

## Appendix A – Multi Criteria Analysis Tables

MCA criteria	Assessment Sub-Criteria	R1 Option 1	R1 Option 2	R2 Option 1	R2 Option 2	R3 Option 1	R3 Option 2
Economy	1.a. Capital Cost	Capital Cost: €3.08M Length: 2.1km Cost/Km: 1.47M <b>Indicative Scheme Infrastructure Works Cost</b> - €3.08M <b>No Land Acquisition Cost</b>	Capital Cost: €3.12M Length: 2.1km Cost/Km: 1.49M <b>Indicative Scheme Infrastructure Works Cost</b> - €3.12M <b>No Land Acquisition Cost</b>	Capital Cost: €5.40M Length: 3.4km Cost/Km: 1.59M <b>Indicative Scheme Infrastructure Works Cost</b> - €5.40M <b>No Land Acquisition Cost</b>	Capital Cost: €5.90M Length: 3.4km Cost/Km: 2.9M <b>Indicative Scheme Infrastructure Works Cost</b> - €5.40M <b>Land Acquisition Cost</b> - €0.40M	Capital Cost: €6.25M Plus 30M bridge over the Dodder: Length: 3.55km Cost/Km: 1.76M <b>Indicative Scheme Infrastructure Works Cost</b> - €6.25M <b>No Land Acquisition Cost</b>	Capital Cost: €7.13M Plus 30M bridge over the Dodder: Length: 3.35km Cost/Km: 2.12M <b>Indicative Scheme Infrastructure Works Cost</b> - €5.50M <b>Land Acquisition Cost</b> - €1.63M
	Rank						
	1.b. Transport Reliability and Quality (Journey Time)	Journey Time: 15 mins both directions Length: 2.1km No. of Junctions: 9 No. of pedestrian crossings: 2	Journey Time: 15 mins both directions Length: 2.1km No. of Junctions: 9 No. of pedestrian crossings: 2	Journey Time: 25 mins both directions Length: 3.4km No. of Junctions: 11 No. of pedestrian crossings: 3	Journey Time: 24 mins both directions Length: 3.4km No. of Junctions: 10 No. of pedestrian crossings: 3	Journey Time: 26 mins both directions Length: 3.55km No. of Junctions: 11 No. of pedestrian crossings: 6	Journey Time: 20 mins both directions Length: 3.35km No. of Junctions: 10 No. of pedestrian crossings: 6
Rank							
Integration	2.a. Land Use Integration	Integrates with existing / planned residential, educational, medical and leisure uses in this established area. Route R1 integrates with the Boland's Mill development on Grand Canal Street.	Integrates with existing / planned residential, educational, medical and leisure uses in this established area. Route R1 integrates with the Boland's Mill development on Grand Canal Street.	Integrates with existing / planned residential, educational, medical and leisure uses in this established area. Route R2 integrates with the Irish Glass Bottle Site development in Ringsend and Boland's Mill development on Grand Canal Street.	Integrates with existing / planned residential, educational, medical and leisure uses in this established area. Route R2 integrates with the Irish Glass Bottle Site development in Ringsend and Boland's Mill development on Grand Canal Street.	Integrates with existing / planned residential, educational, medical and leisure uses in this established area. Route R3 integrates with the Irish Glass Bottle Site development in Ringsend.	Integrates with existing / planned residential, educational, medical and leisure uses in this established area. Route R3 integrates with the Irish Glass Bottle Site development in Ringsend.
	Rank						
	2.b. Residential Population and Employment Catchments	<b>Residential Population Catchments</b> - 5 minute walk catchment of approximately 12,000 - 10 minute walk catchment of approximately 23,000 - 15 minute walk catchment of approximately 45,000 <b>Employment catchments</b> 15 minute walk catchment of	<b>Residential Population Catchments</b> - 5 minute walk catchment of approximately 12,000 - 10 minute walk catchment of approximately 33,000 - 15 minute walk catchment of approximately 45,000 <b>Employment catchments</b> 15 minute walk catchment of	<b>Residential Population Catchments</b> - 5 minute walk catchment of approximately 12,000 - 10 minute walk catchment of approximately 22,000 - 15 minute walk catchment of approximately 38,000 <b>Employment catchments</b> 15 minute walk catchment of	<b>Residential Population Catchments</b> - 5 minute walk catchment of approximately 12,000 - 10 minute walk catchment of approximately 22,000 - 15 minute walk catchment of approximately 38,000 <b>Employment catchments</b> 15 minute walk catchment of	<b>Residential Population Catchments</b> - 5 minute walk catchment of approximately 10,000 - 10 minute walk catchment of approximately 26,000 - 15 minute walk catchment of approximately 46,000 <b>Employment catchments</b> 15 minute walk catchment of	<b>Residential Population Catchments</b> - 5 minute walk catchment of approximately 10,000 - 10 minute walk catchment of approximately 26,000 - 15 minute walk catchment of approximately 46,000 <b>Employment catchments</b> 15 minute walk catchment of

	approximately 88,000 <b>Education catchments</b> 15 minute walk catchment of approximately 18,0000	approximately 88,000 <b>Education catchments</b> 15 minute walk catchment of approximately 18,0000	approximately 87,000 <b>Education catchments</b> 15 minute walk catchment of approximately 18,000	approximately 87,000 <b>Education catchments</b> 15 minute walk catchment of approximately 18,000	approximately 86,000 <b>Education catchments</b> 15 minute walk catchment of approximately 20,000	approximately 86,000 <b>Education catchments</b> 15 minute walk catchment of approximately 20,000
Rank						
2.c. Transport Network Integration	Potential for interchange with the DART and buses.	Potential for interchange with the DART and buses.	Potential for interchange with the DART and buses.	Potential for interchange with the DART and buses.	Potential for interchange with the Luas, DART and buses.	Potential for interchange with the Luas, DART and buses.
Rank						
2.d. Cycle Network Integration	Both directions of route R1 align partly with secondary route 13E as identified in the GDA Cycle Network Plan.  See report Section 2 Figure 2.4.2.	Both directions of route R1 align partly with secondary route 13E as identified in the GDA Cycle Network Plan.  See report Section 2 Figure 2.4.2.	Both directions of route R2 align partly with secondary route 13E as identified in the GDA Cycle Network Plan.  See report Section 2 Figure 2.4.2.	Both directions of route R2 align partly with secondary route 13E as identified in the GDA Cycle Network Plan.  See report Section 2 Figure 2.4.2.	Both directions of route R3 align partly with the Dodder Greenway and primary route 5 and secondary route 13E/N5 as identified in the GDA Cycle Network Plan.  See report Section 2 Figure 2.4.2.	Both directions of route R3 align partly with the Dodder Greenway and primary route 5 and secondary route 13E/N5 as identified in the GDA Cycle Network Plan.  See report Section 2 Figure 2.4.2.
Rank						
2.e. Traffic Network Integration	<p>Irishtown Road – Provision of segregated inbound and outbound cycle facilities along the majority of Irishtown Road. Also segregated bus facilities where buses currently share road space – moderate positive impact. Bridge Street – no change to existing facilities – No positive or negative impact. Ringsend Road – Full segregated cycle and bus facilities where currently commuters share the road space – moderate positive impact. Pearse Street - Full segregated cycle and bus facilities where currently commuters share the road space – moderate positive impact.</p> <p>Sandwith Street Lower – Full bus and cycle facilities along Sandwith Street Lower between Townsend Street and Pearse Street where some facilities currently exist – Minor positive impact.</p>	<p>Bath Street – Provision of Inbound cycle lane where none currently exist. May effect on-street parking – moderate negative impact.</p> <p>Pembroke Street - Provision of Outbound cycle lane where none currently exist. May effect on-street parking – moderate negative impact.</p> <p>Bridge Street – no change to existing facilities – No positive or negative impact.</p> <p>Ringsend Road – Full segregated cycle and bus facilities where currently commuters share the road space – moderate positive impact.</p> <p>Pearse Street - Full segregated cycle and bus facilities where currently commuters share the road space – moderate positive impact</p> <p>Sandwith Street Lower – Full bus and cycle facilities along Sandwith Street Lower between Townsend Street and Pearse Street where some</p>	<p>Seán Moore Road - Provision of full cycle and bus facilities where presently none exist – major positive impact</p> <p>Pigeon House Road/R131 East Link Road – Full cycle facilities to be provided along the full length of Pigeon House Road where currently none exist. Segregated Bus facilities also to be provided between Cambridge Road and Cambridge Avenue where none currently exist – major positive impact.</p> <p>Cambridge Road – Full bus and cycle facilities where none currently exist – major positive impact.</p> <p>Bridge Street – no change to existing facilities – No positive or negative impact.</p> <p>Ringsend Road – Full segregated cycle and bus facilities where currently commuters share the road space – moderate positive impact.</p> <p>Pearse Street - Full segregated cycle and bus</p>	<p>Seán Moore Road - Provision of full cycle and bus facilities where presently none exist – major positive impact</p> <p>Pigeon House Road/R131 East Link Road – Full cycle facilities to be provided along the full length of Pigeon House Road where currently none exist. Segregated Bus facilities also to be provided between Cambridge Road and Cambridge Avenue where none currently exist – major positive impact.</p> <p>Cambridge Road – Full bus and cycle facilities where none currently exist – major positive impact.</p> <p>Bridge Street – no change to existing facilities – No positive or negative impact.</p> <p>Ringsend Road – Full segregated cycle and bus facilities where currently commuters share the road space – moderate positive impact.</p> <p>Pearse Street - Full segregated cycle and bus</p>	<p>Seán Moore Road – Provision of full segregated bus and cycle facilities where currently none exist – major positive impact.</p> <p>Pigeon House Road/R131 East Link Road – Full segregated bus facilities to be provided along the full length of Pigeon House Road where currently none exist. – moderate positive impact York Road - Provision of full segregated bus and shared cycle facilities where currently none exist — moderate positive impact.</p> <p>Proposed Bridge over River Dodder - Provision of full segregated bus and cycle facilities where currently none exist – major positive impact.</p> <p>Sir John Rogerson’s Quay – Provision of full segregated cycle facilities to upgrade existing facilities. Bus shall share road space with traffic – Minor positive impact.</p> <p>Loop around Quays - Provision of full segregated bus and</p>	<p>Seán Moore Road – Provision of full segregated bus and cycle facilities where currently none exist – major positive impact.</p> <p>Pidgeon House Road – Full segregated bus and cycle facilities to be provided along the full length of Pidgeon House Road where currently none exist. – Major positive impact.</p> <p>York Road - Provision of segregated cycle facility (eastbound only) and shared cycle facilities (westbound) where currently none exist — moderate positive impact.</p> <p>Proposed Bridge over River Dodder - Provision of full segregated bus and cycle facilities where currently none exist – major positive impact.</p> <p>Sir John Rogerson’s Quay – Provision of full segregated cycle facilities to upgrade existing facilities. Bus shall share road space with traffic between the Benson Street junction and the Forbes street</p>

			facilities currently exist – Minor positive impact.	facilities where currently commuters share the road space – moderate positive impact  Sandwith Street Lower – Full bus and cycle facilities along Sandwith Street Lower between Townsend Street and Pearse Street where some facilities currently exist – Minor positive impact.	facilities where currently commuters share the road space – moderate positive impact  Sandwith Street Lower – Full bus and cycle facilities along Sandwith Street Lower between Townsend Street and Pearse Street where some facilities currently exist – Minor positive impact.	cycle facilities to match existing facilities – No impact.	junction – Minor positive impact.  North and South Quays - Provision of bus and cycle facilities as detailed in Section 6.2.14– Minor positive impact.
	Rank						
Accessibility & Social Inclusion	3.a. Key Trip Attractors (Education/Health/Commercial/Employment)	- South/Grand Canal Docks - Boland’s Mill - Trinity College See Appendix B Figure 2.	- South/Grand Canal Docks - Boland’s Mill - Trinity College See Appendix B Figure 2.	- Irish Glass Bottle Site - South/Grand Canal Docks - Bolands Mill - Trinity College - See Appendix B Figure 2.	- Irish Glass Bottle Site - South/Grand Canal Docks - Bolands Mill - Trinity College See Appendix B Figure 2.	- Irish Glass Bottle Site - South/Grand Canal Docks - Convention Centre - IFSC See Appendix B Figure 2.	- Irish Glass Bottle Site - South/Grand Canal Docks - Convention Centre - IFSC See Appendix B Figure 2.
	Rank						
	3.b. Deprived Geographic Areas	This route serves a wide range of affluent and disadvantaged areas as identified in the Pobal Deprivation Index	This route serves a wide range of affluent and disadvantaged areas as identified in the Pobal Deprivation Index	This route serves a wide range of affluent and disadvantaged areas as identified in the Pobal Deprivation Index	This route serves a wide range of affluent and disadvantaged areas as identified in the Pobal Deprivation Index	This route serves a wide range of affluent and disadvantaged areas as identified in the Pobal Deprivation Index	This route serves a wide range of affluent and disadvantaged areas as identified in the Pobal Deprivation Index
	Rank						
Safety	4.a. Road Safety	No. of Junctions: 9 No turning movements required in either direction	No. of Junctions: 9 No turning movements required in either direction	No. of Junctions: 11 1 turning movement required in each direction (1 inbound left turn, 1 outbound right turn)	No. of Junctions: 10 1 turning movement required in each direction (1 inbound left turn, 1 outbound right turn)	No. of Junctions: 11 3 turning movements required in inbound direction (2 left turns and 1 right turn), 1 turning movement required in outbound direction (1 left turn)	No. of Junctions: 10 1 turning movements required in inbound direction (1 left turn), 3 turning movement required in outbound direction (2 right turn and 1 left turn)
	Rank						
Physical Activity	5.a Physical Activity	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.  The physical benefits associated with the scheme will be quantified as part of a future Cost – Benefit Analysis.	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.  The physical benefits associated with the scheme will be quantified as part of a future Cost – Benefit Analysis.	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.  The physical benefits associated with the scheme will be quantified as part of a future Cost – Benefit Analysis.	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.  The physical benefits associated with the scheme will be quantified as part of a future Cost – Benefit Analysis.	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.  The physical benefits associated with the scheme will be quantified as part of a future Cost – Benefit Analysis.	This criterion relates to the health benefits derived from using different transport modes. The subject scheme options under consideration relate to the same mode of travel (bus). As such, this criterion will not produce any relative differences between the options.  The physical benefits associated with the scheme will be quantified as part of a future Cost – Benefit Analysis.
	Rank						
Environment	6.a. Archaeology and Cultural Heritage	A large portion of the route located within <b>Zones of Archaeological Potential</b> for Dublin City (RMP DU018-020),	A large portion of the route located within <b>Zones of Archaeological Potential</b> for Dublin City (RMP DU018-020),	A large portion of the route located within <b>Zones of Archaeological Potential</b> for Dublin City (RMP DU018-020)	A large portion of the route located within <b>Zones of Archaeological Potential</b> for Dublin City (RMP DU018-020)	A large portion of the route located within <b>Zones of Archaeological Potential</b> for Dublin City (RMP DU018-020)	A large portion of the route located within <b>Zones of Archaeological Potential</b> for Dublin City (RMP DU018-020)

	Ringsend (DU018-053) & Irishtown (DU018-054). Four individual archaeological <b>sub constraints</b> recorded adjacent to route.	Ringsend (DU018-053) & Irishtown (DU018-054). Four individual archaeological <b>sub constraints</b> recorded adjacent to route.	and Ringsend (DU018-053). Two individual archaeological <b>sub constraints</b> recorded adjacent to route, plus one further recorded monument.	and Ringsend (DU018-053). Two individual archaeological <b>sub constraints</b> recorded adjacent to route, plus one further recorded monument.	and Ringsend (DU018-053). Three individual archaeological <b>sub constraints</b> recorded adjacent to route, plus one further recorded monument.  (Note that the quays are included in the RMP)	and Ringsend (DU018-053). Three individual archaeological <b>sub constraints</b> recorded adjacent to route, plus one further recorded monument.  (Note that the quays are included in the RMP)
Rank						
6.b. Architectural Heritage	<b>NIAH</b> survey yet to be completed this part of Dublin City  <b>8 protected structures</b> front onto Pearse St & Sandwith St.  <b>7 protected structures</b> front onto Pearse St & Ringsend Rd  <b>6 protected structures</b> front onto Bridge St.  <b>5 protected structures</b> front onto Irishtown Road.	<b>NIAH</b> survey yet to be completed this part of Dublin City  <b>8 protected structures</b> front onto Pearse St & Sandwith St.  <b>7 protected structures</b> front onto Pearse St & Ringsend Rd  <b>6 protected structures</b> front onto Bridge St.  <b>1 protected structure</b> fronts onto Irishtown Road.	<b>NIAH</b> survey yet to be completed this part of Dublin City  <b>8 protected structures</b> front onto Pearse St & Sandwith St.  <b>7 protected structures</b> front onto Pearse St & Ringsend Rd  <b>6 protected structures</b> front onto Bridge St.  <b>1 protected structure</b> fronts onto Cambridge Road  <b>1 protected structure</b> fronts onto Pigeon House Road.	<b>NIAH</b> survey yet to be completed this part of Dublin City  <b>8 protected structures</b> front onto Pearse St & Sandwith St.  <b>7 protected structures</b> front onto Pearse St & Ringsend Rd  <b>6 protected structures</b> front onto Bridge St.  <b>1 protected structure</b> fronts onto Cambridge Road  <b>1 protected structure</b> fronts onto Pigeon House Road.	Route crosses <b>1 protected structure</b> on Custom House Quay and is adjacent to one further structure.  <b>9 protected structures</b> front onto City Quay  <b>9 protected structures</b> front onto City Quay  <b>4 protected structures</b> front onto Sir John Rogerson's Quay  <b>12 protected structures</b> front onto Pigeon House Road.  (note that the quays are included in the RPS)	Route crosses <b>1 protected structure</b> on Custom House Quay and is adjacent to one further structure.  <b>9 protected structures</b> front onto City Quay  <b>9 protected structures</b> front onto City Quay  <b>4 protected structures</b> front onto Sir John Rogerson's Quay  <b>12 protected structures</b> front onto Pigeon House Road.  (note that the quays are included in the RPS)
Rank						
6.c. Flora & Fauna	R1 Option 1 has the potential to affect 75 trees. Due to the urban nature of the route, it unlikely that these trees comprise bat roosts however may be used for foraging.	R1 Option 2 has the potential to affect 80 trees. Due to the urban nature of the route, it unlikely that these trees comprise bat roosts however may be used for foraging.	R2 Option 1 has the potential to affect 145 trees. Due to the urban nature of the route, it unlikely that these trees comprise bat roosts however may be used for foraging.	R2 Option 2 has the potential to affect 145 trees. Due to the urban nature of the route, it unlikely that these trees comprise bat roosts however may be used for foraging.	R3 Option 1 has the potential to remove 200 trees. Due to the urban nature of the route, it unlikely that these trees comprise bat roosts however may be used for foraging.	R3 Option 2 has the potential to remove 200 trees. Due to the urban nature of the route, it unlikely that these trees comprise bat roosts however may be used for foraging.
Rank						
6.d. Soils and Geology	No appreciable impacts	No appreciable impacts	No appreciable impacts	No appreciable impacts	No appreciable impacts	No appreciable impacts
Rank						
6.e. Hydrology	R1 crosses the Grand Canal and the River Dodder. Pearse street is at risk of coastal flooding. The route is outside the CFRAM fluvial flood extent.	R1 crosses the Grand Canal and the River Dodder. Pearse street is at risk of coastal flooding. The route is outside the CFRAM fluvial flood extent.	R2 crosses the Grand Canal and the River Dodder. Pearse street is in at risk of coastal flooding. The route is outside the CFRAM fluvial flood extent.	R2 crosses the Grand Canal and the River Dodder. Pearse street is in at risk of coastal flooding. The route is outside the CFRAM fluvial flood extent.	R3 crosses the River Liffey and will cross the mouth of the River Dodder via a new bridge. City Quay is at risk of coastal flooding. The route is outside the CFRAM fluvial flood extent.	R3 crosses the River Liffey and will cross the mouth of the River Dodder via a new bridge. City Quay is at risk of coastal flooding. The route is outside the CFRAM fluvial flood extent.
Rank						
6.f. Landscape and Visual	Route R1 passes in close proximity to residential areas on Irishtown Rd, however bus routes already exist along this	Route R1 passes in very close proximity to residential areas on Bath Street and Pembroke Street where buses currently	Route R2 is mostly served by bus routes at present. The route passes less residential areas than Route R1.	Route R2 is mostly served by bus routes at present. The route passes less residential areas than Route R1.	R3 crosses a protected view however bus lanes already exist on this route. The route passes less residential areas	R3 crosses a protected view however bus lanes already exist on this route. The route passes less residential areas

	route.	do not run.			than Route R1.	than Route R1.
Rank						
6.g. Air Quality	Route R1 passes in close proximity to residential areas on Irishtown Rd, however bus routes already exist along this route.	Route R1 passes in very close proximity to residential areas on Bath Street and Pembroke Street where buses currently do not run.	Route R2 is mostly served by bus routes at present. The route passes less residential areas than Route R1.	Route R2 is mostly served by bus routes at present. The route passes less residential areas than Route R1.	Bus lanes already exist on this route. The route passes less residential areas than Route R1 and R2.	Bus lanes already exist on this route. The route passes less residential areas than Route R1 and R2.
Rank						
6.h. Noise & Vibration	R1 Option 1 passes in close proximity to residential areas on Irishtown Rd, however bus routes already exist along this route.	R1 Option 2 passes in very close proximity to residential areas on Bath Street and Pembroke Street where buses currently do not run. Narrow streets will result in significant noise increases.	R2 Option 1 is mostly served by bus routes at present. The route passes less residential areas than Route R1 options.	R2 Option 2 is mostly served by bus routes at present. The route passes less residential areas than Route R1 options.	Bus lanes already exist on this route. The route passes less residential areas than Route R1 and R2 options.	Bus lanes already exist on this route. The route passes less residential areas than Route R1 and R2 options.
Rank						
6.i. Land Use Character	R1 Option 1 passes in close proximity to residential areas on Irishtown Rd, Parking along Pearse St, Ringsend Rd and Irishtown Rd will be affected.	R1 Option 2 passes in very close proximity to residential areas on Bath Street and Pembroke Street. Parking along Pearse St, Ringsend Rd and Irishtown Rd, along with that along Bath St and Pembroke St will be affected.	R2 Option 1 is mostly served by bus routes at present. The route passes less residential areas than Route R1 options. Parking along Pearse St and Ringsend Rd will be affected.	R2 Option 2 is mostly served by bus routes at present. The route passes less residential areas than Route R1 options. Parking along Pearse St and Ringsend Rd will be affected.	Bus lanes already exist on this route. The route passes less residential areas than Route R1 and R2 options. Pedestrian areas along the Quays may be affected.	Bus lanes already exist on this route. The route passes less residential areas than Route R1 and R2 options. Pedestrian areas along the Quays may be affected.
Rank						

# Appendix B – Data Collection



## 1. Study area visit

Each of the route sections were visited / driven, photographed and audited to identify any constraints which may not have been evident from maps and drawings. The site visits enabled a comprehensive evaluation of the route options in terms of their capacity to accommodate of a Core Bus Corridor.

