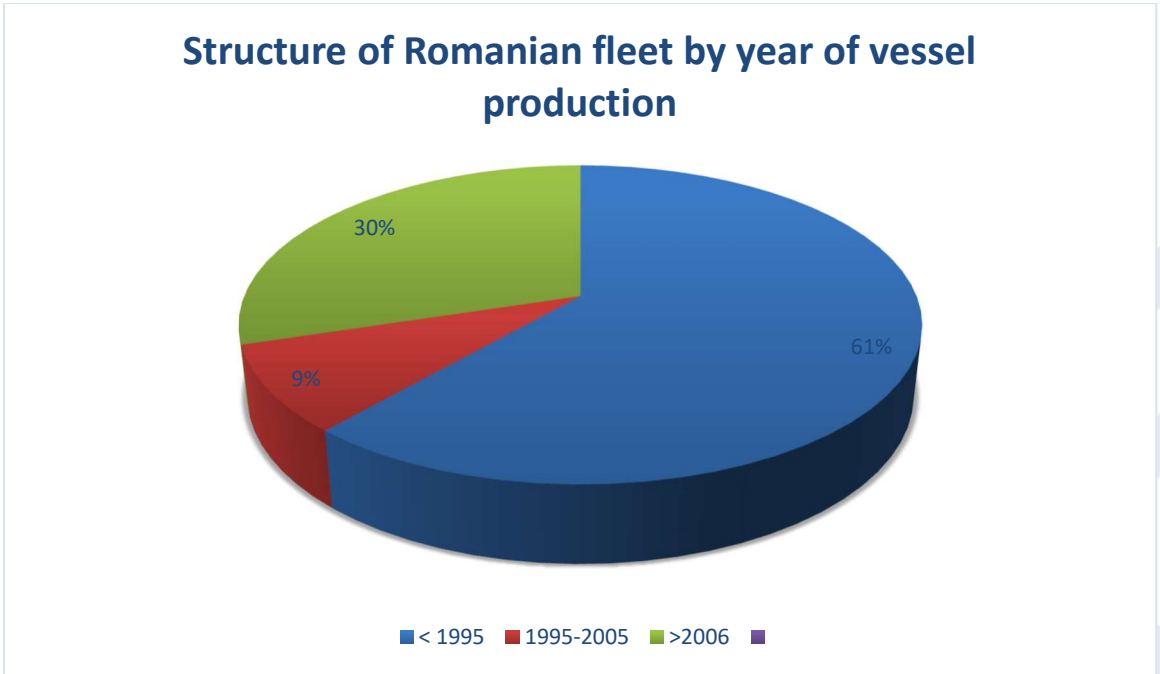

Figure 2 Structure of Romanian fleet by year of vessel construction

Source: Romanian Naval Authority

Large cruise ships are operated and registered by foreign companies, bringing touristsfrom all over the world.

Table 3 Passenger ships operating in Romania

SHIP	Year of construction	Capacity	Length	Width	Cabins	Operator
MS VIVALDI	2009	176	110	11,40	88	CroisiEurope
MS L`EUROPE	2006	180	110	11,40	90	CroisiEurope
MS AMAMAGMA	2019	196	135	22	98	AMA Waterways
Scenic Pearl	2011	159	135	11	80	ScenicTours Australia
SS Beatrice	2009	152	135	11,40	76	Uniworld

For trips in the Danube Delta Romania has pontoons – floating hotels, ranked with 3* and 4 * and a much smaller capacity than a cruise vessel. Such pontoons are owned by small private companies and can be rented.

6.2 Traffic data analyses

The passenger traffic on national level is presented below.

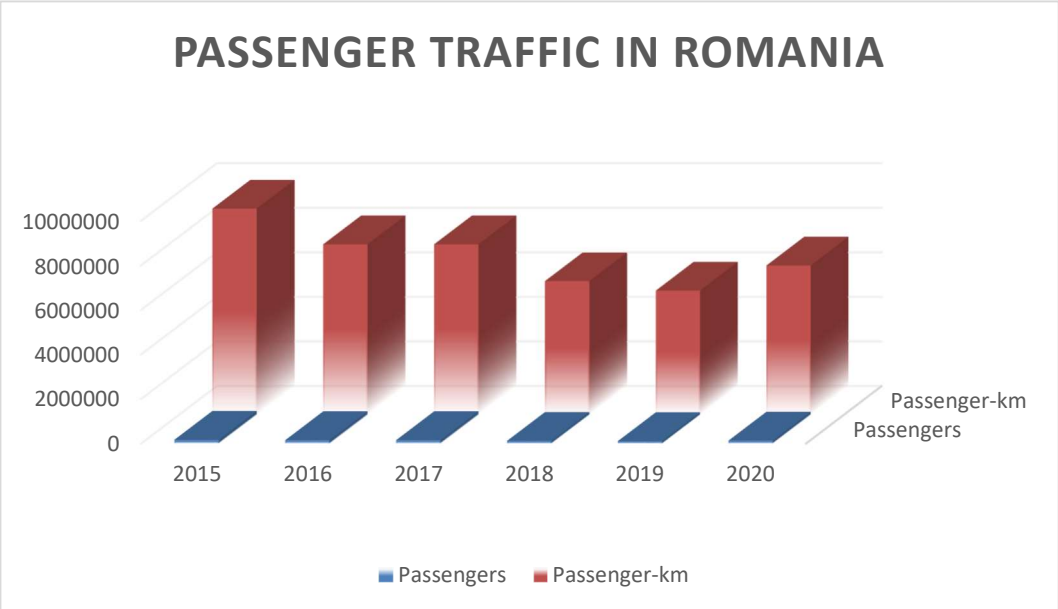

Figure 3 Passenger traffic in Romania (2015-2020)

The statistics presented shows that the number of passengers transported on inland waterways decreased since 2015 on national level. An increase with 20% was registered in 2020 compared with 2019. Passenger-kilometer decreased year by year as well.

Cruises industry on the Danube was hardly hit by the COVID 19 pandemic in the last two years. Nowadays, the risks of a military conflict, a war, in a Danube riparian country, Ukraine, can determine a decrease in the number of passenger or a totally blockage for this industry. The effects of such a crisis last longer than the risk itself in this kind of business.

6.3 Facility/infrastructure demand

The Ministry of Transport is the state authority in the field of water transport. The Administration of the Danube Maritime Ports (Administration of the Maritime Danube Ports CN) operates under the authority of the Ministry of Transport and manages the entire port infrastructure located on the fluvial sea sector of the Danube river from km 0 to km 255.

The Danube River Ports Administration - Giurgiu plays the role of port authority in almost all the ports located on the Danube between Bazias and Cernavoda.

The Maritime Ports Administration has the role of port authority for the Romanian maritime ports of Constanta, Midia and Mangalia. In Romania, the Danube flows for 1,075 kilometers, which represents more than 1/3 of the total length of the river. This is also the longest stretch in a single country compared to any other country along the Danube River.

Table 4 Ports and wharves for passenger ships in Romania

Location	KM	Bank	No of beths
Moldova Veche	1050-1047	left	1
Orşova	953 – 957	left	2
Drobeta Turnu Severin	927- 931	left	3
Cetate	810-811	left	1
Calafat	793 – 796	left	1
Turnu Magurele	597	left	1
Giurgiu	489-497	left	5
Olteniţa	428-431	left	3
Calarasi	371-376	left	1
Cernavoda	298-299	right	3
Fetesti	48 (Borchea arm)	left	1
Harsova		right	1
Brăila	167-175	both	4
Galaţi	151 -149,35	left	1
Isaccea	53-56 sm	right	1
Tulcea	70-73	right	2

Chilia Veche	43-46	right	1
Sfantu Gheorghe	4 (Sf. Gheorghe branch)	left	1
Sulina	0	right	1
Constanta			1

Source: Interreg Danube Transnational Programme, *Study of Development of the Cruise Tourism in the Danube Region*, 2019

Constanta being the last port of the Danube - Black Sea canal, the port also receives river ships from the Danube traffic.

Port infrastructure is state-owned and managed by the port authority, while port operations are carried out by private companies that provide and maintain their own facilities, including buildings and cargo handling equipment. Some of the ports (Turnu Magurele, Sulina) are handed over to the respective municipalities.

7 Cruise development plans in Romania

Romania has 1,045 kilometers of the Danube - approximately 40% of the river's total of 2,400. There are 20 river ports in the Romanian sector of the Danube, 4 of which – Sulina, Tulcea, Brăila, Galați – are on the maritime Danube.

Constanța Port benefits from a direct connection with the Danube River, through the Black Sea Danube Canal. Also, the port of Midia is connected with the Black Sea Danube Canal through the Poarta Albă - Midia Canal.

Considering the development potential of port cities on the Danube due to their position, all development strategies adopted by local or regional authorities include elements regarding the cruise industry and its connection with tourist attractions in each area.

7.1 Cruise terminal/berthing layout in the Port of Constanta

The Passenger's Terminal in Constanta Port was inaugurated in November 2005 and is located in the northern part of the port. The terminal is located between two points of tourist attraction that bear the imprint of history, namely the former Royal Pavilion transformed into the Port Museum and the Old Lighthouse, built during the reign of King Carol I.

Destination of many Danube and maritime cruise routes, the Port of Constanta offers optimal conditions for the docking of river cruise ships that make a stopover, as well as maritime passenger ships, having in view the available depths.

The location in this area presents a series of advantages, intended to attract the interest of including the Port of Constanta as a destination for cruise tourism:

- The terminal allows direct and easy access of ships to the port entrance, without additional maneuvers;
- Location very close to the old city of Constanta;
- The existence of easy road connections with the city, ensuring the flow of car and pedestrian traffic without interfering to the port activities;
- Existence near some points of great historical and tourist interest (the Old Genovese Lighthouse, the Port Museum, the Casino and the Casino waterfront, the Tomis marina, as well as the peninsular area of the city of Constanta whose main points of attraction are: Ovidiu's Statue , the National Museum of History and Archeology and the Roman Mosaic);

- Transportation, accommodation, entertainment facilities in the Romanian resorts on the Black Sea Coast.

The length of the existing mooring front is 293 m, the depth at the wharf is 13.5 m, ensuring the berthing of large ships with drafts of up to 10 - 11 m. The value of the investment amounts to approximately 2.8 million Euros.

Figure 4 Constanta Port Passenger's Terminal

7.2 Alternative development plans presented

From the analyzed data, the alternative with the highest potential to lead to the development of the Danube cruise industry in Romania is to direct the European regional development funds to this field, with the development of the tourist infrastructure in the Danube Delta as a priority.

Another alternative is the orientation towards the modernization of the infrastructure of the Danube ports and their connection with the local tourism development strategies, especially by capitalizing on the tourist potential of each area.

7.3 List of proposed investment projects. Recommendations

In April 2022 started the works to modernize the infrastructure of the Port of Braila, the project having a total value of 24.5 million euros.

In the Danube Delta area there are projects to be financed through European funds for the development of the inland water port infrastructure within the Large Infrastructure Operational Program.

These are the following projects:

- Two projects for the modernization and development of Tulcea Port, with a total value of 214 million lei;
- Modernization of Isaccea Port, 15.3 million lei;
- Setting up the international Romanian-Ukrainian state border crossing point for passengers and cargo in ferry mode between the towns of Isaccea (Romania) and Orlovka (Ukraine), 5.6 million lei.

There are investments with a total value of 235 million lei with an important impact for what it means for local development and the stimulation of tourism.

According to the reports of the *River Danube Ports Administration* Giurgiu, proposals are currently being prepared to modernize the port infrastructure for several Danube ports (Calafat, Giurgiu, Corabia, Bechet, Oltenita, Turnu Severin).

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3 Abbreviations

Abbreviation	Explanation
DR	Danube region
EAMA	Executive Agency Maritime Administration
IWT	Inland water transport
RCI	river cruise industry

4 Overview

From a historical perspective during the 20th century the river cruise industry in Bulgaria had solid traditions and a significant potential for further development. For the last eight years however there have not been any initiatives for the development and elaboration of any plans or strategies on local, regional, or national levels for the improvement of inland waterway transport in the country. On a national level river cruise industry has been a topic of the lowest possible priority when it comes to any strategical development plans.

In Bulgaria regular passenger transport on the Danube River does not exist. This makes cruise tourism the only area of activity involving the movement of people via inland waterway transport, which in turn makes investments in reconstruction and modernisation of port facilities financially unappealing both from the perspective of private and public actors.

There is only one Bulgarian company which offers river cruises on the Danube with its own ships – Dunav Tours Cruises EAD. At the moment the company owns four river cruise vessels with a total capacity of 640 beds, which cover 80% of the famous cruise destinations in Europe. They transport tourists from Western Europe, USA, Canada, Russia, Bulgaria, etc. None of the cruises however are not carried out in the Bulgarian section of the river.

On a national level river cruise industry has been a topic of the lowest possible priority when it comes to any strategical development plans. The only partial exception is Bulgaria's *Integrated Transport Strategy for the period until 2030*, which briefly addresses cruise tourism through the provision of a situational analysis and a forecast for the development of the sector.

5 Projection of Cruise Traffic in Bulgaria

The projection models and results used to forecast the [Bulgarian ports] traffic are based upon current knowledge of the region and historical data collected during the assessment process for a period up to 2040.

The scenarios offered within this section, based on the projection models, are made on the following premises:

- Despite recent (and potential future) major events in world, projections anticipate that the cruise industry will continue to follow fundamental positive trends.
- The forecast methods and various assumptions inherent in each incorporate the best interpretation of demand and supply conditions in the marketplace as of the date of this assessment.
- Projections were developed for cruise passenger throughput first, with anticipated vessel arrivals extrapolated from this total using observed average vessel sizes for each port
- Tariff and general destination service levels are assumed to remain constant with those presently observed.

From a historical perspective throughout the 20th century the river cruise industry in Bulgaria had solid traditions and a significant potential for further development. On the basis of these circumstances the sector followed a trajectory of stable development up until the 1990s. The current situation however is dramatically different. For the last eight years there have not been any initiatives for the development and elaboration of any plans or strategies on local, regional, or national levels for the improvement of inland waterway transport in the country. This reflects on the reality that authorities in Bulgaria have been consistently uninterested in the development of river transportation regardless of the political configuration within the different governments that have been running the country in this period. Throughout the last decade some instances have been registered of representatives of local administrations advocating for initiatives for the renovation and modernisation of the river transportation in the Bulgarian section of Danube, which would be highly beneficial for tourism, but no concrete actions were taken. On a national level river cruise industry has been a topic of the lowest possible priority when it comes to any strategical development plans. The only partial exception is Bulgaria's *Integrated Transport Strategy for the period until 2030*, which briefly addresses cruise tourism through the provision of a situational analysis and a forecast for the development of the sector. The document however does not include any particular projects and suggestions for investments for the development of the river cruise industry. The strategy and its projections are examined in greater detail further on in the document.

The up-to-date statistical information regarding river cruise industry in Bulgaria shows that in the 5-year period until 2022 there was a limited number of cruise ships sailing under Bulgarian flag and none of them sailed in the country's section of the river. The Bulgarian section of the Danube is used predominantly by foreign cruise ships, but they take little advantage of tourism opportunities located on the riverside, which significantly reduces the overall value generated from activities and services within tourism in the area of the river.

What should be pointed out as a positive trend however is the fact that river cruises in the past four years prior to the COVID-19 pandemic have been generating an ever-increasing number of passengers in some of the larger Bulgarian river ports like Vidin, Ruse and Lom. Nevertheless, the Coronavirus crisis turned out to be a new and substantial challenge for the cruise industry in 2020 and for tourism in general. The pandemic largely affected cruises to the Danube's Delta due to the fact that the countries in this section of the river had rapid risings in the cases of infected citizens and were gradually included in the so-called "Blacklist" for travelling in the early months of the pandemic's spread across Europe.

An important fact that should be taken into account is that currently in Bulgaria there is no regular passenger transport on the Danube. This makes cruise tourism the only area of activity involving the movement of people via inland waterway, which in turn makes investments in reconstruction and modernisation of port facilities financially unappealing both from the perspective of private and public actors. Initially passenger transport services in the Bulgarian section of the river existed for slightly more than half a century and during that time the country's Danube fleet transported well over 22 millions of passengers.

Since 2015 local excursions and exploratory cruises were carried out on the small ship "Ruschuk", which has a capacity of 66 passengers. It offers trips from the Ruse city centre to the Danube Bridge 1 and other nearby sites.

Small passenger ships using solar energy sail during the summer season across the Danube between the port of Silistra and the Romanian port of Chiciu, which services the neighboring Romanian town of Calarasi. Short excursions on a small 6-person boat, owned by a local hotel, can also be carried out upon preliminary request.

Short tourist trips are carried out by a boat with a capacity of 8 people along the Danube from Vidin.

The texts above demonstrate that all activities within river cruise industry that are conducted in the Bulgarian section of the Danube, and are organized by local entities, are in reality very small-scaled and have close to neglectable importance for the sector as a whole.

Generally speaking, in the period until 2015, trips with a final destination in Bulgarian ports had the main share of all the cruises and after 2015 they decreased compared to those from foreign cruises, where Bulgaria is an intermediate stop.

There is only one Bulgarian company which offers river cruises on the Danube with its own ships – Dunav Tours Cruises EAD. It has good reputation among its clients and partners both on a national and international levels. It was founded in 1984 and started with the purchase of two passenger vessels. The company achieved success and further invested in the expansion of its capacity. During the last several years Dunav Tours has been actively renovating and modernising its fleet. One of the vessels it uses – "Ruse Prestige" was built in 2004 and has a capacity of 160 passengers, with a crew of 40 members. Its area of activities stretches from Amsterdam, going via the Rhine River, and reaching the Danube's Delta. In 2006 the company purchased two smaller ships which provided flexibility and an opportunity to increase the scope of services. One of these is "Heinrich Heine", with a capacity of 110 passengers and personnel of 30 people. The other is "Elegant Lady", which has a capacity to serve 128 tourists with a crew of 32. In 2012 the company purchased the "Ariana" ship (160 passengers and 40 crew members) and later in 2019 the "Adora" vessel (191 passengers and 48 crew members) was also included in the company's fleet. The ship is 135 m long and 11.40 m wide. It has 95 cabins on three decks (some of them have French balconies). At the moment Dunav Tours Cruises EAD owns four river cruise vessels with a total capacity of 640 beds, which cover 80% of the famous cruise destinations in Europe. They transport tourists from Western Europe, USA, Canada, Russia, Bulgaria, etc. None of the cruises however are carried out in the Bulgarian section of the river.

There are other tour operators and agents on the Bulgarian market that offer cruises on the Danube, but they only act as intermediaries for foreign ships.

The Integrated Transport Strategy for the period until 2030 is the current document that represents a comprehensive plan for the sustainable development of the transport system of the Republic of Bulgaria and a framework for investments in transport. The Strategy complies with the requirements for scope, structure and content of a comprehensive transport plan and meets the applicable thematic preconditions for the European Structural and Investment Funds for the period 2014-2020, undertaken as a commitment in the Partnership Agreement with the Republic of Bulgaria. The strategy defines the contribution of the Republic of Bulgaria to the Single European Transport Area in accordance with the Common Priorities, Article 10 of Regulation (EU) № 1315/2013 of the European Parliament and of the Council, including priorities for investments in the core and extended TEN-T networks. secondary connectivity.

The strategy examines the potential opportunities for the development of river cruises and presents a forecast for the passenger traffic until 2050. In the preparation of the forecasts for river cruises, the following facts are considered:

- The river cruise market in Europe has had a growth of 10% per year for the last 5 years. The most popular river cruise destinations are the Rhine, Main, and Danube rivers due to the large number of attractive and easily accessible places along the coast.

- Bulgarian river ports will not become important ports, as there are no large cities or airports near them, nor other convenient transport infrastructure.

- The income of the population in Southeast Europe may increase, which could lead to the development of the internal market for cruises.

The forecasting scenario is the one in which it is assumed that the Bulgarian river cruise ports grow by 5% per year for the next 10 years, after which the increase falls to 1% per year. The forecasts of the transported passengers by river transport (river cruises) are made under the basic assumption that no dramatic changes are implemented in the field of transport in Bulgaria.

	2009	2014	2020	2027	2034	2044	2047	2050
Ruse/Svishtov	9 244	8624	11557	13964	16012	17853	18378	18553
Vidin/Lom	16393	17213	23067	26723	29504	34237	35983	3593
Total	25637	258837	34624	40669	45516	52090	54361	54536

Table 1: Forecast for the development of river cruises (number of passengers)

Source: Project „Concept for development of the Bulgarian ports for public transport of national importance on the basis of the expected cargo flows“, 2014

In 2022 a new challenge for the river cruise industry occurred – the intensive drought and the following extremely low water levels of the Danube, which also caused a reduction in the number of ships sailing through the Bulgarian section of the river in general. River cruise operators try to partially tackle this issue through various approaches such as using more suitable vessels and implementing small deviations in the average routes in order to guarantee that passengers will still get as much as possible from voyages. Nevertheless, such interventions could still have a negative impact on tourist experience. For instance, a ship might need to leave a specific site several hours earlier than usual in order to avoid accidently running aground.

A certain opportunity lies in the trend for the decrease of interest in cruise tourism along the Rhine River, which could lead to a raise of the touristic appeal of voyages on the Danube. As a whole, the tendency for the shift of popularity of tourist sites from traditional European river cruises towards ocean voyages has been steady throughout the last years and will most probably accelerate in the future, with cruise companies changing their priorities and areas of most intensive investments. This could potentially lead to significant changes in the whole ecosystem of European tourism in general.

6 Cruise Berth Demand in the Ports of Bulgaria

6.1 Cruise Vessel Trends

To forecast the infrastructure and facilities requirements to meet the projections, it is important to take into account the anticipated trends in ship construction and their deployment. This section illustrates the requirements of the industry relevant to the construction and deployment of cruise vessels in Bulgaria.

- CRUISE VESSEL NEW-BUILD PROGRAM (large, medium and small size)
- Recommended VESSEL DESIGN for Danube Region
- Cruise vessels size-split
- Innovative vessels to be included.

Bulgarian shipbuilding and ship repair enterprises demonstrate sound expertise, abilities and resources in marine and offshore industry.

According to information provided by the Bulgarian Register of Shipping (state entity engaged in technical supervision and classification of vessels) as of August 2021 (the most up-to-date data available) in the country currently there are 14 legal entities certified to perform shipbuilding and ship repair activities. Four companies are qualified to provide welding services on ships, and five are classified to conduct ultrasound inspection and thickness measurement. In addition, there are four Bulgarian companies that are certified to repair underwater sections of vessels, and only two, which could provide repair and certification of fire and emergency equipment. Most of these organisations, however, are located and operate in seaport cities Varna and Burgas, and only four are on the Danube: two in the city of Vidin (*AKVADAR 111 Ltd.* – provides shipbuilding services; *VODOLAZ 1 Ltd.* – underwater certification), one in the town of Kozloduy (*ATOMENERGOREMONT JSCo* – all types of services), and one in the city of Ruse (*MASHINEN REMONT RUSE* – repair services).

In an interview with the former chief executive officer of the Bulgarian Executive Agency Maritime Administration captain Zhivko Petrov the following information was obtained:

In the area of Varna currently there are four operational shipyards which conduct construction and repair of ships, including that of specialized vessels. One of them is “Bulyard Shiipbuilding Industry” EAD, which mainly specialises in ship repairs.

Another shipyard that has been active throughout the last decade in Varna is “Dolphin”. Its facilities are used predominantly for building and repairing small vessels and repairing ships sailing under foreign flag. Nevertheless, in the last several years the

shipyard was used for the construction of two tugboats which were used by Navibulgar (the largest shipping company in the country).

