



Urban logistics 2030 in Germany

Stronger together: Keep the Wild West scenario at bay with cooperation



Long-term perspectives for urban logistics

Dear reader,

The Germany-based logistics association BVL International has made it its mission to improve logistics in our towns and cities. We do this by speaking and debating at various industry gatherings, including the International Supply Chain Conference. In March 2017 we launched our BVL Focus Group Urban Logistics to serve as a platform for discussing the topics and challenges facing the industry and considering what practical steps can be taken to resolve them. As such, the BVL brings together the diverse range of players within urban logistics and gets them talking. Talking with one another, not over one another and not at cross-purposes – that is our aim.

The International Urban Logistics Convention we hosted in conjunction with consulting firm Roland Berger in Amsterdam in November 2017 demonstrated that businesses, academics and politicians are working on potential solutions, mainly of a short-term nature. Unlike in many other countries, the long-term evolution of urban logistics is not yet the subject of wider debate in Germany.

The BVL and Roland Berger share a desire to help kick off the debate and to offer constructive ideas through this study we have produced. Talking about this subject is crucial for the future of our economy and our society and I warmly invite you to get involved in the dialogue for yourself.

Robert Blackburn

President & Chairman of the Board
BVL International

URBAN LOGISTICS IN TRANSITION

To judge by the headlines, the debate around smart cities, the cities of our future, is mostly centered on urban mobility, with buzzwords like self-driving cars, integrated mobility and ride pooling dominating the media conversation. Much less public interest seems to be directed at urban logistics – defined as the flow of goods in urban areas. But not only is this something that is fundamental to the supply of goods within our towns and cities, it is also central to the quality of life of the people who live there. As the growing scale of urban logistics increasingly brings into conflict the sometimes complex demands of different stakeholders (city authorities, logistics companies, retailers and citizens), the call for action is getting ever louder. What we need to do, as a society, is weigh up and balance the different needs.

The city ecosystem: Pressure continues to build

Four trends influence urban logistics today:

Urbanization: Some 77 percent of all Germans already live in towns and cities. And the figure is set to rise to almost 79 percent by 2030. Which means that about 1.6 million more people – enough to fill a city the size of Munich – will be living in our urban areas just twelve years from now.

The rise of e-commerce: Ever more people are shopping online. The amount of money spent in online retail has gone up almost 8 percent in each of the past three years. And this is making itself felt not least in the growing volume of traffic on our roads from within the courier, express and postal (CEP) industry.

Demanding customers: People are increasingly comparing products and prices online. The transparency that this creates means that providers are compelled to compete to offer the fastest and most individualized delivery service.

Growing requirements of retail: The retail business, too, is a source of more and more logistics demand. Instead of ordering goods at fixed times in the season, retailers are increasingly placing orders for small quantities and expecting flexible delivery. Warehouse capacities are falling and we are essentially seeing stocks being shifted onto the roads on an increasing scale. The result is a big rise in deliveries – both into and out of retail organizations.

These trends have enormous consequences, and not just for the logistics industry – they also affect the people who live in our towns and cities. The growing weight of delivery vehicles on our roads causes traffic congestion. Many couriers and parcel delivery drivers are forced to park illegally to use their vehicles as decentralized warehouses. The increase in greenhouse gas and particulate emissions worsens our air quality. Light commercial vehicles (LCVs) and their heavy-duty counterparts – both vans and trucks – are the source of some 19 percent of all noxious emissions in German cities. The availability of logistics depots in city centers, which could help bring down the volume of traffic and reduce the scale of emissions, is continuing to decline in the wake of growing competition for space between the public realm, residential districts and the commercial sector and the high rents that such a situation entails.

But logistics service providers find themselves under growing pressure, too. In spite of rising revenues, there are limits to how far supply chains can be optimized, not least because of the lack of space available for logistics depots in the urban environment. Recruitment, too, is difficult, with drivers in particularly short supply. This is pushing wages up significantly. As customers' demands rise in terms of the delivery service they expect (specific delivery windows and same day or same hour deliveries), so the flexibility required of employees goes up accordingly. The impending ban on diesel vehicles in various cities also calls for investments in operators' fleets. Subcontractors or franchisees in urban logistics are finding life increasingly difficult as a result.