## 2. Land Use

The land use assessment was carried out using GIS and examined private and public land along the different route options. This information was used for developing cost estimates for each of the route options, based on the area and nature (public or private) of the land acquisition required. The land use assessment results are presented in the MCA tables in Appendix A.

## 3. Existing Bus Lanes

A map indicating the existing bus lanes throughout the CBC study area was produced to highlight sections of the corridor already capable of accommodating segregated facilities. Blue routes indicate inbound bus lanes while red routes indicated outbound bus lanes.

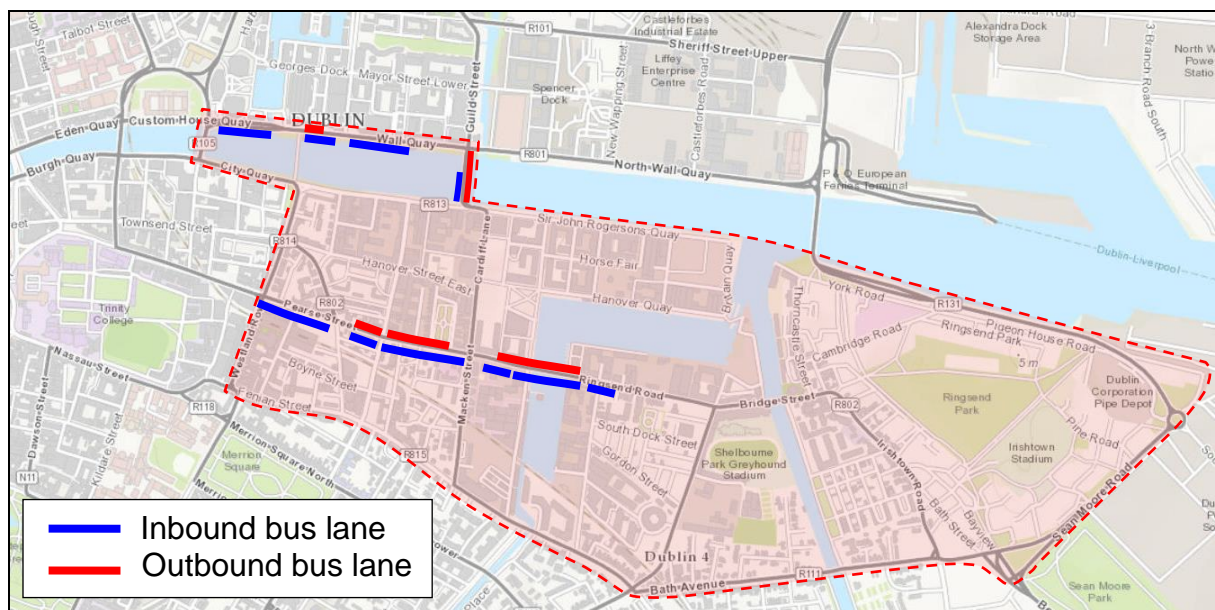


Figure 1: Existing bus lanes within the study area



## 4. Bus Journey Times

The bus travel times for each scheme option along the CBC were estimated based on a number of criteria, including;

- Length of segregated bus lane (suburban)
- Length of shared bus / traffic lane (urban / city centre)
- Number of signalised junctions with no turning lane and good priority
- Number of signalised junctions with no turning lane and poor priority
- Number of signalised junctions with right turning lane and good priority
- Number of signalised junctions with right turning lane and poor priority
- Number of signalised junctions with left turning lane and good priority
- Number of signalised junctions with left turning lane and poor priority
- Number of pedestrian crossings
- Number of busy bus stops
- Number of average use bus stops
- Number of lightly used bus stops

Due to the large number of route options and calculations, the results of the bus journey time estimates are presented in Appendix C.

## 5. Trip attractors

A map was produced to illustrate the location of the main trip destinations within the CBC study area, including IADT College, Dun Laoghaire, Blackrock Village, Blackrock Clinic, UCD, St. Vincent's Hospital, RTE, RDS, Ballsbridge, Sandymount Village and Aviva Stadium. Also identified were interchange points between different modes of public transport i.e. bus and rail routes. It is important that the CBC is designed to facilitate easy interchange for commuters between different transport systems along its route. This map was used to identify 'spider-web' routes sections for bus routes within the study area which could optimise connectivity between trip attractor destinations.

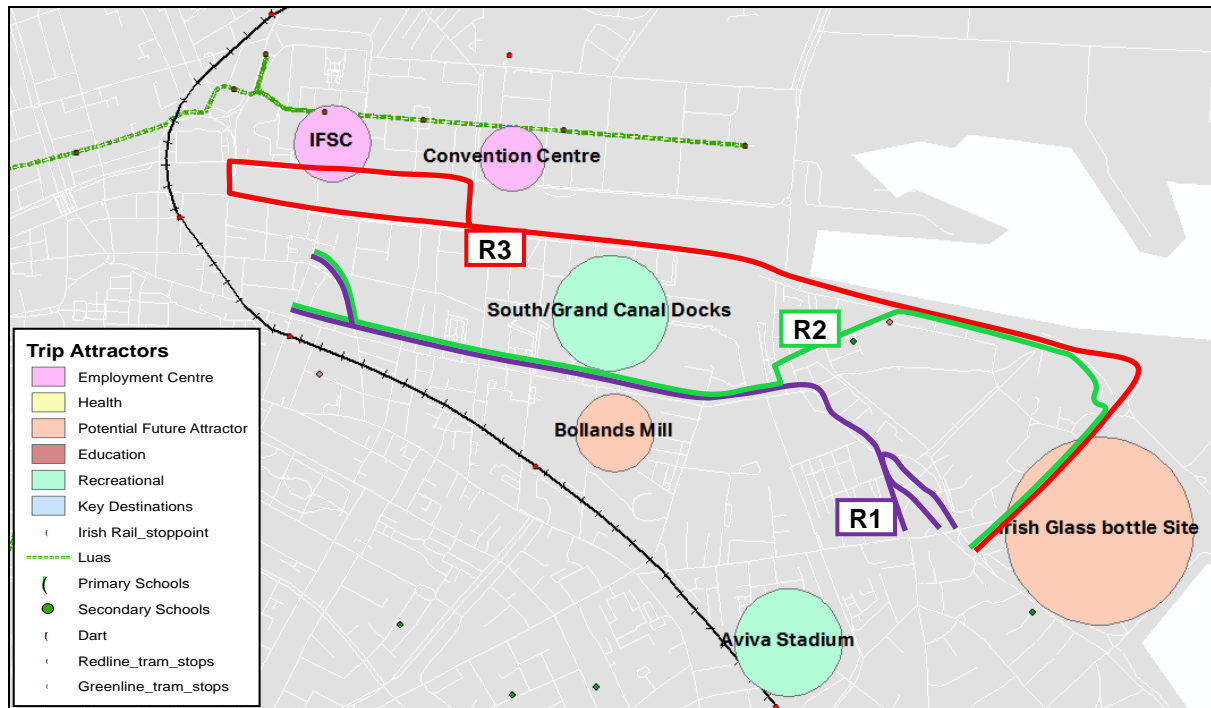


Figure 2: Trip attractors in the study area

## 6. Road collision history

The Road Safety Authority database of personal injury accidents was examined to establish if there are any existing safety issues in the study area that were not evident from the site visits. The database provides accident records for the period 2005 to 2013; in terms of location, year, road user type involved (pedestrian, car, cyclist, motorcyclist, bus etc.), circumstances and severity of collision (minor, serious or fatal). The following bus collision history maps indicate the location of incidents along the route options identified within the study area.

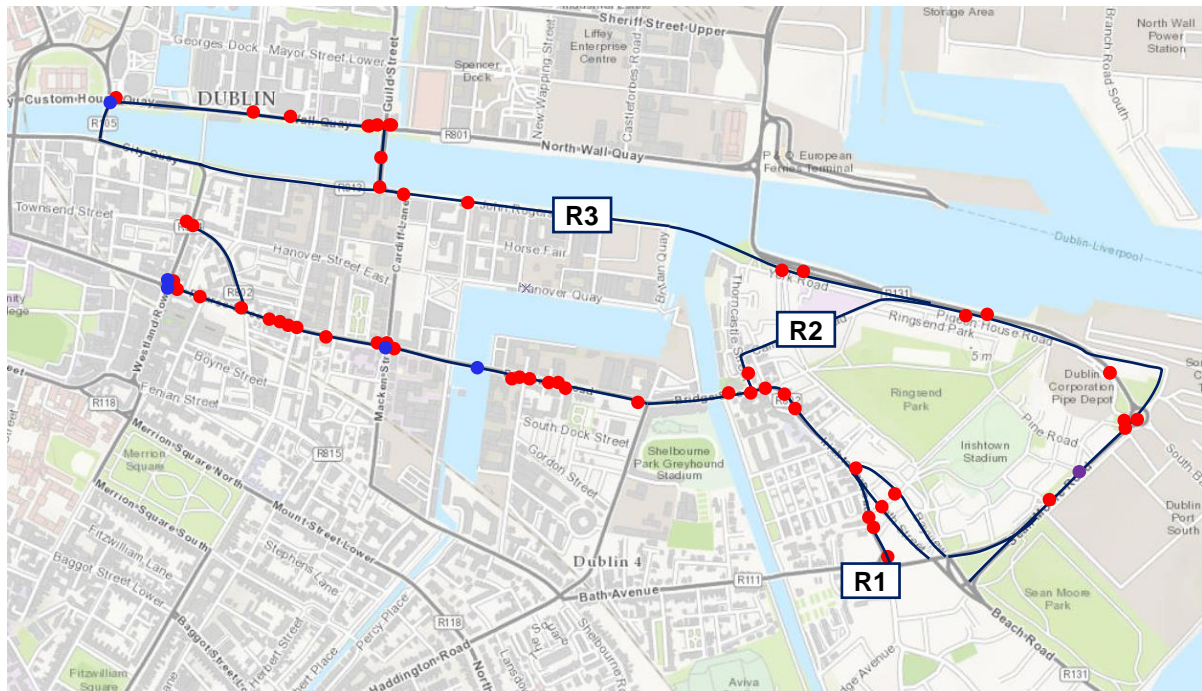


Figure 3: Bus collision history along route options

## 7. Tree surveys

Dr. Phillip Blackstock was commissioned to carry out a detailed and high-level tree survey along the route options. The tree survey assessment identified the number and approximate location of all roadside trees along the route options, as well as trees and hedges growing on adjoining grounds where their canopy extends over the carriageway. It also noted the location of those trees that have trunks or limbs close to and or within 5.1m above the carriageway. Due to the large number of drawings received, the results of the tree survey are contained in a separate document.



## 8. Vertical alignments

Existing vertical alignments of all route options were examined as part of the scheme option designs development. The following images illustrate the road elevation along each of the routes.

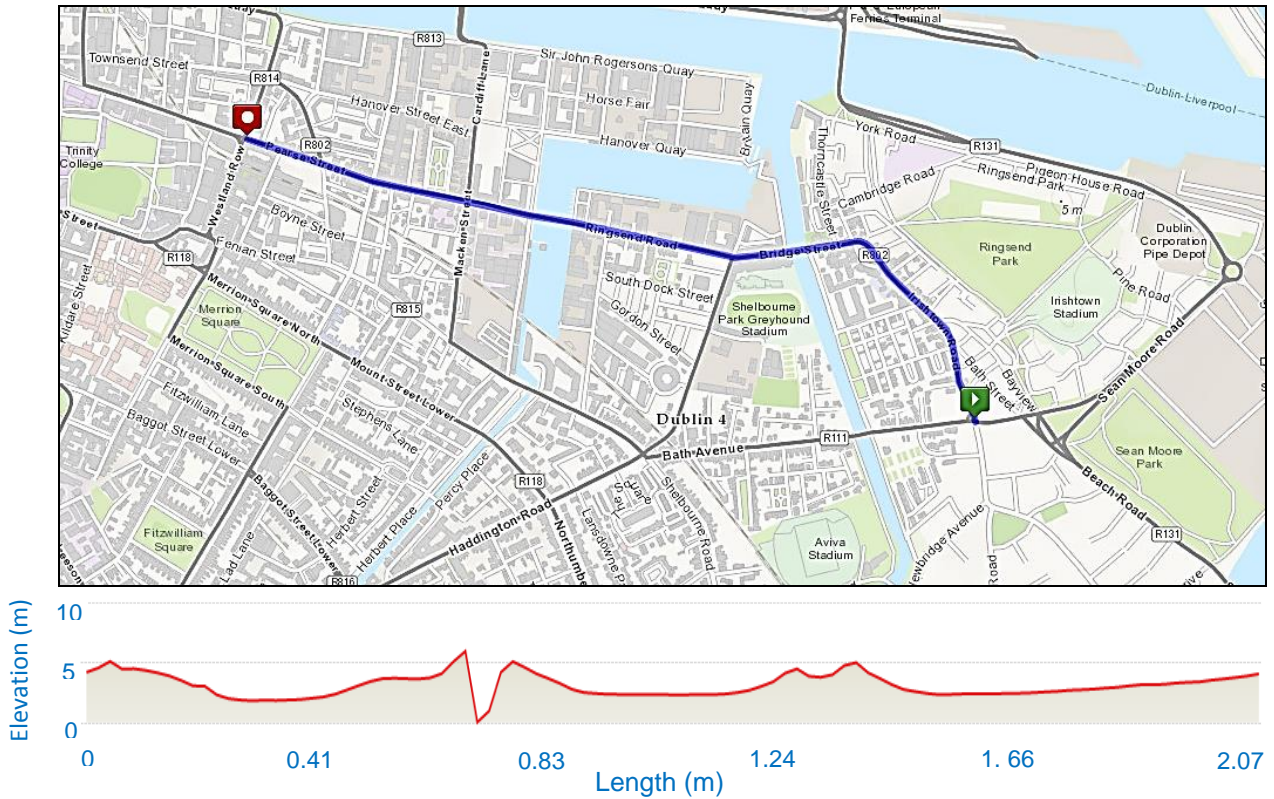


Figure 4: Vertical alignment of R1 option 1 in the inbound direction

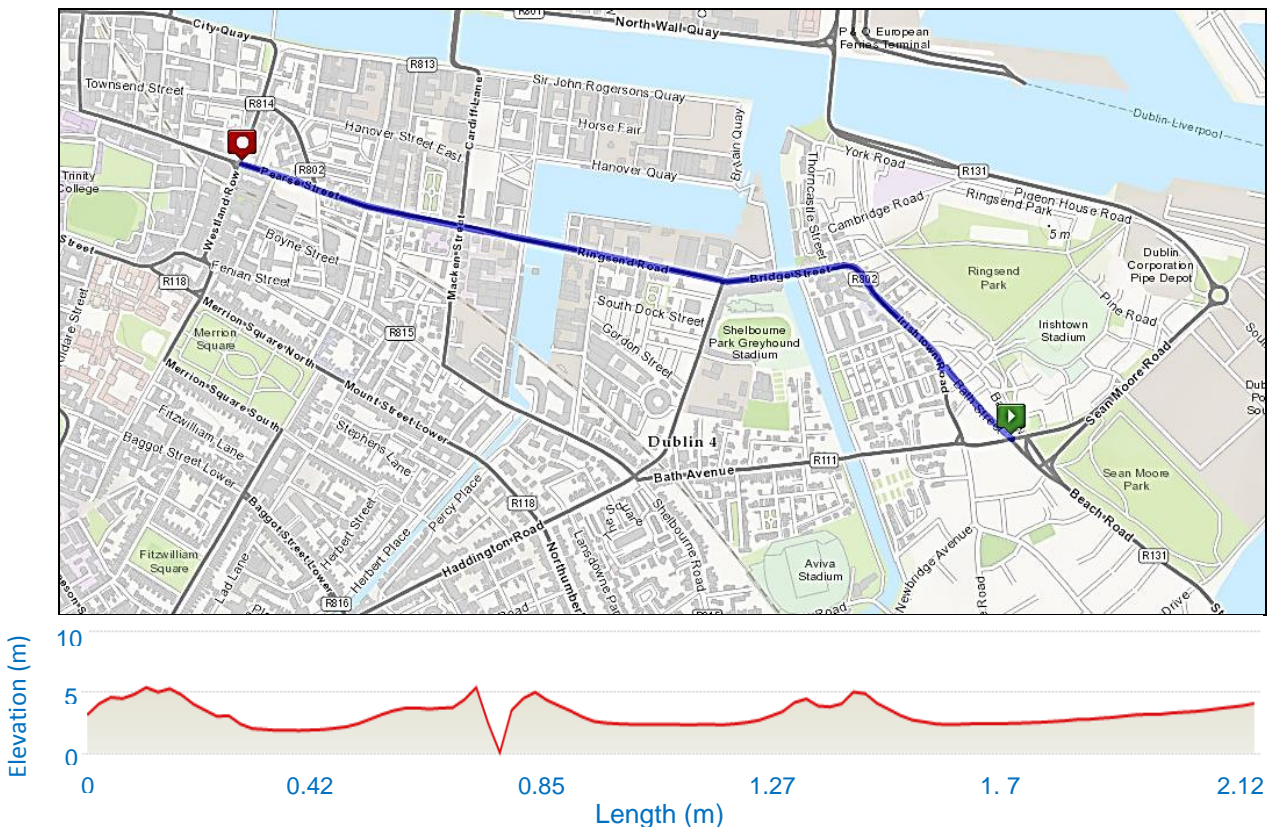




Figure 5: Vertical alignment of R1 option 2 in the inbound direction

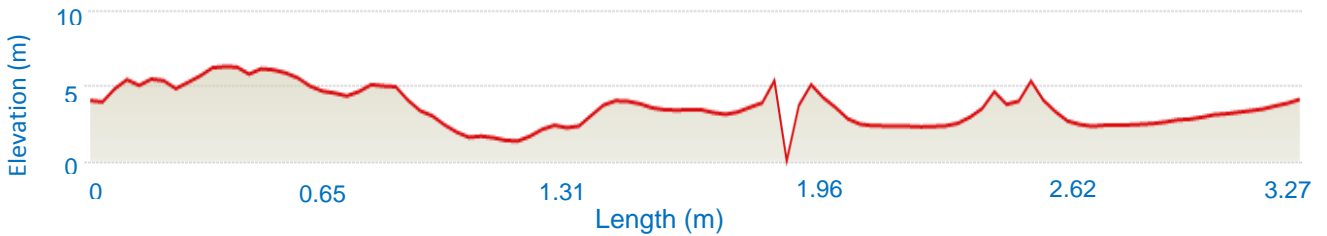
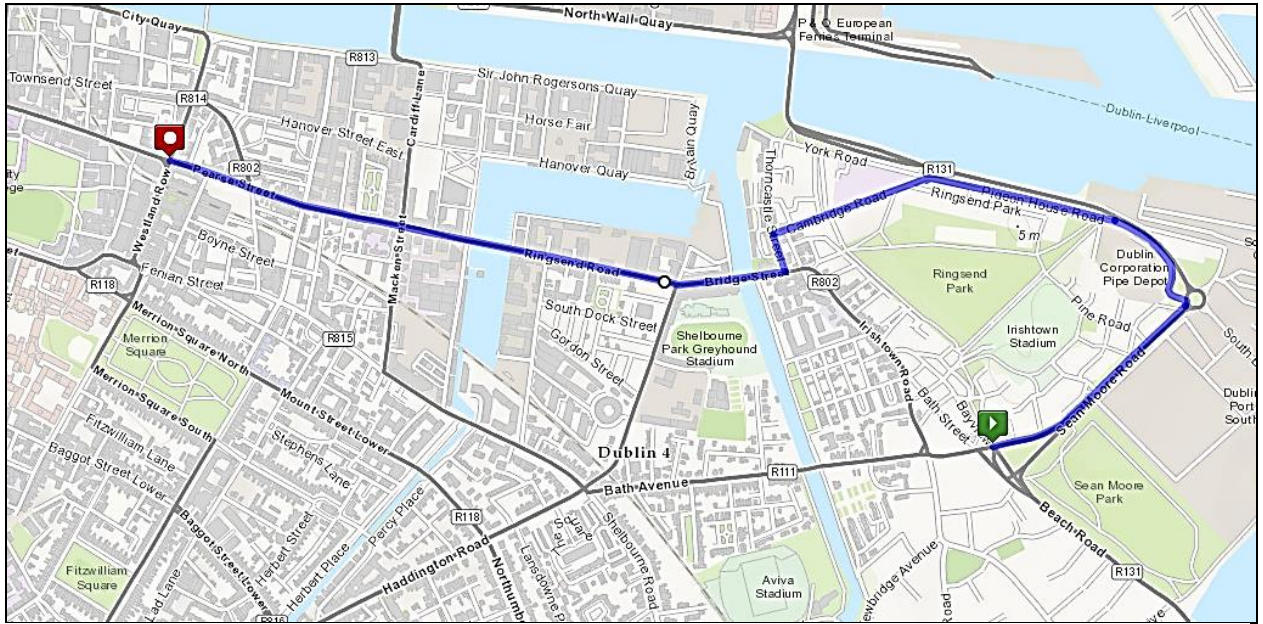


Figure 6: Vertical alignment of R2 scheme options in the inbound direction

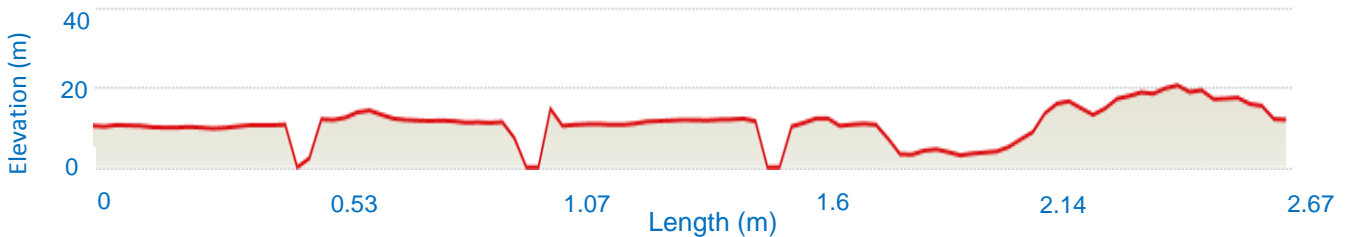
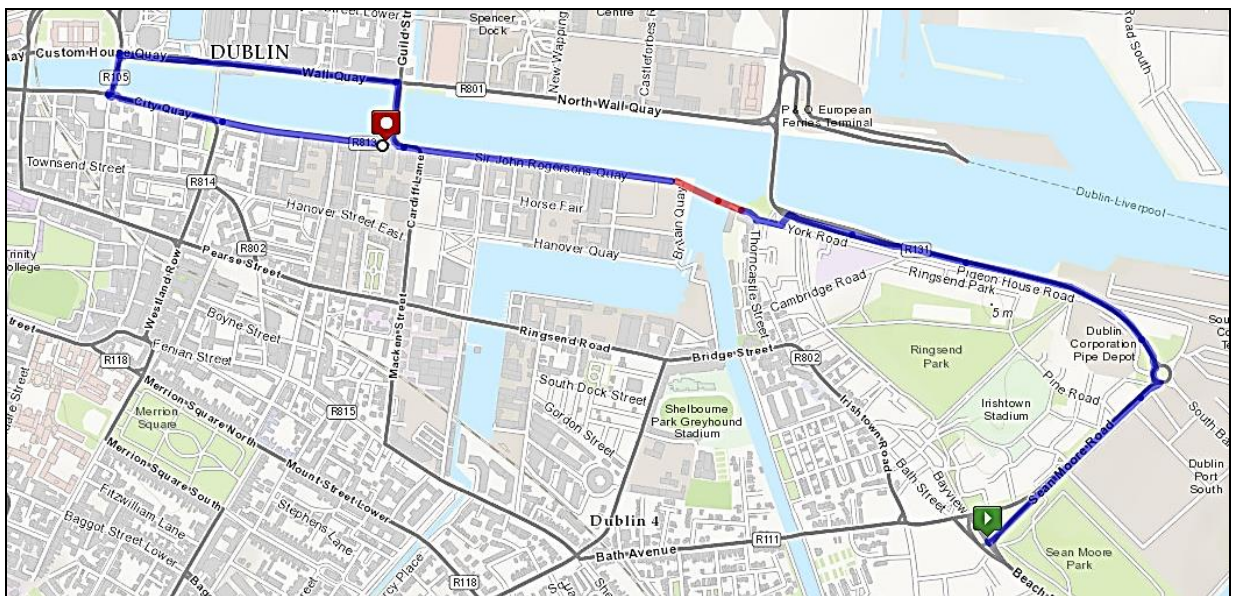


Figure 7: Vertical alignment of R3 scheme options in the inbound direction

## 9. Architectural and Archaeological information

Irish Archaeological Consultancy (IAC) and Roughan & O' Donovan (ROD) provided an environmental assessment of the different route options under the following criteria:

- Archaeology and Cultural Heritage
- Architectural Heritage
- Flora & Fauna
- Soils and Geology
- Hydrology
- Landscape and Visual
- Air Quality
- Noise & Vibration
- Land Use Character

The architectural and archaeological assessment results are presented in the MCA tables in Appendix A.

