



Regional Action Plan

Car sharing and electric bike sharing between strategic points in Hajnowka County (Poland)

December 2020

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Introduction

Description of MARA

MARA – Mobility and Accessibility in Rural Areas – aims to improve the accessibility and mobility in touristic remote areas of the BSR by increasing the capacity of transport actors. The project is funded by the Interreg Baltic Sea Region Programme 2014–2020. The project is gathering 12 full partners and 13 associated partners from nine countries surrounding the Baltic Sea. The partnership is made up of regional and national public administrations as well as universities.

Several common challenges are faced by rural areas of the Baltic Sea Region:

- Population decline/demographic change
- Seasonal fluctuation of population/tourists
- Expensive public transport
- Car dependent lifestyle
- Many stakeholders involved
- Lack of using digital solution

MARA aims to crosscheck the actual mobility demand of residents and tourists with current mobility offers. The project aims to increase the capacity of regional and local transport actors to address multifaceted mobility needs by:

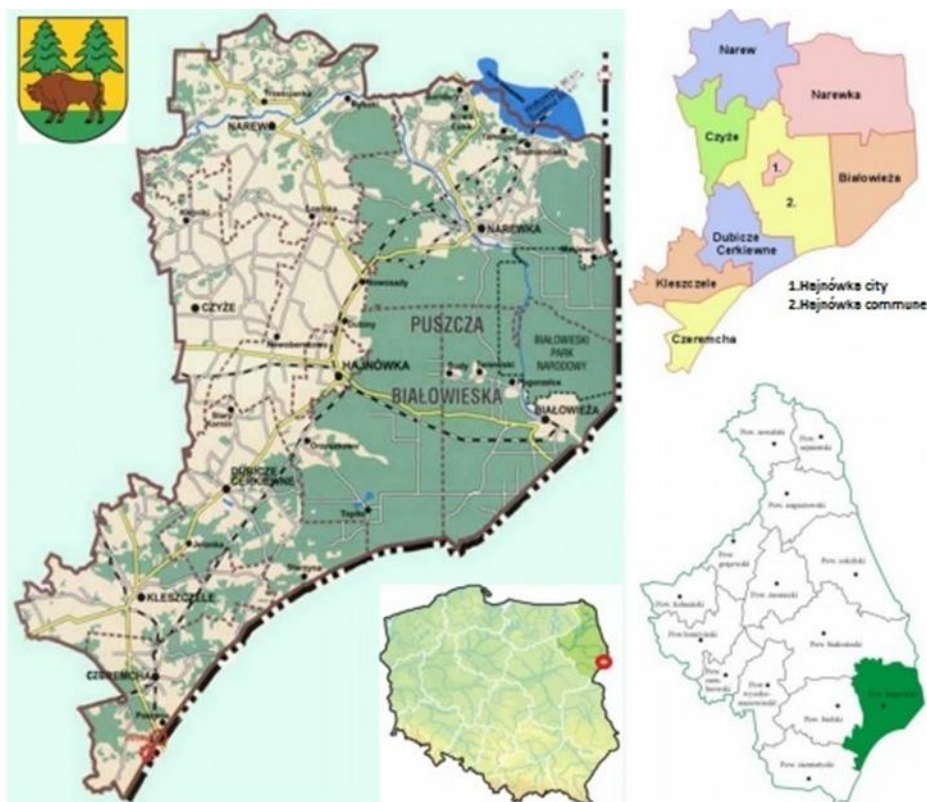
- improving existing services
- developing and testing innovative sustainable mobility solutions for remote areas.

Finally, the project will integrate its improved or new mobility approaches in remote areas into regional spatial and mobility development plans. This will increase the long-term impact of the main outputs and help to share the project results with other BSR regions.

Introduction to Case study Region of Partner

The idea of the pilot case (innovation) developed by BUT embraces a transportation system with a rental of e-cars and e-bikes available by the means of registering in the application designed for this purpose and by using a special card. This innovative solution may help to the Hajnówka District in improving communication in the region.

Hajnówka County is located in north-eastern Poland, in the south-eastern part of the Podlasie Voivodship. Interesting is also fact that this district is located on the sidelines of the communication axes connecting the key metropolitan centers in Poland and Belarus. The main transport infrastructure of the county consists: the national road number 66 transiting through the county area, connecting the main national road number 19 for Eastern Poland with the road border crossing with Belarus (Połowce – Pieszczałka) and four provincial roads (numbers 685, 687, 693 and 689 with a total length of 131 km in the region). The most important circular roads are complemented by a system of district roads (total 510 km) and municipal roads (total 427 km).



(Figure 1 Location of Hajnówka County- Photo from Strategy of Hajnówka County Development Program unit 2020)

Generally speaking, the Hajnówka County is characterized by a low percentage of density in the district and commune roads, compared to both neighboring counties and similar indicators for the entire Podlasie Voivodship and for whole Poland. Low road density in the Hajnówka District results, among others from a large area of forest complexes, also characterized by a low population density.

The transport infrastructure is complemented by railway lines: No. 31 Hajnówka -Siedlce and currently being modernized: railway line No. 31 province border - Czeremcha - Hajnówka, No. 52 section Hajnówka - Lewki, No. 59 state border Chryzanów. An alternative to motor transport are bicycle routes - because they connect the seats of municipalities and also lead to attractive tourist places in the Hajnówka County.

In Hajnówka County there are 14 bicycle routes with a length of over 500 km. Four of them have a loop route, one- 58 km long, it runs in Poland and Belarus using the border crossing for pedestrians and cyclists in Białowieża. After year 2021 the potential of cycling tourism will increase because of the reconstruction of voivodship road No. 685 connecting Hajnówka - the capital of the district with Białystok - the capital of the Podlasie Voivodeship which involves the construction of a bicycle path running parallel to the road lane. At the same time, the region is working on the construction of the Hajnówka - Białowieża bicycle path.



