



Ministry of Infrastructure  
and Water Management

## **Urban logistics and city hubs**

### Exploratory study of relevant factors and the role of national government

English summary

Gabrielle Uitbeijerse and Mette Wagenvoort

14 April 2026 | <https://doi.org/10.82230/KiM.DG2507>

Netherlands Institute for Transport Policy Analysis | KiM

## Summary

**Current urban logistics by trucks and vans is associated with CO<sub>2</sub> emissions, air pollution and takes up scarce space. Possible reasons for the government to manage urban logistics are negative externalities and an uneven distribution of costs and benefits to society. The national government already takes on various roles as regulator and facilitator. In doing so, it chooses policy instruments, such as levying excise duties on fossil fuel.**

**Urban logistics can be executed with city hubs – transshipment points in or at the edge of the city centre. Logistics providers might use light electric freight vehicles (LEFVs) such as electric cargo bicycles and small electric vehicles. City hubs or urban logistics hubs (ULH) combined with LEFVs are often seen as a promising way to reduce the impact of urban logistics. Consolidation of goods can contribute to more efficient logistics. However, city hubs with LEFVs do not necessarily contribute more positively to societal goals, such as clean air and CO<sub>2</sub> emissions, than electric vans. This is because the impact of using city hubs depends on the overall logistical execution, such as the type of vehicle, the location of the hub, and the type and quantity of goods transported.**

**City hubs with LEFVs only contribute positively to societal impacts in specific cases, such as in metropolitan areas. In addition, it appears difficult to operate hubs (with LEFVs) economically viable in practice. Due to the current regulatory policies and the limited positive societal benefits, we do not foresee an additional role for the national government in stimulating city hubs and LEFVs.**

### Background

An increasing number of cities are introducing car-free policies and/or so-called zero-emission zones (ZE zones) in city centres. By January 2026, 18 municipalities and Schiphol Airport in the Netherlands have implemented ZE zones. 10 other municipalities have decided to introduce a ZE zone. They intend to, amongst others, make the city more liveable and sustainable. Moreover, the Ministry of Infrastructure and Water Management (I&W) is aiming for smart and sustainable urban logistics.

Entrepreneurs in city centres with these ZE zones are looking for ways to deal with this. They can use electric vans and trucks to drive their goods into the city. They can also, for example, use hubs on the edges of city centres to transfer their goods to emission-free vehicles, such as light electric freight vehicles (LEFVs) and electric vans.

At the request of the Ministry of Infrastructure (I&W), the KiM Netherlands Institute for Transport Policy Analysis examined what is known in the literature about city logistics and the role of city hubs and LEFVs. We also investigated what role the national government fills in urban logistics, and what additional role the national government could take in realising emission-free urban logistics. This study deals only with city hubs; we did not investigate distribution centres outside the city.