The military shipyard "Terem" is another shipbuilding facility that operates in the region of Varna. Its operations mainly involve repairing of military and commercial vessels.

"Shipyard Burgas" was an enterprise located near Burgas with its main activities including construction, repair, and conversion of ships and other vessels. The shipyard was declared bankrupt in 2014, but in May 2022 the involvement of the US company Bering Yachts on the Bulgarian market was announced. It will invest in and use local capacity for the construction of ships. The facilities will be used for building luxurious steel transatlantic yachts and other smaller boats.

Further, the table below provides technical data regarding all passenger ships registered under Bulgarian flag and currently in operation.

Type of boat	**Quantity**	**Category of boat** (hotel ship, sightseeing boat, party boat, standing ship)	**Year of construction**	**Capacity (persons)**	**Speed (km/h)**	**Length / width / draught (m)**
Motor ship "ARIANA"	1	Cruise ship	2012	162	n/a	110 / 11,5 / n/a
Motor ship "ELEGANT LADY"	1	Cruise ship	2003	128	n/a	110 / 11,4 / 1,55
Motor ship "ADORA"	1	Cruise ship	n/a	n/a	n/a	n/a
Motor ship "RUSE PRESTIGE"	1	Cruise ship	2004	164	n/a	n/a
Motor ship "SOFIA"	1	Cruise ship	1984 (renovated in 2001)	210	n/a	n/a

Motor ship (imitation of a steam engine) "RADETSKI"	1	Sailing museum	1966 (renovated in 2020)	n/a	n/a	57,4 / 7,6 / 1,31
Motor ship "BELLA"	1	Public transport ship	2001	70	n/a	20,8 / 4,94 / 1,52

Table 2: Technical data regarding passenger ships under Bulgarian flag

Source: Dunav Tours Cruises EAD and BRCCI's database.

In addition, on 29 August 2021, a new tourist ship engaged in operations at the Black Sea port of Burgas. It is the catamaran "Burgus", which was built at the shipyard of Varna. The vessel has a total length of 20 meters and is eight meters wide. It has a capacity of 100 passengers and its average speed is 25 kilometers per hour. Further, "Burgus" is also equipped with a solar power system which provides approximately 20 percent of the ship's required energy. Additional services on the ship include telephone chargers and wireless internet on board. Its first trip was from the shipyard of Varna to the port of Burgas.

In the city of Varna there are several companies specializing in ship design of large-scale passenger vessels. In 2017 a Bulgarian company designed an ocean liner with a total length of 361,6 meters and width of 47 meters.

6.2 Traffic Data Analyses

Part of the process in identifying long-term berth demand is to develop an understanding of the traffic patterns for the infrastructure/facility.

Identifying traffic patterns is based on the following factors (using a 5 years past period):

- TOTAL VOLUME. Volume depends on the amount of cruise traffic at the Port and the potential for future traffic within the peak seasons, months, or days;
- SIZE OF VESSEL. Larger vessels within the market over time will likely decrease the total volume of vessel calls, while increasing passenger throughput. Additionally, the LOA of the vessel is an important component in assessing the size of future infrastructure needed to support cruise operations;
- SEASONALITY. due to weather conditions and depths

- LENGTH OF CRUISE. Cruise length directly affects the peak days in which a port experiences the majority of its cruise calls.
- DAILY FLUCTUATIONS.

The river's importance for the country as an international waterway has been historically tremendous. The beginning of Danube navigation in Bulgaria was set in 1935 with the opening a regular passenger and cargo line between the ports of Ruse and Vidin on the reconstructed steam tugboats "Vit" and "Osym". After the Second World War, the single passenger line executor Bulgarian River Shipping J.S.Co. initiated extensive construction of series of vessels in domestic shipyards in Ruse, Burgas, and Varna and in some other European shipyards as well.

Between 1967 and 1974 there was a regular internal route between the Bulgarian ports Silistra and Vidin (covers the whole Bulgarian section of the Danube), which transported passengers with decommissioned old ships, as well as with new ships with underwater wings, which were called "Rocket" and "Meteor". They were purchased for the Bulgarian fleet by the Bulgarian Shipping Company. Those ships also executed regular 14-day international cruises to Vienna and back which became a prerequisite for the faster development of international passenger transport and tourism on the Danube.

In the beginning of the 90s the fleet of Bulgarian River Shipping J.S.Co. consisted of more than 300 vessels – pushers, passenger ships, open top and covered barges, oil tanks, specialized barges, Ro-Ro barges, etc. In 2009 the company increased its fleet with 6 new vessels, each with a capacity of 2 000 tons. All of them were built in River Shipping J.S.Co.'s own shipyard.

Each year the river cruise season in Bulgaria typically starts in the beginning of March. However, Inland waterway transportation has a small share within national tourism. In the inner parts of the country there are no large navigable rivers and thus the Danube remains the only route suitable for such activities on a larger scale.

Bulgarian River ports have all the needed natural preconditions for the establishment of strong connections with other countries within the Danube Region (Germany, Austria, Slovakia, Hungary, Croatia, Serbia, Romania, Ukraine, and Moldova). River cruise industry in the Bulgarian section of the Danube has been steadily developing throughout the last decade. Usually cruises last between 9 to 25 days. Ships are almost always smaller than the average vessels conducting overseas voyages. Typically, the

most intensive part of the cruise season is from June to September, but trips are also organised early in April until October, usually with some discounts

EAMA collects and analyses data regarding all tourists travelling on board on cruise ships which docked in Bulgarian Danube ports. The largest share of vessels arrives at the ports of Vidin, Svishtov, and Ruse. In fact, the facilities in Vidin and Ruse are the most visited Bulgarian river ports. One of the reasons for this is that the passenger terminal in Vidin was renovated in 2017, and the infrastructure in the area of the Ruse port was modernised in 2020, which included the construction of a new promenade.

According to publicly available data from the Executive Agency maritime Administration the port operators registered in Bulgaria providing services to cruise ships are as follows:

- "Port of Vidin" EOOD, in the city of Vidin;
- "Port Invest" Ltd., in the town of Lom;
- "Slanchev Dar" JSC, in the town of Oryahovo;
- Dredging "Istar" PLC, in the town of Svishtov;
- "Port of Nikopol" EOOD, in the town of Nikopol;
- “Port Pristis” Ltd., in the city of Ruse;
- "Port Complex - Ruse" EAD, which operates the port in the town of Tutracan;
- "Drustar 2004" JSC, in the city of Silistra.

Port of Vidin

According to data provided by the local port administration 325 luxurious cruise ships arrived at the port of Vidin in 2019, with approximately 48 000 foreign tourists.

In 2020 (the first year of the COVID-19 pandemic) only 18 port-of-calls were conducted, out of 456 planned, with just 1 730 people on board in total, which is 25 time less than what was expected.

By the end of the tourist season in 2021 the data shows that 124 vessels carrying 11 595 passengers arrived at the port of Vidin.

There is still no official statistical data regarding the number of cruises conducted and the number of passengers on board for 2022. Since the beginning of the season in March by mid-August 215 cruise ships visited the port of Vidin, out of which 74 arrived at the port in the period between the beginning of July and the end of the second week of August. It should be taken into account that this year the water levels of the Danube and that of other rivers across Europe were critically low. Despite that cruises were still conducted in moderate numbers.

The port of Ruse is the largest one on the Danube River in its Bulgarian section and is visited by the largest number of cruise ships among all of the countries river ports. In recent years the duration of the tourist season for cruises reaching the port of Ruse has increased with the very first trips starting in March and the last ones in November, which also helps increase the overall number of visits.

For the period from 01 January until 10 of August 2019 approximately 300 passenger ships docked at the port of Ruse, with over 41 600 tourists on board. For the same period in 2020 only 8 vessels arrive at the port, carrying 849 passengers. The sharp decline is entirely due to the COVID-19 pandemic.

In publicly available reports from the Executive Agency Maritime Administration the following data regarding 2021 is available:

Throughout the year the total number of 229 tourist ships visited Bulgarian Danube ports, including the ports of Ruse, Svishtov, and Nikopol. The ports of Silistra and Tutrakan were not visited. In comparison, the total number of cruise ship arrivals for previous years is as follows: 22 for 2020, 755 for 2019, 578 for 2018. The provided data shows that a partial recovery from the effects of the COVID-19 pandemic within the river cruise industry is observed.

Further, in 2021 there were 22 900 passengers on cruise ships served at Bulgarian river ports (2 215 in 2020) and 37 554 passengers using the ferry lines Nikopol – Turnu Magurele, Svishtov – Zimnicea, and Silistra – Calarasi (20 759 in 2020). The number of self-propelled ships, including ferries and passenger ships with cabins, that visited the ports falling under the territorial competence of Directorate "River Supervision - Ruse"in 2021 was 9 169 (6,353 in 2020). Self-propelled vessel visits account for 80% (76% in 2020) of total number of vessel visits.

In addition, in 2021 a total of 460 sea and 245 river vessels were registered in the Bulgarian national ship register (357 for 2020; 543 for 2019; 495 for 2018). Of these, 680 are small vessels up to 40 GT and up to 20 m in length, and 25 are large vessels of over 40 GT and with a length greater than 20 m. Modifications in the registration of 851 vessels have been conducted (534 for 2020; 678 for 2019; 464 for 2018), with modifications of ships up to 40 GT/ with a length of up to 20 meters being 797, and modifications of ships over 40 GT/ with a length larger than 20 meters being 54. Most of the registered small vessels were bought second-hand and just a few were constructed by the owner entity. Additionally, in 2021 EAMA issued 50 shipping certificates for inland navigation of large ships on the Danube (75 in 2020, 91 in 2019,

and 36 in 2018). The gradual decrease in the number of certificates issued is an indirect indicator for the decline of shipping activities in the Bulgarian section of the river.

6.3 Facility/infrastructure Demand

Translating cruise passenger traffic assessment and forecasts into berth or facility/infrastructure demand over the projection period (2040) is an essential element in the overall master planning process.

This process looks to identify the facility need over time and, more specifically, to focus on the timing of the facilities/infrastructure required to accommodate future traffic demand.

Infrastructure-demand forecasting relies on identifying cruise deployment patterns, establishing future vessel sizes, and forecasting vessel calls.

The projection scenarios presented prior provide a planning perspective that allows the Port's future decision-making processes to envision the potential maximum use of existing and future required facilities, whether berth, terminal, ground transportation areas or other infrastructure.

Optimum berth demand is between 80 to 90% based upon daily or weekend utilization. Once this is achieved, an additional berth is likely needed to be able to meet the demand and allow for peak use on weekends and key days, by using the most recommended design vessel for this port/country.
The berth demand until 2040 will be based using this recommended design vessel.

Graphics:

birth demand until 2040;

passengers per berth until 2040.

In the Bulgarian section of the Danube there are currently 11 ports and terminals in 9 locations that have the required facilities and whose operators are registered to service passenger ships. The main ports are the Port Complex - Ruse, operating in 3 terminals - the Central Passenger Quay of Ruse (Port Terminal Ruse - Center), Silistra Port and Tutrakan Port, and Vidin Port - Center.

Generally, from an infrastructure perspective, Bulgarian ports do not completely comply with European quality standards, which demonstrates the need for an adequate state policy for modernisation and renovation of the existing facilities. In terms of passenger capacity, the greatest opportunities lie within the Public Transport Port of National Importance - Ruse, due to the existence of large number of passenger ports and ferry terminals.

The ports/ports facilities exclusively dedicated to RCI in Bulgaria are described in the following table.

Port and Terminal Name	Location (km no.)	Terminal capacity	Quay length or No. of simultaneous ships
Vidin	791.300	2	140 m
Lom	742.600 742,750	2 3	140 m 140 m
Oryahovo	678,050	2	140 m
Somovit	607.550	4	100 m.
Nikopol	597.500	3	100 m
Svishtov	553,950	4	80 m
Ruse	495.700 494,800 494,620	4 3 4	110 m 130 m 130 m
Tutrakan	432.670	4	135 m
Silistra	375.800	3	140 m

Table 3: Ports exclusively dedicated to RCI in Bulgaria

Source: EAMA

During the last five years cruises in the Lower Danube and in particular in the Bulgarian section of the river have been conducted by the following more popular foreign cruise companies:

AmaWaterways

In its catalogs there is one programme including Bulgaria as a destination - "Gems of Southeast Europe", which is carried out on the MS AMAVERDE which has a length of 135 m and width – 11,58 m.

Riviera Travel

Currently the activities featured in its catalogue include one trip to Bulgaria – "Budapest to The Black Sea River Cruise", which is carried out on the following vessels:

MS Thomas Hardy - 135 m length, 12 m width.

MS Oscar Wilde - 135 m length, 12 m width.

Tauck World Discovery

It offers a Danube cruise programme that includes visiting Bulgaria – "Budapest to the Black Sea", which is carried out on the MS Esprit (former name: MS VistaPrima) which is 110 m long, 12 m wide.

Uniworld River Cruises

Two of its programmes are aimed at the Bulgarian section of the Danube: "Accents from Eastern Europe" and "Portraits from Eastern Europe", which are carried out on the S.S. BEATRICE – 131 m length, 11,4 m width.

Viking Cruises

The world's leading company also operates two programmes which include visits of the Bulgarian Danube ports: "Journey to Eastern Europe" and "European Transition". They are carried out on the Viking Lif ship, which is 135 m long, 29 m wide

Thurgau travel

Offers 15-day cruises to the Danube Delta, which are carried out on the MS Thurgau Prestige – 110 m length, 11.4 m width.

Avalon Waterways

The company conducts its cruises on the Avalon Passion ship, which is 135 m long and 12 m wide.

Taking into consideration the fact that as of 2017 there are no up-to-date plans or strategies (and no initiatives for the elaboration of new ones) for the development of the river cruise industry and inland waterway transportation in Bulgaria on local, regional, or national level whatsoever, it is extremely challenging to provide even an approximate estimate of the expected number of cruise ships arrivals and passenger throughput in Bulgarian Danube ports until 2040.

Currently the capacity of the existing port facilities specializing in the provision of services for passenger ships is sufficient, considering the average number of visiting ships and tourists, which remain relatively low. No significant difference in the intensity of activities of cruise ships in Bulgarian ports during weekdays and weekends has been registered.

For the last two years between 200 and 300 cruise vessels have arrived at the main Bulgarian Danube ports throughout the whole tourist season, which lasts approximately seven months. These numbers could potentially grow if Bulgaria becomes more appealing as a destination for foreign tourists. In order to achieve success in this aspect the existing tourist programmes, should be developed and expanded, and new products and services should be created and promoted. Another important prerequisite for achieving steady growth in the field of tourism is the elaboration of initiatives for the renovation and modernisation of infrastructure in the area of ports, which includes port facilities, as well as road and railroad connections. In this regard the enhancement of connectivity with regions of the country that are further inland would be of significant importance, considering the vast opportunities for various tourist activities that Bulgaria provides.

In addition if passenger transport is to be renewed between Bulgarian Danube cities and regular passenger lines are restored, this could lead to a dramatic positive trend in the development of the movement of people via inland waterway transport in the country in general. Bulgaria's Danube Region also has significant potential for growth in the field of transport on a transnational level, considering its geographical proximity to Romania, and therefore the establishment of regular passenger lines between Bulgarian and Romanian cities is also an opportunity that would be highly beneficial for port activities and the economic situation in the area in general.

7 Cruise Development Plans in Bulgaria

Historically, the cruise ports develop its cruise facilities organically as the need has arisen.
This means that, as cruise vessel volumes (numbers of total vessels needing to be accommodated) as well as the vessel size (increases in vessel length, tonnage and passenger capacity) have increased, the Port has created the upland cruise terminal, ground transportation areas, and parking to accommodate the need. In many instances, the Port had to respond to customer needs within months and resorted to building a terminal at a location that might not be the best from a planning perspective, but rather it was the only practical solution at the time. not overly extend itself, this method does not work for long-term planning.
What has occurred at the Port is that facilities built in the mid-1990's to serve that generation of cruise vessels are now out of place, creating conditions that impact operations and service for the Port and cruise line users.
The consistent planning means when and where to place the terminal can and should be made at the time that the need arises, however this will allow the Port to proceed with items that are very long- term in nature such as the environmental permitting and financial planning.

The Danube is the biggest navigable river in Europe, which makes it an attractive choice for cruise tourism. Despite its numerous advantages, including suitable navigation conditions, Danube's potential to attract cruise-related businesses is underutilized, especially in the Bulgarian part of the river.

The last existing strategy for the development of maritime and river transport in Bulgaria had a horizon until 2015. Beyond that no other plan or strategy have been elaborated. This circumstance underlines the lack of strategic vision on a national level for the overall development of waterway transport and for the construction of modern port infrastructure and facilities to meet the up-to-date needs and tendencies within RCI.

Despite the fact that for decades Bulgaria has been a country with well-developed river transport which served both the internal and foreign market, for the last seven or eight years the country's river cruise industry has been in gradual and consistent decline.

7.1 Cruise Terminal/berthing Layout in the Bulgarian Danube Ports

[maps/autocad]

The Port of Vidin provides pontoon services to ships for domestic and international navigation like water and electricity supply, embarkment and disembarkment of passengers. Pontoon № 4 - port terminal for public transport "Vidin - center - km. 790,300 – is intended for stay and supply of self-propelled and passenger ships and it allows for up to two ships on board to stay on board at a time.

https://www.google.bg/maps/place/43%C2%B058'59.8%22N+22%C2%B052'40.6%22E/@43.9832718,22.876862,488m/data=!3m2!1e3!4b1!4m5!3m4!1s0x0:0x0!8m2!3d43.9832718!4d22.8779563?hl=en

Figure 1: Port of Vidin

Source: EAMA

The Public Transportation Port of Lom has two pontoons: Pontoon № 1, situated at 742,600 km. and allowing for 2 ships to be on board as well as Pontoon №2, situated at 742,750, which allows for up to three ships to be on board.

https://www.google.bg/maps/place/43%C2%B049'59.5%22N+23%C2%B013'57.7%22E/@43.833186,23.2305083,978m/data=!3m2!1e3!4b1!4m5!3m4!1s0x0:0x0!8m2!3d43.833186!4d23.232697?hl=en

Figure 2 – Port of Lom

Source: EAMA

The Public Transportation Port of Oryahovo hosts Pontoon № at 678,050 km. which is meant for the stay of self-propelled ships and allows for up to 2 ships to be on board at the same time.

https://www.google.bg/maps/place/43%C2%B044'28.6%22N+23%C2%B057'46.4%22E/@43.741272,23.9606923,979m/data=!3m2!1e3!4b1!4m5!3m4!1s0x0:0x0!8m2!3d43.741272!4d23.962881?hl=en

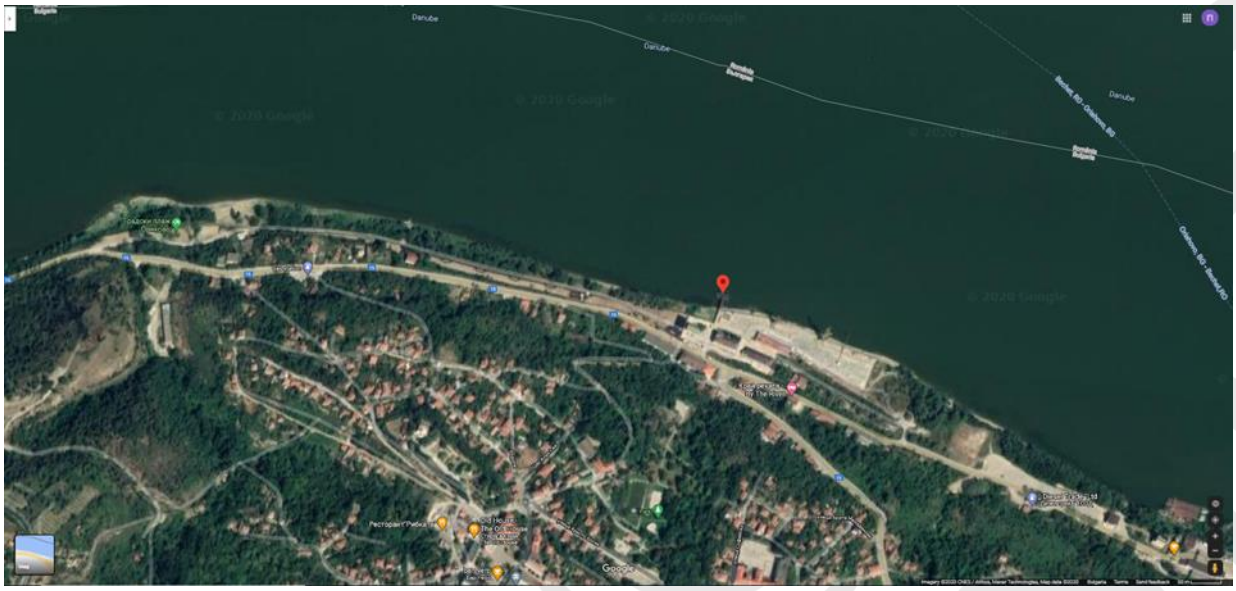

Figure 3: Port of Oryahovo

Source: EAMA

The port terminal Somovit, part of the Public Transport Port of National Importance Ruse, hosts the Ship Place № 1 at the 607,550 km with a length of 100 m. The Ship Place № 1 is equipped with a pontoon, designated for the stay of self-propelled ships when performing entry-exit border controls and passenger service activities. It allows to tie up to four (4) ships on board in one row.

https://www.google.bg/maps/place/43%C2%B041'26.2%22N+24%C2%B046'16.3%22E/@43.6901193,24.7714948,583m/data=!3m1!1e3!4m5!3m4!1s0x0:0x0!8m2!3d43.690598!4d24.771186?hl=en

Figure 4: Port terminal Somovit

Source: EAMA

The Public Transport Port with National Importance Nikopol is intended for passenger servicing and is situated between 597,550 km and 597,450 km. It has 1 ship place at the 597,500 km., which is equipped with a pontoon, designated for the stay of self-propelled ships when performing entry-exit border controls and passenger service activities. It allows to tie up to three (3) ships on board in one row.

https://www.google.bg/maps/place/43%C2%B042'20.4%22N+24%C2%B053'28.6%22E/@43.7056711,24.8899626,980m/data=!3m2!1e3!4b1!4m5!3m4!1s0x0:0x0!8m2!3d43.7056711!4d24.891264?hl=en

Figure 5: Port of Nikopol

Source: EAMA

The port terminal Svishtov, part of the Public Transport Port of National Importance Ruse, hosts Ship Place № 6 at 553,950 km with a length of 80 meters. It is equipped with a pontoon, designated for servicing passengers and ships when performing entry-exit border controls and passenger service activities. It allows to tie up to four (4) ships on board in one row.

https://www.google.bg/maps/place/43%C2%B037'23.6%22N+25%C2%B020'49.9%22E/@43.6232134,25.3464161,491m/data=!3m2!1e3!4b1!4m5!3m4!1s0x0:0x0!8m2!3d43.6232134!4d25.3471899?hl=en

Figure 6: Port Terminal Svishtov

Source: EAMA

The port terminal Ruse Center, part of the Public Transport Port of National Importance Ruse hosts the Ship Place № 2 at 498,700 km and it is 110 m. long. It is equipped with a pontoon, designated for the stay and bunkering (fuel, lubrication materials, water) of self-propelled ships when performing entry-exit border controls and passenger service activities. Tying up of up to three (3) passenger ships on board in one row or up to four (4) self-propelled ships on board in one row. It is not convenient for parking of busses.

