

Nordic cycling policy:

National objectives, mechanisms,
and actors in Denmark, Finland,
Norway, and Sweden

Lisa Rohrer, Johannes Lidmo,
and Christoph Beidenhauser



Contents

NORDREGIO WORKING PAPER 2023:8	1
Nordic cycling policy: National objectives, mechanisms, and actors in Denmark, Finland, Norway, and Sweden	1
Executive summary	3
Sammanfattning	5
Introduction	7
Transport emissions in the Nordic countries	7
Shifting to sustainable mobility	8
The Nordic Cycle Power Network	10
Methodology and limitations	12
Cycling policy in four Nordic countries	13
Denmark	18
Finland	29
Norway	44
Sweden	56
Discussion	66
References	71
About this publication	88



Photo: Gemma Evans/unsplash.com

Executive summary

The Nordic countries are facing a variety of social, environmental, and economic challenges as they pursue their vision of becoming the most green, competitive, and socially sustainable region. One major arena for this work is within the transportation sector. How people move through the city—and who has access to which kinds of mobility modes—are fundamental questions that influence all three components of the Nordic Vision 2030. When it comes to urban mobility, cities in the Nordics face challenges with regard to increased spatial segregation, cost of living, and transport emissions.

To become more environmentally, socially, and economically sustainable, cities need to target the transportation sector and make a radical shift towards more sustainable modes of transport. Cycling is a key mode of sustainable urban mobility. Municipalities and regional authorities can use cycling as a crucial measure to reduce road transport emissions rapidly and effectively. Research also shows that there are many benefits of choosing the bicycle beyond mitigating climate change, such as promoting a healthier population, reducing car congestion, reducing air and noise pollution in our cities, and enabling large-scale cost savings. Furthermore, sociologists have posited that incorporating cycling into cities can improve exposure to diversity and improve levels of trust and feelings of connectedness as cyclists negotiate the street among one another. However, objectives for transitioning transport users from the private car to the bicycle must be supported by a variety of mechanisms and involve several key actors.

This paper reviews how Nordic countries are working to improving cycling via policy and planning. It takes a national-level approach to review cycling objectives in Denmark, Finland, Norway, and Sweden, reviews a range of mechanisms to achieve these objectives, and identifies the key actors responsible for carrying out the work. In the discussion section, the paper identifies several findings from the review work with regards to how the Nordic countries are currently addressing cycling at the policy level:

- Cycling is primarily discussed as a means for contributing to environmental goals, such as GHG emission reductions, but is occasionally discussed as a means for improving health and well-being. Much less policy discourse focuses on economic or other social benefits of cycling.
- The primary method for reducing GHG emissions in the transportation sector focuses on replacing fossil fuel cars with electric-powered vehicles rather than on cycling infrastructure or spatial forms that decrease overall mobility requirements.
- The Nordic countries have some distinctions with regards to how spatial planning is operationalised, which influences how cycling is prioritised and managed.
- Beyond a dedicated cycling strategy, cycling objectives are often baked into other key plans and documents at the national level.
- Achieving national cycling objectives requires clear communication among local, regional, and national actors and across ministries, agencies, and departments, which is often a challenge.
- Political turnover can be a hindrance to gaining support for long-term cycling projects.
- There are many different indicators and ways to measure success for cycling objectives in the Nordic countries.

The paper also highlights some of the developments taking place at the UN and EU levels, making cycling and its potential for improving cities and regions more visible across international policy.



Photo: Nomadic Julien/unsplash.com

Sammanfattning

De nordiska länderna står inför en rad sociala, miljömässiga och ekonomiska utmaningar i deras stävan mot att uppnå vår nordiska vision 2030 om att bli den mest gröna, konkurrenskraftiga och socialt hållbara regionen. En viktig arena för detta arbete är transportsektorn. Hur människor rör sig genom staden - och vem som har tillgång till vilka typer av transportmedel - är grundläggande frågor som påverkar alla tre komponenter i den nordiska visionen 2030. När det gäller urban mobilitet står städerna i Norden inför utmaningar i form av ökad rumslig segregation, levnadskostnader och transportutsläpp.

För att bli mer miljömässigt, socialt och ekonomiskt hållbara måste städerna i Norden rikta in sig på transportsektorn och göra en radikal övergång till mer hållbara transportsätt. Cykling är ett viktigt sätt för hållbar rörlighet i städer. Kommuner och regionala myndigheter kan använda cykling som en åtgärd för att snabbt och effektivt minska utsläppen från vägtransporter. Forskning visar också att det finns många fördelar med att välja cykeln som att, utöver att begränsa klimatförändringarna, till exempel bidrar till att främja en friskare befolkning, minska bilköerna, minska luftföroreningarna och bullret i våra städer samt möjliggöra storskaliga kostnadsbesparingar. Dessutom har sociologer föreslagit att integrering av cykling i städer kan öka exponeringen för mångfald och öka förtroendet och känslan av samhörighet när cyklister navigerar gatorna tillsammans. Målen som handlar om att byta transportmedel, från bil till cykel, måste dock stödjas av en rad olika mekanismer och involvera flera viktiga aktörer.

Denna rapport undersöker hur de nordiska länderna arbetar för att förbättra cykling genom policy och planering. Den tar ett nationellt angreppssätt och går således igenom nationella mål som är kopplade till cykling i Danmark, Finland, Norge och Sverige, en rad mekanismer för att uppnå dessa mål och identifierar de viktigaste aktörerna som ansvarar för att genomföra arbetet. I diskussionsavsnittet identifieras flera resultat från vår studie med avseende på hur de nordiska länderna för närvarande hanterar cykling på policynivå.

- Cykling används främst som ett medel som bidrar till att uppnå miljömål, till exempel minskade utsläpp av växthusgaser, men diskuteras emellanåt som ett medel för att förbättra hälsa och välbefinnande. Mycket mindre policydiskurs fokuserar på ekonomiska eller andra sociala fördelar med cykling.
- Den främsta metoden för att minska utsläppen av växthusgaser inom transportsektorn är att ersätta fossildrivna bilar med eldrivna fordon, snarare än utökad/förbättrad cykelinfrastruktur eller genom utformning av den fysiska miljön som minskar det totala behovet av rörlighet.
- De nordiska länderna har vissa skillnader när det gäller hur den fysiska planeringen genomförs, vilket påverkar hur cykling prioriteras och hanteras.
- Utöver en särskild nationell cykelstrategi är de så kallade "cykelmålen" ofta inbakade i andra viktiga planerings- och, policy-, strategidokument på nationell nivå.
- För att uppnå nationella cykelmål krävs tydlig kommunikation mellan lokala, regionala och nationella aktörer och mellan ministerier och myndigheter, vilket är en utmaning.
- Politiskt maktskifte kan vara ett hinder för att få stöd för långsiktiga cykelprojekt.
- Det finns många olika indikatorer och sätt att mäta framgång för cykelmålen i de nordiska länderna.

Rapporten lyfter också fram några av de förändringar som sker inom FN och på EU-nivå, vilket gör cykling och dess potential för att förbättra städer och regioner mer synliga för en internationell politik.



Photo: Tapio Haaja/unsplash.com

Introduction

Transport emissions in the Nordic countries

As the Nordic countries pursue their vision to become the most green, competitive, and socially sustainable region, they must contend with several challenges. With regards to the transportation sector, cities and regions in the Nordic countries must consider how urban mobility is linked to spatial segregation, cost of living, accessibility issues, and transport emissions.

Such challenges are being addressed on a wider, international stage as well as at the local level. The EU's Fit for 55 green transition package aims to decrease greenhouse gas (GHG) emissions by a minimum of 55% by 2030 (compared to 1990 levels). In 2023, the EU revised the effort sharing regulation, thereby updating emission targets for EU member states in several sectors, specifically road transport, agriculture, buildings, small industries, and waste (European Council, 2023). Together, these sectors contribute to 60% of total emissions in the EU. For the Nordic countries of Denmark, Finland, and Sweden, this means a dramatic change in emissions target reductions—all three countries are now obligated to decrease their emissions by 50% by 2030 (replacing previous target reductions around 40%). Alongside Germany and Luxembourg, the Nordic member states have the most ambitious target goals under the Fit for 55 package within the EU (European Council, 2023).

Given that nearly 25% of Europe's GHG emissions are from the transportation sector, it is not surprising that the Fit for 55 package aims to reduce emissions in this particular sector by 90% (European Commission, n.d.-a; European Council, 2022). In fact, unlike most other sectors, the transportation sector has generally been increasing in emissions since 1990 (European Commission, n.d.-a; European Environment Agency, 2022-a). These figures are reflected within the Nordic countries of Denmark, Finland, Norway, and Sweden, as well, with the transport sector contributing to around one-fourth to one-third of emissions in each country, with road transport as the primary culprit (see Table 1).

Table 1. Status of GHG emissions attributed to the transport sector and, more specifically, to road transport in Nordic countries.

	Denmark ^[1]	Finland ^[2]	Norway ^[3]	Sweden ^[4]
Percent of emissions attributed to transport sector	28%	20%	33%	33%
Percent of domestic transport emissions attributed to road transport	91%	94%	More than half	90%

Within the EU, road transport is responsible for more than 75% of GHG emissions within the transportation sector (European Environment Agency, 2022-a). Yet much of the focus for decreasing emissions in this critical sector has been geared towards alternative fuels and electrification infrastructure (Kester et al., 2018). For example, electric car registrations worldwide increased by 41% between 2019 and 2020 (IEA, 2021-a in Refsgaard et al., 2022). In 2021, the share of new passenger car registrations in Norway was around 65% (compared to Sweden's 19.5%, Finland's 10.6%, and Denmark's 13.6%; European Environment Agency, 2022-b). While vehicle electrification does aid in decreasing transport emissions, these numbers emphasise the car-centricity of the Nordic countries. However, this approach tends to overlook the root issues of the climate crisis and cannot lead to long-term sustainability. The European Environment Agency (2023) emphasises that electric vehicles are not enough to achieve a sustainable mobility system. Orsi (2021) highlights the problems that electric vehicles pose to land use and the inevitable maintenance and potential expansion of impervious surfaces that come along with this space-occupying mode of transport associated with sprawling urban settlements. Furthermore, as Kyriakopoulou et al. (2021) state in their assessment of Sweden, "a three-pronged strategy is required [to achieve environmental goals]: movement towards a transport-efficient society; energy-efficient and fossil-free vehicles; and biofuels" (11). Thus, addressing road transport emissions may require a transformation of urban form, with sustainable urban mobility options—and particularly cycling—at the forefront (Warren, 2021).

Shifting to sustainable mobility

To combat the climate crisis, cities need to make a radical shift towards more sustainable modes of transport. Cycling is a key form of sustainable urban mobility that helps to achieve this shift. Municipalities and regional authorities can use cycling as a crucial measure to reduce road transport emissions rapidly and effectively. Research also shows that there are many additional benefits of

choosing the bicycle beyond mitigating climate change, such as promoting a healthier population, reducing car congestion and air and noise pollution in our cities, and enabling large-scale cost savings (Sommar et al., 2022; Johansson et al., 2017). Furthermore, sociologists have posited that incorporating cycling into cities can improve exposure to diversity and improve levels of trust and feelings of connectedness as cyclists negotiate the street among one another (Brömmelstroet et al., 2017). Another recent study shows that cycling is positively associated with orientation towards the common good (i.e., political participation, social participation, neighbourhood solidarity, and neighbourly helpfulness; Schuster et al., 2023). A 2022 UN resolution regarding the integration of cycling into public transportation systems states that the bicycle has been a “simple, affordable, reliable, clean, and environmentally fit sustainable means of transportation, fostering environmental stewardship and health” for over two centuries (UN, 2022). Furthermore, the bicycle can “serve as a tool for development and as a means not just of transportation but also of access to education, health care, and sport,” and serves as an “eco-friendly mode of transportation that significantly reduces emissions and (...) delivers far-reaching positive socioeconomic impacts in addition to reduced pollution” (UN, 2022).

While not every car trip can be replaced by a manual bicycle, the wide-scale adoption of e-bikes has afforded the opportunity to substitute longer car trips (e.g., distances between 5 and 25 km) with two wheels instead of four. According to the Danish National Transport Survey, 37.8% of all journeys are between 4 and 19 km, over half of which are made by car.⁵ And various studies suggest that swapping out one’s car for an e-bike to make such trips could be an efficient way to reduce emissions in the land-based transport sector (Hiselius & Svensson, 2017). For example, a recent study in Norway demonstrated that people with e-bikes use private cars less frequently than other transport user groups while more than doubling their distances travelled by bike (Fyhri & Sundfør, 2020).

However, the aim of transitioning transport users from the private car to the bicycle must be supported by a variety of mechanisms. While bicycle access is a key component for achieving increased cycling in cities (Pucher et al., 2010), other key support measures include things like bicycle infrastructure (e.g., separated bike paths as well as access to bike paths), end-of-trip accommodations (e.g., safe parking facilities), multi-modal transport integration (e.g., parking facilities at metro stations or the ability to carry bicycles onto trams, ferries, or subways), and educational measures, safety measures, and various legal measures that enable riders of all ages, backgrounds, and needs to feel comfortable when moving from A to B.

According to an international review conducted by Pucher et al. (2010), policy plays a crucial role in increasing cycling. While there are several mechanisms that have been employed to achieve this—infrastructure, parking, multi-modal transport integration, legal interventions, public campaigns, land-use planning tactics, and

building capacity among planners and decision-makers—there remains some uncertainty regarding which mechanisms are most effective, with a strategic combination of efforts as the most likely pathway towards success (Pucher et al., 2010; PATH, 2022; Alm & Koglin, 2022). However, such capacities are not evenly available to all municipalities or regions, and major cities typically have greater capacity to, for example, apply for state funding to achieve local-level cycling objectives.

With these ideas in mind, **the aim of this working paper is to provide a review of how Nordic countries are working towards improving cycling via policy and planning.** The paper takes a national-level approach to review cycling objectives in Denmark, Finland, Norway, and Sweden, reviews a range of mechanisms to achieve these objectives, and identifies the key actors responsible for carrying out the work. The paper then unfolds a discussion of the common and dissenting ways in which these Nordic countries plan for and create policies to support cycling.

The Nordic Cycle Power Network

This report was produced as part of the Nordic Cycle Power Network—a 2-year project funded by the Nordic Council of Ministers (see Box 1). The main aim of the project is to activate a knowledge-sharing network among municipal and regional planners working to improving conditions for cycling in the Nordic Region. While informal networks within and among Nordic cities and countries exist, the Nordic Cycle Power Network is the first formalised cooperation across the Nordic Region that supports strategic initiatives that encourage increased cycling and decreased private car transport.

Box 1. About the Nordic Cycle Power Network

Funded by the Nordic Council of Ministers, the Nordic Cycle Power Network is a 2-year project running from February 2023 until January 2025. The key aim of the project is to activate a knowledge-sharing network among municipal and regional planners working to improve conditions for cycling. Through a series of workshops and study visits, the network will identify measures that can be implemented in Nordic cities and regions to facilitate and enable a significant increase in trips made by bike to replace car use and reduce carbon emissions from the land-based transport sector.

By engaging in various topics—such as collecting and using cycling data, integrating cycling into multi-modal forms of transport, prioritising cycling work within political frameworks, and planning and maintaining cycling infrastructure in winter conditions—the project addresses the discrepancy that exists between current cycling aims and their implementation. Many measures have been put into practice

by Nordic regions and municipalities. However, according to local partner organisations who focus on cycling, there is a need to qualify and strengthen these measures in planning and decision-making processes. By facilitating Nordic collaboration on a range of critical topics, the project will lead to enabling residents in the Nordic Region to use the bicycle as a preferred mean of transportation.

The network provides planners with tangible input for concrete actions and measurable outcomes to facilitate the development of actions that boost cycling in their own contexts, as well as inspire other European cities and regions with similar challenges. Findings from the workshops will be summarised into a Nordic Cycle Agenda, developed based on the discussions among the participating network of municipal and regional authorities and agencies. The Agenda will include a policy brief to inform decisionmakers what can be done at local, national, and Nordic-levels of policymaking to improve cycling conditions in the Nordic Region.

The long-term impact of these activities will be a significant decrease of carbon emissions from the land-based transport sector. As more people choose to cycle, we will witness more positive effects on the climate, environment, and public health in Nordic cities and communities. Thus, the project will produce a variety of social, environmental, and economic benefits that contribute to achieving the Nordic Vision.

Project coordinator: Nordregio

Knowledge-sharing facilitation: European Cyclists' Federation

Participating cities and regions: Cycle Superhighways of the Capital Region, Cycle Superhighways of the Central Region, and City of Copenhagen (Denmark); Helsinki Region Transport and Helsinki Municipality (Finland); Icelandic Road and Coast Management Agency and City of Reykjavík (Iceland); City of Oslo (Norway); Region Stockholm, Region Skåne, and City of Stockholm (Sweden); and City of Mariehamn and Åland Department of Infrastructure (Åland).

For more information and updates on the progress of the Nordic Cycle Power Network's activities, visit <https://nordregioprojects.org/nordic-cycle-power-network>.

The Nordic countries and autonomous territories have many similarities with regards to culture, governance structures, and urban and regional planning. The Nordic Cycle Power Network provides an opportunity for planners working with various measures and solutions for cycling to inspire, encourage, and learn from one another.

Methodology and limitations

In this report, we have primarily utilised document analysis to explore the ways in which the Nordic countries of Denmark, Finland, Norway, and Sweden are working with cycling. Researchers have conducted desk research to identify objectives at the national level by exploring key documents such as government programmes, climate plans, national-level cycling strategies, transportation plans and reports, and other documents published by relevant ministries in each country.

The research was carried out between February and June of 2023, in advance of a workshop series which commenced in August 2023 among the Nordic Cycle Power Network participants. Due to the nature of project, there are several limitations that should be noted. Firstly, some of the Nordic countries underwent a change in government just before or during the research period, which means that certain national-level objectives that are identified from previous government programmes have not necessarily been taken up by the incoming or newly established leadership. The research was also restricted to a limited amount of time which has meant that we have not included the entire Nordic Region in this study. For example, Iceland, Åland, Greenland, and the Faroe Islands are not represented in this work. The limited amount of time also means that the report does not represent a comprehensive overview of all mechanisms or actors involved. Rather, the value of the report is that it offers a sampling of the work happening in each country. Further mechanisms may also be active at the local level or through non-governmental organisations. New objectives, mechanisms, and actors may have emerged since the time of research.

¹ Simoes & Victoria (2021); Danish Energy Agency (2022)

² Climate Roadmaps 2035 (n.d.); Jämskeläinen (2021)

³ Ministry of Transport (2021)

⁴ Trafikverket (n.d.-a)

⁵ In Denmark, about 12.1% of all journeys are made by bicycle, with the greatest percent of these journeys at between 4 and 9.9 km. Between 10 and 19, the car is the dominant mode of transport compared to walking, cycling, and public transport. (13.8% of all journeys are between 10 and 19 km, with 10.1% of them being made by car. In other words, 73% of journeys between 10 and 19 km are made by car.) While it may not be likely to adopt the bicycle for trips much further than 20 km, still the car accounts for 46% of all trips between 4 and 9.9 km, and 23% of all trips between 2 and 3.9 km. Though walking and cycling have higher shares for shorter journeys, still 8% of trips under 2 km are made by car (compared to 10% by bike). Importantly, the average number of occupants in passenger cars is only 1.33 (see Tables 11b and 11c in Christiansen & Baescu, 2022).



Photo: Tom Dick/unsplash.com

Cycling policy in four Nordic countries

In recent decades, many cities and regions within the Nordic Region have worked towards planning for sustainable mobility by developing infrastructure and rethinking public spaces to prioritise street users on foot or bike. In doing so, the space becomes more accessible to a wider range of visitors, not only those who have the privilege of accessing a private vehicle.

While the share of cyclists in several cities and regions in the Nordic countries is relatively high compared to other European countries (ECF, n.d.), there are still gaps, for example, when it comes to bicycle connections across municipalities and regions.

The following tables and figures (Tables 2-4; Figures 1-3) highlight the modal share in Denmark, Finland, Norway, and Sweden. As there are many ways of measuring modal share, Table 2 and Figure 1 are displayed as modal share by number of trips, while Table 3 and Figure 2 show modal share by passenger-kilometres travelled. Table 4 and Figure 3 provide a more detailed view of the capital cities in these countries.

Table 2. Modal share in four Nordic countries (by number of trips)

	Denmark (2021) ^[1]	Finland (2021) ^[2]	Norway (2021) ^[3]	Sweden (2021) ^[4]
Cycling	12.1%	7.5%	4.0%	14.7%
Walking	31.4%	22.4%	22.0%	16.9%
Public transport	4.4%	6.1%	7.0%	11.6%
Car	52.1%	61.4%	65.0%	54.8%
Other	0.1%	2.6%	2.0%	2.0%

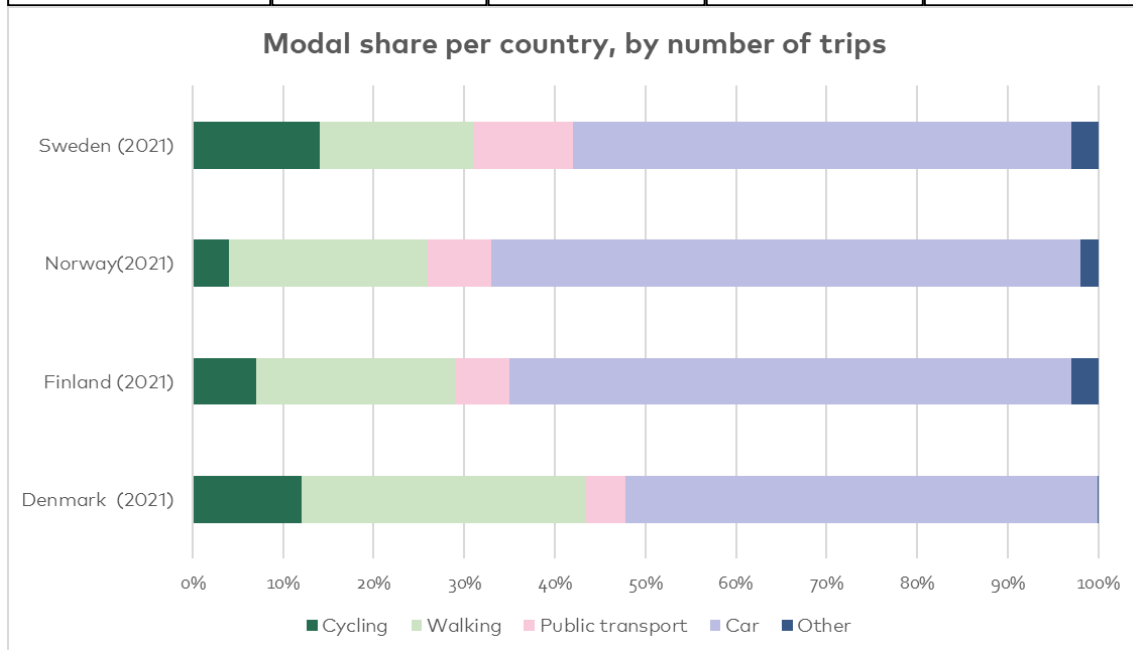
**Figure 1.** Modal share in four Nordic countries (by number of trips)

Table 3. Modal share in four Nordic countries, by passenger-kilometres travelled (km/person/day)

	Denmark (2021) [5]		Finland (2021) ^[6]		Norway (2018, trips under 70km) [7]		Sweden (2021) ^[8]	
Total km/ pers/day	33.9		34.3		22.5		28.3	
	km/pers /day	%	km/pers /day	%	km/pers /day	%	km/pers /day	%
Cycling	1.2	3.7%	0.7	2.0%	0.3	1.4%	0.6	2.1%
Walking	1.5	4.4%	1	2.9%	1.4	6.2%	0.7	2.5%
Public transport	1.5	4.5%	2.7	7.9%	4.5	19.9%	4	14.1%
Car	28.9	85.2%	28.9	84.3%	16.3	72.3%	22	77.7%
Other	0.7	2.1%	1	2.9%	0.03	0.1%	1	3.5%

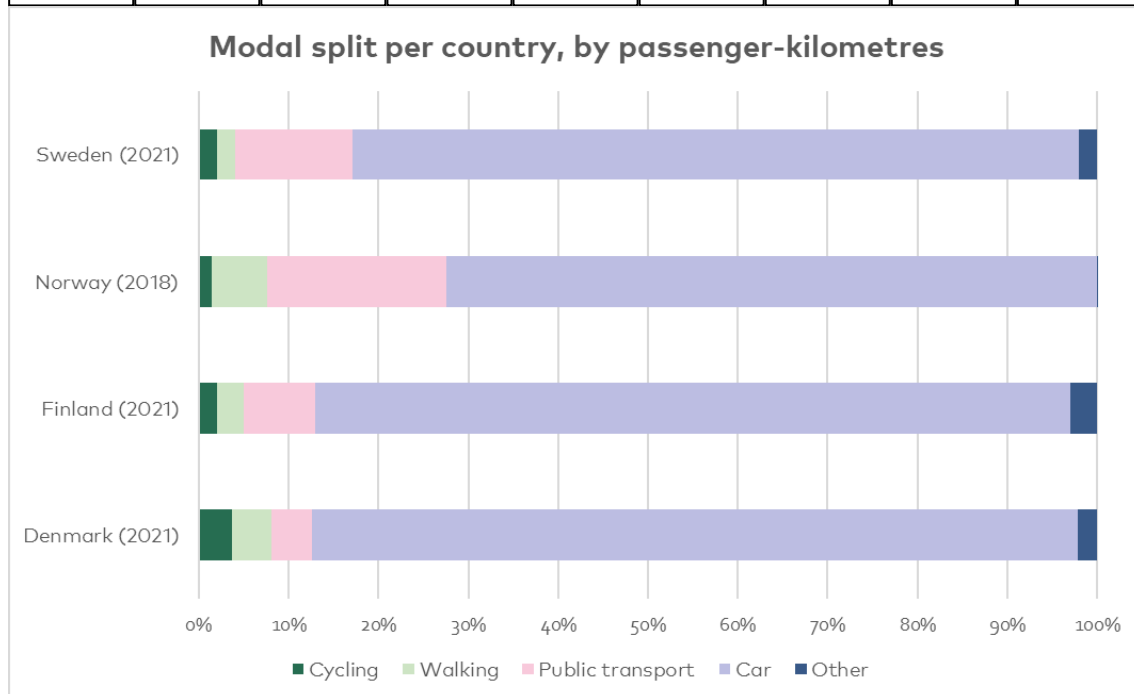


Figure 2. Modal share in four Nordic countries, by passenger-kilometres travelled (km/person/day)

When measured by passenger-kilometres travelled per day, Denmark has the highest share of travel from cycling compared to the other Nordic countries, but also the highest share of car travel. This is related to the fact that fewer

passenger-kilometres per day are travelled by public transport in Denmark compared to Finland, Norway, and Sweden. But when it comes to number of total trips, Denmark has the fewest car trips compared to the other Nordic countries. In Norway, almost 20% of passenger-kilometres per day are made by public transport, and 6.2% by walking, but only 1.4% by cycling—the least of the Nordic countries. While the highest share of passenger-kilometres travelled per day in all four Nordic countries is made, unsurprisingly, by the car, a greater percentage of passenger-kilometres travelled per day in Norway and Sweden comes from sustainable modes of transport (walking, cycling, or public transport) compared to Finland and Denmark.

