

SULP POLICY DOCUMENT STUTTGART

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1. The SULPiTER project

Transport is the second largest energy-consuming sector, with a 32 % of share of final energy consumption. Therefore it is necessary to consider the White Paper (2011) of the European Commission, which sets 10 goals for a competitive and resource-efficient transport, two of which are specific for urban areas: “Halve the use of ‘conventionally-fuelled’ vehicles in urban transport by 2030, phase them out by 2050“ and “Achieve essentially CO₂-free city logistics by 2030 - in major urban centres.” Paris climate agreement (2015) - the world’s first comprehensive climate agreement - has an important role also in the logistic sector, if we are looking into the aims of it: “Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.”. Recognising the important role Sustainable Urban Mobility Plans can play, the European Commission proposed in its Action Plan on Urban Mobility of 2009 to accelerate the take-up of Sustainable Urban Mobility Plans in Europe by providing guidance material, promote best practice exchange, and support educational activities for urban mobility professionals.

To fully understand possibilities for mitigating urban freight flows and to solve the problem holistically, we would need to tackle urban freight on the level of entire supply chain (including enterprise’s strategies) and from the perspective of Functional Urban Areas (FUA). By the definition, FUA consists of the city and its commuting zone and is identified as polycentric cores and the hinterlands of FUAs identified based on commuting data, including all settlements from where at least 15% of the workers commute to any of the core settlement(s) (OECD, 2016).

The project SULPiTER (Sustainable Urban Logistics Planning To Enhance Regional freight transport) has been developed to support policy makers in improving their understanding of the FUA freight phenomena in an energy and environmental perspective, enhancing their capacity in urban freight mobility planning in order to develop and adopt Sustainable Urban Logistics Plans - SULPs. The Project focused on several FUAs in Central Europe, namely Bologna, Budapest, Poznan, Brescia, Stuttgart, Maribor and Rijeka, whose authorities were involved in the project as fully-fledged partners.

SULPiTER designed and developed a tool aimed at estimating the freight demand generated by the economic activities in the FUA individuated by the project partners. SULPiTER tackles urban freight in the perspective of FUAs, taking into consideration the functional transport and economic relations between inner urban centres (the usual and limited territorial target of public regulations) and the surrounding urban territories, as well as the functional transport and economic relations within FUAs not affecting downtowns. The SULPiTER tool is intended to be a decision support system for policy makers to facilitate the process of elaboration of alternative city logistics scenarios.

2. The SULP Policy Document

This document is the basis of the SULP development for each FUA in the frame of the SULPiTER project. Each partner will follow this template in order to report the main points of each Sustainable Urban Logistics Plan at Functional Urban Area level. Based on the EC ELTIS guidelines, it describes the process as each city uses the SULPiTER procedure to access the SULP from the data collection through the processing of the data.

In each FUA, Authorities will develop their own SULP in a more detailed document, including all the necessary information listed in the national guidelines. In order to make them transnational, this template will include only the most important issues and the relevant results from other Work Packages. The SULP in original language may be attached as annex of this document.



Level	Specific Objects	Activity
National action plan	Improve people's protection against	The plan exclusively relates to the

2.1. How to use this template

All Partners will find the chapters of the Sulp with a description of what is expected to be included. It means that all FUAs must fill in this document as a report and not as a questionnaire. Be clear, comprehensive and detailed.

Some of the chapters may refer to already developed activities. We are not requesting to duplicate your work! Please re-elaborate your conclusions of already developed deliverables/contributions in order to be aligned with this document. You can also add as annex the deliverable then. But do not forget to describe the results in the relevant chapter of this template.

3. Transport policies - state of the art analysis



<p>traffic noise</p>	<p>protection from freight wagons and trains. Road transport noise may be a question to be legally handled on the level of the 16 federal states or even on lower level. ‘However, the question of road traffic noise is not even mentioned.</p>
<p>Support alternative propulsion technologies</p>	<p>“Mobility and fuel strategy of the Federal Government” is explained here as a measure to secure the energy base for transport while improving the environmental aspects, with alternative fuels and alternative means of propulsion as key technologies, including a network of service stations for all modes of transport. Electric technologies for vans and light tracks as well as for urban distribution are explicitly mentioned, with reference to the topic below.</p>
<p>Develop measures to strengthen urban logistics</p>	<p>The federal government states that this is important but not the responsibility of the federal level, which is why it can only support measures on the level of the 16 federal states or the municipalities. Support is basically done via research and via supporting electric and fuel cell energy technologies, including loading infrastructures.</p>
<p>Federal General traffic and transport plan</p>	<p><i>Service transport.</i> Urban planning is supposed to take the different segments of service transport into account. This holds for residential as well as for commercial areas.</p>
<p><i>Urban logistics.</i> The problem is acknowledged. The plan refers to the lack of success of earlier bundling and cooperation initiatives. It suggest cooperation in “Round Tables”, initiatives by local actors, telematics, as well as the initiative suggested by the federal “Aktionsplan Güterverkehr und Logistik” (see policy 1; responsibility is therewith reciprocally returned to the respective “other” level of government). New technologies are encouraged.</p>	
<p><i>Connection with private sidings / terminals.</i> This is seen as important, but not explicitly with relevance to the FUA, just relevant for industries and transport in general.</p>	<p>The state “support” keeping and extending the infrastructure</p>
<p>Regional traffic and</p>	<p><i>To make the transport network</i></p>



transport plan *properly work ... but no topic related to urban freight traffic.*

The policies in the past have been generally vague regarding urban freight. This was mainly because the general political idea was to shift freight from road to rail and waterway in general, with the help of terminals at the edge of inner Stuttgart. However, most of the rail freight is either hinterland traffic of the seaports or part of established individual high-volume supply chains. The general cargo and delivery services were addressed mainly by delivery time windows at pedestrian streets. It was not much taken into account that most of the general cargo also originates / terminates at the regional industry and, more and more, at the households across the regions. So, while the policies may be called successful, there was much traffic they did not address.

There was one exception about 20 years ago: In downtown Stuttgart a classic “city logistics” scheme was tried, with one forwarder doing some downtown delivery for several companies. This failed immediately, due to lack of understanding of transport flows and a lack of a sustainable business model. One may also add, from today’s point of view, that the effort added complexity without reducing traffic.

4. Urban Freight Transport - state of the art analysis

This chapter is important to define the borders of the FUA and to understand how many freight is generated in each part of the FUA. It describes the current situation of logistic flows in FUA (with data on goods flow entering, outgoing and transiting the FUA (including rail and water/air freight transport-if relevant). Describe the current situation on the field (deliverable times, capacity of consolidation centres, e-delivery vehicles, etc.). List the main problems/challenges and who is responsible. You can add what has already be implemented (to avoid negative aspects).

To elaborate this chapter, please include the local contribution of D.1.2.11 (Transnational report on understanding freight behaviours and impacts in SULPiTER FUAs) - Annex 2, in order to explain in detail what is the situation in terms of freight generated.

We do not have a clear idea about the amount of transit freight. It is a lot for sure, with two main Autobahn routes passing the region. However, the state’s main transit freight axes are elsewhere: The north-south axis along the Rhine, and the main east-west axis passing north of Stuttgart Region. The same is for rail: The main transit line may have a total of 40 pairs of through freight trains per 24h. This is quite a lot and at an average cargo of 1,000 tons per train on 300 days would add up to 24 mio. Tons per year, which is much less than the transit along the Rhine, but nevertheless significant.

Waterway has no transit route in Stuttgart Region, because the Neckar River (a tributary to the Rhine) is navigable only from Stuttgart Region. Air freight also does not transit much. Stuttgart airport is a rather important air freight hub. It does not show in the statistics, which lists only the air cargo actually flown in and out of the airport. More than 90% is trucked, however, because the main air cargo hubs are sufficiently close. Stuttgart airport therefore is a distribution center for perhaps 300,000 t of air cargo per year. Most of that originates or terminates within the region, but the catchment area of the airport goes beyond the region.

The total yearly tonnage of water and rail transport to and from Stuttgart Region combined has been estimated to be about 10 m tons/year. This traffic is highly concentrated in 2 ports (which also are rail hubs), a large intermodal terminal, and the Daimler automotive plant in Sindelfingen. Together, the many installations at these just 4 locations may handle about 80-90% of all rail and water transport.



We do have all types of logistics at sufficient quantities. Besides many specialized regional logisticians, all the national logisticians either have regional establishments or are represented by partners. The total size of warehouses and consolidation centers is not known. Since many of them are just part of industrial enterprises, they also are difficult to measure, and any result of such measurement risks to be seriously misleading. We do know, however, that a lack of warehousing already threatens the regional industry.

As for e-mobility, there is an increasing number of electric vans and also of cargo bikes. We estimated that the region would allow for about 100 electric cargo bikes without any logistician having to seriously adapt procedures. At the moment, we are still far from this number. Electric vans are not just used by logisticians, but also by construction companies, artisans and facility managers. However, their number is small, with the largest fleet being used by DHL / Deutsche Post (“Streetscooter”).

For details, see annex 2.

5. SULP’s specific objectives

The SULP involves strategic and operative goals, that can be adopted with a cooperative approach among different actors for reaching common objectives aimed at an overall urban sustainability.

Strategic goals (general):

- *ensure the conditions of dynamic traffic by reducing traffic jams;*
- *creating a liveable urban environment, reducing the environmental impact caused by freight traffic.*

Operative goals (general):

- *reducing traffic congestion from freight loading and parking;*
- *reducing freight transport and freight rates, optimizing capacities;*
- *reducing the environmental load on freight vehicles;*
- *encouraging operators to accept these goals*

Please state these goals specifically for your own FUA. These goals should be in line with all stakeholders (e.g. deliver clean and just in time) and operative goals (targets) should be in line with identified problems/challenges (could be equipped with Key Performance Indicators).

Our main problems are pollution, traffic jams and land use. Therefore, these three issues have to improve through the SULP.

It is assumed without saying, that the service level will remain constant. This level at the time is rather good, but there are no significant differences between agglomerations in Germany.

6. Measures vs. demands

Identification and analysis of the possible measures/solutions to be adopted by the FUA. It is possible to identify 3 types of measures which are applied:



- in a specific part of the city, including the city centre;
- at the wider city - FUA level;
- at different territorial levels in the city

The types of measures that we analysed concern regulatory, technology, infrastructure, services, economic, urban and energy actions. In general, these types of measures are more frequently concerning regulation and transport services.

Table 2 includes an overview of the low carbon logistics measure types and their benchmarking with reference to their costs, territorial level of applicability and category.

Measure	Regulation	Technology	Infrastructure	Services	Energy	Scale of application	city centre	wider city - FUA level	different territorial levels in the city
Parking bays	X		x			small			X
Private space	X					medium			X
Cargo bikes		X				medium		X	
Vehicle construction		X			x	large			X
Micro depots	x		X			small			x
Packing stations for commercial recipients	x	x	X			small	X		
Power generation	x	x	X		x	medium		X	
Charging infrastructure	x	x	X		x	large		X	
Power storage	x	x	X		x	medium		X	
Fuelling of trucks			X		x			X	
Interfaces between transport modes			X			large		X	
Locations for logistics	x		X			large		X	
Local delivery points				X		small		X	
Automated delivery points	x	x		X		medium		X	
Delivery points at private housing	x	x		X		medium to large		X	
Delivery to pre-defined address				X		small		X	
Delivery to employer's premises				x		small		X	



Delivery to recipient's car		x		X		medium		X	
Delivery of beverages				X		small		X	
Working group for inner city logistics	x	x	x	x	x	n.a.	X		
FQP	x	x	x	x	x	small			X

Table 2 Overview and benchmark of logistics measures

6.1. Regulatory measures

Regulatory measures that determine logistics processes such as loading/unloading, time windows, parking regulations and other measures (that do not apply to none of the aforementioned categories) belong to this category. Policies and measures that imply access restrictions to certain areas based on concrete constraints (environmental, vehicle weight, etc.), traffic calming measures and others are included in this category. Enforcement, routing optimization and training. Police enforcement actions, training activities (eco-driving, etc.) and routing optimization (infrastructure and road marking for route optimization) are among the measures that form this category.

Parking bays for delivery vehicles

Some parking bays are to be reserved for delivery vehicles. This needs cooperation between local administration and the logistics sector to determine those locations as solutions, where such parking bays would improve the traffic situation and reduce traffic as well as congestion.

<i>Traffic</i>	<i>More steady</i>
<i>Costs (to the economy as a whole)</i>	<i>About neutral</i>
<i>Emissions</i>	<i>Decrease</i>
<i>Time horizon</i>	<i>Short to mid term</i>

Defining privately owned space for goods transport



Future construction planning has to ensure that loading and unloading will be handled on private premises. This would not only improve the situation on the streets, but would also allow faster handling. This is, however, a measure that will have results only in the long term.

<i>Traffic</i>	<i>More steady</i>
<i>Costs (to the economy as a whole)</i>	<i>About neutral</i>
<i>Emissions</i>	<i>Decrease</i>
<i>Time horizon</i>	<i>Long term</i>

6.2. Technology

ICT, ITS and vehicle technology (cargo bikes) based measures are identified in this category.

Use of cargo bikes on last mile

It is argued that the use of electrical cargo bikes should be much increased in the future, because they get larger and their use is not just ecological but also more economical. Advantages in mobility and parking can also make up for the lower maximum speed, resulting in economical advantage as well.

<i>Traffic</i>	<i>Decrease (cars)</i>
<i>Costs (to the economy as a whole)</i>	<i>About neutral</i>
<i>Emissions</i>	<i>Decrease</i>
<i>Time horizon</i>	<i>Short to mid term</i>



Vehicle construction

The list of electric vehicles for commercial transport still is rather short. We expect that delivery vans will soon be available in fully electric versions, mid-size trucks will also arrive, but heavy trucks will for quite some time be suitable only for uses where distance limitations do not matter and where the additional weight of the batteries is not a problem. The vehicles working on the apron of Stuttgart Airport are one example, and the logistics actors are asked to look actively for more niches.

<i>Traffic</i>	<i>No influence</i>
<i>Costs (to the economy as a whole)</i>	<i>About neutral</i>
<i>Emissions</i>	<i>Decrease</i>
<i>Time horizon</i>	<i>Short to mid term</i>

6.3. Infrastructure development

Infrastructure development construction/development of consolidation/distribution centres and logistics places. Capacity sharing. This category regards measures that entail the use of existing infrastructure or vehicles (i.e. road infrastructure) for multiple operators (i.e. multi-use lanes).

Use of microdepots for distribution

The use of microdepots for many cases is a precondition of last mile delivery by other means than conventional vans and light trucks. For logisticians, it implies the need to find locations. For public administrations, it implies to treat the competitors equally. And it allows for additional business models on a local scale. Debate with logisticians showed that Stuttgart Region has a need for microdepots in several locations, mostly in the downtown areas and inner residential areas of the larger towns.

This means that logisticians will have to actively seek for locations, while the administrations will have to be supportive in finding such areas.



