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Commuting and Work-Related Mobility in the Lower Rhine Valley

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Principal

Subgroup on urban and interurban mobility of the Alpine Convention

Abstract

This paper presents a regional mobility analysis focussing on three areas of interest. First the cross-border commuting relationship in the Lower Rhine Valley, second a city logistics concept for the city of St. Gallen and third the situation regarding mobility management, spatial planning, and combined mobility in work related mobility. Based on the analysis and an identification of best practice examples, recommendations for the area are given. The study was elaborated by Competence Centre for Mobility at Lucerne School of Business, on behalf of the subgroup on urban and interurban mobility of the Alpine Convention.

Keywords

Cross-border commuting, City logistics, Commuting, Work-related mobility, Lower Rhine Valley, Alpine Convention

Citation

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1. Introduction

The subgroup on urban and interurban mobility of the Alpine Convention asked the Lucerne School of Business to produce a detailed analysis of commuting and work-related mobility in the Lower Rhine Valley, i.e. the border region between Austria and Switzerland.

The objectives of the Swiss Contribution were threefold:

1. Analysis of cross-border commuting in the Lower Rhine valley, focusing on the St.Gallen-Heerbrugg-Lindau-Dornbirn corridor, including modal split; analysis of commuter traffic between the city of St. Gallen and its environs; analysis of the relationship between St. Gallen and Vaduz (Liechtenstein).
2. City logistics concept / solution for the city of St. Gallen
3. Analysis of the situation as regards mobility management, spatial planning, combined mobility offers etc.; identification of examples of best practice in the area; recommendations for the area and best practice from other areas

For the first and the second task, the spatial limitations were clearly defined. For the third task, however, the perimeter was chosen by the Lucerne School of Business in order to keep the analysis within reasonable bounds. Both the city of St. Gallen and the Lower Rhine Valley in the Canton of St. Gallen were to be covered. The perimeter will be defined at the beginning of Chapter 2.

2. Commuting relationships in the Lower Rhine Valley

2.1. The Lower Rhine Valley: an overview

The Lower Rhine Valley extends to include Canton St. Gallen in the west and the Austrian province of Vorarlberg on the eastern bank of the Rhine. It therefore covers:

The St. Gallen Rhine Valley

12 municipalities
63,228 inhabitants (2009)
13,673 hectares total area
2,181 hectares construction zone (2009)
18,436 buildings (2009)

The Vorarlberg Rhine Valley

29 municipalities
245,355 inhabitants (2009)
45,574 hectares total area
7,108 hectares construction area (2010)
92,670 buildings (2009)

Source: The Province of Vorarlberg & Canton St. Gallen 2010: based on data from Switzerland's Federal Statistics Office, the Office for Spatial Development and Geoinformation of Canton St. Gallen, Statistics Austria, and the Office of the Provincial Government of Vorarlberg.

In Switzerland, the limitation of the study area followed the Rhine Valley Conurbation Programme. The conurbation programmes are a young but important spatial planning instrument in Switzerland (see glossary for more details). The Rhine Valley Conurbation Programme includes twelve municipalities:

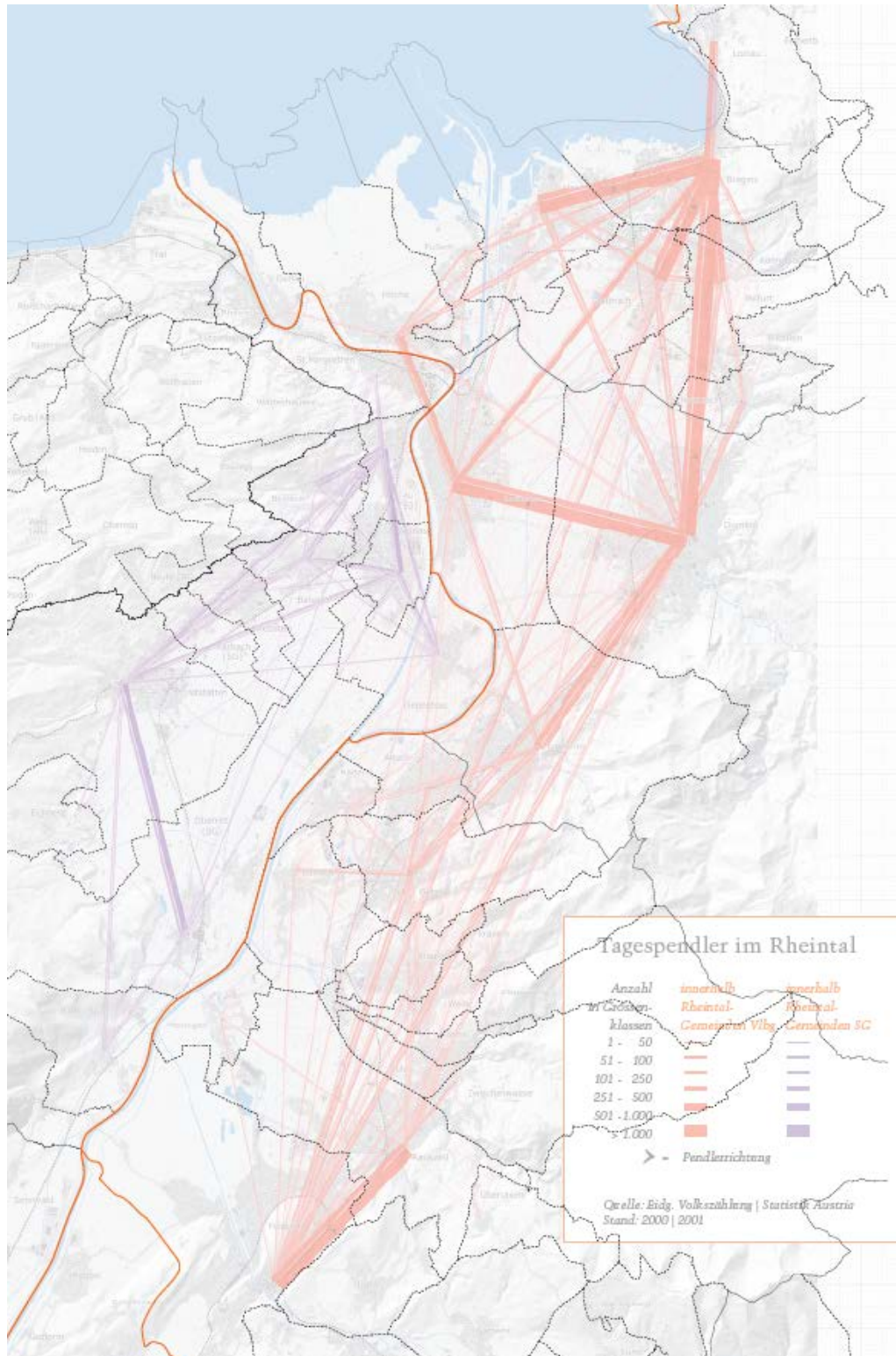
- Au
- Balgach
- Berneck
- Diepoldsau
- St.Margrethen
- Widnau
- Altstätten
- Eichberg
- Marbach
- Oberriet
- Rebstein
- Rüthi