Table 4. Modal share in four Nordic capital cities, by number of trips

	Copenhagen (2021) ^[9]	Helsinki (2021) ^[10]	Oslo (2021) ^[11]	Stockholm (2019) ^[12]
Cycling	21%	9%	7%	11.2%
Walking	35%	46%	39%	28.1%
Public transport	14%	23%	22%	37%
Car	30%	21%	30%	22.0%
Other	0%	1%	2%	2.2%

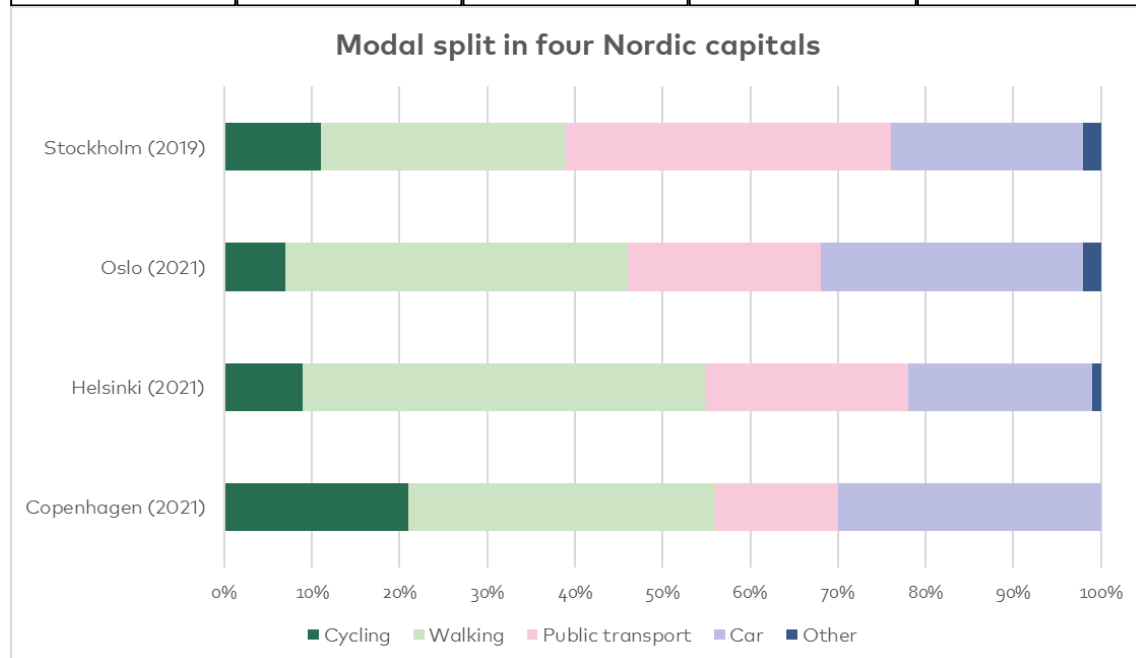


Figure 3. Modal share in four Nordic capitals

At the local level, Copenhagen stands out from the other capital cities when it comes to the share of trips made by cycling. However, Copenhagen has the least trips made by public transport (14%; and reflective of the situation in Denmark as a whole), a large share (37%) of weekday travel trips in Stockholm are completed by public transport. Helsinki and Stockholm have the least number of trips made by car (21% and 22% respectively). For Helsinki, this is especially due to the high shares of trips made by walking (46%). Meanwhile, Copenhagen and Oslo share the same percent of trips made by car (30%), the highest of these four cities. In Oslo, fewer trips (7%) are made by cycling than the other capital cities; however, they also have a relatively high share of trips made by walking (39%).

This data provides a quantitative background as to the status of cycling in the Nordic countries. In the following sections, we will explore the national-level objectives, mechanisms, and key actors in each of these Nordic countries.

¹ See Table 4 in Christiansen & Baescu (2022); Vejdirektoratet (n.d.-c)

² See Traficom (2023-a)

³ See Statens Vegvesen (2022-a); Figure 16 in Opinion AS (2021).

⁴ See Table 1 in Trafikanalys (2022).

⁵ See Table 3 in Christiansen & Baescu (2022).

⁶ See Traficom (2023-a)

⁷ See Table 5.1 in Madslien et al. (2021); author's calculations.

⁸ See Table 6 in Trafikanalys (2021)

⁹ Calculated as entire travel chains in Copenhagen Municipality; figures are based on DTU transport habits survey where participants were asked, at different times of the year, about their previous day's travel; see Figure 3 in Københavns kommune (2022).

¹⁰ Data shows primary means of transport as percentage of all trips made within Helsinki; see City of Helsinki (2022-a).

¹¹ Modes of travel for daily journeys in Oslo Municipality; see Statistikkbanken (n.d.)

¹² The Stockholm data shows modal share from Monday to Friday in 2019, so it includes all trips during those days, including leisure, grocery shopping, commuting, etc. The share has been calculated by the authors based on Table 1 in the Regional Travel Survey; see Johansson (2020).



Photo: Max Adulyanukoso/unsplash.com

Denmark

National-level objectives

Denmark has a special relationship with cycling that developed during the 20th century, when cycling became something of a national and democratic symbol (Carstensen & Ebert, 2012). Carstensen and Ebert (2012) point to critical factors such as strategic alliances between cyclists and drivers, bicycle tourism, and a clear national narrative about the independence and sensibility of the bicycle as factors that contribute to the “naturalness” of cycling in the Danish society. Despite the unique position of cycling as synonymous with Danish culture, numbers of cyclists have stagnated in recent years. During the last decade, numbers have generally decreased and only reached 2012-levels again in 2022 (Vejdirektoratet, 2023-a).

Following the Danish Climate Act of 2020, Denmark set itself the target to reduce GHG emissions by 70% in 2030 compared to the levels of 1990 as it transitions to carbon-neutrality by 2050 (Danish Ministry of Climate, Energy, and Utilities, 2020). The goal runs parallel with the country's commitments to the Paris Agreement targets and EU climate objectives. The Danish government is also bound to the indicative interim goal of a 50-54% reduction of GHG emissions by 2025 (Danish Ministry of Climate, Energy, and Utilities, 2021). Notably, the Danish Climate Act also introduced a system of checks and balances by expanding the role of the Danish Council on Climate Change (*Klimarådet*) which follows up on the government's work on climate protection, outlined in an annual governmental climate programme. To reach its emissions reduction objective, the Danish government seeks to implement a set of 24 initiatives supporting a green transition in the energy, transportation, agriculture, industry, and waste-management sectors by 2025, which are outlined in the Green Roadmap (2021). The transportation sector is one of the largest emitting sectors of greenhouse gases in Denmark (around 28% in 2019; Simões & Victoria, 2021). Within the sector, road transport is

by far the greatest majority of emissions, responsible for 91% of total transport emissions in 2019 (Danish Energy Agency, 2022). According to Denmark's Climate Status and Outlook report for 2022, the main contributor to road transport emissions are passenger cars. The Danish Energy Agency reports that emissions from the transport sector are expected to fall from 13.5 million tonnes CO₂e in 2019 to around 10.7 million tonnes CO₂e in 2030, mainly due to vehicle electrification, increased blending of renewable fuels, and other energy-efficiency improvements (Danish Energy Agency, 2022). The Green Roadmap estimates a carbon emissions reduction by 2030 by transforming car transportation, specifically through electrification of vehicles but also by encouraging residents to choose the bus or bicycle instead of a fossil fuel car (Statsministeriet, 2021).

To facilitate the green transition in road transport, the former Danish government entered into agreement with other political parties in 2020, committing to several goals, measures, and funding of different policies related to the green transition in the road transport sector (*Aftale om grøn omstilling af vejtransporten*).^[1] While agreements such as this one have no legal standing, the main significance of the document comes from the implementation measures taken after the parties (in this case the Social Democrats, the Socialist People's Part, and the Red-Green Alliance) commit to the work (Folketinget, n.d.).

The agreement on a green transition of road transport has had several follow up measures, such as changes to registration taxes for vehicles based on their CO₂ emissions (Folketinget, 2020) amendments to the Biofuel Act (Folketinget, 2021), and a more recent (2023) legislative proposal that aims to incentivise fuel suppliers to use sustainable fuels for trucks (Danish Ministry of Climate, Energy and Utilities, 2023). The signatories also expressed their support for investing in cycling infrastructure. Several funding schemes are noted, such as DKK 10 million in 2024 allocated to publicly available charging of electric bicycles in order to encourage more people to choose the bicycle as a climate-friendly mode of transport. More immediately, the agreement acknowledges funding for the *cykelpulje* (see Mechanisms section below), with DKK 170 million annually for 2022-2023 for cycle path construction along state roads to make cycling more accessible, with assumed 50% co-funding from municipalities.

The government's most recently published climate programme (*Klimaprogram* 2022) points out the high emissions reduction potential of behavioural changes, including switching to the bicycle. (It also mentions taking public transport or switching to an electric vehicle.) The programme provides an implementation plan for achieving the major climate agreements. However, in his foreword for the programme, the Minister for Climate, Energy, and Utilities admits that Denmark only accounts for 0.1% of global emissions; therefore, while national contributions do not necessarily make a profound global impact, the country can provide inspiration in their climate action to other nations. The 2022 programme focused primarily on electrification and biofuels as the key technologies that will support

reduced emissions for transport, with sustainable modes such as cycling, walking, and taking public transport, as more marginal additions (Danish Ministry of Climate, Energy and Utilities, 2022). After the 2022 elections, the new Danish centre-left government vowed to accelerate the work with the development of green transportation, but again with a focus on electrification of car and lorry transportation, as well as increased taxation of plane travels (Statsministeriet, 2022).

Denmark's National Infrastructure Plan 2035 is organised into seven pillars, one of which is dedicated to the development of cycling (Transportministeriet, 2021-a). Within the plan, the government emphasises its interest to support more people choosing to travel by bicycle, noting that the emergence of the e-bike provides additional opportunities to achieve this both within and beyond urban areas. The plan also articulates goals around less congestion and noise pollution from vehicular traffic, more attractive public transportation (i.e., transfer opportunities and cycling parking at transport stations), and making it easier to recharge electric vehicles. While cycling plays a role in the plan, extensive focus is also put towards developing new and maintaining existing road infrastructure for road transport, the roll out of electric car infrastructure (such as charging stations), and funding for things like noise screens to control noise pollution from motorways (Transportministeriet, 2021-a). Emphasis in the area of the green transition is on having more green cars on the road (Transportministeriet, 2021-a). Furthermore, several political parties agreed to actions for green conversion of road transport in a 2020 agreement that aims for 1 million green cars in 2030 and a low electricity tax for charging cars, among others (Ministry of Finance, 2020), again displaying the emphasis on electrification of cars as a main method for addressing climate concerns.

When it comes to safety, the Danish government aims for roads to be safer for motorists, cyclists, and pedestrians (Transportministeriet, 2021-a). The Danish Road Safety Commission's latest Action Plan (2021-2030) identifies three objectives for 2030: "the number of fatalities in road traffic should be 90 or below," "the number of seriously injured in road traffic should be 900 or below," and "no more than 10,000 persons should be slightly injured in road traffic" (Danish Road Safety Commission, 2021, 4). The action plan identifies cyclists, moped riders, and pedestrians as the vulnerable road users who constitute the majority of seriously injured individuals in urban area accidents.

In the wake of the COVID-19 pandemic, Denmark launched its recovery and resilience plan with seven components to recover from the crisis in a way that ensures progress in the green transition, specifically towards achieving the 70% GHG emissions reduction (Ministry of Finance, 2021). Sustainable road transport is one target area of the plan, where several objectives related to cycling are outlined. Since cycling contributes both to positive environmental and public health outcomes, the plan suggests that Denmark should maintain its leading position as

one of the world's best cycling nations and encourage more people to choose the bicycle (Ministry of Finance, 2021, 152). Furthermore, the plan specifically suggests that citizens should be encouraged to "choose bicycles rather than cars", including those living outside of urban areas where cycling is not always prioritised (Ministry of Finance, 2021, 154).

Denmark's national cycling strategy was last updated in 2014. At that time, the Ministry of Transport presented three pillars for increasing the "use of bicycles as a means of transport for the benefit of mobility, the environment, and public health" (Transportministeriet, 2014, 10). While no measurable target is determined in the strategy, these pillars focussed on everyday cycling, active holiday and recreational cycling, and new and safe cyclists (such as children travelling to and from school). The strategy suggested that the goal of increasing cycling in Denmark can lead to a plethora of benefits: it promotes health, reduced congestion, requires less space than cars (both active and parked), reduces air pollution and noise pollution, is environmentally friendly, can be used by all ages, and can be a socially sustainable option as well (Transportministeriet, 2014). While the strategy has not been updated since 2014, a motion was submitted in 2021 for a parliamentary resolution on a national cycling strategy. According to an article in NetAvisen, the Danish Liberal Party (Venstre) was working on a cycling strategy in 2020 which would act as a way to strengthen funding for cycling projects and encourage coordination between national and local level work (Jørgensen, 2020). However, as of spring 2023, no official cycling strategy has been presented, either from the Ministry of Transport or the Danish Road Directorate.

Box 2. Summary of national-level cycling-related objectives in Denmark

- More people choose to travel by bicycle (National Infrastructure Plan 2035).
- Reduce GHG emissions by 70% in 2030 compared to the levels of 1990 and transition to carbon-neutrality by 2050 (Danish Climate Act 2020).
- Increase the use of bicycles as a means of transport for the benefit of mobility, the environment, and public health (Transportministeriet, 2014).
- The number of seriously injured in road traffic should be 900 or below, and no more than 10,000 persons should be slightly injured in road traffic (Danish Road Safety Commission, 2021).
- More people should choose bicycles over cars (Ministry of Finance, 2021)
- Denmark should remain its position as a world-renowned cycling nation (Ministry of Finance, 2021)

National-level mechanisms

Funding mechanisms for increased cycling

According to the recovery and resilience plan, the Danish Road Directorate estimates that the average cost per kilometre of bicycle path is about DKK 7.4 million (Ministry of Finance, 2021). While much of the funding for cycling projects in Denmark comes from the municipalities themselves, several co-financing schemes also exist from the national level, such as the Bicycle Subsidy Scheme (*cykelpuljen*), which was first introduced in 2009. Municipalities apply for funding from the pool of funds for various projects targeted at cyclists and projects that improve cycling conditions. Municipalities can receive up to 50% of the project co-financed through the state. But the Bicycle Subsidy Scheme also includes funding for cycling projects on national roads, with special focus on bicycle commuting and Denmark's cycling superhighways. Additionally, research institutions and municipalities can apply for funding for research projects, which can be covered up to 100% by the fund (Transportministeriet, 2021-c). In 2018, the national cycling fund contributed just over DKK 104 million to cycling projects. Some examples of projects supported by the fund include a 5.5 km super cycle path in Odense,^[2] and DKK 2.4 million supporting Copenhagen's 6 km cycle route linking Ørestad and Central Copenhagen (Vejdirektoratet, 2018).^[3]

Between 2009 and 2020, national subsidies for municipal cycling projects amounted to approximately DKK 1.1 billion (Ministry of Finance, 2021). From 2021, the Danish government plans to invest DKK 2 billion in subsidies into the advancement of cycling and bicycle infrastructure until 2035 through the Bicycle Subsidy Scheme (Transportministeriet, 2021-c). Around DKK 170 million has been allocated annually between 2022 and 2023 to support the construction of cycling infrastructure so that residents are provided with a more robust transport network via cycling (Ministry of Finance, 2021, 154). This does not include an additional DKK 150 million allocated specifically to municipal construction projects, which assumes 50% co-financings from the municipalities. Particular focus is made with rural and suburban connectivity, corresponding with the EU Sustainable and Smart Mobility Strategy.^[4] As the cycling scheme has existed for more than a decade, research on its effects has been conducted by the Danish Road Directorate (Vejdirektoratet, 2019).

Even though the study applied a broad set of methods to crystalize the fund's effect on the numbers of cyclists and traffic safety, it was not possible to link national developments in cyclist numbers or traffic safety to the cycling fund, as the development of cycling is multifactorial. None the less, the evaluation showed that within the concrete contexts of the projects that received funding through the fund, several effects were proven including higher usage of new stretches of infrastructure by 22% (on average), 3% of the users of these stretches would have

otherwise taken the car, and cyclists felt both safer and happier with the new infrastructure (Vejdirektoratet, 2019). But working with the Bicycle Subsidy Scheme also had implications on work processes within the municipalities who applied, as cycling has been put on the municipalities' agendas more often nation-wide. Another two advantages are that practical knowledge about cycling has grown among administrators in different sectors, who are now working closer than before. Lastly, municipalities that received funding from the Bicycle Subsidy Scheme also ended up increasing their municipal spending on cycling through, e.g., campaigning (Vejdirektoratet, 2019).

According to the National Infrastructure Plan, a specific pool of DKK 50 million will be dedicated to promoting bicycle parking in connection with public transport and DKK 520 million for promoting green mobility and making it more obvious for citizens to choose the bicycle and the electric bicycle over other forms of transport. It is unclear if these pools are part of, or in addition to, the Bicycle Subsidy Scheme. In the plan period (2021-2035), the Danish government intends to invest DKK 105.8 billion into the country's entire transport infrastructure, with rolling investments for 5-year periods, so that infrastructure development and planning can adapt to the big changes coming to the transport sector with the green transitioning formalized in the *Agreement on the green transitioning of road transportation* (Transportministeriet, 2021-a).

As part of the green road transport agreement (*Aftale om grøn omstilling af vejtransporten*), the Danish government has made direct investments into the cycling network infrastructure along state-owned roads (Ministry of Finance, 2020). The contracting parties agreed to several allocations connected to the Bicycle Subsidy Scheme, as well as future allocation of DKK 10 million in 2024 for public charging stations for electric bicycles. According to Denmark's Recovery and Resilience Plan, this financial allocation may support around 200 charging locations (Ministry of Finance, 2021).

Cycling infrastructure

Denmark uses cycle superhighways as a form of cycling infrastructure to support safe and accessible commuting for cyclists across municipalities. The cycle highways generally run near other forms of sustainable transport (busses, and trains) to enable multi-modal transport (Ministry of Foreign Affairs of Denmark, n.d.). To be included as a cycle superhighway, the path must adhere to four design principles: accessibility, directness, comfort, and safety (Supercykelstier, n.d.; see Figure 4). The current cycle path network spans across 240 km, but there are plans to expand this dramatically over the next 20 years, to more than 850 km by 2045 (Supercykelstier, 2023).

According to the Cycle Superhighway's own bicycle account of 2019, transformation and expansion of existing infrastructure to Cycle Superhighways saw various effects, such as a 23% increase in numbers of cyclists on transformed routes and 14% of the new cyclists chose the bicycle instead of the car (Supercykelstier, 2019).



Figure 4. A cycle superhighway route near Ishøj, marked with the cycle superhighways orange C logo. (Source: Supercykelstier)

The Cycle Superhighways organisation is a network of 29 municipalities in the Capital Region and the Capital Region (Region Hovedstaden) collaborating since 2011 to create a coherent cycling network. The participating municipalities, who hold individual responsibility for planning, building, and financing the routes, are the primary developers of the cycling infrastructure. They are often able to obtain co-financing through the state through, for example, the National Cycling Fund or alternative funding schemes like the 2014-15 cycle superhighway fund (Supercykelstier 2018; Vejdirektoratet, 2023-b).^[5] The Secretariat of Cycle Superhighways plays a facilitating role in the work (Supercykelstier, 2019).

In addition to the superhighway model, the Infrastructure Plan also notes that enabling more people to choose the bicycle as an everyday means of transport requires well-designed and modern infrastructure that ensures safe mobility for cyclists who travel alongside other road users. While the main mechanism driving this is financial support to build appropriate cycling infrastructure, the plan also highlights how measures such as developing a comprehensive cycling strategy, marking cycle-friendly routes, providing better cycling access to nature, and

mapping existing cycling infrastructure are also important initiatives (Transportministeriet, 2021-c). Conducting a comprehensive overview of Danish cycling infrastructure, for example, would enable the government to make more informed decisions about where future investments should be made and support municipal collaboration.

Another infrastructure mechanism mentioned to increase cycling and also make public transportation more attractive is to ensure smooth transfer conditions between different modes of transport. The infrastructure plan specifically mentions that this means people should be able to take their bicycle with them on trains, and cycling parking should be made easily available at transportation stations. This mechanism was also highlighted in the 2014 national cycling strategy, referred to as the door-to-door strategy. It took into consideration the number of rail passengers who cycled to and from the train station and acknowledged that combining cycling and public transport can allow for smoother trips that make sustainable mobility more attractive (Transportministeriet, 2014). The strategy also highlights several principles for bicycle parking, including ease of access to cycle parking areas, high availability of parking for a wide range of bicycles (including cargo bikes), well-designed racks that enable cyclists to securely lock their frame to the rack, and potentially incorporating charging stations for e-bikes.

