

National Transport Authority (NTA)

SUSTAINABLE FREIGHT DISTRIBUTION FRAMEWORK: GREATER DUBLIN AREA (GDA)

Final Report



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EXECUTIVE SUMMARY

This report has been developed as a framework for a Sustainable Freight Distribution Framework and to provide an approach towards developing a strategy for the efficient, safe and sustainable movement of goods based around the following key themes;

- **Stakeholder Engagement**
- **Freight Data**
- **Infrastructure**
- **Technology & Decarbonisation**
- **Operational & Planning Considerations**

The assessment of the freight and logistics context considered the analysis of freight and transport data and information from a number of core sources, namely:

- National Transport Strategy for Greater Dublin Area (2016-2036)
- Review of the National Transport Strategy for Greater Dublin Area (Issues Report 2020/2021)
- Greater Dublin Area Draft Transport Strategy 2011-2030 (Eltis)
- Ten Year Strategy for the Haulage Sector (2021)
- Regional Spatial & Economic Strategy for Eastern & Midland Regional Assembly (2019-2031)
- Rail Review Report (2016) & Irish Rail Freight Strategy (2021)
- 2030 Rail Freight Network Strategy Review (2011)
- National Ports Policy (2019)
- GDA Strategy (Transport Demand Management Measures (2015)
- Cities Demand Management Study (2021)

In summary, a number of key issues and opportunities have been collated together to set the scene for the role of freight transport across the GDA. This has been balanced against future and emerging trends across the sector to develop a clear list of measures under each of the aforementioned key themes which have been assessed against economic, environmental and social objectives for the freight industry using a Multi Criteria Assessment Framework (MCAF). Detailed dashboards have then been produced for selected measures that show the greatest potential to meet these objectives.

There is a dependency on road freight to move goods around the GDA and a reliance on the primary road network to fulfil this requirement to support burgeoning sector growth and local/national prosperity. The network is vital for servicing the activities of major freight generators, namely Dublin Port and a band of warehousing, business parks and logistics centres around the M50 orbital. Infrastructure investment should look to enhance network resilience and provide viable alternative fuel technologies and options for re-moding consignments; both for strategic trips and within the confinements of the city of Dublin. This is whilst still supporting the growth of freight and logistics presence and helping unlock future capacity.

There are plentiful measures to help the sector decarbonise, a key priority going forward, that uses technology to optimise trips and improve efficiencies which can cater for both large and smaller fleet operators. An approach must recognise the short-term limitations of alternative fuel technologies and the need to apply a suite of attractive tools to improve fuel efficiency, reduce travel demand and raise standards.

Public authorities and industry must work collaboratively to scale up initiatives that reduce the externalities on society and the environment and support a transition towards a sustainable, safe and efficient freight sector; combining the use of legislation to manage access and influence travel behaviour, with incentives and schemes to nudge industry towards adopting best practice. Generally, a 'think freight' approach needs to be better interwoven into the fabric of local decision making and the public consciousness with a future strategy having four component parts to deliver on the overarching GDA Transport objectives.

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GLOSSARY

B2B – Business 2 Business
 B2C – Business 2 Customer
 BEV – Battery Electric vehicle
 C2B – Customer 2 Business
 CSO – Central Statistics Office
 CAZ – Clean Air Zone
 CNG – Compressed Natural Gas
 C2C – Customer 2 Customer
 DMURS – Design Manual for Urban Roads and Streets
 DPC – Dublin Port Company
 EPA – Environmental Protection Agency
 ESB – Electricity Supply Board
 FTA – Freight Transport Association
 FLGFF – Freight, Logistics and Gateways Freight Forum

FLGSG – Freight, Logistics and Gateways Steering Group

FTZ – Future Transport Zone

GDA – Greater Dublin Area

GHG – Green House Gas

HGV – Heavy Goods Vehicle

ITS – Intelligent Transport System

ISO – International Organization for Standardization

JIT – Just In Time

KPIs – Key Performance Indicator

LGV – Light Goods Vehicle

Lo-Lo – Lift-on/Lift-off

LNG – Liquified Natural Gas

MCAF – Multi Criteria Assessment Framework

NPA – National Planning Framework

NTA – National Transport Authority

NUTS3 – Nomenclature of Territorial Units

OEM – Original Equipment Manufacturer

PHEV – Plug-in Hybrid Electric Vehicle

PPP – Public Private Partnership

PCC – Pure Car Carriers

PC/TC – Pure Car/ Truck Carriers

RSA – Road Safety Authority

Ro-Ro – Roll-on/ Roll-off

RoPax – Roll-on Passenger

RSES – Regional Spatial and Economic Strategy

SEAI – Sustainable Energy Authority of Ireland

SWOC – Strengths, Weakness, Opportunities, Challenges

TEN-T – Trans-European Transport Network

TII - Transport Infrastructure Ireland

ToR – Terms of Reference

UMS – Message Service

Standalone Appendices

Appendix 1: Dashboards

Appendix 2: Maps of Infrastructure Provision

Appendix 3: Multi Criteria Assessment Framework (MCAF)

Appendix 4: FLGFF Terms of Reference (ToF)

Appendix 5: FLGSG Terms of Reference (ToF)

Appendix 6: Stakeholder Contact Matrix

Appendix 7: Freight Data Catalogue Matrix

INTRODUCTION

This report has been developed by WSP and Transport Insights for the attention of the National Transport Authority (NTA) and aims to provide a framework for the future development of a Sustainable Freight Distribution Strategy. It has been developed concurrently with the Transport Strategy for the Greater Dublin Area (GDA) (2022-2042) which provides the basis for the planning and delivery of transport infrastructure and services over the next two decades.

Chapter Fifteen of the Transport Strategy makes reference to goods movements, the role of freight across the GDA and the intention to develop a Sustainable Freight Distribution Strategy (Measure 1). This report helped inform the content of the strategy but also looks ahead to build on prior knowledge and insights to help provide a framework for further investigation into the role of freight, delivery and servicing; now and in the future.

THE ROLE OF FREIGHT

The efficient, safe and sustainable movement of goods is a fundamental part of supporting everyday life. The scale and complexity of movements vary enormously along with the types of goods being transported. Freight transport can often be viewed as the silent network that operates behind the scenes using different forms of travel along a supply chain to support local economies and to help sustain society.

The significance of freight can be understated within transport policy and the public consciousness, but its role is increasingly important to consider and manage, especially in an urban context, to keep up with changes to how we live, work and move. Freight plays an essential role in servicing industry and communities and supporting economic prosperity. It allows residents to have choice as consumers and businesses, to sustain thriving and attractive places and enhance people's quality of life. Future developments depend on the expeditious movement of materials to construction sites by different types of freight transport whilst waste and recycling must be collected and disposed of efficiently with due care and attention.

Effective freight management is crucial for businesses and consumers who depend on access to a range of goods being transported safely and efficiently. The demand for goods is only likely to increase in the future as the local population grows and more development takes place. However, wider changes in consumer behaviours driven by new technology are reshaping what goods are being moved; all of which is catalysing a change in the freight and logistics sector to respond to new expectations.

The movement of freight has an important role in Ireland's ambition to halve carbon emissions by 2030 and reach net zero no later than 2050, as set out in the Climate Action Plan 2021. This action plan sets out a number of actions to deliver on climate targets over the coming decades including decarbonising the transport system. In terms of the movement of freight actions including increasing the use of renewable and alternative fuel types, measures to support a shift to electric vans, introducing eco-driving practices (especially for HGV drivers), increasing use and decarbonise rail on the island etc.

This Sustainable Freight Distribution Strategy considers a number of steps to further the decarbonisation of the freight sector and promote a carbon neutral sustainable focused freight sector.

FLOWS OF FREIGHT MOVEMENTS

There are different types of freight movement across the GDA that will require different types of freight transport and vehicles to move the goods. Consideration must be given to:

- **Business2Business (B2B):** the delivery of goods through the different stages of a supply chain, between the supplier of raw materials to a manufacturer to a retailer. For example, taking containers from Dublin Port to the new Inland Port nearby the M50 and Airport Logistics Park.
- **Business2Consumer (B2C):** the final stage of the 'forward' supply chain, where goods are moved between a retailer to the final destination for consumption. For example, steel being delivered from a factory to a construction site for erecting as part of a new building.
- **Consumer2Business (C2B):** what is described as 'reverse logistics'; going back up the supply chain after a product has been consumed, such as recycling. For example, requesting an item that has been delivered to be returned back to a retailer.
- **Consumer2Consumer (C2C):** a more informal, fluid and non-transactional movement of goods becoming more commonly associated with the circular, sharing economy. For example, a business group sharing recycled surplus packaging.

TYPES OF FREIGHT TRANSPORT

Freight transport comes in many forms, especially across an area the size of the GDA and for meeting the demands of a growing, globalised, capital city such as Dublin. Freight will move along a supply chain interacting with different organisations, modes of transport and addresses on its door to door journey. It is important to acknowledge the different modes of transport that make it possible to keep society functioning and ensure that the networks they run on across the GDA are future ready.

Many supply chains will demand intermodal transport; meaning that goods are moved between different types of transport to continue their onward journey through a supply chain. This is especially the case in larger urban areas, such as the GDA, with the convergence of many local, national and international supply chain activities taking place every day, all day, across the transport network. Freight Transport therefore also covers the way items are handled, stored and processed at different stages of a journey.

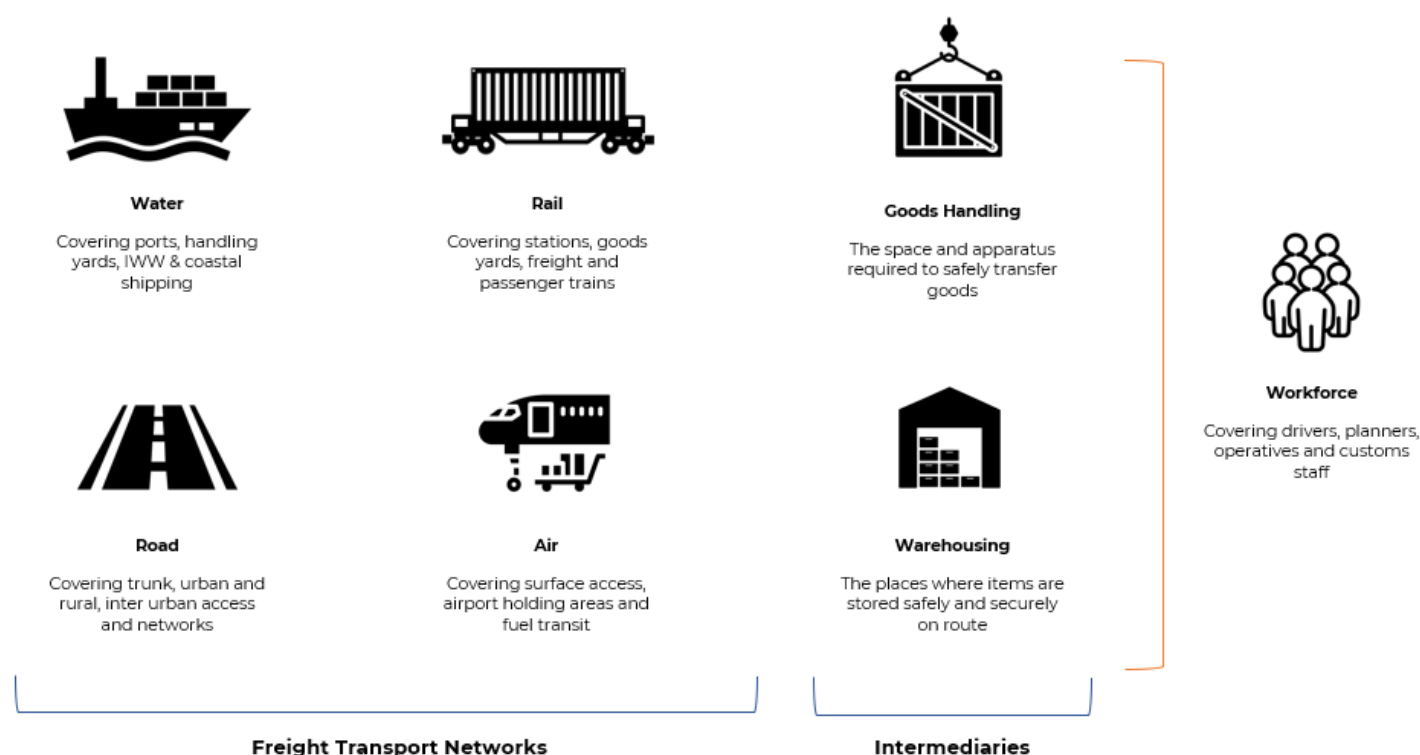


Figure 1 Different types of freight transport applicable to the GDA (Author, 2021)

FREIGHT OBJECTIVES & MEASURES

A Transport Strategy for the GDA has been prepared which sets out the framework for investment in transport infrastructure and services over the next two decades to 2042 to help manage current and future economic, environmental and social challenges. The plan is holistic in nature; understanding the need to support emerging developments and responding to changes in the way people move, shop and travel generally. This includes the role of freight and logistics, an understated part of the transport system.

A set of Measures has been developed for the purpose of selecting, delivering and monitoring the impact of freight specific measures across the GDA in the future¹. These are associated with the way in which goods are moved from place to place and based around the three pillars of creating a sustainable, safe and efficient transport system. The Measures are set out in Chapter 15 of the Transport Strategy and are repeated below:

Measure FREIGHT 1: Strategy for Sustainable Freight Distribution - the NTA in collaboration with other authorities, including TII and Irish Rail, and stakeholders to prepare a Strategy for Sustainable Freight Distribution for the Greater Dublin Area – to inter alia, support the decarbonisation of the freight sector, to seek to further integrate smart technologies in logistics management and to

reinforce the important role that the strategic road and rail network play in the efficient movement of freight.

Measure FREIGHT 2: Planning Policy and Freight - recommended that local authorities in the GDA, with the input of the NTA and TII, identify appropriate locations for freight-intensive developments in their Development Plans.

Measure FREIGHT 3: HGV Management - Consideration will be given to identifying specific HGV routes and / or time restrictions for deliveries, to improve the efficiency of while minimising the impact of HGV movements.

Measure FREIGHT 4: Rail Freight - The NTA will support Irish Rail in the implementation of the outcomes of the Rail Freight 2040 Strategy.

Measure FREIGHT 5: Consolidation Centres - intention of the NTA, in collaboration with local authorities, to examine the feasibility of consolidation centres and break bulk facilities, to facilitate smaller vehicle delivering to Dublin City Centre and other major town centres.

Measure FREIGHT 6: Environmental Measures for Freight - intention of the NTA, in collaboration with other authorities, to 1) Seek the reduction of the amount of 'last mile trips' being made by motorised vehicles; 2) Facilitate the transition to zero-emission delivery vehicles such as cargo bikes and electric vehicles; 3) Support local 'Click and Collect' facilities where appropriate to minimise trips to individual homes and workplaces.

The implementation of these Measures and associated practices should seek to be sustainable by satisfying each of the three pillars.

Economy

- **Freight efficiency:** Improved journey times, connectivity and integration between modes and reduced impact from and on congestion.
- **Industry contribution:** Improved jobs and opportunities to address skills shortages, support for inward investment, land availability, infrastructure provision.
- **Connectivity:** Improved connectivity to, from and within international gateways and enhanced access locally between locations.

Environment

- **Air quality:** Reduce the impact of the sector through air quality improvements and a reduction in other forms of pollution and intrusive activities.
- **Greenhouse gas emissions:** Reduction in greenhouse gas emissions from the sector to achieve net-zero by 2050.
- **Externalities:** Minimising the intrusive impact of freight transport on, for example, visual amenity and local, protected settings.

¹ Greater Dublin Area Transport Strategy 2022-2042, Chapter 15, Freight, Delivery and Servicing.

Society

- **Safety:** Improve the safety of the sector to reduce the number of accidents involving goods vehicles
- **Community disturbance:** Reduce the impact of freight on communities, noise levels, air quality and informal overnight lorry parking
- **Placemaking:** Better consideration of freight in land use planning policy and development, construction and servicing plans, more evidence based decision making based on better freight data

Freight transport shouldn't be considered and viewed in isolation from the rest of the transport mix. Paying greater attention and respect to the industry and recognising its presence and role locally can help to fulfil the four objectives of the Transport Strategy namely²:

1. **An Enhanced Natural and Built Environment:** To meet our environmental obligations by transitioning to a clean, low emission transport system, reducing car dependency and increasing walking, cycling and public transport use.
2. **Connected Communities and Better Quality of Life:** To enhance the health and quality of life of our society by improving connectivity between people and places, delivering safe and integrated transport options, and increasing opportunities for walking and cycling.
3. **A Strong Sustainable Economy:** Supporting economic activity and growth by improving the opportunity for people to travel for work or business where and when they need to and facilitating the efficient movement of goods.
4. **An Inclusive Transport System:** To deliver a high quality, equitable and accessible transport system, which caters for the needs of all members of society.

A FREIGHT VISION

The freight Measures identified must seek to tie into a broader vision for the role and future direction of freight transport across the GDA to set the tone for future investment and prioritisation of measures and practices. Ultimately the expeditious movement of goods through a supply chain must come to better the quality of life of local, national and international populations through the consumption of goods. A vision for freight must always fulfil this primary aim but could look to apply the following three principles:

- To be future ready and responsive to emerging trends and behaviours that are changing the way that goods are moved, processed and consumed.
- To ensure that freight and logistics are interwoven within the fabric of key decision making and the public consciousness and to value its contribution towards local prosperity.
- To stimulate a shift in the way goods are moved to help address the climate emergency, create better places and leverage economic activity.

FREIGHT TRIP MANAGEMENT

The underlying component of this framework and the development of practices to maximise the realisation of the freight objectives, revolves around the principle of managing (and minimising) freight trips; reviewing and developing freight transport in ways in which people, businesses and organisations are encouraged to make optimal use of locally available transport resources to improve efficiencies, reduce costs and mitigate the impact of travel on society.

Ultimately this is the lens through which freight objectives can be satisfied with the 4Rs approach being a useful way in which to assess the role of new infrastructure, technology and planning/industry considerations.

- **Remode:** To change how goods are moved from A to B; associated with reducing the most polluting and inefficient forms of road transport.
- **Reduce:** To lower the number of trips that are made and ultimately helping to reduce the demand to travel.
- **Reroute:** To recalibrate the way in which items are delivered and for planning and optimising journeys to avoid sensitive areas or navigate busier travel corridors.
- **Retime:** To change the point in time when goods are being delivered; with the primary aim of travelling outside of peak periods.

WHAT IS THIS EXERCISE?

The aim of this report is to guide the development of a Strategy for Sustainable Freight Distribution Strategy and content for the Transport Strategy for the Greater Dublin Area (GDA) (2022-2042) (Measure: Freight 1). This document intends to provide a high level, 'sprint' overview of five identified work packages that can guide the future focus of a Freight Strategy and ultimately the expeditious, safe and sustainable movement of goods.

The structure of this document follows the order of the identified work packages with key desirables being outlined in each case to help steer the focus of discussion and final outputs:

1. **Stakeholder Engagement:** To develop a database of key industry partners, local authorities, interest groups and businesses who can contribute towards the development of the strategy. This can be the vehicle for transporting perceptions of the sector, its role within society and the contributions it can make to a healthier, prosperous global city region.
2. **Freight Data:** To develop a catalogue of key datasets and a robust evidence base on which to base the foundations of a strategy that can withstand the test of time. This should foster data sharing and knowledge exchange on freight travel patterns, needs and opportunities allowing for the identification of opportunities for sustainable freight distribution.
3. **Key Infrastructure:** To develop a picture of freight gateways, transport facilities and vital physical and virtual networks to support the movement of goods. This includes assessing

² Transport Strategy for the Greater Dublin Area 2022-2042, Chapter 5 (Strategy Aim and Objectives).

current provision and outlining potential infrastructure with decarbonisation, resilience and predictability at its core.

4. **Technology & Decarbonisation:** To develop an understanding of emerging trends with freight and logistics and future innovations to deliver a roadmap towards zero emissions for the Greater Dublin area. This includes drawing on traditional and innovative solutions that could be adopted through the freight industry.
5. **Operational & Planning Considerations:** To develop and recognise the role of industry and local/public institutions in supporting an 'optimised' environment for freight movements. This covers the role of urban planning and decision making, alongside increased training and educational opportunities for the safe, reliable and efficient movement of goods.

MULTI CRITERIA ASSESSMENT FRAMEWORK

A Multi Criteria Assessment Framework (MCAF) has been developed to aid the process of filtering and selecting an appropriate and relevant range of practices and measures for consideration in a Sustainable Freight Distribution Strategy. This has been designed as a 'live' tool whereby a plethora of practices are scored using a traffic light system to evaluate the impact they would have on meeting a set of high-level freight objectives (see Figure 2 for a screenshot of the MCAF tool). A 'relevancy' rating has also been applied in an attempt to contextualise the practice and its future deliverability in the GDA with commentary also being provided to aid decision making.

This tool, which includes reference to stakeholders suggestions collated during a workshop session in June 2022, will be applied to a range of practices identified under the following work packages:

- Key Infrastructure
- Technology & Decarbonisation
- Operational & Planning Considerations (split between industry & public authorities)

A screenshot (Figure 2) of the MCAF for the range of practices across the work packages/themes (Author, 2021) is presented below. The full MCAF can be found in Appendix 3.

[illegible]

Figure 2 A screenshot of the MCAF for the range of practices across the work packages/themes (Author, 2021)

This tool can be updated periodically to reflect changing priorities and has been through several iterations to help shortlist the most appealing interventions to take forward. It cannot be stressed enough that this should be a process taken forward by key stakeholders across industry, public authorities and trade associations collectively and defined during the journey of developing the strategy. Additional columns relating to cost, responsibility (lead) and timescales should also be added with further interrogation of data and information sources.

DASHBOARDS

Concise dashboards have been created for measures under each work package that have been sifted through the MCAF to help provide a more detailed picture of its potential role, benefits and relevancy to the GDA; whilst referencing use cases and best practice examples of where it has been deployed successfully. The dashboards (see Appendix 1) are a key precursor for collating together key information to take towards next steps where additional details, such as cost estimates and soft industry market testing would be recommended at the strategy phase. At this stage, the dashboards are more descriptive than providing a reference to key performance indicators.

The type of measures and practices alluded to in both the MCAF and expressed through dashboards are designed to be freight specific and complementary to wider travel, transport and land use planning objectives and recommendations. There is an appreciation that the safe, efficient and sustainable movement of goods is inextricably related to the performance and development of other transport networks, such as public transport and active travel. In some cases, the same practices and measures can fulfil a broader remit and objectives.

