EGCA 2018, Umeå, Sweden

2 Local transport

With its 120,000 residents Umeå is one of the fastest growing cities in Sweden, thus generating increased transport demand. Diminishing air quality and acoustic environment follows increased traffic. In order to achieve population growth targets (chapter 1) and create a sustainable and attractive city, environmental factors is a central part of urban planning.

2A Present situation

Approximately half of journeys in Umeå city are considered sustainable (figure 2A2). This means half are made by car, resulting in negative environmental impacts both locally and globally. Therefore Umeå is striving to increase the modal share for sustainable transport modes.

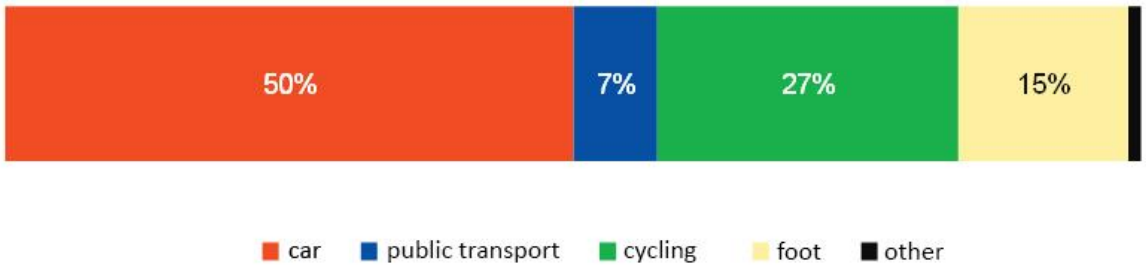

Figure 1A2. Modal split for journeys in Umeå city 2014

There is currently no data available on modal share for local freight transport. Umeå is working for a transfer of freight transports from road to rail and sea (2B and 2C).

Indicator	Data		Units	Year of data provided
Proportion of population living within 300 metres of an hourly (or more frequent) public transport service[1]	78		%	2015
For all journeys under 5km, proportion of these journeys undertaken by: i) car, ii) public transport, iii) bicycle, iv) by foot and v) other	Car	41	%	2014
	Public transport	4		
	Cycling	34		
	Foot	20		
	Other[2]	1		
Proportion of buses operating in the city that are low emission (at least Euro V)	Local buses - currently 50 (from 06/2016; 100) Regional buses - currently 96 (from 2016; 100)		%	2015

Table 2A1. Data on accessibility to public transport, modal split for journeys under 5 km, and low emission buses.

