Regional Action Plan

E-bicycles/E-cargo bicycle sharing system in Vidzeme (Latvia)

December 2020

Content

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

Vidzeme Planning Region (VPR) lies in the North East of Latvia and borders with Latgale planning region in the South East, Zemgale Planning Region in the South and Riga Planning Region in the West. Vidzeme Planning Region is the biggest of the planning regions according to its territory. It covers 15 257 km2 or 24% of the territory of Latvia.

VPR comprises the former district municipalities of Aluksne, Cesis, Gulbene, Madona, Valka and Valmiera. There are 25 local municipalities (novads) and one city - Valmiera. The region's population is around 184 thousand (January 2020).

VPR as organisation was established in 2006. The main goal of VPR is to ensure regional planning and coordination, as well as cooperation between municipalities and different governmental institutions. VPR provides planning services on national, regional, and local level; it ensures regional and local level representation in elaboration of entrepreneurship, employment, and social policies. VPR mission is to coordinate and promote long-term and well-balanced development of the Vidzeme region by providing effective services to local inhabitants, NGOs, entrepreneurs, and municipalities.

VPR services at regional level:

1. Ensuring the planning - organization and implementation of territorial development planning at the regional level, involving all stakeholders; issuing adjustments on local planning documents;
2. Representation of interests - representation of the regional development interests on the national and international levels;
3. Support to development and partnership - organizing cooperation events, providing consultations, organizing project competitions, involvement of other regions and foreign partners, implementation of projects for local governments, NGOs, entrepreneurs and other groups;
4. Provision of information – compiling statistical information, management of different kinds of research, compiling and publishing information on various current issues;
5. Coordinating the work of local governments - promoting cooperation of local authorities by organizing events and ensuring successful work of the Development Council;
6. Implementation of specific functions - strategy for the period - public transport planning in the region.

Vidzeme area is a predominantly rural and remote region with distinct signs of economic and demographic depletion. VPR has the lowest density of population in Latvia – 12 people/ km2 (on average 34 people/ km2 in Latvia), and the biggest share of the rural population - 56% (the national average 36%). Around 22 % of inhabitants are older than 65.

Main development challenges are:

- Population decline due to low birth rates and out-migration (from remote rural areas to Riga and other urbanised areas),
- Growing social, economic, and regional disparities,
- Shrinking local market,

- Increasing costs of maintaining and delivering of services while public funding for infrastructure improvements is being reduced.

There are also specific challenges faced by the private investors and/or companies in the Vidzeme area:

- Low accessibility while the economic sectors in the region are highly dependent on ground transportation,
- Ineffective supply-delivery chains make the region an unfavourable location for business development and leads to missed opportunities to integrate in wider international business networks in the BSR,
- High costs of logistics.

These challenges require a coordinated public and private response. This, however, is hindered by several organisational capacity challenges:

- Insufficient competence of the stakeholders, especially at local level (architects, planners, engineers, decision-makers) - lack of in-house expertise in transport planning approaches that would take into account mobility needs of residents and businesses + lack of working models how to combine multimodal transport solutions with land-use planning + weak awareness of supply chain management and logistics,
- Inefficient inter-municipal cooperation and integration between different administrative levels (regional and local) in transport planning,
- Weak coordination and exchange of information among ministries, planning regions and other relevant institutions.

Aim of the Regional Action Plan

This Action Plan for improved e-bike mobility opportunities in Vidzeme is a detailed plan with specified actions that are needed to achieve a goal – modal shift from private car use in favour of bikes and e-bikes for short distance trips. This document includes current situation analysis, mobility needs gap analysis, recommendations and operation plan for improved mobility offer in Vidzeme.

Research and data gathering and analysis for this Action Plan was done mostly during MARA project implementation, additional data was gathered form national policy documents and previous VPR cross-border projects.

Transport planning – national and regional level regulations

Main information about transport policy in the country

In Latvia, the Ministry of Transport is a leading institution of state administration of transport and communication sectors which elaborates legal acts and policy planning documents regulating all related industries. It provides the implementation of the transport policy.

Main midterm development policy document in Latvia is the National Development plan 2027 and it covers development in all sectors. More specifically for transport sector, there are Transport Development Guidelines for 7-year period. Most recent Guidelines for year 2020 – 2027 are in the final stage of approval.

The Transport Development Guidelines is a policy planning document, in which the basic principles, development objectives and priorities of the policy in the transport sector have been specified for the time period from 2020 to 2027.