## 10. Problem identification

A detailed assessment of each route option was carried out to identify existing problems and constraints under the following criteria;

- Cycle Facilities
- Road Condition
- Pinch Points
- Footpath Condition
- Mobility Impaired and Disabled
- Dangerous Structures/Buildings
- Public Lighting
- Access Points
- Electricity Poles

The results of this assessment are contained in a report in Appendix D.

## 11. Parking survey

A parking survey study was carried out to identify the parking conditions in the existing road network. Each route was assessed under the following criteria:

- *Formal Parking*: On-street parking in which marked spaces has been provided. These are spaces in which the Local Authority charges an hourly rate to use.
- *Informal Parking*: On-street parking in which spaces may or may not be marked and in which the Local Authority does not charge for use.
- *Adjacent Parking*: Parking which is accessible to the general public and is located in close proximity to the street. These are spaces in which the Local Authority charges an hourly rate to use.

The results of the parking survey assessment are contained in a report in Appendix E.



## 12. Cost estimates

A breakdown of the cost estimation process is presented in Appendix F.

## Appendix C – Bus Journey Times



Route Option			R1 Option 1	R1 Option 2	R2 Option 1	R2 Option 2	R3 Option 1	R3 Option 2
	<i>KM per Hour</i>	<i>Average Delay(Minute)</i>						
<b>Total Length (km)</b>			2.10	2.10	3.40	3.40	3.55	3.35
Fully Segregated Bus Lane (km)	20		1.51	1.46	2.04	2.04	2.60	3.10
Shared Bus/Traffic Lane - suburban (km)	10							
Shared Bus/Traffic Lane - urban/city centre (km)	8		0.59	0.64	1.36	1.36	0.95	0.25
Signalised Junction with No turning and good Priority (15 Seconds)		0.25	7	7	6	6	5	5
Signalised Junction with No turning and Reasonable Priority (45 Seconds)		0.75	2	2	4	3	3	2
Signalised Junction with No turning and poor Priority (60 Seconds)		1.00						
Signalised Junction with Right turning Lane and Good Priority (30 seconds)		0.50					1	1
Signalised Junction with Right turn and Reasonable Priority (1 minute)		1.00						
Signalised Junction with Right turn and Poor Priority (2 minutes)		2.00						
Signalised Junction with Left turning Lane and Good Priority (30 seconds)		0.50						
Signalised Junction with Left turning Lane and Reasonable Priority (1 minute)		1.00			1	1	2	2
Signalised Junction with Left turn and Poor Priority (2 minutes)		2.00						
Pedestrian Crossing (15 second average)		0.25	2	2	3	3	6	6
Busy Bus Stop Dwell Time (60 seconds)		1.00						
Average use Bus Stop Dwell Time (30 Seconds)		0.50						
Lightly Used Bus Stop Dwell Time (10 seconds)		0.17	11	12	15	15	11	11
<b>Total Journey Time (Minutes)</b>			15	15	15	15	25	24

## Appendix D – Problem Identification



## 1. Introduction

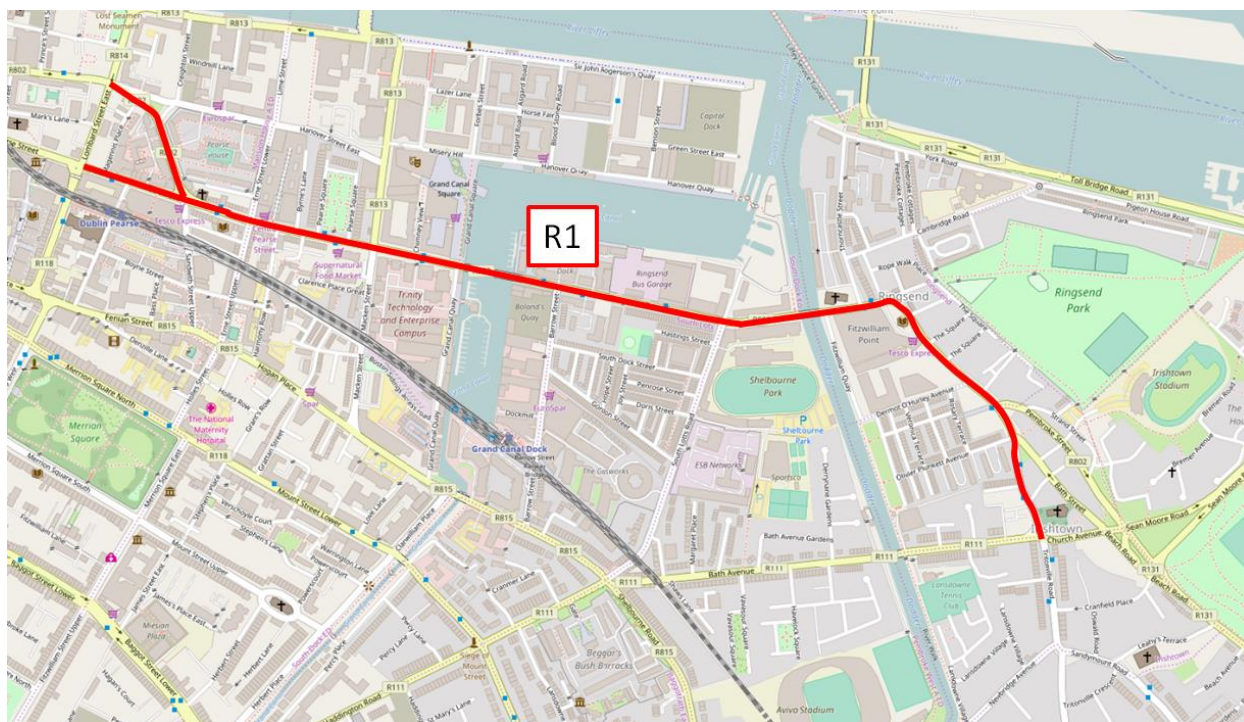
AECOM have been tasked by the National Transport Authority (NTA) to identify viable routes for a Core Bus Corridor which aims to provide ease of bus travel with the objective of improving journey times from South County Dublin into Dublin City Centre.

This report shall seek to identify problems with the existing conditions in the road network. Each route was assessed using the following criteria:

- *Cycle Facilities* – Each road along the possible route options were checked to see if cycle facilities such as cycle tracks have been provided and if so, the condition of the construction materials used.
- *Road Condition* - The roads along each route were assessed to determine the existing conditions of the road pavement, both the condition of the existing surface course and also the visibility of road markings, both in the carriageway and at existing bus stops.
- *Pinch Points* - Pinch points were assessed on whether each route could provide the minimum road standard width requirement to provide a two-way carriageway, a cycle track and a footpath. In areas that roads do not provide the minimum widths required these areas are identifiable as “pinch points”.
- *Footpath Condition* - The condition of the footpaths were also assessed along the possible route options to check for sections which have become dilapidated over time. The footpaths were also checked for uprights and traffic signs which may cause obstructions to pedestrians.
- *Mobility Impaired and Disabled* – Each road on the route options were assessed to determine if the correct facilities have been provided to ensure unrestricted movement, in the safest possible manner, for people with mobility impairments.
- *Dangerous Structures/Buildings* - Along each route, any buildings or structures which may potentially pose a health and safety risk to the general public and which may pose a hazard during any proposed construction works were recorded.
- *Public Lighting* – Public lighting columns along each route have been checked for damage. Any damage to the existing public lighting which may pose a hazard to the general public, and the location of same, was then duly recorded.
- *Access Points* – Each access point has been assessed to analyse the condition of pavements.
- *Electricity Poles* – Electricity Poles along each of the separate route options have been checked for damage. The location of the damaged poles have been recorded and also the damage that has occurred.
- *Retaining Walls* – Retaining walls locations have been identified along each of the separate routes.

## 2. R1 Option 1: Irishtown Road/Bridge Street/Ringsend Road/Pearce Street/Sandwith Street Lower

### Route Map



### Cycle Facilities

There are no cycle facilities along Irishtown Road, from the junction at Church Avenue to the junction of Irishtown Road and Pembroke Street. For all other problems with cycle facilities on this route see Table 1.

### Road condition

Following assessment of Irishtown Road one location was identified where the road pavement and markings were found to be in poor condition. For all other problems identified on this route see Table 1.

### Pinch Points

No problems were found with pinch points along this route.

### Footpath Condition

Following assessment of Irishtown Road one location was identified where the road pavement and markings were found to be in poor condition. For all other problems identified on this route see Table 1.

### Mobility Impaired and Disabled (MID)

Following assessment of Irishtown Road two locations were identified where road crossings lacked the necessary tactile paving. These can be found at the Irishtown



Road/Barrack Lane junction and at the junction of Irishtown Road and Dodder Terrace.

### **Dangerous Structures/Buildings**

No problems were found with the existing structures and buildings along this route.

### **Public Lighting**

No problems were found with the existing public lighting along this route.

### **Access Points**

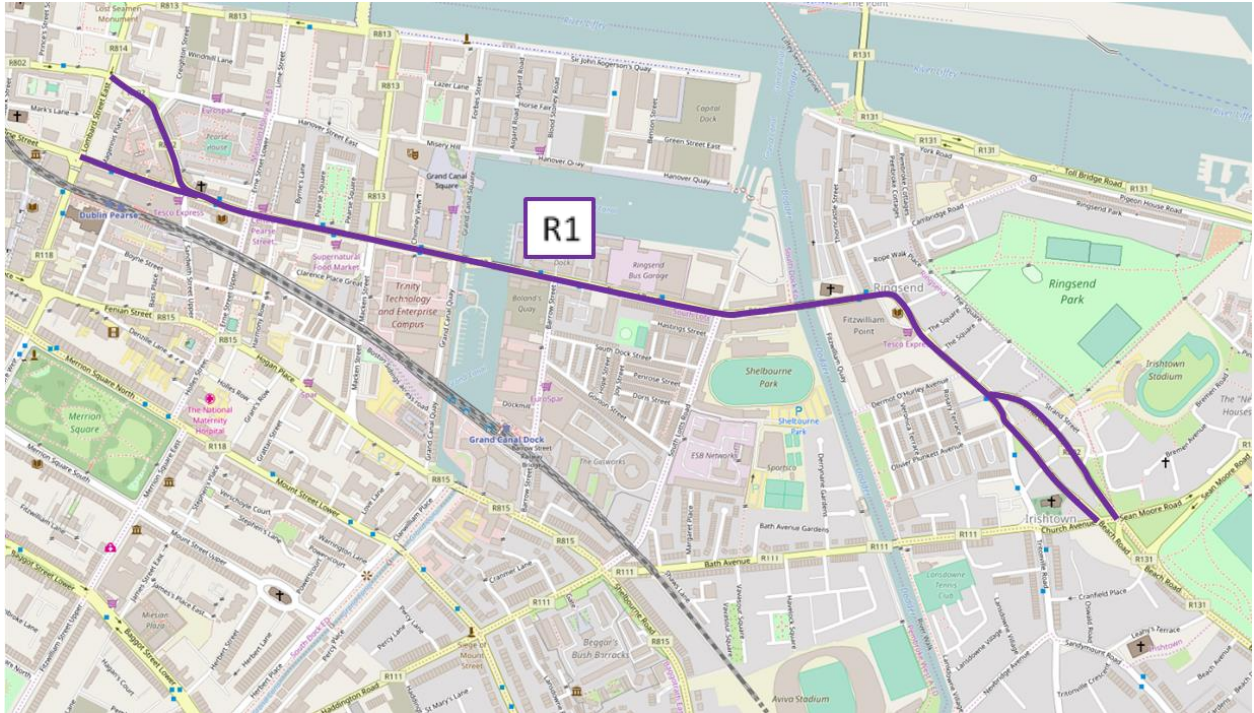
One problem was identified on this route whilst conducting this survey, namely the poor condition of the road pavement at the entrance to Dodder Terrace from Irishtown Road.

### **Electricity Poles**

No problems were found with the existing electricity poles along this route.

### 3. R1 Option 2: Bath Street/Pembroke Street/Irishtown Road/Bridge Street/Ringsend Road/Pearse Street/Sandwith Street Lower

#### Route Map



R2 option 1 utilises Bath Street and Pembroke Street in a one way system to match current conditions. The route follows Irishtown Road before taking the same route as R1 option 1 i.e. along Bridge Street, Ringsend Road etc. Therefore the same issues identified in the R1 option 1 survey from the Bath Street/Pembroke Street/Irishtown road junction, are also applicable to the R1 option 2 survey.

#### Cycle Facilities

There is a lack of cycle facilities at numerous locations on the route. Also at several locations along the route, cycle lanes have been provided but not constructed using the standard thermoplastic material. A full list of the problems identified with the cycle facilities along this route are contained within Table 2 below.

#### Road condition

Following assessment of the route in numerous locations both the road pavement and markings were found to be in poor condition. A full list of the problems identified with the road pavement and markings along this route are contained within Table 2.

#### Pinch Points

Two pinch points have been identified during the course of this assessment on Bath Street.

## **Footpath Condition**

The survey has identified locations along the route where footpaths are in poor condition, examples of which can be seen on Bath Street, travelling south – north along Bay View and travelling east – west along Ringsend Road. A full list of the problems identified with the footpaths along this route is contained within Table 2.

## **Mobility Impaired and Disabled (MID)**

The survey has identified locations along the route where tactile paving is not provided. A full list of missing MID facilities and locations is contained Table 2.

## **Dangerous Structures/Buildings**

No problems were found with the existing structures and buildings along this route.

## **Public Lighting**

No problems were found with the existing public lighting along this route.

## **Access Points**

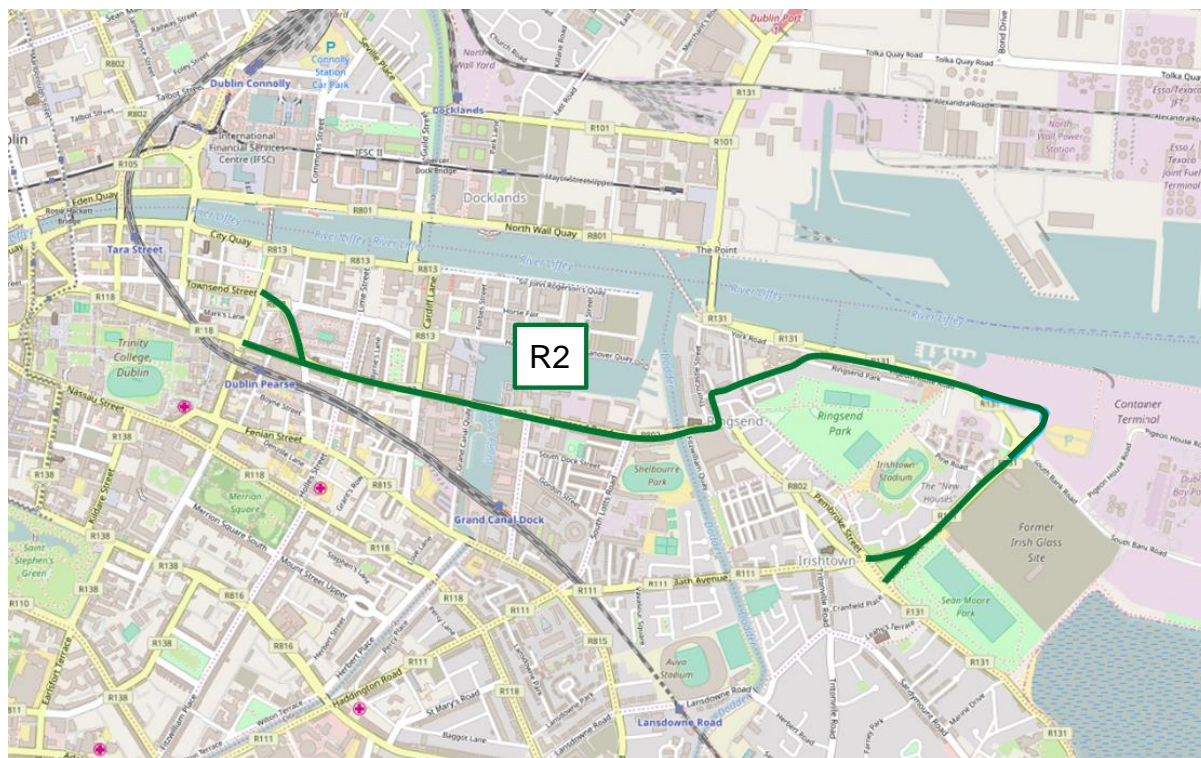
No problems were found with the existing access points along this route.

## **Electricity Poles**

No problems were found with the existing electricity poles along this route.

## 4. R2 Option 1: Seán Moore Road/Pidgeon House Road/Cambridge Road/Thorncastle Street/ Bridge Street/Ringsend Road/Pearce Street/Sandwith Street Lower

### Route Map



R2 option 1 begins at the junction of Irishtown road and Church Avenue. The route follows Seán Moore Road, Pigeon House Road, Cambridge Road and Thorncastle Street before taking the same route as R1 i.e. along Bridge Street, Ringsend Road etc. Therefore the same issues identified in the R1 option 1 survey from the Thorncastle Road/Bridge Street junction, are also applicable to the R2 option 1 Survey.

### Cycle Facilities

As a result of the study, a lack of cycle facilities were identified at a number of locations namely Seán Moore Road, Pidgeon House Road, Cambridge Road and Thorncastle Street. For all other problems with cycle facilities on this route see R1 option 1.

### Road condition

Following assessment of the route from Seán Moore Road to the Thorncastle Street/ Bridge Street junction several locations were identified where the road pavement and markings were found to be in poor condition. For all other problems identified on the second half of this route see R1 option 1. A full list of the problems identified along this route is contained on Table 3.

## **Pinch Points**

Following the survey, one pinch point, where the footpath does not meet the required standard width of 1.8m, was identified on the route on Pidgeon House Road approaching Cambridge Avenue travelling east - west.

## **Footpath Condition**

The majority of the footpaths along the first half of the route are in good condition. Problems were identified at two locations from Seán Moore Road to the junction of Thorncastle Street and Bridge Street. The second half of this route option follows the same route as R1 option 1 namely along Bridge Street, Ringsend Road etc., therefore encountering the same footpath conditions as detailed in section Route R1 option 1 above.

## **Mobility Impaired and Disabled (MID)**

The survey has identified locations along the route where MID facilities are not provided. A full list of missing facilities and locations are contained on Table 3.

## **Dangerous Structures/Buildings**

No problems were found with the existing structures and buildings along this route.

## **Public Lighting**

No problems were found with the existing public lighting along this route.

## **Access Points**

No problems were found with the existing public lighting along this route.

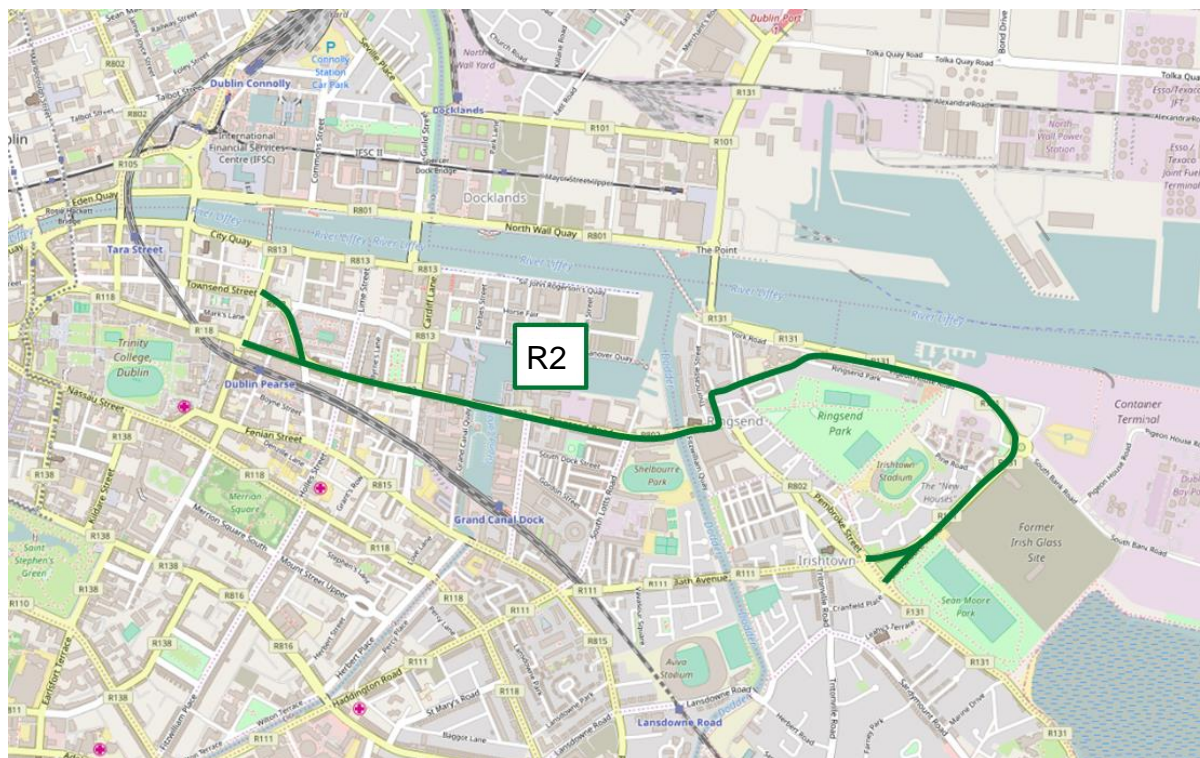
## **Electricity Poles**

No problems were found with the existing public lighting along this route.



