

WPT1

SOLEZ Action Plans for an effective usage of LEZ and other access restriction schemes in project territories

Activity A.T1.3

Elaboration of SOLEZ Action Plans in the 8 project target FUAs

<i>Deliverable D.T.1.3.4</i>	Final Version
Action Plan for integration of LEZ policies in the mobility planning in Graz's FUA	03 2019

INTELLIGENTE LÖSUNGEN ZUR FÖRDERUNG SCHADSTOFFARMER MOBILITÄTSPOLITIK IN DER STADTREGION GRAZ





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Vicenza Municipality

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Authors: Christian NUSSMÜLLER and Thomas DRAGE (City of Graz) Fred DOTTER (M21 International)	
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Table of contents

1	Introduction.....	4
2	Baseline scenario for the Functional Urban Area of Graz.....	5
2.1	Mobility planning and sustainable energy plans.....	5
2.2	Push and pull measures at FUA level.....	7
2.3	Main critical issues and bottlenecks of mobility in the FUA.....	10
3	Reasons and strategic objectives for the Functional Urban Area of Graz.....	12
3.1	Opportunities for sustainable mobility in the FUA.....	12
3.2	Strategic objectives for low-carbon mobility in the FUA.....	14
4	Strategies for the Functional Urban Area of Graz.....	15
4.1	Short-medium term strategy.....	15
4.2	Long-term strategy.....	18
5	Low-carbon mobility actions for the Functional Urban Area of Graz.....	19



1 Introduction

Graz and its surroundings are still growing year per year. Already in the early 1990s, within the project ‚Space for People‘, the City of Graz decided to change the mobility behaviour from the former car orientation of the 1960s to ‚soft mobility‘ as a new and general guideline for the future.

Soft mobility represents a political concept promoting walking, cycling and the usage of public transport as forms of sustainable, eco-friendly, socially acceptable and safe means of transport. Soft mobility provides improvements for inhabitants, the environment and transport safety. This requires regulatory measures that limit motorised traffic to a necessary level and prevent car trips manageable with ‚soft‘ possibilities.

However, hyper-urbanisation, climate change, and demographic and societal changes are some of the trends that have put pressure on the transport network in Graz and set obstacles to door-to-door mobility. Technological breakthroughs can tackle many of the problems, and produce novel mobility services that could contribute to seamless mobility.

Society is moving towards an era where everything is a service. People’s needs and expectations will continuously become more demanding and fragmented, while the resources for developing transport systems are decreasing. New technologies enable travellers to take a more dynamic, proactive role as a developer and data producer in the transport system. The user will no longer be the only consumer in the transport system. Instead, the whole transport system will be generated together with and by the people.

The actions outlined in Chapter 5 are the results of a governance process, initiated by the City of Graz / EU-Programmes and International Cooperation Unit in accordance with the department for traffic and transport planning.

Not only experience, but also good and long-standing practice, shows, that a cooperation with other departments of the City administration, and beyond, lead to the best results. It is because of such a holistic approach of governance that the acceptance of proposed actions is high and that all involved departments and other important stakeholders do have a feeling of ownership. Therefore, the main aim of this Action Plan, and its respective actions, were elaborated and developed in close cooperation with the department of Traffic Planning, the department for the Environment, as well as with the Regional Management Metropolitan Area of Styria, under the moderation and coordination of the EU-Programmes and International Cooperation Unit of the City of Graz, as partner of the SOLEZ project.

The goal of this Action Plan for Graz is to identify, and agree with key stakeholders and other interested parties, a set of concrete actions that can contribute to improve sustainable mobility and transport in Graz and its FUA (Functional Urban Area) in the next five years.





2 Baseline scenario for the Functional Urban Area of Graz

2.1 Mobility planning and sustainable energy plans

Mobility Planning

The regional traffic concept (**Regionales Verkehrskonzept RVK, 2010**¹) is based on the general traffic concept of the state of Styria (**Steirisches Gesamtverkehrskonzept STGVK 2008+**²), the regional general principle (**Regionales Entwicklungsleitbild 2014+ der Region Steirischer Zentralraum**³) and the regional development programme (**Regionale Entwicklungsprogramm REPRO**⁴). The regional traffic concept (RVK) is of special importance, as it treats both, ‚trend‘ (estimated development w/o increased sustainable measures), and ‚Space and environment complying environmental standards‘ (aspired, demanding further sustainable development for traffic and spatial planning).

Although it is **not compulsory for Austrian cities to have a Sustainable Urban Mobility Plan (SUMP)** in place, some cities have compiled transport plans, which include certain elements and/or variations of the SUMP approach. In Graz, the ‚Transport Policy Guidance Note 2020‘ (**Verkehrspolitische Leitlinie 2020**)⁵, and the ‚Mobility Scheme for Graz‘ (**Mobilitätskonzept 2020**)⁶ together form the ‚Mobility Strategy of the City of Graz‘.

Sustainable Energy Planning

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- 1 RVK Graz Graz-Umgebung, accessed June 06, 2018, <http://www.verkehr.steiermark.at/cms/beitrag/11293415/11160874>
 - 2 Steirisches Gesamtverkehrskonzept 2008+, accessed June 06, 2018, http://www.verkehr.steiermark.at/cms/dokumente/10911747_11160763/4425550b/Steirisches%20Gesamtverkehrskonzept%202008%2B.pdf
 - 3 Regionales Entwicklungsleitbild 2014+ der Region Steirischer Zentralraum, accessed June 06, 2018, http://www.landesentwicklung.steiermark.at/cms/dokumente/12636806_142543737/3da50ee3/Leitbild_Zentralraum_2014_Langfassung.pdf
 - 4 Regionale Entwicklungsprogramme Steiermark 2016, accessed June 06, 2018, <http://www.landesentwicklung.steiermark.at/cms/beitrag/12644779/141975702/>
 - 5 Mobilitätsstrategie der Stadt Graz – Verkehrspolitische Leitlinie 2020, accessed June 06, 2018, https://www.graz.at/cms/dokumente/10191191_8038228/e0105636/Verkehrspol_Leitlinie_einzelseiten_klein_neu.pdf
 - 6 Mobilitätskonzept 2020, accessed June 06, 2018, https://www.graz.at/cms/dokumente/10191191_8038228/e8c23751/Ziele_einzelseiten_klein.pdf (targets)
https://www.graz.at/cms/dokumente/10191191_8038228/1bfae640/vprl_web_final.pdf (planning policy), and
https://www.graz.at/cms/dokumente/10191191_8038228/46b25ed3/20150622_ENDBERICHT_MO KO2020_MASSNAHMEN_BESCHLUSSFASSUNG_NOV.2015.PDF (measures)



Obstacles standing in the way of rational energy utilisation can be overcome with the help of energy services that include financing schemes. At present, however, these innovative models are still largely unknown and their potential is far from being fully utilised.