<i>Traffic</i>	<i>Decrease</i>
<i>Costs (to the economy as a whole)</i>	<i>About neutral</i>
<i>Emissions</i>	<i>Decrease</i>
<i>Time horizon</i>	<i>Short to mid term</i>

Packing stations for commercial recipients

Commercial recipients usually can only take deliveries during opening hours. Given tight time windows, this leads to multiple runs of small trucks, causing additional traffic, noise and pollution. The idea is to deliver most of the volume to packing stations within easy reach of the receivers. They then have the advantage not to get interrupted by each delivery, but they can take the cargo when they actually have the time for it.

<i>Traffic</i>	<i>Decrease</i>
<i>Costs (to the economy as a whole)</i>	<i>About neutral</i>
<i>Emissions</i>	<i>Decrease</i>
<i>Time horizon</i>	<i>Short to mid term</i>

Electric power generating

Use of electric vehicles makes ecological sense only if the generation of electric power is sustainable. That is why regenerative sources of electric energy (including wind and photovoltaic installations) are explicitly supported in this context.



<i>Traffic</i>	<i>Neutral</i>
<i>Costs (to the economy as a whole)</i>	<i>Considerable</i>
<i>Emissions</i>	<i>Decrease</i>
<i>Time horizon</i>	<i>Short to mid term</i>

Charging infrastructure

The capacities of the electric power grid do not allow fast charging of masses of vehicles. This is a problem of the network's last mile that has to be actively handled and will be quite costly.

<i>Traffic</i>	<i>Neutral</i>
<i>Costs (to the economy as a whole)</i>	<i>Considerable</i>
<i>Emissions</i>	<i>Decrease</i>
<i>Time horizon</i>	<i>Short to long term</i>

Energy storage

An alternative method to generate sufficient loading capacities for electric vehicles is the use of intermediate energy storage. Batteries, which are almost at the end of their lifetime, but also temporarily unused vehicle batteries, could be used for that purpose.



<i>Traffic</i>	<i>Decrease</i>
<i>Costs (to the economy as a whole)</i>	<i>Quite considerable</i>
<i>Emissions</i>	<i>Decrease</i>
<i>Time horizon</i>	<i>Short to mid term</i>

Fuelling of trucks

Many trucks, usually mid-size delivery trucks, most the time fuel up at the end of their daily run. In many cases, they do detours to reach a gas station that caters to trucks. In a number of locations across Stuttgart Region, gas stations for trucks are located to cause additional traffic. Planners are not aware of this problem, because they view gas stations from the perspective of passenger car drivers. A study has found that the detours cause significant extra mileage and emissions. Additional locations for gas stations thus are suggested.

Furthermore, the gas stations are in historical locations that do not take into account the new bypasses. As a result, fuelling upon entering an industrial area often results in driving through the city center. The maps below show a good and a bad example from Stuttgart Region.

Interfaces between transport modes

Stuttgart has a number of container terminals, but hardly any other interfaces for rail cargo besides a number of industrial sidings. This means that a number of transport chains to and from Stuttgart Region remain on the road simply for lack of loading facilities. There is a study on existing and potential rail and inland waterway facilities in Stuttgart Region, which is part of the Sulp strategy. It lists the interfaces and estimates they are handling about 10m tons of cargo per year.

Locations for logistics

Within Stuttgart Region, there are three locations which could easily qualify as „freight villages“, if they would care. They offer interfaces to rail and waterway. However, it is argued here that logistics should not be completely concentrated in a few such hubs, but rather be close to the industries they serve. This



is both to minimize traffic and to improve the work relations along the supply chains. However, the statement must be made because logistics in most cases is not wanted locally, and many regional actors would be happy to define reservations for the logistics industry in order to get rid of it elsewhere. This is here described as counterproductive to the environment.

6.4. Services

New distribution and logistics models for operators embeds mostly measures that are initiated by the private sector. It could include either cooperative measures or not. Measures that are appointed in this category are: off-peak deliveries, consolidation schemes and joint operations, etc.

Delivery points

Deliveries to households often do not reach absent recipients, resulting in multiple transport volume. A number of alternatives is listed and debated here: Delivery counters in shops, packing stations of logisticians, packing stations of residential buildings, delivery to employer, delivery to designated addresses, delivery into recipient’s car. It is made clear that the list is not exhaustive and that the suggestions are not mutually exclusive.

Local delivery points

Local delivery points exist for many years. Small stores contract with parcel delivery services. Having to receive goods there results in additional traffic, especially because the different services use different delivery points. Therefore, this topic is mentioned only for reference as an established practice.

<i>Traffic</i>	<i>Unclear</i>
<i>Costs (to the economy as a whole)</i>	<i>About neutral</i>
<i>Emissions</i>	<i>Unclear</i>
<i>Time horizon</i>	<i>Short term</i>

The declaration as „unclear“in the fields of traffic and emission result from the unknown amount of additional traffic generated for picking up the deliveries.



Automated delivery points

Automated delivery points are different from the delivery points as described above, in so far, as they do not keep staff and need less space. Therefore, it is easier to set them up at frequented places. However, they must be in places that can be reached both by the parcel services and by the parcel recipients. Finding such places may need cooperation between parcel services and public administrations, since the latest may know more about traffic frequencies and centrality of places.

<i>Traffic</i>	<i>Unclear</i>
<i>Costs (to the economy as a whole)</i>	<i>About neutral</i>
<i>Emissions</i>	<i>Unclear</i>
<i>Time horizon</i>	<i>Short term</i>

The declaration as „unclear“ in the fields of traffic and emission results from the unknown amount of additional traffic, which will be generated for picking up these deliveries.

Delivery points at private housing

In this case, the end-users set up their own delivery point and operate it. The idea is that it is in their best interest to have such a station near their apartment. Especially for larger apartment buildings, the costs could be so low that the owners might invest on their own. We have found in Stuttgart that this business model has so far escaped the parcel delivery services. The parcel delivery services rather invest into their own systems, which may be overly complex, given the number of competing services.

<i>Traffic</i>	<i>Decrease</i>
<i>Costs (to the economy as a whole)</i>	<i>About neutral</i>
<i>Emissions</i>	<i>Decrease</i>



<i>Time horizon</i>	<i>Short to mid term</i>
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Delivery to an external pre-defined address

Recipients can declare the delivery address they want, resulting in a greater chance of delivery. This is frequently used already and just listed here for completeness.

<i>Traffic</i>	<i>Decrease</i>
<i>Costs (to the economy as a whole)</i>	<i>Decrease</i>
<i>Emissions</i>	<i>Decrease</i>
<i>Time horizon</i>	<i>Short to mid term</i>

Offering delivery to the employer's premises

This is a special case of delivery. It often happens already but is legally difficult and may disrupt work at the premises. However, since most of the larger employers have the infrastructure to receive parcels and distribute them internally. Since this is a real advantage for employees, the service to formally help employers to install this service together with the delivery services, has become a business model.

<i>Traffic</i>	<i>Decrease</i>
<i>Costs (to the economy as a whole)</i>	<i>About neutral</i>
<i>Emissions</i>	<i>Decrease</i>
<i>Time horizon</i>	<i>Short to mid term</i>



Delivery to the recipient's car

Recipients who own a car will usually be nearby during the day. Also, cars can easily be located. While there certainly are questions regarding data protection and insurance, this could be a promising way to increase the share of successful deliveries.

<i>Traffic</i>	<i>Decrease</i>
<i>Costs (to the economy as a whole)</i>	<i>Decrease</i>
<i>Emissions</i>	<i>Decrease</i>
<i>Time horizon</i>	<i>Short to mid term</i>

Precondition for the thoroughly positive evaluation is that the car can be reached without detours and that offloading as well as noticing the owner can be done without problems by a software.

Delivery of beverages

Water, beer and soft drinks are rather cheap in relation to its weight. Therefore, they are often produced regionally, since transport costs can soon be prohibitive. On the other hand, national brands have caused a strong increase of transports. So has the use of bottled water and soft drinks that replace tap water and syrups. An estimation shows that in Stuttgart Region alone the delivery of bottled water and soft drinks adds up to a daily truck mileage of once around the earth, while consumers need to shop by car to get the bottles home. It is suggested to promote pipeline-based means of supporting households with water. Pipelines and quality water are both available in Stuttgart Region already.

6.5. Energy

We have included in the energy category only the measure type that can directly focus on energy issues (i.e. development of electric mobility schemes which can be part of energy policies at urban level).

Electric vehicles



Electric vehicles are a means to reduce emissions and noise. Electric delivery trucks can be forerunners of the transformation of the automotive sector. However, the topic is so complex that it is here split up into different topics: production of the electric vehicles, producing electric energy, loading infrastructure and battery storage infrastructure. It is also pointed out that the region remains open to other environmentally friendly means of propulsion besides electric energy.

In this context we include a number of measures which are listed under “infrastructure” and “technology”.

6.6. Possible new technologies

Medium and long term global trends of freight transport in FUA from autonomous vehicles across dedicated freight pipeline networks into Internet of Things.

(No measures here, because they appear to be too far from regional implementation.)

6.7. Other

Working group for inner city logistics

The Stuttgart Chamber of Commerce runs a regular „working group for inner city logistics“, dealing with delivery services in downtown Stuttgart. It is stated here that the work of that circle is highly appreciated and not at all counteracted by an additional regional approach.

Partnership for Regional Goods Transport

The „Partnership for Regional Goods Transport” is what across Europe is known as a Freight Quality Partnership, or „FQP” for short. It is made clear that such a partnership, meeting with key actors on a regular base, is a central element of the goods transport strategy as well as its implementation.

7. Layout of measures

Measures can be explained more in detail ad concrete if needed. An action plan with approximal implementation date and estimated budget costs are welcomed. Pictures of good practice or designed pictures of suggested measures can provide attractive and user friendly document (in line with Application and monitoring). Important parts of these chapter:



- *definition of the business-as-usual (BAU) scenario, which indicates that no or just actual measurements are taken into account for the future emission trends;*
- *specification of services/measures (which were identified in the Chapter 6 and 7 as the most suitable for FUA's objectives - SWOT analysis);*
- *integrated packages of measures (synergies).*

Since chapter 6 is rather elaborated, the info can be found there. Photos regarding measures are in the SULP, which is an annex to this paper and also exists in a version with English language explanations.

8. Road-map for implementing the measures

The overall aim of this chapter is to identify the support conditions of each measure/service for the implementation, designed in Chapter 6 and 7 and for the evaluation of the different impacts to be carried out in Chapter 9. The complexity of measures/services is directly linked to the complexity of levels of every single component involved in the specification and design. For this reason, for the identification of the supporting conditions, it is essential to consider, at least, the following issues:

- *Organisational/operational aspects and management model of the different design logistics measures;*
- *Business model related issues;*
- *Contractual issues (regulating the relationship among the different actors involved);*
- *Aspects related to the possible structure of the actors providing/managing services;*
- *Cost estimation (preliminary) or CBA (if all necessary data is available);*

All these issues can be done based on the rules identified above in the previous chapters.

SULP is a document that is produced for Stuttgart Region. That means, it is not binding. Why this is so is elaborated under chapter 11. This is, however, not a bad idea. If it was binding, all involved parties would look at it from the perspective of the maximum inconvenience it could mean to them, and they would probably oppose it.

In a multi-stakeholder environment, it can be a lot easier to get results from a non-binding document than from a binding document. A non-binding document allows for step-by-step introduction with the willing partners. However, these partners must be monitored and encouraged.

Therefore, Stuttgart Region is planning a project that allows for the monitoring of logistics measures implementation on local level. This basically is the SULP implementation, although we will probably experience some municipalities coming up with more measures once they are triggered by the SULP.

The other topic to be settled within that contract is the continuation of the FQP. The FQP then will monitor the measures as well.



Besides this, most measures include infrastructure and planning as a necessity for success. They will be adopted by a number of municipalities each, mainly during this process. The main point is to ensure that there will always be a person in charge of promoting and pushing. At the moment, the contract for this issue is not yet ready.

9. Evaluation of impacts

In this chapter, the effects of each selected device have to be evaluated. Sustainability, along with the complex nature of decision-making, poses the need to create integrated evaluation tools, due to the difficulty to systematically consider and manage all the information required to take effective decisions:

- *Multi-Criteria Decision Analysis (MCDA) tools have been developed to provide directions considering all the different components of sustainability, i.e. economy, environment, society, transport system. The formulation of an integrated tool, however, is becoming even more challenging when different types of stakeholders are involved in the decision-making process. For this reason, it can be a valid index to implement a multi-stakeholder MCDA in the specific sector addressed by SULPiTER.*
- *The Logistics Sustainability Index (LSI) is elaborated adopting a bottom-up approach which starts with the valorisation of basic performance indicators that will be aggregated into weighted composite indicators per impact area and finally into a unique synthetic index.*

The impact evaluation for most measures was done in the charts of chapter 6. Some big and long term measures, such as the shift from road to rail, cannot sufficiently be evaluated in this simple way. On the other hand, success of these measures varies a lot. Example: The intermodal terminals in Stuttgart Region work at full capacity. The terminal in neighbouring Heilbronn has no traffic at all, for reasons which may be easy to explain but could not have been foreseen by any SULP, should there have been one. We do monitor the amount of traffic shifted from road to rail and inland waterway, both in tonnage and TEU. Any weekly pair of trains (the minimum set for a container connection) would mean a shift of about 8000 TEU or 80,000 tons, equalling 4,000 long distance truck runs.

10. Role of the stakeholders involvement

This section includes the results of the Freight Quality Partnership (FQP) meetings in each FUA:

- *members of the FQP (maybe photos of meetings);*
- *role of the FQP within the SULP's decision making process;*
- *concrete results (added-value).*

The role of FQP in the future has to be stated here.



The FQP is Stuttgart Region has more purposes than just developing a Sulp. However, FQP and Sulp interacted.

The Sulp was drafted and then presented to the FQP.

It was clear from the beginning: If a measure doesn't pass the FQP, it will not make it into the Sulp. All else would just result in obstruction by key stakeholders.

To the surprise of the Sulpiter team, there was no effort to water down the measures. In the last meeting, the FQP even added measures. This added greatly to the standing of the Sulp.

The FQP will monitor the progress on Sulp implementation. It is also expected to come up with further measures over time.

11. Main steps for the adaptation of the Sulp

The approval and adoption process for a planning act (regulated by national and local laws, which may significantly differ from country to country, characterised by different methods and publicity level to guarantee the interests of all the citizens and not only those of the directly involved actors).

This chapter can be flexible:

- Sulp is a chapter of Sump or should it be integrated within each chapter of the Sump?
- Or both (chapter on Sulp + cross-references in the whole document)?
- Sulp should follow national rules for the official adoption.
- Communication activities to be included also here.

The Sulp supplements the new Regionalverkehrsplan (regional traffic and transport plan). It could not be made part of that plan because the plan had just recently be renewed and for the coming years there is no chance to get an addition of that size through the regional parliament. We decided not to try, in order not to have the plan officially refused, even if just for formal reasons.

