How to get around in the Danube Delta?

Past, Present and Future

An analysis of the mobility in the municipality of C. A. Rosetti

Maurice Philipp Schreiberhuber

01425853

033 240 (Spatial Planning/Bachelor)

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Support by:

Dr. Meinhard Breiling

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This work is for the people in the Danube Delta. Thank you for your hospitality and kindness.

Thank you also to Mrs. Gabriela Murgeanu from the Ministery of Transport (Ministerul Transporturilor), Directia Transport Naval, for providing me information about cargo ship traffic on the Sulina channel.

Vienna, August 2017

Introduction

About this work

In this work I want to evaluate the mobility in the Danube Delta, the mobility choices, which people have and the influence on the quality of living. The main question is how mobility changed in the Danube Delta? Mobility generally has influence on the development of an area and is also strongly oriented on the geography. Also this connection between this three aspects I want to discuss in this work.

The area which will be evaluated is the Danube Delta, which I visited in July 2017 as part of an excursion. I am very interested in mobility and traffic planning and therefore I have a special view on this topic. The Danube Delta is a special region and due to its geography it has less development. The mobility is very difficult to handle and has therefore an important role for the development of this region.

Structure of the work

Past, Present and Future are the three main chapters which point out the most important steps of the development of mobility in the Danube Delta. In the past the conditions of mobility were developed, in the present there is the current mobility system and in the future there will be new things possible.

Research Questions

Following questions will be answered in the following work:

- Past: How the mobility in the Danube Delta changed?
- Present: What are the most important means of transport in the Danube Delta and why?
- Future: What are the possibilities of mobility in the future?

The Danube Delta in general

"The Danube Delta, listed on the UNESCO World Heritage List since 1991, is Europe's second largest Delta (after the Volga River Delta), but is one of the best preserved of all European Deltas, with a total area of 3,446 km2. In the Danube Delta, there are 16 strictly protected reserves, where no economic activity is allowed.
Also, ecological rehabilitation and buffer zones are set up, where tourism activities can be carried out with respect for environmental protection.

In Delta there are over 1,200 varieties of plants, 300 bird species, and 45 freshwater fish species living in numerous lakes and marshes. The Danube Delta is probably one of the least inhabited regions in temperate Europe, with about 20,000 people living in several ports and several dispersed villages. Isolation and harsh living conditions in subsistence (for the most part) are also features of the Danube Delta. The ecological and economic importance of this area, as well as the social challenges related to this unique Danube Delta region, make it necessary to develop an integrated development strategy on which the sustainable development of the region is based."

Source: http://www.ziare.com/tulcea/stiri-business/informare-strategia-integrata-de-dezvoltare-durabila-a-deltei-dunarii-romania-4167655, 19.08.2017

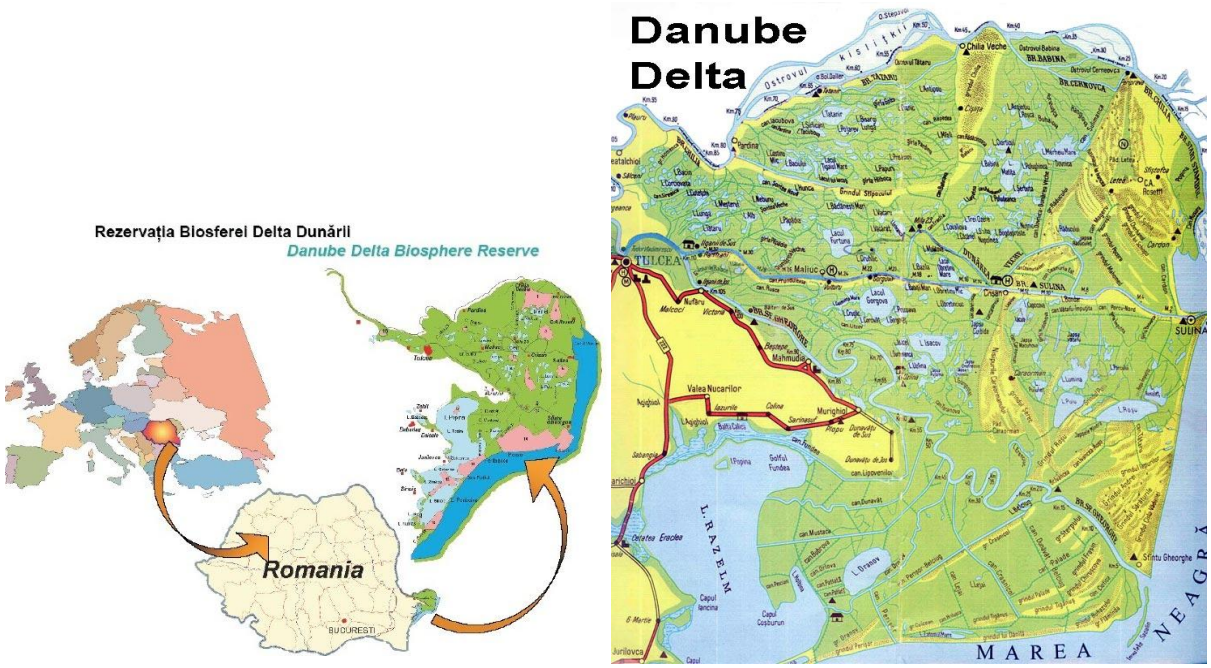


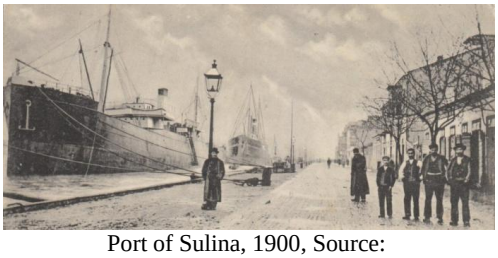
Fig.01: Location of the Danube Delta, Sources:
https://commons.wikimedia.org/wiki/File:Sulina._Partial_view_of_the_harbour,_1900.jpg, 05.08.2017

The Past

Mobility development in the Danube Delta

How has mobility changed in the Danube Delta in the last decades?