Following defined midterm goals in both above mentioned policy documents, Ministry of Transport can develop and implement specific plans related to more specific field or type of transportation. For example, there is now a Micro-mobility development plan being drafted. This plan will focus on actions that should be taken to make micro-mobility more popular option. Micro-mobility refers to a range of small, lightweight vehicles operating at speeds typically below 25 km/h (including bicycles, e-bikes, electric scooters, electric skateboards, shared bicycles, electric pedal assisted (pedelec) bicycles).

As for usual citizens and organisations, both governmental and non-governmental can participate in drafting process of such documents. Vidzeme Planning Region often participates in public consultation process to make sure regional and local needs are represented and taken into account and documents do not become to city oriented.

Decision making levels

National level:

Ministry of Transport - leading institution of state administration of transport and communication sectors which elaborates legal acts and policy planning documents regulating the related industries. It provides the implementation of the transport policy.

Public Transport Board - confirms regional public transport route network and its amendments, decides on the opening of experimental routes and after the end of experiment decides on closure or incorporation of regional route in regional route network etc.

Road Transport Administration - acts on behalf of the state in organizing public transport on routes of regional inter-city importance and regionally local importance.

Municipalities of 9 republic cities - organize public transportat services along routes of urban importance.

Planning Regions – participate in Public Transport Board, develop regional mobility plans (recently – Vidzeme Regional mobility investment plan 2030), a mediator between local municipalities, citizens, and national institutions.

Local Municipalities – organise mobility on local level (mostly through construction and maintenance of infrastructure) using their own budget, develop local policy documents. In Latvia, cities and municipalities are not required by law to develop mobility plans. In occasions when mobility and transport planning related documents are developed it is done because of local interest. These documents do not follow strict guidelines (for example SUMP) but aim to solve local issues. In cities the issues can be related to public transport, parking, walkability, micro mobility or a combination of issues. Sometimes these documents are a foundation for future investments, in other cases they are structured more like thematic analysis of some mobility related issues. Up to now only a small share of municipalities and cities have such planning documents.

Existing national legislation

Three main laws that regulate transport in Latvia are the Law on Public Transport Services, Railway Law and Road Traffic Law. In the context of this Action Plan only Road Traffic Law is relevant. It provides a definition of a bicycle and explains the distinction between the vehicle types (including e-bike and moped). The law defines a bicycle as a vehicle intended for riding using the muscular force of a person on it (except for wheelchairs). The bicycle may be equipped with an electric motor with a power not exceeding 0.25 kW. Two-wheel vehicles faster than that are defined as mopeds and motorcycles.

Financing of transport development

Transport development is financed by national government (investments in road, rail and port infrastructure, aviation, and public transport subsidies), small share of financing comes from local municipalities (for local roads, local public transport subsidies, local mobility initiatives).

European Cohesion fund and European Regional Development fund play significant role in financing transport development in Latvia (through cross-border projects and large-scale investments in infrastructure).

Description of the region and existing mobility models/offers

Demographic description

The transport system is significantly affected by the population density of the region, the location of socio-economic activities, as well as economic growth. The population in Vidzeme region is decreasing annually over the past six years, and researchers from Domnica CERTUS predict that such a trend could continue until 2030. Assuming GDP growth scenarion of 5% per year and the decrease in wage differences betwen the region and the capital of Latvia, population migration could be slower and the number of inhabitants could decrease by 8% by 2030 in Vidzeme. If economic growth is slower, the population could decrease by even 15% by 2030.

Table 1. Basic information about population (January 2020)

Region	Total population	Population		Population change per 1,000 inhabitants (2014-2020)	Population		
		city	village		0-14 years	15-64 years	>65 years
Vidzeme Planning region	183938	80643 (44%)	103295 (56%)	-89 [201915 (2014); 183938 (2020)]	28255	116155	39528

Table 2. Basic information about region

Region	Area of the region (km2)	Number of inhabitants	Density of population (number of inhabitants per km2)	Hard paved public roads per 100 km² 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)
Vidzeme Planning Region	15 257	183938	12	18,7 km [2849 km / 15 257km2]	423,8 [77 958 private vehicles / 183938]	Less than 0,5 km per 1000 inhabitants	No airports (only private ones) and ports	Two railway lines with multiple regional stops (connection between Riga and Valka, Riga and Gulbene), multiple regional bus lines. No waterways for public transportation, only for tourism and recreation purposes.	163 accommodations with total 4 352 beds (more detailed information not available) + places oriented for Airbnb platform don't show up in official statistics.