Instead, the plan will be presented to the regional parliament as a guideline. That will not be before summer. After that presentation, it can be used as an official regional document, which is most helpful for involving the municipalities in the measures, and in monitoring them.

For communication activities, see chapter 13.



12. Application and monitoring

- *Allocation of responsibilities among the actors involved (from the perspective of responsibility upon the development of the Sulp, to have a clear vision of the actors in charge of the related measures/services).*
- *Definition of a realistic implementation plan (with respect to the time).*
- *Risk matrix: how to manage the uncertainty from Year 5 to 10?*

The responsibility will legally remain with Verband Region Stuttgart (VRS). VRS plans to subcontract application and monitoring, and at the time is negotiating this with their own subdivision WRS.

13. Promotion and Communication Plan

- *Description of main strategies (in order to spread all the information concerning various activities and actions results, and prepares the ground for sustainable results).*
- *Dissemination and promotion activities (designed to address and meet the main objectives of promoting sustainable, eco-compatible services and solutions for city freight distribution. For this reason, local dissemination and promotion are crucial for the success of the measures/action to gain interest, involvement and trust of all concerned user and public categories in the FUA).*

So far, communication of the Sulp has mainly been:

- Promotion within SULPiTER project communication,
- Promotion within Stuttgart FQP,
- Promotion within key partners in the municipal administrations, beyond FQP.

This will not be sufficient for the future. We will purposely differentiate between promoting the Sulp and promoting individual measures.

Promoting the Sulp:

The Sulp as a whole will be promoted to administrations and associations. These mainly are the administrations of the towns and cities within Stuttgart Region (and, where applicable, also beyond - we already work with Reutlingen City on these issues).

The reason is that these institutions are themselves interested in having a bundle of measures at hand, to select a starting point and a local strategy. For them, selecting from a bundle is more attractive than learning just about individual measures.



Promoting individual Sulp measures:

Individual measures will be promoted to private companies. This will be done with reference to the existence of a Sulp, but the Sulp itself will remain in the background.

The reason is that the pragmatics who run such companies usually want to learn about exactly the topics they are expected to deal with, and not waste business time with plans and political documents. This part of the interaction they happily hand over to their business organizations - and the Sulp was already debated there.

At the moment, a project by Verband Region Stuttgart (i.e. "Stuttgart Region") is prepared to allow for a budget for project implementation and promotion until the end of 2020. In 2021 and onwards, promotion will probably be on some individual measures of the Sulp.



14. Annexes

14.1. Annex 1: FUAs transport policies state of the art analysis

Template for the collection of urban freight and logistics policies/planning, based on the WP T3 - D3.1.1 FUAs transport policies state of the art analysis.

14.1.1. Introduction

In SULPiTER project the all participating Functional Urban Areas - Bologna, Budapest, Poznan, Brescia, Stuttgart, Maribor and Rijeka - have a different maturity in policies related to logistics and freight transport. Policies related to logistics and freight transport are developed and implemented within an interdisciplinary context that involves different departments (e.g. transport, spatial planning, environment-energy, economy). Transport, with its 32% of final energy consumption share is the second largest energy-using sector and the OECD claims that 20% of energy consumption is attributable to freight transport alone. The European Commission leads path towards CO₂-free city logistics and to reach this goal set by 2030, a shift in the paradigm of policies is required. In order to have effective policies, the functional transport & economic relations between inner urban centres and the surrounding urban territories, as well as the functional transport & economic relations within FUAs not affecting downtowns have to be taken into consideration. In order to effectively pursue SULPiTER mission of support to policy makers in improvement of their understanding of FUAs freight phenomena in an energy and environmental perspective and in enhancement of their capacity in urban freight mobility planning, project partners have to start from the analysis and understanding of status quo of policy related to urban freight and logistics. Once collected and analysed the policies, partners will continue with transnational analytical and governance tools, resulting in improved and adopted policies for the future energy and environmental sustainability of freight transport in Central Europe FUAs.

As said, the starting point for an improved policy making is thus the update (since the SULPiTER submission) of the status of acts, laws, policy & planning documents relevant to urban freight & logistics in each PP FUA, by an inter-departmental dialogue & a dialogue among Authorities of the same FUA. (D.T3.1.1)

To enable the responsible partner Brescia Mobilità (PP06) to collected data and information from each FUA and to draw up a document that illustrates the state of art of freight transport policies at local, regional, national and European level, each partner is asked to fill in the following questionnaire. All the data on policies collected will be analysed and clustered first and then compared outlining elements which link and differentiate policies collected.

As accurately defined by the EU guidelines, the development and effective implementation of Sustainable Urban Mobility Plans (SUMP) and Sustainable Urban Logistics Plan (SULP), cannot overlook a careful analysis of the reference context, in this case policies related to logistics and transport. Therefore, the analysis which will be carried out by Brescia Mobilità, will highlight each FUAs context in terms of strategies, policies and actions that regulate and affect freight transport and logistics. It will compare SULPiTER FUAs regulatory conditions defined by their Public Administrations and complete the framework with European ones. It will help project partners to define at what stage is each FUA context related to forthcoming SULPs that will be developed during the project.

In Europe, SUMP guidelines are provided thanks to the ELTIS report. Also the ENCLOSE Project is providing useful indications on how to develop a SULP. In each Country, national and regional guidelines are provided by the relevant Ministries of Transport. Please summarize the national guidelines and provide



information on how to include the policies of this questionnaire within the Sulp in your FUA. The main objectives of this analysis are:

1. identify whether the different policies (local, regional and national) that are in force at the same time in each FUA are, among them, consistent (or not) in terms of actions planned and coordinated (or not) between the different policy makers;
2. identify for each FUA, if the all policies shared common strategic addresses (or not);
3. highlight the main constraints posed by the regulation and planning that precedes the development of the Sulp.

14.1.2. Instructions

14.1.2.1. Who?

All partners must contribute to the implementation of this activity, in particular those included in the following Functional Urban Areas (FUAs) have to collaborate together as coupled here below:

- Bologna (IT009) - Metropolitan City of Bologna PP09 & Institute for Transport and Logistics Foundation LP
- Budapest (HU001) - Municipality of 18th District of Budapest PP02 & Vecsés Municipality PP11
- Stuttgart (DE007) - Stuttgart Region Economic Development Corporation PP10 & KLOK Logistics Cooperation Centre PP13
- Poznan (PL005) - City of Poznań PP08 & Institute of Logistics and Warehousing PP07
- Brescia (IT029) - Brescia Mobility PP06
- Maribor (SI002) - Municipality of Maribor PP14 & University of Maribor PP03
- Rijeka (N/A) - City of Rijeka PP12

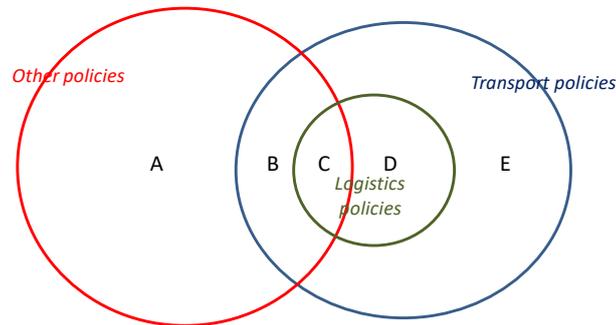
Unioncamere Veneto and CEI are not directly involved in the activities at FUA level, but they can contribute if the activity is of interest for their associated partners.

14.1.2.2. What?

While completing the questionnaire, you should consider listing and detailing both transport Policies and Planning according to the following definitions:

- Transport policy deals with the development of a set of constructs and propositions that are established to achieve particular objectives relating to social, economic and environmental development, and the functioning and performance of the transport system.
- Transport planning deals with the preparation and implementation of actions designed to address specific problems.

As far as the content of each policy/planning considered refer to the chart below:



- *Policy area A: Not to be considered*
- *Policy area B: Only if related to freight transport in FUA*
- *Policy area C: To be considered*
- *Policy area D: To be considered*
- *Policy area E: Only if related to freight transport in FUA*

Partners responsible for single FUA as listed above, should list and detail policies/planning at local, regional and national level; Brescia Mobilità will take care of its own FUA and EU level policies/planning, and will elaborate the final document once received contributions from all Partners.

14.1.2.3. How?

This questionnaire is divided into two sections:

- In section I you should to match the Partners with the FUA, briefly list the local, regional and national policies that meet the criteria described above (par. 2.2), and you should specify if there are national or regional guidelines on the SUMP/SULP development;
- In section II you should schematically describe the main features of each policy listed in the section I. For each policy selected and listed in section I, you should fill in section II.

14.1.3. Questionnaire section I - General information

This section of the questionnaire is an overview of policies related to logistics and transport sector in each FUA. The information you are asked to provide will be used to hand over general framework about relevant policies freight transport and logistics policies in specific FUA.

The aim is to first select and list the policies in your FUA according to criteria described in paragraph 2.2 and second, to analyse the most relevant ones related to the development and implementation of SULP in each FUA context. It is also required to specify whether national or regional guidelines already exist for the development of SUMP or SULP.

I.1 PPs name *<please select one of the following options>*

- LP Institute for Transport and Logistics Foundation
- PP2 Municipality of 18th District of Budapest
- PP3 University of Maribor



- PP4 Regional Union of the Chamber of Commerce of Veneto - Eurosportello Veneto
- PP5 Central European Initiative- Executive Secretariat
- PP6 Brescia Mobility
- PP7 Institute of Logistics and Warehousing
- PP8 City of Poznań
- PP9 Metropolitan City of Bologna

PP10 Stuttgart Region Economic Development Corporation

- PP11 Vecsés Municipality
- PP12 City of Rijeka

PP13 KLOK Logistics Cooperation Centre

- PP14 Municipality of Maribor

I.2 Related FUA *<please select one of the following options>*

- Bologna (IT009) complex FUA, 1 million inh.
- Budapest (HU001) complex FUA, 1,7 million inh.

Stuttgart (DE007) complex FUA, 600.000 inh. in Stuttgart City; 2.7 million inhabitants in FUA.

- Poznan (PL005) complex FUA, 600.000 inh.
- Brescia (IT029) small FUA, 335.000 inh.
- Maribor (SI002) small FUA, 230.000 inh.
- Rijeka (N/A) small FUA, 210.000 inh.
- Other (for UCV or CEI)

I.3 Please specify if your Country or your Region released national or regional guidelines on the SUMP/SULP development (following the ELTIS example), and if there are rules for the adoption of the SUMP/SULP *<please select one of the following options>*

- Yes

No, but see below.

- No, but it is planned

I.4 If “yes” to question number I.3, briefly describe the existing Guidelines or rules *<please fill in the text - max 500 characters>*

We typically develop them out of the transport and mobility planning documents and their procedural rules. The national plan exists, the states do the planning on their own, so do



the municipalities and regions. This is due to the federal set-up, combined with self-governance of municipalities.

1.5 If “No, but it is planned” specify if from Region or State *<please select one of the following options>*

- Region
- State
- Other <please specify> _____

1.6 List the policies addressed *<please fill in the following Table - only policies which are able to influence freight transport in your FUA >*

	POLICY NAME (original language)	POLICY NAME (English)	POLICY LEVEL (national, regional, local)	IMPACT RATE on freight transport (please rate from 1 - low impact to 5 high impact)	WEB LINK (local language)	WEB LINK (english - if available)
1						
2						
3						
...						

(Found the table awkward to fill in. Requested info is given below in list form.)

1. Aktionsplan Güterverkehr und Logistik (Action Plan for Goods Transport and Logistics)

Federal level. Impact 1-2 on Sulp and Sump questions, 3-4 on logistics in general.

http://www.bmvi.de/SharedDocs/DE/Publikationen/G/aktionsplan-gueterverkehr-und-logistik.pdf?__blob=publicationFile; English n.a.

2. Generalverkehrsplan Baden-Württemberg 2010 (General traffic and transport plan for Baden-Württemberg 2010)

Level of federal state. Impact 2-3 on Sulp and Sump.

<https://vm.baden-wuerttemberg.de/de/service/publikation/did/generalverkehrsplan-baden-wuerttemberg-2010/>; English n.a.



3. Regionalverkehrsplan (Regional Traffic and Transport Plan)

Level of Stuttgart Region. Impact 1-2 on SULP and SUMP.

https://www.region-stuttgart.org/video/20161221_Entwurf_Regionalverkehrsplan.pdf; English
n.a.

4. Citylogistikkonzept (City logistics concept)

Local level. Impact to be seen after completion.

(not yet published.)

14.1.4. Questionnaire section II - Policy description

Policy description for policy 1

This section, that has to be filled in for each policy listed in I.6 (e.g. if there are six lines in I.6, there must be six questionnaire part II) is open to the description of the main features of each policy.

A first set of questions must be answered by selecting an option from a closed list of possible options. This part will define the main formal policy features and will enable Brescia Mobilità to compare policies within and between FUAs, to underline if there is (or not) consistency and collaboration between different actors.

The second part of the section focuses on the constituent elements of the policy with the aim to identify the guidelines and limitations of each policy, and to evaluate if there is a common strategic address, and if planned action are consistent among different public authorities.

II.1 Policy level *<please select one of the following options>*

- Local
- FUA (Province)
- Regional
- National**
- European
- Other *<please specify>* _____

II.2 Name of the responsible body: *<please fill in text - max 100 characters>*

Federal Ministry of Transport and Digital Infrastructure



II.3 If the partner is not the responsible body, please describe how you are able to influence the decisions of the responsible body. *<please fill in text - max 500 character>*

WRS and Region Stuttgart both have political contacts through the parties in regional and national parliament. KLOK also has contacts through research / science.

The ability or non-ability of a player to influence the decisions of the other players in the field in practice will never be laid open by that player...

II.4 Department of the responsible body *<please select one of the following options>*

- Mobility and Transport**
- Spatial Planning
- Environment and Energy
- Territorial development
- Other *<please specify>* _____

II. 5 Type of document related to the policy *<please select one of the following options>*

- Act
- Law
- Regulation
- Planning document
- Other *<please specify>* __Action Plan (list of measures)

II.6 Is this an operational/cooperation program financed by Structural Funds? *<please select one of the following options>*

Yes

No

II.7 Policy budget and source of funding: *<please fill in text - max 500 characters>*

This plan has no budget of its own. It merely puts together the various plans and programs of the ministry regarding logistics.

II.8 Specify policy life-cycle status *<please select one of the following options>*

- Definition
- Implementation**



- Monitoring and Evaluation

- **upgrade (it is the 3rd edition)**

II.9 Specific policy field of application *<please select one or more of the following options>*

- Road safety
- Green mobility service (e.g. car and van sharing)

- **Integrated planning of mobility and transport (included loading and unloading areas planning)**

- Transport demand management (included LTZ management and charges)
- Integrated parking management & integrate payment system

- **Urban logistics services- platform for urban distribution management**
- **ICT system and infrastructure**
- **Energy efficiency, environmental impact analysis (e.g SEAP) and reduction (e.g. alternative fuels and E-mobility)**
- **Transport infrastructures**

- Other <please specify> _____

II.10 Primary policy objective *<please select one or more of the following options>*

- Provide incentives
- Regulation/enforcement component

- Other <please specify> **__ Action Plan (list of measures) serves as guidelines, lists the activities of the ministry.**

II.11 Supporting mechanism *<please select one or more of the following options>*

- **Awareness/Information campaigns**

- Partnerships/Key supporting stakeholders

- Other <please specify> **Explicitly and extensively using the document externally and internally to bind together all logistics related issues on federal level.**

II.12 Synergies with other projects (e.g. local, regional, EU) or Private Public Initiative: *<please fill in text- max 1000 characters>*

The document itself is a kind of framework and is intended to encourage initiatives on the level of the 16 federal states and on local level.