TELEMATICS		Mode Relevance	All freight modes	Freight Sector	Road (Haulage/Courier)	4 Rs	Re-route, Re-time	Technical Maturity	Mature technical operation	Commercial Maturity	Mature commercial operation
Definition: [Trajectory]	Fleet management tools can provide real-time visibility into fleet operations while increasing driver satisfaction and decreasing fuel usage through predictive analytics and accurate reporting. It also helps fleet managers ensure that their operations are adhering to the complex regulations governing the industry. Fleet management can also improve operational efficiency by assigning and dispatching routes to drivers in real-time to ensure accurate pickups, deliveries and returns. Solutions include hazard alert services, delivery tracking, and dynamic routing							Category	Data and Connectivity		
								Geographical Applicability:			
Best Practice	Use Cases										
	GeoTab Gnewt [London, UK]	has the UK's largest fully electric commercial vehicle fleet. Delivering zero-emission final mile logistics for retailers and third-party logistics companies, Gnewt's fleet of double payload modified vans has transformed green deliveries in London - growing from just a handful of vans into the UK's largest all-electric fleet. Gnewt needed to optimise its operations in order to compete with ICE delivery companies which were often cheaper. To add to this, there are charging limitations with only a finite amount of power coming into its charging depot. Only 35 vehicles a day could be fully charged at first. To combat these constraints, drive greater scalability, and provide a platform for future innovation, Gnewt needed a telematics solution that could transform how it views and models its fleet's charging operations - one that could directly feed in vital intelligence on vehicle state of charge									
	OptimoRoute [Software]	OptimoRoute enables users to optimise for the best routes & schedules while respecting all order and task criteria: priority, time windows, day of week, date range, reverse logistics orders, variable job durations vehicle matching (e.g. loading ramp/refrigeration). List minute orders can be integrated into route plans and automatically recalculated to reflect manual changes. It also integrates with delivery systems to provide proof of delivery, capturing digital signatures and sending messages to customers informing them when the driver is scheduled to arrive.									
	E-cargo bikes Zedify [UK, Nationwide]	Zedify built their own robust, efficient technology platform that addresses the specific demands of providing predominantly cargo bike based city logistics. Routes are optimised daily meaning deliveries are made as quickly and efficiently as possible. Barcode scanning enables consistency with other systems in the supply chain. Digital proof of delivery capture provides end-to-end tracking and client login means deliveries can be booked and tracked and reports accessed directly.									
Major Market Failures	General	Route planning and optimisation is currently executed in isolation by individual fleet operators. There is a risk that if multiple fleet operators optimise their routing strategies in response to the same stimuli (e.g. diverting freight traffic onto a lower capacity road to avoid congestion), this could create new problems elsewhere. To counter this, more data sharing between major hauliers should be encouraged. Simulations have shown that if we were all willing to take a wider variety of coordinated routes that may not be optimised on an individual level, it would yield an overall reduction in congestion.									
Opportunities	Vehicle emissions savings due to route optimisation, reducing the amount of stem mileage and empty running. Better co-ordination of assets resulting in reduced waiting times and delivery windows										
Barriers	No co-ordination between operators, only done in isolation										
Local Relevancy	Larger fleet operators can again pave the way for the uptake in telematics and in cab technologies as they are more likely to have access to capital for upgrades and associated driver training requirements. The use and application of telematics can be a short-term win for helping the road sector, particularly HGVs, decarbonise in the event of a slower transition to alternative fuels. Congestion on the network and routing concerns in and around Dublin, as well as a lack of network resilience provided by on ground infrastructure, makes telematics investment a cost effective way to improve driver efficiency (and save costs). Improve road safety and reduce the externalities from road freight movements (all led by industry).										
Impact on Freight Objectives											
Economy				Environment				Society			
Freight efficiency			Max	Air quality			Max	Safety			Min
Improved journey times, optimised use of fleets, delay mitigation and improved supply chain connectivity to save time and costs				Reduce the impact of the sector through air quality improvements and a reduction in other forms of pollution and intrusive activities				Improve the safety of the sector to reduce the number of accidents involving goods vehicles			
Industry contribution			Min	Greenhouse gas emissions			Max	Community disturbance			Max
Improved jobs and opportunities to address skills shortages, support for inward investment, land availability, infrastructure provision				Reduction in greenhouse gas emissions from the sector to achieve net-zero by 2050				Reduce the impact of freight on communities, noise levels, air quality and informal overnight lorry parking			
Connectivity			Med	Urban realm			Med	Placemaking			Max
Improved connectivity seamless intermodal activity to support local, national and international freight movements across the area				Minimising the intrusive impact of freight transport on visual amenity and local, protected settings				Better integrate freight into land use planning, development, construction and servicing plans, better freight data			

Figure 3 An example dashboard for Telematics which outlines use cases, benefits and local relevancy (Author, 2021)

GREATER DUBLIN AREA: FREIGHT SNAPSHOT

INTRODUCTION

Freight plays a pivotal role in the GDA economy and many businesses and industries based and serving the sub region depend on the expeditious movement of goods. The assessment of freight in Ireland, like many places, is heavily orientated towards road transport which constitutes the vast proportion of movements (and issues) across the GDA. The city of Dublin and the area bounded by the M50 also tends to receive the vast majority of attention as this is where the most substantial movements of commercial and private traffic intersects and where issues around safety, sustainability and efficiency are questioned.

The issues and challenges facing the freight sector are typically associated with the dependency of road freight transport as the primary means of transporting goods across and through the GDA supported by upgrades to access arrangements to areas which have emerged as significant growth locations for logistics, distribution and warehousing facilities around the primary road network. This is coupled with alternative transport networks being underutilised due to capacity or logistical constraints, a lack of market demand or awareness of the potential for unlocking new opportunities.

A robust strategy relies on accurate and extensive datasets. As in many cases, the datasets available within the public domain are collected by public authorities and tend to focus on the performance of the transport networks rather than painting a detailed picture of how the freight industry operates to support future investment planning and forecasting. This is perhaps unsurprisingly as data sharing potentially exposes the competitive advantages developed over time by fleet operators; although accreditation and recognition schemes are emerging as a valuable means in which to exchange data for boosting an operators profile, and market access, across the industry. This should be a key priority for public authorities to try and leverage with industry.

This chapter aims to provide a concise overview of the freight context, including the opportunities and issues associated with each mode of freight transport across the GDA.

ROAD FREIGHT

CONTEXT

The freight context for the GDA is heavily defined by its larger freight trip generators; its ports, namely Dublin Port, Dublin Airport, which are of national significance to economic prosperity. These are part of the European TEN-T Core Network and heavily dependent on efficient access for the movement of goods, mainly by the national motorway network, particularly the M50 orbital road, M1 and Dublin Port Tunnel, opened in 2006. The M50, managed by Transport Infrastructure Ireland (TII), carries both local freight (approximately 40% of all HGV traffic (hauliers and freight forwarders) with a 25km catchment) and inter regional trips moving between key gateways and the rest of Ireland.

The M50 serves a number of premium logistics spots that have developed over recent years alongside linking into the N7 corridor, and estates such as Greenogue Business Park, providing access between Dublin and Cork and becoming home to a number of reputable logistics firms. A number of sites have been zoned for industrial and logistics use outside the M50 boundary which has inevitably drawn interest from companies wishing to benefit from the proximity of a major urban centre and international gateways.



Figure 4 Dublin Port Tunnel is pivotal to regional and national connectivity and prosperity (Dublin Tunnel 2021)

As in many urban areas, the movement of goods vehicles within an urban setting, by road, has implications on air quality, place making and road safety. Urban logistics is therefore a key consideration. Proposals to increase pedestrianised space and remove parking in the centre of Dublin (around College Green/Dame Street, Parnell and Capel Streets and adjacent roads), inevitably raises questions about servicing and delivering to businesses and residents within the immediate location. The same 'think freight' approach is equally as important against a backdrop of developments, housing and employment land, across the city and the wider city region.

A HGV Management Strategy was introduced across Dublin City Centre concurrently with the opening of the Dublin Port Tunnel with the introduction of a permit scheme being developed in 2019 to further restrict (and charge) 5+ vehicle axle movements, the most prominent vehicle type using the port, inside operational hours (07:00-19:00). Since its introduction, HGV movements within the cordon have decreased by 91%, although total emissions, in part arising from the need to re-route trips, increased across the Dublin region. Discussions are ongoing to expand the cordon and incorporate a broader range of commercial vehicles whilst there are known issues with enforcing the policy which needs to be addressed.

ISSUES AND OPPORTUNITIES

There are significant capacity constraints on the M50, the major regional and inter urban distribution roads for freight traffic upon which major trip attractors, namely Dublin Port and clusters of business parks and industrial estates around its periphery, that have come to rely on for the distribution of goods. It has been widely acknowledged that traffic congestion severely hampers freight efficiency with typical weekday flows being unstable at sections to the west and south west of the city. The decision taken not to expand road capacity any further (after investment pre 2016) places emphasis on travel demand management techniques to boost network resilience and reduce car dependency.



Figure 5 There are many burgeoning distribution and logistics sites which rely on the strategic road network (Savills, 2022)

The resilience of the road network is key, including arterial roads radiating across the GDA; both within the M50 boundary to address localised traffic delays, and where the hinterland intersects with the metropolitan area. Whilst the M7 enhancement project and Osberstown Interchange have improved national road accessibility to strategic employment locations (along this alignment) capacity constraints in housing and infrastructure must be addressed to ensure the regions continued competitiveness as a national economic driver.

Whilst there is a single point tolling system in place along a section of the M50, between Junction 6-7, plans to expand provision along its course (at each access point/junction) have taken place over a number of years with the aim of reducing congestion along its course. Variable speed limits have been implemented to improve traffic flow, reduce accidents and boost network resilience; alongside efforts to update and improve the provision of interconnected public transport interchanges. Opportunities for freight consolidation (a form of interchange facility) should be explored as part of these proposals or considered separately for reducing traffic circulation.

Road freight mixes with general traffic and at least half of the annual housing requirements, 25,000 outlined in the National Planning Framework for Ireland, will be across the GDA; adding additional vehicles on the network. All new residential and commercial property will have a delivery and waste requirement and will put further pressure on road capacity. Employment growth and commercial developments situated along other radial routes present a major threat to the efficient movement of goods in the medium to long term without any intervention and management of vehicle movements.

Urban Context

In an urban context, there are challenges with enforcing existing restrictions on HGV movements despite a HGV Management Strategy being in place. This has the potential to compromise road safety through traffic mixing on roads with limited capacity. Similar issues arise in accessing Drogheda Port, a port of regional significance which requires consignments to pass through residential areas. At the city centre scale, greater awareness and planning for delivery and servicing needs to be incorporated within the development control process, as well as part of plans for supporting better placemaking.

The dependence on road transport and the proportion of private vehicle use generates high levels of Nitrogen Dioxide across certain parts of the GDA, namely within Dublin City Centre, the entrance to the Port Tunnel and along the M50 motorway. This is particularly problematic where locations are used by pedestrians or abut residential neighbourhoods and must seek to be addressed by switching towards cleaner fuel technologies, switching the way we travel and ultimately reducing trip demand. Increased congestion around these areas also exacerbates air quality problems.

There are also notable areas, namely St Johns Road West in Dublin, where EU annual average legal limit values for particulate matter (PM2.5) have been exceeded; triggering a legal requirement for an air quality action plan. PM2.5 is particularly harmful to human respiratory systems and is associated with tyre wear and tear as well as vehicle braking which are more prevalent in congested urban centres and from larger freight vehicles.

RAIL FREIGHT

CONTEXT

Rail freight has significant involvement in few markets namely traditional bulk traffics to/from private sidings on single customer trainloads, mineral services (daily from Tara Mines to Dublin Port) and container traffic serving the port (recently suspended due to customs and spatial pressures on site but with freight paths towards Ballina in West of Ireland). The role of heavy rail freight shipments by train is likely to increase in the future to bring up rail freight market share in line with other European countries. This includes through rail enhancements to Tier 1 ports (such as Dublin) and exploiting the rise in intermodal traffic whilst removing HGVs from the road network around the GDA³. Irish Rail is also pursuing new rail freight business opportunities including the drinks, healthcare, building materials, biomass, waste and dairy industries; with more businesses seeking to develop for environmentally efficient means of managing their respective supply chains.



Figure 6 Intermodal rail freight, including links to ports, is on the rise as part of the decarbonisation agenda (Railfreight, 2021)

Rail is also high on the Governments programme for continued investment in inter-urban and intercity networks to boost future freight carrying capacity. The introduction of longer freight trains in 2016 also boosts the sectors competitiveness versus road transportation for carrying bulk goods. The principle of rail freight aligns closely with the National Ports Policy, Dublin Port Master Plan and the emerging Department of the Environment National Low Carbon Roadmap, to increase its freight share across the GDA. Despite the challenges, the rail spur that serves Dublin Port, opened in 2011, offers huge potential for the movement of containers and bulk solids with increases in market demand potentially leading to freight volumes exceeding 130,000 TEUs (containers).

ISSUES AND OPPORTUNITIES

There are limited railhead facilities across the GDA generally, with the exception of Dublin Port and a number of private sidings, equipped to undertake cargo handling to upscale the movement of freight by rail and to shift regional based freight movements from the road network. Differences in loading gauge and rail gauge clearances also limits rail cargo to Load On Load Off (Lo-Lo) freight consignments across Ireland. However, there is scope to explore future links between key processing and extraction sites around the periphery of the M50 and radial rail routes and the option of re-moding freight from road to rail; providing the infrastructure can be supplied.

However, a major upgrade of the city centre railway signalling system, completed in 2020, allows a significant increase in the number of trains that can operate through the city central area, including a 50% increase in the number of trains able to cross the Loop Line Bridge over the Liffey. This offers potential to both expand designated freight train services (providing demand is sought) but also exploring opportunities for utilising services for the movement of goods around the city region.

Rail access to the Dublin Port has been temporarily halted to ease port congestion in response to the UK leaving the European Union whilst Wicklow and Drogheda both have sidings and underutilised capacity to cater for more rail freight paths. This is a core part of the Rail Freight Strategy (2040). The Irish Rail Freight Strategy also advocates connecting large scale industrial sites across the GDA with rail; with Irish Rail proposing several intermodal rail freight terminals across the GDA.

³ Irish Rail (2040) Rail Freight 2040 Strategy, https://www.irishrail.ie/Admin/getmedia/685e9919-f012-4018-879b-06618bb536af/IE_Rail-Freight-2040-Strategy_Public_Final_20210715.pdf

SHIPPING

CONTEXT

Sea Ports play a vital role in the transfer of goods internationally and are key gateways where the transshipment of goods take place. Dublin Port, managed by the Dublin Port Company (DPC), is responsible for over 50% of overall tonnage through Irish Ports (CSO); with the UK being the biggest market for goods. It provides services across all five modes, including Ro-Ro and Lo-Lo services, with the former being most prominent with volumes expected to rise from 0.7 units in 2010 to 2.2m units by 2040. On this basis a new Ro-Ro terminal is being constructed. The Dublin Masterplan 2040 seeks to identify how the port can handle 77million gross tonnes by end of the masterplan period whilst also seeking to reintegrate with the city centre. In contrast, Wicklow Port, to the east of Wicklow Town, is a Port of Regional Significance with a small percentage of overall tonnage in comparison. Dun Laoghaire Port, to the south of Dublin (city), has ceased operations in recent years.

The interconnections between the national primary road network and the commercial port network will continue to be of primary importance, especially for Dublin Port; with over three quarters of goods arriving from outside the M50 area and 21% originating within the city region catchment (Regional Freight Study, NTA 2011). Dublin Port benefits from its direct connection to the national motorway network through the Dublin Port Tunnel; with an average of 6,260 (or 86%) HGVs transporting port related consignments daily. Around 30% of all traffic moving through Dublin Port Tunnel on a daily basis are HGVs on average (2018); highlighting the critical role the link plays in the national and local economy.



Figure 7 Dublin Port is expected to reach maximum throughput between 2030-2040 and requires new infrastructure to hold, process and transfer goods (Dublin Port Company 2021)

The Dublin Port Masterplan 2040 and Transport Strategy for the Greater Dublin Area 2016- 2035 sets out objectives to improve the integration of the port with the bay and city area and expand

access southbound into Poolbeg Peninsula via a Southern Port Access Route by 2030 to unlock future capacity. This is the preferred option as opposed to the development of a completely new dock site further afield. Despite the potential, there is limited coastal shipping activity between Dublin Port and other ports on the island of Ireland.

ISSUES AND OPPORTUNITIES



Figure 8 An Inland Port has been created to hold empty containers and free up space dockside (Dublin Port Company, 2022)

Despite rising interest in modal shift from road to rail for moving bulky goods and containers through Dublin Port, site storage capacity is constrained; partly as a consequence of additional customs and border inspection activities. Consolidation of existing areas for handling anticipated levels of bulk solid trade and Roll On-Roll Off (Ro-Ro) freight is the biggest challenge to be addressed in the recent Dublin Port Masterplan 2040. Smaller ports at Wicklow and Drogheda do not have a direct rail connection and rely purely on road-based access and goods handling.

For hauliers and freight forwarders, strict reception windows are enforced at Dublin Port with limited provision and timetabling to help coordinate arrivals and departures. The issue of access

has been exacerbated by the UK leaving the European Union with there being a limited supply of lorry parking available to cater for HGV traffic during customs procedures; leading to delays and congestion on the immediate road network. The range of customs formalities and regulatory requirements is having significant impacts on the haulage sector and the Ro-Ro traffic through Irish Ports.

AIR FREIGHT

CONTEXT

The importance of air freight has increasingly come to the fore during the pandemic with the interconnectedness of supply chains being a crucial component of the national and local economy. Dublin Airport, the only commercial (and public access) airport within the GDA is only served by road. Air cargo is generally used to move mission critical, high value / time sensitive goods and packages with night flights being particularly important to the freight industry and local economy prosperity; allowing businesses to send a range of time critical consignments and loads; ranging from pharmaceutical products and manufacturing components to legal documents and consumer goods over night for arrival next day. Approximately 60% of freight through the airport travels on passenger services (within the bellyhold) with the remaining 40% on dedicated cargo flights.

In total, 38% of all air freight associated with Dublin is flown at night, with the sector generally supporting 330 jobs and contributing €27 million annually to the economy and representing 90% of Ireland's air cargo movements⁴. Air cargo has also grown substantially in recent years; from 114,000 tonnes in 2013 to 145,000 tonnes in 2018 and is viewed as a key component of the economic recovery from the pandemic (FTA Ireland, 2020). Night deliveries are crucial for supporting highly sensitive, Just in Time (JIT) supply chains and the rise in time sensitive B2C shipping is likely to be a trend that continues growing in the near future.



Figure 9 IAG have a cargo hub at Dublin Port connecting ten destinations, with over 6,000 sqm of handling space (IAG, 2022)

Efficient road transport around the airport and serving Dublin is key for last mile deliveries by express freight services operated by major industry partners namely DHL, FedEx, TNT and UPS to meet growing customer expectations. Road access via the M50 is pivotal as limited reserves are held at the airport to refuel aircraft; with any prolonged delays presenting huge risks to supply chain efficiency. As night deliveries operate outside of peak periods, consignments delivered by road avoid congestion and enable greater speed, efficiency and reliability of processing; all of which are key to the service being delivered.

ISSUES AND OPPORTUNITIES

The planning conditions stipulated for the constructed North Runway (Condition 3(d) does not permit night time deliveries of air cargo and enable the competitive advantage offered through next day deliveries by third party logistics providers. A limit (Condition 5) is also placed on the average number of night time aircraft movements (during the busy summer period) that can take place at the airport. These should not exceed 65 per night (between 11pm and 7am⁵).

However, there is a five year plan due to come into place to redevelop the airports air cargo facilities which will safeguard for spreading demand (both in terms of flights and connecting services) across a 24 hour period. This is with the aim of growing tonnage throughout but managing demand on the road network for first and last mile distribution.

⁴ FTA Ireland (2020) The Economic Impact of Cargo Night Flying at Dublin Airport, https://www.dublinairport.com/docs/default-source/north-runway-downloads/ftai-economic-impact-of-cargo-night-flying-2020.pdf?sfvrsn=73e5ab60_2

⁵ An Board Pleanála Planning Conditions (2007), hosted on Dublin Airport website https://www.dublinairport.com/docs/default-source/planning/planning-conditions.pdf?sfvrsn=ff46e534_0



Figure 10 North Runway is scheduled to be operational in 2022 and will support local supply chains (Dublin Airport, 2022)

STAKEHOLDER PROFILING

INTRODUCTION

Gaining insights into the local freight context will be essential for developing a robust and resilience strategy to guide the efficient, safe and sustainable movement of goods across the GDA in the future. Early identification and engagement with a broad range of organisations operating across the freight and logistics sector as well as key institutions that have a freight requirement, will be essential to highlighting some of the issues, challenges and opportunities associated with the movement of goods throughout a supply chain.

The stakeholders involve a range of key entities from the government departments, public sector bodies, transport operators, trade chambers and associations, Not-for-profit and Non-Governmental organisations, industrial groups and associations, Road safety groups, vehicle manufacturers along with Original Equipment Manufacturers (OEMs). It also involves legal and social groups that represent interests of the workforce employed in this sector.

Airport Operator	Industrial Estate
Airports	Regional Transport Authorities
Business (Trip Generator)	Logistics (3PL) Operators
Business (Fleet Operator)	Port Operators
Business Groups	Port Transport Authority
Business Associations	Energy Providers
Business Park	Transport/Urban Think Tanks
Constituent/Local Authority	Future Fuel Technologies
Road Safety Group	Public-Private Partnership
Environmental Group	Rail Group
Rail Freight Operator	Rail Operator
National Government	Road Haulier
Not-for-Profit Organisation	Inland Waterway Operators
Inland Waterway Authority	Sub-National Transport Body
Shipping Operators/Agents	Trade association

Table 1 List of different stakeholders with a freight requirement and interest (Author, 2021)

Early indications from the collated stakeholder data shows a large share of the businesses (trip generator) due to their prevalent role and nature of operations. These businesses have the ability to generate large amounts of freight traffic and influence other segments. The second largest share is of shipping operators/agents followed by Logistics (3PL) operators. In addition, a number of waste management and construction companies have been included within the stakeholder data, owing to their substantial involvement in freight movements on the network. Given the importance of sustainability to the freight network in the coming decade, energy providers, grid operators and transport/ urban think tanks were also noted to be key stakeholders. The full list of stakeholders is noted in Appendix 6.

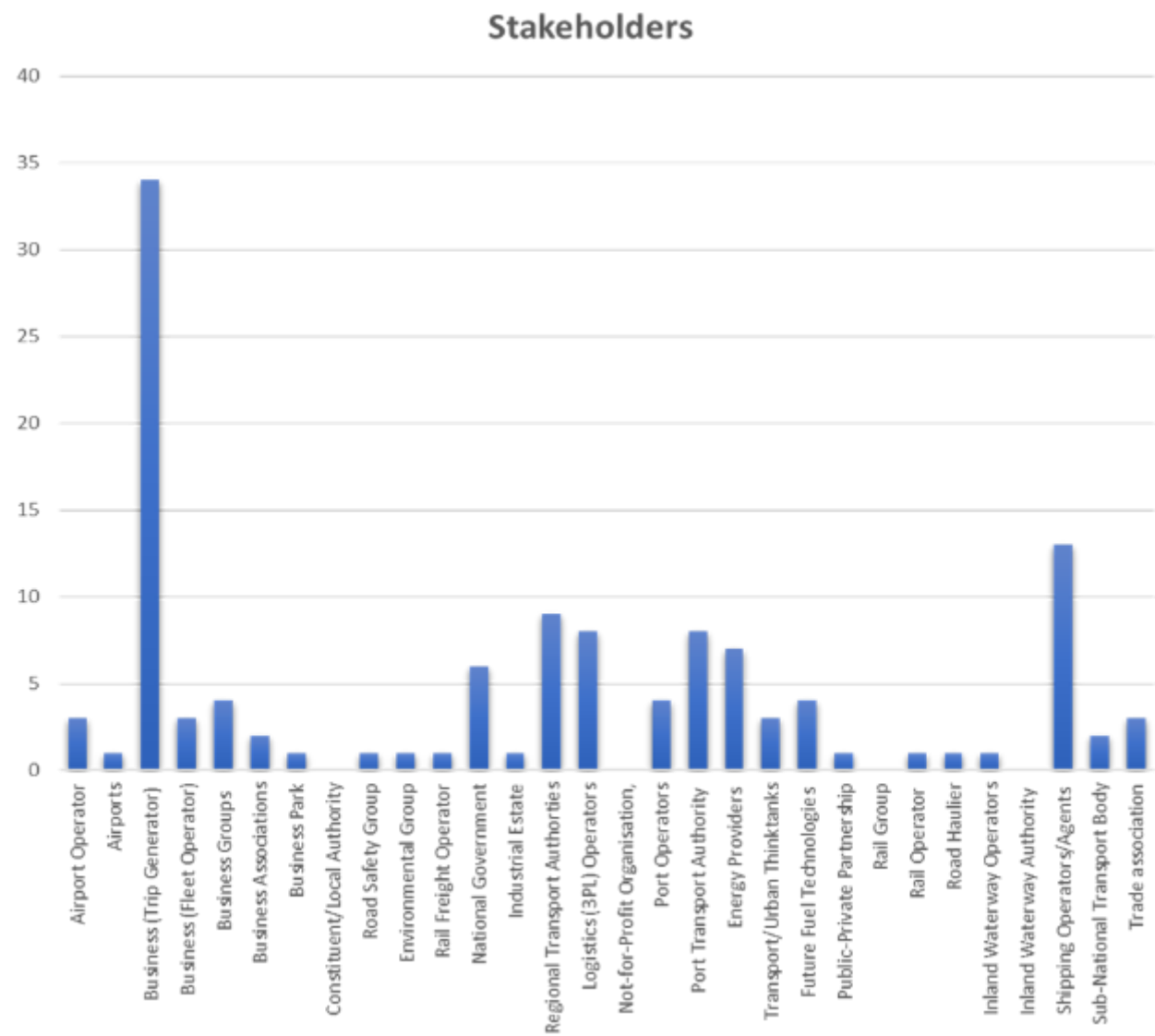


Table 2 Spread of stakeholders collated (Author, 2021)

There are several effective platforms for capturing data insights and feedback from organisations and businesses to feed into the process of developing a strategy. There is significant value and buy in that can be generated by reaching out to local institutions and encouraging participation in the formation of a strategy; especially as the movement of goods has a direct impact on people's everyday life. On this basis, engagement shouldn't be exclusively targeted at the freight industry.

