City Quay

Delivery and Service Management Plan

Bakkala Consulting Engineers

Report No. B1876-BLP-RP-C-007
November 2022
Revision 01

BAKKALA CONSULTING ENGINEERS

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Document Control

Document: Delivery and Service Management Plan

Project: City Quay

Client: Bakkala Consulting Engineers

Report Number: B1876-BLP-RP-C-007

Document Checking:

Revision	Revision/ Review Date	Details of Issue	Authorised		
			Prepared By	Checked By	Approved By
01	03/11/2022	Information	Padraig O'Brien	Maurice Ryan	Maurice Ryan
00	02/11/2022	Review	Padraig O'Brien	Maurice Ryan	Maurice Ryan

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1 Introduction

1.1 Introduction

ByrneLooby have been engaged by Bakkala Consulting Engineers (Bakkala), on behalf of Ventaway Ltd., to complete a Delivery and Servicing Management Plan (DSMP) for the proposed development at City Quay in Dublin City Centre.

1.2 Report Objectives

The purpose of this document is to set out the intended strategy for managing both incoming and outgoing vehicular servicing of the proposed development (when operational) and to demonstrate how the proposed development can operate in terms of delivery of goods and the removal of waste. The development must operate in a safe and efficient manner and must take all measures to ensure negligible disruption at this busy city centre location.

Outgoing servicing shall principally comprise the collection of municipal waste generated by the occupation of the building, while incoming servicing shall include deliveries to the office and Arts centre elements of the development. Emergency vehicles will mainly be fire access.

This plan will identify industry standard operational systems which aim to consolidate and time deliveries / collections to outside of peak traffic and people movement times. In particular the following will be addressed:

- Details how the proposed development will be accessed and served by deliveries, including refuse vehicles and emergency vehicles,
- Outlines the number, type and frequency of service vehicles envisaged for the development and details how it will be managed,
- Swept-path analysis demonstrating the safe manoeuvrability of all vehicles servicing the site.

With any such building when operational, a dedicated Facilities Management Team shall co-ordinate and manage the implementation of this Delivery and Service Management Plan to ensure the optimal operation of the facility while limiting the impact on the surrounding environs and neighbouring properties and public space. The eventual Facilities Management Team shall be appointed by the overall property management team.

2 Site Description & Proposed Development

2.1 Existing Site Description

The site is located in the Dublin City Centre, at the junction between Moss Street and City Quay, as shown in Figure 2.1. The site is currently made up of a derelict three storey property which borders City Quay and Moss Street in the northwest of the site. The south of the site is made up of hardstanding areas which is used as a car park.

The area surrounding the site is generally made up of commercial premises. The River Liffey and Talbot Memorial Bridge are located directly north of the site. Access to the site is currently available from City Quay at the northeast corner of the site, as well as from Moss St., close to the southwest corner of the site.

Figure 2.1: Site Location (ref: Mahony Architecture)

The site borders City Quay, directly north of the site, Moss Street, directly west of the site, and Gloucester Street South directly south of the site. Park Rite City Quay Car Park and City Quay Covid-19 Test Centre borders the site in the northeast of the site, while City Quay National School borders the site along the south east boundary.

The total site footprint area is circa 2100m^2. The existing building occupies a footprint of circa 700m^2. The existing building is an amalgamation of a red bricked 3 storey building with pitched roof and an open plan studio type building with a flat roof. The buildings are loadbearing brick masonry construction with timber joist floors. Referring to OS historical mapping, we understand that the property was constructed in the 1850's.

The existing road and surface levels around the site boundaries range from approximately 2.95m to 3.15m OD.

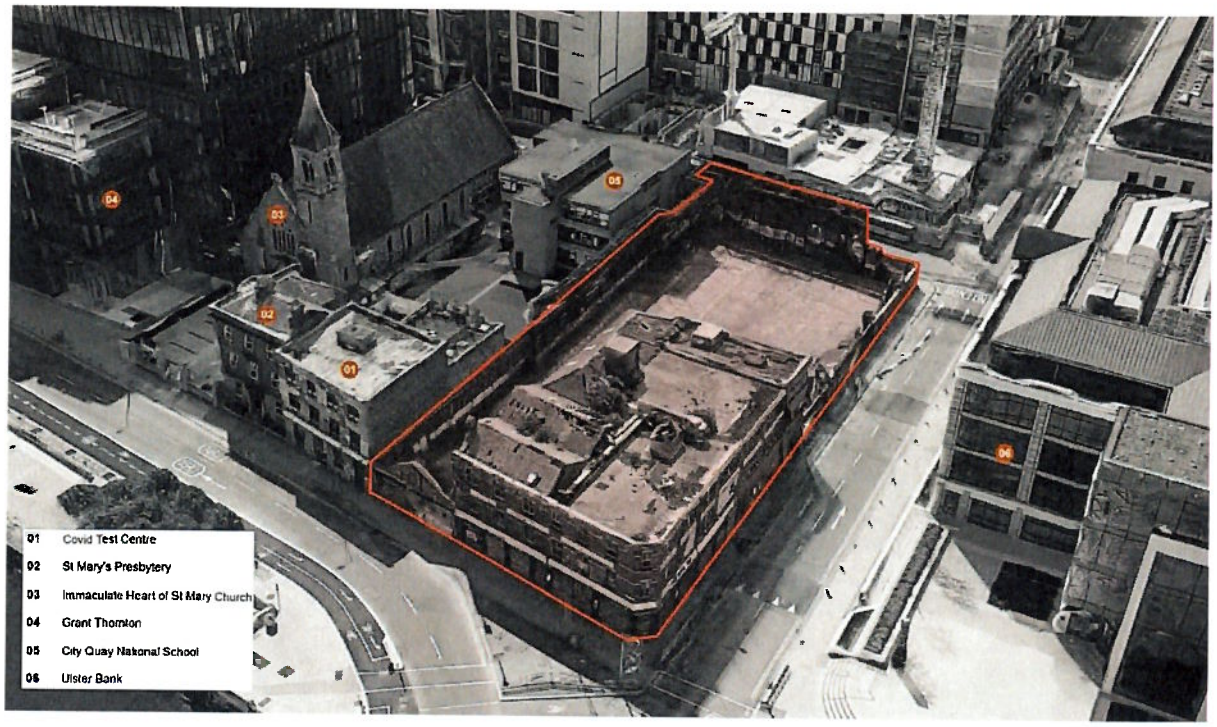

Figure 2.2: Existing site – pre demolition (ref: Mahony Architecture)

2.2 Proposed Development

The proposed development will deliver a 24 storey, 108m tall, mixed-use building containing an arts centre, office and café with 2 basement levels providing cyclist facilities, car parking, plantrooms and exhibition-performance space. The approximate floor areas are 32,030m^2 above ground and 3,880m^2 below ground, totalling 35,910m^2. The approximate floor areas of the Arts Centre, Office and Gym are 1404m^2, 22,587m^2 and 244m^2 respectively.

The existing road and surface levels around the site boundaries range from approximately 2.95m to 3.15m OD. The ground floor level of the proposed building will vary between street level at the building entrance, rising to 4.000m OD at the lift and stair lobby. The proposed development will have a two-level basement, with the lowest finished basement floor level set at -4.9m OD, a depth of 8.9m below the highest ground floor level.

The site's main vehicular access will be provided from Gloucester St. South, via a car lift to basement -2 level, where vehicle parking spaces will be provided. Pedestrian access will be provided from the respective street frontages. Cyclist access will also be provided from Gloucester St. South, via the car lift and a stair core with wheel ramp to basement -1 level, where cycle parking spaces will be provided.

2.3 Surrounding Transport System

Vehicular movement at City Quay and Moss Street, which bound the site to the north and west respectively, are part of a one-way road network system which is depicted in the Figure below. Traffic flows in both directions at Gloucester Street South.

Figure 2.3: Vehicular Traffic direction of movements (Basemap: Google Maps)

Vehicular traffic flows from north to south via the Talbot Memorial Bridge. Towards the southern end, road users then have the option of going west along George's Quay, east along City Quay or south towards Moss Street. Current vehicular access to Gloucester Street south at the southwest corner of the site, is also accessible via Moss Street.

Pedestrian access is currently provided on both sides of the pavement on all surrounding highway networks. The proposed development seeks to maintain, and where possible enhance, pedestrian access on all surrounding boundaries and will aim to promote the use of walking to and from site.

Cyclists are currently able to avail of the dedicated cycle lanes and trails on Talbot Memorial Bridge as well as George's Quay. A segregated trail also exists for cycling in both directions along City Quay. Cyclists are also able to easily access Moss Street, heading south and Gloucester Street south travelling east.

The site is considered very accessible for cyclists. There are good quality dedicated cycle lanes which have already been constructed along the Quays. There is also shared usage lanes in the surrounding vicinity that would provide connectivity between the site and the local road network.

3 Delivery and Service Management Plan

3.1 General Access Arrangements

This section details how the proposed development will be accessed by standard vehicles and cyclists and serviced by deliveries, including refuse vehicles and emergency vehicles. The primary access point for the proposed development is situated on the south of the site on Gloucester Street. This proposal will aim to alleviate any potential congestion upstream of the development and provide road users the option of continuing south on Moss Street.

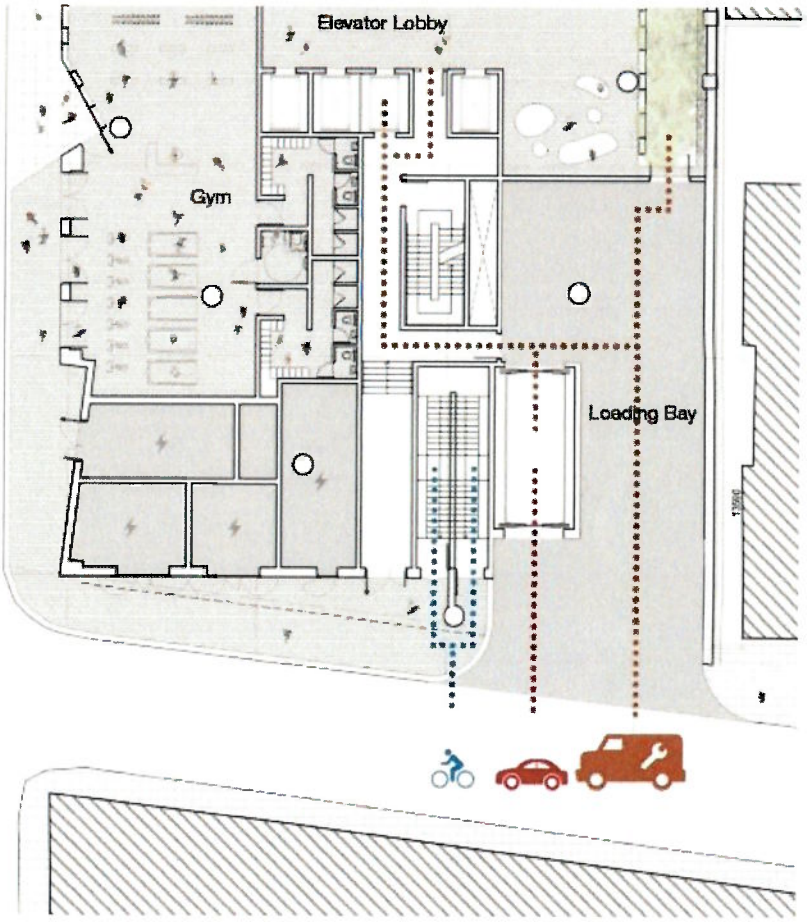

Figure 3.1: Main Vehicular Access Point from Gloucester Street (ref: Mahony Architects)

3.1.1 Service Vehicle Access

The building will be serviced from Gloucester Street South where access to a loading bay is provided. This loading bay is linked directly to the office reception area and lift core, where a service lift connects to all floors above ground level. It is envisaged that service vehicles will use the Gloucester Street South access for all loading operations. It is envisaged that deliveries will be managed with operational requirements for the servicing of the building in mind, as well as avoiding congestion and traffic build-up in the surrounding road network.

3.1.2 Car & Motorbike

The proposed development will be accessible for cars and motorbikes seeking to park on the site via the entrance at Gloucester Street South. Car and motorbike parking is provided at the lower basement level. A car lift is located next to the loading bay and serves the basement, allowing for the vertical transportation of cars, motorbikes and cyclists. Current architect's plans indicate provision for 9 No. car parking spaces, 2 No. disabled parking spaces and 20 No. motorbike spaces.

It is anticipated that any small service vehicles which are required to attend the building will be able to access the basement and will be assigned a previously booked parking bay for the duration of their works. No parking in the loading bay will be permitted. The Management Company will ensure that a suitable parking space is reserved for the small service vehicles.

3.1.3 Cyclists

In addition to the car lift, a double-width stairs with wheel tracks provides access for cyclist to the upper basement. A total of 424 standard bike parking spaces will be provided as well as 12 cargo bike spaces, 36 scooter spaces and a cycle repair dock. Cyclists will have access to a total 20 showers including 4 disabled accessible showers, 4 WCs and 430 lockers.

3.1.4 Fire Fighting Access

The fire fighting strategy for the building has been developed in consultation with the project fire fighting consultants and following meetings with Dublin City Fire Brigade. The primary points of access for the tower floors are located north and south of the lift core and the stairs exit onto Moss Street and Gloucester Street South providing well separated access points for the fire fighters to enter the building.

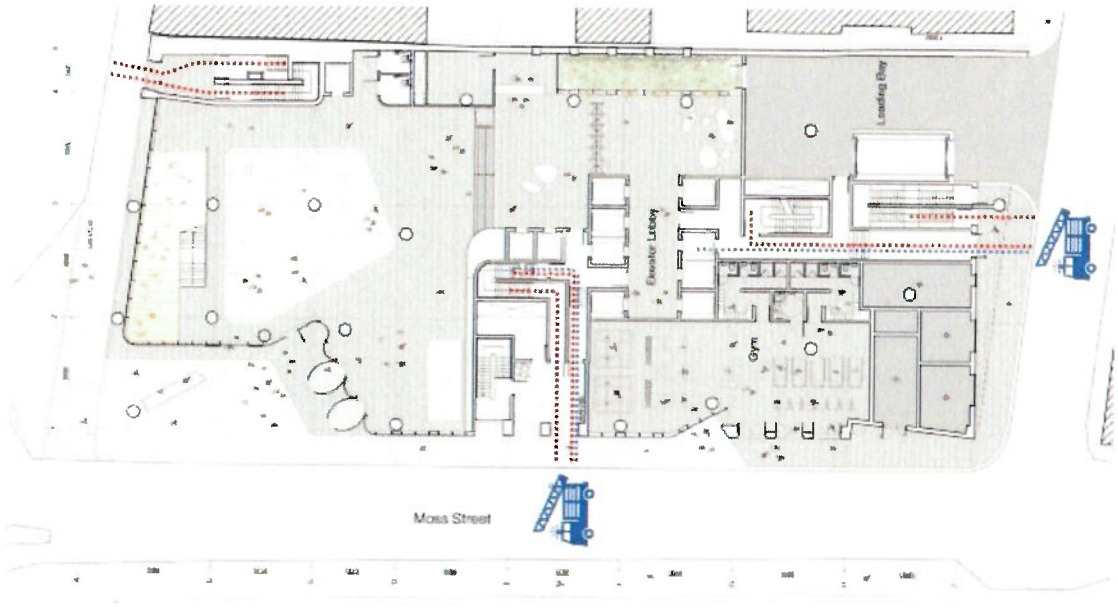

Figure 3.2: Fire Fighting Access (ref: Mahony Architects)

Internally, two of the lifts are dual access and serve as fire fighting lifts for all floors above ground. An additional fire escape stairs located at the north east corner of the building provides additional egress for the larger podium level floors and exits onto City Quay. Separate escape stairs serve the basement levels with independent exits to City Quay, Moss Street and Gloucester Street South.

