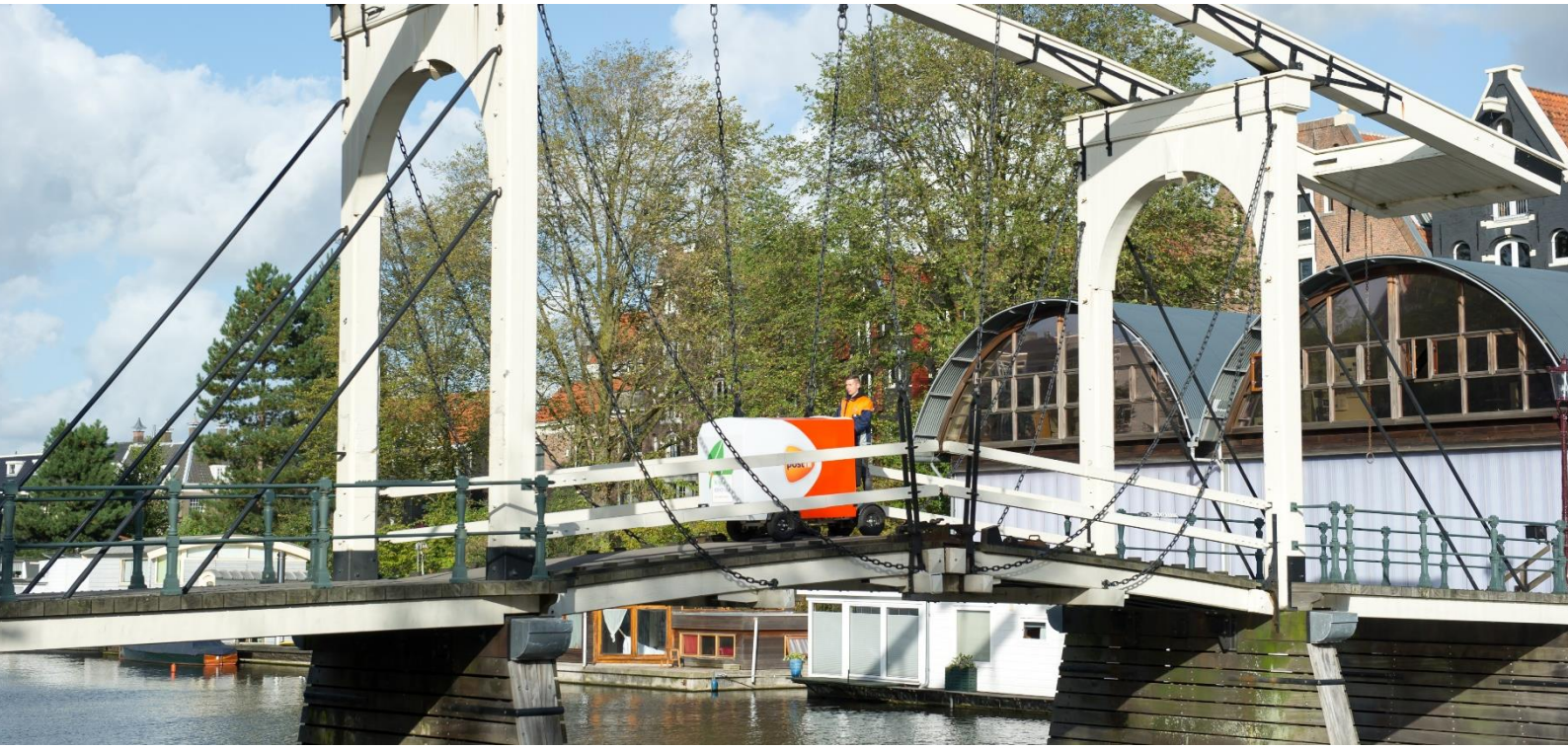
CITYLAB
AMSTERDAM

The CITYLAB implementation in Amsterdam examined different models for last mile freight delivery in the city's centre. Envisaged delivery based on floating depots turned out to be infeasible, instead unused shops and underused post offices were utilised as micro hubs for delivery by bike. The implementation is a hybrid model, were bikes operate along conventional trucks.



Context

The Amsterdam implementation aims to improve last mile logistics by enhancing the utilisation of existing infrastructure. In Amsterdam, the recorded congestion level in remains at around 22-27% of additional travel time in recent years. In the peak times this can reach up to 65% of added travel time. TomTom estimates 26 minutes average additional travel time per day and 101 hours per year per driver, adding considerable cost to deliveries.