Logistics providers are launching innovative pilot projects in an attempt to identify solutions to these challenges. Initiatives include field testing cargo bikes, creating city hubs, establishing joint packing stations for several different providers, setting up so-called micro-depots as miniature warehouses in the city, having parcels delivered into the trunk of the customer's car and making delivery drops by drone. Many of these mainly limited pilots are still in the trial stages. Nevertheless, there are already signs that these innovations will not be enough to make urban logistics truly fit for the future.

So the question is, how can we make the evolution of urban logistics sustainable? And indeed, who will take the lead in this process? Will logistics companies themselves find scalable solutions, are city authorities going to have to take active steps to intervene or will close alignment between the private and public sector ultimately deliver the best outcome?

In search of constructive solutions

This study aspires to offer answers and contribute to finding a solution – even if the effect of any suggested measures is unlikely to be felt immediately. What is important, in our view, is to do the right groundwork now. This publication does not present a clearly delineated target situation but outlines a number of scenarios that could occur as described or in a similar form.

The scenarios are envisaged as a conceptual basis for a start – providing support to those within whose remit it lies to formulate specific recommendations on the right

actions to take now. And the scenarios are further intended to offer guidance in the wider debate spanning policy, public services and private sector provision.

In an effort to keep complexity down to manageable levels, we set the following restrictions:

- First, we considered only the period up until 2030. This meant that we could make links with today's reality and were able to avoid largely theoretical discussions.
- Second, we limited our investigation to commercial traffic that does not leave the city boundaries. In particular, this includes CEP deliveries, but it also encompasses logistics traffic for brick-and-mortar retail. We excluded construction site traffic and all traffic involved with service providers and waste disposal services because these are much more fragmented in nature and would need to be studied separately.
- Third, we laid our geographic focus firmly on German towns and cities. They range from mid-sized towns to major cities.

FOUR VERY DIFFERENT VISIONS OF 2030

Critical uncertainties in the urban logistics of the future

What will urban logistics look like for Germany in the year 2030?

To answer this question, we polled the opinions of more than 30 logistics experts from across the private sector, public services and academia, asking for their views on what they thought the key factors were, the respective impact each one would have and the uncertainty surrounding whether or not the developments would actually occur. The scenarios outlined below do not incorporate developments that the experts consider very likely to occur. These include, for example, a further increase in delivery demand from the dynamic growth of e-commerce and the trend toward smaller deliveries. Constituting part of the general framework, these factors are equally relevant for all of the scenarios.

The most decisive elements in our survey are factors whose evolution is considered uncertain by the experts but whose influence on the future of urban logistics is expected to be substantial. These factors are what we call "critical uncertainties". → **A**

The picture the experts paint is one of technological progress. Of overriding importance are topics like the promotion of alternative drivetrains (e.g. e-mobility), the development of energy prices, the emergence of self-driving delivery vehicles for the mass market and the 5G networks on which they are based being rolled out across the urban environment. The experts believe that the disruption brought by self-driving cars in particular will dramatically impact the urban logistics ecosystem in all scenarios and give existing and future players the chance to redraw the sector in Germany.

Regulation and cooperation as key dimensions

The remaining critical uncertainties fall under one of two dimensions:

The first is the regulatory dimension, which ranges between passive and active regulation. On the passive side the city relies on the market self-regulating, whereas active regulation is all about the city setting the rules for urban logistics.

The second is the dimension of cooperation between the players. At one end of the scale is a largely uncooperative overall system comprising individual smart solutions, while at the other end are logistics companies cooperating with the aim of achieving network efficiency gains and thereby cutting costs. Along these two dimensions of regulation and cooperation a model emerges with four distinct scenarios, which we describe in more detail below. → **B**

1 The Wild West

Logistics providers in increasing numbers compete to win customers by coming up with innovative delivery concepts.