Denmark's Recovery and Resilience Plan also describes a scheme for e-bike infrastructure as a means for achieving the green transition in road transport and for using the bicycle as an alternative to more energy inefficient transport modes in urban and rural areas. The plan identifies electric bicycles as an attractive way for people to choose cycling when travelling longer distances, but this requires charging opportunities along the journey or at end points.

Cycling in spatial and land-use planning

The Danish Planning Act of 2007 is characterised by its decentralist nature, giving more decision-making powers to the local level (Lidmo & Bogason, 2020), yet it provides several tools for the national government to shape land-use and spatial planning. The minister responsible for planning issues can give national planning directives (*landsplandirektiv*), which regulate municipal planning, either for specific regions or nationwide. So far, this avenue has not been used to make national regulations for cycling related to land-use and spatial planning, but in the Finger Plan 2019, for example, there are directives given on the inclusion of cycling while planning the placement of public institutions, green spaces, or public transport (Kirkeministeriet, 2019). However, these mechanisms are generally one-off instances, and they have not been used to regulate spatial or land-use planning for cycling in a holistic sense as of yet.

The Danish Road Safety Commission has identified several measures to be taken up by national and local-level actors for improving road safety. During the planning

period, the commission selected the percentage of cyclists who use a helmet as one of several key performance indicators (KPIs) for measuring road safety. Other KPIs include measurements such as the percentage of car drivers observing road speed limits, use of distracting devices whilst driving, use of seatbelt, the percentage of the car fleet older than 10 years, and road safety education (including walking and cycling safety tests in schools). Improving lighting on bikes is also a recommended action for the public.

Soft measures

To generate more awareness for the increased national focus on cycling and to use its public attention, the Ministry of Transport launched the Year of the Bike 2022 as an initiative coinciding with the start of the Tour de France in Copenhagen. The initiative acted as an investment campaign for cycling infrastructure and projects outlined in the National Infrastructure Plan 2035. DKK 400 million is reserved for cycling related infrastructure projects (split between municipal projects and cycling infrastructure projects along national roads) (Transportministeriet, 2021-b). In a similar vein, the government is also interested in promoting cycling tourism in Denmark.

The National Infrastructure Plan 2035 announced the introduction of the National Knowledge Centre for Cycling Promotion (*Det Nationale Videnscenter for Cykelfremme*), which was founded March 2022 (Vejdirektoratet, n.d.-a). The centre is organised under the Danish Road Directorate and is tasked with generating and communicating applicable cycling knowledge through various media such as publications, handbooks, webinars, and newsletters. The centre was originally financed with DKK 4 million through the National Infrastructure Plan; however, the amount of financial backing provided for the centre has been criticised by some researchers who argue that national coordination efforts for ensuring Denmark remains and grows as a cycling nation need to be better supported—for example, with funding that enables a more comprehensive research database (Antabi, 2022).

Acting as an advisory council for the cycling knowledge centre is the Danish Road Directorate's Cycling Council (*Vejdirektoratets Cykelråd*), comprised of members from Danish cycling and tourist interest organisations, the association of Danish municipalities (KL), universities, and other councils and agencies (Vejdirektoratet, n.d.-b). In tandem, the Danish Road Directorate organises an annual conference or one-day seminar on cycling for which it invites relevant actors into its headquarters. It is a forum for exchanging knowledge, best practices, and difficulties in developing cycling both nationally and locally.

Finally, the infrastructure plan also mentions using informational campaigns directed towards children and young people to encourage this population group to use the bicycle for commuting to and from school and other leisure activities. Educational campaigns would also, according to the plan, improve traffic safety.

Key actors

There are several actors involved in the development of cycling in Denmark. While several national ministries play a role by providing support through financial means and policies, there is a broad collection of actors from local level administration, local organisations, and private sector actors that are making strides to achieve national-level objectives.

The **Ministry of Transport** has, for 8 years, been active in establishing bicycle parking facilities, improving wayfinding on national bicycle paths, setting up monitoring to reduce bicycle theft around public transport hubs, and supporting the work of establishing the cycle superhighways network, among other initiatives. They have also worked to establish an expert group on evaluating Denmark's potential for cycling tourism along with the Ministry of the Environment, the Ministry of Business and Growth, and VisitDenmark. The Ministry of Transport also works with other stakeholders to develop education tools for cycling, such as instructing children on road safety in schools alongside the Ministry of Education. Another ministry—Denmark's **Ministry of Climate, Energy, and Utilities**—is the key ministry working towards achieving a 70% reduction of GHG emissions.

The Danish Transport Authority (*Trafikstyrelsen*) plays an important role in working with road safety and green transport throughout the country, conducting traffic analysis and providing subsidies for cycling (such as a scheme for promoting bicycle parking in combination with public transport in 2020). The authority has also, for example, acted as the chairman of the Bicycle Parking Task Force in the past, working in collaboration with DSB, Rail Net Denmark, and Metroselskabet and reporting to the transport minister.

The Danish National Rail Company (DSB) also plays a collaborative role in ensuring smooth connections for cyclists moving between the bike and other modes of rail transport.

Public authorities at the national and local levels are the key responsible parties for investing in cycling infrastructure in their respectively owned roads. The **Danish Road Directorate** (*Vejdirektoratet*) is in charge of making sure Denmark's state roads are developed and maintained, including the National Cycle Routes (*Nationale Cykelruter*) under the Danish Road Directorate's Bicycle Council. The National Cycle Routes were established nearly three decades ago in collaboration between the Road Directorate, the Ministry of the Environment, and the local-level authorities (counties, at the time of their establishment; Vejdirektoratet, 2023-c). The Directorate plays a key role therefore in enabling today's 11 National Cycling Routes across the country to form a coherent network. Most recently, the Directorate was also responsible for conducting a user survey on the National Cycle Routes, which they completed by conducting various interviews with users and tallying numbers of users across the cycling network (Vejdirektoratet, 2023-c). The

survey informed the publication of key principles for the National Cycle Routes which municipalities must use as a basis when applying for changes to existing or developing new routes (Vejdirektoratet, 2023-d).

In addition to **Cycle Superhighways** secretariat facilitating the cycle superhighways throughout Denmark with municipalities and the Capital Region, other organisations such as the **Cycling Embassy of Denmark** (established in 2009) share knowledge and facilitate cooperation among private companies, local authorities, and NGOs. They also help to improve cycling on the policy agenda in Danish municipalities (Cycling Embassy of Denmark, n.d.).

Private companies also play a role in cycling work by ensuring that employees can park their bicycles at their offices and are granted appropriate end-of-trip facilities. They also work to ensure cooperation of employer-paid commuter bicycles.

¹ https://fm.dk/media/18511/aftale-om-groen-omstilling-af-vejtransporten_a.pdf

² <https://www.odense.dk/borger/trafik-og-veje/veje/vejarbejde/hjallesevej-odensevej-og-svendborgvej-faar-supercykelstier#:~:text=Odense%20Kommune%20er%20ved%20at,penge%20til%20i%202021%2D2022.>

³ <https://supercykelstier.dk/rute/oerestadsruten/>

⁴ See <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0789>.

⁵ See, for example, <https://api.vejdirektoratet.dk/sites/default/files/2019-07/Regnskabsinstruks%20for%20supercykelstier.pdf>



Photo: Kwan Fung/unsplash.com

Finland

National-level objectives

In Finland, the most recent government programme has provided much of the basis for national-level cycling objectives. The government programme^[1] aims to make Finland a “socially, economically, and ecologically sustainable society by 2030” (Finnish Government, 2019). Encouraging and enabling more people to cycle is one part of reaching such a goal, especially through the work of the Ministry of Transport and Communications. Under Sanna Marin’s government programme (2019-2023), several key objectives indicate the role of the bicycle, and in the past two years, documents such as Finland’s new climate and energy strategy and the national transport system plan provide more detailed targets and mechanisms that help contribute to overarching national objectives concerning carbon neutrality, transport efficiency, and low-emission transport. However, a key point of departure for Finland’s cycling work comes from an earlier government initiative: the 2018 walking and cycling promotion programme (*Kävelyn ja pyöräilyn edistämishjelma*) produced by the Ministry of Transport and Communications (LVM).

In 2019, the government programme under Sanna Marin was established, outlining seven strategic themes. Among these themes, there are three main objectives for which cycling plays a major role (Finnish Government, 2019). Firstly, under the strategic theme related to carbon neutrality and biodiversity, Objective 1 states that “Finland will achieve carbon neutrality by 2035” (Finnish Government, 2019, 35). The Climate Act was recently reformed to align with this objective, as were the revised climate and energy strategy and medium-term climate change policy plan. Secondly, the programme aims for “efficient transport infrastructure” under its “dynamic and thriving Finland” theme (Finnish Government, 2019, 118). This objective calls for improvements to basic infrastructure, traffic safety, and

accessibility, as well as reduced emissions, and refers to the development of the 12-year National Transport System Plan and the traffic safety strategy. Within the same strategic theme, the programme aims for “low-emission transport” (Finnish Government, 2019, 123). The general framework of this objective is based on the 2018 walking and cycling promotion programme, but the objective also establishes the need for a roadmap for achieving fossil-free transport.

Walking and cycling promotion programme

Modal share is one indicator of cycling success in Finland. The 2018 national programme for the promotion of walking and cycling set a clear objective to increase the number of trips made by walking and cycling by 30% by 2030 (Jääskeläinen, 2018).^[2] According to the programme report, walking and cycling has been slowly decreasing over recent decades—whereas walking and cycling represented 34% of all trips in Finland in 1998-1999, the share in 2010-2011 was around 30% and has remained around there since (Jääskeläinen, 2018). In 2021, walking accounted for 22% of trips in Finland, and cycling just 7% of trips, though this varies substantially based on municipality and trip distance (Traficom, 2023-a).^[3]

Overall, the walking and cycling programme stems from the notion that walking and cycling are favourable for both individuals and society because, as opposed to private vehicle traffic, they can reduce greenhouse gas emissions, reduce noise pollution in cities, and improve both environmental and traffic safety. Furthermore, the programme suggests that walking and cycling are cost-effective ways for improving health and well-being and states that a combination of reduced traffic emissions, road fatalities, and public health improvement due to a 30% increase in walking and cycling could save Finnish society billions of euros (Jääskeläinen, 2018). The programme outlines three overarching goals: (1) enhance the requirements necessary for walking and cycling in Finland's municipalities, (2) support the reduction of greenhouse gas emissions in traffic, and (3) promote public health (Jääskeläinen, 2018).

The target to increase the number of trips made by walking and cycling by 30% by 2030 replaces the previous target set out in the National Walking and Cycling Strategy 2020 (published in 2011) which aimed to increase the share of walking and cycling journeys by 20% by 2020 (Ministry of Transport and Communications, 2011). In aiming to increase these sustainable transport journeys, the programme expects at least half of the increase in trips to replace passenger car trips, especially since car trips have been increasing even for journeys of just 1-2 kilometres (Jääskeläinen, 2018).

Cycling and carbon neutrality

Following the carbon neutrality objective, Finland revised the Climate Act in 2022 to heighten the ambition of their neutrality goals. The climate policy reform sets the carbon neutrality goal for 2035 and identifies key milestone targets: 60% emission reductions by 2030, 80% by 2040, and 95% by 2050 (compared to 1990). The act is a direct response to EU climate policy.

The carbon neutrality objective also set the basis for updating both the national climate and energy strategy (Carbon neutral Finland 2035) and the medium-term climate change policy plan. Both of these were updated in 2022 and they have identified cycling as a key measure for the long-term achievement of the objective.

Finland's latest climate and energy strategy highlights the roadmap's fossil-free transport objectives while using the EU's 2030 climate goals as a basis for their own national objectives. Such goals have also been replicated in Finland's national Climate Act (in force since July 2022) which emphasizes the targets towards carbon neutrality by 2035. Prepared once every electoral term by the Ministry of Economic Affairs and Employment, the role of the climate and energy strategy is to describe how Finland will achieve both national and EU climate goals.

These climate goals, such as achieving carbon neutrality by 2035 and significantly reducing GHG emissions 5 years prior (60% by 2030, compared to levels from 1990), has direct implications on the transport sector and sustainable transport modes like cycling. As transport by passenger car stagnates, the Finnish government suggests that people's needs for sustainable transport modes will grow (Huttunen et al., 2022, 39). The strategy aims to improve energy efficiency in the transport system by "developing transport services, conditions for walking and cycling, as well as the energy efficiency of road transport" (Huttunen et al., 2022, 37). Such objectives are framed in by aiming to slow down the growth in passenger car transport sector while meeting a rising demand for sustainable mobility. The climate and energy strategy also highlights several co-benefits of cycling, for example, that increasing bicycle traffic while reducing car transport can reduce street dust emissions and noise pollution while increasing the population's physical activity, thereby producing a variety of health benefits (Huttunen et al., 2022, 98). The strategy also considers the impacts of reducing transport emissions and increasing cycling on gender equality, stating that one of "the most neutral means of reducing transport emissions include increasing the proportion of cycling as a mode of transport" (Huttunen et al., 2022, 117).

Fourteen sectors in Finland, including the logistics and transport sector, have prepared unique low-carbon roadmaps which highlight how the country will achieve the goals set out in the Government Programme. Finland's transport sector is responsible for around 20% of carbon emissions for the state and, according to the roadmap, "about half of the emissions [from Finnish logistics and transport] are

from passenger traffic and the second biggest emission source is lorries" (Climate Roadmaps 2035, n.d.). To achieve the Climate and Energy Strategy's goals and the Roadmap to Fossil-Free Transport aims of halving emissions from traffic by 2030, the logistics and transport sector roadmap highlights measures such as replacing old cars with electric cars, enabling public transport and sustainable modes of transport (such as cycling and walking) in cities, using renewable fuels, improving sustainable transport services, and increasing digitalisation and infrastructural investments within transport systems. The emphasis in the text is on electrification more so than transport modes offering sustainable alternatives to the car.

Under Finland's Climate Change Act, a working group under the government is responsible for the development and implementation of climate change policy plans. These plans go hand in hand with the climate and energy strategy drawn up by the Ministry of Economic Affairs and Employment. They are directly informed by the goals of the Climate Change Act and articulate actions for the effort-sharing sectors (transport, buildings, agriculture, waste) to meet the overall climate goals. The Medium-term Climate Change Policy Plan, which was approved by the government and provided to Parliament in June 2022, generally aims to "halve emissions from the effort-sharing sector by 2030 and achieve carbon neutrality by 2035" (Ministry of the Environment, 2022), thereby echoing the Roadmap to fossil-free transport (2021). In terms of cycling, the plan refers to the investment programme for walking and cycling as a key part of reducing GHG emissions from the transport sector.

Cycling and efficient transport infrastructure

Under the "transport network development" strategic theme of the last government programme, Objective 1 states that "an overall picture of the transport infrastructure network will be formed and extensively assessed. The overall development will be laid down in the 12-year plan for the national transport system presented by the parliamentary working group" (Finnish Government, 2019). Required under the Act on the Transport System and Highways and produced by the Ministry of Transport and Communications, the National Transport System Plan for 2021-2032 provides a vision, objectives, and an action plan for Finland's transport system, including road networks, walking and cycling infrastructure, ports, and aviation.

The transport system plan describes three parallel objectives which together aim to mitigate climate change: accessibility, sustainability, and efficiency (Finnish Government, 2021).^[4] Cycling is implicated in all three of these objectives, particularly in the sustainability objective which aims to provide residents with greater opportunities to use sustainable modes of transport. And with regards to cycling, the plan states in its 2050 vision that "trips made on foot or by bicycle will have replaced those made by passenger car to a considerable extent, particularly in urban sub-regions" and "the shares of public transport, walking, cycling, and other

sustainable modes of mobility will increase while GHG emissions from transport will decrease, contributing to the achievement of the climate target (Finnish Government, 2021, 34; 38).

Additionally, the national objective raises the concern of traffic safety in response to the European Union's zero traffic fatalities by 2050 goal (Rekola et al., 2022). The Ministry of Transport and Communications' most recent Traffic Safety Strategy 2022-2026 (2022) refers to the 2018 walking and cycling programme, noting the national aim of increasing the modal share of cycling while simultaneously ensuring that such trips contribute to the national vision of zero deaths or serious injuries from any mode of transport by 2050 (Rekola et al., 2022).

Cycling roadmap for low-emission transport

In 2019, Finland's domestic transport emissions accounted for about one-fifth of all GHG emissions. About 94% of transport emissions are attributed specifically to road traffic, with passenger cars responsible for the majority of the emissions (Jääskeläinen, 2021, 10). These numbers explain why the government has directed its attention towards making the transport sector fossil free in its Roadmap to Fossil-free Transport.

The drafting of such a roadmap is described under the low-emission transport objective (Objective 2), to be written "in accordance with the carbon neutrality target" (Finnish Government, 2019). The Ministry of Transport and Communication published the Roadmap to Fossil-free Transport in 2021, which aims to reduce GHG emissions from domestic transport. The roadmap sets a target of reducing domestic transport emissions by at least 50% between 2005 and 2030, with the ultimate goal of achieving a fossil-fuel free transport sector by 2045 (Jääskeläinen, 2021). This means a reduction from 12.5 million tonnes of CO₂ emissions from road transport (2005) to 6.25 million tonnes in 2030. However, as of 2019, CO₂ emissions from road transport was about 11 million tonnes, leaving a long way to go (Jääskeläinen, 2021).

The roadmap also identifies the objective that vehicle-kilometres attributed to passenger cars will not increase in the 2020s (Jääskeläinen, 2021, 30). Put in another way, this objective means that "growth of about 10% in the vehicle-kilometres of each sustainable transport mode in 2030" (Jääskeläinen, 2021, 30). While cars are still viewed as a necessity in rural areas of Finland, an increasingly urbanised population can make this possible.

The roadmap also highlights the objective that the current increase in vehicle-kilometres due to freight transport will slow down on the grounds of shifting towards more sustainable transport modes for goods delivery.

These transport goals run parallel to other cycling objectives; the roadmap names the promotion of walking, cycling, and public transport services as pathways for doing so, in addition to measures such as the digitalisation of logistics and strengthening legislation around electric fuels and biogas. One of the roadmap's 24 procedures for reducing transport emissions explicitly identifies the continued investment in improving cycling conditions as a means for encouraging residents to choose the bicycle over the car.

Box 3. Summary of national cycling-related objectives in Finland

- Passenger car transport sector will no longer grow in the future, but that people's growing needs for mobility are more often met with sustainable modes of transport; growth of about 10% in the performance of each sustainable transport mode in 2030. (Carbon neutral Finland 2035—national climate and energy strategy; Huttunen et al., 2022)
- The shares of public transport, walking, cycling, and other sustainable modes of mobility will increase while greenhouse gas emissions from transport will decrease, contributing to the achievement of the climate target. (National Transport System Plan for 2021-2032; Finnish Government, 2021)
- By 2050 nobody shall die or be seriously injured in traffic, regardless of the mode of transport. (Traffic Safety Strategy 2022-2026; Rekola et al., 2022)
- Increase the number trips made by walking and cycling by 30% by 2030. (National programme for the promotion of walking and cycling; Jääskeläinen, 2018)
- Vehicle-kilometres attributed to passenger cars will not increase in the 2020s; Current increase in vehicle-kilometres due to freight transport will slow down; growth of about 10% in the vehicle-kilometres of each sustainable transport mode in 2030. (Roadmap to Fossil-free Transport; Jääskeläinen, 2021).

National-level mechanisms

To address the various national objectives, the Finnish Government applies several mechanisms that work parallel to one another to achieve a greater impact. These mechanisms take on various forms—from financial and legal mechanisms to infrastructure and design-based mechanisms.

Mechanisms to achieve safe road travel

This objective is mainly documented in the Traffic Safety Strategy 2022-2026, which articulates a total of 103 measures, several of which directly identify the safety needs of cyclists. Each measure (*toimenpide*) has been identified as either a continuation of, development of, one-off, or new activity. And while the strategy identifies the responsible party/parties for each measure and criteria for assessing the measure's success, the measures themselves do not always provide clear processes for carrying out the activity (Rekola et al., 2022).

Firstly, education is taken into account—cycling, as well as various forms of micro-mobility, are integrated into driver training courses, and the government aims to improve communication practices about road safety to ensure that road users of all types know the rules and guidelines for using and encountering different modes of transport (see Rekola et al., 2022, Measure 44). The intention of this measures is to increase the share of people using cycling as their mode of transport.

Another key mechanism for improving bicycle safety comes down to road conditions. The Traffic Safety Strategy notes that both state and municipal road networks need to be maintained and made attractive in order to improve overall safety. This especially means taking into account accessibility in the winter months so that cyclists can manoeuvre through the streets regardless of the season. These measures aim to decrease cycling accidents that result in hospitalisation or death (see Rekola et al., 2022, Measure 63, Measure 72). The measure indicates an interest in making cycling conditions more attractive and barrier-free in the wintertime, but the strategy does not specify how this will be achieved (e.g., by describing specific methods or processes for clearing bicycle paths).

To increase bicycle safety, the safety strategy also states that municipalities, regional ELY centres,^[5] and the Finnish Transport Infrastructure Agency (Väylävirasto) are responsible for taking bicycle traffic (as well as walking) into account when planning traffic nodes and transport junctions. Infrastructure improvements at these multi-modal points of transition promote safer links among transport options (see Rekola et al., 2022, Measure 73).

Another mechanism for improving cycling safety regards cyclist behaviour. The Ministry of Transport and Communications (LVM), together with the Ministry of Justice (OM), is responsible for making an impact assessment to determine the blood alcohol limit for cycling and other forms of micro-mobility. This legal mechanism will be based on factors such as mobility type (e.g., normal bicycle versus electric bicycle) and determine the severity of punishment according to the potential for drunk cycling to cause harm (see Rekola et al., 2022, Measure 91).

Finally, a final mechanism related to the cycling safety objective is for the government to rethink driving speeds. Given that the risk of death increases exponentially for speeds above 30 km/hour, a change in maximum speed limits, especially around schools and day-care centres, may be a decisive matter for the life or death of more vulnerable street users, including cyclists and pedestrians (see Rekola et al., 2022).

Mechanisms to increase cycling trips and decrease car trips

In response to the 2018 national programme for walking and cycling, the Ministry of Transport and Communication established a national stakeholder forum as a soft mechanism for increasing walking and cycling trips by 2030. The purpose of the forum is to exchange information and experiences for taking effective measures in different regions and cities in Finland in order to accomplish the national programme objectives set forth in 2018 (Ministry of Transport and Communications, 2020). The latest forum gathering, arranged by the Ministry of Transport and Communication, Traficom, and the Transport Infrastructure Agency, took place digitally in May 2022 where department experts came together with traffic engineers, planning managers, and others to discuss the success of the walking and cycling promotion programme and how to better communicate about sustainable modes of transport across Finnish cities and regions (Ministry of Transport and Communications, 2022).

To accomplish the national programme's goals of increasing cycling/walking trips by 30% (by 2030), the government established the Walking and Cycling Investment Programme (*Kävely- ja pyöräilyinvestointiohjelma*) through the Finnish Transport and Communications Agency (Traficom). Since 2018, municipalities or groups of municipalities can apply to the state grant to receive funding for specific walking and cycling projects that help to reduce road emissions whilst increasing cycling and walking (Traficom, 2023-b). This could include improving bicycle parking, paving for walk/cycle paths, or other construction and infrastructure improvement work. For example, Espoo was granted EUR 345,000 in 2018 towards the development of the Western Tarvon Bridge (*Läntinen Tarvonsilta*)—a low-traffic bridge with two separate lanes for cyclists and pedestrians (Aalto, 2020). Helsinki received over EUR 1.8 million in 2021 from the Walking and Cycling Investment Programme in 2021 to fund a segment of the Itäbaana—a cycling lane running parallel to a highway to enable better cycle commuting in the eastern part of Helsinki (City of Helsinki, 2022-c). Funding also goes to smaller projects, such as EUR 22,640 in funds provided to bicycle parking at a local high school in Kuopio in 2023. Sixty-one projects were supported in 2022 alone with funding of around EUR 15.4 million.

