2 Local transport

2A. Present Situation

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Data</th>
<th>Units</th>
<th>Year of data provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of population living within 300 metres of an hourly (or more frequent) public transport service</td>
<td>90</td>
<td>%</td>
<td>2013</td>
</tr>
<tr>
<td>For all journeys under 5km, proportion of these journeys undertaken by: i) car, ii) public transport, iii) bicycle, iv) by foot and v) other</td>
<td>Car</td>
<td>28</td>
<td>2013</td>
</tr>
<tr>
<td></td>
<td>Public Transport</td>
<td>24</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>Cycling</td>
<td>13</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>Foot</td>
<td>35</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>-</td>
<td>2015</td>
</tr>
<tr>
<td>Proportion of buses operating in the city that are low emission (at least Euro V)</td>
<td>90% (20% Euro VI)</td>
<td>%</td>
<td>2015</td>
</tr>
</tbody>
</table>

The Oslo-region has a total of 1.2 million inhabitants and consists of a compact urban core (the City) surrounded by the County of Akershus. The region has invested in coordinated and efficient transport system to accommodate the ease of mobility in the region.

**Densification through coordinated planning**

Coordinated land use and transport planning is an important factor driving Oslo’s development away from urban sprawl. Since the 1990s, there has been a professional and political consensus concerning urban densification as an overall strategy for urban development. A deliberate policy transforming old industrial areas into housing and densification around public transport hubs makes car-ownership unnecessary.

**Replacing cars with public transport**

During the past few years, the inhabitants of Oslo have changed their travel habits considerably.
Figure 2.1: The figure shows the development in public traffic, car traffic and population from 2007-2014, in both Oslo and the neighbouring county Akershus. (Source: 2D8)

The share of daily trips by car is decreasing, and the share of trips by public transport and by foot are increasing. Oslo is a compact and walkable city; most journeys are short and there is a focus on accessibility for all users. Walking is easy and popular: 28% of all daily trips were done by foot in 2015 (2D9).

Figure 2.2: The figure shows the modal shares for daily trips shorter than 5 km (2013). Source: The Cycling strategy 2015-2025 (2D4)
Oslo has a comprehensive public transport network and 90% of the population lives within 300 metres of an hourly (or more frequent) public transport service (GIS analysis, 2013). The City of Oslo owns 60% of Ruter, the joint public transport company in Oslo-region and the neighbouring Akershus County owns the remaining 40%. The joint ownership allows for more holistic transport planning and operations.

The public transport infrastructure consists of metro, buses, trams, trains and boats. The metro system in Oslo has 6 lines with a total of 189 kilometers of lines. The tram network consists of 90 kilometers of tracks and 72 trams. In 2015, Ruter operated 1204 buses.

Intelligent transport systems (ITS) provide buses and trams priority at nearly 300 intersections, to facilitate better traffic flow for public transport. Furthermore, the use of ITS in Oslo contributes to improved road safety and helps convey traffic information to the road users. The City is in the process of developing its Sustainable Urban Mobility Plan (SUMP).

**Figure 2.3: Emission standards, Oslo buses 2015. (Source: 2D10)**
Electric vehicles and car sharing

Oslo is the world capital of electrical vehicles (EVs), with almost 35,000 EVs and plug-in hybrids. Over 30% of all new cars sold in Oslo in 2015 and 2016 (by September) were EVs. The City of Oslo is replacing its car fleet (1100 cars) with EVs and is half way there. Through City ownership and financial incentives there are approximately 2000 charging points for EVs and the City is one of the world’s largest owners of charging infrastructure (2D20).

There are three different car sharing schemes in Oslo (2014), with 360 cars and 9600 users.

Figure 2.4: 57% of all public transport journeys in Oslo are made by trains, trams or metro. (Source: 2D9)

Figure 2.5: Pictures: EV parade in front of the town hall (left), opening of the first quick charging station for taxis (right).
**Biking in Oslo**

The cycling network consists of 205 km of cycling lanes. In addition, Oslo has 567 km of recreational trails and cycle/footpaths. Each winter, 335 km of the recreational trails are groomed for skiing. They are all free for public use.