https://www.google.bg/maps/place/43%C2%B050'52.2%22N+25%C2%B056'41.3%22E/@43.8476974,25.9458225,291m/data=!3m1!1e3!4m5!3m4!1s0x0:0x0!8m2!3d43.847845!4d25.944813?hl=en

Figure 7: Port Terminal Ruse Center

Source: EAMA

Ship place meant for the servicing of passengers – Dunav Tours Pontoon is situated at 494,800 km. and is designated for the servicing of passengers when performing entry-exit border controls. It also allows stay and water supply. It is allowed to tie up to three (3) passenger ships on board in one row, and it is mandatory to provide conditions for servicing disabled passengers on each ship. It is forbidden to anchor when standing.

https://www.google.bg/maps/place/43%C2%B051'14.3%22N+25%C2%B057'01.6%22E/@43.8534194,25.9533338,977m/data=!3m1!1e3!4m5!3m4!1s0x0:0x0!8m2!3d43.853961!4d25.950437?hl=en

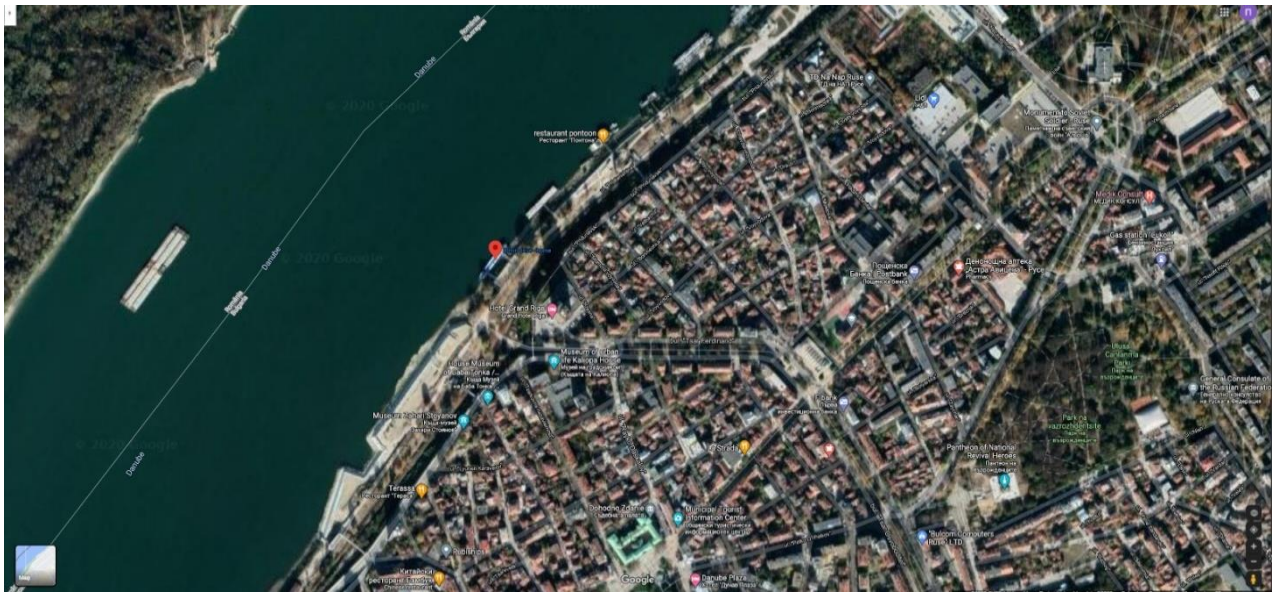

Figure 8: Dunav Tours Pontoon

Source: EAMA

Port for public transport of regional importance "Pristis", operated by Balkan Tours **hosts the Ship Place № 9** –at 494,620 km. and is 135 m. long – designated for servicing of passengers when performing entry-exit border controls. It also allows stay and water supply. It is allowed to tie up to four (4) passenger ships on board in one row with a total width of up to 50 m and it is mandatory to provide conditions for servicing disabled passengers on each ship. In the absence of passenger ships, the pontoon is allowed to moor up to 4 (four) self-propelled ships on board in one row.

https://www.google.bg/maps/place/43%C2%B051'17.3%22N+25%C2%B057'05.1%22E/@43.854812,25.9492193,977m/data=!3m2!1e3!4b1!4m5!3m4!1s0x0:0x0!8m2!3d43.854812!4d25.951408?hl=en

Figure 9: Port Pristis, operated by Balkan Tours

Source: EAMA

The port terminal Tutrakan, part of Public Transport Port of National Importance Ruse, hosts Ship Place №2 at 432,670 km. and is 135 m. long. It is equipped with a pontoon for the stay and supply of passenger ships and self-propelled ships, as well as for servicing passengers. The tie up of up to four (4) ships on board in one row is allowed.

https://www.google.bg/maps/place/44%C2%B003'07.3%22N+26%C2%B036'39.7%22E/@44.0522231,26.6098578,410m/data=!3m1!1e3!4m5!3m4!1s0x0:0x0!8m2!3d44.052022!4d26.611033?hl=en

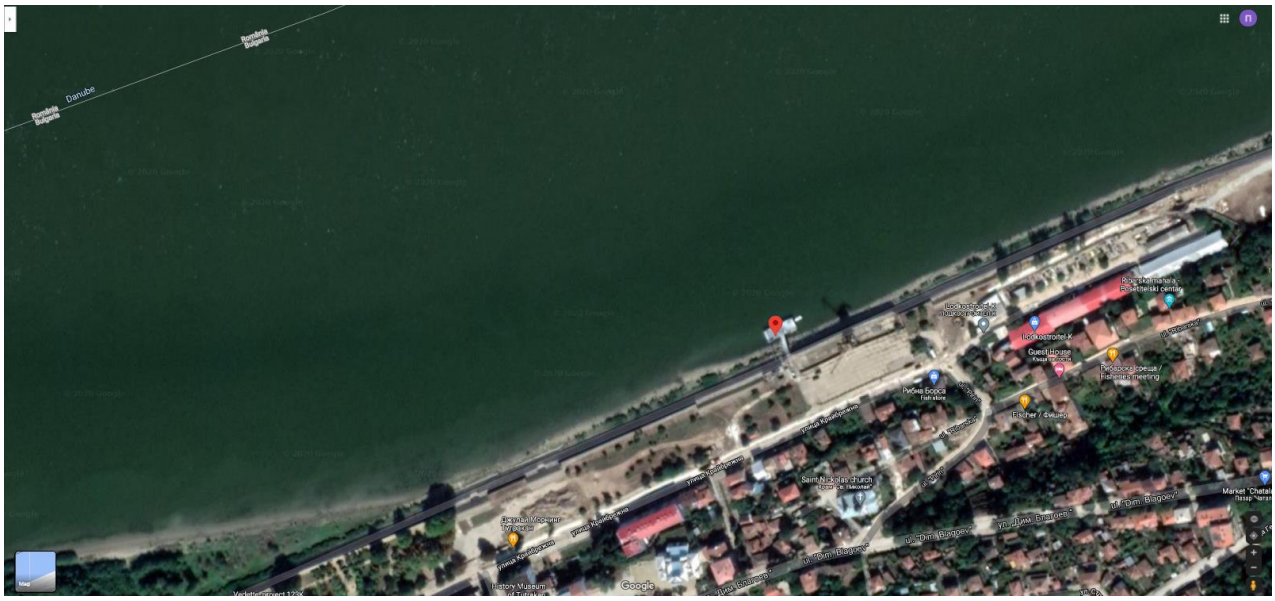

Figure 10: Port Terminal Tutrakan

Source: EAMA

Public Transport Port with Regional Importance „East Point“ , Silistra, is meant for passengers servicing and is situated between 375,870 km. and 375,640 km. It has 1 ship place at 375,800 km with a length of 140 meters. It is equipped with **pontoon “Draster”** for the stay of passenger ships and ship bunkering (fuel, lubrication materials, water). Tying up of up to three (3) ships on board is allowed.

https://www.google.bg/maps/place/44%C2%B007'21.5%22N+27%C2%B015'39.8%22E/@44.1218101,27.2604143,578m/data=!3m1!1e3!4m5!3m4!1s0x0:0x0!8m2!3d44.122649!4d27.261043?hl=en

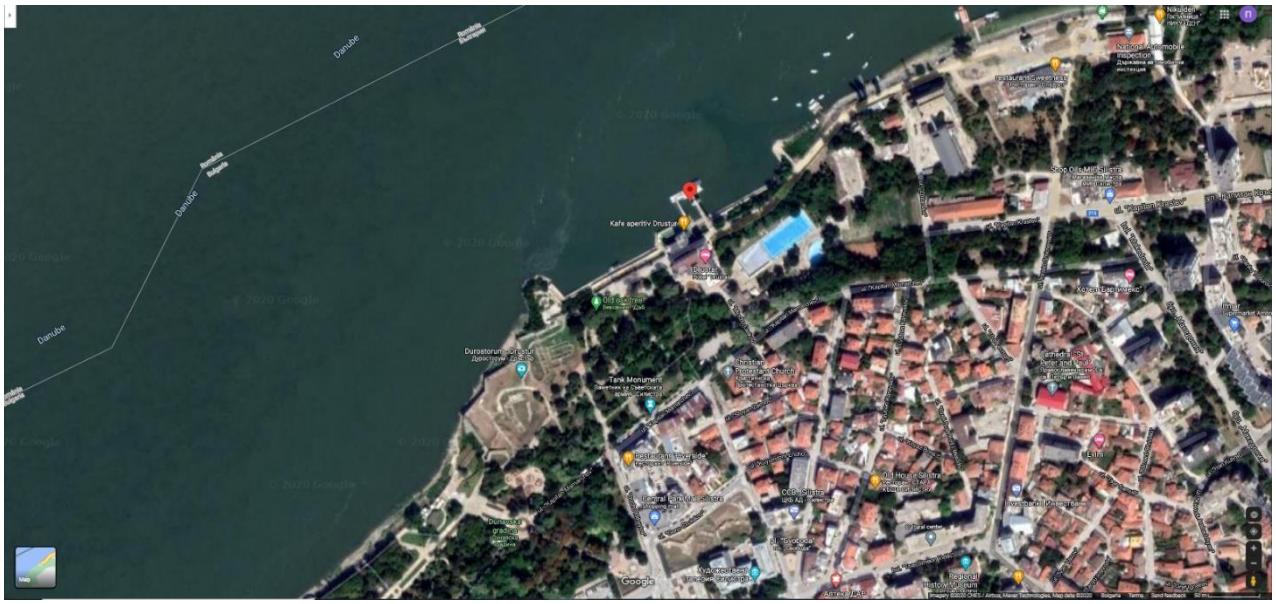

Figure 11: Port East Point, Silistra

Source: EAMA

7.2 Alternative Development Plans Presented

Layout/ berths/infrastructure costs/simplified ACB for each alternative in order to justify the recommended one for each alternative presented.

Inland waterway transportation and RCI in particular is a sector of low priority for the Bulgarian national administration. Private and public port operators in the country do not invest in the development of cruise-related services. Bulgarian ports are in the best-case scenario a transit stop for foreign companies, which organise voyages to the Danube Delta, with vessels usually spending just a couple of hours at each port.

The team behind the elaboration of the current deliverable made efforts to discover information regarding existing or planned strategic documents for the development of Bulgarian river and maritime ports. Our research did not identify any meaningful initiatives in this regard. Only initial data for the seaports of Varna and Burgas, which includes plans for their expansion and the construction of new terminals and facilities for bulk cargo are publicly available. The construction of an intermodal terminal in Ruse is expected to start in 2023. The project is included in Bulgaria's National Recovery and Resilience Plan, but in it there are no planned investments for river ports serving passenger ships.

7.3 List of Proposed Investment Projects. Recommendations

List the selected infrastructure investments and their estimated costs. They will also include accompanying organizational and regulatory measures, will identify responsibilities and will address issues of financing the proposed investment.

Based on conclusions made during our work on the current deliverable, it can be summarized that currently in Bulgaria there are no particular investment projects or even preliminary studies for investments in the river cruise industry, and therefore the thorough listing and presentation of such within the document is impossible. The unstable economic and political situation in the country and the frequent change of governments are a major hindrance for the development of a consistent long-term policy for the improvement of the RCI and the waterway transportation in general.

Interreg
Danube Transnational Programme
DIONYSUS

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

D.T3.4.3 - National Infrastructure Master Plans: AT, SK, HU, HR, RS, BG, RO, MD, UA for sustainable development of the River Cruise Industry

[Final v.01]

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3 Abbreviations

Abbreviation	Explanation
IWT	Inland water transport
RCI	River cruise industry
DR	Danube region
RM	Republic of Moldova

4 Overview

The industry of river cruises along the Danube is at the initial stage of development in the Republic of Moldova. The history of the river cruise industry dates back to the construction of a passenger terminal in the port of Giurgiulesti. It is located at the junction of the Prut and Danube rivers. Due to the location and the official granting of international status to the passenger terminal, there are good prospects for organizing cruises along the Danube River, as well as sea cruises with access to the Black and Mediterranean Seas. These prospects remain quite realistic, despite the crises that all the countries represented in the DIONYSUS project are going through at the moment.

The prospects for the successful development of the river and sea cruise industry are associated with their great popularity due to the richness of impressions and images that can be found on any cruise, with any route. Since ancient times, rivers have been the real "arteries" of states and civilizations, people transported products and goods along them, moved themselves on business and simply for their own entertainment. Cruises are especially popular among active and inquisitive people who want to see several cities and even countries in a minimum amount of time without long journeys. The most favorable period for cruise travel is the beginning of May and until the end of August. With good value for money, a cruise vacation allows you to get the most pleasure compared to other types of travel. As a rule, a fixed amount per day is paid, which includes accommodation, all-inclusive meals, all entertainment and transportation along the cruise itinerary. Cruises lasting 7-10 days are ideal, as they are considered the most affordable, although monthly and quarterly tours are also in special demand.

Among the promising forms of cruise organization for the tourism industry of Moldova are:

- the transportation of passengers and tourists on regular flights in the summer;

- the transportation of passengers and tourists on charter flights;

- pleasure and sightseeing flights;

- special cruises: congress cruises, business cruises, study cruises, etc.

River cruises are an expensive type of tourism and this, in the current economic conditions, leads to the fact that there is a reduction in the volume of passenger traffic on tourist lines. At the same time, river cruises are characterized by:

a) the unique properties of the tourist product, which allow you to quickly get acquainted with the unique natural and historical places when performing cruises according to the "river - sea - river" scheme;

b) the possibility of conducting tours with various programs aimed only at recreation, combining recreation and sports, business trips, seminars, etc.;

c) simplified visa regime for cruise trips

d) a sufficiently high level of service;

e) competitive prices, allowing to form a stable demand;

f) a small share of river cruises in the tourist services market.

Compared to sea routes, river cruises are less affected by the weather, more informative and provide an opportunity for short-term stops.

During river cruises, tourists are given the opportunity to:

- visit opera performances in cities and participate in shows;

- make bus tours

- take part in recreational activities

- relax on the sea beaches in the most famous resort places.

Performances, competitions, concerts of professional ensembles and entertainment programs are organized for tourists on board the cruise ship.

With a modern passenger terminal of international importance, corresponding in its capacity to the existing demand in the Republic of Moldova, the initial task for the development of cruise travel is to organize the efficient operation of tour operators.

The tour operator needs to keep in mind that the attractiveness of river cruises for different groups has significant differences, which depend on age, profession and other factors.

The best justification for the demand for river cruises in a particular region will be the results of a survey of tourists and research data on inland water transport, which provide an opportunity in the tourism industry to:

a) expanding the geography of cruises;

b) establishing mutually beneficial interaction with other modes of transport in the development and implementation of combined tours;

c) targeted reconstruction or modernization of river tourist ships.

River cruises are diverse in length, duration of routes, and topics. As a rule, cruises are offered from 7 to 15 days. There are cognitive, sports, astronomical cruises, wine-growing places, etc. The main consumers of river cruises are elderly people who prefer coziness, comfort, full board, constant proximity to the coast, as well as interesting excursions to memorable places.

The greatest prospects in the Republic of Moldova may have: river cruises on the Danube through seven countries; sea cruises in the Black and Mediterranean seas; sightseeing cruises to the natural and historical areas of the Danube Delta.

The main problems in the organization of cruise trips include: inconsistency of travel programs with the needs of consumers; inaccessible cost of a tourist product; non-compliance of the level of service with international standards.

Mutual relations between passengers, tour operators, ship owners and public services are established in accordance with applicable law.

Depending on the type of route, the rules for the transportation of passengers and the procedure for their service are established. In any case, a contract of carriage is concluded between the carrier and the passenger. The passenger is issued a ticket and

a baggage receipt. Vouchers may be issued instead of tickets when traveling along tourist and excursion routes.

In accordance with the current legislation, passengers are subject to compulsory insurance.

The Code of Inland Water Transport provides for the possibility of leasing ships on the basis of an agreement concluded between the person leasing the ship and the person accepting it. At the same time, the lease term, the calculation procedure, the rights and obligations of the lessor and the tenant, and cases of termination of the contract must be determined in the contract.

The interaction of the tour operator with ship owners in the organization of river and sea cruises has certain differences.

The organizers of river cruises can be:

- the shipowners themselves, who have formed their own tourist structure or a subsidiary;
- a travel company that has accumulated experience in carrying out trips by water on chartered vessels or owns vessels of the appropriate class.

The development of the European sea cruise market is due to the formation of competitive advantages based on the quality service and mobility of new generation cruise ships.

Developing the potential of the river cruise tourism market will help attract investment in port infrastructure, shipbuilding, and the regional economy of the Danube region.

5 Development potential of river cruises in the Republic of Moldova

In the Republic of Moldova, for the development of the industry of river and sea cruises, not enough has been done in relation to what the market of tourist services allows. There is a positive potential for development in the RCI direction. This is confirmed by the level of consumer ability of the population and the steady growth in the number of tourist trips abroad.

The main problems of the development of the river cruise industry in Moldova include:

- the high capital intensity of the industry and, as a result, long-term return on investment;

- the weak activity of tour operators in promoting RCI;

- poorly developed inland navigation routes;

- a limited section of the coastline (430 meters) on the Danube River.

The analysis of the tourist services market leads to the conclusion that for the development of river cruises, one should rely on the increased interest of tourists from Moldova in the culture and history of the European Union countries from the Danube region, as well as in the nature reserve in the Danube Delta.

The analysis of statistical data shows that the annual number of passengers transported by ships on all inland waterways (Figure 1) is stable and is 135 - 139 thousand passengers.

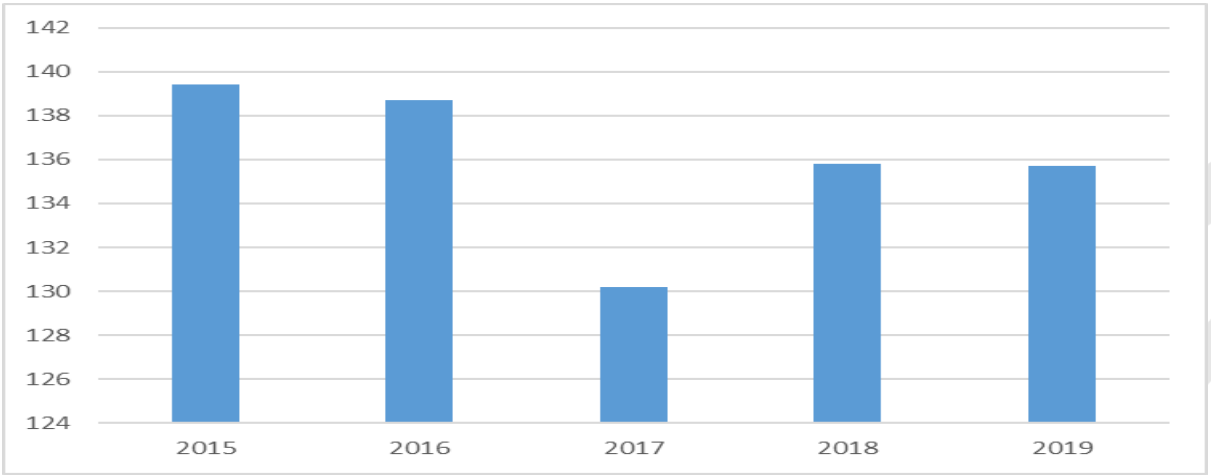

Figure 1: Variation in the annual number of passengers carried by ships on all inland waterways, thousands of passengers

To assess the development potential of RCI, a study was conducted on the development of tourism in the Republic of Moldova during the last five years.

According to statistical data, the main indices that characterize the national tourism services market, including:

a) the number of departures of Moldovan visitors abroad to rest (Figure 2);

b) the number of arrivals of foreign visitors at rest or on vacation (Figure 3);

c) the number of places in hotels and motels (Figure 3);

d) the number of tourists staying in hotels and motels (Figure 4)

are growing steadily.