II.13 Brief description of the policy: *<please fill in text - max 2000 characters>*

It is basically a collection of all logistics related activities the federal government is involved in. That does serve as a political propaganda document, but anyway it is helpful to have the logistics aspects of the various policies combined in one document. This way, the document lays open which parts of the strategies correspond to each other, how coherent the policies are, and what in practice is targeted. This way, the plan is the main document for the logistics policy debate on federal level.

II.14 Main goal of the policy: *<please fill in text - max 1000 characters>*

Much of the policy is to support Germany as a logistics hub, also for oversea traffic, and to show what is done in this respect. At the same time, the document tries to encourage environmentally friendly logistics, also on local level.

II.15 Specific objectives (SO) *<please fill in the following chart - max 700 characters>*

Many objectives completely unrelated to FUA freight transport. However, specifically related policies are:

- 4.a Improve people’s protection against traffic noise.*
- 4.b Support alternative propulsion technologies.*
- 4.c Develop measures to strengthen urban logistics.*

SO	SO NAME AND SHORT DESCRIPTION
SO1	<i>Improve people’s protection against traffic noise.</i> Lists the measures as well as the current / intended federal activities in the field.
SO2	<i>Support alternative propulsion technologies.</i> Lists the measures as well as the current / intended federal activities in the field.
SO3	<i>Develop measures to strengthen urban logistics.</i> Lists the measures as well as the current / intended federal activities in the field.
...	



SO _n	
-----------------	--

II.16 SO Result indicators: please list, if the policy identify relevant qualitative or quantitative indicator of tangible improvement for final beneficiaries of the policy *<please fill in the following chart - if relevant >*

Qualitative or quantitative indicators are not being evaluated in the plan. There is a number of indicators or targets named, but not related to the field of SUMP/SULP.

SO	SO RESULT INDICATOR <i><max 300 characters></i>	INDICATOR CURRENT VALUE	TARGET VALUE
SO1 (example)	Number of deliveries out of peak traffic hours		
SO2			
SO3			
...			
SO _n			

II.17 Activities: please specify Actions defined by the policy and through which it aims to achieve its goals *<please fill in the following chart - max 1000 characters each activity >*

ACTIVITY	ACTIVITY NAME AND SHORT DESCRIPTION
A01	<p>Improve people’s protection against traffic noise.</p> <p>The plan exclusively relates to the protection from freight wagons and trains. Road transport noise may be a question to be legally handled on the level of the 16 federal states or even on lower level. ‘However, the question of road traffic noise is not even mentioned.</p>
A02	<p>Support alternative propulsion technologies.</p> <p>The “Mobilitäts- und Kraftstoffstrategie der Bundesregierung” (“Mobility and fuel strategy of the Federal Government”) is explained here as a measure to secure the energy base for transport while improving the environmental aspects, with alternative fuels and alternative means of propulsion as key technologies, including a network of service stations for all modes of transport.</p> <p>Electric technologies for vans and light tracks as well as for urban distribution are explicitly mentioned, with explicit reference to the topic below.</p>
A03	<p>Develop measures to strengthen urban logistics.</p>



	The federal government states that this is important but not the responsibility of the federal level, which is why it can only support measures on the level of the 16 federal states or the municipalities. Support is basically done via research and via supporting electric and fuel cell energy technologies, including loading infrastructures.
...	
An	

Policy description for policy 2

This section, that has to be filled in for each policy listed in I.6 (e.g. if there are six lines in I.6, there must be six questionnaire part II) is open to the description of the main features of each policy.

A first set of questions must be answered by selecting an option from a closed list of possible options. This part will define the main formal policy features and will enable Brescia Mobilità to compare policies within and between FUAs, to underline if there is (or not) consistency and collaboration between different actors.

The second part of the section focuses on the constituent elements of the policy with the aim to identify the guidelines and limitations of each policy, and to evaluate if there is a common strategic address, and if planned action are consistent among different public authorities.

II.1 Policy level *<please select one of the following options>*

- Local
- FUA (Province)
- Regional (Federal State of Baden-Württemberg)**
- National
- European
- Other <please specify> _____

II.2 Name of the responsible body: *<please fill in text - max 100 characters>*
Ministry of Transport, Baden-Württemberg state.

II.3 If the partner is not the responsible body, please describe how you are able to influence the decisions of the responsible body. *<please fill in text - max 500 character>*
 The “Generalverkehrsplan” is a legal planning document, which can be finalized only after listening to the opinions of the relevant “Träger öffentlicher Belange”, i.e. “carrier of public



purposes.” This is how Stuttgart Region of needs is included, and as far as I remember KLOK also was asked for comment regarding some relevant chapter.

II.4 Department of the responsible body *<please select one of the following options>*

- Mobility and Transport**
- Spatial Planning
- Environment and Energy
- Territorial development
- Other <please specify> _____

II. 5 Type of document related to the policy *<please select one of the following options>*

- Act
- Law
- Regulation
- Planning document**
- Other <please specify>

II.6 Is this an operational/cooperation program financed by Structural Funds? *<please select one of the following options>*

- Yes
- No**

II.7 Policy budget and source of funding: *<please fill in text - max 500 characters>*

The plan covers the scope of the budget for the Baden-Württemberg Ministry of Transport (roughly a billion Euros per year), plus the part of the national budget for transport that is to be spent in Baden-Württemberg as co-financing or under the supervision of the state (sic, not the other way round!), plus regional and municipal budgets, plus EU money.

II.8 Specify policy life-cycle status *<please select one of the following options>*

- Definition
- Implementation**
- Monitoring and Evaluation
- upgrade



II.9 Specific policy field of application *<please select one or more of the following options>*

- Road safety
 - Green mobility service (e.g. car and van sharing)
 - Integrated planning of mobility and transport (included loading and unloading areas planning)
 - Transport demand management (included LTZ management and charges)
 - Integrated parking management & integrate payment system
 - Urban logistics services- platform for urban distribution management
 - ICT system and infrastructure
 - Energy efficiency, environmental impact analysis (e.g SEAP) and reduction (e.g. alternative fuels and E-mobility)
 - Transport infrastructures
- Other *<please specify>* **It basically covers all fields of transport and traffic, even by negative implication (if something is not mentioned, that can also be considered as a statement).**

II.10 Primary policy objective *<please select one or more of the following options>*

- Provide incentives
- Regulation/enforcement component (a measure gets financed only if in accordance with the targets of the Generalverkehrsplan)
- Other *<please specify>* **Also serves as action plan (list of measures), guidelines, and lists the activities of the ministry.**

II.11 Supporting mechanism *<please select one or more of the following options>*

- Awareness/Information campaigns (of course it was publicly presented etc., but that is not the key element)
- Partnerships/Key supporting stakeholders
- Other *<please specify>* **Well understood as guidance for all levels to align with in order to get funding, well beyond the questions of immediate legal binding of anything stated in the plan.**

II.12 Synergies with other projects (e.g. local, regional, EU) or Private Public Initiative: *<please fill in text- max 1000 characters>*

Key umbrella document.



II.13 Brief description of the policy: *<please fill in text - max 2000 characters>*

This is the main document for the traffic and transport policy of Baden-Württemberg. It has a general part and a part referring to specific concepts. The general part starts with guidelines (as of 2010, “securing mobility” is the main target), followed by “development of society, economy, environment”, and “development of traffic / transport (passenger / freight / infrastructure / policies / financing)”.

The specific part is divided into “Road Transport”, “Public Passenger Transport”, “Commercial Transport” and “Air Transport”. In our context, it is important that commercial transport is a chapter independent of its mode.

II.14 Main goal of the policy: *<please fill in text - max 1000 characters>*

This is the framework document for all traffic and transport policy in the state of Baden-Württemberg. It therefore balances all conflicting targets on the base of the policies of 2010. With government changes since 2010, this is still the legal planning document, but emphasis has shifted among the targets towards environmental policies.

II.15 Specific objectives (SO) *<please fill in the following chart - max 700 characters>*

Many objectives completely unrelated to FUA freight transport. However, specifically related policies are:

3.2.1 “Service transport”,

3.2.2 “Urban logistics”,

3.3.2 “Connection with private sidings / terminals”.

SO	SO NAME AND SHORT DESCRIPTION
S01	<i>Service transport.</i> Urban planning is supposed to take the different segments of service transport into account. This holds for residential as well as for commercial areas.
S02	<i>Urban logistics.</i> The problem is acknowledged. The plan refers to the lack of success of earlier bundling and cooperation initiatives. It suggest cooperation in “Round Tables”, initiatives by local actors, telematics, as well as the initiative suggested by the federal “Aktionsplan Güterverkehr und Logistik” (see policy 1; responsibility is therewith reciprocally returned to the respective “other” level of government). New technologies are encouraged.



S03	<i>Connection with private sidings / terminals.</i> This is seen as important, but not explicitly with relevance to the FUA, just relevant for industries and transport in general.
...	
SOn	

II.16 SO Result indicators: please list, if the policy identify relevant qualitative or quantitative indicator of tangible improvement for final beneficiaries of the policy *<please fill in the following chart - if relevant >*

Qualitative or quantitative indicators are not being evaluated in this part of the plan. There is a number of indicators or targets named, but not related to the field of SUMP/SULP.

SO	SO RESULT INDICATOR <i><max 300 characters></i>	INDICATOR CURRENT VALUE	TARGET VALUE
S01 (example)	Number of deliveries out of peak traffic hours		
S02			
S03			
...			
Son			

II.17 Activities: please specify Actions defined by the policy and through which it aims to achieve its goals *<please fill in the following chart - max 1000 characters each activity >*

ACTIVITY	ACTIVITY NAME AND SHORT DESCRIPTION
A01	Service transport. No activities listed beyond naming the policies (see above).
A02	Urban logistics. No activities listed beyond naming the policies (see above).
A03	Connection with private sidings / terminals. The state “supports” keeping and extending the infrastructure.



...	
An	

Policy description for policy 3

This section, that has to be filled in for each policy listed in I.6 (e.g. if there are six lines in I.6, there must be six questionnaire part II) is open to the description of the main features of each policy.

A first set of questions must be answered by selecting an option from a closed list of possible options. This part will define the main formal policy features and will enable Brescia Mobilità to compare policies within and between FUAs, to underline if there is (or not) consistency and collaboration between different actors.

The second part of the section focuses on the constituent elements of the policy with the aim to identify the guidelines and limitations of each policy, and to evaluate if there is a common strategic address, and if planned action are consistent among different public authorities.

II.1 Policy level *<please select one of the following options>*

- Local
- FUA ("Region")
- Regional
- National
- European
- Other <please specify> _____

II.2 Name of the responsible body: *<please fill in text - max 100 characters>*

Verband Region Stuttgart

II.3 If the partner is not the responsible body, please describe how you are able to influence the decisions of the responsible body. *<please fill in text - max 500 character>*

WRS is the economic development agency of the Verband Region Stuttgart, so there are institutional ties. With KLOK, the relation is less formal, but the Regionalverkehrsplan contains a number of pages (not related to SUMP/SULP that are written on the base of explicit KLOK input, so there for sure is cooperation.

II.4 Department of the responsible body *<please select one of the following options>*

- Mobility and Transport



- Spatial Planning
- Environment and Energy
- Territorial development
- Other <please specify> _____

II. 5 Type of document related to the policy *<please select one of the following options>*

- Act
- Law
- Regulation

Planning document

- Other <please specify>

II.6 Is this an operational/cooperation program financed by Structural Funds? *<please select one of the following options>*

- Yes

No

II.7 Policy budget and source of funding: *<please fill in text - max 500 characters>*

This plan basically is the framework for the planning of the 179 municipalities in the 6 counties of Stuttgart Region. While there is a regional budget involved, mainly for public rail transport, this is of little relevance to the questions of SUMP and SULP.

II.8 Specify policy life-cycle status *<please select one of the following options>*

- Definition
- Implementation
- Monitoring and Evaluation

upgrade (new version, in last steps towards implementation)

II.9 Specific policy field of application *<please select one or more of the following options>*

- Road safety
- Green mobility service (e.g. car and van sharing)

Integrated planning of mobility and transport (included loading and unloading areas planning)



- Transports demand management (included LTZ management and charges)
- Integrated parking management & integrate payment system
- Urban logistics services- platform for urban distribution management
- ICT system and infrastructure
- **Energy efficiency, environmental impact analysis (e.g SEAP) and reduction (e.g. alternative fuels and E-mobility)**
- **Transport infrastructures**
- Other <please specify> _____

II.10 Primary policy objective *<please select one or more of the following options>*

- Provide incentives
- **Regulation/enforcement component**
- Other <please specify> __ Action Plan (list of measures) serves as guidelines, lists the activities of the ministry.

II.11 Supporting mechanism *<please select one or more of the following options>*

- Awareness/Information campaigns
- Partnerships/Key supporting stakeholders
- **Other <please specify> The document is mandatory for the planning of counties and municipalities, which in itself is a supporting mechanism.**

II.12 Synergies with other projects (e.g. local, regional, EU) or Private Public Initiative: *<please fill in text- max 1000 characters>*

The document sticks to the regional competences in questions of traffic and transport. The region is responsible for issues too big to be handled by the counties. That is the mandatory designation of through roads, and the operation of mainline commuter trains. It therefore in part supplements all municipal traffic and transport planning, but does not interfere in purely municipal issues.

II.13 Brief description of the policy: *<please fill in text - max 2000 characters>*

Definition of the regional framework regarding traffic and transport, for the municipalities and the counties to fill it with measures. It does make statements about desired policies on behalf of the region, but will carefully avoid to interfere with municipal planning, except where the municipal planning has consequences for the region as a whole.



II.14 Main goal of the policy: *<please fill in text - max 1000 characters>*

To make transport function in the Stuttgart FUA. That mainly is road transport and public (rail) transport. With severe traffic jams and only few through roads, the region has a problem in this field that overshadows all other potential measures..

II.15 Specific objectives (SO) *<please fill in the following chart - max 700 characters>*

Many objectives completely unrelated to FUA freight transport. The absence of any specific urban freight issues is striking. This has to do with the general legal understanding that a certain level of government is not allowed to handle things that the level below can also handle. Urban freight thus is decidedly urban.

The plan is mentioned here nevertheless, because the absence of the urban freight and SULP topic, however justified, keeps the topic out of the mind of politics.

