



A Road Map of Commuting in Tallinn-Harju Region

Recommendations of the Interreg BSR project SUMBA for the development
of a transport system supporting sustainable commuting in the Tallinn-Harju
region

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1. Introduction

This commuting roadmap offers a vision and measures for the development of sustainable commuting in the Tallinn-Harju region. The roadmap supports the compact and human-scale development of the Tallinn-Harju region and the overall increase in the share of sustainable modes of travel. The reduced use of cars and the increased use of sustainable modes of transport establish preconditions for the densification of Tallinn and the surrounding settlements. A denser settlement improves access to necessary services, while reduced car use makes it possible to create a human-scale urban environment that improves the inhabitants' quality of life and provides additional opportunities for recreation and socialisation.

As a general vision, the roadmap is based on the goal of making the region's transport system (including commuting) sustainable without reducing the accessibility of jobs and services. This requires comprehensive changes in both land use and mobility planning. The use of the private car should be reduced many times over, while walking and cycling should become the main modes of travel for everyday journeys, and longer journeys should be combined with a fast and convenient public transport service. Only in this way will the Tallinn region be able to adapt to the negative pressures arising from the new climate reality and the intensification of urbanisation.

This document is broadly divided into two parts. The first part provides background information on commuting in the region and mobility in general. The second part presents a vision for the development of sustainable commuting with measures to support it.

2. Background information

2.1. Geographical area

The centre of the region covered in this document is Tallinn, where a large part of the region's jobs and services are consolidated. The Tallinn region consists of Tallinn, together with the entirety of Harju County and Rapla and Kohila rural municipalities. The population of the region is over 620,000 people, of which about 450,000 live in Tallinn. In addition to Tallinn, there are seven cities (Kehra, Keila, Loksas, Maardu, Paldiski, Saue, Rapla), three towns (Aegviidu, Kiili, Kohila), over 40 small towns, and over 400 villages in the region. Around 50,000 people live in the region's cities (excluding Tallinn), around 60,000 in towns and small towns, and more than 60,000 in villages. The definition of the region is based on Eurostat definition, according to which the functional area of a city consists of the city itself and its commuting zone. The commuting zone includes all areas around the city where at least 15% of the working population commutes to the city on a daily basis. Particularly frequent commuting takes place between the settlements in the immediate vicinity of Tallinn and Tallinn city, as well as between Tallinn's residential districts and the industrial offices located around the city. In total, more than 110,000 people participated in two-way commuting in 2017 (Harju County-Tallinn-Harju County: over 60,000; Tallinn-Harju County-Tallinn: 50,000) (Harju County Development Strategy).

2.2. Parties

The management and planning of transport is divided mainly by administrative boundaries and modes of transport. Within the borders of local governments, mobility is largely managed, financed, and planned by local municipal governments. For mobility with a regional dimension, the national level of government has a greater role to play.

There are four different public transport service systems in the Tallinn region:

- 1) Tallinn city routes (buses, trams, trolleys) operated by the municipal enterprise Tallinna Linnatranspordi AS. The commissioning of the service is organised by the Tallinn Transport Department, and operating expenses are covered from the city budget.
- 2) Harju County public bus routes, which are administered by MTÜ Põhja-Eesti Ühistranspordikeskus, established by the local municipal governments of Harju County and receiving operating support from the state budget.
- 3) Train routes within Estonia. The service is organised by the state-owned company AS Elron, which receives operating support from the state budget.
- 4) Commercial bus routes in Harju County, financed by carriers through ticket revenue.

Local governments are responsible for the construction and maintenance of pedestrian routes and cycle paths within their administrative boundaries.

Public transport, pedestrian routes and cycle paths are financed as a combination of the budget of the local government and the Ministry of Economic Affairs and Communications,

and the European Union's investment subsidies. While a large part of the money for new investments often comes from the European Union (especially for larger investments) or through a state-level support measure, the regular administrative costs of road maintenance and public transport are covered by ticket revenue, as well as the budgets of local governments and the Ministry of Economic Affairs and Communications.

The major parties involved in mobility in the region are brought together by the Mobility Council, which has been established to coordinate regional mobility. In addition, the development of a cooperation model is planned for the near future, which would allow for the unified planning, financing, and management of public transport in the entire region. In order to define the exact format of the cooperation model, the Ministry of Finance will commission a corresponding analysis.

In addition to the administrative institutions mentioned above, the relevant parties in the field of mobility are:

- Local governments of Harju County
- Kohila Rural Municipality
- Rapla Rural Municipality
- AS Eesti Liinirongid (train operator)
- As Eesti Raudtee (railway infrastructure owner)
- Union of Estonian Automobile Enterprises
- Ministry of Finance (responsible for spatial planning and EU structural funds)
- Hendrikson & Ko (consulting company – spatial planning, local government mobility plans, etc.)
- Skepast & Puhkim OÜ (consulting and engineering bureau – spatial planning, infrastructure)
- K-project AS (consulting and engineering bureau – spatial planning, infrastructure)
- Tallinn University of Technology
- Tallinn University
- Estonian Academy of Arts
- Urban Lab
- Estonian Urban Cyclists Union

Ticket revenue and operating expenses

The operating expenses of the city routes in Tallinn significantly exceed the ticket revenue, primarily due to the free travel right established for all city residents. The need for subsidies has been growing year by year and was already significant before the introduction of the free travel right (in 2013).

Table 1.1. Change in Tallinn's public transport operating costs and ticket revenue 2011–2019. Source: Tallinn in Figures 2019; Tallinn Mobility Plan.

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Ticket revenue, EUR MM	16.42	16.17	3.76	3.36	3.73	3.83	4.08	4.63	4.08
Operating expenses, EUR MM	49.15	51.19	55.58	59.93	63.53	66.16	67.70	71.37	71.7

Ticket revenue (and the number of users) for public bus routes in Harju County grew steadily until 2017. It decreased in 2018, when the right to free travel was introduced for everyone aged 0–19 and 63+.

Table 1.2. Harju County public bus routes from 2012–2018. Source: Tallinn Mobility Plan.

	2012	2013	2014	2015	2016	2017	2018
Ticket revenue, EUR MM	2.052	2.327	2.475	2.832	3.169	3.437	3.062
Number of trips, MM	2.298	2.300	2.534	2.860	3.167	3.499	4.173
Line mileage MM routes per km	4.434	4.901	5.383	5.790	6.277	6.582	7.368
Ticket revenue per passenger (EUR per ride)	0.89	1.01	0.98	0.99	1.00	1.02	0.73
Allocation, EUR MM	3.068	2.605	2.7	2.8	2.9	3.069	4.028

Ticket revenue and operating expenses for train traffic in the Tallinn region are not available separately for the region; it is known that less than half of operating expenses are covered by ticket revenue. In general, the availability of trains in Harju County and, therefore, also ticket revenue has grown strongly year by year. The number of travellers on Tallinn commuter trains increased by 86% from 2013–2017. There is no systematic overview of ticket revenue and operating expenses of commercial bus routes operating in Harju County.

2.3. Overview of the current situation

2.3.1. Relevant development documents

At the national level, mobility is guided by the National Transport and Mobility Development Plan for 2021–2035. Compared to the previous development plan, the topic of sustainable mobility is much more prominent. Nationwide, the development of rail transport and the introduction of alternative fuels are prioritised. With regard to urban mobility, the importance of multimodality is emphasised and the development of sustainable mobility infrastructure and traffic calming are supported. National integration and improvement of public transport services are also important. At the same time, road development remains the highest priority, at least in terms of investment costs. There is also a disproportionate emphasis on the use of alternative fuels and smart mobility solutions, given the impact of the measures on greenhouse gas emissions.

At the regional level, the development strategy of Harju County includes development trends in the field of mobility. It establishes the key measures needed to develop public transport, intermodality, and active modes of travel at the national, regional, and local level. At the same time, however, considerable emphasis has been placed on improving road traffic conditions, especially the construction of large infrastructure projects. Another important document is the development plan of the North-Estonia Public Transport Centre, which sets out in some detail the development directions needed to increase the number of travellers on regional buses in Harju County. Terms and responsible institutions have also been established. The most important recommendations are, for example, the integration of the route network and the implementation of a single ticketing system throughout the region.

At the level of Tallinn, an important role is played by the Tallinn Mobility Plan. It describes the current major mobility challenges and proposes the necessary courses of action to address them. The main directions proposed include more compact land use, an urban environment that supports active mobility, and better organised public transport. In addition, mobility is addressed in the Tallinn Development Strategy 'Tallinn 2035', which is largely based on the Tallinn Mobility Plan on the strategy and goal level. Therefore, it focuses on the development of sustainable modes of travel quite thoroughly. The Tallinn Cycling Strategy 2018–2027 sets targets for increasing the share of bicycle use in Tallinn and provides the network of cycle paths and basic requirements for the design of bicycle infrastructure.

2.3.2. Population and housing management

The population of the Tallinn region is over 620,000 and the current growth trend can be expected to continue in the coming years. Within the region, the population is concentrated in Tallinn and its immediate rural municipalities (Viimsi and Rae, Harku and Kiili municipalities), while the population of more remote local governments is growing more slowly or is even decreasing. In Estonia as a whole, the population is shrinking and aging. These trends have a smaller impact in the Tallinn region than elsewhere, but here, too, a significant aging of the

population is forecast for 2040, while the population will remain roughly the same or decrease slightly. The aging of the population in Tallinn and its surrounding rural municipalities can be expected to a lesser extent than in the more remote rural municipalities of the region.

The growing population causes a continuing high demand for new real estate developments, both in Tallinn and its vicinity. In the early 2000s, as a result of this pressure, many new developments were built near Tallinn in areas where there were largely no public services and mobility solutions. This facilitated suburban sprawl and car based commuting in the Tallinn region. Today, the construction of such new developments has decreased considerably, as local governments have changed their planning practices and people's demands on their living environment have increased. However, there is still room for improvement in land use and transport planning coordination.

2.3.3. Employment and retail space

As of 2018, the share of the working age population in Harju County was 71% of the total population. In turn, 74% of them were employed – this is a higher share than elsewhere in Estonia.

In the Tallinn region, jobs are very clearly concentrated in Tallinn and, more recently, in the surrounding rural municipalities. Most of the employed in the neighbouring rural municipalities work in Tallinn (50–80%), while about a fifth of those employed in Tallinn work outside Tallinn. In the most remote rural municipalities of the region, 15–45% of the employed work in Tallinn. In 2017, more than 60,000 people commuted to Tallinn from outside Tallinn on a daily basis (Harju County Development Strategy). While different types of jobs have been concentrated in Tallinn for a long time, a more recent trend is the development of logistics and industrial parks in the vicinity of Tallinn. In addition to traditional commuting (from the immediate vicinity to Tallinn), this development has also increased commuting from Tallinn to neighbouring municipalities.

The retail space in the Tallinn region is largely concentrated in shopping malls, which are located in different locations throughout the city, but are especially common in the city centre and on the outskirts of the city.

2.3.4. Developments in the near future

New developments are still planned on a large scale both in Tallinn and elsewhere. The following are the major potential developments in the next 10–15 years that will affect the functioning of the current transport system (the list is not exhaustive):

- Harku Rural Municipality
 - 1500–2000 new living spaces in the Tabasalu commuting corridor
 - 500 new living spaces in the Paldiski commuting corridor
- Rae Rural Municipality
 - 300 new living spaces per year

- Ski resort as a potential tourist attraction
- Driving school centre
- Saue Rural Municipality
 - New development of Vanamõisa (2000–3000 new living spaces)
- The growth potential of Tallinn is estimated at 1000 living spaces and 1000 m² of office space per year
 - The number of trips made by car in the North Tallinn region may increase 2.4 times if all planned developments are built and modal share trends do not change
- Lasnamäe Hospital
- Rail Baltic terminal
- Both the Tallinn gate and trade developments at the far end of Rae Rural Municipality (former detailed plans that may be placed back on the table) would each generate an estimated 2000 cars per hour between themselves and Tallinn
- School locations and accessibility (550 students per school)
 - Jüri
 - Tabasalu
 - Laagri

2.3.5. Mobility demand

Transport demand is boosted by several different, albeit interrelated, developments in the Tallinn region.

- 1) The population is growing. The population of Harju County has grown very quickly in recent years, and this trend is likely to continue in the near future.
- 2) Jobs are concentrated in the city centre, industrial parks, and industrial offices on the outskirts of the city. Such concentration creates greater transport demand, as concentration in certain places means that jobs are becoming increasingly distant from the majority of the population.
- 3) Incomes are generally growing. As a result, it will increase the demand for road transport in particular, as people in the lower income quartiles are increasingly able to own several cars. The use of cars has increased the most among them in recent years (Tallinn Mobility Plan 2019).
- 4) At the same time, lower-paid jobs are largely concentrated in peri-urban industrial areas, to which there are few alternatives to car use. This trend is boosting car use and increasing mobility poverty. Commercial activities are also largely concentrated in shopping centres requiring the use of cars, meaning that you have to use a car and drive quite far in order to visit a shop. Settlement patterns are perhaps the biggest driver of transport demand. In recent decades, Tallinn has expanded strongly to the surrounding former farmland, the inhabitants of which have to travel relatively long

distances on a daily basis. According to Statistics Estonia, the distances covered in the region have increased over the last 20 years, especially for people living outside Tallinn.

2.3.6. Mobility statistics and impacts

The modal distribution of the region is clearly dominated by car use. Over the last twenty years, the use of cars has grown strongly, while the use of other modes of travel has either decreased or increased very little.