Figure 2 Bicycle path in Białowieża Forest- (photo from lot.bialowieza.pl)

Number and length of cycling routes, tourist attractions of the region (indicated by one of the slogans promoting the region "Feel the natural rhythm", recommended as part of the Strategy for the Management and Promotion of Tourism of the Białowieża Forest Region developed in 2015). As well as the communication potential of the trails and their advantages (the trails are connected by the headquarters of the municipalities of the district, lead to tourist attractions of the region- natural and cultural), indicate their great potential for mobility.

Transport planning – national and regional level regulations

In Poland there is a tripartite administrative division. Communes are at the lowest level. They are the "first contact" self-government and are responsible for all local matters. Their task is to meet the needs of the community living in a specific area. Next, we distinguish counties and voivodships. Local government units at individual levels are not subordinate to each other. The supervisory authorities are: the Prime Minister and the Voivode.

A county is a local government unit of a supra-municipal nature. Performs public tasks of a supra-municipal nature and complements the competences of the commune. The authorities in the county are the council and the board. In the local government elections, we elect councilors for a period of 5 years who will sit in the county council. The county board is composed of the starost, deputy starost and other members. Neither the staroste nor the deputy staroste are elected by universal suffrage. They are elected by the district council. In cities with county rights, the city president performs the function of the board. In the field of collective transport and public roads - organizes and supervises public transport, which goes beyond the boundaries of one commune. He also supervises district roads, is responsible for organizing repairs and examining the condition of roads.

The voivodship is the highest level of local government organization. The authorities of the voivodeship self-government are the voivodeship council and the voivodeship board. In self-government elections, councilors are elected to the council for a period of 5 years. The voivodeship board consists of the marshal, the vice-marshal or 2 vice-marshals and the remaining parties. The voivodeship marshal is elected by the voivodeship sejmik. The basic government of the voivodeship self-government is taking care of the development of the entire region.

The basic sources of transport infrastructure are the budgetary budget, funds of local government, non-returnable EU funds, loans from international financial institutions, and in terms of solving the costs of transport infrastructure (selected road sections, ports and costs, logistic centers, public transport) - through private funds or in public-private partnership system.

Transport electrification is one of the key themes in the development of modern cities. Governments of many countries have been carrying out activities for years to encourage citizens to purchase electric vehicles also Poland has taken steps since 2017 to create conditions for the development of electromobility and alternative fuels (electricity, liquefied / compressed gas) in the

transport sector, therefore, on January 11, 2018. The act on electromobility and alternative fuels was passed (Journal of Laws 2020, item 908).

The Electromobility Strategies developed by local governments are response to the need for sustainable development of the mobility market focused on the use of zero-emission vehicles in Poland. As well as the climate and transport policy pursued by local governments, including assessment of possibilities, definition of an action plan and analysis of possible investments that should be undertaken in order to take full advantage of potential for the development of electromobility. The construction of the electromobility strategy results from the above-mentioned Act - supporting the development of electromobility is one of the tasks of local governments.

The most important requirements for Local Government Units resulting from the Act are: "Ensuring the share of electric vehicles in the fleet of vehicles in use. A local government unit, with the exception of municipalities and districts, the number of inhabitants of which does not exceed 50,000, ensures that the share of electric vehicles in the fleet of vehicles in service in the office serving it is at least 30% of the number of vehicles used (Article 35, paragraph 1 of the Act on electromobility and alternative fuels). Local governments, fulfilling the obligation resulting from the Act of 11 January 2018 on electromobility and alternative fuels, prepare Electromobility Strategies. In building the Strategy, local governments could apply for government support - the project may be implemented with the funds of a targeted subsidy obtained from the National Fund for Environmental Protection and Water Management under the Priority Program No. 3.4 "Atmospheric Protection 3.4 GEPARD II - low-emission transport". The program will be implemented in 2018-2021, whereby:

- 1) commitments (understood as signing contracts) were undertaken until 2019;
- 2) the funds will be spent in the years 2019-2021

The electromobility strategy adopted by the legislative bodies are already in: Piastów City, Płock City, Krynica-Zdrój commune, Zgierz commune and the: incl. Pruszków District, Żywiec District (the strategy involves the construction of a charging station for electric vehicles and electric bicycles). One of the tasks of local governments regarding electromobility is to expand the public charging network for electric vehicles. For example, in the city of Gdańsk there are 52 such points so far and 21 are under construction. Electric cars are owned by the local governments of the largest cities in Poland: Kraków, Wrocław, Katowice, Szczecin and Rzeszów.

At the central level: ACT of January 11, 2018 on electromobility and alternative fuels (Journal of Laws 2020.908).

The Act specifies:

- 1) the rules for the development and operation of infrastructure for the use of alternative fuels in transport, hereinafter referred to as "alternative fuels infrastructure", including technical requirements to be met by this infrastructure;
- 2) obligations of public entities with regard to the development of alternative fuel infrastructure;
- 3) information obligations with regard to alternative fuels;
- 4) conditions for the functioning of clean transport zones;
- 5) the national framework for the alternative fuels infrastructure development policy and the method of their implementation.

In order to develop the idea of electromobility in Poland, the President of the Republic of Poland signed the Act of August 14, 2020 amending the Act on biocomponents and liquid biofuels and some other acts. The goal is to liquidate the Low-Emission Transport Fund and to replace it with a new long-term commitment of the National Fund for Environmental Protection and Water Management. The intention is to accelerate public funding for the development of low-emission transport and correspond with the scope of activities of the National Fund for Environmental Protection and Water Management as an environmental protection institution responsible for financing environmental protection. Ultimately, the funds are to be allocated to co-financing projects related to electromobility. The scope of projects that can receive funding is very wide - support may be provided for example to producers of means of transport, local governments investing in clean public transport, producers of biocomponents, including financial support in the purchase of electric cars .

The response to the need for sustainable development of the mobility market focused on the use of zero-emission vehicles in Poland, as well as the climate and transport policy, are the Electromobility Strategies developed by local governments, including assessments of opportunities, definition of an action plan and an analysis of possible investments that should be undertaken in order to take full advantage of potential for the development of electromobility. All local governments with more than 50,000,000 inhabitants are required to develop a strategy.

