9. Future approaches

Drawing on best practices from urban centres around the world, this section outlines some emerging approaches that could be applied to urban centres' transport task.

9.1 Placemaking

Placemaking refers to the development and management of the built environment to influence the character and experience of places. Successful placemaking either preserves or enhances the character of public spaces, making them more accessible, attractive, comfortable and safe. Good place outcomes can directly benefit local businesses. An attractive, high-amenity shopping area which prioritises pedestrians and cyclists, for instance, is likely to attract more customers than a dilapidated or otherwise unappealing shopping strip dominated by through traffic.

Successful placemaking typically encourages space-efficient transport modes such as walking and cycling and discourages the use of motor vehicles, which create congestion and detract from amenity. However, shops, cafes and restaurants that help create places for people inevitably generate a freight and servicing task, for which planners need to cater.

How well planners cater for this task can influence the ultimate success of a location's vision for place. A well planned, discreet freight and servicing task can enhance the liveability and amenity of a place, while making it efficient to service. A poorly planned task, on the other hand, can lead to inefficient, untidy, unsightly and unsafe practices, all of which detract from local amenity.

Consider

A substantial local freight task is a sign of vibrant economy and social activity. An inconspicuous freight task operating around a vibrant, busy area is proof of good urban planning.

9.2 Improved transport planning in urban areas

TfNSW's **Future Transport 2056** sets out a vision for transport as an enabler of economic and social activity and a contributor to long term economic, social and environmental outcomes. This represents a fundamental step forward in transport planning, including for freight and servicing activity.

A key objective of the Toolkit is to support **Future Transport 2056** and improve freight planning in urban areas by educating planners, developers and other stakeholders about the relationship between the **Future Transport 2056** vision and planning for the movement of goods and services.

NSW is not alone in pursuing these objectives. Progressive organisations throughout the world are improving their approaches to freight and servicing planning.

CASE STUDY

A Swedish arena for transport efficiency

The CLOSER Organisation in Sweden is working with several cities, business organisations and industries to develop sustainable freight transport and urban logistics solutions that will improve living conditions in Swedish cities. It has developed several methods to meet the urban transport challenge, such as:

- integrating freight transport considerations into urban planning
- creating smart solutions for more efficient use of infrastructure
- developing and testing new types of services and business models
- developing and testing new vehicle solutions
- identifying challenges in existing rules and regulations, and working to standardise approaches to transport management.

(CLOSER 2020)

9.3 Precinct approaches

Precinct approaches such as that developed in Barangaroo, Sydney, generate successful place outcomes. Although Barangaroo has a significant level of freight and servicing activity, with approximately 10,000 vehicle movements per month as of 2019, its coordinated off-street facilities keep this activity inconspicuous, enhancing Barangaroo's amenity. The same task would require approximately 230 metres of kerbside space per day, leading to congestion and reducing the precinct's amenity.

The approach set out in **Figure 26** summarises international best practices for an end-to-end precinct design and management.

