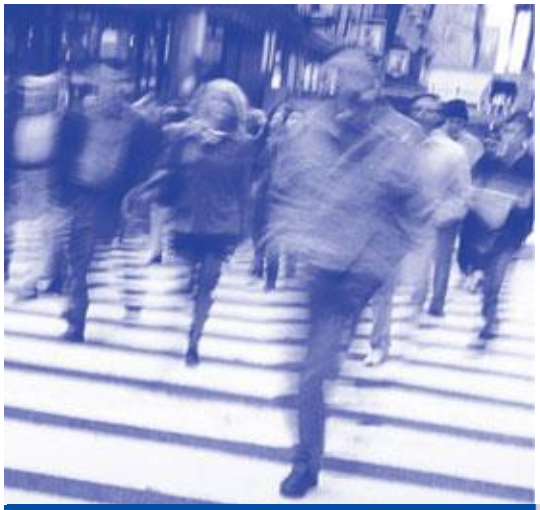

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PROSPERITY

TRAINING TOPIC SUMMARY

Urban Freight Transport and City Logistics

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2020 CIVITAS Cleaner and better transport in cities PROSPERITY

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1 Environmentally friendly urban freight transport in urban areas

1.1 Trends and problems

There are many reasons behind the increase of urban freight transport in cities. These include but not limited to the dispersion of labour and supply chains, on-line retail economy, rising customer expectations like “same-day delivery” or narrower time windows etc.

The increase in Urban Freight Transport (UFT) has led to increasing problems in cities. Typical problems include double parking of delivery vehicles, noise and air pollutants from delivery vehicles, major space requirements and road accidents. The light commercial vehicles alone account for 20% of particulate matter (PM10) inside towns and cities. The social acceptance of noise, visual disturbance and environmental impact of UFT has been decreasing. The commercial transport (both passenger and goods) has a significant role in decarbonisation of the national economies. In particular, trucks have a high share on traffic-related CO_2 emissions.

The majority of the UFT vehicles are diesel engines which emits much more NO_X and particle (the diesel exhaust) than the benzine engines. Figure 1 shows the traffic-related NO_X share in inner urban areas by different vehicles categories. Trucks and duty vehicles emit around one third of the NO_X in inner urban areas. The relation is the same in the case of particle emission.

