Expert Group

City Distribution

The Future Is Closer Than You Think!

shopping tomorrow

Takeaways

1. Urban consolidation centers (UCCs) facilitate zero-emission delivery in cities. In a method known as "consolidated shipment," freight forwarders combine several individual consignments into one full container which is then transported into the city. The purpose of consolidated shipment is to reduce the environmental impact and improve public health and quality of life in urban areas.
2. UCCs are multimodal terminals equipped to accommodate a variety of vehicle types. Consolidated Shipment Is Essential
3. Clarity regarding future zero-emission zones in cities is important in order to be able to move forward. UCCs are located just outside zero-emission zones, preferably in a business park.

Hosts

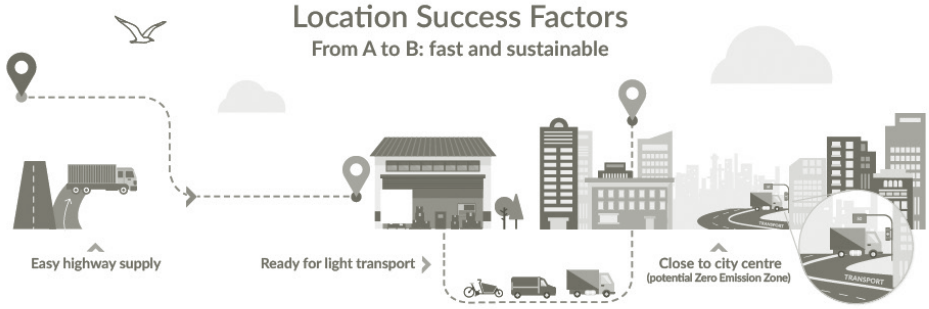
Chair

READY FOR THE FUTURE

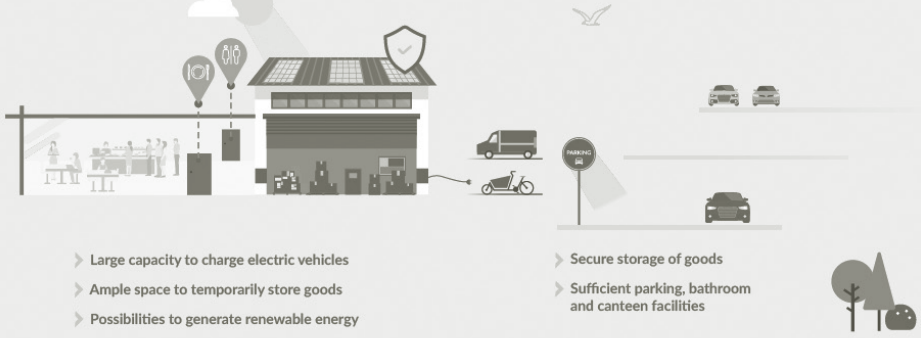
The Key Features of an Urban Consolidation Centre

Location Success Factors

From A to B: fast and sustainable



Asset Success Factors



- Large capacity to charge electric vehicles
- Ample space to temporarily store goods
- Possibilities to generate renewable energy
- Secure storage of goods
- Sufficient parking, bathroom and canteen facilities

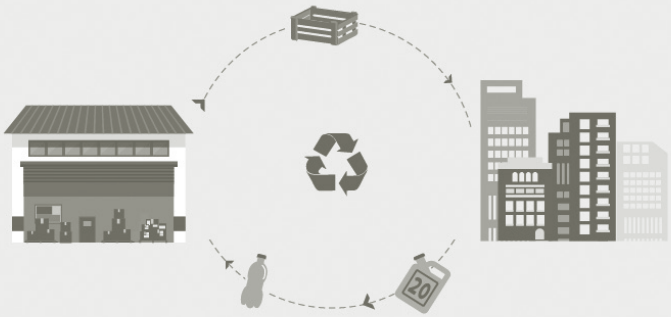
Targeted city logistics for:

1. consumers

2. retail

3. restaurant/bars

For distribution **and** returns



UCCs facilitate separate goods flows, to and from the city and back into the supply chain

One common digital platform

Real-time data sharing ensures only fully loaded vehicles go into the city

Views above are based on views of 30 experts active in City Distribution. These experts are active in all different areas: from transporters, retailers, real estate, public authorities, IT, etc.

Supplying Cities Through Urban Consolidation Centers

The way we deliver supplies to cities is about to undergo a transformation. Urban areas are becoming more crowded, we are seeing an increase in urban populations, and the number of shipments to both consumers and retailers is growing. At the same time, the quality of life in cities needs to be protected. There is a growing need for areas with reduced car traffic, and we seek to cut back on carbon emissions generated by transportation in order to reduce climate change.[1] This means we need to find new ways to supply cities – ways that are smart, clean, and safe.

