Developing an urban freight micro hub

March 2021 | Version: 1

Contents

Author:	Michael Stokoe – Director Urban Freight
Date:	March 2021
Version:	1
Reference:	
Division:	Freight Branch, Customer Service and Technology
Review date:	-

1 Introduction

This document shares Transport for NSW's (TfNSW) experience in developing a Micro distribution hub (micro hub) and the subsequent learnings from five years of its operation. The facility is known as the "Courier Hub".

Figure 1 A bike courier leaving the Courier hub to make CBD deliveries

It is anticipated that this will be treated as a live document with further learnings and evidence added over time.

2 Why establish the Courier Hub?

In 2015, TfNSW and the City of Sydney jointly developed a Courier Hub by repurposing a disused wash-bay in a council owned car park in Goulburn Street. It opened in January 2016. The Courier Hub is located in the southern part of the CBD, a short bike ride from main commercial, retail and hospitality centres in the city.

The main rationale for establishing the Courier Hub was to provide an alternative way to complete deliveries in Sydney CBD to the traditional use of vans and truck. The Courier Hub was established during the construction of City and South East Light Rail. This infrastructure project required many changes to the CBD road network, including the removal and temporal reduction of some loading zone capacity.

Traffic congestion and parking/unloading availability are a challenge in Sydney CBD. The Courier Hub provides an alternative on the fringe of the CBD, limiting the need for vehicles to enter the busiest areas.

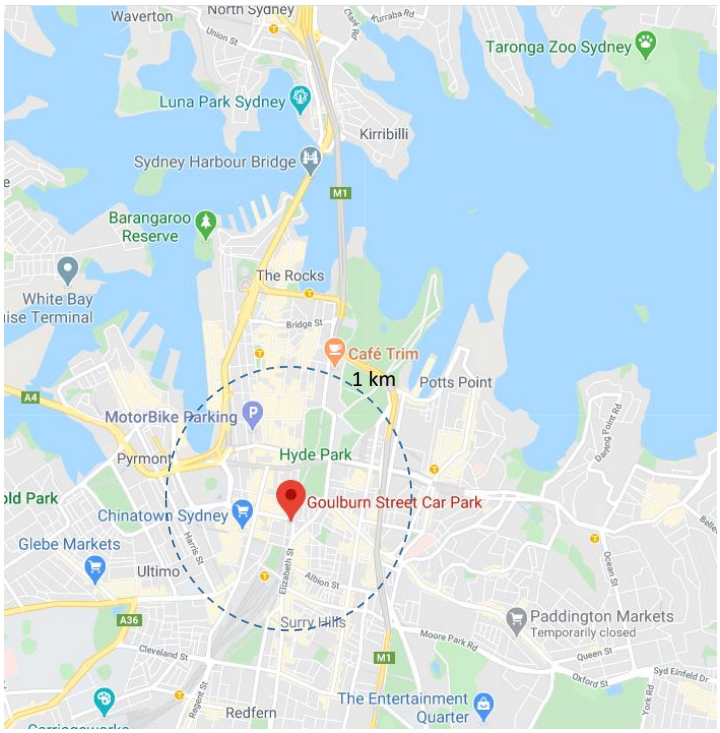

Figure 2 Courier Hub location at Goulburn Street Car Park

The Courier Hub is a small operational space (approximately 25x5 metres) but it is unique in Australia as an open access, multi user hub facility aimed at delivering:

- Environmental benefits for the city
- Time savings for road users, including easing pressure on couriers driving in a challenging road and parking environment
- Making a small but recognisable economic contribution by reducing congestion.

It achieves the objective of demonstrating an easy and alternative way to deliver in congested CBD areas. Large logistics companies have at times operated a number of similar single user micro hubs in various Australian cities. From its initial conception, the Courier Hub has always been a shared space for multiple operators to work side by side and potentially collaborate.

3 Ongoing Innovation

There are two main types of transport deliveries at the Courier Hub:

- **Daily distribution**: couriers use light commercial vehicles to bring bulk loads into the hub in the morning, and remode to bikes for delivery throughout the CBD across the day.
- Urgent **point to point** movements: couriers use the hub's lockers, cages and parking spaces to quickly drop off and transfer items between modes for delivery into and from the CBD.