Since commercial logistics is not a highly regulated field, innovative providers have no difficulty in entering the market. Incumbent players are therefore under growing competitive pressure combined with greater and greater pressure to innovate. Individual company-specific solutions will dominate in this scenario given the fact that cooperation is limited owing to a lack of standardization and missing interfaces.

The growing demand and the trend toward ever faster and more flexible delivery of ever smaller volumes will lead to a rise in the number of delivery vehicles, which will be nowhere near fully utilized owing to the lack of cooperation between operators. Examples are wide-ranging and even include delivery by private individuals, a method that Amazon is piloting in the US. The result will be a further massive increase in urban logistics traffic. The flow of traffic will be seriously obstructed by illegal parking in particular. So even though the availability of goods – for both B2B and B2C customers – is higher, the urban space will become considerably less attractive to residents under this scenario owing to the high volume of traffic.

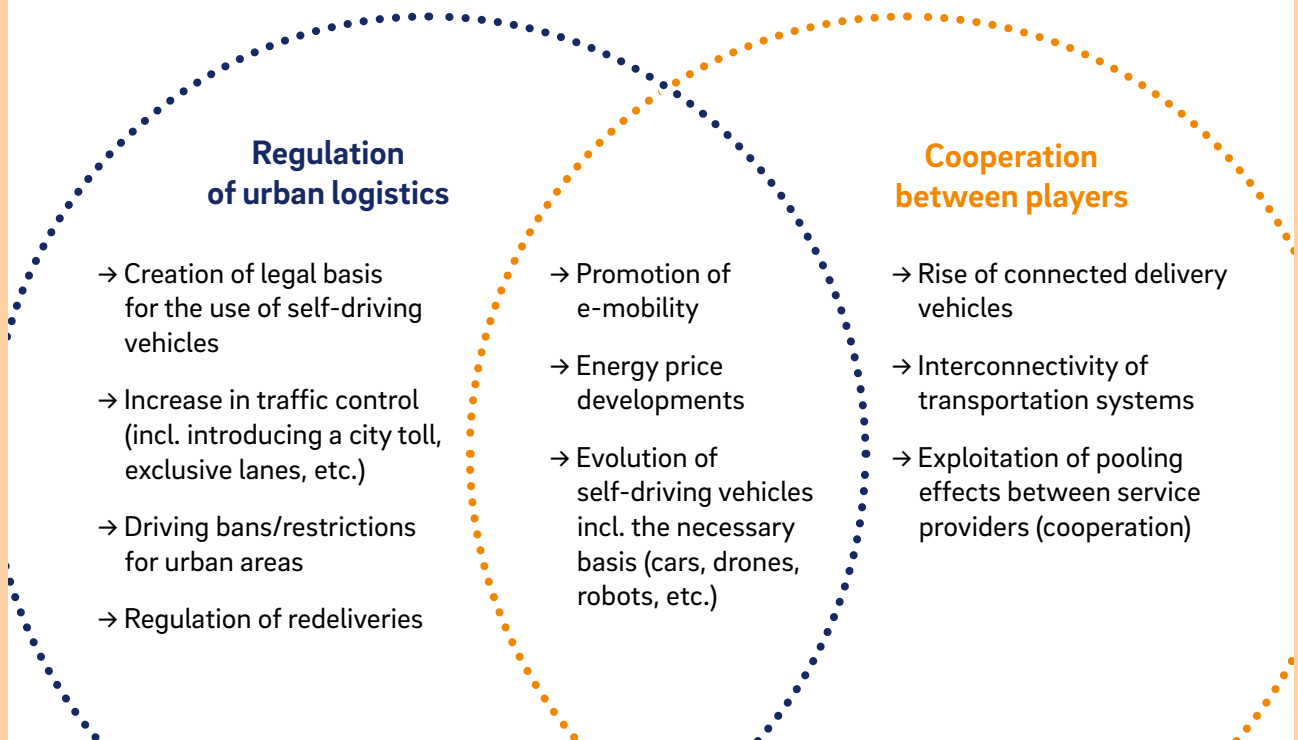
2 Regulated diversity

The city defines and monitors a regulatory framework to manage urban logistics traffic more efficiently and reduce the volume of traffic on the roads. Strong competition between providers precludes cooperation and prevents the introduction of standards.