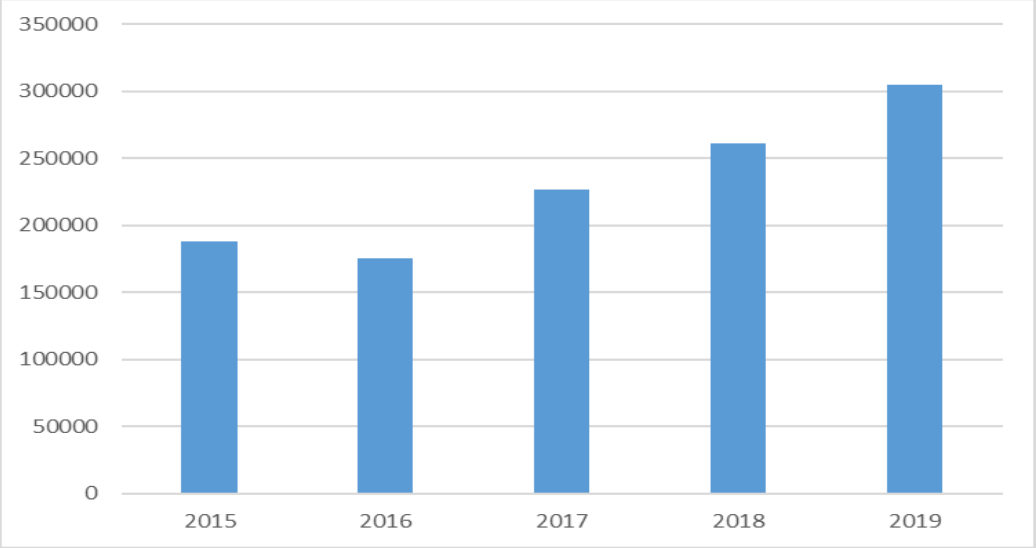

Figure 2: Dynamics of the number of departures of Moldovan visitors abroad to rest

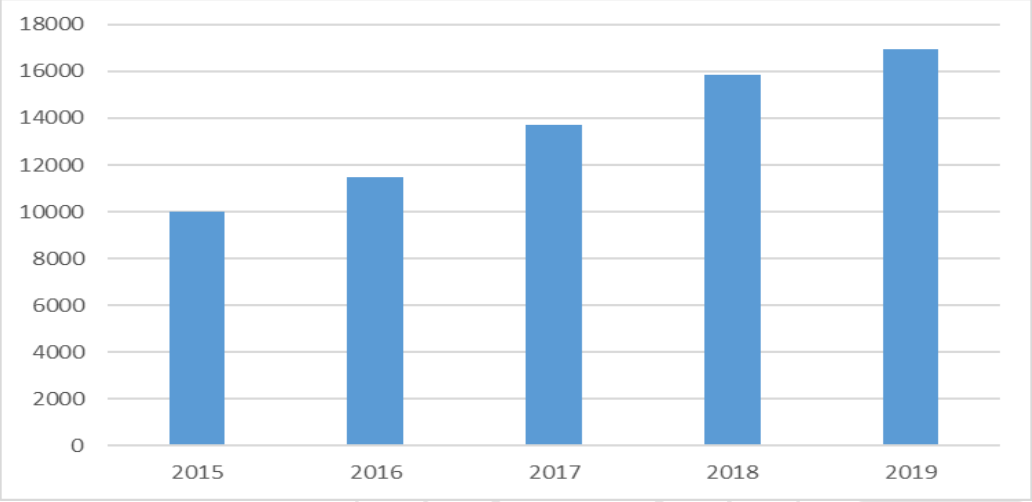

Figure 3: Dynamics of the number of arrivals of foreign visitors at rest or on vacation

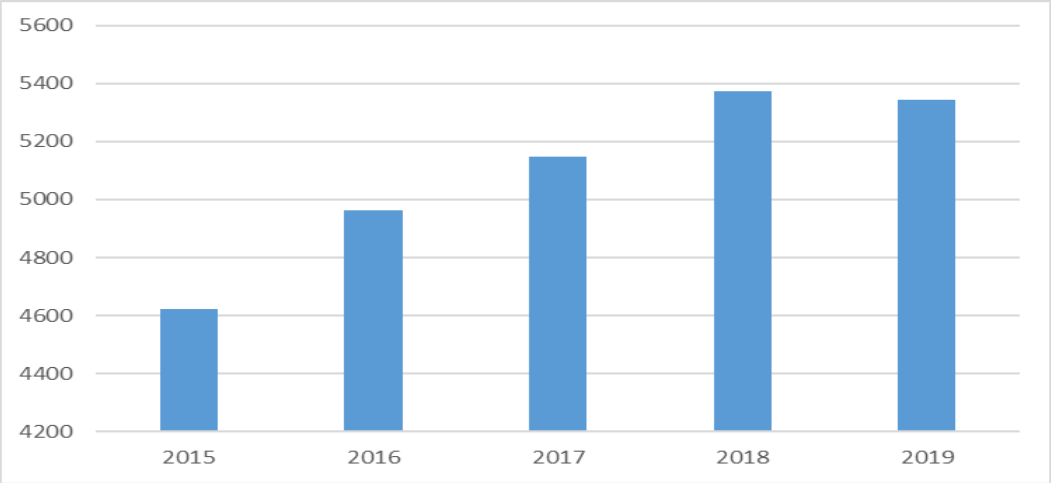

Figure 4: Dynamics of the number of places in hotels and motels

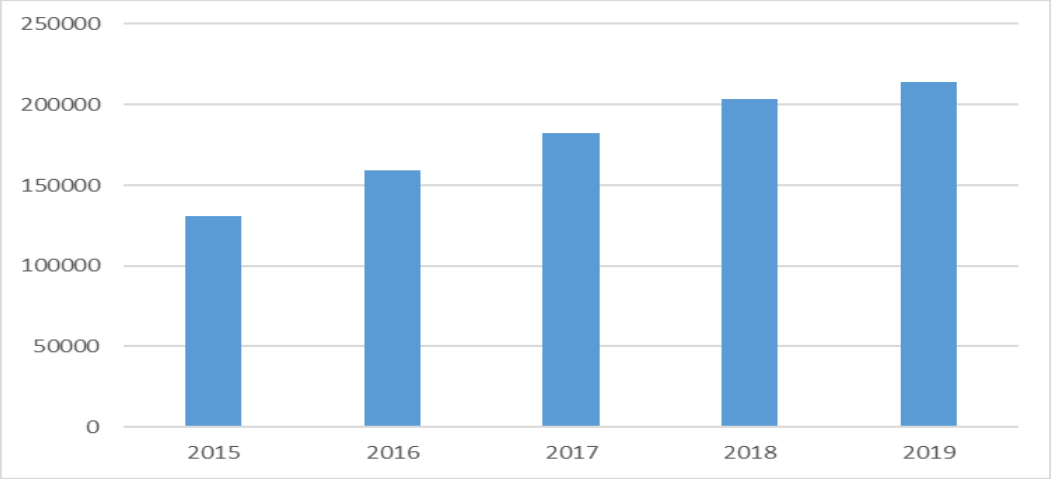

Figure 5: Dynamics of the number of tourists staying in hotels and motels

This fact speaks of an almost double increase in the interest of the Moldovan population in travel. This trend is to be used to promote RCI.

6 Infrastructure and organization of river cruises

6.1. Characteristics of the passenger terminal of the port of Giurgiulesti

There is only one port in the Republic of Moldova, which, due to its location (Fig. 6; 7) and technical capabilities (Table 1), can successfully contribute to the development of the river and sea cruise industry.

The passenger terminal was built as a strategic point with the financial support of the country's budget, especially for foreign tourists visiting the Republic of Moldova on cruise ships.

The port can accommodate ships with a capacity of up to 300 passengers.

Within 250 km from the port of Giurgiulesti, there are cities and tourist sites with a large number of attractions.

Port and Terminal Name	Location (km no.)	Terminal capacity	Quay length or No. of simultaneous ships	Statistics (no. of passengers passed on 2017,2018,2019 vs. 2020)	Activity during pandemic [% from normal]
Giurgiulesti Passenger and Goods Port	0.65 km of the Prut River. (the maritime section of the Danube river at km 133.8; maritime mile 72.2).	Two waiting rooms (transit type). Passing capacity of 300 people per day. Access to the port is also provided for people with disabilities of the musculoskeletal system.	Quay length 128 m Up to 2 ships simultaneously	2017 - 1116 passengers 2018 - there were no entries 2019 - 3600 passengers 2020 - there were no entries	0 %

Table 1: Characteristics of Giurgiulesti Passenger and Goods Port

The passenger port, which is a branch of the state enterprise Ungheni River Port, was built in 2009 with state money and cost 100 million lei.

It is a 120-meter berth, a comfortable four-story building with a passenger hall, offices for the administration, customs and border guards.

Giurgiulesti Passenger Port is relatively small compared to other European ports, it is the only access of the Republic of Moldova to the sea and enjoys a strategic location on the border with Ukraine and Romania.

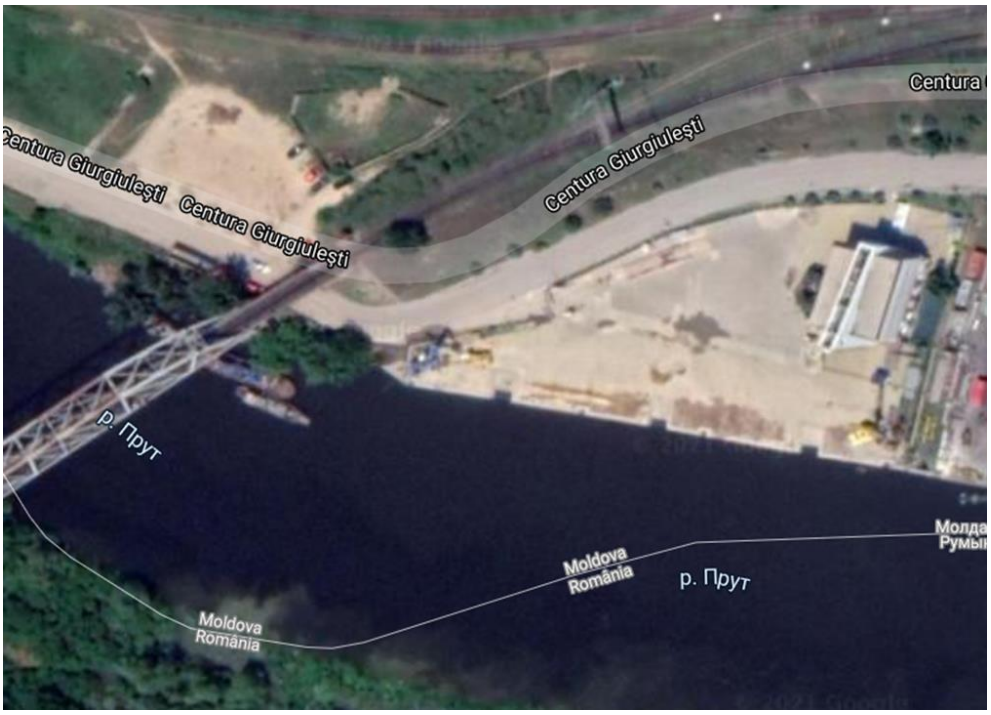

Figure 6: Location of the passenger terminal in the port of Giurgiulesti

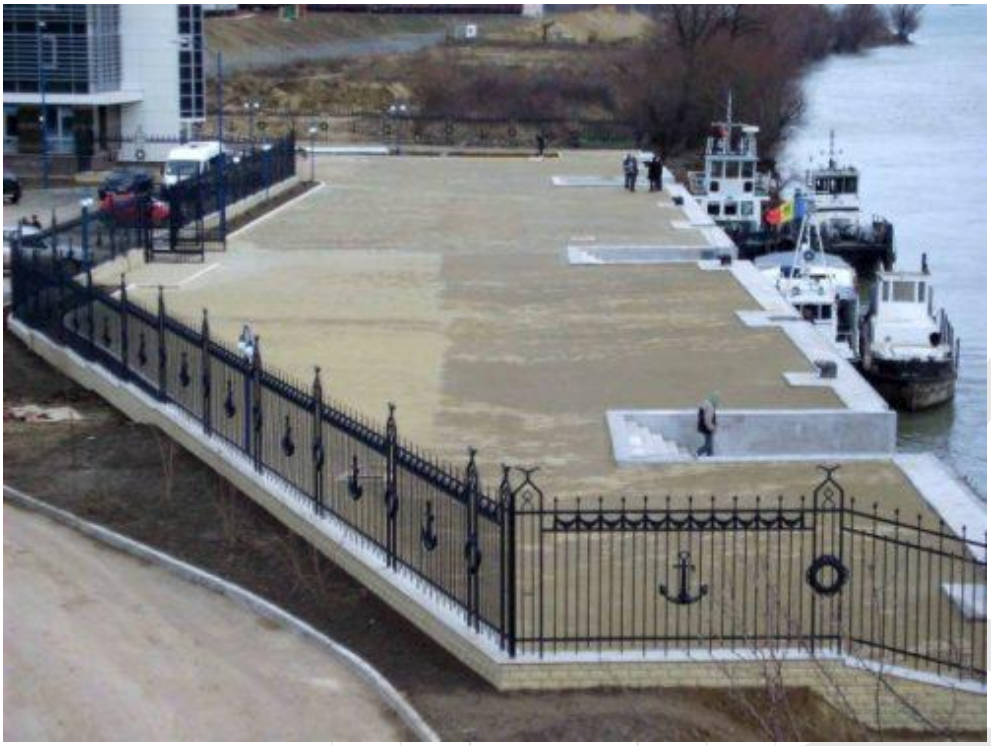

Figure 7: Passenger terminal in the port of Giurgiulesti

6.2 Characteristics of cruise ships accepted at the port of Giurgiulesti

The choice of cruise ships for cruise trips is largely determined by the capabilities of the waterway, the capacity of the river passenger terminal, as well as the required passenger capacity of the ship.

The basis of the operating passenger fleet in the lower Danube region is three-deck vessels with a length of 110-135 meters and a capacity of 120-200 passengers.

The passenger terminal in the port of Giurgiulesti is able to receive almost all cruise ships available in the lower Danube region.

One of the most successful cruise trips from the port of Giurgiulesti to Istanbul was realized by the cruise ship "Princess Elena" (Figure 8) with a passenger capacity of 170 people.

Figure 8: Cruise ship "Princess Elena" in the port of Giurgiulesti

6.3 General requirements for the organization of cruise transportation

Among the national strategic plans for the development of the transport branch, the priorities are:

a) improving the navigation conditions on inland waterways;

b) development of the transport fleet in accordance with the requirements of the market;

c) ensuring the safety of navigation on inland waterways;

d) ensuring the integration of the internal waterways of the Republic of Moldova into the international transport system.

In order to achieve these priorities, the central branch authority has, in recent years, massively harmonized national legislation in the field of shipping with the European Union and international legislation.

In 2018, by Government Decision no. 706, the administrative authority of the Naval Agency of the Republic of Moldova was created.

The Naval Agency of the Republic of Moldova has the mission to ensure the implementation of state policies in the field of shipping and to monitor compliance by individuals and legal entities with the regulatory framework in this area to ensure safe navigation in domestic and port waterways, quality and safety of services shipping and navigation in general.

The Naval Agency has acceded to the RISC Memorandum, which will strengthen its efforts to improve the performance of the national flag through better risk management and the establishment of cooperative relations with similar administrations in maritime countries.

The interaction of the tour operator with ship owners in the organization of river and sea cruises has certain differences.

The organizers of river cruises can be:

- the shipowners themselves, who have formed their own tourist structure or a subsidiary;

- a travel company that has accumulated experience in traveling by water on chartered ships or owns ships of the appropriate class.

In the first case, the travel company in advance, but no later than September 1 of the year preceding the planned one, submits an application to the shipowner, indicating in it:

- destinations on the ring or linear route for the transportation of tourists in the upcoming navigation period;

- the planned number of full trips (turns) for each route;

- when the shipowner opens permanent tourist and excursion lines,

- itineraries of cruises and their terms according to the programs of domestic or inbound tours;

- the number of places and accommodation conditions on board the ship (by category of cabins).

On the basis of the application and based on its own capabilities, the shipowner plans to allocate a certain number of seats on his ships and, before the start of the navigation period, concludes an agreement with the travel agency.

When chartering vehicles, the shipowner can:

a) conclude an agreement for the maintenance of the ship during the stays, for the supply of fuel and food for tourists on board. In this case, the tour operator receives a full package of services for an amount that he cannot adjust;

b) shift the functions to the tour operator, which can minimize the cost of the tour in order to reduce the cost of the package of services. This defines:

- number and names of ships;

- the number of places by category of accommodation on each vessel;

- routes and dates of cruises;

- the number of beddings per one full turnaround voyage of each ship and the amount of payment for their use;

- the cost of moving along the route for one complete round trip and the total amount of expenses payable;

- terms of payment for each full round trip.

The tour operator must pay the cost of chartering the vessel within the terms established by the contract. As a rule, payment for the rental of the vessel for each tour is made no later than 15 days before the start of the voyage.

If the river (lake) cruise is long, then the tour operator concludes separate agreements for:

- catering on board tourists;

- excursion service at destinations;

- holding cultural and entertainment events on board during the cruise (musical groups, artistic teams, etc.);

- organization of leisure activities - delivery of books and magazines, films and videos, etc. on board.

Before sailing, tourists arrive at the pier 2 hours before the ship's departure, undergo registration, security control and inspection of luggage and hand luggage, and then are accommodated in cabins.

After sailing, the captain of the ship, the cruise manager from the travel agency, the director of the restaurant and the ship's doctor introduce tourists to the rules

a) on board;

b) on the shore and while swimming;

c) with the diet and precautions to prevent illness on the cruise

For tourists making a river cruise, the tour operator issues the stubs of tourist vouchers, which they must have with them when going ashore and present to the sailor on duty when returning to the ship.

If the tourists were on an excursion during the vessel's stay, then they are obliged to return by the set time, flight delays due to tourists being late are not allowed.

A river cruise is a unique tourist product, which is a water route, generally multi-day, on a river vessel, on which a tourist is provided with a package of transportation, accommodation and meals, entertainment, land-based excursion and other tourist services, and maintenance. Consequently, the main place of stay for passengers during the cruise is the ship, and often, it is the main attraction.

Depending on the purpose, river vessels have extensive deck spaces for passengers (covered or open with seating, and for flights lasting more than 24 hours - also sleeping cabins for passengers of various classes and crew, showers). Practically on all ships, common areas are arranged - restaurants, buffets, reading rooms, lounges, toilets, and various office premises.

Transportation along long water routes takes up to a month (or more), such ships are equipped with sleeping cabins and are adapted for a long comfortable stay of passengers. Huge three- or four-deck comfortable ships with a capacity of 300-400 passengers are being built for river cruise transportation.

7 Plans for the development of the river cruise industry

7.1 Goals and objectives of the development of the river cruise industry

Based on the analysis of the state and prospects of the river cruise industry, the goals and objectives of the developed master plan can be formulated as follows:

- comprehensive development of the cruise industry by creating conditions for the formation and promotion of a high-quality tourist product that is competitive in the domestic and world markets;

- strengthening the social role of tourism, increasing the availability of cruise vacations.

As a target indicator for the development of cruise holidays for the period up to 2030, the following should be adopted:

- more than doubling the number of cruise trips per inhabitant of the Republic of Moldova by 2030;

- double investment in the cruise travel industry by 2030.

The objectives of the river cruise industry development plan are:

- the creation of a competitive tourist product;

- stimulating demand and increasing the availability of the tourist product;

- improvement of regulatory and legal regulation in the sphere of the cruise industry, taking into account the development trends of the tourism industry;

- improvement of the system for managing the cruise industry, including the system for collecting, processing and analyzing statistical data on realized trips.

When solving these problems, it is necessary to be guided by the following principles that determine the social significance of the development of this form of tourism:

- the use of an integrated approach in the development of tourism, taking into account economic, social, cultural, environmental and other aspects of the development of tourism activities;

- strengthening the role of tourism in shaping the cultural and moral potential of the population;

- ensuring intercultural communication and international interaction;

- the development of tourism, taking into account the minimization of the negative impact on the environment, environmental and socio-cultural risks, the need to ensure safety when planning the development of tourism.

The key objective of the Master Plan for the development of the cruise travel industry is to increase the availability of tourism for the population, ensuring the necessary diversity through the formation of a tourist product, taking into account the age, gender, ethnic, religious and other characteristics of the population.

The economic role of tourism is manifested primarily in accelerating the economic growth of the Russian Federation, providing employment for the population. Tourism is one of the industries with the largest multiplier effects on the economy. Investments in the tourism industry form the added value in transport, trade and services, construction and production of building materials and other types of economic activity. An important socio-economic effect of tourism development for the population involved in the formation and provision of services is the growth of employment and incomes of the population, the formation of an entrepreneurial culture.

Taking into account the high growth rates of cruise tourism in the world, it is planned to develop a concept for the development of cruise tourism in the Republic of Moldova for the period up to 2030.

The most promising directions for the development of cruise tourism are combined river and sea cruises in the Danube, Black Sea and Mediterranean basins.

The most priority direction seems to be cruise tourism in the countries of the Danube region.

Taking into account the characteristics of the profile of the global consumer of the cruise tourism product (returning tourists, a constant search for new cruise routes), the development of the cruise industry is an opportunity to offer a unique type of cruise product on the global market - a combined sea cruise on the Black Sea and a river cruise on the Danube River. The development of cruise tourism in this region will stimulate the growth of cruises in the lower reaches of the Danube, providing new opportunities for the growth of the tourist flow.

At the same time, the volume indicators of cruise shipping in Moldova over the past years have consistently low values without significant positive dynamics.

One of the conditions for competition in the global cruise market is the quality of the fleet and the availability of an attractive tourist product for the consumer.

The low profitability of shipping companies reduces the demand for the reconstruction and construction of new ships. The level of the current order does not allow organizing mass production and reducing the cost of ships.

Creating conditions for the growth of investment in cruise tourism, stimulating the investment activity of entrepreneurs, and the formation of modern investment projects are the basis for a modern competitive product.

Measures of state support for increasing investment attractiveness should be aimed at creating conditions for reducing payback periods and operational risks, removing barriers to activating investments and creating the necessary incentives to improve the quality of the offer.

In addition, it is important to develop incentive measures for public authorities and local governments for the development of tourism, measures to change the composition of tax revenues of regional and local budgets, measures to change the

accounting system for tax revenues from tourism when determining the level of budgetary security for the distribution of interbudgetary transfers, systems grant support for regions and municipalities that most successfully develop domestic and inbound tourism.

Increasing the investment attractiveness of tourism requires the adoption of individual measures for tourist areas, including, among other things, state support for development plans for tourist areas.

Investment activity should be stimulated by tax support measures in the tourism industry, as well as tax incentives for certain categories of participants in the tourism market in terms of reducing tax rates.

In this regard, the concept of development of cruise tourism should pay special attention to:

- creating conditions for the synchronization of intensive fleet renewal and infrastructure renewal (ports, mooring walls, dredging, receiving services on land);

- development of land infrastructure necessary for the organization of cruise tourism (including road and rail infrastructure);

- prioritizing the development of international cruises.

The main external risk factors for the implementation of the proposed cruise tourism development plan are the changing geopolitical situation due to the difficult situation in the region.

Other external risks include the outstripping development of tourism in foreign countries, which may negatively affect the dynamics of the incoming tourist flow; a possible decrease in household income, which will lead to a reduction in demand for cruise trips, regardless of the measures developed under this Master Plan.

The most negative impact comes from the risk of a decrease in the income level of the citizens of the Republic of Moldova, leading to the exclusion of travel and leisure expenses from the consumer basket of a significant part of the population since they do not have a priority status.

Among the internal risks of tourism development, the risk of lack of synchronization of state support measures may become significant. In the absence of a balance of state support measures in favor of the development of tourism infrastructure and measures to stimulate demand, there is a high probability of a decrease in the efficiency of the tourism industry. The growth rate of the tourist flow will lag behind the increase in the capacity of collective accommodation facilities, which will negatively affect the financial situation of organizations. Equally important is the synchronization of measures to develop tourism and transport infrastructure - the risk of an imbalance can lead to higher prices.

A significant risk for the investment attractiveness and sustainability of the industry may be an increase in the tax burden on enterprises in the tourism industry.

Significant risks for the fulfillment of the industry development goals are associated with the synchronization of activities in relation to the tourism product and individual tourist areas.

The implementation of measures to promote the tourism product without simultaneous changes and improvement in the quality of services can lead to the formation of a negative experience for tourists, which will affect the reduction in the number of repeat trips and will stimulate an increase in negative reviews about this type of tourism.

The main risk factor for the lack of synchronization of state support measures is the reduction of budgets for their implementation, which can lead to an increase in the timing of achieving key goals and a decrease in the competitiveness of developed tourism products.

Significant risks are associated with a possible increase in the environmental burden on tourist areas, in which the tourist flow will grow rapidly. The natural areas of the Danube Delta will be the most vulnerable. For individual tourist areas, it is possible to implement measures to limit the tourist flow due to increased environmental risks.

7.2 Sample Action Plan for the Development of the River Cruise Industry

The main activities for the development of the river cruise industry in the Republic of Moldova include:

- Creation of a competitive tourism product;

- Stimulation of demand for a tourist product;

- Development of systemic support measures.

To create a competitive tourism product, it is recommended to carry out the following activities:

- Determination of a set of measures and volumes of state support for the implementation of projects in order to increase competitiveness and stimulate their investment attractiveness below benchmark countries;

- Development of proposals for the improvement of tax legislation, ensuring the investment attractiveness of the tourism industry;

- Development of a system of state support measures for the implementation of large concession projects, projects of public-private partnership and municipal-private partnership in the field of tourism;

- Development of a set of measures to ensure fair competition among participants in the tourism industry, aimed at reducing the share of the shadow sector;

- Development and implementation of measures for the integrated development of river ports, as well as the railway station infrastructure of tourist areas with objects of tourist navigation in the field of tourism, parking lots for tourist buses, bus stops for embarking and disembarking tourist groups at transport hubs and at popular tourist display facilities;

- Development of coastal infrastructure in accordance with plans for the development of tourist areas, including the construction, repair and restoration of river berths, anchorages, gas stations, treatment facilities, dredging and bank protection works, creation and reconstruction of infrastructure for river cruise tourism;

- Actualization and improvement of educational standards and programs of all levels of education in the field of hospitality and tourism, providing an innovative approach, including strategic partnership with leading international universities.