The space is shared by various couriers companies. The couriers walk, or predominately cycle, to make deliveries throughout Sydney CBD and surrounding inner city areas.

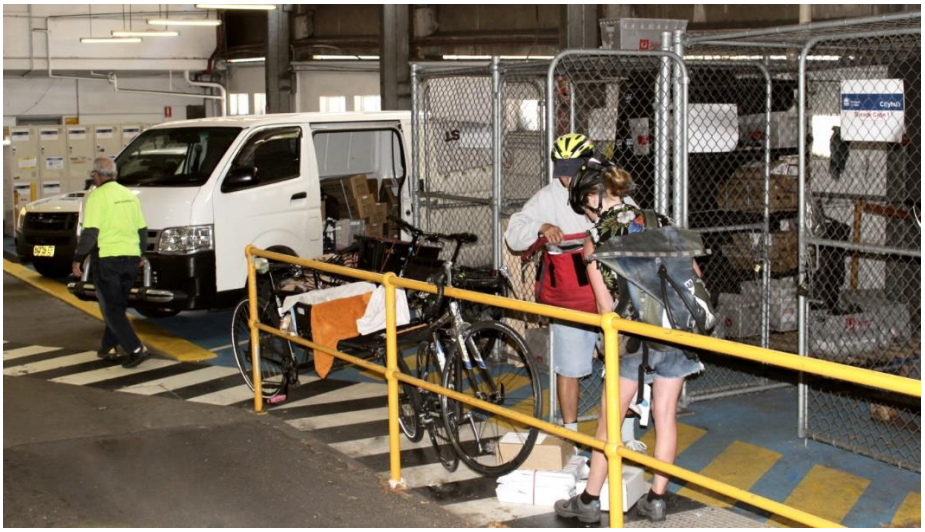

Figure 3 Daily operations at the Courier Hub

The Courier Hub facilitates support for ongoing last mile innovation. Operators continue to trial new equipment and methods to improve their efficiency and environmental impact. Increasing use of electric powered bikes or higher capacity electric trikes is increasing the geographic area that the facility can efficiently service and increasing throughput, leading to greater environmental benefits. While these initiatives are driven mainly by couriers, TfNSW continues to explore other opportunities to innovate. Recent tests have also included charging capabilities for electric trikes.

Figure 4 High capacity electric courier bikes and trikes being tested from the Courier Hub

4 Courier Hub facilities

The Courier Hub provides:

- Short-term parking spots for couriers
- A bank of secure lockers to store consignments
- Secure cages to store bulky consignments

The City of Sydney already provides secure bike storage facilities and public restrooms at the Goulburn Street car park. These facilities assist with the Courier Hub. When setting up the Courier Hub, Transport for NSW also installed dedicated security cameras.

While TfNSW and the City of Sydney provide these facilities, couriers operating at the hub utilise their own processes, systems and workforce agreements to support their logistics operations.

The hub's is available by agreement with TfNSW to any couriers operating in the CBD.

5 Performance Metrics

5.1 Benefits analysis conducted mid 2019

The below results are measurements of the daily operations of seven courier companies using the Courier Hub at that time. The key benefits generated by the Courier Hub comes from a reduction in the number of vehicles driving into the CBD, and the subsequent increase in the number of trips being completed by courier bikes.