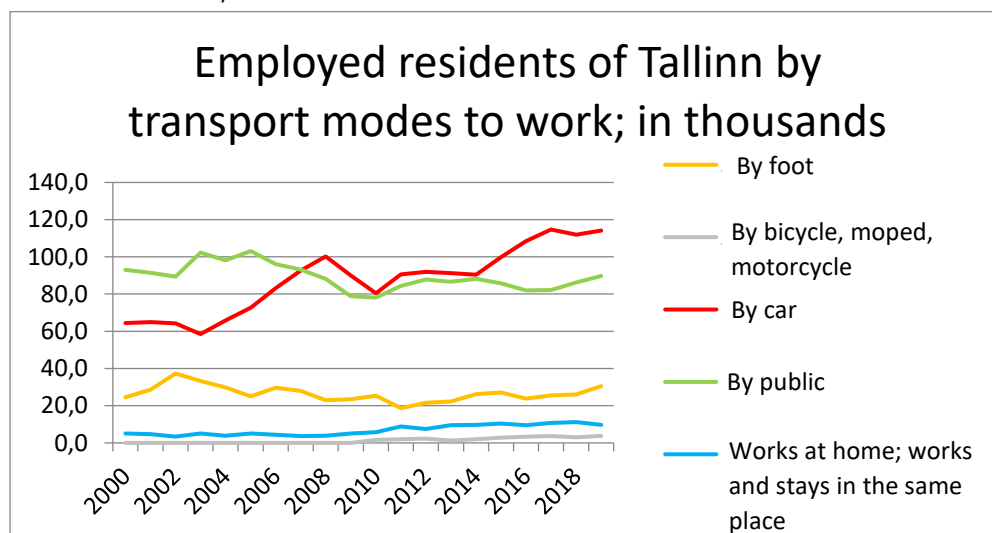


Figure 2.1. Number of employed residents of Tallinn by transport mode to work from 2000–2019; in thousands

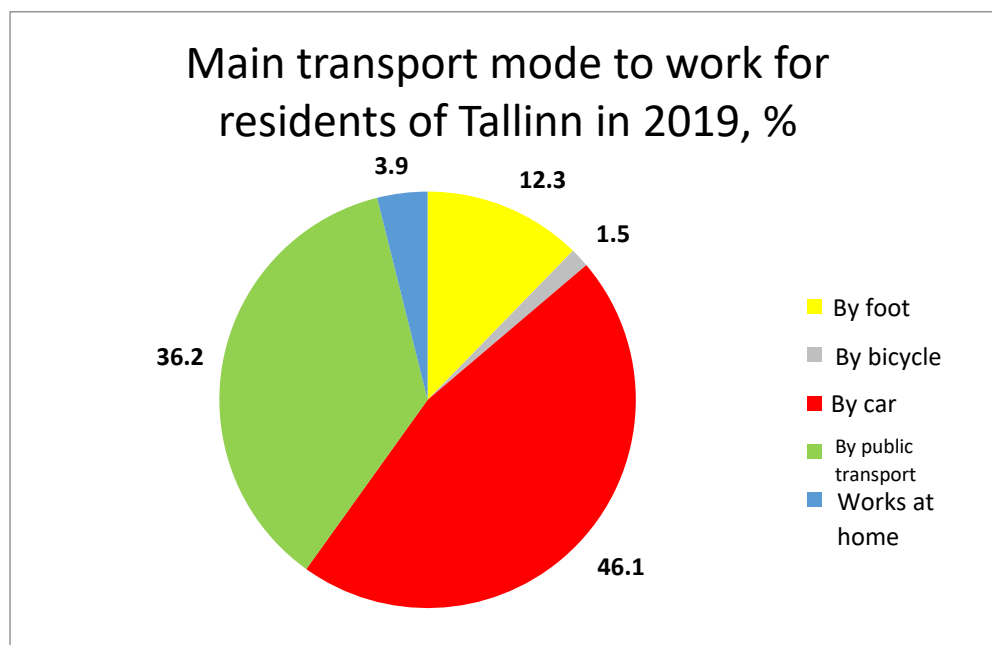


Figure 2.2. Modal share of Tallinn in 2019 by transport to work

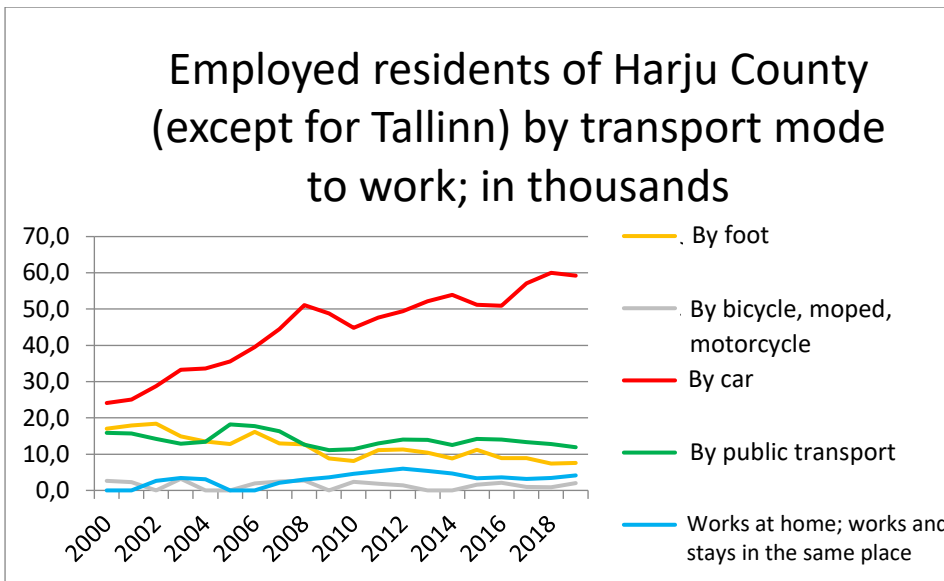


Figure 2.3. Number of employed residents of Harju County (except for Tallinn) by transport mode to work from 2000–2019; in thousands

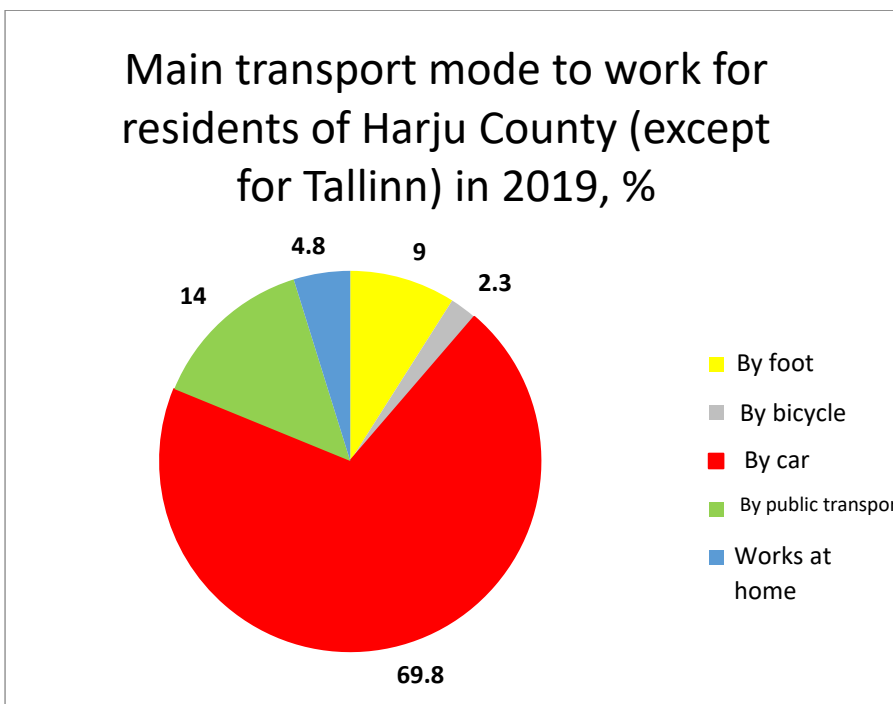


Figure 2.4. Modal share of Harju County (except for Tallinn) in 2019 by transport to work

Due to the rapid growth of car use in the Tallinn region, the negative effects of transport are experiencing a clear growth trend. In 2019, parking spaces in Tallinn covered a total area of 12 km² (Tallinn Mobility Plan 2019). CO₂ emissions from transport have been steadily increasing, and the same applies to energy consumption. While total greenhouse gas emissions by transport in Tallinn in 2007 amounted to 682 CO₂ equivalent kilotonnes and energy consumption to 2590 GW/h, in 2015, these indicators were already 853 and 3224, respectively. Fine particles, which come mainly from transport, are responsible for the premature death of approx. 300 people each year in Tallinn. Obesity is also a growing problem among the

population, exacerbated by car use. The number of traffic accidents and those injured in them has increased in Tallinn and Harju County over the past seven years, while the number of fatalities has slightly decreased. The main problem is ensuring the safety of pedestrians and cyclists by designing the street space accordingly, which also includes techniques for traffic calming. Also, people tend to fall a lot due to slipperiness, which indicates poor winter maintenance of pavements.

2.3.7. Commuting statistics

The main reasons for commuting are going to and coming from work or school. According to the national Transport Administration, in 2018 almost 175,000 cars crossed the border of Tallinn each day. That is 28,000 more cars than in 2012.

In 2017, nearly 50,000 people from the rural municipalities of Harju County commuted to Tallinn by car and more than 11,000 people by public transport (Harju County Development Strategy). These statistics are supplemented by commuters from Tallinn to Harju County and Rapla County, and their number has increased rapidly in recent years because of the concentration of industrial office work in the vicinity of Tallinn. Almost a fifth of the employed in Tallinn (approximately 50,000 people) work outside Tallinn (Harju County Development Strategy).

2.3.8. Public transport ticketing systems and regional integration

There are four different public transport systems in the Tallinn region: city routes (which in turn are divided between buses, trolleys, and trams), trains, county public bus routes, and commercial bus routes. The combined ticketing system and payment method apply to city routes: payment is made with a bus card, and the use of city routes is free of charge for all residents of Tallinn. The city's ticketing system has recently been extended to other modes of public transport. The payment method for the county routes is the same, but the ticketing system is different. When traveling by train, it is possible to pay with the city's public transport card, and within Tallinn, city residents can also travel for free, but starting from the city limits, Tallinn residents must also pay for the trip. The most problematic are commercial lines with a completely separate payment and ticketing system.

2.3.9. Increasing car use

The number of cars in households has been constantly growing. In Harju County, especially in the neighbouring rural municipalities of Tallinn, this indicator is even higher than in Tallinn.

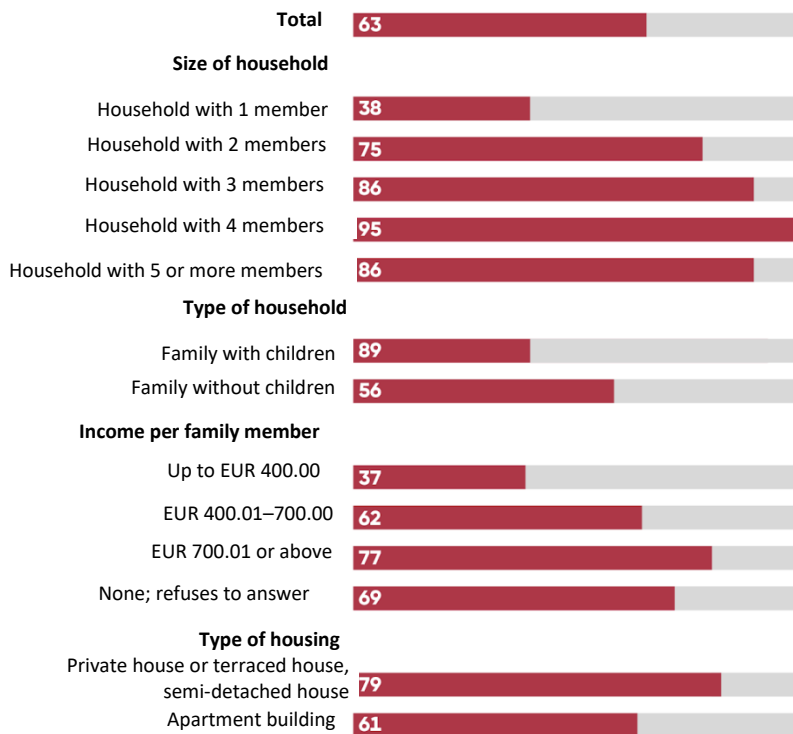
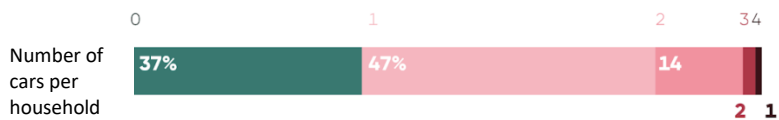


Figure 2.5. Car ownership in Tallinn by size and type of household, type of housing, and income. Source: Strategy on sustainable modes of travel in the Tallinn region 2035; Survey of modes of travel of people living in Tallinn 2015. EMOR 2015

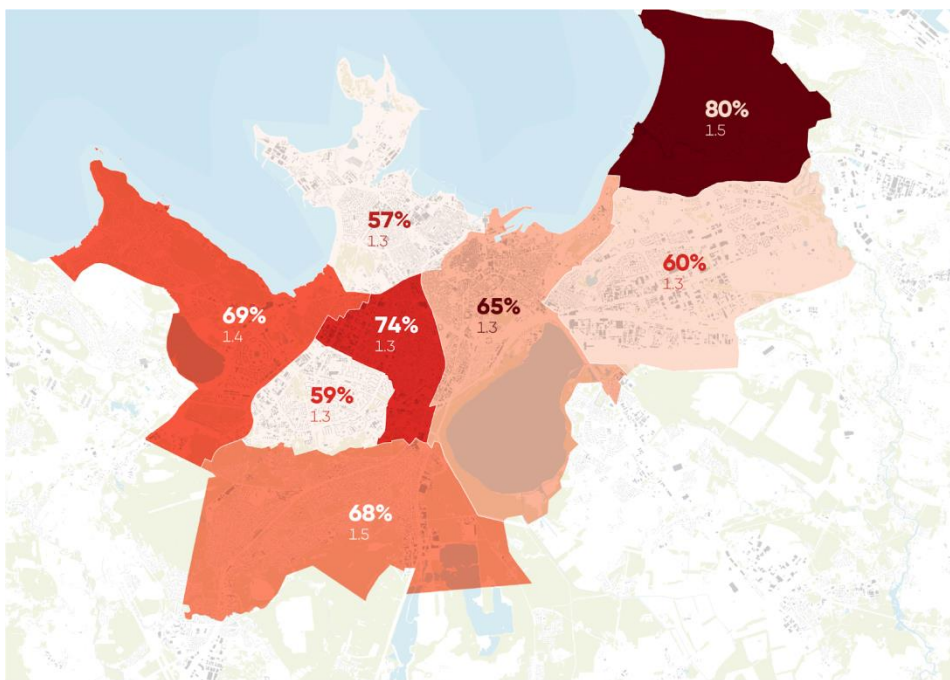


Figure 2.6. Presence of a car in the household (% of households with one or more cars in use) and average number of cars in the household by district of Tallinn. Source: Strategy on sustainable modes of travel in the Tallinn region 2035; Survey of modes of travel of people living in Tallinn 2015. EMOR