Transport infrastructure

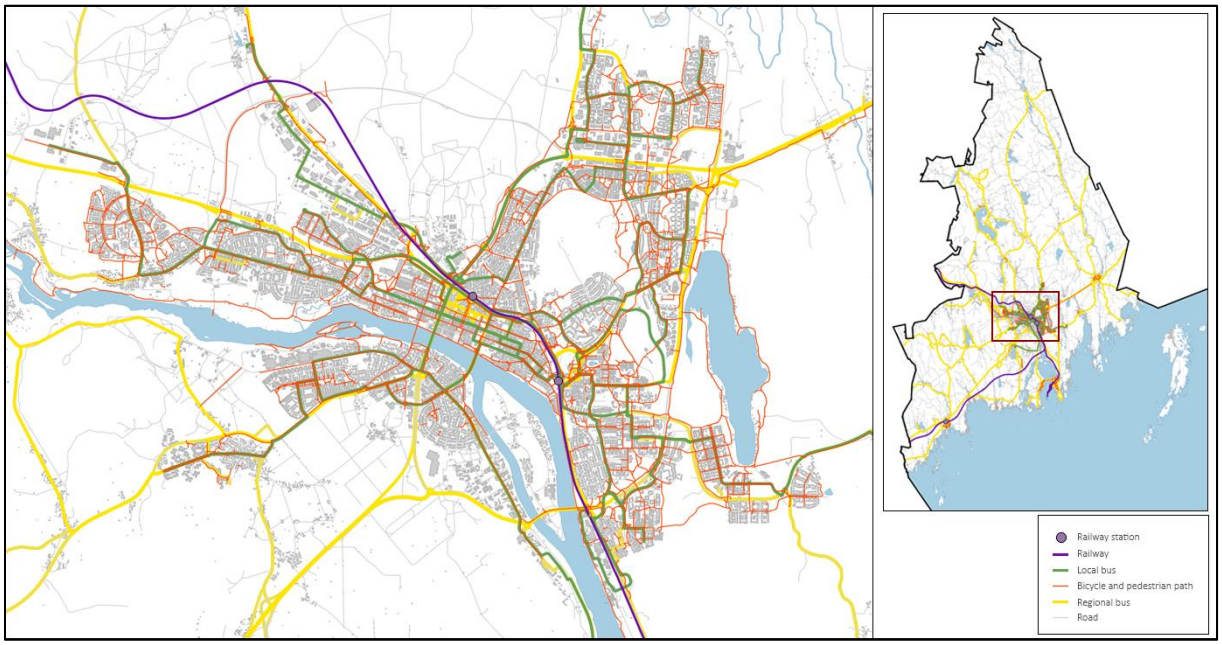

Figure 2A2. Map of transport infrastructure for sustainable transport modes in Umeå. Detail of central Umeå to the left, and the entire municipality to the right. According to the Travel Survey 2014, 46% of the residents of Umeå think that walking and cycling should be given the highest priority in urban planning, two-thirds think

[1] *Has been calculated using GIS to create a 300 meter buffer around public transport services with at least four trips per hour, and then summing the number of individuals living inside the area.*
[2] *Contains any vehicle type other than car, public transport or bicycle. The majority of journeys in this category are motorcycle trips.*

Local buses service most of central Umeå, with 95% of city population living within 500 metres of main lines. Since 2005, local public transport journeys have increased by 57%. A fully-electric bus system, including ultra-fast charging stations, is being implemented (2B and 2C). Local public transport is collaboration between a municipally owned company, the public transport operator of Västerbotten County and a local bus operator, in cooperation between public and private sector. ITS is used to optimise passenger experience through GPS-based real-time information.

Regional bus and train networks connect Umeå with neighbouring towns and cities. Railway infrastructure has been greatly improved, since the new Bothnia railway was inaugurated in 2010. The railway is equipped with ERTMS to optimise train flows. Journeys by train have increased by 67% along the Bothnia railway since 2012.

Bicycle and pedestrian paths consists of 276 km, and is well used. 83% of population in the urban area have access to main paths within 200 meters. The busiest 86 km of lanes are considered "main network", and have a particularly high standard of accessibility, road safety, lighting, operation and winter road maintenance, to keep as many citizens as possible on their bicycles all year around. This is important in a city with a challenging winter climate.

Figure 2A3. Umeå Östra is situated just next to the University hospital and Umeå University in the largest work place area in northern Sweden. Connected to the station is a new bus station enabling multimodal journeys.

Vehicle numbers

There are 54 local buses of which 27 (50%) are EURO V EEV. There are two (4%) fully-electric buses in operation charged with electricity from Umeå's renewable wind and hydrogen power.

Of 51,600 cars registered in Umeå, 67% run by gasoline, 26% diesel, 6% ethanol, 1% PEV/PEHV, and less than 1% gas. Of

new cars registered in 2014, 64% were diesel, 5% PEV/PHEV, while only 30% were gasoline.

City authorities have 359 vehicles (162 diesel, 22 ethanol, 109 gasoline, 13 PEV, 53 hybrid). Municipal companies have 204 vehicles (14 PEV, 6 PHEV, 4 hybrid). 16 vehicles (14 diesel, 1 ethanol, 1 PHEV) in a carpool open for public use.

Along with "Skjutsgruppen"[3], a web-based carpooling service is developed (figure 2A5). Collaboration with the car rental company Hertz recently started, it is now possible to use free cars from Hertz for car-sharing.

Figure 2A4. "Help lonely car drivers" – campaign to encourage car-sharing (collaboration between the City of Umeå and the nonprofit car-sharing movement Skjutsgruppen). It is free to join and "Skjutsgruppen" has more than 60,000 active members all over Sweden.

Mobility flows

7,700 people are commuting to Umeå, while 5,200 are commuting from Umeå. The greatest mobility flows, though, are trips within the municipality. Umeå's citizens make approximately 286,000 trips per weekday. 31% of journeys are work trips.