According to the low-emission transport objective in the 2019 government programme, "EUR 41 million will be reserved for planning work and project promotion related to walking and cycling" from 2020 to 2022. This is considered one of several "quick measure[s] for reducing emissions and promoting a circular

economy" along with drawing up quality standards for cycling paths, and promoting commuter cycling (Finnish Government, 2019, 124). By 2022, the Roadmap to Fossil-free Transport reported that the "state would direct [EUR] 30 million per year of funding for the investment programme for walking and cycling in 2022-2024" (Jääskeläinen, 2021, 32), with the subsidy levels after 2024 decided upon afterwards in accordance with the National Transport System Plan (also referred to as Traffic12). This indicates a significant increase in funding towards the cycling programme.

The Roadmap to Fossil-free Transport also notes that an additional minimum of EUR 10 million per year between 2022 and 2024 will be allocated specifically towards improving walking/cycling infrastructure on highways and at traffic nodes as a way to support increased cycling traffic and cycling tourism (Jääskeläinen, 2021). A further subsidy (beyond the investment programme and road network funding) is dedicated to road maintenance and repairs, including providing high-quality winter maintenance on cycling paths (Jääskeläinen, 2021).

In addition to the Walking and Cycling Investment Programme, state grants have also been awarded to various municipalities for walking and cycling *promotional* programmes since 2021 (Traficom, 2023-c). For example, the City of Vantaa received EUR 35,000 in 2021 to support their cycle traffic development programme (Vantaan Kaupungin Pyöräliikenteen Kehittämishjelma 2021-2026),^[6] and in 2023, the City of Rauma will receive just over EUR 26,000 towards their program for promoting cycling, walking, and sustainable transport chains (City of Rauma, 2023). A total of 38 projects have been supported by this state funding, totalling around EUR 1 million in joint walking/cycling support.

In order for passenger car transport to stop growing in the future, the National Climate and Energy Strategy (2022) outlines several phases of the fossil-free transport roadmap that will be used to accomplish this. This includes providing subsidies for electric vehicles as well as for sustainable transport modes like cycling and walking. The government reserved EUR 113 million in the 2022 budget specifically for "promoting public transport, walking, and cycling" (Ministry of Economic Affairs and Employment, 2022, 85), while an additional EUR 53 million is expected to be allocated for the promotion of sustainable transport between 2022 and 2024.

Another way in which the government seeks to increase cycling trips is through marketing, mobility planning, and service coordination. For example, the central government provides discretionary government grants of around EUR 1 million per year to local authorities as well as non-profit organisations (which will be increased to EUR 2.5 million in 2025) for managing mobility through sustainable mobility plans and parking strategies at the local level. Market-based parking costs for private vehicles in urban areas is another mechanism used to achieve this goal.

The walking and cycling promotion programme identified more than 30 key measures for achieving this major cycling/walking share increase. While the previously described investment programme is a key funding mechanism that has emerged from the programme, additional mechanisms range from developing infrastructure and land-use planning, influencing attitudes and mobility habits, and building cooperation among multiple actors. For example, municipalities and provinces (*maakunnat*) and the Ministry of the Environment (YM) will together determine how walking and cycling can be integrated into municipal construction regulations (including regulations for bicycle parking), and various agencies at the local and regional levels are tasked with considering how key public services (such as schools and healthcare centres) are located in places accessible to cyclists and pedestrians.

The walking and cycling promotion programme also emphasizes design-oriented mechanisms to encourage increased cycling, such as separating walking and bicycling paths, developing higher quality bicycle parking, and improving the quality and attractiveness of cycling transport corridors. This includes making sure that key cycling routes are well-marked. Another mechanism outlined by the national programme includes the development of infrastructure at residential buildings, educational institutions, and workplaces more functional for cyclists (and pedestrians) by improving bicycle parking and general accessibility. Cycling path maintenance is also mentioned as a mechanism to enable increased cycle users in Finland. This requires cooperation among the different road and street managers and establishing winter maintenance contracts. The programme document points to Oulu's winter maintenance as a role model in this area. The programme is a government resolution, meaning that the government is committed to implementing them (Pyöräliitto, 2018). Furthermore, the national cycling and walking programme has generally shaped the work of local walking and cycling promotion programmes, such as that of Espoo, Jyväskylä, Lahti, Pyhtää, and many more (Pyöräilykuntien verkosto, n.d.).

To improve people's likelihood of choosing the bike over the car, the National Transport System Plan highlights the importance of development work, like creating a dense urban structure. For urban sub-regions, maintenance, and development of cycling infrastructure and improving travel chains is key and made possible through public co-financing through the central government. To decrease vehicle-kilometres attributed to passenger cars (and freight transport), as outlined in the Roadmap to Fossil-free transport, the Finnish government suggests promoting sustainable transport (walking, cycling, public transport, and various mobility services) in cooperation with national and municipal actors. As noted in the National Transport System Plan as well, this includes developing a "dense and cohesive urban structure," enabling easy "travel chains" (especially in comparison to passenger car use), and creating safe, smooth, attractive, and accessible walking and cycling routes (Jääskeläinen, 2021, 31). The roadmap also points to municipal walking and cycling projects that improve cycling path conditions (their

accessibility, connectivity, and attractiveness) as crucial mechanisms for making an impact in decreasing car transport and increasing cycling.

There are also some taxation mechanisms that aim to increase cycling shares. For example, employee-benefit bikes have been made a tax-free benefit (up to EUR 1,200). Congestion charges are another mechanism simultaneously oriented towards decreasing car use in urban areas and supporting residents to take up cycling as the less expensive option instead. The National Climate and Energy Strategy also suggests targeting transport in urban areas and between cities as a way to enable a less car-centric mobility system. The idea here is to enable multi-modal transport services—connecting cycling infrastructure with public transport infrastructure, for example—to provide fewer obstacles and smoother transitions for residents to choose an alternative to a private vehicle.

A final important mechanism used in Finland is the land use, housing, and transportation agreement (or MAL agreement in Finnish). These agreements are made among State agencies (the Ministry of the Environment, Ministry of Transport and Communications, Finnish Transport Infrastructure Agency, etc.) and several municipalities with an aim to “coordinate the measures to develop community structures and the transport system so as to create the preconditions for a sufficient and diverse offering of plots and housing production, more compact urban structures, and a functional, safe, and sustainable transport system” (Ministry of the Environment, 2023, 39). According to a recent (2022) report from the Association of Finnish Municipalities, these agreements have effectively enabled cooperation among urban regions and the central government, with many of their objectives succeeding; however, further cooperation and larger investments are necessary to develop urban regions in the future (Mervi & Lönnqvist, 2022). Currently, MAL agreements have been signed in the urban regions of Helsinki, Tampere, Turku, Oulu, Jyväskylä, Kuopio, and Lahti (Ministry of the Environment, n.d.). As one area of the MAL agreement regards transport, the agreements can influence cycling. For example, Tampere accesses government funding to support cycling and walking in the Tampere region through their 2020-2023 MAL agreement. Beyond confirming state allocation of around EUR 830,000, the MAL agreement states that the Tampere region municipalities can apply for further co-funded aid for improving walking and cycling conditions within the municipal street network (City of Tampere, 2023).

Mechanisms using cycling to achieve climate targets

Many of the mechanisms used to increase the share of cyclists while decreasing the share of passenger car users are also cited as a way to contribute to climate objectives in Finland. Financial and infrastructure mechanisms like cycle path maintenance (renovations and repairs) and congestion charges are cited as measures for reducing greenhouse gas emissions from road transport. Under

Sanna Marin's government programme, congestion charges have been implemented as a way to reduce traffic congestion, shorten travel times, and make the transport system smoother and safer. In addition to these, several other mechanisms are acknowledged as instruments for achieving these goals, with cycling as a key element.

The Medium-term Climate Change Policy Plan refers to improving the urban fabric as an underlying measure for reducing emissions in cities. Larger changes to the traffic system can enable sustainable transport on a larger scale. For example, zoning can be used to "create a foundation for improving the functionality and sustainability of the community structure," and developing safe and well-maintained cycling networks that extend well across urban areas and connect to public transport nodes can help residents reduce their carbon footprint (Ministry of the Environment, 2022, 138). Developing smoother travel chains is also a key infrastructural mechanism for regions surrounding cities.

Providing substantial funding for infrastructure management and development projects are critical to enable residents to use cycling as a means for reducing emissions. The National Transport Plan notes that around EUR 5-10 million per year is set aside for road safety improvement projects, EUR 10 million has been designated towards promoting walking and cycling within the state road network, and EUR 2-5 million has been allocated for developing park-and-ride facilities within the state road network (Finnish Government, 2021, 57-58). Importantly, conducting such network improvements requires a high degree of coordination between state and municipal government.

Some emphasis has also been placed on implementing scrapping premiums as a way to support electrification. These efforts, as well as subsidising electric cars and providing clean energy infrastructure, are additional ways to reduce greenhouse gases by 2030 and are often cited alongside promoting cycling and walking. However, such efforts do not necessarily contribute to increased cycling, especially because they rely on maintaining road systems that prioritise or support passenger transport. Still, scrapping premiums can contribute if one uses the opportunity to replace their former car with an electric bicycle or a seasonal public transport ticket instead of using the premium towards a new electric car. Between 2020 and 2021, the state provided between EUR 1,000 and 2,000 as a scrapping premium towards an electric bicycle, and according to the 2018 walking and cycling programme, such campaigns should be repeated at different times in accordance with the fluctuations of the car market in Finland (Jämskeläinen, 2018, 26-27).

To increase cycling trips, Finland aims to direct demand towards sustainable transport. This requires "economic steering instruments and land use supporting sustainable transport" (Finnish Government, 2021, 93).

This is where Finland's National Land Use Guidelines (informed by the Land Use and Building Act) come into play. Local authorities are charged with using land use planning to "promote low-carbon and resource-efficient community development and sustainable mobility" (Finnish Government, 2021, 93)

Key actors

As stated in the 2018 walking and cycling programme, achieving national cycling objectives relies heavily on the cooperation among myriad actors working across different departments and levels of government. Developing and ensuring strong governance models and ways of working are therefore key to implementing the various mechanisms listed above, and agreeing on a common vision for the future of cycling is a must. The walking and cycling programme, setting up the overarching goal of increasing cycling trips by 30%, has provided the backbone for the various plans, financial proposals, and strategic actions over the past four to five years.

The **Finnish Transport Infrastructure Agency** and the **Centres for Economic Development, Transport, and the Environment** (ELY Centres) are the two key managing authorities when it comes to improving the state road network. Together, these parties are responsible for coordinating state road networks throughout the country and ensuring transport conditions (from road safety to highway management to public transport organisation) are suitable (Finnish Government, 2021). These actors also work closely with the **Finnish Transport and Communications Agency** (Traficom), who is responsible for evaluating the current state of the transport network and assessing transport development needs based on the networks' users. From these three authorities, the Finnish Transport Infrastructure Agency holds the responsibility of outlining an investment programme based on the National Transport System Plan and the infrastructure planning programme (for which they are also responsible). Such an investment programme entails not only major development projects but also smaller projects for improving state transport networks.

The **central government** plays a key role for promoting walking and cycling in terms of infrastructure since infrastructure and maintenance have "a significant impact on the attractiveness of walking and cycling and accessibility of routes" (Finnish Government, 2021, 63). To increase the modal share of walking and cycling, the central government is responsible for extending grants to local governments which can be used for street network projects that improve walking and cycling conditions. Furthermore, the central government is responsible for developing walking/cycling infrastructure within the state highway network with funds of EUR 10 million per year. Funding will also be reserved for state highway maintenance and repairs. Meanwhile local authorities hold the responsibility of developing programmes for promoting walking/cycling. This includes planning bike-sharing systems and working with the state to improve information regarding walking/cycling.

To enable smooth travel chain (e.g., via park-and-ride facilities as expressed in the National Transport System Plan), the central government (specifically the **Finnish Transport Infrastructure Agency** and the **Finnish Transport and Communications Agency**) plays a key role. This is mainly through directing funds towards development and management of park-and-ride infrastructure, though this takes place in cooperation with local authorities. Large urban sub-regions are targeted in this work, where park-and-ride facilities for bicycles will be enabled. This work helps to meet travel and transport service levels and more sustainable transport.

The **Ministry of the Environment** also plays a critical role by funding development projects related to land use and transport planning and promoting accessibility, specifically through so-called MAL agreements (land-use, housing, and transport agreements). Alongside this work, the **Ministry of Social Affairs and Health** and the **Ministry of Education and Culture** work towards encouraging the population towards health-promoting activities, including walking and cycling.

Meanwhile, at the local level, **municipal authorities** hold the responsibility of enabling safe local road networks, but they must work alongside state-level actors to provide smooth transitions between local and state roads. This is especially the case when it comes to ensuring traffic safety and maintenance of cycling paths. Municipalities and regions can seek fundings from various sources to support climate actions, including promoting cycling. Additionally **non-governmental groups** of relevance include the cycling association (Pyöräliitto), the Network of Cycling Councils (Pyöräilykuntien verkosto), and Liikenneturva, a volunteer organisation for traffic safety.

Importantly, and as highlighted in the walking and cycling programme, the most fruitful results are most likely to occur when planning and promotion involve strong horizontal alignment, with efforts not only from the transport sector, but also the environmental, health, and even sports sectors (Jääskeläinen, 2018).

In their categorisation of future walking and cycling scenarios for Finland, Kiviluoto et al. (2022) derive five potential scenarios for the country based on interviews with experts. The success of the scenario most in line with the national objectives—the so-called Era of Soft Modes scenario—is dependent on three key components: “(1) coordinated cross-sectoral cooperation, (2) strong political will supporting walking and cycling investments, and (3) vocal public support of soft modes and restricted car use” (Kiviluoto et al., 2022, p.10). Even while addressing these three components through various mechanisms, many experts suggest that car use will continue to permeate the culture, especially as technology (such as vehicle electrification) further enables the vehicle to appear more environmentally sustainable (Kiviluoto, 2022). In addition to cooperation within and among levels of government to enact cycle-friendly policies and invest in effective cycling infrastructure, the future of Finland’s mobility patterns will depend on the density of the urban structure as well as the degree to which individuals themselves are willing to accept, value, and adopt lifestyles that incorporate the bicycle.

¹ This report was written in spring 2023. In the April 2023 elections in Finland, the National Coalition Party led by Petteri Orpo earned the most votes, leading to a government transition. At the time of this report, the new government programme—formed by the coalition of the National Coalition Party, the Finns Party, the Swedish People's Party of Finland, and the Christian Democrats—has not yet been established.

² The walking and cycling promotion programme objective to increase walking and cycling by 30% from 2018 until 2030 is referenced under the low-emission transport objective of the 2019 government programme.

³ The remainder of trips in Finland are represented by passenger car (61%), public transport (6%), and other (3%). At the sub-national level, the Helsinki region has the highest share of overall sustainable trips in Finland (52%--30% pedestrian traffic, 15% public transport, and 7% by bicycle), while the Oulu region has the highest share of trips made by bicycle (18%) of all Finnish regions; see Traficom (2023-a).

⁴ The objectives are further described as: "accessibility: the transport system will ensure access to the whole of Finland and will respond to the needs of businesses, employment, and housing; sustainability: opportunities to choose more sustainable modes of mobility will improve—particularly in urban sub-regions; efficiency: the socio-economic efficiency of the transport system will improve" (see Finnish Government, 2021, 35).

⁵ ELY centres, also known as Centres for Economic Development, Transport, and the Environment, are centres of the national government that is responsible for regional development activities around business, transportation, and the environment (see <https://www.ely-keskus.fi/en/web/ely-en/>).

⁶ For more information about the City of Vantaa development programme, see <https://www.traficom.fi/sites/default/files/media/file/Vantaan%20py%C3%B6r%C3%A4liikenteen%20kehitt%C3%A4misohjelma.pdf>



Photo: Marek Lumi/unsplash.com

Norway

National-level objectives

The zero-growth goal and climate-related cycling objectives

A guiding principle for the development of transportation in urban areas in Norway is the zero-growth goal (*nullvekstmål*). First introduced in the "Norwegian Climate Policy" white paper, it is defined as the goal "[...] of absorbing the growth of passenger transport in major urban areas through public transportation, bicycling, and walking. In and around urban areas, public transportation and bicycling initiatives shall be granted higher priority in the allocation of transport funding" (Norwegian Ministry of the Environment, 2012, 9). The goal was adapted as national policy in a subsequent parliamentary decision in the agreement on climate policy (Klimaforliket 2012; Norwegian Ministry of the Environment, 2012). As part of the country's climate policy, the zero-growth goal was primarily developed to help reduce GHG emissions in the transportation sector (Norwegian Ministry of the Environment, 2012).

The agreement on climate policy of 2012 gave political momentum to the development of cycling and the zero-growth goal in the National Transportation Plan for the period of 2014-2023 (Norwegian Ministry of the Environment, 2012); thus, the goal to increase the modal share of cycling from 4 % to 8 % by 2023 was developed, while pointing out the public health benefits of active transportation (Ministry of Transport, 2013). After the 2013 parliamentary election, Stoltenberg's social democratic government was replaced by a centre-right coalition under the leadership of Erna Solberg, which in turn released its NTP for 2018-2029 in 2017. In addition to discussing climate advantages, the NTP 2018-2029 emphasises the mobility and economic benefits brought about by the zero-growth goal as the development of public transport, cycling, and pedestrian infrastructure are

significantly cheaper and more space-efficient compared to automobile infrastructure. Furthermore, the NTP 2018-2029 highlights that the zero-growth goal forms the basis for the development and state financing infrastructure for public transportation, cycling, and walking (Ministry of Transport, 2017).

In 2021, Solberg's cabinet released the latest instalment of the NTP (for 2022-2033). In it, equality, increased quality of life, and contributing positively to public health, climate, and environment are the general objectives for the development of transportation and infrastructure in Norway (Ministry of Transport, 2021). Looking to the future, the plan provides a vision for the Norwegian transport system in 2050 to be effective, environmentally friendly, and safe, by (1) being more cost-effective, (2) using new technology effectively, (3) aiding Norway in achieving its climate goals, (4) realising Vision Zero (the objective of reducing serious traffic injuries and deaths to zero), and (5) providing better every day travel and improving the competitiveness of the private sector.

The Norwegian government used the NTP 2022-2033 to further develop the zero-growth goal to specify what aspects should be safeguarded and prioritised through land-use and transport planning in urban areas (Ministry of Transport, 2021). These aspects are anchored in different political developments.

Firstly, the zero-growth goal, according to the NTP 2022-2033, maintains its function as a tool to curb GHG emissions from automotive transportation in urban areas. This happens against the backdrop of Norway's current climate goals, enacted through the Climate Change Act 2021 (Klimaloven 2021). The Climate Change Act aims to reduce Norway's GHG emissions by 50-55% within 2030 and 90-95% by 2050 (taking the year 1990 as a point of reference). Through the Climate Change Act, the Norwegian commitment to the Paris Agreement's 2°C-objective, as well as to its commitment to European cooperation on fighting climate change, is integrated into the country's national legislation. Following a government assignment, a cooperation among the Norwegian Environment Agency, the Norwegian Public Roads Administration, and several other administrative bodies assembled the Klimakur 2030^[1] report, which was released in 2020. As an analysis, it is an instructive document that outlines potentialities and measures for effectively cutting quota non-obligatory emissions. The research anticipates that the transport sector will be the greatest emitting sector between 2021 and 2030 (55% of anticipated emissions; Norwegian Environment Agency, 2020, 13). The greatest potential for cutting GHG emissions is identified in the road transport sector with possible savings of 11.8 million tonnes of CO₂ between 2021 and 2023 (Norwegian Environment Agency, 2020, 53). The Klimakur report estimates that, as a measure for reducing carbon emissions, the zero-growth goal has the potential to reduce around 0.75 million tonnes of CO₂ equivalents.

In addition to the framing of the zero-growth goal by Norwegian climate objectives and policy, the Norwegian Ministry of Health and Care Services (HOD) highlights the advantages cycling has for public health in its Action Plan on Physical Activity 2020-2029 (Ministry of Health and Care Services, 2020). The action plan's overarching goal is to establish an exercise-friendly society where, regardless of age, sex, ability, and social background, there are good opportunities for physical exercise. The development of the zero-growth goal in the NTP 2022-2033 prioritises public transportation, cycling, and walking as effective measures for reaching this goal.

The newly developed zero-growth goal in the NTP 2022-2033 now targets GHG emissions, traffic flow, and air and noise pollution, which are to be addressed through effective land use and through the absorption of growth in traffic numbers by public transportation, cycling, and walking. Additionally, it is acknowledged that the zero-growth goal contributes to more attractive cities, with increased mobility and accessibility for the private sector. The goal also contributes to lowering GHG emissions from the transport sector, although the primary tool for achieving this objective is through the electrification of road transportation (Ministry of Transport, 2021).

Many different aspects and objectives, stemming from different aspects of Norwegian environmental, public health, and acquisition policy, have been synthesised into the zero-growth goal, making it both objective and development principle. The NTP 2022-33 acknowledges that the zero-growth goal is ambitious, and that increased cycling is an important component in its achievement, emphasising the government's commitment to prioritising cycling during the plan period. Following the guiding objective of the NTP 2018-2029, the NTP 2022-2033 continues the long-term cycling objective of a national cycling share of 8% in rural areas and 20% in urban areas (Ministry of Transport, 2017; 2021). An evaluation by the Norwegian Centre for Transport Research (TØI) showed that if only the greater Oslo area reached the 20% modal share objective, national objectives of reaching a modal share of 8% nationwide would be fulfilled, highlighting the importance of urban areas in achieving national cycling objectives (Bjørnson Lunke & Grue, 2018).

Following the Norwegian general election in 2021, the coalition of the Norwegian workers party and centre party released the *Hurdalsplattformen 2021-2025* as a basis for the coalition's work during its legislature. In it, the government outlines its ambitions to develop the country's transport sector and infrastructure along notions of social and environmental sustainability. When it comes to cycling, the platform document articulates that metropolitan areas should be developed with housing and workplaces so that passenger transport can increasingly be done by foot, bicycle, or public transport. The platform also suggests increased spending on national tourist routes, cycling and hiking trails, as well as adapting the norms for cycling and pedestrian ways (Arbeiderpartiet & Senterpartiet, 2021).

Currently the Norwegian Government under Gahr Større is working on a new National Transport Plan to be released in spring 2024. The release of this next transport plan (NTP 2025-2036) is scheduled one year earlier than usual in order to account for changes in the global economy and to more realistically reflect the status of Norway's challenges regarding future transport (Regjeringen, 2022). According to the Minister of Transport, the plan must determine how to reach Norway's climate goals while also proposing an efficient, safe, and realistic transport policy.

National cycling strategy objectives

Back in 2012, the Norwegian Public Roads Administration published a national cycling strategy for 2014-2023 to coincide with and act as a foundational document for the NTP 2014-2023. The strategy is a non-binding instructive document, but its role is to guide national cycling objectives (Statens Vegvesen, 2012). Such objectives include: formulating better design principles for infrastructure, establishing better cooperation among actors in infrastructure development, providing coherent and high-quality infrastructure, improving road safety, placing special attention on cycling networks surrounding schools, and increasing the number of children and youth who cycle to school to 80%. While there have been several new national transport plans since this cycling strategy was produced, it is unclear whether a revised strategy will be produced to coincide with the most recent transport plan.

Traffic safety and health-related objectives

Though not accompanied by a specific cycling strategy, several cycling objectives have been articulated in the latest NTP 2022-2033. Using the Vision Zero objective—zero traffic deaths or serious injuries by 2050—as a basis, the plan puts forth the traffic safety objective of reducing serious injuries and deaths in 2030 to a maximum of 350 (of which no more than 50 should be deaths; Ministry of Transport, 2021, 89). In conjunction with the NTP 2022-2033, the Norwegian government mandated the Norwegian National Public Roads Administration, the Norwegian Police, and other national associations and directorates to assemble the National Action Plan for Road Safety 2022-2025. This plan identifies a set of measures to achieve traffic safety objectives and to strengthen collaboration between different actors in traffic safety (Ministry of Transport, 2021, 89). For cyclists, it seeks to reduce the number of serious injuries and deaths in traffic by 25% within the plan period, while increasing the number of people who use a bicycle helmet to 75% by 2026 (Dobbe et al., 2021, 87).