### Relation between factors and effects in urban logistics

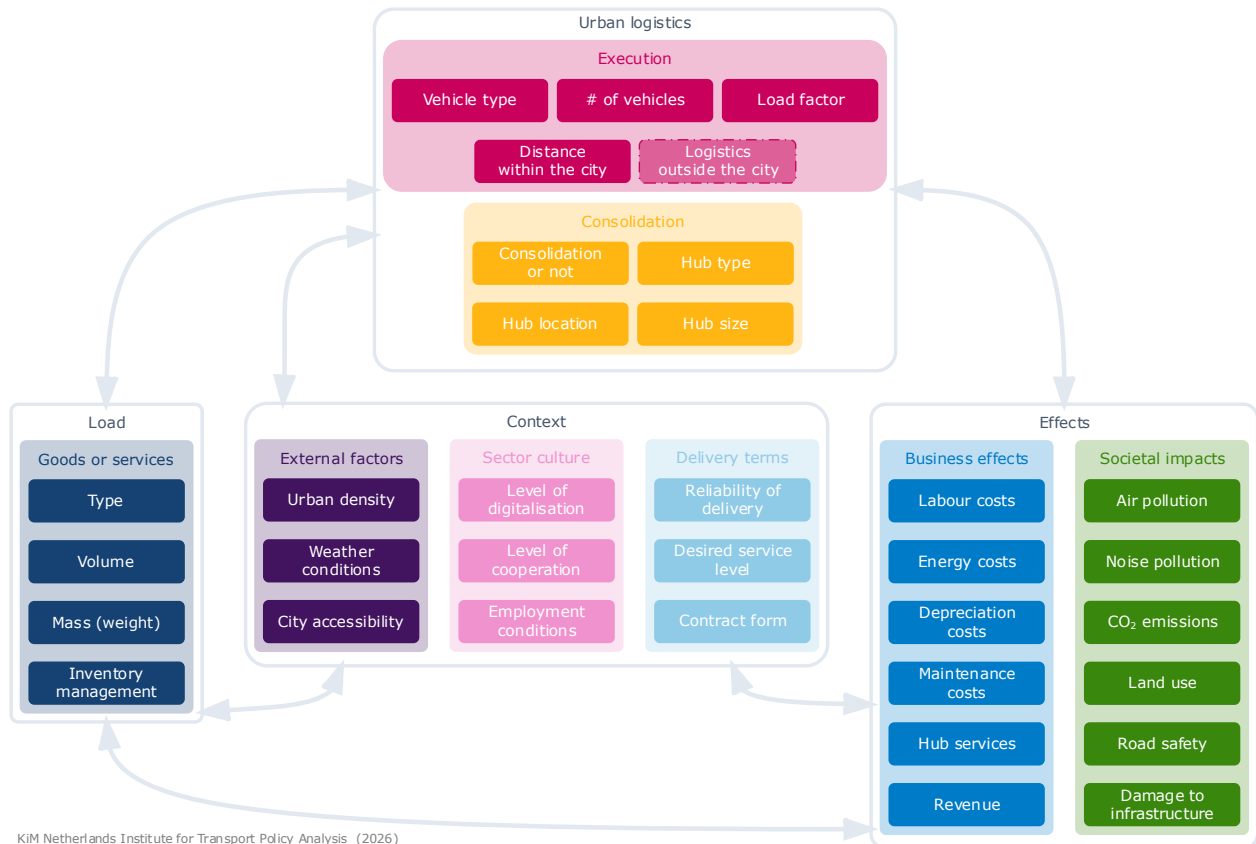
Urban logistics is influenced by and affects the type of goods or service, contextual factors, such as urban density and the degree of cooperation by logistical parties, and business and societal effects. The interaction between different types of factors and effects is shown in Figure 1. For example, societal effects (such as CO<sub>2</sub>

emissions) are related to the execution of urban logistics: including the type of vehicle and the travel distance in the city.

The diagram is a general representation of urban logistics and the factors and effects associated with it. As a result, not all factors shown in the model are always applicable to a specific implementation, such as with ULHs and LEFVs.

The explanation of the diagram (conceptual model) is elaborated in the chapter 2.

**Figure 1** Relation between different aspects of city logistics (large version on page 7)



### Opportunities and focal points for city hubs with LEFVs

City hubs, possibly combined with LEFVs, can be used for the 'last-mile' in urban logistics. However, setting-up and operating these ULHs involves (additional) costs. Therefore, to operate ULHs profitably, a large volume of goods is required to achieve the necessary efficiency gain through more efficient routes. The overall logistical implementation is also important, such as hub placement and adjustments to the logistics chain. In addition, the type of vehicle that is used affects the profitability for businesses. This includes fuel costs as well as vehicle acquisition and maintenance costs. For instance, literature shows that cargo bikes are cheaper than vans due to lower depreciation and fuel costs. But if more than 1.5 times as many cargo bikes are needed compared to (electric) vans due to the lower capacity and range of these bikes, the costs of using cargo bikes will be higher. The high cost of setting up ULHs (with LEFVs) combined with low margins in the logistics sector makes for low business viability. As a result, ULH initiatives often disappear when the subsidy ends.

City hubs can contribute positively to societal goals. However, it is not clear how the societal effects of ULHs will turn out. For instance, the distance travelled in the city depends on, among other things, the volume to be transported and the location of the hub. The type of vehicle is also an important factor for the societal effects.

In specific situations, such as in high-density, historic city centres, LEFVs can make a positive contribution to air quality, noise pollution and land use as they are smaller

and powered by electricity. However, as their capacity and range are smaller compared to those of vans, the distance travelled and land use, can also increase significantly. This occurs when they have to cover many more kilometres because they have to return to the hub more often to get a new load or to recharge the battery. The societal effects of city hubs (with LEFVs) therefore depend on the overall logistics implementation.

### **No additional role for national government**

The national government may want to guide urban logistics for several reasons. For instance, in case of market failure that prevent negative externalities from being priced.