The major destinations for all types of trips are central Umeå and the university area, with over 60,000 trips per weekday going to each.

Local buses account for 6.6 million trips (2014), up 47% since 2006. Regional buses have three major stops in Umeå, with a total of 665,000 boarding passengers per year. The two railway stations in

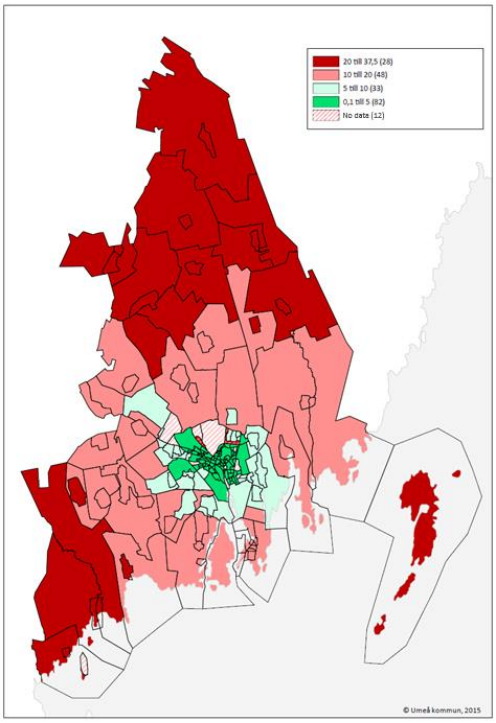

Figure 2A5 Average commuting distance in Umeå municipality. 54% of citizens have shorter than 5 km between home and work.

[3] A non-profit car-sharing movement

Umeå have about 325,000 boarding passengers per year together for regional trains.

Sustainable Urban Mobility Plans

A Sustainable Urban Mobility Plan (SUMP) integrated as part of the comprehensive plan was adopted in 2011.

2B Past performance

Strategies and plans

Umeå adopted a new comprehensive plan in 2011 including six development strategies for sustainable growth. These strategies aim at building a denser, more land-use and transport efficient city, with high quality parks and public places, and where openness, democracy and equality are integral parts of planning (chapter 12).

Since mobility and land-use planning are co-dependent, Umeå has a Sustainable Urban Mobility Plan (SUMP) integrated with the comprehensive plan, aiming to accomplish a shift from car dependency towards sustainable transport modes. The majority of urban growth should be within a five kilometres radius and along the public transport system main lines, to make it easier for people to get around by foot, bicycle or public transport. This means car traffic can be reduced in central Umeå, enabling a transformation of the old traffic arteries into city streets with priority for sustainable transport and urban development. Pedestrians, bicyclists and public transport passengers are prioritized in the SUMP.

To complement the development strategies, Umeå has adopted several plans for urban mobility. To cope with air quality problems in central Umeå, the city adopted an Air Quality Management Plan in 2009, and a new plan in 2015 (chapter 5), aiming at reducing NO_2-levels by a wide range of measures, mainly reducing traffic and facilitating cleaner technology.

Figure 2B1. Bike & Fly –The City of Umeå, together with Umeå Airport, has developed a bicycle garage since the Airport is located only 4.5 km from the city centre. There are lockers and bicycle repair equipment should you need it.

In 2009 a bicycle plan was adopted. In the SUMP and Bicycle Plan, a main network of pedestrian and bicycle paths is identified, where maintenance should be of very high quality. This is important, northern European winter climate poses a challenge for anyone wanting to use their bicycle. A challenge many citizens are willing to accept; 22% state that they use their bicycle for commuting during winter. One important component of sustainable transport is traffic safety for bicyclists and pedestrians. Umeå has therefore adopted a Traffic Safety Programme in 2007, and revised it in 2014.

Parking is a central component of the transport system and has its own strategy connected to the SUMP in the comprehensive plan. A Parking Programme was adopted in 2013. Visitor and residential parking are given priority over work place parking in central Umeå. Work place parking is located a bit further out, creating advantages for sustainable transport modes when commuting. This way car traffic can be reduced in peak hours when air quality problems are worst (chapter 5).

Figure 2B2. Campaign ad – "The bicycle battle". 39 cities participated and Umeå was ranked as the best of the Swedish participating cities and received an award during Civitas Forum in Ljubljana as 3rd best cycling city in the European cycling challenge. Best female cyclist in Europe attended Umeå´s team.