SO	SO NAME AND SHORT DESCRIPTION
S01	<i>(see comment at II.15)</i>
S02	
S03	
...	
S0n	

II.16 SO Result indicators: please list, if the policy identify relevant qualitative or quantitative indicator of tangible improvement for final beneficiaries of the policy *<please fill in the following chart - if relevant >*

Nothing of relevance to urban logistics.

SO	SO RESULT INDICATOR <i><max 300 characters></i>	INDICATOR CURRENT VALUE	TARGET VALUE
S01 (example)	Number of deliveries out of peak traffic hours		
S02			
S03			
...			



Son			
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II.17 Activities: please specify Actions defined by the policy and through which it aims to achieve its goals *<please fill in the following chart - max 1000 characters each activity >*

ACTIVITY	ACTIVITY NAME AND SHORT DESCRIPTION
A01	(see comment at II.15)
A02	
A03	
...	
An	

Policy description for policy 4

This section, that has to be filled in for each policy listed in I.6 (e.g. if there are six lines in I.6, there must be six questionnaire part II) is open to the description of the main features of each policy.

A first set of questions must be answered by selecting an option from a closed list of possible options. This part will define the main formal policy features and will enable Brescia Mobilità to compare policies within and between FUAs, to underline if there is (or not) consistency and collaboration between different actors.

The second part of the section focuses on the constituent elements of the policy with the aim to identify the guidelines and limitations of each policy, and to evaluate if there is a common strategic address, and if planned action are consistent among different public authorities.

II.1 Policy level *<please select one of the following options>*

- Local
- FUA (Province)
- Regional
- National
- European
- Other *<please specify>* _____

II.2 Name of the responsible body: *<please fill in text - max 100 characters>*



Wirtschaftsverkehrsbeauftragter (authorized representative for commercial transport) of Stuttgart City

II.3 If the partner is not the responsible body, please describe how you are able to influence the decisions of the responsible body. *<please fill in text - max 500 character>*

WRS KLOK both are part of the “Arbeitskreis Innenstadtlogistik” (Circle for inner city logistics”) in Stuttgart, where the concepts of the Wirtschaftsverkehrsbeauftragter are debated.

II.4 Department of the responsible body *<please select one of the following options>*

- Mobility and Transport
- Spatial Planning
- Environment and Energy
- Territorial development

Other <please specify> Economic development

II. 5 Type of document related to the policy *<please select one of the following options>*

- Act
- Law
- Regulation
- Planning document
- Other <please specify> **__Action Plan (list of measures)**

II.6 Is this an operational/cooperation program financed by Structural Funds? *<please select one of the following options>*

Yes

No

II.7 Policy budget and source of funding: *<please fill in text - max 500 characters>*

No budget, but it can plea to the Stuttgart Municipal Assembly for funding.

II.8 Specify policy life-cycle status *<please select one of the following options>*

Definition



- Implementation
- Monitoring and Evaluation
- upgrade (it is the 3rd edition)

II.9 Specific policy field of application *<please select one or more of the following options>*

- Road safety
- Green mobility service (e.g. car and van sharing)

□ **Integrated planning of mobility and transport (included loading and unloading areas planning)**

- Transport demand management (included LTZ management and charges)
- Integrated parking management & integrate payment system

□ **Urban logistics services- platform for urban distribution management**

□ **ICT system and infrastructure**

□ **Energy efficiency, environmental impact analysis (e.g SEAP) and reduction (e.g. alternative fuels and E-mobility)**

□ **Transport infrastructures**

- Other <please specify> _____

II.10 Primary policy objective *<please select one or more of the following options>*

- Provide incentives
- Regulation/enforcement component

□ **Other <please specify> Naming policies and targets for municipal measures in local goods transport.**

II.11 Supporting mechanism *<please select one or more of the following options>*

- Awareness/Information campaigns

□ **Partnerships/Key supporting stakeholders**

- Other <please specify>

II.12 Synergies with other projects (e.g. local, regional, EU) or Private Public Initiative: *<please fill in text- max 1000 characters>*

In principle it is to connect with any local or regional research project regarding urban goods mobility or city logistics..



II.13 Brief description of the policy: *<please fill in text - max 2000 characters>*
It is a collection of aspects regarding the current situation and possible measures.

II.14 Main goal of the policy: *<please fill in text - max 1000 characters>*
Have urban logistics aspects brought into urban planning and decision making.
However, for the time being a certain lack of structuring led to rejection both from the industry and from the mayor.

II.15 Specific objectives (SO) *<please fill in the following chart - max 700 characters>*
(due to the limitations outlined above, the objectives cannot be laid out in a systematic way.)

SO	SO NAME AND SHORT DESCRIPTION
SO1	<i>(see comment at II.15).</i>
SO2	
SO3	
...	
SO _n	

II.16 SO Result indicators: please list, if the policy identify relevant qualitative or quantitative indicator of tangible improvement for final beneficiaries of the policy *<please fill in the following chart - if relevant >*
(see comment at II.15)

SO	SO RESULT INDICATOR <i><max 300 characters></i>	INDICATOR CURRENT VALUE	TARGET VALUE
SO1 (example)	Number of deliveries out of peak traffic hours		



S02			
S03			
...			
Sn			

II.17 Activities: please specify Actions defined by the policy and through which it aims to achieve its goals <please fill in the following chart - max 1000 characters each activity >

ACTIVITY	ACTIVITY NAME AND SHORT DESCRIPTION
A01	(see comment at II.15).
A02	
A03	
...	
An	



14.2. Annex 2: Transnational report on understanding freight behaviours and impacts in SULPiTER FUAs

14.2.1. Introduction

This annex arise from the FUA reports of each involved city and will provide the inputs for the deliverable T1.2.11 “understanding Freight behaviour and impact on FUA”. It is essential to arrive to a harmonized description of each FUA and to provide a suitable comparison among them.

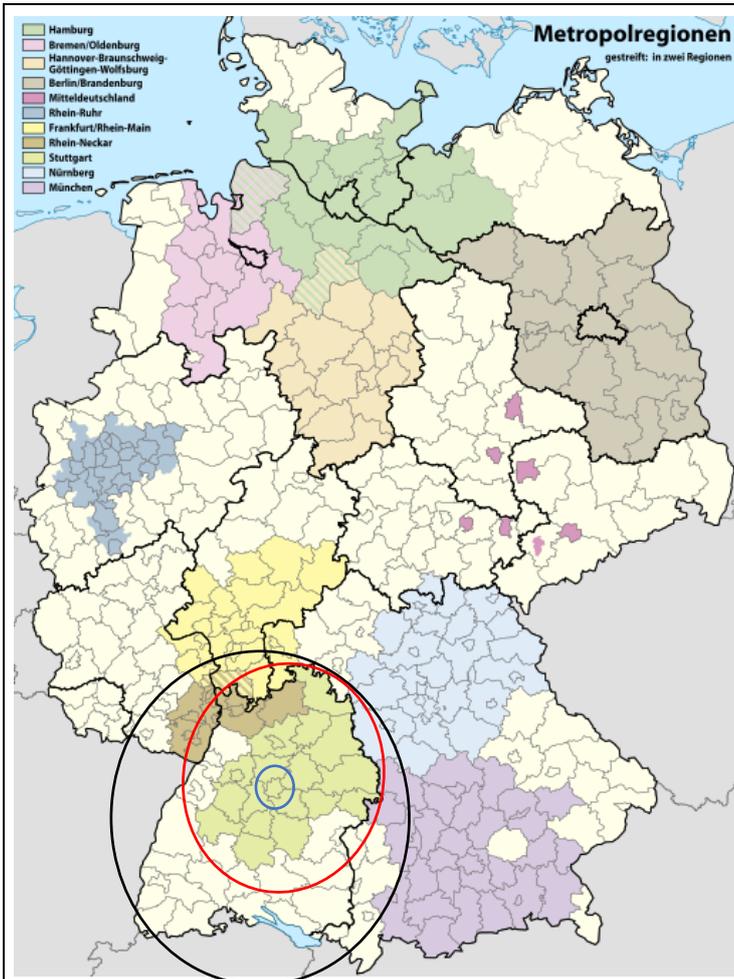
Each FUA is required to fill in the following form starting from the surveys and tool implementation. Please note that this template includes the minimum requirements for the SULPiTER project.

Please, do not answer as a questionnaire (i.e.: yes, no...) but use the template for elaborating the results of your interviews. As an example, we expect a deep and exhaustive qualitative report. Each component of the survey should be analysed and reported here with comments and interpretation of the results. Once you completed the report, please format the document removing the tables for a better readability.

14.2.2. The territorial contest

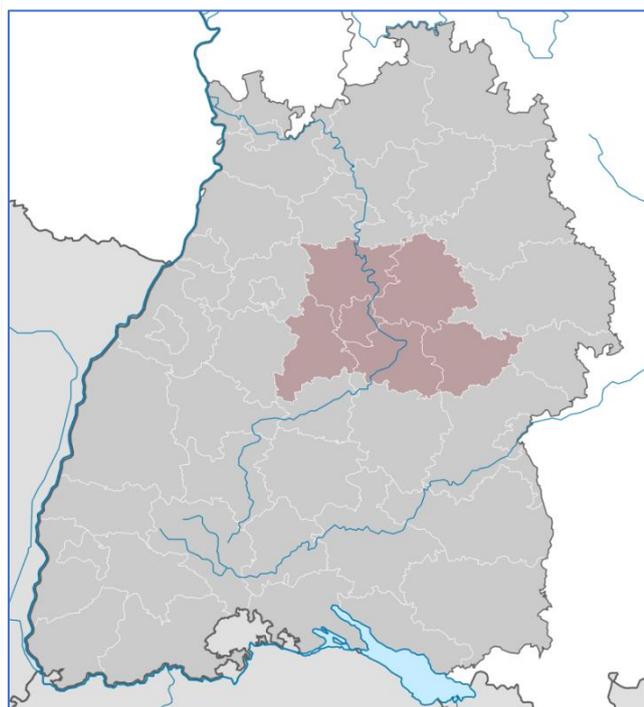
The information included in this chapter, are general. Please include also some specific information even if not requested by the template, in order to better focus the area of study.

<p><i>FUA name:</i></p> <p>Stuttgart Region</p>
<p><i>Km² involved in the study-area:</i></p> <p>As is typical for agglomerations, the Stuttgart agglomeration can be defined in several ways.</p> <p>The widest possible definition would be the German federal state of Baden-Württemberg, with a population of 10.5 million and a surface area of 35,000 km². However, for large parts of the state Stuttgart is just the political capital, while some main cities (Mannheim/Heidelberg, Karlsruhe, Freiburg, Ulm, Konstanz, Villingen-Schwenningen) by all means have their own catchment areas.</p> <p>The next level below the state on a geographical scale (as opposed to searching for the EU’s statistical “NUTS” regions) would be “Stuttgart Metropolitan Region”. That includes all the area which somehow has Stuttgart as its highest level center, defined on county level. Within Germany, 11 such regions are defined (see fig. 1):</p> <p>Fig. 1: Administrative map of Germany (federal states, counties within federal states), with metropolitan regions indicated in colour.</p> <p><i>Encircled in black:</i> Federal state of Baden-Württemberg.</p> <p><i>Encircled in red:</i> Stuttgart Metropolitan Region.</p> <p><i>Encircled in blue:</i> Stuttgart municipality.</p> <p><i>Source: Wikimedia commons; circles added by authors.</i></p>



This widest reasonable definition includes five of the 12 Baden-Württemberg regions (Stuttgart, Heilbronn-Franken, Nordschwarzwald, Ostwürttemberg, Neckar-Alb), with a size of 15,400 km² and a population of about 5.2 million. However, while it cannot be denied that Stuttgart is not only by far the largest town of the metropolitan area, and to a certain degree also its center, there are a number of mid-size towns and smaller cities that serve as centers of highest centrality: Heilbronn, Pforzheim, Reutlingen/Tübingen and partly Aalen), so that the functional

interdependence of the metropolitan region's outer area is neglectible in our context of goods transport, compared to the traffic to and from these other cities.



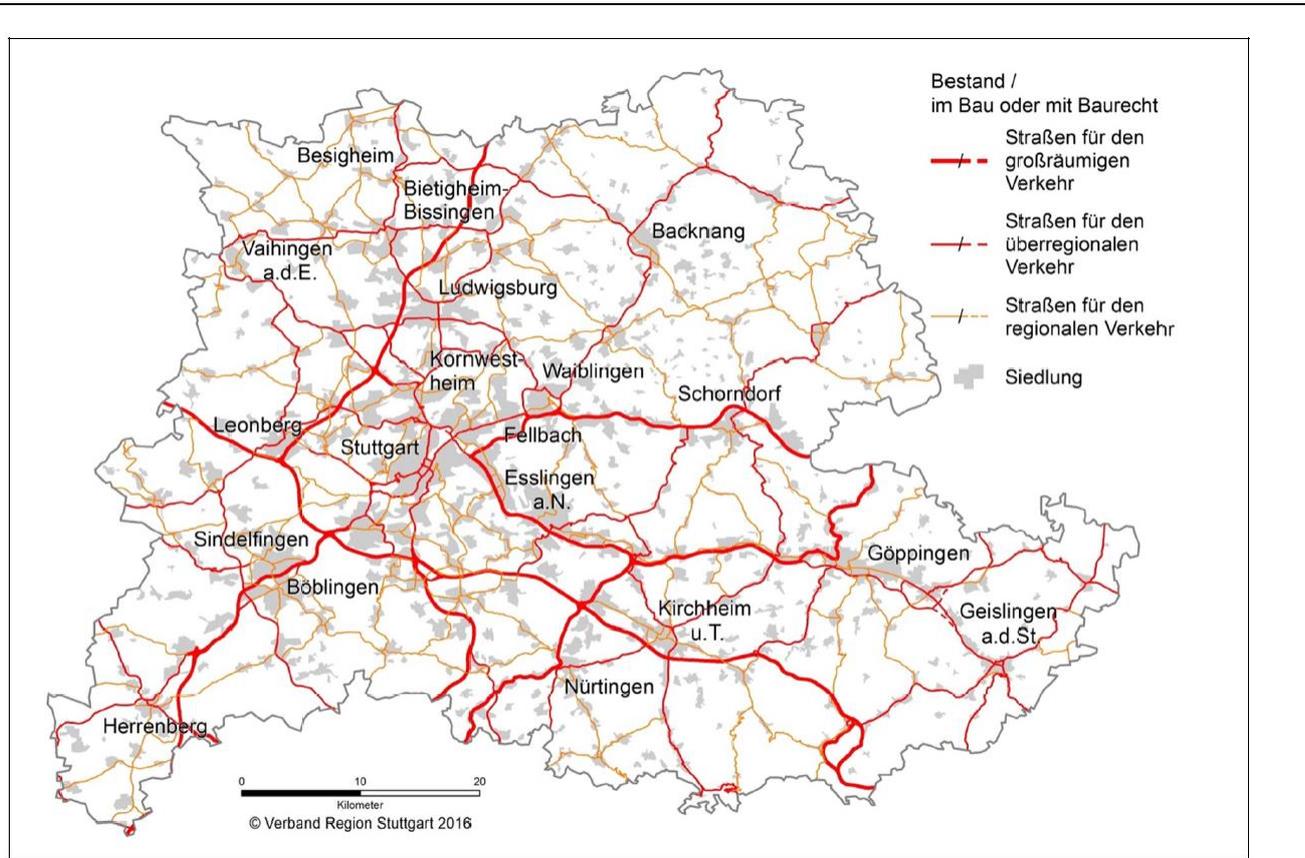
Therefore, the metropolitan region also is too large an area to be considered as a "functional urban area". The next level below the metropolitan region level would be the area of "**Stuttgart Region**", an area that is an administrative region of Stuttgart city plus five adjoining counties. It includes most of the area of intense commuting to Stuttgart and its surrounding towns. While it can be argued that the technical commuting area is somewhat larger and includes the towns of Reutlingen, Tübingen and Schwäbisch Gmünd outside Stuttgart Region, it is clear that on county level the area of Stuttgart Region nevertheless is the best approximation. It has a surface area of 3654 km² and a total population of about 2.7 million.