To encourage cycling in a hilly city and long-distance trips the City introduced a support scheme for electrical bikes from the start of 2016, a measure that was very popular. In three weeks the EUR 0.6 million that was set aside for this was gone.

To support cycling during the winter months Oslo has an aggressive snow-clearing practice where cycling lanes are prioritized. Non-car routes are lit and maintained.

Oslo City Bike had 1200 bicycles in 2015. This is a popular service, with an efficiency of 9.7 trips on average per bicycle per day, and over 30 000 people using the bikes (2D23).
2B. Past Performance

Over the past years, Oslo has implemented a series of measures to create a more sustainable transport system. Public transport has been improved and has become more energy efficient and environmentally friendly. Car traffic per capita has been reduced (figure 2.1), and low-emission vehicles have been promoted.

![Energy use kWh/pkm graph]

*Figure 2.6: The figure shows the development of energy use by buses, trams and the Metro from 2007-2015. (Source: 2D10)*

**Improvements to the public transportation system**

A massive residential development in Løren-area in recent years called for an extension of the metro system. To ensure connectivity to the city center, 1600 meters of new metro line and a new metro station, opened in 2016.

In 2013 Oslo launched a list of 100 measures to make public transport faster and more accessible. The measures include separating public transport from other traffic, prioritizing public traffic in intersections and optimizing stop distances. A number of parking places have been removed or relocated, and measures to reduce car traffic are being introduced (2D24).

The establishment of Ruter in 2008, as a joint regional public transport company has significantly improved the planning and operation of public transport in the region.

The passenger service for tram and bus passengers has been improved with new station furniture, a real-time digital information system, preference for public transport at nearly 300 traffic lights and increased frequency on tramlines, the metro and the most important bus routes.

In 2010, Ruter implemented an enhanced travel guarantee for all public transport in Oslo and Akershus. The guarantee consists of ten points concerning punctuality, information before and during travels, as well as comfort on means of transport and at stops.

A digital ticketing system has been introduced to give travellers increased access and possibility to buy tickets on mobile devices. In 2015 approximately 1,5 million tickets sold through the mobile application every month (2D10).
Figure 2.7: The modal split shows that the share of travels by car is decreasing from 2005, while the modal share for public transport and bicycle is increasing in the same period. Source: the City of Oslo Statistics, with data from Institute of Transport Economics, Prosam.org and Ruter (2D11).

The toll ring as financing model
The toll ring and the Master transport plan for Oslo and Akershus (Oslo Package) constitute an important financing framework for public transport investments. When it was introduced in 1990, 10% of toll ring revenues were used for public transport. Since then, the share has increased. In 2012, the City Council decided that 60% of revenues were to be allocated for public transport (2D8). Since 2008, EUR 2.8 billion of the income generated from the toll ring has been invested in roads and public transport (2D21).

The objectives of road user charges include improved mobility, facilitating more trips by public transport, bicycling and walking, reducing the number of fatalities and serious injuries by traffic, and reducing congestion. The result is that, between 2005 and 2015, the public transport share increased from 21 to 32%, while the car share decreased from 45 to 34%. Since 2008, the number of cars passing through the toll ring has declined (figure 2.8), despite population growth. Part of the explanation is probably a toll-price increase, combined with reduced fares on public transport.
Smart urban planning reduces the long-term demand for transport

Cities that use their land efficiently will normally use less energy due to shorter travel distances and reduced demand for motorised transport. The population density in the inner city has increased, partly as a result of the City’s planning policy in the Municipal Master Plans of 2008 and 2015 (2D1, 2D2), focusing on compact development in areas close to stations and public transport hubs.

At the same time, Oslo has adopted a more restrictive parking policy for the city center and has raised the parking fees by 50% from January 2016. Parking meter hours have been extended, while the maximum permitted parking time has been reduced from 3 to 2 hours.