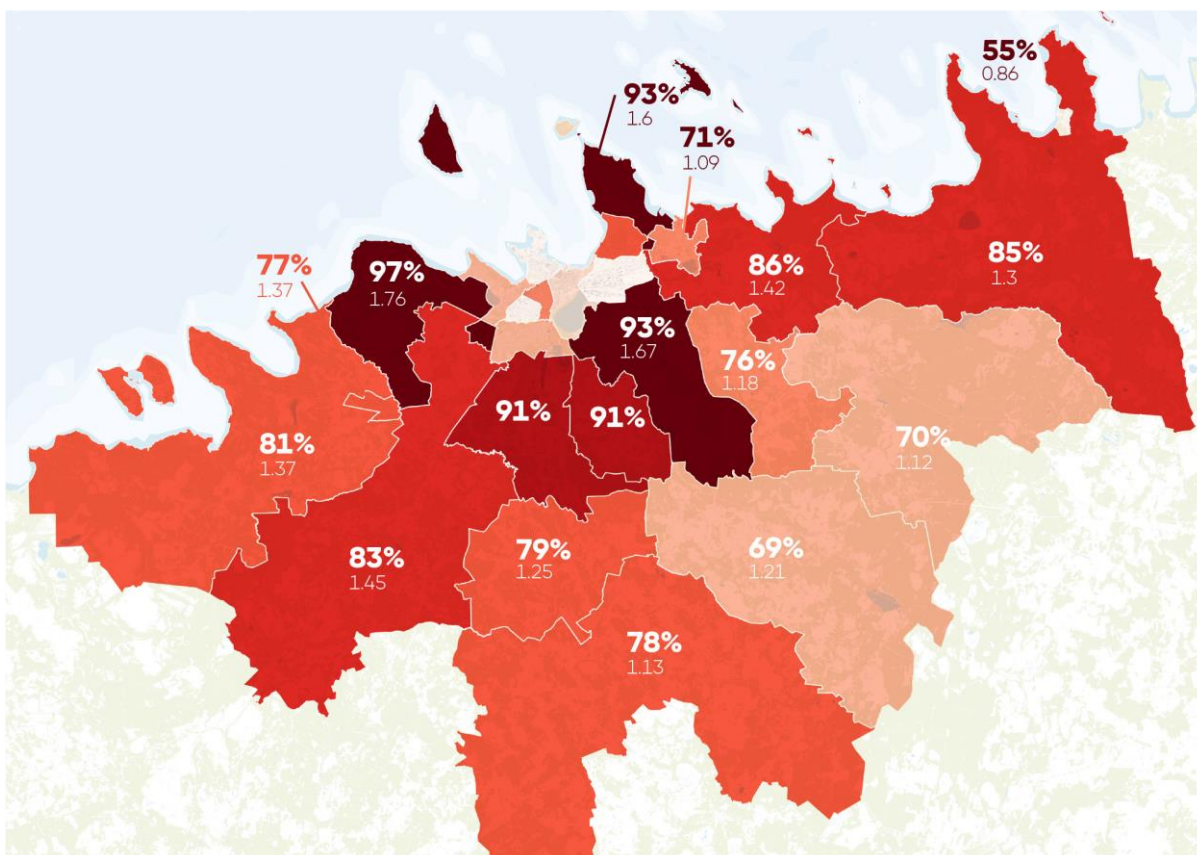


Figure 2.7. Presence of a car in the household (% of households with one or more cars in use) and average number of cars in the household in Harju County. Source. Strategy on sustainable modes of travel in the Tallinn region 2035; Survey of modes of travel of people living in Tallinn 2015. EMOR

2.3.10. Mobility expenses

Mobility expenses increase mainly due to increased time expenditure and lengthening of distances. This trend is especially noticeable for the employed living outside Tallinn, who amount to more than half of the commuters in the whole region. The development of public transport in recent decades has not been able to keep pace with rapid urban sprawl, which is why the rapidly growing commuting has become largely car-based. This has increased the traffic load in the region and, therefore, the average travel time for both drivers and public transport users. Without a drastic change in the region's modal share, the projected continued growth of the region's population and car use is likely to further increase mobility expenses in the future.

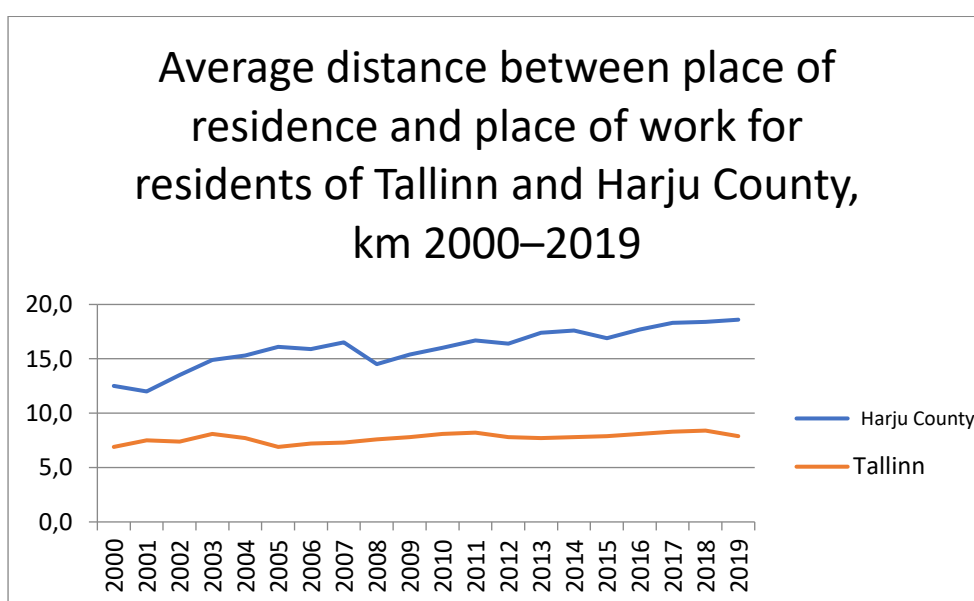


Figure 2.8. Average distance between place of residence and place of work for residents of Tallinn and Harju County from 2000–2019, km. Source. Statistics Estonia

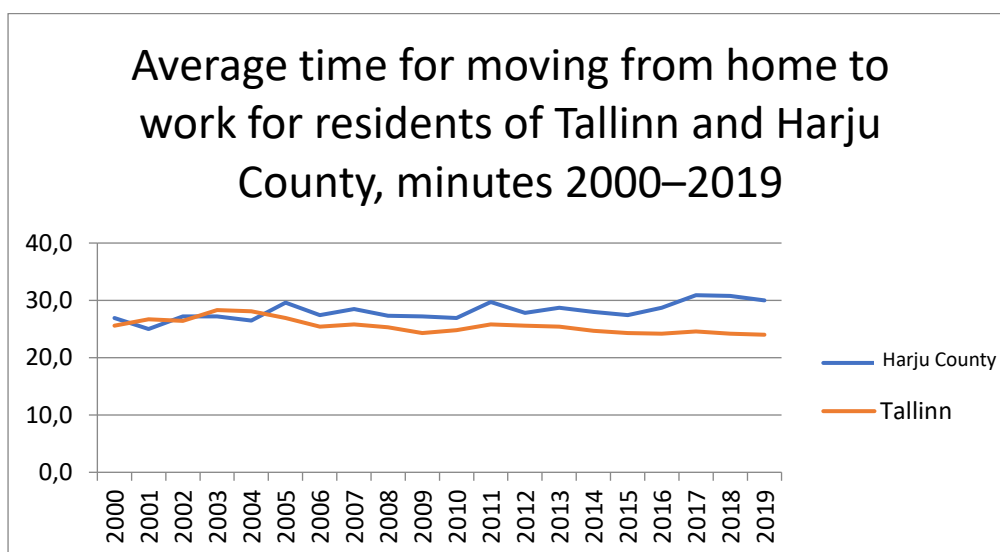


Figure 2.9. Average time for moving from home to work for residents of Tallinn and Harju County (in minutes) from 2000–2019 Source. Statistics Estonia

The problem of mobility poverty has also become increasingly relevant in the region. The relocation of industrial parks from Tallinn to areas poorly connected to public transport is forcing lower-income earners to increasingly rely on cars and incur additional costs. Across the entire region, the total annual cost of car use amounts to approximately EUR 1.4 billion (Tallinn Mobility Plan 2019).

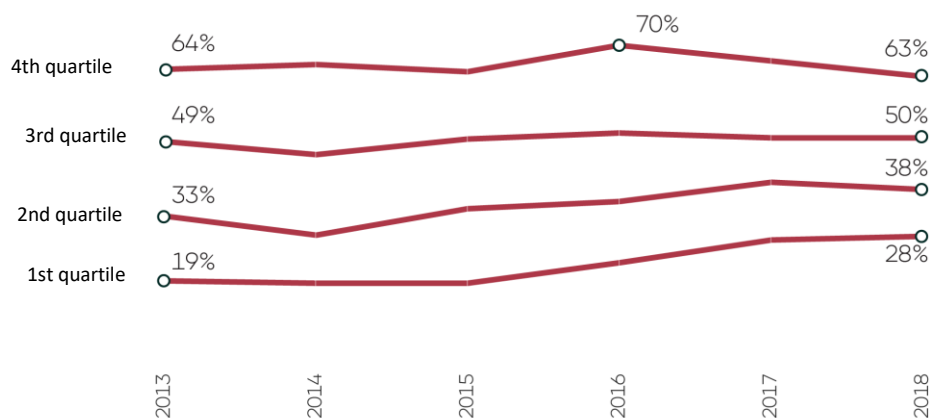


Figure 2.10. Distribution of Tallinn residents commuting by car by wage quartile. Source. Tallinn Region Urban Mobility Strategy 2035, Statistics Estonia

2.3.11. Image of public transport and active modes of travel

Various surveys conducted in Tallinn and Harju County indicate that, in general, satisfaction with public transport in the region is relatively high. People are the least satisfied with the frequency, routes, and transfer options offered by public transport. The latter problem is more acute for the residents of Harju County. Other important concerns for residents of Tallinn are vehicle hygiene and overcrowding. The most common barriers to the use of public transport are unsuitable routes, considerable time expenditure, inconvenience (more common in Tallinn), and poor transfer options (more common in Harju County).

The share of cycling in commuting in the Tallinn region is very small. The main reasons for not using bicycles are long distances (especially in Harju County), bad weather, time expenditure, and inconvenience. Incomplete and unsafe infrastructure is also an important barrier.

Walking is not considered separately here, as in the case of commuting, the distances and time spent walking are usually too great. However, walking conditions are important to increase the use of public transport and intermodal mobility solutions.

Among the residents of Harju County, women, middle-income people, and people who often visit Tallinn would be more likely to exchange cars for public transport or bicycles.

2.4. An analysis of the problems with the current mobility system from the perspective of commuting

2.4.1. Deficiencies in the regional (public) transport system

Due to the administrative division, public transport systems are fragmented, which has led to an illogical route network and an uneven level of mobility hubs in terms of multimodality. The construction of bicycle parking lots at bus and train stops takes place on a per project basis and requires an active and interested local government. A single mobility organisation or other model of cooperation across the region is needed to develop integrated solutions and harmonise standards. Similarly, cooperation between municipalities in land use planning should be intensified, which is currently producing solutions that promote car use. This issue would also benefit greatly from a regional mobility organisation. The network of cycle tracks is intermittent and does not connect logically across local government borders.

2.4.2. Most important connections in the region

The Tallinn border crossing points with the highest traffic density are on Pärnu Highway, Peterburi Road, and Tartu Highway. Most of the traffic on these routes is made up of commuters from Saue, Saku, Kiili, Rae, Jõelähtme, and Kose rural municipalities, and from the cities of Maardu and Keila. There are still a very large number of commuters coming from Viimsi and Harku rural municipalities, but the traffic flow from them is distributed across several routes (the largest connections are Paldiski Highway and Viimsi Road).

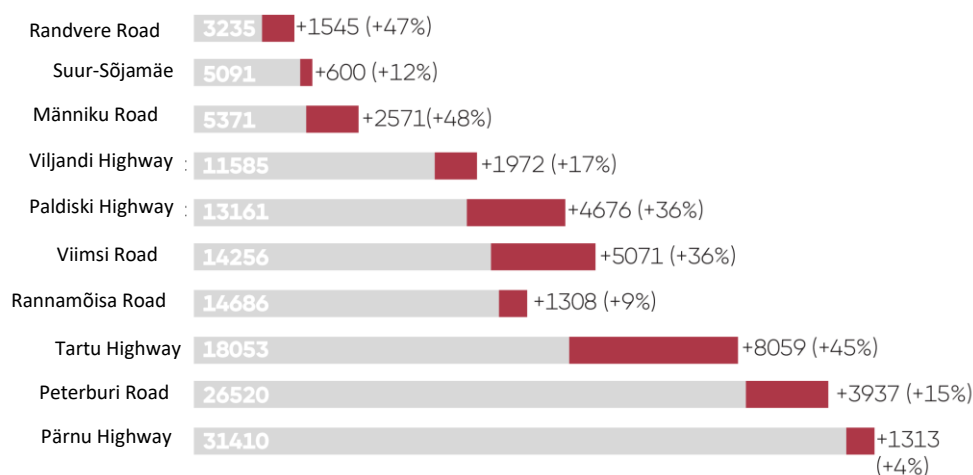


Figure 2.11. Change in traffic frequency on the border of Tallinn, 2012 and 2018. Source: Tallinn Region Urban Mobility Strategy 2035, Transport Administration

Of the largest starting points for commuting, the share of commuters is the lowest from Viimsi, Saku, and Kose rural municipalities (approximately 11% in all). Public transport also plays a

relatively small role in commuting from Harku Rural Municipality (14%), although the situation is slightly better in Rae Rural Municipality (20%) and Saue Rural Municipality (19%). The situation is best in Kiili (29%), Keila (26%), and Maardu (23%).

