



SANDYMOUNT / MERRION TO BLACKROCK CORRIDOR STUDY

FEASIBILITY STUDY AND OPTIONS ASSESSMENT REPORT

Part B: Merrion Road / Rock Road Cycle Route No.13

Prepared by:
Eoin O'Mahony/Johanne Browne/
Associate Director/Senior Consultant

Checked by:
Eoin O'Mahony /Joe Seymour
Director

Approved by:
Joe Seymour
Director

Sandymount / Merrion to Blackrock Corridor Study

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Adelphi Plaza, Upper Georges Street, Dun Laoghaire, Co Dublin, Republic of Ireland
Telephone: +353 (0) 1 238 3100 Website: <http://www.aecom.com>

Job No 60336416

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Capabilities on project:
Transportation

1 Introduction

The National Transport Authority (NTA) commissioned AECOM-Roughan and O'Donovan (ROD) in November 2014 to prepare a feasibility study for the implementation of high quality cycle facilities between Sandymount and Blackrock Corridor. This is one of the busiest radial cycle routes into the County, which also has significant potential for growth as has been identified in the Greater Dublin Area (GDA) Cycle Network Plan. Within the Sandymount/ Merrion Road to Blackrock Corridor there are two cycle routes – the East Coast Trail (previously known as Sutton to Sandycove "S2S") and the Blackrock to City Centre cycle scheme. The East Coast Trail is Part A of the study and this was led by ROD and is reported on under a separate cover. Part B is the Blackrock to City Centre Cycle Scheme and this was led by AECOM and is reported on within this report.

The scheme extents are shown in the figure below.

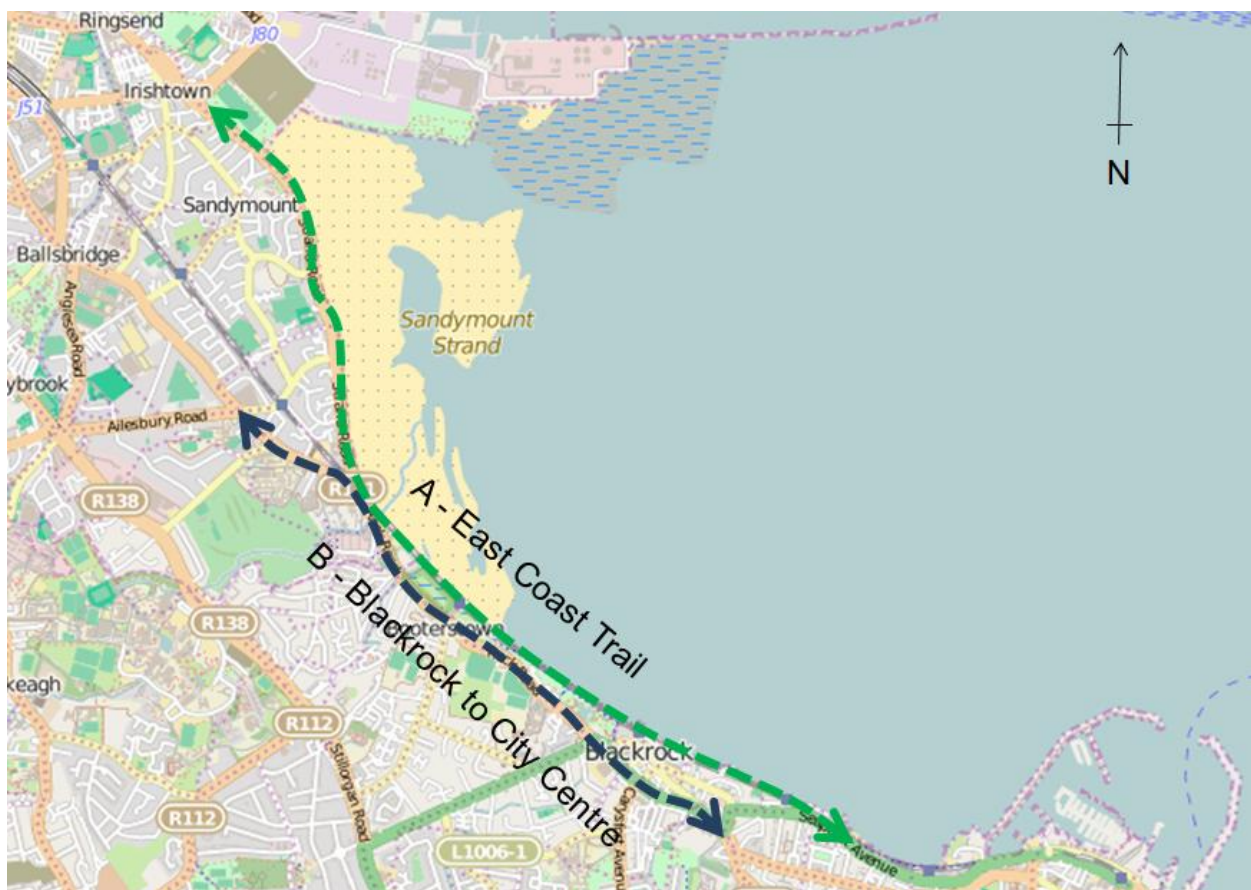


Figure 1.1 Scheme Extents as per NTA Brief (2014) - (Source: Openstreet map)

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The East Coast Trail for the purposes of this study runs from Brighton Vale, south of Blackrock, to Sean Moore Road, south of Ringsend, along the indicative route corridor of the Coastline. These routes cover sections of Routes 13, 13E and 14 of the NTA Cycle Network Plan for the Greater Dublin Area. This routes forms part of the Sutton to Sandycove (S2S) cycle and pedestrian rout, the provision of which is strategic aim of both Dublin City Council and Dun Laoghaire Rathdown County Council. The S2S is to be a 22km continuous walking and cycling corridor around coast line of Dublin Bay, linking Sutton on the northside to Sandycove on the south. This section of the corridor is one of the more challenging as it passes close or within environmentally sensitive areas.

The Blackrock to City on-road route starts at Blackrock at the junction of Monkstown Road and Temple Hill, runs along the indicative corridor of Rock Road & Merrion Road, and for this study finishes at the Merrion Road/Ailesbury Road junction. The Frascati Road section between Temple Hill and Mount Merrion Avenue is already under construction, thus this section has been removed from the this study.

This report outlines how this on-road route can be upgraded to provide a high quality continuous cycle facility over its entire length which will have a Quality of Service “A” rating, and will accommodate the project demand for cycling on this corridor for the decades to come.

2 Objectives

The objectives of the study are:

1. to establish the feasibility of developing the two cycle routes referenced above through the study area, together with associated pedestrian facilities, having particular regard to the environmental constraints within the study area;
2. to identify and evaluate all of the feasible route options; and
3. to identify a preferred option for each of the two cycle routes.

Within Part B, Rock Road/Merrion Road, of the study, the key aims are to improve the level of service for cyclists, to increase the efficiency of the movements of all modes within the study area, to improve safety for all transport modes and users within the study area and to improve the accessibility and permeability of the area for pedestrians, cyclists and public transport users.

During the study it was also indicated that the Bus Priority facilities along the corridor should be enhanced where possible, particularly between Ailesbury Road and Merrion Gates, in order to ensure that the buses using this route were not delayed as a result of these proposals.



Figure 2.1 Rock Road at Booterstown during the morning peak October 2014.

Capabilities on project:
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3 Functional Requirements

3.1 Introduction

The National Cycle Manual (NCM) contains a guidance graph to assist in the selection of appropriate cycling infrastructure.

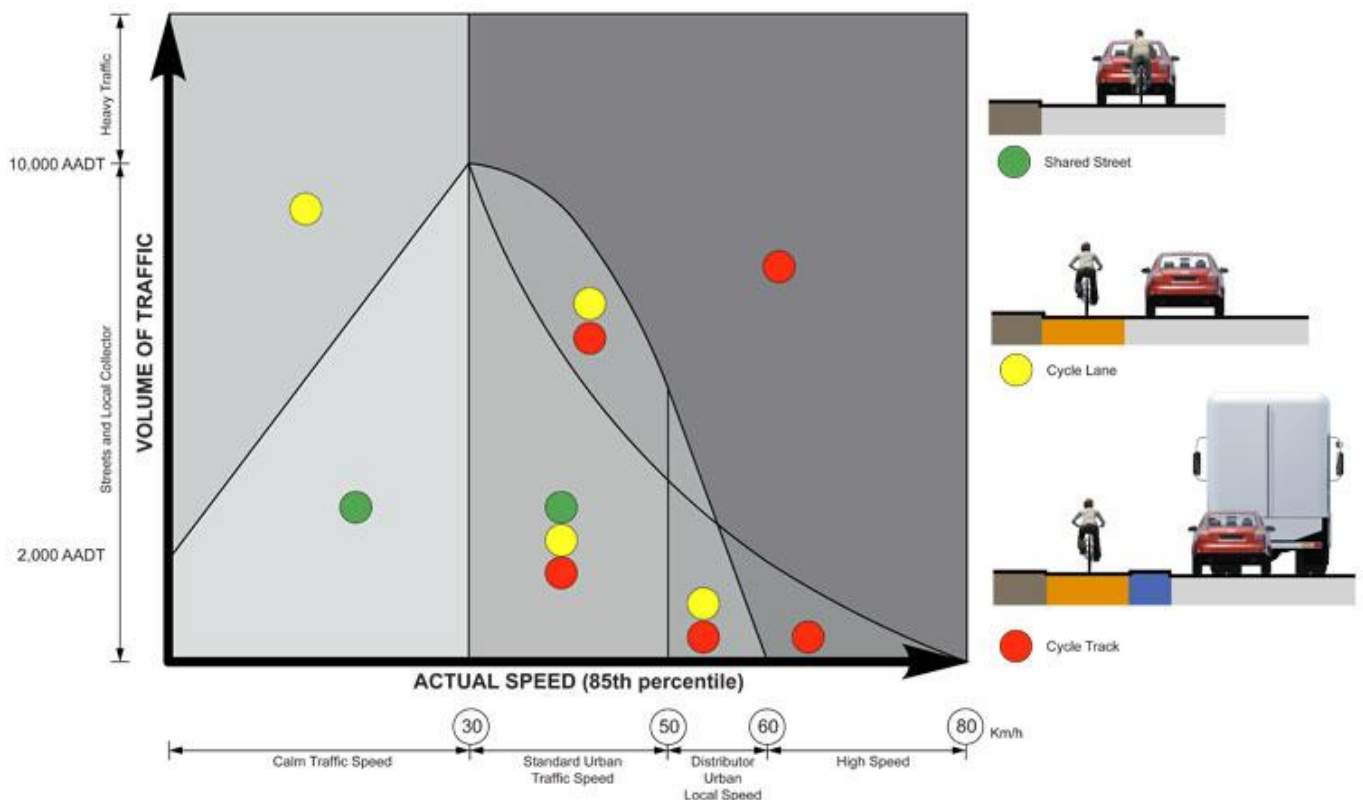


Figure 3.1 Cycle Infrastructure Selection Graph (National Cycle Manual)

The Annual Average Daily Traffic (AADT) on the Rock Road is over 20,000 vehicles per day and 85th percentile speed of vehicles is over 50kph. Using the above graph this would indicate that cycle track facility is the most appropriate facility. This is consistent with the Frascati Road/Temple Hill Road Improvement Scheme, indicated here, which is currently under construction (Spring 2015), and includes segregated cycle tracks over most of its length.



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Using the National Cycle Manual, the level of service achievable is set out based on five criteria, including number of adjacent cyclists, number of conflicts, pavement condition etc. Details are set out in Table 3.1 below.

Table 3.1 Cycle Quality of Service (National Cycle Manual)

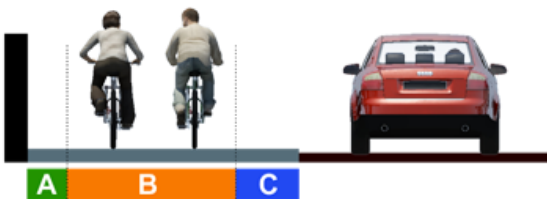
Quality of Service	Pavement condition (PCI range)	Number of adjacent cyclists	Number of conflicts per 100m of route	Journey time delay (% of total travel time)	HGV influence (% of total traffic volume)
Level A+	86 – 100	2 + 1	0 – 1	0 – 5%	0-1%
Level A	66 – 85	1 + 1	0 – 1	6– 10%	0-1%
Level B	51 – 65	1 + 1	1 – 3	11 – 25%	2 – 5%
Level C	41 – 50	1 + 0	4 – 10	26 – 50%	6 – 10%
Level D	20 – 40	1 + 0	>10	>50%	>10%

Currently the route is considered to have a Level of Service (LoS) of C, with some short sections rated D. The general requirement for the proposed route is a facility that offers users a LoS A.

3.2 Cycle Track Width

The National Cycle Manual provides guidance on the width required for cycle tracks, which will vary according to conditions and quality of service to be provided. This gives a range of basic widths as follows, excluding necessary edge strips as appropriate to the location:

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A Inside Edge	B Cycling Regime	C Outside Edge	D Additional Features
Kerb  0.25m	Single File  0.75m	30kph, 3.0m wide lane  0.50m	Uphill 0.25m Sharp bends 0.25m
Channel Gully  0.25m	Single File + Overtaking, Partially using next lane  1.25m	50kph, 3.0m wide lane  0.75m	Cyclist stacking, Stopping and starting 0.50m
Wall, Fence or Crash Barrier  0.65m	Basic Two-Way  1.75m	Raised kerb, dropped Kerb or physical barrier  0.50m	Around primary schools, Interchanges, or for larger tourist bikes 0.25m
Poles or Bollards  0.50m	Single File + Overtaking, Partially using next lane  2.00m	Kerb to vegetation etc. (ie. cycleway)  0.25m	Taxi ranks, loading, line of parked cars 1.00m (min 0.8m)
	2 Abreast + overtaking (tracks and cycleways)  2.50m		Turning pocket cyclists 0.50m

Figure 3.2 Width Calculator (National Cycle Manual)

The Frascati Road Improvement Scheme, currently under construction, offers cyclists a facility that is 2m wide. This allows for single file cycling and safe overtaking. For this project the following design widths will be used:

- Desirable width: 2.25m (clear effective width of 2.0m cycle lane) - segregated
- Desirable width: 2.0m – on-road
- Absolute minimum cycle lane width: 1.5m (inside 3.0m bus lane*).

*** Note that the Rock Road Bus Lanes are relatively lightly used which makes this narrower cycle lane width acceptable.**

Figure 3.3 indicates a typical segregated cycle facility that is located downstream of this project, on Frascati Road. Figure 3.4 is also from Frascati Road and is of a 2.0m wide cycle lane passing a junction, where segregation is not appropriate. The scheme on the Rock Road should be consistent with this downstream project.

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Figure 3.3 Frascati Road/Temple Hill Road Improvement Scheme: Northbound 2.0m Segregated Cycle Lane.

Capabilities on project:
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Figure 3.4 Frascati Road/Temple Hill Road Improvement Scheme:
Southbound 2.0m Cycle Lane after Rock Hill Junction.

3.3 Footway Width

The *Design Manual for Urban Roads and Streets (DMURS)* outlines appropriate footpath widths for various conditions. These range from a minimum of 1.8m to a desirable width of 4.0m for busy locations to provide a comfortable facility. Particular attention should be paid to areas of potential conflict with other road users, such as bus stops and around schools. For this project the main pedestrian conflict occurs around the Booterstown junction where a school children walk from the station to various schools leading to high flows at the start and end of the school day.

Therefore for this project the provision of a 2.0m width footpath over the entire length will be adequate, with some localised widening around the Booterstown Junction.

Capabilities on project:
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4 Existing Conditions

4.1 Introduction

The Study Area is located along the Merrion Road/Rock Road (R118), extending from the junction of Mount Merrion Avenue (N31) to Ailesbury Road (R824). The route is a main radial route into the city from the southern suburbs, such as Dun Laoghaire, Dalkey and Killiney. Land use along the route is mainly residential or community related (schools and hospitals) on the western side and park lands or protected ecological areas on the east. The route is located in the administrative areas of both Dublin City Council (DCC) and Dun Laoghaire Rathdown County Council (DLRCC), with the county boundary located at Trimleston Road (approx.).