Through joint ownership of Ruter and the Oslo-package agreement, Oslo has also been able to coordinate transport priorities with neighbouring municipalities.

Environmentally-friendly public transport

Oslo has sought to make its public transport network more energy-efficient and climate friendly. Ruter’s implementation policy Fossil Free 2020 is ongoing. So far buses have shifted from diesel to a variety of technologies and fuels: 17% is biodiesel, 8% biogas, 8% natural gas and 2% bioethanol. The emission of NOx (g/person-km) from buses has been reduced by 78% since 2007, and at the same time the PM emission from exhaust (g/person-km) has been reduced by 88% (2D10).

More cycle lanes and focus on road safety

155 km of new cycle lanes were built since 1999 (2D7, 2D12). To ensure that measures from the Comprehensive Bicycle Strategy for Oslo are implemented, the Bicycle Project was established in 2010. In 2015 and 2016 approximately 300 parking places were removed to make space for more bicycle lanes in the city. Oslo has reduced the speed limit in central parts of the city to 30 km/h, to prioritize access for cyclists and pedestrians and to enhance traffic safety.

As a part of the road safety focus, a mobile application called The Traffic Agent has been developed to detect unsafe areas on school roads. The application is designed for children, built in a game format. The phone’s GPS records where the child is located, and gives them opportunity to register travel habits and traffic situations. They can register both positive and unsafe circumstances with comments and photos, and the app registers the exact location. This has proved to be a valuable tool to identify needs for action to improve road safety (2D25).
A world leader in electric car use

The EV success in Oslo is due to a substantial package of incentives developed to promote zero emission vehicles. These include (2D13):

- No registration taxes (which is high for ordinary cars)
- Exemption from 25% VAT on purchase and leasing
- No charges on toll roads
- Access to bus lanes
- Free parking in municipal car parks
- Establishment of charging points includes grant scheme of EUR 1,250 per station

In order to lead by example, The City is replacing its car fleet (1100 cars) with EVs and is half way there.

![Electric and Plug-in Hybrid Electric Vehicles in the Oslo region](image)

*Figure 2.9 The figure shows the tremendous growth of EVs in Oslo.*

Onshore power supply in the Port of Oslo

To reduce emissions from shipping, the Port of Oslo provides onshore power supply from hydro power. One of the largest cruise companies, Color Line, uses shore based power when docked in Oslo. This reduces CO₂ emissions in Oslo by 3,000 tonnes and NOₓ emissions by 50 tonnes each year (2D14).

Emission results

Figure 2.10 shows a decrease in CO₂ emissions from transport per capita from 1991 to 2011. This implies that the measures relating to improved public transport and car traffic reduction have reduced emissions from transport. The peaks in 2005 and 2013 are largely due to construction booms. Additionally, in expectation of a tax-increase, many companies increased their fuel reserves in 2013. This is confirmed by fuels sales statistics from 2015, indicating that 2013 was an extraordinary year. Emission from construction has not received sufficient attention up until now, but is included in future plans.
The toll ring has been a successful measure, contributing to both reducing car traffic per capita and financing better public transport infrastructure in Oslo. This, together with the tremendous growth in electric vehicles, have provided important lessons learned. Regarding EVs, it is obvious that making EVs financially competitive with traditionally fuelled cars has been key to success.
2C. Future Plans

Becoming a greener capital
In order to become a green capital, the City Council adopted The Climate and Energy Strategy in June 2016 to facilitate the needed transformation. This entails substantial emissions reduction, cleaner air, improved cycling infrastructure and better public transport. The main transport objectives are to reduce car traffic by 20% by 2019 (figure 2.11) and by 33% by 2030, thus significantly increasing the share of public transport, cycling and walking. By 2020, all public transport will run on renewable fuels and 16% of daily trips will be made by bicycle, increasing to 25% in 2025 (2D3).

Figure 2.11: Development in car traffic and public traffic in Oslo: the figure illustrates the 20% reduction in car traffic that the City Government aims for by 2019.