Pedestrian and bicycle infrastructure

In line with the SUMP, it is important to see land-use planning as integrated with transport planning. Umeå has been reallocating land from parking and car lanes to parks, bicycle and pedestrian paths. This has been done along Nygatan, the main route connecting the University with the city centre. Along Nygatan, one car lane has been removed while bicycle and pedestrian paths have been broadened, forming a super cycle highway. Similar transformations have been made downtown (figure 2B3). Bicycle parking availability is important to keep people using their bicycles, so the city has increased bicycle parking opportunities. To facilitate multimodality, many new bicycle parking places have been built near the railway stations (Bike & Ride), at car parking places (Park & Bike), and at the airport (Bike & Fly, figure 2B1).

Figure 2B3. "Staden mellan broarna" (The city between the bridges) is a project where new park and recreational areas have been developed along the riverbank. A great deal of this area used to be dedicated for cars which now have been transformed into parks and pedestrian/bicycle paths.

Mobility management

The City of Umeå has been working with mobility management since 2008. In 2010 EC granted funding for the project "Green Citizens of Europe/Be Green Umeå" through the LIFE+ program. The project motivated and helped citizens change their travel behaviour through activities and campaigns.

Public transport

In order to increase ridership and modal share for public transport, several measures have been implemented. Regarding local buses, much work has been done to reduce travel time (e.g. infrastructural measures such as bus priority and dedicated bus lanes), and increasing services, with a frequency of one bus every 10 minutes in peak hours. The local public transport company has also worked with mobility management activities since 2009 in

collaboration with the City of Umeå. Buses and trains are provided with free Wi-Fi and possibilities to purchase tickets online or through apps, making travel more comfortable.

A new state-financed 190 km long high-speed railway, the Bothnia railway (2010), connects Umeå with southern Sweden. The City of Umeå invested in new railway stations along the line. One in Hörnefors south of Umeå, and two in central Umeå: Umeå Central and Umeå Östra (figure 2A4 and 2B4). Norrtåg, a regional train operator, has implemented a new commuter rail system serving all three new stations in Umeå municipality.

Figure 2B4. Umeå Central is an existing station that has been refurbished in order to facilitate new train services, and provided with a new pedestrian and bicycle passage, designed as an integrated passage, train station, and artwork called "Lev!" (Live!). One example how the City of Umeå plan and build infrastructure for cyclists and pedestrians that are perceived as safe any time of the day.

Umeå participated in BEST- BioEthanol for Sustainable Transport, preparing a market breakthrough for ethanol vehicles and bioethanol fuel. As one result, there are many ethanol filling stations. During 2006–2013 parking was free for cars classified as "environmental cars". Car drivers can visit Green Zone, an eco-cyclic stop for motorists in collaboration with McDonalds, Statoil, and local car dealer Carstedts.

A low emission zone for heavy trucks has been instated in central Umeå, to enhance use of clean vehicles and reduce air pollution (chapter 5).

PEVs can be charged at block heater outlets installed almost all over town.

To achieve a clean bus fleet Umeå is implementing a fully-electric, ultra-fast charging bus system. Two buses are in use as of today, with far greater plans for the future (2C).

Figure 2B5. Highway 503, going right through central Umeå is the city's busiest road. A new ring road is being built with the aim of redistributing traffic where the capacity to handle pollutions is much greater (chapter 5). As a way to reduce heavy traffic, a prohibition to pass through central Umeå has been instated for heavy trucks, decreasing heavy traffic by approximately 30%.

Freight transport

Umeå has been working in several projects with freight transports in order to move more freight from road to rail and sea. In connection to the new railway, a 40 ha multimodal logistic centre (NLC) has been developed in western Umeå, and several measures have been implemented to increase capacity in the port of Umeå (e.g. electrifying railway connections and straightening roads).

Reduced car parking

"Green parking payoff" is a pilot, based on an agreement between the city, the city parking company and property developers. Through the agreement, the extent of employee parking on commercial properties can be reduced if property developers provide sustainable mobility services in return (i.e. provide bicycle facilities, connect the property to a carpool

and allocate resources to a mobility management fund). The allocation of funds for mobility management has allowed the city parking company to hire two employees. Forecasts show the potential of Green parking payoff is a 41% shift from car to sustainable transport modes at real estate level. The arrangement creates a win-win situation for Umeå, the property developer and the environment.

