exurbs, the need for car travel has increased.

According to the Labour Force Survey of Statistics Estonia, there has been a significant decrease in the share of those commuting by public transport (from 50% to 36%) or foot in Tallinn over the last 18 years, while the share of those travelling by car among Harju County's residents has grown from 25% to nearly 60% (see Figures 3.1 and 3.2.) This is primarily due to the relocation of jobs and homes and the emergence of new developments in places where there is no proper public transport and walking and cycling distances are too long. Ownership and usage of cars (see Figure 3.5) has also increased due to higher purchasing power and better financing opportunities, which have made it possible to move both homes and jobs from Tallinn to Harju County, where buildings are modern and more affordable, but where public transport services and light traffic paths are not yet comparable in quality or the number of links. As a result, public transport is no longer an option for many in the capital region, and cars are preferred instead (Figure 3.6). In Tallinn and Harju County, the total annual vehicle mileage has increased to 2.5 times that of 18 years ago (Figure 3.3). In the last six years alone, the number of vehicles crossing the city limits daily has increased by 28,000 (Figure 3.4).

Access to good public transport links for people and jobs based in Harju County has decreased as a result of settlement becoming less dense. Convenient and fast links still exist near the main public transport and railway corridors. However, often, even living near a public transport route does not mean that people have access to good public transport links, because the route does not cover their destination or travel at suitable times.

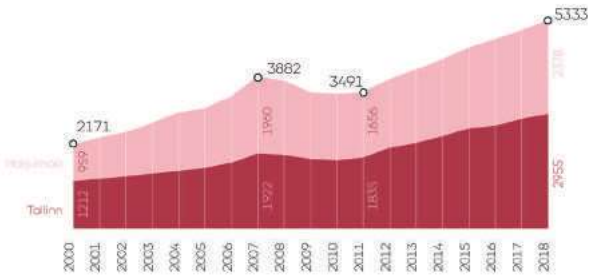


Figure 3.3. Vehicle mileage in Tallinn and Harju County in the period 2000–2018 (million kilometres). Source: Estonian Road Administration

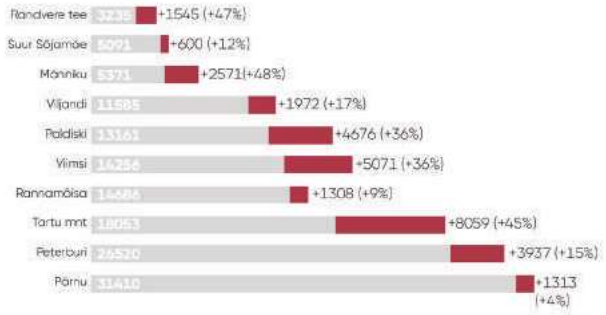


Figure 3.4. Change in traffic volume at Tallinn's city limits, 2012 and 2018. Source: Estonian Road Administration.

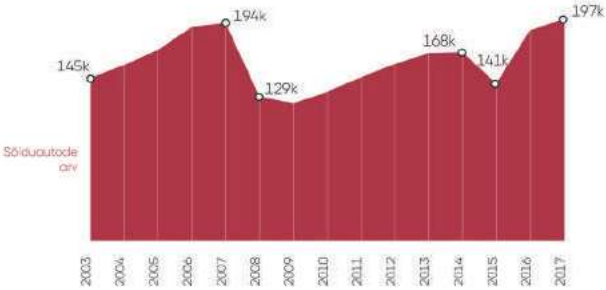


Figure 3.5. Number of passenger cars registered in Tallinn, 2010–2017. Source: Statistical Yearbook of Tallinn 2018

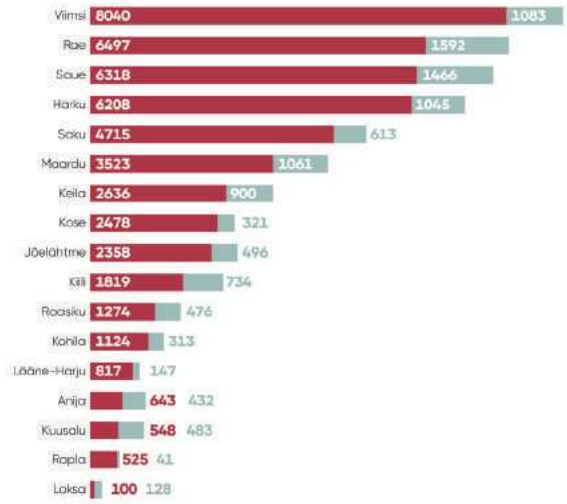


Figure 3.6. Number of people commuting by car (red) and foot (green) from rural municipalities in Harju County to Tallinn in 2017. Source: Kantar EMOR, 2017

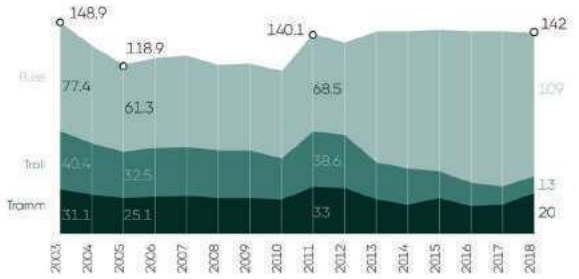


Figure 3.7. Number of journeys on Tallinn's public city routes per year (millions)

Source: Statistical Yearbook of Tallinn 2019

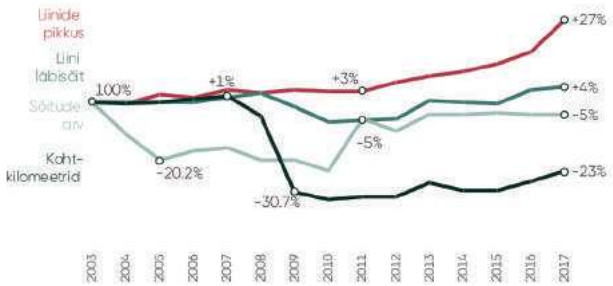


Figure 3.8. Changes in the provision of Tallinn's public transport services

Source: Statistical Yearbook of Tallinn 2018

CHANGE IN THE NUMBER OF PUBLIC TRANSPORT USERS BETWEEN 2003 AND 2018 ON PUBLIC ROUTES IN TALLINN AND HARJU COUNTY

There are four different public transport service systems in the Tallinn region: Tallinn's city routes, which are operated by the municipal enterprise TLT (bus, tram, trolleybus), with the service orders managed by the Tallinn Transport Department and the operating costs covered by city the budget; Harju County's public bus routes, which are managed by Põhja-Eesti Ühistranspordikeskus and the operation of which is subsidised from the state budget; domestic rail routes (including commuter rail), which are managed by AS Elron and the operation of which is subsidised from the state budget. In addition to the above, in Harju County, public transport services are also provided by so-called commercial carriers, whose operations are funded from ticket revenues. There is no systematic data available on commercial carrier ticket sales, passenger numbers, and route statistics by year.

The number of users of Tallinn's city routes decreased both in the first half of 2000 and during the recession, but increased in 2011, when employment had recovered after the 2008 economic crisis, and in 2013, when public transport was made free for Tallinn's residents. Over the last six years, the number of public transport users has remained stable, with about 140 million journeys a year (see Figure 3.7).

The total length of Tallinn's public transport routes and the mileage of public vehicles serving the routes have increased over the last 15 years. The number of public transport seat-kilometres (which reflects the total volume of public transport services) and the number of journeys decreased significantly during the 2008 economic crisis, but have recovered somewhat thanks to the new period of economic growth and increased number of residents, however they are still lower than 10 years ago.

With the introduction of new comfortable and fast trains, some of those travelling in Tallinn as well as in Harju County have started using trains more often. The number of passengers on electric trains and county bus routes has increased significantly in the last 8 years: from around 5 million passengers per year to more than 8 million (Figure 3.9). The number of passengers has increased due to the growth of the population and the number of jobs, due to the very frequent and comfortable passenger trains on the Keila route, and the continuous improvement of the Harju County public bus service (see Table 3.1). Compared to the total volume of public transport usage (148 million journeys per year), the total number of public transport users in the region has not been significantly affected (Figure 3.9).

Operating costs and ticket revenue of public transport

The operating costs of Tallinn's public transport and the costs covered from the city budget have been constantly increasing over the last 15 years. In spite of population growth, employment recovery, and the free access to public transport of Tallinn's residents, the number of public transport users in the city has not increased significantly nor has it influenced the trend of rapidly increasing car ownership.

The number of users and ticket revenue of Harju County's public bus services had been increasing up to 2017 (Table 3.1). From July 2018, the public county bus services have been free to all persons aged 0–19 and 63+.

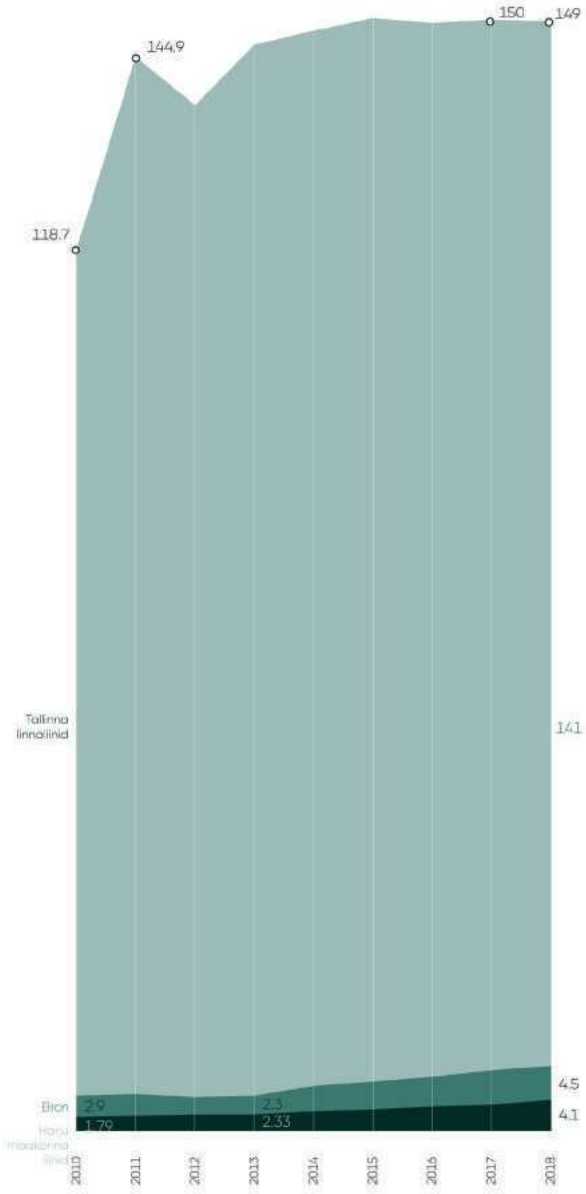


Figure 3.9. Number of passengers on public transport routes in Tallinn and Harju County Source: City of Tallinn, Elron, Estonian Road Administration

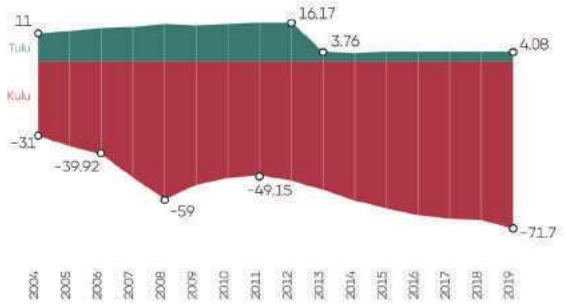


Figure 3.10. Changes in the operating costs and ticket revenue of public transport in the city of Tallinn, 2004–2019

Source: Statistical Yearbook of Tallinn 2018, Tallinn Transport Department

Table 3.1. Public bus routes of Harju County 2012–2018

	2012	2013	2014	2015	2016	2017	2018
Ticket revenue €M	2.052	2.327	2.475	2.832	3.169	3.437	3.062
Number of journeys, million	2.298	2.300	2.534	2.860	3.167	3.499	4.173
Route mileage, million route km	4.434	4.901	5.383	5.790	6.277	6.582	7.368
Ticket revenue per passenger, €/journey	0.89	1.01	0.98	0.99	1.00	1.02	0.73
Subsidies, €M	3.968	2.605	2.7	2.8	2.9	3.069	4.028

13 MOBILITY-RELATED CHALLENGES AND PROBLEMS THAT NEED SOLVING IN THE TALLINN REGION

Travel times and costs are increasing

Commuting has increased in Tallinn and Harju County both from the county to Tallinn and back, as a result of which the number of cars on the road has increased by about 21,000 over the last six years (with a total of 30,000 more people travelling to work by car). This causes traffic congestion on the roads of Tallinn and Harju County and increases average driving times. By 2035, the population of the Tallinn region is projected to grow by 60,000, including 45,000 people in the city of Tallinn. Increased traffic and congestion increases the time it takes to travel both by car and public transport. As travelling by public transport takes more time due to transfers and walking, an increasing number of residents of Tallinn and Harju County are deciding in favour of cars to save time. This in turn slows down traffic for all motor vehicles. Thus far, traffic congestion has been attempted to be reduced by expanding major roads and building multi-level junctions (Haabersti junction, Järvevana tee and Ülemiste junction, Tartu mnt and Vabaduse pst, Männiku tee expansion, Põhja väil, Tammsaare tee expansion, Tehnika street extension). However, this has been largely unsuccessful as congestion has simply shifted to the next bottleneck, and travel times have not decreased, because the number of cars and car journeys has increased significantly.