## 5. R2 Option 2: Seán Moore Road/Pidgeon House Road/Cambridge Road/Thorncastle Street/ Bridge Street/Ringsend Road/Pearce Street/Sandwith Street Lower

### Route Map



R2 option 2 begins at the junction of Irishtown road and Church Avenue. The route follows Seán Moore Road, Pigeon House Road, Cambridge Road and Thorncastle Street before taking the same route as R1 i.e. along Bridge Street, Ringsend Road etc. Therefore the same issues identified in the R1 option 1 survey from the Thorncastle Road/Bridge Street junction, are also applicable to the R2 option 2 Survey.

### Cycle Facilities

As a result of the study, a lack of cycle facilities were identified at a number of locations namely Seán Moore Road, Pidgeon House Road, Cambridge Road and Thorncastle Street. For all other problems with cycle facilities on this route see R1 option 1.

### Road condition

Following assessment of the route from Seán Moore Road to the Thorncastle Street/ Bridge Street junction several locations were identified where the road pavement and markings were found to be in poor condition. For all other problems identified on the second half of this route see Route Option R1. A full list of the problems identified along this route is contained on Table 3.



## **Pinch Points**

Following the survey, one pinch point, where the footpath does not meet the required standard width of 1.8m, was identified on the route on Pidgeon House Road approaching Cambridge Avenue travelling east - west.

## **Footpath Condition**

The majority of the footpaths along the first half of the route are in good condition. Problems were identified at two locations from Seán Moore Road to the junction of Thorncastle Street and Bridge Street. The second half of this route option follows the same route as Option R1 namely along Bridge Street, Ringsend Road etc., therefore encountering the same footpath conditions as detailed in section R1 option 1 above.

## **Mobility Impaired and Disabled (MID)**

The survey has identified locations along the route where MID facilities are not provided. A full list of missing facilities and locations are contained on Table 3.

## **Dangerous Structures/Buildings**

No problems were found with the existing structures and buildings along this route.

## **Public Lighting**

No problems were found with the existing public lighting along this route.

## **Access Points**

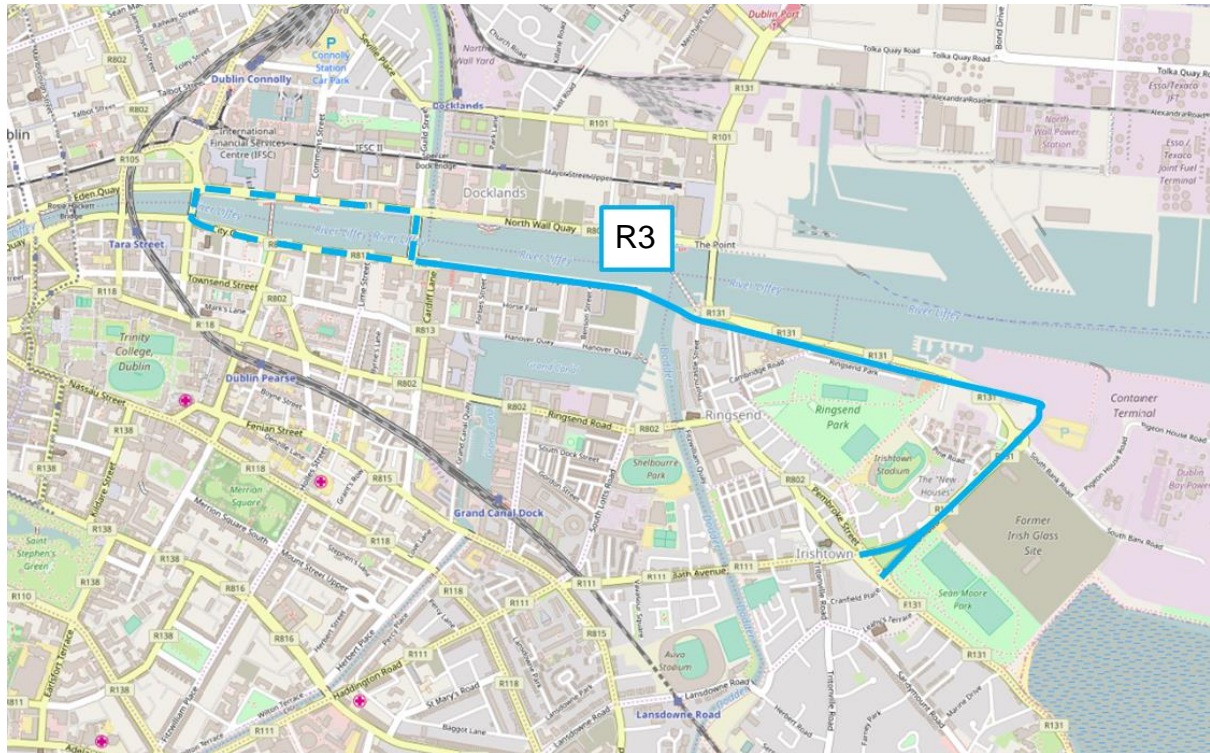
No problems were found with the existing public lighting along this route.

## **Electricity Poles**

No problems were found with the existing public lighting along this route.

## 6. R3 Option 1: Church Avenue/Sean Moore Road/Pigeon House Road/York Road/Sir John Rogerson's Quay/City Quay/Lombard Street East

### Route Map



The first section of this route follows Seán Moore Road and as such, the problems have already been recorded in the R2 section above. This section shall therefore categorize the problems identified starting at the Seán Moore/Pidgeon House Road/R131 roundabout.

### Cycle Facilities

The survey identified several locations along the route which have a lack of cycling facilities including along Pidgeon House road, Sir John Rogerson's Quay and on Lombard Street East.

### Road condition

The road pavements along Sir John Rogerson's quay and Lombard Street East were generally found to be in poor condition.

### Pinch Points

No problems were found with pinch points along this route.

### Footpath Condition

Following assessment of the route footpath facilities have been provided along all streets.

## **Mobility Impaired and Disabled (MID)**

The survey has identified locations along the route where tactile paving is not provided, namely at the Seán Moore/R131 Roundabout, at the junction of Sir John Rogerson's Quay and Britain Quay, at the junction of Sir John Rogerson's Quay and Asgard Road, at the junction of Sir John Rogerson's Quay and Lime Street and at the junction of Lombard Street East and Lombard Court. A full list of missing MID facilities and locations is contained on Table 4.

## **Dangerous Structures/Buildings**

No problems were found with the existing structures and buildings along this route.

## **Public Lighting**

No problems were found with the existing public lighting along this route.

## **Access Points**

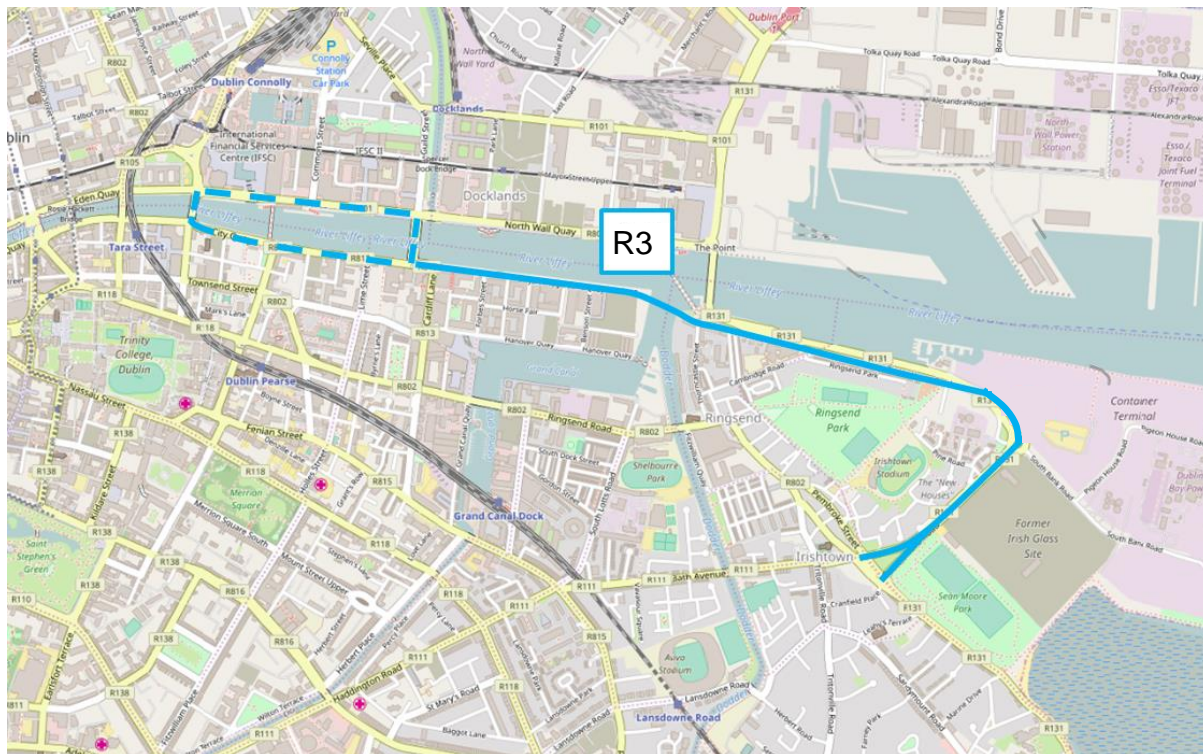
No problems were found with the existing public lighting along this route.

## **Electricity Poles**

No problems were found with the existing public lighting along this route.

## 7. R3 Option 2: Church Avenue/Sean Moore Road/Pigeon House Road/York Road/Sir John Rogerson's Quay/City Quay/Lombard Street East

### Route Map



The first section of this route follows Seán Moore Road and as such, the problems have already been recorded in the R2 section above. This section shall therefore categorize the problems identified starting at the Seán Moore/Pidgeon House Road/R131 roundabout.

### Cycle Facilities

The survey identified several locations along the route which have a lack of cycling facilities including along Pidgeon House road, Sir John Rogerson's Quay and on Lombard Street East.

### Road condition

The road pavements along Sir John Rogerson's quay and Lombard Street East were generally found to be in poor condition.

### Pinch Points

No problems were found with pinch points along this route.

### Footpath Condition

Following assessment of the route footpath facilities have been provided along all streets.

## **Mobility Impaired and Disabled (MID)**

The survey has identified locations along the route where tactile paving is not provided, namely at the Seán Moore/R131 Roundabout, at the junction of Sir John Rogerson's Quay and Britain Quay, at the junction of Sir John Rogerson's Quay and Asgard Road, at the junction of Sir John Rogerson's Quay and Lime Street and at the junction of Lombard Street East and Lombard Court. A full list of missing MID facilities and locations is contained on Table 4.

## **Dangerous Structures/Buildings**

No problems were found with the existing structures and buildings along this route.

## **Public Lighting**

No problems were found with the existing public lighting along this route.

## **Access Points**

No problems were found with the existing public lighting along this route.

## **Electricity Poles**

No problems were found with the existing public lighting along this route.



Table 1: R1 Option 1 Problem Identification

Irishtown Road/Bridge Street/Ringsend Road/Pearse Street/Sandwith Street Lower		
Physical Items	Condition	Location
Cycle facilities	No Cycle Facilities	Travelling South - North along Irishtown Road from Church Avenue/Londonbridge road junction
	No Cycle Facilities	Travelling South - North along Irishtown Road from Bath Street junction to St. Patrick's Villas
	No Cycle Facilities	Travelling East - West along Bridge Street
	No Cycle Facilities	Along Pearse street
Roads	Road Pavement and markings in poor condition	Travelling North - South along Irishtown Road
	Road Pavement in poor condition	At junction of Bridge Street/Ringsend Road/St.Lotts Road
	Road Markings in poor condition	Pearse Street bus stop
	Road Markings in poor condition	At junction of Pearse Street and Chimney View
	Road Markings in poor condition	St.Andrew's Resource Centre Bus Stop Pearse Street
	Road Pavement in poor condition	St.Andrew's Resource Centre Bus Stop Pearse Street
	Road Markings in poor condition	Bus Lane travelling South - North along Pearse Street
	Road Pavement in poor condition	In several areas along Pearse Street
	Road Markings in poor condition	Bus Lane travelling East -West along Pearse Street
	Road Markings in poor condition	Bus Lane travelling West - East along Pearse Street
	Road Markings in poor condition	Yellow Box at junction of Pearse Street and lombard Street
	Road Pavement in poor condition	At entrance to Pearse House from Sandwith street Lower
	Road Pavement in poor condition	At junction of Sandwith Street Lower and Townsend Street
	Road Pavement in poor condition	At numerous locations along Sandwith Street
Road Pavement in poor condition	At junction of Townsend Street and Lombard Street East	
Pinch points		
Lateral and Head Clearance		
Footpaths	Section of footpath in dilapidated condition	Travelling east-west along Ringsend Road
	Section of footpath in dilapidated condition	At junction of Sandwith Street Lower and Townsend Street
MID facilities	No tactile paving at crossing point	At junction of Irishtown Road and St.Brendan's Cottages
	No tactile paving at crossing point	Crossing Irishtown Road outside bookmakers
	No tactile paving at crossing point	At junction of Irishtown Road and Dermot O' Hurley Avenue
	No tactile paving at crossing point	At junction of Irishtown Road and The Square
	No tactile paving at crossing point	At junction of Irishtown Road and St. Patrick's Villas
	No tactile paving at crossing point	At junction of Irishtown Road and Fitzwilliam Street
	No tactile paving at crossing point	At junction of Bridge Street and Thorncastle Street
	No tactile paving at crossing point	At junction of Bridge Street and Fitzwilliam Quay
	Missing tactile paving	Tactile paving does not cover entire dishing at crossing point Ringsend Road
	No tactile paving at crossing point	At junction of Pearse Street and Chimney view
	No tactile paving at crossing point	At entrance to Trinity Tech. and Enterprise Campus Pearse Street
	No tactile paving at crossing point	At junction of Pearse Street and Pearse Square (both entrances)
	No tactile paving at crossing point	At junction of Pearse Street and Pearse Grove
	No tactile paving at crossing point	At junction of Pearse Street and Byrne's lane
	No tactile paving at crossing point	At junction of Pearse Street and Brunswick Place
No tactile paving at crossing point	At junction of Sandwith Street Lower and Townsend Street	
No tactile paving at crossing point	At junction of Sandwith Street Lower and Magennis Place	



Table 2: R1 Option 2 Problem Identification

Bath Street/Pembroke Street/Irishtown Road/Bridge Street/Ringsend Road/Pearce Street/Sandwith Street Lower		
Physical Items	Condition	Location
Cycle facilities	No Cycle Facilities	Along the full length of Bath Street
	No Cycle Facilities	Along the full length of Bay View/Pembroke Street
	No Cycle Facilities	Travelling South - North along Irishtown Road from Bath Street junction to St. Patrick's Villas
	No Cycle Facilities	Travelling East - West along Bridge Street
	No Cycle Facilities	Along Pearse street
Roads	Road Pavement in poor condition	At junction of Bay View and Church Avenue
	Road Pavement in poor condition	Travelling North - South along Bay View
	Road Pavement in poor condition	Travelling North - South along Irishtown Road
	Road Pavement in poor condition	At junction of Bridge Street/Ringsend Road/St.Lotts Road
	Road Markings in poor condition	Pearse Street bus stop
	Road Markings in poor condition	At junction of Pearse Street and Chimney View
	Road Markings in poor condition	St.Andrew's Resource Centre Bus Stop Pearse Street
	Road Pavement in poor condition	St.Andrew's Resource Centre Bus Stop Pearse Street
	Road Markings in poor condition	Bus Lane travelling South - North along Pearse Street
	Road Pavement in poor condition	In several areas along Pearse Street
	Road Markings in poor condition	Bus Lane travelling East -West along Pearse Street
	Road Markings in poor condition	Bus Lane travelling West - East along Pearse Street
	Road Markings in poor condition	Yellow Box at junction of Pearse Street and lombard Street
	Road Pavement in poor condition	At entrance to Pearse House from Sandwith street Lower
	Road Pavement in poor condition	At junction of Sandwith Street Lower and Townsend Street
Pinch points	Road not wide enough to provide two footpaths, cycle facilities and carriageway	Along Bath Street from the junction with Church Avenue to the junction with Herbert Place
	Section of footpath does not meet required width of 1.8m	Travelling North - South along Pembroke Street
Lateral and Head Clearance		
Footpaths	Section of footpath in dilapidated condition	Travelling East-West along Bath Street from Church Avenue junction
	Section of footpath in dilapidated condition	Travelling North - South along Bay View
	Section of footpath in dilapidated condition	Travelling east-west along Ringsend Road
	Section of footpath in dilapidated condition	At junction of Sandwith Street Lower and Townsend Street

MID facilities	No tactile paving at crossing point	At junction of Bath Street and Herbert Place
	No tactile paving at crossing point	At junction of Bath Street and Chapel Avenue
	No tactile paving at crossing point	At junction of Pembroke Street and Chapel Avenue
	No tactile paving at crossing point	At junction of Pembroke Street and Herbert Place
	No tactile paving at crossing point	At junction of Bayview and Strand Road
	No tactile paving at crossing point	At junction of Irishtown Road and St.Brendan's Cottages
	No tactile paving at crossing point	Crossing Irishtown Road outside bookmakers
	No tactile paving at crossing point	At junction of Irishtown Road and Dermot O' Hurley Avenue
	No tactile paving at crossing point	At junction of Irishtown Road and The Square
	No tactile paving at crossing point	At junction of Irishtown Road and St. Patrick's Villas
	No tactile paving at crossing point	At junction of Irishtown Road and Fitzwilliam Street
	No tactile paving at crossing point	At junction of Bridge Street and Thorncastle Street
	No tactile paving at crossing point	At junction of Bridge Street and Fitzwilliam Quay
	Missing tactile paving	Tactile paving does not cover entire dishing at crossing point Ringsend Road
	No tactile paving at crossing point	At junction of Pearse Street and Chimney view
	No tactile paving at crossing point	At entrance to Trinity Tech. and Enterprise Campus Pearse Street
	No tactile paving at crossing point	At junction of Pearse Street and Pearse Square (both entrances)
	No tactile paving at crossing point	At junction of Pearse Street and Pearse Grove
	No tactile paving at crossing point	At junction of Pearse Street and Byrne's lane
	No tactile paving at crossing point	At junction of Pearse Street and Brunswick Place
No tactile paving at crossing point	At junction of Sandwith Street Lower and Townsend Street	
No tactile paving at crossing point	At junction of Sandwith Street Lower and Magennis Place	

Table 3: R2 Problem Identification

Church Avenue/Sean Moore Road/Pigeon House Road/Cambridge Road/Thorncastle Street/ Bridge Street/Ringsend Road/Pearce Street/Sandwith Street Lower		
Physical Items	Condition	Location
Cycle facilities	No cycle facilities	Along the entire length of Seán Moore Road
	No cycle facilities	Along the entire length of Pidgeon House Road
	No cycle facilities	Along the entire length of Cambridge Road
	No cycle facilities	Along the entire length of Thorncastle Street
	No Cycle Facilities	Travelling East - West along Bridge Street
	No Cycle Facilities	Along Pearse street
Roads	Road Pavement and markings in poor condition	At Seán Moore crossing point adjacent to Pine Road residential estate
	Road Pavement in poor condition	Travelling South - North along Seán Moore Road towards Seán Moore/Pigeon House Road roundabout
	Road Pavement in poor condition	Travelling North - South along Seán Moore Road away from Seán Moore/Pigeon House Road roundabout
	Road Pavement in poor condition	At Pidgeon House Road/Cambridge Avenue junction
	Road Pavement in poor condition	At numerous locations along Pidgeon House Road
	Road Markings in poor condition	Pearse Street bus stop
	Road Markings in poor condition	At junction of Pearse Street and Chimney View
	Road Markings in poor condition	St.Andrew's Resource Centre Bus Stop Pearse Street
	Road Pavement in poor condition	St.Andrew's Resource Centre Bus Stop Pearse Street
	Road Markings in poor condition	Bus Lane travelling South - North along Pearse Street
	Road Pavement in poor condition	In several areas along Pearse Street
	Road Markings in poor condition	Bus Lane travelling East -West along Pearse Street
	Road Markings in poor condition	Bus Lane travelling West - East along Pearse Street
	Road Markings in poor condition	Yellow Box at junction of Pearse Street and lombard Street
	Road Pavement in poor condition	At entrance to Pearse House from Sandwith street Lower
	Road Pavement in poor condition	At junction of Sandwith Street Lower and Townsend Street
	Road Pavement in poor condition	At numerous locations along Sandwith Street
	Road Pavement in poor condition	At junction of Townsend Street and Lombard Street East
Drainage		
Pinch points	Footpath does not meet the required minimum width of 1.8m	On Pidgeon House Road
Lateral and Head Clearance		
Footpaths	Footpath in poor condition	At numerous locations on Seán Moore road travelling north-south towards Beach Road junction
	Section of footpath in dilapidated condition	Travelling east-west along Ringsend Road
	Section of footpath in dilapidated condition	At junction of Sandwith Street Lower and Townsend Street

MID facilities	No tactile paving at crossing point	Across Seán Moore Road
	No tactile paving at crossing point	At Seán Moore/Bremen Road junction
	No tactile paving at crossing point	At Seán Moore/Pine Road junction
	No tactile paving at crossing point	At crossing point Seán Moore/Pigeon House Road roundabout
	No tactile paving at crossing point	At exit from Seán Moore roundabout onto Pidgeon House Road
	No tactile paving at crossing point	At junction of Pidgeon House Road and Cambridge Avenue
	No tactile paving at crossing point	At junction of Cambridge Road and Cambridge Park
	No tactile paving at crossing point	At junction of Cambridge Road and Pembroke Cottages (both entrance/exits)
	No tactile paving at crossing point	At junction of Cambridge Road and Cambridge Square
	No tactile paving at crossing point	At junction of Cambridge Road and Fitzwilliam Street
	No tactile paving at crossing point	At junction of Cambridge Road and Fitzwilliam Street
	No tactile paving at crossing point	At junction of Cambridge Road and Thorncastle Street
	No tactile paving at crossing point	At junction of Bridge Street and Fitzwilliam Quay
	Missing tactile paving	Tactile paving does not cover entire dishing at crossing point Ringsend Road
	No tactile paving at crossing point	At junction of Pearse Street and Chimney view
	No tactile paving at crossing point	At entrance to Trinity Tech. and Enterprise Campus Pearse Street
	No tactile paving at crossing point	At junction of Pearse Street and Pearse Square (both entrances)
	No tactile paving at crossing point	At junction of Pearse Street and Pearse Grove
	No tactile paving at crossing point	At junction of Pearse Street and Byrne's lane
	No tactile paving at crossing point	At junction of Pearse Street and Brunswick Place
No tactile paving at crossing point	At junction of Sandwith Street Lower and Townsend Street	
No tactile paving at crossing point	At junction of Sandwith Street Lower and Magennis Place	

Table 4: R3 Problem Identification

Church Avenue/Sean Moore Road/R131/Sir John Rogerson's Quay/City Quay/Lombard Street East		
Physical Items	Condition	Location
Cycle facilities	No cycle facilities	Along the entire length of Seán Moore Road
	Lack of cycle facilities	Along the R131
	Lack of cycle facilities	For 125m along Sir John Rogerson's Quay
	Poor cycle lane markings	Along full length of Lombard Street East
Roads	Road Pavement and markings in poor condition	At Seán Moore crossing point adjacent to Pine Road residential estate
	Road Pavement in poor condition	Travelling South - North along Seán Moore Road towards Seán Moore/Pigeon House Road roundabout
	Road Pavement in poor condition	Travelling North - South along Seán Moore Road away from Seán Moore/Pigeon House Road roundabout
	Road pavement in poor condition	At several locations along Sir John Rogersons Quay
	Road pavement in poor condition	At several locations along Lombard Street East
Drainage		
Pinch points		
Lateral and Head Clearance		
Footpaths	Footpath in poor condition	At numerous locations on Seán Moore road travelling north-south towards Beach Road junction
	Lack of footpath facilities	For approximately 70m from roundabout travelling south - north along R131
MID facilities	No tactile paving at crossing point	At crossing point at Seán Moore/R131 roundabout
	No tactile paving at crossing point	At junction of Sir John Rogerson's Quay and Britain Quay
	No tactile paving at crossing point	At junction of Sir John Rogerson's Quay and Blood Stoney Road
	No tactile paving at crossing point	At junction of Sir John Rogerson's Quay and Asgard Road
	No tactile paving at crossing point	At junction of Sir John Rogerson's Quay and Lime Street
	No tactile paving at crossing point	At junction of Sir John Rogerson's Quay and Windmill Lane
	No tactile paving at crossing point	At junction of Lombard Street East and Lombard Court

## Appendix E – Parking Survey








# 1. Introduction

AECOM have been tasked by the National Transport Authority (NTA) to identify viable routes for a Core Bus Corridor which aims to provide ease of bus travel with the objective of improving journey times from Ringsend into Dublin City Centre.