It extends over a distance of approximately 3km and passes through nine signalised junctions as well as two signalised pedestrian crossings. The road generally follows the coastline from the junction of Strand Road to Mount Merrion Avenue junction. In the main, the carriageway is four lanes wide, accommodating a general traffic lane and a bus lane in each direction; however it does widen at junctions to accommodate turning lanes, while a short section of the route is five lanes wide. The road was upgraded to include bus and cycle lanes in each direction in 2006 as part of works undertaken by the Quality Bus Network Project Office in association with DLRCC and DCC. The section at Elm Park Business Campus was upgraded at a later date; however it does not include bus or cycle facilities in the inbound direction.

Footpaths are provided on both sides of the road over the entire length of the route, with pedestrian crossing facilities incorporated at the signalised junctions, on at least one of the main arms of each junction. There are two additional signalised crossings along the route. Discontinuous cycle facilities are provided along the route, with some cycle lanes provided, and more areas with cyclists accommodated within the bus lanes. There are a number of bus routes travelling along the corridor, including the Dublin Bus No. 4 and No. 7 routes as well as two Aircoach routes.



Figure 4.1 Location of Study Area (Source: Openstreet map)

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Transportation

4.2 Pedestrian Environment

The pedestrian environment varies along the route with footpaths provided along both sides of the road throughout the study area. Pedestrian movements are not concentrated, with limited numbers of pedestrians walking the entire route on a daily basis apart from at the Booterstown junction where there can be a significant concentration of pedestrians at the start and end of the school day walking to the nearby train station and bus stops. The quality and width of the footpaths provided vary along the route. Trees, signage, lighting columns and street furniture reduce footpath widths in many places.

Tactile paving is provided at all signalised crossings but is generally not provided at priority junctions, with it recorded at just three of the 14 junctions. Three priority junctions have raised entry treatments also provided (St. Helens Road and Herbert Avenue).



Figure 4.2 Footpath with trees and bad state of repair

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Transportation



Figure 4.3 Raised Crossing on Herbert Avenue, bad state of repair, no tactile paving.

Capabilities on project:
Transportation



Figure 4.4 Raised crossing on St. Helens Avenue with tactile.

Pedestrian crossing facilities have been included at all signalised junctions, however generally only provided on either the northern or southern side of the junction on the main line. Details of pedestrian accidents are included in Section 4.6, which show that a number of pedestrian accidents occurred away from junctions, where pedestrians have crossed without facilities.

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Table 4.1 List of Pedestrian Crossing Facilities within the Study Area

Location	Provision
Signalised Jct Ailesbury Road	All 4 arms
North of Nutley Lane	Stand alone pedestrian crossing
Signalised Jct Nutley Lane	Merrion Road (southern arm) Nutley Lane
Signalised Jct St. Vincent's Hospital	Merrion Road (northern arm) Hospital Access
Herbert Avenue	Stand alone pedestrian crossing
Signalised Jct of Strand Road	Merrion Road (northern arm)
Signalised Jct of Elmswood Business Campus	Merrion Road (southern arm) Business Campus Access
Signalised Jct of Trimleston Avenue	Merrion Road (southern arm) Trimleston Avenue
Signalised Jct of Booterstown Avenue	Merrion Road (southern arm) Booterstown Avenue
Signalised Jct of Blackrock Clinic	Rock Road (northern arm)
Signalised Jct of Mount Merrion Avenue	Rock Road (southern arm) Mount Merrion Avenue

There are a number of locations where pedestrian facilities are lacking, including the junction of Merrion Road/Strand Road, on the Strand Road arm. In addition, a distance of approximately 700m is recorded between crossings at Booterstown Junction and Blackrock Clinic. Within this area there are a number of bus stops located on either side of the road, Blackrock College, as well as access to a park, the seafront walk/cycle facility, residential and commercial properties.

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Transportation

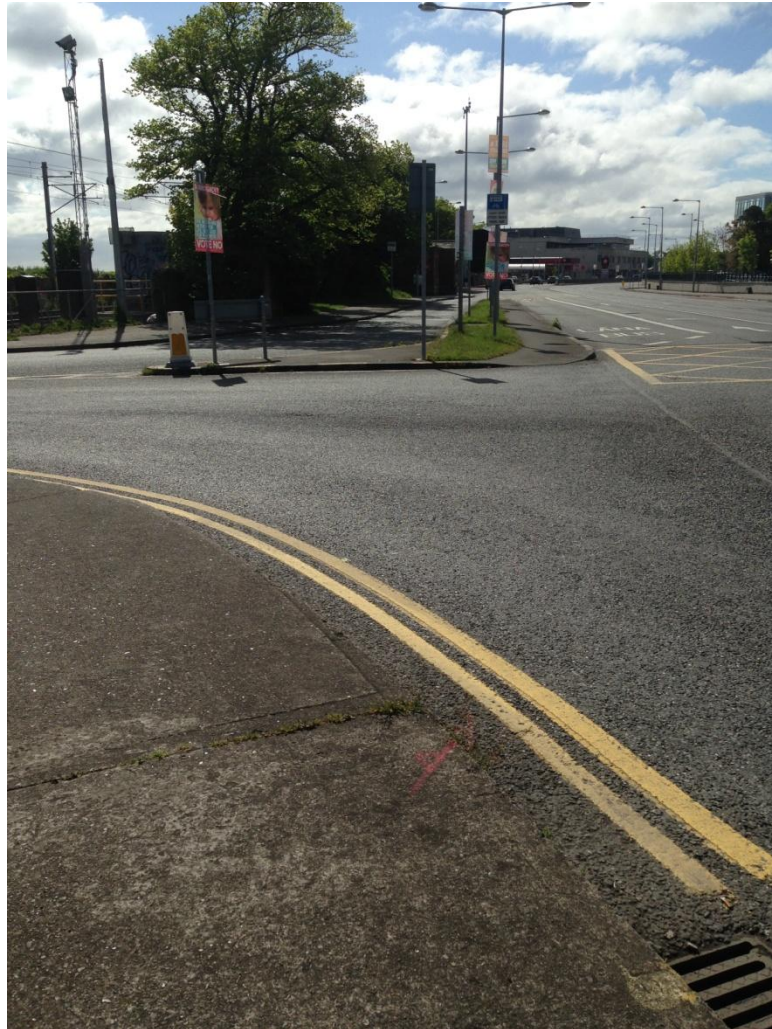


Figure 4.5 Merrion Gates Left Slip Lane, no pedestrian crossings

There are numerous attractions along the route, with origin-destination points including:

- St. Vincent's Hospital (with over 500 beds and over 1000 nursing staff numbers)
- Number of business parks/office blocks (Elm Park Business Campus being the largest)
- St. Marys Centre (nursing home and independent living quarters)
- Booterstown Dart Station (as well as Sydney Parade and Blackrock at the northern and southern extremes of the study area)
- Blackrock College (Over 1,000 day and boarding students)
- Blackrock Clinic (Over 300 Consultants working out of here)
- Blackrock Shopping Centre/Frascati Shopping Centre/Merrion Shopping Centre

There is also an active street edge along sections of the route, such as close to Blackrock Clinic as well as close to St. Vincent's Hospital, with own door residential properties located at Blackrock College/Blackrock Clinic and Merrion Gates.

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In summary, accessibility along the route is good, with footpaths provided throughout and crossings provided at all of the signalised junctions. While there are some issues with a lack of tactile paving, and footpath restrictions due to street clutter, the provision gives a continuous, safe and relatively attractive offering to pedestrians in the area. There are numerous attractors along the route, which generate large numbers of pedestrians on the network daily. With the varied nature of the attractions, the demand is spread throughout the day.

4.3 Cycling Environment

The cycling facilities were assessed by site visits and by reference to the GDA Cycle Network Plan. The facilities provided along Merrion Road/Rock Road vary along the route, in nature, quality, and width. In general there are either advisory cycle lanes or bus lanes that accommodate cyclists along the entire route. There are no facilities provided from the junction of Trimleston Avenue and Elm Park Business Campus for northbound cyclists.

The facilities indicated in the GDA Cycle Network Plan were found to be accurate on site, as shown in Figure 4.6, with the orange suggesting cycle lane, even within bus lane and the red being cycle lane.

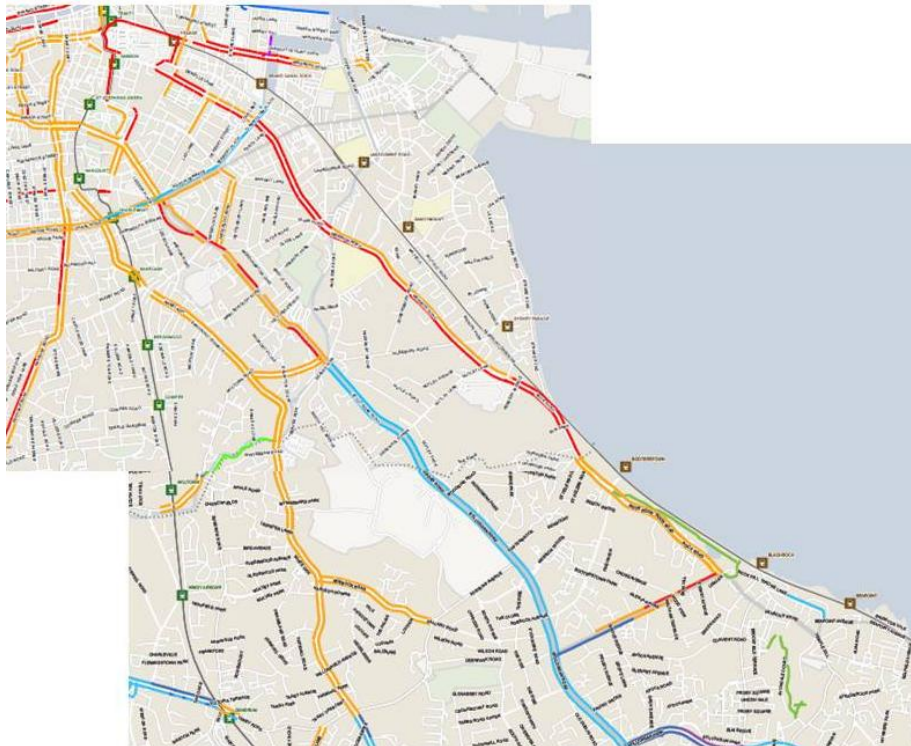


Figure 4.6 Existing Facilities on Merrion Road/Rock Road (GDA Network Plan)

There are five elements that contribute to the overall Quality of Service rating of a route, details of which are shown in Table 4.2 below. The Quality of Service rating for the existing cycle facilities along Merrion Road/Rock Road comprises mostly of level D facilities with short sections of level C facilities, as shown in Figure 4.7.

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Table 4.2 Quality of Service Criteria (National Cycle Manual)

Quality of Service	Pavement condition (PCI range)	Number of adjacent cyclists	Number of conflicts per 100m of route	Journey time delay (% of total travel time)	HGV influence (% of total traffic volume)
Level A+	86 – 100	2 + 1	0 – 1	0 – 5%	0-1%
Level A	66 – 85	1 + 1	0 – 1	6 – 10%	0-1%
Level B	51 – 65	1 + 1	1 – 3	11 – 25%	2 – 5%
Level C	41 – 50	1 + 0	4 – 10	26 – 50%	6 – 10%
Level D	20 – 40	1 + 0	>10	>50%	>10%

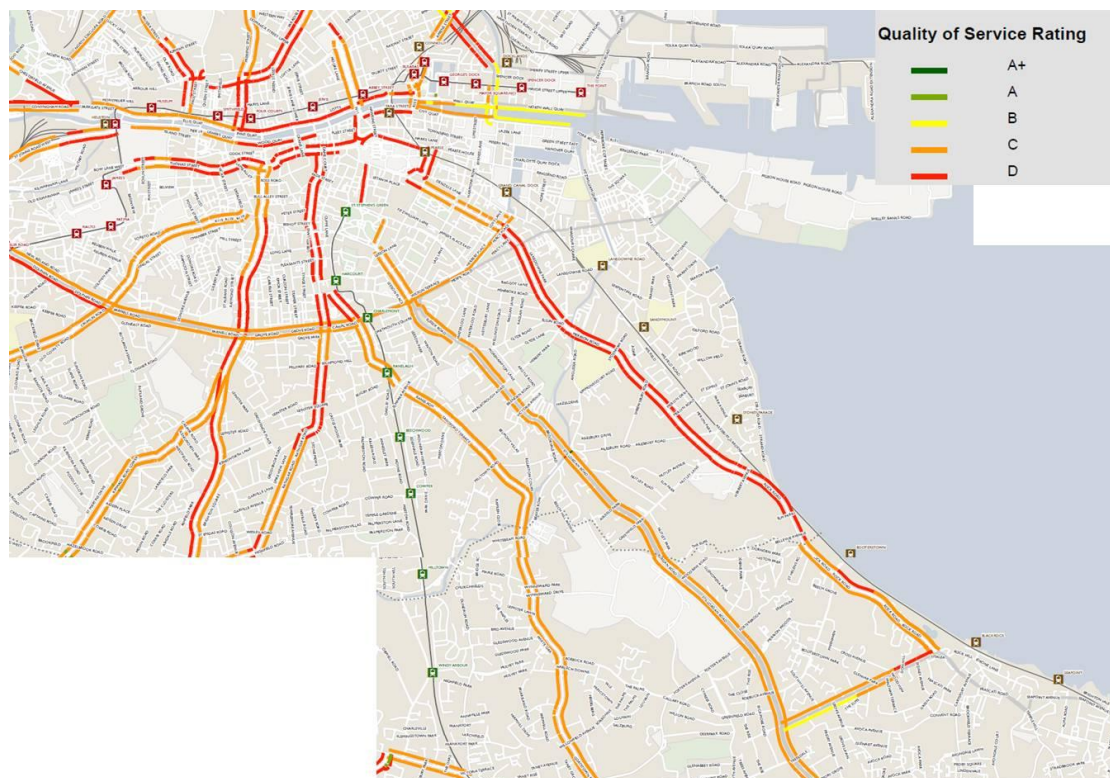


Figure 4.7 Existing Quality of Service Rating

The GDA cycle network plan records low traffic comfort levels, generally recorded as D throughout, indicating “heavy competing levels with a general feeling of discomfort”. The width of the facilities provided was generally recorded as less than 1.5m, given a Level D quality of service. There are a high number of conflicts recorded along the route from Ailesbury Road to Elm Park Business Campus, reducing as the route moves towards Mount Merrion Avenue.

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Figure 1.8 On-street parking along Merrion Road, approaching Merrion Gates southbound.

Capabilities on project:
Transportation



Figure 4.9 Bus Lane with cycle facilities included outside of Blackrock College.

The pavement condition is generally good, with A recorded throughout, with the exception of the southbound carriageway from Herbert Avenue to Trimleston Avenue recorded as a level C and a section south of Booterstown Avenue recorded as a level D, as shown in Figure 4.10. However, over the past winter the pavement condition (in the bus and cycle lane) has deteriorated significantly in both the inbound and outbound direction between the Blackrock Clinic and the Car Showrooms and is in need of urgent rehabilitation.