As was the case in the NTP 2018-2029, the NTP 2022-2033 includes a Children's Transport Plan (*Barnas transportplan*) organised as one chapter. Through the Children's Transport Plan, the Norwegian government seeks to ensure that children's needs in areal and transport planning receive sufficient consideration,

and that children are educated to navigate traffic actively and independently. The plan emphasises children's special role as daily users of the public transport network—be it as pedestrians, cyclists, or in public transport—as they commute to schools, playgrounds, or other free-time activities (Ministry of Transport, 2021.). Walking and cycling alone, with other children, or with adults are often the modes of transport children use to reach various activities, mostly because of convenience (NTP 2022-2033; Opedal et al., 2020). Seeing the advantages for public health among children and youth, the NTP aims to increase the modal share of children who bike or walk to commute up to 4 km to school to 80% (Ministry of Transport, 2021), thus keeping the objectives set in the Children's Transport Plan.

Box 4. Summary of national-level cycling objectives in Norway

- Absorbing the growth of passenger transport in major urban areas through public transportation, bicycling, and walking. In and around urban areas, public transportation and bicycling initiatives shall be granted higher priority in the allocation of transport funding (zero-growth goal; Norwegian Ministry of the Environment, 2012).
 - The zero-growth goal states that GHG emissions, traffic congestion, and air and noise pollution should be reduced through effective land use, and that personal transportation is absorbed by public transport cycling and walking (Ministry of Transport, 2021).
- Establishing an exercise-friendly society where, regardless of age, sex, ability, and social background, there are good opportunities for physical exercise. (Ministry of Health and Care Services, 2020, 18)
 - It has to become easier and safer to travel by foot or bicycle and to choose active mobility over the car on short trips (Ministry of Health and Care Services, 2020, 11)
- Cycling makes up 8% of modal share in rural areas and 20% in urban areas (Ministry of Transport, 2021)
- Reduce serious injuries and deaths in 2030 to a maximum of 350, of which no more than 50 should be deaths; zero traffic deaths or serious injuries in 2050. (Ministry of Transport, 2021)
 - Reduce the number of serious injuries and deaths in traffic by 25% between 2022-2025 while increasing the number of people who use a bicycle helmet to 75% by 2026 (Dobbe et al., 2021).
- Increase the modal share of children who bike or walk to commute up to 4 km to school to 80% (Ministry of Transport, 2021).

National-level mechanisms

There are several mechanisms in place that directly or indirectly support the achievement of Norway's national cycling objectives. Some of them are holistic measures and tools that address several national objectives (of which cycling is merely one aspect), while others explicitly target the development of cycling.

Funding schemes

Urban growth agreements

For reaching the zero-growth goal, as well as the associated national cycling objectives for urban areas, the Norwegian government views urban growth agreements (*byvekstavtaler*, formerly *bymiljøavtaler*) as its most important tool (Ministry of Transport, 2021, 115). Through these agreements, the Norwegian government financially supports public transport, cycling, and walking projects. Specifically, the agreements aim to prevent growth in car traffic even as passenger transport increases in cities (Statens Vegvesen, n.d.). Legally binding, urban growth agreements are negotiated between the urban area (made up of multiple municipalities), the county, and the state. All parties commit to objectives regarding transport and spatial development. Equipped with a budget of NOK 80.1 billion for the plan period of the NTP 2022-2033, the urban growth agreements are primarily a financing mechanism for projects in areal planning and transportation, as the agreement consists of concrete projects that are financed through the state (Statens Vegvesen, n.d.). The Norwegian state contributes 50% of the funding for projects, while the other half must be financed by the municipalities, counties, and through road tolls.

Urban growth agreements grant greater autonomy to local authorities and can also enable multiple actors to work together across different governance levels. However, as Amundsen et al. (2019) point out, such agreements often depend upon road tolls to finance local measures, which can be locally unpopular and, in some cases, undercut financing power. Four large urban areas (Oslo, Bergen, Trondheim, and Nord-Jæren) negotiated and ratified urban growth agreements between 2019 and 2020. Additionally, the NTP 2022-2033 sets out to negotiate five further agreements with the urban areas of Tromsø, Kristiansand, Grenland, Buskerudbyen, and Nedre Glomma, all of which are transitioning from older incentive schemes to urban growth agreements.

For the urban areas of Bodø, Ålesund, Haugesund, Vestfoldbyen (Larvik, Sandefjord and Tønsberg), and Arendal/Grimstad, the NTP 2022-2033 introduces a new subsidy scheme, equipped with NOK 600 million for a 4-year planning period. By committing to a zero-growth objective and implementing target-oriented measures, the municipalities receive subsidies for smaller investments into cycling and pedestrian infrastructure as well as collective transport such as bus stops and

transport hubs along national, regional, or municipal roads. For example, Bergen's 2019-2029 urban growth agreement highlights the participation of Bergen, Alver, Askøy, Bjørnafjorden, and Øygarden along with Vestland county, which are dedicated to achieving the zero-growth goal through improvements in public transportation, walking, and cycling (Statens vegvesen, 2020).

Cycling city agreements

Cycling city agreements (*sykkelbyavtaler* and *sykkelbygdavtaler*) form an important component for working towards the advancement of cycling in Norway. Similar to urban growth agreements, a cycling city agreement is a legally binding financing scheme for projects and measures in individual municipalities, but with a special focus on cycling. Unlike the urban growth agreements, they are not negotiated between several different municipalities; rather municipalities negotiate individual agreements with their respective county and the Norwegian Public Roads Administration, in which they commit to cycling related objectives, measures, and financing. Further, the role of the Norwegian Public Roads Administration is limited to that of a facilitator and advisor, but does not participate financially; instead, the county shares the financial burden with the individual municipality. To be eligible for a cycling city agreement, the municipality must have ratified a plan for a main cycling path network. To date, almost 50 cycling city agreements have been signed by municipalities in 10 different counties (Statens Vegvesen, n.d.). The agreements have supported a variety of projects, such as in Kongsvinger Municipality, which contributes NOK 6 million matched by NOK 6 million from Innlandet County to implement measures for traffic safety, cycling, and walking to help achieve an objective of increasing the numbers and safety of cycling (Kongsvinger kommune, 2022).

Climate schemes

Klimasats is a subsidy scheme awarded through the Norwegian Environment Agency. The scheme supports local climate actions in municipalities and counties that help curb GHG emissions while also aiding local development. Annually, municipalities and counties can apply for funding for a variety of projects in planning, acquisition, construction, or transport from a funding pool (NOK 100 million in 2023). Since 2016, several municipalities have received funding for cycling projects—such as the construction of bicycle infrastructure or the advancement of cycling—amounting to approximately NOK 43 million dedicated specifically to cycling projects (Norwegian Environment Agency, 2022). Such projects include, for example, a circular economy project in Tromsø, which received NOK 200,000 through the climate scheme to provide residents with access to tools for repairing, recycling, and upcycling bicycles (as well as clothes and electronics; Norwegian Environment Agency, 2021). Another example is the so-called cycling hotel located by two metro stations in Bærum, which received NOK 4.16 million to ensure secure cycle parking and strengthen intermodal transport in the greater Oslo area (Norwegian Environment Agency, 2016).

Funding to support cycling among children

To reach the cycling objective advanced in the Children's Transport Plan (a modal share of 80% for all school commutes under 4 km), the NTP 2022-2033 identifies several measures targeting children and teenagers. Cycling and traffic safety are to be advanced through investments of NOK 500 million. This includes a subsidy scheme to provide local incentives for the development of safer ways to schools and nearby environments (Ministry of Transport, 2021, 141).

Statutory national planning instruments

The Norwegian Planning and Building Act (2008) equips the Norwegian government with various national planning instruments: the national planning guidelines for coordinated housing, land-use, and transport planning is one of existing planning instruments which "aim to guide regional and local plans and to draw attention to and propose issues of national importance" (Huynh et al., 2022). Released in 2014, the guidelines stress that development should take place according to compact city planning which support sustainable transport modes like walking, cycling, and public transport. According to the guidelines, planning work should advance cycling and walking as a means of transportation, that coherent cycling and pedestrian networks should be developed in larger cities where cycling and walking are effective transport solutions, and public transport should adapt to cycling and walking modes to ensure an effective and continuous transport network (Kommunal- og distriktsdepartementet, 2014).

National expectations for regional and municipal planning are also instrumental in meeting cycling objectives. Formulated every 4 years by the Norwegian government, national expectations are presented in one non-binding, central document, which guides municipal and regional planning processes (Lidmo & Bogason, 2020). For example, the 2019-2023 national expectations encourage local governments to develop according to principles of transit-oriented development to "strengthen the foundation for living towns, increased public transport, cycling, and walking" (Ministry of Local Government and Modernisation, 2019, 21). The expectations also reflect the language of the zero-growth goal, stating that "passenger transport needs shall be met by public transport, cycling, and walking" (Ministry of Local Government and Modernisation, 2019, 25), and suggest improving the liveability and attractiveness of town centres as one way to achieve this.

Traffic planning

For achieving the objectives for traffic safety for cyclists, the National Plan of Action for Road Safety 2022-2025 introduces an abundance of measures targeted at the built environment, the traffic behaviour of cyclists and pedestrians, and the cycling and walking culture overall. For example, the Norwegian Public Roads

Administration will provide cycling facilities on stretches of roads linked to the national road network and review rules and regulations around road visibility. At the local level, several large municipalities are expected to improve the design and road maintenance of local roads to address cycling and pedestrian safety, while county administrations will conduct road safety assessments of cycling routes and ensure that funding for implementing improvements is prioritised (Statens Vegvesen, 2022-b).

From a traffic planning perspective, the criteria for speed limits have also been reviewed with special attention to environments surrounding kindergartens and schools (Ministry of Transport, 2021, 151), and the inclusion of children in the planning process through methods such as *barnetråkk* or writing and drawing competitions are highlighted (Ministry of Transport, 2021, 153). Additionally, the so-called heart zones (*hjertesone-tryggere skolevei*) along school routes are an important measure that facilitates safer mobility to and from school (Trygg Trafik, n.d.-a). The zones are developed in cooperation with municipalities, Trygg Trafikk, the Norwegian Directorate of Health, Norwegian Public Road Administration, Police, Norwegian Cyclist's Organisation, and local parents' boards (Ministry of Transport, 2021, 151). The specific measures depend on the school and its particular context. For example, some heart zones include road marking and signage while others involve implementing design changes to ensure behavioural change from motorists (such as speed bumps or changes to the pavement; Oslo Municipality, n.d.).

Cycle superhighways

The concept of investing in cycle superhighways (*sykkelstamveger*) emerged in the NTP 2018-2029 as a mechanism to enable people to choose cycling as a means of transport for both shorter and longer distances (Miljøløftet, 2019). These separated cycle routes are designed for quick and direct cycling movement across regional and municipal roads. One of the first developments in this area was the 13-km route connecting Stavanger, Forus, and Sandnes (within Rogaland County; Klimapartnere, n.d.; Grønnestad, 2020). The cycle superhighway project began in 2018 and, as of spring 2023, three of the seven total sections have been completed (Bymiljøpakken, 2023).

Similar projects have been introduced on a smaller scale from municipalities such as in Bergen, where a 7.8-km pathway has been under development to connect cyclists from Fyllingsdalen to central Bergen. The superhighway involves not only a dedicated cycle lane but also a 3-km tunnel for cyclists and pedestrians along the stretch between Fyllingsdalen and Minde, where the Kristianborg tram station is located along E39 (Miljøløftet, 2023; see Figure 5). Superhighways such as these provide the infrastructure for commuters to cut across urban areas (and through mountains). Both the Bergen and Stavanger superhighway projects are concretised within urban growth agreements (Ministry of Transport, 2021, 244-246). No other superhighways are mentioned apart from these in the current NTP.



Figure 5. Route of the Bergen cycle superhighway. Source: Miljøløftet (2023)

Soft measures

There are several actors working to raise awareness or promote cycling through various avenues in Norway, mostly in connection to road safety, and mostly targeted towards cyclists rather than motorists. While wearing a helmet is not legally required, Trygg Trafik and Tryg Forsikring launched a digital campaign to raise awareness around the importance of wearing a helmet while cycling or operating other modes of urban micromobility such as e-scooters (Tryg Forsikring, n.d.). The Norwegian Cyclists' Association also carries out a "visible cyclists" (*synlig syklist*) campaign each autumn and winter, which involves distributing free bicycle lights to cyclists (Syklistforeningen, n.d.), while county administrations encourage bicycle helmets and the use of reflectors in various ways, such as by participating in Reflector Day (*Refleksdagen*)—another campaign established by Trygg Trafikk back in 2006 (Trygg Trafikk, n.d.-b). (Unlike helmets, lights are a legal requirement for cycling.) These measures are all encouraged by the National plan of action for road safety 2022-2025.

Key actors

The review of the Norwegian national objectives and measures for the development of cycling has shown that many of the national cycling ambitions have been coordinated and, in many cases, synthesised with ambitions for increasing public transport and in the zero-growth goal. Thus, the development of cycling for the most part is not receiving undivided national attention, but is tackled primarily through the urban growth agreements, that target multiple aspects of transport development.

Regardless, there is a broad network, spanning vertically and horizontally across different layers of governance, that is involved in working with and towards Norway's national cycling objectives.

The **Norwegian Public Roads Administration** is a central actor for the implementation of national transport strategy and policy. The administration holds responsibility over the development of the road and transport sector, including specifically the facilitation of cycling traffic along national roads. It is thus in charge of setting up several plans, that follow up on the objectives and policy directions outlined in the National Transport Plans, such as the Action Plan 2022-2027 (Gjennomføringsplan 2022-2027). The administration also plays a key role in negotiating urban growth agreements and coordinating the monitoring and reporting of the agreements once they are established (e.g., measuring traffic counts to use as the key performance indicator for the success of urban growth agreements; Statens Vegvesen, n.d.).

According to the National Cycling Strategy 2014-2023, the role of the Norwegian Public Roads Administration is mainly to incentivise and support other actors in the development of cycling (Statens vegvesen, 2012). It does this in various ways, such as by sharing knowledge among a cycling city network and providing handbooks for cycling design.^[2] The Public Roads Administration operates as a knowledge facilitator in the cycling cities agreements. The institution also plays a key role in the negotiation and facilitation of the urban growth agreements, as it is responsible for laying the groundwork for the agreements by conducting surveys and potency analysis for the urban areas in question, representing the state in the negotiations with the counties and municipalities, and following up on the objectives agreed upon in the individual agreements.

More than 80% of the cycling infrastructure is under the mandate of **counties and municipalities**, which elevates them to the most important developers for cycling infrastructure on the ground. This also has implications for responsibility of maintenance and physical upgrading of existing infrastructure owned by the individual counties and municipalities.

In addition to government and administrative institutions, there are also many other **organisations** involved in the work of cycling development and national objectives. For example, to achieve traffic safety objectives, the **Norwegian Council for Road Safety** (*Trygg Trafikk*) and **Norwegian Cyclists' Association** (*Syklistens Landsforening*) take up roles in facilitating campaigns for public engagement (Ministry of Transport, 2021).

¹ <https://www.miljodirektoratet.no/klimakur>

² See, for example, <https://www.vegvesen.no/globalassets/fag/horinger/2013/2013033341-hb233-frist-20130430/hb233-sykelhandboka-hoeringsutg.pdf>



Photo: Sofia Sabel/imagebank.sweden.se

Sweden

National-level objectives

In Sweden, the importance of increased and safe cycling has existed in the national policy discourse for some time, or, as Rensvala (2020) points out, "Sweden has for years expressed willingness to achieve 'increased and safe cycling'" (p. 4). Although cycling has not necessarily been highlighted as an objective of its own, there are some related objectives where cycling is discussed or implied. In 2022, the Swedish National Road and Transport Research Institute (VTI) published an investigation about objectives for increased cycling in Sweden. The background to their investigation was a government assignment from October 2021 (see Regeringskansliet, 2021-a/ Diarienummer: I2021/02603). VTI notes that there is not a well-defined national cycling objective in Sweden, except the so called GCK-objective (see Eriksson et al., 2022).^[1] The GCK-objective is the only existing national objective in Sweden that explicitly regards cycling. It is part of the Milestone targets,^[2] under the category *sustainable urban development*. The objective regards proportion of pedestrian, bicycle and public transport and is outlined as follows:

- "The proportion of personal journeys using public transport, cycling or walking in Sweden must be at least 25 percent by 2025, expressed in person kilometres travelled, with a view to doubling in the long term the proportion for pedestrian, bicycle and public transport." (Naturvårdsverket, n.d.-a)

This objective is not yet fulfilled, and the current assessment^[3] of the goals (as of August 2023) shows that it is uncertain whether it is possible to even fulfil this objective before the target year 2025 (Naturvårdsverket, 2022). In addition to the modal share objective, there is another cycling-related objective that is part of the Milestone targets under the category of *reduced climate impact*. The specific

objective regards *emissions of greenhouse gases from domestic transport* and is outlined as follows:

- "Emissions from domestic transport, excluding domestic aviation, are to be reduced by at least 70 per cent at latest by 2030 compared with 2010. Domestic aviation is not included in the goal since domestic aviation is included in the EU ETS." (Naturvårdsverket, n.d.-a)

Unlike the GCK-objective, the Swedish national agencies have, as of August 2023, assessed that it will not be possible to achieve this objective by 2030 (see Naturvårdsverket, 2023). The assessment suggests that new policy instruments will likely be required to achieve the emissions goal.

Despite the lack of clear national cycling objectives in Sweden, a national cycling strategy was produced in 2017. The strategy (see Regeringskansliet, 2017-a) does not define any new objectives but refers to a few political objectives with importance for increased and safe cycling. For instance, UN's Agenda 2030 is mentioned, where the national cycling strategy claims that sustainable transport solutions, traffic safety, and health are relevant political goals for increased and safe cycling. The strategy also articulates the so-called environmental quality objectives (*miljö kvalitetsmålet*) which in total consist of 16 objectives. Of the 16 objectives, the strategy refers to developing a good built environment, specifically referring to public transport systems and having attractive, safe, and efficient pedestrian and cycle paths (see Naturvårdsverket, 2018-a; Naturvårdsverket, 2018-b).

In addition to this, there are governing national objectives for transportation policy in Sweden, to which the national cycling strategy also refers (Regeringskansliet, 2017-a). The Swedish government outlines them on its website and divides them into one overarching objective and two secondary objectives (Regeringskansliet n.d.; see also Trafikverket, 2022-a). The relation between these three objectives is that the transportation system must develop towards the overarching objective, whilst the secondary ones are equal to one another. In short, the overarching transport objective aims to ensure a socio-economic efficient and long-term sustainable transportation provision for all citizens and businesses in the entire country (Regeringskansliet, n.d.) The secondary objectives consist of 1) the accessibility objective and 2) the consideration objective. The accessibility objective regards the design, function, and usability of the transportation system which should contribute to accessibility with good quality and usability in the entire country, as well as being equal (meaning it should equally address the transportation needs of women and men). The consideration objective focuses on issues to consider when it comes to the design, function, and usability of the transportation system. For example, the consideration objective stresses that no one should be killed or seriously injured; therefore, the transportation system should be adapted to protect against this. It also means that the transportation system must contribute to the

overarching generation goal for the environment, the environmental quality objectives, and increased health.^[4]

The Swedish government notes on its website that, in order to achieve the overarching national transportation objective, the accessibility objective must develop within the framework set by the consideration objective (Regeringskansliet, n.d.). In other words, the accessibility objective focuses on developing a transportation system that is well-developed with good quality and accessible throughout the entire country, but it cannot develop without considering the aspects in the considerations objectives (in brief, several climate and environmental objectives, including a reduction of greenhouse gas emissions by 70 % in 2030 compared to 2010).

Another important objective, which is brought up by the Swedish Traffic Administration, is that as a national transportation agency, they must relate their work to the overarching objective for public health policy, which is about creating societal conditions for good and equal health for the entire population (see, e.g., Trafikverket, 2021-b). All of the areas within the public health policy in Sweden guide the broad work with public health in society in which, for example, the sub-objective to improve food habits and physical activity is one relevant for transportation and cycling. Therefore transportation policy should also contribute to promoting increased physical activity (Trafikverket 2021-b; for more information about Swedish public health policy and objectives, see Folkhälsomyndigheten, 2022)

In sum, there are several national objectives in Sweden that, in one way or another, can be linked to cycling—at the least to increased and safe cycling. As VTI concludes in their 2022 investigation, there are not any clear and specific national cycling objectives in Sweden (Eriksson et al., 2022). As part of its government assignment, VTI was also tasked to propose new objectives to specifically increase the share of cycling that promotes increased cycling for all ages and considers its effects on socio-economic groups in the entire country (Regeringskansliet, 2021-a). This shows an interest from the Swedish state to improve the objectives and potentially also the mechanisms that strengthen the possibilities to improve the cycling network throughout Sweden. The proposed cycling objectives in VTI's investigation are, at the time of this report, still proposals and can be found in VTI's report (see Eriksson et al., 2022). It remains to be seen in the coming years whether the national cycling objectives will be improved and made clearer. However, as Rensvala (2020) points out, "Increased and safe cycling has been repeated in politics and bureaucracy nationally since the turn of the millennium [...] but it has never been an official, national objective" (6). With those words, the ambition from the Swedish state exists *to some extent*, but for cycling per se, the national objectives are, so far, more implicitly outlined and "baked in" rather than being specific and targeted.

Box 5. Summary of national-level cycling objectives in Sweden

- The proportion of personal journeys using public transport, cycling, or walking in Sweden must be at least 25 percent by 2025, expressed in person kilometres travelled, with a view to doubling in the long term the proportion for pedestrian, bicycle, and public transport (GCK-objective, milestone target; Naturvårdsverket, n.d.-a)
- Emissions from domestic transport, excluding domestic aviation, are to be reduced by at least 70% at latest by 2030, compared with 2010 (Milestone target; Naturvårdsverket, n.d.-a)
- Public transport systems are environmentally friendly, energy-efficient and accessible, and there are attractive, safe and efficient walking and cycling paths (Environmental quality objective—Good built environment; Naturvårdsverket, 2018-a)
- Ensure a socio-economic efficient and long-term sustainable transportation provision for all citizens and businesses in the entire country (Regeringskansliet, n.d.)
 - The design, function and use of the transport system should contribute to providing everyone with basic accessibility with good quality and usability and contribute to development power throughout the country. The transport system must be equal, i.e., equally meet the transport needs of women and men.
 - The design, function and use of the transport system must be adapted so that no one is killed or seriously injured, contribute to achieving the overall generational goal for the environment and the environmental quality objectives and contribute to increased health.
- Transportation policy should also contribute to promoting increased physical activity (Trafikverket, 2021-b; Folkhälsomyndigheten, 2022)

National-level mechanisms

Road-ownership and road network for bicycle infrastructure

To start with, about 80 % of bicycle infrastructure is under the responsibility of Swedish municipalities (in total 19,810 km of bicycle network), whilst 2,940 km of the bicycle network are either state-owned national or state-owned regional bicycle infrastructure (Trafikverket, 2021-a). The Swedish Transport Administration is responsible for both types of the state-owned bicycle network when it comes to maintenance and construction; the difference is that the state-owned regional network is planned and developed in the regional counterparts of the national transportation plan (i.e., county transportation plans), which is developed by the

regions (Trafikverket, 2021-b). Overall, this means that a significant part of the Swedish bicycle infrastructure is under the responsibility of the Swedish Transport Administration.

In general, maintenance of the existing infrastructure falls under the responsibility of the road owner, which means that most maintenance of bicycle infrastructure is a municipal responsibility. Since a significant amount of the road network is state-owned bicycle infrastructure, the shared responsibility for the overall maintenance between municipalities and the Swedish Traffic Administration should not be underestimated. The budget allocated for maintenance of state-owned bicycle infrastructure is determined in the national transportation plan (and in their regional counterparts in the county transportation plans).