1900/1930 2017



Port of Sulina, 1900, Source: https://commons.wikimedia.org/wiki/File:Sulina._Partial_view_of_the_harbour,_1900.jpg, 05.08.2017

Port of Sulina, 2017, Source: Maurice Schreiberhuber, July 2017

Difference: The port of Sulina is still mayor port of the Delta. The Danube Commission was there in the 20th century, but today not anymore.

Danube Delta, 1930, Source: https://gypsy.ninja/picturesque-romania-1930s/, 05.08.2017

Sfistofca, 2017, Source: Maurice Schreiberhuber, July 2017

Difference: Nowadays boats have an engine, in past times they had sails.

Danube Delta, 1930, Source: https://gypsy.ninja/picturesque-romania-1930s/, 05.08.2017

Sfistofca, 2017, Source: Maurice Schreiberhuber, July 2017

Difference: Field work is done today and in past times by animals which are carrying things, but today there are also tractors which only people which an higher income can afford.

Figure 02: Mobility development in the Danube Delta; Maurice Schreiberhuber, August 2017

The following chapters are about the three factors influencing the mobility development.

Geography

General data

The Danube Delta consists of four river mouths into the Black sea which are the main watercourses. The watercourses have different characteristics.

1) Sulina (64 km) is the river-sea traffic channel
2) Tulcea-between Chilia and Sfantul Gheorghe branches (19 km) is a main navigation course
3) Chilia- Periprava (105 km) is for local interest navigation.
4) Sfantul Gheorghe (64km is also for local navigation interest.

Source: http://romaniatraveltourism.com/danube-Delta.htm-0, 31.07.2017

"The Danube Delta: Physical geography and environmental problems"

According to the article "The Danube Delta: Physical geography and environmental problems" the Danube Delta became an area of nature conservation and environmental protection in the 1980ies. Today various parts now are objects of different kind of protection (Ramsar Territory, Part of World Heritage, Biosphere Reserve). The author describes in this article different conflicts in the Danube Delta, the protected areas maybe play a role. Topographically the Danube Delta has been developing of different processes and the landscape changed always.

According to the author of the article effective protection could only be realized with the reduction of negative effects of human activity. Due to this there are regulations of transport, for example the speed of boats. This problem will be discussed in another article (see page __)

Source: https://www.researchgate.net/publication/289733860_The_Danube_Delta_Physical_geography_and_environmental_problems, 02.08.2017

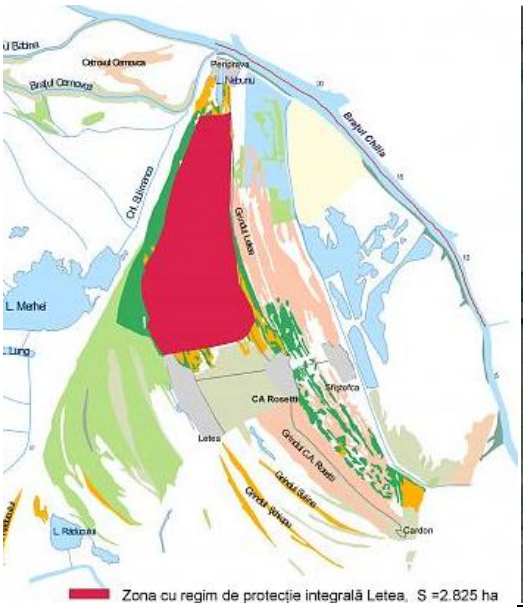


Fig. 03: Geography of municipality of C. A. Rosetti, Source: http://wikimapia.org/12306879/Letea-Forest, 05.08.2017

Fig. 04: Geography of municipality C. A. Rosetti, Source: Google Maps, July 2017

The Geography of municipality of C. A. Rosetti

The municipality (see Fig.__) consits of the villages Peripraca, Letea, C. A. Rosetti, Sfistofca and Cardon. The Letea forest is protected. The access is only allowed upon request. The municipality is borderd by the Chilia-channel in the north and several smaller channels for example in the east of the village Sfistofca. Near the village Cardon the Sfistofca-channel ends in the Golf Ma/usura. Only the village C. A. Rosetti has no access to a channel.

Source: https://de.wikipedia.org/wiki/Biosph%C3%A4renreservat_DonauDelta#Verkehr, 31.07.2017

How geography is influencing the means of transport?

According to the geography/topology ships and boats are the dominant means of transport in the Delta in the absence of connecting roads and the large water areas. The local water transport takes place with smaller ships and boats on the river Danube and the canals. Only the Sulina-channel is developed for the transport of ocean-going vessels.