On the Austrian side the definition follows the project perimeter of “Rhine Valley Vision” [Vision Rheintal] with a total of 29 municipalities.

2.2. Domestic commuting relationships in the Lower Rhine Valley

There is intensive commuter traffic in the Lower Rhine Valley. Several thousand people travel daily within and between the two countries to get to their place of work or education. Precise commuter data was gathered most recently as part of the censuses in 2000 (Austria: 2001). In the census, only domestic commuters were included. These are shown in Map 1 on the next page.

Map 1: Internal commuters in the Rhine Valley in 2001



Source: Province of Vorarlberg, based on the 2000/2001 censuses

2.3. Overview of cross-border commuter movements

As far as cross-border relationships are concerned, the most reliable data can be obtained from the relevant cross-border commuter statistics. The EUREGIO Bodensee organisation, which covers the area around Lake Constance, has produced an overview of cross-border commuter movements for this region. These are summarised in Table 1.

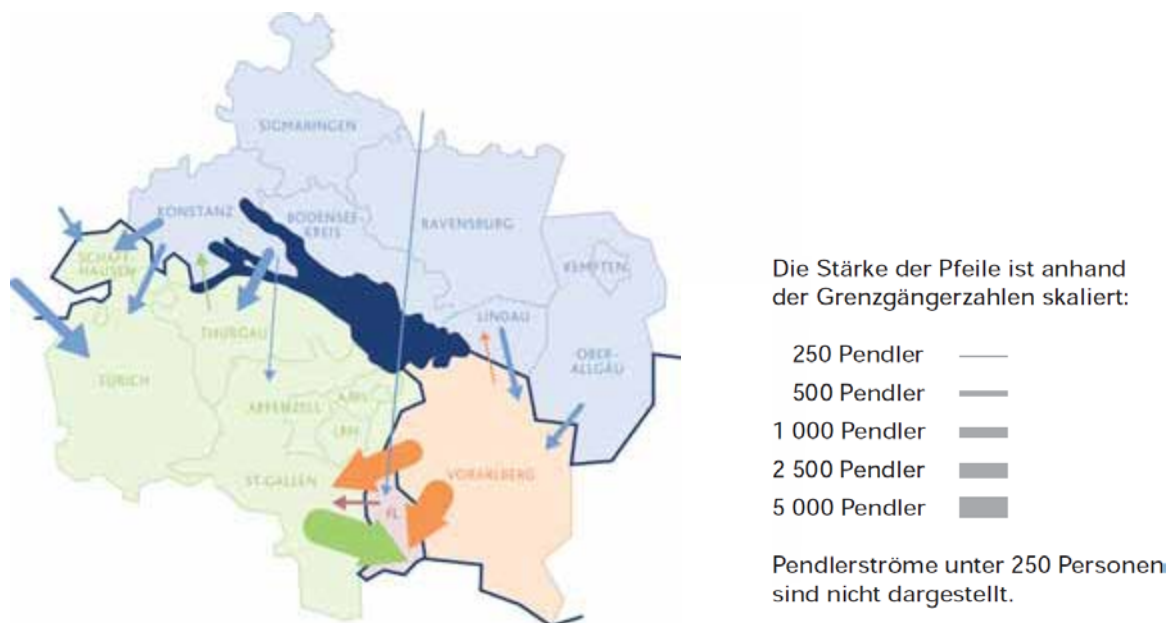
Table 1: Cross-border commuters coming into the Rhine Valley in 2010

	Canton SG	Vorarlberg	Liechtenstein
from Austria	6,180	-	7,500
from Germany	1,100	2,980	8
from Liechtenstein	880	20	-
from Switzerland	-	40	8,940
Total	8,160	3,040	16,448

Source: Huter (2011), p. 23

Intensive cross-border commuter relationships therefore exist from Austria, Germany and Liechtenstein into Switzerland as well as from Austria and Switzerland into Liechtenstein and from Germany into Austria. The figure below shows the situation around Lake Constance. As a result of the origin of the source material it goes beyond the perimeter of this study.

Map 2: Cross-border commuters in REGIO Bodensee in 2010



Source: Huter (2011), p. 22

2.4. Commuters coming into the Swiss Rhine Valley and St. Gallen

Switzerland produces quarterly statistics showing the number of foreigners living abroad who commute to Switzerland. The data is available at municipal level in terms of both starting point and destination. The table below shows the international commuter relationships between Austria and Switzerland for the municipalities in question in the Lower Swiss Rhine Valley. Every day more than 1,000 individuals commute into the target region from each of the three Austrian districts of Feldkirch, Dornbirn and Bregenz. Bludenz is less significant.