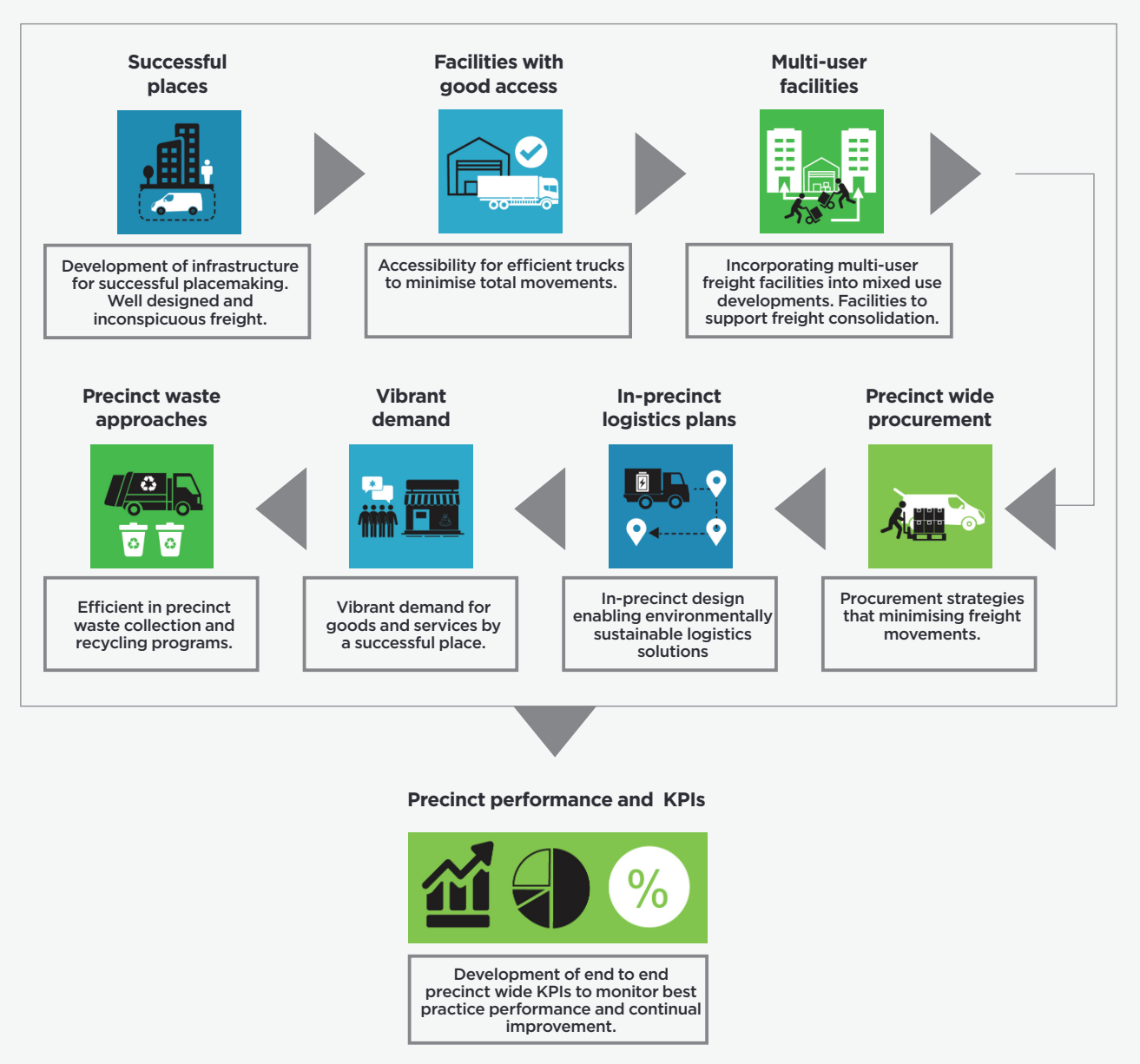


Figure 26 Planning a best practice precinct-based freight and servicing approach

9.4 Last mile freight and Connected and Automated Vehicles

Today, almost all available daytime kerbside space in the Sydney CBD is allocated to loading zones to support freight and servicing activity. In the future, more of this space may be needed to support other uses, such as active transport and autonomous vehicles.

The broad adoption of Connected and Automated Vehicles (CAVs) could bring substantial changes to Sydney's transport network. Although driverless vehicles may be useful to the freight industry as a whole, their benefit to the last mile freight task is less clear. In the last mile, delivery personnel are still needed for tasks such as unloading items, obtaining proof of delivery and resolving any delivery issues.

Driverless vehicles may also affect the last mile task in a different way. Traffic levels are forecast to increase when driverless vehicles join our roads as a result of zero-occupancy trips and increased car travel for non-drivers (Ellis 2019). These vehicles will also need kerbside space to pick up and drop off their passengers – this new kerbside demand could significantly impact space available for loading zones.

Driverless vehicles are likely to reduce demand for car parking spaces, but more space opening up in carparks would not necessarily benefit the freight task. Some 54 per cent of public car parking space in the Sydney CBD does not have sufficient height clearance to allow access for even small freight and servicing vehicles. The 46 per cent of parking space that can support these vehicles is approximately 10 times greater in capacity than the current amount of kerbside loading zone space, yet it is typically privately owned and is not evenly distributed across the city.