Mechanisms in relation to the GCK-objective

When it comes to mechanisms and measures that are taken to fulfil the GCK-objective, the website "Sveriges miljömål" lists several important actions (Naturvårdsverket, 2022).^[5] Among those listed, one mechanism is to make car-use less attractive in combination with allocating more funding to public transportation. However, by having *one* national objective for *three modes* of transportation (pedestrian, cycling, and public transportation) it is unclear which concrete measures relate to fulfilling the cycling part alone. However, some of the mechanisms related to cycling are to design and plan a transportation system that prioritizes walking, cycling, and public transportation over car use, as well as to make the traffic environment safe, particularly for youths and elderly people. The responsible Swedish agencies (see more, Naturvårdsverket, 2022) also encourages the development of direct routes with good capacity for these modes of transportation compared to car-use. Although these are not very clear mechanisms, some additional measures are emphasized (Naturvårdsverket, 2022). For example, all road owners and involved actors at all levels of governance must proactively work to prioritize design and land-use to pedestrian, cycling, busses, and rail in the larger cities.^[6]

In order to plan and design Swedish cities in a more sustainable way, one implemented mechanism listed under the GCK-objective is the establishment of the Swedish Council for Sustainable Cities. The Council aims to implement the Swedish government's policy for sustainable urban development. Moreover, the Swedish National Board of Housing, Building, and Planning has committed to work together with the Swedish Traffic Administration to ensure walking, cycling, and public transit are to be used as guiding principles in Swedish urban transportation planning (Naturvårdsverket, 2022). In other words, planning for sustainable transport methods should take precedence over car-centric urban development.

Financial mechanisms

In Sweden, we can distinguish between what we call *hard mechanisms* and *soft mechanisms* at the national level to fulfil the national objectives. The former is related to funding^[7] and other concrete measures to improve existing or develop new bicycle infrastructure, whilst the soft mechanisms are knowledge developing activities, knowledge exchanges, or similar initiatives. Hard mechanisms are crucial to get the infrastructure in place. The national and regional transportation plans, which allocate national funds, are central financial plans.

In addition to the maintenance introduced above, there are also mechanisms *at the national level* to improve the infrastructure network for cyclists and to develop or support measures for new or improved bicycle infrastructure. In Sweden, as can be seen in Figure 6, the funding for developing and maintaining state-owned road infrastructure comes from either the national transportation plan or the regional transportation plans. The municipal road network, that dominates all of the bicycle infrastructure, is mainly funded through the municipal budget, but also through co-financing from the state Outlined in the county transportation plans or the in urban environment agreements (see below). As an example, the regional transportation plan in the Stockholm Region (for 2022-2033), allocates 18 percent of its SEK 9.9 billion budget to investments in bicycle infrastructure (see Region Stockholm, 2022). Finally, the private road ownership is funded either through road fees or through subsidies from the state or the municipalities (see Trafikverket, 2021-b).

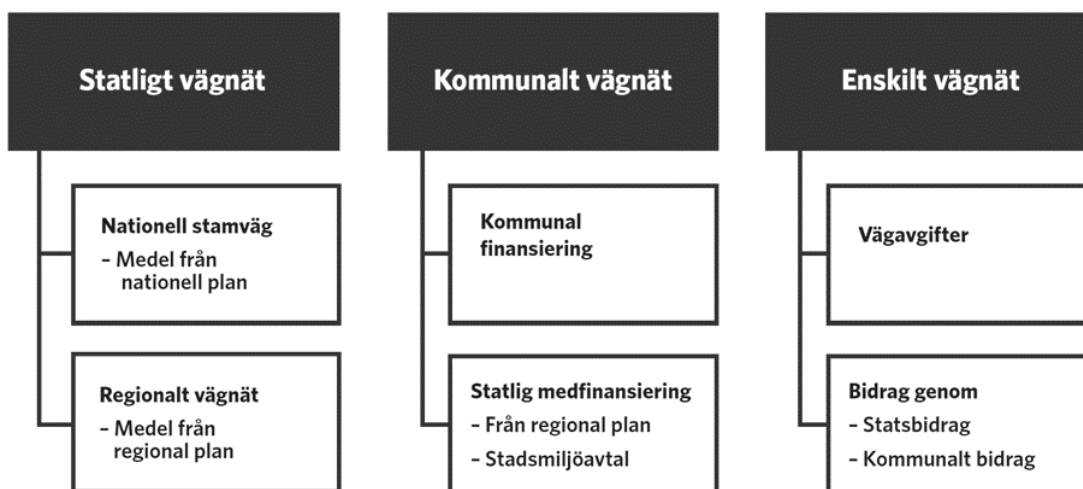


Figure 6. This figure illustrates the three ownership types of the Swedish road network (including bicycling infrastructure), and how they are funded both in terms of development/construction and maintenance. Source: Trafikverket (2021-b).

In Sweden, the so-called *stadsmiljöavtalen* (urban environment agreements, or UEAs) are another hard mechanism. As a response to the rapid population growth in urban areas, the Swedish government implemented a decree (SFS 2015:579) for promoting sustainable urban environments. Municipalities and regions can apply for a government grant for initiatives that aim to increase the usability and use of regional and local public transport and/or biking as well as more sustainable freight transport or increase housing construction. The initiatives should lead to more energy efficient solutions in public transport and/or biking, streamlining of freight transport, and good built environments. To receive funding, involved municipalities must undertake countermeasures. Such countermeasures can be either physical or other relevant strategic physical measures, such as parking and traffic strategies or detailed plans, which all contribute to improved sustainable transportation or increased housing development. The application of UEAs has slightly changed since they were introduced in 2015. For example, in 2020 the Swedish parliament decided on a reinforcement of the UEAs for the period 2021-2022, allocating specific financing to measures for bicycle infrastructure (see Huynh et al., 2022). In 2021, 43 applications were approved, with a total funding of SEK 280 million to support 39 municipalities and regions with 65 km of pedestrian and cycling lanes as well as bicycle garages and parking spaces (see Trafikverket, 2022-b). For example, just under SEK 50 million of support was provided to Göteborg to go towards the detailed planning, intersection reconstruction, and construction of a bicycle parking garage beside the newly developing Haga train station (Trafikverket, n.d.-b). Between 2015 and 2021, a total of SEK 5.7 billion was allocated through UEAs, of which SEK 1.2 billion regards measures for bicycle infrastructure, and SEK 1.1 billion regards combined measures for public transportation and bicycle measures (Trafikverket 2022-a).

In addition to the funds that municipalities and regions can receive through the UEAs, the national transportation plan for 2022-2033 has a specific budget line for increased and safe cycling, also known as *cykelpotten*. This is the first time that cycling has its own budget line in the national transportation plan; in fact, the Swedish government commissioned the Swedish Traffic Administration to propose a specific budget line for cycling measures along state-owned roads in the directives to prepare the new national transportation plan (see Regeringskansliet, 2021-b). In total, SEK 1.7 billion is allocated to measures for increased and safe cycling, of which SEK 700 million SEK should be allocated to the regional transportation plans and thus be co-funded by the regions with the same amount. The main reason for this, according to the Swedish Traffic Administration, is that the state-owned regional roads have the highest need for upgrades to existing or development of new bicycle infrastructure along state-owned roads. On the contrary, and as pointed out by the same agency, there is no comprehensive overview of the need for measures directed to cycling along state-owned roads (Trafikverket, 2022-a), which indicates that, at this point, it is hard to make an assessment where the need for bicycle infrastructure is highest.

Soft mechanisms

There are at least two soft mechanisms used to achieve cycling objectives as well. Firstly, the National Cycling Council (*Nationella cykelrådet*) is a forum for cooperation within national efforts for increased and safe bicycling. The council is led by the Swedish Traffic Administration and consists of an array of national and local-level stakeholders^[8] including civil society and interest organisations. Every other year, the council compiles and publishes a so-called "bicycle account" (*cykelbokslut*, in which *bokslut* normally refers to the financial accounts). The bicycle account is a report that consists of the current state of bicycling in Sweden when it comes to reporting, monitoring, and following up on the development of cycling in connection to the transport policy objectives in Sweden. For other means of transportation, there has been a long tradition of monitoring the development in relation to the transportation objectives, but for cycling, the bicycle accounts were first published in 2014 (Trafikverket, 2023).

In 2017, the Swedish government decided that the Swedish Traffic Administration (within the work of the National Cycling Council) should monitor the development of bicycling in Sweden by describing both the development and the efforts undertaken by relevant actors for increased and safe cycling at national, regional, and local levels (see Regeringskansliet, 2017-b, N2017/04201/TS). This work should be reported back to the responsible ministries in connection to the national bicycle account.

In parallel to the National Cycling Council, there is a national knowledge centre for cycling, called *cykelcentrum*. This knowledge centre was established in 2017/2018 when the Swedish government commissioned VTI to be the administrative host of the new knowledge centre in Sweden for research and education about cycling. The investment from the Swedish government consists of 5 million SEK per year between 2018 and 2023, and VTI will, together with several other researchers, interests organisations, national agencies, road owners, etc., develop the role of cycling in Sweden in order to contribute to a sustainable society with high quality of life in the entire country (see VTI, n.d). The knowledge centre aims to better connect cooperation and research to the issues relevant to bicycle actors (e.g., municipalities). Moreover, another important task for the centre is to collect and disseminate knowledge about cycling through knowledge reports, webinars, etc. (VTI, n.d.).

Key actors

Several actors on all three levels of government are involved in bicycle planning in Sweden. (For an overview of all key actors at all three levels of government in Swedish bicycle infrastructure planning, see Trafikverket, 2021-b). As bicycle infrastructure is highly integrated in both urban, regional, and spatial planning as well as in transportation planning, there are several actors who are responsible for

various actions. The network of relevant actors includes agencies, municipalities, and other private actors. At a more detailed level, for example when it comes to the design of cycling infrastructure, it is important that municipalities have clear guidelines and policies connected to design but also that the entrepreneurs who perform the work have the necessary knowledge.

All in all, the national objectives at least target a shift to reduced car-use and increased use of walking, cycling, and public transportation. At least in urban areas, it calls for a willingness among **road owners** (mainly state and municipal) to (re)-organise the road infrastructure to promote these modes of transportation over car-use. The largest share of the road network is locally owned, which means that municipalities have a great responsibility. How the municipalities organise themselves plays a role as well as how the procurement of other actors to maintain the road network. Municipalities in Sweden organise themselves differently and the responsibility for cycling infrastructure can therefore fall on different administrations within the municipalities. The municipal planning monopoly is important as is the action of setting aside funds for coordinating with various departments that are involved in design, maintenance, and development of streets and traffic environments. This illustrates the importance of collaboration, but perhaps more importantly, coordination both vertically among stakeholders at different levels of government and horizontally across sectors.

Achieving policy coordination is not an easy task; however, the existing **National Cycling Council**, together with the establishment of the knowledge centre for cycling, work towards better coordination. With regards to agencies, **Swedish Traffic Administration** is one actor with the responsibility to maintain the national road network. Swedish Traffic Administration is also the responsible agency for the urban environment agreements and for the national transport plan, both of which involve setting aside funds for, among other things, infrastructure projects for cycling and walking. Additionally, the **Swedish Traffic Administration** (with the work of the National Cycling Council) should monitor the development of cycling in Sweden by reporting on the developments and efforts for increased and safe cycling at local, national, and regional levels (see Regeringskansliet, 2017-b).

The Swedish Environmental Protection Agency holds the overarching coordination responsibility for Sweden's environmental objectives, but they are also responsible for providing guidance to other public authorities, municipalities, and regions (Naturvårdsverket, n.d.-b). For example, other agencies, such as **Transport Analysis**, have government assignments linked to transport policy goals where they report and coordinate with the Swedish Environmental Protection Agency. One task for the agency is to conduct an annual follow-up of the transport policy goals (Trafikanalys n.d.-a).

There are many other agencies that could be relevant to highlight. For example, since cycling can promote better public health, **the Public Health Agency of Sweden** is an important actor in this context. Additionally, **the Swedish National Board of Housing, Building and Planning** is an important actor as they are the agency responsible for spatial planning and since increased cycling is an ingredient in sustainable urban development, the Swedish National Board of Housing, Building and Planning works together with the Swedish Traffic Administration to normalise walking, cycling, and public transport within urban transport planning (Naturevårdsverket, 2022).

To sum up, Sweden relies on collaboration both horizontally between sectors and vertically across administrative levels and in collaboration with civil society and private companies.

¹ GCK= gång, cykel och kollektivtrafik. (Pedestrian, bicycle and public transport)

² " The milestone targets are intended to identify a desired social change and specify steps towards achieving the generational goal and one or more of the environmental quality objectives." (Naturvårdsverket n.d.-a)

³ The assessment can be found at the website Sveriges Miljömål. It is run by the Swedish Environmental Protection Agency in cooperation with seven other Swedish National Agencies and all County Administrative Boards. It outlines all environmental and climate objectives and collects them all to a national webpage for all environmental work. (See <https://www.sverigesmiljomal.se/>)

⁴ This means that the consideration objective refers to several other climate and environmental targets that must be considered when designing and developing the transportation system in Sweden.

⁵ See <https://www.sverigesmiljomal.se/>

⁶ This is not to claim this is done in practice, rather this particular action is listed as one measure that needs to be taken in order to fulfil the GCK-objective.

⁷ A more comprehensive overview of funding can be found in Trafikverket (2021-b)

⁸ In Swedish, the following organisations: Boverket, Cykelfrämjandet, Finspångs kommun, Folkhälsomyndigheten, Göteborgs Stad, Komexp (Västra Götalandsregionen och Region Jönköpings län), Naturvårdsverket, Svensk cykling, Sveriges kommuner och regioner, Trafikverket, Transportstyrelsen, Umeå kommun, VTI samt Cykelcentrum.



Photo: green ant/unsplash.com

Discussion

After reviewing the objectives, mechanisms, and key actors related to cycling in these Nordic countries, several key findings come to light.

Denmark, Finland, Norway, and Sweden all have some form of national-level cycling objectives and mechanisms, though these take many different forms. Objectives are sometimes found in explicit cycling-related documents, such as a national cycling strategy, but are more often baked into other key laws, plans, and planning instruments, such as an infrastructure plan, climate strategy, transport strategy, or within a national climate act. Cycling is implicated in a wide range of national-level aims including traffic safety, health objectives, sustainable mobility, climate objectives, and even cultural objectives.

While all four of the countries have some form of national cycling strategy, the latest strategies from Denmark and Norway were published around 10 years ago. Sweden's most recent strategy is from 2017, while Finland's equivalent of a cycling strategy, the walking and cycling promotion programme published in 2018, combines walking and cycling, thereby widening its scope and risking less clear expression for how cycling in its own right can be addressed and advanced. It is also important to recognise the distinctions across the government systems in these Nordic countries. Sweden and Finland do not have ministerial rule, and Denmark and Norway have larger and more operational ministries than, for example, in Sweden, where spatial planning often takes place through more autonomous agencies (Schmidt & Smas, 2018). There are some differences with regards to which ministries hold greater responsibilities for establishing or monitoring cycling strategies in these countries as well, in addition to the reality that ministry responsibilities may change over the years. For example, in 2017 in Sweden, the Ministry for Infrastructure was within the Ministry of Enterprise, but these became two distinct ministries between 2019 and 2022.

Then, in 2022, the Ministry of Infrastructure merged with the Ministry of Rural Development and Infrastructure. Another example of agency reshuffling comes from Denmark, where, in 2022, the Agency of Planning and Rural Development—responsible for spatial planning and urban development—was established under the Ministry of Church Affairs. Such changes have implications for how cycling and other transport issues are addressed in the Nordic countries.

Within current policies, cycling is primarily discussed as a means for contributing to environmental goals, such as GHG emissions reductions. Several of the countries also mention some of the additional co-benefits of cycling, such as contributing to healthy and active lifestyles. However, much less of the cycling policy discourse in the Nordic countries centres on the potential social and economic benefits of cycling. This contrasts, for example, with the Dutch cycling agenda, wherein the bicycle is framed as a means for providing social participation and combatting poverty in mobility as well as providing access to economic centres, contributing to the rural economy, combatting social isolation, empowering people to be more independent, reducing healthcare costs, and improving overall quality of life.^[1]

The additional benefits of the bicycle are important to highlight for several reasons. Firstly, they reveal the vast **opportunities for synergies among different national (and local or regional) authorities**, for example ministries of transport or climate and environment as well as culture, finance, or education ministries, housing and building authorities, and even regional health authorities. Additionally, as elucidated by a study of local planners in Sweden, "clear and integrated cooperation" within and across municipalities as well as with "relevant actors at regional and national levels" is a critical need (Alm & Koglin, 2022, 7). As described in each country section, achieving national cycling objectives requires clear communication among local, regional, and national actors. This is especially challenging when it comes to developing cycling infrastructure and maintenance routines that enable residents to commute across roads owned by authorities at different governance levels (i.e., state versus local roads). Vertical alignment among national, regional, and municipal actors is thus particularly important for cycling work given the differences in road ownership distribution. Meanwhile, horizontal linkages across municipalities can ensure more cooperation and common procurements and procedures for cycle lanes, all of which helps to enable cohesive networks, such as the facilitation of Supercykelstier in Denmark. Cooperation among actors is also critical when it comes to funding opportunities. In all of the Nordic countries, cycling measures are supported by both local and national funding schemes that, together, help municipalities and regions see tangible results.

Secondly, these co-benefits **distinguish the bicycle from other methods of adopting alternative low-carbon or green transport modes**. Much of the discussion around reducing GHG emissions in the transportation sector has focussed on replacing fossil-fuel cars with electric-powered vehicles. While the achievement of global goals will undoubtedly require the implementation of multiple decarbonisation

strategies, research suggests that increasing the use of electric vehicles is an ineffective long-term method for sustainability (see Hosseini & Stegniec, 2023; Sovacool et al., 2022; Moriarty, 2022). This is due not only to high emissions outputs on the production side of electric vehicles, but also the broader infrastructure and urban form which electric vehicles require cities to maintain. Electric vehicles maintain car-dependent landscapes (such as urban sprawl) thereby preventing the positive consequences of a denser urban structure or transit-oriented development. They also require a large amount of public and private space to continue to be allocated for parking and additional space for charging. Further still, they reinforce a socioeconomic divide in which cities are shaped by and for wealthier inhabitants who can afford private automobiles, at the expense of ensuring public space is accessible to all. Hosseini and Stefaniec (2023) describe the injustices created by car-oriented societies (electric or not) as a form of structural violence. In reference to Ong (2006), they emphasise how driving an electric vehicle can give one the comfort of doing something responsible and even sustainable but “leaves them in a sphere of ignorance” towards the social and environmental consequences of car-dominant societies (Hosseini & Stefaniec, 2023, 4).

Such challenges are not easy to overcome. Given the state of the climate emergency, vehicle electrification is often seen as an immediate step towards reducing emissions in regions dominated by car transport and with infrastructure catering to this transport mode. And while cycling and driving need not be at war, a more dramatic change in behaviour is necessary if the Nordic countries are to develop in an equitable, economically viable, and environmentally friendly manner. This often begins by prioritising the most vulnerable street users first. As Alm and Koglin (2022) describe, “the fact that it is often easier to increase cycling as long as it does not interfere with car traffic is not only a problem in Sweden, but in many other countries as well” (7); yet, cycling infrastructure must prioritise the cyclist over the driver when it comes to factors of “accessibility, safety, and directness” (2).

Another related concern when aiming to increase cycling to meet environmental objectives is to encourage modal shift away from cars, rather than from other sustainable modes of transport. Both Norway and Finland have sought to address these issues to some extent in their national-level objectives. For example, Norway’s zero-growth goal suggests that growth of passenger transport in major urban areas over the coming years should be absorbed through public transportation, cycling, and walking. Similarly, Finland’s objective in the National Climate and Energy Strategy points out that people’s growing mobility needs should be met by sustainable transport modes rather than passenger cars. Furthermore, while several solutions have emerged for cargo delivery bikes^[2] or moving bikes,^[3] little discussion appears (at the national level) regarding opportunities for modal shift from lorries to delivery e-bikes.

To develop and realistically pursue cycling objectives at all governance levels leads to the question of capacity. This could entail, as Alm and Koglin (2022) suggest, technical, financial, institutional, political, and social dimensions. While levels of capacity differ by municipality and country, all dimensions play an important role and require a wide range of actors. This is especially true in gaining support for long-term cycling projects that must endure the challenges of regular political turnover from one governmental programme to the next.

Additional challenges for the Nordic countries centre around the topic of indicators, data collection, and data harmonisation. Abstract cycling objectives targeting an increase in cycling require specific caveats to adequately measure the objective's success and to select the right mechanisms for progress. It is also worth noting that challenges can emerge when measuring for basic indicators such as modal split due to the many ways such data can be collected (by passenger kilometres travelled, by trip, by total trips, by commuting trips, etc.). These different types of modal share calculations can paint different pictures of the status of each country or city.

Additionally, when considering the number of passenger kilometres travelled by various modes of transport, a question emerges regarding the total distances we travel on a regular basis in relation to the urban form. While the discussion around e-bikes opens opportunities for travelling longer distances on two wheels, it is also true that our cities and regions can ultimately reduce the necessity to travel longer distances by shaping (or re-shaping) our cities towards more localised urban forms (e.g., the 15-minute city in which basic services and needs of inhabitants are accessible within a shorter range of travel). While the 15-minute city concept marks itself according to time, distance may be an alternative way to consider more localised living that emphasises slower mobility and reshapes a compact form that reduces our transport and mobility requirements as a whole. While the notion of cities themselves have always been, to some degree, a mobility solution, transportation can act as both a necessity and a luxury, and it is important for planners and policymakers to consider both sides of this coin and what it means for our urban and regional environments.

In March 2022, the UN adopted a resolution for integrating cycling into public transportation systems as a means of sustainable development. The resolution encourages UN member states to "devote particular attention to the bicycle in cross-cutting development strategies" (UN, 2022). The resolution highlights how the bicycle can be an important mechanism for progressing in the Sustainable Development Goals. One year later, in February 2023, the European Parliament adopted the resolution to develop an EU cycling strategy. According to the resolution, the strategy will aim to "doubl[e] the number of kilometres cycled in Europe by 2030" (European Parliament, 2023). While the resolution itself is non-binding, its adoption provides a foundation for future policymaking. Already in March 2023, the European Commission proposed a European Cycling Declaration,

which will include a vision and detailed actions for delivery (Brennan, 2023). At the time of this publication, the European Commission has also just adopted a Declaration on Cycling that recognises the sustainability, accessibility, inclusivity, and affordability of cycling, with a complete list of principles for encouraging cycling and guiding future cycling commitments within the EU (Directorate-General for Mobility and Transport, 2023).

As this work unfolds, it may be an opportune time to challenge the current mobility discourse and reimagine the objectives of cycling at the local, national, and international levels—to make a “political and societal transition in mobility norms” (Alm & Koglin, 2022, 7). Brömmelstroet et al. (2022) provide a foundation for considering alternative ways to plan for future urban mobility. In their work, they highlight the need to liberate mobility narratives from the dominating concepts of utility, efficiency, speed, and cost-effectiveness. Such terms often reduce mobility (of all modes) to their economic efficacy, neglecting the social environmental importance. Instead, planners and policymakers might reconsider mobility in terms of, for example, play, belonging, collective good, or even as an unnecessary (Brömmelstroet et al., 2022, 6). In future transport policy, modes of transport might not be evaluated merely by time and cost savings, but by the exposure they offer to sensory experiences, social diversity, and a common right to the city, among other things—all of which cycling is poised to deliver.