Table 2: Austrian commuters coming into the Swiss Rhine Valley

<i>Destination</i>	<i>Starting point</i>				<i>Total</i>
	Bludenz	Feldkirch	Dornbirn	Bregenz	
St.Gallen	13	158	223	213	607
Au	8	249	256	164	677
Balgach	3	166	173	91	434
Berneck	3	39	73	35	149
Diepoldsau	4	154	157	75	391
St.Margrethen	6	51	172	204	434
Widnau	7	120	178	101	406
Altstätten	8	163	64	62	296
Eichberg	1	5	2	2	9
Marbach	1	10	3	5	19
Oberriet	14	210	46	32	303
Rebstein	6	48	35	24	112
Rüthi	11	105	14	14	144
Total	85	1,478	1,396	1,022	3,981

Source: Federal Statistics Office: Swiss Cross-Border Commuter Statistics, 4th quarter / 2011

By far the most important employer municipality in the Rhine Valley is Au. Other important destinations according to the cross-border commuter statistics are Balgach, St. Margrethen, Widnau and Diepoldsau with just under/over 400 inbound commuters. Around 600 commuters go to work or education facilities in the city of St. Gallen. All of these municipalities have big employment zones. Leica Geosystems AG employs more than 900 people in Balgach and numerous specialised firms from the hi-tech sector have established themselves nearby. SFS Holding in Widnau employs approx. 2,500 people at its site and various other companies employ more than 100.

Therefore, around 60% of the Austrians commuting to Canton St. Gallen travel to the St. Gallen Rhine Valley and/or the city of St. Gallen. In the same way, in addition to the Austrians we assume that approx. 600-800 and 500-600 workers from Germany and Liechtenstein respectively commute to the Rhine Valley and/or city of St. Gallen. In total, there are 5,000-5,500 people from southern Germany, Austria and Liechtenstein who make their way to the area under examination every day. This is equivalent to around three quarters of the total of 7,100 (A+GQPV07, p. 87) commuters who travel into Switzerland.

2.5. Detailed analysis of the St. Gallen – Heerbrugg – Dornbirn corridor

Heerbrugg is the name of a historic settlement that is applied nowadays to five municipal areas (i.e. Au, Balgach, Berneck, Widnau and Diepoldsau). An attempt to merge the municipalities into the town of Heerbrugg with 27,000 inhabitants was defeated at the polls in 2007 (wikipedia). The five municipalities have now almost completely grown together (see Appendix 2). As mentioned above, the commuter relationships from Switzerland to Austria are negligible, and we will therefore concentrate on the St. Gallen - Heerbrugg - Dornbirn corridor in the East - West direction only.

Around 840 individuals commute from Dornbirn to Heerbrugg and an additional approx. 220 commute to the city of St. Gallen. Table 3 shows these interrelationships at municipal level.

Table 3: Commuter interrelationships in the Dornbirn – Heerbrugg – St. Gallen corridor

	Hohenems	Dornbirn	Lustenau	Total
Au	56	89	111	256
Balgach	40	63	69	173
Berneck	18	24	32	73
Diepoldsau	53	66	38	157
Widnau	38	78	62	178
Heerbrugg	205	320	312	837
St. Margrethen	27	73	73	172
St. Gallen	43	108	72	223
Total	275	500	456	1,232

Source: Federal Statistics Office: Swiss Cross-Border Commuter Statistics, 4th Quarter / 2011

2.6. Detailed analysis of St. Gallen – Vaduz

Besides the commuter relationships from Austria (and Germany) into Canton St. Gallen there are also relatively intensive commuter interrelationships between Switzerland and Liechtenstein. According to official Liechtenstein statistics approx. 8,940 individuals from Switzerland commute to the Principality, 2,500 of them to Vaduz. Liechtenstein's statistics also show that of the 7,500 inbound commuters (1,308 of them to Vaduz) 580 came from Germany (79 to Vaduz) (AfV 2010, p. 85). In contrast, 880 people commuted from Liechtenstein to Switzerland, approx. 870 of them to Canton St. Gallen (Huter 2011).

These numbers can be regarded as very high in relation to the approx. 16,000 Liechtensteiners who are employed in Liechtenstein. One reason for the high number of commuters is that foreigners are not allowed to reside in the Principality. Swiss, German and Austrian employees cannot therefore take up residence in Liechtenstein and work there. As far as inbound commuters are concerned, the data for foreign countries is available at country level only. This means that more precise spatial analysis is not possible within the context of this project.

It is not possible to analyse the commuter relationship between St. Gallen and Vaduz in greater detail on the basis of the available data.

2.7. Detailed analysis of commuting between the city of St. Gallen and its environs

Around 150,000 people live in the city of St. Gallen, of whom approx. 72,000 live in the core area. In 2000 more than 31,000 people commuted into St. Gallen to work. In contrast, around 9,000 people who lived in the city worked elsewhere. The city therefore provided work for around 22,500 more people than there were labour market participants living in the city. In 2000 only about 60 percent of the people who worked in the city also lived here (net number of commuters). The data from the 2010 census is not yet available, but it can be expected that the ratio of commuters has once again increased substantially in the interim.

Table 4: Individuals commuting to and from the city of St. Gallen in 2000

	Inbound from	Outbound to	Net inbound
Conurbation	11,576	3,539	8,037
St. Gallen (excl. the city)	18,965	4,846	14,119
Appenzell Ausserrhoden	5,581	1,540	4,041
Appenzell Innerrhoden	611	88	523
Thurgau	4,379	1,003	3,376
Canton Zurich	764	1,191	-427
Other cantons	388	194	194
Germany	183	8	175
Austria	484	6	478
Total	31,399	8,921	22,478

Source: Statistical yearbook of the city of St. Gallen, based on the 2000 census

A more up-to-date analysis of the commuting situation is possible with the help of the DETEC transport model. In this case, in line with the task specification, ("City Centre") the perimeter was restricted to the most central of the three zones of the city of St. Gallen ("St. Gallen Centre"). The approx. 12,000 individuals represent the total of all inbound and outbound commuters; compared with the approx. 40,000 people in the census that is a relatively low number. This is because in the city of St. Gallen very large areas of employment are located in the east and west of the city, which means that they do not feature in Table 5.

