RHENUS HOME DELIVERY

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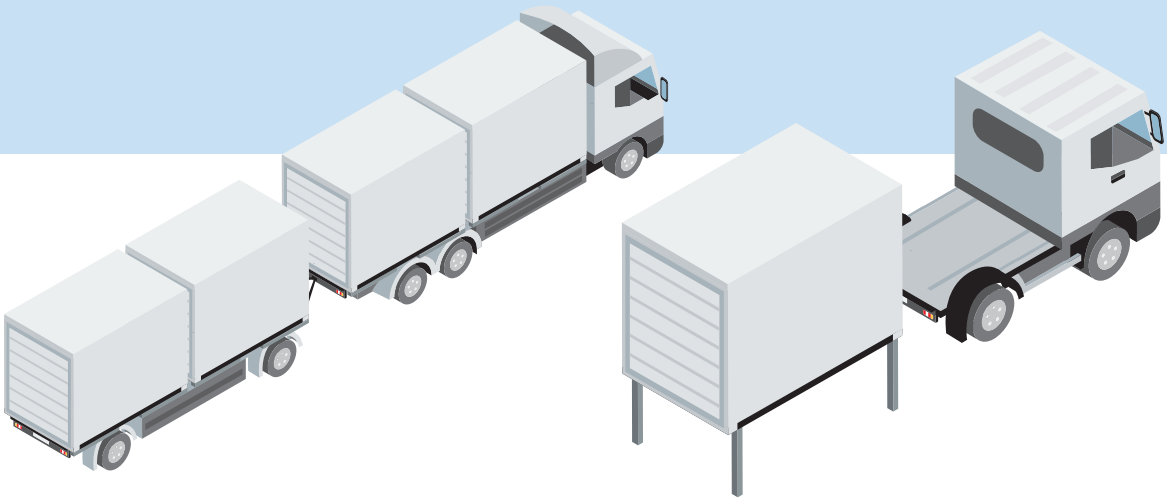
GREATER SUSTAINABILITY THROUGH MICRO-DEPOTS FOR HEAVY-BULK GOODS

whitepaper



INTELLIGENT CITY LOGISTICS

The courier/express parcels sector has set up micro-depots in many cities during the last few years. However, how is it possible to use this kind of mini-distribution centre in a cost-effective and sustainable way for larger general cargo items? Rhenus Home Delivery was one of the first last-mile logistics specialists to take the plunge and launch experimental operations lasting one year from November 2020 onwards. The new distribution system for delivering heavy-bulk consignments in Berlin created fewer traffic jams, lower emissions and greater value added.

The different interests pursued by cities, the retail sector and residents conflict with each other in the area of urban logistics. Individual, commuter and delivery traffic operations compete with each other and the infrastructure and logistics processes in many places have not yet been adapted to the requirements of modern city life. While the online retail sector and the demands for prompt deliveries are on the rise, there are also growing demands for greater quality of life and less traffic. Germany's capital is one good example of this.

Rhenus Home Delivery's depot is located in the area near Berlin in the federal state of Brandenburg, because logistics companies are increasingly setting up their facilities on the edge of cities because of the shortage of space and rising rent prices in the centre. As a result, vehicles have to be driven many kilometres from the business parks to consumers in the cities and back to the warehouse site. The Berlin Senate Administration Department for the Environment, Urban Mobility and Climate Action states the following in its Berlin business transport concept. "The increasing interrelationship with the areas surrounding Berlin and setting up logistics centres on the outskirts of the city are creating greater pressure on the main transport routes (particularly on the roads), which link the city and its surrounding area."[1]

1 Senatsverwaltung für Umwelt, Verkehr und Klimaschutz. "Integriertes Wirtschaftsverkehrskonzept Berlin 2021", p. 77 at: https://www.berlin.de/sen/uvk/verkehr/verkehrspolitik/integriertes-wirtschaftsverkehrskonzept-iwvk/(accessed on 22 April 2022)