In this scenario, the city actively intervenes to improve people's quality of life and regulate urban logistics traffic. These interventions define a new framework for urban logistics. Examples of measures that can be taken include implementing a dynamic city toll to control logistics traffic, regulating the times of the day when logistics traffic can access the city, and implementing active

A Critical uncertainties

Key dimensions for logistics scenarios in 2030



— B —

The urban logistics of 2030

Four scenarios



parking management for all road users – such as by creating parking for commercial vehicles only, or by rigorously enforcing parking fines for violations like double parking or parking passenger vehicles in loading bays. In this scenario the city also creates a clear legal framework for night logistics to be conducted with low-noise electric vehicles. Regional and national incentives for companies to convert to electric trucks and electric LCVs further influence the composition of delivery fleets.

The outlined regulatory restrictions will be pursued consistently and bring a significant improvement in traffic flow. Though delivery windows for B2B and B2C customers will be smaller, any additional disruption to intra-urban traffic can be kept to a minimum. Regulatory measures will be flanked by a public incentive system to offset the potentially higher costs to logistics companies. Financial incentives could also be an option for suburban deliveries, which would improve the service level to these areas of the city.

Providers will be able to extend their offering but they'll need to keep a close eye on the regulatory framework. In contrast to the Wild West scenario, logistics companies will have less scope to respond to particularly demanding customer needs owing to the restriction of vehicle access times and other such measures. Competition between providers will promote the introduction of solutions to comply with whatever regulations are in force, such as deliveries being made within short time slots at set times of the day.

There will not be cooperation between providers in this scenario but nor will that actively be encouraged by the city authorities. One current example is the City of Berlin's KoMoDo initiative, which promotes the cooperative use of micro-depots by delivery services to foster the sustainable use of cargo bikes in the capital. Within this project, Berlin has made public land available to five parcel delivery services as a place to park their transshipment containers. The KoMoDo business model is not determined by the city authorities – their only requirement is that deliveries must be made by pedal power.

3 City-wide platform

All urban delivery capacities run on a single platform. The platform pools the flow of goods across all providers and uses decentralized warehouses to optimize last mile deliveries.

In this scenario the city grants one platform a license to manage all logistics traffic with the help of decentralized warehouses. The platform may be operated by the city authorities themselves, a city-owned company, a third party or as a public-private partnership. The license has to be renewed regularly.

There are two goals the city is pursuing with this kind of platform: First, they want to boost network efficiency by pooling deliveries and getting providers to cooperate, and second, they aim to increase the amount of competition in the market and ramp up the pressure to innovate (primarily through the requirements they set for any platform to win the license). When putting the license out to tender, the city will define the framework within which the platform can operate, encompassing such aspects as prices for end customers, service level or rules that the operator needs to follow when subcontracting last mile deliveries.

The platform concept is built on two pillars: One is the existence of decentralized warehouses in the city. Some of these will be made available to the platform operator by the city as shared facilities, because otherwise there will be little incentive for investment owing to the limited period for which a license is valid. Other providers can also offer the platform warehouse space. The second pillar is the technology on which the platform runs. This is always owned by the platform operator. The operational transition from one licensee to the next will be contractually guaranteed when a new license is granted. What the platform does is bring together the supply and demand for deliveries out of the decentralized warehouses, allocate jobs and handle payments. Jobs will be allocated to the best-suited delivery service. Criteria for being awarded a job may include price, technology of the vehicles used (electric, pedal power, etc.) and the total active volume for a given provider. The city can make access to the platform either restrictive, e.g. available only to providers with a minimum number of delivery vehicles, or inclusive, e.g. with no limits on who can access the last mile.

The platform creates transparency over all of the available delivery capacity and demand in the city, which opens up new prospects for how the different fleets and business models could be composed. Logistics companies will be able to deal with peaks in vehicle or personnel needs in this scenario by having any volumes in excess of a defined base load delivered by other players on the platform. Routes that are already busy can be flexibilized to accommodate additional courier-type deliveries at short notice. Easily accessible logistics depots will enable a fragmented hub-and-spoke system to operate with the involvement of varying delivery partners like taxis and food delivery couriers or the option of customer collection. Artificial intelligence will support the management of the integrated system built not on fixed routes as in a "physical internet" but always finding whatever is the best route and the best price – defined and delimited by the restrictions set by the city.