Table 3. Touristic attractiveness about region

Region	Touristic attractiveness
Vidzeme Planning Region	Gauja National Park is main attraction that offers many outdoor and indoor attractions. Gauja National Park is the largest national park in Latvia, with an area of 917.86 km² running from north-east of Sigulda to south-west of Cēsis along the valley of the Gauja River, from which the park takes its name. Tourism history has a long tradition in the Gauja national Park. The first visitors were hiking in the Sigulda area with walking-sticks as far back as in the 19th century. Every year thousands of visitors are attracted by the unique landscape, the largest Devonian rock outcrops – sandstone precipices, rocks, and caves, as well as monuments of culture and history, which are twined with many legends and stories. In the national park, there are over 500 monuments of history and culture – hillforts, stone castles, churches, manors, water, and windmills, as well as other archeological, architectural and art monuments. City of Cēsis is in Gauja National Park, Valmiera city is very close. These 2 cities have the largest number of tourists, attractions, and accommodations. They are fallowed by Smiltene, Alūksne and Valka. Tourism is very important field of specialization for the majority of VPR municipalities. Many municipalities collaborate and develop common tourism routes. This is highly relevant for bicycle and e-bicycle tourism as many touristic bicycle routes stretch across multiple municipalities.

Existing mobility models in the region (illustrated by maps and quantitative data)

Current mobility system in Vidzeme includes transportation with private vehicles (as drivers or passengers), public transport (buses and trains), walking and cycling. The 2019 Norstat survey[1] shows that almost half of Latvians or 49% travel by private car on a daily basis, 26% of Latvians travel on foot every day, 19% travel by public transport, and only 5% use a bicycle as a vehicle on a daily basis, but 1% of the population uses other means of transport. In large cities, including Valmiera, private cars are used more (52%), public transport is used by 14%, but 3% of the population travel by bicycle.

System of public transportation

According to the available information on the types of population movement in Vidzeme, 27% of the region's population use public transport daily, which is significantly more than the average in Latvia. In VPR public passenger transport services are provided on city, regional, intercity bus routes, as well as on intercity train routes. Bus traffic accounts for about 95% and rail traffic for 5% of the total number of passengers. The state subsidy is on average 72% -74% of the carrier's costs, but there are areas where the public bus is used by an average of 1.7 passengers per kilometre and where public subsidies cover more than 80% of costs.

Public transport in the cities of national significance

Separately from national public transport system, the cities of national significance (called as *republic cities*, e.g. Valmiera in Vidzeme) have their own public transport system and the local municipalities provide school-bus services.

Bike-sharing system

Bike-sharing system currently does not exist in Vidzeme. There is a regular bicycle share system (provided by a single company) as well as e-scooter sharing systems (different systems provided by multiple companies) in the capital city Riga. In some other cities there are bicycle rent options for tourism purposes. Such companies usually provide 5-10 bikes or e-bikes, which can be rented for private rides or in groups with a guide.

During MARA project e-bike sharing system was piloted in Vidzeme in two locations - Valmiera city (population 23 000) and Cēsis city (population 15 000). From the two Valmiera is considered more industrial but Cesis more tourism oriented. Both cities have access to train and buses. In both cases it is the same train line which provides opportunities for reaching the capital city Riga in one direction and twin city Valka / Valga (Estonian border) in other direction. Buses provide the same

[1] The Norstat study about the mobility in Latvia, commissioned by the Ministry of Environmental Protection and Regional Development, 2019

opportunities plus multitude of regional connections. Pilot location in Valmiera was approximately 22 minutes away from the train station, 1 minute away from the bus station and 6 minutes away from the central part of city. Pilot location in Cēsis was approximately 7 minutes away from the train and bus station and 2 minutes away from the central part of city. Around 500 users took the opportunity to use shared e-bicycles within two weeks of the pilot study.

Call-a-bus-system

For 11 months from 2019 to 2020 VPR piloted (during MAMBA cross border project) "transport on-demand" in 2 municipalities of Mazsalaca and Alūksne. The collected data show that 2777 passengers were transported, 1277 trips were made, and 24,821 kilometres were travelled. The service was organized in places where public transport does not run at all or is insufficiently available.

The destinations of the passengers were the primary places of receiving services, which are located mainly in the county centres: doctor, pharmacy, grocery store, public bus stops, ATM, library, hairdresser, state institutions, post office, interest classes, cultural events organized by the municipality. Residents also used the service to get to work. Residents were satisfied with the service received. This made life easier for those who do not have access to public transport close to home and who do not own a private car.

Currently, Vidzeme Planning Region has initiated a state-level discussion on the implementation of alternative local mobility solutions in the regions, offering a "transport on-demand" service as one of the options.