Description of the region and existing mobility models/offers

Białowieża Primeval Forest - it was the resting place of Polish kings and princes (the forest hosted, among others, Stefan Batory, Władysław Jagiełło and Zygmunt August), to this day it tempts those thirsty for a breath from everyday life. The beauty of the nature of the Białowieża Primeval Forest and its vicinity can be admired during walks on hiking trails, educational paths or while cycling - there are over 600 km of clearly marked routes running through the tiny towns and villages of the region. From a collection of legends, pieces of culture and crumbs of tradition, an unusual story has emerged in the form of bicycle routes showing what is most beautiful in the region. An experienced cyclists are invited to the Green Velo Eastern Bicycle Trail, connecting five voivodships of Eastern Poland. Since 2008, the Białowieża Transborder Trail has been operating, linking the Białowieża Forest on both sides of the border.



Figure 3. Group of bison (www.hajnowka.powiat.pl)

In the region of the Białowieża Forest – in other words the Bison Land, everything that is most beautiful in Podlasie is accumulated - nature and multiculturalism. The beauty of the nature of the region can be admired during forest hiking, biking, questing or canoeing trips, narrow-gauge railway

or trolley trips. The close vicinity of historic churches and churches, unique architecture of wooden houses with colorful shutters, regional chambers and galleries show the beauty of the cultural heritage. After an eventful day, hospitable residents will treat wanderers with regional specialties - venison, bread straight from the oven, tsarist cheese, dumplings, honey, and for dessert the original Marcinek cake.



Figure 4. Gate in Białowieża Village Photo (www.powiat.hajnowka.pl)

The Hajnowka County is an agricultural and industrial region. The pillars of the economy of the district are the wood industry, machine industry and tourism. The brand of the Białowieża Forest, on the UNESCO list, attracts many tourists from abroad and from Poland. Region due to its location and natural conditions, is a place conducive to the development of rural tourism and services - catering, medical, equipment rental, etc. The close vicinity of the natural Białowieża

Forest, clean climate, a developed network of tourist routes and the availability of services make the Hajnówka County a perfect place for the development of rehabilitation tourism. An important branch of industry - apart from tourism - is also the machine industry. In the Hajnówka County is located the seat of the PRONAR company, which is the undisputed leader in the production and sale of machinery and equipment for agriculture, municipal services and the transport industry with a nearly 50% share in the Polish market. The company exports its products to over 60 countries, incl. to the African continent, the Americas and New Zealand.

Another big employer in region it is HAMECH which has been operating in the region for almost 60 years - apart from comprehensive agricultural systems, storage and transport of biomass, the company advised services in the field of plastic processing, machining, thermal cutting, welding, balancing, etc. In the region, companies producing ecological boiler houses, heating (including "Moderator" in Hajnówka).

The wood industry is a traditional branch of the region's economy. The FORTE Furniture Factory has its branch in the district . It is one of the producers of self-assembly furniture. Wood services are also provided by individual entrepreneurs.

Also there are conditions for the development of organic farming in the region. The Hajnówka County can boast of healthy manufactures, because they come from the ecologically healthiest area of "Green Lungs of Poland" such as temporary dairy (District Dairy Cooperative in Hajnówka), herbal (RUNO meat and bakeries. There are also organic family farms offering natural products such as vegetables, herbs, eggs, and honey.

Hajnówka County it is an agricultural land - approx. 39% of the region area, a characteristic feature is the fragmentation of farms.

The advantage of the district is its border location. The phytosanitary crossing in Siemianówka, which has been operating since 2014, and the modern, modernized border crossing in Połowce, servicing car traffic, buses and trucks, make it possible to establish non-standard contact with the East.

The Hajnówka County has created the e-mapa portal with an interactive map of the district <https://hajnowski.e-mapa.net/> here you can find every information about topographic of region.