3.1.5 Swept Path Analysis

A vehicle swept path analysis has been undertaken for a standard car and a light goods vehicle which will service the development. The swept path movements are depicted on drawing B1876-XX-XX-DR-C-SK-004 which is included in Appendix A. A snapshot of the vehicle swept path analysis is shown in the figure.

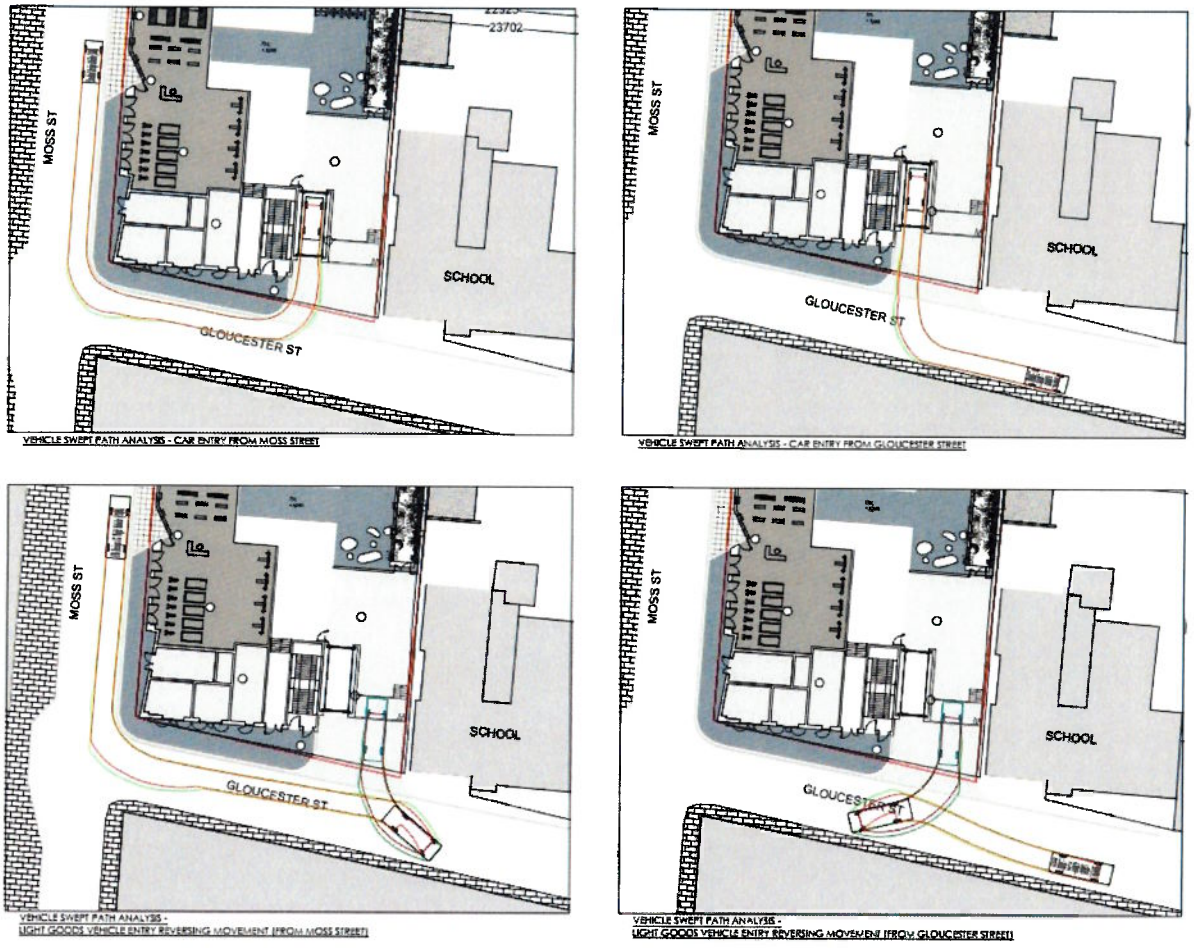

Figure 3.3: Swept Path Analysis (refer to Appendix A)

3.2 Number, Type & Frequency of Servicing

3.2.1 Waste

An Operational Waste Management Plan has been prepared by AWN Consulting and has been included as part of the application submission. As outlined in the Operational Waste Management Plan, the total waste volume was estimated to be 68.79m^3 per week for the office areas and 1.09m^3 per week for the Arts Centre. The waste storage design has been based on the following frequencies of collection:

- Mixed non-recyclables (MNR), dry mixed recyclables (DMR) and organics – twice weekly
- Glass – weekly

This equates to 3 waste or refuse collections per week. In addition, occasional waste collections are expected which would include confidential paper with once per fortnight collection envisaged and WEEE (electrical, electronic and battery) waste envisaged at a twice-yearly collection.

Section 3.3 below presents more detail on the proposed waste management, storage and collection.

3.2.2 Other Servicing

Other incoming servicing of the proposed development are expected to comprise the following operations:

- Postal deliveries to the office, gym and Arts centre
- Food/beverage deliveries to office, gym and Arts centre (e.g. lunches)
- Other servicing of office, gym and Arts centre (e.g. tradespeople, lift maintenance and service teams)

The number of weekly servicing vehicle trips for the proposed development has been derived with reference to typical servicing arrangements for a similar development. An estimate of the frequency of such servicing trips is given in the Table overleaf which includes waste and refuse.

When excluding emergency services, the total number of deliveries comes to 3,645 which in turn equates to approximately 10 per day. Due to the low number of servicing movements predicted it is not envisaged that development servicing will have a noticeable impact on the surrounding road network. It is noted that some frequencies estimated in the table below can be expected to vary (e.g. catering frequencies, furniture / gym equipment) and hence this is presented as a best estimate only.

These activities shall be managed by the Facilities Management Team, to ensure coordination of the activities and deliveries.

Table 1: Expected servicing schedule for development

Service Requirements	Vehicle Type	Maximum Duration of Activity	Frequency of Visit	Nature of Service	Set Down Area
Waste: MNR, DMR, Organics	Bin Lorry / LGV	10 mins	2 per week	Bin Collection	Loading Bay
Waste: Glass	Bin Lorry / LGV	10 mins	1 per week	Bin Collection	Loading Bay
Waste: WEEE	Bin Lorry / LGV	10 mins	2 per year	Bin Collection	Loading Bay
Waste: Confidential paper	Bin Lorry / LGV	10 mins	2 per month	Bin Collection	Loading Bay
Lift maintenance (routine)	Small van	1 day	4 per year	Servicing	Basement car park
Fire service maintenance (routine)	Small van	1 day	4 per year	Servicing	Basement car park
Fire extinguisher inspection (routine)	Small van	1 day	2 per year	Servicing	Basement car park
Postal Deliveries (an Post)	Small van	10 mins	1 per day	Small packages	Loading Bay
Courier Deliveries (private)	Small van	20 mins	3 per day*	Small / medium packages	Loading Bay
Café deliveries	LGV	20 mins	3 per week	Food/beverages/ small trays	Loading Bay
Lunches / catering	Cyclists, small car, motorbike	10 mins	5 per day*	Small packages	Basement car park
Furniture or gym equipment	LGV	0.5 day	1 per month*	Large packages	Loading Bay
HVAC system maintenance (emergency)	Small van	N/A	N/A	Servicing	Basement car park
Electrical system maintenance (emergency)	Small van	N/A	N/A	Servicing	Basement car park
Firefighting (emergency)	Fire Truck	N/A	N/A	Firefighting	Designated areas
Lift system (emergency	Small van	N/A	N/A	Servicing	Basement car park

Table notes: * = frequency subject to variance; LGV = light goods vehicle

3.2.3 Timing Arrangements

Peak hour deliveries will be discouraged throughout the development. Servicing and deliveries will be undertaken outside of peak hours and school drop off and collection hours, where possible. On the basis that the AM peak is often the busiest hour for servicing, the operation of the development will spread deliveries throughout the day wherever possible. The majority of postal deliveries will be delivered directly to the concierge and therefore the delivery time will be minimal in this instance.

It is anticipated that any small service vehicles which are required to attend the building will be able to access the basement and will be assigned a previously booked parking bay for the duration of their works. No parking in the loading bay will be permitted. The Management Company will ensure that a suitable parking space is reserved for the small service vehicles.

3.2.4 Queuing

Given the number of car spaces available in the basement car park (11), queuing is not in envisaged for the car lift. Access to these spaces shall be limited and controlled by the Facilities Management Team such that daily use, and hence access, shall be staggered to ensure queuing is avoided.

In addition, out of the 10 daily service/deliveries anticipated, many of these will be postal and/or food deliveries which are expected to have quick turnaround times. LGV deliveries will be coordinated with Facilities Management to ensure they do not clash with known LGV visits such as refuse.

In the rare event that queuing will occur for the car lift, as outlined in the Road Safety Audit, the current on-street parking bays along Gloucester Street is proposed to be removed, which will facilitate two-way traffic on Gloucester Street. This in turn would allow vehicles to manoeuvre around any vehicles waiting for the car lift.

3.3 Waste Management & Storage

3.3.1 Operational Plan

An Operational Waste Management Plan has been prepared by AWN Consulting and has been included as part of the application submission. Upon completion of the development, a Management Company shall be constituted, with the remit to provide and maintain common areas and communal facilities within the development, including all waste collection and segregation facilities. The Management Company shall prepare an Operational Waste Control Strategy for the development, which shall detail specific operational arrangements. The sections below summarise the proposed arrangements for waste storage and collection.

3.3.2 Waste Storage

The development shall provide sufficient facilities for storage and collection of segregated waste. The Waste Storage Area (WSA) is located at basement -2 level (lower-level basement). The location of the WSA can been seen in the figure below and on the drawings submitted with the planning application. Bins are transported from the office floors to the loading bay area and then taken to the bin storage area in the lower basement level via the car lift.

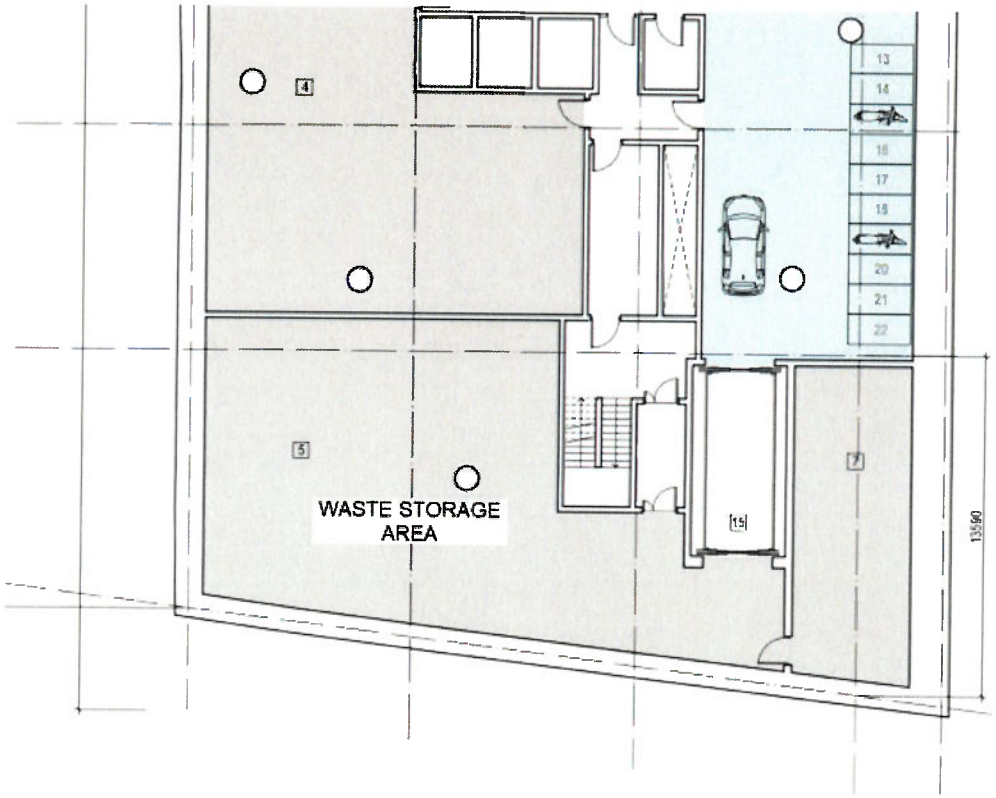

Figure 3.4: Waste Storage Area (ref: Mahony Architects)

The waste will be separated into four streams ready for collection; organic waste, dry mixed recyclables, glass and mixed non-recyclables. The Operational Waste Management Plan prepared by AWN Consulting has made an estimate of the waste generation volumes for the development and in turn has outlined the preliminary waste storage requirements for various waste types based on a *twice weekly* collection for mixed non-recyclables, dry mixed recyclables and organics and *weekly* collection for glass. The proposals are replicated in the Table below.

Table 2: Waste Storage Requirements for the Development (ref: AWN Consulting)

Area/Use	Mixed Non-Recyclables	Dry Mixed Recyclables	Organics	Glass	Bales (Plastic & Cardboard)	Equipment
Office, Arts Centre, WSA	11 x 1100L	9 x 1100L	6 x 240L	2 x 240L	14	Bramidan B3 Baler 2 x Roll Cages

The waste receptacle requirements have been established from distribution of the total weekly waste generation estimate into the holding capacity of each receptacle type. Waste storage receptacles as per Table above (or similar appropriate approved containers) will be provided by the facilities management company in the WSA.

3.3.3 Waste Collection Arrangements

Refuse collection will be undertaken outside of peak hours and school drop off and collection hours where possible, with the specific collection times being arranged with the private waste contractors to minimise the impacts on the operation of the site. The Operational Waste Management Plan prepared by AWN Consulting has made an estimate of twice weekly collections for mixed non-recyclables, dry mixed recyclables and organics and weekly collections for glass.

Immediately prior to collection, the waste receptacles/bales of segregated waste/recyclables will be conveyed by the waste contractor or facilities management via the car lift adjacent to the WSA, to the designated staging area at ground floor level. The staging area will be located adjacent to the loading bay as shown in the figure below. The location of the staging area is such that it will not obstruct traffic or pedestrians (allowing a footway path of at least 1.8m, the space needed for two wheelchairs to pass each other) as is recommended in the Design Manual for Urban Roads and Streets (2019).

From the staging area the bins will be collected/emptied on Gloucester Street South by the nominated waste contractor. Following emptying by the waste contractor, waste receptacles will be promptly removed from the staging areas and returned to the WSA. Bin / bale collection times/days will be staggered to reduce the number of bins required to be emptied at once and the time the waste vehicle is onsite. This will be determined during the process of appointment of a suitable waste contractor.