Source: https://de.wikipedia.org/wiki/Biosph%C3%A4renreservat_DonauDelta#Verkehr, 31.07.2017

Development

In this chapter is about the population of the Danube Delta. Main factors influencing the mobility are covering for example the density and employment of the population. In this case development is meant in the sense of population de- or increase.

Population and density

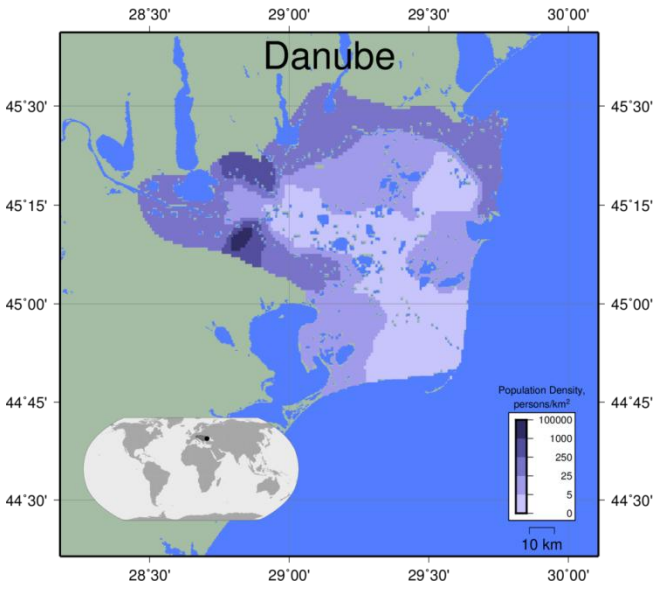


Fig. 05: Density of population in the Danube Delta, Source:

The Danube Delta area has 14,583 inhabitants (2002). The population is spread over 25 residential areas, one of which is the city of Sulina. 68.5% of the population lives in the villages and 31.5% in the town of Sulina.

Source: http://www.rumaenien-info.at/de/sehenswuerdigkeiten/donauDelta/81, abgerufen am 31.07.2017

The Department for Mobility and Urban Development published, that (Urban) Traffic is not only formed by residents' mobility patterns, but also decisively by the character of (urban) spaces. These areas encourage or hinder certain transport modes and their use: sprawling areas of low density favor, for example, motorized passenger transport; mixed and compact urban structures, on the other hand, may encourage walking and cycling.

There are interrelationships between transport demand, urban transport provision and urban spatial structures. At the same time, transport and city planning interventions are also taken into consideration and evaluated, for example with regard to their impact on mobility patterns and other factors.

Source: http://www.dlr.de/vf/en/desktopdefault.aspx/tabid-9438/16180_read-39706/, 06.08.2017

Employment

About 15.3% of the population live on fishing, 29% are employed in forestry and agriculture, 15.7% work in industry, construction and trade as well as services. 15.4% live on tourism, transport and telecommunications, 1.9% work in the health sector, 5.7% work in education, teaching and culture, a further 13.5 are employed in public administration and 3, 6% are active in other areas.

Source: http://www.rumaenien-info.at/de/sehenswuerdigkeiten/donauDelta/81, abgerufen am 31.07.2017

Policy

What are politians in the Danube Delta doing? What is preserved and why? What different programmes covering the region of the delta? What is the content of the programmes and what is the influence on mobility in the Danube Delta? Which programmes have something to do with mobility and influencing it? There are some documents which refer to mobility and transport in the Danube Delta. Aim of this chapter is to give an overlook of the documents and highlight their essential content.

Instruments focusing on transport

Project/Example 1: "Sustainable Transport and Tourism along the Danube", Transdanube

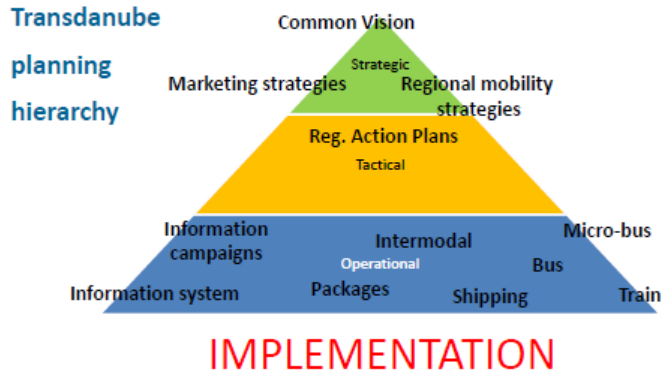


Fig. 06: Implementation, Source: "Sustainable Transport and Tourism along the Danube", Transdanube

Project objectives

- Improve accessibility of regions along the Danube
- Enhance sustainable mobility in the Danube region
- Increase added value from tourism for regions along the river Danube through mobility & tourism marketing packages
- Raise awareness, knowledge and promotion for sustainable mobility in the Danube region
- Stimulate the shift to environmentally friendly mobility systems