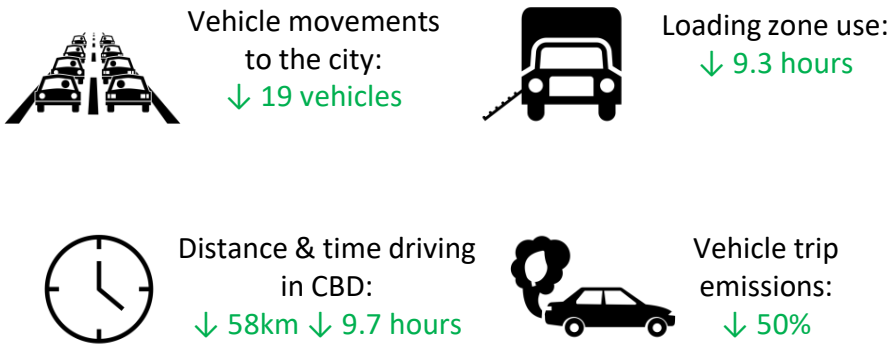

Figure 5 2019 environmental metrics of the Courier Hubs performance

While the above is an assessment of the benefits measured, the following subsection offers some explanation as to why operators would consider this approach.

5.2 2016 Van v bike courier assessment

In 2016, TfNSW conducted an efficiency assessment comparing a bike courier and a van delivering to the same points around the CBD. In the assessment:

- Both couriers started at the same location at an inner city industrial area before travelling into the CBD in vans.
- The van courier commenced his route to the first of ten CBD delivery points
- The bike courier drove the van to the Courier Hub to transfer orders to a bike
- Overall, the bike courier travelled less distance and in shorter time - The van courier drove further and then also walked 3.9km to complete the same task

Key findings from the assessment include:

- An experienced bike courier was able to deliver to the ten customers in one hour; half the time of the experienced van courier
- The main challenge for the van courier was finding on-street parking close to the delivery point
- During the morning peak, the van driver spent approximately 30 per cent of their time driving and searching for a suitable parking location, and 70 per cent of their time walking to the delivery point[1]. This balance eased alter in the day but the majority of time was still spent walking.

[1] Similar figures are reported from other cities around the world.