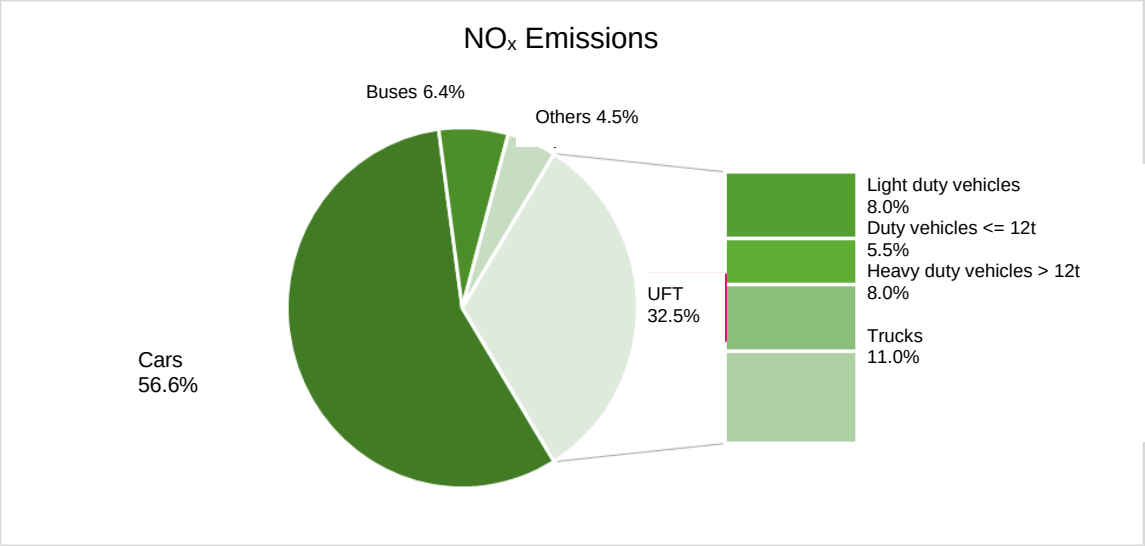


Figure 1: NOX emission inner urban traffic in Germany

Source: Martyn Douglas 2016; Data for 2014, TREMOD 5.61 (09/2015)

The statistical data about the share of urban commercial or freight transport is not very detailed by the European Union. Only a few countries have such differentiated data regarding different city categories on urban and non-urban areas. The city of Frankfurt /Main in Western Germany has conducted a survey, which analysed the share of UFT in CO_2 emissions. Figure 2 shows that UFT emits around a quarter of traffic-related CO_2 emissions. This is much higher than the average CO_2 share in inner urban areas, which is around 12% in Germany. The service sector based economy is the reason for high demand in deliveries. Although industrial cities require higher volume of goods (in tonnes), the number of trips and CO_2 emissions are fewer due to use of more heavy-duty vehicles.

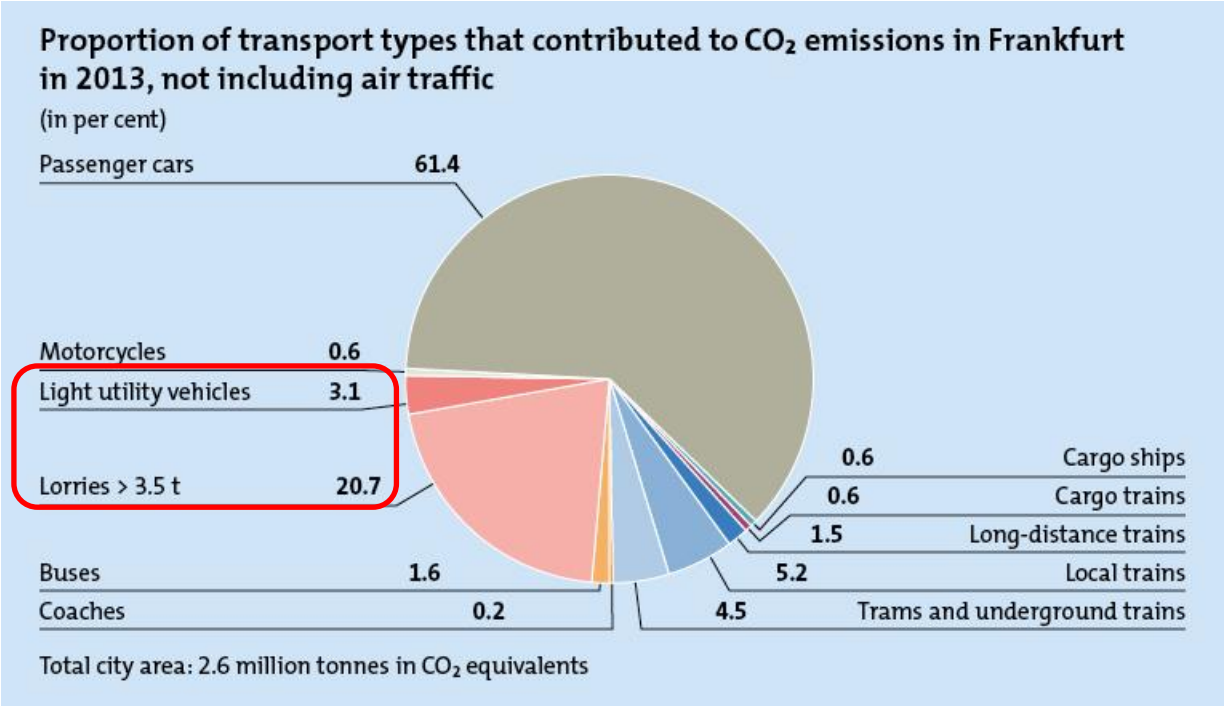


Figure 2: Yearly traffic related CO2 emissions in urban areas in example city of Frankfurt/Main