Car traffic reduction by 20%
The City of Oslo shall facilitate a city logistics system where traffic demand is reduced, and where all new cars and light freight vehicles in Oslo shall use renewable fuels or be plug-in hybrids from 2020. At least 20% of heavy duty vehicles in Oslo shall use renewable by 2020. Furthermore, all heavy duty vehicles and construction machinery shall be able to use renewable fuels by 2030.

A number of measures will be implemented to achieve these objectives. To reduce car traffic, restrictive measures like removing parking lots, more expensive parking and a car-free city center will be initiated. A mobility plan that also includes analysis of logistics and traffic will clarify the basis to reduce traffic, reduce transportation needs and increase the proportion of public transport. The Concept Study Oslo Hub has been completed, and summarizes the important measures recommended for the future public transport system in the capital-region (2D15).

Fossil free construction
To reduce emissions from construction the City has six pilot projects for promoting fossil free construction. The Municipal building companies require entrepreneurs to use renewable energy sources and zero-emission technology when possible. The response from the market has, so far, been overwhelmingly positive.

Project car-free city life
By 2019 the City will remove private cars from the area within Ring road 1 (figure 2.12). The result will be a more vibrant city center that focuses on people rather than cars. The project is currently working on establishing pragmatic and smart solutions, and considering how a car-free city center can contribute to shape the city's identity and character (2D22).
Figure 2.12: Private cars will be removed from an area of approximately 1.7 km² by 2019 to improve city life.

Figure 2.13: The City Government wants to create a greener and warmer city with room for everyone. A city center without cars will be more accessible and provide a more vibrant city life.
Fossil free public transport 2020

In 2020, all public transport in the Oslo-region will be powered solely by renewable energy, including taxis. As part of Ruter's Fossil Free 2020 project, electrification will be an important solution in the bus fleet in Oslo, of which 60% is expected to be electric by 2025 (figure 2.14). Large scale roll-out of battery electric buses will start in 2020, while testing will be carried out in the coming years. The first tests are planned to be in operation by mid-2017. Ruter will also introduce renewable solutions on its ferry services in the Oslo fjord. Fossil Free 2020 has, for 2017, received EUR 2.5 mill in funding from the Oslo budget. Ruter has presented a public transport strategy, M2016, which provides a roadmap for a smart public transport development for the years to come (2D16).

Figure 2.14: All public transport in the Oslo and Akershus is to be powered only by renewable energy in 2020. (Source: Ruter)
Electric vehicle support will be continued
The City of Oslo will continue to replace its entire fleet with zero-emission vehicles by 2017. In 2017, Oslo will also upgrade its EV charging capacity with 400 new public charging points (2D6). Current measures for electric vehicle support will continue.

Building on the success of introducing EVs in the private market, Oslo wants to become the leader in zero emission commercial vehicles like freight EVs, taxis, zero-emission public transportation and service EVs. The first fast-charging station for taxis was opened in 2016.

Financing emission cuts
Recently, a revised Master transport plan for Oslo and Akershus (Oslo Package 3) was agreed upon (2D5), with a budget of approx. EUR 8 billion (toll ring revenues) for the period 2017-2036. In Oslo, 93% of the revenue will be earmarked for investments in public transport system, improved bicycle infrastructure and to promote walking. In the period 2017-2036, over EUR 1 bill is set aside for these large metro and tram projects. EUR 411 mill is set aside for a new metro tunnel from the city centre which is being planning (2D5) and new tram lines are to be planned and built.

The new designed toll ring, that will take effect in early 2017, will introduce congestion and emission based pricing. The redesigned tariff scheme combined with additional tolls is expected to reduce the traffic through the ring by 15%.

In the proposed Climate Budget 2017 funds are allocated to prioritised projects to achieve the goals set in the Climate and Energy Strategy. Over EUR 19 mill are set aside for cycling lanes and an additional EUR 8 mill have been allocated to increase capacity in public transport from 2016 to 2017 (2D6, 2D19).
2D. References

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2. The 2008 Municipal Master Plan, Oslo towards 2025 (Norwegian)

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