Table 5: Inbound and outbound commuters (total) from/to St. Gallen Centre in 2007

	SG Centre	PT%	MPT*%
St. Gallen	6,879	36.4%	63.6%
Appenzell Ausserrhoden	2,710	26.6%	73.4%
Appenzell Innerrhoden	385	13.3%	86.7%
Thurgau	1,389	33.6%	65.4%
Zurich	538	84.9%	15.1%
Total	11,923	35.4%	64.6%

Source: DETEC Transport Model (Stand 2007); analysis by ARE / * motorised private transport

It is interesting to note the very different levels of public transport (PT) utilisation among commuters. For Zurich they are approx. 85%, but only 13% for Appenzell Innerrhoden. The reason

for this is the settlement structure which is relatively complex around the city of St. Gallen. In the two Appenzells dispersed settlements, which are extremely difficult to serve by public transport, dominate. As rural cantons, St. Gallen and Thurgau also provide an ideal environment for MPT, while public transport utilisation rates are significantly higher in urban Canton Zurich. These numbers provide a striking illustration of the importance of a compact settlement for spatial/transport planning.

2.8. Modal Split

Cross-border commuter traffic is dominated by motorised private transport. However, it is not possible to make more detailed statements regarding the modal split on the basis of the available data. The survey of alpine and cross-border movements of people for 2007 in the region under examination reported a modal split of 2%-3%. However, the survey did not include bus routes. Since the only cross-border bus route from Heerbrugg to Dornbirn runs infrequently and can only transport a few hundred people a day, the modal split of public transport can be estimated at 5% maximum. This is very low compared with the rest of Switzerland. There is no data relating to non-motorised transport. The cross-border links currently represent a severe weakness in the network for non-motorised transport because the distances between the bridges over the Rhine, the railway line and the motorways are significant.

In the city of St. Gallen the modal split of public transport is around one third and hence around ten times higher than in the Rhine Valley. On the one hand this difference can be attributed to the fact that public transport provision is much better in the city centre and parking is much more difficult; on the other hand, the settlement structure in the regions of origin of the commuters also has an important impact.

2.9. Conclusion and evaluation

There is intensive commuting activity in the Lower Rhine Valley involving both domestic and foreign commuters. Every day around 4,000 people commute from Austria into the area under examination, while there is virtually no traffic in the opposite direction. Around one third of the commuting movements take place in the corridor from St. Gallen via St. Margrethen and Heerbrugg to Dornbirn. Higher salaries in Switzerland and the lower cost of living in Vorarlberg are the most likely reasons. The flow of commuters into Liechtenstein is remarkable; it attracts approx. 16,000 people from Switzerland and Austria, around half the working population.

The modal split of public transport is less than 5% in the Lower Rhine Valley compared with around 35% in the city of St. Gallen. The low levels of public transport utilisation and non-motorised traffic (NMT) are due to inadequate links across the Rhine and the traffic infrastructures, as well as to the dispersed settlement structure and free parking in the areas of employment.

One unresolved transport problem in the Lower Rhine Valley is the lack of a link between the two motorways that run along either side of the Rhine. High traffic density in the settlement and regular traffic congestion on both sides of the Rhine are the consequence. Within the framework of the "Rheintal mobil" project the Province of Vorarlberg has consulted widely with the local population and the authorities in the Swiss Rhine Valley to develop potential solutions.

3. City logistics in St. Gallen and best practice

The City of St. Gallen has no city logistics concept, nor is any such concept planned in the foreseeable future. However, access for deliveries of goods to the city centre is restricted. Deliveries can only be made on weekdays between 6 a.m. and 11:30 a.m. These restrictions are generally accepted and work well. The City of St. Gallen is working on extending these restrictions in future to include other areas (interview with Pfiffner).

A best practice example of city logistics can be seen in the town of Thun. A city logistics concept was introduced here in the summer of 2000 and is currently run by private sector companies. Suppliers of businesses located in the centre of Thun can make their deliveries to a warehouse in the vicinity of a motorway exit. Here the goods are reloaded onto a delivery lorry which is specially adapted to cope with Thun's narrow streets. These lorries make deliveries to city centre businesses twice a day, always delivering to several businesses on each trip. This service, which runs under the project name of *spediThun*, is provided by a local haulier. The businesses involved take part on a voluntary basis (interview with de Meuron; VCS St. Gallen, 2001, online).

4. Work-related mobility in the Rhine Valley and the city of St. Gallen

4.1. Situation and evaluation of work-related mobility in the Rhine Valley

4.1.1. Mobility management

Current situation: At present we are aware of no large-scale measures in the area of mobility management from the Rhine Valley. The municipality of Balgach came out in favour of setting up a Mobility point beside its municipal offices. Municipal employees are encouraged to use this car sharing program as part of their daily work (interview with Mathieu).

Planned measures: According to the Rhine Valley Conurbation Programme the intention is to encourage more efficient commuting by implementing mobility management for large and medium-sized businesses. The sponsors of the Rhine Valley Conurbation Programme intend therefore to inform, support and advise interested businesses during the consultation phase. Tax breaks for businesses could also be considered in the context of a mobility concept (Region St. Gallen Rhine Valley, 2011). An information campaign on the topic of mobility management may also be launched in 2013 or 2014 in collaboration with the employers' federation.

4.1.2. Combined mobility

Current situation: In the Rhine Valley there is no explicit strategy for combined mobility. There is no regional Park & Ride strategy in the Rhine Valley region. Users of public transport only have access to conventional parking zones. The Rhine Valley bus service allows customers to bring their bicycles onto buses if there is enough space; this service costs six francs. The 24-hour bicycle ticket is not accepted (RTB Rhine Valley Bus, online).

Planned measures: The conurbation programme mentions some features of combined mobility, in particular that the quality of the intermodal interfaces between bicycle and bus/rail should be improved through attractive and user-friendly bicycle parking facilities (Region St. Gallen Rhine Valley, 2011). However, more far-reaching infrastructure projects are only possible with financial support from central government. This should be possible from 2015 onwards.

At present there are no plans to improve Park & Ride facilities (interview with Mathieu). However, the conurbation programme defines the objective of keeping road users better informed about the existing mobility offerings. Starting in 2015 the intention is therefore to establish a regional, trans-national mobility office (which may initially be only virtual) to provide information and advice on mobility issues (Region St. Gallen Rhine Valley, 2011; interview with Mathieu).

4.1.3. Promotion of public transport and NMT (overarching measures)

Current situation: No measures have yet been implemented.