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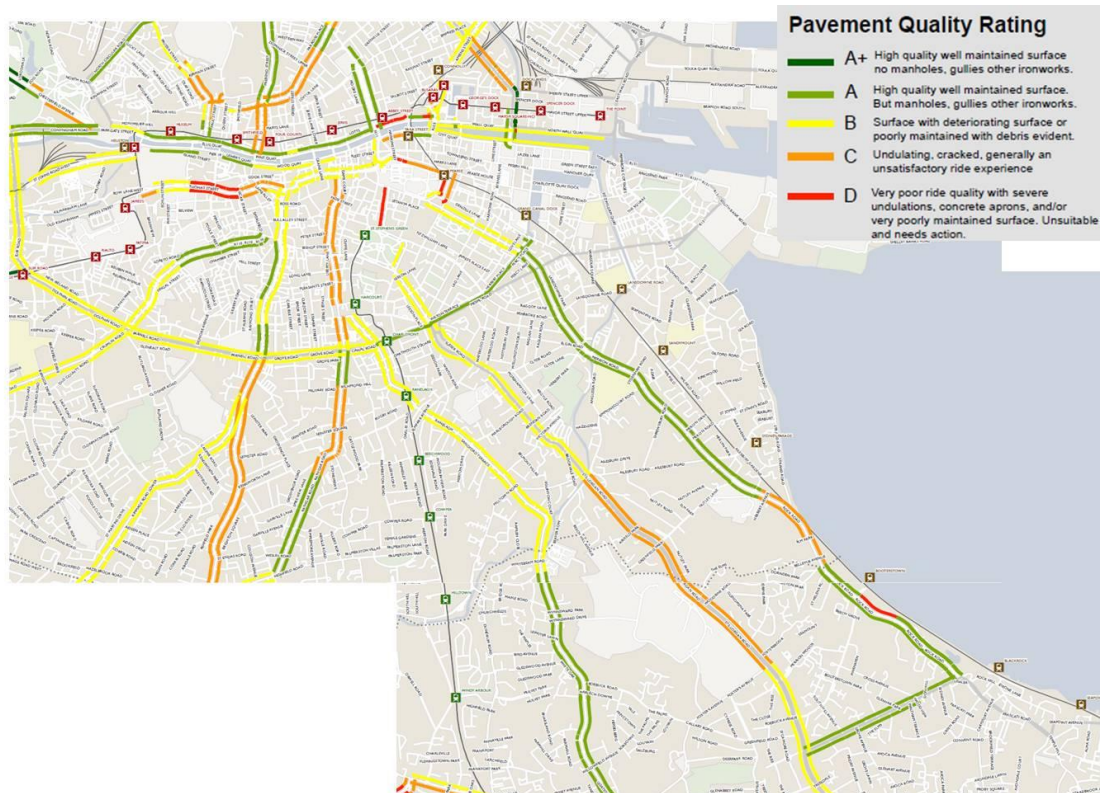


Figure 4.10 Pavement Quality Rating (GDA Cycle Network Plan)

For outbound cycle traffic, particularly in the evening peak hours, the advisory cycle facility from Ailesbury Road to Nutley Lane is infringed upon quiet often, restricting the comfort levels for cyclists, and often stopping or slowing cyclists considerably. At the junction of Merrion Road/Strand Road, where a left slip is provided for motorists joining Merrion Road from Strand Road cyclist safety is questionable. Speeds can be high at this location, and due to the angle of the merge, some motorists fail to adequately observe cyclists travelling southbound along Merrion Road.

It was noted on site that a sign has been erected to warn cyclists of “exiting vehicles” from a car park opposite the Tara Towers Hotel, suggesting there may have been issues at this location recently. The quality of the surface from Strand Road to Trimleston Avenue is less than ideal for cyclists, with many cycling in the centre of the bus lane to avoid the gully pots, ironworks and potholes. Similarly from Booterstown Avenue to Blackrock Clinic, the surface quality is poor for cyclists.

For inbound cycle traffic, the quality of surface from Mount Merrion Avenue to Booterstown is acceptable (but deteriorating), however with a large amount of ironworks located on the inside lane, cyclists often take the middle of the bus lane, or outside edge of the cycle lane. There is less ironworks in the section of carriageway between Booterstown and Nutley Lane; hence cyclists tend to cycle within the cycle lane areas. On the approach to the Nutley Lane junction, cycle facilities end at a location where left turning vehicular traffic is merging into a left turn lane. Cyclists wishing to travel straight ahead can come into conflict with traffic at this location. An accident, which resulted in a cyclists being seriously injured, occurred in this area in 2011.

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Cyclist volumes are relatively high during the peak periods along the route. Data collected by Dun Laoghaire Rathdown County Council shows average cyclists number growing from 2013 to 2014, with an average of 2000 cyclist on Rock Road on a typical weekday. There was a peak of 4500 cyclists in June 2014. The results show a 27% increase for the period January – June 2013 to the same period in 2014, while a 9% increase is shown for the summer 2013 to 2014 (May-August).

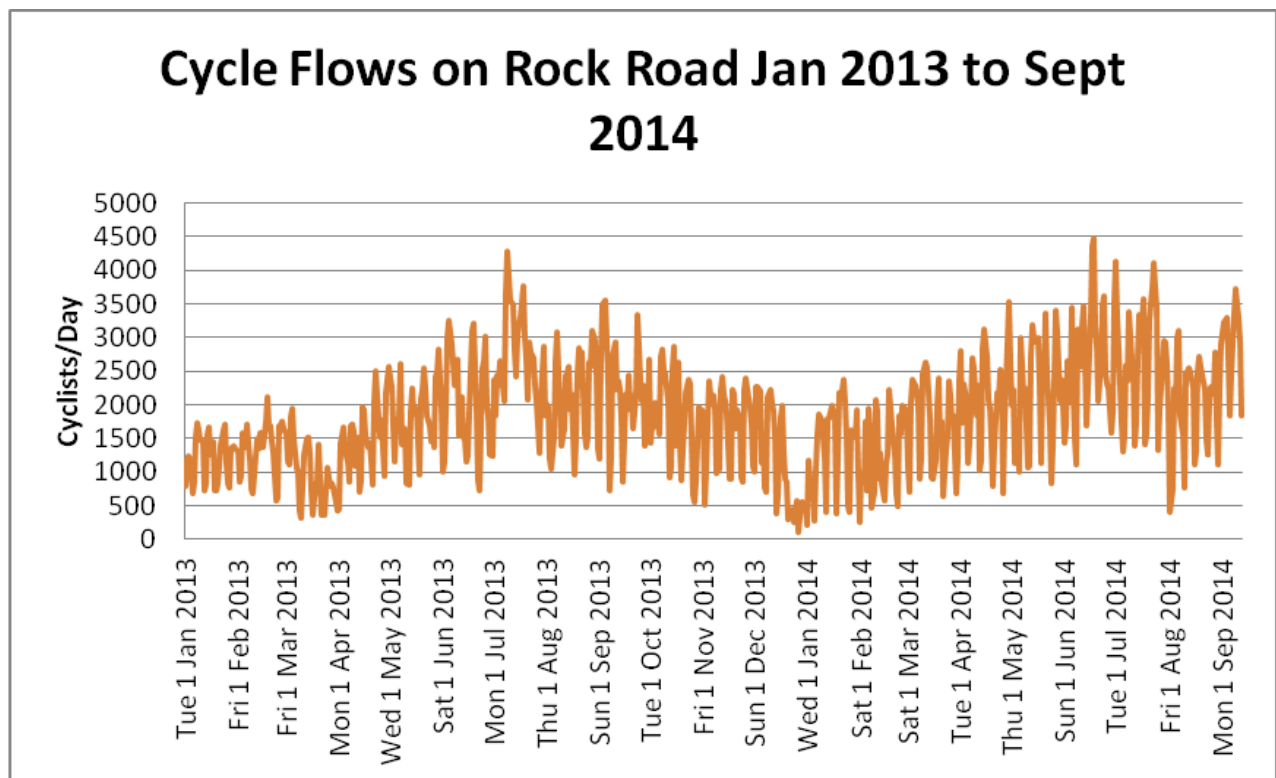


Figure 4.11 Total Daily Cycle Flow at Rock Road Cycle Counter Jan 2013 to September 2014

Figure 4.12 below indicates data gathered through the Strava App that records a cyclist's position and speed allowing a speed profile to be generated for the route. This was used by a typical commuter cyclist to gain and understanding of the speed and delays on the route. This indicated that the gradient is flat over much of the route with a rise of less than 10m as cyclists enter Blackrock from the north. Cyclist's speeds are generally in the 20 to 25kph range, although speeds of over 30kph can be achieved by sports cyclist. Of particular note is cyclists can make significant progress over this section as there are few junctions to be stopped. Similar results were recorded for both the AM and PM Peak's.

Figure 4.12 Cycle Speed and Gradient Data for Rock Road/ Merrion Road
(Source: Strava and Google Earth)

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4.4 Public Transport

There are three Dublin Bus services serving the route corridor, No. 4, No.7 and No.8. In addition there are two Aircoach services which travel along Rock Road/Merrion Road, the Greystones service as well as the Killiney/Dalkey service.

The No. 4 bus route travels between Harristown and Monkstown at a frequency of four per hour. The No. 7 bus route travels between Cherrywood and Mountjoy Square, this also runs every 15 minutes, equating to four buses an hour both inbound and outbound. The No. 8 bus has a limited service, with just one an hour in the AM peak inbound, reducing to no services beyond 18:40. Similarly there is just one outbound service in the AM peak hour and one in the PM peak.

The Aircoach services from Greystones and Killiney/Dalkey run one service per hour in each direction.

Journey time information was obtained from surveys carried out in November 2014, by Dublin Bus. Taking bus route No.4 as an example, it shows that average journey times to travel the 3kms between St. Vincent's Hospital and the Frascati Centre is approximately 11 minutes inbound in the AM peak period (data from a typical day). The reverse journey in the PM peak period was recorded as 10 minutes 25 seconds. Details are shown in Figures 4.14 and 4.15 below. This equates to an average speed of approximately 15kph inbound during the AM Peak and 20kph outbound during the PM Peak, which are a little below that desirable for a Bus Priority Route of this nature, particularly during the AM Peak. In general the buses are not significantly delayed over the length of the study area.



Figure 4.13 Bus Routes
in the Study Area

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Transportation

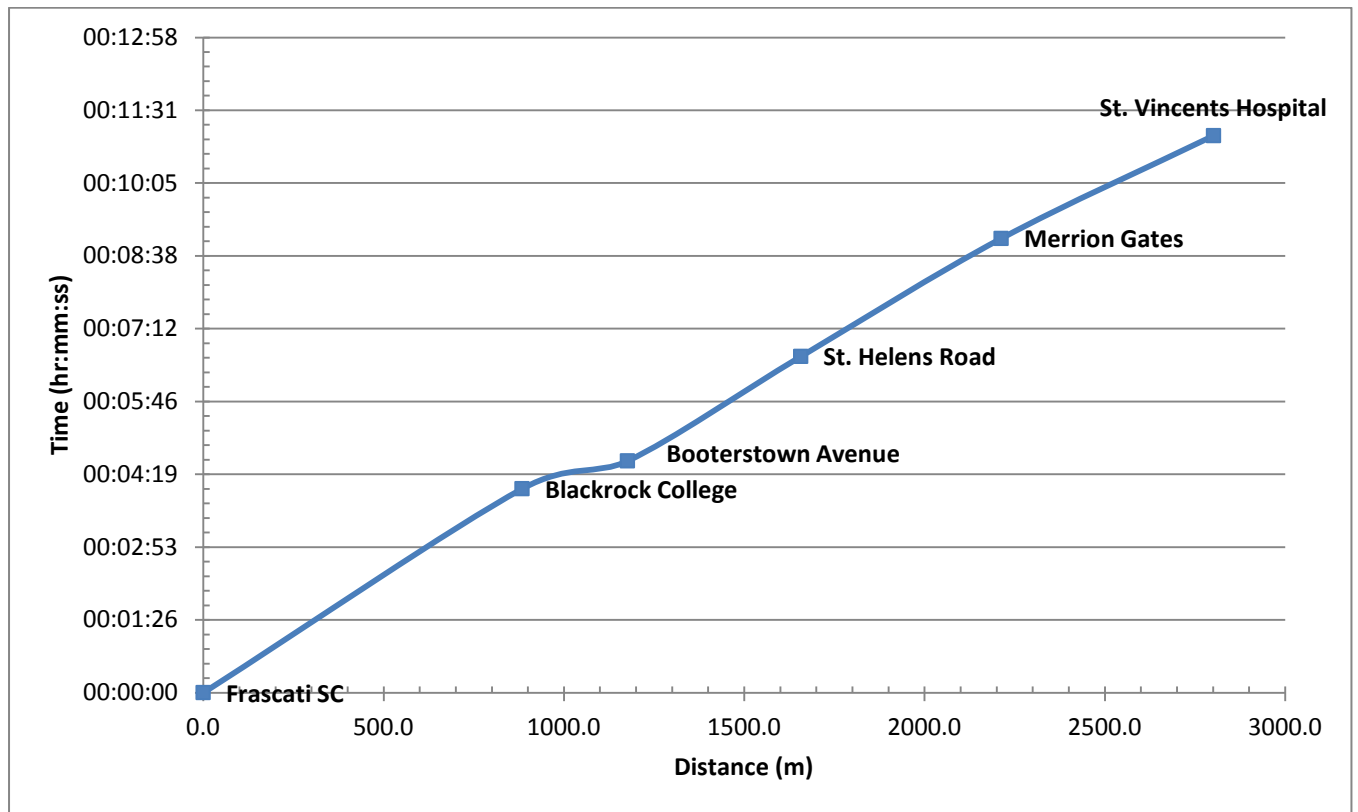


Figure 4.14 Dublin Bus No. 4 Inbound Journey Time (AM Peak Period)

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Transportation

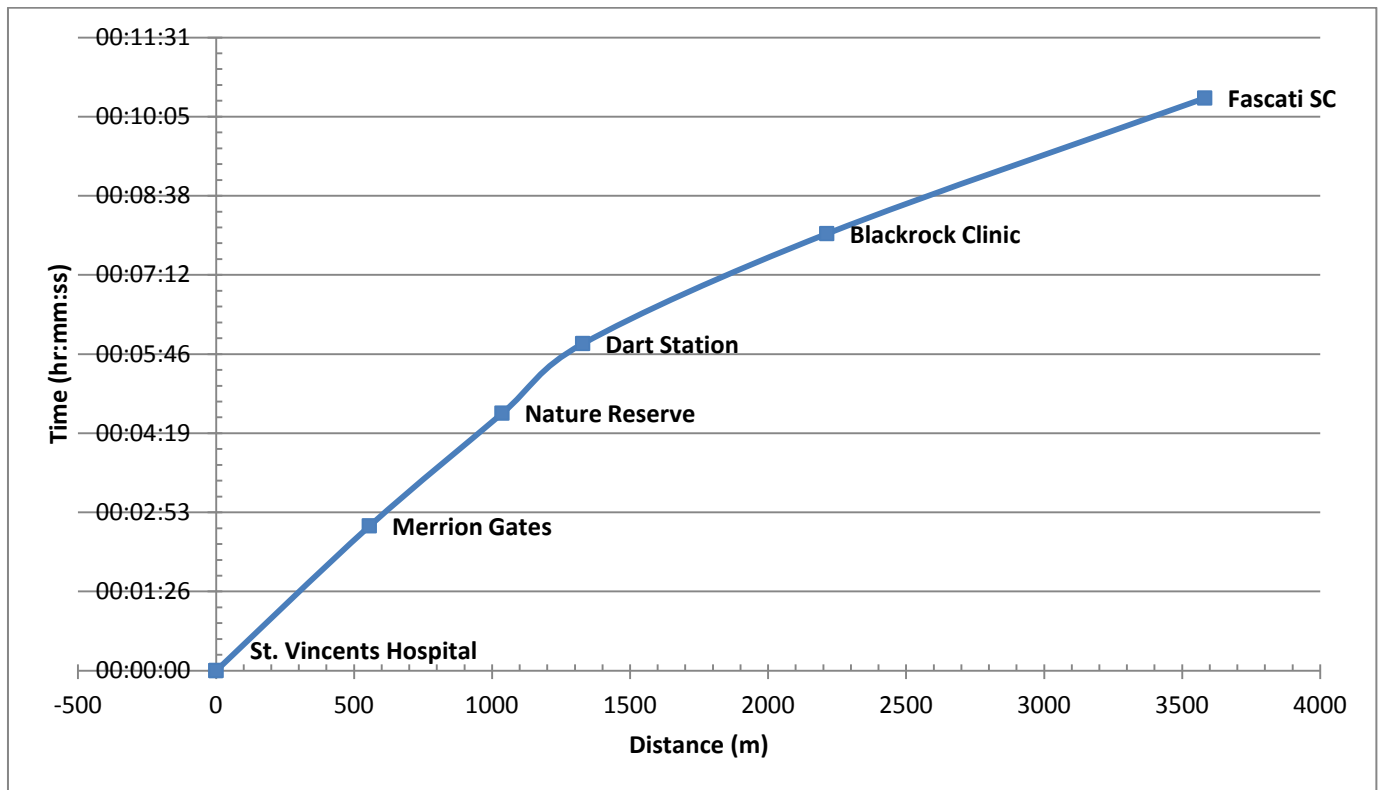


Figure 4.15 Dublin Bus No. 4 Outbound Journey Time (PM Peak Period)

There are ten sets of bus stops located along the corridor, with various facilities provided at each stop.