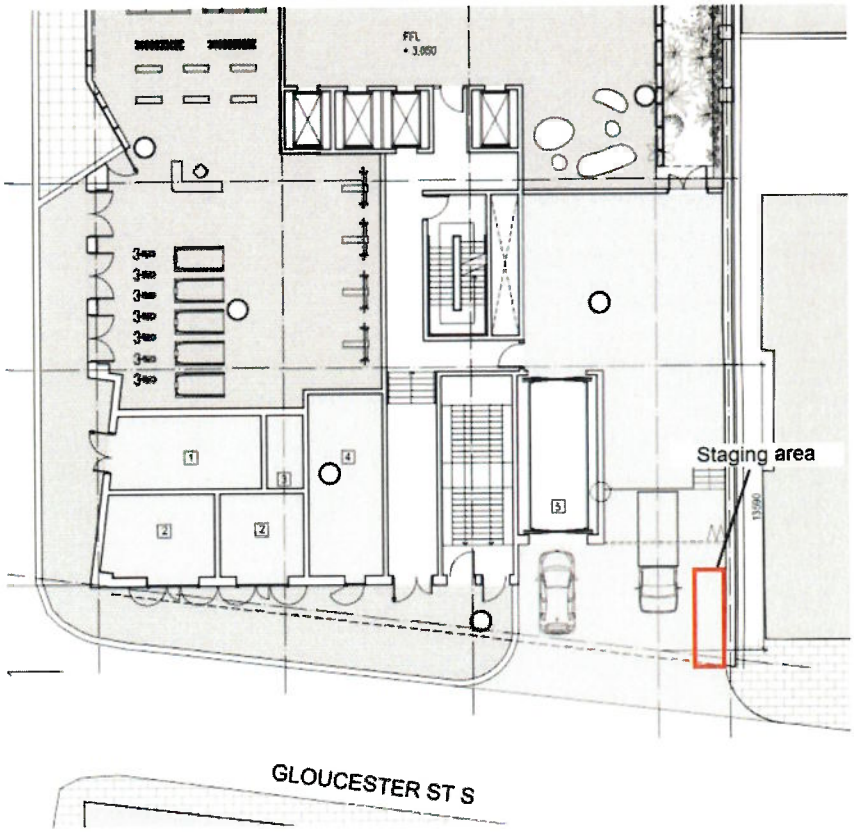

Figure 3.5: Waste Storage Area (ref: AWN Consulting)

3.4 Accommodating Special Deliveries

Any special deliveries to the proposed development will need to be arranged with site management in advance. Special deliveries are defined as unusually large items which would arrive on an infrequent basis. The delivery time and duration will be agreed with the site management office to minimise the impact upon the routine daily servicing requirements of the development and the surrounding road network. All special deliveries should be arranged for off-peak periods, where possible.

3.5 Operational Coordination, Restrictions and Enforcement

The development's Management Company and Facilities Management Team shall be responsible for establishing and enforcing restrictions on the nature and scheduling of permitted vehicular servicing operations within the site. The Management Company and Facilities Management Team shall maintain records of all large deliveries and shall coordinate with all development occupants to ensure that regular scheduled servicing operations are conducted at suitable times and do not conflict with one another.

The Management Company and Facilities Management Team shall take enforcement measures where such operations are conducted without its approval; these may include vehicle clamping or towing. The Management Company and Facilities Management Team shall also be responsible for

preventing unauthorised vehicle parking within the development, which may obstruct servicing operations and could endanger vulnerable road users.

The appointed site management company will be responsible for the provision of staff training relating to all operational procedures.

Appendix A – Swept Path Analysis

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Appendix C – Stage 1 Road Safety Audit

Byrne Looby

Proposed Office Development at 23-35 Moss Street, 2-6 Gloucester Street & 1-6 City Quay, Dublin 2

Stage 1 Road Safety Audit

P·M·C·E

November 2022

Byrne Looby

Proposed Office Development at 23-35 Moss Street, 2-6 Gloucester Street & 1-6 City Quay, Dublin 2

Stage 1 Road Safety Audit

Document Ref:	P22-058-RSA-PD-RP-001

Rev	Prepared By	Reviewed By	Approved By	Issue Date	Reason for Revision
2.0	TAG	NB	TAG	1st Nov 2022	Final Report
1.0	TAG	NB	TAG	1st Nov 2022	Draft Report

P·M·C·E

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1 Introduction

1.1 General

This report results from a Stage 1 Road Safety Audit on a proposed multi-storey office development at 23-35 Moss Street, 2-6 Gloucester Street & 1-6 City Quay, Dublin 2, carried out at the request of Mr Maurice Ryan of Byrne Looby.

The members of the Road Safety Audit Team are independent of the design team, and include:

Mr. Aly Gleeson
(BSc MEng MBA RSACert CEng FIEI)
Road Safety Audit Team Leader

Mr. Norman Bruton
(BE RSACert CEng FIEI)
Road Safety Audit Team Member

The Road Safety Audit took place during October and November 2022 and comprised an examination of the documents provided by the designers (see Appendix B). In addition to examining the documents supplied the Road Safety Audit Team visited the site of the proposed measures on the 26th October 2022. Weather conditions during the site visit were dry and the road surface was dry. Traffic volumes during the site visit were moderate, pedestrian and cyclist volumes were moderate and traffic speeds were considered to be generally within the posted speed limit.

Where problems are relevant to specific locations these are shown on drawing extracts within the main body of the report and their locations are shown in Appendix D. Where problems are general to the proposals sample drawing extracts are within the main body of the report, where considered necessary.

This Stage 1 Road Safety Audit has been carried out in accordance with the requirements of GE-STY-01024 - Road Safety Audit (December 2017), contained on the Transport Infrastructure Ireland (TII) Publications website.

The scheme has been examined and this report compiled in respect of the consideration of those matters that have an adverse effect on road safety and considers the perspective of all road users. It has not been examined or verified for compliance with any other standards or criteria. The problems identified in this report are considered to require action in order to improve the safety of the scheme and minimise collision occurrence.

If any of the recommendations within this road safety audit report are not accepted, a written response is required, stating reasons for non-acceptance. Comments made within the report under the heading of Observations are intended to be for information only. Written responses to Observations are not required.

1.2 Items Not Submitted for Auditing

Details of the following items were not submitted for audit; therefore no specific problems have been identified at this stage relating to these design elements, however where the absence of this information has given rise to a safety concern it has been commented upon in Section 3:

- Visibility splays

2 Project Description

2.1 General

A new multi-storey office development is proposed at the junction between Moss Street and City Quay in Dublin 2. The application site consists of lands bounded by City Quay to the north, Moss Street to the west, Gloucester Street South to the south and the City Quay National School to the east (see Figure 2-1).

The proposed development is in the centre of Dublin City, c. 165m east of the Tara Street DART Station, 250m south of the Busáras and the Luas Red Line and 400m south of Connolly Station. The site is presently brownfield in nature and includes a disused three storey building on the northern portion of the site and a surface car park on the southern portion.

Adjacent the site, to the east, are the City Quay National School, St. Marys Crèche & Pre-School and the City Quay Church. To the west, on the opposite (western) side of Moss Street is the St. George's Quay office building.

A recently completed hotel and residential development is located to the south, on the opposite (southern) side of Gloucester Street South.

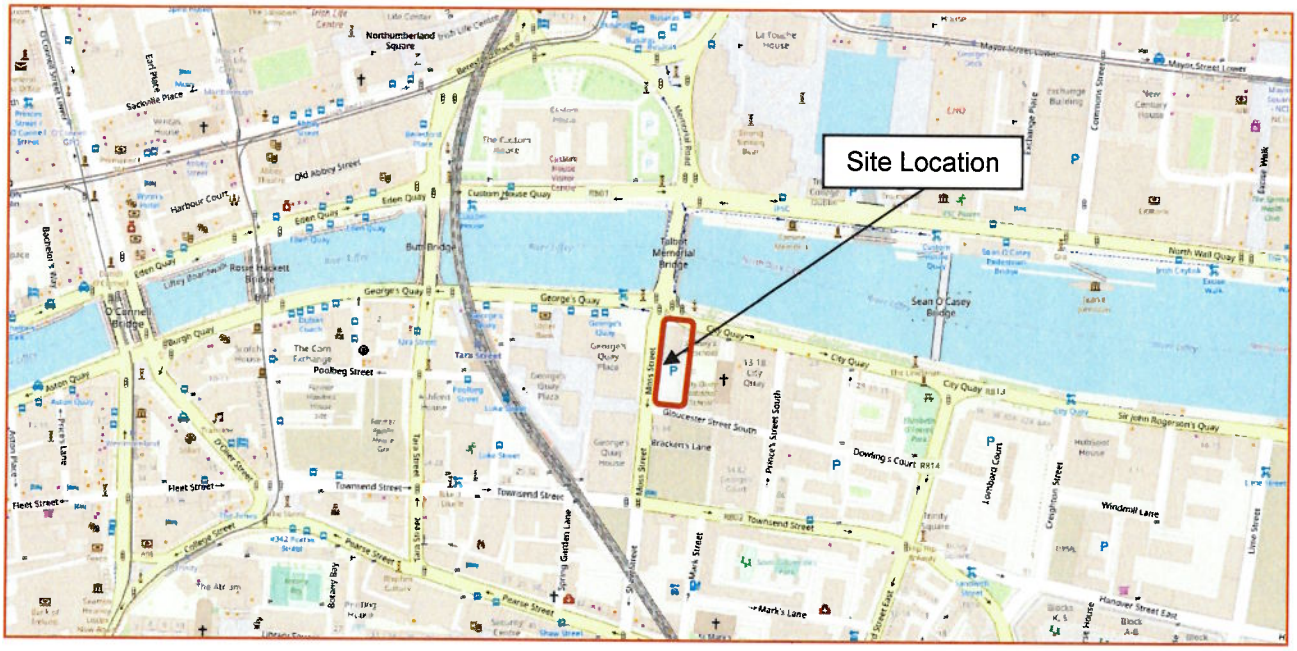


FIGURE 2-1 LOCATION PLAN (SOURCE: WWW.OPENSTREETMAP.ORG)

The proposed development would consist of a new 24-storey building accommodating offices (c. 22,587m²), a gym (c. 244m2) and a community arts facility (c. 1,404m2). Vehicular access to the development would be via Gloucester Street South, where a loading bay for service/maintenance vehicles would also be located and a car lift for private vehicle access to the proposed basement parking. Within the proposed basement parking there would be 11 electric vehicle (EV) car parking spaces (on the basement level -2), 22 motorcycle parking spaces, 36 Electric Scooter parking spaces and 424 bicycle parking stations.

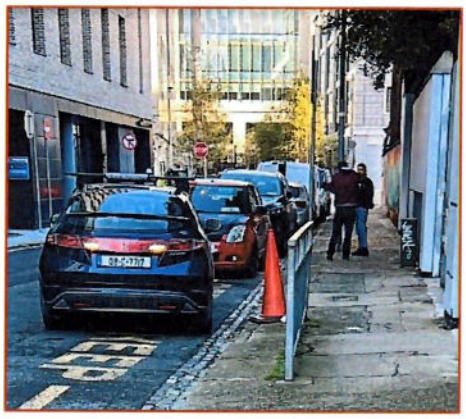
Pedestrian access to the development would be from Moss Street, along the western boundary, where it is proposed to widen the existing footpath.

3 Main Report

3.1 Problem

Location: *Dwg. 2106-MA-01-ZZ-DR-A-0111 (Rev P01)*

Summary: *On-street parking may block a driver's visibility as they exit the car park/lift.*



There is an existing permit parking bay on the northern side of Gloucester Street South. When occupied, the parking bay may limit or obstruct visibility between drivers exiting the development's carpark, and vehicles or cyclists on the carriageway, increasing the risk of side-on collisions.

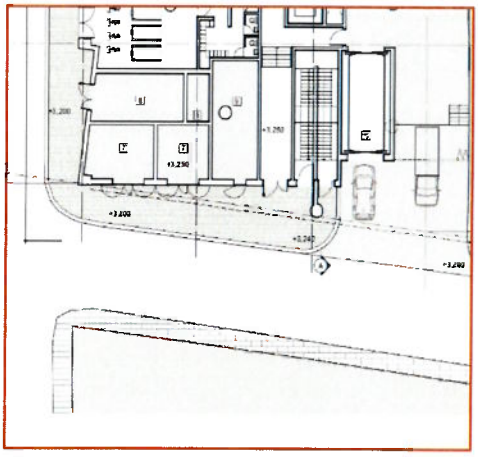
Recommendation

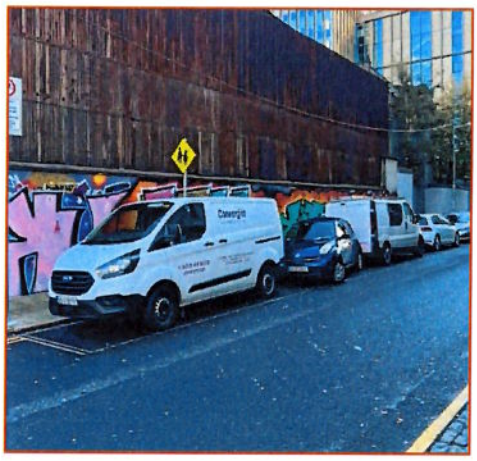
Ensure required sightlines are free from obstructions.

3.2 Problem

Location: *Dwg. 2106-MA-01-ZZ-DR-A-0111 (Rev P01)*

Summary: Removal of the parking bay could lead to informal parking on the footway, or in front of the school, leading to vehicle/pedestrian collisions.





It is unclear if the parking bay on Gloucester Street South is being removed or retained (in reduced form) as part of the development. Should the parking bay be removed, regular users of the parking bay may be forced to park on the footway in the absence of any local parking provision. Informal parking on the footway could result in pedestrians needing to temporarily step into the carriageway, where they are at an increased risk of being struck by a vehicle.

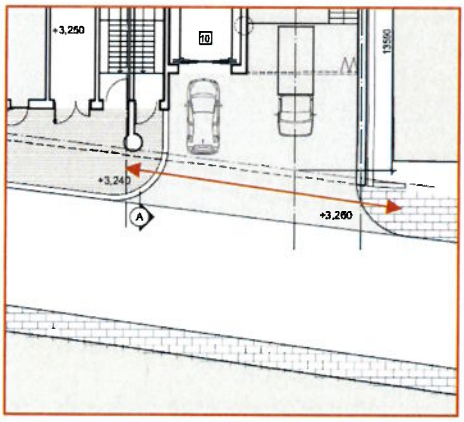
Recommendation

Ensure parking demand is fully understood, and if necessary, provide parking on Gloucester Street South.

3.3 Problem

Location: *Dwg. 2106-MA-01-ZZ-DR-A-0111 (Rev P01)*

Summary: *Vehicular access is wide, increasing the time a pedestrian is within the crossing.*



The development's vehicular access is located on Gloucester Street South. The access caters for cars accessing the car lift, and a loading bay access for HGVs. The current layout suggests that pedestrians will need to yield to vehicles entering/exiting the development. As the access needs to accommodate both cars and HGV's, the development access is wide, which will increase the time a pedestrian (particularly a school pupil) will be within the crossing. This may increase the risk of a vehicle/pedestrian collisions.

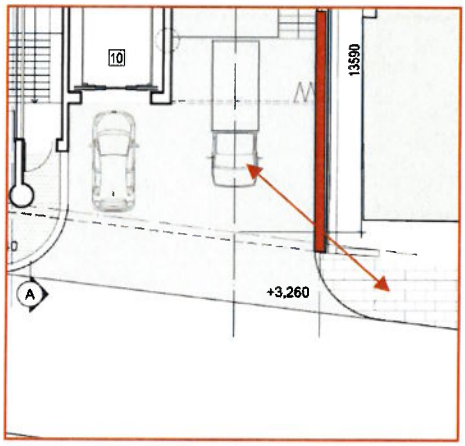
Recommendation

The footway should be continuous across the access, such that pedestrians have priority.

3.4 Problem

Location: *Dwg. 2106-MA-01-ZZ-DR-A-0111 (Rev P01)*

Summary: *Building structure may reduce inter-visibility between pedestrians and drivers exiting the development.*



A wall is shown along the development's east facing boundary, extending south toward the northern footway on Gloucester Street South. The wall's proximity to the footway may reduce inter-visibility between pedestrians (particularly school children) and drivers exiting the development. Reduced inter-visibility may increase the risk of vehicle/pedestrian collisions.