Taking into account the total mileage of cars and the average total cost per kilometre (€0.3/km) of travel by car, businesses and individuals are currently spending about 1.4 billion euros on car ownership and usage in Tallinn and Harju County, i.e. twice the annual budget of the City of Tallinn (Figure 3.13). This direct cost of car purchase/leasing, fuel, repairs, etc. is borne both by the

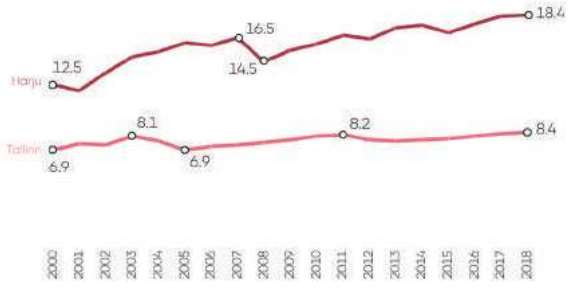


Figure 3.11. Average distance between the place of residence and place of work of residents of Tallinn and Harju County in 2000–2018.

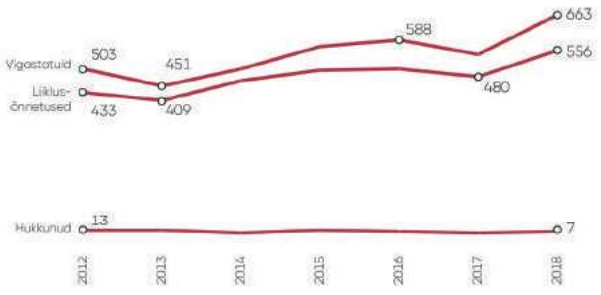


Figure 3.12. Average time (minutes) of commuting to work from home in Tallinn and Harju County, 2000–2018.

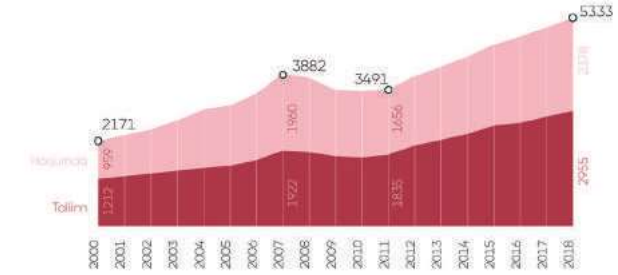


Figure 3.13. Costs of owning and using a car in Tallinn and Harju County (€M/year), 2000–2017. Source: calculations by the authors of the Strategy

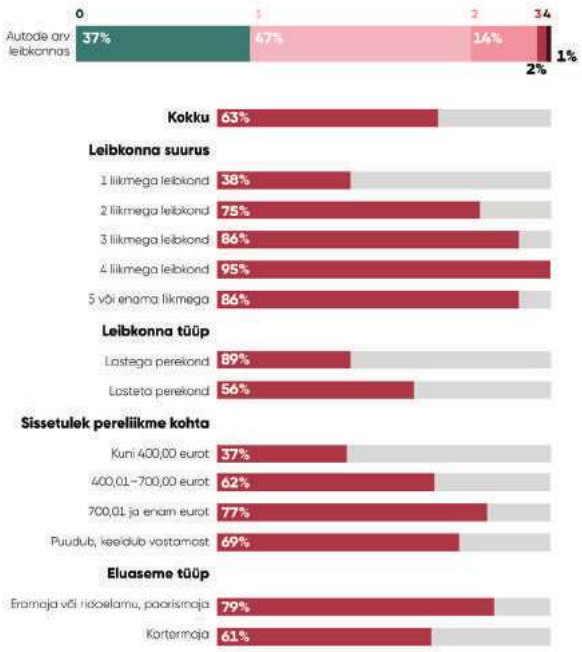


Figure 3.14. Ownership of passenger cars in Tallinn by household size, type, type of housing, and income Source: survey of mobility habits of Tallinn's residents, 2015. EMOR, 2015

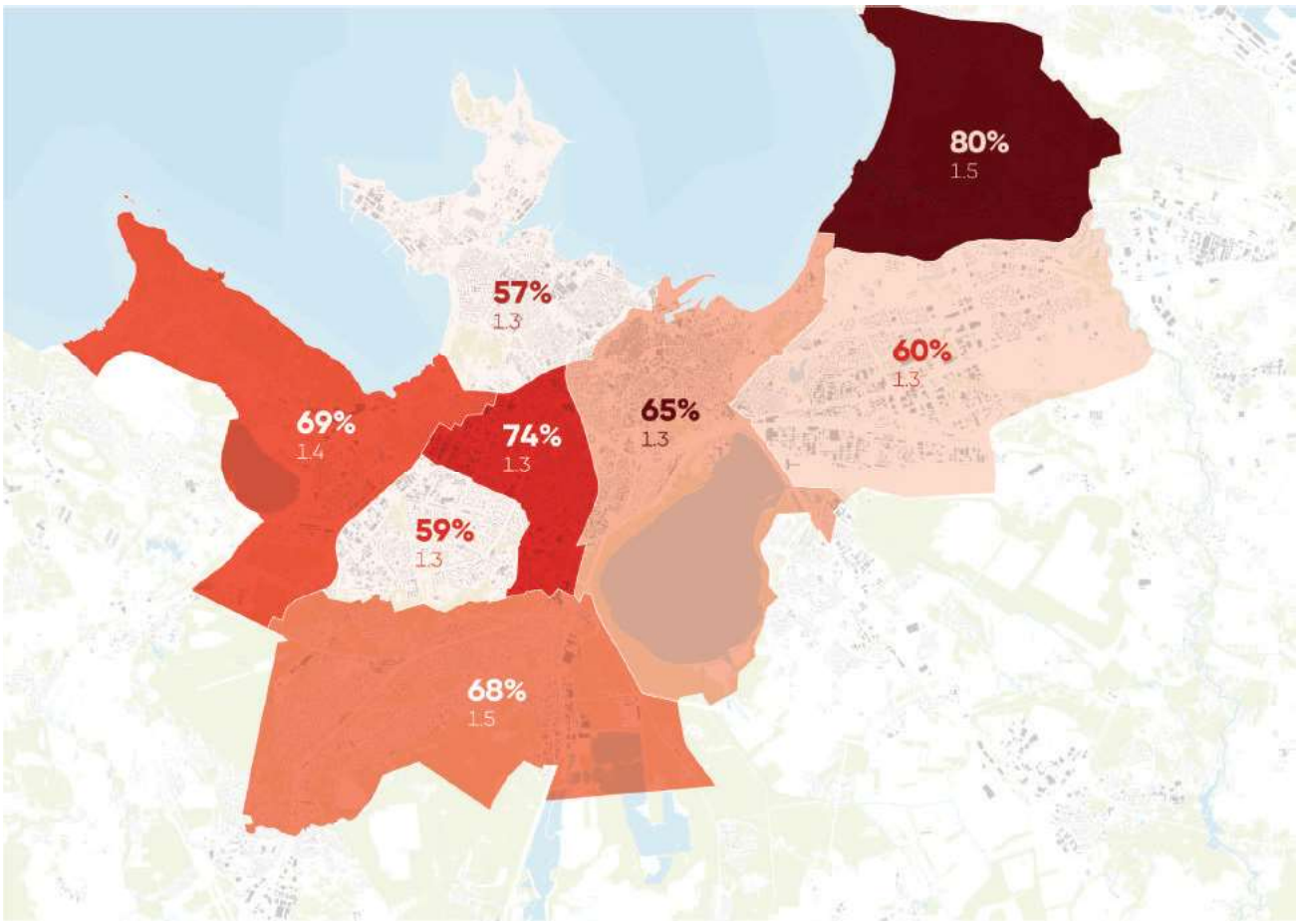


Figure 3.15. Share of car-owning households (% of households with at least 1 car) and average number of cars per household by districts of Tallinn Source: survey of mobility habits of Tallinn's residents, 2015, EMOR

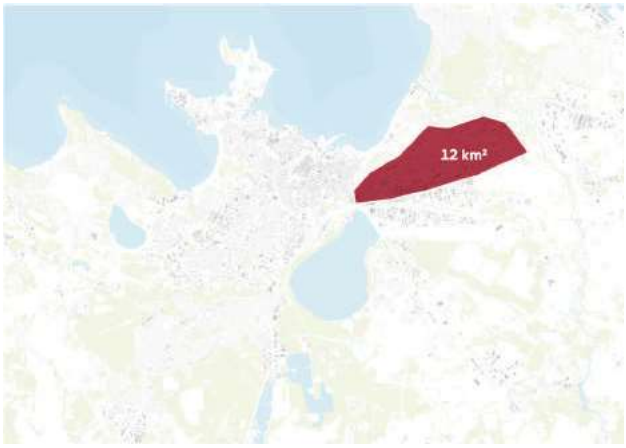


Figure 3.16. The parking spaces for the approximately 250,000 cars in Harju County and Tallinn occupy an area of approximately 12 km².

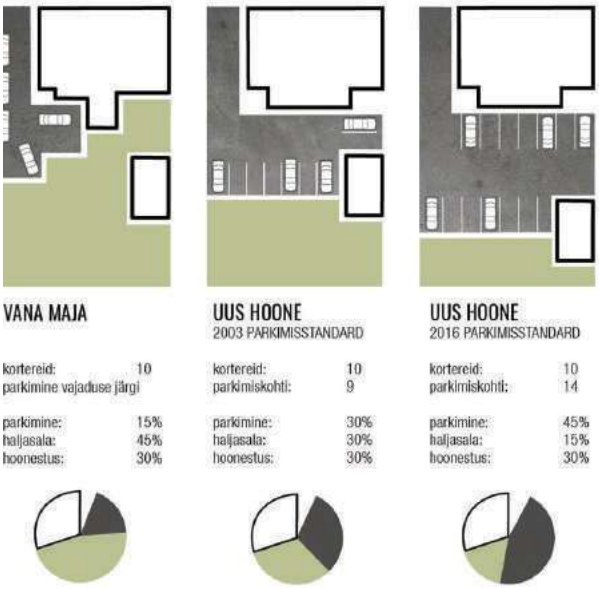


Figure 3.17. Increase of space requirements in the yards of residential buildings due to increasing car ownership and parking requirements. Source: Tõnis Arjus, Sirp 2019.