The government, both municipalities and national government, already takes on various roles. In doing so, governments aim to deploy instruments at the lowest possible level of scale to achieve societal goals. Measures such as ZE zones at local level contribute to emission-free city logistics, thereby supporting national clean air and climate goals. National frameworks for ZE zones contribute to the uniform treatment of parties in the different cities where these zones are set up. In cities with ZE zones, an additional role for the central government with this goal in mind is not necessary.

Currently, the national government already takes on some roles regarding city logistics. These roles are mainly regulator or facilitator, for example by setting-up instruments such as levying excise taxes on fossil fuel, providing frameworks for ZE-zones or admission of LEFVs, and facilitating knowledge sharing between municipalities.

We see no reason to revise or expand the role of the national government to further encourage the use of city hubs and LEFVs. This is due to both the existing regulatory policies as well as the limited contribution of city hubs and LEFVs to societal goals. City hubs with LEFVs do indeed not appear more effective and efficient in contributing to societal goals than city logistics with other electric vehicles. Local governments may have other reasons to encourage the use of city hubs and LEFVs, such as reducing damage to urban infrastructure.

## 2 Factors and effects of urban logistics

- **The specific logistics implementation, including the vehicle type, determines societal impacts, such as CO<sub>2</sub> emissions, air pollution and land use.**
- **Logistical choices are determined, amongst others, by the freight or service segment and loading, environmental factors, sector culture, delivery conditions, and expected impacts (such as costs).**

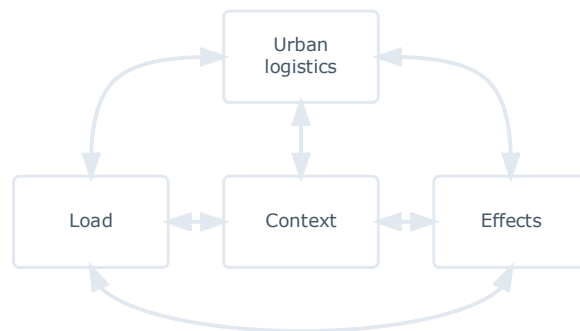
In this chapter, we describe how different factors in urban logistics are interrelated through a conceptual model. The Dutch background report also describes the use of hubs and LEFVs using this model.

### 2.1 Conceptual model

The conceptual model is a simplified representation of the complex relationships in urban logistics and was drawn up on the basis of expert interviews and a literature scan. The sources of these factors are shown in the next paragraph.

The outline of the conceptual model is shown in Figure 2.1. Urban logistics is influenced by contextual factors and has certain business and societal effects. There is also a *feedback loop*, whereby the economic and societal effects influence urban logistics choices and related factors, such as the type of vehicle used and how inventory is managed.

**Figure 2.1** Outline conceptual model of urban logistics



The complete conceptual model is shown in Figure 2.2. The model is a general representation of urban logistics and the factors and effects associated with urban logistics. As a result, not all factors shown in the model are applicable to a specific implementation, such as with hubs and LEFVs. For example, some factors are sector-dependent and consolidation may not be an option or may not be used. In addition, the factors may apply to other parties in different situations, see e.g. the note on business effects.

- **Logistical execution is central**  
Urban logistical execution includes the type of vehicle, the number of vehicles, the distance travelled in the city, and the logistical execution outside the city (dark pink). The logistical execution outside the city includes the distance travelled, as well as the logistics chain such as the origin of loading and any transshipment points. The total transport performance is calculated by multiplying the number of vehicles by the distance and the weight (mass) transported.
- **Consolidation and execution are strongly related**  
The urban logistical execution and possible consolidation (yellow) influence each other mutually, as the execution depends on the consolidation option chosen and

these options in turn depend on their effect on the urban logistics operation. Note that it is also possible that there are no consolidation options or it is not chosen.

Consolidation involves combining multiple shipments from different consignors or locations to efficiently transport them to their destinations and is directly related to the logistical execution. For instance, the location of a hub influences which vehicle can take care of the last-mile and what distance it travels within the city.

Conversely, the choice of hub location takes into account the effect on the logistical execution, such as the number of kilometres to be driven from the hub.

■ *Loading depends on logistics segment and company size*

Loading (dark blue) strongly depends on the service or sector and company size. The load affects both the city logistical execution and the possibility of bundling. For example, for transporting large and heavy goods, the choice of vehicle type is more limited than for transporting small and light parcels. In addition, there are more bundling opportunities when performers drive into the city with half-full vehicles.