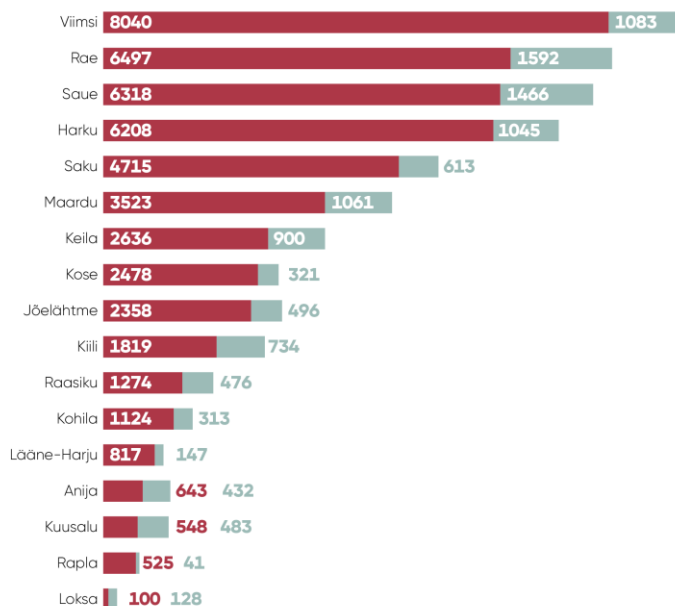


Figure 2.12. Number of commuters by car (red) and public transport (green) from Harju County's rural municipalities to Tallinn in 2017. Source: Tallinn Region Urban Mobility Strategy 2035, Kantar Emor 2017

2.4.3. Comparison of time expenditure of five commuting routes: car and public transport

Trip lengths and durations are measured using the Google Maps application during weekday peak hours.

- 1) Ülemiste City–Viimsi settlement centre
By car (distance 14.5 km): 22–40 minutes depending on traffic
By public transport: 56 min (one transfer)
- 2) Freedom Square–Jüri settlement (Rae Rural Municipality)
By car (distance 15.4 km): 20–40 minutes depending on traffic
By public transport: 33 minutes
- 3) Kristiine shopping centre–Saue settlement (Saue Rural Municipality)
By car (distance 19.8 km): 22–45 minutes
By public transport: 32 minutes (train)
- 4) Tallinn University of Technology – Tabasalu settlement (Harku Rural Municipality)
By car (distance 11.3 km): 18–30 minutes
By public transport: 28 minutes

5) Telliskivi Creative City–Saku settlement (Saku Rural Municipality)

By car (distance 18.3 km): 22–45 minutes

By public transport: 44 minutes

For these example routes, the car is generally faster, although in most cases public transport is more or less competitive in terms of trip duration. Compared to a car, it takes on average 10 minutes longer for residents of Tallinn and almost 20 minutes longer for residents of the rest of Harju County to travel to work by public transport. With these figures, it must be borne in mind that connections for current public transport users are likely to be better than for current car users, so in fact the time difference between car and public transport is greater, as people tend to use the car in areas with the poorest public transport connection.

2.4.4. Travel cost comparison: car and public transport

In Tallinn and Harju County, the average total cost of car use is EUR 0.3 per km (Tallinn Mobility Plan). It includes the purchase, leasing, fuel, repair, and other costs of the car. According to data from Statistics Estonia, the average distance from the place of residence to work in Tallinn, as of 2019, was 7.9 km, and 18.6 km elsewhere in Harju County. Therefore, travelling to work by car (one way) in Tallinn costs on average about EUR 2.40 and elsewhere in Harju County EUR 5.60.

City residents have a free right to travel on Tallinn routes. The ticket price for other passengers is EUR 1.50. On county routes in Harju County, the ticket price is between EUR 0.72 and EUR 1.60, depending on the payment method and the duration of the ride. A train ticket within the Tallinn region generally does not cost more than EUR 3. For most employed people in the region, commuting by public transport should be much cheaper than by car. Even when combining county routes or train and city routes, the total cost is likely to be lower than when using a car. Especially since these calculations only take into account the prices of a single ticket. When using a public transport ticket purchased for a longer period, it is even cheaper.

2.4.5. Public transport connections and service level in the region

Due to the urban sprawl that arose during the economic boom and the recent relocation of jobs to Tallinn's neighbouring rural municipalities, a settlement pattern has developed in the Tallinn region that does not favour the use of public transport in many places. The level of good public transport connections is not guaranteed in several densely populated areas (see Figures 2.12, 2.13, 2.14). An area with good public transport connections is considered to be an area at most 400 m from a public transport stop with an average of at least 10 departures per hour. The potential of train traffic, the stops of which are relatively sparsely populated, has been least exploited.

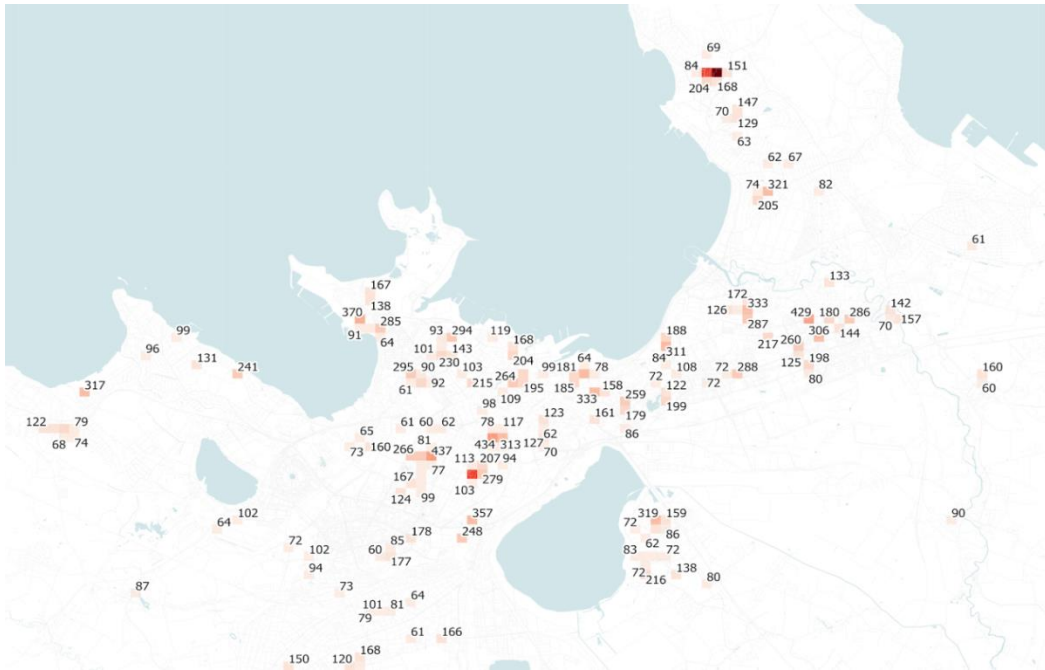


Figure 2.12. Number of housing units located in a poor public transport service area. Source: Tallinn Region Urban Mobility Strategy 2035, Raul Kalvo 2019.



Figure 2.13. Location of residence and level of public transport service, 2019 (red marks poor and green marks good public transport connections in terms of location of residential buildings). Source: Tallinn Region Urban Mobility Strategy 2035, Raul Kalvo 2019 (Land Board, Estonian Road Administration (GTFS), OpenStreetMap)

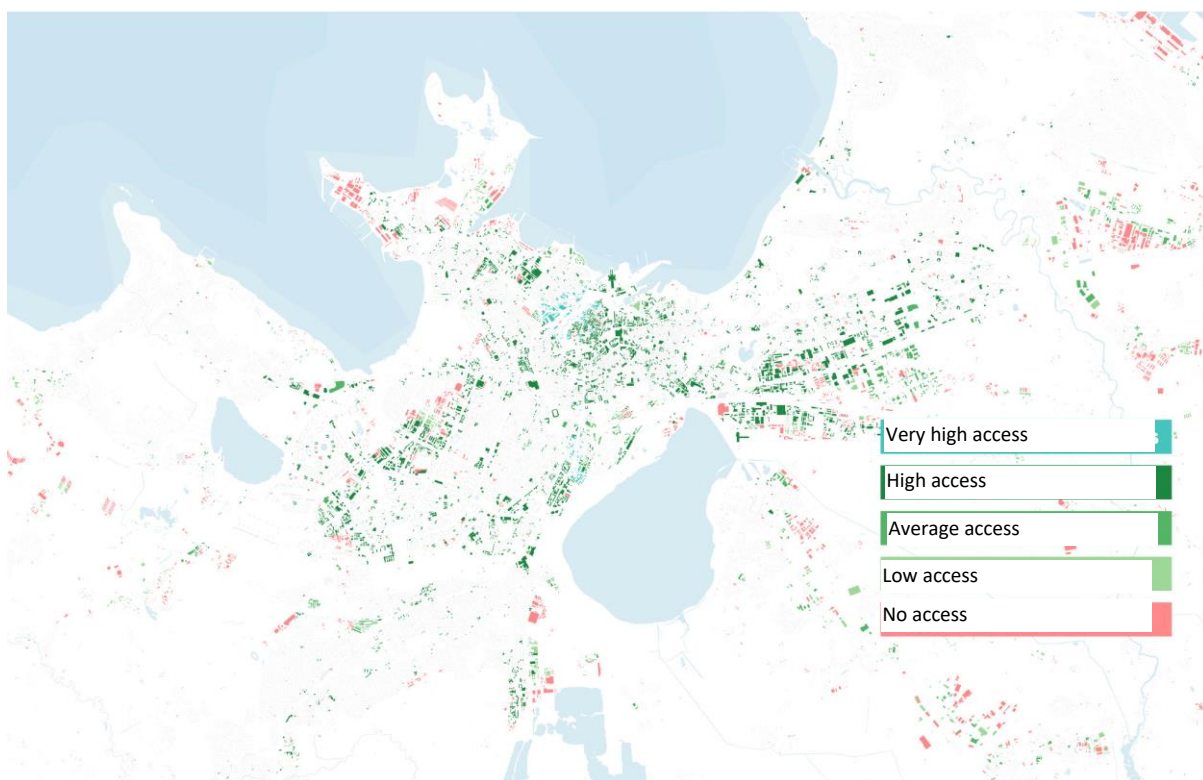


Figure 2.14. Location of companies and level of public transport service, 2019 (red marks poor and green marks good public transport connections in terms of location of workplaces). Source. Tallinn Region Urban Mobility Strategy 2035, Raul Kalvo 2019 (Land Board, Estonian Road Administration (GTFS), OpenStreetMap)

2.4.6. Accessibility of the bicycle network, public transport, and buildings

Accessibility is a metric indicating the number of jobs and various kinds of services available from a certain place during a certain period of time. It is measured by mode of travel and different service, for example, the accessibility of schools by bicycle in 20 minutes can be measured. In the Tallinn region, accessibility has been insufficiently measured. The only data on accessibility come from the accessibility study prepared as part of the SUMBA project, which, according to the authors, was not sufficient to carry out a thorough analysis. However, the study provided preliminary results from which to draw some conclusions.

Accessibility of public transport: the study measured the accessibility of public transport stops by foot and bicycle. These measurements were based on distance only, without taking into account the availability and/or condition of the infrastructure or the number of public transport lines passing through the stops. When only measuring the distance and taking all the stops into account, the accessibility of public transport in the Tallinn region by foot and bicycle is quite good (see Figure 2.15); however, when considering the condition of the infrastructure and the frequency of public transport connections, the situation is probably worse, especially in the case of bicycles, as the cycling infrastructure in the Tallinn region is generally insufficient and poorly designed.

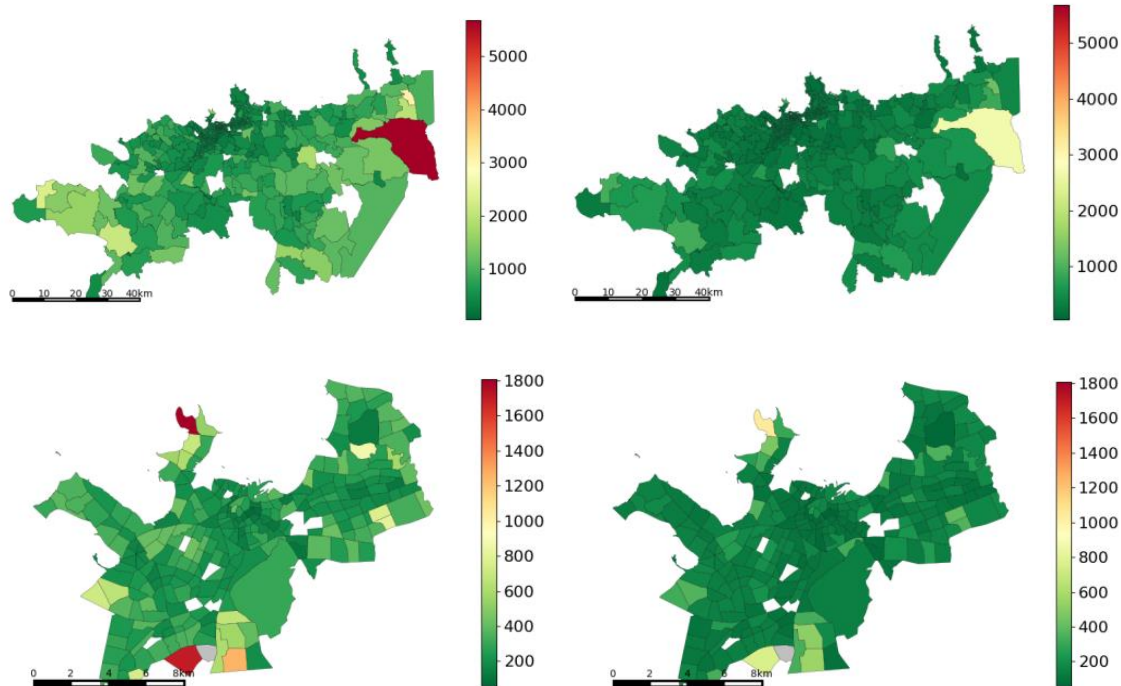
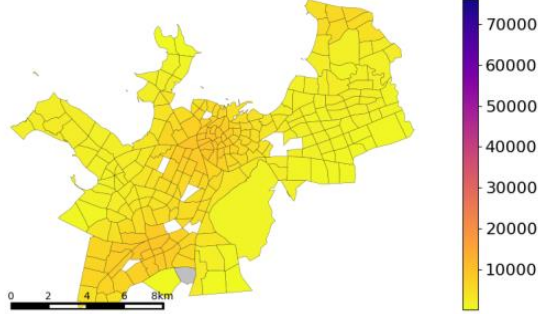