Networks and commitments

Umeå is active in several networks dealing with sustainable planning and transport at national and international level (chapter 12). Umeå is part of CIVITAS initiative since 2009, and an active member of CIVITAS Political Advisory Committee, sharing experiences with other European cities, leading the way to introduce measures for sustainable urban mobility. Umeå is a member of Nordic City Network and Union of the Baltic Cities with cities from other countries facing similar challenges regarding sustainable planning. At national level Umeå is part of MMMiS network focusing on mobility management and parking strategies, TRANA network focusing on SUMP development in northern Sweden and BioFuel Region focusing on a transition to renewable energy.

Umeå has committed to the Covenant of Mayors, where one aim is to reduce CO_2 emissions with 20% until 2020. Umeå also signed the Aalborg commitments for sustainable development of cities.

2C Future plans

One of the main objectives of Umeå is sustainable urban development towards 200,000 inhabitants. The transport system is a key to achieve this. Objectives for transport include reducing average mileage per capita and increasing modal share for public transport, bicycle and walking to 65% in 2022. These objectives were set when Aalborg commitments were signed. Plans and strategies in place to achieve them are described in 2B. The main strategy is to see transport planning and urban planning as integrated, in line with the comprehensive plan and SUMP.

The outcome of the strategies is monitored using statistics and GIS, to calculate the share of population and new residential developments within 5 km of central Umeå, and within 500 metres of the main public transport system. The modal share is evaluated through travel surveys, with the latest conducted in 2014 (2A).

Figure 2C1. In October 2015, Umeå received the CIVITAS Award for Technical Innovation for the work with implementing fully-electric buses and ultra-fast chargers.

Fully electric bus system

Umeå is investing in fully-electric buses and ultra-fast charging stations. In 2016, a total of 9 fully-electric buses will be operating. By 2020, 24 additional buses will be implemented, for a total of 33, or more than 70% of local buses. Fuelled with renewable wind and hydrogen power the new buses will result in close to zero GHG emissions. Reduced noise levels for electric buses create opportunities to build in areas along public transport routes, which previously was impossible because of the environmental impact of traditional diesel buses. By 2016, 100% of buses will meet Euro 6 standards.