Fundamentals

The City Distribution Expert Group expects urban consolidation centers (UCCs) to play a key role in this transformation. UCCs are logistics centers located on the outskirts of cities. They are also known as "city hubs" or "urban distribution centers." For the purpose of this blue paper, we have opted for the internationally used term "urban consolidation center."

The City Distribution Expert Group is comprised of stakeholders from a variety of sectors and industries who are involved in city distribution in some way: shippers (including both online retailers and brick-and-mortar stores), freight forwarders, retail organizations, local governments, IT companies, and engineering firms. The expert group[2] has identified the critical success factors associated with UCCs, focusing specifically on the retail, consumer, and food-service industries.[3]

The Green Deal Zero Emission City Logistics ("ZES Green Deal"), in which the government and the private sector have committed to creating zero-emission zones in downtown areas in the Netherlands by 2025, formed the starting point in this. While it was not yet known which cities, and which areas within those cities, would be designated as zero-emission zones at the time of publication of this paper, we can and must anticipate this shift by starting to think about how supplies will be delivered to these areas. In publishing this blue paper, we hope to support private companies and government bodies in achieving sustainable and effective city distribution.

Background

Our downtown areas continue to attract large numbers of people. The 2018[4] Consumer Survey conducted by GfK revealed that nearly two-thirds of the consumers surveyed expect that by 2023 they will continue to visit downtown areas as often as they did before, but that the purpose(s) will change. 58% of consumers still regard brick-and-mortar stores as the best place for gathering information about products or obtaining advice regarding an intended purchase.

1 FOR AN IN-DEPTH REVIEW OF URBAN TRENDS, PLEASE SEE THE 2017 BLUE PAPER PUBLISHED BY THE CITY DISTRIBUTION EXPERT GROUP: DOORPAKKEN IN DUURZAME STEDELIJKE DISTRIBUTIE ("PROGRESS IN SUSTAINABLE CITY DISTRIBUTION")

2 WE HAVE DRAWN ON THE EXPERTISE OF THE PARTICIPANTS, ANALYZED EXISTING URBAN CONSOLIDATION CENTERS, AND CONSULTED THE AVAILABLE LITERATURE ON THE SUBJECT.

3 WE DID NOT TAKE ANY OTHER SEGMENTS – SUCH AS WASTE, FACILITY SERVICES, AND CONSTRUCTION – INTO CONSIDERATION ON ACCOUNT OF THEIR SPECIFIC NATURE.

4 CONDUCTED BY GFK IN CONJUNCTION WITH SHOPPINGTOMORROW

Some consumers (22%) perceive vans delivering online orders as a nuisance, but they are outnumbered by consumers (41%) who report that they are not bothered by this. When it comes to contributing to a better environment, consumers would rather have to wait a little longer for their orders than pay extra for delivery. Around half of the respondents (46%) stated that they are willing to wait for their order if this is better for the environment, while almost one-third (30%) indicated that they are not willing to do so. In addition, 80% of consumers stated that they would like to be able to choose the delivery time, while 42% value speed of delivery more than any other factor.

Contents
This blue paper is structured as follows:
Section 1 describes the ideal scenario for urban consolidation centers, from their role and processes to their business model.
Section 2 contains recommendations for the various stakeholders involved, summarizes the main findings, and once again enumerates the critical success factors.

1. Urban Consolidation Centers

Urban consolidation centers make it possible for urban residents to continue receiving their supplies in a way that is sustainable, efficient and causes minimal inconvenience.

1.1 Zero Emission and Consolidation

UCCs facilitate zero-emission deliveries of supplies to the city and prevent vehicles from having to enter the city half-empty.

The main purpose of UCCs is facilitating changes in the types of transportation used: from large trucks to zero-emission transportation, e.g., zero-emission tractors and rigid trucks, light electric freight vehicles (LEFVs), and cargo bikes. UCCs serve all freight forwarders that distribute goods to various delivery points around the city. The expert group looked specifically at three categories of recipients: retail, consumers, and food service. They found that these users have similar requirements when it comes to UCCs, which means deliveries can be made to them from the same hub (or the same type of hub). UCCs could also choose to focus on a specific segment.

Thanks to UCCs, vehicles carrying a limited amount of cargo that is destined for downtown areas no longer need to travel all the way to recipients' front doors – which tends to be time-consuming due to roadblocks in inner-city areas – but instead can deliver their goods to the UCC quickly and efficiently. This will save time, fuel, and investments in zero-emission vehicles.