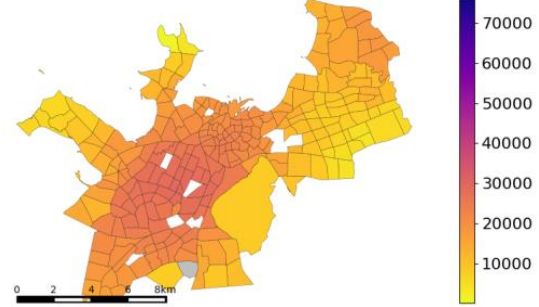
Figure 2.15. Average access time to the nearest public transport stop by walking (left) and cycling (right) in Tallinn (top) and Harju County (bottom). Source. SUMBA study 'Accessibilities in Tallinn/Estonia', Daniel Krajzewicz

Accessibility of buildings: the second measurement of accessibility was based on the number of buildings available in half an hour. Such a measurement does not provide much information on accessibility in absolute terms; however, it does allow for a comparison of different transport modes. The study found that within a period of 30 minutes, the number of buildings accessible by bicycle is much higher than by public transport or by foot. Again, only distances are taken into account here, not real infrastructure, so the actual accessibility by bicycle is probably a bit worse. However, this shows that the distances in Tallinn are short enough to ride a bicycle and that public transport in the Tallinn region is currently too slow to be competitive with cycling, let alone car use (the measurements of car use in the study were too inaccurate to compare them with other indicators).

number of accessible building in 1800s when walking



number of accessible building in 1800s when bicycling



number of accessible building in 1800s when using the pt

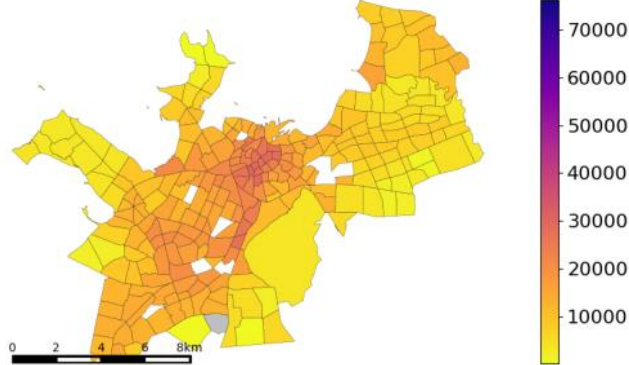
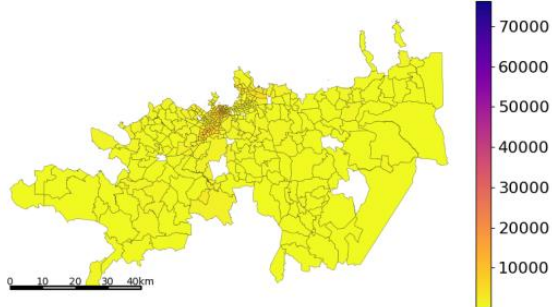
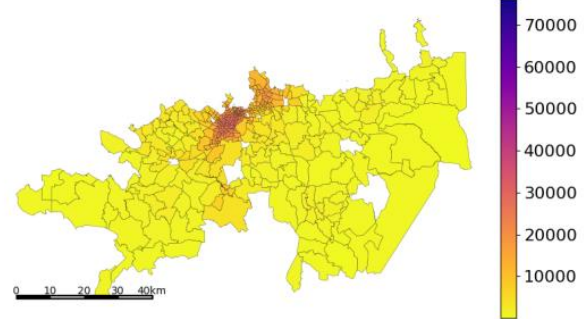


Figure 2.16. Number of buildings accessible within 30 minutes in Tallinn by foot (top left), by bicycle (top right), and by public transport (below)

number of accessible building in 1800s when walking



number of accessible building in 1800s when bicycling



number of accessible building in 1800s when using the pt

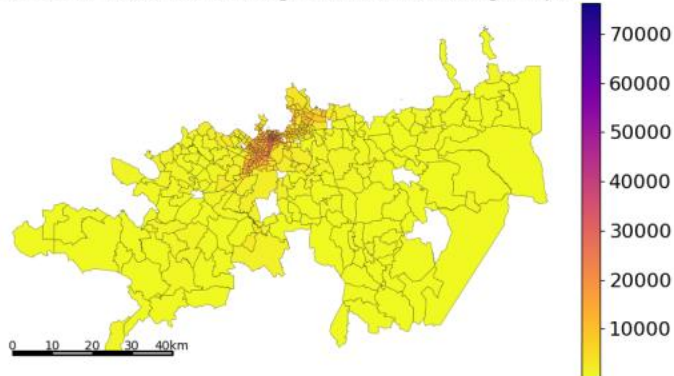


Figure 2.16. Number of buildings accessible within 30 minutes in Harju County by foot (top left), by bicycle (top right), and by public transport (below).

2.5. Impact of COVID-19 on regional mobility

The COVID-19 epidemic has significantly affected mobility in the Tallinn region and its effects may be long-lasting. Although no large-scale mobility studies have been carried out in the region since the first outbreak of the coronavirus, it is known that the spread of the coronavirus has reduced public transport use and increased car use, at least as a proportion of all movements if not in absolute terms. This trend is concerning because, although the immediate effects of the virus are temporary, it may be difficult to change developed habits at a later stage. Therefore, the recovery of the number of public transport users following the coronavirus epidemic must be monitored. In all likelihood, it will not automatically return to its previous level, so it would be useful to use communication and other measures to contribute to recovering the number of public transport users.

For public transport, the time of the coronavirus is a serious challenge, as ticket revenues are significantly reduced, while the spread of the virus places additional demands on the service standard of public transport services (e.g. disinfection), which in turn increases costs. These developments may put downward pressure on the level of public transport services, which must be resisted and, if necessary, temporary additional funding for public transport must be ensured.

In many regions of the world, wider pavements and new temporary cycling infrastructure have been built to adapt to the coronavirus epidemic, as well as other measures to encourage the use of active modes of transport. This allows former public transport users to avoid using a car, spares the mental health of residents in isolation, and also promotes a change in transport habits among car users. Unfortunately, so far (January 2021) no similar measures have been implemented in the Tallinn region. However, this should definitely be done in the near future, as such measures will help reduce the negative impact of the coronavirus on achieving sustainable mobility goals.

3. Recommendations

3.1. Vision

In the Tallinn-Harju region, the necessary services are easily accessible to people. This is ensured, on the one hand, by an exemplary cross-border public transport system with cycling and walking infrastructure and, on the other hand, by land use, which has brought the spatial development of the region closer to existing urban settlements and public transport routes. As a result of these developments, people have started to use sustainable transport modes much more for their daily trips, and car use has decreased significantly. Longer distances are mostly covered by public transport, shorter ones by foot or bicycle. Combining bicycle and public transport on the same route is also very common. As a result, Tallinn, in cooperation with the

surrounding settlements, provides residents with an excellent urban environment where the interests of pedestrians and cyclists are clearly prioritised.

Vision goals:

1. By 2025, at least 50% of daily trips in the Tallinn city region will be done by public transport, by foot or by bicycle. This figure will rise to at least 70% by 2035.
2. According to the Covenant of Mayors, greenhouse gas emissions from transport in the Tallinn region will decrease by 40% compared to 2007, i.e., the CO₂ emissions of the city of Tallinn will be a maximum of 550,000 tonnes in 2025 and 390,000 tonnes in 2030. The combined CO₂ emissions of Tallinn and Harju County in 2035 will amount to a maximum of 930,000 tonnes.
3. The Tallinn region is covered by an excellent public transport network. This means, among other things, a single regional ticketing system and integrated route network, as well as a network of convenient mobility hubs.
4. Networks of pavements and cycle paths with good coverage have been built both within the city and across municipal boundaries.
5. Pavements, public transport stops, and the main bicycle network are accessible to everyone (including the elderly and, in the case of pavements and public transport stops, to the disabled) throughout the year, and 90% of schoolchildren can make their daily movements independently.
6. Convenient mobility services have been developed and are widely used in the Tallinn region, simplifying the combination of different modes of transport on a single route. The most popular of these are the bicycle sharing service covering the entire region and the multimodal travel planner.

The commuting roadmap presented in this document provides input to relevant institutions to shape transport policy in the coming years, starting with the commuting action plan accompanying the roadmap, which sets out the first agreed steps in realising the vision of the roadmap.

3.2. Mobility scenarios for the Tallinn region by 2035

The following describes three future scenarios adapted from the Tallinn Mobility Plan, which help to assess the impact of the activities presented in this roadmap on the mobility of the region. The scenarios only include commuting to and from work as the main drivers of mobility demand during peak hours. The 'Samal kursil' ('On the Same Course') baseline scenario assumes the continuation of the current trends. In the alternative scenarios, the final states of the region by 2035 were determined through key indicators of mobility and transport policy (back-casting methodology). 'Tallinna liikuvus ++' ('Tallinn Mobility ++') is based on the vision goals established in the Mobility Plan (and as adapted in this roadmap), while 'Tallinna ühistransport +' ('Tallinn Public Transport +') sets slightly less ambitious targets.

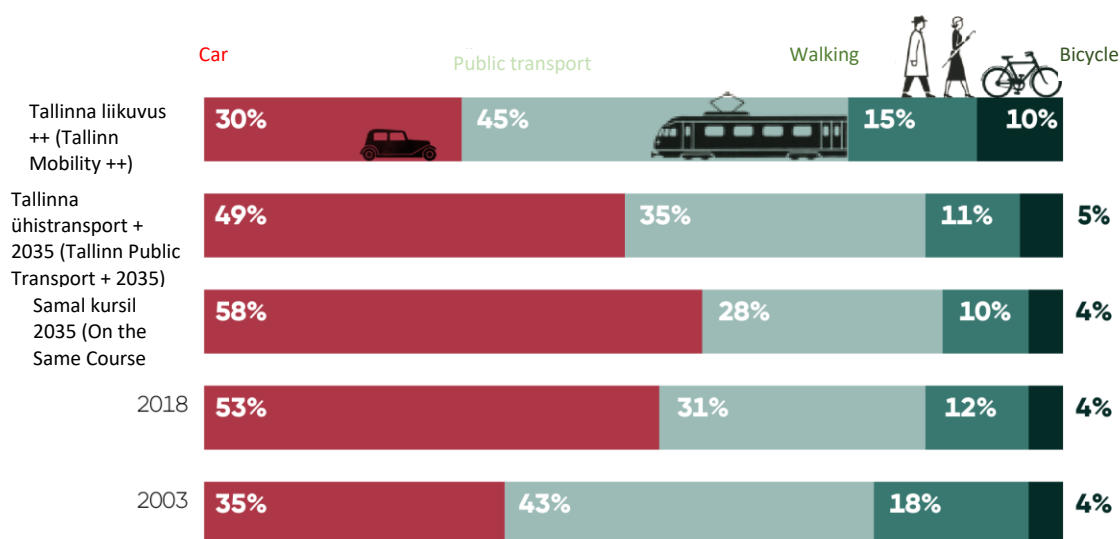


Figure 3. The main transport mode for travelling to work in Tallinn and Harju County in 2003 and 2018, and in 2035 in the event of different scenarios. Source: Tallinn Region Urban Mobility Strategy 2035, Statistics Estonia

3.2.1. Scenario 1: ‘Samal kursil’ (‘On the Same Course’)

The growing population and income in the region, together with the current settlement pattern and infrastructure solutions, will ensure the continued growth of car traffic. The number of cars per 1000 people will increase from the current 450 cars to 550 cars, and the total number of cars in the region will, therefore, increase by up to 100,000 vehicles. This trend is being responded to by expanding car infrastructure, and one way to cover the growing investments is to borrow funds. Increasing car use precludes a reduction in greenhouse gas emissions from transport in the region. Traffic noise is increasing and sedentary lifestyles are intensifying, and the increasingly stringent targets for improving ambient air quality and reducing greenhouse gas emissions are not being met. Due to transport in the Tallinn region, it may be necessary to purchase additional CO₂ emission quotas, depending on the price of the quota, in the amount of EUR 15–25 million per year.

Growing congestion increases travel time and reduces the competitiveness of public transport. Public transport management continues to be largely uncoordinated in several parts of the region. The independent movement of children and the elderly is declining, and public transport is mainly used by students, pensioners, and the unemployed. The number of intermodal movements remains low due to the lack of convenient mobility hubs and integrated transport systems. The number of users of short-term rental of scooters and cars is growing, but in other respects mobility services remain undeveloped. New developments will continue in areas with poor public transport connections.

3.2.2. Scenario 2: 'Tallinna ühistransport +' ('Tallinn Public Transport +')

In this scenario, the establishment of suitable infrastructure for cars will be continued, and in addition to this, more will be invested in the development of public transport. Car traffic continues to grow, increasing congestion and the time spent using cars in the region. Investments in public transport will increase the average speed of public transport and slow down the growth of car traffic by keeping the peak traffic load at the current level. The number of cars in the region will increase to about 500 vehicles per 1000 people and will start to decrease in the long run.

The number of trips made by public transport will increase by 25%. There will be investments in the new (tram) connections and connection speeds. Thanks to the improvement of connection speeds, movement within the City Centre and the number of commuters from Harju County to Tallinn by public transport is growing rapidly. To facilitate commuting, a single ticketing system and route network and mobility services will be set up in the region. The network of convenient mobility hubs to be built will make intermodality more attractive. High-quality pavements and cycle networks will also be built around public transport stops, further promoting intermodality.

Land use planning continues without coordination with transport system planning. At the same time, the market is, to some extent, directing new developments close to existing good public transport connections.

Compared to the baseline scenario, society's mobility costs could be reduced by 15% (by EUR 300 million per year). However, passenger car costs would increase by 25% in the region. CO₂ emissions could be reduced compared to the current levels, but additional allowances are still expected to be purchased for around EUR 16 million per year.