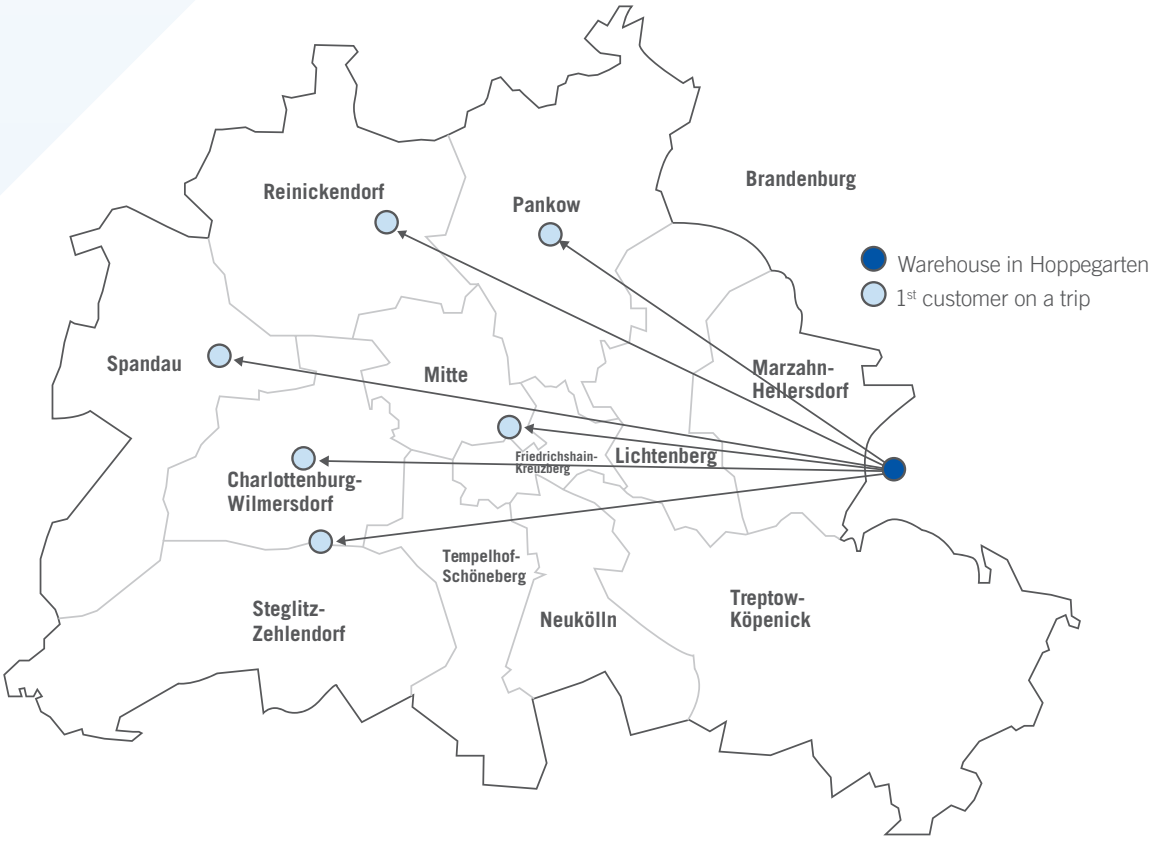
TRAVELLING DURING THE RUSH HOUR

Goods are transported to customers in Berlin from the Rhenus Home Delivery depot every day using a classic delivery concept. The vehicles therefore travel to and from between the states of Berlin and Brandenburg several times a day. It is almost impossible to prevent deliveries to customers during the morning and afternoon peak periods. After all, more and more people are ordering their goods on the Internet and are having them delivered to their homes. These not only include daily necessities and fairly small packages, but also increasingly large and heavy products, which specialists like Rhenus Home Delivery supply for the last-mile services using 2-person teams.

It is true that traffic volumes declined temporarily by 40 percent in Germany and by more than one half in Berlin during the Covid-19 pandemic, but the easing of the Covid restrictions quickly caused traffic levels to rise again. The volume of traffic within Berlin had almost reached the level prior to the crisis again by October 2021. After Munich, Berlin is also the German city that is most prone to traffic jams, causing losses of time of 65 hours per year. The B96 main road, the A100 motorway, the B2 Nord main road and Prenzlauer Allee are particularly subject to high traffic levels.[2] Last-mile transport services in inner-city areas therefore contribute to traffic jams during the rush hour, increase levels of particulate matter, fuel CO_2 emissions and create more noise for city residents.

CLASSIC URBAN DELIVERIES

The transport vehicles have to cover large distances to customers' premises because the depot is located outside the city – and this includes at least one empty journey back to the depot. Goods are also delivered during the rush hour. This creates traffic jams, increases levels of particulate matter and triggers noise disturbances, particularly in large cities.