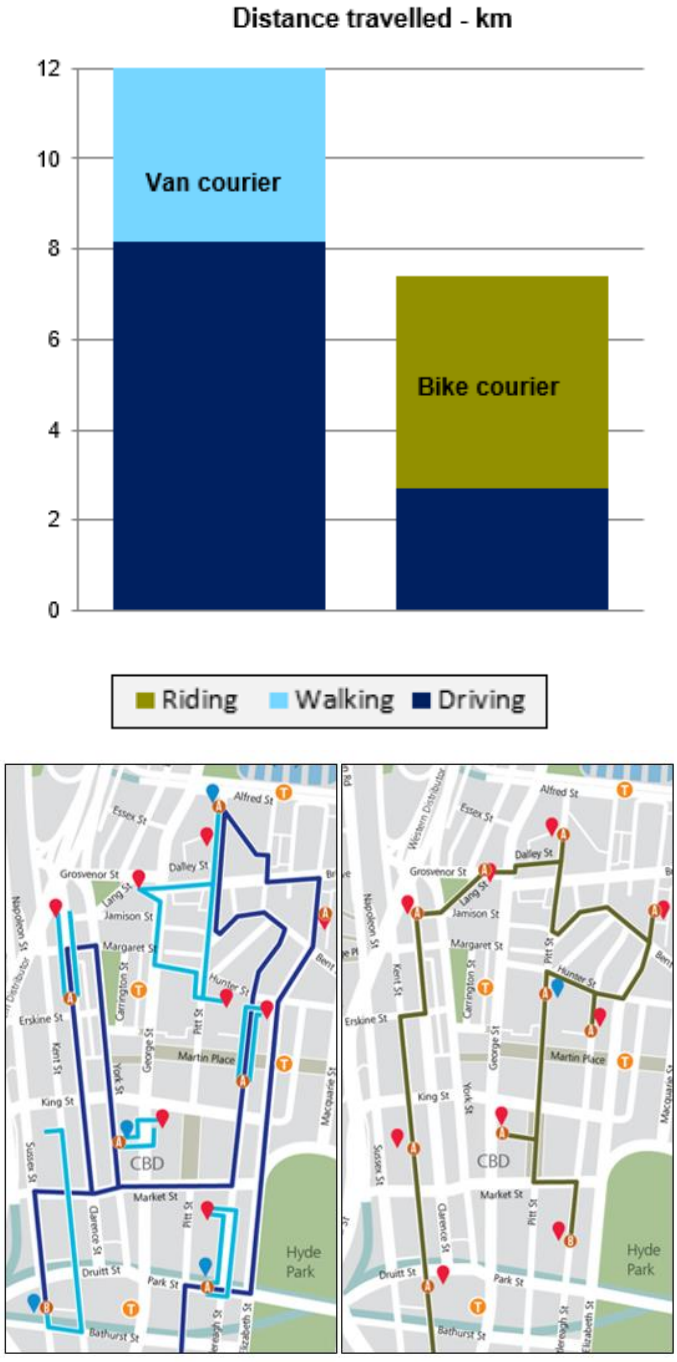

Figure 6 delivery metrics and routes taken by the van and bike courier

It could be concluded that transferring consignments via the Courier Hub to a bike courier can be a commercially viable approach for a logistics company. Several considerations and limitations for this are discussed below.

6 Considerations and limitations

While this Courier Hub, and privately operated ones like it, can work in Sydney CBD, micro hubs may not be feasible in every circumstance.

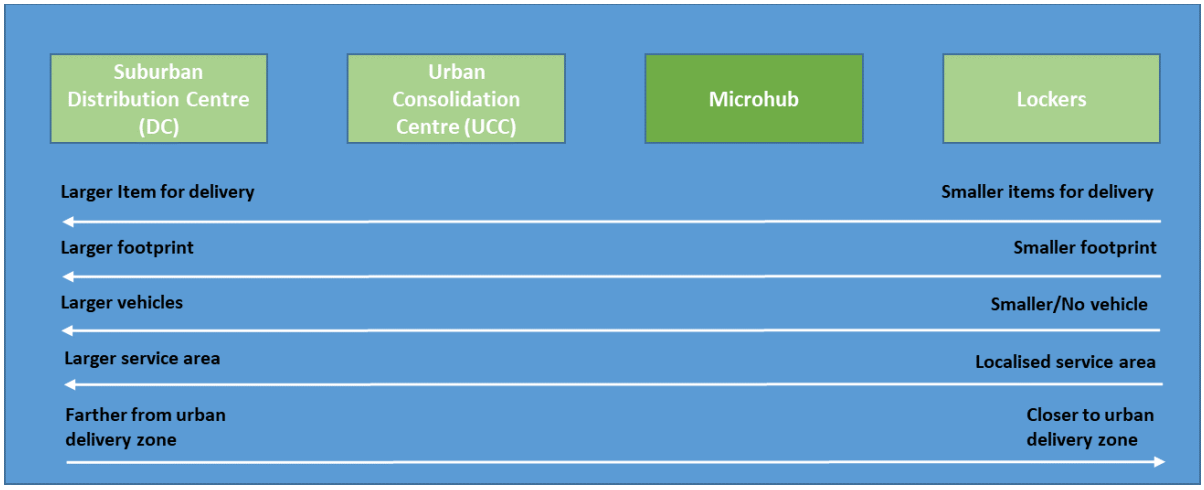

Figure 7 Capabilities of different sizes of logistics hubs

Several factors contribute to this Courier Hub's viability:

6.1 Accessibility

Sydney's Courier Hub is open between 6am and midnight. However, the carpark's 1.95-metre clearance height limits access for larger vehicles. Ideally, a micro hub's entrance would allow access for larger vehicles (Medium Rigid Vehicle) that are commonly used in the CBD. Access for larger vehicles would improving the facility's capacity to increase efficiency and reduce congestion. This access restriction reduces this Courier Hubs potential.

6.2 Collaboration

Though it is a common user facility it is up to the operators if they choose to collaborate. The facility has provided a platform for some businesses to develop collaborative models utilising each of their strengths to improve service levels for their customers. These efficiencies are rewarding to observe but are not a prerequisite for use of the hub. The ongoing policy is that it is up to the operator to apply their own processes and partnerships to how goods flow through the facility.

6.3 Security

The Courier Hub offers some security for consignments. It provides weather protection and its design allows operators to incorporate security measures into their operations. The facility also benefits from additional levels of security developed into the facility. Maintaining integrity for items passing through provides confidence to operators. The approach continues to rely on the operator applying their own processes to maintain integrity of the consignments passing through the hub.