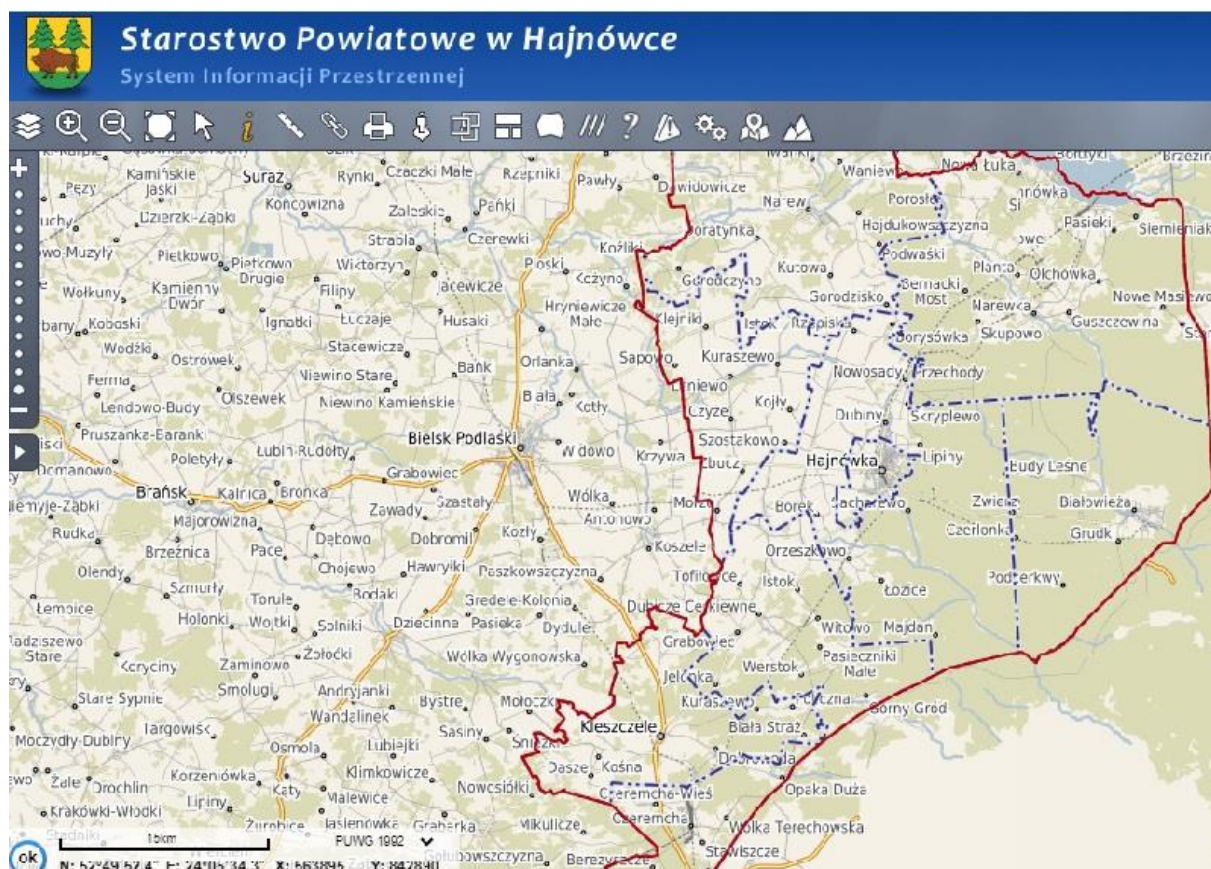


Figure 5. Hajnówka County (<https://hajnowski.e-mapa.net/>)

Table 1. Basic information about population

Region	Total population	Population		Population change per 1,000 inhabitants (2014-2019)	Population		
		city	village		0-19 years	20 – 65 years	over 65 years
Hajnówka Region	42610	21728	20882	-12,4	6816	25454	10340

Table 2. Basic information about region

Region	Area of the region (km ²)	Number of inhabitants	Density of population (number of inhabitants per km ²)	Hard paved public roads per 100 km ² in km	Cars registered per 1000 inhabitants	Bicycle paths (km)	Geographical location/local border traffic/ connectivity to transport hubs (airports, ports)	Access to railway/buses/waterways	Number of holiday and other short-stay accommodation (with more than 10 beds)
Hajnówka Region	1624	43143	27	39,5	571	652	located in the north-eastern part of Poland, proximity of the border with Belarus, the closest airport 223km in Warsaw;	low density of railways and poor offer of passenger connections;	38

Table 3. Touristic attractiveness about region

Region	Touristic attractiveness
Town Hajnówka	The Holy Trinity church- one of the most interesting examples of modern sacred architecture, The Museum of Ironwork and Blacksmith Craft, The Monument to a bison, Holy Cross Exaltation Roman Catholic Church- inside there are unique organ from the turn of 19 th and 20 th century. Miniature Park Monuments- miniatures are made in a scale of 1:25, everyone can admire characteristic for the region colorful wooden architecture.
Commune Białowieża	The St,Nicolas the Miracle Worker Orthodox church- inside there is a unique porcelain iconostasis. Educational paths of the Forest Promotional Complex "Białowieża Forest", "Żebra Żubra", "Krajobrazy Puszczy" "Miejsce Mocy" / Forest Trolley Railway- exploring of the Białowieża Forest with a trolley powered with muscles.
Commune Kleszczele	The wooden belfry from 1709 located in Kleszczele. St Nicolas Orthodox church. The Nature Reserve Jelonka. The Centre of Tourism and Culture "Hładyszka"
Commune Czyże	Orthodox churches in Czyże, Klejniki, KUraszewo and Lady (chapel with miraculous spring) . Burial mounds (from 4 th and 5 th centuries) and early medieval fortress (from 13 th century) in Zbucz village. Archeological educational path.
Commune Dubicze Cerkiewne	Ortodox churches in Stary Kornin, Dubicze Cerkiewne and Werstok. Wooden mindmills in Grabowiec and Dubicze Cerkiewne. Wooden manor complex in Jodłówka from 1860. The chapel by the spring with miraculous water in Stary Kornin. The Nature reserves: Starzyna and Czechy Orleańskie

Commune Narew	Wooden sacred building – The Roman Catholic church in Narew, the Orthodox churches in Narew, Łosinka, Trześcianka and Puchły. The Land of Open Shutters- villages Puchły, Soce, Trześcianka where there are wooden houses with beautiful woodcarving ornaments and colorful shutters.
Commune Narewka	The Water Reserve Siemianówka- an ideal place for anglers and birdwatchers. The Nature reserves among others Gbilec and Dolina Waliczówki. The Jewish cemetery in Narewka. Educational paths of the Forest Promotional Complex- Białowieża Forst, Under the Oaks in Świnoroje and Masiewo- Siemianówka artificial lake and On the track of a bison. BNP Hwoźna Protective Zone- open for free to tourists. Observation Tower Matruszka in Sieminiakowszczyzna
Objects in Białowieża National Park	The European Bison Display of the Biaowieża National Park. The Nature Forest Museum in Białowieża- modern exhibition showing flora and fauna of Białowieża Forest with audio-visual aids The Strict Protection Area Orłówka- the most precious part of the Białowieża Forest where are preserved the oldest tree stands. The Pałacowy Park – the park was founded by tsar’s palace at the 19 th and 20 th centuries in order to make nearest surrounding of the palace more attractive. The Hwoźna Protective Zone- It is northern and underestimated area of the Białowieża National Park there are three tourists trails which make it easier to move around.

As a part of the implementation of the MARA project - Mobility and Accessibility in Rural Areas, Hajnówka District in the period from October 20 to November 20, 2020, conducted a study of traffic tourism in 2019 and 2020. The research covers the acquisition of statistical data on tourist traffic in individual subregions and an internal analysis carried out by the MARA Team Hajnówka County.

Therefore, on October 20, 2020, applications were sent for the transmission of statistical data indicating tourist traffic in places attractive for tourists. The inquiries were sent to selected entities dealing with tourist traffic services:

- the Local Tourist Organization with its seat in Hajnówka city, which carries out the public task "Running the Tourism Center of the Białowieża Forest Region", supports tourist traffic in Hajnówka;
- Center for Tourism and Promotion –THE BISON LAND - an organizational unit of the Hajnówka County, operating since July 2020 located on the route Hajnówka - Białowieża;
- Białowieża National Park - due to the status of the Site from the UNESCO list, the BNP is visited by crowds of tourists;
- Narewka rural commune with tourist information points

Taking into account the plans of building a bicycle path along provincial road 689 on the Hajnówka - Białowieża section, the MARA team Hajnówka County for the purposes of this report, requested the Provincial Roads Authority to present data on the results of traffic volume measurements carried out in August 2020 in the area of Promotion and Tourism Center "The Bison Land" (Zwierzyniec parking lot).