PLATFORMS FOR ENGAGEMENT

Early engagement with relevant stakeholders will be important in gathering data and feedback as the strategy develops, ensuring the strategy foundation is robust. A suitable engagement platform should provide the opportunity for stakeholders, in conjunction with the NTA, to contribute, discuss, review and influence the formation of the background evidence base for strategy and the strategy itself. Two suggested platforms for gathering views and insights are:

- Freight Forum – a broad, large group of interested stakeholders forming a 'listening' group to guide development of the strategy
- Steering Group – a more select group (compared to the Freight Forum) of stakeholders offering a greater level of input to the development of the strategy

There is a complementary relationship between both platforms with members of Freight, Logistics and Gateways Freight Forum (FLGSG) also attending Freight, Logistics and Gateways Steering Group (FLGFF) meetings to both convey key messages and listen to personal accounts. The FLGSG would also be accountable for feeding into the wider governance structure for the strategy as indicated by NTA. Terms of Reference (TOR) have been developed in each case (Appendix 4 and Appendix 5), which may be liable to change, to help establish the following:

- Purpose of the Forum/Group
- Objectives of the Forum/Group
- Meeting Programme
- Ways of Working
- Indicative Group Chair

A key early task to discuss at the inception meeting of the FLGFF and FLGSG will be to sense check any proposed freight objectives to ensure that they hold weight and relevance. A SWOC (Strength, Weaknesses, Opportunities, Challenges) analysis could also be completed in break out groups as a starter exercise to help set the tone for future meetings.

FREIGHT, LOGISTICS AND GATEWAYS FREIGHT FORUM (FLGFF)

A FLGFF will provide a key platform for bringing together a range of industry representatives, local authorities and interest groups to share data, collate local intelligence and express personal experiences with goods handling to assist with shaping and contributing towards the narrative of a strategy during, and potentially beyond, the development period. This is a broad group of members working across different sectors and of varying sizes who welcome the opportunity to contribute thoughts, ideas and feedback but are less inclined to take on responsibility and thought/technical leadership to directly mould the strategy.

A FREIGHT, LOGISTICS AND GATEWAYS STEERING GROUP (FLGSG)

A Freight, Logistics and Gateways Steering Group (FLGSG) comprises of a more select group of individuals and organisations who will provide greater thought and technical leadership during and beyond the development of the strategy. Members will be able to offer technical, operational, local and strategic insight to key themes, helping to elicit key issues and challenges faced by the sector and, most importantly, help drive greater awareness of the strategy, developing outputs of benefit and raising the profile and role of freight as a key component of the traffic mix across Greater Dublin. Members will take on greater responsibility for harvesting data and information to feed into the development of the strategy whilst meeting periodically throughout its duration.



TRANSPORT STRATEGY FOR GREATER DUBLIN 2022-2042

FREIGHT, LOGISTICS AND GATEWAYS FREIGHT FORUM (FLGFF)

TERMS OF REFERENCE

WORKING DRAFT – JULY 2021

INTRODUCTION

A Freight, Logistics and Gateways Freight Forum (FLGFF) would play a role in helping inform the development of a Sustainable Freight Distribution Strategy by contributing feedback on freight and logistics across Greater Dublin. The emergence of a specific freight strategy will align with the development of the Transport Strategy for Greater Dublin (2022-2042) by the National Transport Authority (NTA); the body responsible for developing and implementing strategies to provide sustainable transport across Ireland.

PURPOSE

The role of the FLGFF would be to provide the platform for contributing detailed insights and feedback at each stage of strategy development, adding to the knowledge base of both NTA and the consultants who will be responsible for developing the Sustainable Freight Distribution Strategy. It will also be the place where organisations and individuals can listen and receive information on the strategy.

The FLGFF covers a very broad, larger group of interested bodies; ranging from fleet operators to large businesses with significant freight requirements who may wish only to contribute their views without contributing directly to guiding and shaping the strategy during the plan making process. This differs from members of the Freight, Logistics & Gateways Steering Group (FLGSG) who would offer technical and sector leadership and proactively develop and mobilise the strategy.

Freight Forum members will offer a certain degree of technical, operational and local insight helping to elicit key issues and challenges through their lived experience. They will value the opportunity to contribute and be consulted but will have limited time or interest in proceeding to shape and take responsibility for the development of the strategy.

This is a 'listening' group, anticipated to meet every four weeks throughout the project during the development of the strategy before the FLGSG meeting. Like the FLGSG, the FLGFF has the potential to continue in some form longer term by continuing to provide local insights and local feedback; including in response to any improvements or changes that impact the sector within the Greater Dublin area.

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TRANSPORT STRATEGY FOR GREATER DUBLIN 2022-2042

FREIGHT, LOGISTICS AND GATEWAYS STEERING GROUP (FLGSG)

TERMS OF REFERENCE

WORKING DRAFT – JULY 2021

INTRODUCTION

A Freight, Logistics and Gateways Steering Group (FLGSG) will oversee the development of a Sustainable Freight Distribution Strategy to increase the awareness and role of freight and logistics across Greater Dublin and to aid with prioritising future sector investment across the area. The emergence of a specific freight strategy will align with the development of the Transport Strategy for Greater Dublin (2022-2042) by the National Transport Authority (NTA); the body responsible for developing and implementing strategies to provide sustainable transport across Ireland.

PURPOSE

The role of the FLGSG is to provide stakeholder expertise, intelligence and advice to NTA at each stage of strategy development, adding to the knowledge base of both NTA and the consultants who will be responsible for developing the Sustainable Freight Distribution Strategy.

The development of a steering group (FLGSG) differs slightly from a Freight Forum. A Steering Group comprises of a more select group of individuals and organisations who will provide greater thought and technical leadership during and beyond the development of the strategy. The proposed Freight, Logistics and Gateways Freight Forum (FLGFF) covers a very broad, larger group of interested bodies who may wish only to contribute their views and feedback. Steering group members would be encouraged to attend the Freight Forum.

Steering Group members will offer technical, operational, local and strategic insight to key themes, helping to elicit key issues and challenges face by the sector as well as developing strategic outputs of benefit the across the entire study area. This could range from the development of new fuel technologies to raising awareness of local financial incentives, network capacity concerns or the need to drive recruitment across the industry. Members can offer data insights, share local knowledge and communicate their experiences throughout the plan making process.

This is a 'task and finish' group, anticipated to meet every four weeks throughout the project during the development of the strategy. The FLGSG also has the potential to play more prominent role longer term to help steer, guide and support the implementation of the strategy if no body currently exists to share thoughts and considerations for the sector and its wider bearing within the Greater Dublin area.

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Figure 11 Terms of Reference Forms for a Freight Forum and Steering Group (Author, 2021)

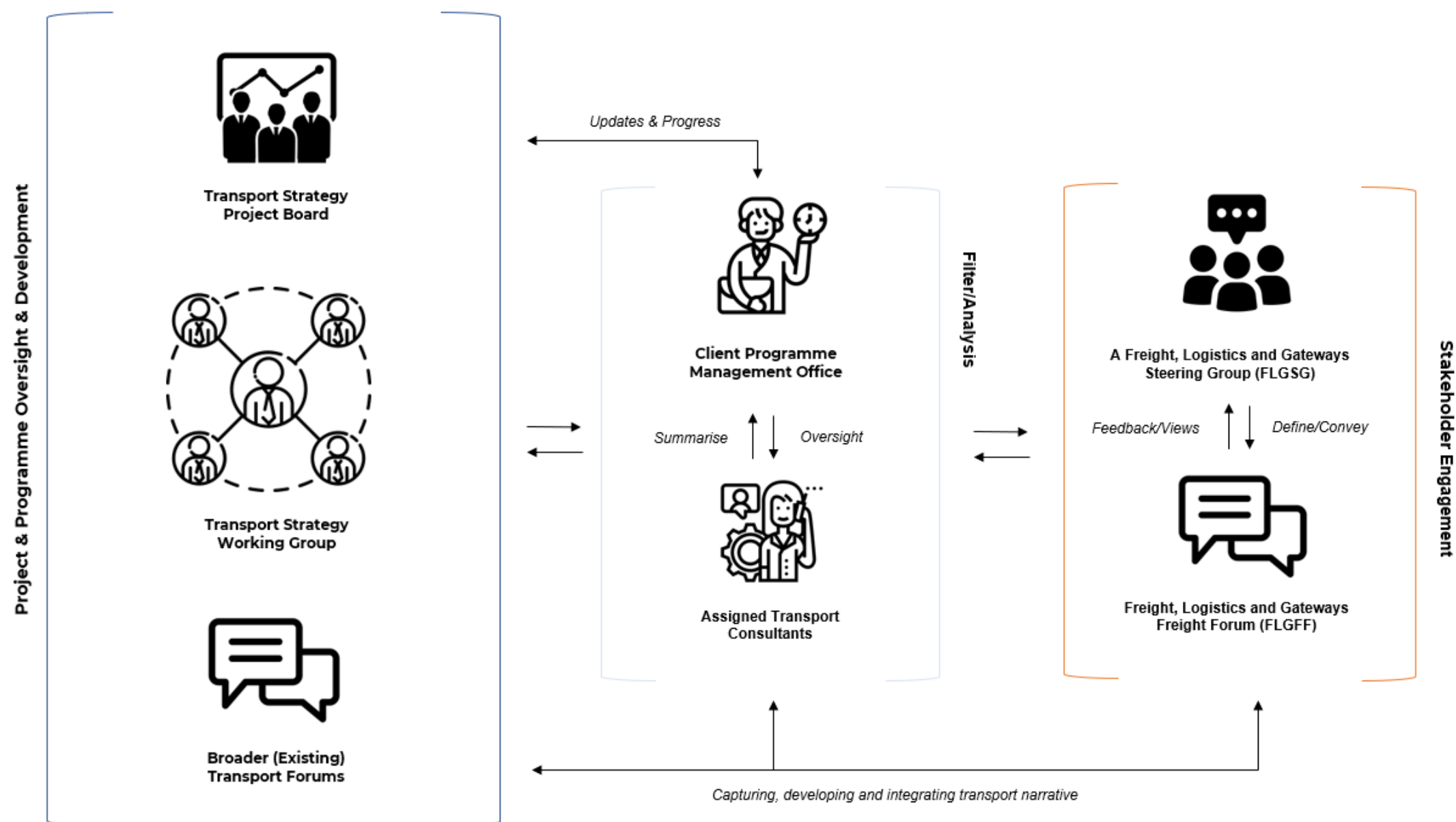


Figure 12 Indicative relationship between the FLGFF and FLGSG with the wider transport strategy development teams (Author, 2021)

NEXT STEPS

This section has defined the importance of stakeholder engagement, outlined feedback from participating key stakeholders across the GDA and outlined the role of a Freight Forum and Steering Group to help guide the development of a Sustainable Freight Distribution Strategy. The next recommended steps, involve planning a comprehensive engagement with identified stakeholders to sense check the issues and challenges identified as part of this study, identify current data availability and further data requirements to inform the development..

FREIGHT DATA

INTRODUCTION

Collating together data and information on freight transport is key to appreciating the role and significance of the sector to supporting society and the economy. This ranges from the flow and volume of goods movements, the type of vehicles used to carry consignments, the origins and destinations of products along a supply chain and a better understanding of the land uses which influence the generation and distribution of freight movements. A picture needs to be developed that captures the networks and gateways used to move freight, where handling and transshipments take place and ultimately the impact that all this activity has on economy, society and environment across the GDA.

The availability of data relating to freight is key to understanding the relationship between land use, economic activity and the generation/movement patterns of freight. Future interventions to support the efficient, safe and sustainable movement of goods must be backed up by a robust evidence base to identify and understand the basis for future investment requirements and complementary transport and land use policies. A critical step towards this point is the need to source and catalogue data and other information available within the public domain or obtainable through industry contacts so this can be assessed at a high level to determine the quality of local insight and determine any 'knowledge gaps'.

The use of Freight data as a policy making tool should be considered in the broader context of integrated land use and transport planning and the manner in which freight related activities are planned for, managed and reconciled with other land uses and their associated transport demands. In this way, it should help to inform the future development of urban settlements and their associated operational requirements. .

DATA CATALOGUE

The Central Statistics Office (CSO) has the main responsibility for collecting and publishing key transport sector statistics, and especially for the freight sector but other public entities such as Department of Transport (DoT), Irish Rail, Environmental Protection Agency (EPA), Sustainable Energy Authority of Ireland (SEAI), Road Safety Authority (RSA), Transport Infrastructure Ireland (TII) and National Transport Authority (NTA) also collect and publish datasets, usually under Government's Open Data initiative. Some private sector entities such as TomTom, that provide navigation and operational support to road freight fleets also collect vital data on Heavy Goods Vehicle (HGV) movements and patterns. The complete data catalogue is presented in Appendix 7.

GAP ANALYSIS

PAST STUDIES AND REPORTS

Few important ones among many are 'Five Cities Demand Management Study', 'Regional Spatial & Economic Strategy for Eastern & Midland Region', 'Freight Transport Report for the Island of Ireland', Dublin Transportation Office Regional Freight Study, Ten-year Strategy for the Haulage Sector, Greening Transport; Final Report no. 338, and Rail Freight and the Western Region. These studies have consolidated a strong background of information that will be helpful in establishing the framework for sustainable freight transport.

ROAD

CSO undertakes Road Freight Transport Survey (RFTS) every quarter and most recent has been published for quarter-4 2021. These statistics provide vital information on the following:

Road freight activity	Road freight tonnage
Quantity of goods	Road freight activity by business owner
Commodity group	Main type of work
Domestic transport activity classified by region of origin	Road freight activity by country of origin

Table 3 Data captured through the Road Freight Transport Survey (Author, 2021)

TII and NTA also collect regular data on HGV movements at key locations on national primary roads and across GDA. These traffic counts provide excellent insight into the scale and volume of freight movements to and from the key locations along with health check of traffic operations leading to identification of congestion pinch points. RSA on the other hand, publishes road collision data, covering major accidents (Fatal and Serious) to minor road collisions all across the country. This data is available from 2005 to 2016 (2017 data awaited) and Figure 13 provides a snapshot of key accident-prone areas and black spots. These are presented in snapshots of the system.

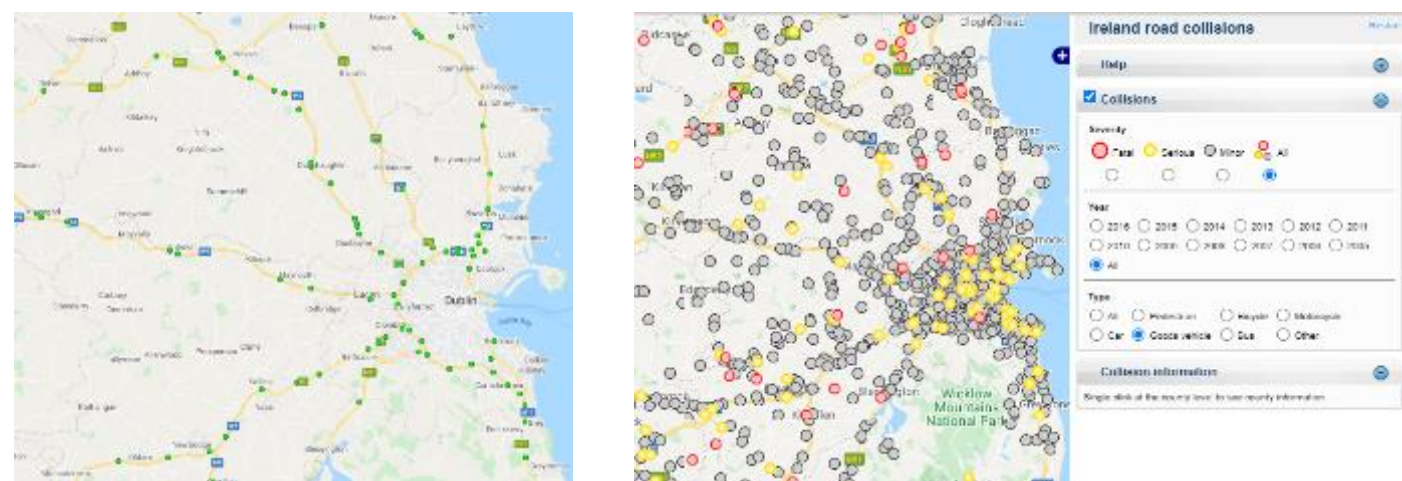


Figure 13 TII Traffic Monitoring Units (TMUs) (Left) and Goods Vehicle Road Collisions in GDA (2005 to 2016) (NTA, 2021, RSA 2021)

SEAPORTS

CSO collects and publishes Statistics of Port Traffic with latest being published for quarter-2 2022. The survey provides data on the scale and development of the carriage of goods and passengers by sea. The principle variables are - Type of cargo, Direction, Port of loading/unloading, Gross weight of goods in tonnes, Number of passengers, Nationality of registration of the vessel, Number of vessels by type and size, Deadweight of vessels, Gross tonnage of vessels.

It covers the following main headline statistics for all ports in Ireland:

Tonnage of goods handled by main Irish ports	Number of arrivals and gross tonnage of vessels
Tonnage of goods handled classified by category of traffic	Details of roll-on/roll-off traffic handled by port
Details of lift-on/lift-off traffic handled by port	Total tonnage of goods handled classified by port and region of trade

Table 4 Headline statistics that can be sourced for ports (Author 2021)

Dublin port accounted for almost two thirds (63%) of all vessel arrivals in Irish ports and half (51%) of the total tonnage of goods handled in Q2 2022. Figure 14 below shows the overall growth at Dublin Port between 2007 and 2018.

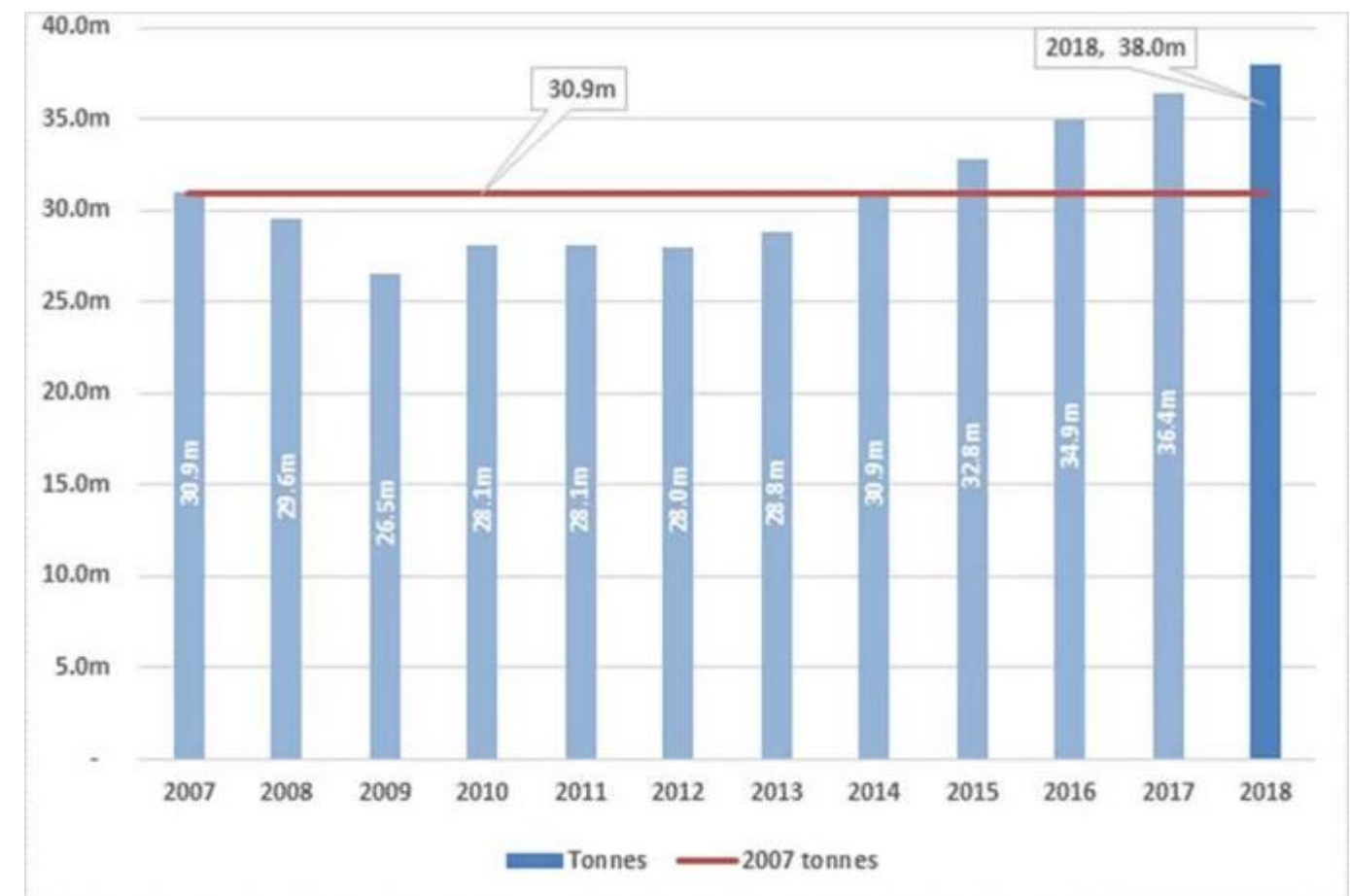


Figure 14 Overall growth at Dublin Port between 2007-2018 (CSO, 2021)

CSO's Aviation statistics have very recently been published for the quarter-2 2022. It provides information on the number of passengers and freight handled by the five main airports, Cork, Dublin, Kerry, Knock and Shannon. The principle variables are Airport origin and destination, number of passengers, air freight, flight types: arrival and departure, scheduled and non-scheduled, passenger and freight. It covers following main headline statistics for all ports in Ireland:

Number of passengers handled by main Irish airports	Passenger numbers classified by arrivals and departures handled by main airports
Air freight classified by national and international traffic handled by main airports	Air freight classified by arrivals and departures handled by main airports

Table 5 Headline statistics that can be sourced for airports (Author, 2021)

Dublin Airport has seen an increased demand in passenger and freight activity in quarter-2 2022 due to Covid-19 travel restrictions lifting and still commands a significant share of overall demand. Dublin Airport handled 35,400 tonnes of air freight and accounted for 91% of all freight handled.

Airports	2013	2014	2015	2016	2017	2018
Dublin	113.5 (89%)	127.4 (92%)	137.3 (92%)	134.2 (91%)	144.9 (88%)	143.7 (91%)
Shannon	13.9	10.9	12.2	12.6	19	13.6

Figure 15 International Freight handled by Key Airports in Ireland (Thousand Tonnes, percentage share) (CSO, 2021)

The Freight Transport Association Ireland (FTAI) recently released the final report on 'The Economic Impact of Cargo Night Flying at Dublin Airport' on March 2020 and provides vital cargo handling facts and figures along with insights into the significance of night cargo flights.