9.5 Dynamic kerbside management

Evolving technology and the adoption of driverless vehicles will also create opportunities to improve kerbside management practices. Developments such as intelligent sensors, vehicle to infrastructure systems, digital signs and dynamic pricing solutions may support the roll-out of "smart kerbs" that streamline existing kerbside management approaches and improve responsiveness to customer demand. A number of cities around the world are already trialling smart kerbs.

9.6 Improved logistics management

Bigger challenges require more creativity. Bigger logistics challenges, therefore, will demand more innovative logistics strategies. Proposals for new buildings may require significant managerial and operational logistics expertise. Logistics providers can propose efficient consolidation solutions for buildings, such as by managing deliveries from outer-city consolidation centres into the dock and using onsite personnel to distribute deliveries to customers within the building.

Logistics planning systems and kerbside management systems are improving. Previous systems produced static plans that did not adapt to daily, let alone hourly, changes in a city's transport networks. New systems are more adaptive, incorporating real-time traffic data, real-time changes to order schedules, customer booking systems, and information from vehicle management and guidance systems. They can also link to kerbside parking management systems to generate parking requests and permissions. In addition, they can learn from past approaches. There is also likely to be improved vehicle to vehicle and vehicle to infrastructure connectivity supporting better adaptive transport planning.

9.7 Crowd-sourced logistics

New business models have emerged in logistics, disrupting existing approaches and offering novel crowd-sourced solutions. These new ways of operating can have both positive and negative impacts on traffic. For example:

- if a driver collects an item and the delivery point is on the driver's route, the crowd-sourced solution may reduce traffic.
- if orders that would otherwise have been consolidated into a single vehicle are picked up by multiple drivers who deviate from their route to reach the delivery point, then the crowd-sourced solution may increase traffic.

Because crowd-sourced logistics activity is less conspicuous due to the variety of vehicles used, it is difficult to monitor and coordinate. Current NSW road rules do not permit passenger vehicles to park in loading zones, limiting the reach of crowd-sourced logistics solutions.

CASE STUDY

Smart Loading Zone pilot – Omaha, Nebraska

The city of Omaha, Nebraska, is piloting the use of smart loading zones. The pilot will allow drivers to reserve a loading zone, and will include dynamic pricing and integration with enforcement systems.

The pilot is intended to reduce illegal parking, congestion and conflicts between road users.

Ken Smith, Omaha's parking and mobility manager, said of the pilot that "there's an obvious benefit for drivers that also benefits non-drivers; there's less circling the block, which means less conflicts with other road users ... if cities don't do this, we're just going to see more and more of these vehicles blocking the way" (Wilson 2020).

9.8 Rethinking the transport task and redesigning vehicles

In Tokyo, (Japan) low vehicles transport soft drinks to vending machines and reload empty bottles onto their roofs to be taken back to the depot for recycling.

As well as redesigning buildings, planners can support the development of versatile vehicles for urban freight and servicing activities.

(IMAGE: Ringman 2018)

Couriers in Dublin (Ireland), Seattle (United States), Hamburg (Germany) and other cities use cargo bikes to complete some freight tasks. Sydney already has a reasonably sized courier bike fleet operating from some small depots in and around the CBD. This fleet is likely to expand as logistics businesses become more interested in bikes with greater cargo capacity. However, parking for cargo bikes is less flexible than for two-wheeled courier bikes.

(IMAGE: Adams 2018)

In Utrecht (Netherlands) and Gothenburg (Sweden) small electric vehicles are used to deliver consolidated freight into the heart of the densely populated CBDs, which have limited capacity to support traditional large freight vehicles.

These cities' use of these vehicles has led to reductions in emissions, noise and freight traffic, and has increased residents' safety and quality of life.

(IMAGE: Ericsson 2020)

CAVs that connect directly to transport infrastructure, traffic management systems and parking management systems are likely to become a reality in the future.

Their technology is well-proven inside industrial plants and warehouses. They could become a fixture of the urban delivery landscape, carrying goods within a limited geographic range.

(IMAGE: Starship 2020)

Applications of CAVs technology may capitalise on innovations such as vehicle electrification and be coupled with emerging service models by new market entrants.