However, there are two major pillars in climate policy in the Federal Province of Styria. **Climate protection and climate change adaptation.** Climate protection pursues the reduction of greenhouse gas emissions in the atmosphere in order to counteract further warming.

In the spring of 2009, the Federal Province of Styria began to develop a comprehensive climate protection plan for the province. Numerous stakeholders from politics, science, NGOs, associations and environmental organisations were involved in the development process. Since 2010 the climate protection plan Styria - Perspective 2020 (**Klimaschutzplan Steiermark**)⁷ is the action plan for the implementation of climate protection activities in Styria. The 26 measures in relation to mobility are of special importance.⁸

After industry, the transport sector is the second largest issuer of greenhouse gas emissions in Styria⁹. The development of emissions between 1990 and 2007, with an increase of 51 percent, also shows that there is a tremendous need in this sector to achieve the reduction targets for GHG emissions for 2020 and beyond by 2030. The aim is to avoid the ‚forced mobility‘ due to grown structures (such as the structure of space) and to make use of new mobility concepts (such as flexible mobility services and a secure integration of private and public transport). In addition, attractive future technologies are already available, which are to be embedded in an overall transport concept.

According to the thematic objectives of the Energy Masterplan of the City of Graz (**Energiemasterplan Graz**)¹⁰, the City of Graz had committed to reduce its own energy consumption in the building sector, based upon the average for the years 2004 through 2008, by 30 percent by the year 2020.

7 Klimaschutzplan Steiermark, accessed on June 06, 2018, http://www.umwelt.steiermark.at/cms/dokumente/11514048_75236689/a74a6e78/KSP-Steiermark-201101-low.pdf

8 26 Maßnahmenbündel für eine zukunftssichernde klimapolitik in der steiermark – Mobilität, accessed on June 06, 2018, http://www.umwelt.steiermark.at/cms/dokumente/11514048_75236689/cb6159f0/Band_3_Mobilitaet_201008.pdf

9 Umweltbundesamt (2009): Anderl, M.; Gangl, M.; Guele, B.; Ibesich, N., Köther, T., Muik, B, Poupa, S.; Pazdernik, K.; Schodl, B.: Bundesländer Luftschadstoff-Inventur 1990-2007. Datenstand 2009, Report, Bd. REP-0238, Wien.

10 Energiemasterplan Graz, accessed June 06, 2018, <http://www.umwelt.graz.at/cms/ziel/4849710/DE/>

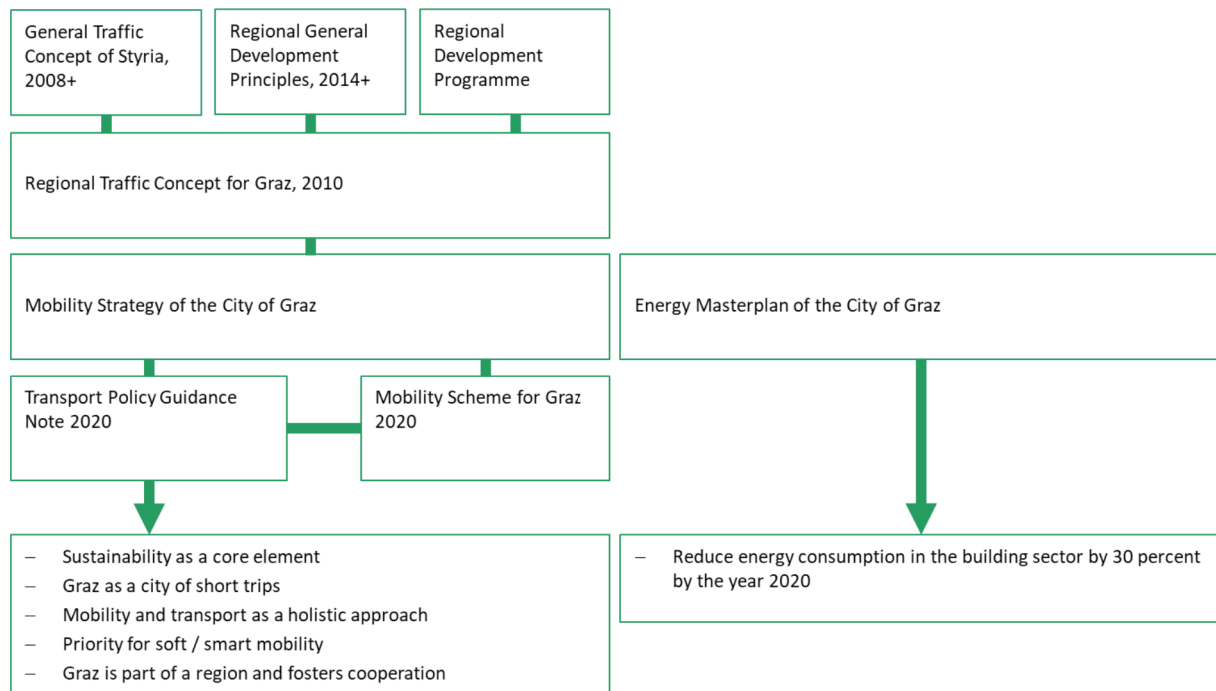


Figure 1: Graz regulations on Mobility Planning and Sustainable Energy Planning

2.2 Push and pull measures at Functional Urban Area level

Push measures: Entering and parking in specific areas

The central core in Graz is reserved for **pedestrians**, but **bicycles** are allowed and the tramway is operating several lines through the zone. Outside this area, new strolling zones have been established. These areas used to be unsafe and unattractive with heavy traffic. Now the pavements have been broadened and roads narrowed to limit car traffic. The space reserved for pedestrians and cyclists as well as for cafés and restaurants has increased. The pedestrian area is the core, and the new strolling zones form a second layer.