RAILWAY

CSO's Rail Statistics have been published up to 2019 with a purpose to collect and publish quarterly and annual data on goods and passenger transport by rail. Data is also collected on rail accidents and railway operators. The principle variable are Tonnes of freight carried, tonne-km, train-km, number of passengers carried, passenger-km, train movements, number of accidents, number of persons killed, number of persons seriously injured.

Iarnród Éireann Freight is a separate division of Irish Rail and provide rail freight services for the Bulk Freight, Intermodal and Freight Forwarding markets. Rail transport offers key advantages such as moving full trainloads of ISO tanks, containers or bulk freight such mineral ores or timber products over long distances.

GAP ANALYSIS

On the basis of completing a thorough assessment of available datasets across the freight and logistics sector (see Appendix 7 for complete Data Catalogue), there are a number of gaps in the quality and quantity of datasets that have been identified. In some instances, especially when engaging with private industry, commercial sensitivity is a barrier to sharing data. Consideration will need to be given to data sharing and privacy policy in this instance between parties. These are as follows.

ROAD

- Data on Van (Light Goods Vehicles (LGVs)) freight data given significant increase in its share;
- Data on Foreign HGVs whether as cabotage or cross trade with focus on parameters such as the length of stay, commodities transported, nationality of vehicles and drivers, degree of planned and unplanned activities and amount of cabotage taken;
- Data on fuel consumption and emissions in relation to freight movements;
- Data on main times of day for travelling for peak activity identification; and
- Data on switching of modes (e.g. ship to road).
- Mobile phone tracking data (from platforms such as Google)
- Data on goods vehicle flows (courtesy of Transport Infrastructure Ireland)

SEAPORTS

- Data on Pure Car Carriers (PCCs) or Pure Car/Truck Carriers (PCTCs);
- Data on hybrid RoRo variations such as ConRo (container and RoRo), LMSR (Large, Medium-Speed Roll-on/Roll-off), RoLo (roll-on/lift-off), RoPax (roll-on/roll-off passenger);
- Data on fuel consumption and emissions in relation to freight movements
- Data on the contents of Ro/Ro and Lo/Lo containers; and
- Data on Real origin and destination of the cargo.

AVIATION

- Data on Mail as a proportion of Air freight; and
- Data on fuel consumption and emissions in relation to freight movements.

RAILWAYS

- CSO Rail Statistics after 2018; and
- Data on fuel consumption and emissions in relation to freight movements.

RECOMMENDATIONS AND NEXT STEPS

It is strongly recommended that regular data collection regime is established by undertaking surveys as outlined in Table 6, below. This will help to develop a more comprehensive and robust evidence base for informing future decision making, providing sufficient resources can be committed to undertaking this on a regular periodic basis.

It is also recommended that a platform is created to enable the collection and sharing of high quality and standardised data from public and private sector organisations. A deeper engagement with the rail and aviation industry would help to consolidate important data on their operations.

A continuous dialogue is recommended with public and private sectors alike to collect high quality, standardised freight data. This would be a core ask of a freight forum and steering group.

Loading-Unloading surveys	Commodity Flow survey
Shippers Survey	Infrastructure Survey
HGV Roadside interviews	Vehicle Trip Diary Survey
Establishment surveys	Parking Surveys
Service Provider Survey	Driver surveys
Axle Load survey	Freight Operator Surveys
Vehicle observations surveys	Mail-out/ Mail-back surveys
Videography and GPS surveys	Telephone surveys

Table 6 Recommended datasets required (Author, 2021)

Greater Dublin Data Catalogue									
Source/Version/Number	Frequency/Update/Periodicity	Format	Location/Geography	Subject/Topic/Category	Access/Availability/Linking	Project/Initiative	Stakeholder/Partner/Agency	Notes/Comments	Other/Related/Links
1. 2021.01.01	Real-time/Continuous	JSON	National	Freight Movement	Public/Accessible	Freight Data Hub	Department of Transport	Freight Data Hub	Freight Data Hub
2. 2021.01.01	Real-time/Continuous	JSON	National	Freight Movement	Public/Accessible	Freight Data Hub	Department of Transport	Freight Data Hub	Freight Data Hub
3. 2021.01.01	Real-time/Continuous	JSON	National	Freight Movement	Public/Accessible	Freight Data Hub	Department of Transport	Freight Data Hub	Freight Data Hub
4. 2021.01.01	Real-time/Continuous	JSON	National	Freight Movement	Public/Accessible	Freight Data Hub	Department of Transport	Freight Data Hub	Freight Data Hub
5. 2021.01.01	Real-time/Continuous	JSON	National	Freight Movement	Public/Accessible	Freight Data Hub	Department of Transport	Freight Data Hub	Freight Data Hub
6. 2021.01.01	Real-time/Continuous	JSON	National	Freight Movement	Public/Accessible	Freight Data Hub	Department of Transport	Freight Data Hub	Freight Data Hub
7. 2021.01.01	Real-time/Continuous	JSON	National	Freight Movement	Public/Accessible	Freight Data Hub	Department of Transport	Freight Data Hub	Freight Data Hub
8. 2021.01.01	Real-time/Continuous	JSON	National	Freight Movement	Public/Accessible	Freight Data Hub	Department of Transport	Freight Data Hub	Freight Data Hub
9. 2021.01.01	Real-time/Continuous	JSON	National	Freight Movement	Public/Accessible	Freight Data Hub	Department of Transport	Freight Data Hub	Freight Data Hub
10. 2021.01.01	Real-time/Continuous	JSON	National	Freight Movement	Public/Accessible	Freight Data Hub	Department of Transport	Freight Data Hub	Freight Data Hub

Table 7 The Data Catalogue (Author, 2022)



Figure 16 There are many innovative freight schemes in play across the GDA already (Business Green, 2017)



Figure 17 'The kerb' trial collected data on vehicle turnover and delivery dynamics for the last mile (Smarter Grid Cities, 2021)

KEY INFRASTRUCTURE

INTRODUCTION

Infrastructure, the tangible provision providing the means to transport freight by road, rail, air or sea is an essential asset in a modern day, functioning society. This is the network of provision, extending to warehousing, distribution centres and gateway facilities that enable consignments to pass through the supply chain. Infrastructure also extends to the availability of welfare provisions for drivers, the type and location of parking areas and the quality of the urban realm to ensure the safety and wellbeing of residents, businesses and industry operatives.

Dublin is a global city importing and exporting goods through a dense network of infrastructure that must support the movement and transfer of goods in an increasingly safe, sustainable and efficient manner to ensure it remains competitive on the world stage. Growth in freight traffic can have detrimental repercussion on air quality, congestion and road safety with infrastructure playing a major role in mitigating the associated risks to the industry and on effected communities.

Intermodal investment can also help stimulate mode shift away from road-based freight movements, the dominant means by which goods are transported, towards other road, rail and sea-based alternatives for at least part of a journey. This will be dictated by market demand. Highlighting missing gaps in the networks or opportunities to unlock freight capacity should form part of developing the future strategy.

OVERVIEW OF INFRASTRUCTURE

The following paragraphs present an overview of the existing network infrastructure in the GDA for road, rail, sea and air. Commentary is also provided regarding warehousing, distribution, gateway and driver welfare infrastructure within the GDA. While every effort has been made to capture detailed data for this sprint stage, the information provided does not form an exhaustive list. As this framework develops, with input from stakeholders, the infrastructure details will be refined to ensure all relevant infrastructure is captured. This section of the report provides a snapshot visual of infrastructure provision across the GDA with full copies available in Appendix 2.

ROAD

The various motorway routes from the north (e.g., M1, M2, M3), west (e.g., M4, M7) and south (e.g., M9, M11) converge at the M50 outside Dublin. In addition, two of the main freight generators in the GDA, Dublin Airport (via the M1) and Dublin Port (via the M50/ Dublin Port Tunnel), are directly accessed from the motorway network. Figure 18 presents a snapshot of the primary road network and illustrates the location of online motorway service areas which include dedicated lorry parking facilities at Lusk (M1), Enfield (M4) and Kilcullen (M9). Figure 18 also presents a diagrammatic overview of the various motorways connection to the M50.

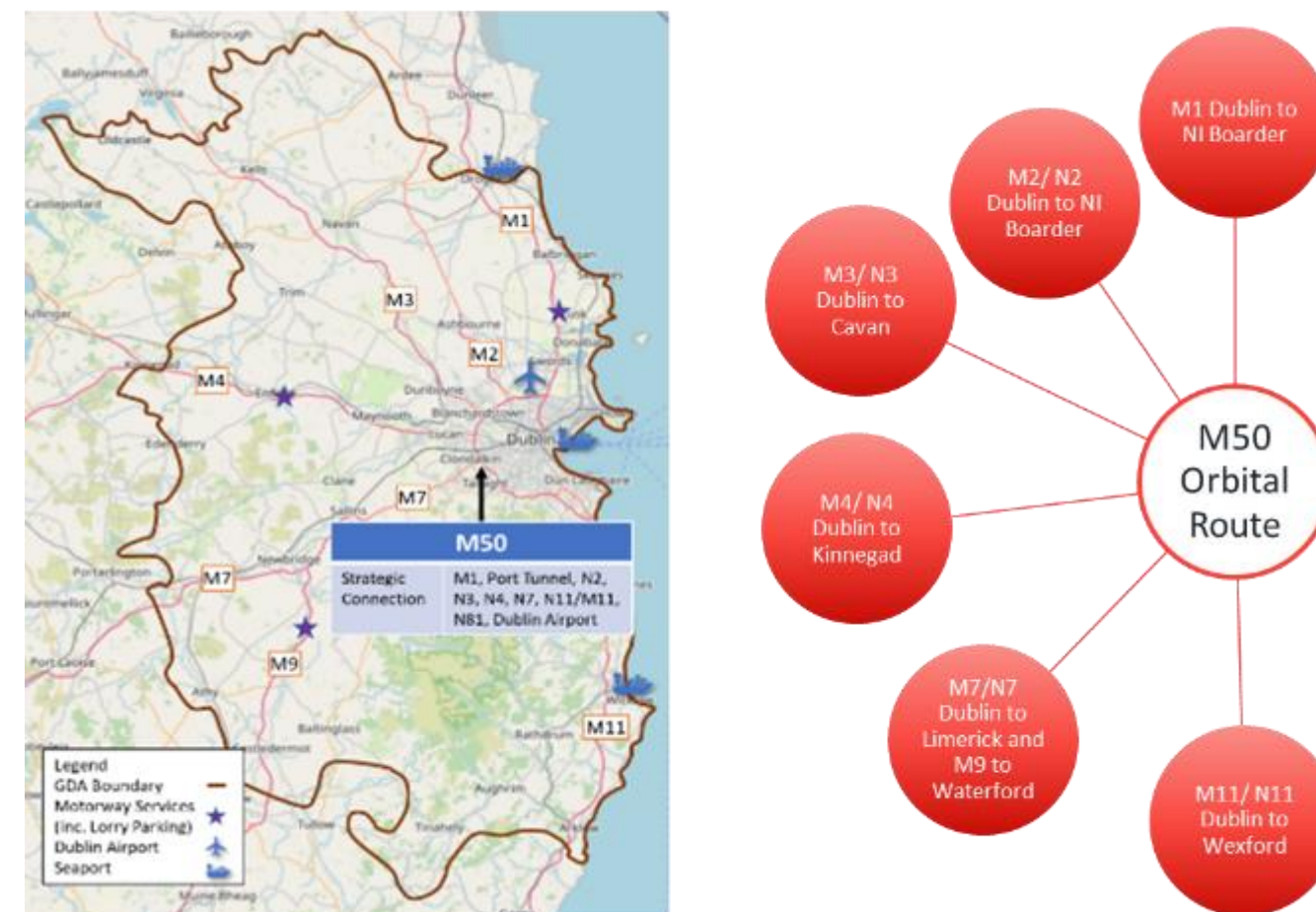


Figure 18 Map of the Primary Road Network across the GDA and interconnectivity (Author, 2021)

As previously noted, the M50 is a vital infrastructure asset for freight movement in the GDA (and nationally) and the continued management of its capacity is inherently linked to the wider routes which feed it. At this sprint stage, initial consideration was also given to provision of infrastructure (e.g., distribution, fulfilment centres, alternative fuel service sites, etc.) within the GDA.

In addition, to the strategic primary road network are numerous national secondary roads, regional roads and lower order local roads which feed into the primary network. These non-primary roads carry less traffic volume and are of a lower standard in comparison to the primary network, however, form an important function as the 'first/ last mile' connection for most freight generators.

RAIL

The rail network in the GDA is oriented towards serving Dublin and overwhelming provides for passenger services with some freight services. Nevertheless, as noted previously, there is opportunity for additional freight services on the rail network. There are two main terminal stations in Dublin, Heuston Station which serves rail lines to the west and southwest and Connolly Station which serves rail lines to the north, northwest and south. The Phoenix Park tunnel provides a rail connection between the north/south mainline and the western mainline and was upgraded in 2016 to improve its capacity.

The Dublin to Belfast mainline has double track infrastructure along its length. A section of the mainline is electrified between Dublin and Malahide (for DART services). The branch line serving Dublin Port and the North Wall Fright Depot connects with the Dublin to Belfast mainline to the north of Connolly Station. In addition, there is a branch line off the mainline at Drogheda which serves Tara Mines outside Navan. The Tara Mines branch line is single track and only used for daily freight services. To the south of Connolly Station, the mainline links Dublin with Wexford and Rosslare Europort. This southern mainline is double track infrastructure as far as Bray (and electrified as far as Greystones), where it switches to single track for the rest of the route.

To the west of Dublin, the mainline from Heuston Station has multiple tracks as far as Hazelhatch which then reduces to a double track layout. This route continues to the southwest coast and west coast (as single track). A single-track line branches off the mainline to serve Waterford to the south. The route infrastructure can accommodate standard High Cube containers and supports daily intermodal services between Ballina and Dublin Port (*as of June 2021, currently suspended) and Belview Port, Waterford. Figure 19 presents a snapshot of the rail network and track infrastructure along with an extract highlighting the Tara Mines branch line (**Error! Reference source not found.**).

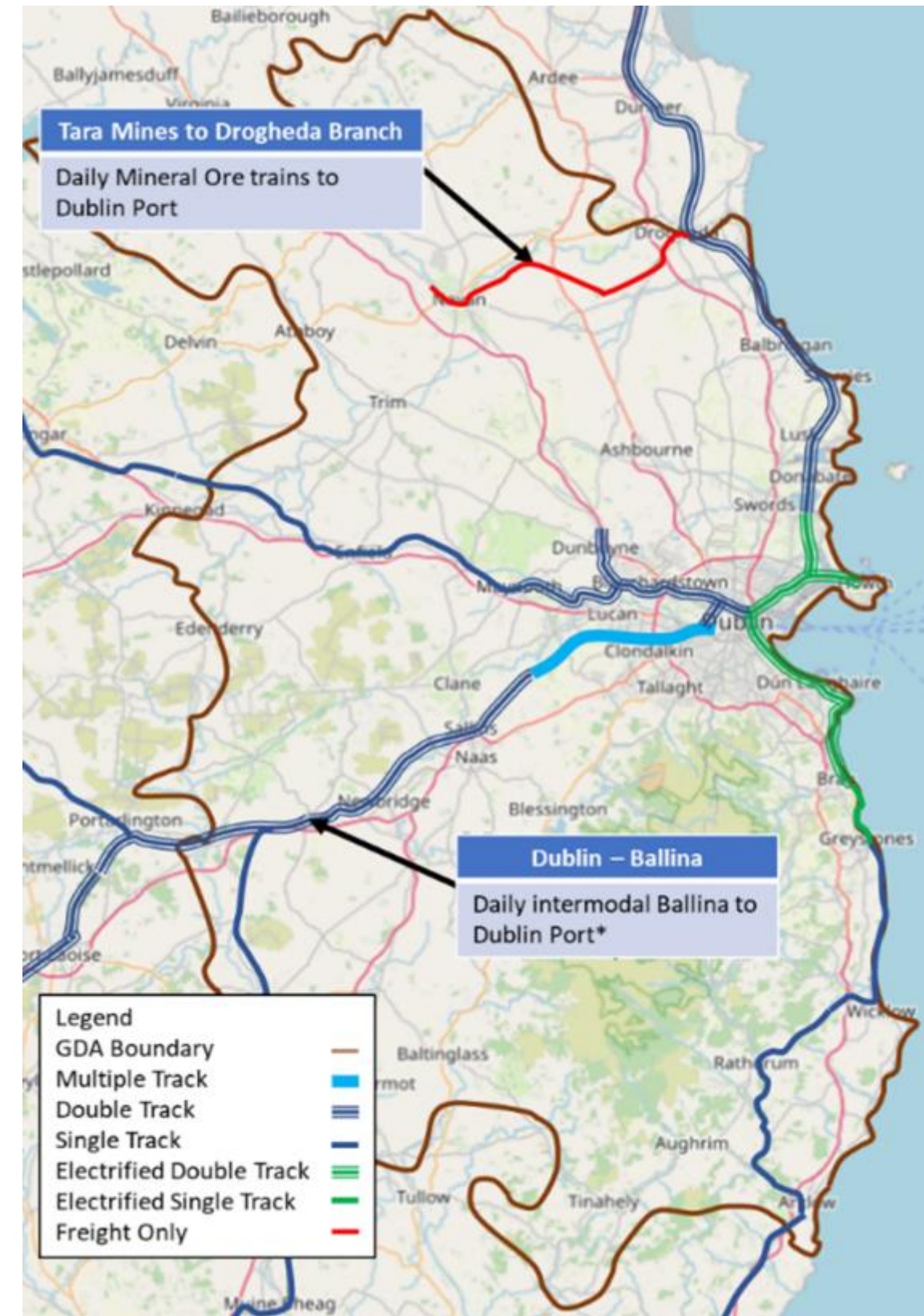


Figure 19 Tara Mines to Drogheda Branch Line (Author, 2021)

Figure 20 Map illustrating the extent of the rail network across the GDA (Author, 2021)

SEAPORTS

Dublin Port, located to the east of the City, is the principal sea port for the GDA and indeed Ireland. Dublin Port is one of the main gateways for fright into/ from the GDA. In addition, Drogheda and Wicklow ports also handle some freight. Drogheda port provides Lo-Lo and bulk solid type freight with sailings to Irish (Belfast, Cork) and European (Rotterdam, Oslo) ports. Wicklow Port, operated by Conway Port company, provides bulk cargo, project cargo and warehousing services. The location of the three seaports and a summary of services are illustrated on mapping contained in Appendix 2.

Dublin Port covers circa 260 ha. of land and has facilities on both sides of the River Liffey. The port can be directly accessed by the primary road network (M50/ Dublin Port Tunnel). Rail infrastructure provides a direct connection to the northern port areas and includes a number of active and inactive railheads. Irish Rail’s North Wall Freight Depot, adjacent to the port, provides further rail infrastructure and storage areas for rail freight traffic. The port area also provides driver rest facilities and some public lorry parking. **Error! Reference source not found.** presents an overview of the port, i ts available facilities and strategic transport connections.

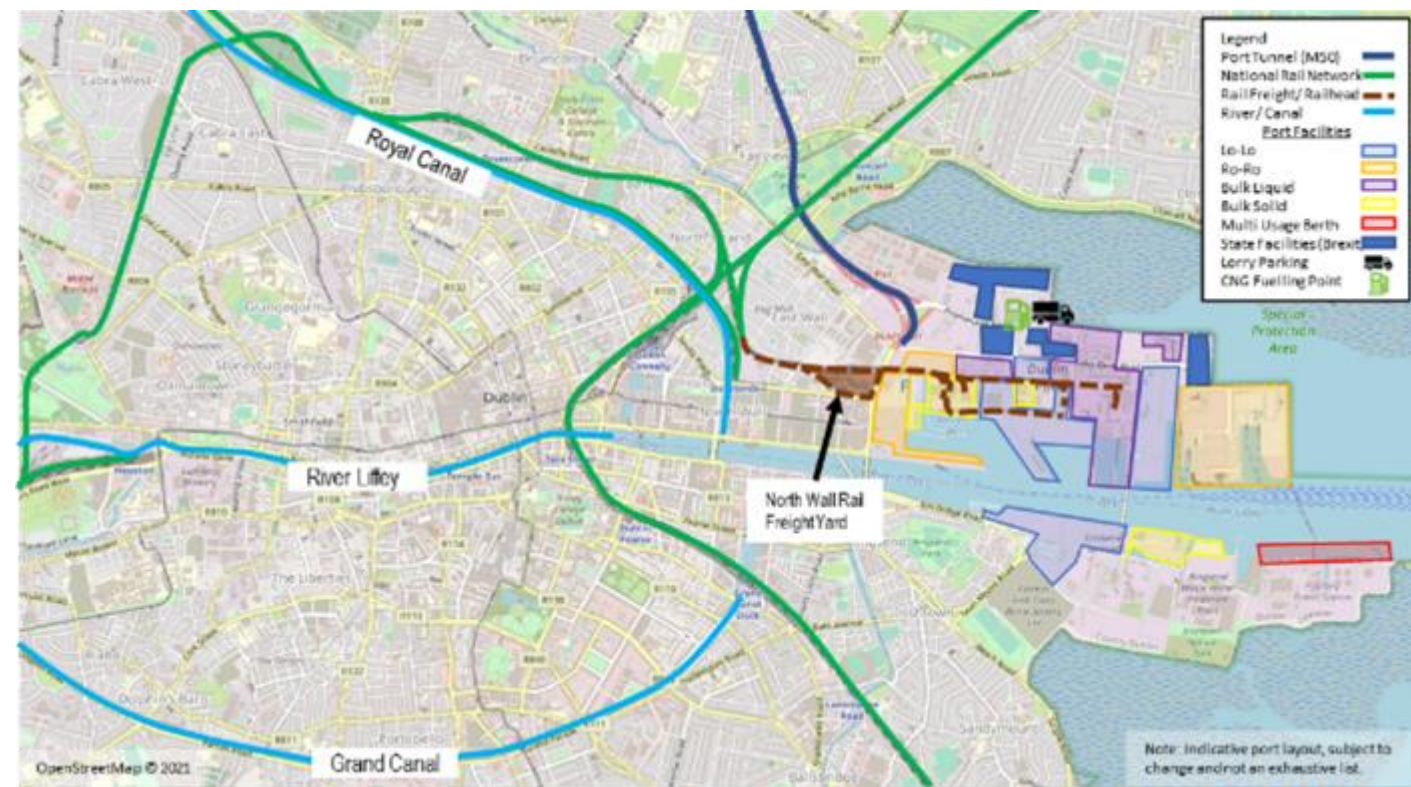


Figure 21 The scale and breadth of facilities and services available at Dublin Port (Author, 2021)

As indicated in Figure 21, Dublin Port handles the following five main freight types, Lo-Lo, Ro-Ro, bulk liquid, bulk solid and break bulk and other goods. To handle the various freight types, the port has an extensive range of handling and storage infrastructure (e.g., warehousing, tanks, holding areas, etc.). Connectivity to the new Dublin Inland Port is key for helping to relocate port-related, but non-core activities, including container storage (intermodal) which continues to grow significantly. In terms of shipping routes, the port is linked to the UK, Europe and other non-European ports. For instance, up to 20 daily sailings, mainly for Ro-Ro type freight, operate between

Dublin Port and UK ports (Holyhead, Liverpool, Heysham). Sailings to European port locations include Cherbourg (Ro-Ro), Rotterdam (Lo-Lo), Bilbao (Lo-Lo) and Antwerp (Lo-Lo) and range from daily to 1 sailing per week

AIR

Dublin Airport, located to the north of the City, is the principal airport for the GDA and indeed Ireland. Dublin Airport is the main gateway for air freight into/ from the GDA. Other airports within the GDA include Weston airport and Baldonnell Aerodrome, both to the west of the city. Weston Airport provides commercial passenger services for private and chartered flights and is accessed from the M4. Baldonnell Aerodrome is a military airport and is accessed from the N7. Figure 22 presents a snapshot of the three airports and provides a summary of services. Figure 23 also presents a diagrammatic overview of the various air freight routes operating from Dublin Airport.