CAVs may further reinforce the already growing trend of on-demand or express deliveries. More widespread adoption of freight and passenger automated vehicles has the potential to place further pressure on local road networks.

(IMAGE: WEF 2020, p.15)

Without question, drones have the potential to be used in the freight task. But in the short term, the use of drones for deliveries in high-density urban centres is likely to be challenging. So far, drone delivery tests have only been carried out in sparsely populated areas. The roll-out of 5G mobile networks may resolve some of the issues surrounding the urban use of drones, but security risks could remain.

Until 100 drones can be dispatched autonomously, replacing a full vehicle worth of goods with a single controller, drones are unlikely to join the urban freight task.

(IMAGE: SmartCitiesWorld 2019)

Vehicle management systems and routing optimisation systems are likely to connect to kerbside management systems in the future. These systems will work together to automatically make decisions throughout the day that continually re-optimise vehicles' delivery and collection operations.

9.9 Freight task growth

The growth of the last mile freight task can be understood through three main lenses:

- growth driven by location
- growth driven by societal change
- growth driven by new services.

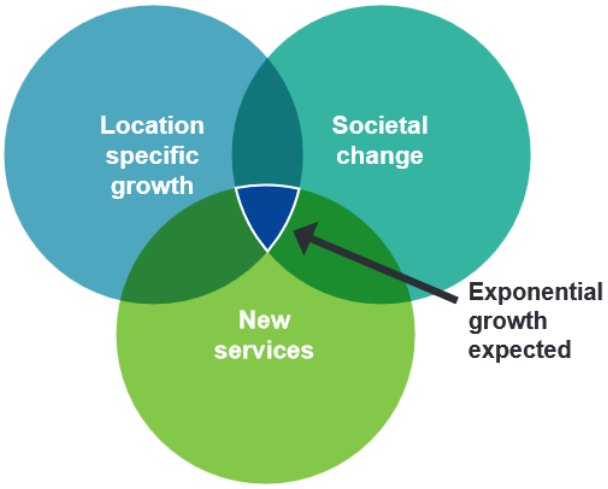


Figure 27 Key factors driving growth in the freight task

9.9.1 Location-specific growth

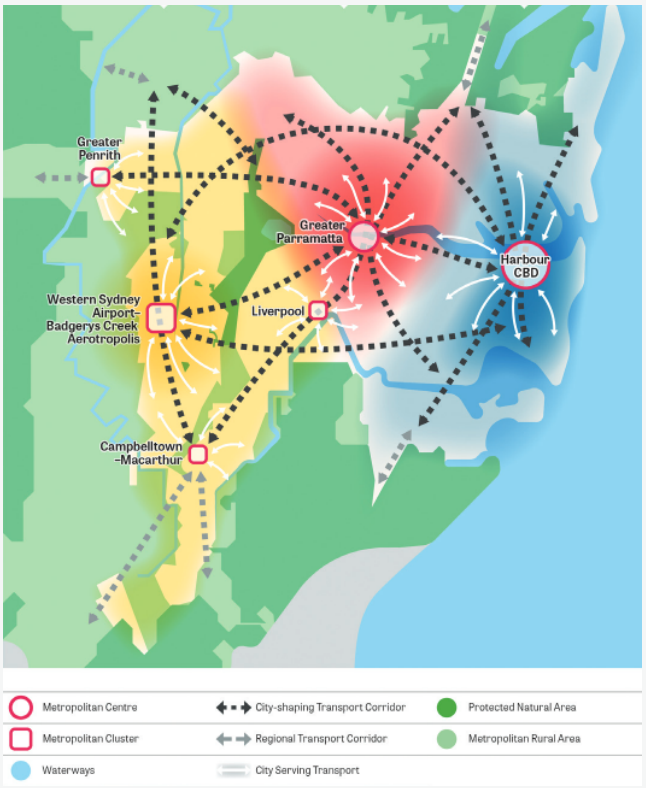
CASE STUDY

Greater Sydney Region Plan, A Metropolis of Three Cities

The Greater Sydney Commission's **Greater Sydney Region Plan, A Metropolis of Three Cities** is built on a vision of three cities where most residents live within 30 minutes of their jobs, education and health facilities, services and great places. To meet the needs of a growing and changing population the vision seeks to transform Greater Sydney into a metropolis of three cities:

- the Western Parkland City
- the Central River City
- the Eastern Harbour City.