Source: https://frankfurt-greencity.de/en/environment-frankfurt/climate-protection-and-energy-supply/traffic-related-co2-emissions/

1.2 Planning for Urban Freight Transport

The managing UFT as well as waste disposal in a way that is compatible with the city's functions represents one of the central challenges for the cities.

Environmental objectives for UFT have been promoted at state and regional planning levels. Planning and managing UFT have not been regarded as compulsory tasks either. As a result, municipal planning practitioners tend to lose sight of UFT even though most of the time the legal frameworks offer greater flexibility to facilitate UFT in towns e.g. by setting up traffic controls (loading zones and user benefits for cleaner vehicles etc.).

Increase in courier express package (CEP) services has in many places led to bottlenecks in urban traffic. Without dedicated parking space allocated for CEP services, the CEP service vehicles often double park - obstructing view and causing risks of road accidents. On the other hand, the “last mile” is a principal cost factor for logistic providers. It often accounts for 50% of the costs of CEP service providers. The city of Berlin developed a planning concept geared to securing space as part of the “Integrated Berlin Commercial Transport Concept” (Figure 3). This concept secures space for freight villages and logistics close to railway lines, ports and the motorway in order to segregate long-distance and urban traffic. In addition, it reserves space for logistics sub-centres, for example, along the Berlin’s circular metropolitan light rail line, the “Ringbahn”.