The most developed tourist subregions - the commune of Białowieża (seat of the Białowieża National Park) and the commune of Narewka recorded really high tourist traffic - in 2020 despite on the unfavorable epidemiological situation of the country. The canoe station in Narewka, which acts as a tourist information point, recorded a visit of 11,560 people. The facilities of the Białowieża National Park were also popular, despite the drop in the number of visitors in 2020 they persist at the level of 20 thousand. visitors - when it comes to the Bison Show Reserve and the Strict Reserve (however, it should be taken into account, the data for 2020 does not cover the last quarter, moreover, the epidemiological situation of the country is not conducive to the development of tourism, it forced the temporary closure of the BNP Museum)

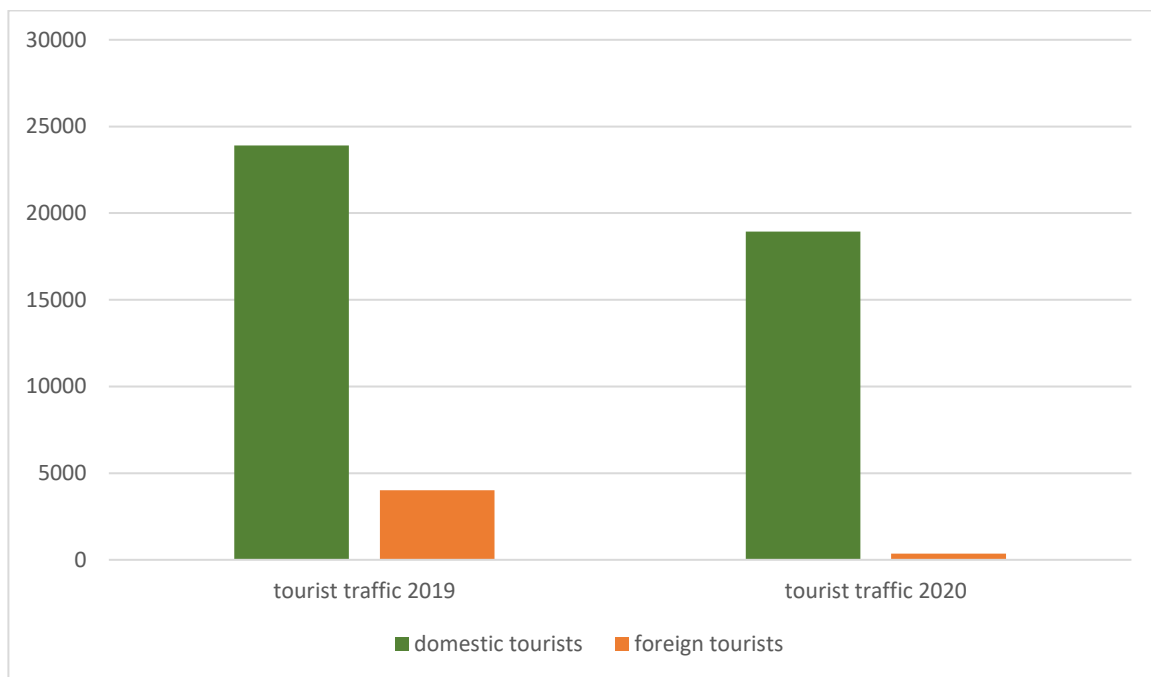


Figure 6. Tourist traffic in the Strict Reserve of Białowieża Primaveral Forest

The intensity of tourist traffic falls on the summer period - the tourist season in the region begins in May, which is reflected in the statistical data of the Białowieża National Park. In the following months, the tourist traffic gradually decreases, the average length of stay is also shortened (on average 5 days in the season, then 2-3 days stays). Most tourists use their own means of transport, and they changed to a bicycle on site. Active tourism, which is the main travel destination, is favored by the proximity of the Białowieża Forest and the number of tourist routes.

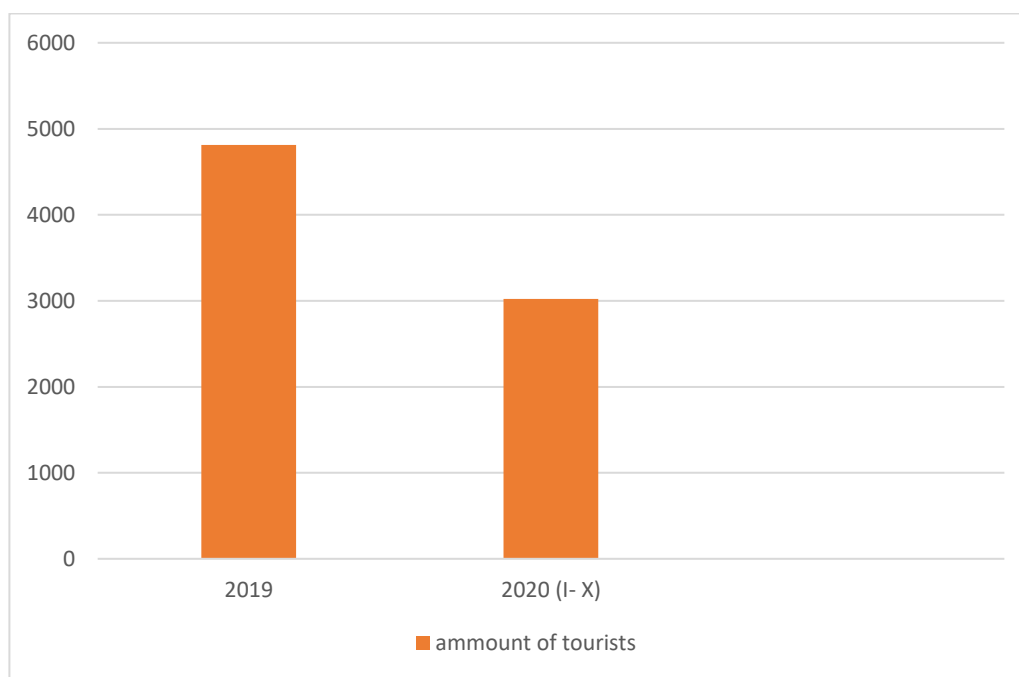


Figure 7. Tourists which visited Local Tourist Organization in Hajnowka

The analysis of tourist traffic complements the research conducted as part of focus groups for the implementation of the MARA project - Mobility and Accessibility in Rural Areas - New approaches for developing mobility concepts in remote areas, on the dates: 21/10/2019 and 04/11/2019. The research results indicated alternative directions of mobility development in the region.