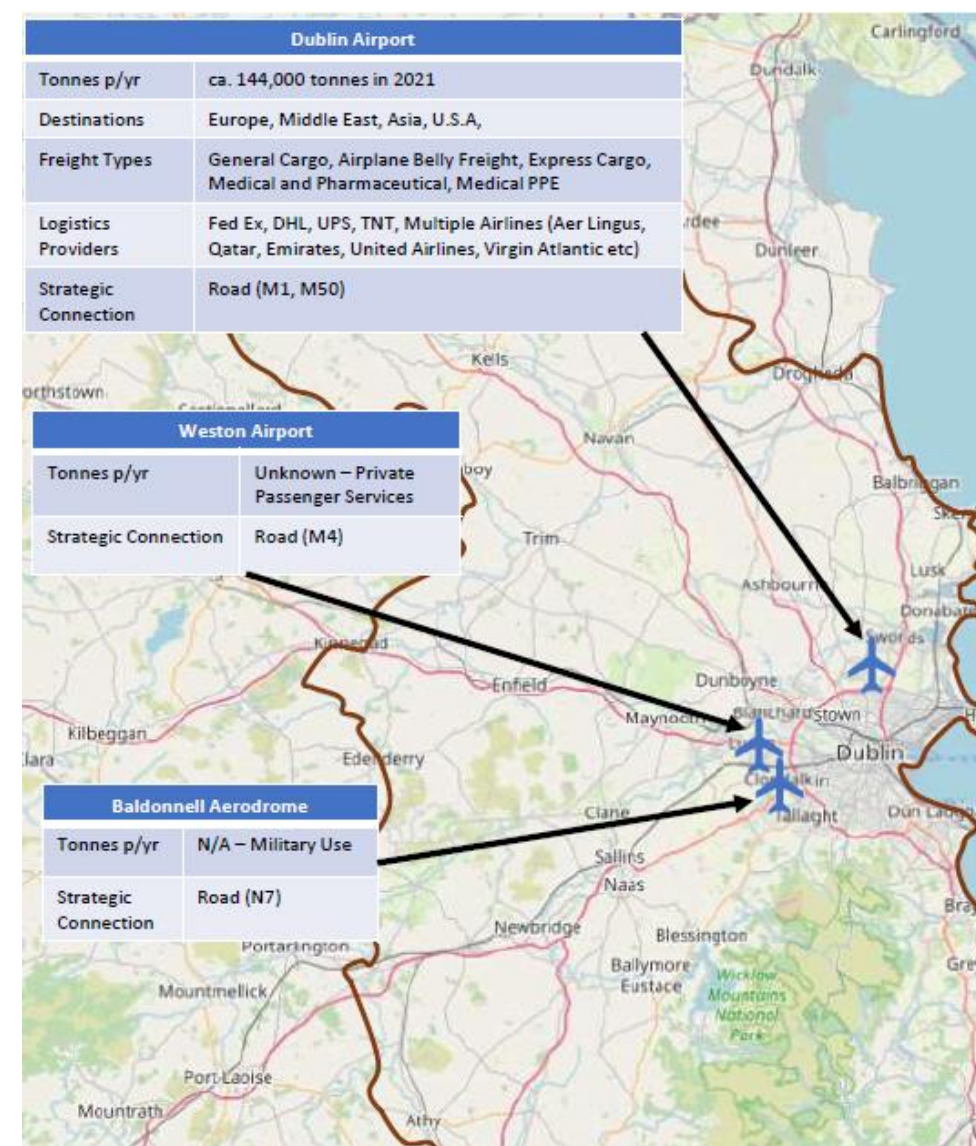


Figure 22 Snapshot of Airports across the GDA (Author, 2021)

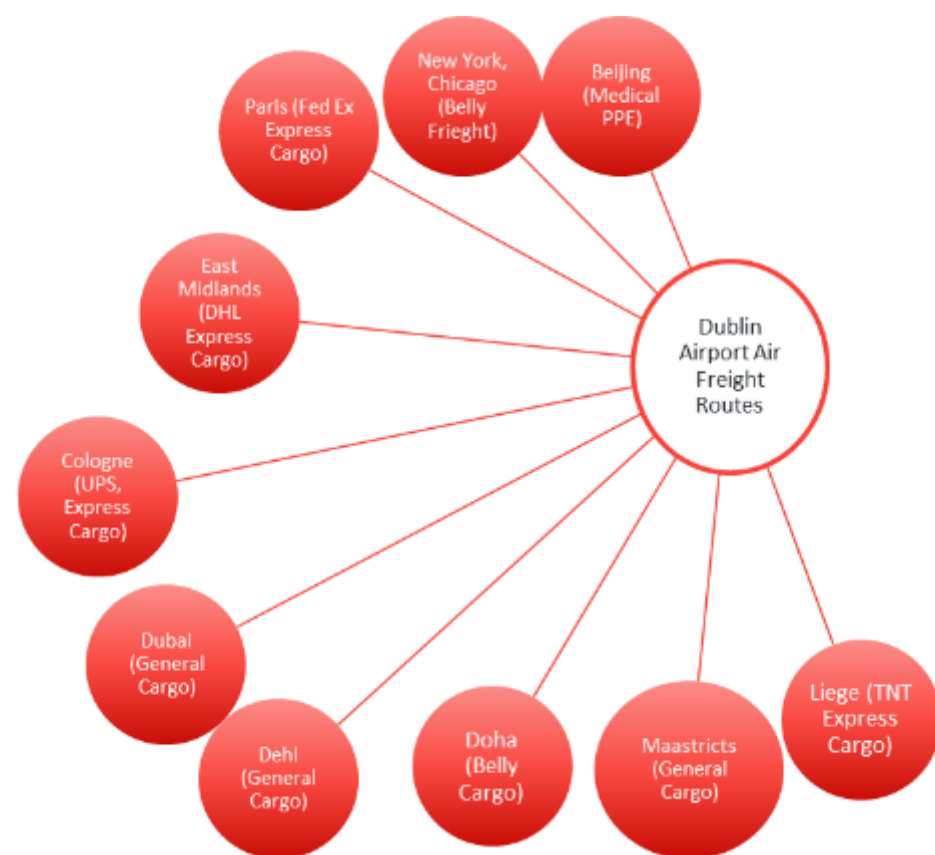


Figure 23 Freight routes to and from Dublin Airport (Author, 2021)

Dublin Airport is located to the north of the city and accessed from the primary road network via the M1. The airport has one main runway and is expected to begin operating a newly built second main runway in 2022. The airport provides passenger and freight services and handled circa 144,000 tonnes of air freight in 2021.

Dublin airport has a number of air freight routes carrying varying freight types operated by both dedicated air freight carriers (e.g., DHL, Fed Ex, UPS, TNT) and as part of scheduled passenger services (e.g., Air Lingus, Emirates, Air France, etc.). Destinations served include airports in Europe, the Middle East, Asia and the U.S.A. To the southeast of the airport complex, dedicated air freight handling infrastructure and facilities with direct access to the apron areas are provided. Aviation fuel storage facilities are also provided in this area, with aviation fuel transported by road from Dublin Port via the M1/ Dublin Port Tunnel. A large number of distribution/ logistics facilities (provision infrastructure) are located in proximity to Dublin airport.

INDICATIVE PRIORITY MEASURES

A shortlist of priority measures (Appendix 3) has been developed on the basis on collating together and mapping infrastructure across the GDA and assessing potential gaps in provision to further develop a safe, sustainable and efficient freight system. These have been highlighted amongst a longer list of measures that brought together best practice and emerging trends alongside measures alluded to in key policy documents and publications. Every measure was subsequently scored against the three freight objectives with commentary being provided on its relevancy to the local context.

The full list of measures and the priority schemes will be reviewed and assessed against using a more detailed MCAF in a post sprint stage with only a brief description of the priority measures being provided below (see Appendix 3 for more detailed rationale and scoring). The location of existing infrastructure networks and provision can also be sourced in the separate appendix document 'infrastructure maps'.

PRIORITY MEASURES

Alternative Fuel/Energy Infrastructure:

Electric Vehicle Charging Infrastructure: Expanding the energy network infrastructure to cater for increases in electric vehicle fleet growth. This coincides with the transition away from conventional fuels and combustion engines with a focus on delivering quick and rapid fuel points along the strategic road network that will reduce range anxiety and boost confidence in the uptake on alternative fuels (and LGVs). This infrastructure is key and a practical solution for decarbonising LGV fleets in the short term to reduce GHG emissions.

Hydrogen Hub: A hydrogen hub brings together several users to share a hydrogen refuelling facility. A large user base creates regular demand for hydrogen and the financial benefits extend to the purchase of vehicles and investment in the hydrogen refuelling station. Producing higher volumes of hydrogen helps to reduce the fuel cost per mile so that it is comparable with diesel. Hydrogen hubs are particularly suitable for larger vehicles, including HGVs and the process is fast and familiar for easy adoption. Development along key primary route network and at major trip generators, namely Dublin Port (and Airport) would be recommended.

Compressed Natural Gas (CNG) Network: Alternative fuel source for use in HGVs and buses. Provides a cleaner and affordable fuel choice compared to traditional petrol and diesel. Requires new infrastructure to supply fuelling stations and building of fuelling stations themselves. May require some updating of vehicle fleet(s). Gas Networks Ireland is beginning to build out a CNG fuelling network across the Island including within the GDA. There is one operational public fuelling station at Dublin Port with 2 further publicly operational fuelling stations in Dublin and further stations are planned within the GDA. Gas Networks Ireland has expansion plans to increase network infrastructure and coverage. CNG is part of the 'fuel mix' alongside LNG, battery electric and biofuels to power larger road and rail freight vehicles.

Sustainable/Renewable Energy Network: Infrastructure investment in renewable and sustainable energy networks is required to meet with growing pressures on freight fleet operators and local governments to meet carbon zero targets and demand for alternative propulsion systems. However, the transition towards battery electric vehicles (for LGVs and HGVs longer term) will require boosting grid capacity substantially. This is especially pertinent given the implications of conflict in Ukraine which has brought to attention the need for energy resilience. This includes the use of solar panels on warehousing, hydroelectricity using local watercourses or tidal power, wind power from turbines and biomass plants transferring energy from waste produce. Limited knowledge of capacity but a key network for powering the shift towards alternative fuels.

HGV & Road Freight Transport Provision

Remote Lorry Parking (& Driver Welfare): Secure, convenient and high-quality parking for HGVs and coaches just off the strategic road network equipped with accommodation, washrooms and refreshment facilities to support driver welfare. High level of surveillance and cleanliness with flexible tariff arrangements for short and long stays. Fuel bunkers and infrastructure can support high volume stays; with the aim of reducing vehicles parked within industrial estates and laybys with limited facilities. There are only four online motorway service areas across the whole of the GDA with dedicated parking and investment would be focused along the primary road network (namely M50) and gateway locations (such as Dublin Port).

HGV Priority Network: Using available road capacity by allocating rights of way to restrict lanes to trucks or other categories of vehicles. Lane usage can be allocated to different users according to time windows: it can be shared by all users at specific time periods or assigned only to certain users all day to avoid a situation of conflict with other urban activities, for which HGV involve a visual intrusion, noise pollution and high occupancy levels on the roads and the rest of the urban space. This would be primarily targeted along the primary road network and could coincide with bus lane priority with timings for application. HGV Priority would be better suited to the corridors of regional and national significance, namely the M50, because of its link to Dublin airport, Dublin Port (alongside Wicklow and Drogheda) as well as the major conurbation.

Consolidation/Transshipment Infrastructure

Bulk Freight Railhead: Explore opportunities to develop new or disused railhead at source of bulk material extraction/ processing. In the past, the rail network was utilised to carry a range of bulk construction material reducing the number of HGV movements, but new investment would require investment in track infrastructure, rolling stock, specialist loading/unloading equipment. Site assessments would also be necessary to attain best fit option with access to the primary road network and other transport networks (i.e. watercourses) being key to supporting inter modality. Collecting and collating additional rail freight data will be invaluable in this respect which should be aligned with proposals for a 'network' of railheads.

Strategic Rail Freight Interchange: A Strategic Rail Freight Interchange (SRFI, by the name of the Dublin Eastern Gateway, has been mooted for the west of Dublin (city) in proximity to rail and trunk road system (M50). This is in response to reducing the dependency on road freight along the M50 (and helping to better future resilience), the implications of additional inspections and customs procedures at the port (and the backlog of vehicles this generates, especially with an uplift in unaccompanied trailers) and the challenging spatial constraints at the port site. A SRFI would aim to serve key trip generators in the region, including being co-located with a dedicated construction materials terminal for responding to housing growth across the GDA.

Port Rail Access: Expanding or integrating new or upgraded railheads into port facilities (prioritising tier 1 ports) to increase the carrying capacity of single trains and to support more efficient marshalling of goods internally within the port confinements. This includes signal and track upgrades with upgrades also allowing for heavier trains to directly serve the port facility; with the aim of modal shift taking place from road to rail. This is driven by forecast growth but dependent on changes to gauge clearances. Rail access to smaller ports at Drogheda and Wicklow, both of which are underserved, is also being considered for the future, especially with the latter who have existing sidings and capacity for accommodating additional rail freight paths.

(Shared Access) Consolidation Centres: Consolidation can be defined as the process of combining goods shipments, often by road, into fewer deliveries to reduce the numbers of freight vehicles entering an urban area and to maximise carrying capacity. A Consolidation Centre is the facility, situated near the urban area that serves as a warehousing and inventory management location where goods are handled. The scale, type and means of access varies significantly depending on context and demand. A shared access model, with more inclusive access to haulers and businesses, can complement industry led examples (by larger third-party logistics operators) on the periphery of the M50 or within a more urban setting along radial routes (primary route network).

Parcel Locker Network: Parcel lockers, or hubs, are becoming commonplace across shopping centres and transport interchanges to allow seamless delivery of goods to a branded consolidation points. DHL and An Post are two key players in the GDA. Parcel lockers allow customers to collect on route and reduces freight miles travelling door to door. Office employees can also have personal goods delivered to transport interchanges to reduce vehicle movements in city centres and staff dependency to manage collections. A network of lockers may be relevant in the context of rail and tram network expansions across the GDA working with Train Operating Company (TOC) to help reduce road freight miles and 'wasted journeys'. Selecting appropriate locations for parcel lockers will be key to avoid incidences of vandalism and to maximise utilisation.

Demand Management (Physical) Provision

Intelligent Transport Systems (ITS): Variable Message Signs (VMS) are digital road signs used to inform car drivers about specific temporary events and real-time traffic conditions. The signs are often linked to a manned control centre via a local network or a radio link. The aim of using VMS is to provide drivers with mandatory and/or advisory information at the roadside and can be used for many different purposes with the potential benefits of reducing car drivers' stress, travel time and increasing traffic safety. An Enhanced Motorway Operation Service (Emos) is beginning to be implemented that will see VMS on 98 gantries over large parts of the M50 to satisfy this requirement.

NEXT STEPS

There are many options to explore when assessing the type of freight-based interventions that could be deployed across the GDA; each with their own benefits and advantages. Investment in key infrastructure is expensive and time consuming so extra due diligence is needed when filtering the most relevant, deliverable options applicable across the GDA. Whilst the use of a Multi Criteria Assessment Framework (MCAF) helps to assess the value of different measures outlined in this section and their relevance to the GDA context, each measure will need to be referenced against Key Performance Indicators (KPIs). Lastly, more specific recommendations can be made to locations where the priority measures could be deployed with further research and investigation under the auspices of a proposed Freight, Logistics and Gateways Freight Forum and (FLGFF) and Freight, Logistics and Gateways Steering Group (FLGSG) (see Platforms for Engagement section).

There are subject matters that will need to be given greater attention and researched thoroughly over the course of developing the final strategy. The following were touched upon during the stakeholder engagement, which will influence the way goods are moved through the GDA:

Irish Border Trade: Inter country trade between Northern Ireland to the Republic of Ireland (RoI) have substantially increased in response to the UK leaving the European Union. There was a 23% increase (£1.9bn) observed between January and May 2022 (on the previous year) for imports to RoI and a 42% increase in the opposite direction over the same period. The movement of foodstuffs and livestock experienced one of the most dramatic (quadrupling), a likely outcome of having frictionless borders, whilst trade in energy products (fuels, lubricants etc.) also rose; due to the changing energy supply chains stimulated by the Ukrainian conflict.

Rural Freight: There is an opportunity to explore how commercial bus and demand responsive transport services (such as the services and routing provided by Remix, a Via Transportation company) combined with locker infrastructure can help move goods (as well as people) to and from peripheral areas.

Workforce Skills: The skills gap in the freight and logistics industry has been acknowledged by industry bodies and the Department of Transport (DfT). The [DfT's Logistics & Supply Chain Skills Group](#) recommended measures to increase the number of HGV drivers. New apprenticeship programmes at [Atlantic Technological University Sligo and Technological University Dublin](#), coming online in 2022, aim to boost the number of young people entering the logistics profession. The shortage of HGV drivers, a notorious challenge across the continent, is aiming to be addressed, in part, through new training academies; with companies such as the Harris Group, offering specialised training to electric vehicle technicians as an inevitable transition towards clear vehicles takes place.

Driver Welfare: The target areas for investment should include stops along the SRN along and around the M50 that serve long distance hauliers/freight forwarders using the port and airport respectively.

TECHNOLOGY & DECARBONISATION

INTRODUCTION

Freight transport is undergoing a transition. The surge in e-commerce coupled with increasing demand for warehousing, driven by next day delivery and rising consumer expectations, is having a profound impact on urban logistics and supply chain management. The spotlight placed on minimising greenhouse gas emissions, improving air quality and place making are subsequently ushering in changes to how and when goods are delivered.

This is part of a broader shift towards a zero-carbon delivery with the development of technology platforms also helping to optimise loading capacities, aid routing behaviour and reduce fuel consumption to save time and costs. Pressure is being applied to nudge the freight industry towards decarbonising with technology helping to support the transition. Attitudes are also changing; there is a recognition across all quarters of society, including the freight sector, that everybody has a role to play in tackling the climate emergency and acting responsibility to move towards carbon neutrality.

CURRENT TRENDS & SCENARIOS

Any transport strategy should seek to be visionary in its outlook based on current and emerging trends taking place across the world. The framework for shaping sustainable urban freight distribution must build in flexibility to cater for the rise of different technologies that aim to improve the sustainability, safety and efficiency of the sector, across all modes and their component parts, such as warehousing and goods handling equipment, in a supply chain. Figure 24 outlines current and emerging trends in Freight and Logistics across the world and have relevance to shaping the discourse and strategy around decarbonising the freight sector and the use of technology across the GDA.

The [Regional Spatial & Economic Strategy \(RSES\) for the Eastern and Midlands Region](#) recognises the challenge posed for transitioning towards a low carbon society but advocates the deployment of alternative fuel infrastructure, compact development patterns, high quality communication networks and smart city programmes to reduce emissions by 40% to 2030 (Section 7.9, RSES).

There must be a package of options and levers available to both industry and public authorities respectively to aid the transition towards decarbonising the freight sector that pivot around the application of various technologies that support re-timing, re-routing and reducing freight trips alongside a more comprehensive shift in goods moved by alternative vehicles. Whilst road freight will continue to make up the vast majority of freight trips and freight volumes, there is an expanded role for rail, IWW and last mile logistics by bike (in particular) across the GDA.

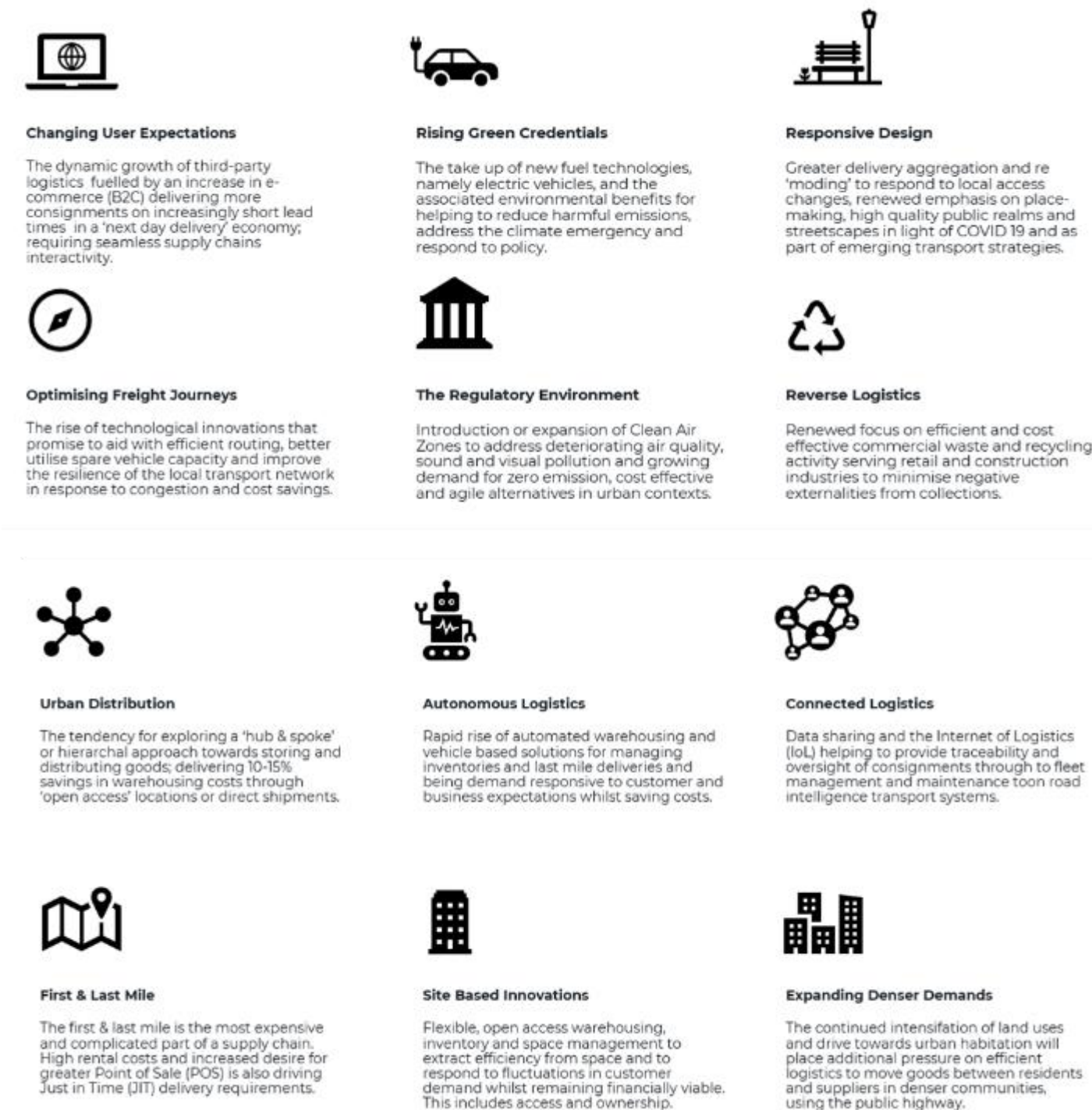


Figure 24 Current & Emerging Trends in Freight & Logistics (Author, 2022)

TYPES OF TECHNOLOGY & DECARBONISATION

There are many existing and emerging technologies and processes that can allow organisations and industries across the GDA to optimise their freight operations, reduce the externalities from their activities on local communities and transition towards using cleaner, greener means of moving goods. The applicability of technology measures in the context of the GDA needs to be assessed against the feedback provided through previous stages of developing the strategy but can broadly sit under five themes. Reference is made to the relevant practices/measures with detailed dashboards, featuring use cases, noted in the Appendix 1.

CLEANER TRANSPORT

- Alternative Fuels
- Alternative Fuel Infrastructure
- Cargo Handling Equipment

Transport is becoming cleaner as a transition takes place from combustion engines to electrified vehicle powertrains, covering battery electric and hydrogen fuel cell across all modes of transport. This is a burgeoning growth area likely to be accelerated by changes in government policy, including future bans on petrol and diesel engines and future incentivisation. Decarbonisation and improved air quality are central to the Transport Strategy for the GDA whilst there are some interventions that specifically address these issues, the broader strategy focuses on tackling climate change and improving the quality of the air breathed by its citizens.