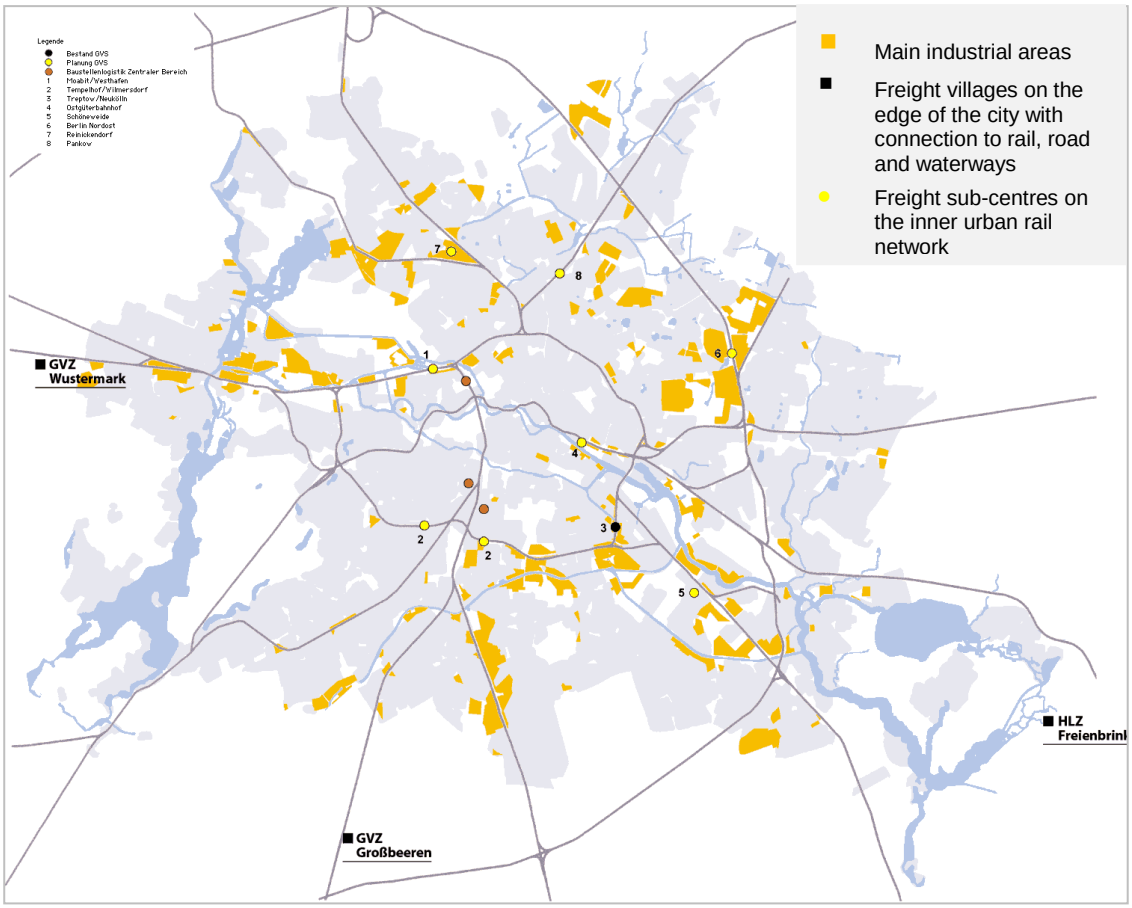


Figure 3: Berlin's freight villages and sub-centres

1.3 Technology solutions

Many different approaches have already been practised beyond embedding urban commercial transport into transport management concepts. In the city of London, for example, entering the inner city makes economic sense mainly with locally emission-free engines like those of electrical vehicles as the city toll is particularly expensive for polluting vehicles. Using e-mobility (using electric vehicles) for delivery is an option in Germany too, as evident by a project by DHL for zero-carbon delivery using a fleet of over 100 e-vehicles in Bonn.

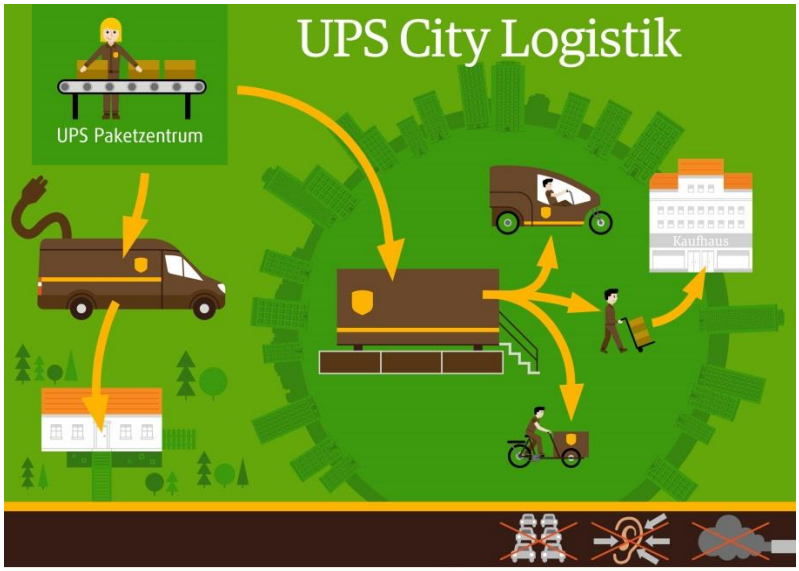
A major step towards supporting e-mobility is to convert the municipal fleet into electric vehicles fleet, including cargo bikes.

Electric vehicles are emissions free and operate with low noise, which is very important for inner urban areas with a high population density. In the Netherlands, an adapted electro delivery solution was developed. A third-party company (Cargohopper) offers an emission-free and low noise electric vans delivery service for companies for the combined last mile delivery in pedestrian zones, residential areas, narrow streets, etc. This example is running without subsidies from the cities. A few similar solutions exist in other EU cities like the Gnewt Cargo in London. The introduction of very low emission and/or low noise zones is necessary to promote the technological solutions in UFT.