Planned measures: The intention is to replace the existing municipal measures with a regional parking space concept by 2015 and to accelerate the shift from MPT to more environmentally friendly modes of transport. This strategy will focus not only on Swiss territory but also on cross-border harmonisation (Rhine Valley region, 2011; interview with Mathieu). The municipalities are implementing 30 kph and encounter zones in which the speed of motorised traffic is gradually reduced. Au, for instance, has introduced 30 kph limits on a large scale (Mathieu 2011).

4.1.4. Promotion of public transport

Current situation: Public transport in the Rhine Valley is underdeveloped compared with the rest of Switzerland. The railway stations are poorly placed because the railway does not go through the historic settlements. Buses are often stuck in traffic because they do not have separate lanes and the idea of giving priority to buses is still in the project phase. However, the cross-border links represent the most important weakness in the public transport system. In the Lower Rhine Valley between the rail links at Buchs and St. Margrethen there is only the Dornbirn-Lustenau-Heerbrugg bus route which runs every half hour or hour. This means that many commuters today choose MPT; the alternative means accepting major detours when crossing the border. In addition, there is no electronic information system for travellers.

Planned measures: The overall objective in relation to the promotion of public transport, as set out in the strategic development plan of Canton St. Gallen, is that the cross-border public transport offering should be improved. The bus routes that exist at present are to be linked up across the national boundaries; however, no actual projects exist as yet. Since November 2011 work has been proceeding on extending the St. Gallen suburban railway network. Concrete regional improvements for the Rhine Valley region are expected by December 2013 in the context of this project.

The conurbation programme also envisages that urban development should only be encouraged in the vicinity of railway stations and well developed bus routes. According to the conurbation programme, at least public transport grade D must be guaranteed for residential and mixed-purpose zones and grade C for industrial and commercial zones when areas are being zoned. At present these unambitious standards, as defined in the conurbation programme, are not even being implemented by the municipalities (Rhine Valley region, 2011; interview with Mathieu).

4.1.5. Promotion of non-motorised transport

Current situation: Non-motorised transport enjoys high priority in the cantonal transport policy. A cantonal deficiency analysis has, however, brought a large number of shortcomings in the non-motorised transport network to light. According to the strategic development plan of Canton St. Gallen the aim therefore is to improve the situation of non-motorised transport over short distances.

Planned measures: A deficiency analysis showed that 60% of the weak points will be fixed by 2018 and the remaining 40% by 2022. All the municipalities in the Rhine Valley have a person who is responsible for the issue of non-motorised transport. Some municipalities (e.g. St. Margrethen) have analysed deficiencies on school routes with the education authorities. Plans to make routes to and from school safer are being implemented.

The quality of cycle and pedestrian links is to be improved in the Rhine Valley as a whole. The major need for action here is on crossings at key traffic junctions and the River Rhine. Additional bridges for cyclists and pedestrians should improve the situation here. The planning needs to take explicit account of commuter needs. In addition, routes that are currently designed for heavy motorised traffic are to be redesigned to meet the needs of non-motorised transport.

Infrastructure for non-motorised transport has a relatively important place in the conurbation programme for the Rhine Valley region. The plan envisages, among other things, that demand-side measures should be used to incentivise the use of non-motorised transport. It can be assumed that communication measures will be implemented with the launch of a (virtual) mobility office. Some municipalities in the Rhine Valley are actively involved in the Bike to Work campaign. (Rhine Valley Region, 2011; interview with Mathieu).

4.1.6. Promotion of short routes

Current situation: At present there are no pilot projects relating to the application of new market-driven measures to spatial planning at settlement level. It is, however, conceivable that the revision of cantonal construction legislation will provide municipalities with the tools they need for pilot projects of this kind (Rhine Valley region, 2011; interview with Mathieu).

Planned measures: According to the conurbation programme the settlement density is to be increased within the existing settlement structures. However, the mix of uses is prescribed in the municipal land use plan.

4.1.7. Assessment of work-related mobility in the Rhine Valley

Work-related mobility in the St. Gallen Rhine Valley is dominated today by motorised personal transport. Action is required in the Rhine Valley on public transport (especially cross-border routes), on combined mobility (Park&Ride, Bike&Ride, bicycle transport on buses), on mobility management in municipalities and businesses, and on infrastructure for non-motorised transport. The dispersed settlement structure in the Lower Rhine Valley (see Appendix 2) has made an important contribution to this need for action. Spatial planning is therefore tasked with ensuring higher settlement densities and with limiting the re-zoning of employment zones to locations which are well served by public and non-motorised transport.

The conurbation programme is especially important to the future development of the St. Gallen Rhine Valley. Comprehensive and wide-ranging strategies and objectives for the future development of the region have been prescribed and are accepted by all the affected municipalities. At present only some of the measures under discussion are being implemented; for many of the projects, however, the region is dependent on support from central government. On the other hand, the detailed deficiency analysis of the situation for non-motorised transport and collaboration between some municipalities and the education authorities on making routes to and from school safer can be regarded as a model for other alpine regions.

4.2. Situation and evaluation of work-related mobility in the city of St. Gallen

4.2.1. Mobility management

Current situation: At present the City of St. Gallen offers minimal operational mobility management; this will, however, be expanded in future (interview with Pfiffner). Responsibility for projects in the area of mobility management in the City of St. Gallen lies with the St. Gallen/Arbon-Rorschach conurbation programme; haulage companies are involved in a supporting role.

At present mobility management for the city administration is at a very early stage and offers a variety of potential development opportunities. Activities both for the public and the city administration have been organised in the context of the “clevermobil” campaign, which aims to raise awareness of rationally combined, environmentally friendly, energy-efficient and healthy mobility. There is, for example, the so-called clevermobil jackpot for city administration employees. Under this initiative a draw is held every week and one person receives a prize of CHF 50 provided that on that day the person in question came to work on foot, by bike, by public transport or by car-sharing (City of St. Gallen, 2011; interview with Pfiffner).

Planned measures: The conurbation programme proposes the promotion of carpooling, business car sharing, company season tickets for public transport, and parking space management (Canton St. Gallen (b), 2007). Operational mobility management as a means of influencing mobility behaviour over the long term is also included (Canton St. Gallen (a), 2007). Here there is the strategy to motivate businesses to embrace operational mobility management by means of a campaign of information and advice (Canton St. Gallen (b), 2007). Any advice would be provided by an external consultancy. The consultancy would work together with the interested business to draft a tailored mobility plan. In 2011 the public sector offered a free initial advisory session worth CHF 1,000 (Region Appenzell AR - St. Gallen - Bodensee, 2012).