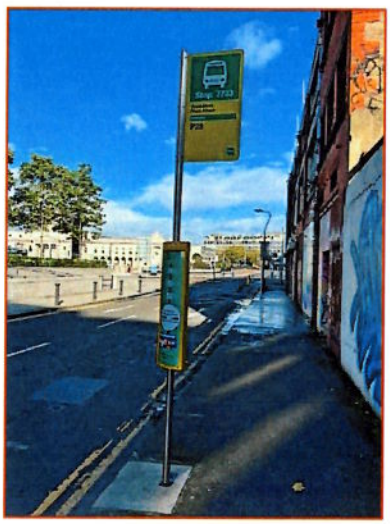
Recommendation

Ensure the building structure does not reduce inter-visibility between pedestrians and drivers at the development access.

3.5 Problem

Location: *Dwg. 2106-MA-01-ZZ-DR-A-0111 (Rev P01)*

Summary: *Potential Ponding at Bus Stop*



An existing bus stop is located near the proposed west facing development access (for pedestrians) on Moss Street. Whilst the kerb details and drainage are likely to be developed in more detail in subsequent design stages, it is likely that Kassel kerb shall be provided at the bus stop on Moss Street. Kassel kerb has a higher upstand than standard kerbing, so may result in the footway cross section falling back toward the building, leading to ponding, and possible slips, trips, and falls.

Recommendation

Ensure footway and kerb levels do not lead to ponding on the footway.

3.6 Problem

Location: *Dwg. 2106-MA-01-ZZ-DR-A-0111 (Rev P01)*

Summary: *Removal of uncontrolled pedestrian crossing may increase the risk of slips, trips, and falls.*

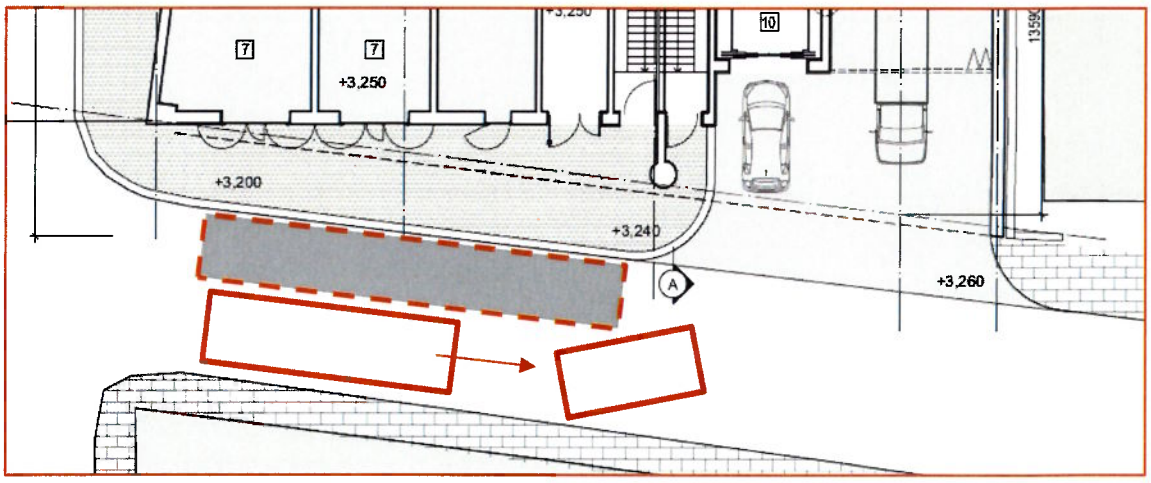
The Audit Team noted an existing uncontrolled pedestrian crossing on Gloucester Street South, at its junction with Moss Street. This crossing is not indicated on the proposed drawings, so it is not clear if this crossing shall be retained or removed as part of the works. The absence of an uncontrolled pedestrian crossing on this pedestrian desire line may increase the risk of pedestrians attempting to mount/dismount the kerb line, leading to possible slips, trips, and falls, particularly for visually impaired pedestrians.

Recommendation

The uncontrolled pedestrian crossing should be retained.

4 Observation

4.1 It is unclear if the existing parking space on the northern side of Gloucester Street South is being retained (in a reduced form) or removed as part of the proposed development. If the on-street parking remains, then a driver waiting for the lift may block the carriageway, which could lead to delays for emergency vehicles. Ensure waiting times at the car lift do not lead to queuing on Gloucester Street South.



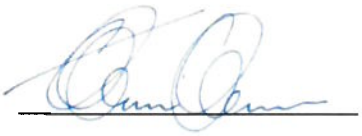
5 Road Safety Audit Team Statement

We certify that we have examined the drawings referred to in this report. The examination has been carried out with the sole purpose of identifying any features of the design that could be removed or modified in order to improve the safety of the scheme.

The problems identified have been noted in this report together with associated safety improvement suggestions, which we would recommend should be studied for implementation.

No one on the Road Safety Audit Team has been involved with the design of the scheme.

ROAD SAFETY AUDIT TEAM LEADER

Aly Gleeson Signed: 

Dated: 1st November 2022

ROAD SAFETY AUDIT TEAM MEMBER

Norman Bruton Signed: 

Dated: 1st November 2022

Appendix A – Road Safety Audit Brief Checklist

Have the following been included in the audit brief?: (*if 'No', reasons should be given below)*

		Yes	No
1.	The Design Brief	☑	☐
2.	Departures from Standard	☐	☑
3.	Scheme Drawings	☑	☐
4.	Scheme Details such as signs schedules, traffic signal staging	☐	☑
5.	Collision data for existing roads affected by scheme	☐	☑
6.	Traffic surveys	☑	☐
7.	Previous Road Safety Audit Reports and Designer's Responses/Feedback Form	☐	☑
8.	Previous Exception Reports	☐	☑
9.	Start date for construction and expected opening date	☐	☑
10.	Any elements to be excluded from audit	☐	☑

Any other information?

(if 'Yes', describe below)

☐ ☑

Appendix B – Documents Submitted to the Road Safety Audit Team

DOCUMENT/DRAWING TITLE	DOCUMENT/DRAWING NO.	REVISION
Site Location O.S. Map	2106-MA-ZZ-00-DR-A-0001	P01
Existing Site Layout Block Plan	2106-MA-01-ZZ-DR-A-0002	P01
Proposed Site Layout Block Plan	2106-MA-01-ZZ-DR-A-0003	P01
Existing Basement Level Plan	2106-MA-01-XX-DR-A-0011	P01
Existing Ground Level Plan	2106-MA-01-XX-DR-A-0012	P01
Existing First level Plan	2106-MA-01-XX-DR-A-0013	P01
Existing Second Level Plan	2106-MA-01-XX-DR-A-0014	P01
Existing Context Elevations N & W	2106-MA-01-XX-DR-A-0024	P01
Existing Site Sections and Elevations	2106-MA-01-XX-DR-A-0027	P01
Basement -1 & -2 Level Plan	2106-MA-01-ZZ-DR-A-0110	P01
Ground & 1st Level Plan	2106-MA-01-ZZ-DR-A-0111	P01
2nd, 3rd & 4th Level Plan	2106-MA-01-ZZ-DR-A-0112	P01
5th, 6th & 7th Level Plan	2106-MA-01-ZZ-DR-A-0113	P01
8th, 9th & 10th Level Plan	2106-MA-01-ZZ-DR-A-0114	P01
11th, 12th & 13th Level Plan	2106-MA-01-ZZ-DR-A-0115	P01
14th, 15th & 16th Level Plan	2106-MA-01-ZZ-DR-A-0116	P01
17th, 18th & 19th Level Plan	2106-MA-01-ZZ-DR-A-0117	P01
20th, 21st & 22nd Level Plan	2106-MA-01-ZZ-DR-A-0118	P01
23rd, Roof Plant and Roof Level Plan	2106-MA-01-ZZ-DR-A-0119	P01
Context Elevation North	2106-MA-01-ZZ-DR-A-0200	P01
Context Elevation East	2106-MA-01-ZZ-DR-A-0201	P01
Context Elevation South	2106-MA-01-ZZ-DR-A-0202	P01
Context Elevation West	2106-MA-01-ZZ-DR-A-0203	P01
North Elevation	2106-MA-01-ZZ-DR-A-0210	P01
East Elevation	2106-MA-01-ZZ-DR-A-0211	P01
South Elevation	2106-MA-01-ZZ-DR-A-0212	P01
West Elevation	2106-MA-01-ZZ-DR-A-0213	P01
N + W + S Public Realm Elevations	2106-MA-01-ZZ-DR-A-0214	P01
Site Section AA	2106-MA-01-ZZ-DR-A-0300	P01
Site Section BB	2106-MA-01-ZZ-DR-A-0301	P01
Section AA	2106-MA-01-ZZ-DR-A-0310	P01
Section BB	2106-MA-01-ZZ-DR-A-0311	P01
Typical Brick Bay Detail 01	2106-MA-01-ZZ-DR-A-0430	P01
Typical Brick Bay Detail 02	2106-MA-01-ZZ-DR-A-0431	P01
Typical Curtain Wall Detail	2106-MA-01-ZZ-DR-A-0432	P01
Roof Plant Screen Detail	2106-MA-01-ZZ-DR-A-0433	P01
Curved Glazing Detail	2106-MA-01-ZZ-DR-A-0434	P01
Landscaped Trellis Detail	2106-MA-01-ZZ-DR-A-0435	P01
Photovoltaic Glazing Detail	2106-MA-01-ZZ-DR-A-0436	P01
East Wall Section	2106-MA-01-XX-DR-A-0437	P01
Landscape Masterplan	CQY_TTT_33-P-001C	C
Upper Floor Terrace Plans	CQY_TTT_33-P-002B	B
For Information		
Architect's Report (Planning Application)	2106-MA-XX-XX-RPT-Arch Statement-P11-2022.08.08	July 2022
Outline Basement Impact Assessment	B1876-BLP-RP-C-001-03_BIA	June 2022
Flood Risk Assessment	B1876-BLP-RP-C-002-02_FRA	May 2022
Outline Construction Management Plan	B1876-BLP-RP-C-003-01_CMP	June 2022
Engineering Assessment	B1876-BLP-RP-C-004-03 EA	July 2022
Transport and Mobility Management Plan	B1876-BLP-RP-C-005 TMP	Aug 2022
Resource & Waste Management Plan	B1876-BLP-RP-C-006-02_RWMP	July 2022

DOCUMENT/DRAWING TITLE	DOCUMENT/DRAWING NO.	REVISION
Landscape Design Statement	-	2022
City Quay – Visual Impact	-	30/06/22

Appendix C – Feedback Form

Road Safety Audit Feedback Form

Scheme: Proposed Office Development at Moss Street/Gloucester Street/City Quay, Dublin 2

Route No.: R802, R813 & Local Roads

Audit Stage: Stage 1 RSA **Date Audit Completed:** 1st November 2022

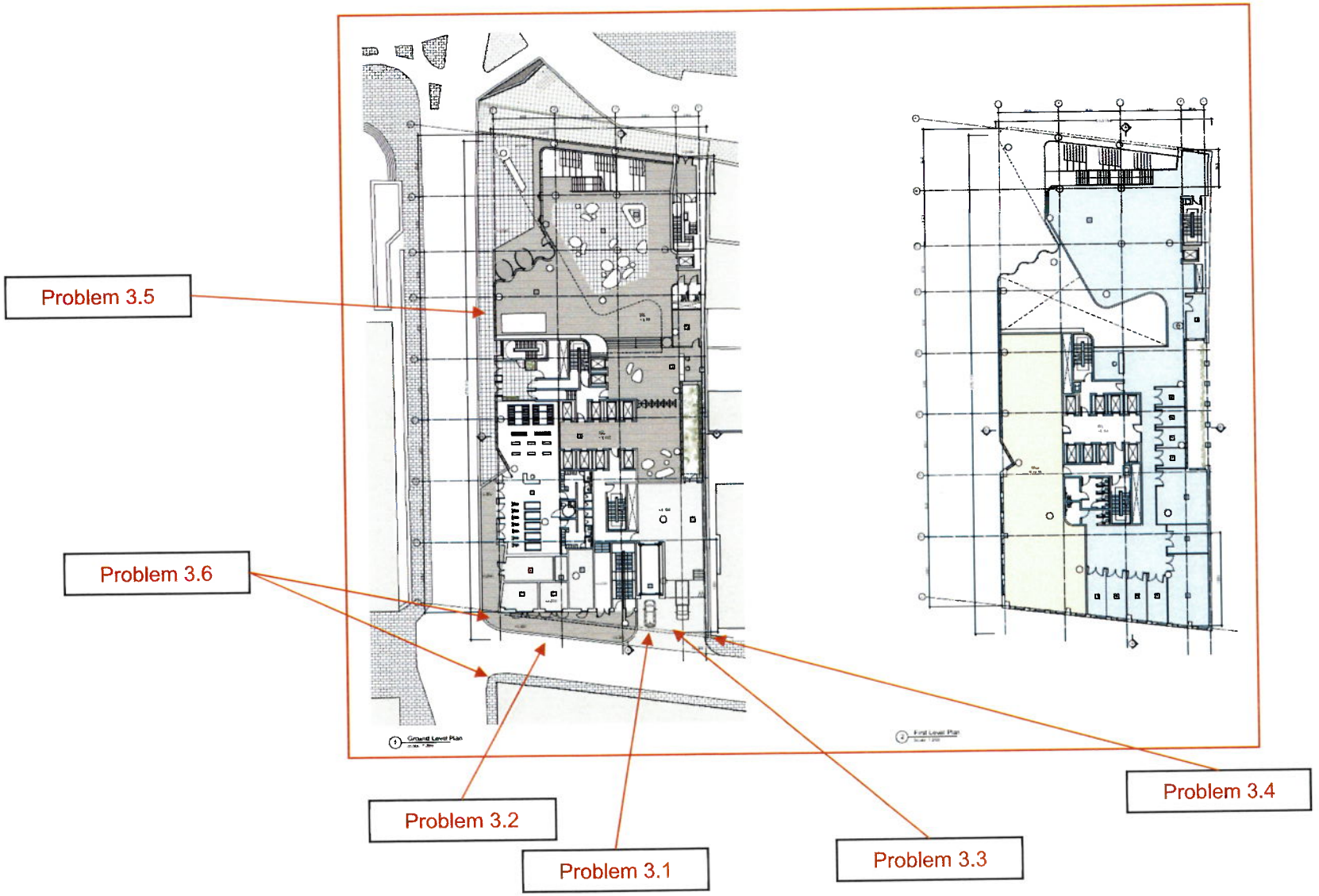
	To be Completed by Designer			To be Completed by Audit Team Leader
Paragraph No. in Safety Audit Report	**Problem Accepted (Yes/No)**	**Recommended Measure(s) Accepted (Yes/No)**	**Describe Alternative Measure(s). Give reasons for not accepting recommended measure**	**Alternative Measures or Reasons Accepted by Auditors (Yes/No)**
3.1	Yes	Yes	Note – It is proposed to remove the on-street parking in this area.	
3.2	Yes	Yes	Note – Parking demand will be satisfied within surrounding areas, with a limited loss of parking space proposed.	
3.3	Yes	Yes		
3.4	Yes	No	A number of bollards shall be placed on western side of proposed wall to ensure vehicles have suitable position and sight lines on exiting.	Yes
3.5	Yes	Yes		
3.6	Yes	Yes		

Signed: Maurice Ryan Designer **Date** 01.11.22

Signed: Audit Team Leader **Date** 1st Nov 2022

Signed: Ventaway Ltd. Employer **Date** 2nd Nov 2022

Appendix D – Problem Locations


Problem 3.5
Problem 3.6
Problem 3.2
Problem 3.1
Problem 3.3
Problem 3.4

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AN aecom COMPANY

Appendix D – Public Transport Capacity Assessment

PUBLIC TRANSPORT CAPACITY ASSESSMENT

CITY QUAY DEVELOPMENT, DUBLIN 2.