During the meetings in which, at the invitation of the Hajnowka County and Białystok University of Technology, representatives of local governments, residents, representatives of the tourism and transport industry participated, the problems of mobility and transport accessibility of the Hajnowka County were diagnosed. The participants assessed the transport accessibility in the region, indicated the sources of problems and their potential solutions. During the discussion, many important demands were made to improve the existing mobility models and to propose new solutions. In particular, it was pointed out: the lack of an integrated and updated source of comprehensive information on transport services - stationary and on-line, insufficient use of environmentally friendly means of transport (e.g. city bike system, electric transport) and insufficient number of passenger connections, resulting in communication "white spots" on the map of the region and the lack of communication between tourist towns.

The development of mobility is one of the most important directions for the economic development of the region, it is worth noting that many of the available opportunities for activities conducive to the development of transport go beyond the competences of the Hajnowka County - they lie in the

competence of other local government units (neighboring districts, voivodeship self-government, communes) state bodies, institutions, or private business entities. On the grounds stated above, in the future Hajnówka District plans to prepare an analysis of the legal feasibility of launching the electric bicycle charging station system in three locations in the Hajnówka County, with particular emphasis on public procurement law, regulations related to the implementation of EU projects and provisions on state aid. The analysis carried out on the basis of statistical data indicates that the points of the bicycle loading station should be located in close proximity to facilities serving tourist traffic. These certainly include the communes of Białowieża and Narewka as well as Hajnówka - which plays the role of the central center of the district.

Table 4. Main problems of mobility and accessibility of region

Region	The main problems of mobility
Hajnówka Region	<ul style="list-style-type: none"> ▪ poor quality of road infrastructure ▪ poor connection with other regions of Poland by means of mass transport (lack of developed offer of direct long-distance connections) ▪ low accessibility in terms of individual transport (low motorization rate, low expenditures on road maintenance, long distance from a network of express ways and motorways) ▪ poor offer of the public road transport (insufficient network of bus connections, large disproportions within the frequency of buses at specific routes, insufficient number of direct connections) ▪ lack or insufficient integration of transport systems (connections between trains and buses) which leads to a prolonged waiting time for transfers ▪ insufficient development of bicycle infrastructure (poor number of marked bike routes, parking shelters, self-service bicycle mending stations, lack of self-service bike rentals, including electric bikes) ▪ unsatisfactory system of publishing timetables by road carriers on websites (lack of Internet service with such a local range that ensures uniform publication of collective timetables of all carriers, outdated or incomplete data), which hinders travel planning for tourists

It is worth mentioning that CarSharing will appear in Hajnówka! CarSharing is a car rental system for minutes and kilometers by phone. To use CarSharing, you must have a driving license and a payment card. After installing the application and verifying the account, the car can be driven immediately. Cars can be rented in all PANEK zones and also returned within zones (currently there are 250), paying only for the time and kilometers traveled. The service provider - Panek CarSharing

appeared in 2017 and at the beginning it covered only large cities - currently CarSharing is available in all cities with over 40,000 inhabitants. Due to the dynamic development, residents of cities above 20,000,000 will also be able to rent a car. residents. It will be possible to travel by cars all over the country.

The railway in the Hajnówka District is also going to a higher level, on January 2021 a new connection will be opened between Hajnówka and Białystok, which will improve communication in the region. After nearly 30 years, rail passenger transport from Białystok to Hajnówka on line No. 52 will be restored. It was possible thanks to the modernization of the Hajnówka - Lewki section and the contract between the Podlaskie Voivodeship and the Polregio company concluded for a period of 10 years (2021-2023). At the beginning there will be 6-8 connections per day. In order to increase the transport accessibility of the region, the route No. 52 was modernized on the 27-kilometer section on the Hajnówka-Lewki route. New tracks, 12 engineering structures, 22 crossings, including 13 with modern railway traffic protection devices and seven stops with modern platforms were built there.

Challenges of transportation models and recommendations for improving mobility offers in policy and planning documents

Assessment of mobility of the Hajnówka County- challenges

The institutional impact

Improving transport accessibility in remote areas (in the area of the Hajnówka District), by:

- removing blank transport gaps on the map of the district- increasing the number of connections on priority routes (Hajnówka - Bielsk Podlaski; Hajnówka - Białowieża; Hajnówka - Narewka; Hajnówka - Kleszczele - Czeremcha) and simultaneously increasing in the number of bus connections with the lowest frequency (in an ideal situation it will be possible to travel 7 days a week to each town by public transport);
- creating, in a public-private partnership game, an attractive transport offer;
- establishment of a communication system between trains and buses by e.g. combining cooperation between bus and rail transports, in order to synchronize the timetable of long-distance trains and transports connecting the capital of the voivodeship: Białystok with the Białowieża Forest region or the compilation of connections, "integrated" in relations with selected attractive touristically cities such as Hajnówka and Białowieża;
- implementation of innovative e-mobility solutions as an alternative to motor transport in order to strengthen the region's brand as an ecological and innovative place.

The economic point :

- Revitalization (in the public-private partnership mode) of the Hajnówka / Nieznany Bór - Białowieża railway line, which is the property of the Hajnówka District
- Improvement of the surface condition of roads in the Hajnówka District and their modernisation - the challenge is to develop legal and financial instruments, including field of road categorisation and the share of co-financing enabling funds to be effectively applied for road modernisation by local authorities.
- Development of bicycle infrastructure by the number of marked bicycle routes and infrastructure services dedicated to bicycles.