3.2.3. Scenario 3: 'Tallinna liikuvus ++' ('Tallinn Mobility ++')

In this scenario, car traffic will continue to grow more slowly until 2025. After that, the proportion of public transport and cycling starts to increase, while vehicle mileage decreases by 10%. By 2035, there will be 360 cars per 1000 people in the Tallinn region. Investments in the development of sustainable transport modes and appropriate land use planning create a situation where 70% of the region's inhabitants walk, cycle, or use public transport for their daily trips. Various combinations of these transport modes are also popular in commuting.

Mobility planning and investments will focus on creating suitable conditions (including infrastructure) for public transport, cycling, and walking. A safe and attractive network of cycle paths will be built, which can be used comfortably and safely by both 8- and 80-year-olds. Pavements and cycle paths are well maintained throughout the year.

A unified zone-based ticketing system and integrated route network will be established in the region, and all public transport services will be planned and financed jointly in the region. Tram lines connecting Tallinn's neighbouring rural municipalities will be built, and a network of mobility hubs will be built for convenient transfers. The mobility hubs also bring together mobility services that are uniformly organised in the region, the most important of which is the bike share service covering the entire region.

New developments, jobs, and institutions will be built in areas with excellent public transport and cycling connections. With the growing attractiveness of public transport and cycling throughout the region, there is also a growing demand for such land use.

Instead of fuel excise duty, a differentiated approach to car taxation is applied: peak hours, CO₂, and parking charges are applied to cover the maintenance costs of existing high-quality infrastructure. In addition, there is a systematic use of traffic calming measures in urban settlements.

In this scenario, expenditure on movements would decrease from the current EUR 1.78 billion per year to EUR 1.68 billion at current prices. Expenses related to passenger cars of the Tallinn and Harju County residents and companies would decrease by 10%, i.e., by EUR 149 million per year compared to the baseline scenario. Investment and repair costs for streets and roads are 35% lower than in the baseline scenario. Traffic noise is reduced and people's physical activity increases. Emissions of CO₂ and other pollutants from transport in the Tallinn region will decrease and Tallinn will become the seller of the CO₂ quota.

3.3. Priority areas

In the following sections nine priority areas are outlined that should be actively addressed in order to achieve the goals set forth in the vision. Under each priority area there are goals and detailed measures to achieve the goals. It is important to note here that the priority areas are not separate, but closely interlinked parts of a comprehensive regional mobility solution. The impact of activities in these areas will be much greater if they are coordinated with activities in other areas. For example, effective communication helps to increase the impact of the construction of the main network of cycle paths on modal share. Similarly, it is much easier to promote intermodality if attractive mobility services are introduced.

The integrated regional mobility solution described in this document approaches the problem of sustainable commuting from two angles: on the one hand, the use of sustainable modes of travel is encouraged, and on the other hand, car use is discouraged. When approaching from both ends, the main emphasis is on changing people's mobility behaviour indirectly, through the established urban environment and other conditions. This means that sustainable modes of travel will be promoted through the development of safe, comfortable, fast, and flexible

mobility solutions, while car use will be discouraged mainly by removing the privileges and conveniences previously offered to car use. In both cases, the broader lifestyles and needs of the population must be considered: the mobility solutions that are created should not address mobility in a vacuum, but should take into account the links between mobility preferences and other aspects of life. For example, land use measures can play a key role in reducing car dependency by creating an urban structure in which important sites and services are sufficiently close to each other. Similarly, the physical calming of car traffic contributes to the independent movement of children, which reduces the need for parents to use a car. This document focuses on the intersections and interactions between different areas in order to emphasise the integrity of the region's mobility solution.

The priority areas are the following:

1. Infrastructure
2. Organisation of sustainable cross-border mobility
3. Intermodality
4. Mobility services
5. Collection and analysis of mobility data
6. Alternative fuels
7. Integration of land use and mobility planning
8. Reduction of car use
9. Communication

3.3.1. Infrastructure

3.3.1.1. *New light rail connections between commuting destinations*

This goal contributes to the development of the comprehensive regional public transport network established in the document's vision and to the reduction of CO₂ emissions from transport. In the long run, the tram network forms the backbone of the region's mobility solution, enabling fast movement between different parts of the region and connecting Tallinn with the surrounding rural municipalities to form one unified urban region. The tram network has an especially large role to play in ensuring sustainable cross-border commuting. At the moment, tram lines run only in a rather limited area within Tallinn, although the recent extension to the airport is a step towards increasing their relevance for cross-border commuting.

The feasibility and cost-benefit analysis of light rail transport in Tallinn and Harju County, which was completed in 2019 (<https://www.hol.ee/docs/file/KRT%20L%c3%b5ppraport.pdf>), presents a vision of the region's comprehensive route network, demonstrates its socio-economic profitability and outlines the most important additions to the tram network for commuting. There are five stages in total.

The first stage most importantly includes the construction of tram routes along Sõle Street and Laagna Road, as well as between the Airport and Peetri Village. In addition, it would be necessary to increase train traffic along the Baltic Station and Vesse section and to build a joint Kristiine terminal.

The focus of the second stage is on the construction of north-eastern routes, including the connection of Viimsi to the City Centre. This will be accompanied by the establishment of the Kristiine-Mustamäe connection.

The third stage envisages connecting Tabasalu and Õismäe with Kristiine and Mustamäe, together with important shorter routes in North Tallinn.

The central part of the fourth stage is the extension of the Peetri route to Jüri, the establishment of a direct connection from Ülemiste to Mustamäe, and the reconstruction of the Bekker railway.

The fifth stage includes the extension of the Laagna Road route to Maardu, the extension of the Pärnu Highway route and a shorter section on the Peterburi Road to connect the existing and perspective routes.

Given the large share of the regions to be connected in commuting (see above) and the central role of the tram network in the region's mobility solution, investment in the development of the tram network is of particular strategic importance.

Measures:

- 1) Preparation of a roadmap for the implementation of the stages presented in the light rail transport study (link above). Although the stages and the general location of the routes have been presented in the afore-mentioned study, in order to implement them, a number of planning tasks and agreements between the parties still need to be carried out. An easy-to-follow roadmap should be drawn up to map and schedule these works, setting out, among other things, the roles and responsibilities of the parties. The preparation of the roadmap includes, among other things, the designation of transport nodes and the adoption of detailed route decisions, which should involve all relevant parties: the main transport organisers, infrastructure owners, the Ministry of Economic Affairs and Communications, and local governments (see also the feasibility and cost-benefit analysis of light rail transport in Tallinn and Harju County (hereinafter 'KRT analysis')).
- 2) Spatial analysis of the routes proposed in the light rail transport study. This activity would establish the location of tramways in the street space and provide an overview of the various preliminary works, traffic management changes, and other aspects that would be needed to build a tram line in specific street corridors. The activity is an important intermediate stage before the construction of tramways.
- 3) Implementation of the stages presented in the light rail transport study. This is the most important measure under this objective, without which the rest will largely lose its meaning (see also KRT analysis).

- 4) Increasing train traffic between the Baltic Station and Vesse. This measure would have a significant impact even without the previous measure, as the route already has a high demand for passengers and passes through the developing Ülemiste region. However, the impact of this measure would also be much greater with the construction of the first stage, as in this case the routes to be developed would be mutually supportive. Well suited for the first activity of the first stage (see also KRT analysis).
- 5) Increasing the average speed of trams operating on the route from the City Centre to the Airport to at least 20 km/h using the measures provided in the light rail transport study, such as priority systems at junctions, optimisation of stops, and removing ticket sales from the tram. Precondition for the construction of the first stage (see also KRT analysis).
- 6) Construction of the planned Old City Harbour tram line. Important for establishing intra-urban connections. Precondition for the construction of the first stage (see also KRT analysis).
- 7) Wider use of priority public transport systems at traffic junctions on high-traffic public transport routes. This measure will make it possible to increase the speed of tram lines in the city, which is important for the development of competitive commuting routes. Depending on the context, all the solutions identified in the light rail transport study are potentially acceptable (see also KRT analysis).
- 8) Procurement of trams with double doors. In the event of procuring new trams, this measure would increase the average speed of trams. In order to use such trams, it is necessary to build a platform on both sides of the tram at the stops (see also KRT analysis).
- 9) Increasing the physical speed of trams on new routes. On new routes, the curve radii should be maximised to allow maximum speeds. Details are provided in the light rail transport study (see also KRT analysis).
- 10) Tram track gauge analysis. It is necessary to analyse whether it would be financially feasible to build new lines and convert existing ones to be compliant with 1435 mm gauge trams (see also KRT analysis).
- 11) Initiation of a special plan for the Tallinn ring railway. The ring railway would offer new opportunities for both freight transport and connecting the area surrounding Tallinn with the city. The ring railway would also connect Paldiski, Keila, and Saue rural municipalities to the mobility centre in Ülemiste. The construction of the route should be coordinated with the construction of Rail Baltic, in order to take into account the crossing of routes. The Union of Harju County Municipalities has submitted an application for a special state plan, which would set out a more detailed action plan and schedule for the project (see also the National Transport and Mobility Development Plan for 2021–2035).

3.3.1.2. *Upgraded public transport stops*

In addition to improving the quality of transport services, a comprehensive understanding of the nature and design of stops is also very important in promoting the use of public transport. A study titled 'Increasing the attractiveness of the network of multimodal public transport

stops and transfer nodes in Tallinn and Harju County and developing service standards' (SPIN Unit and Demos Helsinki 2020) carried out under the SUMBA project identified four aspects that should be taken into account when setting up public transport stops.

- Firstly, the stops should support a multimodal mobility solution for the region. This means concentrating the various mobility services at the stops and designing the public transport timetables and the route network in such a way as to allow fast, flexible, and spontaneous use of the routes.
- Secondly, stops need to be seen in a broader spatial context. Land use measures must ensure that there is the best possible overlap between the locations of stops and mobility demand. Physical and cognitive accessibility of stops for all groups in society should also be ensured.
- Thirdly, additional services (such as parcel machines, kiosks, mobility services) should be provided at stops in order to make the use of public transport and waiting at stops practical and pleasant. Services should be developed and provided in partnership with the private sector.
- Fourthly, a very good design of the stops should be ensured, both in terms of aesthetics and functionality. This is necessary to turn stops into hubs where people are comfortable and safe and where activities are supported by the necessary available information.

For more on the first two aspects, see more in the following paragraphs.

Based on these four aspects, the study has developed a quality standard for stops, which provides for two quality levels – standard and premium – and three sizes (S, M, L). The standard solution includes a shelter, lighting for the stop and its surroundings, route information, and a short-term bicycle parking option. The premium solution includes a covered bicycle parking lot, mobile phone charging option, special architecture, additional services, and many other elements. The detailed content of the quality standard is available in the provided study report.

The proposed quality standard is based on the share of public transport in the modal share of the region when determining the quality level of the stop: the standard level is used at stops in areas with a high share of public transport and the premium level in areas with a low share of public transport. In this way, the premium quality level should make the use of public transport more attractive to current car users.

The design of public transport stops is important because it significantly determines the user experience of passengers, which is especially important for influencing people's mobility preferences, as people's decision-making process is not completely rational, emotions and personal experiences also play a big role in this.

Measures:

- 1) Determination of the desired quality level of public transport stops in the Tallinn region. The necessary analysis has already been carried out in the afore-mentioned study, now it

is necessary to map all the stops based on it and integrate this knowledge into transport planning (see also 'Increasing the attractiveness of the network of multimodal public transport stops and transfer nodes in Tallinn and Harju County and developing service standards' (hereinafter 'stop analysis')).

- 2) Creating a modular stop design that allows one to easily vary the size of the stops according to potential demand (see also the stop analysis).
- 3) Development of the concept of a package of additional services for stops in cooperation with the private sector. Location-specific services can also be added to the universal package at specific stops (see also the stop analysis).
- 4) Upgrading of public transport stops according to the quality level map. It should start with the stops with the highest untapped potential (see also the stop analysis).
- 5) Ensuring accessibility for cyclists and pedestrians at stops. This means establishing comfortable and safe connections between stops and nearby homes and institutions (see also the stop analysis; strategy on sustainable modes of travel in the Tallinn region 2035 (hereinafter 'SUMP')).

3.3.1.3. *Comprehensive network of cycle tracks*

The bicycle is currently a clearly underused means of transport for commuting in the region, especially in a changed mobility situation caused by the COVID-19 pandemic. Due to the high risk of infection in public transport, many people have to change their mode of travel. Increased car use would clog city streets, making cycling or walking the only positive alternatives. In the case of commuting, shorter routes are more likely to be cycled, although the distance people are willing to cycle is constantly increasing with the growing popularity of electric bicycles. For longer distances, cycling can be combined with public transport or driving (for the so-called 'park and pedal' solutions) to facilitate movement between the stop and the destination. Above all, however, there is a need to build road infrastructure suitable for commuters. This is necessary both within the city and across municipal borders. At present, both types of road infrastructure are deficient and do not favour the use of bicycles for commuting. In addition to bicycles, other micro-mobile modes of travel need to be addressed. Electric scooters, skateboards, hoverboards, and similar means of transport are becoming increasingly popular, which poses a number of challenges for urban mobility planning. The most difficult of these is related to the location of such vehicles in the street space. As the infrastructure needs of electric scooters and similar devices sometimes differ significantly from those of traditional modes of travel, it is difficult to accommodate them on existing types of infrastructure: roadways are dangerous for scooter users, while on pavements they are a danger to pedestrians. A network of cycle paths that are physically separated from other traffic may be the most suitable for any micro-mobile vehicle, but further research and analysis is needed to determine this.

Measures:

- 1) Construction of the main network of cycle tracks in Tallinn in accordance with the Tallinn bicycle strategy. It is important to ensure the design quality of the infrastructure built and its suitability for the traffic context in accordance with the instructions given in the cycling strategy (see also Tallinn SUMP).
- 2) Construction of cycle tracks between Tallinn and nearby settlements. Cycle tracks should extend at least 10 km in each direction, depending on the distance between the locations. Cycle paths for cross-border commuting should be well connected to the urban core network.
- 3) Establishment of a network of cycle paths in all settlements of the region. Even if the location is too far from Tallinn for most people to cover the entire distance by bicycle, local cycle paths are important to allow cycling to be combined with public transport. A roadway can also be considered suitable for cyclists if car traffic is sufficiently sparse and physically calmed.
- 4) Ensuring the accessibility and usability of cycle paths for both 8- and 80-year-olds. This includes, among other things, the design of a physical space to mitigate the risks in order to take into account the different reaction speeds of riders of different ages and their ability to assess speeds (see also Tallinn SUMP).
- 5) Improvement of winter maintenance standards for cycle tracks. At the moment, the cycle tracks are very poorly maintained in winter. The level of maintenance should generally be raised and priority should be given to maintaining the main cycle paths in very good condition throughout the year (see also Tallinn SUMP).
- 6) Preparation of infrastructure needs analysis for innovative micro-mobile vehicles. This analysis should find the best location in the street space for safe use of electric scooters and other electric light vehicles, as well as the necessary road surface, speed, and other conditions. If significant additional investments are needed, their socio-economic viability should also be assessed. For example, it may turn out that the paving of cycle paths needs to be renewed much more frequently due to the small wheels of scooters.