Fig. 2: Area of Stuttgart Region within the state of Baden-Württemberg.



Source: TUBS, Wikimedia commons.

Fig. 3: Settlement areas and interurban road system of Stuttgart Region



The above map indicates the road system for

- **long distance traffic,**
- **interregional traffic,**
- **regional traffic.**

The indicated towns are places of middle level centrality, with Stuttgart also being the higher level central place for the region as a whole. Bad Cannstatt, east of Stuttgart downtown, also functions as a central place of middle level. It is not indicated on this official map as it is not an independent municipality.

Source: Verband Region Stuttgart.

In Germany, there is a long-standing political and administrative practice to categorize settlements according to their centrality. This not only includes the “functional urban area” as a whole, but also applies to places on a lower hierarchical level, with lower centrality. Most important for our purposes is the “middle level” centrality, which is defined as a place that offers goods and services not only for day-to-day needs, but also for regular occasional needs: Specialized shops etc. These towns with their “middle level” catchment area typically also have their own labour markets: While it is generally possible within a functional urban area to commute from anywhere into the center and also into quite a number of other places in a broad segment of the functional urban area, definitely a significant portion of commuting, shopping and other trips is within the catchment areas of middle level. In this way, they function as their own urban area, overlapped by the total functional urban area which is defined by its relationship with the central city.

The towns named in the above map do have their own distinct catchment areas on middle level, occasionally shared with a neighbouring town. These places are:



- Backnang
- Bietigheim-Bissingen / Besigheim
- Böblingen / Sindelfingen
- Esslingen
- Geislingen
- Göppingen
- Herrenberg
- Kirchheim
- Leonberg
- Ludwigsburg / Kornwestheim
- Nürtingen
- Schorndorf
- Stuttgart (as middle level center, with Stuttgart - Bad Cannstatt)
- Vaihingen
- Waiblingen / Fellbach

The map shows the multipolar structure of Stuttgart Region. The areas of middle level centrality each have a catchment area (including the population of their respective central town) of 50,000 to 200,000 inhabitants. Far from just being suburbs, these towns each also have a strong industrial base.

The case of Stuttgart sticks out for a number of reasons:

- Stuttgart is the centre of higher centrality for at least the whole of Stuttgart Region. Beyond that role, for a much smaller area it also serves as a centre of middle level, just as the other towns named above do for their own catchment areas.
- Even as a central place on middle level, is much larger than the others. Together with the few smaller surrounding towns that make up the catchment area on middle level, its total population is 700,000 or about five times the average population of the other 14 catchment areas on middle level, which is just about 140,000.
- Stuttgart in reality is not a homogenous centre of middle level. Its downtown for sure acts as such a centre (besides its main function as the centre of the whole functional urban area and thus of the catchment area on higher level). But the historical centre of Bad Cannstatt, politically a part of Stuttgart municipality, in practice also functions as a centre of middle level. It is just not described as such a centre in the regional system of spatial planning, because it is not an independent political entity.

However, Bad Cannstatt as a local labour market as well as a shopping centre has its own catchment area. Because of the lack of spatial planning data, it is a bit difficult to judge the extent of that catchment area, but we can assume that in total it is well above 100,000 people and thus a rather typical entity on middle level.

No. of inhabitants:

The population of Stuttgart Region (the total functional urban area) is 2.7 million.



For a more detailed explanation see “Zoning criteria”, below.

N. of municipalities involved:

Stuttgart Region covers the area of **179 municipalities**. However, for the purpose of the study, most of them are not relevant as individual study objects. The majority are former villages that developed into residential suburbs, and the larger municipalities also have some industry.

That results in a rather disperse pattern which cannot be analysed by sampling. Any meaningful analysis of the area as a whole thus needs modelling, including the transfer of results from one part of the area to another part.

N. of working units (employers):

The total number of working units is much higher than the number of companies / employers, because an employer can have activities spread out over a multitude of locations. However, for Stuttgart Region we can state a number of rather specific issues:

The number of companies with registered employees in Stuttgart Region was 128,533 in 2014. These companies had a total of 1,260,205 employees. The number of business locations in Stuttgart Region was 137,228 in the same year, with a total number of registered employees of 1,088,224. Apparently, a number of businesses have more than one location, and companies based in Stuttgart Region employ about 180,000 people in locations outside the region. The economically active population is quite a bit higher, since these figures include neither public service nor self-employed people like doctors, consultants and lawyers.

Industry (“Verarbeitendes Gewerbe”) plays a rather big role in Stuttgart Region. In 2016, there were 1,660 industrial plants with more than 20 employees, totalling 331,118 employees. If we assume that producers with more than 20 employees really work on an industrial scale (while smaller producers work more or less as craftsmen), this means that more than 30% of all employees in Stuttgart Region work in industrial enterprises, even when “industry” is defined in the most narrow sense. The average size of these industrial plants is about 200 employees. Of course, with several mayor Daimler, Bosch and Porsche plants, each with many thousand and even tens of thousands of employees, most of the 1,660 plants are relatively small, while most employees work in a few really large plants.

Source: Regionaldatenbank of Statistisches Landesamt Baden-Württemberg for the basic figures, own calculations.

This is a huge deviation from the average sectorial labour distribution in European regions or urban areas, and even far exceeds the figures of the typical industrial regions. However, the deviation is caused by only very few large industrial plants. If we imagine the region without perhaps the dozen largest plants (almost all in the automotive sector, as a rule exploiting technologies around the combustion engine, plus a few electric tool and equipment producers such as Trumpf, Kärcher and Stiehl), the figures would look much more average. And just those largest plants do command their own logistics supply chains, which to a large part are separated from general delivery services.

As a result, the figures and findings for Stuttgart Region can be used for other functional urban regions of similar size. It should just be remembered that Stuttgart Region has an additional layer of logistics related to those large plants. However, that layer is not included in this report. It would mean to deal with individual supply chains, which are company secrets.

N. of zones used in the tool and in the o/d matrix:



We used **seven** zones:

- 1 - Historical center of Bad Cannstatt, including the downtown shopping area.
- 2 - Area of Bad Cannstatt railway station and new shopping center.
- 3 - Remaining area of Bad Cannstatt.
- 4 - Remaining area of Stuttgart.
- 5 - Adjoining county “Rems-Murr-Kreis”.
- 6 - Remaining area of Stuttgart Region.
- 7 - All else.

Zoning criteria

(nuts level, all of same nuts dimension or not, all similar dimension or different in dimension, ...)

The zoning was done in order to use Bad Cannstatt as a test field for the Stuttgart agglomeration. This meant that first of all the central district had to be clearly identified. We did not go for any administrative or historical boundary, but went to the spot and checked where the relevant businesses were. As a result, we got **two central zones**:

One includes the historical (medieval) downtown plus some adjoining streets, which form a functional unit. It is like the historical centers of the mid-size towns in Stuttgart Region (and beyond), and is typical of its type for Germany.

The other central zone was designed around a recently built mall and the Bad Cannstatt railway station. It also includes the shopping street that connects the railway station with the historical town. This also is typical for mid-size centres in Germany.

We wanted to learn about these two zones separately for the following reasons:

- Historical downtowns have a different settlement and business pattern than more recent central areas. We did not know whether that means different delivery patterns.
- A main road runs through central Bad Cannstatt, basically separating the two areas. It would result in meaningless data, if entry and exit of each vehicle on that road would be included in traffic counts.

The other zones were defined in relation to these inner city zones:

Zone 3, the historical and political Bad Cannstatt without its inner city, is the main catchment area for Bad Cannstatt downtown. It has intense links to the inner city.

Zones 4 to 7 are defined in relation to NUTS levels: Zone 4 is the remainder of Stuttgart (defined as a NUTS 4 as well as a NUTS 5 area, but without Bad Cannstatt). Zone 5 is another NUTS 4 area, Zone 6 is comprised of four NUTS 4 areas. Zone 7 is the residual zone “rest of the world”).

This zoning allowed for detailed full analysis in Bad Cannstatt and for sufficient detail regarding the regional matrix.

With Stuttgart centre plus another 14 centres on middle level, even if we thought of the 14 smaller centres as representing the functional urban area better than the overall high level centre, why did we not use one of them as a model, but the centre of Bad Cannstatt, which is not even officially named as a centre?



The answer is: Just because of that! We were looking for an apparent contradiction: A centre (plus catchment area) both as generic as possible and at the same time ready for detailed study on the ground.

Going to a town around Stuttgart and inquiring there about transportation and logistics, would need consent with the local political authorities. It is unthinkable that a regional authority (or a project on behalf of it) would just go for the town that fits best and then do something there that is visible in public and will have political implications. The centres around Stuttgart all have their old political traditions and maintain a strong standing. They would not accept to be just on the receiving end of a measure. It is of course possible to work with those administrations on a friendly base, but most likely not within a pre-defined project for pre-defined aims.

For Bad Cannstatt, the things were the other way round: Also a historical town as well as an industrial town of quite some size, it was merged into Stuttgart in 1902. Since that time, it feels a certain lack of attention. That is quite understandable: One just has to imagine a historical downtown with many stores, plus an adjoining shopping centre, due to its political integration into another city not being on the map of spatial planning. Therefore, any attention by a project was welcome.

Map of the study area (if available please attach also the shape file with area and road graph layer)