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

Transport Development Guidelines 2020-2027 (TDG2027):

"It is also important that tourists who have visited the country are provided with the service and opportunities to move freely. TDG2027 must create opportunities and conditions for each of the regions of Latvia to use the transport infrastructure for the development of its territory and ensuring human well-being. TDG2027 should also create common points of contact with regional development planning documents."

"TDG2027 includes a task on the development of mobility points in the whole territory. Regardless of the location of the mobility point, its main task is to provide everyone with convenient connections between different modes of transport, in order to minimize the need to use private road transport."

"The European Green Course points to the growing importance of automated and networked multimodal mobility, as well as intelligent traffic management systems, provided by the introduction of digital solutions. The EU's transport system and infrastructure are set to prepare for new sustainable mobility services that can reduce congestion and pollution, especially in urban areas. Also in this context, the development of the public transport system with the railway as its backbone, the development of mobility points will be important in Latvia, at the same time promoting the increase of micro-mobility of the population (bicycles, also scooters, balance wheels, walking, etc.)."

"TDG2027 also envisages the development of a Micro-mobility Plan, which will allow the implementation of solutions for the safe movement of bicycles or other micro-mobility tools."

National Development Guidelines 2020-2027 (NDG2027):

"Increasing green zones, pedestrian streets and bicycle paths in urban areas and between settlements will make the surroundings more attractive and will provide people, especially families with children and seniors, the opportunity to increase physical activities."

"Improving the transport system to encourage the use of bicycles and other environmentally friendly vehicles as well as RES - by creating appropriate infrastructure and encouraging older vehicle replacement, while ensuring infrastructure accessibility for different groups."

"Ensuring local mobility to encourage employment and access to services by improving infrastructure, supporting innovative micro-mobility solutions."

As both guidelines are developed this year (2020) it is too early to tell if they will be followed when investment opportunities become available or if changes in regulations will be made to facilitate modal shift.

Vidzeme regional mobility investment plan 2030

The Mobility Investment Plan is a policy and development planning document of Vidzeme Region in transport sector, which sets strategic goals and marks the development directions of the transport system until the year 2030. This framework document serves as a guide for transport policy makers, planners, entrepreneurs and residents in Vidzeme region.

The goal of the Mobility Plan is to ensure mobility for residents, entrepreneurs and freight carriers in a safe, convenient, reliable, efficient and environmentally friendly way, thus promoting socio-economic activity in Vidzeme region.

It is recommended for planning of transport infrastructure development at local level in order to cohere local priorities with the long-term development priorities and perspectives of the region in the field of transport, including connection to the TEN-T network. The Mobility Plan is useful for planning the investment program of roads, railways and related infrastructures in order to ensure that transport policy is coherent with the priorities of the region. The Mobility Plan serves as an informative material for citizens and entrepreneurs on the current situation in the transport sector and long-term development prospects in the region.

In order to ensure and improve the mobility of citizens and goods in Vidzeme region, the transport system shall be:

- Comprehensive providing connections at local, regional and national level, as well as connections to the TEN-T network, allowing easy access to international destinations;
- Accessible providing affordable, safe mobility opportunities at a reasonable price for all population groups and needs (education, work, tourism, freight transportation, etc.);
- Efficient transporting people and goods quickly in energy efficient and cost-effective way;
- Safe to help reduce the number of road accidents and the number of people killed in road accidents;

- Multi-modal, which performes as a unified system providing convenient transport connections, interchanges or cargo terminals, offering efficient transport services at a reasonable cost;
- Smart using modern technological possibilities;
- Innovative adapting to the needs of today's users by using new solutions;
- Environmentally-friendly that is attractive to people, reduces the harmful impact on the environment, especially in populated areas, and allows more efficient use of energy resources.

Mobility needs in the region

To identify mobility needs in the region, a desk study was performed reviewing conducted studies and analyzing results of the pilot projects (transport on demand and e-bike rental). Analytical methods were used for selection, compilation and analysis of statistical data from various databases (road administration, road transport administration, bureau of statistics and others). Also, a number of experts were interviewed about the local mobility options, the level of service and necessary improvements.

Mobility is an important precondition for the functioning of society and good quality of life. The Norstat study (2019) commissioned by the Ministry of Environmental Protection and Regional Development of Latvia shows that almost half of Latvia's population (49%) travel by private car for their daily needs, 26% of population walk, 19% travel by public transport, 5% use a bicycle as a mean of transport on a daily basis, and 1% of the population uses other means of transport. In cities, including Valmiera, private cars are used more (52%), public transport is used by 14% of population, and 3% travel by bicycle.