To stimulate demand for a tourist product, the following list of activities is proposed for implementation:

- Simplification of customs and border control procedures for cruise tourist trips;

- Organization and ongoing marketing research of the tourism market by executive authorities and other studies aimed at improving the efficiency of creating, positioning, managing and promoting the national tourism product in the domestic and world markets;

- Development and implementation of programs to attract domestic and foreign tour operators, travel agencies, transport companies to the joint promotion of the product in the tourism market

companies, hospitality enterprises, online services and other interested market participants;

- Creation of conditions for the accessibility of tourism resources for the disabled. Development of norms obliging tour operators and travel agents and organizations providing excursion services for disabled people to provide them with information about tourism products, about the conditions for its

receipt by disabled people in accessible formats; obliging the interested executive authorities to approve the procedures for ensuring accessibility conditions for tourists,

persons with disabilities, tourism resources, tourism infrastructure facilities and services for the implementation of a tourism product, navigation and orientation systems in the field of tourism and tourism information centers.

The systemic measures to support the river cruise industry include the following activities:

- Improving the regulation of tour operator and travel agency activities, including in terms of mechanisms for ensuring the property interests of customers of tourist services, changes in the system for ensuring the financial responsibility of tour operators;

- Development of proposals for ensuring environmental safety in tourist areas;

- Creation of conditions for the development of digital platform solutions in the tourism sector;

- Development and implementation of a monitoring system for the quality of tourism services, tourism infrastructure facilities, including those based on digital technologies;

- Creation and maintenance of a data collection system for the purposes of operational management of the tourism industry;

- Development of the Concept and national strategy for the development of cruise tourism.

- Stimulating the development of international routes for cruise ships on the territory of the Republic of Moldova;

- Expansion of the list of berths for marine cruise ships, including offshore ones, for disembarking passengers and developing tourist infrastructure in the respective coastal areas.

7.3 Recommendations for national travel agencies on the development and promotion of river cruise tours

One of the main reasons for the weak development of river cruises in the Republic of Moldova is the lack of efforts made by travel agencies to promote cruise tours available in the Danube region, to cooperate with tourist operators from neighboring countries, and to develop their own river cruise projects.

As part of the project being developed, methodological recommendations are offered specifically for travel companies on the development and promotion of river cruise trips.

The first step to the successful implementation of the project is to determine the target group of tourist clients. Experts say that the most committed and reliable cruise travelers are those who have already been on a cruise and are planning to do so next year. Such travelers themselves carefully study the routes, offers of cruise companies, the infrastructure of ships and often come to the agency with a clear request, all that remains is to book.

A cruise product, like a beach holiday, is suitable for almost everyone, many simply never thought about such a trip. River tours can easily compete with other types of recreation if the tourist learns about them. This is one of the most dynamic types of

recreation, full of visits to new places, interesting excursions, acquaintances, communication, constantly changing landscapes. An additional plus is the absence of frequent transfers from the hotel to the bus, from the night train to the plane, with the constant repacking of the suitcase. Lovers of outdoor activities and the changing "picture" outside the window. If a tourist is considering tours with a lot of transfers and excursions, he may well be interested in a river cruise.

As a rule, the main clients are older tourists and owners of summer cottages. For them, the cruise will become a relaxing vacation that will help relieve the accumulated tension and stress with beautiful views and “green parking lots”. The humidity of the river air will “smooth out” the climate if the trip falls on the hot season, and will make the trip as comfortable as possible.

Another large group of potential customers are travelers with children. Cruise experts point out that children are almost always delighted when they return from trips. The very atmosphere of traveling on water on a ship with sailors, life buoys, and the cries of seagulls makes an indelible impression on inexperienced travelers. It will not be boring on the road either: most of the ships have children's animators.

The next group are discerning tourists. The level of service and comfort on the best domestic river vessels is not inferior to foreign river cruises. A high-quality program of leisure activities for your tourists will be provided by the crew of the ship. Everyone will find pleasure here for themselves: sports and outdoor games, a disco and a cozy bar, concerts of pop singers.

The second step to success is the effective development of the marketing part of the promoted cruise holiday. The main focus should be on the benefits of a cruise holiday, namely:

- lack of fuss and haste;

- the opportunity to admire picturesque landscapes at any time;

- cruise holidays, according to experts, are the most beneficial for health: slow movement through water spaces relieves stress, and fresh air helps to improve the body;

- rich excursion program;

- the opportunity to spend a lot of time in nature thanks to the "green parking";

- daily entertainment on board.

If you compare river cruises with sea cruises, you can also find a number of advantages and disadvantages.

When traveling along the river, the banks are always clearly visible from the ship, the landscape is constantly changing. When traveling by sea, most of the time only the sea surface is visible to the horizon.

There are no storms on the rivers, so "seasickness" is excluded, but in the sea, you need to be prepared for bad weather and, as a result, pitching.

River cruises are often cheaper than sea cruises.

To travel by sea, ships of a larger capacity are usually used, on average from 6 to 13 decks, while rivers can only be navigated on three or four decks. Due to the area and a large number of passengers, parties on sea cruises are of a large scale, and the internal infrastructure of ships and liners itself provides guests with more opportunities for pastime.

The third step to success is the development of a series of proposals that differ primarily in duration.

By duration, cruises are divided into three main types:

a) Short - 2-3 days. Otherwise, they are called weekend cruises, but for short. An option for tourists who want to spend a busy weekend without using their main vacation days for this. Such flights usually start on Friday and end on Sunday. They are most often chosen by beginners - mostly young people. Demand for "weekend cruises" is stable and does not sag even in the low season.

This type of promising river travel should include trips to the Danube Delta.

b) Medium - 5-8 days. They are designed both for those who have never been on cruises before and want to try this type of vacation and for those who are used to relaxing several times a year. The most popular routes of such cruises are sightseeing. First of all, these are cruises to the countries of the Danube region with a visit to their capitals.

c) Long - 9-22 days. They are most often chosen by cruisers who know and love this type of recreation well. Long routes are connected with access to the Black and Mediterranean Seas and are carried out on cruise ships with a high level of comfort.

The fourth step is choosing the right cruise ship and organizing the trip well.

When choosing a ship, a tourist chooses, in fact, a floating hotel, so it is important to understand that choosing a ship is a key moment when choosing a tour on the river. First of all, it is important to pay attention to what kind of infrastructure the ship has. As a rule, these are one or two restaurants operating on a custom system - this is the classic version, which provides for table setting and the work of waiters. The menu is formed a day in advance, with a choice of two to four options for dishes. In some cases, one of the restaurants may operate as a buffet.

Another, but no less significant point that directly affects the level of comfort and the price of a cruise is the year of the last reconstruction of the ship. Everyone knows that the river cruise fleet is quite old. But, as shipowners never tire of repeating, it doesn't matter how old the ship is, what matters is how the owner takes care of it, and how much he invests in modernization. Motor ships of the same year and the same project,

owned by different companies, can differ not only in the level of comfort but also in the internal layout.

Each ship has a suite, junior suite, and economy options. And, according to experts, there is a client for each of them.

The Danube in the part of the current has a rather shallow fairway, and the operation of large river vessels is not possible, therefore, small vessels with a passenger capacity of up to 100-150 people are in operation.

The fifth step to success is the development of a cooperation strategy and plans for joint work of the national travel agency with major European tour operators and ship owners.

Many players organize river tours on chartered boats (this includes ship-owning companies, which often operate chartered boats in addition to their own fleet), and most work as agents selling the finished product.

The cruise price usually includes:

- travel from the point of departure to the point of arrival with accommodation in a cabin of the selected category;

- meals according to the chosen system (FB or HB on the menu or according to the "buffet" system), not including alcoholic drinks;

- one sightseeing tour at each stopping point, if it is not a "green stop";

- entertainment program on board, travel information.

The sixth step is to properly organize the work of the tour operator with clients.

After the basic information on the river product has been studied, the matter remains small. In order not to lose sight of a single detail and to choose a cruise for a specific tourist as accurately as possible, you need to find out from him the following:

- approximate date of departure;

- duration of the trip;

- who goes on a trip (how many people, what age);

- what type of rest the tourist prefers;

- Does the tourist have their own preferences for routes;

- in hotels of what star rating, in which country he usually rests, is a high level of service fundamental;

- budget.

Summarizing the contents of the above Master Plan for the development of the river cruise industry, we can conclude that for its implementation it is necessary to act in the following directions:

1) Creation of a new and modernization of the existing sea and river passenger fleet;

2) Reconstruction and re-equipment of sea and river cruise berths and harbors;

3) Formation of a centralized system of cruise and excursion routes in the Danube region;

4) Expanding the geography of cruise tourism

5) Prevention of shallowing and silting of rivers, cleaning of fairways;

6) Organization of the international information system of cruise tourism;

7) Conservation of nature and conservation of attractions of coastal areas.

Interreg

EUROPEAN UNION

Danube Transnational Programme

DIONYSUS

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

D.T3.4.3 - National Infrastructure Master Plans: AT, SK, HU, HR, RS, BG, RO, MD, UA for sustainable development of River Cruise industry

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3 Abbreviations

Abbreviation	Explanation
IWT	Inland water transport
RCI	River cruise industry
DR	Danube region
HR (RH)	Republika Hrvatska (Republic of Croatia)

4 Overview

Cruising is one of the types of nautical tourism that are certainly more represented in Croatia at sea, but in the last couple of years, there is some significant growth on rivers, which is usually referred to as river cruising. Cruising tourism involves cruising passenger ships for a tourist sailing experience, most often in a package with a visit to a number of attractive destinations on the mainland. The ship is the primary destination tourist stays, and onshore destinations are secondary. Passengers from the boat in the destination are referred to as one-day visitors. If nautical tourism takes place in the inland waters of only one country it is called domestic cruising and if it is in the inland waters of several countries, it is called international cruising which can take place by sea, rivers and lakes.

Round trips can be classified according to duration - short and long. Short trips last up to 21 days (usually 7 or 14 days), and long trips last more than 21 days to several months while excursions are considered as trips lasting less than 24 h. As for cruising in Croatia, it is important to mention that it takes place mostly at sea, but lately it has also been developing on the rivers of continental Croatia with an emphasis on the Danube. 90% of navigation takes place there, while the remaining 10% of traffic takes place on the river Drava. It is certainly worth mentioning the efforts of port authorities on the Sava River for their construction projects which include passenger ports that will contribute to the development of this type of tourism on Sava. Due to limitations in navigability of the Sava there are now only up to 2-3 cruisers annually.

Multi-day river cruises in international traffic, popularly called river cruising, has in the last few years experienced a real "boom" both in Europe and in Croatia. Cruising is by definition a planned staying on a larger vessel with help from a professional crew. Cruise trips are based on a pre-made itinerary with a predetermined route plan for docking in different ports/ cities/ states. In Europe, there are over 1 million passengers annually that sail in river cruises. The development of river cruises in Croatia began with the construction of the first passenger ports in Vukovar and Ilok. Serious numbers of river cruisers docking on the Danube have been recorded since 2004, when the port of Vukovar docked 57 river cruisers. From then until today, passenger ports on the Drava and the Danube record continuous growth, with exceptions on the Drava River during extremely low water levels such as 2018. This exceptional trend in the development of a new form of tourism in the region has been recognized by the Osijek-Baranja County whose initiative in 2013/2014 resulted in building ¸two new ports on the Danube, one in Batina and one in Aljmaš. On a total of 137 km of the Danube waterway through the territory of the Republic of Croatia there are four arranged passenger ports suited for the reception of river cruisers. It can be concluded that there are certain infrastructural preconditions required for the development of river cruises, which Croatia currently doesn't have, but certainly could. There is talk about an investment of HRK 50 million

in a passenger port on the Drava River, in Osijek. The plan is to obtain a docking infrastructure suitable for river cruisers and safe embarkation and disembarkation of its passengers. With the aim of developing a new tourist product related to the use of the Danube River as a waterway, a smaller pier – Marina, has been arranged and opened for the purpose of mooring smaller tourist, panoramic driving/excursion sailing vessels. It's a dock built with the aim of mooring vessels of smaller dimensions than river cruisers, which could not dock on existing passenger dock for river cruisers due to altitude difference. The port is equipped with a pontoon and an access bridge for safe embarkation and disembarkation of passengers and is the starting point for panoramic driving on the Danube. The port is opened for public and is intended for embarkation and disembarkation of passengers from other vessels on request and with prior notice to Vukovar Port Authority. In addition to the international passenger port in Ilok, there is also a passenger port solely for the needs of a small family hotel "Danube" which in addition to its basic services provide the possibility of navigation on Danube tourist boat "Danubius". There is no timetable in the offer, but according to the announcement, it is possible to sail for up to 30 passengers in the comfortably equipped interior of the ship along with the possibility of consuming food and drink while sailing. In the Municipality of Nijemci, organized by the Tourist Board, it is possible to sail on the tourist ship Sveta Katarina (Saint Catherine). The ship Sveta Katarina sails on the rivers Spačva and Bosut and opens the possibility of river adventurism like bird watching and animal and plant discovering ventures. In the summer months, the ship sails on a regular basis sailing schedule, and during the other months she sails only when appointment is made. The capacity of the ship is 30 passengers, and the embarkation and disembarkation of passengers is performed in the center of the Municipality of Nijemci in a location that is not open and classified as a passenger port in accordance with the regulations of inland navigation.

The Port of Vukovar Authority at its passenger ports in Vukovar and Ilok offers services for the supply of passenger vessels with drinking water and electricity as well as allowing the reception of waste from passenger ships.

Regarding digitalization, the Vukovar Port Authority used an E-port system for traffic control, and since there were technical problems with its maintenance, the system is currently not working. As of this year, the platform Cimis from the Navigation Safety Administration is being used. In 2014, the Port of Vukovar Authority prepared a Study for the Development of the Danube Cruising. Every two years, the Port of Vukovar Authority participates in the second largest cruise industry fair in the world, Seatrade Med, which is held in Hamburg.

From the announced projects related to the development of the potential of river cruises and river tourism, there is definitely a need to single out the project of building a new tourist ship. In the City of Otok, as a part of the project Spačva basin Gates, construction and equipping of the bioecological education center Virovi has started

and there has already been a contract for the procurement of vessels for the transport of tourists. It is an electric ship with a capacity of 50 passengers with two engines with which tourists will have the opportunity to see Vir. The total value of the project funded by the European Regional Development Fund is HRK 25.6 million, while HRK 2.2 million is planned for the construction of an electric ship.

Croatia is included in river cruise programs mainly in the lower Danube basin, downstream of Budapest. Programs mostly start from the embarkation port of Budapest or Vienna all the way to the Black Sea and on average last 11-13 days. The program includes a tour of 5-6 countries: Austria, Hungary, Croatia, Serbia, Romania and Bulgaria. Before entering Croatia, passengers sailing from Hungary, have to go through the passenger revision part which takes place in Mohács which is necessary when leaving the Schengen border.

In passenger ports on inland waters, in 2018, a total of 367 rivers docked cruisers with 51,385 passengers. The fact that Croatia also follows the growth trends of this type of tourism is shown by the data that in 2019, 559 docks were recorded in all 5 passenger docks. Overall, 527 river cruisers docked at the Danube passenger ports and 32 in Osijek on the Drava. From the information above it is concluded that river cruises in Croatia are the tourist product with the highest growth rate. Stated figures do not include occasional dockings at passenger ports on the Sava due to a small number of docks of only 2-3 throughout the year.

Percentage increase in river cruisers on arrival at the destination cannot be calculated because from 2018 there is no data on the number of individual arrivals of river cruisers. Precisely for this reason, the real number that insinuates real growth is the increase in the number of passengers in the destination who came on river cruisers.

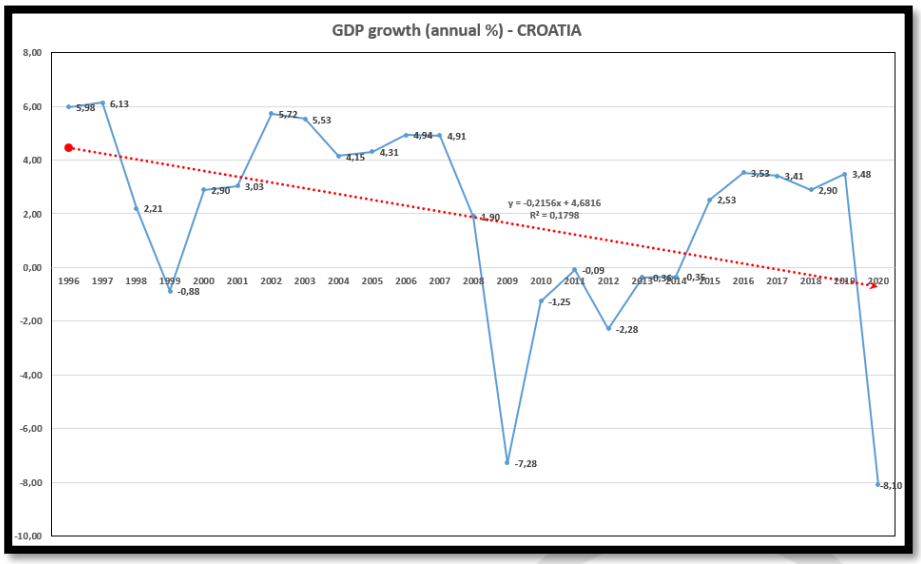
The trend shows that there was an overall increase of the numbers recorded at all ports on the Danube River flow. After the port infrastructure was built in Batina and Aljmaš, the first recorded dockings happened in 2015. Passenger port in Batina averages about 30-40 dockings and is mainly used for disembarking passengers in downstream navigation, that is, boarding passengers in upstream navigation. This port is a great new starting point for Osijek-Baranja County tour programs because travellers no longer have to visit the destination returning from Vukovar. The port has problems which are due to seasons changing and oscillations of water levels. In the passenger port in Aljmaš, the interest in docks started precisely because of the problem with low water level periods when, due to the impossibility of entering the Drava River, river cruisers were diverted to the nearest port which is located in Aljmaš. This port as well as Batina has the potential for acceptance of a number of river cruisers during the berthing season.

5 PROJECTIONS OF CRUISE TRAFFIC IN CROATIA

Cruise traffic projection for Croatian port Vukovar and other smaller ports under the management of Port Authority Vukovar is based on the most recent data provided by the PAV. The accumulated data reflects the number of dockings and the number of passengers that had interaction with the port, port's facilities, etc...

The projection models and results used to forecast the port of Vukovar's traffic are based on current knowledge of the region and historical data collected during the assessment process from up to 2040.
To start the projection of the traffic it is necessary to determine the common multiplier in calculations. This part of the equation most often comes down to the state's ability to produce growth across all sectors, mainly the gross domestic product. Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2015 prices, expressed in U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

Figure 1 Croatia's GDP expresses in annual %



As can be observed from the attached figure, Croatia's GDP was on a steady ascend a couple of years prior to the global pandemic outbreak. When the news and global panic ensued, all of the industry sectors took a hit resulting in a decline on most of the charts regardless of the industries or sector's performance capabilities. Croatia's GDP fell from +3,48% in 2019 to -8.10% in 2020. Some models show predictions that in 2021 Croatia's GDP rose to +10.4% which was to be expected since the "black swan" event happened in 2020. For the purpose of this document, the abovementioned chart from The World Bank will be taken into consideration while doing the projection calculations.

Table 1 Croatia's GDP

CROATIA - GDP		
1996	5,98	
1997	6,13	
1998	2,21	
1999	-0,88	
2000	2,90	
2001	3,03	
2002	5,72	
2003	5,53	
2004	4,15	
2005	4,31	
2006	4,94	
2007	4,91	
2008	1,90	
2009	-7,28	
2010	-1,25	
2011	-0,09	
2012	-2,28	
2013	-0,36	
2014	-0,35	
2015	2,53	
2016	3,53	
2017	3,41	
2018	2,90	
2019	3,48	
2020	-8,10	
Pesim.	0,94	-50%
Average	1,88	
Optim.	2,82	50%

The data provided from The World Bank regarding Croatia's GDP figures guided the fact that the average value allocated to annual performance is the 1.88% growth of the GDP. To properly estimate the projections for the cruise industry, three scenarios were made. One where the average growth rate presents the fundamentals for future projections, and two scenarios where we have 50% fluctuations to the upside and to the downside, or the optimistic and the pessimistic scenario. The pessimistic scenario represents the growth of only 0.94% annually and the optimistic where the growth is +2.82%.

As already mentioned, the port authority Vukovar manages 4 ports or terminals where the industry standards are met to satisfy the needs of passengers on the Danube ports. These ports are the port of Vukovar, the port of Ilok, the port of Batina, and the port of Aljmaš.

The second method used for the projection of the port's cruising performance is the linear forecasting tool. The FORECAST function predicts a value based on existing values along a linear trend. The forecast calculates future value predictions using linear regression and can be used to predict numeric values.

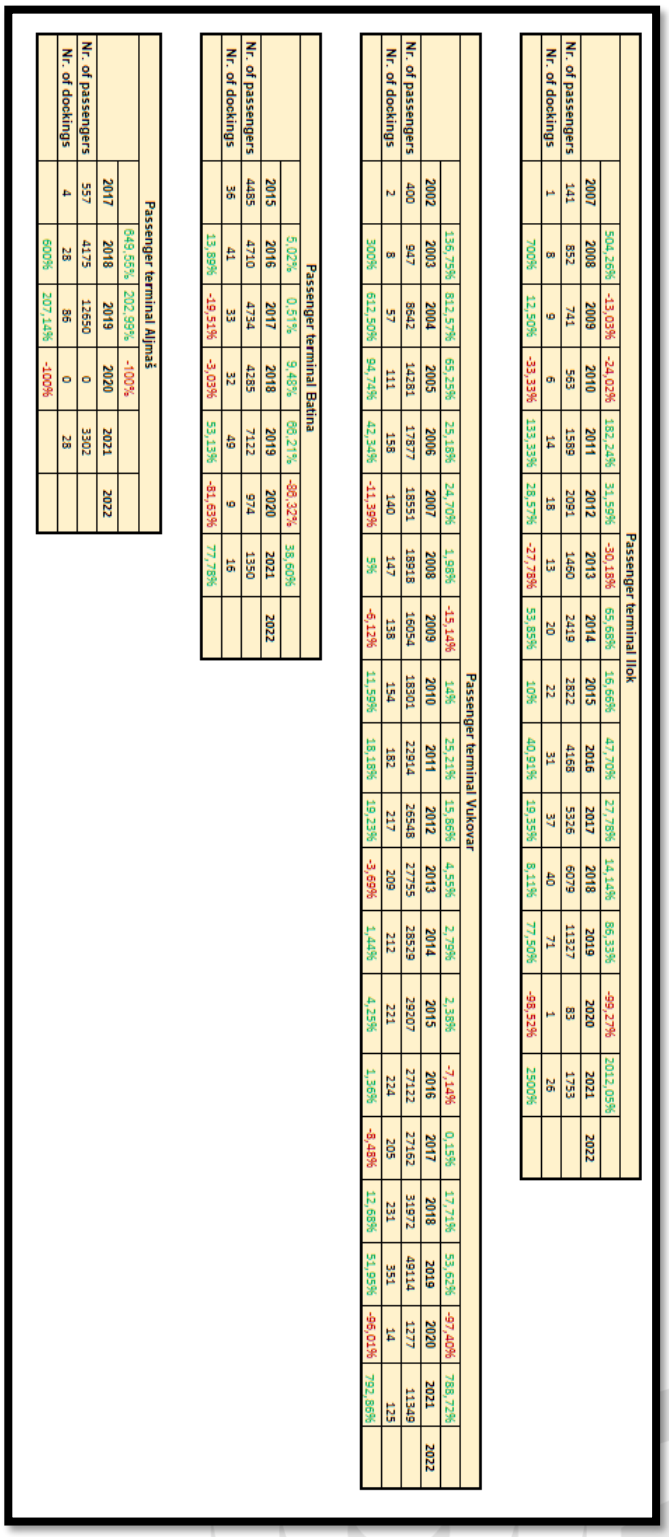
THE LINEAR FORECAST METHOD

The linear forecasting method was also based on a scenario where the black swan year was forgone in an attempt to avoid negative values which were bound to happen when 85% to 100% drops occurred.