Outside of this, Graz was the first European City to decree a citywide **30 km/h speed limit**. The road network in Graz is more than 1,000 km long, (not including high-ways within the city limits), of which more than 2/3 of the total are designated 30 km/h zones. Only main roads are 50 km/h zones. The introduction of 30 km/h zones proved to be the most hotly discussed step on the way towards 'soft mobility'- but at the same time, the most effective. This 'deceleration' policy improved the quality of life in Graz and increased traffic safety enormously. In front of schools, the risk of accidents has halved due to the introduction of 30 km/h zones. Here, the risk of fatal accidents has decreased by up to 90 percent.



With a few exceptions, no short-term **parking** is allowed within the inner city area, although, short-term parking is allowed at the inner city outskirts. According to an evaluation carried out in the year 2015, the city operates a parking management scheme with ca. 26,200 parking spaces, of which 14,400 are in the blue zone (short-term) and 11,800 in the green zone (long-term).

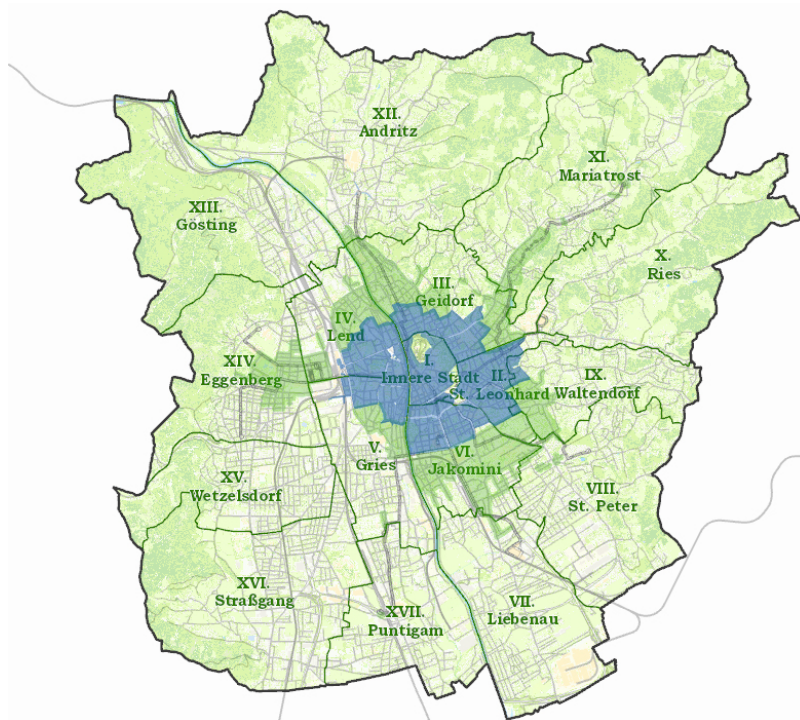


Figure 2: Parking zones in Graz (2018)

Parking privileges for low-emission vehicles were changed in 2013 because advancing technology brought too many vehicles below the agreed threshold. Electric and plugin-hybrid vehicles continue to be exempt from parking fees.

The revenue earned from parking tickets / fines (although, reduced by the costs of monitoring) is earmarked to support the expansion and improvement of the quality of public transport. These improvements are primarily in relation to service frequencies, as well as mobility management measures (e.g. mobility consultants) and improving passenger waiting conditions (stops expansion / canopy / passenger information). In parallel, as a result of the actions mentioned above, there were also significant investments for improving the system by establishing a comprehensive system of parking ticket machines.

In 2014, the City of Graz generated EUR 24.8 million via parking-space management. EUR 18.6 million were taken from charges, the rest from penalties. Taking into account costs for monitoring, staff and maintenance of the parking machines, around EUR 3.8 million remained and was used for traffic measures such as Park and Ride, mobility checks or more frequent and extended bus traffic.



Simultaneously to the introduction of the short-term parking area around the old town area, the construction of (underground) parking garages were implemented. With the opening of these parking garage, a reduction of surface parking lots was realised.¹¹

Pull measures: Sustainable mobility services in operation

Graz has a comprehensive strategy for promoting soft mobility modes through investments in **cycling** infrastructure and information campaigns. The city's cycling network is composed of 123 km of cycle lanes, in addition to 800 km of bike-friendly 30 km/h zones. There are several permanent counting metres all over the city that monitor the use of bicycles. Furthermore, there is a monthly cycling event called Grazer CityRadeln (Graz Residents' City Bike Ride). Graz has the worldwide largest contiguous pedestrian area (6 percent of the inner city) and privileges pedestrians at traffic lights.

In Graz, the public authorities that have competences in **public transport service management** and control are the City of Graz and the Federal Province of Styria. The operator active in public transport service provision is Graz Holding (a 100 percent daughter of the City of Graz), respectively, the third party is the Styrian Association of public transport. Public transport information is fed with data from local transport suppliers and the Federal Austrian railway. Furthermore, position of trains can be seen on the train radar¹² for the transport of goods the Austrian train-service has an internally used tool relying on the same technology for the scheduling.

Graz has a **e-car sharing** offer called tim¹³ (täglich-intelligent-mobil), which is operated by Holding Graz. Currently, seven tim-stations are in operation, which are situated as intermodal mobility-hubs offering an interface for different means of transport. Currently, the EFRE-funded project REGIOtim is working on up to 10 additional stations in the FUA of Graz.

Regarding **bike sharing**, a new bike rental system was launched in Graz (August 2012). Graz Bike enables tourists and residents alike to use a variety of bicycles for many purposes. Graz Bike is a rental system built upon an already existing pool of bikes for hire from which customers can select the right bicycle for their purpose. It supplements this pool with new and different types of bicycles, all in a unified design. Users can choose from city bikes, e-bikes, trekking bikes, kids' bikes and cargo bikes. Regarding carpooling, there is no public carpooling service available.