¹ See, for example, the Dutch Tour de Force Bicycle Agenda <https://www.fietsberaad.nl/getmedia/1c52943f-8948-4539-8b0d-4fda6048b1a2/Tour-de-Force-Bicycle-Agenda-2017-2020.pdf.aspx> and <https://fietsberaad.nl/getmedia/90a1d46c-6ad9-4a13-9824-8005a4c25555/Summary-Tour-de-Force-2nd-stage-Scale-up-Cycling.pdf.aspx>

² <https://smartcitysweden.com/monark-exercise-delivers-smart-mobile-solutions-to-postnord/>

³ <https://movebybike.se/>

References

- Aalto, S. (2020). Uusi kevyen liikenteen silta aukesi Espoon ja Helsingin rajalle – erilliset kaistat kävelijöille ja pyöräilijöille [New pedestrian and bicycle bridge opened on the border of Espoo and Helsinki – separate lanes for pedestrians and cyclists]. Länsiväylä 9 October 2020. Accessed 21 April 2023 from <https://www.lansivayla.fi/paikalliset/3130779>
- Alm, J. & Koglin, T. (2022). (In)capacity to implement measures for increased cycling? Experiences and perspectives from cycling planners in Sweden. *Journal of Urban Mobility* 2, 100029. <https://doi.org/10.1016/j.urbmob.2022.100029>
- Amundsen, H., Christiansen, P., Sandkjær Hanssen, G., Hofstad, H., Tønnesen, A., & Westskog, H. (2019). Byvekstavtaler i et Flernivåperspektiv: Helhetlig Styringsverktøy Med Demokratiske Utfordringer [Urban growth agreements in a multi-level perspective: Comprehensive management tool with democratic challenges]. Report 2019:13. Oslo: CICERO Senter for klimaforskning. <https://pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/2617470/Rapport%202019%2013%20web.pdf?sequence=1&isAllowed=y>
- Antabi, M. (2022). Is Denmark really a cycling nation? SDU. <https://www.sdu.dk/da/delt/lightboxpages/nyviden-og-presse/tour-de-france-tema/er-danmark-en-cykelnation>
- Arbeiderpartiet & Senterpartiet. (2021). Hurdalsplattformen: For en regjering utgått fra arbeiderpartiet og senterpartiet, 2021-2025 [The Hurdal platform: For a government based on the Labour Party and the Centre Party]. Statsministerens kontor. <https://www.regjeringen.no/no/dokumenter/hurdalsplattformen/id2877252/>
- Bjørnson Lunke, E., & Grue, B. (2018). Sykling og sykkelmål : analyser av sykkelandeler og ulike målsetninger for Nasjonal Transportplan [Cycling and cycling targets: analyzes of cycling shares and various targets for the National Transport Plan]. TØI report 1676/2018. <https://www.toi.no/getfile.php?mmfileid=49561>
- Brennan, M. (2023). European Cycling Declaration announced by EVP Timmermans at CIE Summit. Accessed 8 June 2023. <https://ecf.com/news-and-events/news/european-cycling-declaration-announced-evp-timmermans-cie-summit>
- Brömmelstroet, M., Nikolaeva, A., Glaser, M., Nicolaisen, M.S., & Chan, C. (2017). Travelling together alone and alone together: Mobility and potential exposure to diversity. *Applied Mobilities*, 2:1, 1-15. <https://doi.org/10.1080/23800127.2017.1283122>

Bymiljøpakken. (2023). *Slik* kobler du deg på Sykkelstamvegen [This is how you connect to the Cykkelstamvegen]. Accessed 25 September 2023 from <https://bymiljopakken.no/slik-kobler-du-deg-pa-sykkelstamvegen/>

Carstensen, T.A. & Ebert, A-K. (2012). Cycling Cultures in Northern Europe: From "Golden Age" to "Renaissance". In *Cycling and Sustainability*. Vol. 1, 23–53. Emerald Publishing Limited.

Christiansen, H. & Baescu, O. (2022). The Danish National Travel Survey: Annual Statistical Report for Denmark for 2021. DTU Orbit. Department of Technology, Management, and Economics. Accessed 5 June 2023 from <https://orbit.dtu.dk/en/publications/the-danish-national-travel-survey-annual-statistical-report-for-d>

City of Helsinki. (2022-a). Environmental Report 2021. Urban Environment Division. Accessed 25 September 2023 from <https://julkaisut.hel.fi/en/reports/environmental-report-2021>

City of Helsinki. (2022-b). Helsinki Facts and Figures 2022. Accessed 25 September 2023 from https://www.hel.fi/hel2/tietokeskus/julkaisut/pdf/22_06_15_Helsinki_facts_and_figures_2022.pdf

City of Helsinki. (2022-c). Itäbaanan seuraavan osuuden rakentaminen alkaa kesäkuussa Herttoniemessä [Construction of the next section of Itäbaana will begin in Herttoniemi in June]. Helsingin kaupunki, kaupunkiympäristön toimiala [City of Helsinki, Urban Environment Division]. 6 June 2022. Accessed 21 April 2023. <https://www.sttinfo.fi/tiedote/itabaanan-seuraavan-osuuden-rakentaminen-alkaa-kesakuussa-herttoniemessa?publisherId=60577852&releaseId=69943500>

City of Rauma. (2023). Rauman seudulla edistetään kävelyä ja pyöräilyä – vastaa kyselyyn 30.4. mennessä [Walking and cycling are promoted in the Rauma region – answer the survey by 30.4.] Ajankohtaista [News]. 17 April 2023. Accessed 21 April 2023 from <https://www.rauma.fi/ajankohtaista/rauman-seudulla-edistetaan-kavelya-ja-pyorailya-vastaa-kyselyyn-30-4-mennessa/>

City of Tampere. (2023). Valtion ja Tampereen kaupunkiseudun välinen maankäytön, asumisen ja liikenteen sopimus 2020-2023 [Land use, housing, and transport agreement between the state and the Tampere urban region 2020-2023]. Accessed 23 May 2023 from https://tampereenseutu.fi/wp-content/uploads/2020/08/MAL-sopimus_allekirjoitusversio-08102020_saavutettava.pdf

Climate roadmaps 2035. (n.d.). Low-carbon roadmap for the Finnish logistics and transport sector. Accessed 30 March 2023 from <https://www.climate2035.fi/roadmaps/logistics-and-transport/>

Cycling Embassy of Denmark. (n.d.). "Cycling in Denmark – About us". Accessed 7 June 2023 from <https://cyclingsolutions.info/embassy/about-us-2/>

Danish Energy Agency. (2022). Denmark's climate status and outlook. https://ens.dk/sites/ens.dk/files/Forskning_og_udvikling/cso22_-_english_translation_of_kf22_hovedrapport.pdf

Danish Ministry of Climate, Energy, and Utilities. (2020). Climate Act. Act No. 965 of 26 June 2020. Unofficial translation. Accessed 3 June 2023. https://en.kefm.dk/Media/1/B/Climate%20Act_Denmark%20-%20WEBTILG%C3%86NGELIG-A.pdf

Danish Ministry of Climate, Energy and Utilities. (2021). Denmark's climate targets and progress. SBI-First sessional period 2021 Multilateral Assessment presentation. Aette Ejersted, Chief Negotiator. Accessed 3 June 2023. https://unfccc.int/sites/default/files/resource/6_Denmark_SBI2021-1_MA-4Jun2021.pdf

Danish Ministry of Climate, Energy and Utilities. (2022). Klimaprogram 2022. https://kefm.dk/Media/638013322993950605/1042399_klimaprogram-a.pdf

Danish Ministry of Climate, Energy and Utilities. (2023). KEF Alm.del – endeligt svar på spørgsmål 157 [Final answer to question 157]. Accessed 7 June from <https://www.ft.dk/samling/2022/almdel/kef/spm/157/svar/1948241/2690979.pdf>

Danish Road Safety Commission. (2021). 2021-2030 Action Plan Summary. Danish Road Directorate. https://www.faelrdssikkerhedskommissionen.dk/media/eymfxrOn/fsk_resume_haendlingsplaneng_2021-2030_final.pdf

Directorate-General for Mobility and Transport. (2023). Commission proposes list of principles to boost cycling across Europe. European Commission. Accessed 5 October 2023 from https://transport.ec.europa.eu/news-events/news/commission-proposes-list-principles-boost-cycling-across-europe-2023-10-04_en

Dobbe, L.Å.; Eklo, M.L., Gullbrå, E.H., Grytli, T., Kvanvik, M., Oksnes, T., Leknes, L., Willard, E., Jensen, S.K., Løtveit, S., Huserbråten, K., Munch-Olsen, Y., & Haslie, L.-I. (2021). Nasjonal Tiltaksplan for Trafikksikkerhet På Vei 2022-2025: På Vei Mot Nullvisjonen. [National plan of action for road safety 2022-2025: Towards vision zero]. Statens Vegvesen, Politiet, Trygg Trafikk, KS, Helsedirektoratet, and Utdanningsdirektoratet. <https://www.vegvesen.no/fag/fokusomrader/trafikksikkerhet/>

Eriksson et al. (2022). Utredning av mål för ökad cykling i Sverige. <http://vti.diva-portal.org/smash/get/diva2:1656343/FULLTEXT01.pdf>

European Commission. (n.d.-a). "Transport emissions". Climate Action. Accessed 23 March 2023. https://climate.ec.europa.eu/eu-action/transport-emissions_en

European Council. (2022). Fit for 55 package: Council adopts its position on three texts relating to the transport sector. Accessed 26 May 2023 from <https://www.consilium.europa.eu/en/press/press-releases/2022/06/02/fit-for-55-package-council-adopts-its-position-on-three-texts-relating-to-the-transport-sector/>

European Council. (2023). Infographic – Fit for 55: reducing emissions from transport, buildings, agriculture and waste. Accessed 26 May 2023 from <https://www.consilium.europa.eu/en/infographics/fit-for-55-effort-sharing-regulation/>

European Environment Agency. (2022-a). Greenhouse gas emission from transport in Europe. Accessed 26 May from <https://www.eea.europa.eu/ims/greenhouse-gas-emissions-from-transport>

European Environment Agency. (2022-b). CO₂ emission from new passenger cars. Dataset. Accessed 3 June 202 from [Monitoring of CO₂ emissions from passenger cars \(europa.eu\)](https://www.eea.europa.eu/en/topics/in-depth/electric-vehicles)

European Environment Agency. (2023). Electric vehicles. Accessed 3 June 2023. <https://www.eea.europa.eu/en/topics/in-depth/electric-vehicles>

European Cyclists' Federation (ECF). (n.d.). Cycling data map. <https://ecf.com/cycling-data>

European Parliament. (2023). Motion for a resolution on developing an EU cycling strategy. 2022/2909(RSP). B9-0102/2023. Accessed 8 June 2023. https://www.europarl.europa.eu/doceo/document/B-9-2023-0102_EN.html

Finnish Government. (2019). Inclusive and competitive Finland - a socially, economically and ecologically sustainable society. Programme of Prime Minister Sanna Marin's Government 10 December 2019. Publication of the Finnish Government 2019:33. Helsinki. ISBN PDF 978-952-287-811-3

Finnish Government. (2021). The National Transport System Plan for 2021-2032. Finnish Government 2020:77. Ministry of Transport and Communications. Helsinki.

Folketinget. (n.d.). Hvilken betydning har en politisk aftale? [What is the significance of a political agreement?]. Accessed 7 June 2023 from https://www.ft.dk/da/ofte-stillede-spoergsmaal/lov_hvilken-betydning-har-en-politisk-aftale

Folketinget. (2020). L 129 Forslag til lov om ændring af registreringsafgiftsloven, brændstofforbrugsafgiftsloven, ligningsloven og forskellige andre love [Draft Act amending the Registration Tax Act, the Fuel Consumption Tax Act, the Tax Assessment Act and various other acts]. Ministry of Taxation. <https://www.ft.dk/samling/20201/lovforslag/l129/index.htm>

Folketinget. (2021). L 148 B Forslag til lov om ændring af biobrændstofloven [Draft law amending the law on biofuels]. Ministry of Climate, Energy and Utilities. <https://www.ft.dk/samling/20201/lovforslag/l148b/index.htm>

Folkhälsomyndigheten. (2022). Folkhälsopolitiken och friluftslivspolitik. Accessed 27 April 2023 from <https://www.folkhalsomyndigheten.se/livsvillkor-levnadsvanor/friluftsliv/friluftslivspolitik/folkhalsopolitiken-och-friluftslivspolitik/>

Fyhri, A. & Sundfør, H.B. (2020). Do people who buy e-bikes cycle more? *Transportation Research Part D: Transport and Environment*, Vol. 86, 102422. <https://www.sciencedirect.com/science/article/pii/S136192092030609X#s0060>

Grønnestad, K. S. (2020). Nå er «motorveien» for syklistene klar. Her skal det være trygt å sykle i høy fart [Now the motorway for cyclists is ready. Here you can be safe while cycling at high speeds]. TU. Accessed 25 September 2023 from <https://www.tu.no/artikler/na-er-motorveien-for-syklistene-klar-her-skal-det-vaere-trygt-a-sykle-i-hoy-fart/498810>

Hiselius, L.W., and Svensson, Å. (2017). E-bike use in Sweden - CO₂ effects due to modal change and municipal promotion strategies. *Journal of Cleaner Production*, Vol. 141, pp. 818-824. <https://www.sciencedirect.com/science/article/abs/pii/S0959652616314822>

Hosseini, K. & Stefaneic, A. (2023). A wolf in sheep's clothing: Exposing the structural violence of private electric automobility. *Energy Research & Social Science* 99, 103052. <https://doi.org/10.1016/j.erss.2023.103052>

Huttunen, R., Kuuva, P., Kinnunen, M., Lemström, B., & Hirvonen, P. (2022). Carbon neutral Finland 2035 – national climate and energy strategy. Ministry of Economic Affairs and Employment of Finland. <https://julkaisut.valtioneuvosto.fi/handle/10024/164323>

Huynh, D., Lidmo, J., Bogason, A., Salonen, H., & Carlsson, I. (2022). Discussion Paper: Nordic Overview of National Support Initiatives in Urban Planning. Stockholm: Nordregio.

IEA. (2021-a). *Global EV Outlook 2021*. Paris. <https://www.iea.org/reports/global-ev-outlook-2021>

Johansson, C., Lövenheim, B., Schantz, P., Wahlgren, L., Almström, P., Markstedt, A., Strömgren, M., Forsberg, B., Sommar, J.N. (2017). *Science of the Total Environment* 584-585, 55-63. <http://dx.doi.org/10.1016/j.scitotenv.2017.01.145>

Johansson, M. (2020). Resvaneundersökning 2019 [Travel Habits Survey 2019]. Region Stockholm. Trafikförvaltningen. Accessed 25 September 2023 from <https://www.regionstockholm.se/globalassets/2.-kollektivtrafik/kollektivtrafiken-vaxer-med-stockholm/su/resvaneundersokningen/rapport-resvaneundersokning-2019---version-1.3.pdf>

Jääskeläinen, S. (2018). Kävelyn ja pyöräilyn edistämishjelma [Walking and cycling promotion programme]. Liikenne- ja viestintäministeriö 2018:5. Helsinki.
<https://julkaisut.valtioneuvosto.fi/handle/10024/160720>

Jääskeläinen, S. (2021). Roadmap to fossil-free transport: Government resolution on reducing domestic transport's greenhouse gas emissions. Ministry of Transport and Communications. <https://julkaisut.valtioneuvosto.fi/handle/10024/163258>

Jørgensen, A.T. (16 Nov. 2020). Venstre: Danmark skal have en ny national cykelstrategi. NetAvisen. <https://navisen.dk/blog/venstre-danmark-skal-have-en-ny-national-cykelstrategi/>

Kester, J., Noel, L., Zarazua de Rubens, G., & Sovacool, B.K. (2018). Policy mechanisms to accelerate electric vehicle adoption: A qualitative review from the Nordic region. *Energy Reviews*, 94, 719-731.
<https://doi.org/10.1016/j.rser.2018.05.067>

Kirkeministeriet. (2019). Bekendtgørelse om hovedstadsområdets planlægning (Fingerplan 2019 – landsplandirektiv for hovedstadsområdets planlægning) [Executive order on the planning of the capital area (Fingerplan 2019 – national plan directive for the planning of the capital area)]. BEK no 312 of 28/03/2019.
<https://www.retsinformation.dk/eli/lt/2019/312>

Kiviluoto, K., Tapio, P. Tuominen, A., Lyytimäki, J., Ahokas, I., Silonsaari, J. & Schwanen, T. (2022). Towards sustainable mobility - Transformative scenarios for 2034. *Transportation Research Interdisciplinary Perspectives* 16 (2022).
<https://doi.org/10.1016/j.trip.2022.100690>

Klimapartnere. (n.d.). Sykkelstamvegen mellom Stavanger og Sandnes [Cycle superhighway between Stavanger and Sandnes]. Accessed 25 September 2023 from <https://www.klimapartnere.no/losninger/sykkelstamvegen-mellom-stavanger-og-sandnes/>

Kommunal- og distriktsdepartementet. (2014). Statlige Planretningslinjer for Samordnet Bolig-, Areal- Og Transportplanlegging [State planning guidelines for coordinated housing, area and transport planning].
<https://www.regjeringen.no/no/dokumenter/Statlige-planretningslinjer-for-samordnet-bolig--areal--og-transportplanlegging/id2001539/>

Kongsvinger kommune. (2022). 'Saknr. 029/22. 09.03.2022. Inngåelse Av Sykkelbyavtale for Kongsvinger Kommune 2022-2025 [Conclusion of the Cycling City Agreement for Kongsvinger Municipality 2022-2025]. Arkivsaknr. 22/557.

Kyriakopoulou, E., Lu, T., & Hart R. (2021). Towards zero emissions from Swedish urban transport. Report 7004. To buy or not to buy project. Swedish Environmental Protection Agency. Accessed 28 September 2023 from <https://www.naturvardsverket.se/publikationer/7000/towards-zero-emissions-from-swedish-urban-transport/>

- Københavns kommune. (2022). Orientering om mobiletetsredegørelsen 2022 [Orientation on the mobility report 2022]. TMF Mobilitet (1602), Teknik- og Miljøforvaltningen. Accessed 25 September 2023 from <https://www.kk.dk/sites/default/files/agenda/2a8775bd-3e29-46eb-85a6-11ee12f9995a/181ebb09-8416-45c1-bb1c-b467314fb376-bilag-1.pdf>
- Lidmo, J., & Bogason, A. (2020). *Nationella Lagar Och Regler i Arbetet Med Stadsgrönska i Norden*. [National laws and rules in working with urban green space in the Nordics]. 2020:1. Stockholm: Nordregio. <https://www.diva-portal.org/smash/get/diva2:1415165/FULLTEXT01.pdf>
- Madslie, A., Steinsland, C. & Hulleberg, N. (2021). Framskrivninger for persontransport 2018-2015. Oppdatering av beregninger fra 2019. TØI rapport 1824/2021. Accessed 25 September 2023 from <https://www.toi.no/getfile.php?mmfileid=55526>
- Mervi, H. & Lönnqvist, H. (2022). Agreement procedure for land use, housing and transport: What works and what needs changing. The Association of Finnish Local and Regional Authorities (Kuntaliitto). Acta Publications No. 280. Helsinki.
- Miljøløftet. (2019). Handlingsprogram 2019-2022 [Action program 2019-2022]. Accessed 25 September 2023 from <https://www.miljoloftet.no/nyheter/2019/na-kan-du lese miljoloftets-handlingsprogram-2019-2022/>
- Miljøløftet. (2023). Her er den nye gang- og sykkelveien i Bergen [Here is the new pedestrian and cycle path in Bergen]. Accessed 25 September 2023 from <https://www.miljoloftet.no/nyheter/2023/her-er-den-nye-gang--og-sykkelveien-i-bergen/>
- Ministry of Health and Care Services. (2020). Sammen om aktive liv. Handlingsplan for fysisk aktivitet 2020-2029 [Together for active lives: Action plan for physical activity 2020-2029]. <https://www.regjeringen.no/no/dokumenter/sammen-om-aktive-liv/id2704955/>
- Ministry of Economic Affairs and Employment. (2022). Carbon neutral Finland 2035- national climate and energy strategy. Energy 2022:55. Helsinki. ISBN pdf: 978-952-327-843-1
- Ministry of the Environment. (2022). Towards carbon-neutral Finland – Government adopts Medium-term Climate Change Policy Plan. Press Release, 2 June 2022. https://ym.fi/-/kohti-hiilineutraalia-suomea-hallitus-hyvaksyikeskipitka-aikavalin-ilmastopolitiikan-suunnitelman?languageId=en_US
- Ministry of the Environment. (2023). Annual Climate Report 2022. 2023:15. Helsinki ISBN pdf: 978-952-361-390-4 https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/164809/YM_2023_15.pdf?sequence=1&isAllowed=y

Ministry of the Environment. (n.d.). "Land use, housing, and transport agreements." Accessed 23 May 2023 from <https://ym.fi/en/agreements-on-land-use-housing-and-transport>

Ministry of Finance. (2020). Grøn vejtransportaftale: Massiv CO₂-reduktion og ambition om 1 mio. grønne biler i 2030. [Green road transport agreement: Massive CO₂ reduction and ambition of 1 million green cars in 2030]. <https://fm.dk/nyheder/nyhedsarkiv/2020/december/groen-vejtransportaftale-massiv-co2-reduktion-og-ambition-om-1-mio-groenne-biler-i-2030/>

Ministry of Finance. (2021). Denmark's Recovery and Resilience Plan - accelerating the green transition. Accessed 7 June 2023. https://fm.dk/media/18771/denmarks-recovery-and-resilience-plan-accelerating-the-green-transition_web.pdf

Ministry of Foreign Affairs of Denmark. (n.d.). "A nation of cyclists." Accessed 5 June 2023 from <https://denmark.dk/people-and-culture/biking>

Ministry of Local Government and Modernisation. (2019). National expectations regarding regional and municipal planning 2019-2023. Accessed 25 September 2023 from <https://www.regjeringen.no/contentassets/cc2c53c65af24b8ea560c0156d885703/nasjonale-forventninger-2019-engelsk.pdf>

Ministry of Transport. (2013). Nasjonal Transportplan 2014-2023 [National Transport Plan, 2014-2023]. Meld. St. 26. <https://www.regjeringen.no/no/dokumenter/meld-st-26-20122013/id722102/?ch=1>

Ministry of Transport. (2017). Nasjonal Transportplan 2018-2029 [National Transport Plan, 2018-2029]. Meld. St. 33. <https://www.regjeringen.no/no/dokumenter/meld.-st.-33-20162017/id2546287/>

Ministry of Transport. (2021). Nasjonal Transportplan 2022-2033 [National Transport Plan, 2022-2023]. Meld. St. 20. <https://www.regjeringen.no/no/dokumenter/meld.-st.-20-20202021/id2839503/>

Ministry of Transport and Communications. (2011). National strategy for walking and cycling 2020. Ministry of Transport and Communications programmes and strategies 2011:4. Helsinki.