6.4 Location

The Courier Hub is located approximately one kilometre from the heart of Sydney CBD and close to major connecting roads on the fringes of the CBD. By using the Courier Hub, drivers do not need to drive far into the CBD. Drivers have expressed relief at the reduced stress by driving only as far as the Courier Hub.

While a central location may be useful for the delivery of goods, it still entails a necessity to drive into the centre. A location at the fringe can be both less costly from a property perspective and avoid driving into the most congested areas.

6.5 Portability of items

Not all items are suited to delivery using a small format micro hub. It is more efficient to deliver larger items direct from a distribution centre to a customer rather than rehandling at an intermediate point. Micro hubs work well for small portable items and orders that can easily be delivered without needing specific handling equipment.

6.6 Density of commercial activity

With a workforce of approximately 500,000 people in approximately 2.4 square kilometres, Sydney CBD has a workforce density that adequately generates viable volumes of suitable freight for micro hubs. Micro hubs can also work in smaller markets as long as certain 'pull and push' factors are evident. Firstly, the area being serviced must generate enough demand to create full time or reasonable hours of employment for the couriers. Secondly, larger vehicles should be able to access the proposed hub location, which should support bike and foot deliveries. Conversely, constrained road networks, either due to congestion or limited capacity for motor vehicles, can encourage the adoption of alternative approaches.

6.7 Available space for a hub

Finding suitable locations to establish micro hubs can be challenging. Local Environment Plans do not always permit the development of freight and logistics facilities in urban centres. An advantage of micro hubs, however, is that they do not need premium shop frontage locations. Facilities like this can repurpose space otherwise considered unattractive or of little commercial value. In some cities, examples are emerging of micro hubs being incorporated into land use planning or building design. The City of London is increasingly advocating for Micro hubs in the high value "square mile" commercial centre of the city as a means to drive consolidation and reduce vehicle traffic.

6.8 Public sector support

The Courier Hub was developed from a partnership between state and local governments based on common goals to reduce environmental impacts and improve the efficiency of freight on the CBD road network. Once it was established, ongoing managerial support has been relatively limited. It has mostly been up to industry to use the hub and incorporate it into their processes. As a result of careful planning, modest infrastructure and low overheads, the facility does not cost much to operate and can therefore be maintained with minimal support. High overheads in schemes elsewhere in the world have typically seen the projects abandoned once public funding stops.

That the Courier Hub has successfully operated for over five years is globally noteworthy.

6.9 Carrier processes

Some carriers using the hub have found it challenging to adapt their business processes and organisational structure to the micro hub (intermediate point) model. Sometimes this is because they have committed to using subcontractors or franchisees who may have invested in vans and be uninterested in switching to bikes. In other cases it has involved adaptation to remuneration and IT systems to split jobs between individual operators either side of the Courier Hub. Where it is an individual or franchisee courier driving a van, these couriers may elect not to use the hub. Conversely, larger organisations may find a shared hub does not easily fit into their network structure and work approaches. Progressive medium sized businesses and "disruptors" have been the key logistics operators who have most readily adapted to its use.

7 What could further encourage adoption of micro hubs?

Further to the discussion points described above, the following factors could influence the greater adoption of micro hubs:

- Decreasing availability of kerbside space in a key commercial district. In many urban areas, kerbside capacity is shrinking as a result of infrastructure projects and changing urban design priorities (such as increasing pedestrianised areas)
- Encouraging low-carbon transport modes accompanied by provision of infrastructure, such as bike and micro mobility lanes, as a means of quick and easy movement throughout an urban centre
- Increasing commercial activity in a dense area driving an increased freight. This could encourage logistics operators to consider options for maximising the quantity of goods they can deliver and improving the efficiency with which they can deliver them.
- Ensuring the micro hub has the clearance and space to allow larger vehicles to access the site and manoeuvre safely
- While focusing on a shared facility, providing space for couriers to securely establish discrete aspects of their operation. As a consequence however, dedicating space to specific carriers increases the necessity for a stronger commercial approach to be taken.
- Ongoing innovation to increase the use of electric courier bikes. Several businesses are importing, developing and testing the capabilities of various types of new equipment.