DERRY O'LEARY
PUBLIC TRANSPORT CONSULTANT
olearyderry@gmail.com

1. Introduction. 3

2. Background to Dublin's Public Transport Network 6

3. Bus Market Opening (BMO) 7

4. Bus Connects Project Overview. 8

5. Public Transport Surveys. 10

6. Public Transport Capacity Assessment 24

7. Public Transport Plans impacting Dublin City Centre. 29

8. Conclusions. 32

1 Introduction.

1.1 Public Transport Capacity Assessment

Ventaway Limited sought a ten year planning permission at the site at City Quay. This site's development is now under appeal to An Bord Pleanala. This report, by Derry O'Leary, B.E, MSc, MBA, Transport Consultant, has been commissioned, as part of the appeal process, to estimate the available spare capacity in the existing public transport network adjacent to the subject site. Its location, immediately adjacent to the core of Dublin's bus and rail network, offers many opportunities for potential users of the site. The ability of the existing public transport networks to cater for the anticipated level of generated trips from the development is addressed. The author is a Traffic Engineer with over 40 years transport experience in both public and private sectors with 30 years in planning and operations in Dublin Bus. This report should be read with the Traffic and Transport Assessment (TTA) prepared by ByrneLooby/PMCE which was submitted as part of the EIAR included with the original planning application.

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2 Site Location and Development Description.

The City Quay site location and development descriptions are as follows.

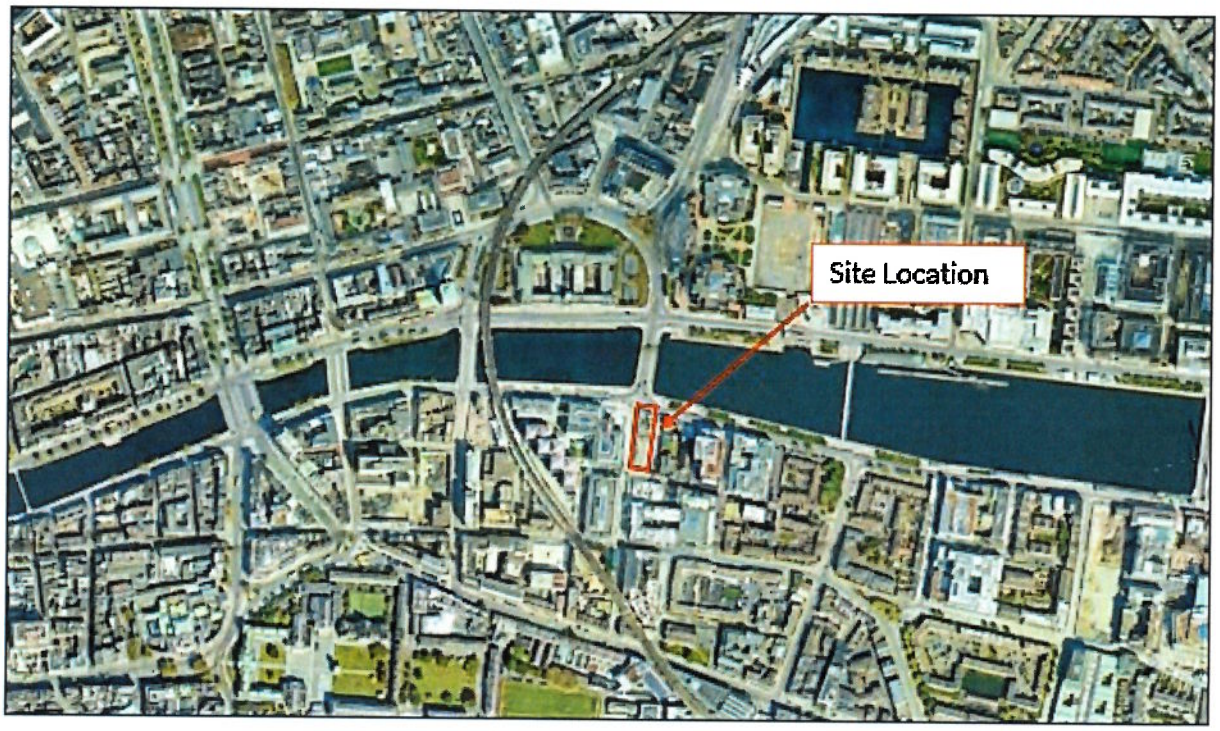


Figure 1. City Quay site location, shown outlined in red.

Development Description

The proposed development will deliver a 24 storey, 108m tall, mixed-use building containing an arts centre, office and café with 2 basement levels providing cyclist facilities, car parking, plant rooms and exhibition-performance space. The approximate floor areas are 32,030m^2 above ground and 3,880m^2 below ground, totalling 35,910m^2. The approximate floor areas of the Arts Centre, Office and Gym are 1404m^2, 22,587m^2 and 244m^2 respectively.

The existing road and surface levels around the site boundaries range from approximately 2.95m to 3.15m OD. The ground floor level of the proposed building will vary between street level at the building entrance, rising to 4.000m OD at the lift and stair lobby. The proposed development will have a two-level basement, with the lowest finished basement floor level set at -4.9m OD, a depth of 8.9m below the highest ground floor level.

The site's main vehicular access will be provided from Gloucester St. South, via a car lift to basement -2 level, where vehicle parking spaces will be provided. Pedestrian access will be provided from the respective street frontages. Cyclist access will also be provided from Gloucester St. South, via the car lift and a stair core with wheel ramp to basement -1 level, where cycle parking spaces will be provided.

1.3 Structure of the Report.

In **Chapter Two** the background to the new structure to the organisation of public transport services is outlined. The National Transport Authority's (NTA) initial move to open up the bus market in Ireland is described in **Chapter Three**. The key aspects of the innovative BusConnects project for the Greater Dublin Area are presented in **Chapter Four** as are the proposed DART+ and Metrolink plans. In **Chapter Five** the bus survey results and demand statistics of the public transport network adjacent to the site are outlined. The surveys undertaken form the basis for the public transport capacity assessment in **Chapter Six.** In **Chapter Seven** the major public transport projects set to benefit the site are outlined. Finally, in **Chapter Eight**, the key conclusions of the report on the status of the existing public transport network serving the City Quay site are outlined.

Background to Dublin's Public Transport Network

2.1 While the customer-facing bus network serving the Greater Dublin Area has been relatively stable in recent years, the organisation of these operations has undergone significant structural change in the last decade or so. The National Transport Authority (NTA), established in 2009, is now the public transport Regulator. The overall planning of bus and rail services nationwide has now moved from the CIE Group of companies to within the control of the NTA. Responsibility for the bus network and individual route designs, frequency, fares and timetable details, etc. now lies solely with the Regulator. Under this regime even the smallest modification to any bus route or timetable must be agreed with the NTA in advance of implementation. The NTA also allocates State funding to meet the Public Service Obligation (PSO) benefits provided by the public transport network. In addition, the NTA approves and allocates licenses to commercial bus operators, subject to agreed routes, timetables and conditions. Irish Rail and LUAS operations - both operating in close proximity to the subject site - also come within the ambit of the NTA, the latter in conjunction with Transport Infrastructure Ireland (TII).

2.2 In 2015, the NTA commenced a fundamental review of the efficiency and effectiveness of the Greater Dublin Area's (GDA) bus network, branded as Bus Connects. In parallel, it also began a Bus Market Opening (BMO) process to open the Irish bus market to competition. These are now briefly outlined below.

Bus Market Opening (BMO)

3.1 In order to open the Irish bus market to competition for the incumbent State-owned operators (Dublin Bus and Bus Eireann) the NTA first tendered a package of orbital bus routes operated by Dublin Bus in 2016. The group of 24 routes, and total fleet of 125 buses, represented 10% of the bus market in the Greater Dublin Area (GDA). Following the competitive tendering process, the Go-Ahead Group (a largely UK-based bus and rail operator with large overseas businesses) was selected to operate these routes. The seamless transfer of routes, in stages, from Dublin Bus to Go-Ahead Ireland (GAI) took place over a 12-month period in 2018/2019. The switch was barely noticed by the general public and passengers alike, as the new operations were introduced under the NTA's Transport for Ireland (TFI) brand. All routes in the Dublin bus network operating near the City Quay site are operated by Dublin Bus. The tender of some Dublin commuter bus routes in 2018 resulted in Go-Ahead winning the contract to operate routes mostly from County Kildare to Dublin. Most of these commuter routes operate close to the subject site.

3.2 All PSO operators, whether commercially or State-owned, operate bus services under contract to the NTA and must meet a set of key performance indicators (KPIs) covering reliability, timekeeping and vehicle maintenance. Similar standards are expected of all contracted operators and failure to meet the targets will result in fines or contract cessation. Both the performance standards expected of contractors and any fines recovered from Operators for not meeting those standards are on the record.

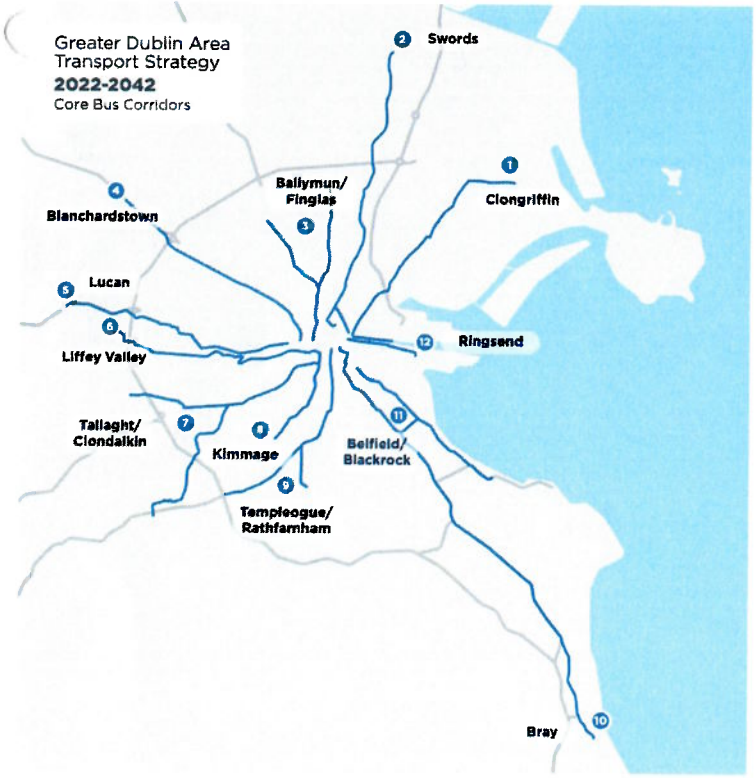
3.3 The NTA owns the fleet deployed by GAI to operate its routes in the GDA. The expectation is that, over time, the entire public transport fleet will be owned by the NTA as the fleet is renewed and the Authority obtains the capital funding to buy and replace buses for use in the PSO networks across Ireland. The next batch of buses on order for the Dublin urban market are fully-electric traction. The delivery of the first of these fully electric buses is expected in 2024.

Bus Connects Project Overview.

4.1 A comprehensive re-design of the urban bus network in the Greater Dublin Area (GDA) was commenced by the NTA in 2015. BusConnects is the NTA's masterplan for bus travel in Dublin. For a wider review of the BusConnects project please see more details at https://busconnects.ie/initiatives/new-dublin-area-bus-network/ . It consists of both a major route network re-design and much improved bus priority measures. One of the key initiatives is the Core Bus Corridors, in which the NTA proposes to build 230 km of bus lanes and 200km of segregated cycle track on 16 key routes into the city. See https://busconnects.ie/initiatives/core-bus-corridors/ for more details on the physical infrastructure improvements planned .

4.2 In tandem with the now agreed bus service re-designs, the key bus route alignments, including those that will directly impact buses serving the subject site, will be upgraded. The NTA plan is to enhance the capacity and potential of the public transport system by improving bus speeds, reliability and punctuality through the provision of bus lanes and other measures to provide priority to bus movement over general traffic movements. This investment is required to protect the enhanced bus operations from further adverse impacts on reliability caused by traffic congestion. These Core Bus Corridors (CBCs), along which the new high-frequent "Spine routes" will run, and the revised routes themselves have been through a series of extensive consultation phases with the general public and key stakeholders. A series of "Spine routes" from any given area begin in different locations and merge on their CBC in the suburbs. The new Spine routes are designated by letters. For example, the existing route 15 surveyed below will form part of the "A-Spine" that passes close to the subject site. It will consist of four "Spine-routes" - routes A1, A2, A3 and A4 - that merge and operate cross-city from Ballycullen and other locations to termini in Dublin Airport, Beaumont and Swords.

4.3 Local Authorities have been directly involved in both the bus route and CBC design process. The final route network, modified following the review of thousands of submissions by members of the public and key stakeholders, was finalised in 2020 and implementation has commenced. A number of the CBC proposals, a key part of the NTA strategy, have entered the State's planning process in recent months. The City Quay site, by virtue of its central location, will benefit from both the service and infrastructure elements of the BusConnects project.



1.	Clongriffin to City Centre
2.	Swords to City Centre
3.	Ballymun/Finglas to City Centre
4.	Blanchardstown to City Centre
5.	Lucan to City to Centre
6.	Liffey Valley to City Centre
7.	Tallaght/Clondalkin to City Centre
8.	Kimmage to City Centre
9.	Templeogue/Rathfarnham to City Centre
10.	Bray to City Centre
11.	Belfield/Blackrock to City Centre
12.	Ringsend to City Centre

Figure 2. NTA's Core Bus Corridors (CBCs). The subject site is close to the focal point of all the corridors in the heart of Dublin City.

4.4 Phased implementation of new Spine routes has started. To date (early November, 2022) only four of the many phases required to modify the bus network in the Greater Dublin Area have been introduced. Three of the first four phases involved new Spine routes while the other phase of BusConnects route changes involved the first tranche of orbital bus routes north of the city centre. The C-Spine, G-Spine and H-Spine bus services have been introduced in parts of the west (C and G) and north suburbs (H) of Dublin. All of the new Spine routes now operate close to the subject site. Further phases have been designed and planned but will take a number of years to implement. The NTA expects the whole network of services to be completed by 2024 but this looks optimistic at this stage. The planned timescale for the implementation of the CBC corridors, the physical upgrading of bus priority measures, is unclear at this point as they are still in the planning process.

5. Public Transport Surveys.

5.1 The main objective of this analysis is to determine whether or not the incremental demand for public transport generated by the proposed development at City Quay will put the capacity of the existing public transport services (bus and rail) in the wider subject site area under undue pressure. An appropriate share of the newly generated patronage from the new development has already been determined by Byrne Looby in their TTA. To assist this process a survey of bus usage in the immediate area of the subject site has been undertaken.

5.2 The demand profile for public transport services, like road traffic, is quite seasonal in nature. Ideally then, surveys of bus and rail travel should be conducted during periods of highest demand. In reality, public transport supply and demand tends to follow quite predictable patterns, in the absence of unusual factors. For example,

- Demand for bus, Commuter Rail and LUAS services, in general, is materially lower in the Summer and school holiday periods.
- Demand tends to be somewhat higher in the late Autumn and in the run up to the busy Christmas holiday. Surveying in the none-holiday weeks in the opening four or five months of the year, and Autumn, represent the most reliable indication of base-level pre-development expressed demand for transport.
- Demand also varies by day of the week, with traffic demand generally lower on Mondays and Fridays, with some exceptions. Public transport usage on Saturdays and Sundays (in particular) are materially lower than mid-week demand in most areas but at weekends demand can pick up appreciably, especially in the run up to Christmas.
- Demand for public transport also follows a predictable pattern throughout the standard weekday but the morning peak is shorter in duration but has higher patronage levels than the corresponding, returning evening peak flows.