Regulatory intervention by the city is also conceivable in this scenario (as in the regulated diversity scenario) as a means of making deliveries as compatible as possible with private transport. Customers and citizens alike will benefit from this in that everyone gets a guaranteed service level, and the service level to outlying areas will also be improved thanks to corresponding tender specifications.

4 Coexistence of giants

A small number of large, competing platforms emerge that dominate urban logistics. With rising user numbers and an increased volume of deliveries, the platforms are able to pool logistics traffic more efficiently.

This scenario sees a few large platforms emerging, which control the vast majority of urban logistics. The city relies on the free market's ability to self-regulate intra-urban logistics traffic.

Platforms may arise out of big players already active in the market who evolve their business model in this direction. But the emergence of independent white-label platforms is equally possible, operated by big technology providers or startups with strong financial backing. The competitive edge that these platforms will have against individual logistics firms comes from the information that platform participants provide on supply and

demand in relation to deliveries. The platform can make much better use of the capacities it has as a result. This scenario is biased toward providers without vehicles and infrastructure of their own because they are more flexible than those that need to keep their own fleet working at capacity. Both types of providers will be able to achieve efficiency gains through higher productivity and can pass the resulting cost advantage on to B2B and B2C customers, making themselves more competitive.

Logistics providers can either join one of the existing platforms or build their own. Any firm not on a platform will increasingly disappear from our city roads in the course of continual consolidation. The market power of the platform operators will also grow with the number of users they attract. Ultimately, we will end up with just a small number of platforms operating, each with their own ecosystem and separate standards.

The platforms will pool logistics traffic and raise the level of network efficiency as a result. One way of achieving this could be to pool deliveries to brick-and-mortar retailers and also pool CEP deliveries, or opt to handle some of the last-minute courier services that get booked. Platform operators and member companies will increasingly make shared use of delivery vehicles, drivers and logistics buildings.

The actual needs of customers will be the key element in the emerging coexistence of giants. Innovation sharing will happen within the platforms, and there will also be internal competition of the kind that occurs between the different suppliers to automotive OEMs. Both B2B and B2C customers will benefit from having their parcels and their merchandise delivered faster and in a more individualized way.

That said, the platforms will operate on the basis of commercial logic, which means that service levels and supply quality could even fall for certain customer groups. And it's also possible that customers might desert a platform, which may then disappear from the market completely.

LAY THE GROUNDWORK NOW

The outlined scenarios illustrate the long-term perspective. We believe it's important, however, to start laying the groundwork now in order to play an active part in shaping the urban logistics of 2030. It should be the shared aim of both city authorities and businesses to avoid the Wild West scenario, because abandoning all concept of network efficiency will bring a huge increase in urban traffic volumes coupled with further obstruction of the flow of traffic. It is relevant in this context to consider whether or not the initiatives already in place will allow urban logistics to make a tangible contribution to improving quality of life in our cities.

Current initiatives such as the pilot project involving the use of micro-depots and cargo bikes in Berlin need to be pursued consistently and expanded in scope. Doing so will keep the status quo as it is. However, recent examples like GLS's exit from the ParcelLock parcel box solution created in partnership with DPD and Hermes, and the almost wholesale refusal of Deutsche Post DHL to participate in cooperative ventures of this kind does give rise to doubts about whether there is ever going to be cooperation of any real significance between the big players. At the same time, many German cities are already having trouble formulating specific measures for urban logistics in the context of smart city strategies, for example, that could bring the prospect of a permanent reduction in traffic in the coming years that bit closer. The kind of synergies that would arise from cities sharing ideas and developing joint strategies for resolving the issues they face currently remain untapped even though this is exactly what logistics companies operating across regional boundaries would need. In the absence of active countermeasures by city authorities and companies, a future that looks very much like the Wild