■ *External factors mainly influence the type of vehicle*

The type of vehicle used for city logistics depends on various external factors (purple), such as urban density and specific requirements of the sector in which the company operates. The use of smaller vehicles is more attractive in busy cities with narrow roads and in car-free neighbourhoods.

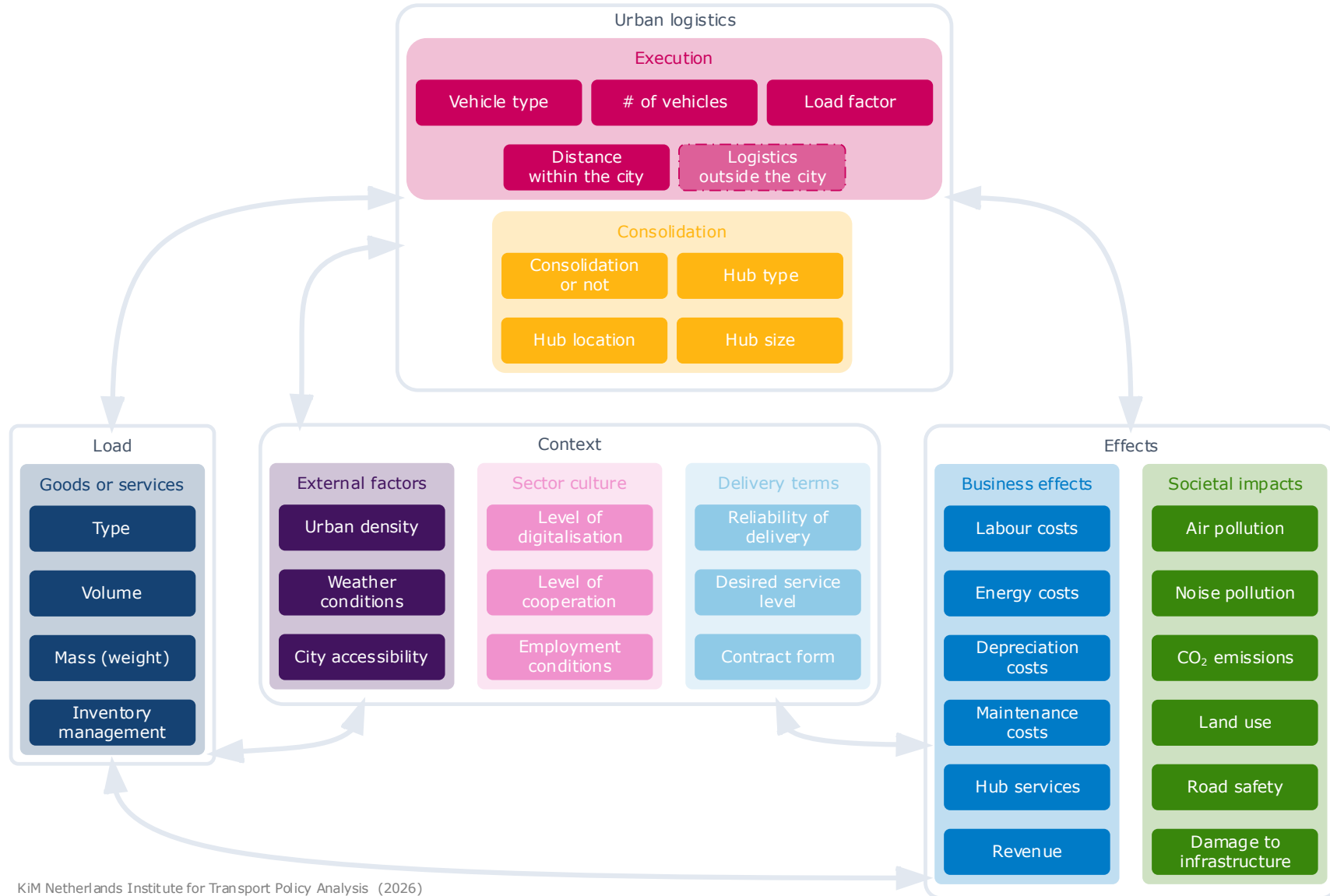
■ *Delivery terms influence the desirability of consolidation*

Delivery terms (light blue) determine the extent to which bundling is feasible and desirable. Due to long-term contracts, it is not always possible for service providers to adjust their logistics chain and thus make deliveries via a hub. In addition, companies see direct contact with their customers as part of the service. Therefore, the use of a white-label hub service is less desirable, because the 'last-mile' is executed by an external partner.