Graz Hauptbahnhof is the main **railway** station in Graz. The station is located some 2 kilometres west of the city centre, to which it is connected by the tram. The station serves as a major node on the Southern Railway, which links it to Vienna in the north and Slovenia in the south. It is also the terminus of the Styrian Eastern Railway, which runs eastwards towards Hungary, and of the local Köflacherbahn to the west. In future, the Koralm Railway will provide a direct link from Graz to Italy via Klagenfurt. A new local transport hub for trams and buses has been built on and under the station

11 EPOMM, accessed June 15, 2018
http://www.epomm.eu/newsletter/v2/content/2017/0217/doc/cs10_pp_push_measures_graz_final.pdf
12 Zugradar, accessed June 06, 2018, <http://zugradar.oebb.at/bin/help.exe/dn?tpl=livefahrplan>
13 tim car-sharing, accessed June 06, 2018, www.tim-graz.at



forecourt to connect all four-tram lines to the station which run through the local area. For commuters and for those who are going shopping the tramway line no. 4 was lengthened in 2007 by about 1,3 km now leading up to the shopping center Murpark in the district of Liebenau. The train station Don Bosco is an important hub for commuters from the south and east and is used as a backbone for the main railway station. This hub is also part of the newly build ‚Koralmbahn‘ an important part of the Baltic-adriatic axis (Pan-European corridor PP23), which is currently under construction and will serve the connection Graz to Carinthia, inter alia through the longest Austrian train tunnel up to now.

Regarding **Park and Ride** facilities, the City of Graz offers currently ten Park and Ride facilities with a capacity for 2,124 cars¹⁴. There is also the offer for combined mobility with the ‚Kombi-Ticket‘, for the user of the Park and Ride with a reduced fare for the public transport¹⁵.

2.3 Main critical issues and bottlenecks of mobility in the Functional Urban Area

At **national level**, Austria does not have currently any regular Low Emission Zones (LEZs), but a number of Provinces and cities have LEZs for lorries, and Federal Province of Tyrol has a ‚Highway Low emission Zone‘ and various other schemes in operation on the A12 motorway to reduce the pollution.

At **regional level**, the Air Pollution Act (**Immissionsschutzgesetz-Luft**)¹⁶ regulates traffic measures, like spatial and temporal restrictions on movement of heavy vehicles for all or only certain types. At regional level, the governor can issue regulations to encourage the reduction of air pollutants from vehicles. These regulations may provide for speed reductions, night driving bans and polluting trucks bans. The LEZ in Styria covers a large part of its area.

At **local level**, the City of Graz does not operate a Low Emission Zone, because 70 percent voted against it in a local referendum in 2012. Nevertheless, a LEZ for lorries has been operating in Graz for several years, actually obliging them to comply with Euro III emission standards since 2014. Emission regulations regarding non-road mobile machinery require national legislation. Such legislation has been in place since 2011 and became legally binding in 2013. Called the ‚Offroad-Verordnung‘¹⁷ (ordinance), this implements an incremental tightening of emission requirements for mobile machinery above 18kW between 2013 and 2019. Depending on the power of the machinery, specific Euro standards are compulsory. Finally, from 2019, Euro IIIa or higher will be compulsory for all

14 P+R in Graz, accessed June 06, 2018, <http://www.parken.graz.at/cms/beitrag/10176964/4203641>

15 Combined ticket for P&R, accessed June 06, 2018,
<http://www.parken.graz.at/cms/beitrag/10176969/4203706>

16 (Immissionsschutzgesetz-Luft (IG-L), accessed June 06, 2018, <https://www.bmnt.gv.at/umwelt/luft-laerm-verkehr/luft/richtlinien/ig-l.html>

17 IG-L Off-Road Verordnung, accessed June 06, 2018, <http://www.offroadverordnung.at/>



machinery in order to have access to cities. New machinery purchases need to meet diesel Euro IIIb standards as the minimum requirement.

Apart from that, the city's dense public transport system consists of trams, buses and commuter trains. The city has Europe's largest pedestrian zone and has been active in promoting public transport as well as cycling and walking, in particular in recent years. However, the share of private motorised transport is still very high and continues to be a major source of air pollution. Graz has problems complying with EU limits for the CO₂ annual mean value: the traffic station Don Bosco, for example, has not shown a reduction trend, but has fluctuated between 51.3 and 47.2 µg/m³ since 2008. Graz also monitors high NO_x annual mean values for the background station of about 33 µg/m³ on average.

In addition to these, also the critical issue on **commuting within the Federal Province of Styria, as well as Graz and its FUA** needs to be added. About 60 percent of Styrians commute. There are more than 340,000 commuters in Styria, according to a 2013 published commuter report. About 60 percent of employees do not work in their home town, but commute between home and work. With the commuters, the city of Graz is at the top. A logical consequence, since 50 percent of the Styrian workplaces are located in the Graz area.

According to ,Stadtregion.at'¹⁸, a project of the Austrian Association of Cities and Towns and KDZ, the Centre for Public Administration Research, more than 257,000 people commute each day to Graz and its FUA, of which 203,000 commute to the city centre of Graz and its closest neighbouring communities (see also next figure).