Decarbonisation is taking place at varying rates across the freight industry; contrasting the availability of capital investment, incentives and availability of new technologies that support Light Goods Vehicles (LGVs) undertaking short, local trips, with the requirements of Heavy Goods Vehicles (HGVs) on strategic journeys that demand greater capacity requirements. However, decarbonising the road haulage industry is proving challenging, despite the strong collaboration between industry and government stakeholders with almost all HGVs in Ireland being diesel fuelled (Ten Years Strategy for Haulage Sector, 2021).

There are a number of support mechanisms in place including maintaining a low excise rate for natural gas and biogas for a period of eight years to facilitate the uptake of CNG and natural gas technologies and the acceleration of indigenous renewable biogas production; and an accelerated capital allowance scheme for gas-propelled vehicles and related equipment.

Grants of €5,000 are available for new Battery Electric Vehicles (BEVs) or PHEV (Plug In Hybrid Electric Vehicles) purchased and registered in Ireland whilst these vehicles also qualify for Vehicle Road Tax relief of up to €5,000 for a BEV and €2,500 for a PHEV respectively. However, the vehicle threshold (below €50,000) will only appeal to LGVs across the freight sector.

However, to put this in context, 45% of HGVs are also 10 years or older which presents itself as both an opportunity and a challenge to transition to cleaner transport or risk 'locking in' diesel fleets for the foreseeable future. The transition may also be difficult, without financial incentive for smaller, licenced fleet operators (with less than five HGVs) who constitute the vast majority of national

hauliers. This is despite the European Commission Sustainable and Smart Mobility Strategy adopted in December 2020 which refers to 'Greening Freight Transport' and utilising digital technologies to reduce emissions by 50% by 2050.

Cleaner Transport relates both the network infrastructure to support alternative fuel technologies and the actual availability of vehicles that run on the fuel provided. Cleaner Transport also relates heavily to off road infrastructure that forms part of the supply chain, alongside future intermodal facilities serving national and international freight movements. In this respect, cleaner transport practices/measures are viewed from the perspective of reducing Green House Gas (GHG) emissions and conventional petrol and diesel engines and opting for alternative vehicle fuels and associated infrastructure.

The Road Haulage Sector in Ireland notes the strong correlation between freight emissions and economic activity. There is a risk that newer and more efficient vehicles may be offset by increased freight activity, particularly around burgeoning logistics clusters. Without significant policy action, the emissions trajectory could increase substantially.

Currently there is limited capacity for alternative fuels serving both means of road freight across the GDA, particularly HGVs operating inter regional trips using the primary road network.. Larger fleet operators, and notably couriers/3PLs affiliated with Dublin Port Company's Inland Port and Air Cargo Services (UPS, DHL) would be primed for the transition of LGVs to cleaner vehicles. This is also dependent on an extensive charging network being developed (ESB e-cars are the main provider across Ireland). The use of alternative fuels, mainly electric, could also drive plant equipment and facilities supporting the transshipment of goods around Dublin Port.

NEW MODES

- E Cargo Bikes
- Waterbourne Transport
- Freight on Public Transport

Technology is bringing forward new ways in which goods can be transported. New modes of freight transport powered by alternative fuel technologies and programmed to make pre planned data driven decisions can reduce freight miles, optimise trips and reduce the impact of movements on air quality. New modes can range from the conventional, such as e-bikes, to the more innovative and newer concepts for meeting a freight requirement, such as drones. Partnerships will be necessary to support trials and research in some cases and will support adoption to market and viability across a range of different use cases. Inherent to this approach towards decarbonisation is modal shift; the transition away from conventional road freight transport, the primary means by which consignments are moved across the GDA and Dublin.

The continued growth of LGVs and B2C freight activity presents an equal challenge to the use of road space and network capacity; which has been driven by the rise in e-commerce and accelerated amidst the response to the pandemic and the future of more flexible, hybrid working arrangements. Exploration into re-moding trips seeks to address environmental concerns such as

air and visual pollution whilst adopting zero carbon means of transport to deliver goods over the first & last mile to navigate congestion and areas restricted to other users. On this basis, proposals to restrict inner city access into Dublin City Centre (Dublin City Centre Transport Study), may help foster a re-moding of last mile logistics. There are already operators, such as DPD who are already delivering innovative last mile solutions in the city.

However, the movement of heavier, bulkier goods, typically undertaken by HGVs is a key consideration; with opportunities to utilise alternative transport networks, namely the city regions rail network, to move non-perishable, non-time sensitive goods, such as construction materials over short distances within an urban setting to new developments in the docklands and quays. The selection of new modes presented all require either some form of consolidation and intermodal interface between road freight or a substantial efficiency savings within the supply chain to save time and costs.

In total, 126 million vehicle-kilometres of freight movements move within Dublin (as defined under NUTS3 – a Eurostat territorial unit including Dublin City and County) alone; outstripping any other movements across the rest of Ireland (2018); with scope to shift shorter trips to other modes. Dublin also has the largest concentration of hauliers with registered licences 574 (2018); a similar number that was recorded five years previously. Relative to the rest of Ireland, almost a quarter (22%) of all road freight transport is destined for the capital.

There is scope to explore the role of other transport networks at the interface with the primary road network (M50 and radial M roads) to reduce freight miles and HGV traffic volumes during peak periods (recorded as between 11:00-13:00). The expansion of DART and MetroLink networks. services and stations across the city region could also be exploited to this effect; primarily through a network of unmanned, micro consolidation (locker) points.

E-cargo bikes, in their various guises, have been trialled across the centre of Dublin already. This includes a pilot initiative led by the City Council in partnership with Enterprise Ireland under the Small Business Innovation Research (SBIR) challenge which sought to optimise deliveries. This included developing a network of mini urban distribution hubs for receiving and redistributing groceries, medicines and parcels. UPS, the partner in the trial, noted that with just two hubs in place, it has removed five diesel vehicles from the road, reducing carbon emissions by up to 45%. E-walkers were also used during the trial for navigating pedestrianised areas.

Elsewhere, Dún Laoghaire Rathdown County Council, Smart Sandyford, and bike sharing operator Bleeper have launched a pilot project which will enable businesses based in the county to trial e-cargo bikes for the delivery of their products or services. This represents an opportunity to reduce grey fleet usage and swapping out the use of vans for bikes over short distances.

DATA & CONNECTIVITY

- Portside Booking System
- Telematics
- Dynamic Kerbside Management

Data and digital connectivity are becoming essential and commonplace for enabling freight transport to access to optimise journeys, enabling responsiveness and facilitating more seamless connections between modes of transport, places and people. Data sharing across industries, sectors and organisations will help to plan, monitor and adjust freight deliveries across a supply chain in real-time whilst the role of data will play an increasingly important role in more heavily congested parts of urban areas to maximise the use of space.

The ease of access to trip generators across the GDA, namely Dublin Port and Dublin Airport and current challenges faced to managing and optimising trips, by road, is crucial; with technology being able to proactively regulate and manage vehicle volumes at select times to minimise backlogs. This would also align with the development of two empty container depots which form part of the 22-hectare first stage development of Dublin Inland Port, on the M2 with access to the M50, Dublin Port Tunnel and Dublin Port.

Challenges around loading and unloading are ever prominent across local service centres, and the city centre; a situation that could be resolved through the digitisation of space to aid re-timing and re-routing of deliveries. This should also form part of an assessment of design standards for streets to ensure a wider appreciation of delivery and servicing requirements and needs.

Telematics, otherwise referred to as fleet management systems, are in cab technologies designed to aid with more efficient, safe and sustainable driving behaviours; with responsibility on operators to develop best practice as a cost saving mechanism and to fulfil their environmental and social obligations. Larger fleet operators, with greater capital spend and more advanced fleets, would be best placed to take up this technology (alongside driver training).

Dynamic Kerbside Management has been previously trialled in Dublin (The 'Kerb') and brings benefits to utilising inner-city space more efficiently. The use of data is particularly relevant to dictating port access with strict reception windows currently not being managed to allow forward planning. Equally the need for road network resilience is being driven through infrastructure-based use of Intelligence Transport Systems (ITS) in its various guises, which can be complemented by in can telematics designed to support trip optimisation.

The ongoing development of Dublin Inland Port, adjacent to Dublin Airport, includes providing a container terminal check in area whereby hauliers can be called forward in a controlled manner to reduce backlogs around the sea port entrances (via Dublin Port Tunnel). Dublin Port Company (DPC) are exploring opportunities for testing smart mobility and technology in the context of Dublin City Councils Smart Dublin Initiative.

AUTOMATION

- Autonomous Vehicles
- Platooning

The pinnacle of technology use, especially in tackling the endemic challenge of driver shortages and reducing mundane tasks, is through automation of vehicle fleets. There are several trials and revolutionary approaches being fostered globally to explore and test the relevance of this field and measures that can be deployed within the public domain in the short term. This is an area that is likely to evolve with the potential applicability to different parts of the supply chain process beyond vehicle fleets, including storage, warehousing and inventory management (at port side for example and other intermodal facilities developed in the future).

Automation is closely aligned with emissions reduction and is a burgeoning theme running throughout each freight sector that is likely to revolutionise the industry. According to the Cities Demand Management Study (2021), HGV platooning could reduce CO2 emissions from between 1 to 8% for the lead vehicle and between 7 and 16% with the benefits being relevant for inter urban trips. Automation in an urban context could entail the use of small, unmanned vehicles undertaking smaller consignments, normally undertaken by an LGV over the 'first & last mile' in sensitive urban contexts.

Alongside issues of driver shortages, automation over longer distances presents an opportunity to maximise driver 'road time' whilst automation can help overcome issues associated with warehousing and inventory management that can be subject to human error or be relatively time-consuming practices. There is small scale evidence of the latter taking place across distribution sites in peri urban locations around the M50 but generally the role of automated vehicles and platooning has been limited to date in large part due to the costs and concerns around safety and legal responsibilities.

Much of the technology behind automation is still in its infancy. The rise in autonomous vehicles would help address driver shortages observed across Ireland for long distance haulage and freight forwarding, whilst platooning would be relevant in the context of completing inter urban journeys using the primary road network across the GDA.

A study has been commissioned into the application of autonomous vehicles on Irish Roads to examine technologies, policies and governance with particular reference to the applicability to inter urban road freight movements.

AGGREGATION

- Load Sharing

The means by which to group otherwise individual consignments, brokered by a single technology platform or facilitated through the collaboration of multiple organisations, into an optimised, dynamic delivery programme. This can simultaneously reduce freight miles by reducing travel demand and seeks to maximise vehicle payload. Technology can facilitate aggregation with the aim of removing vehicle traffic and stimulating mode shift if dynamic routing reduces journey distances.

Emerging technology can help with reducing freight miles, empty running and sub optimal carrying capacity of freight carriers; with a view to maximising vehicle utilisation and payloads (the revenue generated from a delivery). This is highly relevant and realistic for traffic mitigation; on the premise that data is shared transparently between a web of suppliers, couriers and customers; especially in the context of the GDA and the scale of local, national and international supply chain movements.

Enhanced aggregation should help stabilise the growth in road freight transport (LGVs) across the primary road network and within urban centres using software platforms that are readily available within the public domain. Some caution must be exerted as to the popularity and take up of load sharing because of the low rates charged for services and concerns by industry to share information on vehicle fleets, goods carried and fleet utilisation.



Figure 25 Load sharing can help reduce vehicle volumes, but there are various factors to consider (Supply Chain 24/7, 2022)

NEXT STEPS

This section has sought to raise awareness of emerging technologies and how they can be effective in tackling the issues and challenges faced by the freight sector across the GDA. The practices identified are 'future ready'; applicable in a post-pandemic life and relevant for developing a sustainable transport network which meets climate change requirements. The next step will be for members of a proposed FLGSG/FLGFF to take the MCAF tool (detailed in the Introduction chapter) and sense check assumptions and the level of prioritisation given to each intervention. This will then filter down to the number of interventions through to a preferred shortlist.

OPERATIONAL & PLANNING CONSIDERATIONS

INTRODUCTION

The responsibility for sustainable urban freight distribution and meeting wider transport objectives to unlock economic development, protect the environment and support society, must be shared between public authorities and industry. The appropriate conditions for creating a safe, sustainable and efficient freight movements and supply chain activity to meet these objectives will need to be fostered over time. Public authorities and industry must also be responsive to changing circumstances and trends such as the way people shop or work going forward but are equally responsible for dictating the future discourse that shapes freight activity.

Generally, the role and significance of freight must also be appreciated whilst greater integration is required between transport and land use development planning to envelop a 'think freight' approach throughout decision making processes and formal mechanisms. This lack of awareness and knowledge of freight can have consequences on urban design, development masterplans and strategic growth. This section seeks to distinguish between the role and influence of the freight industry (industry considerations) and public authorities (planning considerations) and the role they play together for creating an optimal freight environment. Reference is made to the relevant practices/measures with detailed dashboards, featuring use cases, noted in the Appendix 1.

PARTNERSHIPS

- Waste Management Partnership

Public authorities play the leading role in shaping transport and land use policy and securing funding for delivering public goods. Local authorities across the GDA alongside the NTA, will ultimately be shaping the freight environment throughout the course of day to day based on decision making across a range of transport, land use, environmental and development planning subject areas. There is a critical role to play for public authorities on numerous fronts to create optimal conditions for the freight sector to thrive and support the economic, environmental and social wellbeing of the GDA. This should ideally coincide with greater industry collaboration to develop synergies and shared visions for the role of freight in the future.

The freight industry, composing of suppliers, couriers, hauliers, shippers and businesses partaking in a supply chain, alongside trade bodies, will play a key role in lifting industry standards. Industry increasingly recognises the role it plays in meeting environmental obligations and addressing concerns around road safety. The freight sector generally has developed a poor reputation with HGV driver shortages (most notably) being symptomatic of a wider challenge of recruiting and retaining staff across the industry.

Partnerships can also be key to supporting economic activity and coordinating a response across multiple stakeholders; such as responding to the impact on deliveries and collections from pedestrianisation proposals. Chamber of Commerce and Business Improvement Districts, for example, can be useful platforms for organising around a theme or agenda, which may have a freight and logistics angle.

FREIGHT DATA

Data harvesting is increasingly key for developing a robust evidence base for informing decision making by both businesses and public authorities. However, obtaining and collecting freight specific data, ranging from vehicle movements to road and vehicle utilisation, is a notorious challenge faced by the freight sector historically and impacts on the relevancy of future investment priorities and fleet management respectively. This was acknowledged in a previous Regional Freight Study commissioned by NTA.

The emergence of the sharing economy and initiatives such as the FreightShare Lab⁶ (a collaboration of industry bodies which are trailblazing approaches to collating and collecting data sources for informing policy approaches and investment priorities across the industry. In this instance, FreightShare Lab seeks to reduce empty running and partially laden truck running.

A similar initiative in the context of the GDA could help bring together disparate industry data to capture the true freight picture and mark a milestone in the link between public authorities and industry. This exists to a limited extent as Dublin City Council already manages the system that captures and stores permit data (HGV permits issued) as part of the HGV Management Strategy (although challenges with enforcement)

There is limited statistics available on what amount and type of freight comes in and out of Ireland by air, including via Dublin Airport. Better statistics on air freight would be useful to assess whether other policy considerations related to air freight should be further explored. The same applies to rail freight on the network and the characteristics of services and infrastructure provision which impacts on the ability to make informed decisions.

REGULATIONS

- Emission Zones
- HGV Management/Routing
- Quiet Deliveries

⁶ FreightShare Lab (2018) A Collaborative Research Project to Improve Freight Efficiency
<https://www.freightsharelab.com/freightsharelab2018/en/page/home>

Public authorities are increasingly introducing measures to minimise the impact of freight (and vehicle) movements in sensitive areas and the impact the sector has on air quality and the urban realm. Barriers imposed through traffic management or regulation orders, loading restrictions and zoning principles shape the freight operational environment. This can bring about the benefit of nudging fleet operators and freight sector businesses to transition towards greener vehicle fleets, in response to charging zones being introduced for higher emitting vehicles, alongside re-timing deliveries outside of peak hours to minimise interaction with vulnerable road users.



Figure 26 Access restrictions can generate other problems for industry (Author, 2022)

Caution must be taken to the disproportionate impacts of regulations on different parts of the freight sector across the GDA and their ability to respond (quickly) to changing conditions. For example, lorry parking bans may be symptomatic over a lack of available parking and absence of real data demonstrating the gulf between demand and supply available locally which must be factored into the discourse by those involved in the making decisions internally. The harmonisation and legibility of regulations is also key; this can lead to issues with enforcement and overall effectiveness whilst infrastructure costs, administrative and maintenance costs must be evaluated.

Since 2007, Dublin City Council have operated an HGV Management Strategy which bans 5+ axle vehicles during the hours of 07.00-19.00, seven days a week from a designated cordon area around the city. This is with the aim of reducing through traffic and incentivising the use of Dublin Port Tunnel and reducing conflict between vulnerable road users and the servicing requirements of businesses. However, enforcing this legislation and testing compliance has been challenging. Permits can be sourced to enter the restricted area along designated roads for delivering or collection materials from registered addresses /construction site (Load/Unload Permit), or where vehicle loads exceed 2.6 metres in length (Transit Permit).

Enforcement of the HGV management scheme has been a challenge; one that other local authorities have also experienced. Extending the cordon or adding additional vehicle specific restrictions may be premature without developing a more coherent package of freight related measures alongside enhanced enforcement measures, such as ANPR technology (similar to that used to enforce the M50 Barrier free tolling) that could feature as part of developing a Clean Air Zone (CAZ). A CAZ offers the potential to stimulate mode shift and reduce all vehicle trips on the local network to free up capacity. There is also limited data available within the public domain to assess the nature of HGV trips passing through the city centre.

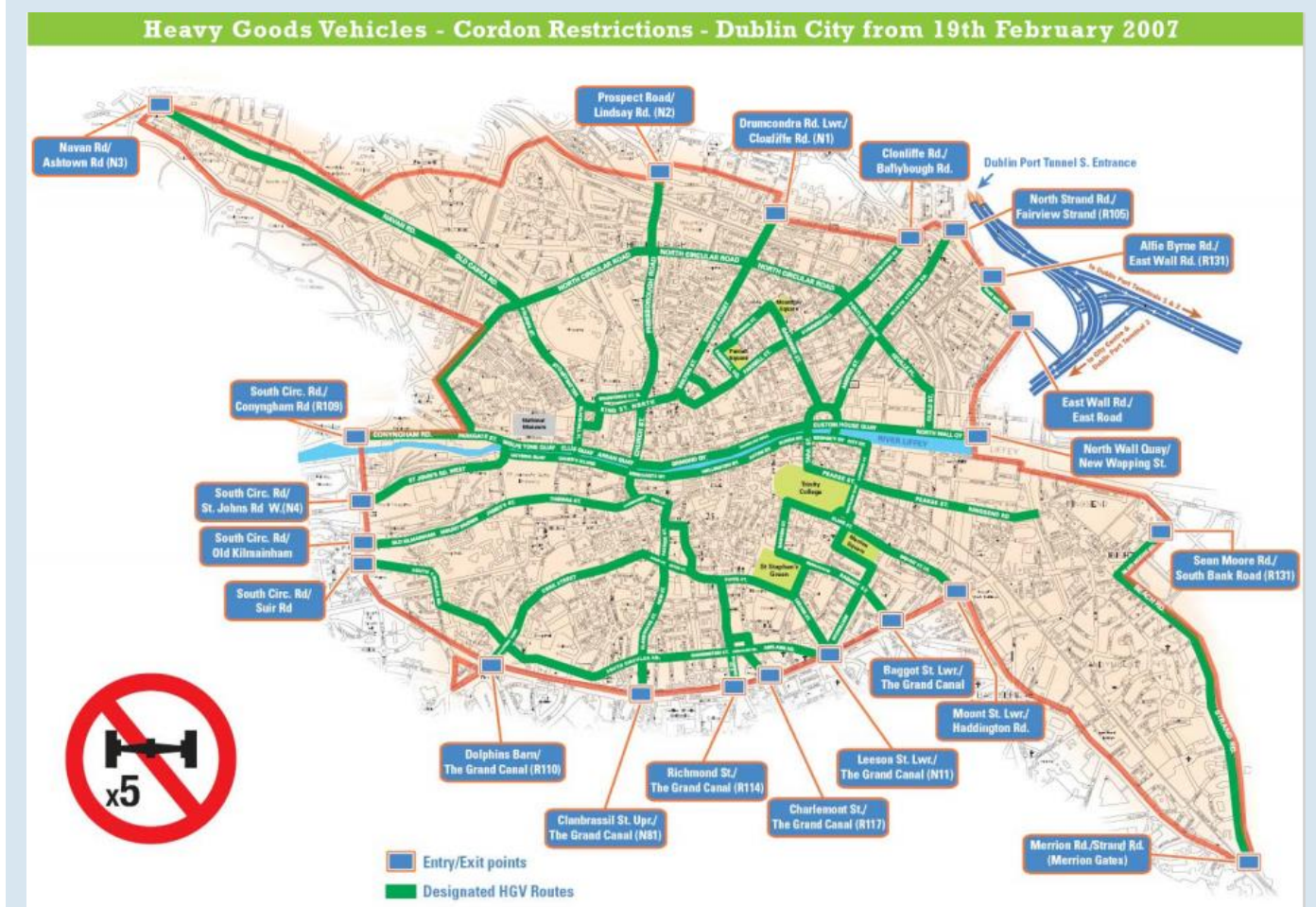


Figure 27 Cordon Restrictions as part of the HGV Management Strategy for the GDA (NTA, 2021)

Travel Demand Management

Within the GDA, tolling is applied at various points on the motorway network and is generally connected to schemes which were funded through Public Private Partnerships (PPPs). Dublin Port Tunnel uses tolling as a means to protect road space for HGVs. Advancements in tolling may include further demand management measures such as the TII's proposal to implement multi-point tolling on the M50 during peak periods to manage traffic levels on the route. A reduced tolling incentive regime was also rolled out in 2020 for alternatively fuelled HGVs to support re-modelling whilst tolling systems can be configured to incentivise the use of less polluting vehicles.

Variable Messaging Signs (VMS) are currently located on various sections of the road network in the GDA and provide for the communication of real time journey information to help re-route journeys or prioritise the movement of certain road users at different times of the day. This could be tailored to support the expeditious movement of freight, through the use of priority lanes, or to aid with re-routing car traffic to Park & Ride facilities to reduce traffic volumes as a whole. Incident Detection Systems (IDS) are also another means to aid network resilience and influence travel behaviour to minimise the impact on journey times and reliability.

PLANNING POLICY

Policy integration must take place across different areas beyond transport to ensure holistic approaches are being adopted to prevent freight and logistics being siloed. This is whilst ensuring consistent with the spatial planning policies and objectives set out in the Regional Spatial and Economic Strategy (RSES) adopted by the Eastern and Midland Regional Assembly in January 2020 and the National Planning Framework (NPF) 2018-2027.

The NPF aims to address unsustainable travel patterns and the implications that this could have on exacerbating congestion by promoting developments that reduce trip demand, distances and support the uptake on sustainable travel through the co-ordinated delivery of infrastructure and services in tandem. This can be extremely complex and involve multiple agencies. Encouraging policymakers and stakeholders to view developments through a 'freight lens' will be a first step toward embedding in good practice principles.

Freight efficiency, particularly intermodal movements of transport, rely on the seamless transition between different stages and stakeholders of the supply chain and the ease of access between and through local, national and international gateways. This can manifest in different ways and can be shaped by public authorities by means of:

Economic Agglomeration

The term to describe the clustering of businesses activity to support economies of scale, productivity efficiencies and cost reduction. The zoning principles deployed across the GDA are evident; ranging from Dublin Port and Dublin Airport Logistics Park (Inland Port) through to the hive of industry hugging the M50 south west of the city of Dublin. These locations, often in peri-urban settings, ultimately come to depend on high quality access by road but have limited rail capacity (with the exception of the Dublin Port).