5.3 In determining whether spare capacity is available to meet increasing demand from any development site it is clearly best, from the observations in 5.2, to undertake surveys and test the midweek morning or evening peaks prior to the Summer period, or in the Autumn, when schools, etc. are open. In addition to the established pattern of demand for public transport services described in 5.2 above, any assessment has the added complexity of the residual impacts of the Covid-19 pandemic. The fall-out for public transport demand has been significant due to alterations in work patterns and the increased tendency for many white collar workers to work-from-home (WFH). While the seasonal factors will work through as the year progresses there is no compelling evidence here, or internationally, that public transport usage, post Covid-19, will ever return to normal. Recent fare reductions have certainly boosted demand, not necessarily in the peak periods.

In assessing the demand for public transport from the subject site a survey of bus usage at one of the numerous nearby busy bus stops was undertaken. It was important that the stop selected would be indicative of what is happening elsewhere in the core of the city

entre. Current DART and Commuter Rail demand into and out of Dublin City has been examined from a review of the latest available published statistics and more recent observations.

Bus Survey in Dublin City Centre near Subject Site

The location of the subject site and its proximity to multiple city centre bus (and rail) stops somewhat complicates the selection of the most appropriate location for the bus survey. Figure 3 below shows the multiplicity of stops in the Dublin Bus' categorisation of the "Trinity College Bus Stops":

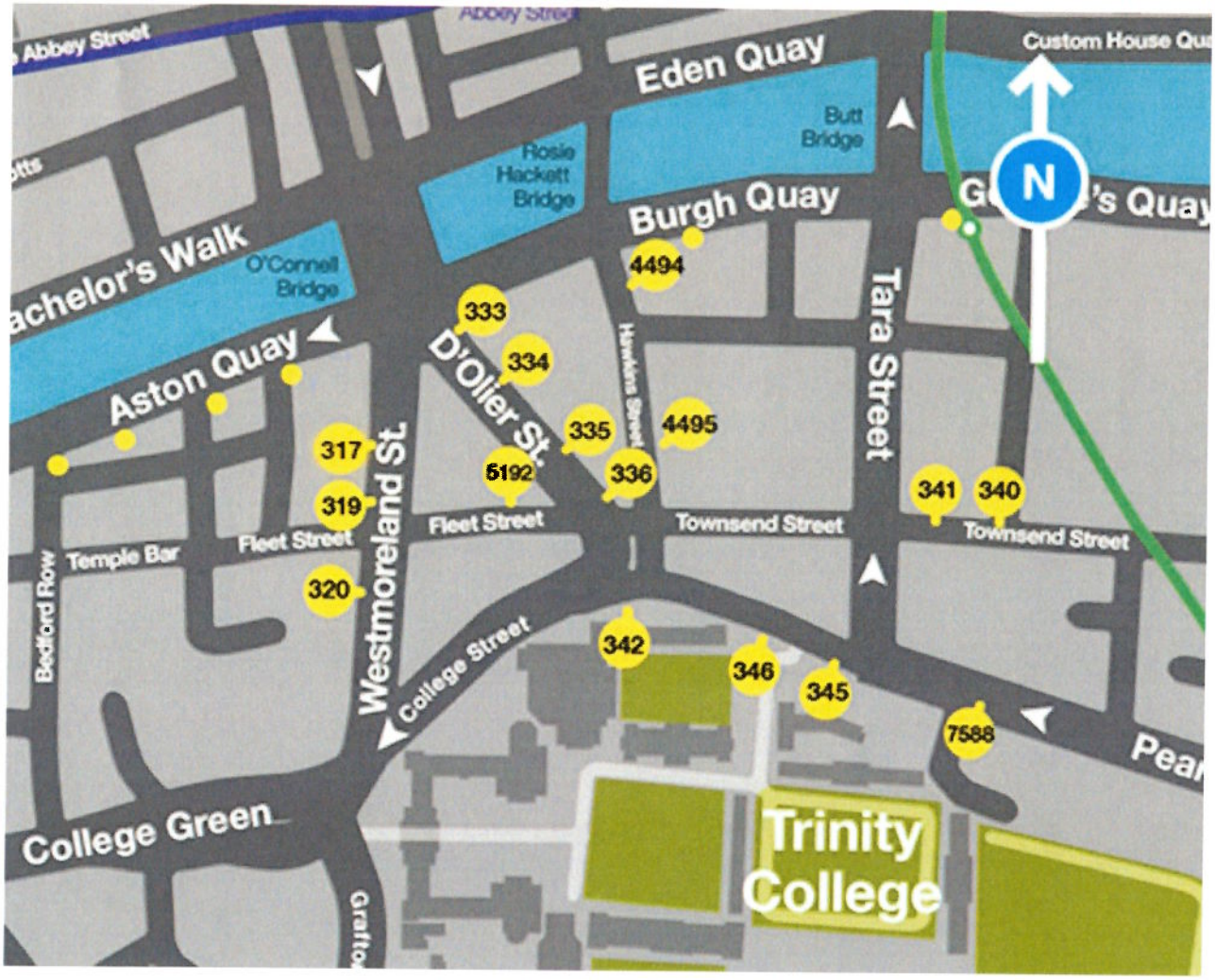


Figure 3. Bus Stops South of the Liffey near Trinity College. Source, Dublin Bus website.

The busiest bus stops in this area include the following (selected on the basis of the frequency of the routes at any given stop):

Bus Stop Number	High Frequency Routes	Others	Total Number
319	9, 13, 40, 155	1, 44, 83, 140	8
334	46A, 145, 155	7B, 7D, 140	6
335	13, 39, 40	39A, 123	5
336	9, 14, 16	83	4
340	C1 - C4, 15A, 15B,	1, 44, 47, 52, 77A	16
4495	15, 27	68/A, 69, 84X, 150, 151	17

There is a another graphic display of the stops under the heading of "The Quays" where some of the stops are closer to the subject site:

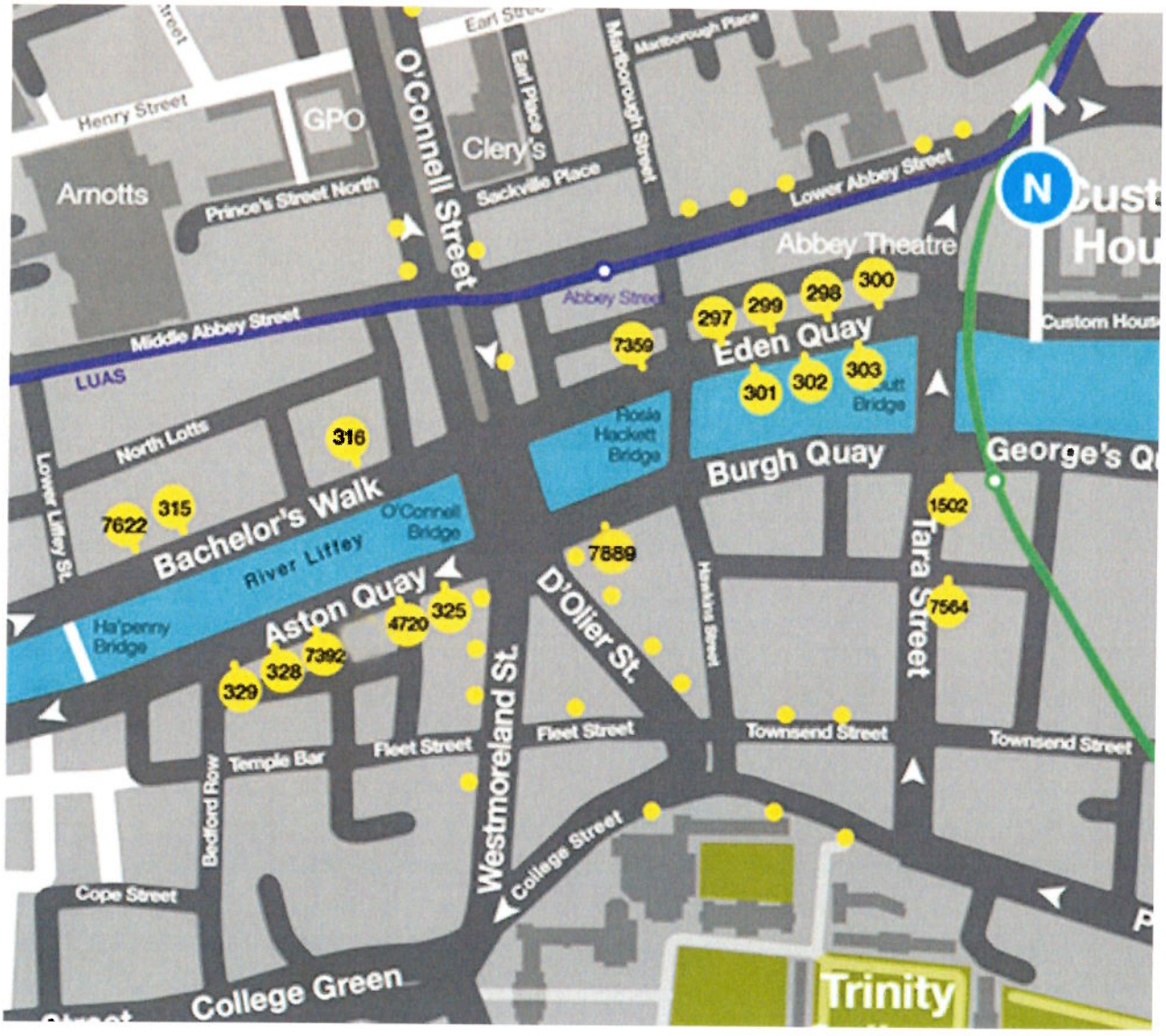


Figure 4. The graphic showing "the Quays" bus stops. Source, Dublin Bus website.

Bus Stop Number	High Frequency Routes	Others	Total Number
301	14, 15	142	3
302	27, 151	27X, 33X, 33D, 61	6
303	G1, G2	61, 84X, 118	5
315	C1-C4, 39, 39A	26, 37, 70, 83, etc.	24
328	39, 39A	39X	3
7392	C1-C4,	52, P29, etc.	15

The principal bus stops from Figure 3 included those on D'Olier St and hawkin's St. The keys stops from Figure 4 include stops 301, 302 and 303 on Eden Quay while stops 315 on Bachelor's Walk and 7392 on Aston's Quay were seen as too distant from the subject site.

The deciding factors in going for bus stop 4495 in Hawkin's St were

- Its **close proximity** to the subject site, as it is within 6 minutes walk.
- The presence of two **high frequency, high capacity routes** - 15 and 27 - at this stop.
- The **mix, geographical spread and number of routes** operating to different parts of the city from this stop. While 17 routes are designated to stop at this location many are small Express or "X" routes that only operate in the AM peak, and only at certain times of the year.
- Surveys here **capture many of the buses that have previously served stops 301 and 302** on Eden Quay (such as cross-city routes 15, 27 and 151).
- The selection of this stop **allowed observations of the Green Route LUAS services** as they headed southbound on this street.

In keeping with the guidelines regarding when best to undertake meaningful surveys it was agreed to conduct the bus stop survey at stop 4495 (Hawkin's St) on the evening of Thursday 27 October, 2022 in advance of the Halloween mid-term breaks for schools and when universities have reopened.

5.4 The survey methodology required that the following process was followed.

1. Design of survey form to capture all relevant data including the time the bus departed the stop, bus type (for capacity), numbers on board the bus, whether any were standing, and space for notes.
2. Survey form to also capture the Survey Sheet number, date, Stop Number, Location and Surveyor ID.
3. Survey stop selection based primarily on proximity to the subject site.

4. The most appropriate two hour survey period determined based on network knowledge and subject site location. The peak hour is determined by the frequency of buses in the busiest hour (e.g. 07.20 - 08.20) on the day.
5. For each bus using the stop the following were recorded - Time of Departure, Route No, Bus Type (Single or Double-Decker), Passenger Numbers on departing bus, Passengers Standing (Yes/No) and any notes of interest.

The bus survey which forms the basis for the existing bus capacity assessment was undertaken at stop 4495 between 16.25 and 18.33 on Thursday, 27th October, 2022. In terms of the overall bus network this would be seen as one of a number of predictably busy city centre bus stops. Others are identified in the tables above. Passengers accessing the bus network here have the choice of a whole range of services. They vary from frequent cross-city routes (15, 27) to medium frequency routes (150, 151) offering all-day services and others of relatively limited frequency (68/A, 69/X and 84X). The routes also vary in their geographical coverage with southbound buses operating as far as Kilcoole/Newcastle, Co Wicklow and to Ballycullen, Templeogue, Tallaght, Lucan, Rathcoole and Newcastle in County Dublin. They serve a wide variety of suburbs and towns on the way to these destinations.

Table 1 below shows the observed passenger demand profile by time bands for the evening peak in question.

Timeband	Number of Buses	Total Passenger Nos	Average Passengers/Bus
16.30 - 16.45	6	173	29
16.46 - 17.00	5	121	24
17.01 - 17.15	9	155	17
17.16 - 17.30	3	125	42
17.31 - 17.45	3	78	26
17.46 - 18.00	6	170	28
18.01 - 18.15	6	192	32
18.16 - 18.30	6	168	28
Total	44	1,182	**27**

Table 1. Bus numbers and passengers at Hawkin's Street, Dublin 2, Stop 4495, PM peak.

The summary of bus passengers by 15 minute time band in Table 1 indicates that 1,182 passengers left on 44 buses over the two hour duration of the survey. This equates to a bus approximately every 2.7 minutes. From Table 1 it can be seen that the bus arrivals were generally well spread over the survey period, but with a noticeable peak between 17.01 and 17.15 when some routes were over-represented. For example, three route 15 buses arrived between 17.02 and 17.10. Controlling headways on cross-city routes is an onerous task, especially in Dublin traffic. The passenger loadings on the buses were also quite evenly spread with only one bus, also on route 15, observed to be full post 18.00.

The peak hour (the "peak within the peak") at stop 4495 occurred between 17.31 and 18.30 when a total of 608 passengers were on board buses leaving this stop at an average of 29 passengers per bus for the 21 buses in this hour. This was only a little higher than the 27 per bus over the whole of the survey period. But one of the key conclusions of this survey is that the overall pattern of loadings past this stop is very evenly spread over the two-hour survey period.

Buses passing this stop over the survey period have significant spare capacity, as can be seen in table 2 below where the data in broken down by route;

Route Number	Bus Numbers	Passenger Nos	Average Passenger/Bus	Spare Capacity %
15	13	470	36	**46**
27	12	405	34	**49**
150	4	59	15	78
151	4	112	28	58
68/A	4	26	7	90
69/X	3	36	12	82
84X	4	74	19	72
Total	**44**	**1,182**	**27**	**60**

Table 2. Surveyed passengers by Bus Route, at Stop 4495, Hawkin's Street, Dublin 2.

Table 2 shows the passenger demand by route at stop 4495. Not surprisingly, the two dominant, high-frequency, cross-city bus routes (services 15 and 27) account for 875 or 74% of passengers and 57% of buses surveyed. Both of these routes are amongst the

biggest in the entire city bus network in terms of passenger demand and frequency. Route 15 is one of the few routes to operate over a 24-hour period, a relatively novel occurrence in Dublin. Both routes are also strategically important cross-city services and feature in another form as "Spine routes" under BusConnects (see section 7 below). Higher loadings in the core city centre area is a feature of cross-city routes. While radial routes either empty as they approach their city centre termini (inbound) or start to fill up on departure (outbound), especially in the evening peak, cross-city routes demand profiles are somewhat different from most routes. The whole raison d'être of cross-city routes is that they facilitate movements from north to south (and vice versa) across the city centre without the need to interchange. While each one operates as a combination of two discrete radials, and caters for pure radial movements, they also facilitate those whose origins and destinations are either side of the Liffey.