Citizens adapt the available mobility solutions to their needs, capabilities (physical, financial), and convenience. In Vidzeme, the situation is complicated from the point of view of organizing public transport (PT) service because of the low population density and long distances between the households and service facilities. 58% of Vidzeme population live in rural areas with density 13 inhabitants/km^2 (in the European Union, on average, 28% of the population live in rural areas). As a result, to ensure mobility by PT is difficult - providing regular passenger transport is expensive and inefficient in sparsely populated areas. The state subsidizes PT services on average in the amount of 74% of the cost. Long travelling distances with a low number of passengers are economically disadvantageous for carriers. Under the given circumstances, the number of regular bus trips is gradually reduced, and in some cases it leads to the route closure.
In sparsely populated areas, the service facilities are usually long distance away from home. PT services in such areas are usually poor, and often the private vehicle (car, bicycle) is the only mean of transport available.

With the continued positive economic growth in the country, the welfare of the population is increasing. As a result, the number of private cars in the ownership of the population gradually increase as well (1 car per 2.9 people on average in 2016 in Vidzeme region). A private car as a mode of transport plays a major role and a predominant role, especially in rural areas, and it is expected in the future that households who have a car will primarily choose this mode of transport for mobility purposes.

All public transport is organized on fixed-routes and on a fixed schedule. There is no any flexible transport services provided in Vidzeme, neither as semi-fixed with minor variations nor as on-demand services. Likewise, there is no supply for car-sharing or bike-sharing services in territories outside the cities.

Transport on Demand service (ToD) was piloted in two counties of the region – Mazsalaca County and Alūksne County in 2019-2020. The pilot was initiated by the Vidzeme Planning Region in the framework of the EU funded MAMBA project. The aim of the pilot project was to increase the residents' mobility in remote rural areas, where public transport is poor or does not exist at all. ToD was offered as an alternative local mobility solution, with the intention to ensure accessibility to public services and equal quality of life in any area of the region.

In total, 2777 passengers were transported and 24,821 kilometers were travelled using ToD service. The results of the pilot project showed that there is a demand for local mobility options in sparsely populated rural areas, and it cannot be detected by fixed PT services. The pilot project highlighted the existing needs and demand for alternative and flexible mobility solutions to overcome car-dependency, isolation and social exclusion in rural areas.

In 2017, when the Ministry of Transport of Latvia developed the Bicycle Traffic Development Plan 2018-2020, data on the existing bicycle infrastructure in Latvia were collected. The information was obtained through surveys, approaching local municipalities. Questionnaires were sent electronically to all local governments with a request to provide information on:

a) cycling infrastructure;
b) training grounds (BMX and MTB tracks, skate parks);
c) bicycle parking lots and other service infrastructure;
d) the planned measures for the improvement of cycling infrastructure.

About 25% of inhabitants in Vidzeme region prefer walking or biking for daily purposes. Significant investments have been made in recent years to improve cycling and pedestrian infrastructure in built-up areas, but the length of cycling roads is still limited and thus it is an obstacle for comfortable and safe travelling conditions. (Figure 1).