4.2.2. Combined mobility

Current situation: The city of St. Gallen already has some Bike & Ride parking facilities at public transport stops; further development is planned.

Planned measures: The concept devised by the City of St. Gallen envisages that Park & Ride should be implemented in the conurbations. That is why no such offers exist for the city centre (Canton St. Gallen, 2012; interview with Pfiffner). Bicycles can be taken on to buses belonging to the city's transport company provided that the passenger has a valid ticket; there are, however, periods during the day when this is not possible (i.e. 11 a.m. to 2:00 p.m. and 5:00 p.m. to 6:30 p.m.) (St. Gallen Transport Systems, online). Starting in the summer of 2012 it is planned to make a basic version of a virtual mobility platform available; the full version is planned for the end of 2012. At present a needs and feasibility study regarding the establishment of a regional mobility office is being drawn up in collaboration with the public transport providers (Appenzell AR - St. Gallen – Bodensee region, 2012).

4.2.3. Promotion of public transport and NMT (overarching measures)

Current situation: The major shopping centres in the city of St. Gallen operate a limited car trip model [German: Fahrtenmodell]. This works well. In St. Gallen West (Geisberg) there is a usage restriction which permits 25 trips per hour and hectare (Saturday only 2:00 p.m. - 3:00 p.m.). It is also intended to introduce a limited car trip model in the St. Gallen West/Gossau East development zone by 2013 (Canton St. Gallen, 2012; interview with Pfiffner).

Planned measures: Car parking management is seen in St. Gallen as one way of exerting long-term influence on mobility behaviour (Canton St. Gallen (a), 2007). A comprehensive car parking management system is currently being planned (interview with Pfiffner). Another overarching measure is that the entire historic city centre and the major public open spaces are to be modified to turn them into encounter zones. Moreover, it is intended in future to reduce the speed limit in the remaining public thoroughfares in the city of St. Gallen to 30 kph. At present around 75% of all these measures have been implemented.

4.2.4. Promotion of public transport

Current situation: St. Gallen already gives priority to public transport at traffic signals. An electronic passenger information system is currently being implemented. The majority of displays in the city of St. Gallen have already been installed. Moreover, an app that provides real-time information is under development (interview with Pfiffner). The City of St. Gallen has Europe's most modern fleet of vehicles but wants to further boost the attractiveness of public transport in respect of both availability and comfort. The construction of any new facility that is liable to attract

large numbers of people requires at least public transport grade B if the building in question is larger than 2,000 m² for one unit or 3,500 m² for combinations (Canton St. Gallen (a), 2007; interview with Pfiffner).

Planned measures: It is intended to further prioritise public transport (interview with Pfiffner). According to the conurbation programme it is also planned to provide more dedicated bus lanes. A project to this end is being planned (Canton St. Gallen (a), 2007; interview with Pfiffner).

4.2.5. Promotion of non-motorised transport

Current situation: In the City of St. Gallen administration there is a contact person for non-motorised transport with a budget of CHF 240,000 for 2011, 2012 and 2013. In addition, there is a loan of CHF 280,000 for 2012, 2013 and 2014 to enable small-scale construction measures in the area of non-motorised transport. City planning law prescribes that 0.8 bicycle parking places must be made available per room in residential areas. In future this target may be regulated at cantonal level and extended to include other zones (e.g. employment zones). A further planning principle in St. Gallen specifies that routes to and from schools must be safe. The local school authorities, the city police and the traffic planners meet once every six months to consider requests from schools. This works well; routes to and from schools are checked regularly and modified if necessary.

Non-motorised transport is encouraged through a variety of measures in St. Gallen. The “Pédibus” has existed for some time now. Under this scheme children are accompanied on their way to and from school, especially during their first few weeks at school. The aim is for children to get to know the route so that they can get to and from school safely and independently. In addition, the city police also provide road safety training for first-year children. These two initiatives for schoolchildren are established and work well. In St. Gallen planners and politicians are not particularly aware of or trained in non-motorised transport; this happens in informal conversations as part of the normal information flow (Canton St. Gallen, 2012; interview with Pfiffner).

Planned measures: Technical/infrastructural measures are also planned for the promotion of non-motorised transport. It is planned to separate the traffic on busy streets (bicycle paths on main routes). Furthermore, the strategic development plan defines the objective of having a dense and continuous network of routes; this is currently in planning. The aim is not only to allocate a high priority to objective and subjective safety, but also to offer attractive, unhindered and direct footpaths in a coherent, unhindered and dense network without gaps. The City of St. Gallen also aims to minimise waiting times for pedestrians at traffic signals. Here, however, there remains little substantial room for improvement.

4.2.6. Promotion of short routes

Current situation: As far as the promotion of short routes is concerned, the City of St. Gallen follows the principles of a compact settlement structure and a high level of mixed usage. Settlement density will be defined, for example, during zoning/re-zoning; this process works very well. The town does not have any pilot projects relating to the application of new market-driven measures in spatial planning.

Planned measures: At present it is planned that settlements should be developed in areas with good facilities and that settlement development should be harmonised with the quality of the available public transport (Canton St. Gallen (a), 2007; interview with Pfiffner).

4.2.7. Evaluation of work-related mobility in the city of St. Gallen

Current situation: Until now, as expected, more measures for managing commuter traffic have been implemented in the urban environment of St. Gallen than in the Lower Rhine Valley. In the city administration there is a contact person for the promotion of non-motorised transport, who also has an adequate budget. The administration has also implemented a simple mobility management system in the form of “clevermobil”. A multimodal mobility platform is currently being implemented, and the Pédibus and road safety programmes for first-year children are a success.

Planned measures: Further interesting initiatives are currently in the planning stage including, for example, comprehensive parking space management, a car-free historic city centre, the expansion of 30 kph zones, the strengthening of the infrastructure for non-motorised transport, and the concentration of construction activity in areas which are well served by public transport. In comparison with exemplary cities such as Zurich, however, much still remains to be accomplished in these areas in St. Gallen.