The table on the following page shows the statistical data kept by the Port Authority of Vukovar on the number of dockings and the number of passengers in ports managed by the public institution.

The data represents the annual increases/decreases of the monitored information coupled with calculations, percentage-wise regarding the previous years marked in green and red color. The green color suggests that the growth occurred in regards to the year before and the red color suggests the opposite.

Table 2 Ports statistics



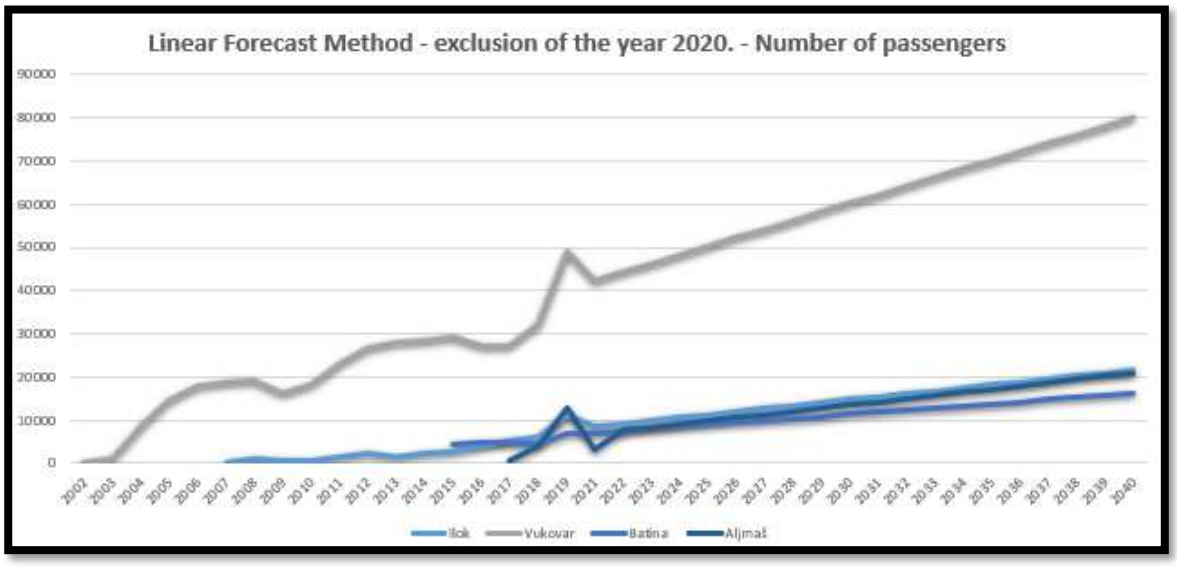
Passenger terminal Ilok																				
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022				
		504,26%	-13,03%	-24,02%	182,24%	31,59%	-30,18%	65,68%	15,66%	47,70%	27,78%	14,14%	86,33%	-99,27%	2012,05%					
Nr. of passengers	141	852	741	563	1589	2091	1460	2419	2822	4168	5326	6079	11327	83	1753					
Nr. of dockings	1	8	9	6	14	18	13	20	22	31	37	40	71	1	26					
		700%	12,50%	-33,33%	133,33%	28,57%	-27,78%	53,85%	10%	40,91%	19,35%	8,11%	77,50%	-98,52%	2500%					

Passenger terminal Vukovar																				
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
		136,75%	812,57%	65,25%	25,18%	24,70%	4,98%	-15,14%	14%	25,21%	15,86%	4,55%	2,79%	2,38%	-7,14%	0,15%	17,71%	53,62%	-97,40%	788,72%	
Nr. of passengers	400	947	8642	14281	17877	18551	18918	16054	18301	22914	26548	27755	28529	29207	27122	27162	31972	49114	1277	11349	
Nr. of dockings	2	8	57	111	158	140	147	138	154	182	217	209	212	221	224	205	231	351	14	125	
		300%	612,50%	94,74%	42,34%	-11,39%	5%	-6,12%	11,59%	18,18%	19,23%	-3,69%	1,44%	4,25%	1,36%	-8,48%	12,68%	51,95%	-96,01%	792,86%	

Passenger terminal Batina								
	2015	2016	2017	2018	2019	2020	2021	2022
		5,02%	0,61%	9,48%	66,21%	-86,32%	38,60%	
Nr. of passengers	4485	4710	4734	4285	7122	974	1350	
Nr. of dockings	36	41	33	32	49	9	16	
		13,89%	-19,51%	-3,03%	53,13%	-81,63%	77,78%	

Passenger terminal Ajmaš						
	2017	2018	2019	2020	2021	2022
		649,55%	202,99%	-100%		
Nr. of passengers	557	4175	12650	0	3302	
Nr. of dockings	4	28	86	0	28	
		600%	207,14%	-100%		

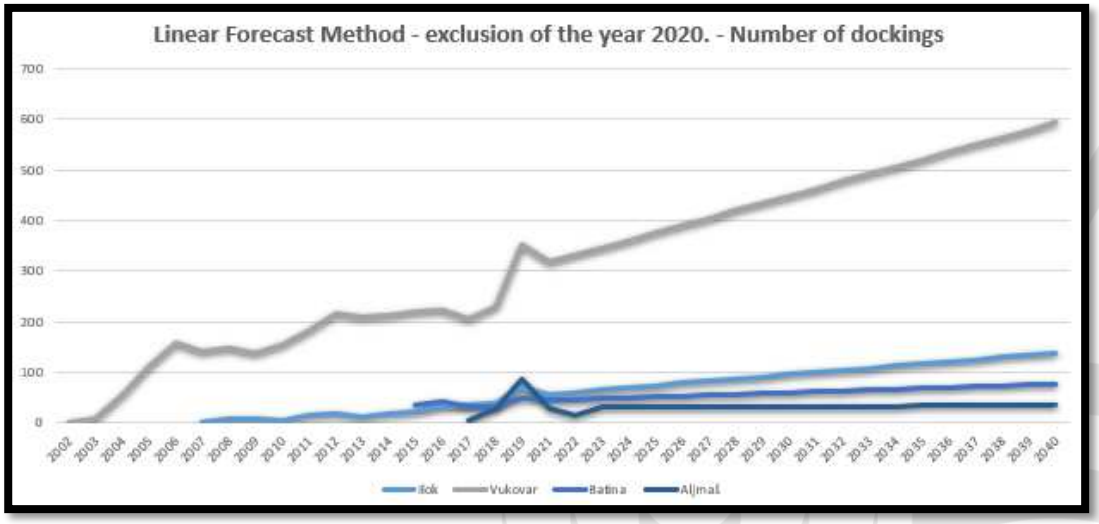
Figure 2 Linear forecasting - Number of passengers



As mentioned before, the linear forecasting method is a tool used for value predictions based on existing values along a linear trend. The calculations were made using linear regression.

It is possible to see in the provided figure that the patterns are more or less similar. The year 2019 was a continuation of the previous years with a stronger and stronger push to the upside. Small deviation can be seen across all of the ports in the gap where the year 2020 should be which points to the fact that leveling due to linear regression occurred.

Figure 3 Linear forecasting - Number of dockings



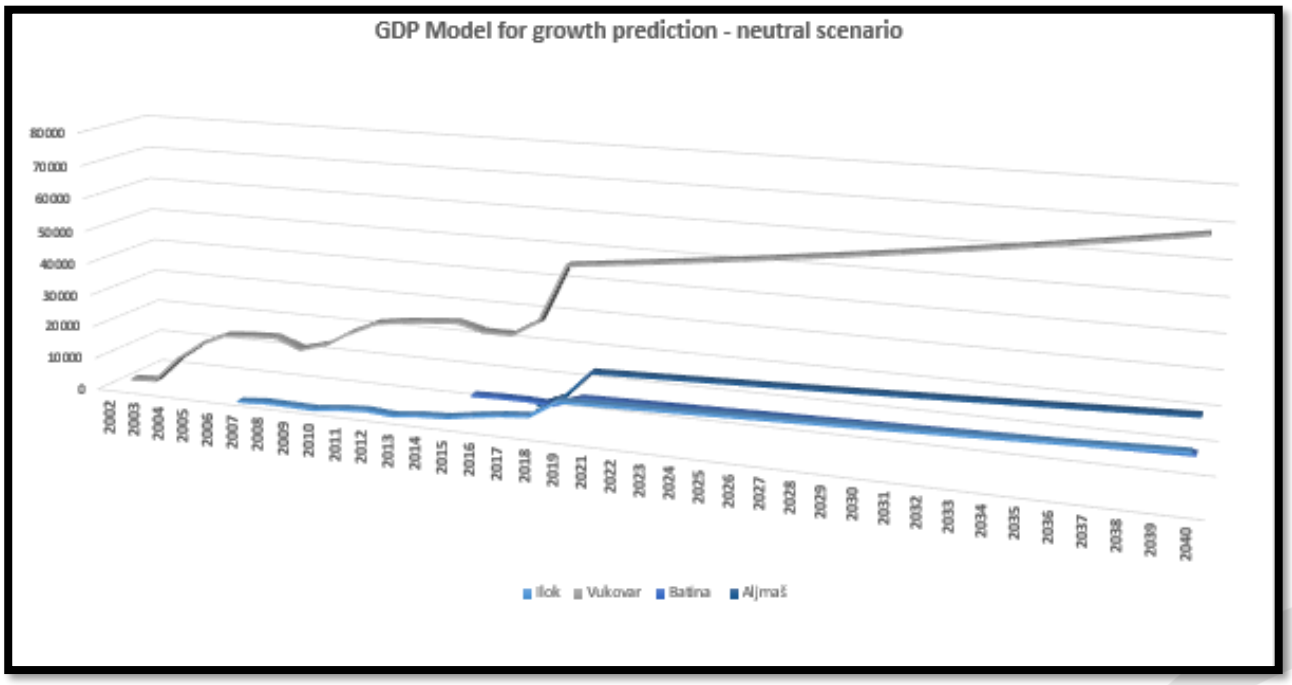
The almost identical pattern can be seen while observing the number of dockings. This outcome was expected since the number of passengers per cruise ship mostly remains constant and the correlation between the number of dockings and the number of passengers remains highly predictable.

PREDICTION MODEL BASED ON GDP

The prediction model based on GDP incorporates 3 scenarios. The average GDP up to this point in time, an optimistic and a pessimistic one.

The current GDP represents an annual growth on average of 1.88%.

Figure 4 Prediction model based on GDP (+1.88%) - PASSENGERS



The prediction model based on GDP growth showcases that the expected growth of the monitored data remains at a constant 1.88% growth level annually up to the year 2040. According to this model, the number of passengers in ports should rise as follows:

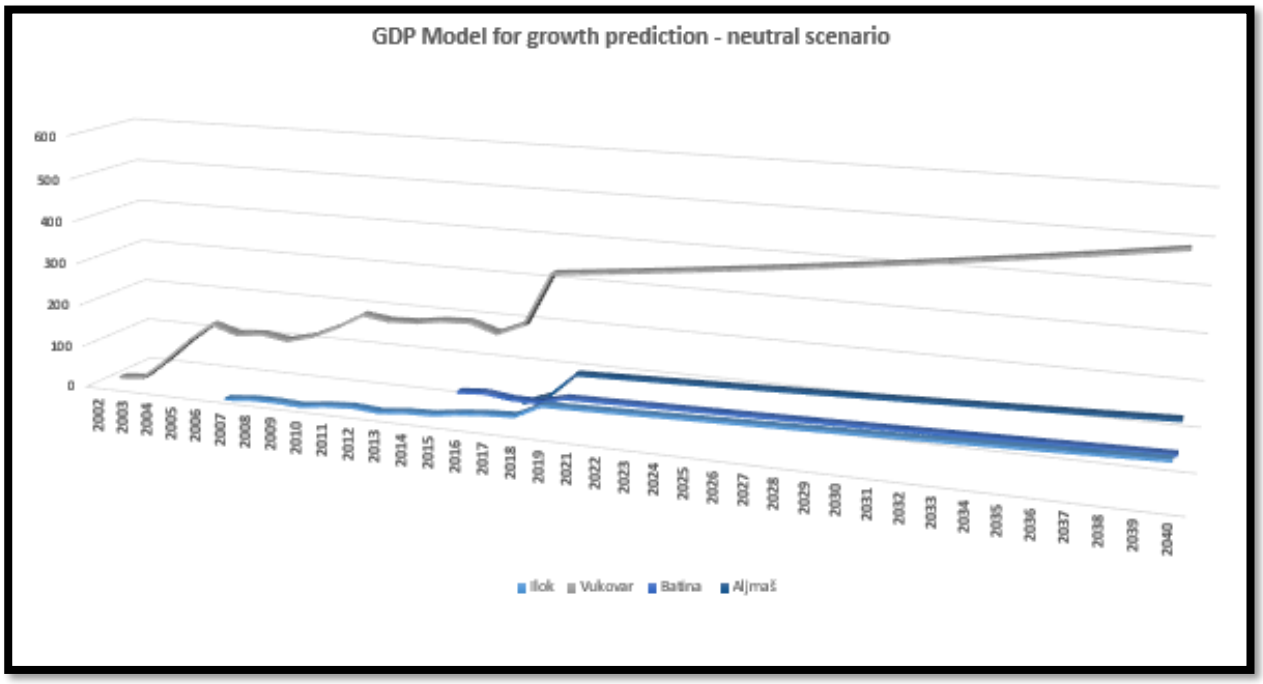
Passenger terminal Vukovar: 2021. (50.037) ->2040. (71.283)

Passenger terminal Ilok: 2021. (11.540) ->2040. (16.440)

Passenger terminal Batina: 2021. (7.256) ->2040. (10.337)

Passenger terminal Aljmaš: 2021. (12.888) ->2040. (18.360)

Figure 5 Prediction model based on GDP (+1.88%) - DOCKINGS



The outlook of the chart reflecting on the number of ships' dockings remains practically unchanged when compared with the number of passengers. The reason is that the average number of passengers per ship remains the same. Projected dockings are as follows:

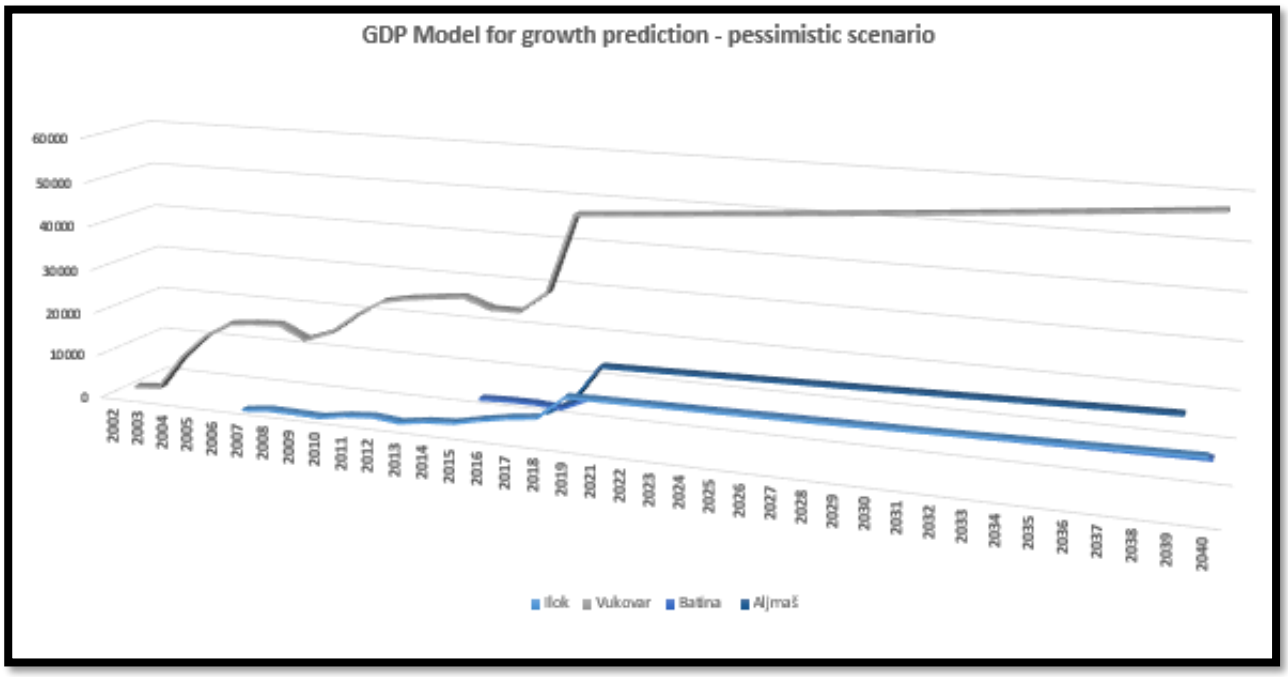
Passenger terminal Vukovar: 2021. (358) ->2040. (509)

Passenger terminal Ilok: 2021. (72) ->2040. (103)

Passenger terminal Batina: 2021. (50) ->2040. (71)

Passenger terminal Aljmaš: 2021. (88) ->2040. (125)

Figure 6 Prediction model based on GDP (+0.94%) - PASSENGERS



Pessimistic scenario represents taking the average GDP as a constant in calculations but with a 50% drop in regard to the current levels.

The prediction model based on GDP growth showcases that the expected growth of the monitored data remains at a constant 0.94% growth level annually up to the year 2040. According to this model, the number of passengers in ports should rise as follows:

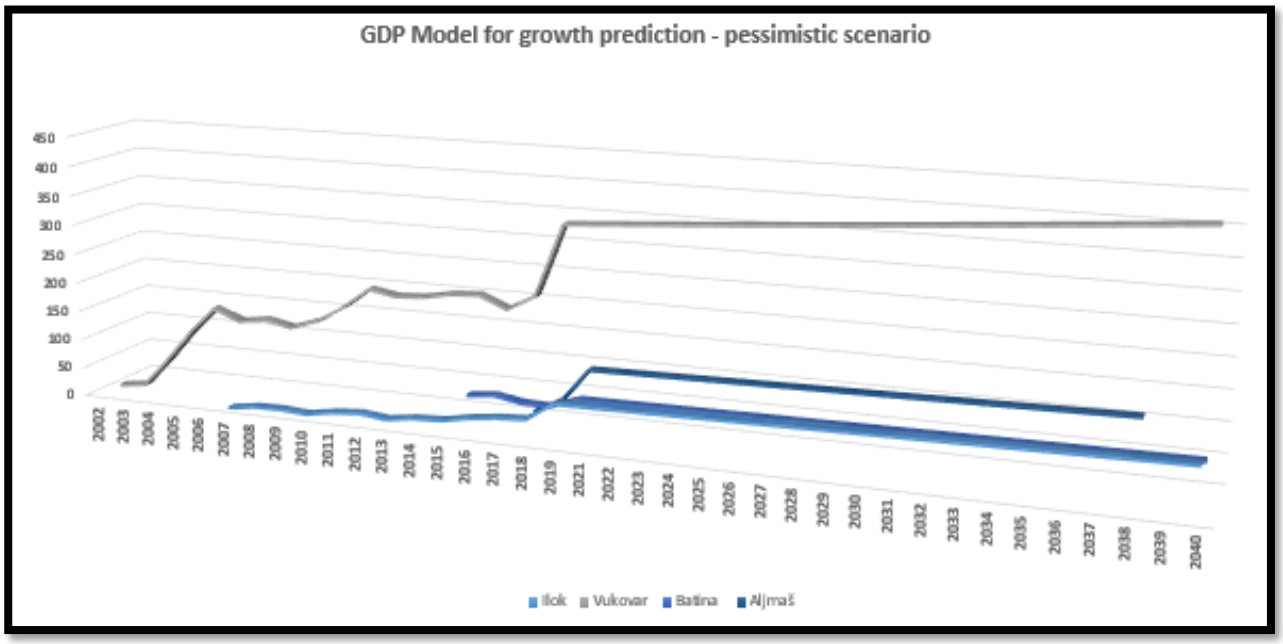
Passenger terminal Vukovar: 2021. (49.576) ->2040. (59.220)

Passenger terminal Ilok: 2021. (11.384) ->2040. (13.189)

Passenger terminal Batina: 2021. (7.189) ->2040. (8.588)

Passenger terminal Aljmaš: 2021. (12.769) ->2040. (15.253)

Figure 7 Prediction model based on GDP (+0.94%) - DOCKINGS



Projected dockings are as follows:

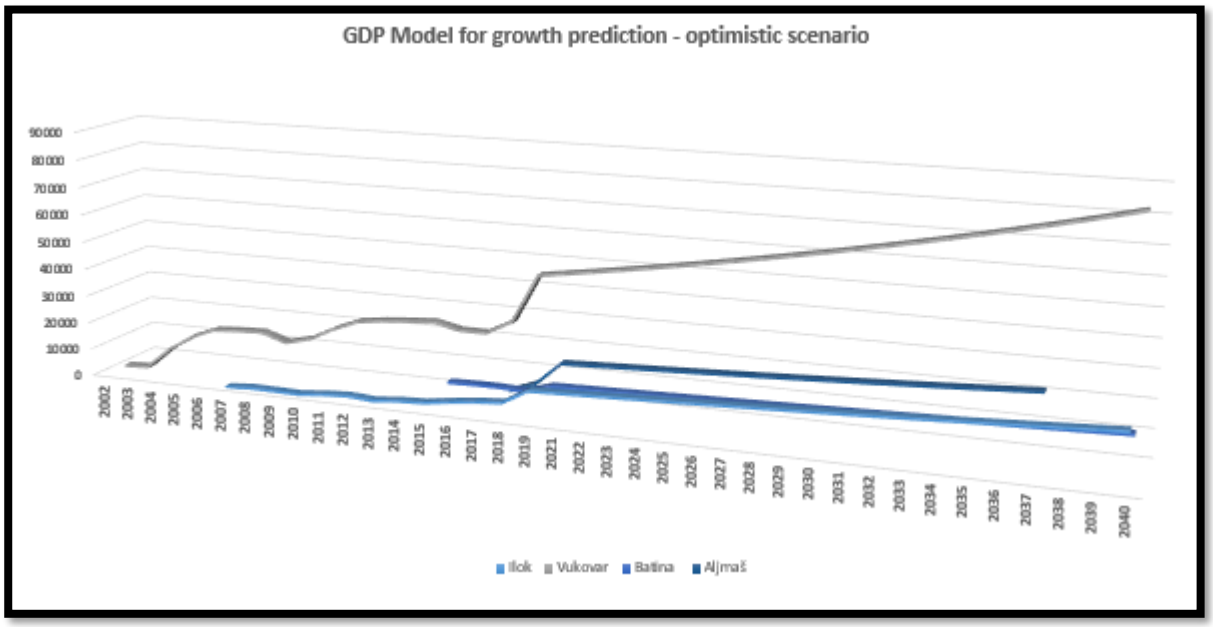
Passenger terminal Vukovar: 2021. (354) ->2040. (423)

Passenger terminal Ilok: 2021. (72) ->2040. (86)

Passenger terminal Batina: 2021. (49) ->2040. (59)

Passenger terminal Aljmaš: 2021. (87) ->2040. (104)

Figure 8 Prediction model based on GDP (+2.82%) - PASSENGERS



Optimistic scenario represents taking the average GDP as a constant in calculations but with a 50% increase in regard to the current levels.