The vision brings new thinking to land use and transport patterns to boost Greater Sydney's liveability, productivity and sustainability by spreading the benefits of growth. (GSC 2020, p.6)



New centres will inevitably experience significant growth in their freight and servicing tasks. Rapid increases in the amount and density of office and residential floor space in Parramatta, for example, will attract further retail and hospitality uses leading to significant year-on-year growth of the freight task. Planners need to accommodate this by developing more off-street facilities and loading docks.

New developments are also creating extra traffic. As of 2019, Barangaroo, for example, receives approximately 10,000 freight delivery vehicles each month. However, not all of this traffic is new. It is reasonable to assume that a substantial portion of Barangaroo's deliveries once went to areas around the Sydney CBD before businesses relocated to the new precinct. As a result, vehicle movements to these businesses may be more efficient and consolidated now.

Green Square in the inner east of Sydney has 35,700 dwellings under development as of 2019 and is likely to generate more than 5,000 freight movements per day to residential properties alone. On top of this volume will be deliveries to the new businesses, cafes and retail destinations that will develop in the area.

9.9.2 Societal change

In 2018, more than 73 per cent of Australians shopped online, accounting for approximately 10 per cent of all retail sales (Australia Post 2019, pp.6-7). This figure is forecast to grow, and as a result so too will the number of parcel deliveries. With online shopping growing, bricks-and-mortar retail sales are declining. Thus, although the number of items being sold in the whole retail market may remain stable, the number of freight vehicle movements these sales generate is likely to increase.

As the number of people living in dense urban centres increases and car ownership decreases, more people are likely to order groceries online. One large van delivering groceries is more efficient than many small cars completing the same task. This trend should result in less private vehicle movements.

9.9.3 New services

In response to these societal changes and to differentiate themselves from competitors, companies are developing new service offerings. Often, these offerings centre on faster delivery times. For retailers, the main constraint on continued growth is their ability to provide cost-effective deliveries in short timeframes.

Freight movements are likely to grow faster than online sales, partly as a result of the faster delivery times companies are promising customers. Typically, more vehicles are required to meet two- or three-hour delivery times compared to next day deliveries, which can be consolidated more effectively. These faster delivery times may even require delivery personnel to visit the same address more than once in a day.

Thousands of electric courier bikes operate across Sydney every day, the vast majority making food deliveries. These were virtually non-existent just a few years earlier. In 2018, the Australian food delivery market was valued at $2.6 billion, with approximately 7,000 orders placed every hour (Banney 2018). For this reason, the market is experiencing double-digit year-on-year growth.

9.10 New logistics structures

Minimising the distance between origin and destination points for last mile deliveries can change the urban freight transport task significantly, and improve place outcomes and amenity.

Over the last 30 years, logistics providers have moved their facilities from inner to outer metropolitan areas. This has reduced property costs, but increased transport costs for last mile deliveries as vehicles must travel further to reach urban centres.

As the sizes of consignments get smaller and consumers expect their deliveries sooner, logistics providers' outer metropolitan locations are constraining their ability to meet customer demand. To provide the service customers want, some logistics facilities are moving back into urban centres. In 2018, one European leader in eCommerce deliveries, for instance, established a small depot to operate a fleet of variously sized electric vehicles in central London, UK, less than 400 metres from Buckingham Palace. More micro depots are planned elsewhere in central London and in other cities.

Micro depots help reduce transport costs and increase the feasibility of expedited deliveries. However, they also increase property and land use costs for logistics providers.

9.11 Global predictions

In 2020, the WEF released a report on "The Future of the Last-Mile Ecosystem" (WEF 2020). The report explores the challenges facing urban freight due to the growth in eCommerce, more demanding customer expectations, changing technology and the increasing impact of supply chain disruptors. It identifies 24 prioritised interventions to respond to these challenges and mitigate the impacts of last mile freight on traffic volumes, congestion and pollution. These interventions are summarised into three "transition roadmaps": sustainability; economic; and a multiplayer or integrated ecosystem (**Figure 28**). The report argues that the integrated ecosystem approach, based on close collaboration between public and private sector stakeholders, "would optimise the last mile ... while minimising customer disruption" (WEF 2020, p.5) to produce beneficial results for all ecosystem players.