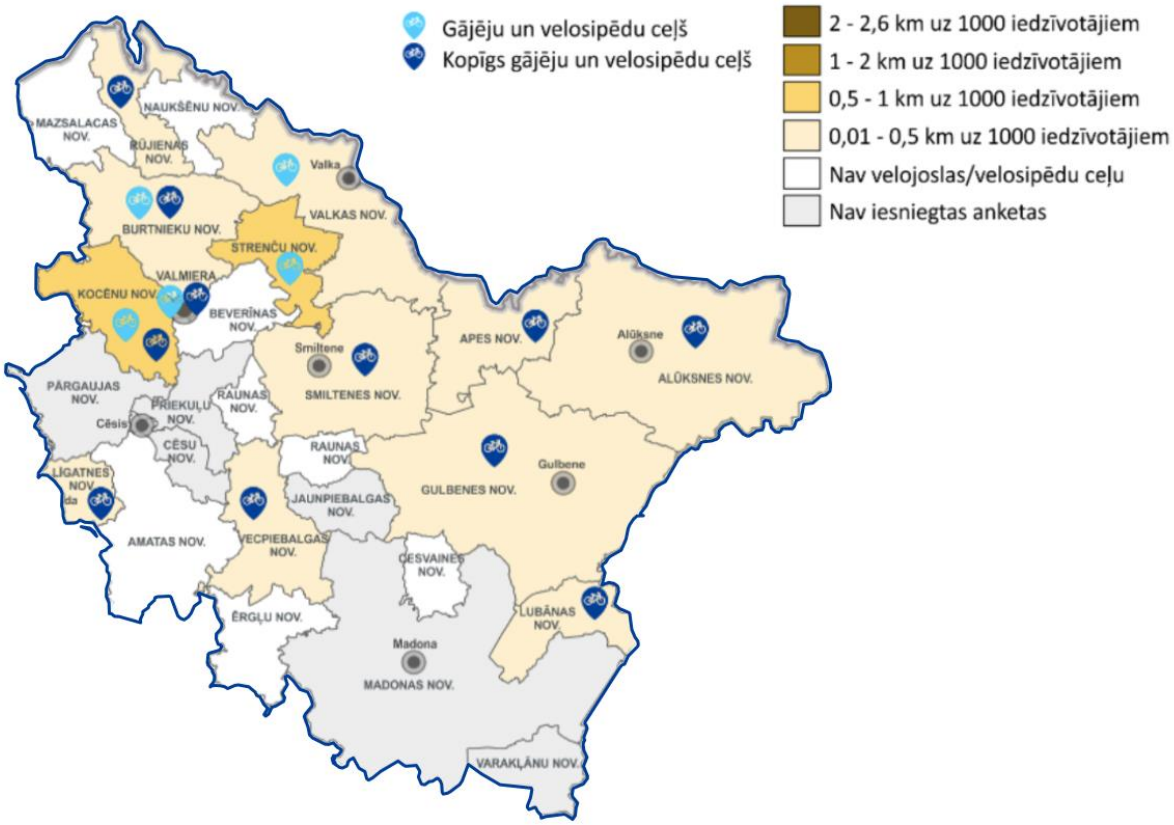

Figure 1 Location of the existing cycling infrastructure in Vidzeme planning region

Analyzing provided information about the cycling infrastructure (separate cycling lanes, common pedestrian and cycling paths) per km per 1000 inhabitants, it can be seen that in Vidzeme region better situation is in Kocēni municipality and Strenči municipality (0.5-1 km cycling roads per 1000 inhabitants). There are no cycling roads in 8 counties. Construction of cycling lanes is one of the priorities of local governments in these municipalities.

In urban areas there are bicycle parking lots created near public buildings, trade, service, and tourism facilities. Cycling training grounds near educational institutions are established in Rauna municipality and Alūksne municipality.

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
VPR	x	x		x	x							x			x	x	x				x

*"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)
		▪ safe infrastructure ▪ satisfactory level of service (comfort, security, availability, convenient to use etc.) ▪ lack of cycling roads ▪ a few bicycle parking lots provided near public buildings, trade, service, and tourism facilities ▪ lack of vehicle-sharing systems outside the capital

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

Region	Measure (% or other indicator)	Mobility needs (in points)
		• Safe infrastructure ▪ satisfactory level of service (comfort, speed, security, availability, etc.) • lack of cycling roads • a few bicycle parking lots provided near public buildings, trade, service, and tourism facilities • lack of bicycle sheds near the train and bus stations

Disparities between the current mobility needs and the existing mobility solutions

In Vidzeme region, there is a certain part of population that use PT services regularly, and also, there are groups of population whose mobility needs cannot be met by conventional PT.

In suburban and rural areas, which tend to be less populated, investments are required in smart, user-friendly transport services which better suit travelers' needs. New car-sharing and bike-sharing concepts, and e-bike services are examples of transport modes that could replace or complement the poor bus service.

The use of e-bikes essentially requires the same infrastructure as a conventional bicycle - cycling lanes, parking lots or sheds and information signs. Unfortunately, in many places in Vidzeme, the cycling infrastructure is relatively poorly developed, which is one of the main factors hindering the use of bicycles.

Wrong approach was made at the beginning of the development of cycling infrastructure in urban areas - bicycle lanes were combined with pedestrian paths, thus increasing accident risk.
Poor development of pedestrian and cycling infrastructure outside the built-up areas deters from using bicycle for everyday needs. Also, towns where cycling is more developed are not interconnected, for example, Līgatne - Ieriķi, Priekuli – Cēsis.

As the average speed of an e-bike is higher than that of a conventional bike, a flat, wide enough cycling road, separated from pedestrian and car traffic, is much more appropriate for safe travelling conditions. This applies not only to cities, but also to rural areas, where high road traffic and the lack of cycling lanes pose significant safety risks to cyclists and thus discourage people from using bicycles.