■ *Sector culture influences the possibility of consolidation and the type of vehicle*

Sector culture (light pink), together with delivery conditions, determines the extent to which bundling is possible and any vehicle type preferences. The extent to which a company works digitally affects the consolidation options as not all companies use digital waybills, making hub intervention administratively complex. In addition, consolidation depends on a companies' ability to cooperate. When companies cannot or do not want to cooperate with other logistical companies, bundling will not be possible. Furthermore, employees see the use of a 'private' bus sometimes as a term of employment, which discourage bundling via a hub.

Figure 2.2 Conceptual model of urban logistics



■ *Business effects as a result*

The urban logistical execution, loading, and possible bundling determine the business effects of urban logistics (blue), such as different types of costs and revenues. The costs and revenues can be borne by different companies, depending on the layout of the logistics chain. For example, all costs are covered by a company that performs the entire logistics chain itself. When a company uses a white-label hub, this company pays for the hub service. The hub operator receives this as revenue, but has its own costs in setting-up and operating the hub.

Several costs are involved in setting-up, using and operating a hub. For instance, there is an initial investment needed to start-up a hub for, amongst others, the purchase of land, the construction of the hub, and the possible purchase of new vehicles, such as LEFVs or electric vans. There are also costs for operating the hub, such as energy and staff costs. When a company starts using a hub, it will additionally need to invest in ICT systems. The hub can also generate revenue through additional activities, such as by installing solar panels on the roof, or providing office space at this location.

■ *Societal impact as an outcome*

The city logistical execution and possible loading (together the transport performance) determine the societal effects of city logistics (green). These include air pollution, noise pollution, CO<sub>2</sub> emissions, land use, road safety, and infrastructural damage caused by logistics execution. Land use involves both the space occupied by vehicles and the land usage of a hub.

*Policy opportunities*

Policy measures can address different factors in the diagram, depending, amongst others, on the goals and role of the government. For example, by regulating the vehicle characteristics through the implementation of ZE or environmental zones. The government can also facilitate certain collaboration or digitalisation to help change the sector culture. The model can be used to retrace which elements of urban logistics are potentially affected by a particular measure. Conversely, it can also be used to see which factors are relevant for achieving certain societal goals.

## 2.2 Literature conceptual model

The table on the next page shows in which literature the different factors in the conceptual model (Figure 2.2 on page 7) are discussed. Not all relationships (arrows) are explicitly mentioned in the literature, some of the relationships are based on expert interviews.

**Table 2.1 Literature on factors in conceptual model**

	Knoope et al. (2022)	Quak and Kin (2024)	Quak et al. (2025)	Kin et al. (2016)	ITF (2025)	Bond Beter Leefmilieu (2023)	Over-Morgen (2025)	Dreischerf and Buijs (2022)	Kin et al. (2024)	Dreischerf (2024)	Top sector Logistics (2024)	Ploos van Amstel (2024)	Vahrenkamp (2016)	SUGAR (2011)
<b>External factors</b>														
Urban density	X	X			X	X			X		X	X		
Weather conditions	X													
City accessibility	X	X	X		X				X		X	X		
<b>Load or service</b>														
Type	X	X			X	X			X					X
Volume	X	X		X	X	X	X							
Mass (weight)	X	X		X	X	X								
Inventory management			X					X						
<b>Consolidation</b>														
Bundling options	X	X				X	X	X		X				X
Hub type		X	X		X		X	X	X					
Hub size	X	X	X	X	X		X	X	X					
Hub location	X	X		X		X	X	X	X					
<b>Sector culture</b>														
Level of cooperation		X				X	X				X		X	
Level of digitalisation		X			X									X
Employment conditions	X													
<b>Delivery conditions</b>														
Reliability of delivery	X		X					X						
Desired service level								X						
Contract form	X							X						
<b>Execution</b>														
Vehicle type	X	X	X	X	X	X	X		X	X		X		
# of vehicles	X	X	X	X	X	X		X						
Distance within the city	X	X	X	X	X	X	X			X	X			
Load factor	X	X	X	X		X	X						X	
Logistics outside the city	X	X	X	X		X					X			
<b>Operational costs</b>														
Labour costs	X		X	X			X	X						
Energy costs	X		X	X	X									
Depreciation costs	X	X	X	X			X					X		
Maintenance costs	X		X	X										
Hub services		X	X	X	X		X	X	X					
Revenue														
<b>Societal effects</b>														
Air pollution	X	X	X	X	X	X								
Noise pollution	X	X	X	X						X				
CO <sub>2</sub> emissions	X	X	X	X	X	X	X			X	X	X		
Land use	X	X	X	X	X	X	X			X				
Road safety	X	X	X	X						X				
Damage to infrastructure			X	X						X				