Freight forwarders that operate zero-emission vehicles are able to enter the zero-emission zones, but this is subject to certain restrictions in terms of access times. This means UCCs are also important for this group of users, as they allow them to deliver goods outside these time windows.

UCCs are relevant mainly for transporters of low-volume consignments, enabling their goods to be consolidated for distribution using zero-emission modes of transportation. A good example is the multiple vendors that serve one neighborhood store, sometimes making dozens of deliveries in one week. By combining multiple low-volume consignments wherever possible, smaller suppliers can deliver their products to the city more efficiently. More research is required into the number of low-volume

consignments that enter the city, as there is a lack of clear data on this subject. Retailers and food-service companies that do not want to be restricted to the permitted delivery hours may benefit from using a UCC, as this makes it possible to deliver smaller shipments using smaller vehicles at various times of the day.

1.2 All Modes of Transportation

Designed as multimodal terminals where various logistics companies can store and transfer goods, UCCs need to facilitate an efficient switch from using heavy trucks to the use of greener alternatives such as zero-emission vehicles, electric vans, and cargo bikes. It is important that UCCs remain accessible to different types of carriers and shippers, so as to facilitate extensive, efficient zero-emission distribution networks in urban areas in which different types of cargo can be combined, either by transferring goods to smaller vans or by consolidating them in larger freight vehicles that are permitted to enter the zero-emission zone. This is important, as clean transportation should not result in a substantial increase in traffic.

It is not advisable for retailers to pick up their goods from the UCC themselves, or for the UCC to also be used as a pick-up and drop-off point for consumers. This only generates more traffic, which causes activity in and around the UCC to sharply increase and reduces efficiency.

1.3 Location

UCCs should ideally be located as close to the periphery of the zero-emission zone as possible. Conventional transportation can be used between the distribution center and the ZE zone. Logistics companies that do not operate any zero-emission vehicles are not permitted to enter the zero-emission zone, but can deliver their goods to the UCC. The last leg of the journey should be completed using zero-emission transportation; this distance should be relatively short.

It is vital that the boundaries of the zero-emission zones in urban areas be defined clearly. Does the zero-emission zone only comprise the main shopping area or does it also include the surrounding neighborhoods? If the zero-emission zone is restricted to the downtown area, it does not make sense to build the UCC right on the edge of it, in the adjacent residential area, due to the impact this would have on traffic safety, congestion and air quality and the lack of space. We expect that all shopping and historical areas in cities will become zero-emission and that vehicle traffic will be severely restricted in these areas, for example through the introduction of limited time windows for larger vehicles. Areas with a population of more than 5,000 residents per square kilometer (i.e., highly urbanized areas) will also be turned into zero-emission zones.

Business parks are obvious locations for UCCs: as well as being equipped to accommodate large vehicles and generally being easily accessible, they are usually located outside the downtown area or on the outskirts of the city. This reduces inconvenience to local residents. UCCs should preferably be located on a quay, so that electric ships can also be used deliver goods to the downtown area.

Local road managers need to take UCCs into consideration in designing traffic scenarios. Transportation to and from the UCC can, for example, be prioritized at intersections (using smart traffic lights), including during peak times. This represents clear added value for freight forwarders using the UCC.

1.4 What Does a UCC Look Like?

UCCs must be designed to accommodate various types of transportation. For example, larger trucks must be able to efficiently unload larger shipments, while zero-emission vehicles – ranging from rigid trucks to vans and cargo bikes – must be able to enter and exit the facility quickly. In addition, inbound and outbound traffic should not get in each other's way. A return shipping process must be established for crates, boxes, returned items and, possibly, certain types of waste (including packaging waste), and there

must be room for storage. It must be possible to temporarily store goods which need to be consolidated with other items, and there should ideally also be special facilities available for valuables and chilled products. The UCC can also be used to store fast-moving consumer goods (FMCGs) for the consumer market and deliver these on request – including delivery at night to neighborhood shopping centers or self-service pick-up stations if required.

Since the availability of sufficient network capacity for charging stations (including fast charging stations) for zero-emission vehicles is essential, it would be good if the UCC were to produce its own renewable energy. Since the UCC is used by a variety of different entities, physical security and data security must also be well organized. Finally, there is a need for facilities for the center's employees, including parking, sanitary facilities, and a cafeteria.

1.5 What Does the Process Look Like?

The physical process of operating a UCC appears to be fairly straightforward: goods are delivered and, based on size, delivery time, distance, and specific customer needs, a mode of transportation is then selected. The bar codes on the goods contain the appropriate *business rules*, and the most efficient mode of transportation into the city is determined automatically. This also applies to return shipments and packaging.