It is no surprise then to see higher volumes of passengers on routes 15 and 27 from the survey data. The other five (radial or Express) routes are only commencing, or have just started at a neighbouring stop, and have much lower passenger numbers on board when surveyed in the core of the city centre. It could be argued that route 151 is also a cross-city route in that it operates from East Wall in the east to Lucan, Co Dublin in the west but the eastern end of the route is materially shorter than the western end, unlike the two biggest north/south routes. The two large routes have average per bus, in Table 2 above, in the mid-thirties. Loadings on the other five, radial, routes average half this but route 151 does stand out as being materially higher at 28 passengers per bus. All routes have a combined average loading of only 27 passengers.

The loading (or occupancy) data inevitably leads to information of spare capacity on these buses. Bus capacity, for the purposes of this analysis, is taken, conservatively, as only the seated capacity of the bus. Bus spare capacity is the **inverse** of the bus occupancy rate. With double deck buses having 67 seats, this understates the ultimate true capacity of buses by roughly 20%. There is much greater clarity around buses' seated capacity and, additionally, passengers would not be expected to stand for a protracted period of time. From Table 2 above we see that, with higher loadings, the two key routes - 15 and 27 - have lower, but very significant, levels of spare capacity of nearly 50%. The figure increases materially (and up to 90%) for the remaining five routes. The resultant average spare capacity at stop 4495 in Hawkin's Street is 60%, as seen in Table 2. While these routes have yet to pick up passengers at a number of relatively busy bus stops in either Dame St or Nassau St before heading to the suburbs, this level of spare capacity strongly indicates that there is much scope for further increases in customers before bus capacity on these routes is even challenged. The recent 20% fares reduction, now confirmed through 2023, has resulted in rising patronage but the recent survey data reflect this. From a bus operator's perspective many of these buses might be seen as under-utilised at this point in the route, especially during peaks, but it must be recognised that, as indicated above, these services still have to operate over the bulk of their route. In terms of the proposed development in City Quay, the extent to which the generated traffic leaving the subject site in the evening peak impacts these types of passenger loadings is discussed in the following sections.

LUAS Survey Data

One of the many reasons for selecting bus stop 4495 in Hawkins street over others of similar stature was the opportunity afforded this surveyor to observe Green Line LUAS patronage as the trams operated, southbound, passed the survey point. Very broad estimates were made of the numbers on board each tram, based on seated loads and the number standing. In many instances passengers were standing in some parts of the tram while seats were visibly empty nearby.

Table 3 shows the Luas Survey data for the same time period (16.25 - 18.33) on Thursday October. 27, 2022 for trams observed operating on Hawkin's Street:

Tram Time	Fleet Number	Destination	Estimated Passengers
16.30	-	Sandyford	294
16.37	5040	Bride's Glen	330
———	———	———	———
17.41	5003	Sandyford	349
17.44	5029	Sandyford	294
17.46	5002	Bride's Glen	257
17.49	5019	Bride's Glen	202
17.51	5026	Sandyford	239
17.55	5016	Sandyford	184
18.12	5032	Bride's Glen	330
18.14	5013	Sandyford	239
18.15	5031	Bride's Glen	73
18.17	5010	Bride's Glen	37
18.22	5039	Sandyford	312
TOTAL			**3,140**

Table 3. Evening Peak Southbound Green Line LUAS Services from Hawkin's Street.

Table 3 shows that the total number of LUAS passengers on southbound trams at the survey site was an estimated 3,140 on the 13 trams surveyed. Trams destinations were split quite evenly between Sandyford and Bride's Glen, the southernmost terminus. Tram capacity is cited by both the NTA and Transdev (Luas Operator) as 408 per tram for the LUAS Citadis 502 type trams. Following the LUAS Green Line Capacity Enhancement project all the trams on this route are 55m long. Their fleet numbers, where recorded, are also shown in Table 3.

While technically the 55m tram capacity is 408 - based on the seating capacity and high standee density - a more practical, observed capacity is more like 90% of this number or 367 per unit. The observer undertaking the survey estimated the % capacity loadings in each tram, noting where passengers were standing, if at all. These figures were converted to passenger numbers using the lower capacity estimate and the output shown in Table 3 above.

Table 4 below shows the passenger demand profile by time band of the LUAS survey data for the evening peak in question. Due to operational difficulties it should be noted that no southbound trams operated between Dominick and St Stephen's Green for much of the survey period. The LUAS website warned customers of this operational outage in real time at the time of the survey. No tram was recorded between 16.37 and 17.41 in the data above.

Timeband	Tram Numbers	Passengers	Passengers/Tram	% Spare Capacity
16.30 - 17.00	2	624	312	15
17.01 - 17.30	-	-	-	-
17.31 - 18.00	6	1,525	254	31
18.01 - 18.30	5	991	191	48
Total	**13**	**3,140**	**242**	**34**

Table 4. Passengers and capacity utilisation on LUAS at Hawkins St, by time band.

From Table 4 it is clear that the level of disruption to Luas services caused by the operational problems was significant. Between 16.37 and 17.41 there was no southbound tram through Hawkin's Street. Without knowing the precise nature of the time and geographical scale of the outage it is hard to draw firm conclusions. For example, the heavy loading on the first two trams may be due to earlier gaps in service brought about by missing trams. What we can indicate from the survey is that:

There was a strong peak in demand between 17.31 and 18.00, with nearly 50% of Luas passengers in this time band.

- Average loadings per tram were strong, undoubtedly helped by the restricted service.
- Despite service reductions, spare tram capacity varied between 15% and 48%, averaging 34% over the period.
- Declining passengers per tram over each time band (the blank time period aside).
- A total of 13 trams over a two-hour period. This equates to a tram only every nine minutes, well below the advertised timetable frequency.
- The severe bunching of trams on two occasions is notable. This is an inevitable consequence of the service disruption. Between 17.41 and 17.55 there were six trams, an average headway of under 3 minutes.
- The later trams had appreciably lower passenger loading, especially those destined for Bride's Glen, perhaps suggesting that they had started from the relatively close Parnell stop (as opposed to Broombridge).

While accepting that trams approaching the Trinity Stop are relatively early in the journey to Bride's Glen, the level of spare capacity at that point is material. While many will board at the next few stops, others will alight in the core of the city centre.

DART and Commuter Services Demand Overview.

In order to get a handle on the demand for both DART and other Commuter (heavy rail) services serving Dublin the most insightful source is the NTA's "PSO Bus and Rail Statistics" for 2021. The impact of the pandemic on all public transport services is evident when one examines These are best summarised in table format here.

Year / Operator	Dublin City Buses	Dublin Commuter Rail & DART	Dublin Commuter Bus	LUAS	TOTAL Passenger Journeys
2013	112.3	25.9	4.9	30.5	173.8
2014	116.3	26.5	5.0	32.6	180.4
2015	119.8	28.1	5.1	34.6	187.6
2016	125.4	30.9	5.5	34.0	195.8
2017	136.3	32.8	5.1	37.6	211.7
2018	141.5	34.2	5.9	41.8	223.4
2019	152.7	35.6	6.6	48.3	243.2
2020	77.6	12.8	3.4	19.2	113.0
2021	78.9	11.8	3.8	19.5	114.0

Table 5. Dublin Region Annual Passenger Numbers (millions). Source, NTA.

The drop in passenger numbers on all services and modes of travel between 2019 and 2020, caused by the pandemic, was precipitous. For example, passengers on Dublin bus routes (both Dublin Bus and Go-Ahead volumes) halved, despite the first quarter of 2020 having near normal levels of activity. While the data in Table 5 indicates only a very minor recovery in 2021, volumes have shown some recovery in 2022 helped by some return to office work, etc. and lower bus fares. However, bus passenger volumes are not yet consistently back to the 2019 levels. A series of surveys on bus usage in 2022 have been undertaken in recent months at a number of discrete locations spread around the Dublin bus network. At each of these locations, whether inner suburban, outer suburban or commuter towns, the analysis clearly indicated that there are currently excessive levels of spare capacity in the existing city bus network in the AM peak period. The same level of spare capacity will also apply in the PM peak given the nature of the timetables. The level of spare capacity, ceteris paribus, will increase with the significant bus mileage to be added with the introduction of the complete BusConnects network. The bus survey outlined above confirms the extent of spare capacity in the bus network.

The fall in rail volumes was even more dramatic than the collapse in bus demand. The combined Commuter Rail and DART patronage falling by 64% in 2020. Passenger numbers in Table 5 indicate that they fell from 35.6m in 2019 to 12.8m in 2020. LUAS passenger numbers followed a similar pattern to other rail systems and fell 60%. In general, rail modes - whether Intercity, Commuter or LUAS - saw **greater reductions** in customer numbers during the course of the pandemic. The equivalent NTA rail figures for 2021 in Table 5 do not show any material recovery in passenger volumes. While LUAS figures have nudged higher, other commuter/DART passenger numbers continued to decline further in 2021. The latest information for 2022 indicates a recovery for rail services but, unlike bus services, the rail passenger volumes in urban areas are still well below the pre-pandemic base level in 2019.

Current Demand for Rail Services from Tara St Station.

The current level of commuter rail travel, having shown some level of recovery in 2022, is still well below "historic" or pre-Covid-19 levels. Of all the various public transport modes and sectors, commuter rail (including the DART services) has lagged the most in its recovery. The demand for bus travel has shown more positive signs of improvement while still below pre-Covid-19 levels in the capital. Within the bus sector demand for Dublin bus services continue to lag their regional counterparts, with some local rural services operating at new highs in terms of passenger demand. Bus commuter demand on routes into Dublin from Counties Kildare and Meath has also been slower to recover. While Intercity rail travel has shown some recent signs of recovery, assisted by the recent fare reductions and the latent demand for travel generally, indications are that the commuter rail services into and within Dublin continue to lag. To get a true reflection of the underlying demand for travel from Tara St Station the most reliable source is the NTA"s annual "National Rail Census Report". The 2019 Census is the most recent available, having been released in July 2020. It identifies the following trend in demand from Tara Station prior to any pandemic impact. Table 6 below shows the scale of growth of daily passenger demand for rail services at this station.

Year	Daily Passenger Boardings	Increase (Decrease) on Previous Year	% increase/(decrease)
2013	6344	-	
2014	6746	402	6.3
2015	7730	984	14.6
2016	7952	222	2.9
2017	9302	1359	17.0
2018	9639	337	3.6
2019	9274	(365)	(3.8)
2020E	3060	(6214)	(67.0)
2021E	2824	(236)	(7.7)

Table 6. Source - Appendix A, P40 of National Rail Census Report, 2019, NTA, July 2020. E = Estimate.

Tara St Station is a long established commuter rail station located in the heart of the city's rail network. Given its location in the Central Business District, Tara St, as confirmed by the annual census data, is one of the busiest stations in the wider Dublin Commuter Rail network. Tara St is within 200M of the proposed development and will attract many working in the City Quay site. The volume of passengers from this station is only ever exceeded by the two neighbouring rail stations, Connolly and Pearse.

From a relatively high base, the level of patronage through Tara St station struggled as demand mirrored the poorly performing Irish economy nearly a decade ago. In recent years the scale of growth in daily boardings at Tara St station has been relatively solid (pre-pandemic) as Table 6 above clearly illustrates. These demand numbers indicate that demand for rail services was relatively stable between 2017 and 2019 and confirmed its status as one of the busiest in the rail network serving the Dublin area. The NTA regional passenger numbers for 2020 in Table 5 suggest that Tara St commuters have fallen by roughly two thirds on 2019 levels. On this basis it would have reduced from 9,274 to an estimated 3,060 passengers on a typical day in 2020. The most recent relevant publication from the NTA - the Bus-and-Rail-Statistics, 2021 - indicates that demand for commuter rail services in Dublin actually fell away by a further 7.7% in 2021. This would suggest that Tara St boardings, falling in line with the average, have further reduced to 2,824 daily boardings. While there has been some good recovery since then with increasing volumes returning to work, Commuter Rail and DART volumes remain well

below "normal" levels. If it is now at the estimated 65% of historic levels then demand will be of the order of 6,000+ passengers, leaving aside any seasonal factors. This suggests that there are still enormous levels of spare rail capacity on the rail services operating in and out of Tara St.

Tara St Station, located within 200M of the subject site, is the focal point for many DART and other rail services. The 2019 Census shows the breakdown of daily demand from this station in more detail, as shown here is Table 7.

Rail Service, Direction	Passengers Boarding	% Share
DART, northbound	3417	36.8
DART, southbound	3743	40.4
Rosslare/Belfast, northbound	1037	11.2
Rosslare/Belfast, southbound	319	3.4
Maynooth/Sligo, northbound	702	7.6
Maynooth/Sligo, southbound	56	0.6
TOTAL	9274	100

Table 7. Breakdown of Weekday Demand, by service, at Tara St. Source. NTA - Heavy Rail Census, 2019, Appendix A, p39.

Table 7 clearly indicates the wide range of rail services available to rail users from this key station. While DART services account for over three-quarters of boardings at this station, split reasonably evenly between Northbound and Southbound, nearly 15% of travellers from this station travel on Northern commuter and other commuter services. Over 8% also use Tara St to access Commuter rail services on the Maynooth Line to the West. In other words, commuters can travel north, south and west on quality rail services from this station in close proximity to the subject site.

The summary for rail services out of Tara Street Station is straightforward. While rail services are back to normal, with DART frequencies again operating every 10 minutes on weekdays, rail demand is well behind levels seen as recently as 2019. The level of spare capacity is at levels never before witnessed while the economy is fully open, as it is now. The range of services accessible from the station - DART, Commuter and Intercity - is in keeping with the two other key city centre stations (Connolly and Pearse). Access to Connolly Station, with direct access to the Dublin-Belfast Enterprise rail service as well as DART and other rail services is another attractive option from the City Quay site.

Public Transport Capacity Assessment

Generated Trips

The level of generated trips from the City Quay development have been determined by PMCE Consultants in their Traffic and Transport Assessment (TTA) for the site. In 14.4.1 of that report the Trip Generation and Distribution aspects of the development are outlined. The forecast development traffic during the operational phase has been estimated using trip rates from the Trip Rate Information Computer System (TRICS) database based on the surveyed traffic for similar types of development in similar urban locations.

Time Range	Development Unit size	Arrivals		Departures		Total
		Trip Rate Factor (Per 100m²)	Trips	Trip Rate Factor (Per 100m²)	Trips	
07:00-08:00	22,587 m²	0.665	150.2	0.111	25.1	175.3
08:00-09:00		3.06	691.2	0.298	67.3	758.5
09:00-10:00		2.943	664.7	0.404	91.3	756.0
10:00-11:00		1.115	251.8	0.7	158.1	410.0
11:00-12:00		0.643	145.2	0.543	122.6	267.9
12:00-13:00		0.868	196.1	1.091	246.4	442.5
13:00-14:00		1.074	242.6	1.251	282.6	525.1
14:00-15:00		0.724	163.5	0.676	152.7	316.2
15:00-16:00		0.306	69.1	0.727	164.2	233.3
16:00-17:00		0.212	47.9	0.956	215.9	263.8
17:00-18:00		0.203	45.9	2.828	638.8	684.6
18:00-19:00		0.084	19.0	1.998	451.3	470.3
Totals			2,687		2,616	5,303

Table 8. Development Traffic (Offices) - Forecast Arrivals & departures (07:00 - 19:00). Source. PMCE Consultants, TTA.

It can be seen that the scale of departures in the evening peak hour (between 17:00 and 18:00) broadly minor the arrival rates in the morning peak period hours (between 08:00 to 09:00 and 09:00 to 10:00). The generated trips from both the Gym and Arts Centre have negligible impact on peak loads.