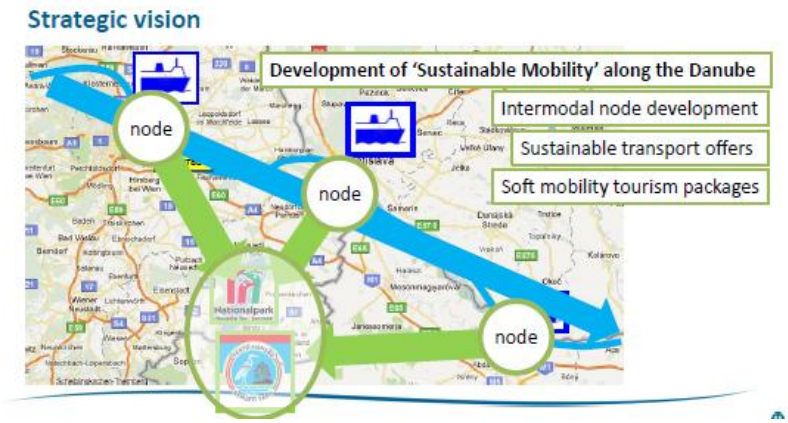


Fig. 07: Strategic vision, Source: "Sustainable Transport and Tourism along the Danube", Transdanube

Transdanube planning hierarchy

The planning hierarchy of Transdanube: From a common vision there will be derived Regional Actions Plans which contain measusres which should be implemented. In the basic step, the operational phase/step there are all the measures which should be finally implemented.

Regional action plans

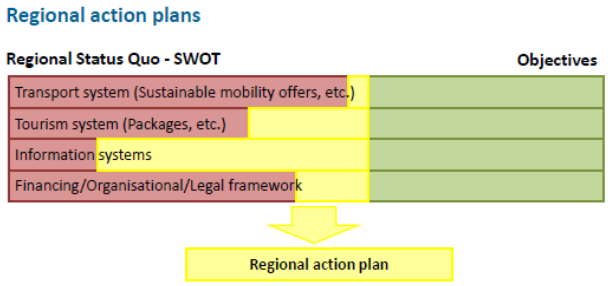


Fig. 08: Regional action plans, Source: "Sustainable Transport and Tourism along the Danube", Transdanube

The "Regional Action Plan" which will be discussed further in detail contain different parts of the SWOT-Analysis of the region. In the Regional Action Plan about sustainable mobility in the Danube Delta

Transdanube, Sustainable Transport and Tourism along the Danube, "Strategic Development / Action Plan", Danube Delta Biosphere Reserve

Fig 09: Strategy Development/Action Plan

There are some documents which refer to mobility and transport in the Danube Delta. Aim of this chapter is to give an overlook of the documents and highlight their essential content.

"STRATEGIC DEVELOPMENT / ACTION PLAN, Danube Delta Biosphere Reserve", South-East Regional Development Agency, Romania, The Danube Delta Biosphere Reserve, Transdanube, Sustainable Transport and Tourism along the Danube (www.transdanube.eu)

-> Content: Regional Strategy for Sustainable Mobility in Tourism, Objectives, Regional Framework conditions, Regional Action Plan, Catalogue of development measures, evaluation of development measures, priorisation of realisable development measures

Example: Catalogue of development measures:

1) Sustainable transport offers
2) Tourist packages
3) Information & Marketing
4) Financing options, organizational and legal framework

Example 2: "Integrated Strategy for Sustainable Development of the Danube Delta - Romania"

“The main objective of the Consultancy Services (SC) is to help the Beneficiary for the planned and developed development according to the environmental problems existing in the Danube Delta region. Situated in eastern Romania, the Danube Delta is an ecologically rich area but faces various economic challenges.”

“This objective will be achieved by:

1) developing a comprehensive development strategy for the Danube Delta, integrating the key sectors;

2) preparing action plans to help implement such a strategy during the EU 2014-2020 programming and funding phase; And

3) providing support to develop a framework for the implementation of a new EU instrument called "Integrated Territorial Investments (ITI)" in Romania and identifying feasibility for a number of ITI pilot programs / regions. The Bank will provide consultancy services in a manner consistent with its relevant environmental and social protection policies.”

The World Bank will provide the following advisory services to Tulcea County:

Component 1: Diagnostic Analysis and Preparation of the Vision on the Danube Delta Territory
Component 2: Elaboration of the Integrated Sustainable Development Strategy of the Danube Delta
Component 3: Prepare the implementation of an Integrated Territorial Investment Instrument for the 2014-2020 programming period.

“In view of the sustainability of the project, an Interinstitutional Group for the elaboration of the integrated sustainable development strategy of the Danube Delta for the period 2014-2020 was formed, consisting of different actors (Akteure?) including Ministry of Transport and Infrastructure and others. “This relevant for Transport issues. “The main tasks of the interinstitutional group will be (uter anderem) investments in infrastructure and others.”

Source: http://www.ziare.com/tulcea/stiri-business/informare-strategia-integrata-de-dezvoltare-durabila-a-deltei-dunarii-romania-4167655, 15.08.2017)

Data about cargo ships on Sulina channel

		National			
Port name	Achieved the year 2016	% Compared to 2015	Loaded goods	Total	%
Delta area	76	149.0	76	76	100.0

Fig. 10: Inland waterway transport in 2016 (in thousand tons)

		National			
Port name	Completed the fourth quarter of 2016	% compared to forth quarter of 2015	Loaded goods	Total	%
Delta area	47	3.4 times	47	47	100.0

Fig. 11: Inland waterway transport in the IV quarter 2016 (in thousand tons)

		National			
Port name	Achieved the year 2016	% Compared to 2015	Loaded goods	Total	%
Delta area	19479	137.7	19479	19479	100.0