## References

- Bond Beter Leefmilieu (2023). *Green Deal Duurzame Stedelijke Logistiek – Acties en Resultaten*. [Dutch; Green Deal Sustainable Urban Logistics - Actions and Results].
- Dreischerf, A. (2024). *From caveats to catalysts: accelerating urban freight transport sustainability through public initiatives*. Thesis, University of Groningen.
- Dreischerf, A., & Buijs, P. (2022). How Urban Consolidation Centres affect distribution networks : An empirical investigation from the perspective of suppliers. *Case Studies on Transport Policy*, 10(1), 518-528.
- Hendriksen, E., Kolk, H. van der, & Rutgers, S. (2025). *Logistieke hubs - Onderzoek naar succesfactoren* [Dutch; Logistics hubs - Research on success factors]. OverMorgen.
- ITF (2025). *Lightening The Load: Integrating Light Cargo Vehicles in Cities*, OECD Publishing, Paris.
- Kin, B., Ploos van Amstel, W., & Fransen, R. (2024). Light electric freight vehicles - beyond the hype? *Transport Logistics Working Days*.
- Kin, B., Verlinde, S., Van Lier, T., & Macharis, C. (2016). Is there life after subsidy for an urban consolidation centre? An investigation of the total costs and benefits of a privately-initiated concept. *Transportation Research Procedia*, 12, 357-369.
- Knoope, M.M.J., Krabbenborg, L., & Terwindt, M. (2022). *Stedelijke distributie met vrachtfietsen en andere LEVV's*. [Dutch; Urban distribution with cargo bikes and other LEFVs]. Background report. The Hague: KiM Netherlands Institute for Transport Policy Analysis.
- Ploos van Amstel, W. (2024). *Vrachtfietsen en LEVV's: zijn ze echt kansrijk in stadslogistiek?* [Dutch; Cargo bikes and LEFVs: are they really promising in urban logistics?] <https://www.managementsite.nl/de-laatste-meter/vrachtfietsen-en-LEFVs-zijn-ze-echt-kansrijk-in-stadslogistiek>
- Quak, H., & Kin, B. (2024). Reorganizing city logistics to reduce urban movements - Experiences with hubs and decoupling inner and outer urban transport. *Transportation Research Procedia*, 79, 36-43.
- Quak, H., Kin, B., & Meijer, L. (2025). *Hubs – Waarom het op papier mooi klinkt, maar in de praktijk zelden een groot succes wordt*. Vervoerslogistieke Werkdagen (VLW) 2025 [Dutch: Hubs - Why it sounds nice on paper but rarely becomes a great success in practice. Transport Logistics Working Days 2025].
- SUGAR (2011). *City Logistics Best Practices: a Handbook for Authorities*.
- Vahrenkamp, R. (2016). 25 Years City Logistic: Why did urban consolidation centres fail? *European Transport*, 60(4), 6.

The complete Dutch study makes use of other literature as well. For other references and e.g. an elaboration on the role of the government and opportunities and concerns for city hubs, please consult the Dutch background report.

## Colophon

This is a publication of the KiM Netherlands Institute for Transport Policy Analysis, Ministry of Infrastructure and Water Management.

24 March 2026

Authors:

Gabrielle Uitbeijerse

Mette Wagenvoort

Project number: DG2507

Design and layout: I&W

Publication reference: <https://doi.org/10.82230/KiM.DG2507>

KiM Netherlands Institute for Transport Policy Analysis

Bezuidenhoutseweg 20

2594 AV The Hague

PO Box 20901

2500 EX The Hague

Telephone : 070 456 1965

Website : <https://english.kimnet.nl/>

E-mail : [info@kimnet.nl](mailto:info@kimnet.nl)

KiM publications can be downloaded as PDFs from our website <https://english.kimnet.nl/> or requested from KiM (via [info@kimnet.nl](mailto:info@kimnet.nl)). You can of course always contact one of our staff members.

Parts of this publication may be reproduced provided the source is acknowledged: Uitbeijerse, G.C.M. & Wagenvoort, M. (2026). Urban logistics and city hubs, Exploratory study of relevant factors and the role of central government. The Hague: KiM Netherlands Institute for Transport Policy Analysis.