This report shall seek to identify the parking conditions in the existing road network. Each route was assessed using criteria specified by the NTA. The assessment criteria for the existing parking on the separate routes are listed as follows:

- *Formal Parking:* On-street parking in which marked spaces has been provided. These are spaces in which the Local Authority charges an hourly rate to use.
- *Informal Parking:* On-street parking in which spaces may or may not be marked and in which the Local Authority does not charge for use.
- *Adjacent Parking:* Parking which is accessible to the general public and is located in close proximity to the street. These are spaces in which the Local Authority charges an hourly rate to use.
- *Taxi Facilities:* Parking spaces which have been allocated for use by taxi services only.

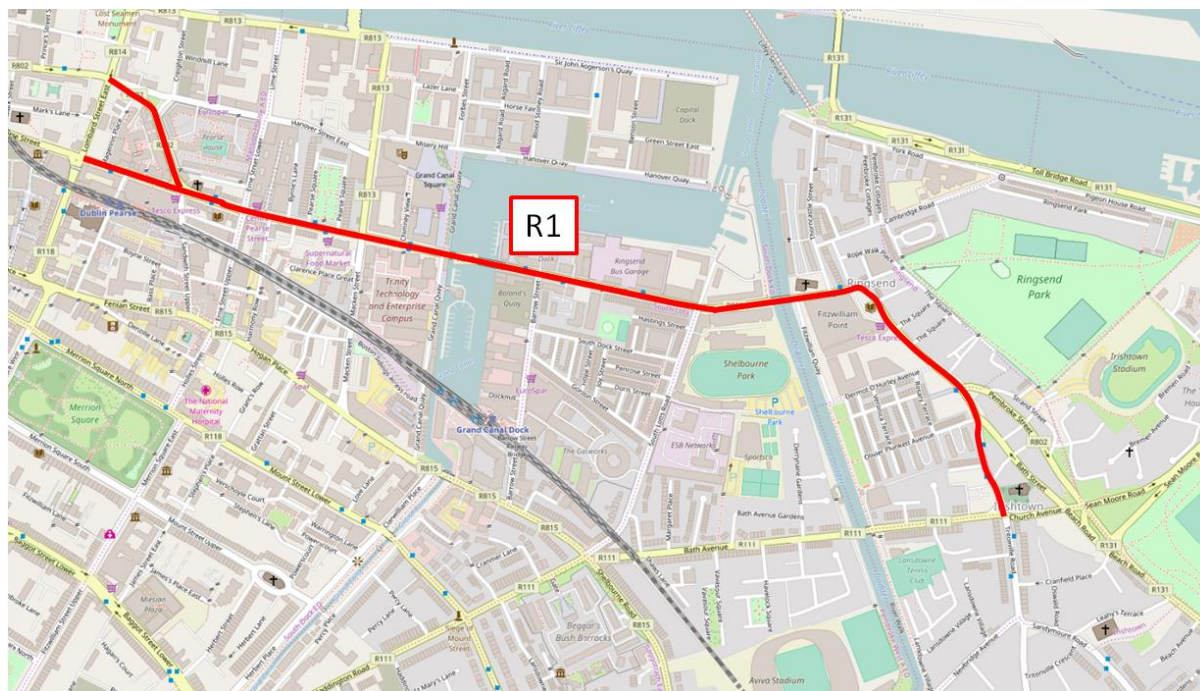
- **Legend**

-  - This colour represents sections along a route which has no parking facilities.
-  - This colour represents sections along a route which has formal parking facilities.
-  - This colour represents sections along a route which has informal parking facilities.
-  - This colour represents sections along a route which has adjacent parking facilities.
-  - This colour represents sections along a route which have taxi facilities.

## 2. Ringsend – City Centre Route Options

### 1. R1 Option 1: Irishtown Road/Bridge Street/Ringsend Road/Pearce Street/Sandwith Street Lower

- **Route Map**



- **Irishtown Road**

There is evidence of formal and informal on-street parking and also some adjacent parking along Irishtown Road. The parking breakdown on Irishtown Road is as follows:

- Formal Parking – 10 (Of which 3 are disabled parking) spaces.
- Informal Parking – Approximately 66 spaces.
- Adjacent Parking – Approximately 12 spaces.

- **Bridge Street**

There are no parking facilities along the entire length of Bridge Street.

- **Ringsend Road**

The survey has shown that there is formal parking available at the locations along Ringsend Road.

- Formal Parking – Approximately 12 spaces

- **Pearse Street**

The survey has shown that there is formal parking available at the locations along Pearse Street. The parking breakdown on Irishtown Road is as follows:

- Formal Parking – Approximately 61 spaces.
- Informal Parking – Approximately 7 spaces.

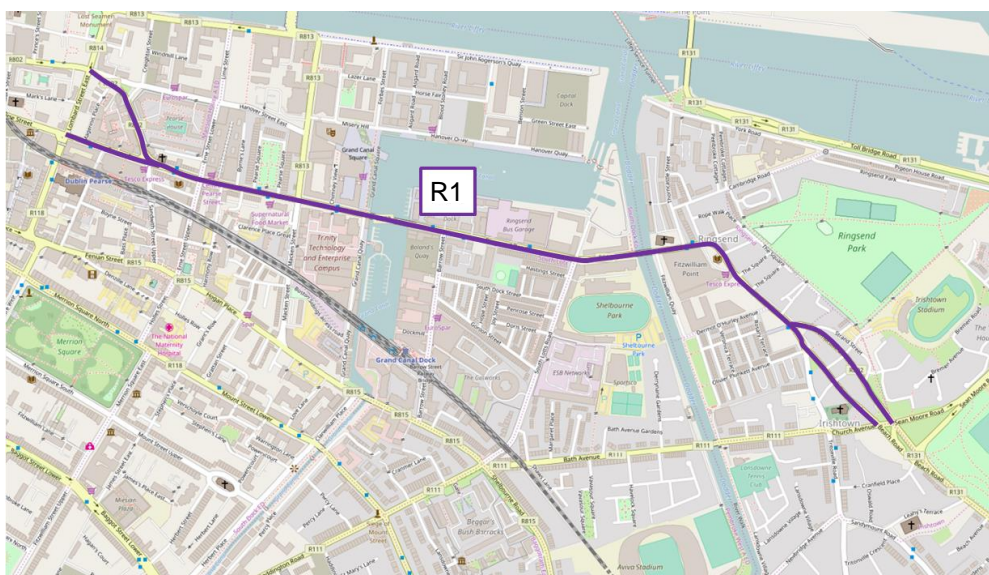
- **Sandwith Street**

The survey has shown that there is formal parking available at the locations along Sandwith Street. The parking breakdown on Sandwith Street is as follows:

- Formal Parking – Approximately 28 spaces.
- Coach Parking – Approximately 4 spaces.

## 2. R1 Option 2: Bath Street/Pembroke Street/Irishtown Road/Bridge Street/Ringsend Road/Pearse Street/Sandwith Street Lower

- **Route Map**



R1 option 2 follows Irishtown Road before taking the same route as R1 option 1 i.e. along Bridge Street, Ringsend Road etc. Therefore the same car parking facilities identified in the R1 option 1 survey from the Bath Street/Pembroke Street/Irishtown road junction are also applicable to the R1 option 2 Survey.

- **Bath Street**

Currently there are no defined parking spaces, except for 2 impaired mobility spaces. The parking breakdown on Bath Street is as follows:

- Formal Parking – 2 spaces.
- Informal Parking – Approximately 23 spaces.

- Adjacent Parking – 0 spaces.
- **Pembroke Street**

The survey has identified informal on-street parking along Pembroke Street. The parking breakdown on Pembroke Street is as follows:

- Formal Parking – 0 spaces.
- Informal Parking – Approximately 29 spaces.
- Adjacent Parking – 0 spaces.
- **Irishtown Road**

For the purposes of this report this section shall concentrate on the length of Irishtown road from the junction of Irishtown Road/Oliver Plunkett Avenue/Bath Street to the junction of Bridge Street.

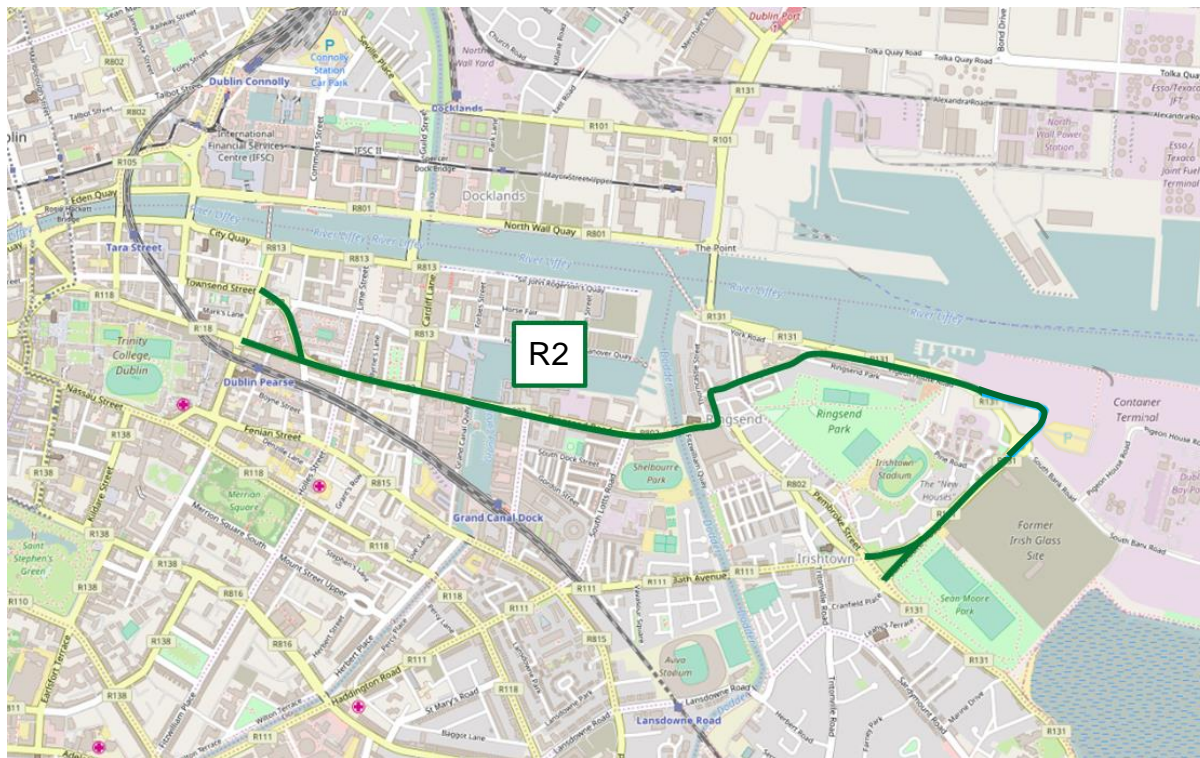
There is evidence of formal and informal on-street parking and also some adjacent parking along Irishtown Road. The parking breakdown on Irishtown Road is as follows:

- Formal Parking – 10 (Of which 3 are disabled parking) spaces.
- Informal Parking – Approximately 44 spaces.
- Adjacent Parking – Approximately 12 spaces.



### 3. R2 Option 1: Seán Moore Road/Pidgeon House Road/Cambridge Road/Thorncastle Street/ Bridge Street/Ringsend Road/Pearce Street/Sandwith Street Lower

- Route Map



R2 option 1 begins at the junction of Irishtown road and Church Avenue. The route follows Seán Moore Road, Pigeon House Road, Cambridge Road and Thorncastle Street before taking the same route as R1 options i.e. along Bridge Street, Ringsend Road etc. Therefore the same issues identified in the R1 option 1 survey from the Thorncastle Road/Bridge Street junction, are also applicable to the R2 option 1 survey.

For the purposes of this report, this section will concentrate on the car parking facilities along Seán Moore Road, Pidgeon House Road, Cambridge Road and Thorncastle Street.

- Seán Moore Road

There is no evidence of any car parking facilities along Seán Moore road.

- Pidgeon House Road

The survey has identified informal on-street parking along Pidgeon House Road. There is no formal or adjacent car parking facilities on Pidgeon House Road. The parking breakdown on Pidgeon House Road is as follows:

- Formal Parking – 0 spaces.

- Informal Parking – Approximately 76 spaces.
- Adjacent Parking – 0 spaces.
- **Cambridge Road**

The survey has identified both formal and informal on-street parking along Cambridge Road. There is no adjacent car parking facilities on Cambridge Road. The parking breakdown on Cambridge Road is as follows:

- Formal Parking – 7 spaces.
- Informal Parking – Approximately 110 spaces.
- Adjacent Parking – 0 spaces.
- **Thorncastle Street**

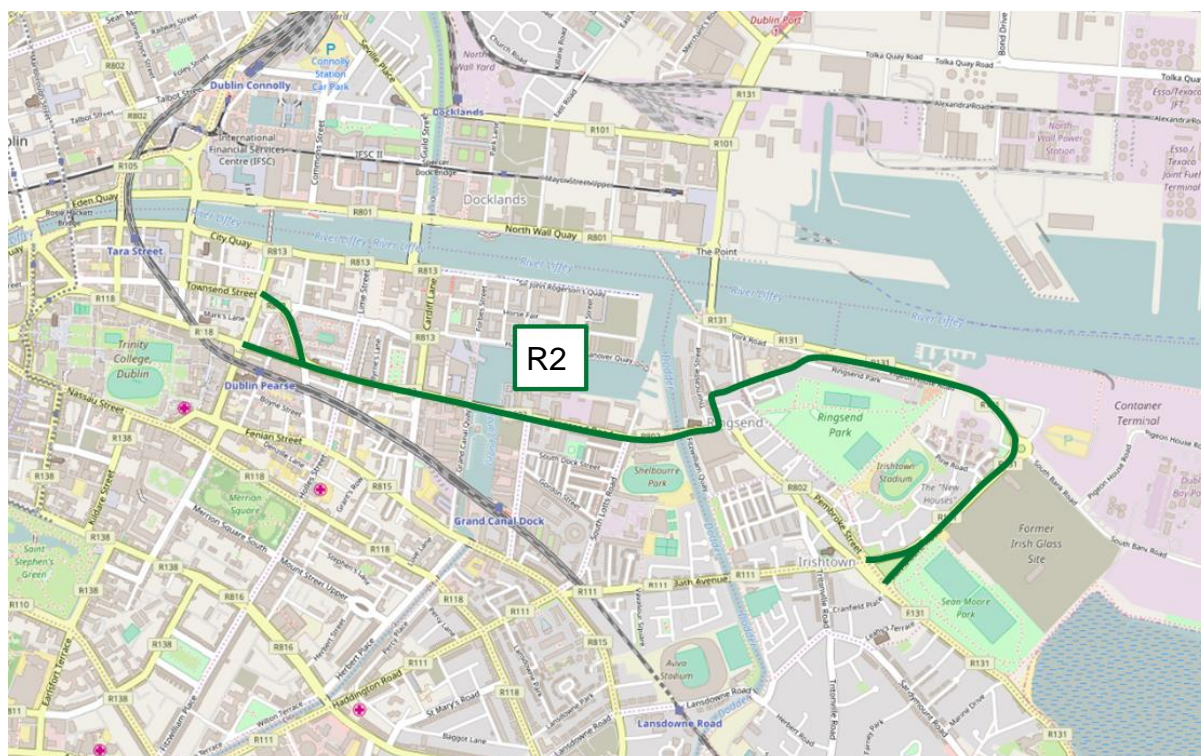
The survey has identified formal on-street parking along Thorncastle Street. There is no informal or adjacent car parking facilities on Thorncastle Street. The parking breakdown on Thorncastle Street is as follows:

- Formal Parking – 32 spaces.
- Informal Parking – 0 spaces.
- Adjacent Parking – 0 spaces.



## 4. R2 Option 2: Seán Moore Road/Pidgeon House Road/Cambridge Road/Thorncastle Street/ Bridge Street/Ringsend Road/Pearce Street/Sandwith Street Lower

- Route Map



R2 option 2 begins at the junction of Irishtown road and Church Avenue. The route follows Seán Moore Road, Pigeon House Road, Cambridge Road and Thorncastle Street before taking the same route as R1 options i.e. along Bridge Street, Ringsend Road etc. Therefore the same issues identified in the R1 option 1 survey from the Thorncastle Road/Bridge Street junction, are also applicable to the R2 option 2 survey.

For the purposes of this report, this section will concentrate on the car parking facilities along Seán Moore Road, Pidgeon House Road, Cambridge Road and Thorncastle Street.

- Seán Moore Road

There is no evidence of any car parking facilities along Seán Moore road.

- **Pidgeon House Road**

The survey has identified informal on-street parking along Pidgeon House Road. There is no formal or adjacent car parking facilities on Pidgeon House Road. The parking breakdown on Pidgeon House Road is as follows:

- Formal Parking – 0 spaces.
- Informal Parking – Approximately 76 spaces.
- Adjacent Parking – 0 spaces.

- **Cambridge Road**

The survey has identified both formal and informal on-street parking along Cambridge Road. There is no adjacent car parking facilities on Cambridge Road. The parking breakdown on Cambridge Road is as follows:

- Formal Parking – 7 spaces.
- Informal Parking – Approximately 110 spaces.
- Adjacent Parking – 0 spaces.

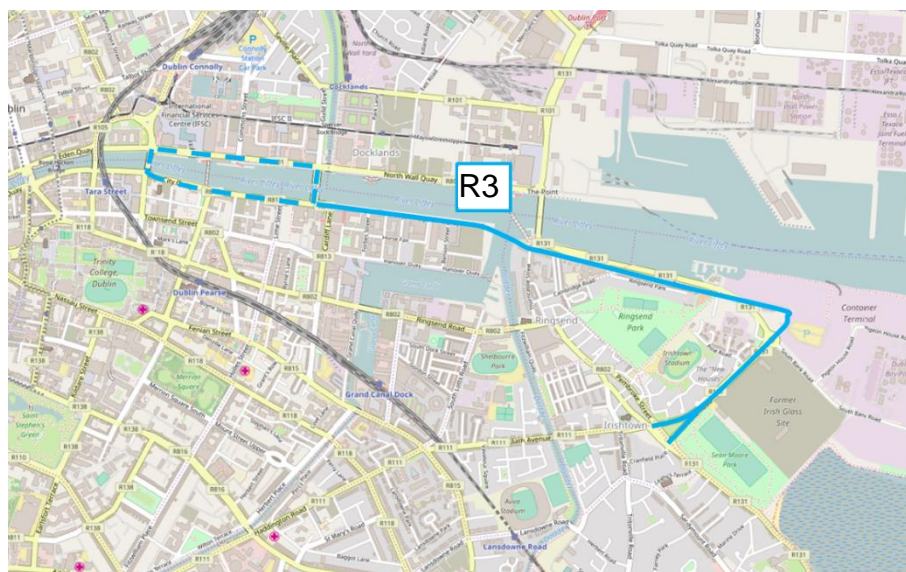
- **Thorncastle Street**

The survey has identified formal on-street parking along Thorncastle Street. There is no informal or adjacent car parking facilities on Thorncastle Street. The parking breakdown on Thorncastle Street is as follows:

- Formal Parking – 32 spaces.
- Informal Parking – 0 spaces.
- Adjacent Parking – 0 spaces.

## 5. R3 Option 1: Church Avenue/Sean Moore Road/R131/Sir John Rogerson's Quay/City Quay

- **Route Map**



The first section of this route follows Seán Moore Road and as such, the problems have already been recorded R2 above. This section shall therefore concentrate on the car parking facilities identified on the R131, Sir John Rogerson's Quay, City Quay and Lombard Street East starting at the Seán Moore/Pidgeon House Road/R131 roundabout.