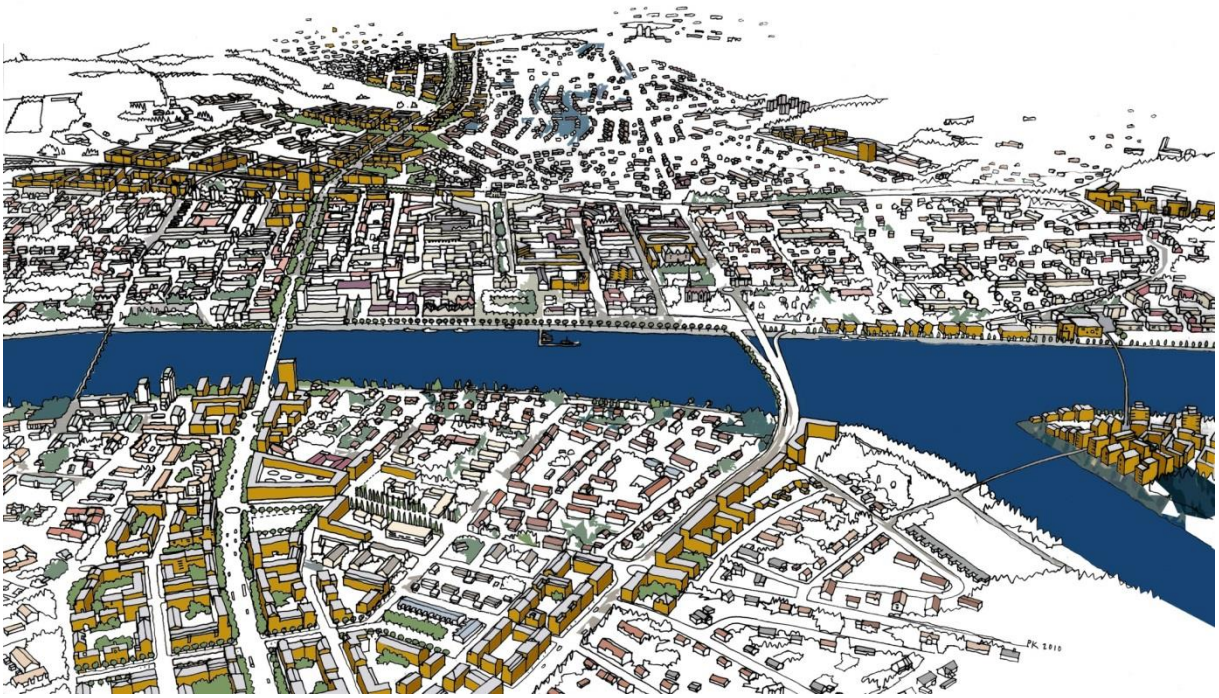

Figure 2C2. An illustration of how the former highway areas can be transformed to housing and commercial zones, in line with the comprehensive plan. Yellow structures represent additional buildings. The former traffic arteries will be transformed to city streets with a clear priority of pedestrians, bicyclists and public transport.

Transformation of highways to city streets

One of the most ambitious measures to come is the re-planning and rebuilding of the old highways passing through central Umeå. This will be possible when the ring road is completed in 2021. By transforming areas previously used for cars into areas for urban development, and rebuilding former traffic arteries into city streets with priority for pedestrians, bicyclists and public transport, traffic can be reduced in central Umeå leading to significantly lower pollution levels (figure 2C2).

Figure 2C3. Artistic impression of new liquid natural gas ferry between Umeå and Vaasa, Finland as a part of the NLC corridor. The ferry will halve GHG emissions compared to today's values. LNG fuel will also help meet the standards of the EU sulphur directive (Directive 2012/33/EU).The ferry will be important for both goods and passenger transport between the two countries and further on.

New freight infrastructure

Based on transport concepts of Bothnian Green Logistic Corridor[4], and Nordic Logistic Corridor, NLC[5], Umeå will continue planning multimodal passenger and goods infrastructure. The Port of Umeå and NLC freight terminal are important nodes. The new North Bothnia railway is being planned, and will connect Umeå with the rest of northern Sweden, reducing the use of cars and heavy trucks. This is one of the projects prioritized by EC to receive funding from Connecting Europe Facility in 2015. To ensure goods transport planning is based on sound analysis, Umeå has been active in cooperating with Umeå University, University of Nordland and University of Vaasa for research in the transport sector of the region, in the EU-funded Simlab East-West project.

[4] North–south along TEN-T Core Network
[5] East–west along TEN-T Comprehensive Network

Bicycle infrastructure

Improvements for pedestrians and cyclists make these modes of transport more attractive and safe. Most of the main bicycle network is already separated from car traffic (92,5%). The bicycle network will be expanded[6] and even further separated from car traffic, super-cycle highways will also be expanded. Bicycle parking will be improved with multi-storey establishment for more efficient land-use and new maintenance technology is being tested (figure 2C4). An annual campaign to increase interaction between all modes of transport and reduce traffic accidents will be held.[7] Cargo bikes will be made available for rental for public users and taken into the planning process.

Figure 2C4. To the left is a cycle path on a sunny winter's day. Despite ploughing and spreading of sand the bicycle paths can become tracked and difficult to ride. To the right snow removal by sweeping and spreading road salt has been tested with a very satisfying result. The tests will continue during 2016.

[6] E.g. a new bicycle bridge connecting north and south of central Umeå.
[7] http://www.umea.se/kollvisionen

Mobility management

The project Green Citizens of Europe expired in 2015. Mobility management is now integrated in ordinary operation at the municipality and municipality parking company. Working with attitudes and behaviour on transport and mobility is crucial. One way of finding new financing for mobility management is through Green parking payoff described in 2B. Umeå is examining the possibilities to develop this concept further, to work with residential property developers as well.

Figure 2C5. Air Quality Demonstrator, with real-time information on air quality in Umeå city is used to encourage people to choose alternative driving routes to lower emissions in central Umeå.