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Table 4.3 Bus Stop Locations and Facilities

Bus Stop	Direction	Facility	Additional
<i>Merrion Road - Merrion Shopping Centre/Ailesbury Road</i>	Inbound	Bus shelters with seating	No RTPI
	Outbound		
<i>Merrion Road – St. Vincent’s Hospital</i>	Inbound	Bus shelter with seating (Pull in bay)	RTPI
	Outbound		
<i>Merrion Road – Estate Avenue/Herbert Avenue</i>	Inbound	Bus shelter with seating	No RTPI
	Outbound	Pole	
<i>Merrion Road – Merrion Gates</i>	Inbound	Bus shelter with seating	No RTPI
	Outbound	Bus shelter	
<i>Rock Road – Bellevue Avenue</i>	Inbound	Bus shelters	RTPI Inbound
	Outbound		
<i>Rock Road – St. Helens Avenue/Nature Reserve</i>	Inbound	Bus shelter with seating (Pull in bays)	No RTPI
	Outbound		
<i>Rock Road – Grotto Avenue</i>	Inbound	Pole	No RTPI
<i>Rock Road – Dart Station/Boooterstown Avenue</i>	Inbound	Bus shelter with seating (pull in bay outbound)	RTPI Outbound
	Outbound		
<i>Rock Road – Blackrock College</i>	Inbound	Bus shelter (with seating outbound)	No RTPI
	Outbound		
<i>Rock Road – Blackrock Clinic</i>	Inbound	Pole	No RTPI
	Outbound	Bus shelter with seating	
<i>Rock Road – Mount Merrion Avenue</i>	Inbound	Bus shelter with seating	No RTPI

It was found that while Aircoach has its own pole locations, the stops are generally located in the same area as the Dublin Bus stops. This leads to some street clutter around bus stops.

Pedestrian crossing facilities are generally located close to the bus stops listed above, with the exception of the bus stops located at Blackrock College entrance (Circus Field).

4.5 Vehicular Traffic

Merrion Road/Rock Road is a busy radial route into the city from the southern suburbs running in a northwest-southeast direction. The route plays a number of roles in terms of the link and place function. The ‘Link and Place’ theory highlights the varying needs of ‘Links’ or transport corridors and ‘Places’. The theory implies that, for example, strategic routes need to provide high speed and reliable journey time between ‘Places’. Merrion Road/Rock Road has an important transport function; however it also has an important place function,

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particularly at the Merrion Shopping Centre/St. Vincent's Hospital area as well as Booterstown Avenue junction and Blackrock Clinic/College. The dual function can lead to a conflict between various road users.

The speed limit along the route is 50kph, however due to congestion in the AM and PM periods, the average speed along the route is far below this. When conditions permit, outside of peak hours, site observations note that speeds increase substantially, particularly towards the southern end of the scheme. This could be due to the reduced number of access points to the south of the scheme, the wider carriageway and the physical separation between northbound and southbound carriageways provided in parts.

The route is often congested, with slow moving traffic in both the AM and PM peak periods. Journey time surveys were conducted over a two day period in January 2014. These surveys were carried out between Mount Merrion Avenue and Ailesbury Road. The average journey time for inbound vehicles is 8 minutes, with 15 minutes 22 seconds being the average outbound journey time. Details are shown in Figures 4.16 and 4.17 below. These figures indicate that traffic moves at a constant speed inbound during the morning peak, whereas during the evening peak traffic speeds are very low between Ailesbury and Trimleston Avenue due to congestion.

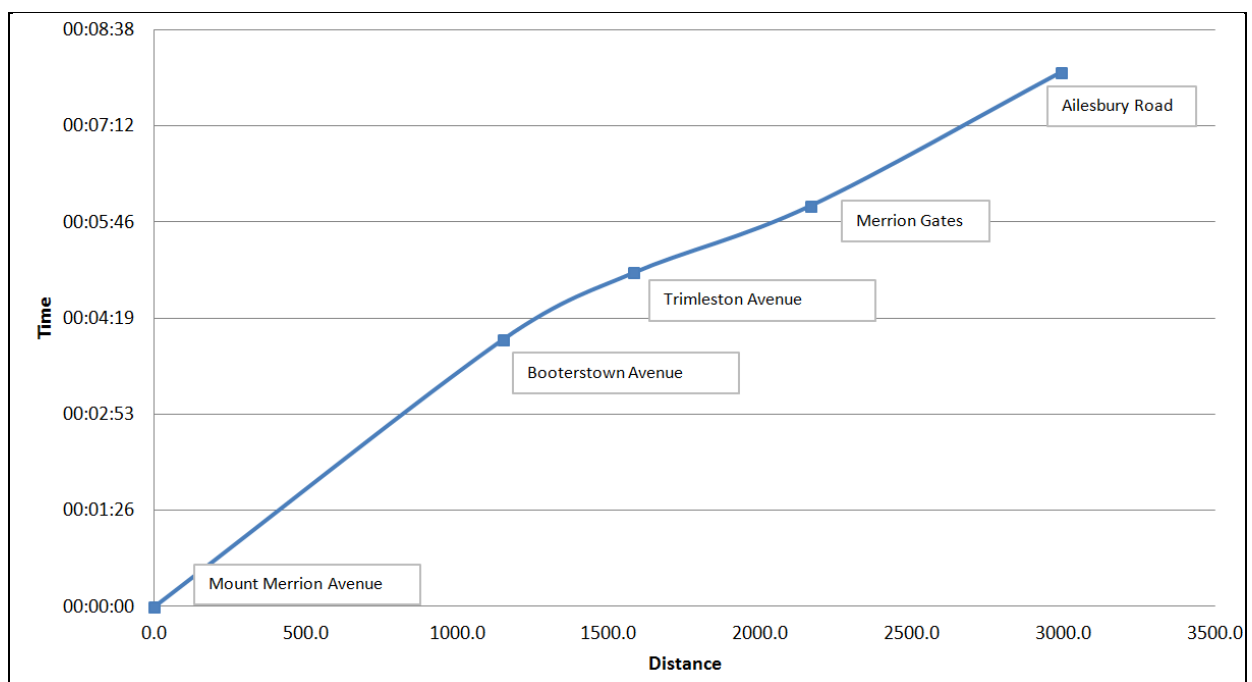


Figure 4.16 Car Journey Time Inbound (AM Peak)

Capabilities on project:
Transportation

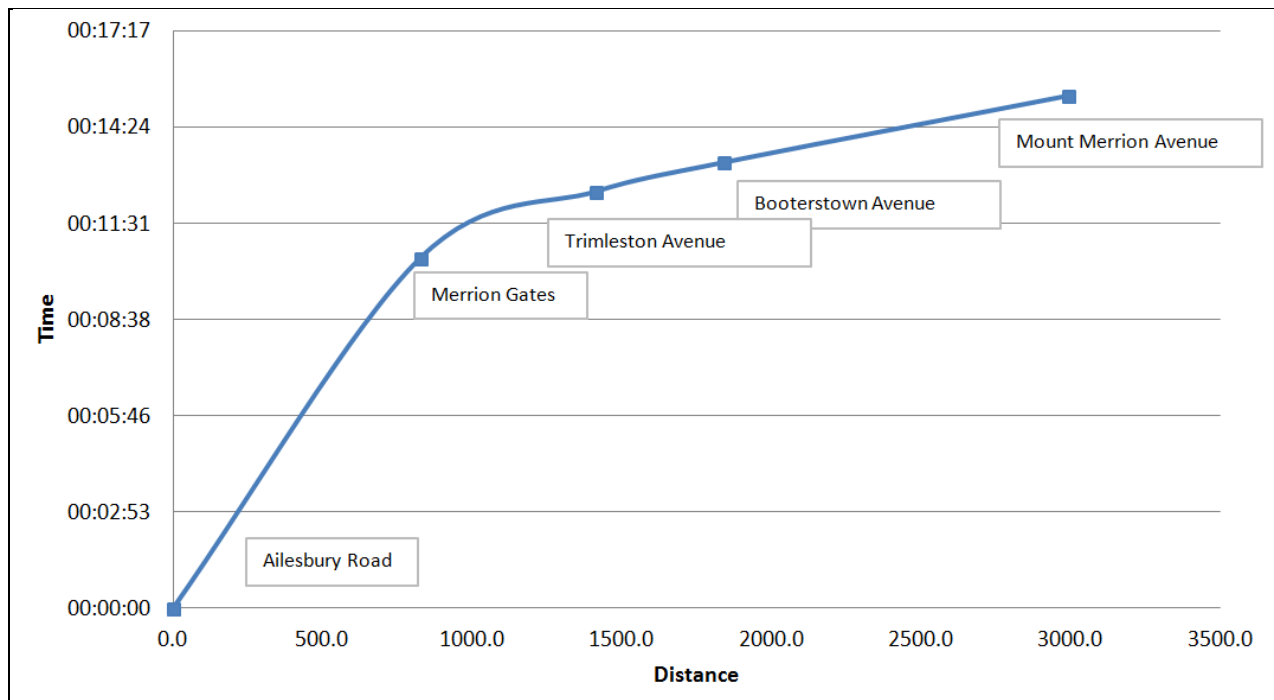


Figure 4.17 Car Journey Time Outbound (PM Peak)

The route shows evidence of tidal flows in the AM and PM peaks, with similar flows passing through the junctions in these peak hours. The table below indicates the AM and PM peak hour flows through the junctions along the route.

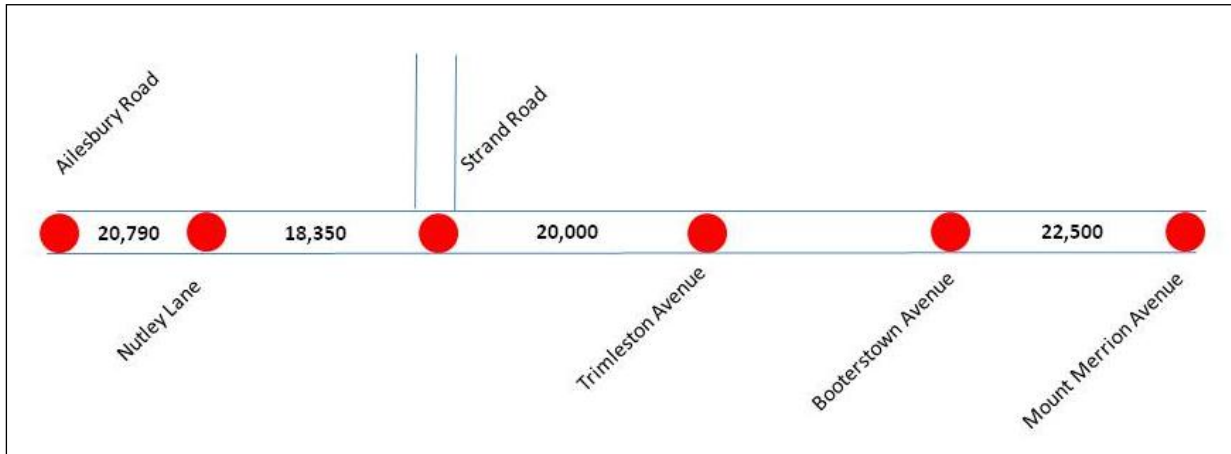
Table 4.4 AM and PM peak hour two-way flow

Junction	AM	PM
Ailesbury Road	1973	1677
Nutley Lane	1537	1330
Strand Road	1685	1826
Elmpark	2430	1907
Trimleston Avenue	2241	2140
Mount Merrion Avenue	1977	1978

From traffic data available the Annual Average Daily Traffic (AADT) for the route was estimated. The average AADT along the route is approximately 20,000 vehicles a day.

Capabilities on project:
Transportation

Figure 4.18 AADT along corridor (2014)



4.6 Collision Investigation

The Road Safety Authority (RSA) database of personal injury accidents was examined to establish the number of historic accidents which have occurred along the route in recent years. The RSA database contains accidents spanning from 2005-2012 and contains information regarding accident severity, number vehicles/pedestrians involved, vehicle classification and the time and date the accidents occurred.

The information gathered from the interrogation of the RSA database has been used to identify accident hotspots as well as common collision types within the study area, which may establish a problem in terms of road geometry, desire line needs, and/or issues when the risk of collision is heightened.

The information available on this database is the basic information regarding the accident. Addition data, such as Garda reports have not been made available to the design team. Material damage only accidents are not present in the RSA's database.

The accident database shows a total of 50 accidents occurred in the five year period of 2008-2012 from Ailesbury Road to Mount Merrion Avenue. Of these, there were no fatal accidents recorded within the study area. There were just two serious accidents with the remaining 48 accidents (96%) recorded as minor. There are a large number of rear end type accidents as well as angled type accidents. Other accidents have been recorded as "other" which does not specify the details of the accident.

Capabilities on project:
Transportation

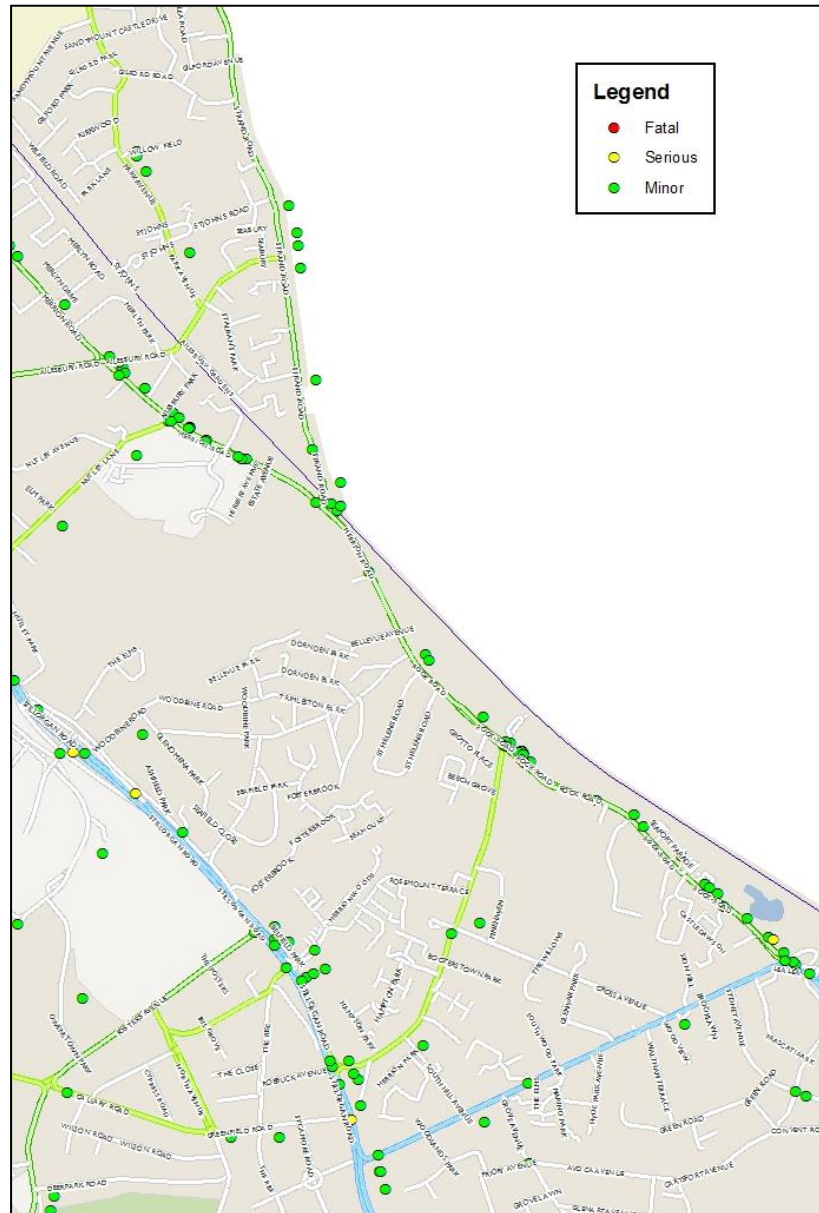


Figure 4.19 All Personal Injury Accidents (2008-2012 RSA Database)

Pedestrians were involved in eight accidents, all of which were recorded as minor. Two of these accidents were recorded close to the junction of Merrion Road/Nutley Lane. A pedestrian accident was also recorded at the Merrion Gates junction. Two of the accidents were recorded mid-link, suggesting pedestrians crossing the road without facilities, while the remaining accidents occurred at junction.