- **Pidgeon House Road**

The survey has identified informal on-street parking along Pidgeon House Road. There is no formal or adjacent car parking facilities on Pidgeon House Road. The parking breakdown on Pidgeon House Road is as follows:

- Formal Parking – 0 spaces.
- Informal Parking – Approximately 76 spaces.
- Adjacent Parking – 0 Spaces.

- **Sir John Rogerson's Quay**

The survey has identified formal, informal and taxi rank parking at numerous locations along Sir John Rogerson's Quay. There is no adjacent car parking facilities on Sir John Rogerson's Quay.

The parking breakdown on Sir John Rogerson's Quay is as follows:

- Formal Parking – Approximately 67 spaces (Of which one is designated as Disabled parking).
- Informal Parking – 2 spaces.
- Taxi Rank – 3 spaces.



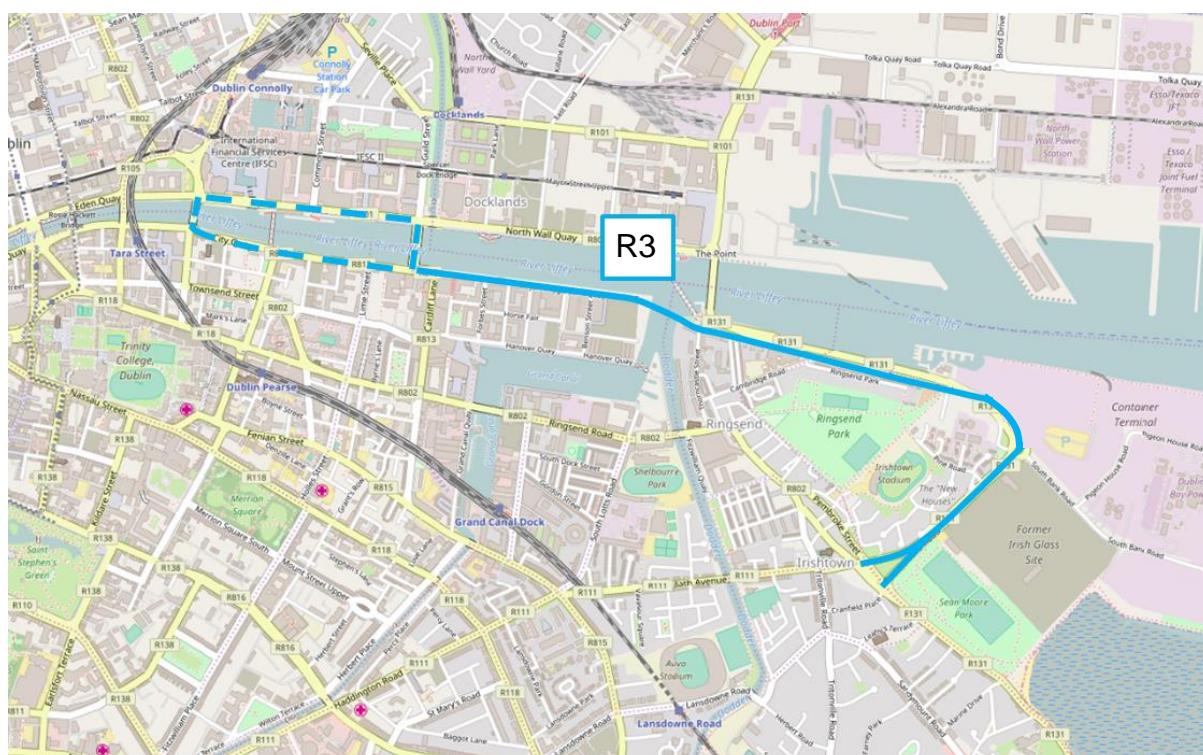
- Adjacent Parking – 0 spaces.
- **City Quay**

The survey has identified formal on-street parking along City Quay. There is no informal or adjacent car parking facilities on City Quay. The parking breakdown on City Quay is as follows:

- Formal Parking – 24 spaces (Of which one has been designated Disabled Parking).
- Informal Parking – 0 spaces.
- Adjacent Parking – 0 spaces.

## 6. R3 Option 2: Church Avenue/Sean Moore Road/R131/Sir John Rogerson's Quay/City Quay

- **Route Map**



The first section of this route follows Seán Moore Road and as such, the problems have already been recorded Route Option R3 above. This section shall therefore concentrate on the car parking facilities identified on the R131, Sir John Rogerson's Quay, City Quay and Lombard Street East starting at the Seán Moore/Pidgeon House Road/R131 roundabout.

- **Pidgeon House Road**

The survey has identified informal on-street parking along Pidgeon House Road. There is no formal or adjacent car parking facilities on Pidgeon House Road. The parking breakdown on Pidgeon House Road is as follows:

- Formal Parking – 0 spaces.
- Informal Parking – Approximately 76 spaces.
- Adjacent Parking – 0 Spaces.

- **Sir John Rogerson's Quay**

The survey has identified formal, informal and taxi rank parking at numerous locations along Sir John Rogerson's Quay. There is no adjacent car parking facilities on Sir John Rogerson's Quay.

The parking breakdown on Sir John Rogerson's Quay is as follows:

- Formal Parking – Approximately 67 spaces (Of which one is designated as Disabled parking).
- Informal Parking – 2 spaces.
- Taxi Rank – 3 spaces.
- Adjacent Parking – 0 spaces.

- **City Quay**

The survey has identified formal on-street parking along City Quay. There is no informal or adjacent car parking facilities on City Quay. The parking breakdown on City Quay is as follows:

- Formal Parking – 24 spaces (Of which one has been designated Disabled Parking).
- Informal Parking – 0 spaces.
- Adjacent Parking – 0 spaces.

## Appendix F – Cost Estimate



Route: R1 Option 1					
Route Sections		Route Section Cost Rates (EUR / km)			Route Section Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)		0.149		€ 193,700
2			0.235		€ 305,500
3		0.120			€ 78,000
4			0.083		€ 107,900
5		0.07			€ 46,800
6			0.043		€ 55,900
7		0.03			€ 20,800
8			0.056		€ 72,800
9			0.997		€ 1,296,100
10			0.175		€ 227,500
11			0.130		€ 169,000
12					€ 0
13					€ 0
14					€ 0
15					€ 0
16					€ 0
Total of Route Sections Cost					<b>€ 2,574,000</b>
Junctions		Junction Cost Rates (EUR / junction)			Junctions Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 70,000	€ 230,000	€ 1,000,000	
No of CL1	4			€ 280,000	
No of CL2		1		€ 230,000	
No of CL3				€ 0	
Total of Junctions Lower Costs					<b>€ 510,000</b>
Land Acquisition		Average Land Value (EUR / sq. m.)		Land Take Cost	
		1,500 €			
Sum of Residential along Route (sq.m).		0		0 €	
Sum of Commercial along Route (sq.m).				0 €	
Sum of Agricultural along Route (sq.m).				0 €	
Sum of Industrial along Route (sq.m).				0 €	
Total of Route Junctions Cost					<b>€ 0</b>
<b>Route: R1</b>				<b>Cost</b>	<b>€ 3,084,000</b>

Route: R1 Option 2				
Route Sections	Route Section Cost Rates (EUR / km)			Route Section Cost
	CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
	€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)	0.200		€ 130,000
2		0.160		€ 104,000
3			0.235	€ 305,500
4		0.120		€ 78,000
5			0.083	€ 107,900
6		0.07		€ 46,800
7			0.043	€ 55,900
8		0.03		€ 20,800
9			0.056	€ 72,800
10			0.997	€ 1,296,100
11			0.175	€ 227,500
12			0.130	€ 169,000
13				€ 0
14				€ 0
15				€ 0
16				€ 0
Total of Route Sections Cost				€ 2,614,300
Junctions	Junction Cost Rates (EUR / junction)			Junctions Cost
	CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
	€ 70,000	€ 230,000	€ 1,000,000	
No of CL1	4			€ 280,000
No of CL2		1		€ 230,000
No of CL3				€ 0
Total of Junctions Lower Costs				€ 510,000
Land Acquisition		Average Land Value (EUR / sq.m.)	Land Take Cost	
		1,500 €		
Sum of Residential along Route (sq.m).		0	0 €	
Sum of Commercial along Route (sq.m).			0 €	
Sum of Agricultural along Route (sq.m).			0 €	
Sum of Industrial along Route (sq.m).			0 €	
Total of Route Junctions Cost				€ 0
<b>Route: R2</b>			<b>Cost</b>	<b>€ 3,124,300</b>

Route: R2 Option 1					
Route Sections		Route Section Cost Rates (EUR / km)			Route Section Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)		0.090		€ 117,000
2			0.083		€ 107,900
3			0.054		€ 70,200
4		0.112			€ 72,800
5			0.104		€ 135,200
6		0.026			€ 16,900
7			0.038		€ 49,400
8			0.103		€ 133,900
9			0.367		€ 477,100
10			0.359		€ 466,700
11			0.070		€ 91,000
12			0.083		€ 107,900
13		0.07			€ 46,800
14			0.043		€ 55,900
15		0.03			€ 20,800
16			0.056		€ 72,800
17			0.997		€ 1,296,100
18			0.175		€ 227,500
19			0.130		€ 169,000
Total of Route Sections Cost					<b>€ 3,734,900</b>
Junctions		Junction Cost Rates (EUR / junction)			Junctions Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 70,000	€ 230,000	€ 1,000,000	
No of CL1	3			€ 210,000	
No of CL2		2		€ 460,000	
No of CL3			1	€ 1,000,000	
Total of Junctions Lower Costs					<b>€ 1,670,000</b>
Land Acquisition		Average Land Value (EUR / sq.m.)		Land Take Cost	
		1,500 €			
Sum of Residential along Route (sq.m).		0		0 €	
Sum of Commercial along Route (sq.m).				0 €	
Sum of Agricultural along Route (sq.m).				0 €	
Sum of Industrial along Route (sq.m).				0 €	
Total of Route Junctions Cost					<b>€ 0</b>
<b>Route: R3</b>				<b>Cost</b>	<b>€ 5,404,900</b>

<b>Route: R2 Option 2</b>				
Route Sections	Route Section Cost Rates (EUR / km)			Route Section Cost
	CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
	€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)		0.090	€ 117,000
2			0.083	€ 107,900
3			0.054	€ 70,200
4		0.112		€ 72,800
5			0.104	€ 135,200
6		0.026		€ 16,900
7			0.038	€ 49,400
8			0.103	€ 133,900
9			0.367	€ 477,100
10			0.359	€ 466,700
11			0.070	€ 91,000
12			0.083	€ 107,900
13		0.07		€ 46,800
14			0.043	€ 55,900
15		0.03		€ 20,800
16			0.056	€ 72,800
17			0.997	€ 1,296,100
18			0.175	€ 227,500
19			0.130	€ 169,000
<b>Total of Route Sections Cost</b>				<b>€ 3,734,900</b>
Junctions	Junction Cost Rates (EUR / junction)			Junctions Cost
	CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
	€ 70,000	€ 230,000	€ 1,000,000	
No of CL1	3			€ 210,000
No of CL2		2		€ 460,000
No of CL3			1	€ 1,000,000
<b>Total of Junctions Lower Costs</b>				<b>€ 1,670,000</b>
Land Acquisition		Average Land Value (EUR / sq.m.)		Land Take Cost
		1,500 €		
Sum of Residential along Route (sq.m).		270		405,000 €
Sum of Commercial along Route (sq.m).				0 €
Sum of Agricultural along Route (sq.m).				0 €
Sum of Industrial along Route (sq.m).				0 €
<b>Total of Route Junctions Cost</b>				<b>€ 405,000</b>
<b>Route: R3</b>			<b>Cost</b>	<b>€5,901,250</b>

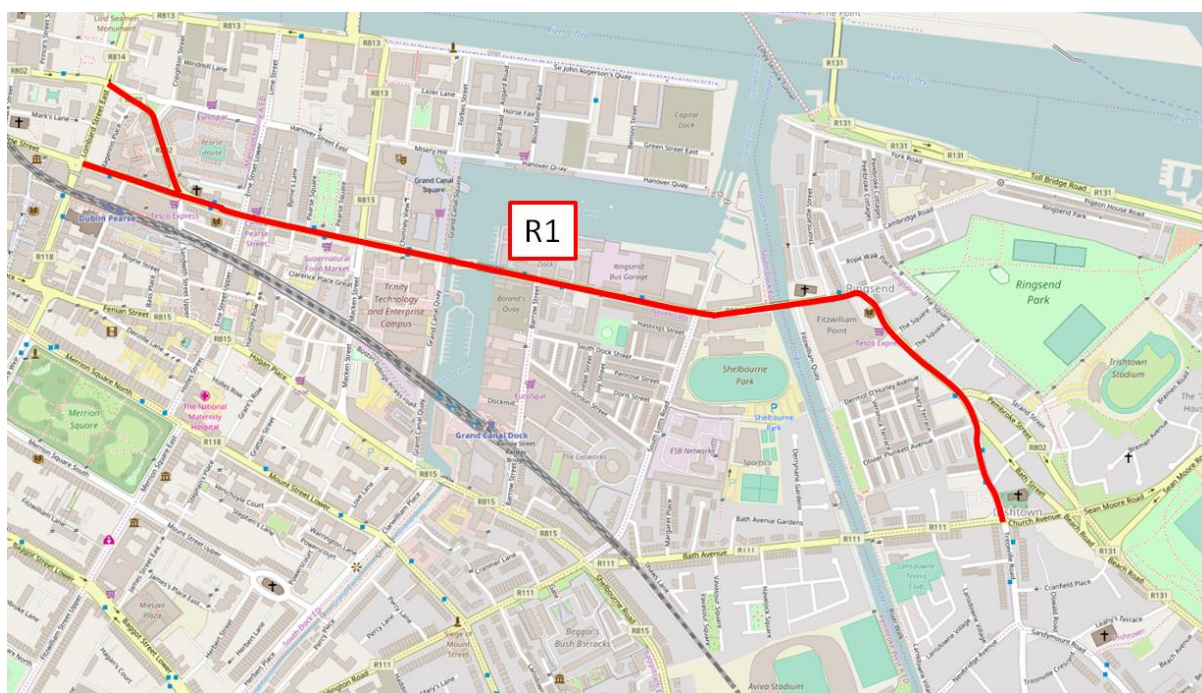
Route: R3 Option 1					
Route Sections		Route Section Cost Rates (EUR / km)			Route Section Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)	0.668			€ 434,200
2		0.118			€ 76,700
3		0.201			€ 130,650
4			0.399		€ 518,700
5		0.20			€ 130,650
6				0.130	€ 325,000
7				0.068	€ 170,000
8			0.677		€ 880,100
9					€ 0
10					€ 0
11					€ 0
12					€ 0
13					€ 0
14					€ 0
15					€ 0
16					€ 0
Total of Route Sections Cost					<b>€ 2,666,000</b>
Junctions		Junction Cost Rates (EUR / junction)			Junctions Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 70,000	€ 230,000	€ 1,000,000	
No of CL1	5				€ 350,000
No of CL2		1			€ 230,000
No of CL3			3		€ 3,000,000
Total of Junctions Lower Costs					<b>€ 3,580,000</b>
Land Acquisition		Average Land Value (EUR / sq.m.)		Land Take Cost	
		1,500 €			
Sum of Residential along Route (sq.m).		0		0 €	
Sum of Commercial along Route (sq.m).				0 €	
Sum of Agricultural along Route (sq.m).				0 €	
Sum of Industrial along Route (sq.m).				0 €	
Total of Route Junctions Cost					<b>€ 0</b>
<b>Route: R4</b>				<b>Cost</b>	<b>€ 6,246,000</b>



Route: R3 Option 2					
Route Sections		Route Section Cost Rates (EUR / km)			Route Section Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 650,000	€ 1,300,000	€ 2,500,000	
1	Section Length (km)	0.668			€ 434,200
2		0.118			€ 76,700
3		0.201			€ 130,650
4			0.399		€ 518,700
5		0.20			€ 130,650
6				0.130	€ 325,000
7				0.068	€ 170,000
8			0.677		€ 880,100
9		0.048			€ 31,200
10		0.34			€ 219,050
Total of Route Sections Cost					<b>€ 2,916,250</b>
Junctions		Junction Cost Rates (EUR / junction)			Junctions Cost
		CAL 1: Minor	CAL 2: Moderate	CAL 3: Major	
		€ 70,000	€ 230,000	€ 1,000,000	
No of CL1	5				€ 350,000
No of CL2		1			€ 230,000
No of CL3			2		€ 2,000,000
Total of Junctions Lower Costs					<b>€ 2,580,000</b>
Land Acquisition		Average Land Value (EUR / sq.m.)		Land Take Cost	
		1,500 €			
Sum of Residential along Route (sq.m).		930		1,395,000 €	
Sum of Commercial along Route (sq.m).		*cost of demolition (€120,000 x two buildings)		240,000 €	
Sum of Agricultural along Route (sq.m).				0 €	
Sum of Industrial along Route (sq.m).				0 €	
Total of Route Junctions Cost					<b>€ 1,635,000</b>
<b>Route: R5</b>		<b>Cost</b>		<b>€ 7,131,250</b>	

Appendix G – Infrastructural Cost Estimate

# 1. R1 Option 1



## • Irishtown Road

- For approximately 150m approximately travelling North towards the City Centre, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Irishtown Road has both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- **Minor modifications** are required at the Oliver Plunkett Avenue/Bath Street/Irishtown Road junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.
- Following the Oliver Plunkett Avenue/Bath Street/Irishtown Road junction heading towards the City Centre works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Irishtown Road has both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- For the next 120m, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.

## • Bridge Street

- For approximately 83m travelling West towards the City Centre, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Bridge Street has both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- For the next 70m approximately, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.

- For the next 45m approximately travelling West towards the City Centre, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Bridge Street has both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- For the next 30m approximately, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- For the next 55m approximately travelling West towards the City Centre, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.

- **Ringsend Road/Pearse Street**

- **Minor modifications** are required at the South Dock Road/Ringsend Road junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary reinstatement works are needed.
- For approximately 997m travelling West towards the City Centre, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Ringsend Road and Pearse Street have both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- **Minor modifications** are required at the Sandwith Street/Pearse Street junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary reinstatement works are needed.

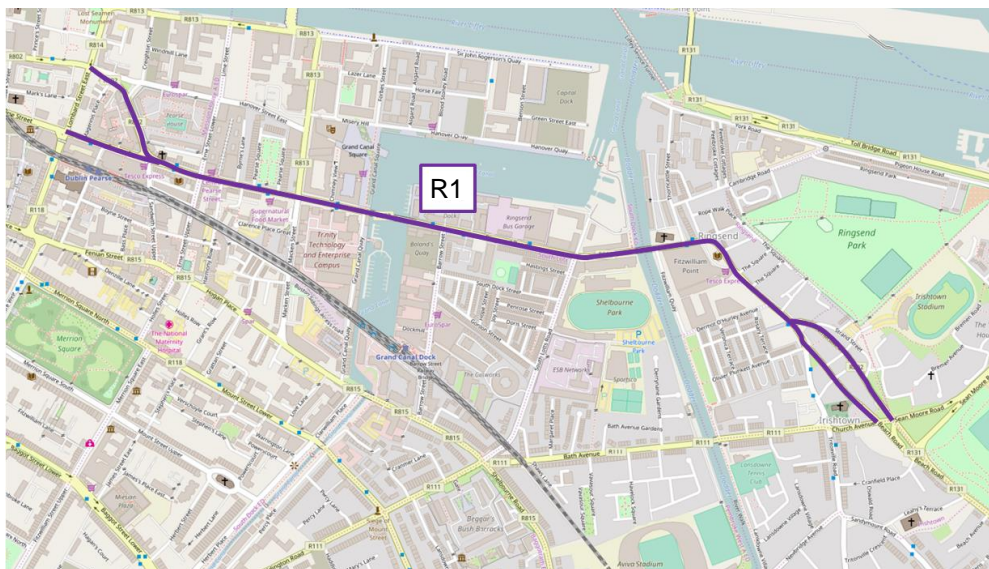


- Following the Sandwith Street/Pearse Street junction travelling West towards the City Centre for approximately 175m, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Pearse Street has both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.

- **Sandwith Street Lower**

- Following the Sandwith Street/Pearse Street junction travelling North-West towards the City Centre for approximately 130m, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Sandwith Street has both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- **Moderate upgrade modifications** are required at the Sandwith Street/Townsend Street junction i.e. the works to accommodate the 20m buffer include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

## 2. R1 Option 2



- **Bath Street**

- For 200m approximately along Bath Street, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- **Minor modifications** are required at the Bath Street/Irishtown Road junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

- **Pembroke Street**

- For 160m approximately along Pembroke Street, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- **Minor modifications** are required at the Pembroke Street/Irishtown Road junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

- **Irishtown Road**

- Following the Oliver Plunkett Avenue/Bath Street/Irishtown Road junction heading towards the City Centre works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Irishtown Road has both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- For the next 120m, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.

- **Bridge Street**

- For approximately 83m travelling West towards the City Centre, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Bridge Street has both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- For the next 70m approximately, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- For the next 45m approximately travelling West towards the City Centre, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Bridge Street has both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- For the next 30m approximately, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- For the next 55m approximately travelling West towards the City Centre, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.

- **Ringsend Road/Pearse Street**

- **Minor modifications** are required at the South Dock Road/Ringsend Road junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.
- For approximately 997m travelling West towards the City Centre, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and

services. As Ringsend Road and Pearse Street have both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.

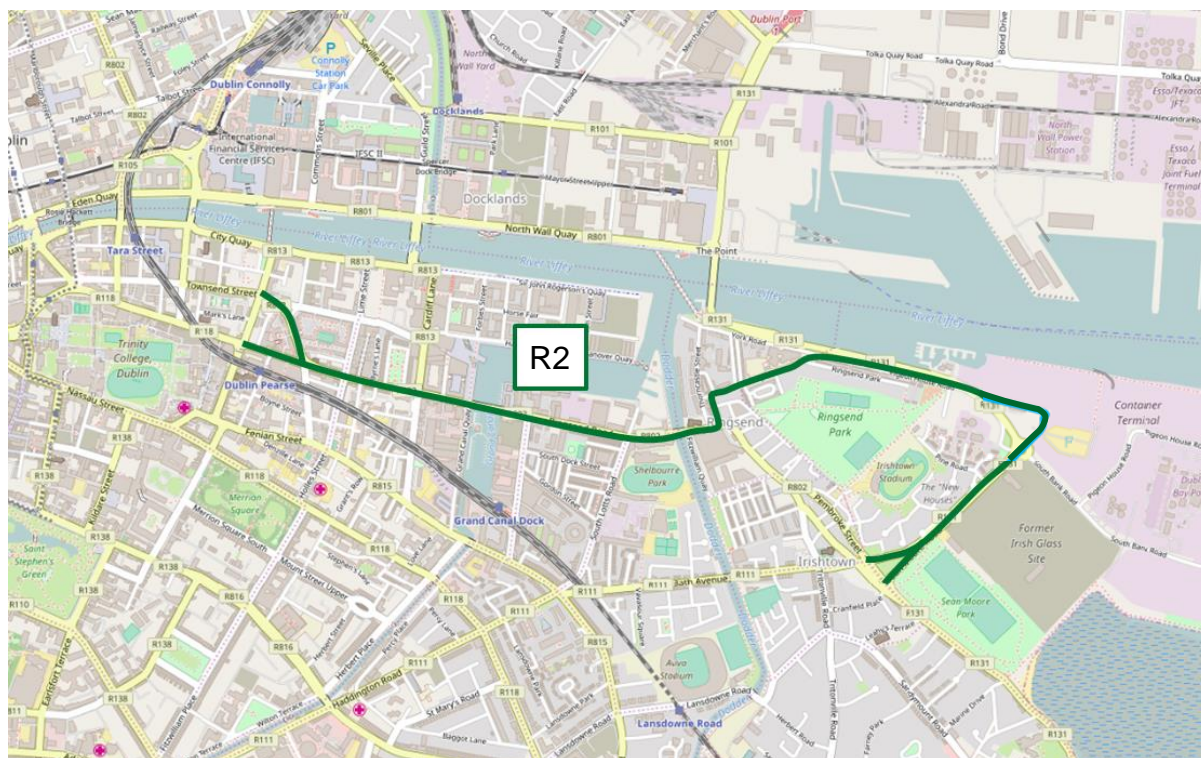
- **Minor modifications** are required at the Sandwith Street/Pearse Street junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.
- Following the Sandwith Street/Pearse Street junction travelling West towards the City Centre for approximately 175m, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Pearse Street has both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.