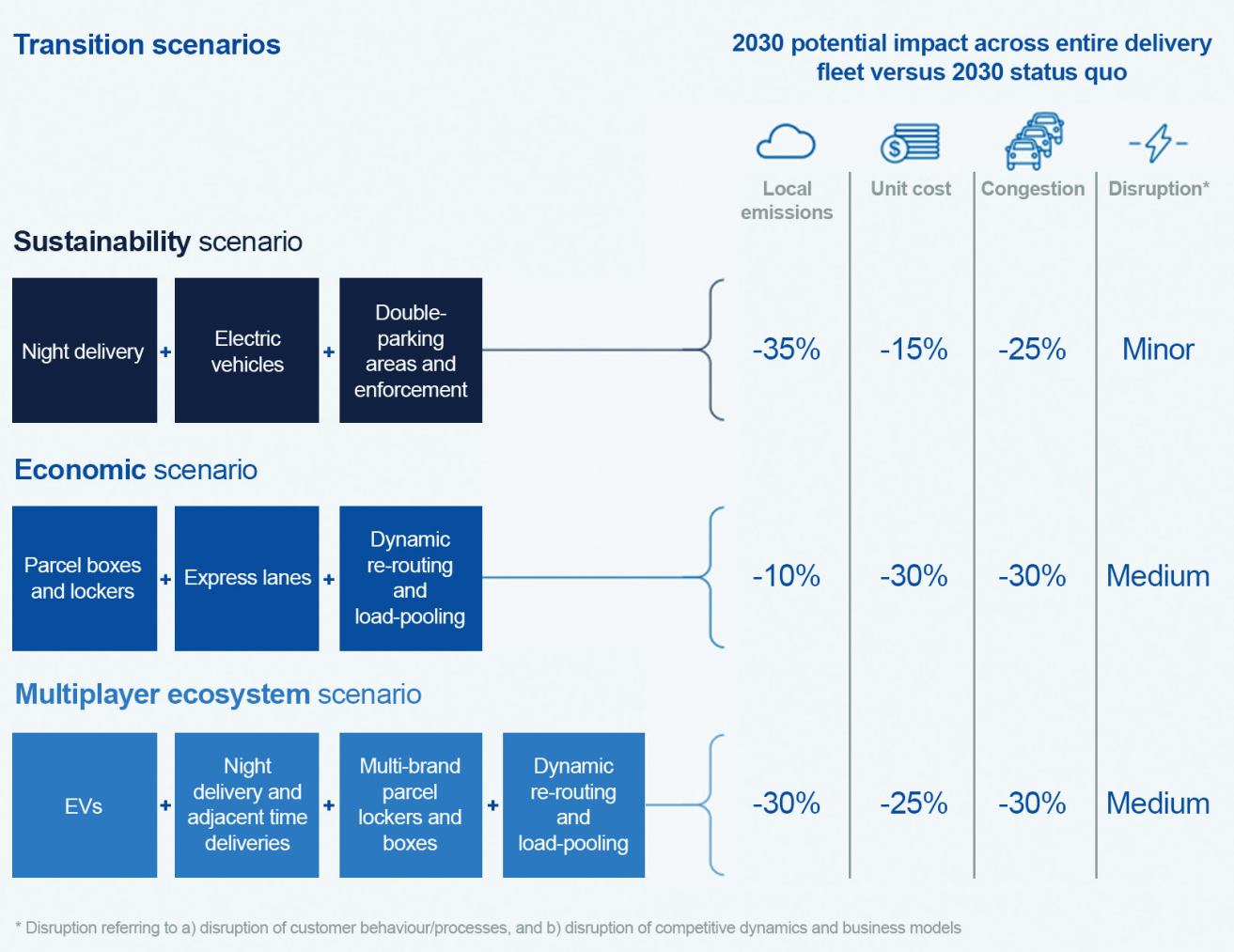


Figure 28 The future of the last mile ecosystem – scenario modelling undertaken by the World Economic Forum (WEF 2020, p.21)