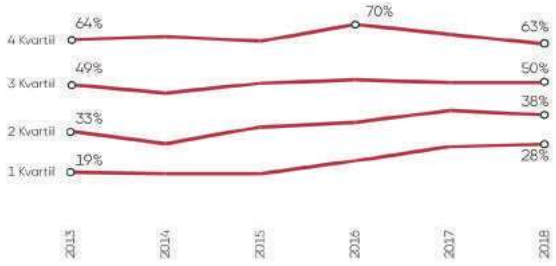


Figure 3.18. Distribution of residents of Tallinn commuting by car by income quartile, %. Source: Statistics Estonia

CARS ARE TAKING UP MORE AND MORE VALUABLE URBAN SPACE

Each additional car in the city requires parking space, not only near the user's place of residence, but also at their travel destinations. In Tallinn, it is estimated that there are approximately 2–3 parking spaces for each passenger car, which equals 40–60 m² of parking space, which requires construction, maintenance, lighting, and repair. The cost of a parking space built for each new dwelling is €3,000–15,000, which in turn increases the cost of dwellings and takes away valuable space from other activities. (See also chapter 4.)

The cost of building a parking space ranges from EUR 3,000 (open-air parking) to EUR 15,000 (parking building, underground car park), which in turn increases the cost of dwellings and the cost of living as a whole.

Expanding roads and street networks and constructing parking spaces increases the costs of construction and subsequent infrastructure maintenance. Expanding individual streets to solve problems related to car traffic does not increase the capacity of the entire road network and does not address higher traffic loads at the destinations. As the number of cars increases, there will be less space and money for economical public transport, which will no longer be able to provide their services at the same speed. As public transport becomes less competitive, people's need to make their unavoidable daily journeys by car will increase further. Ever-increasing congestion will lower the competitiveness of businesses in Tallinn and Harju County in both freight transport and the provision of services, as well as the mobility of their employees and saving time.

DEPENDENCE ON PERSONAL CARS AND THE RESULTING INEQUALITIES ARE GROWING. TRAVEL BY PUBLIC TRANSPORT AND FOOT IS DECREASING

Despite the fact that the Helsinki region is growing much faster than Tallinn, there has been no increase in car usage there in the last 10 years, and car usage is even

expected to decline there in the future.

Expanding roads and street networks and constructing parking spaces increases the costs of construction, dependence on personal cars, and the resulting inequalities. Travel by public transport and foot is decreasing

Despite the fact that the Helsinki region is growing much faster than Tallinn, there has been no increase in car usage there in the last 10 years, and car usage is even expected to decline there in the future.

Expanding roads and street networks and constructing parking spaces increases the costs of construction and subsequent infrastructure maintenance.

TRANSPORT-RELATED ENERGY CONSUMPTION AND GREENHOUSE GAS EMISSIONS ARE INCREASING

Transport has a major environmental impact that cannot be solved solely with new vehicle technologies. Transport-related greenhouse gas emissions and energy consumption in Estonia, including Tallinn, have been increasing due to the continuous growth of car traffic and road transport. Tallinn accounts for more than ⅓ of Estonia's total CO_2 emissions, around 50% with Harju County, and the Tallinn region has the greatest potential to reduce transport-related emissions thanks to its high population density and the huge and untapped potential of public transport and light traffic.

If current trends continue, transport and car usage will either make it impossible to achieve the greenhouse emissions targets pursued under Estonia's climate policy and set by Tallinn in the Covenant of Mayors, or they will make it increasingly difficult and costly to achieve these targets if corrective actions are put off.

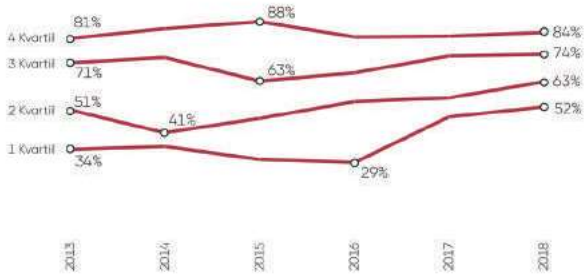
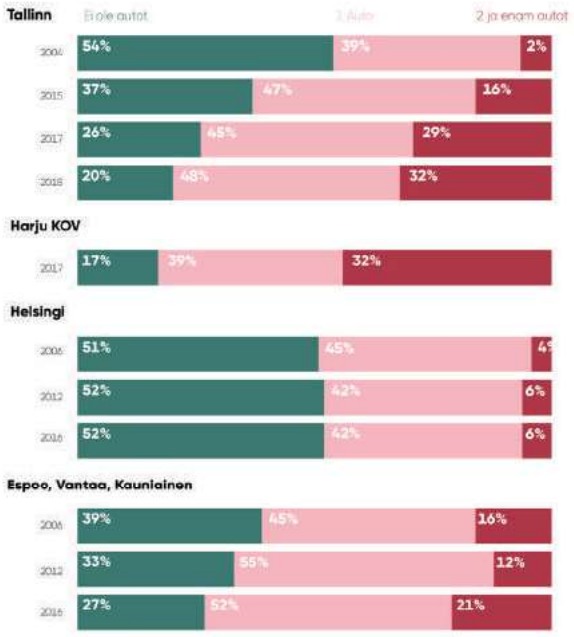


Figure 3.19. Distribution of residents of Harju County commuting by car by income quartile, %. Source: Statistics Estonia



Joonis 3.20. Car ownership in the Tallinn and Helsinki regions by household, 2004–2018. *Single-person households make up 48% of all households in Helsinki and 38% in Tallinn. Sources: SaarPoll 2004, Emor 2015, Emor 2017, Eesti Uuringute Keskus 2018, HSL 2018.

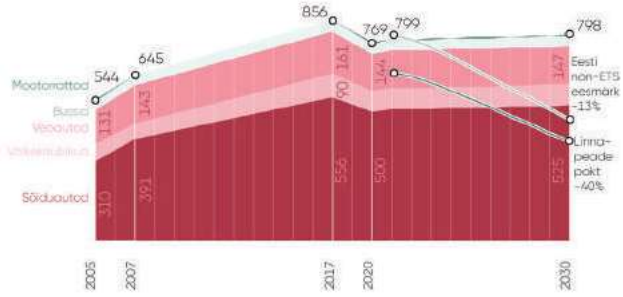


Figure 3.21. CO_2 emissions from transport in Tallinn in the baseline scenario, Estonia's CO_2 emission reduction target, and the target set by the Covenant of Mayors for 2030. Sources: Energy Agency of Tallinn, Estonian Environmental Research Centre, 2019

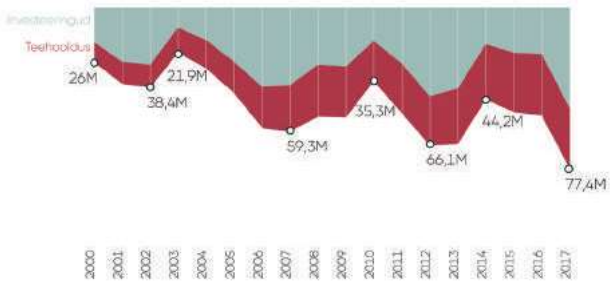


Figure 3.22. Road maintenance costs in the city of Tallinn (€M).

Source: Statistical Yearbook of Tallinn 2018

Figure 3.23. Road maintenance costs and revenue for Tallinn and Harju County in 2018 (€M/year). Source: Statistical Yearbook of Tallinn. Estonian Road Administration

Figure 3.24. Public transport revenue and expenditure for Tallinn, Harju County Public Transport Centre, and Elron in 2018 (€M/year). Sources: Elron, North-Estonian Public Transport Centre, Tallinn City Government

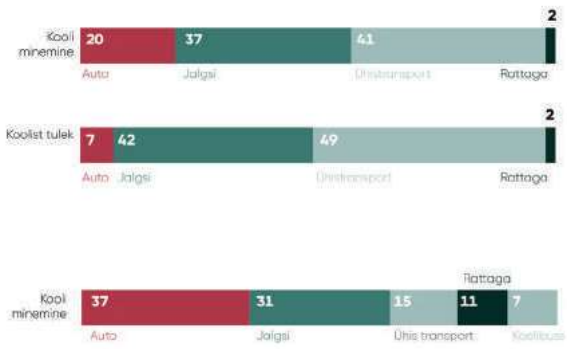


Figure 3.25. Main means of travelling to school for schoolchildren in Tallinn and Harju County

Source: Survey of satisfaction among Tallinn's residents concerning public services, 2017; survey of mobility habits in Harju County (Kantar EMOR 2018).

ROAD MAINTENANCE AND PUBLIC TRANSPORT COSTS ARE INCREASING. THE EXISTING ROAD NETWORK HAS A CONSIDERABLE BACKLOG OF REPAIRS

Maintaining the transport system is costly for both the public and the private sector and requires carefully selected solutions that support the performance of all means of transport as a whole. The organisation and financing of the transport system require increasing co-ordination between different means of transport, administrative levels, and authorities. Regional public transport management (including a common ticket system for all types of public transport) requires agreements at city and state level and new models of co-operation. Most major projects have been co-financed by the European Union. It is clear that solutions to cope with the ever-increasing volume of traffic are becoming more and more expensive as the city becomes denser and space is scarce.

THE INDEPENDENT MOBILITY OF SCHOOLCHILDREN IS DECREASING

The independent daily mobility of schoolchildren has decreased due to urban sprawl and increased car ownership. This has a significant impact on public health and creates problems for families in day-to-day logistics. Complicated traffic management and travel difficulties during the winter season are not conducive to the independent movement of the growing proportion of elderly people in the city. A mobility environment that facilitates daily walking and cycling for people of all ages and is accessible to people with special needs, makes the city attractive for families and is important for maintaining both the living environment and public health.

As parents increasingly take their children to school and sports practice by car, sedentary lifestyles among schoolchildren become more prevalent, while time spent outside in fresh air decreases, which affects both children's health and learning outcomes. It also leads

to an increase in dangerous traffic situations as traffic between and near educational institutions increases. Therefore, the location of kindergartens, schools, and hobby schools is an important influencer of mobility and traffic, which must be taken into account in future urban planning in Tallinn and neighbouring municipalities.

At the moment, we are seeing a 20% reduction in the number of cars in traffic in connection with school transport during school holidays. This is mainly due to the fact that parents who drive their children to school on a daily basis take time off from work during their children's school holidays and thus do not participate in car traffic in the city during rush hour. Thus, many parents of school-age children spend their mornings and afternoons performing the tasks of public transport, because the public transport services of Tallinn and Harju County do not provide sufficiently fast and convenient links between schools and children's homes.

THE NEGATIVE HEALTH EFFECTS OF TRANSPORT (NOISE, POLLUTION, LOW PHYSICAL ACTIVITY, STRESS) ARE INCREASING

Fine particulates in the air, which to a large extent originate from transport, cause the premature death of approximately 300 residents of Tallinn per year (http://rahvatervis.ut.ee/bitstream/1/731/1/Orru2007.pdf). Emissions and noise need to be reduced and further fragmentation of the green areas and recreational areas of Tallinn and its surroundings must be prevented.

NEW DENSELY PACKED DEVELOPMENTS ARE CROPPING UP IN AREAS WITH POOR PUBLIC TRANSPORT LINKS

The mobility needs and preferred means of travel of future residents, employees, and customers depend on the planning of new developments and the location of jobs. In addition to the urban sprawl that took place during the economic boom, car usage has also increased due to the relocation of jobs. Areas around

Figure 3.26. Road traffic noise map of the streets of Tallinn.

Source: Daily Road Traffic Noise Map of Tallinn, 2015.

Figure 3.27. Air quality index for Tallinn, measured at Liivalaia Air Quality Monitoring Station from February to April 2019.

Source: http://airindex.eea.europa.eu/

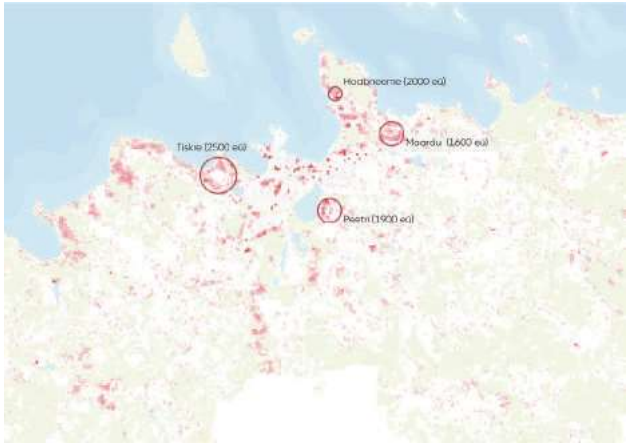


Figure 3.28. Number of dwelling units located in areas with poor public transport access.