Fig. 12: The volume of inland waterway transport in 2016 (in thousands of tons-kilometers)

		National			
Port name	Completed the fourth quarter of 2016	% compared to forth quarter of 2015	Loaded goods	Total	%
Delta area	10211	2.6 times	10211	10211	100.0

Fig. 13: Volume of inland waterway transport in the fourth quarter of 2016 (in thousands of tons-kilometers)

	2006	2016
Incoming ships	887	823
Outgoing ships	1002	948
Total incoming-outgoing ships	**1889**	**1771**

Fig. 14: Incoming-outgoing ships at Sulina channel

	2006	2016
Incoming ships	347.797	513.461
Outgoing ships	2.352.511	3.250.439
Total freight tons	**2.700.308**	**3.763.900**

Fig. 15: Fright tons at Sulina channel

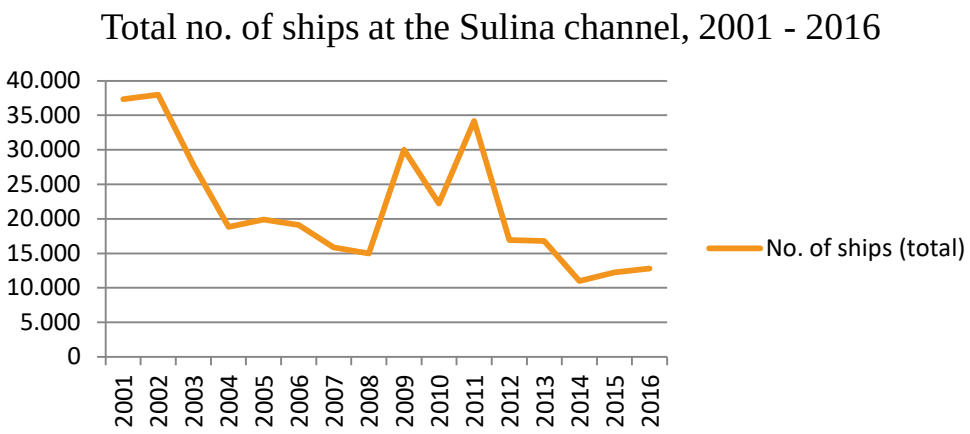


Fig. 16: Total no. of ships at the Sulina channel, 2001 - 2016, Ministry of Transport

"Banks protection on the Sulina Canal"

According to the Project Data Sheet the need and added value of this project for Danube Region Strategy is described the following.

Goals of the project

"The project includes 100 km long protection works for the banks of the Sulina Canal against damages caused by navigation of high-capacity maritime vessels and to protect the Danube Delta area. Implementation of this project will result in:

- Stopping the massive bank erosion of the Sulina Canal
- Keeping under control the water flow in the Sulina Canal
- Decreasing the amount of sediments passing through the Sulina Canal to the sea
- Decreasing the risk of flooding for human settlements and economic operations "

There are some compliances with targets/actions of the Danube Region Strategy:

Targets

- Increase the cargo transport on the river by 20% by 2020 compared to 2010
- Solve obstacles to navigability, taking into account the specific characteristics of each section of the Danube and its navigable tributaries and establish effictive waterway infrastructure management by 2015.

Actions

- To complete the implementation of TEN-T Priority Project 18 on time and in an environmentally sustainable way.

- To invest in waterway infrastructure of Danube and its tributaries and develop the interconnections.

The Present

In General (Danube Delta, Municipality C. A. Rosetti)

“Inside the Delta the accessibility rate is much greater on water than on land. For the communes and villages inside DDRB area, the access is mainly by water; outside these routes, there are a few communal roads, which connect only some settlements and trails for touristic hiking. Letea, CA Rosetti, Sfiștofca, Cardon, Periprava communes, apparently more isolated due to their positioning outside the dense channels system, benefit from paved roads, approachable by car, which establish the link between these communes and the city of Sulina.”

Source: “Pre-Feasibility study, On the development of a sustainable transport network in Danube Delta Biosphere Reserve, Sustainable Transport and Tourism along the Danube”, www.transdanube.eu, Ivan Petzaichin - Mila 23 Association, September 2014

Public transport

“Public transport services on inland waterways for the transport of passengers and goods between the localities in the Danube Delta and Tulcea. The types of boats used are traditional ships (passengers + cargo) ships and semi-fast catamaran type (passengers).The service is operated by SC Navrom Delta, which ensures the transport of passengers between Tulcea and the Danube Delta localities on the three arms, on the routes: Tulcea - Sulina and return; Tulcea – Chilia Veche – Periprava and return; Tulcea – Sfântu Gheorghe and return.
The residents of Tulcea Municipality and the Danube Delta residents benefit from subsidies.
In summer season, on weekly basis, the company supplements -Sfântu George and Tulcea Tulcea – Sulina routs with pleasure boats. For the last two tracks, the classic passenger ships travel and return the next day.

Navrom Delta is equipped with two fast ships, with a capacity of 200 passenger, six classic ships with capacities between 300 and 150 seats and 20 mooring pontoons located in Tulcea and in the major cities of the Danube Delta.

According to the graphs, the route most used, both by locals and tourists is Tulcea-Sulina. For Sulina and Sf. Gheorghe, there are peak tourist periods from June to September, while for the Chilia arm the values are approximately constant throughout the year."