18 Stadtregion.at, accessed June 14, 2018, <http://www.stadtregionen.at/graz/mobilit%C3%A4t>

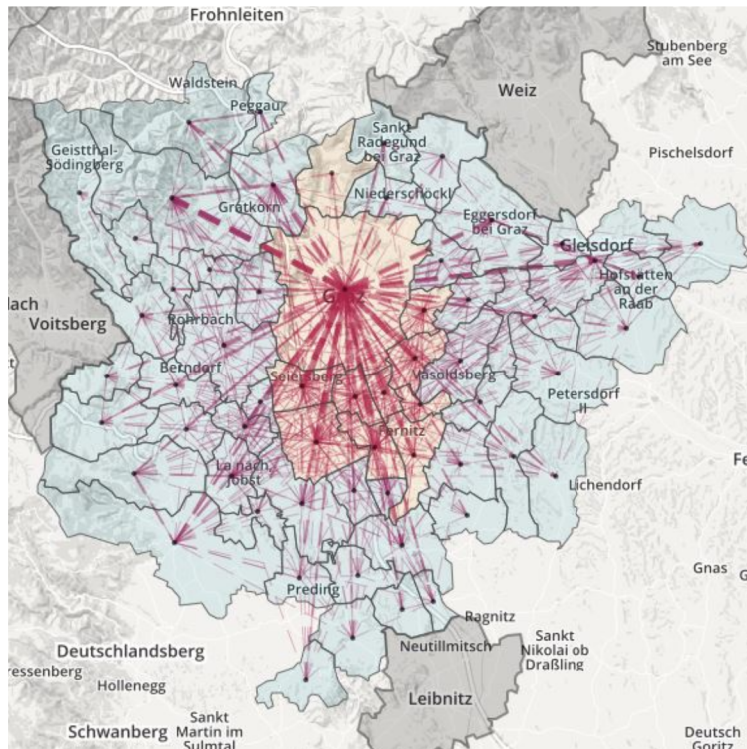


Figure 3: Commuters to Graz and its FUA, and vice versa

All these points can be seen as the major **weaknesses**, in addition to the fact that no congestion charge is carried out, respectively, the city misses bus lanes for commuters that are not being able to be served by the rapid-transit system. Based on this, the main **threats** are the discussion about environmental zones itself, as they may create a collateral damage regarding the disincentives for non-zero emission vehicles. And additionally, commercial oppose restrictions on access for both, customers and freight operators, out of concern for the competitiveness of the business location Grazer in competition with shopping centers and specialty stores.

3 Reasons and strategic objectives for the Functional Urban Area of Graz

3.1 Opportunities for sustainable mobility in the Functional Urban Area

The City of Graz has a **radial public transport system** with harmonised tariffs, uniform tickets and harmonised timetables for the city and the province as a whole. Graz was the first city in Europe to implement a speed limit of 30 kilometres per hour for the entire city (with the exception of major roads). The city centre features many pedestrian zones and the city administration has dedicated great efforts to promoting cycling. Graz was the first Austrian city to open a mobility centre. The city has also started to convert the public bus fleet to run on more environmentally friendly bio-diesel



and started to test e-buses in line operation. There is still great potential in the field of transportation for sustainable development.

In 2013, Graz had a **modal split** of 46.8 percent motorised individual transport, 19.8 percent public transport, 14.5 percent cycling and 18.9 percent walking. The city operates the ‚30/50‘ speed limit model since 1992 with 50km/h on main roads (of which there are about 200km) and 30km/h on all non-main roads (about 800km). There have also been speed limits on the highways since 2008 depending on the emission situation. Graz has a relatively good public transport system with 8 tram lines and 48 bus lines, and further 8 bus lines operating during the night. By 2021, the city aims to reduce the share of cars to 37 percent, to increase the share of public transport to 24 percent, of cycling to 20 percent and to stabilise the share of walking at 19 percent.

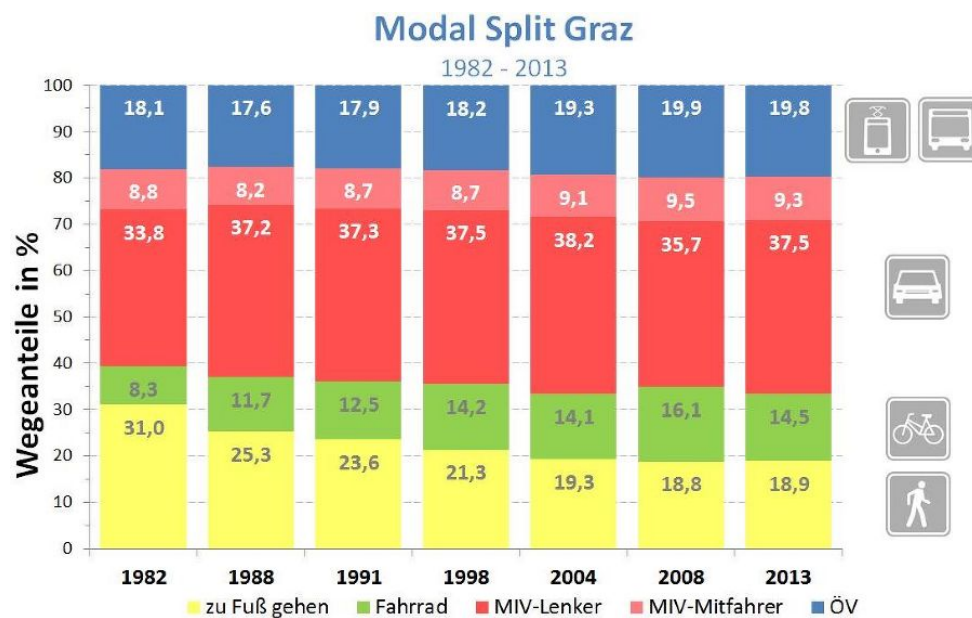


Figure 4: Modal Split in Graz (2013)

When it comes to **transparency and communication policy**, the city of Graz provides a website on air quality with some background information on air quality, legislation and current values of pollutants at all monitoring stations in the city. There is a particulate matter traffic light to give citizens an easy overview of current air quality in the city. A direct and personal contact to the city's air pollution department is provided. Some information on the city website is linked to the Styria region's website on air pollution. The latter provides live information on air quality and comprehensive background information on air pollutants. Long-term data time series can be downloaded from an extensive database called LUIS. Citizen participation has a long tradition in Graz, that started with veto initiatives in the 1970s (the first initiative stopped the planned construction of a motorway through a residential neighbourhood). Today, the municipality offers a broad variety of possibilities and opportunities to engage and participate for the civil society (for example an Unit for Citizens'



Participation', an Advisory board for citizen participation, etc). Findings from citizen participation processes in Graz underline that the further development of participation needs consistency and reliability. Therefore, the 'Guidelines for citizen participation'¹⁹ in Graz aim to foster and ensure transparent information on urban projects as early as possible, a binding approach to participation processes and high-quality of participation processes. The guidelines should also contribute to a new culture of dialogue. Participation concepts that are suitable for each project enable both classic as well as innovative and creative methods of participation. Additionally, there is an independent platform called 'More time for Graz'.