8 Developing a micro hub

Planners, developers or logistics operators considering opening a micro hub must consider both the local community's freight needs as well as their own operational objectives. The table below describes the steps stakeholders could take in assessing the need for and designing a micro hub.

Step	Notes
1. Urban planning objectives	Considering influencing factors beyond the micro hub itself. It is appreciated this section could be extensive • Urban centres are changing to be more people and place orientated. This may typically mean a greater focus on space and traffic lanes for active transport. • Less traffic lanes and increase active transport would serve to encourage the development of a micro hub. Active transport lanes will typically mean less kerbside parking opportunities. In this case Courier bikes or Micro logistics approaches can be a more versatile approach
2. Understanding local demand	• Determine whether the delivery demands of local businesses and residents warrant the development of a micro hub. • Food consignments, particularly fresh produce, are not suited to (re)handling via a micro hub. It is important for the integrity of goods to be maintained with minimal handling and temperature maintained. If local businesses are reliant on fresh produce, a micro hub is not the right solution for them.

3. Provide courier parking spots	• Develop a plan to manage the parking spaces that will be provided. For example, the hub might permit long dwell times to allow couriers to complete multiple deliveries throughout the area. Alternately they may be used for short turnaround as goods are dropped off or collected from the micro hub. Parking policies might also depend on the type of vehicle a courier is using. • Consider a location that is accessible and within a short travel distance (walking or bike) of the desired delivery locations. Will the van driver hand over goods or walk themselves? This will influence the dwell time. • Consider ways to monitor, measure and understand couriers' parking needs and usages. • If individual couriers only require short dwell times (due to low delivery volumes) it is probably unlikely that a micro hub will evolve further – all the couriers need is some equivalent of loading zone capacity. If kerbside loading zone (or short term parking) capacity can be provided, it is a more cost effective option than developing a micro hub.
4. Transfer facilities / dedicated local courier activity	• Where there are significant volumes in a particular area, couriers may look for transfer facilities (secure cages, lockers or lockups) where goods can be dropped off by a van driver for collection by a dedicated local courier who operates on foot or by cycling to make the local deliveries. • An ideal scenario is to have a common user facility for multiple operators. While this clearly demonstrates a strong local need, consideration needs to be what transfer facilities – dedicated or shared – will be provided. Equitable approaches need to be provided that are manageable and sustainable in the longer term.
5. Consider operators' space requirements	• As carriers' delivery volumes through a hub increase, the likelihood is that they will require more shared and/or dedicated space to manage and sort goods. If a hub supports multiple operators, this requirement for additional sorting space may act as a constraint on the efficiency of the site. • Temporal solutions may be feasible for couriers to share at different times of day.

6. Enhancing capability	• Equipment storage, access to shared equipment, and electric vehicle charging capability could continue to drive utilisation and initiate further change. • Similarly, the ability to use specific types of innovative equipment between the hub and the local area (e.g. small electric vehicles or motorised handling equipment) will further enable the facility to develop. This may require input from authorities as to rules for operating innovative equipment.
7. Movement to purpose built facilities	At some stage a repurposed site is likely reach its useful capacity and face operational constraints. At this stage purpose built facilities may be a better option. From global evidence, these may be developed: • By a local authority as part of a redevelopment • Required to be provided by a developer as a local authorities condition of a (re)development • Provided by a private developer who recognises there is a commercial opportunity to do so
8. Developing benefits	To be sustainable into the longer term, the facility must provide demonstrable benefits. This may be a straight forward commercial return to a private developer or, if there is a public sector interest in its establishment, the demonstration of triple bottom line benefits that align to an urban centres objectives.
9. Topography	Flat areas obvious make it easier for goods to be moved safely throughout city streets. There are limitations to the power of electric bikes and handling equipment (trolleys) for use on pavement for moving goods. This can also extend to the design and location of kerb ramps at intersections