Mobility needs in the region

The basic strategic document is the Hajnówka County Development Programme until 2020, setting out the direction of the local government's activities in 2015-2020. As part of the current "Hajnówka County Development Program until 2020", the district has a "prepared communication accessibility analysis" prepared in 2014. Strategic documents have been developed as part of the project 'Platform for cooperation for sustainable development of the Białowieża Forest region', co-financed with European Union funds in the participation of the local community, institutions and local governments.

The document contains general characteristics of transport infrastructure in the Białowieża Forest region: road and rail roads, bicycle routes. Detailed analytical data characterize the main communication nodes of the region (road transport and rail transport), including the assessment of the transport offer in the Hajnówka County, an assessment of the availability of individual towns of the Hajnówka county to the main villages in the region and an assessment of tourist accessibility.

The analysis also includes recommendations for improving the state of communication accessibility. The authors paid the most attention to the assessment, characteristics and prospects for the development of road transport - with particular emphasis on the condition of roads, public transport, bus services, and rail transport - characterizing the most important railway sections, the condition and the prospect of railway development in Hajnówka County. The importance of the transport development is even greater because the "transport accessibility" of the county in comparison to other districts. In addition, Hajnówka county is poorly connected by public transport with other regions of Poland.

In addition to the infrastructure for motor vehicles, due to the touristic nature of the region, the authors of the analysis drew attention to bicycle routes located in the Białowieża Forest region. In the Hajnówka County there are 14 bicycle routes with a length of over 500 km in the . Four of them have a loop route, one, 58 km long, it runs in Poland and Belarus using the border crossing for pedestrians and cyclists in Białowieża. This is the Białowieża Transborder Trail - a tourist product prepared by the Hajnówka District in 2008.

Number and length of cycling routes, tourist attractions of the region (indicated by one of the slogans promoting the region "Feel the natural rhythm", recommended as part of the Strategy for the Management and Promotion of Tourism of the Białowieża Forest Region developed in 2015). As well as the communication potential of the trails and their advantages (the trails are connected

by the headquarters of the municipalities of the district, lead to tourist attractions of the region-natural and cultural), indicate their great potential for mobility.

The authors of the document recommend the development of cycling infrastructure by increasing the number of marked cycling routes and building infrastructure dedicated to bicycles.

Research conducted as part of focus groups for the implementation of the MARA project - Mobility and Accessibility in Rural Areas - New approaches for developing mobility concepts in remote areas, in the dates: October 21, 2019 and November 4, 2019 it also pointed to alternative directions for the development of mobility in the region.

Meetings were attended by representatives of local governments, residents, representatives of the tourist and transport companies on the invitation of the Hajnówka County and the Białystok University of Technology. During the discussion all agreed that Hajnówka district has serious problems with mobility and communication accessibility of the region

Participants assessed the transport accessibility in the region, pointed out the sources of problems and their potential solutions. During the discussion, many important demands were made to improve existing mobility models and proposals for new solutions. In particular, it pointed out the lack of an integrated and updated source of comprehensive information on transport services - stationary and on-line, insufficient use of environmentally friendly means of transport (e.g. city bicycle system, electric transport) and insufficient number of passenger connections, resulting in communication "white spots " on the map of the region and the lack of communication of tourist destinations.

Table 5. Research methods used to assess and analyze the needs of tourists and residents

Partner (Institution)	Methods applied																				
	Quantitative						Qualitative									Other					
	PAPI			CAWI			IDI			Case study			Desk research			Delphi method			Spatial information/ dynamic maps development and processing (including PPGIS)		
	T*	I*	A*	T	I	A	T	I	A	T	I	A	T	I	A	T	I	A	T	I	A
	+	+																			

*"T" – tourists; "I"- inhabitants; "A" - authorities/tourists entities (e.g. tourist agencies), (other?)

Table 6. The mobility needs of tourists – main results

Region	Measure (% or other indicator)	Mobility needs (in points)
Hajnowka Region	in % of 421 respondents	<ul style="list-style-type: none"> ▪ improvement of technical condition of roads (71%) ▪ improving travel safety (42%) ▪ reducing the cost of bus tickets (18%) and train ticket (18%) ▪ increasing the frequency of buses (45%) and trains (31%) ▪ improving the technical condition of bus stops (32%), buses (35%), railway stations (27%) and rolling stock (24%) ▪ increasing the number of bus stops (25%), railway stations (18%), bicycle paths (57%), parking spaces for bicycles (51%) and parking spaces for cars (44%) ▪ increasing the availability of information about bus communication (35%) ▪ improving bus punctuality (28%) ▪ introducing facilities for the disabled in buses (32%) and in trains (29%)

Table 7. The main mobility needs of inhabitants – main results

Region	Measure (% or other indicator)	Mobility needs (in points)
Hajnowka Region	% of 381 respondents	<ul style="list-style-type: none"> • improvement of technical condition of roads (90%) • improving travel safety (61%) • reducing the cost of bus tickets (44%) and train ticket (49%) • increasing the frequency of buses (71%) and trains (63%) • improving the technical condition of bus stops (54%), buses (62%), railway stations (61%) and rolling stock (60%) • increasing the number of bus stops (43%), railway stations (41%), bicycle paths (74%), parking spaces for bicycles (64%) and parking spaces for cars (76%) • increasing the availability of information about bus communication (57%) • improving bus punctuality (50%) • introducing facilities for the disabled in buses (64%) and in trains (59%)

Disparities between the current mobility needs and the existing mobility solutions

When we will think about stimulating mobility in region we should borne in mind that those ideas going beyond the capacity of the county authorities should be considered in the category of projects on which lobbying measures may be taken (with the support of the media, representatives of the business world, etc.) it might increase the opportunity of implementation.