The main **strengths** that have been identified, are the PM₁₀ and CO₂ targets that are set out in the local transport policy, as well as the long tradition of Graz in Mobility Management. This is also reflected in the main **opportunities**, such as the high amount of commuters from the Functional Urban Area (FUA) and beyond. Therefore, the potential to improve the air quality significantly is one of the main reasons for innovative sustainable mobility measures for both, the transport of people and goods.

3.2 Strategic objectives for low-carbon mobility in the Functional Urban Area

The overall objectives are derived from the 'Transport Policy Guideline 2020', which stipulates **a shift of ratio between motorised private transport and environmental friendly mobility** from 45:55 (2008) to 37:63. The aim is not to restrict the mobility of the inhabitants of Graz, but a shift of the shares of motorised vehicle traffic to public transport, cycling and walking.

In order to monitor the extent to which the desired development of urban mobility has been achieved, the number of inhabitants who have a facility of daily necessity within walking distance (300m) to their place of residence is used. The close proximity to groceries, childcare facilities for children up to 10 years and a public transport stop are important factors that influence car ownership of the inhabitants of Graz. The number of residents within walking distance to these facilities was calculated on the basis of the Graz walking network. However, the objectives for the mobility are not only dependent on the implementation of measures from the transport sector, but are closely linked to urban and settlement developments: the creation of compact housing structures, ie the prevention of urban sprawl and the facilitation of structurally balanced intermixing of mutually compatible uses.

For the monitoring, variables according to the satisfaction with the individual traffic types as well as the air quality in Graz and its FUA are measured. At the present time, the assumed target values are assumptions, since only partial comparative figures from previous surveys are available.

¹⁹ Leitlinien für die BürgerInnenbeteiligung bei Vorhaben der Stadt Graz, accessed June 14, 2018, https://www.graz.at/cms/beitrag/10244969/7755171/Leitlinien_fuer_BuergerInnenbeteiligung.html





4 Strategies for the Functional Urban Area of Graz

As said before, and as a baseline for the strategies for Graz and its FUA, the Transport Policy Guidance Note 2020, and the Mobility Scheme for Graz together form the Mobility Strategy of the City of Graz. Additionally, it is important to mention the Regional traffic concept for Graz and its Functional Urban Area, which formulates three guiding principles.

Mobility Strategy of the City of Graz		Regional traffic concept
Transport Policy Guidance Note 2020	Mobility Scheme for Graz	
Aims 1. Sustainability as a core element 2. Graz as a city of short trips 3. Mobility as a holistic approach 4. Priority for soft / smart mobility 5. Graz as part of a region	Targets 1. Quantifiable targets as basis for measures 2. Overarching and qualitative targets 3. Evaluation all 5 years 4. Targets independent from city development 5. Obligation to report back to the city council	Guiding principles 1. Securing mobility for all 2. Increasing quality of life and environment 3. Securing financial resources to implement regional transport and mobility concept

Hence, these considerations are not only relevant for the core city of Graz, but also affects the whole Functional Urban Area.

4.1 Short-medium term strategy

The period for short and medium-term strategies on transport and mobility in the City of Graz are defined from 2008 to 2021, with the overarching objective to shift the ratio between motorised individual traffic and more sustainable mobility from 45:88 (2008) to 37:63 (2021). The aim is not to restrict the mobility of the people of Graz, but to shift the share of motor vehicle traffic towards public transport, cycling and pedestrian traffic.



Target	2008	2021
Shift ratio between motorised individual traffic and more sustainable mobility	45:55	37:63
Increase modal split of public transport	19,9%	24%
Increase modal split of cycling	16,1%	20%
Stabilise modal split of walking	18,8%	19%
Reduction of commuting by car	45%	40%
Reduction of car trips of Graz' residents	360,800	330,900
Increase occupation rate per car	1,27	1,5
Reduce road accidents with personnel injuries	2.036	-40%

Of special interest is the Transport Policy Guidance Note 2020 that determines the implementation strategy according to the following five aims:

1. **Sustainability as a core element:** Sustainable mobility has to be coordinated with a look at its impact on society, the economy and the environment.
2. **Graz as a city of short trips:** New housing structures in the surrounding areas and shopping centres in the periphery not only raise demand for more motorised vehicles they also attract motorised traffic flows. An intervention through spatial planning policy is needed here to provide the necessary infrastructure and enable shorter trips.
3. **Mobility and transport as a holistic approach:** The transport policies of past decades have been rather sectoral: the types of traffic were developed for its own and neglected reciprocal interactions and supplements. The goal is to offer a holistic consideration of the reciprocal relations between modes of transport, including the city limit.
4. **Priority for soft / smart mobility:** Soft mobility represents a political concept promoting walking, cycling and the usage of public transport as forms of sustainable, eco-friendly, socially acceptable and safe means of transport. Soft mobility provides improvements for inhabitants, the environment and transport safety. This requires regulatory measures that limit motorised traffic to a necessary level and prevent car trips manageable with 'soft' possibilities.
5. **Graz is part of a region and fosters cooperation:** Due to its location, the City of Graz has only limited possibilities and competences, to steer the traffic in the city. Graz is the core city of the Styrian conurbation, and relies on cooperation in mobility policy to achieve its objectives.

The following provides an overview on the main strategies in regards to considered transport modes.