4.3. Recommendations and best practice in relation to work-related mobility

This chapter will contain recommendations in relation to work-related mobility for the Rhine Valley Region and the City of St. Gallen on the basis of the situational analysis and the evaluation of the planned activities. The explanations will make reference to best practice examples from other Swiss town/cities.

Table 6 gives an overview of the proposed measures; these are then described in greater detail.

Table 6: Proposed measures for optimizing commuter mobility

Topic area	Measure	Implemented by
Mobility management	Mobility management in businesses	Municipality, canton, businesses
	Mobility management in public administrations	Municipality, canton, businesses
Combined mobility	Strategy for combined mobility	Municipality, canton, region
	Promotion of Park & Ride / Bike & Ride	Municipality, canton
	Allow bikes on public transport	Public transport providers
	Information to the public ("MAP")	Public transport network, canton
Promotion of public transport & NMT (overarching measures)	Comprehensive parking space management	Municipality
	30 kph zones / encounter zones	Municipality
	Limited car trip model [Fahrtenmodell]	Municipality, canton
Promotion of public transport	Separate lanes	Municipality, canton
	Setting of priorities at traffic signals	Municipality, canton
	Appropriate communication for each target group	Municipality, canton
	High service frequency, the right routes	Canton, businesses
	Modern vehicles	Canton, businesses
	Good public transport links with places of work	Municipality, canton, businesses
	Promotion of NMT	Legal basis for the promotion of cycling
Continuous network of cycle paths		Canton
New pedestrian zones in the city centre		Municipality, canton
Setting of priorities at traffic signals		Municipality, canton
Communal or regional strategic development plan for non-motorised transport		Municipality, region
Promotion of short routes	Mixes of usage	Municipality
	High-density construction	Municipality
	Development of employment areas at public transport hubs	Municipality, canton
	Location criteria for new employment areas and schools (NMT link; adequate public transport)	Municipality, canton

Source: Own presentation

4.3.1. Mobility management

In the area of mobility management we recommend that similar activities to those found in the city of Zurich be established. The City of Zurich's mobility management system is comprehensive and provides exemplary support to interested businesses. There is a separate program for mobility management with a focus on commuter and business traffic. Since 2006 the public sector in Zurich has also offered a mobility advisory service for businesses, with financial support by Canton Zurich, the City of Zurich, other municipalities and regions in Canton Zurich. The aim of the advisory service is to inform businesses about effective measures, introduce them to contacts and provide support during implementation. The following advisory services exist:

- Stimulus meeting: Initial discussion, overview of the mobility situation, need for action, initial potential solutions
- Quick Guide: Experts draw up a list of measures that can be implemented easily and effectively
- Intensive Guide: In-depth analysis (employee survey, cost/benefit calculation in relation to measures etc.)
- Implementation support: Support in implementing the measures (e.g. implementation of measures, provision of support in respect of communication, quality assurance, controlling in relation to the effectiveness of measures taken)

Excursus: Operational mobility management at IBM Switzerland

IBM Switzerland has a total of six locations in Switzerland, with its headquarters in Zurich. In 1992 the company had already made a commitment in its environmental mission statement to encourage the use of public transport for transporting people and goods. Work-life balance is also an important aspect of HR policy. The mobility management measures, which were introduced in the mid-90s and form part of IBM's environmental management system, apply to all six locations in Switzerland. The individual measures are promoted via a variety of channels (e.g. the intranet, employee newspaper, flyers, campaigns, the HR department etc.).

Some of IBM's numerous mobility management measures relate directly to commuter traffic:

- *Promotion of the use of public transport:* Company contribution towards season tickets (e.g. general network pass) and free half-fare card
- *Promotion of the use of bicycles:* Provision of covered parking for bicycles and changing facilities with showers
- *Car parking management:* Allocation of parking spaces on the basis of business need and an online parking reservation system based on a day pool concept (employees are entitled to use a company parking space no more than twice a week)
- *Work organisation:* Promotion of video and telephone conferencing and of working from home (on an average working day more than 40% of IBM Switzerland's employees are not at their desk)

IBM Switzerland is therefore an example of best practice in operational mobility management. Some businesses in the Rhine Valley region and the City of St. Gallen can take an example from this company and gather ideas to be used in their own organisation.

The public sector supports these advisory services by funding the stimulus meeting. It also shares the cost of the Quick Guide, the Intensive Guide and the implementation support (MIU, 2012). This form of mobility management in the city of Zurich can be regarded as best practice in Switzerland.

Canton Aargau also has a comprehensive mobility management concept which deals explicitly with the topic of mobility management in the cantonal administration. Car parking management was introduced within the cantonal administration and the use of car-sharing was not only offered but explicitly encouraged. Furthermore, departments within the cantonal administration, schools and hospitals are put through a mobility analysis. This leads to concrete measures being proposed and their impact for the cantonal administration being quantified (Canton Aargau, 2007).

4.3.2. Combined mobility

The basis for promoting combined mobility is an appropriate strategy. This is missing both in the Rhine Valley and in the city of St. Gallen. The City of Zurich has a detailed (sub-) strategy for combined mobility. This covers the issues of infrastructure, information relating to all the transport modes, and services (City of Zurich, 2002). Canton Aargau also has a detailed concept. There are already 79 Park & Ride car parks with around 2,900 spaces (as at 2010) and approx. 7,000 Bike & Ride parking spaces. The plan is to increase the number of Park & Ride parking spaces by 900 by 2025 (Canton Aargau, 2010). A dense network of Park & Ride and Bike & Ride parking spaces combined with direct public transport links is essential for the promotion of combined mobility.

Another important aspect is the ability for passengers to take bicycles along with them on regional and urban public transport. There is a substantial need for action in this area in both the city of St. Gallen and the Rhine Valley. In the city of Zurich passengers can take their bicycle on to VBZ vehicles as long as they buy a second-class ticket for the bicycle (VBZ, online).