The availability of bicycle parking lots and sheds is also important, where users can leave e-bikes safely for a longer period of time, protecting them from theft and precipitation (rain, snow). It is especially important to create such bicycle sheds at public transport nodes (railway stations, bus stations) and thus promote the use of e-bicycles as a part of multi-modal trip. Bicycle storage facilities are also necessary at public, sports, cultural and commercial sites.

An accurate and easy-to-understand information system (including road signs) is helpful for any user of cycling infrastructure, but it is especially important for tourists who travel in unfamiliar environments and face differences in traffic organization, culture and language. It is important for e-bike users to plan the trip in advance: to calculate the expected length of the trip according to

the capacity of the battery and to locate the charging points. Road signs to tourist attractions and service places are useful to stay on the right track and safely reach the destination.

Innovative solutions to improve mobility in the region

Everyday bicycle users can be divided into urban and rural residents. For urban residents, the use of e-bikes is relatively easier - the distances covered are usually shorter, there is better developed cycling infrastructure and more opportunities to rent e-bikes. For rural residents, it is often not possible to rent an e-bike near the place of residence, so it is more realistic to use a personal e-bike.

Potential users of the tourism segment can be divided into several groups:

- middle- and high-income travelers, for whom a certain level of comfort is important in their free time. Being in nature, they like to choose moderate physical activity;
- lovers of sporting activities and adventures: young and middle-aged travelers who look for challenges. They prefer higher-level rides that e-bikes are able to provide - longer distances, steeper climbs and more difficult routes than conventional cycling or hiking;
- active travelers in the age group over 50 years. Well-off seniors who want to travel and maintain an active lifestyle but prefer to have a good time. This age group had a significant impact on the introduction of e-bikes in European countries about 10 years ago, but is still the largest group of e-bike users today;
- families with children. This target group may also need bicycle trailers and children's e-bikes.

There are many opportunities to use e-bikes for tourism in Vidzeme:

- e-bike rental for city sightseeing (Cēsis, Valmiera, Gulbene, Alūksne and others);
- e-bike rental for individual trips to tourist attraction objects (Gauja National Park, Lake Burtnieks, Lake Āraiši and others);
- guided tours for groups with different thematic orientations: sightseeing, tourist attractions, tasting the local cuisine and others;
- organized multi-day e-bike tours around Vidzeme with accommodation in hotels or guest houses.

As the everyday users and tourists are different target audiences, requirements for the technical parameters of e-bikes, usage and complementary services differ as well. A self-service sharing scheme, possibly together with the mobile application is more suitable for everyday users, while in the tourism segment it is better to set up full-service rental points, where qualified staff can provide customers with detailed information on e-bike use and suggest the most interesting routes and attractions.

The use of e-bikes essentially requires the same infrastructure as a conventional bicycle - bicycle lanes, bicycle sheds and information signs. Unfortunately, in many places in Latvia, including Vidzeme, the bicycle infrastructure is relatively poorly developed, which is one of the main factors hindering the development of bicycle traffic.

As the average speed of an e-bike is higher than that of a conventional bike, a flat, wide enough and separated from pedestrian and car traffic is much more important for road safety. This applies not only to cities, but also to rural areas, where high road traffic and the lack of bicycles pose significant safety risks to cyclists and thus discourage some people from using their bicycles.

The availability of bicycle sheds is also important, where users can leave e-bikes safely for a longer period of time, protecting them from theft and bad weather conditions (rain, snow). It is especially important to create such bicycle sheds at PT stations(railway stations, bus stations) in order to promote the use of e-bicycles in connection with public transport. Also, it is necessary to provide a standard 220 V port at the bicycle shed for charging the battery.

An accurate and easy-to-understand signage system is useful for any user of cycling infrastructure, but it is especially important for tourists who travel in unfamiliar environments and face differences in traffic organization, culture and language. It is important for cyclists to plan the length of their trip, so directions to the most important tourist attractions are very useful.

The e-bike rental or sharing system can be organized both by using fixed docking stations and by allowing users to leave their e-bikes in a freely chosen place within a certain area. The second solution is more convenient for users, as it does not require making a trip to the nearest parking lot and looking for a place to park the bicycle. This principle is currently used by most electric scooter providers. However, in this case, it is necessary to install a GPS tracking system for all bicycles and invest extra work to move them and charge the batteries at the end of each day. In addition, free parking can lead to chaos in the city with cases of vandalism and bicycles left in the most inappropriate places. This solution is better suited to very densely populated cities.

Recommendations and operation plan for improved mobility offers

Recommendations for improved mobility offers are compiled from other studies in related projects, namely, Action Checklist for Municipalities and Companies: E-Bikes (project BSR electric), Feasibility study for introduction of new transport services in the municipalities of Vidzeme planning region (project MARA).