- **Sandwith Street Lower**

- Following the Sandwith Street/Pearse Street junction travelling North-West towards the City Centre for approximately 130m, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Sandwith Street has both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- **Moderate upgrade modifications** are required at the Sandwith Street/Townsend Street junction i.e. the works to accommodate the 20m buffer include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.



### 3. R2 Option 1



- **Sean Moore Road**

- From the Bayview/Sean Moore road junction on both inbound and outbound lanes for 90m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- Following the inbound and outbound forks and heading North-East for approximately 55m works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- For the next 112m approximately, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- For the next 104m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Services (power supply, communications, water, gas) will have to be



protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.

- For the next 26m approximately, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- For the next 38m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- **Moderate upgrade modifications** are required at the Sean Moore/Pidgeon House Road roundabout i.e. the works to accommodate the 20m buffer include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

- **Pidgeon House Road/Cambridge Road/Thorncastle Street**

- From the Sean Moore/Pidgeon House Road roundabout heading North-West for approximately 103m along Pidgeon House Road, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- **Significant major modifications** are required at the R131/Pidgeon House Road junction to accommodate the proposed works which include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. Some land take is required at this junction and as such property boundary re-instatement works are needed.
- For the next 367m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Pidgeon House Road is predominantly a residential area, services (power supply, communications, water, gas) will have to be protected/relocated/diverted.

Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.

- **Minor modifications** are required at the Pidgeon House Road/York Street/Cambridge Road junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.
- For the next 360m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Cambridge Road is predominantly a residential area, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- For the next 70m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Thorncastle Street is predominantly a residential area, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.

## ● Ringsend Road/Pearse Street

- **Minor modifications** are required at the South Dock Road/Ringsend Road junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.
- For approximately 997m travelling West towards the City Centre, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Ringsend Road and Pearse Street have both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- **Minor modifications** are required at the Sandwith Street/Pearse Street junction. I.e. the works associated with this categorization include: removal

and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

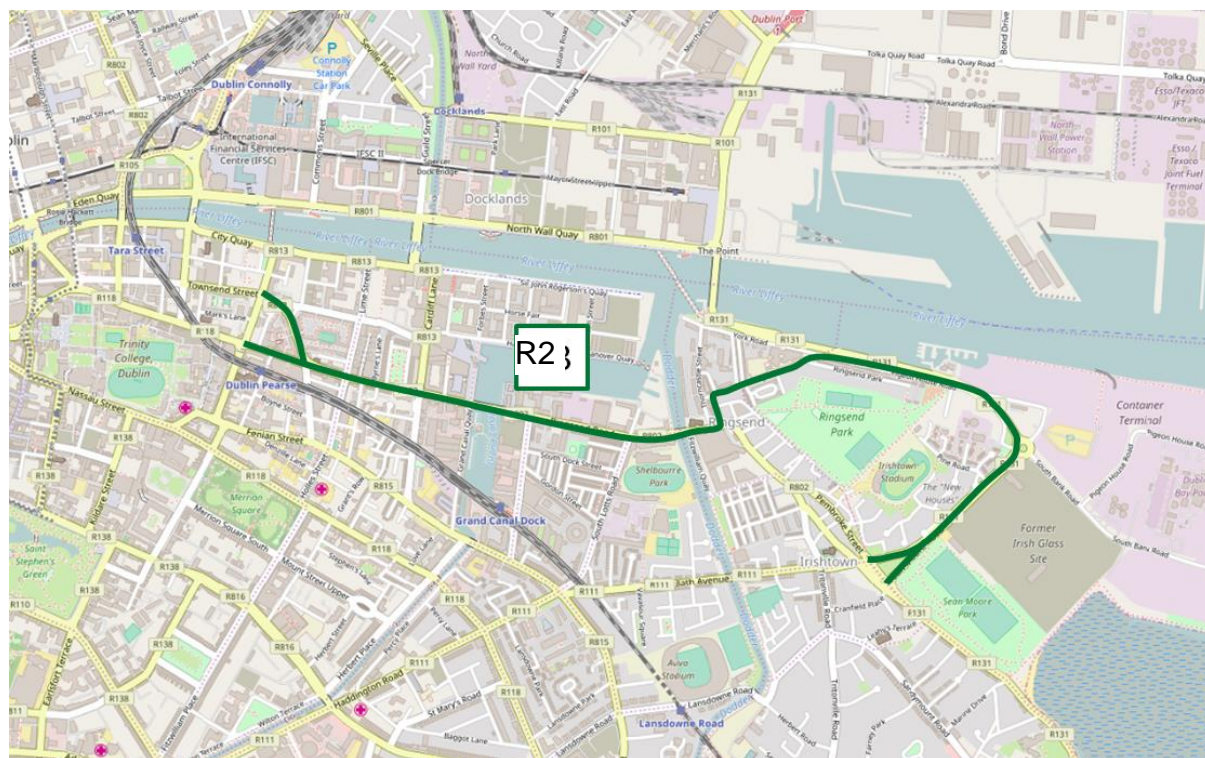
- Following the Sandwith Street/Pearse Street junction travelling West towards the City Centre for approximately 175m, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Pearse Street has both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.

- **Sandwith Street Lower**

- Following the Sandwith Street/Pearse Street junction travelling North-West towards the City Centre for approximately 130m, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Sandwith Street has both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- **Moderate upgrade modifications** are required at the Sandwith Street/Townsend Street junction i.e. the works to accommodate the 20m buffer include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.



## 4. R2 Option 2



- **Sean Moore Road**

- From the Bayview/Sean Moore road junction on both inbound and outbound lanes for 90m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Services (power supply, communications, water, gas) will have to be protected/relocated/diverted. R1 sting road signage may be removed and relocated and/or replaced. No land take is required along this section.
- Following the inbound and outbound forks and heading North-East for approximately 55m works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- For the next 112m approximately, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- For the next 104m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Services (power supply, communications, water, gas) will have to be

protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.

- For the next 26m approximately, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- For the next 38m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- **Moderate upgrade modifications** are required at the Sean Moore/Pidgeon House Road roundabout i.e. the works to accommodate the 20m buffer include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

- **Pidgeon House Road/Cambridge Road/Thorncastle Street**

- From the Sean Moore/Pidgeon House Road roundabout heading North-West for approximately 103m along Pidgeon House Road, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. Services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- **Significant major modifications** are required at the R131/Pidgeon House Road junction to accommodate the proposed works which include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. Some land take is required at this junction and as such property boundary re-instatement works are needed.
- For the next 367m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Pidgeon House Road is predominantly a residential area, services (power supply, communications, water, gas) will have to be protected/relocated/diverted.



Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.

- **Minor modifications** are required at the Pidgeon House Road/York Street/Cambridge Road junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.
- For the next 360m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Cambridge Road is predominantly a residential area, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- For the next 70m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Thorncastle Street is predominantly a residential area, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.

## ● Ringsend Road/Pearse Street

- **Minor modifications** are required at the South Dock Road/Ringsend Road junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.
- For approximately 997m travelling West towards the City Centre, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Ringsend Road and Pearse Street have both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- **Minor modifications** are required at the Sandwith Street/Pearse Street junction. I.e. the works associated with this categorization include: removal

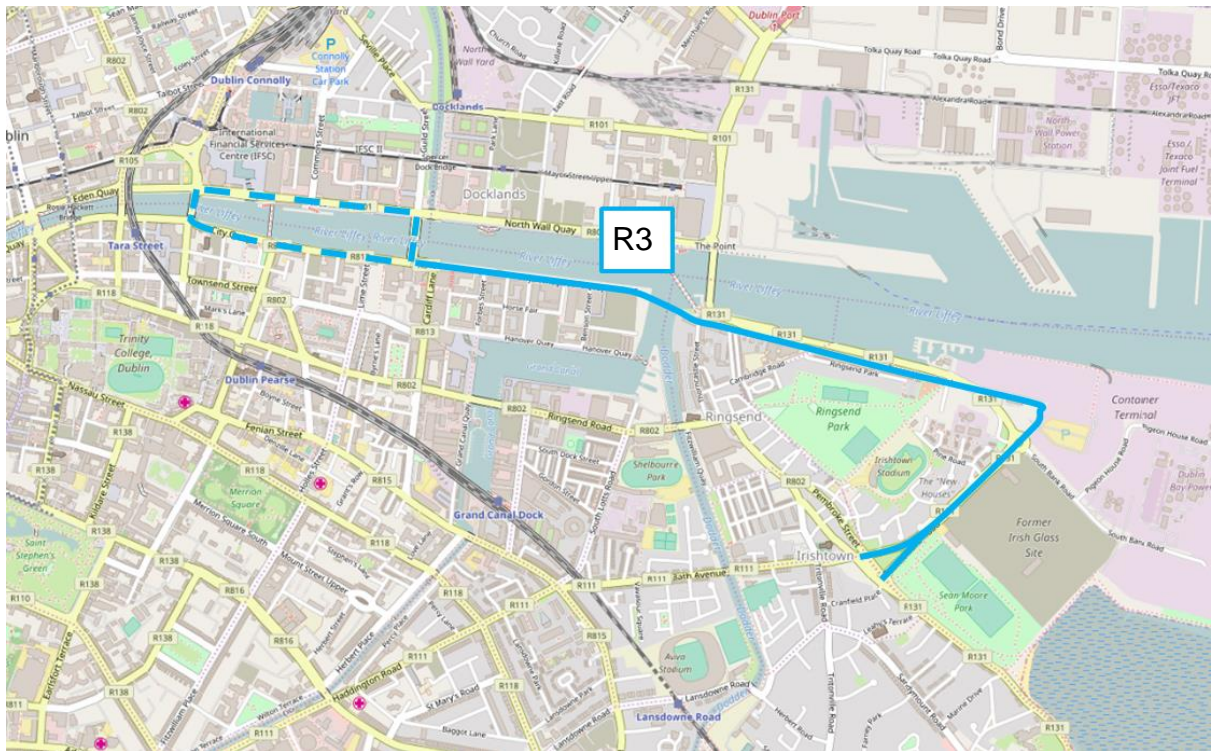
and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

- Following the Sandwith Street/Pearse Street junction travelling West towards the City Centre for approximately 175m, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Pearse Street has both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.

- **Sandwith Street Lower**

- Following the Sandwith Street/Pearse Street junction travelling North-West towards the City Centre for approximately 130m, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Sandwith Street has both residential and commercial properties, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- **Moderate upgrade modifications** are required at the Sandwith Street/Townsend Street junction i.e. the works to accommodate the 20m buffer include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

## 5. R3 Option 1



- **Sean Moore Road**

- From the Bayview/Sean Moore road junction on both inbound and outbound lanes for 550m approximately, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- For the next 120m approximately, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- **Moderate upgrade modifications** are required at the Sean Moore/Pidgeon House Road roundabout i.e. the works to accommodate the 20m buffer include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

- **Pidgeon House Road**

- For the next 200m approximately heading west along Pidgeon House Road, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- **Significant major modifications** are required at the R131/Pidgeon House Road junction to accommodate the proposed works which include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. Some land take is required at this junction and as such property boundary re-instatement works are needed.
- For the next 400m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Pidgeon House Road is predominantly a residential area, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.



- **Minor modifications** are required at the Pidgeon House Road/York Street/Cambridge Road junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

- **York Road**

- For the next 200m approximately, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- For the next 130m approximately, the proposed works have been categorized as **major**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways greater than 500mm and the removal of and installation of new drainage systems. Road lighting (and associated works i.e. cabling and ducting) along the route to be protected/relocated/diverted. Existing services (power supply, communications, water, gas) will have to be protected/relocated/diverted. To accommodate the works limited earthworks works are also required along with full depth pavement reconstruction and associated road markings. Road signage and road furniture (bins and bollards) to be removed/ relocated or replaced. Safety barriers/guardrails to be removed and relocated/replaced.
- **Moderate upgrade modifications** are required at the York Road/Thorncastle Street junction i.e. the works to accommodate the 20m buffer include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.
- From the York Road/Thorncastle Street junction for approximately 70m heading towards the new proposed bridge, works have been categorized as **major**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways greater than 500mm and the removal of and installation of new drainage systems. Road lighting (and associated works i.e. cabling and ducting) along the route to be protected/relocated/diverted. Existing services (power supply, communications, water, gas) will have to be protected/relocated/diverted. To accommodate the works limited earthworks works are also required along with full depth pavement reconstruction and associated road markings. Road



signage and road furniture (bins and bollards) to be removed/ relocated or replaced. Safety barriers/guardrails to be removed and relocated/replaced.

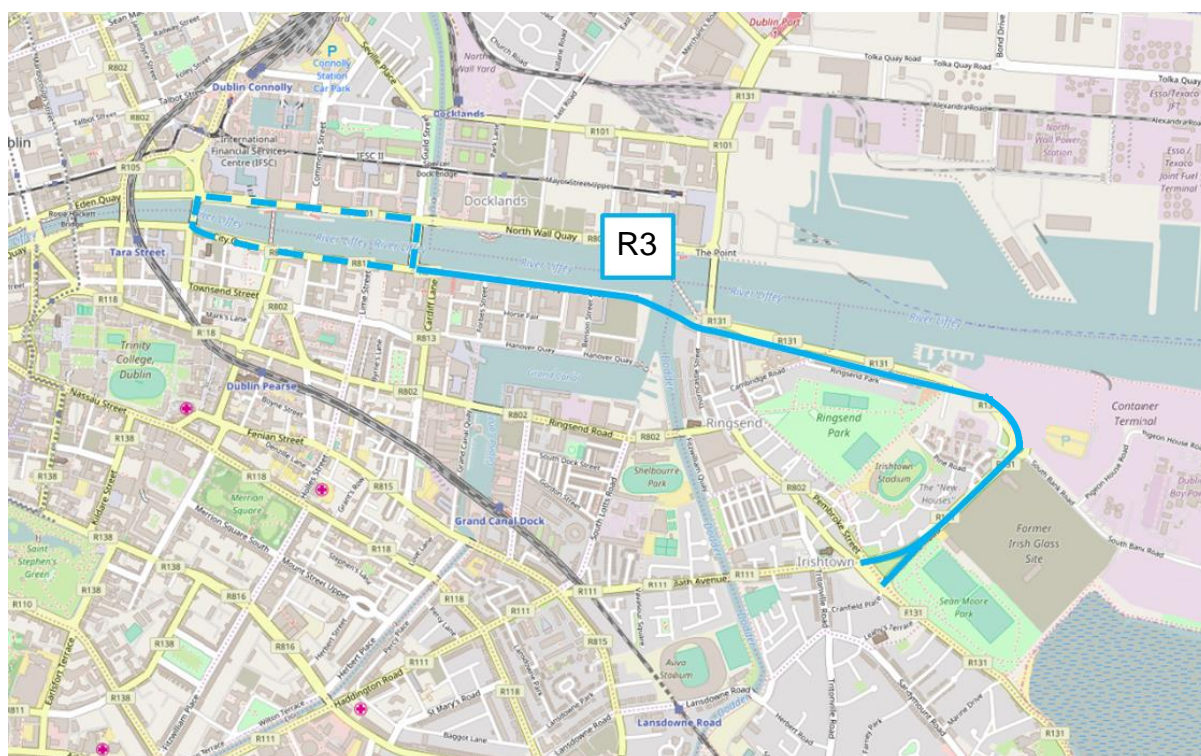
- **Sir John Rogerson's Quay**

- For 680m approximately along Sir John Rogerson's Quay approaching Samuel Beckett Bridge, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Sir John Rogerson's Quay is predominantly a commercial area, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- **Minor modifications** are required at the Sir John Rogerson's Quay/Samuel Beckett Bridge junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

- **Proposed Loop**

- The proposal for this route option includes a proposed loop Sir John Rogerson's Quay, travelling along the North Wall and Custom House Quays before circling back towards Sir John Rogerson's Quay via Talbot Memorial Bridge and City Quay.

## 6. R3 Option 2



- **Sean Moore Road**

- From the Bayview/Sean Moore road junction on both inbound and outbound lanes for 550m approximately, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- For the next 120m approximately, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- **Moderate upgrade modifications** are required at the Sean Moore/Pidgeon House Road roundabout i.e. the works to accommodate the 20m buffer include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and

additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

## • Pidgeon House Road

- For the next 200m approximately heading west along Pidgeon House Road, the proposed works have been categorized as **minor**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways with a width less than 500mm. Existing road markings to be removed and replaced. No land take is required along this section.
- **Significant major modifications** are required at the R131/Pidgeon House Road junction to accommodate the proposed works which include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. Some land take is required at this junction and as such property boundary re-instatement works are needed.
- For the next 400m approximately, works have been categorized as **moderate** due to the removal of kerbs and footways greater than 500mm and the removal/realignment of drainage systems and services. As Pidgeon House Road is predominantly a residential area, services (power supply, communications, water, gas) will have to be protected/relocated/diverted. Existing road signage may be removed and relocated and/or replaced. No land take is required along this section.
- **Minor modifications** are required at the Pidgeon House Road/York Street/Cambridge Road junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

## • York Road

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- For the next 130m approximately, the proposed works have been categorized as **major**. I.e. the works associated with widening of the road to accommodate the proposed works include the removal of kerbs and footways greater than 500mm and the removal of and installation of new drainage

systems. Road lighting (and associated works i.e. cabling and ducting) along the route to be protected/relocated/diverted. Existing services (power supply, communications, water, gas) will have to be protected/relocated/diverted. To accommodate the works limited earthworks works are also required along with full depth pavement reconstruction and associated road markings. Road signage and road furniture (bins and bollards) to be removed/ relocated or replaced. Safety barriers/guardrails to be removed and relocated/replaced.

- **Moderate upgrade modifications** are required at the York Road/Thorncastle Street junction i.e. the works to accommodate the 20m buffer include: General site clearance, removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.
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- **Minor modifications** are required at the Sir John Rogerson's Quay/Samuel Beckett Bridge junction. I.e. the works associated with this categorization include: removal and replacement of kerbs, footways and paved areas, laying of Anti-skid surface, Protection/relocation/diversion of services (i.e. power supply, communications, water and gas), removal and replacement of existing road markings, dished kerbs and tactile paving at all crossing points, the provision of guardrails and bollards, landscaping works, additional traffic signals including ducting, cabling and chambers and additional signal poles/heads. No land take is required at this junction and as such property boundary re-instatement works are needed.

- **Proposed Loop**

- The proposal for this route option includes a proposed loop Sir John Rogerson's Quay, travelling along the North Wall and Custom House Quays before circling back towards Sir John Rogerson's Quay via Talbot Memorial Bridge and City Quay.



## Appendix H – Environmental Desktop Study



# Ringsend to City Centre Core Bus Corridor Study - Feasibility and Options Assessment Report

## Environmental Desktop Study Report

DRAFT



Draft – March 2017

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# Ringsend to City Centre Core Bus Corridor Study

## Environmental Desktop Study Report

Document No:..... 16.175

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Checked:..... Barry Corrigan

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Issue	Description	Made	Checked	Approved	Date
0	Environmental Desktop Study Report	GR	BC		08/03/2017

# Ringsend to City Centre Core Bus Corridor Study

## Environmental Desktop Study Report

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### APPENDICES

#### APPENDIX A: Drawing of Proposed Core Bus Corridor Route

## 1.0 INTRODUCTION

### 1.1 Introduction (Objectives and Benefits)

Roughan & O'Donovan – AECOM Alliance Consulting Engineers has been commissioned by the National Transport Authority (NTA) to identify improvement proposals for the Ringsend to City Centre Core Bus Corridor Scheme (hereafter referred to as the “Scheme”).

The main objectives of the Scheme are as follows:

- To deliver on-street infrastructure in order to provide continuous priority for bus movements along the Core Bus Corridor, facilitating a reliable and effective bus service;
- To provide on-street cycle facilities, particularly those required under the Greater Dublin Area Cycle Network Plan; and
- To optimise the movement of people and goods along the corridor, consistent with local constraints and place-making requirements.

### 1.2 Site Location

Although the exact route is not decided, the Scheme is proposed to provide a bus route that will connect the city centre to Ringsend. Proposed routes R1 and R2 run from Lombard St to Irishtown Rd, Bath St and Pembroke St via Ringsend Rd and Bridge Street. R3 also travels from Lombard St to Bridge Street, prior to turning onto Thorncastle St and Cambridge Rd. Route R3 then travels along Pigeon House Rd, crossing the R131 and continues through the roundabout onto the Sean Moore Rd. Route R4 begins by travelling a loop along Samuel Beckett Bridge, North Wall Quay, Talbot Memorial Bridge and City Quay. It then follows on to Sir John Rogerson's Quay where it crosses over to York Rd via a proposed bridge. From York Rd, the route follows the same route as R3 along Pigeon House Rd and Sean Moore Rd. The proposed routes are illustrated in Figure 1.1 and in Appendix A.

### 1.3 Purpose of the Environmental Desktop Study

This Environmental Desktop Study has been carried out with the objective of compiling as much information as possible relating to the natural environment in order to identify and assess all feasible potential route options for the Scheme. This data collection is focussed on determining environmental constraints and designated sites which could affect the route of the scheme.

As part of the Desktop Study, an assessment of route options for the Scheme has been considered. These have taken into account the environmental constraints of the study area. The chapters that follow examine these constraints in more detail.