West is sadly an all-too-real possibility for our cities. Out of the four scenarios presented here, we can determine three potential ways of warding off a Wild West situation through active regulation or heightened cooperation. → **C**

Key to any future development is the promotion of new technologies, such as e-mobility in the urban sphere as a means of realizing low-noise night logistics. Self-driving cars could also play a role soon: Because the productivity of such vehicles in the city would be much higher than that of passenger cars today, one of the consequences would be more parking spaces left unoccupied, and these could then be used as decentralized logistics depots or similar. Even with the partial introduction of self-driving cars in certain city districts only, such systems could bring about a totally new understanding of how our roads are used, which may include, for example, the mixed use of public robocabs to transport both people and goods.

What needs to be done now?

→ Regulated diversity

Create and approve a regulatory framework for urban logistics

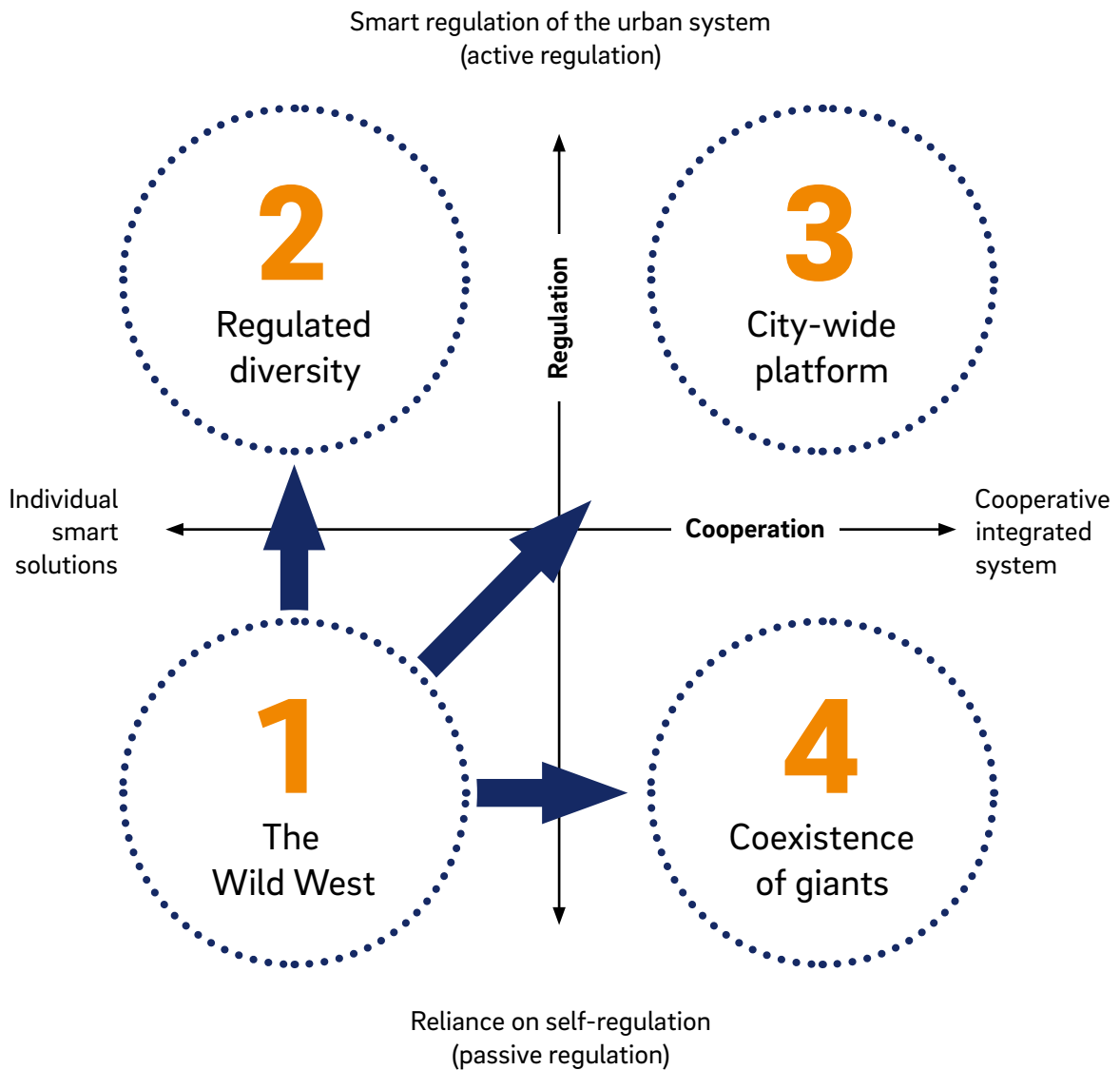
What cities need to do:

- Take urban planning measures to make it easier for commercial logistics operators to go about their business. Examples include installing short-stay parking bays, creating special lanes for cargo bikes or leasing space for micro-depots

C

Perspectives for urban logistics

Three approaches to keep the Wild West scenario at bay



- Create incentives for companies to invest in low-noise logistics and to expand the scale of their night logistics operations
- Formulate a transparent catalogue of rules that bans anyone from disrupting traffic and fines them if they do. Also set the level of the fines to differentiate according to the severity of the disruption caused to the overall flow of traffic: the bigger the "crime against efficiency", the higher the fine. Industry associations, especially those from the logistics sphere, can help plug any gaps in expertise
- Build up the staffing and technological capacity to ensure that the rules are obeyed
- Introduce a dynamic city toll (higher charges in peak commuting times) for all road users or even restrict the times of the day that commercial logistics providers can enter the city

What businesses need to do:

- Adapt their business models based on whatever regulatory framework is in place
- Expand the scale of their night logistics operations, including through the use of fleets of electric vehicles and more low-noise drop-off points
- Overhaul products and delivery procedures to absorb any higher costs of making deliveries during commuting periods when a city toll applies

→ City-wide platform

Integrated management of logistics traffic

What cities need to do:

- Introduce a transparent catalogue of rules and fines as in the regulated diversity scenario
- Build up the specialist expertise to put platform operation out to tender and to handle the establishment and further development of the platform. This could be achieved through a public-private partnership
- Develop common delivery standards (in collaboration with industry associations, other city authorities, national government, the EU, etc.)
- Define logistics spaces in which to establish shared micro-depots

What businesses need to do:

- Create the technical and physical foundations for operating on a shared platform, such as by imple-

menting appropriate technical interfaces and delivery standards

- Integrate their own depots and vehicles for use via the platform (possibly by all companies)
- Develop common standards with the city and other companies
- Develop the platform further, either directly or through a stakeholder group, and monitor the operator's quality management
- Create and enhance efficient platform operations to remain competitive with other platform participants

→ Coexistence of giants

Promote consolidation around a few platforms

What cities need to do:

- Remove market barriers, such as by ruling out a ban on diesel vehicles for a set period of time
- Open up the public realm for the platforms (whether or not they get used will be decided by how well they perform in competition)

What businesses need to do:

- Identify companies that make suitable candidates for cooperation or acquisition (more know-how, more capacity, more users)
- Agree to cooperate and set joint standards for certain aspects like package sizes, delivery lead times or joint collective wage agreements
- Establish a shared IT platform with standardized interfaces and smart management of delivery routes
- Consistently expand the customer base to guarantee optimum utilization of delivery capacities

The groundwork is being laid today for the urban logistics of tomorrow. Scenarios that rely on the market to self-regulate will very likely bring benefits for only a small number of players in the urban space. The majority will find themselves at a disadvantage. Cooperative ventures can inject greater network efficiency into urban logistics long term. In the interests of at least avoiding any further deterioration of quality of life in our growing cities, all stakeholders need to engage in or step up the dialogue.

Our sincere thanks go to all of the experts who were involved in this study, particularly the BVL Focus Group Urban Logistics, for their constructive contributions.

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About us

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Founded in 1978, BVL International is a non-profit institution, objective and unbiased in its understanding of its role. It is a network for logistics managers in industry, retail and the service sector as well as for academics and students and has more than 11,000 members. The primary objective of the BVL is to communicate the importance of supply chain management and logistics and further their application and evolution.

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