Other recommended measures relate to keeping the public informed about combined mobility. In Zurich there are two city maps ("MAP Zurich – by bicycle" and "MAP Zurich – on foot, by public transport and car") which contain all the information necessary for (combined) mobility. They list all the mobility information about Zurich's tram, bus and rail network, the Mobility car-sharing locations and car parks. The City of Zurich also runs a variety of campaigns on the topic of combined mobility (e.g. "multimobil unterwegs") (City of Zurich, online). An information/communication offering of this kind has a positive impact on the existence of combined mobility.

4.3.3. Promotion of public transport and NMT (overarching measures)

For both of these modes of transport a comprehensive parking space management system in the street, particularly in employment and business locations, is recommended as an overarching promotion measure. Furthermore, additional 30 kph zones and encounter zones can be introduced in selected urban/municipal areas. One other measure for public transport and NMT in commuter mobility is the introduction of limited car trip models [Fahrtenmodelle]/trip contingent models [Fahrleistungsmodelle] in employment and business locations. In both of the regions under examination these measures are either being planned or implemented. Zurich has a detailed guide (with implementation examples) for limited car trip models, which can be used as a planning aid by property developers, experts and the administration (City of Zurich, 2007).

4.3.4. Promotion of public transport

When attempting to promote public transport it is important first of all to upgrade the relevant infrastructure, in particular with regard to separate lanes and the assignment of high priority at traffic signals. These measures can be found in Aargau, an example of best practice (Canton Aargau 2006). Secondly, it is vital that communication be directed at the relevant target groups. This can be achieved, for example, by using modern and dynamic passenger information systems or through an appropriate market image, as it is in the City of Zurich's public transport sub-strategy (City of Zurich, 2005b). There remains a need for action on this front in the Rhine Valley.

Thirdly, a high service frequency, modern vehicles and the right routes are also important. In the Rhine Valley there is a need for action on improving cross-border bus routes. Fourthly, in the case of work-related mobility it is essential that adequate public transport links should also exist in business and employment zones (at least public transport grade C or preferably grade B; cf. Glossary).

4.3.5. Promotion of non-motorised transport

St. Gallen still does not have the legal basis for bicycle traffic or a contact person within the public administration at cantonal level. This hampers the implementation of appropriate measures for promoting the use of bicycles.

In both the city of St. Gallen and the Rhine Valley it is crucial that gaps in the network of pedestrian and bicycle paths should be closed and that physical security should be improved. A safe infrastructure is a key prerequisite for the promotion of pedestrian traffic.

One suitable instrument for the promotion of non-motorised transport is a communal or regional strategic development plan for non-motorised transport. In Zurich the regional strategic development plan defines major thoroughfares and promenades. Moreover, the central areas (city, Oerlikon and Altstetten) are promoted as pedestrian zones (City of Zurich, 2003). A similar situation would be conceivable for the city of St. Gallen. Another way of promoting non-motorised transport in the city is to set priorities appropriately at traffic signals.

In the Rhine Valley the region and/or the individual municipalities are advised to draw up a regional strategic development plan and to make the necessary competencies and funds for the promotion of non-motorised transport available to the Rhine Valley region. In addition, the existing plans for making paths to and from schools safer should be implemented and may also be used as an example by other municipalities. St. Gallen's "Pédibus" system and the road safety programme in schools can also be relatively easily implemented here.

4.3.6. Promotion of short routes

In order to promote short routes it is possible, for example, to define mixed usage and construction densities in communal land use plans or to develop employment areas in locations which are well served by public transport and provide access to non-motorised transport. It is also recommended to define clear location criteria for new employment areas and schools.

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Glossary

Mobility: Mobility is the leading car-sharing organisation in Switzerland and enjoys a virtual monopoly. Mobility offers around 2,600 vehicles of all categories at 1,430 locations in 480 towns and has more than 100,000 registered members. Mobility is run as a cooperative.

Strategic development plan: The strategic development plan is the formal spatial planning tool for Swiss cantons. It contains all the key statements about the spatial development of settlements and transport at cantonal level. A strategic development plan is drawn up by the canton and approved by the Federal Council. It is renewed approximately every 15 years and updated on a regular basis. The relevant strategic development plan here is the Canton St. Gallen plan which was last renewed in 2003 and last updated in February 2012.

Conurbation programme: This spatial and transport planning instrument comprises measures for improving the transport situation within a conurbation. Since 2007 central government has provided the funds for upgrading transport infrastructures on the basis of the conurbation programmes. These are drawn up jointly by the cantons and municipalities, within either an existing or a newly founded organisation. The conurbation programmes contain two fundamentally new features in Swiss spatial planning. First, they are tied to significant amounts of money and, second, they force public administrations to carry out planning in functional spaces.

Public transport grade: The public transport grade indicates how well a particular area is served by public transport. The grading is based on the types of transport available, the service frequency and the distance to the stop. Grade A means: extremely well served, B: well served, C: fairly well served, D: poorly served. If access to public transport is marginal or lacking, no grade is assigned. The calculation method comes from the Federal Office for Spatial Development (ARE 2011).

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Appendices

Appendix 1: List of interviews with experts

Appendix 2: Aerial photograph of the Lower Rhine Valley

Appendix 3: Aerial photograph of the city of St. Gallen

Appendix 1: List of interviews with experts

1. Stefan Pfiffner, Civil Engineering Office of the City of St. Gallen, 1 May 2012
2. Andreas Mathieu, Rhine Valley region, 1 May 2012
3. Andrea de Meuron, Büro Rundum mobil / VCS Thun-Oberland, 2 May 2012

All interviews with experts were conducted by telephone.

Appendix 2: Aerial photograph of the Lower Rhine Valley



Source: Google Maps

The aerial photograph shows the Heerbrugg-Lustenau region. The main motorway and rail axes in Switzerland run alongside the Rhine. The major employment areas lie outside the settlements. The spread of low-density settlements on the plain is already advanced.

Appendix 3: Aerial photograph of the city of St. Gallen



Source: Google Maps

The historic centre of St. Gallen with its many service sector jobs can be seen in the middle on the right. Due to the local topography the town has spread along a NE-SW axis. The major employment and logistics areas (the St. Gallen West/Gossau East development zone) are plainly visible in the west. The town's major employment zones are in the middle of the picture to the north of the railway line and in the east beyond the border of the aerial photograph.