Source: Raul Kalvo 2019

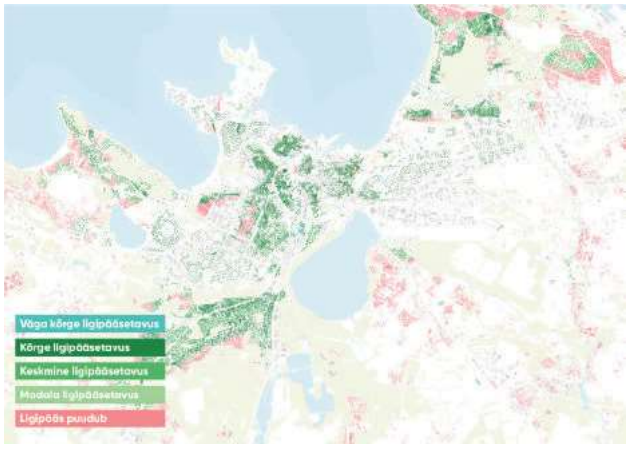


Figure 3.29. Good access to public transport and location of residences (the greener square, the greater the number of residences with good public transport access in the area; the redder the square, the greater the number dwelling units with poor public transport access in the area)

Source: Raul Kalvo, 2019.

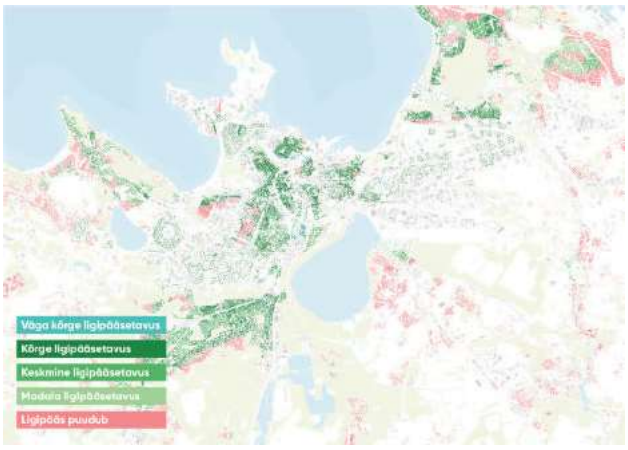


Figure 3.30. Location of businesses and level of public transport service in 2019 (red indicates poor public transport access and green indicates good public transport access in the area) Source: Raul Kalvo, 2019 (peatus.ee; data from Inforegister).

exurban train stops in the vicinity of Tallinn are relatively sparsely populated and the potential of travel by rail is largely untapped compared to travel by tram, trolleybus, and bus. Tapping that potential will require much more effective integration of spatial planning and transport management. The Tallinn Mobility Plan 2035 analyses which areas should be given priority for development to achieve sustainable mobility on the basis of existing efficient public transport routes, where it would be possible to create better conditions for the use of trains, trams, and high-capacity bus routes.

The figure shows densely populated residential areas in Tallinn and its vicinity where public transport access is poor. According to indicators developed in the European Union, good public transport access can be claimed in areas that are located within 400 metres of a public transport stop with an average of at least ten departures per hour.

When building new developments, the only mobility-related investment required from developers is the construction of parking spaces, as a result of which many developments lack public transport services and comfortable light traffic paths. Currently, the only requirements regarding traffic in Tallinn and the mobility needs of residents which are taken into account during the construction of new buildings are parking requirements (i.e. developers are required to construct a certain number of parking spaces per each square metre of apartment or commercial space – see also chapter 4). There are no other requirements that directly support the mobility of the population, and where necessary, support for any new traffic links is negotiated separately with developers.

The mobility needs and preferred means of travel of future residents, employees, and customers depend on the planning or non-planning of new developments and the location of jobs. In addition to the urban sprawl that took place during the economic boom, car usage has also increased due to the relocation of jobs.

Figure 3.29 shows the distribution of dwellings in the Tallinn region by level of public transport service.

The public sector has largely failed to seize opportunities to direct new developments to areas with good public transport links (rail, frequent trolleybus and bus service) and avoid the dense settlement of people in areas with poor public transport links.
Areas around exurban train stops in the vicinity of Tallinn are still relatively sparsely populated and the potential

of travel by rail is largely untapped compared to the capacities of trams, trolleybuses, and buses. Tapping that potential will require considerably more effective integration of spatial planning and transport management.

THE PUBLIC TRANSPORT SERVICES OF TALLINN AND HARJU COUNTY ARE FRAGMENTED AND THEIR TICKETING SYSTEMS ARE NOT CONDUCIVE TO COMBINING MULTIPLE MEANS OF TRAVEL

In Tallinn and Harju County, common public transport period cards are used on Tallinn's city routes and Harju County's bus routes, as well as Tallinn's routes and Elron trains. However, there is no common monthly card that is valid for all three operators' services, nor a common single journey ticket for convenient and affordable cross-usage of public transport services. Common monthly cards would allow regular public transport users to benefit from lower fares. The number of period ticket purchasers indicates the number of regular public transport users, i.e. loyal customers. Given that nearly 120,000 commuters travel between Tallinn and Harju County daily, the currently paltry number of 1,400 common period card users indicates that developing a common ticketing system could significantly increase the number of public transport users as well as loyal customers. Currently, for example, commuting between Keila and Tallinn costs around 100 euros per month in total if paying for the monthly cards of all three service providers (Elron, TLT, county buses); meanwhile, transferring from a train to a tram using single journey tickets is disproportionately expensive and is not conducive to transfers between and cross-usage of the public transport systems.

Although the number of users of electric trains and Harju County routes is increasing, especially on western train routes and routes passing through Harku, where buses fill up quickly with the addition of new departure times, the potential of public transport is untapped. The bottlenecks here are the lack of good links between new residential areas, new hubs, and jobs; the lack of fast direct links between major destinations; the lack of convenient options for transfers and combining of different types of public transport; the lack of a jointly managed route network, schedules, and ticketing system; and the lack of Park & Ride car parks at the edge of the city for those travelling to the city from sparsely populated areas.

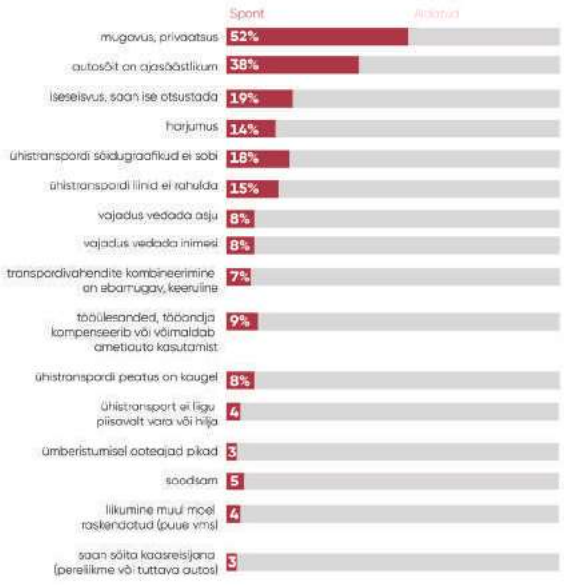


Figure 3.31. Reasons why residents of Harju County prefer a car.

Source: Kantar EMOR, 2017

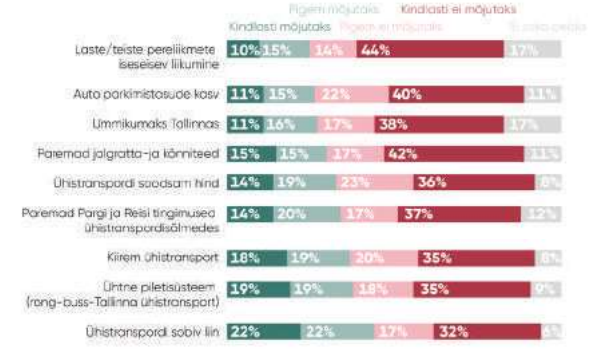


Figure 3.32. Willingness of residents of Harju County who drive a car to use public transport and/or a bicycle.

Source: Kantar EMOR, 2017

Table 3.2. Average number of monthly users of public transport period cards in Tallinn and Harju County.

Source: Tallinn Transport Department

	2011	2012	2013	2014	2015	2016	2017
Tallinn–Harju	993	902	874	810	807	820	870
Tallinn–Elron	687	608	339	487	502	507	513
Total period card users	1,680	1,510	1,213	1,297	1,309	1,327	1,382

THE CITY STREETS ARE NOT ATTRACTIVE FOR WALKING AND CYCLING. THE ELDERLY AND PEDESTRIANS ARE STILL HIGHLY VULNERABLE IN URBAN TRAFFIC AND ROAD SAFETY IS POOR

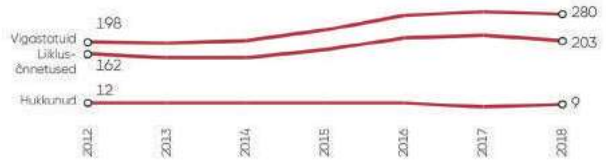
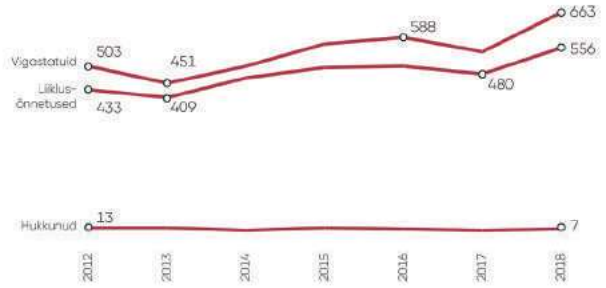


Figure 3.33. Traffic accidents in Harju County, 2012–2018. Source: Estonian Road Administration.



Joonis 3.34. Traffic accidents in Tallinn, 2012–2018. Source: Estonian Road Administration

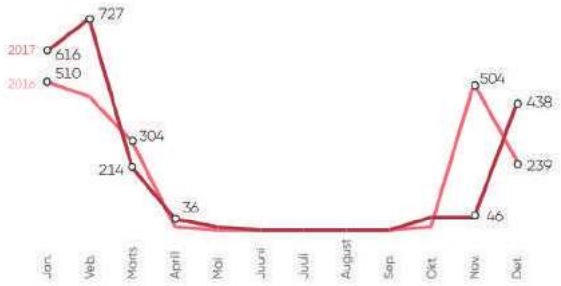


Figure 3.35. Falls due to snow and ice in Tallinn in 2016 and 2017. Source: National Institute for Health Development.

In the last seven years, the number of traffic accidents and traffic injuries in Tallinn and Harju County has increased. The number of fatal traffic accidents is, however, dropping slightly. In 2018, there were 1,464 traffic accidents where people were hurt in Estonia, including 67 deaths and 1,823 persons injured; Tallinn and Harju County account for approximately 50% of the total number of traffic accidents in Estonia and 50% of traffic accidents resulting in injury.

It is more important than ever that streets be made to accommodate different users, which, where necessary, means using traffic calming measures. Equally important is that public transport stops and sidewalks be designed and constructed or reconstructed in a way that increases the safety of pedestrians. In order to improve safety, the traffic environment must be actively shaped to match the function of the street and promote safe and sustainable traffic behaviour, in particular by reducing speeding.

With regard to road maintenance, attention needs to be paid to the situation of pedestrians and the condition of sidewalks, which are significantly less accessible during the winter season, because their maintenance is the duty of the owner of each adjacent plot. As a result, the maintenance of sidewalks is often inconsistent in the winter and makes it difficult for pedestrians and other non-car users to get around. Figure 3.35 shows how, according to data from the National Institute for Health Development, during the winter months, snow and ice are responsible for around five hundred additional injuries among Tallinn's residents. This significantly reduces the mobility of the elderly for almost half a year as they do not want to risk trauma and hospitalisation on slippery and poorly maintained sidewalks.