The prediction model based on GDP growth showcases that the expected growth of the monitored data remains at a constant 2.82% growth level annually up to the year 2040. According to this model, the number of passengers in ports should rise as follows:

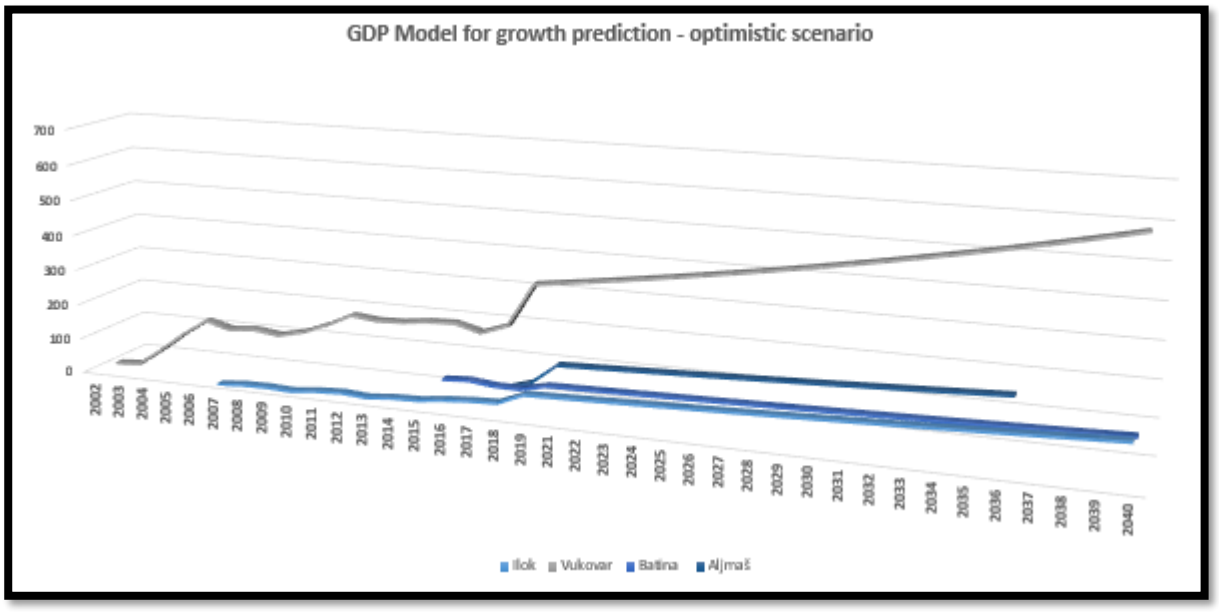
Passenger terminal Vukovar: 2021. (50.499) ->2040. (85.656)

Passenger terminal Ilok: 2021. (11.646) ->2040. (19.755)

Passenger terminal Batina: 2021. (7.323) ->2040. (12.421)

Passenger terminal Aljmaš: 2021. (13.007) ->2040. (22.062)

Figure 9 Prediction model based on GDP (+2.82%) - DOCKINGS



Projected dockings in an optimistic projection are as follows:

Passenger terminal Vukovar: 2021. (361) ->2040. (612)

Passenger terminal Ilok: 2021. (73) ->2040. (124)

Passenger terminal Batina: 2021. (50) ->2040. (85)

Passenger terminal Aljmaš: 2021. (88) ->2040. (150)

6 Cruise berth demand in the ports of Croatia

6.1 Cruise vessel trends

With its 137 km length, the Croatian section of the Danube is the third shortest national section along the river (after those of Moldova and Ukraine). In all its course through the country the Danube River is the state border between Croatia and Serbia. At national level, the Ministry of the Sea, Transport and Infrastructure is the authority in charge of navigation and port operations and the Agency for Inland Waterways is responsible for the river Danube and the other inland waterways. In addition, the Vukovar Port Authority is the public institution for the management and development of the Vukovar port and all public interests of Croatia along the Danube River. Croatia's Navigation and Inland Ports Act defines the port as a part of the waterway and the land area immediately adjacent to it that is designated and equipped for mooring, anchoring and safety of vessels, loading, unloading and storage of goods, and embarking and disembarking of passengers, where activities are carried out that are economically, transport wise and technologically sound and related to goods or vessels.

The Port of Vukovar is the main Croatian port on the Danube. In 2006, a passenger terminal was built within it. Port passenger terminals also are operated in the cities of Ilok, Batina and Aljmaš. Although not directly located on the Danube, the port of Osijek (river Drava, km 21) is present in many cruise programs and should also be considered as part of the Danube ports.

N	Location	KM	Bank	No of berths
1	Batina	1425 + 500	right	1
2	Aljmaš	1380,2	right	1
3	Osijek	21,400-21,282,Drava	right	1
4	Vukovar	1333	right	1
5	Ilok	1298,68	right	1

The structure of the Danube Fleet according to the age of the vessels shows continuous renewal, which continued as a process in 2020 - according to the announced cruise programs for the year 2021, 8 new ships were launched. This was provoked by two major factors - increased environmental requirements that older engines cannot meet, and increased consumer demands about the conditions and expected services on board of a cruise ship.

The current age structure of the vessels of the Danube fleet shows that new vessels prevail - the number of ships produced after 2010 is 93 and together with the planned 8 ships in 2020 make up 57% of all ships. In addition, 30% of the fleet is made up of ships built between 2000 and 2010 (52 ships). Only 13% of the ships have a year of production before 1999.

Figure 10 Structure of the Danube fleet by year of vessel production

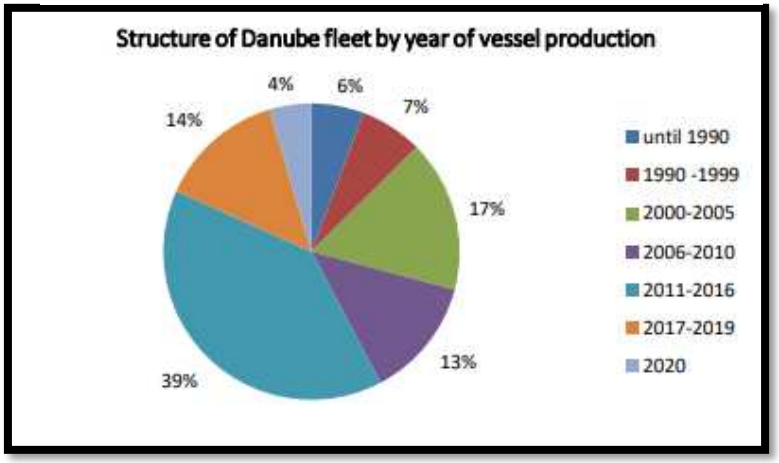
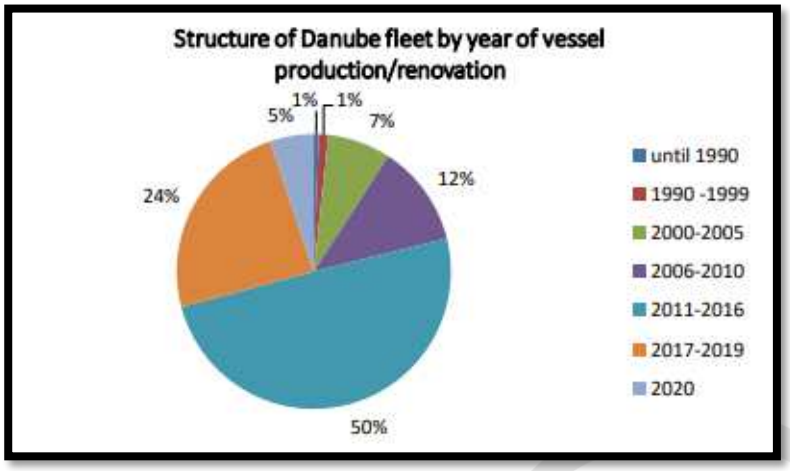


Figure 11 Structure of Danube fleet by year of vessel production/renovation



The situation is even more significant if the renovations of the vessels are taken into account. For the 2020 season, from this point of view, cruises will be made by ships, 79% of which were manufactured and/or refurbished in the period 2011 to 2020, and the proportion of ships produced or refurbished until 1999 will be only 2%.

Types of cruise vessels on the Danube

The specifics of the waterway, combined with economic efficiency and technology have an impact on the technical parameters of the Danube ships. At present Danube cruises are realised with the following main types of cruise ships:

Small ships with length below 110 m
In this group are present mainly older ships with length less than 110 m and breadth of up to 11 m. They have limited capacity and at present for this reason their production is limited. They are used for the low-cost segment of the cruises.

Ships with length of 110 m
Production of such type of ships is wide spread after year 2000, when the maximum dimensional "standard" becomes length of 110 m and breadth of 11.5 m. The breadth dimension is defined by the width of the European river and channel locks.

Ships with length of 135 m
At present in the inland waterways the biggest ships are with length of 135 m and breadth of 11.5 m.

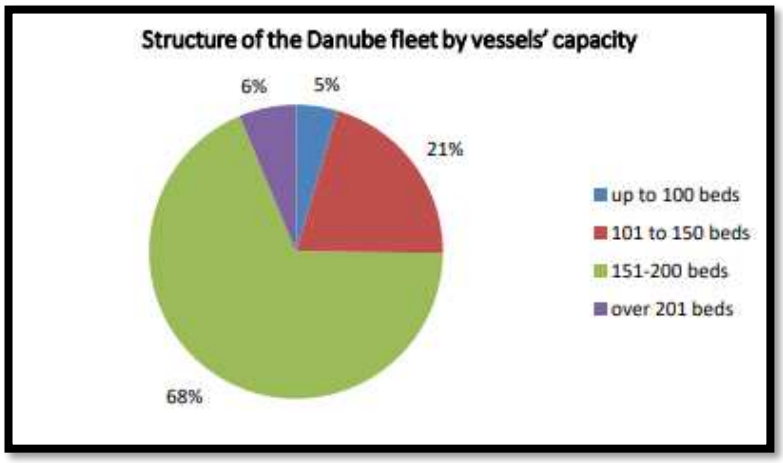
Ships with "over"- breadth dimensions
In recent years, some vessels have been manufactured with a standard length of 135 m, but with a breadth exceeding the usual one and with "over-breadth" of 17, 20 or even 23 m. Due to their inability to pass through the channel locks, these vessels are restricted to sail only the waterway where they were initially placed on water (e.g., Rhine or Danube). A typical example of such a ship is the AmaMagna of AmaWaterways launched on the Danube in 2019, and her breadth is 22 meters.

Capacity of the Danube cruise ships

Cruise ships on the Danube are limited in their capacity, generally because of the optimum physical dimensions of a vessel (135 m long/11.5 m breadth). With these dimensions, the average capacity of a ship is 166.7 passengers' accommodation.

In terms of capacity, ships of the Danube fleet are strongly dominated by ships with accommodation for between 151 and 200 passengers. These are 120 ships or 68% of all ships. Between 101 and 150 accommodations offer 21% of the ships (36). Ships with up to 100 beds are only 8 (5%). The largest one is the Ukrainian Rosa Victoria, belonging to Chervona Ruta, with a total of 400 accommodations, for cruises on the lower Danube (to Fetesti).

Figure 12 Structure of the Danube fleet by vessels' capacity



In addition, it should be noted that the maximum number of decks registered on Danube vessels is 3 decks with cabins. This is also the prevailing number of decks for most ships (only 20 are ships with 2 decks with cabins). Increasing the capacity of the Danube Fleet is possible, within these limiting conditions, mainly through increasing the number of vessels.

6.2 Traffic data analyses

River cruises on the eve of the pandemic recorded continuous growth, and this year that trend has returned. A total of 565 river cruise ships have been announced to dock at four passenger piers on the Danube this year in Croatia. Plans to break the record from 2019, when 557 such ships docked in Croatia, could be disrupted by the low water level of the Danube.

There are four passenger piers on the Danube, in Batina, Aljmaš, Vukovar and Ilok. The river cruise season in the far east of Croatia started in mid-March. From then until now, the most cruise ships docked in Vukovar, 214 of them with 20,749 passengers, and another 90 cruise ships should dock by the end of the year. The first passenger cruise ship docked in Vukovar in 2002. Only two arrived that year, bringing 400 passengers to the city of Vukovar.

The average length of passenger vessels that dock at passenger piers on the Danube River in Croatia is 135 meters with a capacity of 190 passengers. The majority of guests from the USA, Germany and France arrived by river in Vukovar.

It is mainly about elderly people who are traveling from Budapest to the Black Sea. In most visits to Vukovar, there are the City Museum and the Museum of Vučedol Culture, which are organized tours, as well as the city center, the Church of St. Philip and Jacob, the Water Tower and the Franciscan Museum. Tourists come prepared and know what they want to see during their free time in city which ranges from 3-10 hours depending on the cruise schedule. The international river cruise season starts in March and lasts until November, with its peak in the summer months.

Docking numbers increased month by month and by November, when the season ends, the record from 2019 should be claimed. But this year, the scenario from 2018 was repeated, when due to extremely low water levels, river traffic as a whole experienced great loss.

In terms of international river cruises, 2019 was also a record year because, according to the data, 589 dockings were recorded on the Danube and Drava, which brought over 60,000 visitors and generated around HRK 30 million in revenue. It was the low water level during July and August that led to the cancellation of 84 dockings. When the water level in the Vukovar pier gets too low, those in Aljmaš and Ilok are being used.

Such restrictions also affect passenger traffic, but the exact figures will be known at the end of the season, as forecasts of low water levels are still valid. Cruising companies in such situations have reserve options in preparation that overcome critical sections of navigation. Some continue their journey by bus to the next pier from which sailing is possible, others in their fleet have vessels with a smaller draft, so passengers are

redistributed, and some cruises, depending on the sailing route, unfortunately, have to be interrupted due to restrictions.

Starting this summer, Croatian river piers have a common visual identity. A logo, six identical masts, and seven flags were created for the Danube quays Aljmaš, Batina, Vukovar, and Ilok, the Drava quay in Osijek, and two on the Sava, in Slavonski Brod and Sisak. It is a project of the Croatian Tourist Board (HTZ) worth slightly less than HRK 92,000, which was realized with the cooperation of the project holder, the Tourist Board of Vukovar-Srijem County, and the regional tourist boards of Osijek-Baranja, Brod-Posavina, Sisak-Moslavina, and the competent port authorities, Vukovar, Osijek, Slavonski Brod, and Sisak.

With this cooperation, the goal was to raise the awareness and interest of the tourist sector in the area of nautical tourism of river cruises. The common visual identity and its application at all seven river piers promote and strengthen the visibility and position of the Croatian Danube and the Sava River on the market of organized tourist traffic for river cruises.

2020. DATA

The year 2020 marked the year when the global economy came to a halt. Everything in most of the industries started hitting unexpected roadblocks ranging from lack of workforce, loss of revenue to a global supply chain crisis. The river cruising industry also took a big hit, resulting in 85% to 100% losses in terms of the number of passengers and the number of dockings in ports (see Table 2. Ports statistics).

Some of the companies with stronger fundamentals continued throughout the crisis as soon as chance presented itself.

Below, it is possible to see some statistics about the number of ships from certain companies and the nationality of its passengers in ports under the management of Port authority Vukovar.

It can be seen that few of the biggest market players in the river cruising industry managed to preserve their position in a pandemic year establishing their position in the industry.

Figure 13 Overview of the ships 2020.

Total number of ships --> 24				
#	Shipping company	Number of ships	Share	Share in %
1.	Scylla	7	0,29166667	29.2%
2.	ROI BOLERO	6	0,25	25%
3.	Dunav Tours	4	0,16666667	16.7%
4.	ROI SCI	3	0,125	12.5%
5.	ROI Belvedere	2	0,08333333	8.3%
6.	ROI MAXIMA	1	0,04166667	4.15%
7.	Apollon River Managment	1	0,04166667	4.15%

Figure 14 Nationality of passengers in 2020.

Nationality of passengers				
#	Nationality	Number	Share	Share in %
	Overall	2334	1	100%
1.	Germany	2132	0,9134533	91%
2.	Russia	113	0,04841474	5%
3.	Ukraine	10	0,00428449	0.5%
4.	Other	79	0,03384747	3.5%

Figure 14. shows that the majority of passengers came from Germany, to be exact, 91% of them. This was to be expected since intercontinental traveling was interpreted vaguely and the traveling industry, in general, was under a lot of restrictions, so the longer journeys were most often postponed or even canceled. After the Germans, second place belongs to Russians and third to Ukrainians.

2021. DATA

Figure 15 Overview of the ships 2021.

Total number of ships --> 150				
#	Shipping company	Number of ships	Share	Share in %
1.	Viking River Cruises	28	0,186666667	18.7%
2.	Luftner Cruises	19	0,126666667	12.7%
3.	Ama Waterways	14	0,093333333	9.3%
4.	ROI Mixed Fleet	14	0,093333333	9.3%
5.	ROI Bolero	12	0,08	8%
6.	Global River Cruises	9	0,06	6%
7.	Scylla	5	0,033333333	3.3%

When comparing data from 2020. and 2021. it is possible to see the change in structure of the presence of shippers. First three companies that take almost 42% of the total fleet of ships concerning ports under the management of Port of authority Vukovar. Detailed analysis of the companies whose fleet operates on the Danube, including the port of Vukovar was explained in the deliverable “Analysis of the National Transport Strategy/Masterplan and forecasts with regard to the River Cruise Industry”. The document covers the fleet, its technical and mechanical specifications, tour descriptions, history of the companies and the fleet’s features. Couple of these certain cruise lines have a repeated occurrence over the years pointing to the fact how valuable is partnership with them and the overall benefit they bring with their business developing the Danube region and the surrounding area.

Figure 16 Nationality of passengers 2021.

Nationality of passengers				
#	Nationality	Number of passengers	Share	Share in %
	Overall	14661		
1	Austria	89	0,006070527	0.6%
2	Belgium	183	0,012482095	1.2%
3	Denmark	524	0,035741082	3.6%
4	France	665	0,045358434	4.5%
5	Finland	1	6,82082E-05	0.01%
6	Croatia	43	0,002932951	0.3%
7	Italy	84	0,005729486	0.6%
8	Israel	17	0,001159539	0.1%
9	Canada	127	0,008662438	0.9%
10	Hungary	57	0,003887866	0.4%
11	Mexico	4	0,000272833	0.03%
12	Netherlands	226	0,015415047	1.5%
13	Norway	162	0,011049724	1.1%
14	Germany	7313	0,498806357	49.9%
15	Poland	4	0,000272833	0.03%
16	Romania	3	0,000204625	0.02%
17	USA	4009	0,273446559	27.3%
18	Slovakia	1	6,82082E-05	0.01%
19	Serbia	5	0,000341041	0.03%
20	Spain	1	6,82082E-05	0.01%
21	Sweden	57	0,003887866	0.4%
22	Switzerland	454	0,03096651	3.1%
23	UK	52	0,003546825	0.4%
24	Other	580	0,039560739	4%

From the Figure 16. it is evident that the structure of the passenger has changed in 2021. Passengers from Germany are still in first place with a share of almost 50%. The second place goes to the passengers from the United States where the culture of river cruising began early on since the USA is filled with navigable rivers and the industry related to river cruise shipping already experienced a swift development phase. Following the passengers from the USA, the third place in the ranking belongs to France, the third one to Denmark, and the fourth one to the Netherlands.

6.3 Facility/infrastructure demand

Vukovar's passenger port is located at the rkm 1333 + 000 on the right bank of the Danube River and is constructed out of one steel floating facility (pontoon) which can accommodate up to three vessels at a time (alongside mooring). Simplistic design points to the fact that at the moment, infrastructural and superstructural requirements suffice the current demand. As in most ports, the demand for berths in ports most often ranges from early Spring months towards mid to late Autumn. From the other point of view, it is also worth mentioning that the late Autumn and Winter months receive little to no traffic and any kind of investments should take into consideration that 25% of the year, practically speaking, ne berth is required for the purpose of river cruising in Vukovar.

The peak months are June, July, August, and September when almost every day at least one cruiser docks in the Vukovar port. There are a substantial number of days when there are 3 or 4 vessels scheduled within one day. Peak days seem to vary, but most often it is the weekends and early weekdays, which seems logical if the journey's route ends at the Black Sea and Croatian ports find themselves at the beginning or towards the middle of the planned route.

Since the port of Vukovar operates with only one passenger terminal, peak days' demand would really benefit from the second pontoon. Current demand suffices, but if the projections from the previous chapter come true, increases in dockings would range from +20% in the pessimistic scenario to +70% in the optimistic scenario while the increases in passengers would move in a similar range.

These scenarios would push the current port's capacities out of the scope since all of the traffic would congest the port and it wouldn't be able to accommodate all of the vessels.

If one extra pontoon or a terminal was to be constructed, since the port's current capacities are capable of handling the workload, two terminals would be able to handle double the workload (dockings and passengers).

From the investment's point of view, in current conditions, construction of the new terminal wouldn't be a justifiable expense, but if the traffic in Vukovar's port grows on average only by about 2.88% for the next 15-20 years it is going to almost double from the current position and if the port wants to stay competitive, new infrastructure and superstructure is going to be needed.

7 Cruise development plans in Croatia

This subchapter will be dedicated to the presentation of the factors that contribute to the development of the river cruise industry in a sustainable and efficient way. The first thing when starting the transformational path towards a "green" and sustainable environment has to be to take into account general tourism overviews around the world together with crucial and pivotal moments for cruise tourism growth. These factors can include a variety of regional and local parameters that help the movement thrive and prosper through various investments and incentives.

Second, and one of the most important steps has to be factoring in the concept of creating the value chain to cruise tourism. A value chain is a set of activities that a firm operating in a specific industry performs in order to deliver a valuable product (i.e., good and/or service) to the market. The concept of value chains as decision support tools was added to the competitive strategies paradigm developed by Porter as early as 1979. In Porter's value chains, Inbound Logistics, Operations, Outbound Logistics, Marketing and Sales, and Service are categorized as primary activities. Secondary activities include Procurement, Human Resource management, Technological Development, and Infrastructure. Classification of the value chain within the river cruise industry encompasses passengers, distribution channels, cruise lines, cruise destinations, expanded value chains of cruise terminals and port reception facilities, ground transportation, local communities and heritage, activities, attractions, and sites.

Following the previous step, the concept of cruise tourism impact has to be reviewed. For easier orientation, 3 categories can serve as a basis for categorizing impacts within the river cruise industry. The first category consists of environmental impacts such as impacts from physical arrivals of cruise ships, marine degradation, air pollution, and noise pollution. The second category would have to focus on social impacts like congestion, cultural heritage degradation, and community disruption. The third segment encompasses economic benefits and long-term vitality, leakage, and economic multiplier effect together with economic impact studies.

Since river cruising shows high growth rates in general, which is also confirmed by the number of cruise ship arrivals in Vukovar, it is a "product" that represents a great chance for tourist profiling/positioning of the city, especially on the international market.