Ministry of Transport and Communications. (2020). Walking and cycling in Finland —National walking and cycling forum to be established. Press Release, 1 July 2020. Accessed 21 April 2023. <https://lvm.fi/en/-/walking-and-cycling-in-finland-national-walking-and-cycling-forum-to-be-established-1215741>

Ministry of Transport and Communications. (2022). Fourth walking and cycling forum focuses on the promotion of walking and information pro-vision. Press Release, 13 May 2022. Accessed 21 April 2023. <https://valtioneuvosto.fi/en/-/1410829/fourth-walking-and-cycling-forum-focuses-on-the-promotion-of-walking-and-information-pro-vision-1747068>

Moriarty, P. (2022). Making urban travel sustainable: Travel reductions are needed. *Cleaner Production Letters*, 3, 100010. <https://doi.org/10.1016/j.clpl.2022.100010>

Naturvårdsverket. (n.d.-a.) Milestone targets. <https://www.naturvardsverket.se/en/environmental-work/swedish-environmental-objectives/milestone-targets/>

Naturvårdsverket. (n.d.-b). Naturvårdsverkets uppdrag och ansvar [The Swedish Environmental Protection Agency's mission and responsibilities]. <https://www.naturvardsverket.se/om-miljoarbetet/sveriges-miljomal/naturvardsverkets-uppdrag-och-ansvar/>

Naturvårdsverket. (2018-a). Preciseringar av God bebyggd miljö. Accessed on 30 March 2023 at: <https://sverigesmiljomal.se/miljomalen/god-bebyggd-miljo/preciseringar-av-god-bebyggd-miljo/>

Naturvårdsverket. (2018-b). Sweden's environmental objectives: an introduction. Accessed on 30 March 2023 at: <http://urn.kb.se/resolve?urn=urn:nbn:se:naturvardsverket:diva-8604>

Naturvårdsverket. (2022). Andelen gång-, cykel- och kollektivtrafik. Accessed on 20 March 2023 at: <https://www.sverigesmiljomal.se/etappmalen/andelen-gang--cykel--och-kollektivtrafik>

Naturvårdsverket. (2023). Utsläpp av växthusgaser från inrikes transporter. Accessed on 20 March 2023 at: <https://www.sverigesmiljomal.se/etappmalen/utslapp-av-vaxthusgaser-fran-inrikes-transporter/>

Norwegian Environment Agency. (2016). Sykkelhotell ved Østerås og Kolsås t-banestasjoner [Bicycle hotel at Østerås and Kolsås metro stations]. Accessed 7 June 2023 from <https://www.miljodirektoratet.no/ansvarsomrader/klima/for-myndigheter/kutte-utslipp-av-klimagasser/klimasats/2016/sykkelhotell-ved-osteras-og-kolsas-t-banestasjoner/>

Norwegian Environment Agency. (2020). Klimakur 2030: Tiltak og virkemidler mot 2030 [Climate cure 2030: Measures and tools]. <https://www.miljodirektoratet.no/klimakur>

Norwegian Environment Agency. (2021). Sirkulær økonomi i Tromsø kommune [Circular economy in Tromsø municipality]. Accessed 7 June 2023 from <https://www.miljodirektoratet.no/ansvarsomrader/klima/for-myndigheter/kutte-utslipp-av-klimagasser/klimasats/2021/sirkular-okonomi-i-tromso-kommune/>

Norwegian Environment Agency. (2022). Klimasats - Støtte Til Klimatiltak [Climate schemes: Support for climate measures]. Accessed 16 May 2023 <https://www.miljodirektoratet.no/klimasats>

Norwegian Ministry of the Environment. (2012). Norwegian Climate Policy. Report No. 21 (2011-2012) to the Storting (white paper) summary. Meld St. 21.

<https://www.regjeringen.no/no/dokumenter/meld-st-21-2011-2012/id679374/>

Opedal, J., Skar, H., Dischler, R., & Brauteset, O. (2020). Barnas Aktiviteter Og Dagelige Resier i 2020 [Children's activities and daily trips in 2020]. Oslo: Opinion AS.

Opinion AS. (2021). Nøkkeltallsrapport 2021: Nasjonal reisevaneundersøkelse [Key figures report 2021: National Travel Survey]. Statens vegvesen and RVU-gruppa. Accessed 30 October 2023 from

https://www.vegvesen.no/globalassets/fag/fokusomrader/nasjonalt-transportplan-ntp/reisevaner/2021/nokkeltallsrapport-2021_levert-29.06.22_pdf.pdf

Orsi, F. (2021). On the sustainability of electric vehicles: What about their impacts on land use? *Sustainable Cities and Society* 66, 102680.

<https://doi.org/10.1016/j.scs.2020.102680>

Oslo Municipality. (n.d.). Hjertesone - tryggere skolevei [Heart-zones – safer routes to school]. Accessed 25 September 2023 from <https://www.oslo.kommune.no/fag-og-utviklingsprosjekter/hjertesone-tryggere-skolevei/#:~:text=En%20hjertesone%20er%20en%20sone%20rundt%20skolen%20hvor,ut%20i%20fra%20sin%20skoles%20beliggenhet%20og%20utfordringer.>

Partnership for Active Transport and Health (PATH). (2022). Make way for walking and cycling. Accessed 25 May 2023 from <https://pathforwalkingcycling.com/report/>

Pucher, J., Dill, J., & Handy, S. (2010). Infrastructure, programs, and policies to increase bicycling: An international review. *Preventive Medicine* 50, S106-S125.

<https://doi.org/10.1016/j.ypmed.2009.07.028>

Pyöräiliitto. (2018). Kävelyn ja pyöräilyn edistämishjelma – kysymyksiä ja vastauksia [Programme to promote walking and cycling - questions and answers]. 23 March 2018. Accessed 23 May 2023. <https://pyoraliitto.fi/ajankohtaista/kavelyn-ja-pyorailyn-edistamisohjelma-kysymyksia-ja-vastauksia>

Pyöräilykuntien verkosto. (n.d.). Pyöräilyn edistämishjelmat ja seuranta [Cycling promotion programmes and monitoring].

<https://www.poljin.fi/jasenyhteisot/pyorailyn-edistamisohjelmat-ja-seuranta>

Refsgaard, K., Cuadrado, A., & Tragotsis, N. (2022). Consumption, GHG emissions, car sales, and housing markets in *State of the Nordic Region 2022*. Nordregio.

<https://pub.nordregio.org/snr22/#98860>

Regeringskansliet (n.d.). Mål för transportpolitiken. Accessed on 30 March 2023 at: <https://www.regeringen.se/regeringens-politik/transporter-och-infrastruktur/mal-for-transporter-och-infrastruktur/>

Regeringskansliet (2017-a). En nationell cykelstrategi för ökad och säker cykling – som bidrar till ett hållbart samhälle med hög livskvalitet i hela landet. Accessed on 22 March 2023 at:

https://bicycleinfrastructuremanuals.com/manuals5/Ministry%20of%20Trade%20and%20Industry_Cycling%20Strategy_20170426.pdf

Regeringskansliet (2017-b). Uppdrag att följa upp utvecklingen inom cykling.

Diarienummer: N2017/04201/TS. Accessed on 27 April 2023 at:

<https://www.regeringen.se/regeringsuppdrag/2017/06/uppdrag-att-folja-upp-utvecklingen-inom-cykling/>

Regeringskansliet (2021-a). Uppdrag att ta fram mål för ökad andel cykling.

Accessed on 17 March 2023 at:

<https://www.regeringen.se/regeringsuppdrag/2021/10/uppdrag-att-ta-fram-mal-for-okad-andel-cykling/>

Regeringskansliet. (2021-b). Uppdrag att ta fram förslag till nationell plan för transportinfrastrukturen och möjlighet att ta fram länsplaner för regional transportinfrastruktur. Diarienummer: I2021/01904, I2021/01876 (delvis), I2021/00336. Accessed on 19 April 2023 from

<https://www.regeringen.se/regeringsuppdrag/2021/06/uppdrag-att-ta-fram-forslag-till-nationell-plan-for-transport--infrastrukturen-och-mojlighet-att-ta-fram-lansplaner-for-regional-transportinfrastruktur/>

Region Stockholm (2022). Länsplan för transportinfrastruktur. Accessed on 5 April 2023 at: <https://www.regionstockholm.se/verksamhet/Regional-utveckling/strategier-och-planer-inom-regional-utveckling/lansplan-for-regional-transportinfrastruktur/>

Regjeringen. (2022). Ny Nasjonal transportplan kommer ett år tidligere [New National Transport Plan will come one year early]. Press Release. Accessed 21 September 2023 from <https://www.regjeringen.no/no/aktuelt/ny-nasjonal-transportplan-kommer-ett-ar-tidligere/id2920588/>

Rekola, M., Kolinen, L., Asikainen, E., Heliste, L., Immonen, E., Starck, M., Ahokas, M., Suomento, J., & Johansson, S. (2022). Liikenneturvallisuusstrategia 2022-2026 [Traffic Safety Strategy 2022-2026]. Liikenne- ja viestintäministeriö 2022:3. <https://julkaisut.valtioneuvosto.fi/handle/10024/163951>

Rensvala, E. (2020). Impediments for cycling infrastructure funding: The case of Sweden. Master Thesis. Department of Human Geography, Stockholm University.

Schmitt, P. & Smas, L. (2018). Shifting political conditions for spatial planning in the Nordic countries, in A. Eraydin & K. Frey (Eds.) *Politics and conflict in governance and planning: Theory and practice*. Routledge.

- Schuster, H.; van der Noll, J. & Rohmann, A. (2023). Orientation towards the common good in cities: The role of individual urban mobility behavior. *Journal of Environmental Psychology*, 91, 102125. <https://doi.org/10.1016/j.jenvp.2023.102125>
- Simões, H.M. and Victoria, G.M. (2021). Climate action in Denmark - Latest state of play. European Parliamentary Research Service. PE 679.106. Briefing, EU progress on climate action - How are the Member States doing? Accessed 3 June 2023 from [https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/679106/EPRS_BRI\(2021\)679106_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/679106/EPRS_BRI(2021)679106_EN.pdf)
- Sommar, J.N., Johansson, C., Lövenheim, B., Schantz, P., Markstedt, A., Strömgren, M., Stigson, H., Forsberg, B. (2022). Overall health impacts of a potential increase in cycle commuting in Stockholm, Sweden. *Scandinavian Journal of Public Health*, 50, 552-564. <https://doi.org/10.1177/14034948211010024>
- Sovacool, B.K., Newell, P., Carley, S., & Fanzo, J. (2022). Equity, technological innovation, and sustainable behaviour in a low-carbon future. *Nature Human Behaviour*, 6, 326-337. <https://doi.org/10.1038/s41562-021-01257-8>
- Statens Vegvesen. (2012). 'Nasjonal Sykkelstrategi - Sats På Sykkel [National cycling strategy: Bet on the bicycle] . Grunnlagsdokument for NTP 2014-2023'. <https://vegvesen.brage.unit.no/vegvesen-xmlui/bitstream/handle/11250/2577105/Nasjonal%20sykkelstrategi%202014-2023.pdf?sequence=1>
- Statens Vegvesen. (n.d.). Byvekstavtaler [Urban growth agreements]. Accessed 2 June 2023 from <https://www.vegvesen.no/fag/fokusomrader/nasjonal-transportplan/byvekstavtaler/>
- Statens Vegvesen. (2020). Byvekstavtale mellom kommunane Bergen, Alver, Askøy, Bjørnafjorden og Øygarden, Vestlandfylkeskommune og Statens/Samferdselsdepartementet og Kommunal-og moderniseringsdepartementet [Urban growth agreement between the municipalities of Bergen, Alver, Askøy, Bjørnafjorden, and Øygarden, Vestland County, and the Ministry of Transport and the Ministry of Local Government and Modernisation]. Accessed 25 September 2023 from <https://www.vegvesen.no/globalassets/fag/fokusomrader/nasjonal-transportplan-ntp/byvekstavtaler/signert-byvekstavtale-for-bergensområdet-2019-2029-11957830.pdf>
- Statens Vegvesen. (2022-a). Nasjonalt regnskap for bærekraftig mobilitet 2021 [National accounts for sustainable mobility 2021]. Accessed 25 September 2023 from <https://www.vegvesen.no/globalassets/fag/fokusomrader/miljoennlig-transport/mobilitetsregnskapet/nasjonalt-regnskap-for-baerekraftig-mobilitet-2021.pdf>

Statens Vegvesen. (2022-b). National Plan of Action for Road Safety 2022-2025 – short version. Accessed 25 September 2023 from <https://www.vegvesen.no/fag/fokusomrader/trafikksikkerhet/>

Statista. (2022). Population of Stockholm from 2010 to 2021. Accessed 25 September 2023 from <https://www.statista.com/statistics/1357797/population-stockholm/>

Statistikkbanken. (n.d.). Reisemiddelfordeling daglige reiser Oslo, 2009-2022 [Travel means distribution, daily trips Oslo, 2009-2022]. Oslo kommune. Accessed 25 September 2023 from https://statistikkbanken.oslo.kommune.no/webview/index.jsp?headers=r&virtualsubset=Andel_value&stubs=Reisemiddel&Reisemiddelsubset=1+-+8&measure=common&virtuallslice=Andel_value&rsubset=2009+-+2022&layers=virtual&measuretype=4&cube=http%3A%2F%2F10.134.180.90%3A80%2Fobj%2Fcube%2FTL-reisemiddelfordeling-daglige-reiser_C1&mode=cube&top=yes

Statsministeriet. (2021). Køreplan for et grønt Danmark. [Green Roadmap of Denmark]. <https://www.regeringen.dk/media/10651/pjece-koereplan-for-et-groent-danmark.pdf>

Statsministeriet. (2022). Ansvar for Danmark: Det politiske grundlag for Danmarks regering [Responsibility for Denmark: The political basis for Denmark's government]. https://fm.dk/media/26729/ansvar-for-danmark-det-politiske-grundlag-for-danmarks-regering_december-2022.pdf

Supercykelstier. (n.d.). Koncept for superckelstier [Concept for cycle superhighways]. Accessed 5 June 2023 from <https://supercykelstier.dk/koncept/>

Supercykelstier. (2019). Supercykelsticykelregnskab 2019 - Nøgletal fra supercykelstierne i hovedstadsregionen. [Cycle superhighways account 2019: Key figures from the cycle superhighways in the capital region]. Accessed 5 June 2023 from <https://supercykelstier.dk/wp-content/uploads/2016/03/Supercykelsticykelregnskab-2021.pdf>

Supercykelstier. (2023). Visionsplan 2045. Accessed 5 June 2023 from https://supercykelstier.dk/wp-content/uploads/2023/01/Visionsplan-2045_2023.pdf

Syklistforeningen. (n.d.). Synlig syklist [Visible cyclists]. Accessed 25 September 2023 from <https://syklistforeningen.no/eventer/synlig-syklist/>

Traficom. (2023-a). "Finns' travel habits." Accessed 10 May 2023 from <https://tieto.traficom.fi/en/statistics/finns-travel-habits>

Traficom. (2023-b). Kävelyn ja pyöräilyn investointiohjelman valtionavustus [Government subsidy for the investment programme for walking and cycling]. Accessed 21 April 2023 from <https://www.traficom.fi/fi/liikenne/liikennejarjestelma/kavelyn-ja-pyorailyn-investointiohjelman-valtionavustus>

Traficom. (2023-c). Kävelyn ja pyöräiliikenteen edistämishjelmien valtionavustukset [Government subsidies for programmes to promote walking and cycling]. Accessed 21 April 2023 from <https://www.traficom.fi/fi/liikenne/liikennejarjestelma/kavelyn-ja-pyoraliikenteen-edistamisohjelmien-valtionavustukset?toggle=Vuosi%202023&toggle=Vuosi%202022&toggle=Vuosi%202021>

Trafikanalys. (2021). RVU i Sverige: Färdlängd per person och dag, i kilometer efter år och huvudsakligt färd sätt [RVU in Sweden. Length of journey per person per day, in kilometres by year and main mode of travel]. Accessed 15 September 2023 from <https://www.trafa.se/kommunikationsvanor/RVU-Sverige/?cw=1&q=t1101|ar:2021|fardlangdpers|hvarsatt~standardtable>

Trafikanalys. (2022). Resvaror [Travel habits]. Accessed 5 October 2023 from <https://www.trafa.se/kommunikationsvanor/RVU-Sverige/#>

Trafikanalys. (n.d.-a). Transportpolitiska målen [The transport policy objectives]. Accessed 5 October 2023 from <https://www.trafa.se/uppdrag/transportpolitiska-mal/>

Trafikanalys. (n.d.-b). Gång- cykel- och kollektivtrafik - uppföljning och indikativa kommunala mål [Walking, cycling, and public transportation – follow-up and indicative municipal targets]. Accessed 5 October 2023 from <https://www.trafa.se/etiketter/transportovergripande/gang--cykel--och-kollektivtrafik---uppfoljning-och-indikativa-kommunala-mal-8284/>

Trafikverket (2021-a). Cykel i samhällsplaneringen. Accessed on 5 April 2023 at: <https://bransch.trafikverket.se/for-dig-i-branschen/Planera-och-utreda/samhallsplanering/planera-for-transporter-i-samhallsplaneringen/Personresor/cykel-i-samhallsplaneringen/>

Trafikverket (2021-b). Temarapport Cykelplanering i Sverige: Nationella cykelrådet 2021. Accessed on 20 March 2023 at: <http://trafikverket.diva-portal.org/smash/get/diva2:1564146/FULLTEXT02.pdf>

Trafikverket (2022-a). Förslag till nationell plan för transportinfrastrukturen 2022-2033. Accessed 17 March 2022 from <http://trafikverket.diva-portal.org/smash/get/diva2:1615267/FULLTEXT02.pdf>

Trafikverket (2022-b). Stadsmiljöavtal ger fler möjlighet att cykla i städer. Accessed on 18 april 2023 at: <https://www.trafikverket.se/om-oss/nyheter/nationella-nyheter/2022/februari/stadsmiljoavtal-ger-fler-mojlighet-att-cykla-i-stader/>

Trafikverket. (2023). Attraktiv, smidig och säker cykling. Accessed 27 April 2023 from <https://bransch.trafikverket.se/om-oss/var-verksamhet/sa-har-jobbar-vi-med/Attraktiv-smidig-och-saker-cykling/>

Trafikverket. (n.d.-a). Transporternas klimatpåverkan [Transport's climate impact]. Accessed 25 September 2023 from <https://bransch.trafikverket.se/for-dig-i-branschen/miljo---for-dig-i-branschen/minskad-klimatpaverkan/transporternas-klimatpaverkan/>

Trafikverket. (n.d.-b). Ansök om bidrag för hållbara stadsmiljöer – stadsmiljöavtal [Apply for grants for sustainable urban environments – urban environment agreements]. Accessed 11 September 2023. <https://bransch.trafikverket.se/tjanster/ansok-om/ansok-om-bidrag/statligt-stod-for-hallbara-stadsmiljoer---stadsmiljoavtal/>

Transportministeriet. (2014). Denmark - on your bike! The national bicycle strategy. Accessed 20 March 20223. <https://www.trm.dk/media/qkfpoagy/engelsk-cykelstrategi-til-web.pdf>

Transportministeriet. (2021-a). Danmark fremad-Infrastrukturplan 2035. Accessed 5 June 2023. <https://www.trm.dk/publikationer/2021/danmark-fremad-infrastrukturplan-2035>

Transportministeriet. (2021-b). 'Aftale Mellem Regeringen (Socialdemokratiet), Venstre, Dansk Folkeparti, Socialistisk Folkeparti, Radikale Venstre, Enhedslisten, Det Konservative Folkeparti, Nye Borgerlige, Liberal Alliance, Alternativet Og Kristendemokraterne Om: Infrastrukturplan 2035' [Agreement Between the Government (Social Democracy), Liberals, Danish People's Party, Socialist People's Party, Radical Left, Enhedslisten, Conservative People's Party, New Citizens, Liberal Alliance, Alternative and Christian Democrats About: Infrastructure Plan 2035']. Accessed 7 June 2023 from <https://www.trm.dk/media/rt1h51td/endelig-aftaletekst-infrastrukturplan-2035-final-a.pdf>

Transportministeriet. (2021-c). Bekendtgørelse om pulje til cykelprojekter [Decree on bicycle project funding scheme]. BEK nr 629 af 12/04/2021. <https://www.retsinformation.dk/eli/ltg/2021/629>

Tryg Forsikring. (n.d.). Sikkerhet på to hjul - samarbeid med Trygg Trafikk [Safety on two wheels - collaboration with Trygg Trafikk]. Accessed 25 September 2023 from https://www.tryg.no/om-tryg/samfunnsansvar/skadeforebygging/samarbeid_med_trygg_trafikk/index.html

Trygg Trafikk. (n.d.-a). Hjertesone - tryggere skolevei [Heart zones – safer routes to school. Accessed 25 September 2023 from <https://www.tryggtrafikk.no/opplaering/skole/hjertesone/>

Trygg Trafikk. (n.d.-b). Refleksdagen [Reflector day]. Accessed 25 September 2023 from <https://www.tryggtrafikk.no/ga/refleks/refleksdagen/>

Warren, J. (15 December 2021). A shift to cycling, not only electric cars, is needed to cut urban transport emissions. EURACTIV.

<https://www.euractiv.com/section/transport/opinion/a-shift-to-cycling-not-only-electric-cars-is-needed-to-cut-urban-transport-emissions/>

UN. (2022). UN A/RES/76/255 Integration of mainstream bicycling into public transportation systems for sustainable development. <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N22/288/95/PDF/N2228895.pdf?OpenElement>

Vejdirektoratet. (2018). Administrationsgrundlag til udmøntning af midler til kommunale cykelstipprojekter [Administrative basis for disbursement of funds for municipal cycle path projects].

[https://api.vejdirektoratet.dk/sites/default/files/2019-07/Administrationsgrundlag%20til%20udm%C3%B8ntning%20af%20midler%20ti](https://api.vejdirektoratet.dk/sites/default/files/2019-07/Administrationsgrundlag%20til%20udm%C3%B8ntning%20af%20midler%20til%20kommuna_wcag)

Vejdirektoratet. (2019). Samlet vurdering af effekten af cykelpuljeprojekterne. [Overall assessment of the effect of the national cycling fund].

[https://www.vejdirektoratet.dk/api/drupal/sites/default/files/2019-12/Samlet%20vurdering%20af%20Cykelpuljens%20effekt_endelig%20rapport_wc](https://www.vejdirektoratet.dk/api/drupal/sites/default/files/2019-12/Samlet%20vurdering%20af%20Cykelpuljens%20effekt_endelig%20rapport_wcag)

Vejdirektoratet. (2023-a). Trafikkens udvikling i tal. [Traffic development in figures]. Accessed 3 June 2023. <https://www.vejdirektoratet.dk/side/trafikkens-udvikling-i-tal#0>

Vejdirektoratet. (2023-b). Administation af cykelpuljer. [Administration of the Bicycle Subsidy Scheme]. Accessed 2 June 2023.

<https://www.vejdirektoratet.dk/side/administration-af-cykelpuljer>

Vejdirektoratet. (2023-c). Brugerundersøgelse af de nationale cykelruter [User survey of the national cycle routes]. Transportministeriet. Accessed 7 June 2023 from <https://www.vejdirektoratet.dk/sites/default/files/2023-06/De%20Nationale%20Cykelruter%20Brugerunders%C3%B8gelse.pdf>

Vejdirektoratet. (2023-d). Principper for de nationale cykelruter [Principles for the national cycle routes]. Transportministeriet. Accessed 7 June 2023 from https://www.vejdirektoratet.dk/sites/default/files/2023-06/Principper_Nationale_Cykelruter_Rapport_.pdf

Vejdirektoratet. (n.d.-a). Viden om cykelfremme [Knowledge about bicycle promotion]. Det nationale videnscenter for cykelfreeme. Accessed 5 June 2023 from <https://www.vejdirektoratet.dk/cykelviden>

Vejdirektoratet. (n.d.-b). Vejdirektoratets cykelråd [The road directorate's cycling council]. Det nationale videnscenter for cykelfreeme. Accessed 5 June 2023 from <https://www.vejdirektoratet.dk/cykelviden/om-centret/vejdirektoratets-cykelraad>

Vejdirektoratet. (n.d.-c). Cykeltrafikken i Danmark [Bicycle traffic in Denmark].
Accessed 5 June 2023 from <https://www.vejdirektoratet.dk/tema/cykler-paa-vejene>

VTI. (n.d.) Om Cykelcentrum. Accessed 27 April 2023 at:
<https://cykelcentrum.vti.se/nationellt-cykelcentrum/>

About this publication

Nordic cycling policy: National objectives, mechanisms, and actors in Denmark, Finland, Norway, and Sweden

Lisa Rohrer, Johannes Lidmo, and Christoph Beidenhauser

This working paper is part of the Nordic Cycling Power Network, a 2-year project running from February 2023-January 2025. The key aim of the project is to activate a knowledge-sharing network among municipal and regional planners working to improve conditions for cycling. The project is funded by the Nordic Council of Ministers.

Nordregio Working Paper 2023:8

ISBN 978-91-8001-086-3

ISSN: 1403-2511

<http://doi.org/10.6027/WP2023:81403-2511>

© Nordregio 2023

Layout: Sara Melander

Cover Photo: Filip Rankovic Grobgaard/unsplash.com

Nordregio

Nordregio is a leading Nordic and European research centre for regional development and planning, established by the Nordic Council of Ministers in 1997. We conduct solution-oriented and applied research, addressing current issues from both a research perspective and the viewpoint of policymakers and practitioners. Operating at the international, national, regional and local levels, Nordregio's research covers a wide geographic scope, emphasising the Nordic and Baltic Sea Regions, Europe and the Arctic.

Nordregio

Holmamiralens Väg 10

Skeppsholmen

Stockholm, Sweden

www.nordregio.org