3.3.1.4. *Exemplary pedestrian infrastructure*

Walking, as the most space-efficient mode of travel, is extremely important for the mobility of every urban region, especially after the COVID-19 pandemic. Pedestrians are able to relate to the greatest extent with the space and people around them. Therefore, good walking conditions are a prerequisite for lively streets, the success of local businesses, social cohesion in society, and space-efficient mobility. In addition, good walking conditions are necessary to ensure the availability of public transport. To make the most of the potential of walking, it is necessary to create comfortable, accessible, and attractive pedestrian routes.

Measures:

- 1) Construction of pavements in suburban settlements. While pavements exist in most areas of Tallinn, they are often lacking in suburban settlements. They need to be built so that residents can move safely between homes, services, and public transport stops.
- 2) When planning land use, it is necessary to apply the requirement to build service and commercial premises on the first floor more extensively. In addition to reducing daily trip distances, this measure would also make the walking experience more intense and thus more attractive.
- 3) Ensuring accessibility for both 8- and 80-year-olds. When planning a walking space, it is also necessary to make sure that it is suitable for users of all ages and abilities. This means, among other things, avoiding unnecessary stairs, extending pedestrian traffic light cycles, and providing enough space for playing and running (see also Tallinn SUMP).
- 4) Excellent year-round maintenance of pavements. In Estonian weather conditions, the most important period for maintenance of pavements is winter, but also autumn, in order to prevent falling due to slipperiness. Maintenance priorities should be established according to the pavements' intensity of use for both mobility and as public space. For this purpose, it is good to use the map of Tallinn street types completed in 2019 as part of the CREATE project (see also Tallinn SUMP).

3.3.2. Organisation of sustainable cross-border mobility

3.3.2.1. Regionally integrated mobility management and planning

The current mobility management in the Tallinn-Harju region is fragmented by municipal borders and departmental silos. The problem is most acute in the field of public transport, where there is a lack of coordination between the various modes of public transport to ensure that users can travel easily and smoothly across municipal borders. This is reflected in the non-harmonised route network and the different ticketing systems. Similarly, other modes of travel should be considered holistically in the region, so that users can move smoothly throughout the region. In addition, it is important to plan the different modes of travel in a coordinated manner, so that they complement each other and promote intermodality. The establishment of regional governance structures should take place in coordination with the national restructuring planned in the new National Transport and Mobility Development Plan.

Measures:

- 1) Development and implementation of a regional cooperation model that would allow the integration of the management and financing of all public transport systems in the region. This measure should be one of the highest mobility priorities in the region, as it creates the preconditions for the implementation of many further measures and the creation of a comprehensive mobility solution in the region (see also Tallinn SUMP; the National Transport and Mobility Development Plan; Tallinn Development Strategy 'Tallinn 2035' (hereinafter 'Tallinn 2035')).

3.3.2.2. *Integrated public transport network and zone based ticketing system*

Public transport is the most important means of transport in sustainable cross-border commuting, as it allows people to travel long distances, which is typical of cross-border commuting. It is therefore particularly important that the public transport system meets the needs of commuters. In the Tallinn region, the fulfilment of this goal is most significantly hindered by the lack of a unified route network and ticketing system. This reduces the convenience, affordability, speed, and ease of travelling across municipal borders. A necessary or at least significantly favourable precondition for all of the following measures is the implementation of a regional public transport cooperation model. The establishment of an integrated regional route network and ticketing system should be coordinated with the national ticketing system and route network planned under the National Transport and Mobility Development Plan.

Measures:

- 1) Conduction of the analysis of the regional route network. This analysis is already under way as part of the process of drawing up the national transport development plan (see also SUMP).
- 2) Adaptation of different line networks into one whole based on the results of line network analysis (see also SUMP; the National Transport and Mobility Development Plan).
- 3) Based on the results of the route network analysis, construction of public transport hubs at key nodes to allow convenient and smooth connections (see also SUMP).
- 4) Extension of the Tallinn public transport card system to regional commercial bus lines. It is currently the only mode of public transport in the region that does not have a uniform payment method for the region (see also SUMP).
- 5) Implementation of a single ticketing system for all modes of public transport. It includes both a time-limited individual ticket and a longer period ticket. As the same payment method exists in most regional modes of public transport, the implementation of a single ticketing system is no longer technically difficult. However, this requires close cooperation between various service providers. It also presupposes the suspension of the free travel right for Tallinn residents on city routes or the extension of the free travel right within Tallinn in all modes of public transport to all users. The first of these options is financially much more realistic and allows for a more sustainable and consistent development of public transport (see also SUMP).

3.3.3. *Intermodality*

3.3.3.1. *Comprehensive network of multimodal mobility hubs*

In order to facilitate the smoothest possible combination of modes of travel, multimodal mobility hubs (or further development of public transport stops) should be set up in dense transport junctions, bringing together different mobility services and facilities in one place.

Although multimodality is already a pervasive principle in the design of the region's unified public transport network and stops, this general principle needs to be complemented by dedicated mobility hubs according to the requirements of the route network. Depending on the location, the hubs should have some combination of a public transport stop, bicycle and other micro-mobile vehicle rental, bicycle parking and car rental. The design of the hubs should be based on the quality standard developed in the study 'Increasing the attractiveness of the network of multimodal public transport stops and transfer nodes in Tallinn and Harju County and developing service standards' (SPIN Unit and Demos Helsinki 2020). Such hubs need to form a network to enable intermodal commuting for as many people in the area as possible. The network of mobility hubs is an essential part of a comprehensive mobility solution for the region.

Measures:

- 1) Preparation of an analysis of the optimal location of mobility hubs and the so-called 'park and ride' points, possibly as part of an analysis of the integrated public transport network in the region.
- 2) Gradual construction of the network of mobility hubs according to the prepared analysis (see also SUMP).
- 3) Establishment of the 'park and ride' points according to the results of the prepared analysis. The 'park and ride' points complement mobility hubs as smaller and more one-sided multimodal points, the main purpose of which is to reduce urban car traffic caused by commuters.
- 4) Addition of covered bicycle parking and bicycle rental points to all the 'park and ride' points. These relatively simple additions would turn 'park and ride' points into mobility points that support much more diverse intermodality, which would also encourage the use of more active modes of travel.

3.3.3.2. *Excellent conditions for combining cycling and public transport*

When speaking about the combinations of sustainable modes of travel, bicycle + public transport is perhaps the most important, as it combines speed over long distances with flexibility on the first and last mile. It should therefore be possible to transport a bicycle on public transport and to store it at stops, especially in the absence of an extensive bicycle rental system. The most important public transport routes for bicycle transport are regional public transport routes, as it is often those that cover distances that are too great to cycle. Within the city, the transport of bicycles is not a priority. Taking a bicycle on public transport has to be convenient, i.e., it should not involve disassembling the bicycle, packing it in a bag or lifting it in such a way that requires a lot of strength. At the moment, bicycles can only be transported relatively comfortably when travelling by train, although the system there could also be improved. However, bicycles cannot be transported at all on regional buses.

Measures:

- 1) Abolition of time restrictions on the transport of bicycles by train, whatever the season. The precondition for taking a bicycle on a train on a daily basis is that people do not have to check for each train separately whether they can take the bicycle with them or not. This measure might become impractical once the cycling modal share reaches a high enough level. From that point on, bike share schemes and bicycle parking at stations should be prioritised over transporting bicycles in public transport.
- 2) Establishment of bicycle transport capacity on regional bus routes, starting with more frequently used lines. The bus should be able to transport at least four bicycles. A possible solution is to attach the bicycle base in front of the bus.
- 3) Establishment of good long-term bicycle parking facilities at public transport stops. In the experience of the rest of the world, in the long run, parking bicycles at public transport stops is a more sustainable solution than large-scale transport of bicycles in public transport. See also the measure on the implementation of the quality standard for public transport stops (see also stop analysis).

3.3.4. Mobility services

3.3.4.1. *Bike share scheme throughout the region*

Shared bicycles, cars or scooters enable flexible and intermodal routes and these are, therefore, central to the region's overall mobility solution. They also reduce the need for both bicycle and car parking spaces. Commercial schemes already exist in the region for both cars and scooters, but there is no proper bike share scheme to speak of. It is therefore necessary to set up a city-wide bike share scheme.

Measures:

- 1) Establishment of a city-wide bike share scheme. The scheme should cover the whole city, although it could start from the city centre and then gradually add coverage. Schemes prepared in cooperation with private companies are also acceptable, but only if the quality and affordability of the schemes for users is maintained at a high level. In addition, their integration with other modes of public transport should be ensured. This measure is also planned within the framework of the Tallinn Development Strategy 'Tallinn 2035' (see also SUMP; Tallinn 2035).
- 2) Extension of the bicycle sharing scheme to larger settlements closer to the city limits.

3.3.4.2. *Compatible and well-regulated mobility services*

Perhaps more important than the number and diversity of different mobility services is the compatibility of existing ones. In the case of share schemes, ensuring compatibility requires a common payment and reservation system, which would make it easy to combine different

modes of travel. Compatibility needs to be ensured at three levels. Firstly, there is a need to ensure compatibility within one mode of travel if there are several service providers in the area. This is most typical of scooters. Secondly, compatibility must be ensured between the share schemes for the various modes of travel, and thirdly, the share schemes must be compatible with traditional public transport. In this way, all shared mobility options in the region form a coherent whole, allowing for smooth intermodal movement. Interoperability is based on a single payment and reservation system and a public travel planning tool that can offer intermodal routes for all modes of travel. All three levels of compatibility are largely lacking in Tallinn.

In addition, regulation is also important. As mobility services are a relatively new phenomenon, they are not yet properly regulated in many regions. This creates a situation where the disadvantages of mobility services are often not sufficiently minimised and the benefits maximised.

Measures:

- 1) To establish, in cooperation with service providers, a single ticketing and reservation system for all existing share schemes. A unified system allows users to conveniently and quickly connect the services of different service providers. A specific solution has yet to be developed, but one option would be to extend the Tallinn public transport card to all public use systems and to create a common web-based reservation system. It is very important to create integrated systems now when there are still few share schemes and they are relatively easy to integrate. This way, the schemes created in the future can join the existing system and thus prevent the fragmentation of the schemes between several systems.
- 2) Creating a travel planner that can take into account and combine all existing share schemes and public transport when planning routes. The travel planner should be on the same platform as the share scheme reservation system (see also Tallinn 2035).
- 3) Defining the basic principles for regulating mobility services. The underlying principles should be based on the recommendations of the ITF and the OECD: <https://www.oecd.org/publications/regulating-app-based-mobility-services-94d27a3a-en.htm> (see also the ITF study 'The Future of Passenger Mobility and Goods Transport in Estonia' (hereinafter 'ITF')).

3.3.5. Collection and analysis of mobility data

3.3.5.1. *Collection of data on sustainable modes of travel integrated into standard practice*

There is much less data on the use of sustainable modes of transport in most cities around the world than on car use. The same applies to the Tallinn region. There is relatively good information about public transport within the city, as the public transport card allows quite detailed monitoring of the number of passengers and movement. However, data on walking and cycling are relatively scarce. The lack of data hinders informed decision-making and

increases uncertainty about the effects of different investments. Therefore, instead of focusing narrowly on vehicle movements, data should be collected more generally on people's mobility, the causes of trips, and the mobility choices made. Data collection should also be periodic to identify trends and assess the impact of investments.

Measures:

- 1) In order for the traffic model being compiled by the Tallinn Transport Department to function fully, it is necessary to collect additional data on bicycle use and walking. Otherwise, these modes of travel cannot be modelled. It is necessary to periodically begin collecting data that have a clear use in the form of the new traffic model.
- 2) Conducting a periodic, high-quality mobility survey in the region, which would collect comprehensive information on people's mobility and consider data on vehicle movements as just one way among many for gathering information on mobility (see also SUMP).

3.3.5.2. Modern traffic models used to plan investments

Today, the use of traffic models has become standard practice, as they allow for rather accurate predictions of complex future scenarios. This is especially useful for assessing the impact of investments or network changes. In the Tallinn region, the introduction of a high-quality and multi-modal traffic model is underway. Unfortunately, this model will initially be unable to model cycling or walking, although it will have the technical capability to do so. Active modes of travel should be integrated into the model as soon as possible in order to assess the impact of different mobility investments (including car infrastructure) on active modes of travel.

Measures:

- 1) Introduction of a modern traffic model that takes into account all major modes of travel. It would not be a one-off project, but a long-term investment that could be used to make various planning decisions. The measure is being developed by the Tallinn Transport Department.
- 2) Integration of cycling and walking into the traffic model of the Tallinn region. The main prerequisite of this measure is to collect the necessary data on active modes of travel, which are currently lacking. This measure is essential for integrated mobility planning.
- 3) Periodic measurement and modelling of accessibility of jobs and services across the region. The accessibility of jobs and services is one of the most important indicators of mobility. Therefore, it should be modelled every three to four years for all major modes of travel. The accessibility of jobs and services can be modelled on the basis of a general macro traffic model.

3.3.6. Alternative energy sources

3.3.6.1. Greener car fleet

Cars currently generate most of the greenhouse gases in the transport sector in the Tallinn region. Reducing cars' emissions is therefore crucial to meeting climate goals. The most effective way to do this is to drastically reduce the number and mileage of passenger cars (see priority area 9), but at the same time the transition from fossil fuels to more environmentally friendly fuels in passenger cars should be encouraged. In doing so, however, it is very important to remember that passenger cars running on alternative fuels are only a sustainable solution on a very small scale.