In their report PCME Consultants used the 2016 Census data for the Dublin City Centre Small catchment area to estimate the projected Modal Split for the proposed development. The low car parking provision is expected to discourage commuter car parking and promote a shift from private car use towards more sustainable forms of transport. Table 9 summarises the predicted daily trips for the proposed development by transport mode.

Means of Transport	Projected Modal Split	Arrivals	Departures	Total Daily Trips
Private Car	2%	55	54	109
Bicycle	16%	438	424	862
Pedestrians	51%	1,307	1,353	2,750
Bus	22%	603	**584**	1,187
Luas/Dart	9%	247	**239**	486

Table 9. Summary of Predicted Daily Trips by Mode. Source, PMCE TTA.

Generated Bus Trips

On the basis of the data in the PMCE analysis it has been assumed that

- **All bus commuters** will leave the site in the surveyed peak hour (17.00 - 18.00). This is very much a worst case scenario.
- Given its proximity to the site, and the range of routes available at stop 4495, it is further assumed that **25% of the development's bus users will depart from this stop.** This is another onerous assumption despite this stop's proximity to the subject site. There are a wide variety of similarly busy bus stops operated to areas north and south of the city as illustrated earlier. But stop 4495 is selected as representative of this wider group.

On the basis of these assumptions, the generated trips by bus commuters using this stop increases by 584 x 25% = **146 extra trips.** These are now allocated to the buses that were surveyed in the peak hour (17.00 - 18.00) in order to assess the impact on bus spare capacity. Table 1 from earlier has been reproduced but with the additional bus generated trips allocated to buses in the peak hour (17.00 - 18.00).

Table 10 below shows the revised passenger demand profile by time bands for the evening peak surveyed with the estimated generated trips added_to the surveyed bus passenger numbers in the relevant peak time bands.

Timeband	Number of Buses	Total Passenger Nos	Average Passengers/ Bus	Revised % Spare capacity
16.30 - 16.45	6	173	29	57
16.46 - 17.00	5	121	24	64
17.01 - 17.15	9	155+**36**=191	21	69
17.16 - 17.30	3	125+**37**=162	54	19
17.31 - 17.45	3	78+**36**=114	38	43
17.46 - 18.00	6	170+**37**=207	35	48
18.01 - 18.15	6	192	32	52
18.16 - 18.30	6	168	28	58
Total	44	1,328	**30**	**55**

Table 10. Assessment of Generated Bus Passengers at Hawkin's Street, Dublin 2, Stop 4495, PM peak.

The addition of the generated trips increased the total bus passengers from 1,182 (from Table 2) to 1,328 in Table 10. This represents an overall increase of 12.4% in passenger numbers, compared to those surveyed. The additional 146 bus trips were allocated in near equal increments to the surveyed passenger volumes to each of the four 15 minute bands between 17.00 and 18.00.

Passenger numbers in this hour-long time band increased from the 528 surveyed to 674, an increase of 27.7%. The additional passengers in Table 10 in the evening peak hour had the effect of increasing the average passengers per bus for these time bands and for the total as a whole. The overall average number of passengers per bus increased from 27 (in Table 2) to 30 over the two-hour survey period. But this average of 30 passengers per bus represents seated occupancy of only 45% for the 44 double decker buses observed in the survey period. This equates to **spare seated capacity of 55%**. Even allowing for residual Covid effects, based on recent patronage, this analysis clearly indicates that the bus network's spare capacity, post generated trips, is more than adequate to cater for the increased bus commuter demand from the proposed development. This conclusion is indicative of the anticipated outcome for all the bus stops in the core of the city centre.

Generated Luas/DART Trips

In similar fashion to the bus strips estimated to be generated from the City Quay development, the anticipated growth in Luas/DART trips have also been estimated by PMCE in their TTA for the subject site. From Table 9 above a total of 239 additional Luas and DART/Commuter Rail trips are expected from the development.

Table 5 earlier outlined the extent to which the annual Luas and DART/Commuter rail patronage collapsed in 2020, with little or no recovery in 2021. Indications are that numbers have increased somewhat in 2022, with a partial return to "normal" work patterns. Nevertheless, the number of generated passengers - evenly split between Luas and DART in the absence of other data - will barely be noticed given the fall-off in passengers.

In Table 4 earlier the estimated number of passengers on the Luas Green Line passing through Hawkin's Street came to a total of 3,140 commuters on 13 trams. If all 50% of the 239 generated rail trips attributed to Luas were to use the Green Line southbound only this would increase the observed patronage as shown in Table 11:

Trips	Surveyed October 2022	Generated by Site	Future Estimate
Luas Southbound	3,140	120	3,260
Passengers/Tram	242	9	251

Table 11. Impact of allocation of all Generated Luas trips to Green Line, southbound.

Despite the onerous allocation of all generated Luas trips to just the Green Line southbound, the impact on Luas capacity is quite minimal in that the average increase per tram amounts to only 9 passengers. Tram loadings after the increase above still remain more than 30% below stated Luas tram capacity. When one takes into account that the full tram service did not operate on the day of the survey, due to operational issues, then the impact is likely to be smaller again.

Monitoring of Public Transport Capacity

The NTA, in its draft Transport Strategy for the GDA 2022-2042, proposes that "*periodic reviews will be undertaken during the period of the Transport Strategy to evaluate the impacts of changing development and transport patterns, and to implement appropriate additions or adjustments to the overall bus system to accommodate the changing arrangements*". This forms the basis for what is termed "Measure Bus5" to continually monitor the bus network and enhance or amend it accordingly. This assurance applies to all routes, large and small.

Pandemic impact or not, it is clear that there is lots of capacity remaining in both the bus and rail services to meet the growing commuter needs of both existing and future residents of this Blanchardstown Town Centre site A. The NTA's major DART+ plans for the upgrade of Commuter rail services for the Dublin region will radically increase the capacity of rail services to/from the city centre. This report will outline how the DART+ and other proposals directly impact on the city centre in section 7 below, after the review of BusConnects network currently being implemented.

Capacity Assessment Summary

In summary then, the analysis of the current and anticipated future bus and rail passengers, from the granular data in the case of the buses and Luas to the overview numbers for DART patronage, it is clear that the proposed development at City Quay can be easily accommodated by the sheer scale of the public transport offering open to future commuters to and from the subject site. The current plans for the ongoing upgrade of Dublin's public transport infrastructure, both bus and rail, are outlined in the next section. These will further boost the capacity of the city's public transport network to cater for future developments such as City Quay.

7. Public Transport Plans impacting Dublin City Centre.

7.1 This section of the report identifies the key public transport projects that will positively benefit both the quality and future capacity of the public transport system in Dublin. The proposed development, by virtue of its central location, will directly benefit from these upgrades.

BusConnects

The BusConnects route consultation process carried out by the NTA, which concluded in 2020, modified the original service proposals following the review of tens of thousands of submissions by members of the public and key stakeholders. The final, agreed, bus network commenced implementation in 2021. Four phases of the BusConnects project, the latest in mid-October, 2022, have been implemented. Figure 3 below shows the proposed Bus Connects network for the Dublin City Centre area. It is extracted from the NTA's most recently revised "Big Picture Network" following rounds of public consultation and revision. The NTA proposals, in many respects, are similar to many existing bus services serving the Dublin area but with a number of new elements.

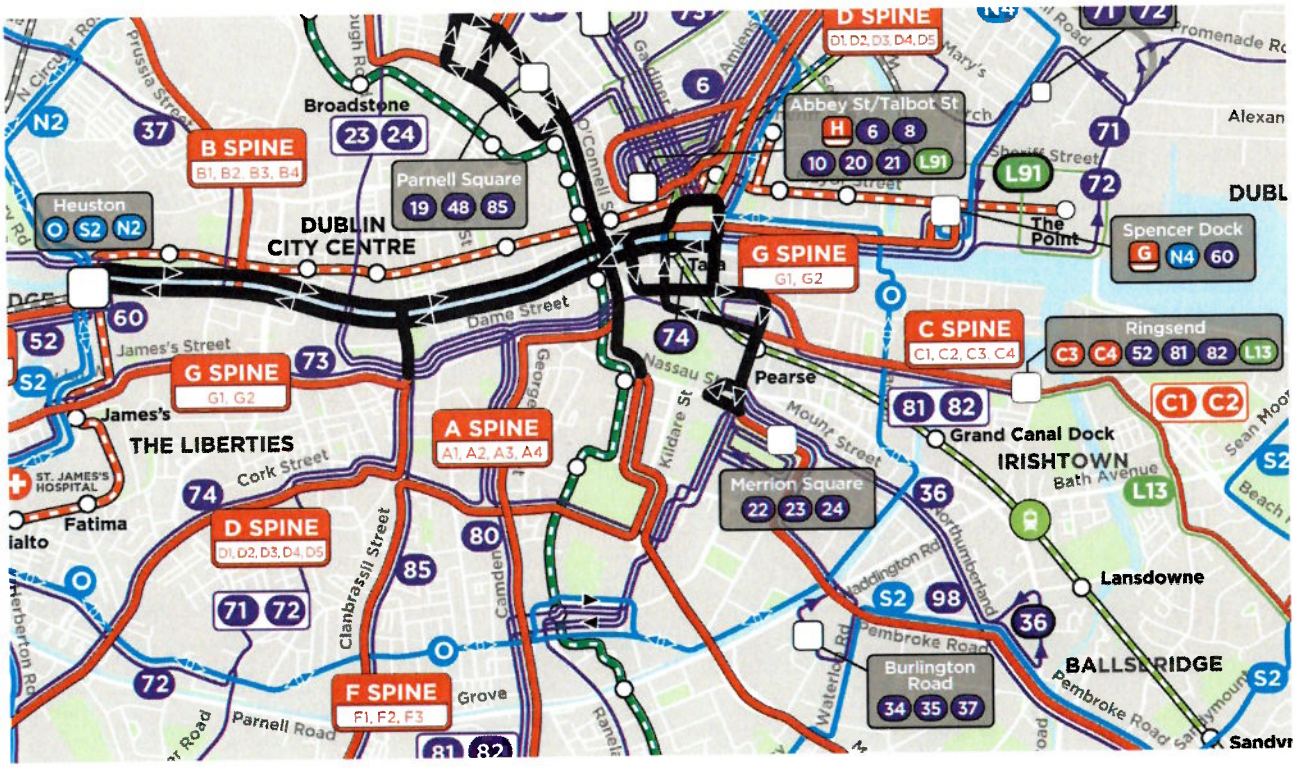


Figure 3. BusConnects "Big Picture" mapping of the future Dublin City Centre Bus Network. Source, NTA.

It is difficult to visually describe the scale of increase in bus service anticipated with the full implementation of the BusConnects project. The density of bus routes in the core city centre mitigates against a good description of individual routes or corridors. In section 3 earlier this report outlined the development of both the bus route network and the new Core Bus Corridors (CBC) alignments, along which the key so-called "Spine-Routes" will operate. The focal point for all the new CBCs and the upgraded frequencies on radial routes is the city centre, where the subject site is located. Some of the new BusConnects Spine routes (for the C, G and H spines) have already been implemented and operate close to the development site. Over the course of the next two years or so the balance of the BusConnects routes will be implemented. The impact of this will be to increase the capacity of the whole bus system by nearly a third and will future proof the bus network for the next decade or so.

Metrolink Project

As described in the PMCE TTA for the City Quay site, the MetroLink project includes the development of a north-south urban railway service that will run along the busy corridor between Swords and Sandyford, connecting key destinations including Dublin Airport and the City Centre along the 26 km route.

A large portion of the route will be underground within the city centre and Dublin Airport. The proposed MetroLink will connect to the Luas Green Line and Charlemont to create a Luas / Metro interchange, at Tara Street, adjacent to the subject development, to create a Dart / Metro interchange and at Glasnevin to connect to the Maynooth and Kildare Rail Lines.

The proposed MetroLink will cater for 15,000 passages per direction each hour and will have a maximum journey time of 50 minutes in one direction. The subject development is located within 200m of the proposed MetroLink station at Tara Street, which will form the only interchange in the city between the existing Dart and proposed MetroLink. As such the proposed development of the site, which will provide for significant high-density office accommodation as well as cultural uses, will be able to provide a place of work for a large quantity of workers who can avail of this and other forms of sustainable public transport.

DART+ Project

The DART+ Programme, promoted and funded by the NTA and now being implemented by Irish Rail, promises to revolutionise rail travel in the Greater Dublin Area (GDA). This investment will see the DART network expand from its current 50 km in length to over 150 km. It promises to "promote multi-modal transit, active transport, boost regional connectivity and make public transport the preferred option for more and more people."
The DART+ Programme will deliver frequent, modern, electrified services within the GDA and will improve connectivity to Regional towns and cities. The five key reasons/objectives why the DART+ Programme is needed are cited as

- To reduce the over-reliance on the private car,
- To improve land-use planning,
- To Improve integration with other modes of transport,
- To support economic and population growth,
- To achieve climate change targets.

The project is seen as supporting growing communities, businesses, and future developments by providing high-quality integrated public transport service in line with Government policy including the National Planning Framework and Climate Action Plan. The core of the city centre and surrounding areas will significantly benefit from the DART+ proposals. The DART+ project is promoted as part of the Project Ireland 2040 investment plan and the NTA's Transport Strategy for the Greater Dublin Area (2016-2035).

LUAS Projects

Since its introduction nearly two decades ago, the Luas network has expanded incrementally with extensions to both the Red and Green Lines. While no further extensions are earmarked in the near term further expansion of the network on new alignments are being considered. Any additions will further enhance the Luas network and raise the quality of the public transport network.

Summary

There are numerous, significant infrastructural plans in place to enhance the scale and quality of the existing public transport network in and around Dublin. Without exception, these projects will improve connectivity to and from the core city centre for public transport passengers. The development site at City Quay is well placed to benefit from all these planned schemes.

8 Conclusions.

In this report we have outlined how well located that development site is in relation to the existing public transport network. The subject site also stands to benefit from the enhanced capacity and quality that the various planned service and infrastructure projects for the public transport modes, bus and rail, will bring to Dublin city centre.

The report examined the existing level of capacity in the public transport networks serving the development site. The bus and Luas surveys undertaken in close proximity to the site together will an analysis of overall growth trends in heavy rail services (DART and Commuter Rail) lead to the following key conclusions:

1. The development site is extremely well located, immediately adjacent to the heart of Dublin's public transport network, bus and rail.

2. The bus survey undertaken in the key evening peak shows a significant degree of spare capacity in the existing bus network close to the development site. The spare capacity was measured following a recent recovery in bus patronage brought about by an increasing return to work and the effects of the 20% reduction in public transport fares.

3. When the generated bus trips anticipated from the development were added to observed passenger data the impact on bus spare capacity was limited. There remained more than adequate spare capacity in the bus network available to bus passengers.

4. However, in the event of any material rise in patronage in the years to come, the NTA, through "Measure Bus5", will respond to this increased demand with even higher bus frequencies in keeping with its transport strategy for the Dublin area.

5. Similar exercises carried out on the surveyed Luas passenger numbers showed significant levels of existing spare capacity, even with reduced service. The overall trend data since the commencement of the pandemic suggests that there is lots of leeway to increase Luas patronage. The number of generated trips expected to use the Luas service will not challenge existing network capacity.

6. DART and Commuter Rail services operating out of nearby Tara St Station, like Luas, have seen dramatic falls in patronage during the pandemic. Recovery in rail passengers has been slow with significant, almost excessive, spare capacity in the system. The extra trips generated will, in a limited way,assist the recovery of rail services.

7. The future infrastructure and service enhancements expected with Metrolink, DART+ and BusConnects (including the new CBCs), will further enhance the capacity and quality of the public transport network in the vicinity of the development site at City Quay.

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Appendix E – Updated Outline Construction Management Plan