Future agglomeration will depend on policy and investment commitments, including mode shift and multi-modalism, to unlock industry growth. This is hinted at in the optimum growth scenarios for the regional economic strategy (RSES); to promote smart specialisation and cluster policies based on identified strengths and competitive advantages. However, planning for key processing facilities is equally as pertinent in the current climate as the transport network; with a growing lack of affordable, accessible warehousing facilities available or visible to meet the demand of space (led by e-commerce). Planning complementary, intensive land uses is key.

The burgeoning freight and logistics sector is an emerging economic driver driven by both the proximity of strategic road and rail networks and clustering of suppliers, wholesales and third party logistics providers, offering competitive advantages through supply chain efficiencies. Alongside high-profile companies such as Amazon who had established distribution hubs pre pandemic amidst the boost in e-commerce, other third-party logistics companies, namely UPS, who recently acquired Irish Nightline Logistics Group, an Irish parcel delivery company, are also establishing residency. This presents a fantastic opportunity to work with industry to address some of the challenges faced from the rise in e-commerce.

The recent emergence of an Inland Port by Dublin Port adjacent to Dublin Airport signifies the future significance of the sector and its role in supporting local employment and economic prosperity. Continued investment in major infrastructural investment (such as Dublin Port Tunnel and radial road network around Dublin) continues to attract shippers and hauliers and will inevitably lead to future demand for warehousing capacity and associated land uses.

Dublin Port is developing Dublin Inland Port; a 44-hectare estate located 14km from Dublin Port which will comprise of empty storage depots, haulier facilities and warehousing facilities earmarked for existing operators in Dublin Port who will be reallocated from Dublin Port to Dublin Inland Port as DPC implements the Franchise Policy. This will help support the operational requirements of the container terminals at the port but more importantly help to manage traffic flows through to Dublin Port by road from a designated check in area. The Inland Port is explicitly zoned to include the activities envisaged by DPC including road transport depots and transport logistics facilities to expand the roles contribution towards the local economy.

Land Uses

Land use policy advocating greater development consolidation within urban areas will simultaneously boost the financial viability of public transport whilst improvements to the active travel network have been well underway across Dublin for many years to boost cycling and walking and reduce car dependency (Healthy Place Making). The population of the GDA is set to grow to 2.2

million by 2031⁷; which will lead to the increased intensification of land and additional demand for consuming goods.

The competing use of space and the ramifications on freight, notably waste management and local delivery access need to be considered in this equation. The docklands in particular and more specifically the intensification of development around the north and south quays are prime targets for embedding in best practice principles to offset the impact of construction and future delivery traffic within the immediacy. It is also key to safeguarding the resilience of all major freight handling facilities and freight corridors within and between neighbouring jurisdictions, including local government areas.

In another context, the M50 in particular, has acted as a magnet for large-scale, car centric employment developments such as office parks, business parks and industrial estates, including the intensification of employment at Sandyford / Leopardstown, Park West, City West, Grange Castle, Greenogue and between the M2 and N3 at Ballycoolin / Damastown to north of Blanchardstown. This has and will continue creating additional pressure on the road network.

Infrastructure Schemes

Infrastructure schemes, which are often integrated into land use planning decisions, are the most substantial category of measures and are usually implemented by public authorities. Due to the high cost of planning, implementing, and maintaining transport infrastructure in urban areas and their perception as being for the “public good”, they are often the only actors willing and able to fund their implementation. Public Private Partnerships (PPPs) have emerged over recent decades as another financing model to invest in substantial improvements to road, rail, sea and air networks whereby the initial capital and risk is absolved by public authorities to leverage private sector investment in the operational and longer term viability of initiatives that are associated with delivering a public good.

This would include developing a network of strategic rail-based park and ride facilities at appropriate points, as indicated in local policy narrative, where rail services intersect with the national road network, adjacent to, or outside of, the M50. Such schemes can incorporate a freight component, particularly in this context where there are opportunities to support micro consolidation (parcel locker provision) and parcels by public transport to dovetail service upgrades to DART and Metrolink.

Building Design

- Streetscape & Building Design

Fostering a ‘think freight’ mentality into to the design of buildings, street design and the future of urban precincts and neighbourhoods to accommodate the type, range and access requirements of vehicles that require front door deliveries (especially). This must take into consideration freight volumes, types and handling needs with the built environment being responsive to new designs. Rest facilities for drivers, especially in industrial parks and trading estates, must be accommodated through the planning process but be adequately designed to meet the needs and expectations of those working within the profession. Limited attention is given to freight and logistics, such as the

need to access kerbside or surface course materials within the Design Manual for Urban Roads and Streets (DMURS).

CONSOLIDATION

- Urban Consolidation

Consolidation, the means of grouping consignments in fewer vehicles based out of ‘remote’ or ‘last mile’ hubs are increasingly popular as a mechanism to reduce freight externalities in an urban setting but requires proactively identifying and developing appropriate sites with industry partners to bring this to fruition. In the context of the GDA, remote consolidation; hosting suppliers, couriers and other distribution activities, can benefit from the orbital nature of the M50 and radial road, rail and inland waterway connections to move goods within the city region, providing complementary policies is in place to upgrade transport network infrastructure.

There is a prime opportunity for the new NTA Park & Ride Design Office to factor in micro consolidation into the various Park & Ride projects through their design and planning stages, covering both manned and unmanned (parcel locker) facilities for the storage and movement of goods (namely parcels). Park & Ride sites are proposed in Project Ireland 2040: National Development Plan 2018-2027 and sites must look to incorporate provision for loading/unloading and any good handling/storage equipment to aid with the transhipment of goods.

Previous industry experience of consolidation points towards the challenges of a state led scheme comparatively to facilities that are accepted and embedded within business supply chains (the users). This brings into question whether a scheme should be voluntary or mandatory (including being incorporated into lease arrangements via ‘receivers’). The growth in third party logistics companies establishing bases around the GDA provides an opportunity to work with industry partners on initiatives that can re-mode and reduce trips into Dublin City and other towns across the GDA.

There is evidence of this type of initiative being explored; a ‘Last Mile Delivery Challenge’ was launched in late 2018 with six organisations, which was co-funded by Enterprise Ireland and Dublin City Council, in partnership with Belfast City Council, as part of the Small Business Innovation Research Programme. The feedback from trials revealed the need to upgrade parking legislation to reflect technological advancements alongside the need for detailed stakeholder engagement and buy-in from local businesses.

⁷ Eastern & Midland Regional Spatial & Economic Strategy 2019-2031, https://emra.ie/dubh/wp-content/uploads/2020/05/EMRA_RSES_1.4.5web.pdf

PLANNING CONDITIONS

- Delivery & Servicing Plans
- Construction Logistics Plans
- Streetscapes and Building Design

A prime opportunity to counteract the combined challenges of a growing urban population, rapid development growth and increased freight trips across GDA, is to embed a 'think freight' approach into the planning process and the conditions requested by developers to secure permission. Land zoned for housing, industrial development and employment/commercial uses will all have a freight requirement and generate freight movements; contributing and potentially exacerbating concerns around congestion, local access, pollution and road safety.

On this basis, there is an opportunity to embed freight best practice principles into the process of securing permission and ensuring new developments and urban regeneration mitigate the externalities from freight movements; during both the construction (build) phase and for day to day operations covering waste management, deliveries and servicing activity. This will require providing sufficient materials and guidance to developers and initially upskilling department staff on the value, requirements and application of conditions. This should align with a commitment in local policy discourse with consideration also given to enforcing conditions and monitoring compliance.

Good site management practices, traffic and construction management plans and consultation with the competent and statutory authorities prior to any port related developments have been outlined to be kept to a minimum over a short timescale. This approach to mitigation, combined with monitoring of these activities, should be upheld across all larger sites; with Dublin Port having taken a particularly proactive approach to development plans for their sites.

PROCUREMENT

- Sustainable Procurement
- Greener Fleets

Anchor institutions, large public and private sector organisations with deep roots within the GDA and notably sway over local decision making, also have substantial budgets and spending power to procure goods and services. Alongside obvious examples, such as each of the four local authorities, businesses such as Guinness, can arrange procurement contracts and terms to develop sustainable and local supply chains. This can help to reduce travel demand and freight miles with smaller organisations based within the GDA being able to compete on smaller contracts delivering goods over a shorter distance or in clean vehicles. This itself supports the local freight and logistics sector and local prosperity whilst minimising the impact of supply chain activities.

Whilst decarbonisation within the private sector is likely to be driven by cost efficiencies and a strong commitment to Corporate Social Responsibility (CSR) policies, public authorities can start to set future trends and are increasingly faced with legislative obligations to adapt procurement practices and policies to reflect this change.



Figure 28 Public authorities can take inspiration from other organisations mixed, green vehicle fleets (Fleet News, 2022)

The EU Clean Vehicles Directive could be a game changer to accelerating uptake of greener fleets across public sector bodies. This directive will be transposed into Irish law and will oblige public sector bodies to meet minimum targets for the share of low-emission and zero-emission vehicles in public procurement from August 2021. Furthermore, the Sustainable Energy Authority of Ireland (SEAI) mandates for enhanced energy efficiency and GHG emissions reduction for public authorities equivalent to 50% and 30% respectively by 2030.

ISO accreditation (ISO50001) is an internally recognised standard and practical means by which to improve energy use (and transport related activities, fleet operations/grey fleets) which is viewed as best practice for public authorities to uphold. Only 30 organisations across Ireland have been accredited so there is scope for future uptake.

INDUSTRY OPERATIONS

- Shared Assets
- Driver Training
- Accreditation & Recognition Scheme

First and foremost, businesses working within the freight sector are seeking to improve their operational performance to save time and reduce their overheads whilst seeking to enter new markets and build their reputations. Freight transport is always seeking to optimise journeys with hauliers, couriers and shippers naturally consolidating loads to reduce trips and maximise payloads. The rise of sharing platforms to broker spare vehicle capacity or share fleet and warehousing resources are growing whilst options to re-mode away from road freight, the dominant mode of freight transport, to rail or inland waterways, are proving more attractive against a backdrop of changes to local access changes and regulations.

There is growing demand by manufacturers and retailers that freight transport, distribution and logistics providers move goods with a low CO2 footprint and start to invest in environmentally friendly technologies and practices to reduce their impact on society. This transition is also necessary to remain competitive and for longer term financial sustainability. Businesses seeking to access warehousing space or managing a facility can also benefit from new trends towards sharing assets as a low cost means to enter burgeoning new markets.

The Irish Road Haulage industry recognises the challenge posed to individual operators to transition towards cleaner modes of transport and the role of fuel, fleet and journey efficiencies to reduce emissions in the short to medium term. The Low Emission Vehicle Taskforce, a cross section of key industry and academic stakeholders, have helped support the transition towards alternative fuels through incentive programmes but limited focus has been applied to a wider package of measures to maximise the use of assets and support better fleet management.

Whilst individual operators, notably larger companies with larger fleets (and vehicles) have likely explored eco driving techniques or upgraded to in cab telematics systems, additional promotion and targeted marketing campaigns, as well as incentives, would likely be required to nudge smaller companies towards greater uptake in schemes that could benefit their operational efficiencies.

NEXT STEPS

This section has sought to shine a light on the role and importance of public authorities in shaping the freight environment across the GDA and how the freight industry can respond to changing economic, environmental and social conditions. The practices highlighted must be further reviewed as part of the strategy development but are well placed to support freight related objectives and wider demands of society.

Similar to the other work packages, responsibility should lie with the Freight, Logistics and Gateways Freight Forum and Freight, Logistics and Gateways Steering Group to prioritise a list of interventions (based on the MCAF, see Introduction section). Appendix 4 and Appendix 5 provide the Terms of Reference (ToR) for these groups.

STAKEHOLDER ENGAGEMENT

INTRODUCTION

This chapter builds on the stakeholder profiling undertaken during the initial stages of the study for the sprint report, released in July 2021. This supplemented the consultation material available within the public domain as part of the release of the draft NTA Transport Strategy. The following sections within this chapter are as follows:

- **Engagement Rationale:** Providing a summary of why engagement was undertaken and how it was conducted for this study.
- **Consultation Feedback: Draft Transport Strategy for the Greater Dublin Area :** Providing a collated view of the main themes from the consultation in December 2021-January 2022.
- **Summary Findings: Stakeholder Workshop :** Snapshots of the issues, opportunities, barriers and the aspirations for planning a future freight strategy

ENGAGEMENT RATIONALE

The process of listening, collating and analysing feedback on freight related subject matters is crucial for forming developing a relevant and aspirational strategy for sustainable freight distribution strategy. The engagement process followed an initial assessment of freight and logistics related desktop research to develop a more granular understanding and assessment of future needs and priorities and to sense check initial assumptions of secondary based datasets.

The first and most obvious step was to collate together feedback from stakeholders who actively engaged with the freight components of the Draft Transport Strategy. A decision was also made at an early stage to put a particular emphasis on ensuring a representative mix of stakeholders were contacted and engaged during this study to help steer the development of the framework and to provide the foundations for a future strategy. Overall, the engagement process would look to encompass a sweet spot of actors across various sectors.



Industry

Comprising of supply chain operators, such as 3PLs, as well as retail outlets (e.g. supermarkets)



Public Authorities

Comprising of local authorities, highway and rail network infrastructure managers



Trade Associations

Representing sector /industry interests across different modes and businesses/residents

Engaging with a host of individual representatives across a number of key organisations and institutions at this stage was necessary on the basis of:

- Identifying key, relevant contacts across organisations and institutions, particularly as this can be a time consuming and challenging process to undertake.
- To understand and document the work undertaken to date across the GDA and to gain the buy in of stakeholders to the development of a strategy.
- To begin collating and synthesising key themes and work stream areas where there are particular priorities, research and investments required.

A key part of the rationale for stakeholder engagement for this study was the opportunity it presented to develop a vehicle for continued discussion and deliberation. In other words, this process marked the start of a continued dialogue across the different actors with the aim of developing a mutually beneficial strategy that would seek to conciliate varying objectives and ultimately foster a better understanding of each sectors needs and aspirations.

The following sections of this chapter cover the following:

- The feedback received from the NTA Draft Transport Strategy which was analysed to draw out the key themes and queries posed by consultees. This helped as a sense check against what was proposed for supporting the safe, efficient and sustainable movement of goods.
- The development of a stakeholder workshop for a select group of stakeholders to help discern priority areas for research and investigation as well as investment and forward planning.

CONSULTATION FEEDBACK: DRAFT GDA TRANSPORT STRATEGY

The consultation feedback to the NTA Draft Transport Strategy (the freight section) was downloaded and sifted to allow for a high-level content analysis of comments. This analysis was undertaken and illustrated using a 'Miro' board; with the aim of relaying the overarching themes through to officers at the NTA and to stakeholders taking part in a planned workshop as part of the study. A number of suggested 'ideas' were also made to facilitate discussion between the stakeholders invited to the workshop where the feedback to the consultation was relayed. The coloured sticky notes (see below) capture their responses to the major themes.

The main points arising from the consultation feedback were as follows:

- The appetite for developing a positive, proactive and collaborative relationship between different organisations involved, impacted and influenced by the movement of goods.
- The focus on alternative fuels in the short and longer term and the ongoing work being undertaken by industry and public sector organisations on accelerating decarbonisation.
- The consensus across all parties around the role of the planning system and regulatory measures to support industry whilst meeting wider social and environmental targets.

Main Themes

What was on the agenda?

The consultation, expressed by those who contributed, revealed six major themes underpinned by a constructive future working relationship to deliver an effective freight strategy.

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Submissions made on the Freight & Logistics Section



Consultees from Logistics Providers to Supermarkets to Local Groups



Notable absence of larger trade bodies and industry operators

Delivery Programme & Structure

Concerns expressed about the timeframes for the delivery of complex infrastructure and operational interventions in line with ambition carbon mitigation targets and growth agenda.

Ideas? Trial urban freight management package in Dublin City?

There appears to be fear of antisocial & security for parcel lockers, these locations need to be clear - these were motorway service based

Any surprises?

Consolidation (Macro v Micro)

Reservations expressed in relation to consolidation centres and impact on supply chain efficiency (when goods are already highly aggregated). However, emphasis on shared use facility should support SMEs and reduce half loads. Micro consolidation very popular intervention to unlock.

Ideas? Exploring more tailored consolidation centre (or flexi space) and using meanwhile space/vacant retail?

Micro consolidation sites can support sustainable final mile solutions such as e-bikes, EVs, parcel lockers etc. Can be shared facilities.

capacity & demand management - to 'keep freight moving'

Supportive Planning System

Ensuring the planning system supports the designation of suitable land for logistics operations in conducive areas, at a macro (peri urban) and micro (city centre) level to facilitate private sector investment.

Ideas? Planning policy relating to location of logistics; expand parcel locker network?

Future Working Relationship

Ensuring sound cooperation during development of a strategy and future interventions that acknowledge industry concerns (limiting access and logistics land) and support more holistic local authority objectives. May mitigate the need for regulatory interventions (initially)

Ideas? Develop Freight Quality Partnership (FQP) with ToR along thematic lines (e.g. consolidation/re-timing)?

Linking the alternative fuels solution to consolidation distribution solutions and ensuring that there are sufficient refuelling infrastructure in place be it CNG / electric / hydrogen - planning for this needs to start now -

Retiming Activity

Strong preference against imposing restrictions. A more voluntary approach for improving operational efficiency may be preferable for industry that includes promoting early morning deliveries to cost benefits (from a lack of congestion and easier access to site).

Ideas? Understand where delivery and servicing plans 'fit' within future planning and land use decision making?

Rail Freight Potential

Desire to raise profile of rail freight but lack of terminal facilities regionally and capacity concerns at Dublin Port (as well as appropriate handling equipment and laydown areas) present a barrier to mode shift from road. New SRFI seeks to address these concerns & links to other ports.

Ideas? Potential for rail freight - upgrading Dublin Port facilities for handling L-Lo and pursuing SRFI feasibility?

What does port laoise do?

Alternative Fuel Technologies

Greater clarity required on the preferred/optimal fuel technology for informing investment decisions by industry. This is a challenge on numerous fronts; the fuel mix of the future is likely to be mixed and electric LGVs uptake is constrained by lack of network/depot charging capacity

Ideas? Emphasis on using 'drop in' transition low carbon fuels as hydrogen and electric alternatives mature?

Role for renewable fuels for larger vehicles as a bridging technology until other solutions come online

Any thoughts on the Ideas?

Note: new Zero Emission Vehicle Ireland office being set up by DoT

new EU alt fuel regulations coming with min targets for charging facilities for freight (both electric and hydrogen).

CONSULTATION FEEDBACK: STAKEHOLDER WORKSHOP

INTRODUCTION

The importance of bringing together key representatives from across industry, public authorities and trade associations affiliated with maritime, rail, road and aviation sectors, cannot be understated. A detailed stakeholder contract matrix was collated at the start of the project with the primary aim of this morphing into a live database with relevant information for the purposes of developing of the strategy and forging future working relationships.

A filtered group of organisations were engaged during this study and invited to partake in an interactive workshop using 'Miro'. The workshop took place virtually using Microsoft Teams on the 29th June 2022 (14:00-16:00) and aimed to generate a broader understanding of topical subject matters. The list of those invitees who attended the workshop have been captured in Table 8. A broader stakeholder engagement process will be conducted in the event that a Sustainable Freight Distribution Strategy will be developed.

Organisation Invited	Sector/Grouping	Attended
Freight Transport Association Ireland (FTAI)	Trade Association	x
National Transport Authority (NTA)	Public Authority	x
Transport Infrastructure Ireland (TII)	Public Authority	x
Irish Rail	Public Authority/Industry	x
Dublin Airport Authority	Industry	x
BWG Foods	Industry	x
UPS	Industry	x

Table 8 Workshop Invitees (Author, 2021)

WORKSHOP STRUCTURE

The workshop sought to take those who attended on a journey through the progression of the study, the feedback from the consultation on the draft NTA Transport Strategy and, most importantly, to gather views on freight related questions in relation to the GDA. Inevitably feedback would be tailored to their aspirations and observations of each organisation whilst facilitating a holistic conversation on issues, opportunities and the barriers to change. The format was as follows:

1. Introduction to the Study: Outlining the agenda for the workshop
2. A Snapshot of the GDA Transport Strategy: Outline of the consultation and the role of freight as a component part of the strategy (and what was included).
3. A Strategy for Sustainable Freight Distribution: The purpose and rationale for developing a framework and strategy for moving goods safely, sustainably and efficiently.
4. The Purpose of the Workshop: Explaining the value of interacting with representatives of organisations at this stage.
5. Consultation Summary: Casting light on the main themes from the consultation feedback from the draft NTA Strategy.
6. Project Journey: Describing the different stages of developing the study including the four distinct 'work packages' that provide the basis of the framework.
7. Roundtable Discussions: The core part of the workshop where views and thoughts are collected via sticky note comments and facilitated discussions.
8. Developing a Framework: Acknowledging the need and value of contributions during the workshop to shaping the narrative.
9. Next Steps: Stating what the study aims to achieve and the 'look' of a future strategy.

The rest of this chapter will provide a summary of the main findings, focusing specifically on the feedback from the roundtable discussions.

The 'Miro' Board can act as a live feedback forum for the study and a reference point for the development of the strategy. This can continue to be accessed via the following link : https://miro.com/app/board/uXjVOAxum4A=?share_link_id=748652052439

ROUNDTABLE DISCUSSIONS: QUESTION ONE

What are the top three freight related issues and challenges do you encounter, with a particular focus on the Dublin area?

Several themes emerged from the assessment of stakeholder feedback, namely:

- The requirement for freight, particularly delivery and servicing, to be properly incorporated into the current and future design of streetscapes, management practices and building design and for this to be reflected in policy, guidance and best practice standards.
- The difficulty of incorporating 'innovation' and a 'think freight' ethos into planning policy; ranging from larger scale strategic planning of sites for distribution, through to localised interventions, such as locker banks.
- The need for certain corridors to prioritise road freight movements; namely the M50, which carries a mix of vehicles, including commercial traffic of international, national and regional significance between international gateways (which are dependent on road access).
- Network resilience is essential. Maintaining freight flows is crucial to national prosperity with demand management techniques being sought in the absence of substantial investment in infrastructure to expand capacity.
- The pace of change required for decarbonising commercial (road) vehicle fleets is uncertain (EV charging) and that realistically a 'fuel mix' will be required to help reduce emissions over the short and longer term – all of which requires costly investment in infrastructure provision.
- The limited amount of high quality freight data to be able to accurately plan and be responsive to the changing nature of the freight and logistics industry. There is also limited data transparency where this may exist across the public and private sector organisations.
- The need, but challenge, of balancing the objectives of the freight and logistics industry, accelerating the decarbonisation agenda and ensuring the protection of vulnerable road users. The roles and responsibilities are each party needs to be defined and a vision created.

The understanding of what constitutes 'good' planning for the movement of goods needs better consideration.

'Urban distribution poses very specific challenges, with around 60 stores within the canals, each receiving 3-4 pallets worth of stock per day. For example, real benefit for an electric HGV is for it to operate within the city centre all day, and not to be travelling in and out to a RDC/NDC.'

There is a huge dependency on road corridors (where traffic mixing takes place) which creates risk in the event of a temporary closure.

'85% of national RoRo/Lo-Lo traffic (pre-covid) went through Dublin Port and 85% of national passenger traffic goes through Dublin Airport. That means the M50 and its Dublin Port Tunnel are hugely important to national prosperity'

Your Views

What are your thoughts?

This is your chance to feedback on five questions to help us understand how to frame...the framework.

Grab a sticky note and pop in the yellow box



Question One

What are the top three freight related issues and challenges do you encountered, with a particular focus on the Dublin area?



ROUNDTABLE DISCUSSIONS: QUESTION TWO

What are the top three barriers to addressing freight issues and challenges, with a particular focus on the Dublin area?