2 Cf. INTRIX. "INRIX Traffic Scorecard: Innenstadtverkehr nimmt zu und erreicht Vorkrisenniveau", at: https://inrix.com/press-releases/2021-traffic-scorecard-de/ (accessed on 21 April 2022)

HOW CAN URBAN LOGISTICS BE OPTIMISED?

Micro-depots have mainly been used in the courier/express parcels market in the past and serve as collection points for packages in inner-city areas or concentrated residential areas. However, the general cargo items and goods from the retail sector dominate the quantities transported by urban delivery services in contrast to the courier/express parcels sector.[3] Even if the courier/express parcels market is growing more strongly in terms of the transport routes covered, general cargo traffic will continue to account for the lion's share of kilometres travelled (70 million kilometres in 2030), according to forecasts.[4]

How is it possible to optimise inner-city deliveries, shorten routes and prevent bottlenecks for general cargo deliveries in the German capital? Rhenus Home Delivery has developed a new distribution concept in response to this initial question and the crux of it involves setting up a centrally located micro-depot for heavy-bulk consignments.

The driving force behind this project was the company's own Innovation Hub, which handled the preparation, support and assessment work. Inntralog, a subsidiary of Rhenus Home Delivery, also provided support as a project partner and made available the handling space at its site at the Westhafen area in Berlin in the Moabit district in north-west Berlin.

3 Cf. LNC LogisticNetwork Consultants GmbH/Fraunhofer-Institut für Materialfluss und Logistik IML. „Ergebnisbericht – Die Veränderungen des gewerblichen Lieferverkehrs und dessen Auswirkungen auf die städtische Logistik", p. 17 at: https://www.bmvi.de/SharedDocs/DE/Anlage/G/staedtische-logistik-bericht-veraenderungen-lieferverkehr.pdf?_blob=publicationFile (accessed on 3 May 2022)
4 Cf. this. "Ergebnisbericht – Die Veränderungen des gewerblichen Lieferverkehrs and dessen Auswirkungen auf die städtische Logistik", p. 14 from the same source (accessed on 3 May 2022)

THE INNOVATIVE MICRO-DEPOT CONCEPT

Rhenus Home Delivery's environmentally-friendly concept reduces the volume of traffic and cuts the consumption of fossil fuels. The goods are delivered to the micro-depot at night. Using electric trucks[5] means that CO_2 emissions and noise levels decline. The journey to the customer on the next day is shorter, as the delivery vehicles no longer have to commute to the depot in Hoppegarten, but just to the micro-hub within the city.

A FLEXIBLE CONCEPT USING INNOVATIVE TECHNOLOGY

The greatest challenge involved identifying the swap bodies, which are both compatible with the main journey at night and the last mile operations with vehicles weighing 7.5 tonnes. Special 7.5-tonne vehicles, which are capable of accommodating swap bodies, also had to be used. A model produced by the RYTLE start-up proved suitable for the test phase. Its swap bodies make it possible to easily adapt the storage height thanks to its hydraulic supports.

5 Please note: diesel-powered vehicles were still used during the test phase

THE FIELD STUDY

SHORT ROUTES TO CUSTOMERS

During the test phase, a fairly small vehicle handled the last-mile deliveries to customers on the following morning. This kind of special vehicle can accommodate a swap body container. It took half a day to deliver all the consignments inside the box. Once all the consignments had been delivered from the first container, the delivery vehicles did not have to travel back to the depot in Brandenburg, as they did in the past, which often involved a journey lasting one hour, in order to reload for a second trip, but only complete the relatively short return journey to Westhafen. These shorter routes and the fact that the delivery team no longer had to load the vehicle meant that it was possible to reach a larger number of customers and therefore travel fewer kilometres per customer.

The concept of the micro-depot not only saves kilometres and therefore CO_2 emissions, but opens up new potential in the jobs market. Particularly when there is a shortage of specialist workers, it is difficult to attract drivers, particularly if the journey to work is long. A workplace in the centre of the city is much more attractive for local drivers in Berlin. In ideal circumstances, they can even complete this in a CO_2-neutral way using their bike or environmentally-friendly public transport services. It was therefore possible to increase the satisfaction of the delivery teams during the field study.