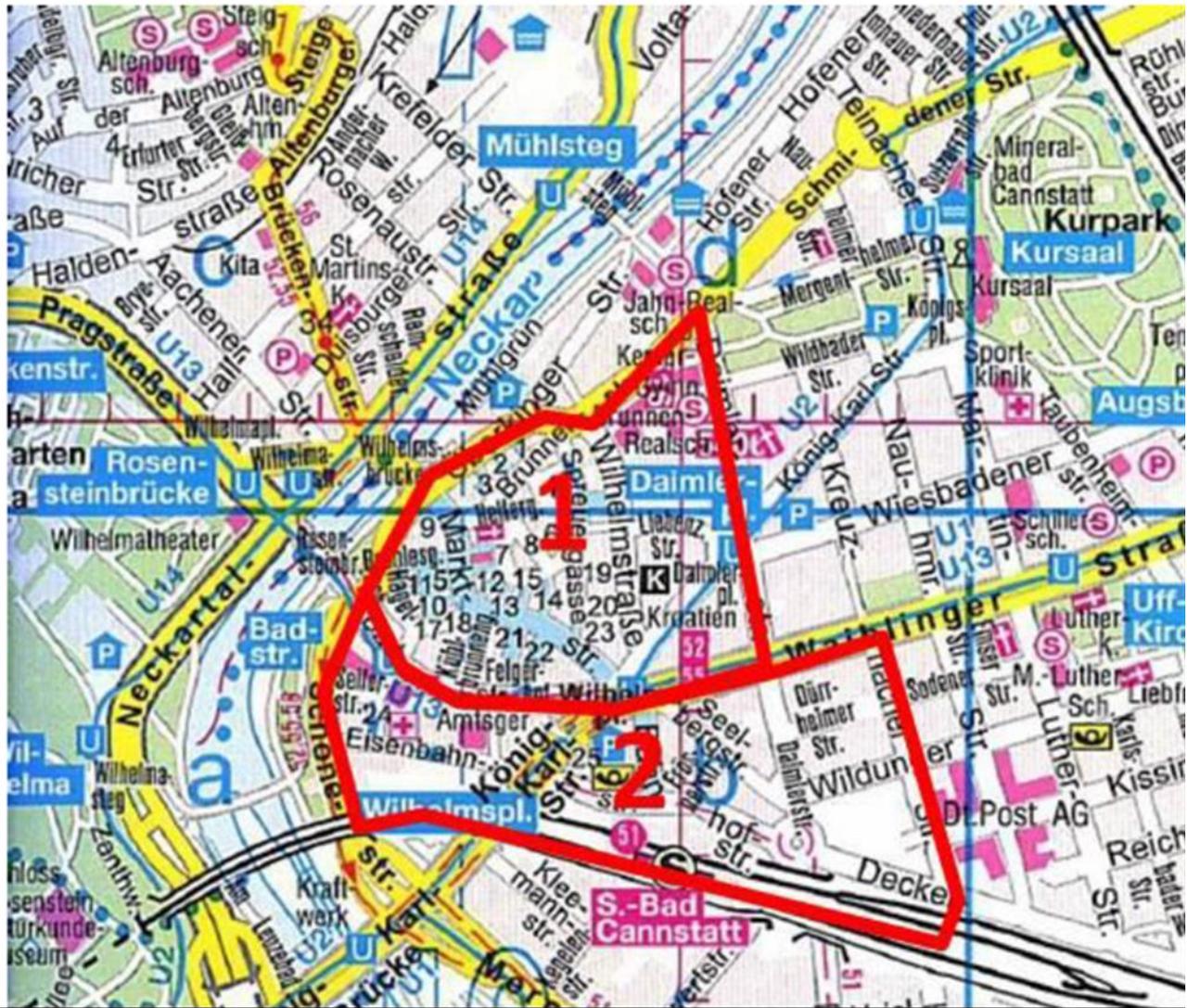
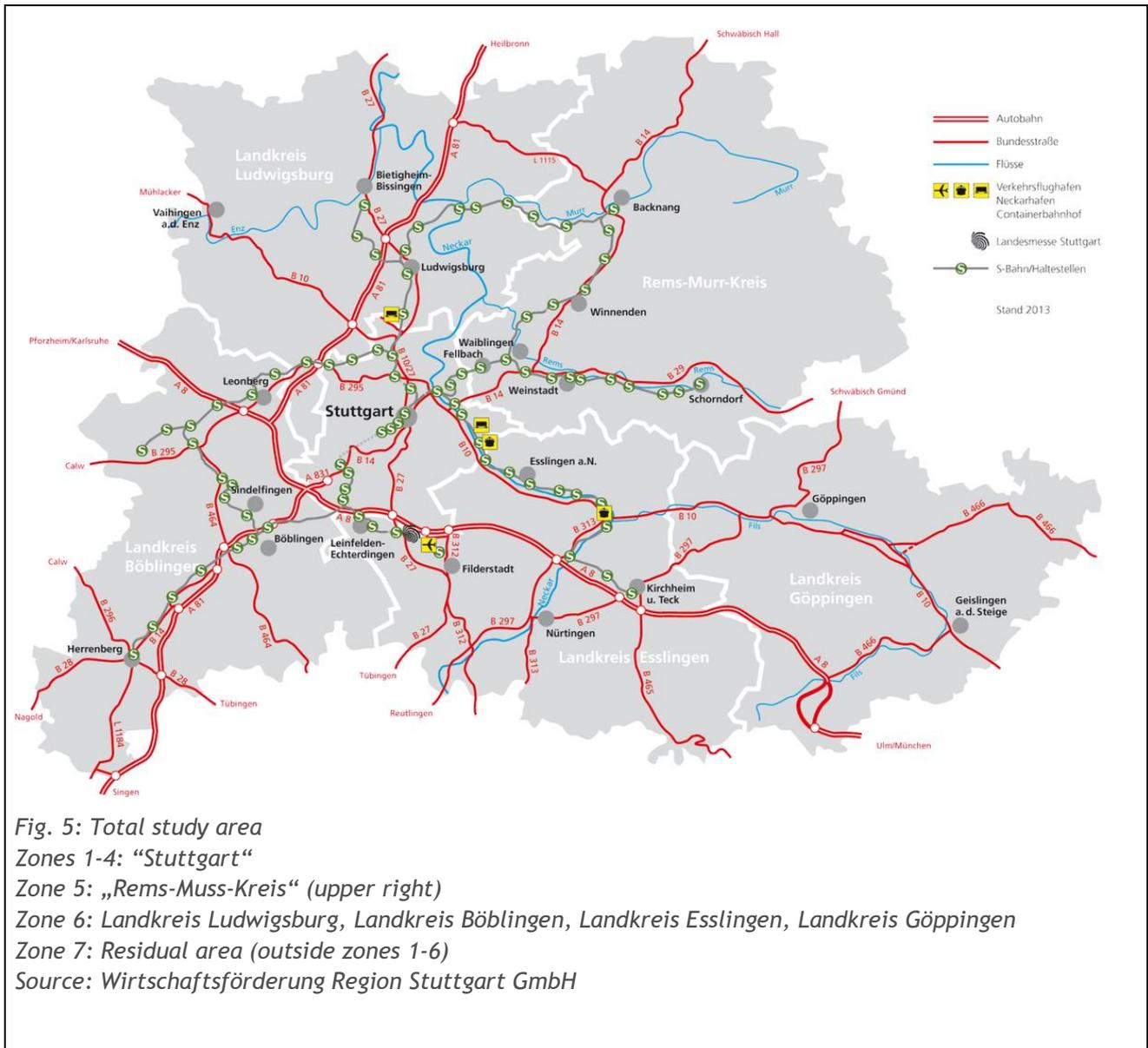
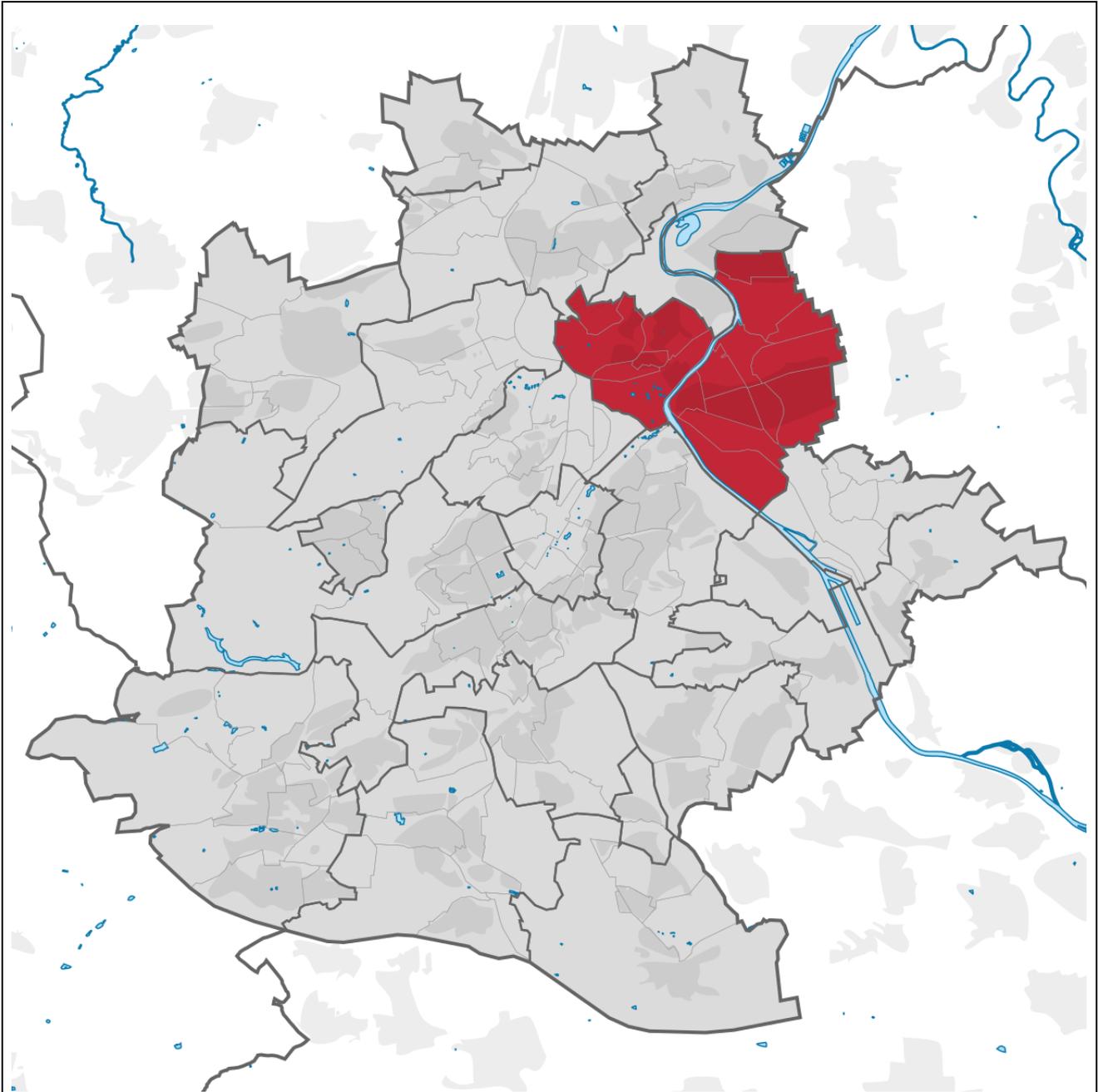


Fig. 4: Study area, inner Bad Cannstatt. Through traffic on König-Karl-Straße and Waiblinger Straße was not counted.





*Fig. 6: Stuttgart and Bad Cannstatt
Zones 1-3 (red): Bad Cannstatt
Zone 4 (grey): Remaining Stuttgart
Source: Wikipedia*

14.2.3. Current freight mobility impact

This chapter is the core of your report. Please include data and interpretation of the results. This activity should be elaborated in the best possible way in order to understand how freight behaviours are impacting in your FUA.



- Total number of interviews (per supply chain)

A good 200 interviews were made, of which the great majority was done on the spot and in person. The interviewer was a former automotive manager who has served in different executive positions in van marketing. Both his personal appearance and his knowledge of transport logistics resulted in a very low denial rate and in rather qualified answers.

- Number of suppliers (average per category ...)

The typical business had a number of suppliers. The total number was not systematically asked for in the interviews, since occasional suppliers are of little relevance. However, the interviewer took care to ask for at least three suppliers where applicable. This way we could be sure to get the relevant suppliers, even if not their total numbers.

- Share of DDP, EX-WORK and OFF TRUCK delivery modes

Most delivery (in fact, almost all of it) was scheduled either by the shipper (larger loads) or by the parcel service.

- Usual hours of delivery (distribution)

Mostly during the late morning.

- Share of OWN ACCOUNT COLLECTION

This was very low. Only a few examples were found, and even these few cases were just a part of the delivery for the business entities which did such collection. So, it may be one or two percent of the trips. The main cause is that retailers as well as restaurants go for the fresh food market in the morning.

- Share of DELIVERIES TO END CUSTOMERS

The business entities in the zones 1 and 2 do not regularly deliver to end consumers. Also, the number of households in this area is limited. Thus, a number of deliveries likely was made to end consumers by the commercial vehicles that entered and left the zones, but these vehicles will also have made stops to serve business entities.

- **Problems and suggestions (short analysis and description)**

The first problem was to define the survey in a way that it could get reasonable results. A sample is likely to misrepresent the logistics flows completely, since the different segments vary a lot in their answering behaviour. We therefore decided to focus on a rather small area but to do a full survey.

We now have data regarding a rather large number of businesses which are typical for an urban centre on middle level. This can be used for other centres in the following way:

- For the downtowns, as a first approximation we can assume that the traffic caused by retail trade is proportional to the size of the catchment area, in comparison with Bad Cannstatt. A closer relation might take into account the “centrality factor” of the respective downtown, which varies throughout Stuttgart Region. However, this factor itself is a statistical number based upon indicators which again may not be precise enough to really improve the results.
- We can also derive typical patterns for typical businesses (groceries, textile, fast food etc.). We do have the data now. The data base may be a bit small to get precise results for each segment. But if we look at e.g. a pedestrian zone with 50 stores of 20 different branches, and if we use typical numbers for each of the 50 stores regarding to their branch, we can assume that the imprecisions will equal out and we will get very reasonable results regarding the delivery patterns along this street.



Analysis of survey on transport operators flows. It may include the following aspects:

- *total number of interviews*
- *type of vehicles*
- *sequence of movements (number of movements, number of stops per trip)*
- *typical quantity*
- *frequency of movements*
- *parking during deliveries*
- *main issues*

Please do not include just the figures, but also detail and comment the results.

This already started with a main issue: The transport operators had much different strongholds within the logistics sector, as well as different market shares (throughout and within their segments). And they were not really willing to talk about hard facts of their business in quantitative terms. The big ones were just regional outlets of national / world-wide chains. Their data thus made no sense at all added up.

The parcel services explained that they send a van into inner Bad Cannstatt in the morning mainly for deliveries and in the afternoon mainly for pickups. This goes with our observations (see below), except that it must be at least two vans for DHL.

From the traffic count we then could conclude that the parcel services make for only about 2% of the commercial goods vehicle trips (which is less than expected), but definitely for a higher share of all delivery stops.

Analysis on traffic counts. It may include the following aspects:

- *AADT (average annual daily traffic)*
- *Total and for different categories of vehicles*

Please do not include just the figures, but also detail and comment the results.

We did a very detailed traffic count in Bad Cannstatt to learn about the traffic getting in and out of the zones 1 and 2. For this purpose, all entries of each zone were supervised and traffic was counted by type of vehicle.

On the other hand, we did not count the number of vehicles on the through roads. So, we checked neither the number of vehicles on the road that separates the zones 1 and 2, nor the traffic on the through road next to Bad Cannstatt. This has several reasons:

- For traffic on the main roads, there is a Stuttgart traffic count by type of vehicle (weight class), that can be utilized if needed.
- The fact that a main road runs right through downtown Bad Cannstatt (and not around it) is not coincidental, since towns develop at main roads resp. crossroads. But most of the traffic is through traffic without any relation to inner Bad Cannstatt (much to the regret of locals as well as local businesses). Focusing on this traffic would just diminish the relevance of the traffic that is caused by the zones 1 and 2, if not outright overwrite that data by its sheer magnitude.
- This is true the more regarding the main road bypassing Bad Cannstatt, which is a main Stuttgart traffic artery that leads into a major overland route.

Instead, with the focus on traffic to and from zones 1 and 2, we got results that not only speak for



themselves regarding Bad Cannstatt, but can be used for modelling the traffic in and out the inner area.

Please report below the 3 matrixes (quantity, deliveries, vehicles) from the tool, for each considered supply chain

Matrix quantities, e.g.: are some relations predominant among the others? Do you see an homogeneous distribution or a concentration in some zones? Do you see some unexpected phenomena?

Table: Origin/Destination Matrix

Table: Origin/Destination Matrix

Zones	1	2	3	4	5	6	7
1 – Historical Bad Cannstatt	0	1	5	12	20	25	150
2 – Remaining inner Bad Cannstatt	1	0	5	12	20	25	150
3 – Remaining Bad Cannstatt*	5	5	Due to the size of the cells 3 to 7 and due to the methodology, any calculated distances between these cells would be meaningless. Also, they are not needed for the purpose of the report.				
4 – Remaining Stuttgart*	12	12					
5 – Adjoining Rems-Murr- District*	20	20					
6 – Remaining Stuttgart Region*	25	25					
7 – Rest of the world*	150	150					

Unit: Kilometers

*Distance calculated as described below

Zones 1 and 2 are close to each other and rather small. Therefore, it was assumed that the average transport between these cells would cover a distance of approximately 1 km.

Zones 1 and 2 are close to each other and rather small. Therefore, it was assumed that the average transport between these cells would cover a distance of approximately 1 km.

The warehousing and logistics area of remaining Bad Cannstatt (zone 3) is a bit further off. 5 km is the distance to the wholesale food market at the Bad Cannstatt limit, where in the harbour area also the other main warehousing and logistics activities of this quarter of Stuttgart are located. Therefore, it is plausible to assume this distance also to serve as the weighted average for all transport between zone 3 and cell 1 and 2.

For remaining Stuttgart (zone 4), there is a multitude of possibilities, including several large logistics areas. One of the largest such areas, at the Stuttgart-Feuerbach Autobahn exit, is 12 km away. Again, this is a plausible weighted average.

For the adjoining Rems-Murr-Kreis (zone 5), it was not possible to find a single location that at the same time would serve as a weighted average. Some logistics activities actually are in Fellbach and Waiblingen, which are close to Bad Cannstatt. Others are in Backnang and, to a lesser extent, in Schorndorf, which is roughly as far as Backnang. Therefore, the 20 km in the above table is the distance to a midpoint between Fellbach and Backnang.

For remaining Stuttgart Region (zone 6), there again are a number of logistics centers all across the region. Chosing Köngen in the south-east was plausible, since there among others is the region’s DHL depot. It makes the average distance 25 km, surprisingly little above the 20 km for the adjoining district.



As for the rest of the world (zone 7), it was not meaningful to fix a specific point as a representation of the weighted average distance. Quite some traffic is to and from the large depots along A 81 motorway northeast of Heilbronn. Since those depots are transfer points, the non-transferred goods must at the average cover a longer trip. This is why an average of well over 100 km was assumed.

Last of all and as a technical remark, we understand that any transport within a zone covers a distance other than zero (or by definition it wouldn't be a transport). However, this internal transport in our model and for the researched supply chains is relevant only for the very small zones 1 and 2, and they have very little such internal transport. Since a better estimate would not add any significant amount of traffic to the total amount, this question was laid at rest.