Source: "Pre-Feasibility study, On the development of a sustainable transport network in Danube Delta Biosphere Reserve, Sustainable Transport and Tourism along the Danube", www.transdanube.eu, Ivan Petzaichin - Mila 23 Association, September 2014

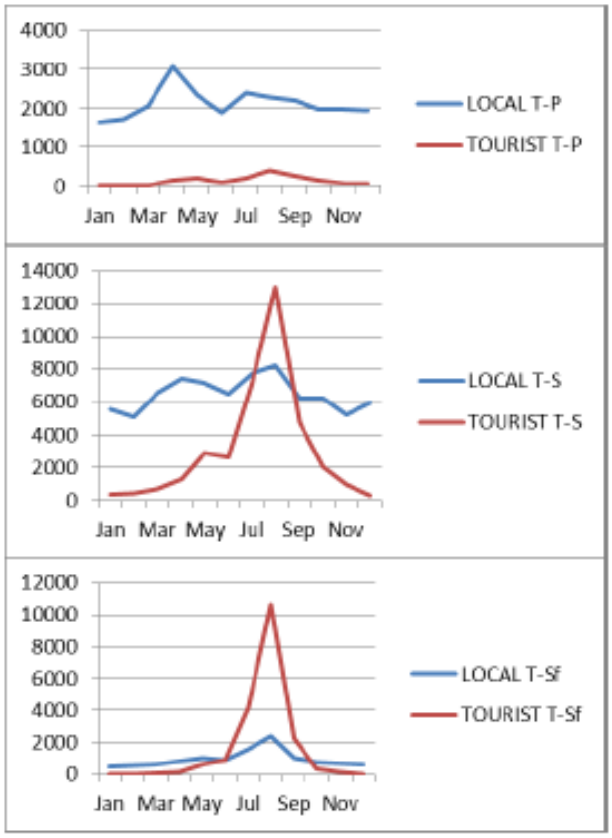


Fig. 17: No. of passengers on the different channels of the Danube Delta

Legend

T-S: Tulcea – Sulina

T-P: Tulcea – Periprava

T-Sf: Tulcea – Sf. Gheorghe

Means of Transport in the Danube Delta

Plane

Fig. 18: Airports near Danube Delta, Source: “Sustainable Transport and Tourism along the Danube www.transdanube.eu , STRATEGY DEVELOPMENT / ACTION PLAN, Danube Delta Biosphere Reserve Action, The Danube Delta Biosphere Reserve

Air transport – regular travels, Bucharest – Tulcea (45 minutes)

Source: http://romaniatraveltourism.com/danube-Delta.htm-0, 31.07.2017

15 km from Tulcea and 25 km from Constanţa is the international airport Mihail Kogălniceanu built between 1952 and 1962.

Source: https://de.wikipedia.org/wiki/Biosph%C3%A4renreservat_DonauDelta#Verkehr, 31.07.2017

Ship

Fig. 19: Departure of a ferry from Tulcea to Periprava; Maurice Schreiberhuber, July 2017

Marine – classic travels: Braila – Galati – Tulcea – Sulina

- Tulcea – Sulina
- Tulcea – Chilia Veche – Periprava
- Tulcea – Saint George
- Crisan – 23 Mile

special (fast) travels: Braila – Galati – Tulcea – Sulina

- Tulcea – Sulina
- Tulcea – Saint George

Source: http://romaniatraveltourism.com/danube-Delta.htm-0, 31.07.2017

Ships and boats are the dominant means of transport in the Delta in the absence of connecting roads and the large water areas. The local water transport takes place with smaller ships and boats on the river Danube and the canals. Only the Sulinaarm is developed for the transport of ocean-going vessels which mainly transport iron ore, coke, bauxite and aluminum.
The city of Tulcea has been an important port city since antiquity. Not far from the ferry terminal for passenger transport is a bus and train station.

Close by is the deep-sea fishing fleet of Romania.

From Tulcea visitors can reach the DonauDelta by private boats or by regular ships:
• along the Sulinaarm through Maliuc, Mila 23 and Crișan to Sulina
• along the Sfântu-Gheorghe-arm through Băltenii de Jos and Uzlina to Sfântu Gheorghe
• along the Chiliaarm to Periprava.

Source: https://de.wikipedia.org/wiki/Biosph%C3%A4renreservat_DonauDelta#Verkehr, 31.07.2017

Touristic routes:

- Tulcea – 35 Mile Channel – Sireasa, Sonta ponds – Olguta Channel – Dunarea Veche (Old Danube) - 23 Mile Village – Crisan – Maliuc –Tulcea
- Tulcea – Victoria – Litcov, Crisan Channels – Caraorman – Crisan – Maliuc – Tulcea
- Tulcea – Maliuc – Crisan – Crisan Channel – Caraorman – Caraorman Channel – Puiu, Rosu, Rosulet Lakes – Red Channel – Imputita – Bursuca Channel –Sulina – Tulcea
- Murighiol – Dunavat, Dranov Channels – Holbina Golf – Razim Lake – Gura Portitei
- Jurilovca – Gura Portitei
- Crisan – Dunarea Veche – Eracle Channel – Lopatna Pond – Lopatna Channel – Trei Iezere
- Crisan – Dunarea Veche – Magearu Channel – Dunarea Veche – Sulina Arm – Crisan