In Action

The Amsterdam CITYLAB examined three solutions of floating parcel depots for the last mile. The initial concept foresaw vessels shipping the parcels. As floating depot, they had to have a mechanism to lift the goods onto the quays. From there, the parcels were to be transported by clean vehicles to the final destination. After some issues, PostNL decided to use conventional vans instead.

In the second scenario, PostNL considered using a floating depot pushed by a hybrid-push boat from where zero emission (ZE) vehicles (EV trucks or bikes) would deliver parcels in the 'de Pijp' in Amsterdam. Evaluation performed at the end of design phase illustrated the lack of a sustainable business model for this scenario.

Currently under trial, the third solution reviews different models of e-freight bikes for the last mile. The best model will be purchased for a more extensive pilot. These E-freight bikes distribute mail and parcels from micro-hubs located in the city centre. To avoid the high rents in the city centre, the depot utilisation needed to be maximised and some micro hubs (for example abandoned stores or

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existing PostNL hubs) are shared with other PostNL activities like daily mail.

This implementation followed the Living Lab approach: based on a shared vision of making the city centre of Amsterdam more sustainable and reducing congestion, PostNL has cooperated with the local authorities and researchers to improve last mile logistics in the city centre.

Results

The first phase of the Amsterdam implementation action was exclusively focused on the floating depot. However, analysis performed during the planning phase has revealed barriers to the implementation:

1) Different business visions of the stakeholders, a small shipping company, a large boatbuilding company (Veka) and PostNL,
2) Lack of local government support;
3) Distance from the distribution centre to the city-centre exceeds light electric vehicles capabilities and reloading to an inner-city floating depot is expensive.

As a result of these barriers the implementation idea was adjusted in the beginning. The targeted segment turned from parcels to the delivery of fresh goods to dedicated hotels, restaurants and bars. Analysis performed for the case indicated that it was not viable for the following reasons:

1) The time to cover the distance (and speed) to the inner city location would take too much time.
2) A delivery barge requires two operators on the boat which is expensive.
3) The barge matched the loading capacity of a regular truck but turned out more expensive.
4) It was hard to find lead customers who wanted to use to boat service of PostNL from the start.

Overall, it was decided that it was not cost-effective to bring the goods into the city by boat. Based on these evaluations, PostNL decided to look at the other possibilities using existing infrastructure.

The second phase suggested utilising disused stores and locations as micro-hubs for the deliveries with e-bikes. They are to be shared with other logistics service providers, to save cost. Initial ambition was to replace vans by 50 to 60 e-freight bikes that will handle around 2000 stops. The freight e-bikes have been implemented since 2017 and until now, seven shared micro-hubs could be opened. Each micro-hub is supplied by a truck twice a day. The first trip includes mail that will be delivered to business clients in the morning. Once the electric freight bicycles deliver all mail to the clients, they return to the micro-hub and are being recharged. In the afternoon the electric freight bicycles start a second shift to empty all public mailboxes and pick-up mail and parcels from business clients. About 1300 orders are still handled by vans while the remaining 2200 orders are handled by bikes from the micro-hubs that are supplied by truck. Due to time savings during the trip caused by cycling infrastructure and lack of parking issues, bicycles can handle 5% more orders during a trip which saves about 5 trips per day. Drivers are satisfied with the additional exercise due to the cycling and experience less stress because congestion and parking issues no longer is affecting them. Also, positive reaction from the public are experienced; tourists making pictured and enthusiasm from clients

Challenges, opportunities and transferability

There are several challenges ahead, especially when extending to other cities. The main challenge in Amsterdam is to find sufficient employees to deliver by freight bike. Another challenge is to increase the utilisation of the freight bikes by extending the operations towards the delivery of packages, food, local products and evening deliveries.

The first lesson is that floating depots do not quickly create a valid business case. The development of an entirely new technical functionality takes long before it is ready to be used in operations. Another lesson is that using the floating device for delivering food products doubled the costs compared to conventional daily practice, due to the higher operational costs. They result from the longer delivery time and the capacity of the floating depot.

Cooperation between industry, research and local authorities resulted in better understanding of each other's issues and strengths. These relations contributed in developing and evaluating the concept. Especially the fact that it was clear to everyone involved why something did not succeed has been helpful when together looking for feasible solutions in a new cycle.

If this concept works well, PostNL would like to extend the concept of micro-hubs and sustainable transport to other cities and the remainder of Amsterdam.

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