Capabilities on project:
Transportation

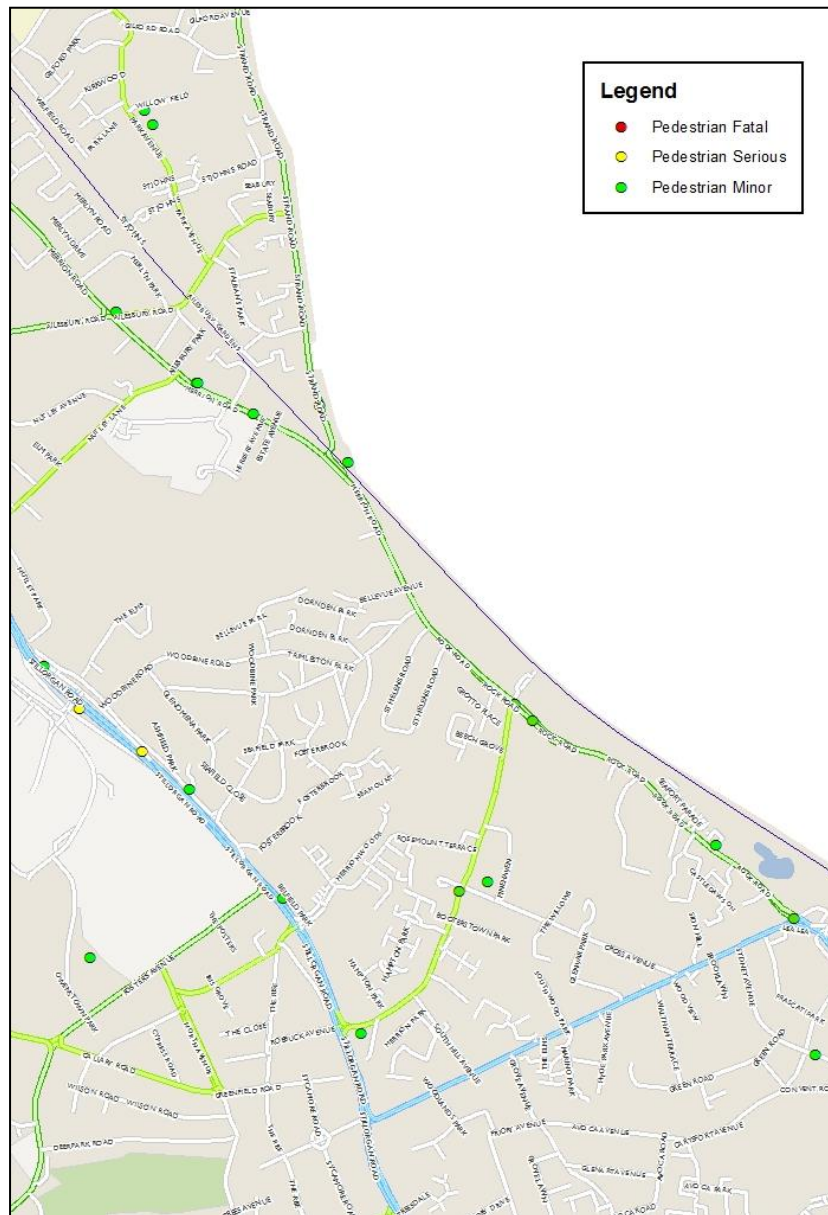


Figure 4.20 Pedestrian Accidents (2008-2012 RSA Database)

Cyclists were involved in four accidents, with three of these located close to the Merrion Road/Nutley Lane junction. One of these accidents resulted in serious injury to the cyclist.

Capabilities on project:
Transportation

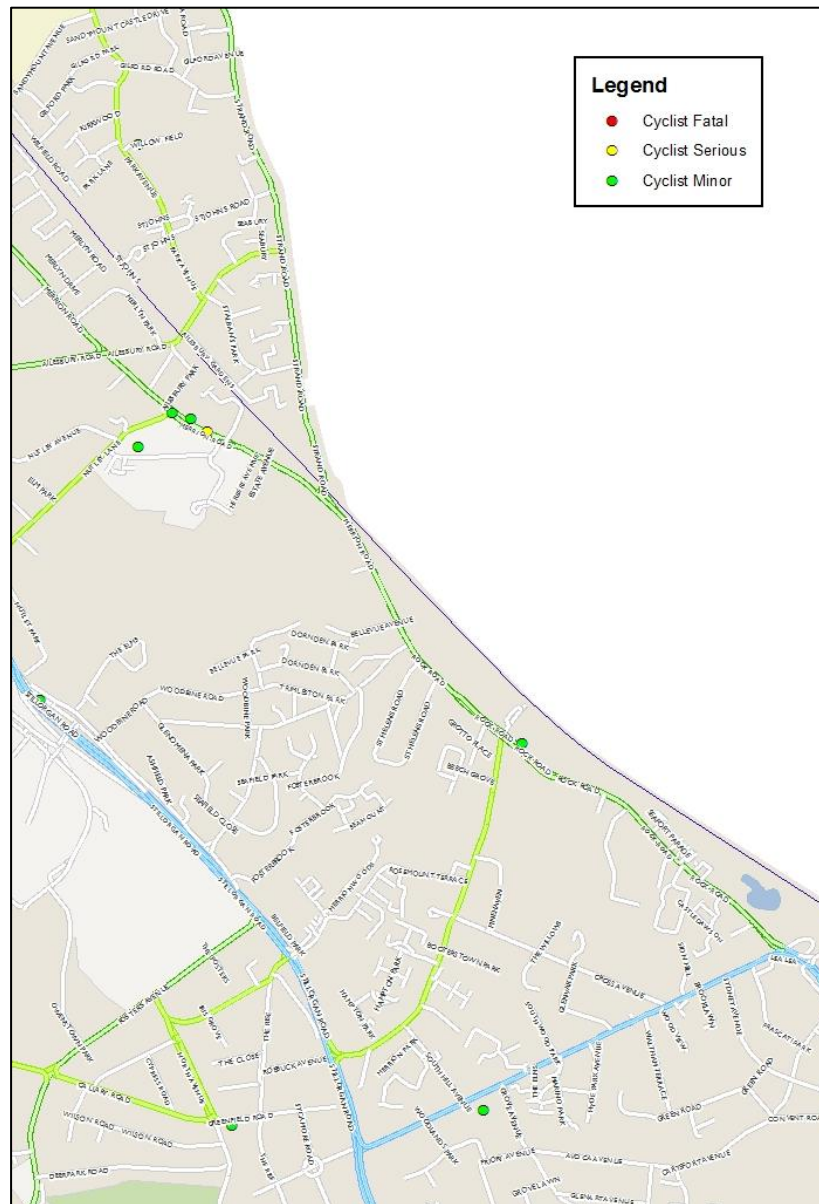


Figure 4.21 Cycle Accidents (2008-2012 RSA Database)

In summary, there are approximately 10 accidents a year along the 3km route. The number of vulnerable road users involved in accidents during this period represents 25% of all accidents. As noted above, the majority of accidents involving vulnerable road users were minor accidents, with just one serious accident recorded which involved a cyclist. As is common, the majority of accidents occur at signalised junctions, particularly the larger junctions of Mount Merrion Avenue, Booterstown Avenue, Nutley Lane and Strand Road, although the cluster of VRU accidents in the vicinity of St Vincent Hospital needs particular attention.

Capabilities on project:
Transportation

4.7 Open Space

The route is bounded at the northern end by build-up urban areas; however a significant section of the route, between Merrion Gates and Blackrock, is located within close proximity of the sea, bounded to the east by park lands and a nature reserve.

Blackrock Park is located at the southern extent of the scheme, and contains a playground, bandstand area, pond and an existing walking/cycling path. It links on the sea side to a Mortello Tower and Booterstown Park. Within, and immediately, to the north of the park there is an area of wet land, which has a Special Protection Area (SPA) designation, namely the South Dublin Bay and River Tolka Estuary SPA. The estuary and parts of the wetland are also identified as Proposed Natural Heritage Area (NHA). More recently in June 2015, the estuary was named a UNESCO Biosphere Reserve reflecting its significant environmental, economic, cultural and tourism importance.

The design process must take cognisance of these environmental designations and where possible disturbance of these areas should be minimised.

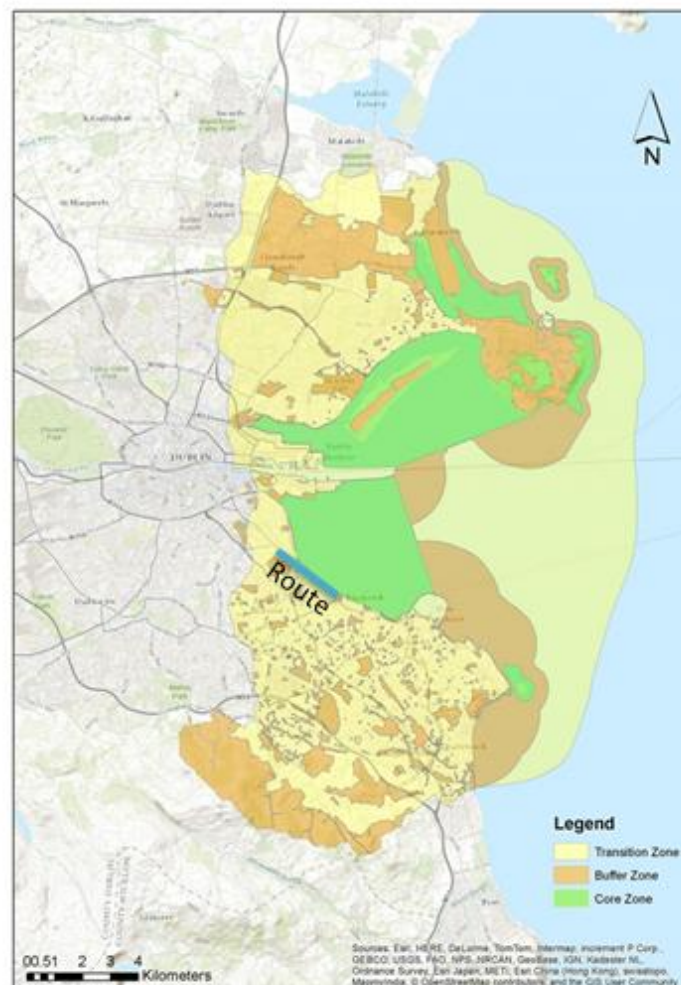


Figure 4.22 UNESCO Dublin Bay Biosphere Reserve Map (2015).

5 Design Development 1

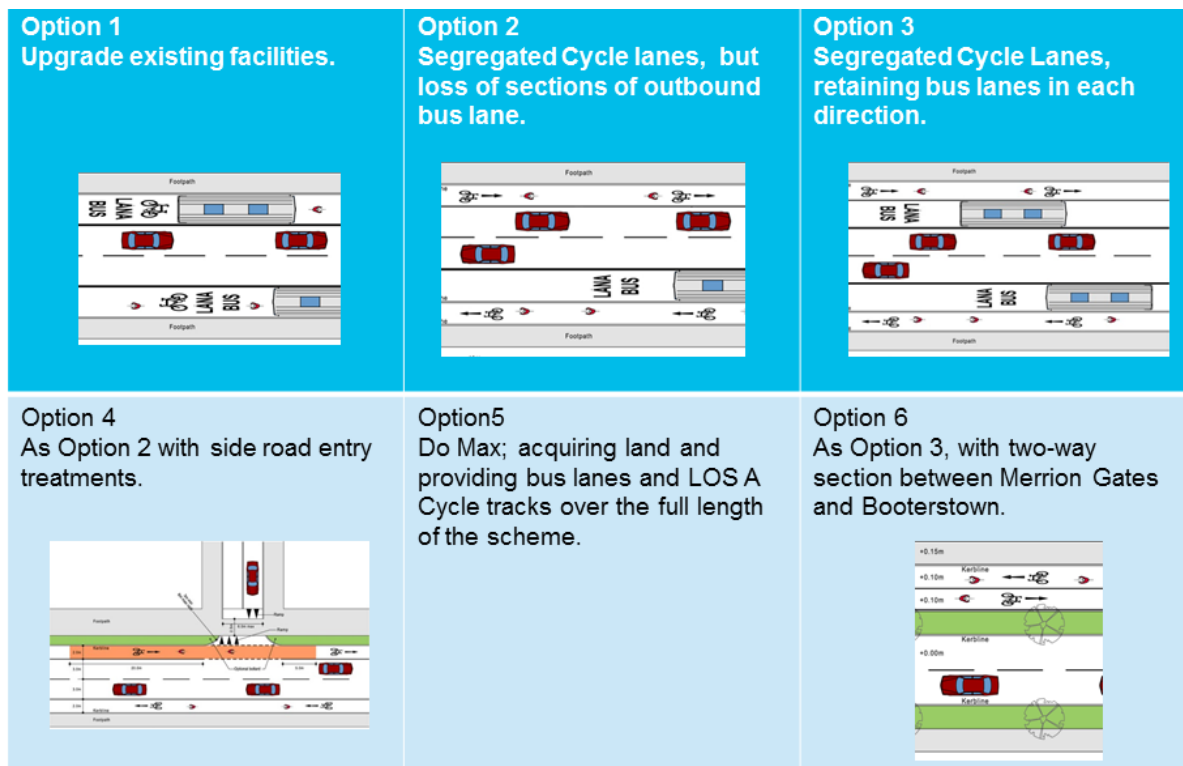
5.1 Introduction

A number of options have been considered, ranging from a Do Minimum scheme, a number of Do Something schemes, and Do Maximum schemes. As suggested by the names, the Do Minimum option largely maintains the existing kerb lines and upgrades cycle facilities were possible. The Do Something scenarios are a little more invasive, making use of some public lands, while also taking some private lands (generally restricted to commercial/industrial lands) and on-street parking areas. The Do Maximum scenarios, takes land and property to achieve the highest level of facility for pedestrians and cyclists.

The existing road layout is indicated on the drawings in Appendix A.

Following a number of design development workshops, six options have been considered and are summarised as follows:

- Option 1: Upgrade existing facilities
- Option 2: Segregated cycle lanes, but loss of sections of outbound bus lane.
- Option 3: Segregated cycle lanes, retaining bus lanes in each direction.
- Option 4: As Option 2 with side road entry treatments
- Option 5: Do Maximum; acquiring land and providing bus lanes and level of service “A” Cycle tracks over the full length of the scheme.
- Option 6: Do Maximum: As Option 3, with two-way cycle track facility between Merrion Gates and Booterstown



Capabilities on project:
Transportation

Detailed drawings for each of these options are presented in Appendix B to G. During this design process alternative route alignments that would serve this corridor were also examined, however no such route was found suitable.

The proposed options have been based on OS Mapping and available topographical survey information (as built drawings for almost the entire route); however a full topographical survey was not carried out as part of the scheme development. Therefore the impact in some of the proposed scheme may not be accurate on some sections and a full topographical survey of the area should be carried out prior to the next stage of design development.

Each of the routes has been split into four sections and options for each area discussed under the following headings:

- environment,
- Cultural, archaeological and architectural heritage
- economy,
- safety accessibility,
- key utility diversions (if relevant), and
- Integration.

Specialist's consultants provided necessary input to the relevant sections including:

- C.R.D.S on Archeology and Cultural Heritage;
- Scott Cawley Ecology Consultancy Services; and
- Brady Shipman Martin.

5.2 Section 1: Frascati Road to Circus Field (Blackrock College Access Gate Lodge)

5.2.1 Introduction

This section of the route generally includes two northbound lanes, made up of a traffic lane and a bus lane, with a similar arrangement southbound. Advisory cycle lanes are also provided as well as footpaths on both sides of the road. The road width varies from approximately 17-20m, including existing pedestrian facilities. This stretch of the study area passes through areas of commercial properties, particularly around the Blackrock Clinic junction, which has on-street parking in parts. There are a number of accesses to residential developments and streets, as well as some properties that access directly off the street.