Source: http://romaniatraveltourism.com/danube-Delta.htm-0, 31.07.2017

According to the article “New traffic rules on Danube Delta inland channels and lakes”, published on July 8th 2017 at gov.ro, the official webportal of the Romanian government. In the article it says that the access and movement of ships and boats will follow new rules established through a decision approved by the Government. “The new regulations are promoted in order to reduce the negative impact of the movement of ships and boats on ecosystems and species in areas adjacent to canals and inland lakes in the Reserve.” Ships and boats will be equipped with electronic transmission devices for the position to fixed stations. “The measure aims to establish a more effective control of the movement and access of ships and boats in the Biosphere Reserve "Danube Delta" area and to identify those who do not comply with traffic laws.” There are also made amendments to the traffic rules in order to reduce the maximum speed of ships and boats on some lakes and canals in the DDBR area, depending on biodiversity in the area. In strictly protected areas, access and navigation are prohibited.

(vgl. http://gov.ro/en/government/cabinet-meeting/new-traffic-rules-on-danube-Delta-inland-channels-and-lakes, 15.08.2017)

Railway

Fig. 20: Train station of Tulcea, Source: Maurice Schreiberhuber, July 2017

Railway network – fast and slow trains Bucharest – Medgidia – Tulcea (5-8 hours); slow trains, Constanta – Tulcea (4 hours)

Source: http://romaniatraveltourism.com/danube-Delta.htm-0, 31.07.2017

There is a daily train connection between Bucharest and Constanţa. Not far from the ferry terminal for passenger transport is a bus and train station.

Source: https://de.wikipedia.org/wiki/Biosph%C3%A4renreservat_DonauDelta#Verkehr, 31.07.2017

Bus

Not far from the ferry terminal for passenger transport in Tulcea is a bus and train station.

Source: https://de.wikipedia.org/wiki/Biosph%C3%A4renreservat_DonauDelta#Verkehr, 31.07.2017

Car

National roads network: regular car travels – Bucharest, Galati, Constanta – Tulcea

Source: http://romaniatraveltourism.com/danube-Delta.htm-0, 31.07.2017

The reserve can be reached via the Europastraße 60 and 67.

Source: https://de.wikipedia.org/wiki/Biosph%C3%A4renreservat_DonauDelta#Verkehr, 31.07.2017

Bicycle

Feasibility study of the first bike lane in the Danube Delta

Due to the article “Romanian authorities kick off feasibility study for first Danube Delta bicycle lane”, published in March 2017 the South East Regional Development Agency in Braila expects to have by the end of 2017 the feasibility study for the first bicycle lane in the Danube Delta. The feasibility study is part of the European project “Transdanube Pearls – Network for Sustainable Mobility along the Danube“. As part of the project, the agency will update the Danube Delta Mobility Plan and open a Sustainable Mobility Center in Tulcea. The aim of the project is to promote new sustainability models in the Danube Delta. The planned Sustainable Mobility Center will promote various cycling routes as Romania does not have at this point a government decision on the national cycling routes network.

Source: https://www.romania-insider.com/romanian-authorities-kick-off-feasibility-study-first-danube-Delta-bicycle-lane/, 29.07.2017

Foot

The theory about enclosure systems

Enclosure systems originally originated from trampling paths. Once a route has been taken, it is exited by repeated use. Such paths are easier to overcome than stretching through a not yet entered thicket; The orientation along such a track also improves. As a result of the specialization of the transport systems, a differentiation of different transport infrastructure (infrastructure) can occur, which are sometimes carried out on separate levels.

Infrastructure networks and, therefore, transport networks also bundle wish-lists of space-transitions, imaginable as possible as possible two-way lines between two points (trampling paths). They offer advantages over these advantages (reduced path resistance, higher safety, reduced space requirements, specialization). As a disadvantage for some of the requests for space transitions, detours have to be created and the cost of infrastructure provision must be borne. The organization of the overcoming of space on infrastructure networks is so widespread, because the total benefits exceed the total costs.

Fig. 21: Sfistofca from above: In the village are a lot of trampling paths, Source: Google maps 2017

In Sfistofca are for example a lot of trampling paths which are the base of an enclosure system. (see Fig.__)

Fig. 22: Women walking in the village Periprava, Source: Maurice Schreiberhuber, July 2017

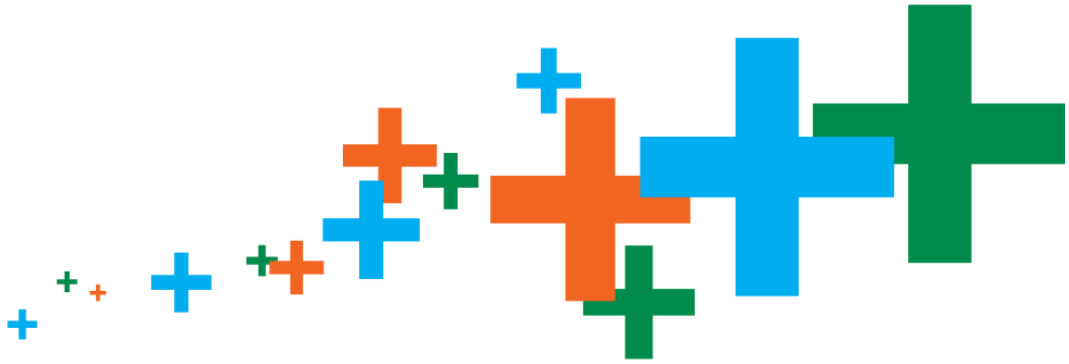


Fig. 23: Source: https://erasmusplus.at/, 05.08.2017

The Future

What the EU is doing?