Physical standardization (e.g., modules, containers which can fit both into a car and onto a cargo bike, and packaging labels) should accelerate the delivery process. For the consumer market, in particular, speed has become essential, as e-commerce businesses are expected to deliver more and more quickly. We have observed this same trend in B2B deliveries. However, standardization requires close cooperation. Specific product segments and market segments come with their own specific priorities, including legislation relating to chilled foods and beverages that needs to be complied with.

1.6 IT and Standardization

Recipients require that performance not be negatively affected by transportation through the hub. There is a trend toward growing transparency, with options for real-time tracking and for recipients to be able to control and adjust the delivery time and location. However, this needs to be supported by the right technologies. Furthermore, it is not advisable for freight forwarders to enter cities carrying a bunch of cellphones, scanners, and on-board computers. Data generated by different freight forwarders regarding multiple shipments must be available to the driver in a single system. Standardization and data sharing are among the biggest challenges as far as IT is concerned – in fact, this is an area where there is a lot to be gained.

The needs of shippers and recipients and the requirements for various types of goods must be incorporated into the transport management system (TMS) used. Algorithms based on big data will help optimize capacity planning, load factor, and route planning processes. Optimization can be

achieved through integration with municipal dynamic traffic management systems, data regarding time windows, and data on time slots for loading and unloading. In view of the complexity and cost involved, standardization of data exchange and labels is also advisable in this area.

1.7 Room for New Trends

Trends and developments in areas such as technology, revenue models, and regulations are occurring at an ever-faster pace. A current trend in e-commerce, for example, is for there to be a wider choice of delivery times, while at the same time customers want to receive their deliveries more and more quickly. In order to be able to accommodate these trends, the UCC requires a certain level of flexibility. Technological trends such as robotization, driverless (autonomous) trucks, and hydrogen-powered vehicles have the potential to become part of the business process over time. It is important to keep this in mind in the development and redevelopment of UCCs. Key aspects will include sufficient network capacity, even floors, and sufficient on-site parking for trucks. New business models are being created all the time, particularly with the emergence of big data and predictive algorithms. A recent example is Uber Freight (freight transport by passenger cars). These kinds of new initiatives are resulting in a large variety of users seeking to access UCCs. Freight and traffic safety, along with efficient traffic flow, are crucial here.

1.8 The Business Model

Looking at existing and failed UCCs shows that figuring out an effective UCC business model is a challenge. Cost increases in logistics are a tough sell, since many customers regard logistics as an overhead burden rather than an extension of their services, and margins in this sector tend to be slim. However, in densely populated urban areas, UCCs can also be regarded as service providers that can contribute to further growth and help improve quality of life in the city, as opposed to being merely a way to save money. Yet this added value is hard to express in financial terms.

Operators must be able to create, and capitalize on, benefits and cost savings for shippers and freight forwarders, which is where public-private partnerships could come in. The creation and enforcement of zero-emission zones – and, by extension, a guaranteed customer base – is an essential prerequisite for UCCs to be successful.

People tend to assume that consolidating freight through a hub will lead to cost savings in the supply chain. The assumption is that additional expenses relating to the hub (e.g., taking a detour to reach the hub, unloading, storage, transfer, and scanning) are offset by the efficiency gains achieved by entering into the city using consolidated, light transport that can move rapidly through busy streets. UCCs need to provide benefits for shippers, freight forwarders, and recipients alike, and the current growth market provides opportunities in this regard.

At the same time, it turns out that these theoretical cost savings in the supply chain are difficult to achieve, because:

- the cost savings generated are fragmented across a large number of parties;
- the savings only really kick in once there is critical mass;
- investing in zero-emission delivery increases cost price and is not (or not yet) mandatory for all market players.

Both the available literature and existing cases show that close communication between all parties involved is essential when it comes to achieving cost savings.

It is expected that UCCs will be able to operate on a cost-neutral basis from 2025, when the zero-emission zones will be in place. Until then, certain measures will need to be rolled out in order to be able to achieve cost-neutrality or cost savings over the next few years, including:

- an actively involved government that provides a suitable location and co-invests in the concept as a customer and/or provider of subsidies. The central government could make this involvement mandatory when creating the zero-emission zones;
- rewarding early adopters that start using zero-emission vehicles before 2015, for example by awarding them specific privileges;
- cooperation between existing freight hubs, supply chain players, and local governments to assess whether their profitability can be improved.

In the longer term (2025 and beyond), UCCs should start generating returns on investment based on standard commercial profit targets.