A big challenge for the full electrification of the whole UFT is the small range of electric vans and in particular of heavy duty vehicles. But all major car producers have announced a broader range for the next few years.

The outcomes of an EU project titled “Cycle Logistics” shows that 50% of all motorised journeys (for both private and business purposes) to do with goods transport can be shifted to bicycles or cargo bikes in urban environments. In commercial delivery transport, the potential for transfer is not less than 38%. The aim of transferring motorised traffic to e-cargo bikes could be distinctly promoted this way. Delivery service employees appear to display increasing levels of acceptance of this mode of transport, one contributor being the “wellness factor” of bicycle use as the weather is not much of an issue for many employees. Cargo bikes, pedelecs and e-bikes are therefore a suitable option for delivery and courier services. Furthermore, there is a whole range of different service and sales vehicles available, for example for purposes like street cleaning and waste disposal. User benefits arise from the opportunity of delivery parking on bicycle parking space and the possibility of circumventing traffic jams because of the lower unit costs of e-cargo bikes.

Increased in cargo bike use should be accompanied by standards for this traffic mode and measures to adjust the streetscape, as well as the logistic concepts. Initial approaches like the BentoBox, which is a solution in the Berlin project Citylog, or similar projects, are examples for micro consolidation centres in urban areas. It involves a cross-company point of consolidation between delivery vans and bicycle couriers for the last mile (Figure 4). If electrically assisted, cargo bikes can increase the trip lengths and cargo weight. As opposed to the passenger car market, the market for electrically assisted bicycles today offers a large range of products covering nearly all segments.



Micro consolidation centres (also micro depots) serve as interface between larger delivery truck and cargo bikes or -cart, which take over the fine distribution on the last mile. These centres can be containers, swap trailer or small storages.

Figure 4: Principle of the micro consolidation for urban areas (Source: UPS)

1.4 Integration of Urban Freight Transport in spatial planning

Most journeys in UFT are made by vans and small trucks, while only 5% use trucks of 7.5t or above. Roads are used for delivery, sale, storage and construction. Roads are also a logistics space for goods transport and craftspeople. Of all the delivery and pick-up operations, 36% take place in the public space.

Redistributing city space will pose major challenges to commercial transport in the next few years. On the one hand, there is a lot of demand for attractive sites, e.g. riverside or downtown areas, to be used for residential purposes. On the other hand, many municipalities support the idea of reserving land to facilitate transshipment towards the inner cities.

One important action area in municipalities involves integrating the earmarking of space for UFT into municipal land-use planning. Location of freight villages and peri-urban transshipment points must be secured to minimise the number of truck journeys or redirect them to less sensitive routes. From

a municipal perspective, it is important to develop transshipment space for consolidating deliveries to craftspeople, retailers/wholesalers and households, as well as concepts for last-mile transshipment. The last-mile logistics space should be located in places close to inner city and densely populated areas. Micro hubs might be set up there as decentralised storage sites for deliveries, as well as automatic parcel delivery systems, delivery boxes and parcel shops to simplify door-to-door delivery to customers. Especially in road alteration schemes, land for delivery vehicle parking must be considered.

Another important solution for spatial integration of UFT involve using clean hybrid trucks that run under fully electric power in sensitive inner-city areas to reduce local pollution. Offsetting the extra costs of electric UFT vehicles could be an effective funding action in the national electric mobility programmes.

Individual UFT measures tend to be less effective in complying with the EU Air Quality and Environmental Noise Directive. Complementary package of measures can mitigate undesired effects from both the commercial and the municipal points of view. Sustainable UFT solutions requires developing complex and complementary concepts supported at all political levels (national, regional and local), along with UFT operators, in cooperating towards developing and implementing a locally tailored and effective combination of activities. Such measures include setting up delivery zones and opportunities for night-time delivery with low-noise vehicles (electric vehicles), harmonisation of certain rules and regulations, e.g. parking permits for craftspeople and tradespersons and noise limits for night-time deliveries. In summary UFT should be given the same attention as the local public transport or waste disposal.