Among guests/in demand for river cruises in Vukovar today the majority are guests from the USA (71%), followed by a smaller proportion from European countries (France 7.4%, Switzerland 4.7%). By age, more than half (52.7%) are guests between 56 and 70 years of age, and even a third (33.7%) are over 70 years old. They are mostly guests who come to Croatia for the first time (69.5%). During their stay in Vukovar, more than two-

thirds of them (73.3%) go to the organized sightseeing of the city, but also an organized trip to the surroundings. Relatively small consumption in Vukovar (11.2 euros) refers to shopping at most souvenirs, bottles of Croatian drinks (wine, brandy, etc.) and/or autochthonous food products.[1]

The success factors for this product are:

- Safety of visitors in the destination (well organized medical care)
- Friendly and hospitable population
- Adaptation to specific target segments (older age)
- Ensured and quickly accessible public transport in the destination
- Availability of different thematic itineraries
- Quality promotion – synergy of traditional and contemporary promotional tools

Required activities on promotion of the river cruise industry

- Coordination of tourism stakeholders of the city
- Development of cooperation with travel organizers/'shippers'
- Arrangement of the port/passenger pier (infrastructure, public surfaces, environment, canopies)
- Info-point near the pier
- Exchange office in the port
- Quality signaling and interpretation
- Further development of thematic itineraries
- Availability of guides
- Neatness and cleanliness of the destination; age appropriateness structure of guests
- Internal marketing with the local population
- Development of quality promotional materials – possibilities individual tours
- Improvement of the technological equipment of the destination (free Wi-Fi zones)

[1] City of Vukovar: Strategic guidelines for the development of tourism in the period from 2016 to 2020.

7.1 Cruise terminal/berthing layout in the river cruise ports in Croatia

This subchapter will review the existing port facilities that are currently used in RCI.

Table 1 Croatian river cruise terminal specifications

Port and Terminal Name	Location (km no.)	Terminal capacity	Quay length or No. of simultaneous ships	Geographic position
Passenger terminal Vukovar	rkm 1333 + 000 right bank of Danube River	1x berth	75,20m 1x steel floating facility and 3x vessels	45°21'06.0"N 19°00'20.8"E
Passenger terminal Ilok	rkm 1298 + 680 right bank of the Danube	1x berth	57,22m 1x steel floating facility and 2x vessels	45°13'50.2"N 19°22'44.2"E
Passenger terminal Batina	rkm 1425 + 500 right bank of the Danube	1x berth	14,53m 1x steel floating facility and 1x vessel	45°51'09.9"N 18°51'16.3"E
Passenger terminal Aljmaš	rkm 1380 + 200 right bank of the Danube	1x berth	14,53m 1x steel floating facility and 1x vessel	45°31'53.4"N 18°57'06.4"E

Despite having only, a limited number of berthing facilities, Croatian river cruising has had a pretty uptrend going over the last years, each year topping the last one. Last year proved to be special in all of the industries and all over the world with not knowing what the next day will bring. On March 16th 2020 official decisions were made on temporary suspension of passenger ports in Vukovar, Ilok, Batina and Aljmaš. Almost like all the other sectors in country, a forceful stop was made due to fear of spreading of COVID-19 and everything was put on hold.

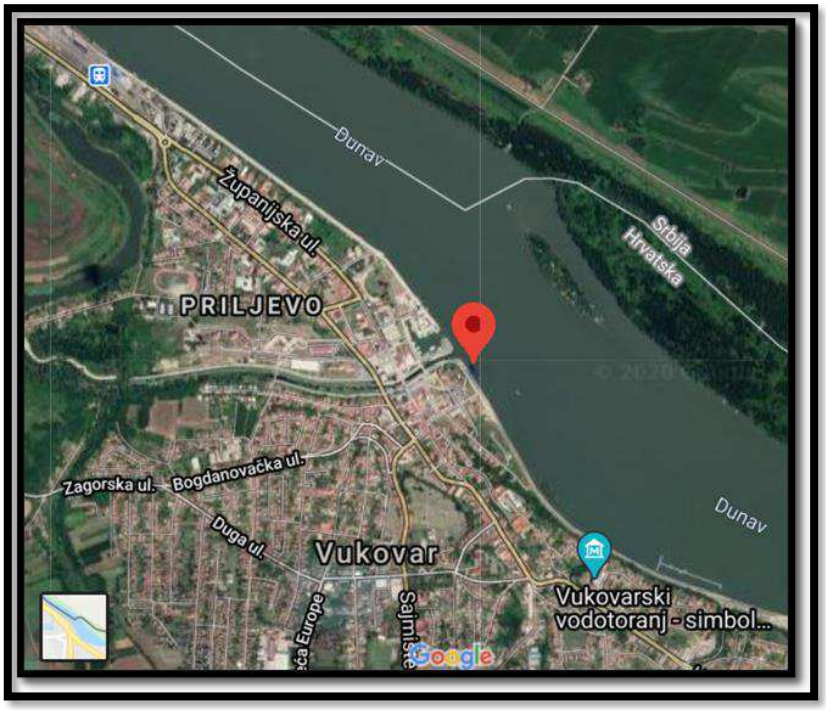
On the July 10th 2020, the Port of Vukovar Authority published a document which stated "Since the decision made on March 16th, related to special circumstances that endanger the lives and health of citizens within the competence of the National Civil Protection Headquarters of the Republic of Croatia, the decision made on March 16th was repealed." This way, things were slowly starting to move forward, but in no way any other usual year could conquer. Borders were still semi closed and rather selective, but the Croatian population were decisive to take whatever they can in what's left of the ongoing season of 2020. 2021 went fairly better despite not knowing the outcome of the touristic season as well as situation with any kind of cross-border or travelling activities up until mid-June 2021. Some segments in the overall picture started to recover while some stagnated. 2022 showed recovery in all of the aspects concerned.

PASSENGER TERMINAL IN VUKOVAR

Passenger dock Vukovar is located on the rkm 1333 + 000 right bank of the Danube River. Among the other cargo handling terminals, Vukovar has also a dedicated passenger terminal with the main purpose of berthing passenger vessels.

The embankment is entirely done, and the bank type is classified as “sloped”. The passenger terminal in Vukovar port is actually a type of pontoon–floating facility made of steel. Pontoon classifies as one berth, but the actual capacity or the number of vessels permitted on this berth accounts for 4 vessels (the floating facility + 3 vessels).

Figure 17 Aerial view of passenger dock location in Vukovar



Source 1 http://luv.hr/

The overall length of the floating facility is 75,20 meters long and the maximum width of 10,00 meters. Additional services which are offered at the passenger terminal include fresh water supply, electricity and waste disposal.

One of the many great things regarding Vukovar port and its overall impact on the river cruising industry definitely has to be the offer of supplying groceries and other products for the needs of the ship's restaurant which is practically speaking an exclusive offer.

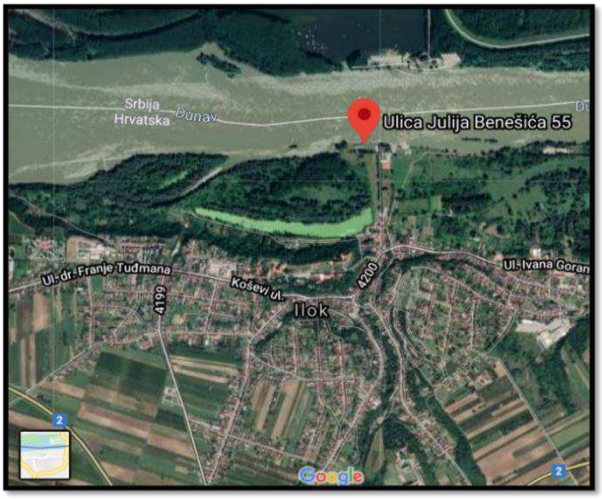
PASSENGER TERMINAL ILOK

Passenger dock in Ilok is located on the rkm 1298 + 680 right bank of the Danube also goes under the management of Port of Vukovar Authority as well as the ports Aljmaš and Batina. Ilok's passenger dock is made similarly to the one made in Vukovar.

The embankment is entirely done and the bank type is sloped. The passenger dock is as well a pontoon type of floating facility made of steel. There is one berth that can accommodate 3 vessels (the floating facility + 2 vessels).

The length of the facility is 57,22 meters and the width is 7,93 meters. Additional services which are offered at the passenger terminal include fresh water supply, electricity and waste disposal.

Figure 18 Aerial view of passenger dock location in Ilok

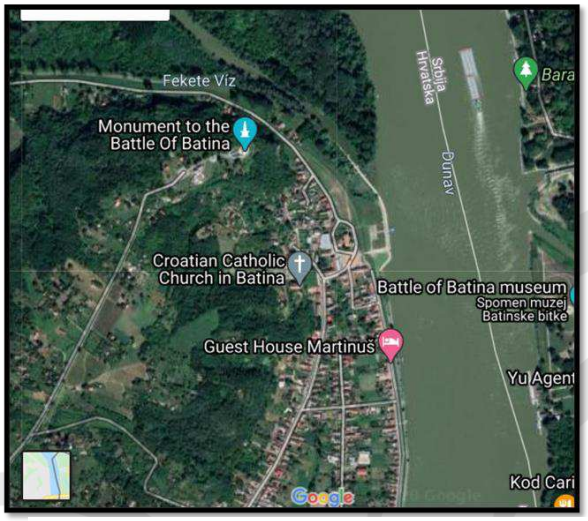


Source 2 http://luv.hr/

PASSENGER DOCK BATINA

Passenger dock Batina is located on the rkm 1425 + 500 right bank of Danube River. The purpose of the dock is berthing of passenger vessels across the overall length of only 14,53 meters and width of 8,02 meters. The permitted number of vessels on a berth is 2 vessels (floating facility and one vessel) Similar to the embankments of Ilok and Vukovar, Batina's shore is an embankment and sloped. Dock is built from a pontoon – floating facility made to facilitate the usual embarkation and disembarkation without the need for an immobile concrete object. Additional services at the passenger terminal include water supply, electrical supply and waste disposal.

Figure 19 Aerial view of passenger dock location in Batina



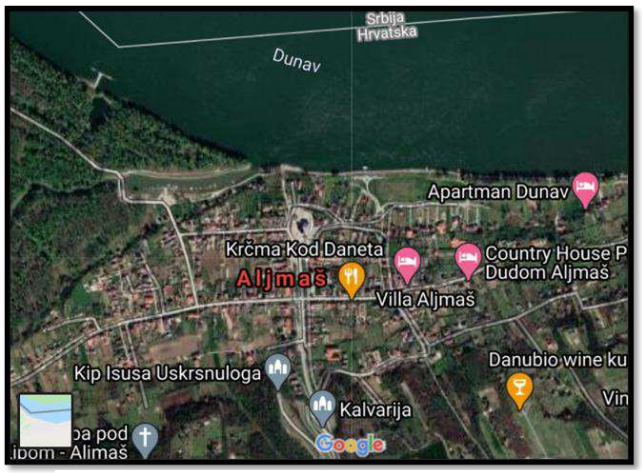
Source 3 http://luv.hr/

PASSENGER DOCK ALJMAŠ

Positioned on the rkm 1380 + 200 right bank of Danube, passenger dock Aljmaš offers similar services and the exact same specifications dedicated for accommodating smaller passenger ships on their way along the Danube River flow.

Embankment stretches behind the pontoon and the sloped bank type. Pontoon is 14,53 meters long and 8,02 meters wide. The permitted number of vessels on a berth is 2 vessels (floating facility and one vessel). Services offered include water supply, electrical supply and waste disposal.

Figure 20 Aerial view of passenger dock location in Aljmaš



Source 5 http://luv.hr/

Other port facilities also used as passenger berths

Apart from the use of pontoons instead of using concrete wharfs, piers or docks, there are no other port facilities except for the docked river ship that serves as an entrance point for all river cruise industry passengers that want to step out in the city of Vukovar. The pontoons are there because the water level oscillation happens and dock structure needs to have a certain level of flexibility. The ship moored at the passenger dock in Vukovar serves its purpose as a terminal and a gateway that safely directs passengers on shore. The Port Authority has provided a special facility at the passenger dock in Vukovar, which is used for the purpose of entry border control.

Figure 21 Passenger dock in Vukovar

Source 5 Port Authority Vukovar internal archive

During the year 2020, for precautionary reasons, of all the audit stakeholders, only the agent has had contact with the crew. The shipping agent entered the vessel and had taken all the necessary documentation and passports from the ship's crew and submitted them to the competent services (border police, customs captaincy) for further processing.

Disinfection barriers have been set up at the docks in the corridors where passengers exit and enter the docks. Dock employees regularly measured their body temperature. After each docking, the Vukovar Port Authority disinfected the entire dock.

The development of a protocol for the introduction of measures to prevent the spread of COVID-19 virus and the promotion of the Republic of Croatia as a safe tourist destination is in the process of updating with every major global news or policy that seems to affect the travelling procedures.

7.2 Alternative development plans presented

- **Expansion of the existing port for passenger ships in Vukovar**

In the next ten years, it is planned to invest in the expansion of the existing port for passenger ships in Vukovar. This project envisages the formation of a berth for mooring passenger ships in parallel with the existing coastal fortification. There is no permanent mooring of vessels at the passenger port, only transhipment of passengers. This project does not envisage construction works, nor obtaining a building permit, since the pontoon and all its equipment are not subject to the Construction Act.

The project of expanding the passenger port is closely related to the project of Hrvatske vode "Regulation of the right bank of the Danube from rkm 1333 + 000 to rkm 1331 + 000 and urban planning of the city of Vukovar". The project "Regulation of the right bank of the Danube from rkm 1333 + 000 to rkm 1331 + 000 and urban planning of the city of Vukovar" designed mooring elements at the location of the existing port and downstream for an additional three berths, while the project of passenger port extension refers only to floating facility design, and its accommodation in space. For the project of regulation of the right bank of the Danube, Hrvatske vode has obtained a building permit, and the beginning of the works is expected. The implementation of the passenger port expansion project is planned in four phases. The first phase is planned at the location of the existing passenger port, while the remaining three phases, which include the construction of three additional berths downstream, are planned after the project "Regulation of the right bank of the Danube from rkm 1333 + 000 to rkm 1331 + 000 and urban planning of Vukovar". Also, as part of the Croatian Waters project downstream from the pier, it is planned to build a protective breakwater on the site of the existing communal port "Marina". With the construction of the breakwater, the formation of a protected port area for accommodating boats is achieved, and it is necessary to relocate the existing municipal port, i.e., to fit it into the newly created waters of the municipal port "Marina".

Given the upward trends in the market for cruise services, there is a growing need to provide services that do not directly mean just mooring vessels for the purpose of disembarking and embarking passengers (for example, vessel maintenance services). Such services will be possible to provide only in ports that will be defined by the legislative framework and purposes that will be different from those that have passenger ports, and in which it will be possible to perform small-scale maintenance on river cruisers or other vessels. Also, the expansion of services would further increase the opportunity for profiling the passenger port of Vukovar (and / or other ports on the Danube) to obtain the status of a starting port for river cruisers (so-called homeport). There are prerequisites for the port of departure in terms of general transport connections and close proximity to Klis Airport.

7.3 List of proposed investment projects. Recommendations

List the selected infrastructure investments and their estimated costs for all of the inland water ports in Croatia. They will also include accompanying organizational and regulatory measures, will identify responsibilities and will address issues of financing the proposed investment.

According to Operational plan for ports and port development
Plan for modernization and arrangement of port infrastructure and port development, including financial plan and implementation plan
The operational plan for the modernization and arrangement of port infrastructure is given below for each of the four Croatian inland ports. The goal for each port is to present the planned direction of development and vision of the port in the next ten years, taking into account the specifics of each port in terms of development so far, geographical and spatial characteristics and expected traffic trends and demand. The preparation of operational plans also took into account the vision of transport development in general and inland navigation in particular, arising from the European and national strategic framework, and in particular the EU Inland Navigation Action Program NAIADES II and future NAIADES III, European Green Plan, Transport Strategy Development of the Republic of Croatia for the period from 2017 to 2030 and the National Development Strategy for the period until 2030.
The Republic of Croatia is a country of exceptional water wealth and potential. In terms of inland navigation, this potential has not been exploited to the extent that it should be, and one of the important aspects in this context is river tourism. Passenger traffic on the Danube River has developed significantly in recent years, and the port of Vukovar leads in the number of berths of passenger ships and the number of passengers. There are also positive trends in the port of Osijek, while in the Croatian ports of the Sava River Basin, passenger traffic is currently of low intensity. All stakeholders in the inland navigation sector are aware of the importance of developing additional services and facilities on waterways in the Republic of Croatia, but also connecting these services and facilities with facilities from other sectors. Therefore, part of the investment in the next ten years wants to dedicate to the development of inland ports.

The following investments in ports are planned in the area under the jurisdiction of the Vukovar Port Authority:

- **Construction of a new passenger port in Vučedol within the project "Archaeological Park Vučedol"**

The construction of the new passenger port Vučedol is planned on the right bank of the river Danube at rkm 1328 + 000, directly in front of the Museum of Vučedol Culture.

It is necessary to ensure a simple and safe berth and the entry and departure of tourist and excursion boats without the possibility of a permanent berth. The formation of a pontoon pier measuring 12x4 m in parallel with the existing coastal fortification is planned. Project-technical documentation for the construction of the port of Vučedol was prepared in 2019. The construction of the pier is part of the strategic project "Archaeological Park Vučedol", so the project for the construction of the pier has already secured funds from the Operational Program Competitiveness and Cohesion 2014-2020.

- **Construction of a communal and passenger port on the Island of Sports in Vukovar**

The project of building a communal and passenger port on the Island of Sports in Vukovar continues with the project of Hrvatske vode "Arrangement and flood protection of the Island of Sports in Vukovar" which carried out construction work on the arrangement of the coastal fortification. The old confluence of the river Vuka and the Danube has been converted into a port for mooring boats. Today, the port is in function for mooring vessels, but it does not have the necessary facilities for mooring vessels, so they are moored on improvised berths. Three separate pontoons will be built for the communal port, on which a berth for 80 vessels will be provided. A pontoon will be set up for the passenger port to accommodate smaller ships. In addition to mooring smaller boats, the pontoon will also be used to moor boats and yachts. The new location of the passenger pier is located in the north-eastern part of the waters of the port of the Island of Sports.

- **Construction of a passenger dock in Ilok**

According to medium term plans by the port authority, financial resources are already envisaged for the upcoming year regarding the preparation of documentation for the construction of the dock in port of Ilok. The docking infrastructure has to be upgraded due to wear and tear over the past years.

- **Construction of a communal port in Batina**

In the next ten-year period, it is planned to implement the project of building a communal port on the right bank of the Danube River from rkm 1425 + 400 to rkm 1425 + 300, downstream from the existing passenger port in the settlement of Batina. The municipal port would provide new berths for a minimum of 40 boats and vessels for sports and leisure up to 6 m in length, and 10 berths for boats and vessels up to 10 m in length. Documentation for the needs of the technical supervisory body responsible for supervising the construction of the floating facility. In addition to the project-technical documentation, the project also envisages the construction of a pontoon marina and its installation on the location and execution of construction works.

Port development plan in the area of competence of the Port of Osijek

The Port of Osijek is located on the right bank of the Drava River in a partially formed port basin, which was built by excavating a new course of the Drava River. The Drava River in this part carries the buoyancy class IV. The Port of Osijek is part of a comprehensive TEN-T network (REN-Danube TEN-T corridor) since the Drava River from the city of Osijek to its confluence with the Danube has the status of an international waterway and is considered a branch of the Rhine-Danube Corridor. The Port of Osijek is also characterized by good transport connections with the road and railway network.

In addition to freight traffic, it is important to point out the growing passenger traffic in the port of Osijek, and in order to ensure adequate infrastructure and passenger transport services in the previous period, the investment in the passenger port of Osijek was undertaken and completed. The specificity of the area under the management of the Port of Osijek is a significant number of sports ports, and in the next ten years it is planned to further improve and expand the infrastructure of sports ports.

- **Passenger ports**

The Port of Osijek is recording a growth trend in passenger traffic, and in 2020 the construction of the passenger port in Osijek was completed, which replaced the previous temporary port of Galija.

In terms of passenger traffic, it is important to mention the planned investment of the City of Osijek in the project "Water tram on the river Drava" which aims to introduce passenger transport on the Drava River from rkm 16 + 400 to rkm 24 + 200, or from Zeleno polje near Vrbik Barracks to Pampas. The water tram, as a functional and tourist attraction, would connect the banks of the Drava with the river, and as part of the project, the construction of nine passenger ports and the purchase of an electric water tram are planned. The exact locations of the docks should be determined in the coming period using the project-technical documentation.

In the next ten-year period, it is possible to open new passenger ports, but this will depend on the needs and justification of such requirements in the area of competence of the Port of Osijek. At the time of drafting this Medium-Term Plan, there are no more detailed plans for the construction and opening of additional passenger docks, but the Spatial Plan of Osijek-Baranja County envisages the reconstruction of docks in the municipalities of Belišće and Donji Miholjac.

Port development plan in the area of competence of the Port Authority of Slavonski Brod

In the area under the jurisdiction of the Port Authority of Slavonski Brod, the establishment and construction of four passenger ports is planned at the following locations on the left bank of the Sava:

• Municipality of Davor (it is necessary to start drafting project documentation and obtaining permits),
• Municipality of Slavonski Kobaš (it is necessary to start drafting project documentation and obtaining permits),
• City of Slavonski Brod (conceptual design made and location permit obtained, it is necessary to complete the design and obtain a building permit),
• Municipality of Babina Greda (it is necessary to start drafting project documentation and obtaining permits).

In Slavonski Brod, there is a temporary location for the docking of passenger ships and they want to invest in the construction of a permanent passenger port. This includes works on the construction of the shore and access to the pier, as well as the conversion of the tanker barge into a floating pier. The construction of this type of passenger pier is envisaged in the municipality of Davor and in the municipality of Slavonski Kobaš, while for the passenger port in the municipality of Babina Greda it is still necessary to determine a possible way of construction, especially considering that the Spatial Plan of the municipality of Babina Greda transportation. It is noted that a study of passenger traffic is being prepared, following which more detailed planning of the development, design and construction of these passenger ports will be performed.

In addition to these docks, the spatial plans of some municipalities also provide for the establishment of docks (for example, the municipality of Bebrina), but at this time there are no more detailed plans. In the next ten years, the construction of a passenger port in Slavonski Brod as a cultural, historical and tourist center of the county and a suitable starting point for trips to the interior and surrounding towns and municipalities will certainly be crucial. Traffic demand in the passenger port of Slavonski Brod will be one of the key drivers of opening additional passenger ports, especially in those locations for which passengers show significant interest.

Port development plan in the area of competence of the Port of Sisak

The area of competence of the Sisak Port Authority is specific because it includes a large number of national parks and nature parks in the wider geographical area. Thus, the Sisak Port Authority is responsible for the establishment of passenger and tourist ports, whereby, in accordance with the ZPLUV, tourist ports can be established only for the purpose of mooring vessels within a national park or nature park.

The assessment of the Sisak Port Authority according to the information currently available is that in the next ten years it will certainly be possible to start drafting project-technical documentation for seven new ports and the construction of two passenger ports. Given the large area covered by the jurisdiction of the Sisak Port Authority, the exact number of requests, and thus the number of new passenger and tourist ports, is difficult to plan in advance. Therefore, in the next ten years, new passenger and tourist ports will be invested in accordance with the real needs and justification of the received requests.