Capabilities on project:
Transportation

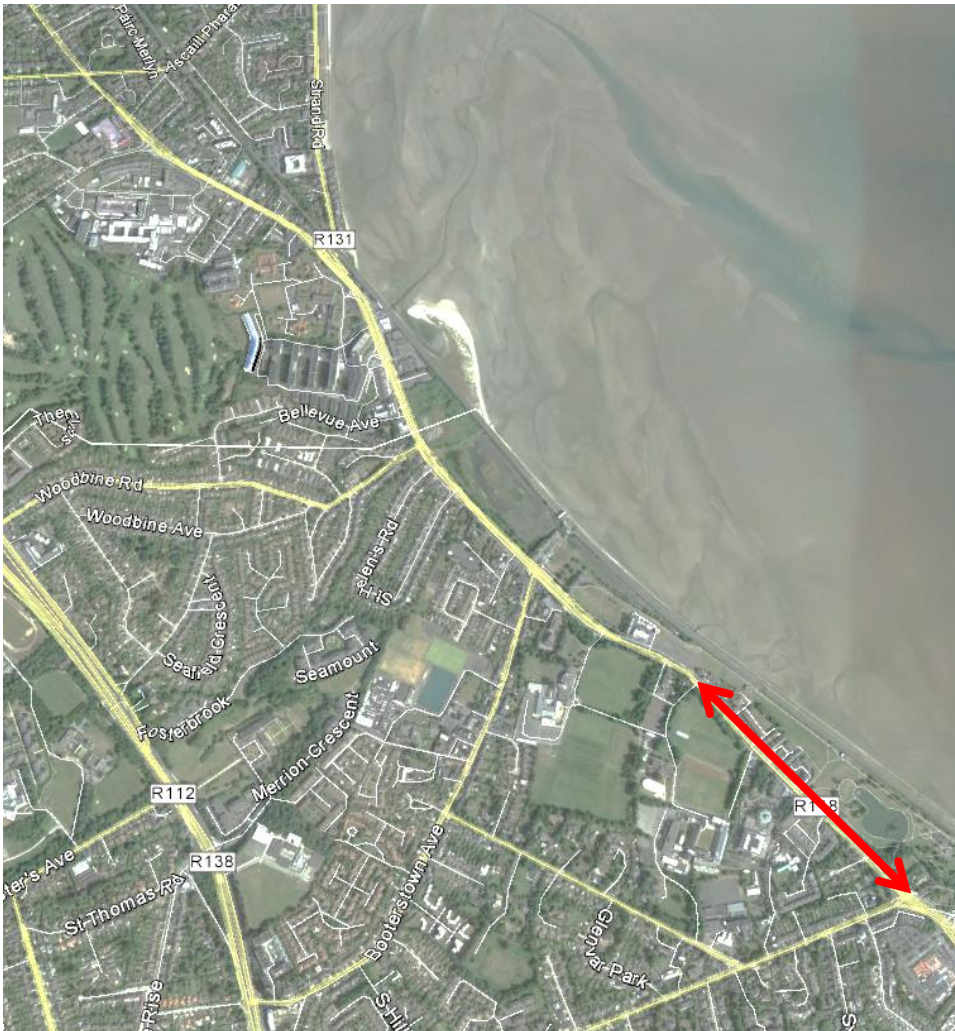
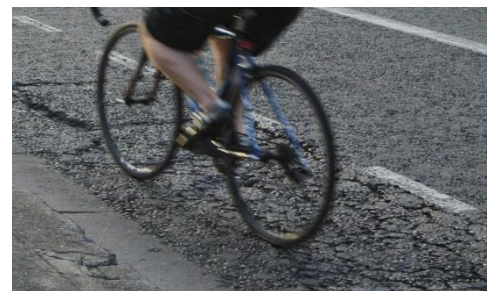


Figure 5.1 Section 1: Frascati Road to Circus Field

There are a number of issues along this section of the route, including the advisory cycle facility within the bus lane for cyclists. With the bus lane width varying over the section, buses often enter the cycle lane, while the poor surface in parts results in cyclists cycling outside of the advisory cycle lane markings. In addition, the right turn into Blackrock Clinic (southbound) can be problematic, while the degradation of the road surface in the area fronting the park; suggests potential underlying problems with the pavement (see photo). In terms of potential land acquisition, Blackrock College forms the largest boundary, on the southern side of the road.



Traffic flows on this section of the route are shown in Figure 5.2. From analysis cyclists make up approximately half of the vehicles travelling in the outside lanes (Lanes 1 and 4) both northbound and southbound during the peak periods. In the AM peak hour, 99 bicycles were recorded in the bus lane heading northbound, with 17

Capabilities on project:
Transportation

southbound. 12 buses are noted in each direction, while taxis make up the remaining, with some car activity also noted.

In the PM 99 bicycles were noted heading southbound, with 43 heading northbound. Eleven and 14 buses were recorded travelling southbound and northbound respectively.

1/A Merrion Road – Section 1 Frascati to Circus Field



Figure 5.2 Traffic Flows on Section 1

5.2.2 Option Description

Option 1: This option retains the existing kerb line and lane arrangement, combining the cycle lane and bus lane into one lane, with appropriate “Lana Bus” and cycle logos.

Option 2: Option 2 includes some off-road cycle tracks, taking land from Blackrock College as well as Blackrock Clinic and Blackrock Park. A new retaining wall would be required at Blackrock Park, however due to the current condition of the existing wall and surrounding footpaths, a new retaining wall would be required in the near future in any case. The outbound bus lane would be removed in parts, with a right turn provided for traffic movements to Blackrock Clinic.

Option 3: With this option in place, additional land take is required from Blackrock College and Blackrock Clinic to accommodate the outbound bus lane, as well as the dedicated cycle facilities (lanes and tracks). A right turn has been provided into Blackrock Clinic. As in Option 2, the road has been widened at Blackrock Park, requiring a new retaining wall structure.

Option 4: Option 4 takes the elements proposed in Option 2 and includes raised entry treatments to all minor arms.

Capabilities on project:
Transportation

Option 5: This option retains the two lanes both northbound and southbound, to accommodate a general traffic lane and a bus lane in either direction. Cycle tracks/lanes have been provided on both sides of the road, averaging 2-2.25m wide. Significant land take is required from both Blackrock College and Blackrock Clinic to accommodate the proposed facilities, while the retaining wall at Blackrock Park will need to be renewed with some land take proposed. A right turn lane is proposed into Blackrock Clinic.

Option 6: At this location, Option 6 has the same elements as Option 3. This includes the retention of the outbound bus lane, as well as the improved cycle facilities on both sides of the road. Land take is required from Blackrock College and Blackrock Clinic. The right turn into Blackrock Clinic is proposed, while land take is also required at Blackrock Park. Works here will include a new retaining wall.

5.2.3 Environmental Impact

The environmental impact of the various options on this section is primarily concerned with the widening of the road and the removal of trees at some locations. Apart from Option 1, which has no impact on existing trees, all other options result in the loss of trees over much of the length of this section. Trees along the boundary of the Park are removed in all options, although these trees are of moderate to low quality/value. At Blackrock Clinic there are several mature trees including Beech (*Fagus sylvatica*), Sycamore and Horse Chestnut (*Aesculus hippocastanum*) established in landscape beds close to the entrance drive; the late mature Beech to the north of the entrance is showing early signs of decline. Along the frontage of Blackrock College (See Photo) there is a significant difference between the options, in that for most options the existing trees can be maintained, or impact is limited to a few immature trees, however for Option 3 and 5 the relocated school wall will result in the removal of/ or impact on many mature and early mature trees (Monterey Cypress *Cupressus macrocarpa*, Sycamore, Lime, Elm, Cherry and Leyland) forming a long landscape feature along the eastern edges of the properties. Overall the environmental impact varies from no impact with Option 1 to reasonably significant with Option 5.



5.2.4 Cultural, archaeological and architectural heritage

All six options will impact on the settings of the following structures, which are included in Record of Protected Structures (RPS):

- Lios an Uisce, Rock Road. There will be a slight impact on the setting of the entrance gates to the west end of the southern boundary wall to Rock Road.
- Pheonix Terrace, Rock Road. There will be a slight impact on a rendered wall to southern boundary to Rock Road and on the setting of the terrace.
- Blackrock College (entrance gates comprising dressed granite piers and cast-iron gates and boundary treatments comprising cast-iron railings on granite plinth). Options 2, 3, 5 and 6 would involve more significant impacts along the college's northern boundary with the Rock Road.
- Willow Terrace, Rock Road. There will be a slight impact on the setting of the main entrance gates to terrace.

There are no impacts on features included in the Record of Monuments and Places (RMP) within Section 1.

Capabilities on project:
Transportation

5.2.5 *Economy*

The economic impact of the proposed options have been explored based on three areas, scheme capital costs, maintenance costs and transport quality of service, i.e. which provides the best facilities for public transport operators and cyclists in this case.

Option 1 is the cheapest option to construct, with just road marking required. All of the other options include the requirement to provide a new retaining wall along the revised boundary of Blackrock Park. As noted, the existing wall is degrading and would need to be replaced in the not too distant future. Option 2 and 4 require some land take from Blackrock College and Blackrock Clinic, while Option 3 and 5 require significantly more land take. The level of finish to the boundary features along these private properties would impact upon the costs of each option.

In terms of maintenance, and based on the additional road width, Option 1, 2 and 4 would have similar maintenance costs, with minimal land take in Option 2 and 4. Options 3 and 5 have additional land take requirements, and hence marginally higher maintenance costs.

The transport quality of service is lowest for Option 1, with discontinuous bus facilities as well as cycle facilities. Option 2 and 4 increases the cycle provision both inbound and outbound, however at the cost of bus travel outbound. Finally Option 3 and 5 provide high quality bus and cycle facilities both inbound and outbound.

5.2.6 *Safety/Accessibility*

Cyclist safety is increased with Options 2-6, with dedicated, segregated facilities provided on links, as well as on-road facilities provided through junctions. Option 1 retains the arrangement whereby cyclists share facilities with buses/taxi, which does not increase the safety of this section of the route.

5.2.7 *Integration*

Option 1 does not improve the integration of this route with the GDA Cycle Network. Option 2,3,4,5 and 6 all offer good connections to the GDA Cycle Network with high class facilities throughout. Similarly, all but Option 1 ties in to the recently constructed cycle facilities on Frascati Road. The Do Something options proposed offer a direct, attractive and comfortable facility for cyclists along the route, offering a coherent network, linking all of the main origin and destination centres along the route.

While options 2-6 are in line with the GDA Cycle Network Plan, Options 2 and 4 remove sections of bus lane, which is contrary to the Smarter Travel objectives of increasing bus priority, reliability and punctuality. Option 5 increases the bus facilities along the route, with continuous bus facilities both inbound and outbound.

5.2.8 *Summary*

In summary, there are effectively three different options for this location. Retain existing kerb lines and resurface and re-mark the existing bus lane to accommodate cyclists. Secondly, partial removal of the bus lane to accommodate a high standard cycle lane/track. This would require some land take from private lands including Blackrock College and Blackrock Clinic. The final option retains bus lanes both inbound and outbound, while also accommodating high standard cycle lanes/tracks. This would require additional land take from Blackrock College/Blackrock Clinic. This preliminary assessment would suggest that the optimum solution for this location is Option 2/4 where the outbound bus lane is dropped over a section where the bus is not delayed and the available space is redistributed to high quality cycle facilities.

Capabilities on project:
Transportation



Figure 5.3 Emerging preferred scheme for Section 1
(Opposite Blackrock College).

5.3 Section 2: Circus Field to Trimleston Avenue

5.3.1 Introduction

This section of the route passes the Booterstown Park and Dart Station as well as Booterstown Nature Reserve. It is an environmental sensitive area, with the Nature Reserve holding a variety of designations, including NHA (Booterstown Marsh), SPA (South Dublin Bay and River Tolka Estuary) status. Northbound there are two general traffic lanes, in addition to the bus lane/cycle lane stretching from Blackrock College to Booterstown Avenue junction. Beyond this the road layout reverts to a single traffic and bus/cycle lane. Southbound there is a single traffic lane and a bus/cycle lane. There are a number of areas of on-street parking, as well as indented bus stops. The road width varies from approximately 20m to 26m in parts,

Capabilities on project:
Transportation

accommodating existing pedestrian areas also. This section of the study area is bounded by the nature reserve/park lands to the east, with residential properties to the west. Small elements of commercial/retail properties are located at the junction of Booterstown Avenue.



Figure 5.4 Section 2: Circus Field to Trimleston Avenue

There are a number of perceived problems for this section of the route, including:

- The shared bus lane/cycle lane is unsatisfactory for many cyclists.
- The additional northbound traffic lane around Booterstown Avenue results in additional delays to buses due to the tie in arrangement and the requirement to merge back into general traffic.
- The southbound right turn for motorists into Willow Park School can be problematic for cyclists, particularly in the AM peak hour. Motorists generally look for a gap in the general traffic lane and can often move across the bus lane without observing cyclists in the bus/cycle lane.

Capabilities on project:
Transportation

- The existing surface within the cycle/bus lane is degrading, causing issues for cyclists, while also suggesting an issue with the pavement in general.
- Difficult manoeuvre for cyclists exiting the Park cycle facility on the northern side of the road.
- In addition to the above, the boundary to Booterstown Nature Reserve is a constraint for this section of the study area. As it is a protected area, there is limited scope to infringe on the protected area.

Traffic Flow data obtained from November 2014 shows an average two-way flow of just over 2000 vehicles in the AM peak period, with a similar number in the PM Peak period. Cycle flow information suggest 600-800 daily inbound, with between 450-700 cyclists travelling outbound daily, on this section of the route.

5.3.2 Option Description

Option 1: This option retains the existing kerb line and lane arrangement and combines the cycle lane and bus lane into one lane, with appropriate “Lana Bus” and cycle logos.

Option 2: Option 2 removes the second general traffic lane heading inbound as well as some of the outbound bus lane to provide cycle tracks/lanes on both sides of the road from Circus Field to Booterstown Avenue. The arrangements from Booterstown Avenue to Trimleston Avenue are similar to existing with the some sections of the existing cycle lanes converted to off-road cycle tracks. No land take is required with this option.

Option 3: With this option in place, additional land take is required from Blackrock College to accommodate the outbound bus lane, as well as the dedicated cycle facilities (lanes and tracks). No additional land is required on the section between Booterstown Avenue and Trimleston Avenue.

Option 4: Option 4 takes the elements proposed in Option 2 and adds raised entry treatments to all minor arms.

Option 5: This option is the same as Option 3 in this area. Between Circus Field and Booterstown Avenue, two lanes are provided both inbound and outbound, with a general traffic lane as well as a bus lane. A high standard cycle facility is also provided on either side of the road. Some land take is required around Blackrock College to achieve this. The existing kerb lines between Booterstown Avenue and Trimleston Avenue are retained, with some sections of existing cycle lane converted to cycle tracks.

Option 6: Option 6 sees the outbound bus lane retained, with high quality cycle facilities provided on either side of the road, from Circus Field to Booterstown Avenue. As with Option 3 and 5, some land take is required along the Blackrock College boundary. From Booterstown Avenue to Trimleston Avenue, and beyond, it is proposed to provide a two way cycle track facility on the northern side of the road. This will require land take and the relocation of the low level boundary wall to the Nature Reserve. Similar to Option 3 and 5, the southern side of the road will be revised to provide cycle tracks in some locations, with a continuous facility over the length of this section. No land take is required on the southern side of the road.

5.3.3 Environmental Impact

In general, there is little negative environmental impact with Options 1 to 5; however Option 6 proposes to take some land from the Nature Reserve area and relocate its boundary wall. The dominant tree population along this section of road is the mixed species scrub woodland growing to the east of the highway and pavement; this woodland is mostly early mature Sycamore and Elm (*Ulmus glabra*) with some Poplar (*Populus* spp.), Ash and Alder (*Alnus cordata*). The trees are mostly occupying a strip of land around 0.5km long between the boundary wall along the road and the wetland to the east; much of which is within the Booterstown Nature Reserve (which extends all the way south to the Booterstown DART station car park). The trees are mostly

Capabilities on project:
Transportation

100-400mm dbh and in mainly fair condition; many have light branching growing out over the pavement. The trees on the embankment provide important screening for the marsh site and its over-wintering birds. Any widening of the carriageway at this location will require the construction of a retaining wall and as a result will most likely result in the loss of most if not all of these trees. In this context the impact of Option 6, requiring the relocation of the existing Marsh wall, is highly negative in terms of Environmental Impact.