Pedestrians

- Consideration of pedestrian friendly pavements when building new streets, or when refurbish existing streets
- Design of traffic areas for pedestrians without structural separation from motor vehicle traffic



- Crossing facilities

Cyclists

- Update of main cycling routes
- Continuous maintenance of the street space
- Special consideration of cycling in the course of construction site coordination
- Organisation and dimensioning of cycling facilities
- Update bike path structures
- Management of bicycle facilities at tram stops
- Consideration of bicycle traffic in the intersection and knot area or in the case of land accesses
- Arrangement and number of cycle-park facilities

Public transport

- Selection of the stop style
- Own track body and bus lane
- Design of bus stops
- Design of tram stops
- "Clearance provisions" of Holding Graz lines for trams
- Kassel special curb for stops
- Equipment for public transport stops
- Traffic calming measures on public transport routes

Motorised traffic

- Parking facilities

Traffic calming

- Shared Space
- Greening the space

Multi-modal hubs

- Lightning
- Property accesses and commercial access

Carriageway drainage

- Surface drainage in new plants
- Property accesses and commercial access

Mobility Management

- Mobility Management for new residential areas
- School Mobility Management
- Company Mobility Management



4.2 Long-term strategy

The Mobility Scheme for Graz provides the following **‘Vision 2050: The sustainable city work living in’**, which has been developed within the project **‘I live Graz – smart people create their smart city’**.

Graz is a dynamic city with compact development and mixed urban use, with attractive public space and an extremely high quality of life. By rigorously pursuing Smart City strategies and creating a broad awareness, it was possible to reduce consumption of resources and energy and associated pollutant emissions significantly, and to take major steps towards realising a zero-emission city. 100 percent of energy required in Graz is generated in the region and from renewable sources. As a city of research, qualification and business, Graz is an international touchstone for value creation by means of innovative urban technologies and systems.

Mobility in Graz in the year 2050 ensures that activities are carried out with the least possible use of resources while at the same time promoting social contacts. An ideal local supply of goods, services and leisure facilities together with an urban structure of short distances for pedestrians, cyclists and public transport ensure not only a low consumption of resources but also a freely motivated mobility. A substantial part of the areas occupied by the individual car traffic has been recaptured for citizens' residency functions. The changed offer allows for a fundamental change in the choice of transport in the urban and regional areas.

This Vision 2050 also establishes quantitative indicators that allow an evaluation of the intermediate states on the way to the goals achieved. For the modal split, starting from the initial value of 45 percent share of journeys in motorised private transport, a target value of 17 percent in 2050 is set.

For local public transport, the proportion of people who can reach a public transport stop on foot is a measurable indicator. It is envisaged that this will raise from, currently, 63 percent to more than 90 percent in 2050. This requires strict adherence to spatial planning requirements as well as the consolidation of the network.

Achieving such ambitious goals requires continuous work. In order to achieve such goals, no measures that are contrary to these objectives must be taken in the short or medium-term, and there must not even be ‘breaks’ in development along this path.



5 Low-carbon mobility actions for the Functional Urban Area of Graz

The following tables provide an overview on **short-medium term and long-term actions** that are considered as useful for boosting low-carbon mobility in Graz and its Functional Area in a short, medium and long term period. The assessment of these actions take seven specific questions into account:

1. What? Action description
2. Why? Addressed strategic objectives and goals
3. Where? Territorial area(s) for action implementation
4. When? Timing for action design and implementation
5. Who? Assigned responsibilities within Public Authorities
6. How? Key stakeholders to be involved
7. How much? Assigned resources (human, knowledge, funding sources)

The Action 01 (Feasibility Study for transforming the mobility offer in a MaaS-system) will be supported through the SOLEZ project becoming a Pilot Activity. Action 02 (Implementation of a MaaS-system in Graz and its FUA) is directly linked with Action 01, but will not be directly supported by SOLEZ. The other Actions described in following are recognised as important and desirable for Graz and its FUA, but will also not be directly supported by SOLEZ.



Action 01	Feasibility Study for transforming the mobility offer in a MaaS-system
What?	A feasibility study will be carried out in order to investigate, if, and under what circumstances, the implementation of MaaS could be a feasible solution for a more environmental-friendly mobility in the city centre of Graz and its FUA, as well as to reduce emissions, resulting from commuting to the City of Graz, respectively its FUA.
Why?	<p>The most fundamental impediment to start a sustainable transformation in many cities is often not the lack of solutions or planning skills but rather a missing culture for innovation and overarching cooperation. Therefore, a broad and stable long-term commitment is a prerequisite. Politicians and all local actors/stakeholders should be pulling in the same direction, formulate a strong vision, adopt effective strategies, overcome barriers for action, and make significant progress in the development and implementation of the sustainable mobility actions.</p> <p>With this feasibility study, it should be determined to what extent, with what means and in what time a MaaS concept can be realised. In particular, since the implementation of a fully integrated MaaS ecosystem requires, in addition to technological innovations, a clarification and definition of legal and transport policy framework conditions should be included in this study. This will also measure possible effects on the mobility system and on innovative business models and new forms of organising transport and mobility in Graz and its FUA. The feasibility study should be combined with a risk analysis, which can serve as a basis for subsequent risk management. Criteria and priorities for feasibility should already be determined at the beginning of the investigations, since otherwise a weighting of advantages and disadvantages as well as the comparison of problems and solution approaches can hardly be realised afterwards.</p>
Where?	Graz and its FUA
When?	September 2018 – March 2019
Who?	<ul style="list-style-type: none"> • Coordination: City of Graz, EU-Programmes and International Cooperation Unit • Involved: City of Graz (Transport Planning Dept, Environmental Dept), Regional Management for the Metropolitan Area of Styria • External expert: M21 International • Organisation that prepares the feasibility study: IZT
How?	<ul style="list-style-type: none"> • City of Graz (Transport Planning Dept, Environmental Dept) • Regional Management for the Metropolitan Area of Graz • Holding Graz • Province of Styria
How much?	Subcontract for preparing the feasibility study (IZT): EUR 54,000.00