Research done as part of focus meetings by the combined forces of two partners, the Białystok University of Technology and the Hajnówka County showed the greatest disproportion in assessing the region's mobility in areas such as:

- 1) Progressive depopulation, low population density and outdated depopulation in the areas of small towns and villages translating into low profitability of rail and bus connections, and to a limited extent - emerging communication white spots on the district map.
- 2) Poor communication with public transport of the Białowieża Forest Region with other Polish regions, which ultimately poses difficulties in social communication and on the other hand it weakens the region's economy, because it makes planning a vacation more difficult and discourages tourists from using the region.
- 3) Poor communication between the public transport of the Białowieża Forest Region and the capitals of the neighboring counties: lack of extensive bus offer for connections between Hajnówka (22,000 residents) and Siemiatycze (14,000 inhabitants) and Bielsk Podlaski (26,000). This makes it difficult to interact with these cities, which are local growth centres.
- 4) Insufficient offer of public transport in the county - eg. in terms of bus networks inside the county, there are large disproportions regarding the frequency of buses running on particular routes. There are places where public transport does not reach on weekends (or on non-school days) or at all. This contributes to the social exclusion of the inhabitants of these villages, who do not have private cars. This is the most significant shortage of public road transport in the region.
- 5) Despite of the developed network of cycling routes, the district has an insufficient offer of alternative transport: eg. bike rental at the level of the local government tourist offer (e-bikes, stationary city bikes) and private business.
- 6) Lack of integration with transport systems linked to the incompatibility of transport carriers; the same situation also applies to rail and bus transport offers.

- 7) Insufficient offer of transport connections with work places, which enables transport to tourist attractions, this in a negative way affects the economic condition of the region.

Given the above, the transport accessibility of the Hajnówka District from the point of view of public transport - both road and rail, should be assessed as inadequate in many respects.

Innovative solutions to improve mobility in the region

Solutions aimed at improving transport accessibility should be designed based on pro-ecological solutions, at least due to the natural conditions of the Hajnowka County. The close proximity of the Białowieża Forest - the last forest in Europe with features similar to natural, the availability of alternative communication nodes - in the form of e.g. hiking and cycling routes are the main advantages of the region. Although the region's bicycle route network is over 500 km long, it is not a particularly prominent means of today's transport. The region lacks a tourist base in the form of bike rentals in the largest tourist centers (Hajnowka, Narewka) and city bike networks. In addition, bicycle routes are treated as part of recreation and not as a means of transport. The change in perception of the bicycle route network and their use for the purpose of improving transport accessibility will be favored by including routes on an equal basis in existing mobility models. And thanks to the use of innovative mobile tools - the possibility of further electronicisation. The tool in question is a mobile application supported by smartphone and tablet users - increasingly personalized devices, which are the first source of contact and information.

The graphical concept of the application should be prepared in the form of a region map with a marked network of routes. The advantage of cycling routes in the Białowieża Forest region is their compatibility - the routes connect. Their connect the seats of municipalities, lead to the most important tourist attractions, as well as to places that are not reached by other means of transport. The application should contain information about the route, its length, coordinates of bicycle stops. Furthermore- it should be compatible with GPS navigation, which will allow you to connect routes freely. In addition, in order to congruence the application with other means of transport (the principle of parity, departure from thinking about routes only as a form of recreation), the application should contain data coordinates of buses and trains stops available on a given bicycle path along with information about the timetable, routes served and contact to the carrier.

The implementation of a mobile application can be treated as an introduction to the design of further solutions to improve mobility model. The application will undoubtedly contribute to the increase in the popularity of the bicycle as a means of transport, which will affect the image of the region as an environmentally friendly place and leveling of communication white spots. In turn, the compatibility of the route network with other forms of transport - will give the routes the status of an alternative means of communication. The application is also an easy tool to update data, which is important from the point of view of information access. This app might encourage tourists to use the bicycle as a means of transport, and the demand for bicycle services may contribute to the

development of cycling tourism. It can be a stage to expand this mobility model in the future, designed using the causative capabilities of municipalities and private business (in the form of city bikes, electric bikes). It is also an excellent tool for the development and implementation of a tourism management system in the Białowieża Forest region.

Recommendations and operation plan for improved mobility offers

The necessary step for the development of the e-bike concept is their legal concentration in strategic documents – at the level of the local government of the county and municipalities. The district government should agreed to creating promotional tools for the concept of e – bike through the available media and also commit to creating an evaluation which will be added to RAP as an attachment. At the same time, the development of e-bike in the Białowieża Forest region, in the current financial and legal system, is possible by exploiting the potential of the natural environment assest in terms of development of cooperation between three sectors: business, science and management (local government). This creates the possibility of inclusion of the Hajnówka County into a number of strategic documents of higher order, as well as possible lobbying for the application of the solution. Electric bicycles, through the use of innovative technology and the potential resulting from cooperation between science, business and management, and the simultaneous development of the existing network of bicycle routes (constantly supplemented), can become an indicator of the development of regional specialization. Only through innovative solutions and close cooperation between the science and business spheres, the Polish economy can create the conditions for increasing the attractiveness of investment. The aim of the district government to create economic and institutional conditions at the level of local participation, enabling the launch of the e-bike network is another challenge which county will face in the long term perspective, and which should remain included in the strategic documentation. Also as a part of MARA project Hajnówka County is planning organization of five promotional meeting which will be held in 2021. Meetings will be attended by ihabitans of five municipalities in order to help them undertand how essential is improving of mobility in the region and launching of e-bike system.

Summary

Conclusions

1. Long-term perspective: Legal constation of the e-bike concept in strategic documents - the role of the Hajnówka County as an entity promoting and supporting the development of the strategy.
2. Short-term perspective: Taking measures to increase the promotion of district resources using existing media (emphasis on the promotion of bicycle as an alternative means of transport, promotion of the network of cycling routes on the internet, in direct contact with tourists at IT points in the region), new tools – e.g. a mobile application. On the one hand, the mobile application corresponds to the mobility discourse, on the other - it links the network of routes in areas that promote this type of communication - so it is a promotional tool from the point of view of interest of a potential investor.
3. Publishing of feasibility study for the concept of launching an electric bicycle charging station system and the possibility of purchasing them in three locations in the Hajnowka County. That might help to encourage potential investors to join the further improvement of communication development in the region.