2. Critical Success Factors and Recommendations

Urban consolidation centers (UCCs) in a nutshell:

- **Why?** They make it possible to supply the city on a zero-emission basis and ensure that deliveries to downtown areas are consolidated, with the objective of reducing environmental impact and improving public health and quality of life in cities.
- **For whom?** UCCs are of interest to all shippers and freight forwarders, with a particular focus on low-volume consignments.
- **What do they look like?** UCCs are multimodal terminals equipped to accommodate a variety of vehicle types.
- **Where are UCCs located?** Just outside the zero-emission zone, preferably in a business park.

2.1 Critical Success Factors

Our expert group has identified the following critical success factors for retailers, consumers, and food-service outlets. These factors are vital when it comes to creating a successful UCC:

- Location on the periphery of a zero-emission zone.
- Good access route, with space and facilities suitable for large vehicles.
- Facilities suitable for small/smaller vehicles, ranging from vans to cargo bikes.
- Multimodal distribution route(s) into the city.
- Development of physical and digital standards.
- Adequate charging infrastructure and capacity for electric vehicles.
- Efficient organization and cooperation in order to combine cargo flows.
- Local road managers must take UCCs into consideration in designing traffic scenarios.
- Transitional period until 2025: active involvement by local governments. The boundaries of zero-emission zones must be decided upon in the near future.
- Alignment of regulations imposed by local governments, policies by the Dutch central government on related areas, and enforcement of zero-emission zones.
- Close coordination with recipients.

2.2 Recommendations for Stakeholders

In order to ensure that UCCs are successful, the various stakeholders need to work together, which also means that various parties need to play an active role.

Establishing physical and digital standards, in particular, requires close cooperation between package delivery services, e-fulfillment companies, B2C and B2B distribution companies, IT suppliers, retailers, logistics real-estate companies, energy providers, and UCC operators.

Below you will find several specific recommendations for the various parties involved.

Shippers, Including Online Retailers

- Cooperate by combining shipments to reduce the amount of traffic.
- Ask your carrier to use zero-emission vehicles and discuss the expenses with them.

- When purchasing transportation services, calculate the expenses both with and without the use of a UCC.
- Communicate with your recipients about the impact of transporting your freight on the environment and the city.

Freight Forwarders

- Work together with other carriers in order to combine freight and shipments as efficiently as possible.
- If your business already uses an urban consolidation center, you should communicate this to local government agencies, customers and potential customers.
- Consider the impact of using a UCC on your staff.
- Consider the impact of using UCC on investment in vehicles.
- Create a business case: how much will the use of the UCC cost/save you?
- Find out what opportunities there are for standardizing information exchange in the supply chain in order to further promote the consolidation of shipments, either through UCCs or otherwise.

Local Governments

Local governments can play a key role in promoting zero-emission transportation through the use of UCCs. We strongly recommend that local authorities make this a priority. Local authorities can implement the following measures:

- setting operational parameters in terms of geographical location and type of cooperation;
- clearly defining the boundaries of zero-emission zones;
- learning from domestic and international examples (Breda, London, Lucca andSiena) which demonstrate that enforcement in zero-emission zones is essential. This is the only way a successful zero-emission business model is feasible;

London *Lucca* *Siena*

- establishing a cross-stakeholder task force;
- taking inventory of the existing UCCs surrounding the city/in the wider area;
- facilitating research in order to determine the size of cargo flows;

- facilitating research into location, land, and buildings, and incorporating the findings into zoning plans;
- highlighting the urgency – 2025 is just around the corner!;
- setting traffic rules for transportation around the UCC;
- promoting zero-emission transportation by awarding special privileges, e.g., more generous time windows, use of the bus/taxi/tram lane, or more loading and unloading possibilities;
- assuming partial responsibility for ensuring the appropriate charging infrastructure is in place.

The Central Government

- Issue clear communications on zero-emission zones.
- Provide a national framework: what will the zone be, what will the zone look like, and what vehicle requirements will apply?
- Require local governments to provide a location for the UCC, on the periphery of a zero-emission zone.

Recipients

- Large corporate players can set requirements for how they want to receive their goods in order to promote zero-emission transport.
- Flexibility in terms of people and buildings when it comes to accepting deliveries of goods.
- Do the math and make informed decisions when it comes to storing/not storing inventories, delivery times and delivery frequency, and processing goods received.
- Collective purchasing and delivery with other recipients through a UCC.

UCC Operators

- Invest in gaining the trust of shippers, carriers, and recipients.
- Invest in your relationship with the local authority.
- Investigate the impact on traffic.
- Be sure the appropriate arrangements are made for the liability for freight transfer.
- Implement effective security for buildings, premises, and IT.
- Invest in energy facilities for zero-emission vehicles.

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