Action 02	Implementation of a MaaS-system in Graz and its FUA
What?	Based on the feasibility study, the city of Graz, in cooperation with its FUA and all other relevant stakeholders, will implement a MaaS-system, taking into account the current available mobility offer, but also the future trends of transport and mobility.
Why?	The transport sector is entering a period of significant change, with new technologies, products and services fundamentally shifting people's expectations and opportunities – and the market for intelligent mobility is rapidly developing. Customers, transport authorities, businesses and governments understand the huge potential of mobility opportunities as part of a wider, integrated system. There is a global discussion on how digitalisation, new technologies and the increasing connectedness of people are potentially changing the transport sector in a fundamental way. Mobility platforms will integrate transport modes and the possibility for people to purchase ‚mobility packages‘ granting access to public transport, bike-sharing, car sharing and taxis at the same time.
Where?	Graz and its FUA
When?	June 2019 – June 2020
Who?	<ul style="list-style-type: none"> • Coordination: City of Graz, EU-Programmes and International Cooperation Unit • Involved: City of Graz (Transport Planning Dept, Environmental Dept), Regional Management for the Metropolitan Area of Graz
How?	<ul style="list-style-type: none"> • City of Graz (Transport Planning Dept, Environmental Dept) • Regional Management for the Metropolitan Area of Graz • Holding Graz • Province of Styria • Regional public transport providers
How much?	Cities' own funding



Action 03	Boosting the public transport offer in Graz and its FUA
What?	In the future, public transport will have to be the backbone of every urban (and sub-urban and rural) mobility and thus forms the basis for multimodal traffic management. The realization of this goal requires a comprehensive public transport offensive.
Why?	<p>Long-term financing model: It is important to secure the development projects for the public transport infrastructure.</p> <p>Network expansion and timetable offer: Future urban development requires the timely implementation of a long-term network strategy and supply chain. In line with the objectives of the city of Graz, the tram has a special role, especially with regard to network expansion.</p> <p>Punctuality: The punctuality of public transport is a key quality criteria for the user. In the entire public transport network, appropriate measures must be taken to ensure compliance with the timetable. This measure is not only of importance to the user, but is also associated with economic benefits for the operator or taxpayer.</p> <p>Connection security: In addition, especially in times with longer timetable intervals (period evening and night), the securing of connections for transfer connections plays a major role. The prerequisite for this is that a high degree of punctuality is guaranteed.</p> <p>Convenience and marketing: In order for the provided public transport offer to be perceived and used appropriately, a corresponding application of the ‚product public transport‘ is necessary. This also means that a contemporary comfort of the entire system is guaranteed.</p> <p>Environmental standards of vehicles: The positive image of public transport also includes compliance with environmental standards by the vehicles used, such as noise emissions and air pollutant emissions.</p>
Where?	Graz and its FUA
When?	Continuous
Who?	<ul style="list-style-type: none"> • City of Graz (Transport Planning Dept, Environmental Dept) • Holding Graz • Regional public transport providers
How?	<ul style="list-style-type: none"> • City of Graz (Transport Planning Dept, Environmental Dept) • Holding Graz • Regional public transport providers
How much?	Cities‘ own funding



Action 04	Awareness raising for sustainable transport and mobility
What?	People who are receiving increased public attention (politicians, civil servants, teachers, etc.) should be attracted to sustainable mobility.
Why?	<p>Increasing the awareness of environmental effects instead of trivializing: It is necessary to point out the negative environmental effects of motorized individual traffic through professionally informed information.</p> <p>Responsibility for the future: Raising awareness of the long-term negative effects of motorized individual transport and of appealing to the children's future are highly emotional, and this effect should be exploited accordingly.</p> <p>Mobility management in companies: In companies, information on alternative ways to private cars in order to reach the workplace should be intensified. Objective information on car costs and alternative means of transport contribute to a realistic assessment of the decision to choose a means of transport.</p> <p>Promoting tele-working and teleconferencing: Even if these forms of communication can not completely replace direct contact at the workplace, at least a small proportion of commuter routes and passenger transport can be avoided.</p> <p>Mobility management for schools: Awareness raising among children in the sense of sustainable mobility also influences the use of transport within the family.</p> <p>Individual mobility advice: Above all, the occasion of the change of place of residence offers a favorable opportunity for individual mobility counseling. In such a change there is a need to reorganize the overall mobility behavior in the household. At this point in time, comprehensive information on all possibilities of the mobility offer for the essential source / target relationships is particularly important and effective in influencing the choice of transport in terms of transport policy objectives.</p>
Where?	Graz and its FUA
When?	Continuous
Who?	<ul style="list-style-type: none"> • City of Graz (Transport Planning Dept, Environmental Dept) • Holding Graz
How?	<ul style="list-style-type: none"> • City of Graz (Transport Planning Dept, Environmental Dept) • Holding Graz
How much?	Cities' own funding



Action 05	Fostering and enhancing multimodal mobility
What?	<p>Multimodality in the transport sector refers to the use of multiple different types of transport during the same journey. The concept of multimodality applies to both freight and passenger transport and in both cases can now be driven on by the growing trend towards digitalisation. Multimodality takes advantage of the strengths of the different modes, and in combination, can offer more efficient transport solutions for people and goods.</p>
Why?	<p>Promotion of collective delivery services: Collective delivery services eliminates the need to use an own car for the whole chain. This facilitates the decision to use alternative means of transport (especially public transport).</p> <p>Mobility contracts: Mobility contracts between the city of Graz and housing developers should promote soft mobility.</p> <p>Multimodal nodes: Multimodal nodes will allow both easy access to the various modes of transport, as well as facilitating the changeover between different modes of transport.</p> <p>Assessment of performance in urban development concepts: In the course of the compilation of neighborhood concepts, especially in the development planning, the criterion of performance for the overall traffic system plays an essential role.</p> <p>Support for car-sharing concepts: There is a significant relationship between vehicle ownership and vehicle use. By reducing the degree of motorization, use is limited to necessary journeys in motorized private transport.</p> <p>Support for city logistics: Efforts in the field of city logistics avoid unnecessary journeys. First and Lastmile concepts must therefore, be developed and implemented.</p>
Where?	Graz and its FUA
When?	Continuous
Who?	<ul style="list-style-type: none"> • City of Graz (Transport Planning Dept, Environmental Dept) • Holding Graz • Regional public transport providers
How?	<ul style="list-style-type: none"> • City of Graz (Transport Planning Dept, Environmental Dept) • Holding Graz • Regional public transport providers
How much?	Cities' own funding