Measures:

- 1) Preparation of a study that would analyse the suitability of different fuel technologies for the region's car fleet. Technologies should be analysed comprehensively, taking into account all associated impacts, including various environmental impacts and cost-effectiveness. Vehicles powered by electric batteries, hydrogen technology, and an efficient internal combustion engine should definitely be analysed, to which other technologies may be added as necessary.

3.3.6.2. Greener means of public transport

Similarly to passenger cars, there is a need to switch from fossil to alternative fuels for public transport. Here, too, the most effective way to reduce greenhouse gases is to reduce public transport (travel). This requires directing land use in such a way as to reduce the need for people to travel long distances. However, public transport can be maintained on a larger scale than passenger cars, as they are much more energy efficient in terms of the number of people they transport.

Measures:

- 1) Preparation of a study to analyse the suitability of different fuel technologies for different modes of public transport in the region. Technologies should be analysed comprehensively, taking into account all associated impacts, including various environmental impacts and cost-effectiveness. Vehicles powered by electric batteries, overhead contact lines/rails, hydrogen technology, and an efficient internal combustion engine should definitely be analysed, to which other technologies may be added as necessary.
- 2) Priority development of light rail transport (see priority area 1). Trams require energy-intensive initial investments; however, they do not require batteries or hydrogen tanks, which are the most problematic part of electric buses in terms of sustainability (see also 'Harju County Development Strategy 2035+' (hereinafter 'Harju County 2035')).

3.3.7. Integration of land use and mobility planning

3.3.7.1. *Integration of land use planning across municipal borders*

In order to achieve the goals of the strategic vision for mobility established in this document, cooperation between land use and mobility areas as well as across municipal borders needs to be significantly intensified. A comprehensive mobility solution for the region should be jointly established, on the basis of which mobility and land use decisions can be made in more detail. Otherwise, decisions made in different agencies and municipalities may contradict each other and thus hinder the fulfilment of any vision. At present, there is little of the necessary type of coordination in the Tallinn region, as a result of which land use and mobility trends have developed rather uncontrollably.

Measures:

- 1) Strengthening of cooperation across municipal borders and between land use and mobility planning. Specific steps in this direction need to be found in the discussions among relevant stakeholders. In addition to mobility, it is vital to also address land use (see also SUMP).
- 2) To consider agreeing on the urbanisation model of a unified area as a joint decision of the local governments of the Tallinn region. One option is the multi-centre model presented in the Tallinn Mobility Plan. Adopting such a model would allow the region to make jointly focused decisions to create a sustainable, people-centred, and accessible regional structure. This and the previous measure serve as preconditions for future actions under this priority area. Without them, the impact of the following measures will be small and isolated (see also SUMP).

3.3.7.2. *Widespread mixed use planning*

The first step in tackling the problem of commuting should be to reduce the need for commuting, or at least to limit its growth. Commuting has a time and financial cost for individuals and a number of negative effects and financial costs for society. The COVID-19 crisis adds to the risk of infection in public transport, which can significantly disrupt people's mobility during major waves of infection. Therefore, the fewer people that are forced to commute, the lower the costs for both individuals and society. The main strategy to reduce commuting is to promote mixed use throughout the region, so that jobs, schools, and other necessary services are close to people's homes. In this regard, not much has been done in the Tallinn region, which is why suburbanisation and segregation of land use types have intensified in the region. However, in the post-COVID-19 world, there is no alternative to the wider mixed use for the functioning of the city.

Measures:

- 1) To allow new developments only in the existing urban settlement structure or in the immediately adjacent area. This ensures the availability of basic services in new developments without leaving the region.
- 2) In new developments, the requirement for mixed use on the ground floors of buildings. In this way, along with the increase in the living space, the increase of the capacity of the services serving it is also ensured. Otherwise, existing services may not be able to meet the needs of all residents in the area.
- 3) Encouraging small grocery stores serving the local area through land tax and other benefits.

3.3.7.3. *Good transport connections*

Based on the urbanisation model proposed for the region in SUMP, it is important to ensure good connections of sustainable modes of travel between major destinations. These are centres of attraction, which are often moved to from outside their immediate surroundings. Therefore, in addition to active modes of travel, it is important to ensure excellent public transport connections.

- 1) The preparation of a mobility solution is set as a precondition for granting a building permit for new developments and high-traffic objects. In the event of institutions, schools, and others with more than 1000 people, the preparation of a mobility plan is set as a precondition. The mobility solution or plan must cover all major modes of travel (see also SUMP).
- 2) Establishment of new developments only in the immediate vicinity of the existing very well-functioning public transport line. This measure is especially important near the border of Tallinn, so that the settlement does not spread too much (see also SUMP).
- 3) Acquisition of land, if necessary, for priority public transport investments, so that the location of the investment would be optimal (see also SUMP).

3.3.8. *Reduction of car use*

3.3.8.1. *Calmed car traffic and a fairly distributed street space*

There is a need to actively reduce car traffic for two reasons. Firstly, the car competes with sustainable modes of travel for limited urban space and creates barriers to sustainable mobility in terms of safety and accessibility. This means that the less car traffic there is in the region, the better it is to walk, cycle, and use public transport. Secondly, in order to preserve the natural environment, it is necessary to reduce not only the share of car journeys, but also the absolute number. A decrease in the former does not always lead to a decrease in the latter: the ratio of car journeys may change even if the number of movements made with other modes of travel increases, while the number of car journeys does not change. This situation may arise if we focus only on the so-called 'pull' measures to increase the use of sustainable

modes of travel. As the demand for mobility is dynamic, i.e., demand may vary greatly depending on supply, then in such a situation the population as a whole may simply start to move more as a whole and the replacement of car travel with other modes of travel will only occur to a small extent. Therefore, in addition to the 'pull' measures, it is necessary to also implement the so-called 'push' measures, the main purpose of which is to reduce car use.

In the Tallinn region, measures to reduce car traffic to some extent have been implemented to encourage the use of other modes of travel, although there is still a lot of room for improvement. However, measures aimed directly and mainly at reducing car traffic have not been implemented at all, as the understanding of the dynamics of mobility demand and its implications is still not very widespread. One way to discourage car use is to redistribute street space. Giving less space to car traffic will free up space for other modes of travel. At the same time, the trip duration for car trips will increase as the street's carrying capacity of vehicles (but not people!) decreases. This contributes to a reduction in car use. Redistribution of space could become much more urgent and politically easier in light of the COVID-19 crisis. Pedestrians and cyclists need more space, while the possible economic downturn due to the pandemic and a temporary reduction in the number of overall trips would reduce the number of car journeys in the region anyway. The fewer cars on the road, the easier it is to redistribute street space. The calming of car traffic has also been taken as an important goal in the recent Tallinn Development Strategy 'Tallinn 2035'.

Measures:

- 1) Calming of car traffic. The goal of this measure is to reduce the speed of cars in urban areas, which will make it safer for pedestrians and cyclists and will reduce the street's carrying capacity of car traffic. It is most effective to do this by districts or other larger areas, but it can also be done by one street or street section. Traffic calming involves lowering the speed limit (usually to 30 km/h) and adjusting the physical street space to support the new speed limit. The latter means physically reducing the speed of cars by using, for example, speed humps, chokers, parked cars, curves, etc. Road traffic calming is a top priority in residential areas, but in the long run it should also be applied to more and more streets (see also SUMP).
- 2) Fair redistribution of Tallinn street space. The establishment of new cycling infrastructure and pedestrian space should not be hampered by the current distribution of street space or perceived lack of space. Fair distribution of street space entails, as a matter of priority, accommodating active modes of travel as the most sustainable modes of transport in terms of environmental impact, use of space, and social costs. Therefore, in order to ensure the exemplary quality of the infrastructure for active mobility, enough street space must be allocated for this purpose, if necessary, at the expense of the current road space dedicated to car traffic. This can be done with confidence, as international studies have shown that reducing car traffic space does not generally lead to a significant increase in time expenditure for car users in the medium to long term.

- 3) Establishment of an Active Mobility Area (AMA), in Tallinn, in accordance with the principles set out in the Tallinn Mobility Plan. This includes, among other things, lowering the minimum requirements for the construction of parking spaces and, in some cases, setting maximum requirements. The parking requirements for new buildings in the region should be lowered according to the level of urbanity. The more densely populated the given area is, the lower the parking requirements should be. Parking is one of the most important aspects that influence people's mobility behaviour (see also SUMP).

3.3.8.2. *Fairly taxed car use and parking*

In addition to spatial interventions, it is also possible to reduce car use by increasing its financial cost. Such measures are often faster and more extensive than spatial interventions, which require money and time. At the same time, they affect the lower-income population proportionally more, for whom benefits or tax exemptions should be applied in certain cases. Little use has been made of financial measures in the Tallinn region, rather car traffic is subsidised in the form of free parking spaces and the absence of pollution charges. A recent study prepared by the International Transport Forum (ITF) entitled 'The Future of Passenger Mobility and Goods Transport in Estonia' (OECD / ITF 2020) also highlighted the effectiveness of financial measures in making the region's modal share more sustainable.

Measures:

- 1) Establishment of a peak hour fee for car use in the city of Tallinn. This alleviates congestion during peak periods and at the same time discourages car use by making it more expensive at peak times (see also SUMP, ITF).
- 2) Introduction of a national car tax, the amount of which would depend on the car's emission class. Today, the Estonian car fleet is one of the least green in Europe. A car tax would encourage the purchase of more efficient cars, which according to the ITF study (see above) is an important method for reducing emissions from Estonian transport (see also ITF).
- 3) National or regional car mileage tax. The need for such a measure stems in part from the expected reduction in fuel excise duties associated with the expected increase in car fuel efficiency. The ITF study (see above) recommends that this tax be initially set at a low rate and then gradually increased to make the measure politically more acceptable. In addition to compensating for the reduction in fuel excise duty, car mileage taxation also has a clear impact on people's mobility behaviour (see also ITF).
- 4) Expansion of the paid parking area in the City of Tallinn in accordance with the AMA principles established in the Tallinn Mobility Plan. The highest priority is the areas with good public transport connections and high population density (see also SUMP).

3.3.9. Communication

3.3.9.1. *Integrated mobility communication strategy*

Communication measures have been widely used around the world to accelerate and facilitate the transition to sustainable modes of travel. Although they will not be of much use without significant physical measures, they can be very effective as part of a comprehensive mobility strategy. It is important that communication is designed at the regional level so that the various measures all work in one clear direction.

Measures:

- 1) Development of a communication plan for sustainable mobility in the region. The plan should include measures that best support the transition to sustainable mobility, given the specificities of the region. This measure provides a framework for all of the following.
- 2) Development of a unified public transport brand in the region, under which bike share and other mobility services could later be added. This measure helps to form the perception among the population about the mobility solution of the region as a unified whole (see also the KRT analysis).
- 3) Strategically targeted dissemination of information on sustainable mobility opportunities. This means identifying groups in society that are more open to changing their mobility habits and channelling the information they need to make the change at the right time. For example, such information could be provided to people who have just moved to the region, changed jobs or had their first child. Such important events have an impact on people's mobility needs and situations, which means that they have to adjust their habits anyway. If it is particularly easy for them to choose a sustainable mode of travel, they are more likely to choose it. Most certainly, such convenient options should actually exist, though. The format of the information disseminated should also facilitate change. For example, a mobility counselling service could be offered to provide solutions to common problems and to address, in a personal way, the more specific barriers to people's use of sustainable modes of travel.
- 4) Organisation of campaigns to promote sustainable modes of mobility. So far, the main focus has been on safety, but there are also important campaigns that encourage changes in travel habits. The forms of campaigns can vary greatly, from the usual street posters to competitions for teams and the like.

3.3.9.2. *Improved traffic skills and knowledge*

When moving away from the car-centric traffic environment, the changing requirements for traffic skills of all groups of road users should also be taken into account. Drivers need to learn to take better account of additional cyclists and pedestrians, while cyclists need to learn to participate in traffic as a separate group of road users (not as faster pedestrians). Improving these skills will help road users to better adapt to changing circumstances and, therefore, speed up the transition to sustainable modes of travel.

Measures:



- 1) Provision of cyclist view training courses for bus drivers. Large motor vehicles such as buses, vans, and lorries pose the greatest threat to cyclists in traffic. Passing the cyclist view training course would improve the ability of bus drivers to consider cyclists and create fewer dangerous situations. A number of similar training courses have been carried out around the world and these have had a significant positive impact on cyclist safety.
- 2) Addition of a mandatory bicycle module to driving instruction in cooperation with the state. This measure would improve the ability of drivers to take cyclists into account and thus encourage greater use of bicycles.
- 3) Carrying out bicycle traffic training courses in schools as part of the process of obtaining licences to ride a bicycle. Currently, the practical part of children's bicycle training is very deficient, as it does not include gaining experience in real traffic conditions. In order to use a bicycle in commuting, it is important that people learn to cope in traffic at an early age.
- 4) Providing bicycle traffic training courses for adults. The traffic skills of adult cyclists are also often deficient. This is a barrier for many when using a bicycle. The training should be subsidised by local governments and the state, and should also include winter cycling training.

4. Related development documents

National level:

National Transport and Mobility Development Plan for 2021–2035

Road Safety Programme 2016–2025

General Principles of Climate Policy until 2050

Climate Change Adaptation Development Plan until 2030

Estonia 2030+

Sustainable Estonia 21

Regional level:

Harju County Development Strategy 2035+

Harju County Plan 2030+

Harju County Public Transport Development Plan 2025

Spatial planning documents of Harju County rural municipalities

Local level:

Tallinn Development Strategy 'Tallinn 2035'

Strategy on sustainable modes of travel in the Tallinn region 2035

Tallinn Bicycle Strategy 2018–2027

Tallinn Development Plan 2018–2035

Tallinn Environmental Strategy until 2030

5. Involvement of parties

The SUMBA project partners were the Union of Harju County Municipalities and Tallinn Transport Department. Both led the commissioning of important project input studies and participated in discussing and commenting on the content of this document. The Ministry of Economic Affairs and Communications was involved as a non-project partner who participated in the development of the action plan and the development of the content of the roadmap. During the preparation of the project input studies, the most important parties in the region (public transport operators, representatives of local governments) were actively involved. The public was thoroughly involved in the preparation of the Tallinn Mobility Plan, upon which this commuting roadmap is largely based. The public was also involved in the roadmap process with an online survey on the barriers to commuting.

6. References

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