Several themes emerged from the assessment of stakeholder feedback, namely:

- That planning for freight and logistics is difficult without having high quality freight data to inform decision making. Data sharing, particularly by the private sector (due to commercial sensitivity) is notoriously challenging, especially across competitors.
- The lack of clarity and policy positions on the use of alternative fuels and the extent to which this shapes investment decisions by industry. The lack of energy network infrastructure and connection upgrades is also a barrier to scaling up adoption of alternative fuel technologies.
 - Network connection costs for upgrades need to be reviewed, as the cost of enhancement can be very significant and sits with the operator on site. That can be prohibitive.
- The sheer complexity of highly interwoven supply chains and the subsequent challenges this presents to developing forms of consolidation (especially when industry already seeks to maximise efficiency). Consolidation is part of a package and not a silver bullet solution.
- Joined up thinking and a lack of coordinated approach towards infrastructure investment to match aspirations with reality. Feedback suggested that there had been lots of consideration around strategy but limited implementation historically.
 - The process of infrastructure investment, planning and approval can take a long time. Resource is limited and the approval processes can take years and even decades.

There is a big question about the role that government and public authorities should and can play in the development of safe, sustainable and efficient freight distribution. This commands attention but can split opinion, especially around subjects such as consolidation with one argument proposing that public sector intervention is needed to unlock access to multiple users of shared facilities through designating logistics land and mandating use by operators.

Your Views

What are your thoughts?

This is your chance to feedback on five questions to help us understand how to frame...the framework.

Grab a sticky note and pop in the yellow box



Question Two

What are the top three barriers to addressing freight issues and challenges, with a particular focus on the Dublin area?



ROUNDTABLE DISCUSSION: QUESTION THREE

What are the top three interventions for improving the movement of freight into and within the Dublin area over the short and longer term?

Several themes emerged from the assessment of stakeholder feedback, namely:

- The emphasis placed on traffic and delivery demand management proposals, ranging from designated 'freight lanes' on major corridors (strategic level), through to access and use of parking bays and areas (at a neighbourhood scale), including for construction volumes.
- The role of consolidation, in a form that is sustainable and viable, to help aggregate goods and rationalise deliveries. Where this could be located and how it could operate would need detailed investigation, including whether they are sector specific (e.g. retail, construction etc)
- The significant role that rail freight can play in helping to relieve congestion and free capacity on the strategic road network and particularly stimulating mode shift away from road freight for accessing ports across the GDA. There is a role for the public sector in designating land and aiding the process of bringing infrastructure online.
 - This aligns with the increase in intermodal, containerised traffic and the shift towards unaccompanied trailers as well as serving multiple extraction sites across the GDA.
 - Three intermodal terminals are being proposed alongside a SRFI within the GDA whilst rail based connections are being considered for Shannon, Foynes and Cork.
 - Increasing freight paths through to existing rail connected ports, including Wicklow and Drogheda as well as Dublin Port in the future.
- The role of e-cargo bikes as part of a package of urban freight interventions alongside other forms of zero emission vehicles for delivering larger volumes. E-cargo bikes and e-walkers are already operating from micro depots in Dublin City Centre to support last mile deliveries.
- The need for a greater focus on delivery and servicing. This ranges from influencing development control arrangements to incorporate best practice dynamics, through to re-timing deliveries as part of place making plans and to flatten peak delivery demand.
- The role that 'consumers', of procured goods and services, can play in helping shape the local freight dynamics by specifying environmental credentials in Service Level Agreements (SLAs), contracts and local procurement practices.
- Changing perceptions of the freight industry and to make the road freight sector more attractive for future generations. This included providing provision (e.g. parking, recreational facilities) for improving driver welfare to recruit and retain staff and meet freight demand.
 - This brings into question the role developers play in financially contributing towards provision through the planning process, especially around international gateways.

A freight awareness piece may be necessary to shape perceptions of the industry and to build greater recognition and consideration of freight across multiple disciplines (including demand management, development control, residential travel planning etc.). Consumers can also play a part by shifting purchasing behaviour and adopting sustainable practices – although this will need to be 'triggered' by other factors (e.g. eco-labelling) and early movers who can present themselves as environmentally responsible.

Your Views

What are your thoughts?

This is your chance to feedback on five questions to help us understand how to frame...the framework.

Grab a sticky note and pop in the yellow box

This means safety, sustainability, efficiency, economy and society



Question Three

What are the top three interventions for improving the movement of freight into and within the Dublin area over the short and longer term.



ROUNDTABLE DISCUSSION: QUESTION FOUR

What needs to happen to achieve the desired outcomes, with a particular focus on the Dublin area?

Several themes emerged from the assessment of stakeholder feedback, namely:

- To establish working relationships and contact between the aforementioned actors, namely industry, public authorities and trade associations to jointly plan, coordinate and shape future decision making. This includes fostering knowledge sharing and greater data transparency.
- To collectively raise awareness of the role and importance of freight and logistics across the public domain and to integrate core principles across multiple disciplines (through internal public authority departments, e.g. planning).
- To raise the profile of the importance and significance of freight and logistics, especially investment in infrastructure, within political spheres, especially where national and regional prosperity relies on creating a resilient and future ready network (e.g. TDM on M50 corridor).
- Greater transparency and input into strategic plan making; including highlighting land availability and opportunities, especially concerning space for warehousing and consolidation (macro and micro) and beginning the discourse around the form it takes with industry.
 - Presentation by Irish Rail on the Rail Freight Strategy
 - Presentation on changes to air cargo facilities at Dublin Airport
 - Start reaching out to public sector departments to give a voice to freight (e.g. on DEMURS)

STAKEHOLDER CONSULTATION: SUMMARY

The process of engaging with stakeholders is, arguably, the most critical in developing a relevant and aspirational strategy for sustainable freight distribution. In fact there are opportunities to build momentum in earnest through the Freight, Logistics and Gateways Freight forum (FLGFF) and Freight, Logistics and Gateways Steering Group (FLGSG) (see next chapter). This is both necessary and desirable based on the feedback from stakeholder consultation and feedback to promote a 'think freight' lens across other disciplines and bring together desperate sectors. There are a number of key, sector specific takeaways (not exhaustive) from the process namely:

- The importance of keeping freight flowing along the strategic road network, especially within the vicinity of Dublin Port (via the tunnel), Dublin Airport and established logistics activity within proximity to the M50. Network resilience is key.
- A TDM inspired approach which precludes providing greater road freight priority should be closer examined alongside supporting mode shift to rail where there are opportunities to link into international gateways and build on current trends and future scenarios.
- To unlock land for logistics space at a strategic level (warehousing, fulfilment and macro consolidation) alongside at the local level (micro consolidation and shared depots as part of an urban freight management package). The form of consolidation needs greater consideration.
- To invest in the energy network capacity and infrastructure to support the decarbonisation agenda, including additional, targeted provision of EV charging bays alongside other refuelling facilities within industrial sites and at international gateways for HGVs.
- To develop and incorporate the 'softer' behaviour change components into design guidance and best practice standards for ultimately influencing delivery and servicing activity.

Your Views

What are your thoughts?

This is your chance to feedback on five questions to help us understand how to frame...the framework.

Grab a sticky note and pop in the yellow box



Question Four

What needs to happen to achieve the desired outcomes, with a particular focus on the Dublin area?



A FUTURE STRATEGY

OVERVIEW

This chapter aims to set out some of the opportunities for developing a Sustainable Freight Distribution Strategy. It takes the content and structure of previous chapters and the feedback received from stakeholders to help guide how to help plan for the movement of goods.

Going forward, the development of a Freight Distribution Strategy will need dedicated resources, to give sufficient profile internally to the NTA and externally (with stakeholders). This is especially true for being able to link to other strategies and enable joined up thinking on freight related matters. At this stage, there is no defined 'vision' of what a strategy should or could look like, this could be determined by the proposed Freight, Logistics and Gateways Freight Forum (FLGFF) and Freight, Logistics and Gateways Steering Group (FLGSG) (see Introduction chapter).

Due consideration should be given to ways in which providing for safe, efficient and sustainable freight could be delivered alongside a strategy which puts onus on the 'implementation' and 'trialling' of schemes (vision and validate). One possible mechanism to consider as the strategy is developed, is the creation of a Future Transport Zone. This could provide a designated area as a 'testbed' to trial potential opportunities to help better understand their applicability to the movement of freight in the GDA and foster continued collaboration between all stakeholders. .



Figure 29 Future Transport Zone in the West of England (West of England Combined Authority, 2022)

A Future Transport Zone (FTZ)

One of the opportunities which could be considered by the NTA in partnership with partner organisations would be the development of a Future Transport Zone (FTZ). A FTZ provides a real-world testing zone to trial innovate ways to transport people and goods. Innovation in the freight and logistics industry is continual, with the vehicles and systems in operation today significantly enhanced, when compared to those of a decade previously. Those developments will continue in the future and there is an opportunity for the NTA and partner organisations to proactively encourage testing and implementation within operations within its area.

The approach adopts the principle of a 'Living Lab', which could actively encourage freight and logistics technology developers, investors and innovators to use Dublin as a test bed area under a programme of supervised and reported trials with real world operators. This could be facilitated through the proposed FLGSG/FLGFF, with a supporting specialist technical working group helping to deliver the Monitoring and Evaluation (M&E) requirements.

There are five stages:

1. **Pilot:** To quickly reach a Minimum Viable Product (MVP) for delivering a service/initiative.
2. **Evaluate:** To continually assess the benefits, challenges and outcomes of the pilot.
3. **Learn:** To capture the lessons from delivering a pilot and what to change in the future.
4. **Plan:** To develop a framework (including a tool) to scale or encourage adoption.
5. **Monitoring & Evaluation:** To assess the virtues of the pilot at periodic intervals.

Whilst it is normal to refer to optimisation for operational efficiencies, there are pressures on the industry to decarbonise and energy efficiency is becoming a top priority. Consequently, it is necessary for the strategy to be responsive to new Signals, Trends and Trajectories in freight, and for it to be continually reviewed. The 'Vision and Validate' approach is centred around desired outcomes for people and places, rather than the most probable outcomes based on current trajectories. In other words, creating a vision and validating this through tangible action.

What would be the benefits of developing a Future Transport Zone for the GDA?

- To address concerns about the disconnect between strategy and implementation of work across the GDA by piloting new innovations in a short period of time within a limited budget.
- To provide an impetus and sense of empowerment to the activities of the FLGSG/FLGFF; allowing for a designated budget to provide much more robust business cases in the future.
- To foster a mobility ecosystem where multiple trials are working in parallel in a 'systems approach' to foster positive change in the short term.

Designated funding and governance structure would be required to develop and support a FTZ. This does not need to be significant relative to the costs of infrastructure provision and with the aim

of relating lessons learnt to other regions. For example, in the UK, the *West of England Combined Authority* funding was £900k (ca. €1 million) from a total programme budget of £24.4 million⁸.

An FTZ also presents a unique opportunity to raise the profile of freight and logistics as a sector (a key issue raised during the stakeholder engagement) and can use the same overarching objectives to help steer and shift a package of freight management options. The collection of high quality freight data is absolutely essential, which is notoriously poor as an industry and can be showcased as demonstrators for others to follow suit.

Several of the suggested interventions captured during the stakeholder engagement process would fall within the scope of an FTZ (these have been identified in the MCAF as options to explore) namely:

- ✓ Exploring different forms of micro consolidation, including parcel lockers and shared use depots alongside the rolling out of micro mobility options in partnership with industry.
- ✓ Trialling delivery re-timing activity in local service centres and waste management partnerships to reduce freight miles and to spread demand outside of peak periods.
- ✓ Parcels as passengers; which involves looking at public transport (rail, coaches, bus) for moving goods on existing services. This includes optimising existing space/capacity.
- ✓ Helping shape future guidance and best practice, particularly revisions of DMURS and working with architectural and design institutions to apply a 'think freight' design lens
- ✓ Sharing warehouse assets and/or fulfilment centres between organisations working within the retail or wholesale sector through the use of new technologies.
- ✓ Load sharing platforms and port booking systems (developing new or upgrading existing varieties) as TDM measures to minimise port backlogs and reducing empty running.
- ✓ HGV Priority corridors which could be developed on a temporary basis for set duration before committing to more expensive, permanent infrastructure measures.

A FTZ is not a replacement for a strategy. In fact, the FTZ can help inform and be influenced by a strategy. However, it can be an early precursor to collaboration between industry, trade associations and public authorities, as demonstrated in a UK context. For instance, the Solent FTZ trailed the use of drones to deliver medical supplies to St. Mary's Hospital from the mainland to the Isle of Wight (via Solent Airport)⁹. The trail indicated the potential use of drones for delivery could offer substantial time savings to the island (or remotes part of the county). To a similar extent, at Shannon Airport and its 'smart campus'¹⁰ a trial for alternative aircraft propulsion systems is on-going. Trailing opportunities, such as those mentioned or similar, could offer a means to test their suitability to the GDA before being incorporated with a Sustainable Freight Distribution Strategy. This approach can inspire a sub-regional model across multiple modes to deliver tangible outcomes.



Figure 30 Future Mobility Campus at Shannon Airport (Regional Gateways, 2022)

⁸ West of England Combined Authority (2022) What is the Future Transport Zone?, <https://www.westofengland-ca.gov.uk/what-we-do/transport/future-transport-zone/>

⁹ Solent FTZ (2022) Solent Future Transport Zone, <https://www.solent-transport.com/solent-future-transport-zone/>

¹⁰ Enterprise Ireland (2022) Tánaiste opens Shannon's Hi-Tech Future Mobility Campus, <https://www.enterprise-ireland.com/en/news/pressreleases/2022-press-releases/tanaiste-opens-shannons-hi-tech-future-mobility-campus.html>

CONCLUSIONS & RECOMMENDATIONS

INTRODUCTION

This report attempts to set the scene and provide the framework for the development of a Sustainable Urban Freight Distribution Strategy. A sprint report was initially written to inform the development of the Draft NTA Transport Strategy for public consultation in late 2021 and was subsequently complemented by feedback from stakeholders and additional content to guide this final content and structure. Ultimately this report helps to frame the development of a Sustainable Freight Distribution Strategy (as per Measure Freight 1 in the GDA Transport Strategy) for the GDA at some stage in the future..

A future strategy (Measure Freight 1) must look towards developing a future ready approach towards freight transport founded on local context and an evidence base as well as a vision of what the sector should and could look like to meet economic, environmental and social objectives. It also must align with the objectives of the Transport Strategy, namely:

1. **An Enhanced Natural and Built Environment:** To meet our environmental obligations by transitioning to a clean, low emission transport system, reducing car dependency and increasing walking, cycling plus public transport use.
2. **Connected Communities and Better Quality of Life:** To enhance the health and quality of life of our society by improving connectivity between people and places, delivering safe and integrated transport options, and increasing opportunities for walking and cycling.
3. **A Strong Sustainable Economy:** Supporting economic activity and growth by improving the opportunity for people to travel for work or business where and when they need to and facilitating the efficient movement of goods.
4. **An Inclusive Transport System:** To deliver a high quality, equitable and accessible transport system, which caters for the needs of all members of society.

A future Sustainable Freight Distribution Strategy will look to accelerate the decarbonisation agenda, integrate smart technologies in logistics management and reinforce the important role that the strategic rail and road (including TEN-T) network play in moving freight sustainably and efficiently. Whilst there are challenges, a strategy can help unlock the possibility of innovative approaches to mitigate the impact of freight activity and reconcile with demand / demand patterns and operational requirements associated with other modes.

Ultimately, the future Sustainable Freight Distribution Strategy will look to inform the development of other measures outlined in the GDA Transport Strategy:

- Freight 2: Planning Policy & Freight
- Freight 3: HGV Management
- Freight 4: Rail Freight
- Freight 5: Consolidation Centres
- Freight 6: Environment Measures for Freight

APPROACH

The development of a Sustainable Freight Distribution Strategy (Figure 31) would consist of several component parts.

- **The Four Work Packages/Workstreams:** These are the four technical areas framed in this report whereby further data interrogation and insights can be gleaned from additional stakeholder engagement and the interrogation of the data catalogue. This process should look to inform the proposed measures outlined in the strategy. These can sit as separate technical annexes to a public facing output.
- **Future Transport Zone (FTZ):** This suggestion (see previous chapter) would be the vehicle for delivering trials and pilots concurrently with the development of a strategy. This would require funding being allocated to deliver trials with industry. The interventions would be best aligned with the measures (Freight 5/Freight 6) but should ultimately fall out of a review of the MCAF Tool.
- **The Heart of the Strategy:** The development of a freight forum and steering group will be the key component of bringing together a strategy that speaks for the industry and can guide future interventions and investments. Engagement with stakeholders provided invaluable insights into major issues and barriers and should continue to allow for sense checking assumptions. They will also ensure a link to the GDA Transport Strategy Objectives.
- **Sector/Audiences:** There are many opportunities that public authorities, trade associations and the freight industry can explore collectively and independently. However, a starting point prior to beginning any work on developing a strategy is the need to begin embedding a 'think freight' approach within the broader narrative about transport and land use planning and processes across the GDA.

There are also a number of 'future requirements' that interrelate to the component parts above. This includes having a plan for monitoring and evaluating the success of the strategy (and individual measures) as well as a master MCAF Tool and a clear governance structure to deliver the strategy. They are 'live' and liable to change.

To help contextualise, granular research and evidence could be collated for identifying logistics land across the GDA and informed by the specifications set by industry and the freight forum. The opportunities must then be easily identified and highlighted and enshrined in policy. A recommended measure may be an interactive GIS dashboard of available land. The requirement for a Delivery & Servicing Plan could also be clearly stipulated.

The key message is that all the above component parts (as illustrated in Figure 31) are key to producing and delivering a successful strategy.

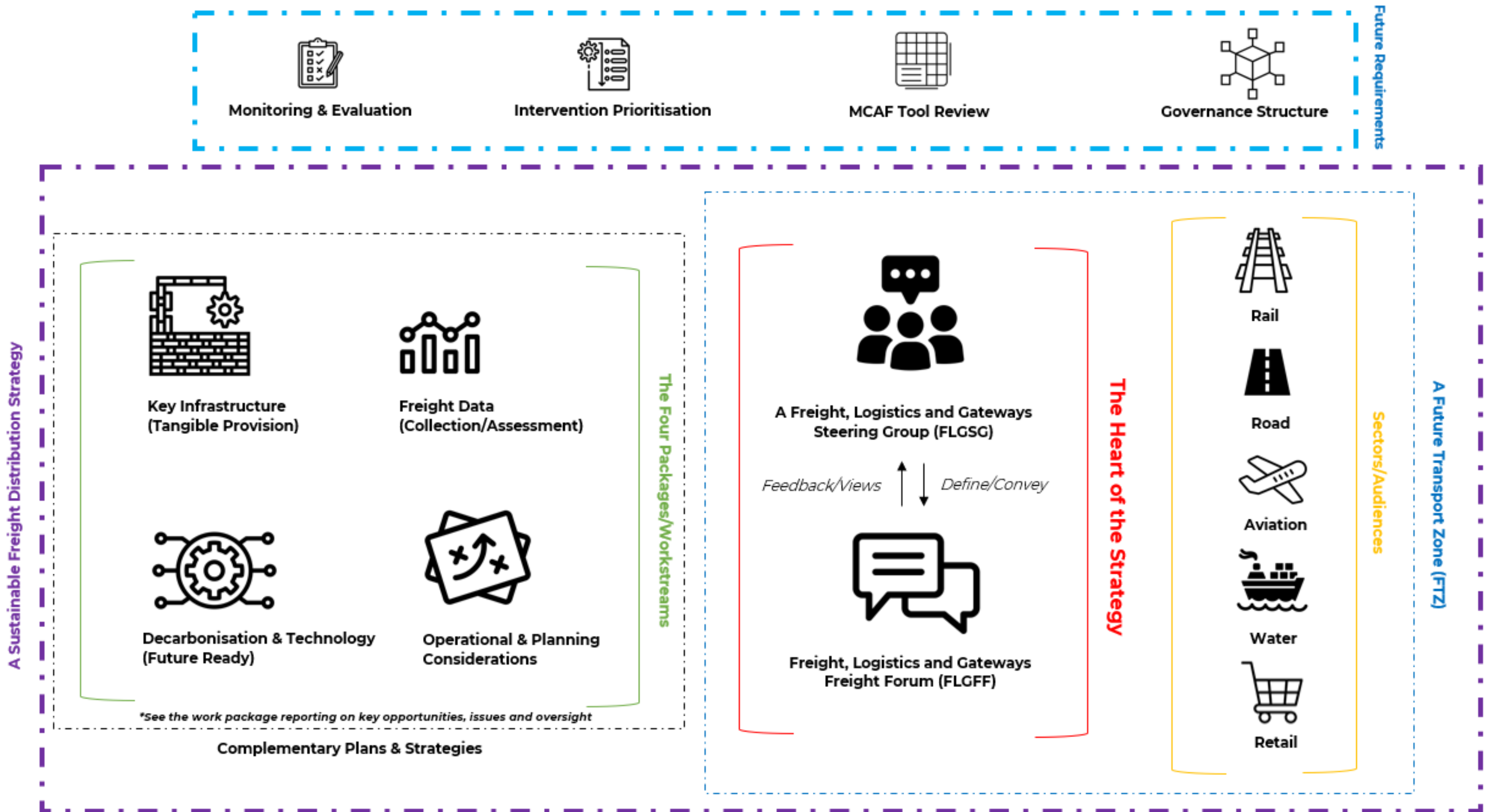


Figure 31 A Framework Map

NEXT STEPS

Now the overall approach has been provided, a set of recommended steps towards developing a strategy has been provided below.

Step	Description	Rationale/Advised
1	Consultants procured to develop the Sustainable Freight Distribution Strategy	On-boarding a reputable company. Risk Register and Project Plan established
2	Inception meeting to agree approach and way of working with core team	Will this entail developing/commitment to a FTZ to explore quick win measures?
3	Confirm ToR arrangement for a Freight Forum and Steering Group	Agreeing who will chair group and likely meeting structure/outcomes (see chapter)
4	Consultation with Trade Bodies, Industry and Public Authorities (Invite to FF/SG)	Use stakeholder matrix to engage/gather data and buy in to 'heart of the strategy'
5	Arrange first FF/SG to kick start strategy work and identify low hanging measures	Taking members on a journey and looking at piloting some measures (NDA Strategy).
6	Delving into the Data Catalogue to start compiling evidence base/baseline and address data gaps	This intelligence will help inform the technical work packages/work streams.
6a	Specific focus on developing evidence for measures in GDA Transport Strategy	Separate sub groups (sectors/audience) can help lead through the FF/SG.
7	Pull together technical work packages/work streams outputs	These can sit as separate documents that feed into the main, short strategy
8	Site visits between public sector officers and transport companies or shippers	Good opportunity to build in the 'think freight' component as part of the strategy
9	Add and filter MCAF Tools based on the technical work packages	Consultants can complete additional round with additional columns as evidence
10	Consultation on interventions with FF/SG and core Transport Team	Helps sense check the relevant interventions to pursue – and how.
11	Identification of funding streams and collaborators for measures	Providing detail on investment opportunities to unlock opportunities
12	Production of a concise final Sustainable Freight Distribution Strategy	This will take content from the technical work packages including implementation plan

Table 9 Recommended Next Steps (Author, 2022)

LAST WORD

This study has aimed to provide the foundations on which a future strategy for sustainable freight distribution can start to be developed.

A snapshot account has been provided of the current freight context across the GDA which has helped to frame the logic behind possible interventions for the safe, efficient and sustainable movement of goods (and servicing).

A framework for developing a strategy and suggestions on how to best go about this have been provided including the need to bring together a committed group of public bodies, industry and trade association representatives to establish a vehicle for taking forward and helping to shape a strategy (the freight forum/steering group).

Ultimately, a future freight strategy would help public and commercial bodies to improve the efficiency and reduce the impact of freight, delivery and servicing within urban areas and to progressively decarbonise the freight sector as set out in the Draft GDA Strategy 2022-2042.



Figure 32 It will be important to link in with ongoing initiatives across the City of Dublin as well as exploring separate interventions (SmartCitiesWorld, 2020)