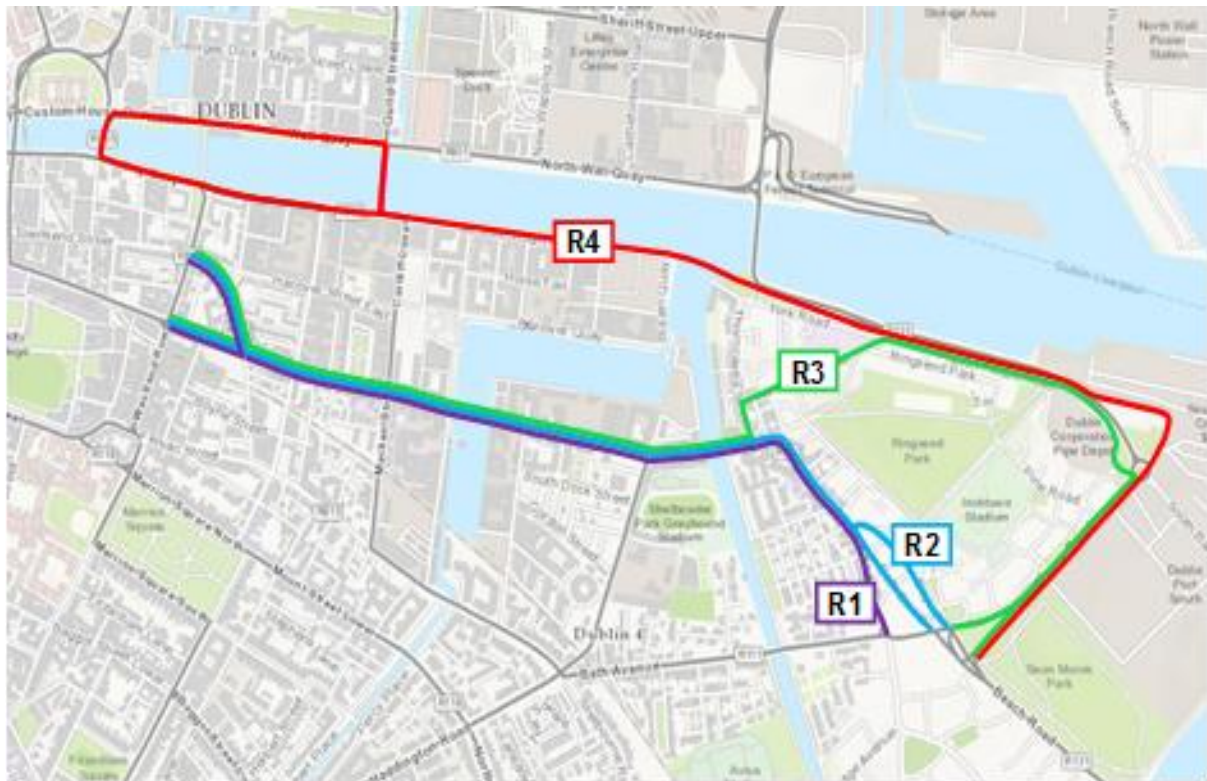


Figure 1.1 Proposed Route Options R1 – R4

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## **2.0 METHODOLOGY**

### **2.1 Desktop Study**

A desktop study was initially undertaken to review potential environmental constraints within the study area. A review of the following available online data sources was carried out to screen the proposed project area for potential impacts:

- OSI mapping
- Aerial photography
- National Parks and Wildlife (NPWS)
- National Biodiversity Data Centre Ireland (NBDC)
- Floodmaps.ie
- EPA Map Viewer (envision.ie)

A review of the National Parks and Wildlife Service (NPWS) website database was undertaken to determine the boundaries of designated areas for conservation in the vicinity of the proposed project and to identify any known records of protected species within the area.

The National Biodiversity Data Centre Ireland (NBDC) database was reviewed to identify any known species records within 2km of the proposed scheme. The Draft Dublin City Biodiversity Action Plan 2015-2020 was also reviewed.

The desk study identified the potential for a range of flora and fauna to be present within the study area, of which protected species identified may be present or utilise the area. A review of the NPWS and the NBDC websites was undertaken to determine the boundaries of designated areas for conservation and to identify known records of the species listed for protection.

### **2.2 Reporting**

The evaluation of the ecological environment and the criteria used to assess the significance of impacts are derived from the Guidelines for Assessment of Ecological Impacts on National Road Schemes (NRA, Rev. 2, 2009) and the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment (EclA).

## 3.0 RECEIVING ENVIRONMENT

### 3.1 Introduction

This chapter of the Environmental Desktop Study Report considers the key constraints for the planning of the Scheme. It reviews the constraints and opportunities for the project in relation to ecology, landscape and flooding. The route of the proposed Scheme is shown in Figure 1.1 and Appendix A.

### 3.2 Designated Areas

#### 3.2.1 Natura 2000 sites

Areas of international significance for nature conservation have been included in a European Union network of protected areas known as Natura 2000. These areas are:

- **Special Areas of Conservation (hereafter referred to as SACs)** are designated under the EU Habitats Directive (92/43/EEC) which are transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No 477 of 2011).
- **Special Protection Areas (SPAs)** are designated under the EU Birds Directive (79/409/EEC) which are transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No 477 of 2011).

A review of the National Parks and Wildlife Service database has identified the following designated sites as being within 10km:

**Table 3.1: Designated Sites within 10km**

Name	Site code	Approximate Location
North Bull Island SPA	004006	3km north east
Baldoyle Bay SPA	004016	9km north east
South Dublin Bay and River Tolka SPA	004024	700m south east / north east
Baldoyle Bay SAC/pNHA	000199	9km north east
Howth Head SAC	000202	9km north east
North Dublin Bay SAC/pNHA	000206	3km north east
South Dublin Bay SAC/pNHA	000210	700m south east
Rockabill to Dalkey Island SAC	000205	9km east east
Liffey Valley pNHA	000128	8km west
Santry Demesne pNHA	000178	6km north
Dodder Valley pNHA	000991	9km south west
Dolphins, Dublin Docks pNHA	000201	1km east
Boosterstown/Marsh pNHA	001205	4km south east
Dalkey Coastal Zone and Killiney pNHA	001206	9km south east
Fitzsimon's Wood pNHA	001753	8km south
Royal Canal pNHA	002103	100m north
Grand Canal pNHA	002104	0km

The study area does not border any Natura 2000 site. The Natura 2000 sites in closest proximity to the site are the South Dublin Bay and River Tolka Estuary SPA (Site Code 004024) and the South Dublin Bay SAC/pNHA (Site Code 000210), both located 700m south east of the scheme. The site synopses and full versions of the Conservation Objectives for the Natura 2000 site can be found on the NPWS website at: <http://www.npws.ie/protectedsites/>.

The study areas of route options R1, R2 and R3 cross the Grand Canal pNHA between Pearse St and Ringsend Rd by means of the Grand Canal Bridge. Due to the small scale of works proposed and the timing of works, the proposed development is unlikely to have any direct or indirect impacts on these pNHAs.

### 3.3 Protected Species

Online sources of publicly available data provided by National Biodiversity Centre (NBDC) with regards to protected species recorded within 2km of the site informed the desk study and are presented in Table 2.

**Table 3.2: Notable Protected Species Records within 2km of the Site**

Species	Most Recent Date Recorded	Suitable Habitat Within the Site
<b>EU Directive</b>		
Mallard ( <i>Anas platyrhynchos</i> )	2016	No
Little Egret ( <i>Egretta garzetta</i> )	2016	No
Red-throated Diver ( <i>Gavia stellata</i> )	2011	No
Red-breasted Merganser ( <i>Mergus serrator</i> )	2011	No
Eurasian Curlew ( <i>Numenius arquata</i> )	2016	No
Common Frog ( <i>Rana temporaria</i> )	2016	No
Rock Pigeon ( <i>Columba livia</i> )	2012	Yes
Common Wood Pigeon ( <i>Columba palumbus</i> )	2013	Yes
Striped Dolphin ( <i>Stenella coeruleoalba</i> )	2001	No
Lesser Noctule ( <i>Nyctalus leisleri</i> )	2013	Yes
Nathusius's Pipistrelle ( <i>Pipistrellus nathusii</i> )	2010	Yes
Pipistrelle ( <i>Pipistrellus pipistrellus sensu lato</i> )	2013	Yes
Soprano Pipistrelle ( <i>Pipistrellus pygmaeus</i> )	2011	Yes
European Otter ( <i>Lutra lutra</i> )	2016	No
Common Kingfisher ( <i>Alcedo atthis</i> )	2011	No
Dunlin ( <i>Calidris alpina</i> )	2011	No
Peregrine Falcon ( <i>Falco peregrines</i> )	2011	No
Mediterranean Gull ( <i>Larus melanocephalus</i> )	2011	No
Bar-tailed Godwit ( <i>Limosa lapponica</i> )	2011	No
Common Tern ( <i>Sterna hirundo</i> )	2011	No
Northern Lapwing ( <i>Vanellus vanellus</i> )	2011	No
Grey seal ( <i>Halichoerus grypus</i> )	2013	No
Common Porpoise ( <i>Phocoena phocoena</i> )	2012	No
Sperm Whale ( <i>Physeter macrocephalus</i> )	1766	No

Species	Most Recent Date Recorded	Suitable Habitat Within the Site
Daubenton's Bat ( <i>Myotis daubentonii</i> )	2011	Yes
Brown Long-eared Bat ( <i>Plecotus auritus</i> )	2013	Yes
Arctic Tern ( <i>Sterna paradisaea</i> )	1999	No
Common Porpoise ( <i>Phocoena phocoena</i> )	1914	No

Although most of these species do not have suitable habitats within the site, potential pathways between the works and species present within the waterways may exist dependent on the extent of construction on the bridge across the River Dodder on route options R1, R2 and R3. However by adhering to the NRA/TII Environmental Assessment and Construction Guidelines (EACG) along with the timing of the works, effects on the environment will not be significant.

Route option R4 may have further effects on these species as a bridge would be required crossing the mouth of the River Dodder and the Grand Canal. If R4 is chosen, an EIS will be required if the bridge is greater than 100m in length.

### 3.4 Invasive Species

Publicly available data offered online by NBDC with regards to invasive species are presented in Table 3. The presence of Japanese Knotweed (*Fallopia japonica*) was identified most recently in 2016. Japanese Knotweed, Giant Hogweed and Indian Balsam are species subject to restrictions (Third Schedule) under Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011. **A complete invasive species survey will be required for the preferred route prior to the commencement of works.**

**Table 3.3: Invasive Species Records within 2km of the Site**

Species	Most Recent Date Recorded	Suitable Habitat Within the Site
Narrow-leaved Ragwort ( <i>Senecio inaequidens</i> )	2014	Yes
Sycamore ( <i>Acer pseudoplatanus</i> )	2014	Yes
Three-cornered Garlic ( <i>Allium triquetrum</i> )	2015	Yes
Butterfly Bush ( <i>Buddleja davidii</i> )	2015	Yes
Japanese Knotweed ( <i>Fallopia japonica</i> )	2016	Yes
Traveller's-joy ( <i>Clematis vitalba</i> )	2013	Yes
Giant Hogweed ( <i>Heracleum mantegazzianum</i> )	2012	Yes
Indian Balsam ( <i>Impatiens glandulifera</i> )	2013	Yes
Cherry Laurel ( <i>Impatiens glandulifera</i> )	2009	Yes
House Mouse ( <i>Mus musculus</i> )	2015	Yes
Eastern Grey Squirrel ( <i>Sciurus carolinensis</i> )	2014	Yes
Canadian Fleabane ( <i>Conyza Canadensis</i> )	2012	Yes
Sea-buckthorn ( <i>Hippophae rhamnoides</i> )	2014	Yes
American Mink ( <i>Mustela vison</i> )	2016	No
Water Fern ( <i>Azolla filiculoides</i> )	1984	No
Nuttall's Waterweed ( <i>Elodea nuttallii</i> )	2009	No
Narrow-leaved Ragwort ( <i>Senecio inaequidens</i> )	2014	Yes



Species	Most Recent Date Recorded	Suitable Habitat Within the Site
European Rabbit ( <i>Oryctolagus cuniculus</i> )	2015	No

### 3.5 Bats

It is unlikely that bat roosts are present within the treelines along the route of the Scheme due to the urban, exposed and well lit nature of the study area. Additionally the trees along the route are young and therefore the tree barks lack degradation and crevasses which are required for bat roosts. However, the linear route and overgrown vegetation may provide foraging and commuting for bats and the potential effects on bats from the removal of trees along the route will need to be assessed. Therefore, **a bat suitability assessment should be carried out by a bat specialist during the bat active survey season, between April to September, in advance of construction.** The assessment should be carried out in accordance with Bat Conservation Trust guidance (Collins. J, 2016) and should determine baseline patterns of site use, identifying specific sections of the route that are important for bats. The NBDC online source of publicly available data determined that six species of bats have been recorded within 2km of the Site including Common Pipistrelle (*Pipistrellus pipistrellus sunsu lato*), Daubenton's Bat (*Myotis daubentonii*), Brown Long-eared Bat (*Plecotus auritus*), Nathusius's Pipistrelle (*Pipistrellus nathusii*), Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Lesser Noctule (*Nyctalus leisleri*) (see Table 2). If tree removal is required due to the proposed works, it is recommended that felled trees are left in-situ for 24 hours prior to removal from site.

### 3.6 Other Protected Mammals

NBDC data provided one Otter record within 2km of the Site boundary from 2016, as seen in Table 2. Due to the urban and exposed nature of the study area along with the lack of suitable habitat for the species, it is unlikely that the study area comprises Otter or Badger habitats. Therefore, no protected mammal survey is deemed necessary in relation to the proposed works.

### 3.7 Trees

Route options R1, R2 and R3 all travel from Lombard Street to Bridge Street before separating. On this section of the route they have the potential to remove approx. 55 trees such as those on Pearse Street and Townsend Street below.



Plate 3.1 Pearse Street



Plate 3.2 Townsend Street

### Route option R1

Route R1 may result in the removal of a further 20 trees such as those shown on Irishtown Road below, in addition to those accounted for above, bringing the potential overall effect of the route to approx. 75 trees.



**Plate 3.3 Irishtown Rd**

### Route Option R2

Similarly route option R2 may have potential impacts for a further 25 trees on Irishtown Rd and Pembroke Street as illustrated below, bringing its overall effect to approx. 80 trees.



**Plate 3.4 Pembroke Street**

### Route Option R3

R3 has the potential to remove 145 trees. In addition to those shown above on Pearse St and Townsend St, approx 90 trees may be subject to removal along Pigeon House Rd and Sean Moore Rd as seen in Plate 3.5.



### Plate 3.5 Sean Moore Rd

#### Route Option R4

R4 has the potential to affect approx. 140 trees along City Quay such as those shown in Plates 3.6 and 3.7. A further 60 trees would be required to be removed along Pigeon House Rd and Sean Moore Rd bringing the total to approx 200 trees.



Plate 3.6 City Quay



Plate 3.7 City Quay

These treelines along the four route options provide a positive visual and landscape aspect to the area, however the trees are young and are of local importance only. It is unlikely that they comprise bat roosts and due to the lack of ground cover, the range of species present is likely to be low. Whilst the trees may have visual benefits locally, the ecological benefit of the trees is not significant.

### 3.8 Breeding birds

Disturbance during construction may cause some temporary displacement of birds from treelines. The treelines on the route of the Scheme are likely to hold a community of breeding birds that would be dominated by small passerine species such as Blackbird, Robin, Chaffinch and Wren. The range of species present is likely to be low due to the urban nature of the study area, the high exposure of the trees to wind, the absence of ground cover and the lighting along the route. A breeding bird survey will not be required as a result of the proposed construction works.

However, any removal of trees required for the Works should be undertaken in a series of phases, thus avoiding simultaneous disturbance on the entire length of the project. Potential disturbance to breeding birds in the existing treelines should be avoided by confining the felling of trees and other site clearance to the period 1<sup>st</sup> September to 28<sup>th</sup> February. It is noted that the design of the proposed development is being developed so as to minimise the intrusiveness of the construction methodologies required.

### 3.9 Landscaping and Visual Impact

The most significant potential landscape and visual impact associated with the proposed development would arise in the case of the removal of tree lines. These tree lines provide a positive visual and landscape aspect to the area at present. However the trees are young and are of local importance only.

Additionally, the view looking west along the River Liffey is identified as a key view by the Dublin City Development Plan 2011-2017, as shown in Plate 3.8. Route 4 along



City Quay may have minor effects on this view as buses will travel across the Samuel Beckett Bridge and North Wall Quay. However, several bus routes currently use this route so there will not be a significant additional impact. This key view will be taken into consideration when developing the Scheme. Although the loss of trees along certain roads will have an adverse landscape and visual impact, it is anticipated that with sensitive design there will not be any significant adverse impacts, however a detailed Landscape and Visual Impact Assessment will be required at planning stage.



**Plate 3.8 Key Views and Prospects from the Dublin City Development Plan 2011-2017**

Route option R4 will have a further adverse effect on the landscape. As a vehicular bridge from Sir John Rogerson's Quay to York Rd, across the mouth of the River Dodder would be required, views from the North Wall Quays and the Grand Canal Docks as shown in Plate 3.9 would be likely to be significantly affected. This bridge does not yet have planning approval and will have to be assessed further in the EIA for the proposed bridge.



**Plate 3.9 View from Grand Canal Docks towards N Wall Quays**

### **3.10 Flooding**

A desktop study was carried out to investigate the flooding history of the site and the existing drainage regime within the study area.

Routes R1, R2 and R3 cross the Grand Canal via Grand Canal Bridge and the River Dodder via Ringsend Bridge. Route R4 crosses the River Liffey via the Samuel Becket Bridge and the Talbot Memorial Bridge and is also proposed to cross from Sir John Rogerson's Quay to York Street via a proposed new bridge.

The OPW floodmaps.ie website was consulted to determine the extent of flooding along the road network of the study area. One flood event occurred in 1963 on Ringsend Rd as seen in Plate 3.10. Tidal floods in Dublin City also occurred on 1<sup>st</sup> February 2002, affecting many areas. Irishtown Rd, Ringsend Rd, the R131, Sir John Rogerson's Quay and North Wall Quay experienced flooding during this event thus affecting all four routes. While the Eastern Catchment Flood Risk Assessment and Management (CFRAM) study details that while City Quay along the River Liffey and Pearse Street are subject to upto 10% Tidal AEP Events, all four routes are outside the River Liffey Fluvial Flood Extents. Ringsend and Irishtown are also detailed in the Dodder CFRAM as being protected by flood defences along the Dodder River.

These events will be taken into consideration when developing the Scheme, while it is also noted that flood assessments and improvement works have since been implemented in recent years including the Dodder CFRAM study and the Eastern CFRAM Study.



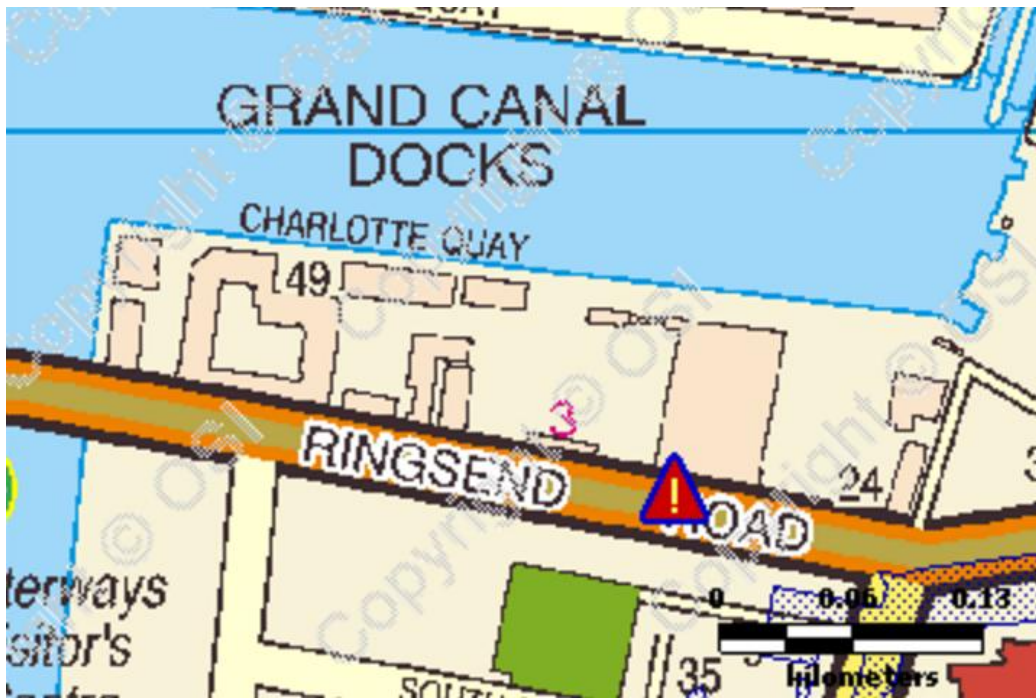


Plate 3.10 Location of flooding event on Ringsend Rd in 1963



Plate 3.11 Dublin tidal flooding along Irishtown Rd in 2002

## 4.0 CONCLUSION

The proposed Scheme will be developed along an urban, well developed area of artificial landscaping, which has minimal biodiversity value at present. The Scheme does not border any Natura 2000 site however it does cross the Grand Canal pNHA. Due to the small scale nature of works required, with appropriate timing of works, the scheme is not likely to impact on any designated sites. Bridge improvement works on Grand Canal Bridge or Ringsend Bridge should not cause any significant effects, once the NRA/TII EACGs and the Guidelines for the crossing of Watercourses during the construction of National Road Schemes 2008 are strongly adhered to.

Route option R4 may result in additional effects on the environment as the construction of the proposed bridge from Sir John Rogerson's Quay to York Rd will be required. The likely significant effects of this bridge will be mitigated for in an EIS, or whatever planning route that is adopted.

**A bat suitability assessment should be carried out by a bat specialist prior to construction works.** A protected mammal survey is not deemed necessary as no suitable habitat is likely to be found onsite. **Due to records of invasive species within the site, a complete invasive species survey will be required for the entire route prior to the commencement of works.**

**Any felling of trees required for the works should be undertaken in a series of phases, thus avoiding simultaneous disturbance to breeding birds along the entire length of the project. The felling of trees should be confined to the period 1<sup>st</sup> September to 28<sup>th</sup> February and felled trees should be left in-situ for 24 hours prior to removal off site.**

Provided that the presented avoidance measures are incorporated into the design of the development, the scheme is not expected to have any appreciable environmental impacts.

## 5.0 REFERENCES

Chartered Institute of Ecology and Environmental Management (CIEEM), (2016), Guidelines for Ecological Impact Assessment (EclA) in the UK and Ireland

Collins, J (ed). (2016), Bat Surveys: Good Practice Guidelines, 3rd Edition, Bat Conservation Trust, London

Dublin City Council, (2013), Dublin City Development Plan, 2011-2017. Written Statement

NRA, (2009), Guidelines for Assessment of Ecological Impacts on National Road Schemes Rev. 2

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**Appendix A:  
Drawing of Proposed Core Bus Corridor Route**

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## Proposed Route Options