DATA ON THE USE OF AND NEED FOR DIFFERENT MEANS OF TRAVEL ARE PATCHY

We have a lot of data on vehicle traffic volumes (permanent counting points and random censuses administered by the Estonian Road Administration and Tallinn Transport Department), but there is no systematic overview and information on people's movements, the purpose of their movements, and the reasons for their choice of means of travel. The state and municipalities do not carry out any systematic monitoring of people's movements and the factors affecting out. As such, the proposed transport solutions are focused on improving vehicle movements (e.g., road surface and capacity improvement).

The Mobility Plan has been drawn up and the options have been assessed on the basis of studies and strategic analyses that look at how and where it is appropriate to act to achieve the objectives of the Mobility Plan: what the impacts of different alternatives are, which actions are effective and feasible both financially and in taking different interests into account. Where the necessary data have not been available, the experience and tested practices of neighbouring countries and cities have been used. The Tallinn Mobility Plan 2035 has been prepared with support from the City of Helsinki and other European cities that have drawn up a mobility plan. In order to implement the Tallinn Mobility Plan 2035, it is necessary to agree on the monitoring of its implementation and the updating of the plan.

THE POTENTIAL OF INNOVATIVE MOBILITY SERVICES REMAINS UNTAPPED

As Tallinn is a major business and economic centre, where the movement of people, goods, and information is essential, it is necessary to develop new transport solutions that bring together public transport services, logistics, combined transport, and new technologies for its effective as well as environment-friendly functioning. It should be borne in mind, however, that new transport and logistics technologies, such as electric vehicles, self-driving vehicles, and delivery robots can both solve current mobility and environmental problems as well as create new bottlenecks.

The success of innovative mobility services such as ridesharing, car and van sharing, bike and electric scooter sharing, courier services, integrated payment and real-time information systems, and integrated mobility service package solutions depends on a well-functioning basic public transport service and a street network that is kept in good condition all year round. New mobility and freight transport services make it easier, faster, and safer to combine different means of travel, and reduce dependence on personal cars. It is important to adapt to new mobility services entering the market and to be prepared to integrate them into the existing transport system by focusing on accessibility and the movement of people and goods instead of that of vehicles.

CURRENT SITUATION AND BOTTLENECKS IN FREIGHT TRANSPORT LOGISTICS

Traffic censuses show a continuing increase in freight transport volumes. The traffic load of road trains on major roads entering Tallinn has increased sharply since 2010. Census data show that although freight traffic mainly flows around the city centre on its outskirts, a considerable amount of freight traffic does still flow through the city and not via the Tallinn Ring Road. Another major source of traffic is commerce, where goods are often delivered without co-ordination and predominantly on business days. Thus, most of the load falls on peak times in downtown traffic. Particularly problematic is the organisation of freight transport in the Old Town, where established time limits are not respected. Possible solutions to this situation include analysing solutions that are used elsewhere, such as consolidation centres, or changes in delivery times, as well as freight bicycles for deliveries in the city centre. In urban logistics, e-commerce is a growing generator of traffic. Information on the volumes and routes of freight transport in Tallinn is patchy, especially for intra-city transport.

PARKING POLICY IN TALLINN – CURRENT STATUS AND FUTURE LINES OF DEVELOPMENT

PARKING POLICY IN TALLINN – CURRENT STATUS AND FUTURE LINES OF DEVELOPMENT

As part of the parking policy study carried out by SPIN Unit, a map of Tallinn's parking spaces was drawn up, combining different data sources (parking space data from the City of Tallinn, Register of Buildings, Tallinn Spatial Data Register; mobile parking data from EuroPark and AS Ühisteenused; Parking Census 2012, and parking spaces on the streets and in open car parks as mapped by SPIN Unit). Street parking spaces here and hereinafter refer to paid parking areas in the city of Tallinn, which are operated by AS Ühisteenused, and off-street parking spaces refer to all car parks operated by EuroPark and other service providers. (For interactive maps, see http://www.spinunit.eu/metalinn/)

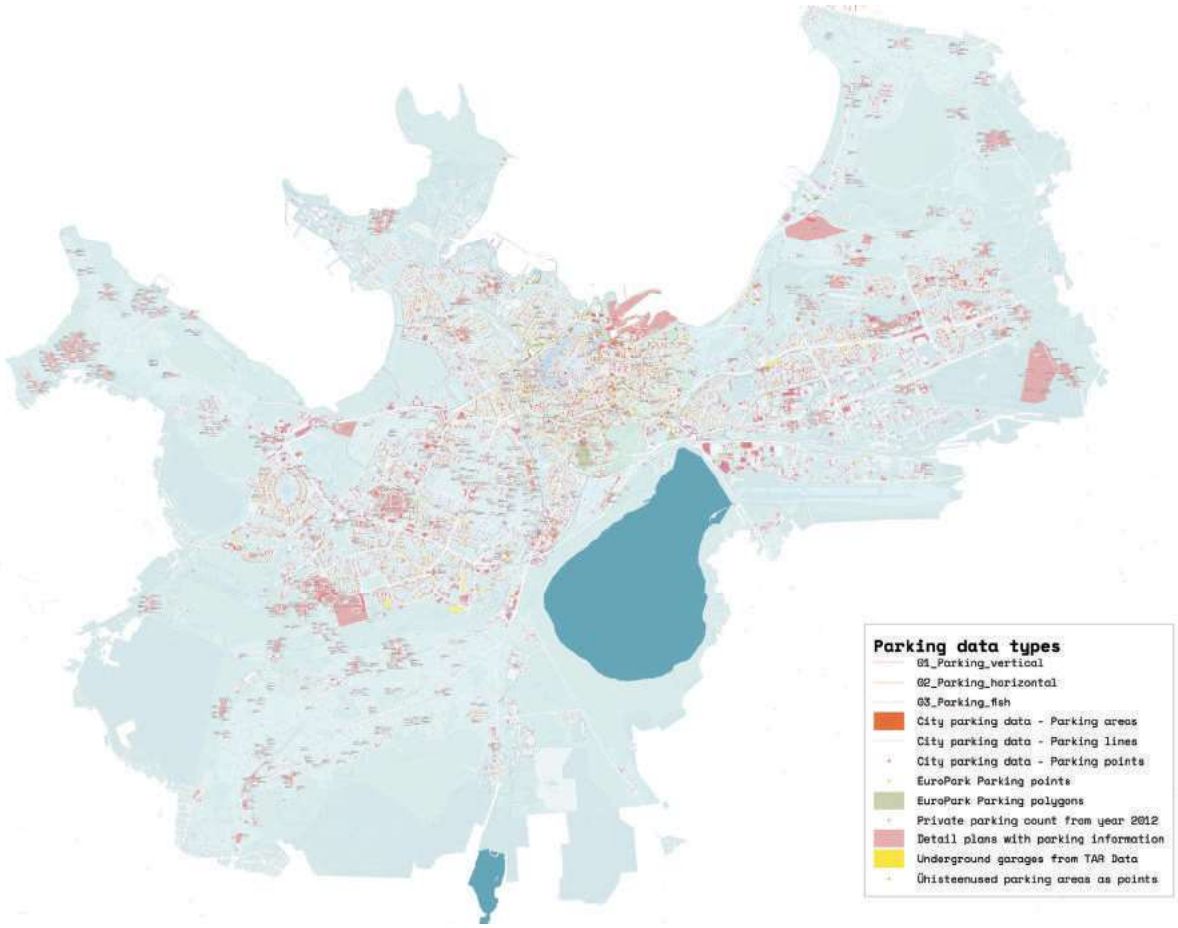


Figure 4.1

HIGH PRICE OF FREE PARKING

Despite the fact that drivers do not pay for parking in free parking lots, parking is never actually 'free'. All parking spaces, whether privately or publicly owned, involve construction, maintenance, and administrative costs. These costs are always paid for by someone and they become evident, for example, in the price of a parking space or when calculating the profitability of public buildings. The cost of paid parking is borne by drivers, but in the case of free parking, the cost is shared between all residents, whether they own a car or not.

The more 'free' parking there is, the higher the social cost of parking. For example, near various stores and businesses, where parking spaces are in high demand, there might be free parking, but the costs of construction and maintenance of such car parks are covered by raising the prices of goods and services. Thus, the price of 'free' parking is carried over to every movie ticket, cup of coffee, or bagful of groceries purchased by visitors. In the case of a free public parking lot, its design, construction, and administrative costs are borne by all taxpayers.

Professor Donald Shoup, a renowned parking policy expert, has extensively studied the relationship between parking and retailing through various case studies. According to him, paid parking actually increases sales, instead of reducing it. The reason for this is that paid parking spaces are generally fewer in number, which means that the areas freed up as a result can be turned into pleasing public spaces (e.g., by adding small design elements and greenery) and the façade of the store is more visible, which attracts more visitors. When choosing between different options for land use, cities should always prefer those that provide the greatest public benefit and improve the quality of life or offer new development opportunities.

Encouraging the proliferation of parking spaces prevents the land taken up by car parks from being used for other economically profitable activities (more profit for entrepreneurs; living spaces, jobs, and services for citizens) or for creating public recreational areas. Parking lots cause urban areas to be spread out, making distances between different destinations longer and longer. Increasing distances, in turn, lead to more car traffic and less sustainable lifestyles.

Due to the high construction costs of parking lots, providing 'free' parking to residents and visitors has become a major item of expense for real estate developers and home buyers alike. The Apartment Ownership and Apartment Associations Act, which entered into force last year, is being interpreted by developers as

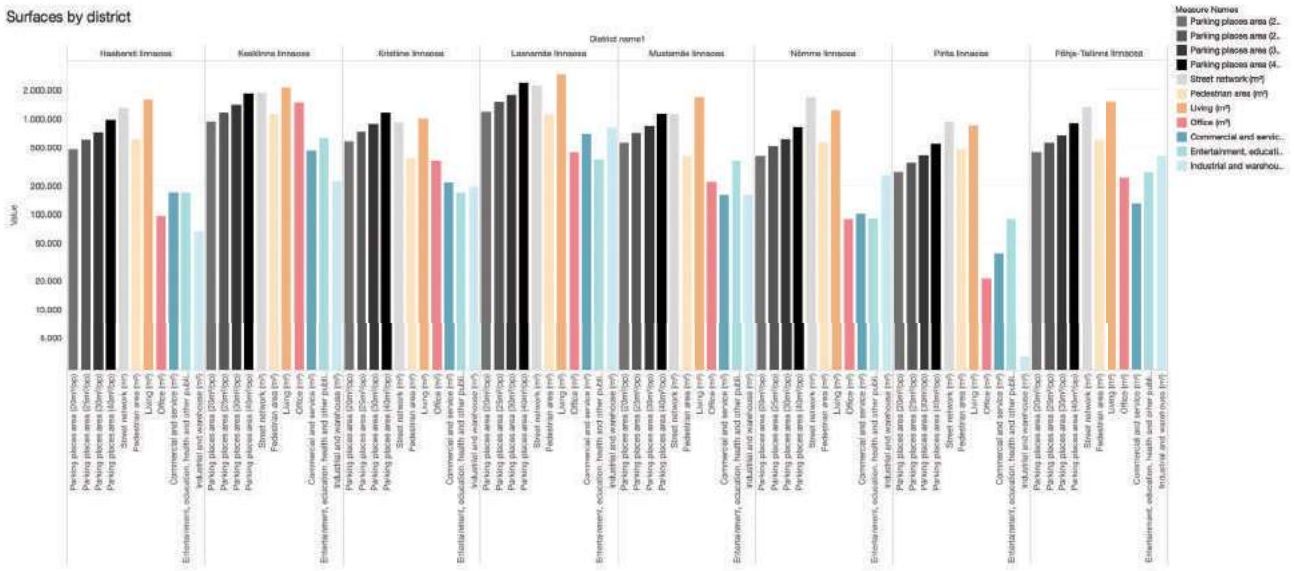


Figure 4.2

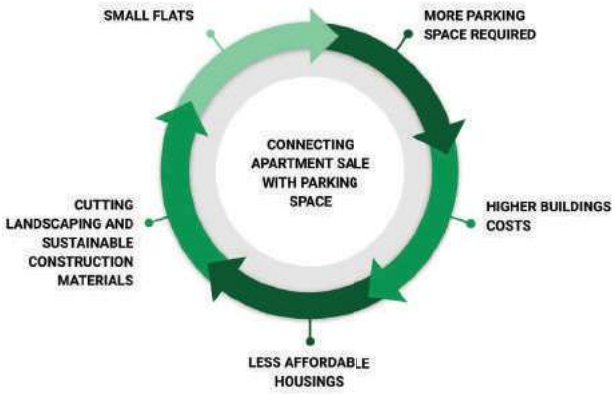


Figure 4.3

requiring that apartments and parking spaces be sold together (Pärli, 2018), as parking spaces are considered a part of the dwelling. This, however, means that parking space construction costs also have to be paid by home buyers who do not actually want a parking space and who use completely different means of transport, such as public transport.