The distances therefore are a qualified estimate. Actually, the project team members did offhand estimations, purposely done before any calculations to reflect the level of pre-scientific prejudice. It turned out that all figures were at least 50% larger than these first estimations. The handwritten offhand table that got closest to the results stated "0 - 1 (resp. 1 - 0) - 3 - 8 - 12 - 20 - 100" for the distances. As a result we can state that this table already by itself proves that delivery trips are much longer than assumed, no matter which way they are organized.

Traffic count

A specific traffic count was made in Bad Cannstatt for the purpose of SULPiTER.

Traffic was counted at all entry points to the zones 1 and 2 on two days, a Tuesday and a Thursday, from 6:00 to 12:00 and from 16:00 to 22:00.

The following notes must be made:

- The time from 12:00 to 16:00 was not covered; neither was the time from 22:00 to 6:00. While the latter due to low night traffic is not important, the former means that the figures underestimate the traffic. This was a compromise in order to allocate two shifts to the times when most commercial traffic would be expected.
- Traffic was counted for all entries and exits. It is well possible that commercial vehicles run out of one zone and into the other, and get counted again.
- We have generated corresponding outbound tables. For all entry points we also have figures for passenger cars, bikes and buses. All data is available in hourly time segments. The table below is an excerpt, showing only the commercial inbound traffic per entry point and summed up for morning and afternoon of both days.

It was not easy even for professionals to distinguish between commercial and private vehicles, when it comes to vans or commercialized private cars. Therefore, all figures for the light vehicles may give an order of magnitude rather than an exact count. In a few cases, the results of the count were implausible. Where this was the case, new counts were made on the same weekday, one or two weeks later.

Table: Inbound commercial goods vehicles



Tuesday	Morning (6:00 - 12:00)				Afternoon (16:00 - 22:00)			
Zone 1	Van	Light Truck	Truck	Heavy Truck	Van	Light Truck	Truck	Heavy Truck
C1B	13	34	12	0	14	13	0	0
C1W	102	224	89	3	61	81	1	3
C2L	54	45	3	0	30	22	1	0
C2K	15	52	11	3	15	16	2	0
C3W	58	194	49	6	52	225	17	1
C3K	12	42	18	0	12	35	0	0
C4B	58	42	21	2	41	10	2	2
C4M	3	8	5	0	2	0	1	0
C5B	3	11	4	1	2	2	0	0
C5K	4	4	2	0	1	3	0	0
C6Z	2	9	0	0	1	2	0	0
C6B	0	0	0	0	0	2	0	0
C7M	8	23	5	0	5	0	0	0
C7Z	0	0	0	0	0	0	0	0
C8K	0	0	0	0	0	0	0	0
C8P	0	1	0	0	0	0	0	0
Sum	332	689	219	15	236	411	24	6
Zone 2	Van	Light Truck	Truck	Heavy Truck	Van	Light Truck	Truck	Heavy Truck
C1D	91	152	26	5	41	59	4	2
C2W	19	43	5	0	15	22	1	1
C3D	105	184	57	3	42	53	6	1
C3K	0	2	1	1	0	3	0	1
C4D	69	101	25	5	21	98	9	3
C4E (out only)								
C5E	69	42	11	0	32	58	16	0
C5W (out only)								
C6S	5	5	0	0	5	3	0	0
C6E	10	26	0	0	15	9	2	2
C7B	1	0	0	0	0	0	0	0
C7S	6	14	1	0	6	3	0	0
Sum	375	569	126	14	177	308	38	10
Thursday	Morning (6:00 - 12:00)				Afternoon (16:00 - 22:00)			
Zone 1	Van	Light Truck	Truck	Heavy Truck	Van	Light Truck	Truck	Heavy Truck
C1B	17	32	6	2	3	3	1	0
C1W	58	179	36	2	23	40	2	0
C2L	20	80	6	0	13	35	3	0
C2K	16	64	12	0	0	17	7	0
C3W	69	253	60	1	60	135	12	1
C3K	12	42	18	0	12	15	1	0
C4B	59	35	21	5	35	18	0	1
C4M	1	7	8	0	1	0	1	0
C5B	0	2	1	0	0	1	0	0
C5K	0	4	0	0	0	0	0	0
C6Z	3	4	2	0	0	3	0	0
C6B	4	1	0	0	0	1	0	0
C7M	11	30	6	0	0	0	0	0
C7Z	0	0	0	0	0	0	1	0
C8K	1	0	0	0	0	0	0	0
C8P	0	0	0	0	0	0	0	0
Sum	271	733	176	10	147	268	28	2
Zone 2	Van	Light Truck	Truck	Heavy Truck	Van	Light Truck	Truck	Heavy Truck
C1D	44	181	50	5	42	39	6	0
C2W	23	38	4	0	9	19	1	0
C3D	74	184	62	8	29	93	6	2
C3K	0	2	1	1	0	0	1	1
C4D	75	73	12	5	23	103	2	1
C4E (out only)								
C5E	15	70	15	0	10	54	8	1
C5W (out only)								
C6S	1	5	0	0	1	1	0	0
C6E	6	12	0	0	21	16	1	0
C7B	0	4	0	0	0	0	0	0
C7S	7	2	1	0	12	13	1	0
Sum	245	571	145	19	147	338	26	5

Note: The entry points in this table are each designated by an abbreviation, in each zone first giving the number of the counter. Since in most cases one traffic counter could watch two entry points, these points are distinguished by the first letter of its road name.

Interpretation / Results

All in all, most traffic is through very few entry points. The highest individual number in the above table is 253 light trucks through one entry point between 6:00 and 12:00 o'clock. This relates to an average of



just one light truck per green phase of a traffic light. Traffic lights in Stuttgart operate on a 90 second scheme, repeating 40 times per hour and thus 240 times in 6 hours. The result, although surprisingly high, thus appears plausible.

Commercial traffic is higher on Tuesdays than on Thursdays, which runs counter to the experience with industrial areas. Also, the specialists from parcel service operators would assume the opposite, judging from their own business.

The figures clearly indicate that the majority of commercial goods traffic is not by parcel services. We asked the counters to do an additional count for the fleets of the larger parcel services. Their vans and light trucks indeed entered the zones occasionally, but did not sum up to more of a handful. We assume that their presence is much overestimated, for the following reasons:

- They carry a clear and visible branding.
- They stop multiple times while proceeding down a street, so their presence is indeed more intense than that of other vehicles.
- It is easy to understand what the parcel services are doing, as opposed to a light truck in more or less neutral colours.
- The courier vehicles thus are identified with commercial goods services, and since we see only what we know, we focus upon them.

However, it is clear from the figures that measures targeting parcel services will for sure not have an overall impact on goods traffic, let alone traffic as a whole.

The figures also include vehicles, probably as a significant share, which are not run by logisticians and not even do delivery services at all. They may be related to construction services and utility services. Furthermore, we learned from other sources that a significant number of commercial vehicles is indeed operated partly for setting out or picking up people, be that family members on private trips or working staff.

Nevertheless, the total figures are high enough to justify targeted measures.

Volume, Distance and Frequency

We have tried to derive the volume of the different logistics chains from the interviews. Indeed, quite a number of the interviewed responded to these questions. However, the aggregations did not result in anything plausible. We assume that the shop owners severely underestimate the amount of goods they receive, and they rather see the individual delivery than the big weekly picture.

As a result, we did two different things: We calculated the distances covered by the parcel services, and we made assumptions that allowed doing the same for the total of commercial vehicles. Both were done to establish a feeling for the order of magnitude.

From the traffic count we knew that the parcel services entered the inner Bad Cannstatt each with probably just one vehicle in the morning and one in the afternoon, although their zigzag journey made it appear in several counts. An exception is market leader DHL, for which we assumed two vehicles each for morning and afternoon.

This purposely resulted in the lowest figures imaginably. For each of the parcel services, we know where their depots are. That again allowed calculating the minimum distance travelled by the vehicles of each service. We based the table below upon these assumptions, well knowing that there are some more services on the market and the number of vehicles may be underestimated.



Table: Distance covered by parcel services for “Inner Bad Cannstatt”

Service	Depot location	Distance (single)	No. Vehicles (morning + afternoon)	Total distance (km, out and back)
DHL	Köngen	25	4	200
Hermes	Bad Rappenau	73	2	292
TNT	Korntal	12	2	48
FedEx	Stuttgart Airport	20	2	80
DPD	Ludwigsburg	20	2	80
UPS	Stuttgart	12	2	48
Sum			10	748

The result was a surprise: Although we claim that the parcel services are an almost neglectable factor in urban goods transport, these few vehicles alone cover a distance of 750 km/day for inner Bad Cannstatt alone. The individual double trip per day for each van is so long that it is risky to run it electrically with today’s batteries, although not totally impossible.

We also found that the “last miles” again were a lot longer than expected, varying from 12 to 73 km. The latter is because the Hermes service has many private households as customers, often outside agglomerations, and thus does not bother to locate itself close to Stuttgart.

The location of the depots also make it appear likely that the total kilometres are roughly the same for Bad Cannstatt as for all 15 centers of middle level in Stuttgart Region. By adding an estimate for the much larger Stuttgart downtown, we can assume that parcel services run a daily 15,000 km the very least just to serve the commercial centers of Stuttgart Region!

In a next step, we did the calculation for the total of commercial goods vehicles as counted in Bad Cannstatt. This again needed a number of assumptions: The total count for each day was well above 2,000 commercial goods vehicles, but we do not know how many of them were counted several times, due to their delivery tours. Therefore, for the total calculation we went for the smallest plausible number of just 1,000 vehicles, well aware that any other number up to two times the amount can also be argued for.

We then assumed the origins and destinations. We assumed that only few of the deliveries are within Bad Cannstatt (roughly 15% or about one in seven), but the largest number is from within Stuttgart, significant amounts also from the adjoining district as well as the other districts of the region. We assumed only 5% of the vehicles to have an origin/destination outside the region. That should not be confused with the origin or destination of the goods, of which many come from far away, but get transferred for the last mile. We again wanted to be on the safe side.

The result can be seen in the table below:

Table: CO₂-consumption for a total of 1,000 commercial goods vehicles per day in Bad Cannstatt

Zone of origin	Distance (single)	Percentage	Vehicles (No.)	Total distance (km, out and back)	CO ₂ * (t/day)
3 – Remaining Bad Cannstatt	5	15	150	1,500	0.5
4 – Remaining Stuttgart	12	40	400	9,600	3



5 – Adjoining Rems-Murr-District	20	20	200	8,000	2.5
6 – Remaining Stuttgart Region	25	20	200	10,000	3
7 – Rest of the world	150	5	100	15,000	5
Sum		100	1000	44,100	14

*Assumption: Average consumption of 10l/100km; factor 3.165 for diesel fuel.

We assumed very modest average fuel consumption. In total, one may double all figures and may still be within the range of plausible results. But even with minimum figures, apparently the commercial goods vehicles serving Bad Cannstatt travel a distance equalling a journey around the globe every day, and causing 14t of CO₂. The latter figure may not sound very impressive, but it is a daily figure. If we assume the yearly figure to be 300x the daily figure (250 work days plus a smaller amount for weekends), we reach a total of 4,200 t/year! Again, this is just the figure for one single center of middle level, of which we have many in Stuttgart Region alone.

Alternative assumption

Based upon the above figures, we could now set the target to “make 30% of deliveries emission free”, i.e. electric. We would then first assume that we only deal with those deliveries from zones 3 to 6, because the distances to and from zone 7 are too far. That would then be 30% out of 9 t of CO₂/day, i. e. a saving of 2.7 t/day or about 800 t/year. Again, this is just the figure for a daily 300 emission free vehicles, serving Bad Cannstatt, and not at all the total for Stuttgart Region.

We would have to keep in mind that almost all of the effect would be along the way between origin and destination, and only a small share would be an actual saving of emission within downtown Bad Cannstatt. This is the result of the surprisingly long “last miles”. Nevertheless, we plan to confront the Freight Quality Partnership with these assumptions in order to find out how in their opinion it changes the Logistics Service Indicator (LSI) for Stuttgart.

We could see from our quantitative results that the number of apparent delivery vehicles in inner Bad Cannstatt was much smaller than expected. This of course has to do with the multiple-stop routes. A pedestrian would stumble across the same vehicle several times and in different places during a morning shopping tour and thus get quite a different impression.

We can quantify only the delivery services to and from the inner town. We do know for each larger service where the regional depot is. However, main delivery traffic appears to be much diverse, between the depots and the households. And then there is the layer of the industrial supply chains, resulting in parcel networks of a different pattern as well as in individual flows to and from individual larger industries. While we do know about many such individual flows, we have not yet been able to sum them up and quantify them. However, for the purpose of getting generic and transferable results, these chains are least interesting, because they for sure are specific for each central place of middle level.

We were surprised about a number of findings:

- There hardly is any long-distance delivery into the downtown area. Almost everything is delivered via regional depots.
- The pedestrian zone has much less parking problems than all other areas. As long as the time



<p>window is open, the delivery vans can park anywhere. This cannot be said about the side streets. Coincidentally, with the new Bad Cannstatt shopping centre we included a centre that has a decent number of delivery ramps, and these ramps are accessible. When we told the logisticians that there apparently are no delivery problems, they were quick to answer that this was exceptional.</p>
<p><i>Matrix deliveries, e.g.: are some relations predominant among the others? Do you see an homogeneous distribution or a concentration in some zones? Do you see some unexpected phenomena?</i></p> <p>Quantity of volume and of delivery services correspond as far as our research went. This would have been vastly different had we included industrial logistics chains.</p>
<p><i>Matrix vehicles, e.g.: are some relations predominant among the others? Do you see an homogeneous distribution or a concentration in some zones? Do you see some unexpected phenomena?</i></p> <p>The vans basically shuttle between the area they serve and their regional depot, which typically is as close as possible to an Autobahn exit (the optimum interface position for long distance transport). This results in typical flows along the main entrance roads.</p>
<p><i>Please provide a comment (qualitative description) for you tool's results, e.g.:</i></p> <ul style="list-style-type: none"> • <i>Vehicle-km travelled by each type of vehicle within the study area</i> • <i>Traffic pollutant and greenhouse emissions</i> • <i>Network assignment</i> • <i>Other?</i> <p>The main result really was from the Bad Cannstatt interviews and of concern to urban planning there. We are not sure that we can conclude from our study to actual vehicle types' travel, because the segment we observed is rather small. The same goes for the emissions.</p> <p>The real result was that, when confronted with the result, the logistics people started talking about the problems they had in practice. We conclude that quite a change will happen in the future, with a larger number of electric vehicles doing delivery, and microhubs combined with electric cargo bicycles doing much of the deliveries in the centers of towns larger than about 100,000 people.</p>

14.2.4. Working documents

Please include all the working documents which allowed the results described in the chapters above.



Please, provide:

- *the complete tables of the O/D Matrices*
- *the final results of the LSI calculations*
- *the surveys (the questionnaires, not the single answers) in original language*