ITS Umeå

A further development of ITS in Umeå is planned, which aims at increasing the efficiency of the transport system. This is based on introducing competitive methods for data collection, systems to communicate and control traffic, an interactive platform for communication with stakeholders and development of instruments and apps. These measures will enhance the effect of the new ring road system and encourage citizens to choose sustainable transport solutions. For ITS Umeå project, Umeå will commit €330,000.

Carpool and electric cars

Umeå has established a carpool for employees as well as the public, which is to be expanded with PEVs. New carpools will be established based on demand.

Designated semi-quick charging places for PEVs are scattered in car parks and other strategic locations, a dozen more will be operating in the coming year. By 2016, municipal energy company Umeå Energi in cooperation with fuel company OKQ8, will have three quick-charging stations installed. Umeå Energi is also developing a product for those who want to provide the opportunity for their customers to recharge vehicles (e.g. supermarkets, hotels).

2D References

Documents:

Vehicle statistics report 2014

http://trafa.se/globalassets/statistik/vagtrafik/fordon/fordon_i_laen_och_kommuner_2014.pdf

Average commuting distance in Umeå Report 2015
http://umea.se/download/18.65c1214d14f38ac155348cc0/1444377540723/Hurl%C3%A5ngtharumebornatilljobbet+slutversion.pdf

Commuting in the Umeå region Report 2013
http://umea.se/download/18.472dbf4213f09f328756ead/1370953497680/2013-06-11+Pendlingsrapport1.pdf

The Umeå Comprehensive Plan Adopted by the City Council 2011
http://www.umea.se/download/18.2ffa3ee213235f4907b8000673/1319703587839/Fop+centrala+stadsdelarna.pdf

Action programme to fulfil the environmental quality norm for nitrogen dioxide in Umeå Adopted by the municipal executive board. August 27, 2007
http://www.umea.se/download/18.2aeb902411d30c9e460800015082/1225975387829/%C3%85tg%C3%A4rdsprogram_milj%C3%B6kvalitet.pdf.pdf

Air Quality Management Plan Adopted by City Council and Swedish government 2015
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Travel Survey 2014. Umeå municipality is conducting a travel survey approximately every eight years. The last one was made in October 2014. 5500 inhabitants received the survey and 50 percent answered.
http://umea.se/download/18.7400452514df41e0121ea29/1435319696817/2015-05-19+Rapport+RVU.pdf

Cycle Traffic programme Adopted by the municipal executive board in 2009
http://www.umea.se/download/18.a979c45130c4b8f4e3800018818/1310121729154/Cykeltrafikprogram+slutrapport+2011-07-07.pdf

Traffic Safety programme Adopted 2007.

Remittance edition of Traffic Safety Programme 2014
http://www.umea.se/download/18.2d25dac514ab9dce1632182/1420711221354/UK_Trafiks%C3%A4kerhetsprogram_LR_2014.pdf

Parking Programme Municipal executive board. November 2013.
http://www.umea.se/download/18.1bcd46311407b7f305b30e73/1377261314751/Parkeringsprogram+2013-08-05.pdf

Bicycle program for sustainable development September 2009.

http://www.umea.se/download/18.a979c45130c4b8f4e3800018818/1361888645666/Cykeltrafikprogram+slutrapport+2011-07-07.pdf

Bicycle report
http://www.umea.se/download/18.35bbcbac14dec9b2c72f1b/1434287098658/UK_Cykelbokslut_2014.pdf

Links:

Hybricon bus systems – Ultra fast chargable Electric bus

http://www.hybricon.se/index.php

Biofuel Region

http://www.biofuelregion.se

BEST- BioEthanol for Sustainable Transport

http://www.best-europe.org

Green Zone

http://www.greenzone.nu/

“The bicycle battle” in European Cycling Challenge

http://www.umea.se/cykelkampen

The traffic safety campaign “Kollvisionen”

http://www.umea.se/kollvisionen

Green Citizens of Europe - Be green Umeå

http://www.greencit.se/

The non-profit car-sharing movement "Skjutsgruppen"

http://www.skjutsgruppen.nu

North Bothnia railway
http://www.norrbotniabanan.se/

Midway Alignment of the Bothnian Corridor

http://midwayalignment.eu/

Nordic Logistic Corridor

http://nordiclogisticcorridor.com/