The combined effect of the city's parking policy and the Apartment Ownership and Apartment Associations Act is likely to further increase the number of parking spaces required. The inclusion of parking space construction costs in the final price of apartments makes apartments increasingly expensive and developments increasingly complex. This, in turn, may also increase inequality within the city, as new developments are only affordable to high income earners.

Simply building smaller apartments is not a solution to the high construction costs. As the current standard sets out a required number of parking spaces per apartment, more apartments directly equates to more parking spaces. The result, again, is higher construction costs, because in a densely packed city this requires the construction of underground floors. Higher costs, in

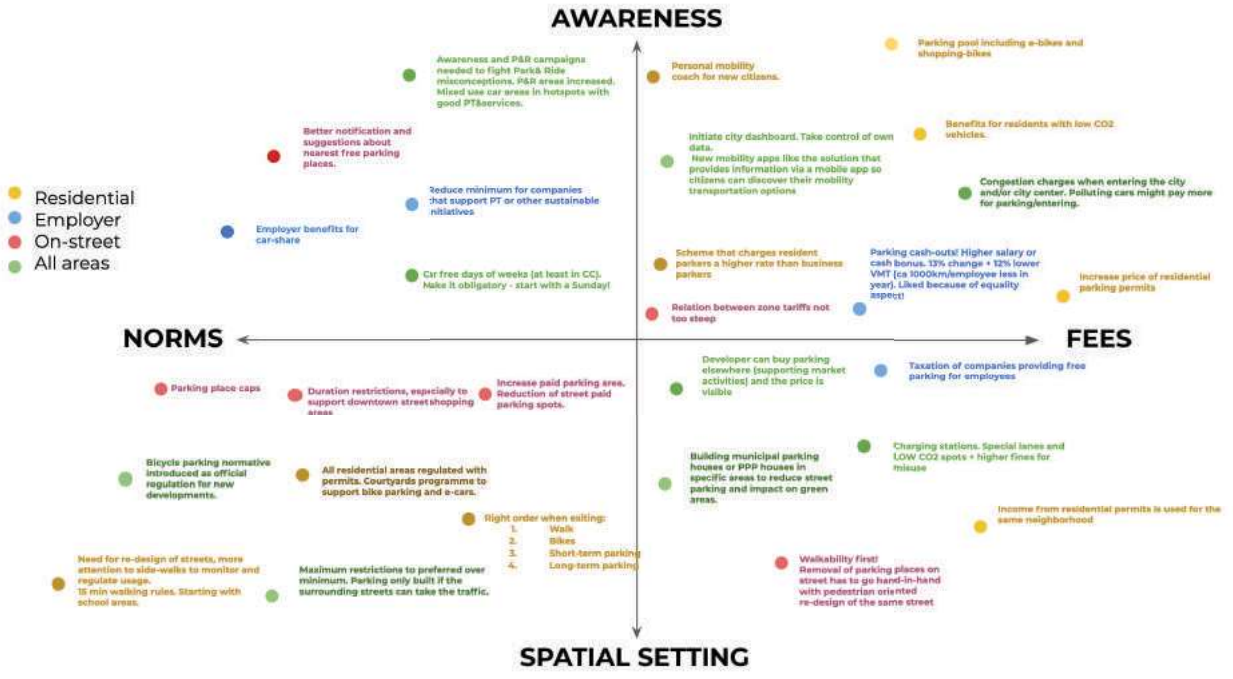


Figure 4.4

turn, force developers to look for ways to save money, by using cheaper materials and lowering the quality of outdoor areas, for example. A vicious cycle ensues, which in turn reduces the quality of the living environment and the diversity of developments.

Another undesirable consequence is the role of land covered by parking spaces in reducing the density of the urban environment, which increases the distances between homes, jobs, and various services and increases car dependency. Here, the city has the opportunity to position itself as an entrepreneurial, people-centred, and green capital by severing the links between apartment sales and parking spaces and rewriting the parking standard to call for parking spaces to be provided not in accordance with a minimum requirement, but a maximum amount, which would be based on gross area instead of the number of apartments.

ROLE MODELS IN PARKING POLICY

The parking policy study analysed the parking policies and related actions of Helsinki, Stockholm, Oslo, and Copenhagen as cities worth emulating. Parking policy can be used to make the urban environment better, more competitive, and more pleasant. Thus, parking policy becomes an instrument through which the city can demonstrate to its residents that it wishes to improve their quality of life. The aforementioned cities have committed themselves to long-term strategic actions for reducing demand for parking spaces, streamlining the parking experience, and reducing the social cost of parking while supporting the health-related behaviour of residents and local businesses. These cities have made all of their free parking areas paid in order to increase the use of public transport and reduce greenhouse gas emissions.

The biggest difference between Tallinn and the cities above is the parking space requirements for commercial buildings. In Tallinn, the minimum requirements for new developments are nearly 5 times higher than in Helsinki and almost 8 times higher than in Stockholm. This should be corrected immediately to allow for existing good public transport access (hereinafter also referred to as 'Active Mobility Area' or 'AMA') to be taken into account when establishing requirements, and current requirements should be eased at least to Helsinki's level. The construction of our residential areas should be modelled on smart solutions which allow requirements to be eased based on the objectives of the particular development project and the availability of public transport or other mobility services.

Figure 4.4 shows different parking policy options in four areas, with different actions across target groups marked in different colours. Currently, Tallinn only employs a few elements across different policy areas and target groups. Table 4.1 shows the requirements for the construction of parking spaces within detailed plans in different Nordic capitals. The numbers indicate one parking space per gross area (m^2). In the city centre of Helsinki, a maximum amount has been established instead of a minimum requirement. There is a strong emphasis on public transport and underground car parks priced by private operators. Stockholm has established a flexible standard with a variety of incentives to promote sustainability.

Table 4.1. Parking requirements in the Nordic capitals

	Tallinn	Helsinki	Stockholm	Copenhagen	Oslo
City centre	1/ 80-120	1/ 500 (max)	1/ 250-1000	1/ 143	1/ 500
Inner city	1/ 80-120	1/ 220-350 (min-max)	1/ 143-200	1/ 143	1/ 500
Sub-centres	1/ 40-60	1/ 250	n/a	1/ 43	1/ 44-143
Rail stations	1/ 40-60	1/ 75	n/a	1/ 43	1/ 55-143
Other areas	1/ 40-60	1/ 60	n/a	1/ 43	1/ 55-143

Table 4.2. Parking policy principles in Helsinki and Stockholm

	Helsinki	Stockholm
Approach	Finding a balance between the quality of the living environment and the competitiveness of businesses	Reducing parking requirements to support the development of new residential areas, and promoting sustainable mobility (bicycles, public transport, ride sharing)
Basis of parking requirements	Building right (gross area) in the detailed plan	Number of apartments according to the approved design
Pros and cons	Provides a clear basis, but can be rigid as the situation changes (delays in development plans, changes in building occupancy). Does not favour large family apartments.	Favours large family apartments, but disfavours small studio apartments. Can increase bureaucracy, as the requirements depend on the location, the detailed plan, and the final design.
Location-based differences	Helsinki is divided into three zones: I, II, and III.	The rules are generally the same throughout the city.
Basic minimum requirement	1 parking space per 100–150 m^2 gross area	0.4–0.6 parking spaces per apartment
Progressive measures	The number of parking spaces can be lower:	The number of parking spaces can be lower:
	· depending on the proximity of rail services;	· depending on the proximity of public transport and public services;
	· by adding bicycle parking spaces;	· depending on project-specific factors, such as building type, size of apartments, and multi-purpose usage of the car park;
	· in the case of the construction of state-subsidised rental premises;	· in the case of a high-quality and well-functioning mobility service package.
	· in the case of access to shared cars;	
	· in the case of multi-purpose parking facilities.	
Final requirements	For state-subsidised rental premises, the requirements can be up to 40% lower. The maximum rate of reduction for open market rental premises and privately owned projects is up to 25%.	The differences are great. Well-organised mobility services provide a 25% reduction. The requirements can be reduced to 0.23 parking spaces per apartment, sometimes even more.

PARKING POLICY RECOMMENDATIONS

Establishing an AMA or Active Mobility Area

Many European cities have a local designation for areas subject to various traffic restrictions. In Italy alone, there are 300 such limited traffic zones. In the aforementioned Nordic cities, congestion charging and the expansion of paid parking zones are becoming increasingly popular. Establishing a congestion charge applicable upon entering a certain area would encourage the residents of neighbouring municipalities to use other means of travel and the Park & Ride system. At the same time, congestion charging in no way contributes to better land use, urban space development, or the reduction of intra-city car traffic.

Here, Tallinn should refrain from blindly following other cities, and should instead seek to be an innovator and a role model for others. Our recommendation is to establish the concept of the Active Mobility Area (AMA), defined as the area with the fastest and most accessible public transport service. As high-speed public transport coverage grows in the future, so, too, will the AMA. After delineating a specific area,
the AMA concept could be used to establish a new parking standard, according to which detailed plans within the AMA would need to comply with a maximum parking space requirement instead of the current minimum requirement.

Another option would be to define the AMA on the basis of a public transport route network buffer zone. This is the case in Helsinki, where planners add parking restrictions or reduce the number of parking spaces for developments located within 400 metres of a public transport stop. This, too, is a good solution, however it only takes into account the proximity of public transport and not its efficiency and speed. The AMA should be dynamic and updated annually based on GTFS data – this would positively link the development of public transport infrastructure with urban development and support the creation of a better-connected route network instead of focusing on only two or three main corridors which could become overburdened.

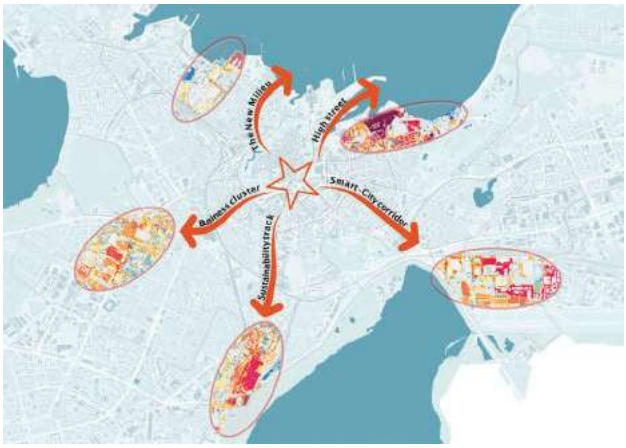


Figure 4.5. Areas of new mobility services (priority development of public transport and light traffic, adaptation of parking requirements, changes in the parking system) as Tallinn becomes a multi-hub city

The AMA gives a clear shape and direction to the sustainable development of the city, which creates a snowball effect. The more efficient public transport becomes, the larger the AMA becomes. The larger the AMA, the more people are motivated to use public transport rather than personal cars, leading to less pollution and leaving more land free for green spaces. Reduced parking space requirements mean that developments located within the AMA involve lower construction costs, allowing for more investment in the indoor and outdoor areas of buildings.