GREATER QUALITY OF LIFE IN THE CITIES

Making available spaces for micro-depots provides benefits to inner-city areas too: fewer polluting emissions, less traffic and a lower noise level all have a positive effect on city residents and the quality of inner-city areas and therefore increase their attractiveness. Space for traffic is in short supply and the reconstruction of cities, traffic-free zones and new cycle paths all require a fresh approach to private and business motorised traffic.

Benefits of micro-depots

- Combining flows of goods
- Journeys outside the rush hour
- Reducing inner-city traffic and traffic jams
- Cutting CO_2 emissions
- Improving delivery processes
- Optimising journeys and increasing the number of stops
- Shortening journeys to work
- Increasing the attractiveness of inner cities

CONCLUSIONS FROM THE PRACTICAL TEST

By establishing micro-depots in cities, it is possible to sensibly combine flows of goods and reduce business traffic. This is necessary, because the 2030 traffic integration forecast from the Federal German Ministry for Digital Matters and Transport is forecasting an increase of 16.8 percent in the volume of road freight transport services in Germany between 2010 and 2030.[6]

Micro-depots help reduce traffic jams and cut traffic noise because smaller vehicles are used. Even greater effects can be achieved by using vehicles with an electric power train. It was possible to significantly increase the number of stops during the project. The micro-depot concept therefore makes economic sense too. Micro-depots in inner-city areas increase the attractiveness of the workplace and boost the satisfaction levels of employees. The new distribution concept with a micro-depot, such as the one at Rhenus Home Delivery, is therefore helping to change the cityscape and create a positive image for logistics services.

Results

- 1,200 kilometres less per day
- 750 kilometres less during the rush hour
- 45 percent higher journey efficiency

EXPANSION WORK IN THE PIPELINE

The micro-depot at Westhafen is due to be expanded because of the success of the project – probably starting at the beginning of 2023. There will then be 600 square metres of space to accommodate the Rhenus swap body containers. Deliveries will also be increased by using six electric vehicles and 16 swap bodies. The vehicles are optimised in terms of their height so that there is no need for any hydraulics for the containers.

One electric articulated truck will be able to deliver four containers from Hoppegarten to Westhafen in future, two of them on a tractor truck and two on a trailer. The aim is to generally deliver goods from twelve swap body containers every day. This provides savings potential of 350,000 kilometres and 132 tonnes of CO_2 per annum.

6 Cf. Bundesministerium für Digitales und Verkehr. “Verkehrsverflechtungsprognose 2030”, at: https://www.bmvi.de/SharedDocs/DE/Artikel/G/verkehrsverflechtungsprognose-2030.html#:~:text=Die%20Verkehrsverflechtungsprognose%202030%20ist%20die,im%20Rahmen%20des%20neuen%20Bundesverkehrswegeplanes(Accessed on 9 May 2022)

MORE STORAGE SPACE REQUIRED

Setting up micro-depots is also conceivable in other German cities such as Düsseldorf, Munich or Frankfurt, but the largest prohibiting factor here is the availability of storage space in city centres; town planners are needed to provide them. Involving electric cargo bikes for fairly small consignments would be one way of further improving sustainability and city-friendly logistics.

A further optimisation of the micro-depot concept is also possible. The Innovation Hub, for example, is already examining multi-usage concepts with partners, which would like to transport goods from cities to the surrounding areas. This would not only reduce the amount of land required in cities, but also prevent empty journeys by heavy goods vehicles, for example, for the route from Westhafen back to Hoppegarten after unloading the containers. There is potential for reciprocal transport operations: according to the German Federal Motor Transport Authority, 13.7 million tonnes of cargo were not only transported from Brandenburg to Berlin in 2020, but 11.1 million tonnes from the city to Brandenburg too.[7]

Are you looking for a sustainable logistics partner for last-mile operations or would you like to discover more about the range of products provided by Rhenus Home Delivery without any obligation? Please get in touch with us!

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You can contact us directly here!

You can obtain more information about sustainability at Rhenus Home Delivery here:

rhenus.group/home-delivery/sustainable-logistics

7 Cf. Kraftfahrt-Bundesamt. “Verkehr deutscher Lastkraftfahrzeuge – Verkehrsverflechtungen 2020“, summary 2, at: https://www.kba.de/DE/Statistik/Kraftverkehr/deutscherLastkraftfahrzeuge/vd_Verkehrsverflechtungen/vd_verkehrsverflechtungen_node.html (accessed on 22 April 2022)