1.5 Summary and Conclusions

There is a broad range of different measures to reduce the impact of UFT. These are listed as an overview as follows:

- Promotion of **low emission delivery vehicles and concepts**, e.g. restricted areas like environmental zones
- Implementation or support of coordinated **route navigation** e.g. using ITS systems to optimise the delivery tours
- Installation of **loading zones** for delivery vehicles, commercial transport is essential for a city
- Support of **receiver cooperation**, e.g. platform (delivery ramp) sharing, common procurement
- Support of **supplier cooperation** (City-logistics 2.0)
- Initiating **consulting platforms** for commercial transport problems
- Implementation of **area concessions** for delivery

The municipalities must consider the several legal conditions for the implementation of these measures. The following list shows the legal framework which must be followed.

1. **Justification and link between goal/objectives and measures**
   - Identify goals and objectives and shift the possible / necessary measures which can help achieving them
   - Present the link / connection between the goals and the planned measures
2. **Developing UFT solutions in development or urban planning**
   - Stage both the development and implementation (both temporal and spatial) UFT plan,
   - Assess the impact of the chosen measures,
   - Cater legitimate interests and concerns of stakeholders (e.g. residents, local enterprises) and involve them in the process
   - Start the implementation with those measures with high chance of success.
3. **Approval by decision makers**

- The UFT solutions / planning concept must be approved by the responsible municipality committee and/or the major.

Firstly, the planned measures must be related to the quality goal of the urban planning as GHG reduction or traffic safety goals. These relations must be described clearly. Secondly, the UFT measures should be integrated in an overall urban development concept as a master plan of urban development or a climate protection concept. This concept must include measures for the UFT, temporal and local realisation steps and an impact assessment of the measures. Moreover, it must consider legitimate interests of parties concerned (residents, local enterprises). At first these measures with high probability of success should be implemented. Finally, the concept:

2. Available training materials

Title	Description	Format	Source
Lectures, Studies, Brochures, Webinar etc.			
Study on urban logistics "The integrated perspective"	A guidance document including best practices on different aspects of urban logistics. The target group being local and regional administrations.	Study	http://ec.europa.eu/transport/sites/transport/files/2018-urban-logistics-study-the-integrated-perspective.zip
SULP	Planning Scheme "Sustainable Urban Logistic Plans"	Website	www.enclose.eu/content.php?p=5
ELTIS	Urban freight/city logistics	Website	www.eltis.org/topics/urban-freightcity-logistics
CIVITAS WEBINAR	Making urban freight logistics more sustainable from theory to practice	Webinar	www.youtube.com/watch?v=SQX0rlC7Y1Y
EU-US Urban Freight Webinar	Examples of Urban Freight Fleet Electrification	Webinar	civitas.eu/event/eu-us-urban-freight-webinar-series-2-examples-urban-freight-fleet-electrification
Inner urban freight transport and city logistics	Presentation on topic inner urban freight transport and city logistics. EU-funded urban transport research project results on www.eu-portal.net TRANSPORT TEACHING. 2003	Webinar	slideplayer.com/slide/4695906 www.eu-portal.net
Best practices material			
CiViTAS	Urban freight logistics	Website	civitas.eu/measures/urban-freight-logistics
BESTUFS.NET	EUROPA - Best Urban Freight Solutions	Website	www.bestufs.net
BESTFACT	A portal of freight transport best practices, contacts and policies.	Website	www.bestfact.net/category/urban-freight
Cargohopper	Examples of Green Logistic with consolidation of shipments	Video	www.youtube.com/watch?v=4xTUMAbBpC4
Micro-consolidation	Description of the (Micro)-consolidation solution for last mile delivery	Website	novelog.eu