Expansion of the paid parking zone

Expanding the paid parking zone as much as possible is beneficial to all citizens, who will no longer have to pay extra for the cars they store in public areas. By collecting parking fees, we can turn a place that has traditionally produced pollution and increased car usage into one

Figure 4.6. Proposal to expand dynamic paid parking on the city streets. Source: Tallinn parking policy study (SPIN Unit, 2019)

that benefits the entire community. To that end, collected parking fees should be used to improve local services. Parking planning is, after all, essentially urban planning, as parking policies relate to both transport and land use. Parking space planning that only considers land use, however, is outdated planning practice. The AMA or Active Mobility Area consists of a proposal to expand paid parking to areas where public transport services are most efficient and accessible. In order to differentiate the areas, the expansion zones are designated with the letters A, B, C, D, E, and F in different directions, but may also be referred to as a single zone during the use phase.

Local redistribution of parking revenue

For everything to function properly, not only in terms of parking, but also socially and politically, all revenue from parking fees should be allocated to the districts where the fees are collected. The funds could be used at the local level to improve public spaces, street design, landscaping, local public transport stops, pedestrian paths, cycle tracks, and municipal services – or quality of life in general. It is important to reach a common understanding or agreement between politicians and citizens on the local use of the collected parking revenue, because without this transparency, local residents are guaranteed to oppose any such changes and to see the expansion of the paid parking zone as another tax being imposed on them.

Minimum parking space requirements should be replaced with maximum permitted amounts

Reducing parking requirements and collaborating with developers will help to accelerate investment in the urban environment. Densification, filling of empty plots, and new services would benefit Tallinn by making the urban environment more diverse. The current overzealous minimum requirements for parking spaces are the main reason why parking spaces are taking up too much valuable land. The requirements have been considered necessary to satisfy the demand for parking spaces during peak hours. However, for developers, meeting these requirements means that they have to build far more parking spaces than market logic would dictate. Another requirement concerning parking spaces that wastes valuable land is the provision of free parking spaces for residents and employees.

New pricing principles for residents' parking permits

The cost of parking permits could be linked to the energy class and CO_2 emissions of each passenger car in order to implement both 'user pays' and 'polluter pays' principles and to meet the environmental and climate objectives of Estonia and Tallinn (see Estonia's Climate Policy Guidelines, the Covenant of Mayors, and the Tallinn Sustainable Energy and Climate Action Plan) – this would make the system more equitable and encourage the development of a more economical fleet of cars with a lower environmental impact. This approach would also enable the city to generate more revenue from parking permits. Meanwhile, the city could offer more affordable parking permits to owners of new electric and low-emission cars. Currently, all residents' parking permits are valid for one year and cannot be obtained for a shorter period. In their study, SPIN Unit recommends offering residents the opportunity to apply for parking permits on a one-month basis, so as to allow residents to use them only when there is an actual need. The price of parking permits should be aligned with the market price. The monthly fees for parking spaces in the city centre start at 25–40 euros, while parking spaces for new developments cost 5,000–12,000 euros. At the current rate for an annual parking permit (€120/year), instead of spending 5,000 euros on a private parking space, you could park for 42 years on the city streets. As mentioned in the introduction, even a small increase of 10% in parking permit fees could reduce car ownership by 8% (OECD, 2019). Surveys of Tallinn's residents have shown that more than 50% of car owners are willing to pay a monthly fee for a parking space near their home, provided that it improves parking space availability, reduces seasonal car storage and storage of so-called junk cars in dormitory suburbs, and leads to tidier public spaces in the dense urban environment.

The full analysis, results, and recommendations of the

parking policy study can be found at http://www.spinunit.eu/metalinn/ and https://www.tallinn.ee/est/liikuvuskava2035/

Table 4.3. Recommendations regarding the parking standard for the implementation of the 'Tallinn Public Transport+' and 'Tallinn following in Helsinki's footsteps' development scenarios

	City centre	Areas with good public transport access – AMA	Other areas
Basic requirement for apartment buildings	1/150 (0.5 parking spaces per apartment)	1/135 (parking spaces per apartment)	1/100 (0.8 parking spaces per apartment)
Small dwellings	1/135 (0.6 parking spaces per apartment)	1/100 (0.8 parking spaces per apartment)	1/80 (1.0 parking spaces per apartment)
Detached houses	--	1 parking space per apartment	2 parking spaces per apartment
Progressive measures to further reduce the number of parking spaces			
Proximity to high-speed rail transport, 600 m	--	--	-15%
Social housing	-20%	-15%	-10%
Workers' mobility package	-15%	-15%	-15%
Note! The standard sets out a maximum number of parking spaces, not a minimum.			
	City centre	Areas with good public transport access – AMA	Other areas
Institutions	1/500	1/250	1/60
Shops	1/200	1/100	1/60
Other functions	Solve individually with a focus on public transport usage and bicycle parking. All public buildings must be easily accessible by public transport and have low parking demand. Possibility for cross-usage.		
Note! The standard sets out a maximum number of parking spaces, not a minimum.			
Proximity to high-speed rail transport, 600 m	--	--	-15%
Public or cross-usage of parking facilities	-20%	-15%	-10%
Workers' mobility package	-10%	-10%	-10%
Buildings with low space usage (production building, warehouse)	-20%	-20%	-20%
Note! The standard also sets out a maximum permitted number of parking spaces, which is up to +20% of the requirements above.			

ANNEXES

ANNEXES

ANNEX I: SCENARIOS FOR THE FUTURE OF URBAN MOBILITY IN THE TALLINN REGION FOR 2035

Scenario 1. Continuing on the same course

As purchasing power and the population increase in Tallinn and Harju County, both the demand for the transport of people and goods and car ownership will increase. The increase described corresponds to the average and higher estimates used in the design of new roads. Road construction will be financed through loans and, by the end of the 2020s, rail transport will be financed from European Union funds. Car ownership will reach the so-called saturation level of European countries at around 600–700 cars per 1,000 residents. People will increasingly prefer cars, because it will be the most convenient and fastest way to travel. As purchasing power grows, people with lower incomes will also turn more towards cars, because parking is free in most areas. Despite new major city-wide road construction projects being opened every 2–4 years (Reidi tee, Tallinn Small Ring Road, Mustakivi tee thoroughfare, Tervise street connection, Rail Baltic), travel in the city will still be time-consuming, peak traffic hours will be longer, the city centre will have become less attractive, and people will be spending their weekends in shopping and entertainment centres, travelling there – with a few exceptions – by car. Housing prices in Tallinn will rise and it will be difficult for young people and the elderly to find affordable housing in attractive locations. Walking will decrease somewhat and children will be driven to school by car twice as often. Bicycle usage will double, primarily due to high congestion, unsatisfactory public transport services, and the preferences of the next generation. Although nearly half of all cars will be semi-self-driving by 2035 and there will be a wide variety of taxi services available, most families will own 1–2 cars. The generation celebrating their 60th birthday in 2020 will have reached a high age of 75 years old. Since there will be twice as many elderly people as ten years ago and they will be used to a mobile lifestyle, their mobility problems will have been solved by means of self-driving vehicle services; the number of falls on the city streets will have decreased, because travel by foot, particularly among the elderly, will have decreased in the city. New infrastructure will be financed through loans taken by the city and from the state budget. Due to demand for mobility and transport growing faster, a congestion charge will be applied in the downtown area from 2027, the proceeds from which will be used to finance new tunnels, thoroughfares, and self-driving bus services.

Scenario 2. Tallinn Public Transport+

As purchasing power and the population increase in Tallinn and Harju County, both the demand for the transport of people and goods and car ownership will increase. As the European Union will not be subsidising major road construction projects, public transport investment projects will be carried out instead: tram service at the port and Pelguranna, extension of the tram network to Lasnamäe and Mustamäe. The construction of the tram line will also involve the construction of multi-level junctions. Tallinn and Harju County will have a common ticketing system, a common route network, and common mobility services. In areas with excellent public transport access, demand for apartments will have increased, and land use will be partially regulated by the market. The millennial generation, who will have begun buying apartments by the early 2020s, will have been unable to purchase homes near the city centre due to high prices. They will have moved into apartment buildings located near train stations and tram stops and will be combining bicycle travel with trains. Inter-district public transport will be convenient and twice as fast as in 2020; there will be a common ticketing system, and new inter-district routes; convenient public transport connection points will have made using transfers and combining various mobility services more attractive. There will be quality cycle tracks and sidewalks in the immediate vicinity

of train stations and mobility hubs, which will increase the share of cyclists in traffic and will enable people of all ages to move around actively. Self-driving vehicles and on-demand buses will have a considerable share in public transport services. From time to time, this will cause uncertainty about transport prices and, like the peak traffic hours of 2020, will cause congestion and uncertainty regarding connection times. Satisfaction with public transport will have increased, but people aged 35–65 and those living in Harju County will be travelling mainly by car.

Scenario 3. Tallinn following in Helsinki's footsteps

The arrival of the millennial generation, new consumption habits and lifestyles, and limited financial and other resources will create a situation in the early 2020s where residents and businesses prefer developments located in areas where customers and workers are not dependent on personal cars. The state, the city, and the municipalities of the Tallinn region will be consciously investing in comprehensive solutions to renovate existing and develop new solutions for the living, working, and mobility environment. Depending on the situation, most people will prefer to travel by combining public transport, cycling, and rental cars, because this will be the quickest, healthiest, most convenient, and most affordable solution. Tallinn and Harju County will have a common network of public transport routes and a common ticketing system and will be acting jointly in the provision of flexible mobility services, such as bicycle and car rental, on-demand buses, and courier services. The backbone of the transport system will be a highly convenient public transport network along with a network of cycle tracks, which will be well maintained throughout the year and usable to everyone from 8 to 80 years of age. In accordance with the Covenant of Mayors and the Estonia's transport-related climate objectives, the Tallinn region in co-operation with the state will have implemented 'polluter pays' and 'user pays' principles from 2020. As a result of smart tax solutions, more than 50% of public transport costs will be financed through ticket revenue (about EUR 50 million per year) and 50% of the environmental costs of streets, parking, and cars will be financed through car usage and road transport charges (about EUR 100 million per year).

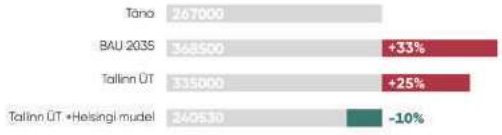


Figure 5.1. Number of passenger cars in the different mobility scenarios in 2035 in Tallinn and Harju County

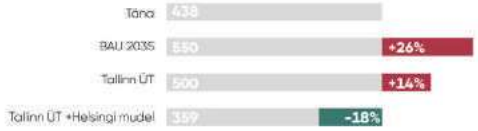


Figure 5.2. Projected car ownership rates in Tallinn and Harju County for 2035

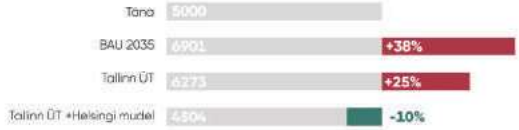


Figure 5.3. Projected mileages of vehicles in Tallinn and Harju County for 2035

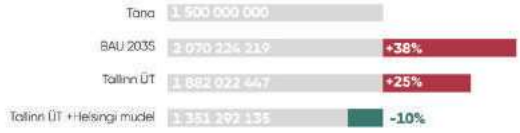


Figure 5.4. Expenses (purchase, fuel, and repair costs) related to passenger cars of residents and businesses of Tallinn and Harju County.