The e-bike rental service can be organized both as a shared system and by creating rental points. For e-bike sharing systems, it is recommended to use fixed bike racks, equip bikes with GPS devices and inform customers about the terms of use.

It is not expected to be cost-effective in the start-up phase of e-bike rental, so it is important to attract public funding during the start-up phase and for some time during the implementation phase.

When launching an e-bike rental service, it is useful to organize free trial trips to allow users to experience the benefits of e-bikes.

Municipalities and businesses can do much to promote the use of e-bikes through infrastructure improvements, economic and social incentives.

Public Awareness

- Enable opportunities for people to try out e-bikes through pilots, organized events and campaigns.
- Enable opportunities for employees to test e-bikes through participatory pilots.
- Identify different user groups and target different groups with appropriate measures.
- Introduce a variety of e-bike types from folding bikes to cargo bikes.
- Focus on the benefits and possibilities of e-bikes for the users and how their usage improves their lives (convenience, health effects).
- Emphasize e-bike as an alternative to motorized means of transport, instead of a substitute for regular bicycle or walking.
- Actively communicate the successes to wider public and in the media. In general, communicate about cycling matters.
- Municipalities: Foster positive image of e-biking through adopting them to municipal operations, when possible.

Incentives

- If possible, create different local/company incentives for bike and e-bike take up and use on regular basis.
- Provide e-bikes as a fringe benefit for employees (leasing).
- Municipalities: Lobby for financial incentives to be introduced on a national level

Strategic Partnerships and Networks

- Benchmark best practices from other municipalities, companies and organizations, also abroad, and consider their applicability.
- Seek opportunities to participate in projects that aim at promoting e-bike usage.
- Talk to local bike shops and bike service providers.
- Municipalities: Involve variety of stakeholders, including employers, schools, municipal employees, housing companies and local biking associations to improve effectiveness of the efforts.

Infrastructure and Transport System

- Municipalities and companies: Provide necessary infastructure that makes the use of e-bikes a desirable option for employees and customers: quality bicycle parking and charging points.
- Municipalities and companies: Invest in quality end-of-trip facilities: changing rooms, lockers, showers etc. Invest in high-quality bicycle routes and infrastructure, which are crucial for e-bikes.
- Provide appropriate maintenance, also for winter months.
- Invest in good regional network of cycling roads.
- Consider including e-bikes in the public bicycle sharing system.
- Facilitate combining e-bikes to public transport by ensuring parking and charging infrastructure e.g. in train stations.
- Make sure there is adequate level of expertise about cycling matters within the municipality.

City Development and Planning

- In city planning, consider the specific needs that e-bikes have for infrastructure, such as safe and high-quality bicycle parking facilities.
- In land use planning, always consider accessibility of services and places by (e-)bikes

Procurement

- Establish a scheduled plan on how and to what extent to replace the municipality-/city-/company-owned vehicles with e-bikes.

- Consider also e-cargo-bikes in order to increase the functionality of the e-bike fleet.
- Consider leasing as an alternative to buying.
- Consider introducing an electric bike-share scheme for employees in different municipality or company departments, as well as for customers.
- Encourage the use of the e-bikes, instead of cars.
- Consider using e-bikes (for example electric assisted cargo bikes) for freight logistics solutions inside the city.
- Include energy efficiency as a procurement criterion, when inviting tenders for functions and services.

Summary

An executive summary, key findings, main recommendations

An e-bike is a good alternative to road transport, as well as a realistic solution for those who need to travel relatively short distances to get to work or school, to spend their free time or to perform work duties.

In VPR, the use of e-bicycles is not yet widespread. The facilitated use of e-bikes can significantly increase the role of cycling in sustainable mobility in both urban and rural areas. E-bikes can become an essential element of local bicycle sharing systems, as well as last-mile option for rail and bus passengers.

The e-bike rental service can be organized both as a shared system and by creating rental points. For e-bike sharing systems, it is recommended to use fixed bike racks, equip bikes with GPS devices and inform customers about the terms of use.

It is not expected to be cost-effective in the start-up phase of e-bike rental, so it is important to attract public funding during the start-up phase and for some time during the implementation phase.

When launching an e-bike rental service, it is useful to organize free trial trips to allow users to see the benefits of e-bikes.

Municipalities and businesses can do much to promote the use of e-bikes through infrastructure improvements, economic and social incentives.

Flexible transport services, together with modern IT solutions, allow to achieve the balance between the demand and the efficient supply of transport services that meet the mobility needs of the population, ensure more efficient use of resources and reduce the environmental footprint.