5.3.4 Cultural, archaeological and architectural heritage

All six options will impact on the settings of the following structures which are included in Record of Protected Structures (RPS):

- Willow Park School, Rock Road. There will be an impact on the setting of entrance gates and boundary treatments to the school's northern boundary with the Rock Road.
- Trimleston Lodge. There will be an impact on the setting of house and its cast-iron railings along its northern boundary with the Rock Road.

There are no impacts on features included in the Record of Monuments and Places (RMP) within Section 2.

There are no significant differences between the impact levels of each Option for Section 2 on the grounds of archaeological and architectural heritage.

5.3.5 Economy

This section of the scheme contains one of the widest sections of roadway, therefore little land take is required for any of the first five options. Option 1 would remain the cheapest, with Option 5 resulting in the most expensive scheme. Should Option 6 be preferred, additional land take is required to accommodate the two-way cycle track facility, requiring land take from the Nature Reserve area.

In terms of maintenance, and based on the additional road width Options 1 to 5 would result in similar costs, as the kerb to kerb road width would be similar throughout. Option 6 would be marginally higher, with the addition of the two-way cycle track.

The transport quality of service is lowest for Option 1, with discontinuous bus facilities as well as cycle facilities. Option 2 and 4 increases the cycle provision both inbound and outbound, however at the cost of bus priority outbound. Finally Option 3 and 5 provide high quality bus and cycle facilities both inbound and outbound. Option 6 offers a high quality of service, particularly for cyclists on the coastal route, which allows users to remain on the northern side of the road, with a continuous facility.

5.3.6 Safety / Accessibility

For this section of the route, Option 1 does not increase the safety for cyclists on this section of the scheme, as there is little improvement in facilities. Option 2 and 4 formalises the two-way facilities and provides off-road facilities where possible, with on-road facilities through junctions. Option 3 and 5 again provide the same level of safety, however Option 6 provides the 2-way off-road facility from Trimleston to Booterstown Avenue, allowing cyclists to travel along the coastal route without crossing Rock Road.

In addition the right turn into Willow Park has been removed, which was hazardous to inbound cyclists particularly during the AM peak period.

Capabilities on project:
Transportation

5.3.7 Integration

Option 1 does not increase the integration of cycle facilities to the GDA cycle network, with cyclists still faced with discontinuous facilities. Options 2 through to 6 would provide high quality cycle facilities that would tie into the GDA Cycle Network. The Do Something options proposed offer a direct, attractive and comfortable facility for cyclists along the route, offering a coherent network, linking all of the main origin and destination centres along the route.

While options 2-6 are in line with the GDA Cycle Network Plan, Options 2 and 4 remove sections of bus lane, which is contrary to the Smarter Travel objectives of increasing bus priority, reliability and punctuality. Option 5 increases the bus facilities along the route, with continuous bus facilities both inbound and outbound.

5.3.8 Summary

In summary, there are four different options for this location. Retain existing kerb lines and resurface and remark the existing bus lane to accommodate cyclists. Secondly, partial removal of the bus lane to accommodate a high standard cycle lane/track. This would require some land take from Blackrock College. The third option (Option 3 & 5) retains bus lanes both inbound and outbound, while also accommodating high standard cycle lanes/tracks on either side of the road. This option requires land take from Blackrock College/Willow Park. The final option (Option 6) is similar to Option 5, however a two way cycle way is proposed from Circus Field to Trimleston Avenue and may require land take from Booterstown Marsh.

Overall the optimum layout would be Option 6, which includes two-way along the eastern side of the road; although it's environmental impact is very significant and is unlikely to be acceptable. For this reason an option that provides the proposed layout which does not require space from the Marsh area needs to be investigated.

5.4 Section 3: Trimleston Avenue to Merrion Gates

5.4.1 Introduction

Section 3 of the scheme runs from Trimleston Avenue to Merrion Gates, a distance of approximately 600m. From Trimleston Avenue to the Elm Park Business Campus (the Elms), there are two general traffic lanes in either direction, with no cycle facilities provided. Two general traffic lanes and a bus lane are provided inbound from the Elms to Merrion Gates, while a single traffic lane and a bus lane is provided from Merrion Gates to the Elms outbound. There is also a right turn lane into the business campus, which is approximately 150m long. This section of the route is largely commercial with some residential units provided within the Elms.

Capabilities on project:
Transportation

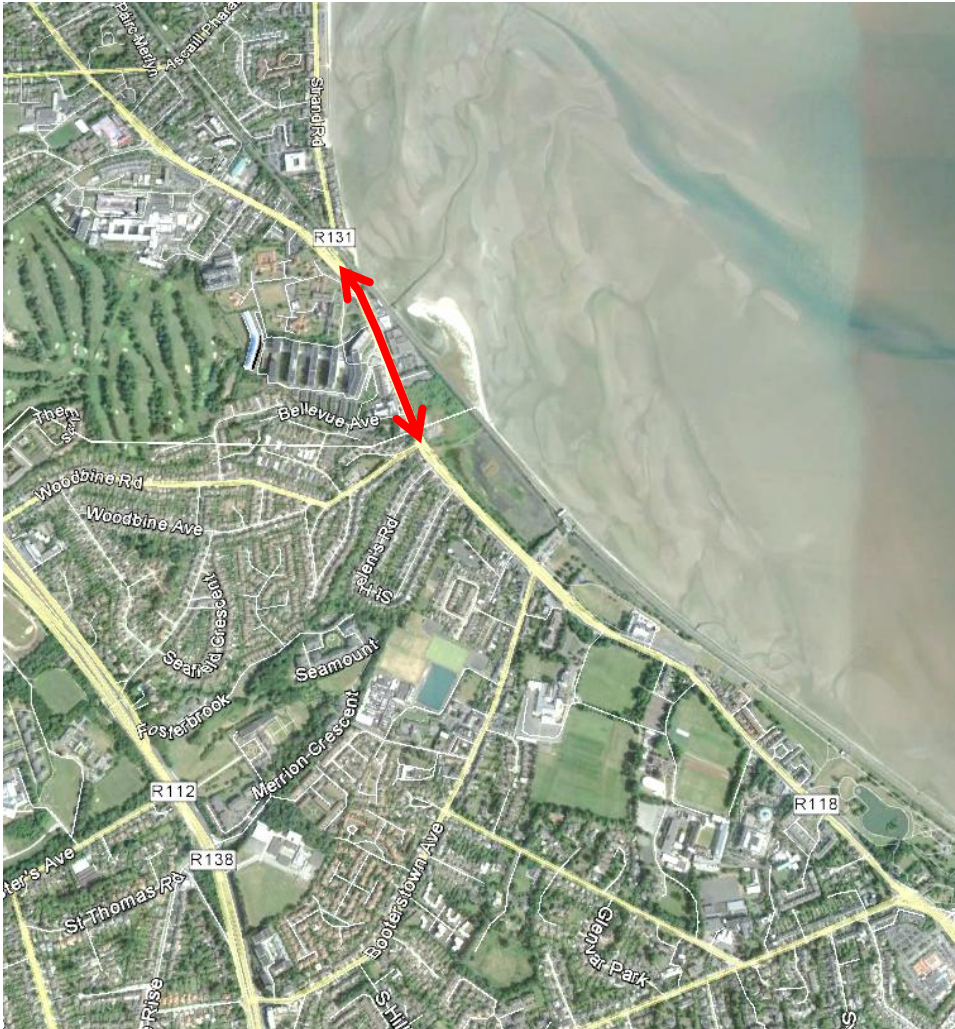


Figure 5.5 Section 3 Trimleston Avenue to Strand Road

The issues associated with this section of the route are summarised as follows:

- No cycle facilities provided for inbound cyclists from Trimleston Avenue to Elm Park Business Campus. There is a bus lane provided from the entrance to Merrion Gates. For outbound journeys, cyclists are permitted to travel within the bus lane, however with heavy illegal car usage, the facilities are particularly poor.
- At points along this section of the route, the traffic lanes are narrow (less than 2.9m in places), which can make cycling very uncomfortable, particularly in peak periods.
- The highway type junction at the Elms leads to high vehicle speeds.
- Poor road surface and an abundance of utility covers make for a difficult cycle.
- Merrion Gates slip lane is particularly difficult to negotiate for cyclists and to a lesser extent buses.

Capabilities on project:
Transportation

Traffic Flows for this section of the route result in an AADT of 28,000 vehicles. The AM peak hour flow through the Merrion Gates junction (all arms) is approximately 2,400 vehicles per hour, while the PM Peak Hour flow is 2,000 vehicles. Of particular note is that the flow remains high throughout the day, rarely dropping below 2,000 from 07.00 to 20.00 on a weekday.

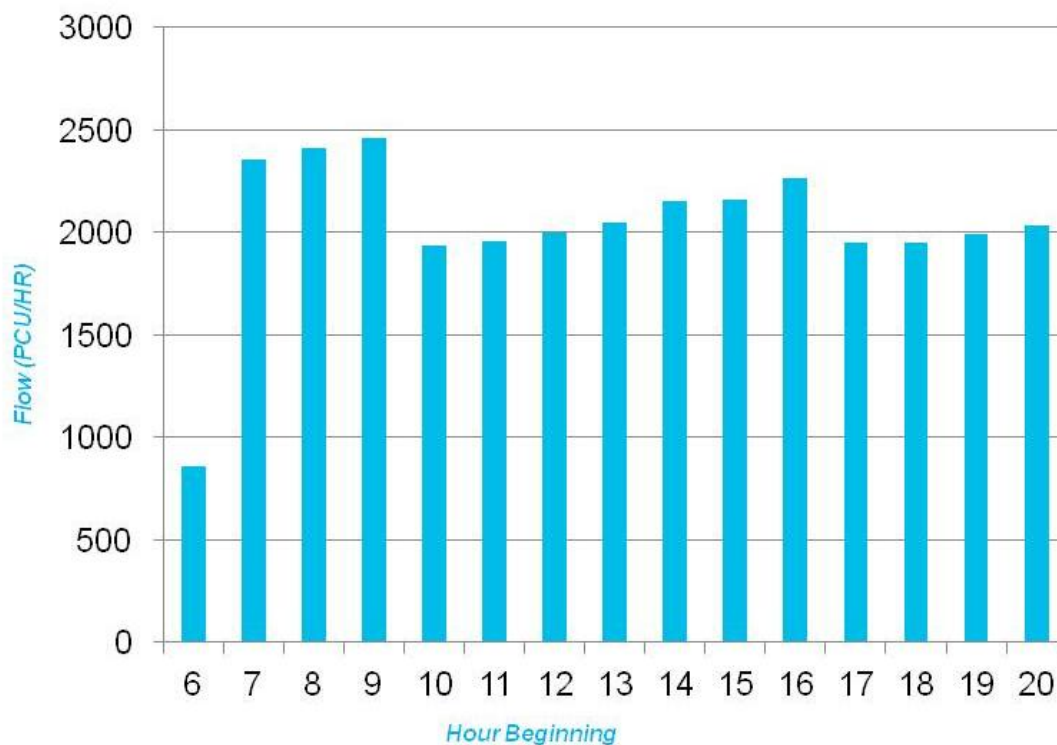


Figure 5.5 Traffic Flows on Section 3 Trimleston Avenue to Strand Road

The busiest junction on this section of the route is the Strand Road/Merrion Road junction. Strand Road provides access to the East Link Bridge and high volumes of traffic (almost 500 pcu in the AM peak period) are noted making the right turn from Merrion Road (inbound) to Strand Road. This junction incorporates the rail line serving the DART as well as regional services to Wicklow and Wexford. The rail line is controlled by a level crossing gate, which opens and closes when trains are detected on the line. In the AM peak period, the gate could be closed approximately 11 times, resulting in 20 minutes of gate closures during the peak hour.

Capabilities on project:
Transportation

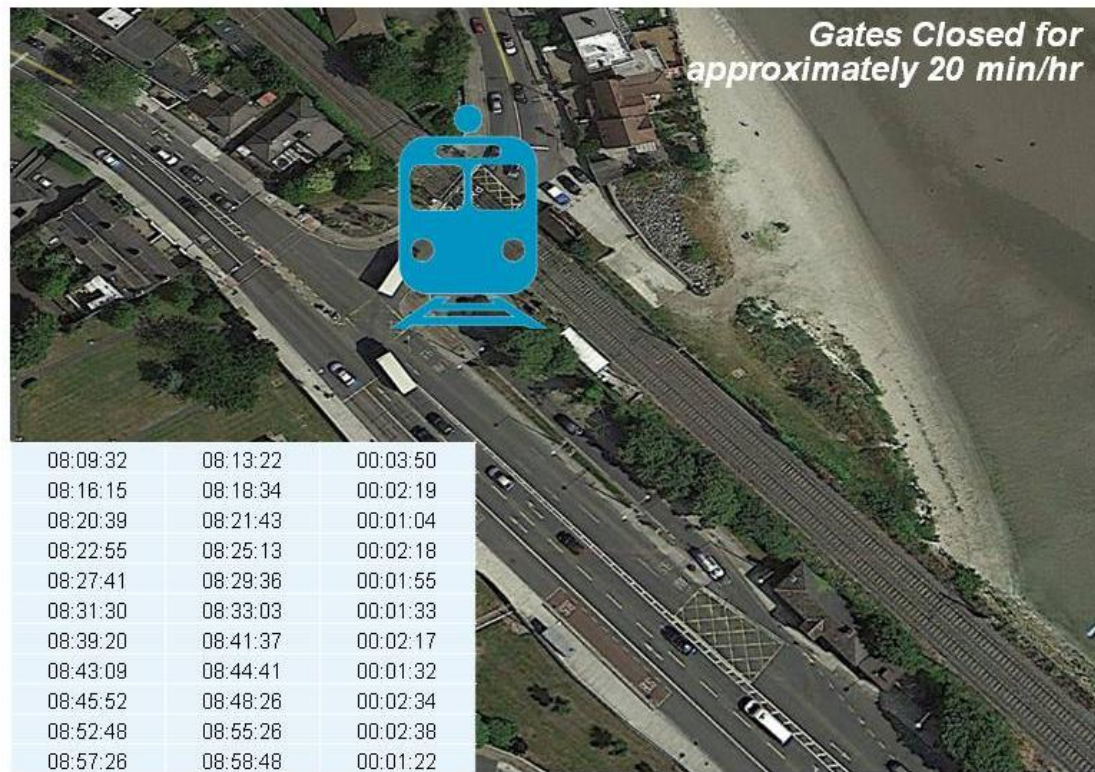


Figure 5.6 Rail line gate closures in AM peak period – AM Peak 2014.

(Key: Gate Close, Open, Duration)

5.4.2 Option Description

Option 1: This option retains the existing kerb line and lane arrangement. Sections of the inbound cycle lane are raised to provide a cycle track, while the existing bus lanes are facilitated with cycle logos in addition to the Lana Bus markings.

Option 2: From Trimleston Avenue to the Elms, Option 2 removes the second general traffic lane and replaces it with a bus lane. Cycle facilities are improved on both sides of the road, with cycle tracks provided throughout. This requires some land take from the commercial properties/nature reserve on the northern side of Rock Road. From the Elms to Merrion Gates, the existing kerb lines are maintained, however heading inbound from the Elms junction, a general traffic lane and bus lane are provided, with a right turn lane opening up approximately 50m from the Elms junction for traffic to Strand Road. In addition, the right turn lane into the Elms development has been shortened considerably, and improved cycle facilities provided throughout.

Option 3: This option is similar to Option 2 from Trimleston Avenue to Merrion Gates, with the exception that the junction arrangement at Merrion Gates has been revised to provide a signalised t-junction, with no slip road arrangement. This option allows the cycle track facilities to be extended.

Option 4: Option 4 takes the elements proposed in Option 2 and adds raised entry treatments to all minor arms.