Tallinn Mobility Plan 2035 key metrics	2018	SAME COURSE 2035	Tallinn PT+	Tallinn following Helsinki
Population of Tallinn region	610,000	670,000	670,000	670,000
Working population	323,100	353,100	353,100	353,100
Car users among commuters	172,000	204,000	172,000	105,930
Public transport users among commuters	99,100	99,100	125,000	158,895
Homeworkers plus pedestrians and cyclists among commuters	52,000	50,000	56,100	88,275
Share of commuting by car, %	53	58	49	30
Share of commuting by public transport, %	31	28	35	45
Share of commuting by foot and bicycle	16	14	16	25
Number of passenger cars	267,000	368,500	335,000	240,530
Rate of car ownership, cars per 1,000 residents	438	550	500	359
Mileage, million vehicle kilometres	5,000	6,901	5,960	4,279
Public transport journeys in millions per year	148.6.	156.2	183.6	217
Public transport costs (based on current entry/ticket prices), €M		92	108.1	127.8
COSTS RELATED TO THE TRANSPORT SYSTEM				
Construction of new roads, multi-level junctions, €M per year	80	120	80	30
of which Tallinn	40	80	40	15
of which the state	40	40	40	15
Road maintenance and repair	80	120	100	120
of which Harju County municipalities	25	30	30	30
of which Tallinn	40	40	40	60
of which the state for Harju County roads	40	60	40	60
New public transport infrastructure, €M	2	10	30	30
New trains (average annual cost over 30 years), €M		1.7	3.3	3.3
Investments in cycle tracks and bike sharing, €M	2	3	5	10
Public transport connection points and public space, €M	1	3	10	10
Calming of traffic, redistribution of street space, €M	1	2	5	15

Tallinn Mobility Plan 2035 key metrics	2018	SAME COURSE 2035	Tallinn PT+	Tallinn following Helsinki
PUBLIC TRANSPORT OPERATING COSTS				
Tallinn	70	80	80	80
Elron	15	17	20	25
Harju County routes	7	9	15	15
Harju County municipalities' contribution to public transport costs, €M	2	3	15	15
CO_2 emissions penalties (€50/t), €M	0	20	7	-8
Total public sector expenditure, €M	283	395.7	378.3	368.3
of which Tallinn	152	219.7	213.3	223.3
of which Harju County municipalities	27	33	45	45
of which the state	102	126	115	115
PUBLIC SECTOR REVENUES, €M				
Revenue from public transport tickets, €M	12	17.5	59	65
Tallinn, €M	4	6	40	40
Elron, €M	5	7.5	10	12
Harju County routes, €M	3	4	8	8
Revenue from bike sharing, €M			1	5
Revenue from parking fees on city streets	6	9	9	20
Annual parking space fee	0	0		10
Rush hour fee, clean air zone fee	0	10	20	40
Building right infrastructure charge		5	10	20
Revenue from CO_2 fees, €M		0	0	39
Revenue from sales of CO_2 allowances, €M		0	0	8
Fuel excise duty for transport in the region	250	260	215	98
Total public sector expenditure, €M	268	301.5	313	299
Spending on passenger cars by residents and businesses, €M (€0.3/km)	1,500	2,070	1,788	1,284
Number of additional parking spaces (2 spaces per reg. car)		203,000	136,000	-52,940
Area of additional parking spaces, m^2		3,654,000	2,448,000	-952,920
Cost of constructing the additional parking spaces (average 3,000), annual average over 15 years, €M		41	27	

Tallinn Mobility Plan 2035 key metrics	2018	SAME COURSE 2035	Tallinn PT+	Tallinn following Helsinki
Total cost to society, €M	1,783	2,547	2,221	1,652
ENVIRONMENTAL IMPACTS				
CO_2 from passenger cars, tonnes	800,000	759,082	536,376	299,536
CO_2 from trucks, tonnes	600,000	570,000	540,000	480,000
Total CO_2 emissions for Tallinn + Harju County (provisional!), tonnes	1,400,000	1,329,082	1,076,376	779,536
Difference between CO_2 emissions and target (max 930,000 t/y)		399,082	146,376	-150,464
External cost of CO_2 emissions €50/tonne)	70	66.5	53.8	39
External cost of noise, €M/y	47.5	65.6	56.6	40.7
Total public sector expenditure on mobility	283	395.7	378.3	368.3
Total public sector revenue from transport taxes and fees	268	301.5	313	299
Spending on passenger cars by residents and businesses, €M (€0.3/km)	1,500	2,070	1,788	1,284
Total direct mobility-related costs	1,783	2,465.9	2,166.3	1,652.1

Table 3.2. Average number of monthly users of public transport period cards in Tallinn and Harju County.

Source: Tallinn Transport Department

ANNEX II: common mobility of the Tallinn and Helsinki capital regions

Cross-border co-operation between Tallinn and Helsinki in the field of mobility and transport management will boost communication between the neighbouring capitals and support the functioning of the economic centres of both countries. At present, the daily shipping and economic activities of the two cities have a major impact on each other's urban traffic. As such, the Tallinn Mobility Plan addresses opportunities for co-operation with the City of Helsinki to reduce the impact of congestion and improve the mobility of visitors through a common system of public transport.

Management of public transport and mobility in the capital region

The City of Tallinn and the Ministry of Economic Affairs and Communications have decided to follow the example of the municipalities of the Helsinki region in the management of public transport. To this end, a memorandum setting out common interests, similar to the co-operation agreement concluded between the Finnish capital and the surrounding municipalities, will be drawn up with the aim of planning the living environment in consideration of societal needs and climate change and ensuring

good connectedness throughout the region in order to create a competitive edge for economic development and better quality of life. The shared vision of the Tallinn City Government and the Ministry of Economic Affairs and Communications is to create a CO_2-neutral and green urban area where there is less forced travel and dependence on personal cars. Both schoolchildren and the elderly must be able to move independently, comfortably, and safely. Municipalities in the capital region will work together in managing mobility, so that people would no longer perceive differences in how mobility is managed in different municipalities and so that all means of travel would be easily accessible to them throughout the region.

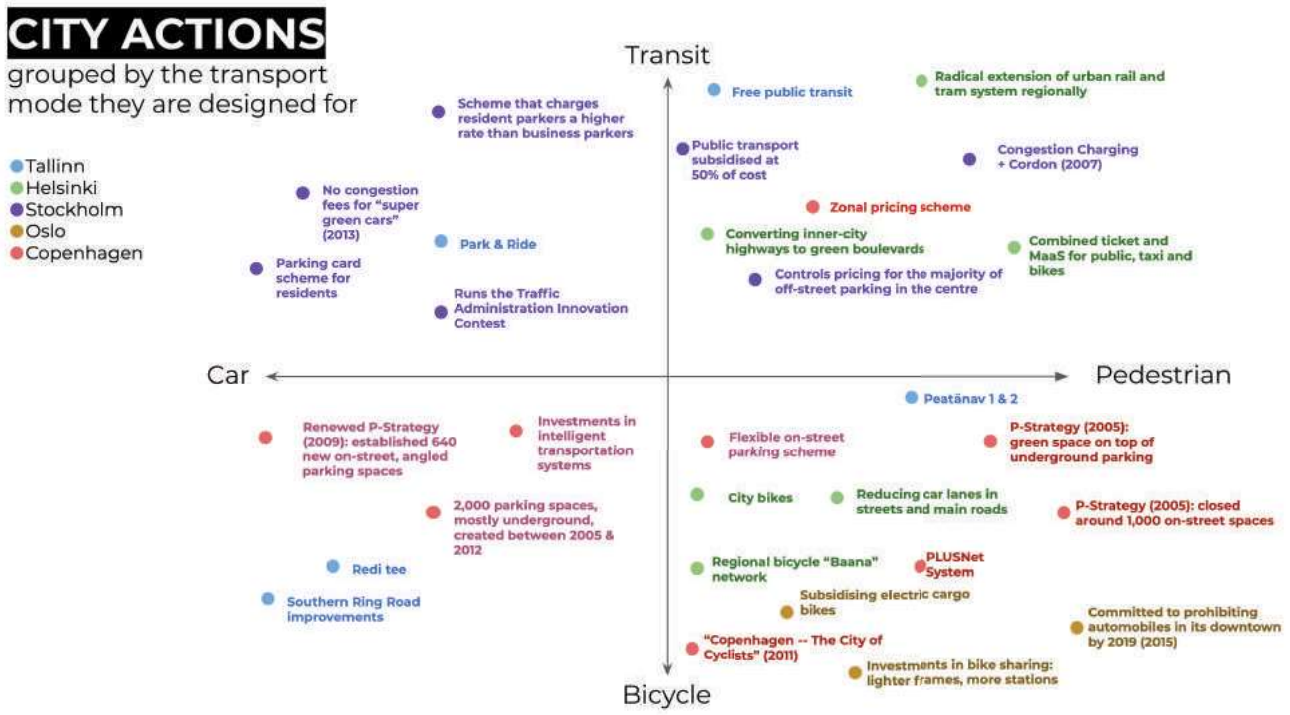
The Memorandum of Co-operation aims to establish a common public transport area in Tallinn and Harju County, similarly to Helsinki, and to establish a common zone-based ticketing system for all types of public transport. In order to achieve efficient mobility management in Tallinn and Harju County, a common network of public transport routes needs to be created that will promote multimodality (i.e. the combining of multiple means of transport), increase public transport usage, reduce infrastructure maintenance costs, reduce journey distances and times, but also increase energy efficiency and reduce negative environmental impacts.

The practical result of the cross-border co-operation between Tallinn and Helsinki will be a common public transport ticketing system that will enable travellers to use public transport in both countries. The capitals of Estonia and Finland are exploring possible ways to pay for the public transport tickets both by mobile phone and QR code sharing.

Helsinki's urban traffic planning principles regarding the planning of land use, settlement, and mobility management (LSM), which are aimed at increasing public transport usage.

Implementation of the principles behind Helsinki's parking policy in Tallinn as per the parking policy study carried out within the framework of the Mobility Plan.

Impact of the ports of Tallinn and Helsinki on traffic in the cities – measures for controlling and steering ship-related traffic growth (truck tax).



ANNEX III: sources and references

Statistics Estonia. Estonian Labour Force Survey 2000–2018. Available at: https://www.stat.ee/toojou-uuring
OÜ Eesti Uuringukeskus, 2018. Survey of satisfaction among Tallinn's residents
HSL, 2018. Available at: https://www.hsl.fi/mal/mal-2019
Estonian Road Administration. Change in traffic volumes at Tallinn's city limits, 2012 and 2018. Available at: https://www.mnt.ee/et/ametist/statistika/liiklussageduse-statistika
Estonian Road Administration. Car fleet mileage in Estonia (extract from reports of 2011–2019)
SaarPoll, 2004. Survey of mobility habits of Tallinn's residents
SPIN Unit, MetaPark. Analysis of lines of development of the parking policy of the City of Tallinn, 2019. Available at: http://www.spinunit.eu/metalinn/
National Institute for Health Development. Falls related to snow and ice in Tallinn in 2016 and 2017. Available at: https://www.tai.ee/et/instituut/pressile/uudised/4264-pea-poolte-vigastuste-pohjus-oli-kukkumine
Statistical Yearbook of Tallinn 2019. Number of passenger cars registered in Tallinn in 2010–2017. Available at: https://www.tallinn.ee/eng/Tallinn-arvudes
Statistical Yearbook of Tallinn 2019. Number of journeys on Tallinn's public routes per year (in millions) in 2003–2018. Available at: https://www.tallinn.ee/eng/Tallinn-arvudes
Emor, 2015. Survey of mobility habits of Tallinn's residents for the development of an electric vehicle sharing system and sustainable public transport (Kredex, EMOR), 2015. Available at: https://www.mkm.ee/et/tegevused-eesmargid/transport
Tallinn Energy Agency, Estonian Environmental Research Centre, 2019. Climate change – mitigation and adaptation. https://www.tallinn.ee/Indicator-1_Climate-change_Tallinn_est
Kantar Emor, 2018. Survey of mobility habits of the residents of Tallinn's neighbouring municipalities – Harju County (excl. the city of Tallinn) and rural municipalities of Kohila and Rapla, 2017. Estonian Road Administration, Kantar EMOR 2018. Available at: https://www.mnt.ee/sites/default/files/02_as_kantar_emor.pdf
Daily road traffic noise map for Tallinn, 2017. Available at: https://www.tallinn.ee/est/keskkond/murakaart-2017
Tallinn Bicycle Strategy 2018–2027. Available at: https://www.tallinn.ee/est/ehitus/Tallinna-Rattastrateegia-2018-2027