According to the arcticle “Romanian authorities kick off feasibility study for first Danube Delta bicycle lane”, which was mentioned before, the South East Regional Development Agency in Braila tries to promote new sustainability models in the Danube Delta. Sustainable transport means, for example eco boats, bicycles or the kayak-canoe concept are different means of getting to tourist destinations. The agency will update the Danube Delta Mobility Plan and open a Sustainable Mobility Center in Tulcea.

My recommendation

In the chapter about Foot as a mean of transport I described that the trampling paths for example in Sfistofca are a base of an enclosure system. Therefore planners in the Danube Delta should look carefully for these kinds of human tracks and plan more for human than technically. More human villages are a planning goal.

Mobility management in the Danube Delta?

What should be important in the future from my point of view. What is my recommendation focusing on mobility in the Danube Delta? I did some research about mobility management, because it is an importantat tool in sptatial planning to improve the use of the local conditions/different means of transport.

Source: http://www.vtpi.org/gtz_module.pdf, 04.08.2017

According to Todd Litman mobility management is a general term for strategies that result in more efficient use of transportation resources. Mobility management emphasises the movement of people and goods, not just motor vehicles, and so gives priority to public transit, ridesharing and non-motorised modes.

"There are many potential mobility management strategies with a variety of impacts. Some improve transportation diversity (the travel options available to users). Others provide incentives for users to change the frequency, mode, destination, route or timing of their travel. Some reduce the need for physical travel through mobility substitutes or more efficient land use. Some involve policy reforms to correct current distortions in transportation planning practices."

Mobility management is an increasingly common response to transport problems, because of its low costs and multiple benefits. Table 1 lists some of the reasons to implement Mobility Management.

Factors that justify mobility management

- ✓ ..... according to Danube Delta

Factors	Description	Situation Danube Delta
Infrastructure supply	Infrastructure is often in poor repair. Urban roads, parking, sidewalks and paths are often congested and crowded. Streets and sidewalks serve many functions and users(walking, talking, retail businesses, sleeping, begging, etc.) Streets not well designed for heavy motor vehicle traffic.	
Vehicle supply	Low automobile ownership among general population. Medium to high automobile ownership among middle-income households. High automobile ownership growth rate among wealthy households. High bicycle ownership in some regions. Medium to high supply of public transit and taxi vehicles.	
Personal mobility	Large variation in mobility between different income groups: low mobility among the general population and high mobility among wealthier groups. High mobility growth rate among medium-income households.	
Transportation diversity	Considerable diversity (walking, cycling, animal carts, public transit, private automobile). Conditions of alternative modes, such as walking, cycling, public transit, are often inferior (slow, uncomfortable, unsafe, unconnected, etc.).	
Institutional capacity	Some developing countries have poor civil institutions to plan, implement and enforce traffic improvements. Sometimes poor cooperation between different levels of government. Most decision-makers are relatively wealthy and so tend to personally favour automobile-oriented improvements.	

Government costs	Limited funding for transportation infrastructure and services.	✓
Consumer costs	Many households spend a large portion of income on transport.	
Traffic safety	High traffic causalities per motor vehicle. High risk to vulnerable road users (pedestrians, cyclists, animals, etc.).	
Comfort	Low comfort levels for non-motorised travel (walking, cycling, animal carts, etc.) Low comfort levels for most public transit. Medium to high comfort for private automobile and taxi travel.	✓
Environment	High pollution concentration in urban areas. Pavement of greenspace (farmlands and wildlife habitat) a problem in some areas.	
Land Use	Medium to high accessibility in urban areas (many destinations can be reached b walking, cycling and public transit). Poor and declining accessibility in most suburbs and new communities. In some regions, limited land available for new transportation infrastructure.	
Economic development	High dependence on imported transportation goods (vehicles, parts and fuel). Economic development harmed by dependency on imported goods.	✓

Fig. 24: Factors that justify mobility management in developing countries

-> Mobility management is justified in the Danube Delta

“Current planning practices tend to create a self-fulfilling prophecy: by favouring automobile travel and giving little support to other modes such as walking, cycling and public transit, the quality of these other modes declines. “

Source: http://www.vtpi.org/gtz_module.pdf, 04.08.2017

Other Recommendation

Sustainable Mobility in Tourism - A Vision for the Danube Region

"Basic Principles and Recommendations

1. Transport and tourism authorities must work on a comprehensive understanding of the mobility challenge and on vertically and horizontally integrated solutions.

2. The transport sector must offer a customer-oriented choice of high quality, healthy and environmentally friendly, energy efficient and carbon neutral means of transport (especially trains, buses, bicycles and boats).

3. The technology sector has to develop user-friendly communication technologies and new low or zero vehicles using renewable sources of energy.

4. Destinations must provide excellent connections to local and regional transport, enable easy arrivals and departures, guarantee environmentally friendly mobility including for the ‚last mile' (public transport, flexible traffic systems, shuttle-services, rental of no nor low-polluting conveyances, footpaths, cycle tracks, horse carriages etc.).

5. The tourism industry should create new, attractive offers which include environmentally friendly mobility solutions."

Source: Sustainable Mobility in Tourism - A Vision for the Danube Region