Option 5: This option is the same as Option 3 for this section of the route.

Capabilities on project:
Transportation

Option 6: Option 6 includes the improved bus provision on the Trimleston Avenue to the Elms junction, as well as a two-way cycle track from the junction of Trimleston Avenue (and on to Booterstown Avenue) to Merrion Gates on the northern side of the road. The revised t-junction arrangement is proposed with this option at Strand Road/Merrion Road while lane take is required at the commercial lands/nature reserve on the northern side of the road.

5.4.3 Environmental Impact

The Environmental impact on this section is limited as the existing roadway is primarily being used. The only significant street trees in this section are located immediately south of the Strand Road junction between the pavement and DART line and are comprised of a short linear group of Lime, of which 5 are in fair condition and moderate value and 1 is dead standing. There are an additional 7 Lime trees located behind a boundary wall to the east of the pavement along the Rock Road to the south. Overall the environmental impact of all options in this section is low.

5.4.4 Cultural, archaeological and architectural heritage

There are no impacts on features included in the Record of Protected Structures (RPS) or the Record of Monuments and Places (RMP) within Section 3.

There are no significant differences between the impact levels of each Option for Section 3 on the grounds of archaeological and architectural heritage.

5.4.5 Economy

Option 1 remains the as the lowest scheme costs for this section of the route. Option 2 and 4 would result in similar costs, with a small amount of land take required. Option 3 and 5 would result in a slightly more expensive scheme, while the addition of the two-way cycle track facility in Option 6 would again increase the total scheme costs.

In terms of maintenance, and based on the additional road width Options 1 to 5 would result in similar costs, as the kerb to kerb road width would be similar throughout. Option 6 would be slightly higher, with the addition of the two-way cycle track.

The transport quality of service is lowest for Option 1, with discontinuous bus facilities as well as cycle facilities. The inbound and outbound bus lanes are retained in Options 2-6, while improved cycle facilities are also proposed. Option 6 has the added advantage of the two-way cycle track facility which improved facilities particularly for leisure cyclists.

5.4.6 Safety / Accessibility

In terms of cyclist safety, Option 1 does not increase the safety for cyclists on this section of the scheme. Option 2 and 4 offer an increased level of safety for cyclists, with dedicated facilities provided throughout. However Options 3 and 5 realign the junction of Strand Road and Merrion Road to reduce the exposure of cyclists to merging traffic. The junction works on a simple t-junction signalised arrangement, with off-road facilities provided at either side of the junction. In Options 2-6 the left slip lanes from St. Mary's development as well as the Elms have been removed, to improve facilities for both cyclists and pedestrians. With the provision of dedicated facilities, and slight lane redistribution, the narrow lanes that existed in parts are no longer an issue.

Capabilities on project:
Transportation

From the junction of Strand Road, there is a two-way off-road cycle facility proposed on the northern side of the road. This allows leisure cyclist in particular to remain on the sea side of the road, and continue their journey on the coastal route, without the need to cross Merrion/Rock Road.

5.4.7 Integration

Option 1 does not increase the integration of cycle facilities to the GDA cycle network, with cyclists still faced with discontinuous facilities. Options 2 through to 6 would provide high quality cycle facilities that would tie into the GDA Cycle Network. The Do Something options proposed offer a direct, attractive and comfortable facility for cyclists along the route, offering a coherent network, linking all of the main origin and destination centres along the route.

While options 2-6 are in line with the GDA Cycle Network Plan, Options 2 and 4 remove sections of bus lane, which is contrary to the Smarter Travel objectives of increasing bus priority, reliability and punctuality. Option 5 increases the bus facilities along the route, with continuous bus facilities both inbound and outbound.

5.4.8 Key Utility Diversion

Within this section of the route, there are two major gas main road crossings. At the junction of Merrion Road/Strand Road, a 400mm ST19 bar gas main is located across Merrion Road to the south of Strand Road. The second location of note is the junction of Trimleston Avenue, where a 400mm ST 40 bar gas main crosses Rock Road, and from heads out to sea. From discussions with Bord Gais, it is understood that the utilities along the route should not pose an issue to the proposed scheme, as the depth of the services are such that they will not be impacted up by scheme.

5.4.9 Summary

Again there are three main options for this location, including the Do Minimum option (Option 1) which retains the existing kerb lines and includes cycle logos within the bus lanes. The second option is to partially remove the outbound bus lane, while providing off-road cycle facilities on both sides of the road. The third option (Option 3 and 5) requires more land take however maintains the outbound bus lane, as well as cycle facilities on both sides of the road. The final addition is a two way section of off-road cycle track between Trimleston Avenue and Merrion Gates.

Capabilities on project:
Transportation

5.5 Section 4: Merrion Gates to Ailesbury Road

5.5.1 Introduction

This Section contains a bus lane and general traffic lane in each direction between Merrion Gates and Nutley Lane, but with the bus lane set back quite a distance from junctions leading to delays for buses. In the outbound direction there is a terrace of houses with no off-street parking, as a result the outbound bus lane only operates during the evening peak, with parking permitted for the rest of the day.

Between Nutley Lane and Ailesbury Road there is an inbound bus lane and 3 general traffic lanes, 1 northbound and 2 southbound. This section is particularly difficult for cyclists to negotiate as the facilities provided are discontinuous in nature, for example northbound approach to Nutley Lane does not have any cycle facilities and cyclists are required to weave between lanes.

Capabilities on project:
Transportation

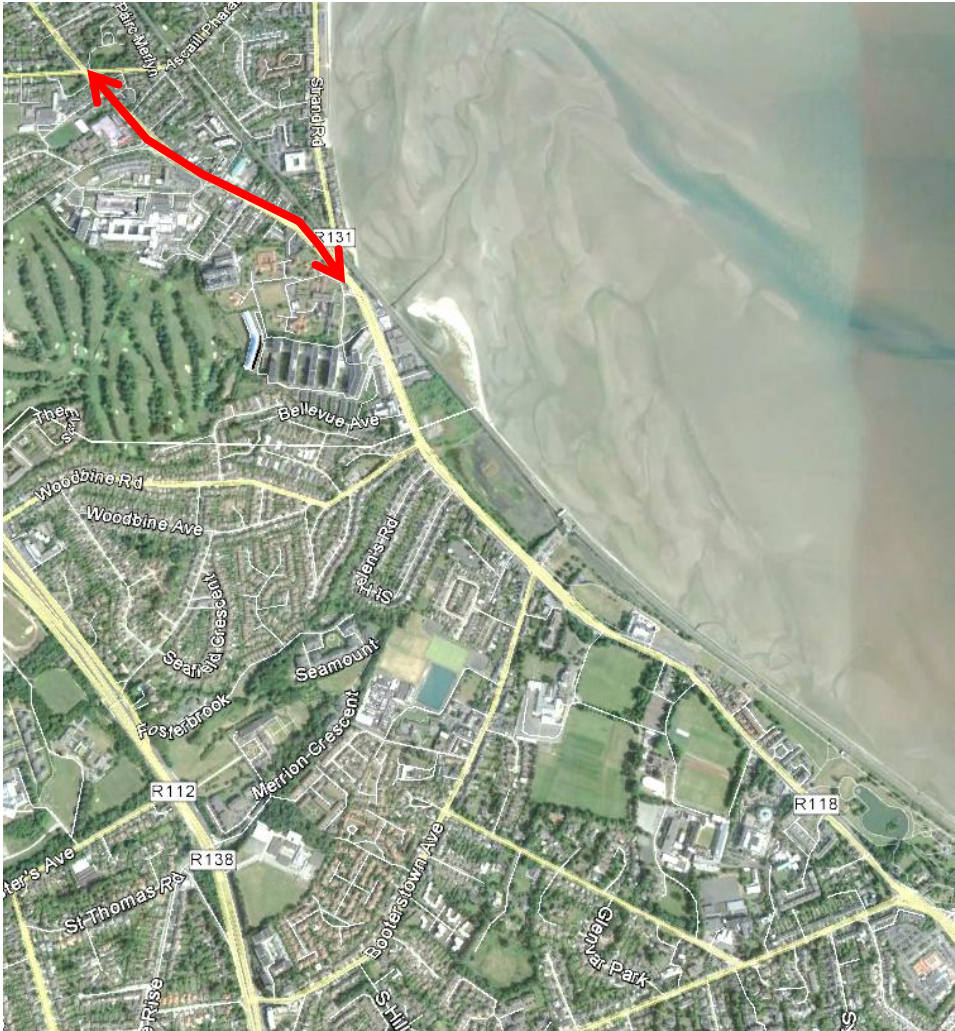


Figure 5.7 Section 4: Merrion Gate to Ailesbury Road

Issues associated with this area include:

- Discontinuous facilities throughout for cyclists;
- Parking in the outbound direction is problematic, with no scope to remove the parking to provide off-street parking.
- Narrow cross section with mature trees in the footpath areas;
- A number of accidents have occurred in this area over the past five years involving cyclists, including a serious accident.

The estimated 2-way flow on this section of the route is 3,300 vehicles, with an AADT of just over 20,000 vehicles a day. In the AM peak there are over 200 cyclists recorded travelling inbound, with 60 outbound. While in the PM peak periods, 80 cyclists were recorded heading outbound.

5.5.2 Option Description

Option 1: This option retains the existing kerb line and lane arrangement. The existing bus lanes are to be marked with Lana Bus markings, as well as the cycle logos. In addition, cycle lane facilities have been continued through the junctions.

Option 2: The inbound bus lane is retained in this option, with cycle facilities improved to provide cycle tracks in part, with cycle lanes through the junctions. Outbound, there is one traffic lane, and a cycle track provided from Ailesbury Road. Between Nutley Lane and the hospital entrance, a bus lane has been provided with cycle track, removing on-street parking spaces. Beyond the hospital entrance junction to Merrion Gates, the second lane has been removed, providing high quality cycle tracks.

Option 3: This option is the same as Option 2 at this location.

Option 4: Option 4 takes the elements proposed in Option 2 and adds raised entry treatments to all minor arms.

Option 5: The Do Maximum scenario for this area provides two lanes in either direction, made up of a general traffic lane and a bus lane, in addition to cycle tracks/lanes and pedestrian facilities. However to achieve this, land take is required, and mainly comes from private residential properties. On the inbound approach, the small gardens to the front of No. 179,181&183 Merrion Road are removed, with some impact on the actual building line of house no. 179. The properties fronting Elm Court would be impacted upon significantly, with two of these properties accessing directly onto the footpath currently. All properties to the junction of Herbert Avenue will be impacted upon with some loss of garden space. In addition a number of mature trees will be removed from this area. On the approach to Nutley Lane, the existing on-street parking spaces will be removed from the northern side of the road. Additional lands will also be required to the east of Merrion Shopping Centre. There is a considerable level difference between the existing footpath and behind the shopping centre boundary wall at this location.

Option 6: Option 6 is the same as Option 3 at this location.

5.5.3 Environmental Impact

The Environmental impact along this section of the route is significant in most options as the existing trees along the route are impacted as a result of the proposed works. These trees have a large presence on this street, providing it with much of its character, particularly north of Nutley Lane. The dominant street trees are mostly specimen London Plane (*Platanus x hispanica*) and Common Lime (*Tilia x europaea*) stems of good form and quality. The trees are in mostly good physiological and structural condition, with mainly full crowns and healthy looking foliage. The trees are medium to large in size; 400-700 dbh and 15-18m tall, and are very significant features in the local landscape. The mature trees appear to be being well managed and were not noted to be requiring any serious remedial works; they are however situated within a fully paved ground surface area and have tarmac right up to the tree stems with no open soil surface at all. There are some established trees and shrubs inside the garden limits of some of the houses along this part of the road; most notably a fine pair of mature Lime trees on either side of the entrance into no.172 Merrion Road. These trees are of high value and are located close to the public pavement and would be likely to have significant root growth extending outside the private property. If the trees on the street were to be removed some of the trees within the gardens will compensate somewhat in terms of the visual impact, although the current streetscape will be altered significantly.

Capabilities on project:
Transportation

South of Nutley Lane the trees are located on the eastern side of Merrion Road where the mature character of the streetscape continues all the way to the junction with Strand Road to the south. The northern section of the western side of the road is devoid of street trees with the exception of the early mature Lime trees along the verge of Nutley Lane; there are 2 mature London Plane and 1 Lime at the southern end close to the junction with Strand road. The large mature high value specimen trees of Lime (x6) and London Plane (x7) are spaced out along the eastern side of the street adding considerable landscape and amenity value to the locality. These trees are in mostly good health and condition and range 450mm to 700mm dbh and 12-17m in height.

5.5.4 Cultural, archaeological and architectural heritage

All six options will impact on the settings of the following structures which are included in Record of Protected Structures (RPS):

- No. 179, 181 and 183 Merrion Road. Each of the 6 options will impact on setting and boundary treatments at these locations. Option 5 would involve the most significant impact as it may involve partial or complete demolition on 179 Merrion Road.
- No. 147, 149, 151 and 153 Merrion Road. Each option will impact on setting and boundary treatments. Option 5 would involve the most significant impact on settings and boundaries.

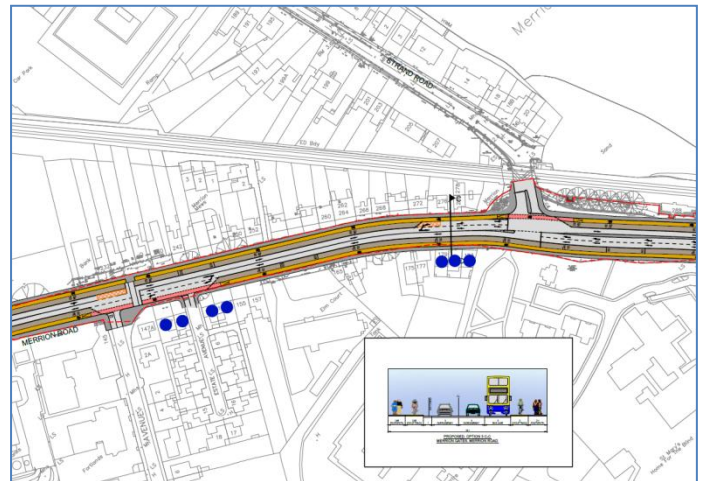


Figure 5.8 Option 5: Listed Properties impacted upon

There are no impacts on features included in the Record of Monuments and Places (RMP) within Section 4.

Option 5 is the least preferred in terms of architectural heritage as it will significantly impact on listed buildings.

5.5.5 Economy

This section of the route is the most constrained in terms of available space. In terms of economy, Option 1 is the least costly scheme with Option 5 being the most costly of the six options for this section of the project, particularly as it will include the cost of residential properties. Options 2, 3, 4 and 6 would incur similar costs.

The transport quality of service is low for Option 1, with discontinuous bus facilities as well as cycle facilities. However the bus offering reduces in Option 2 - 6, with the outbound bus lane removed and replaced with improved and continuous cyclist facilities, is unlikely to be acceptable at this location.

5.5.6 Safety / Accessibility

This section of the route contained the most concentrated number of vulnerable road user accidents along the project route, with three cycle accidents occurring at or close to the junction of Nutley lane. In terms of cyclist safety, Option 1 does not increase the safety for cyclists on this section of the scheme. Option 2 improves existing facilities, while providing continuous facilities over this section of the scheme. This option removes some on-street parking, which can be hazardous to cyclists, as they are at risk from opening doors, in addition, parking in the time plated bus lane has also been removed, which removes a major hazard along this section

Capabilities on project:
Transportation

of the route. Cycle track/lane widths have been improved, which increases cyclist's perception of safety. Options 3, 5 and 6 provide similar improved safety aspects, however with possibly a higher level of service offered, as the cycle facility will be provided beside a bus lane that has a limited number of buses per hour.

This section of the route improves pedestrian accessibility to Strand Road while also improving facilities around St. Vincent's Hospital and Merrion Shopping Centre.

5.5.7 Integration

Option 1 does not increase the integration of cycle facilities to the GDA cycle network, with cyclists still faced with discontinuous facilities. Options 2 through to 6 would provide high quality cycle facilities that would tie into the GDA Cycle Network. The Do Something options proposed offer a direct, attractive and comfortable facility for cyclists along the route, offering a coherent network, linking all of the main origin and destination centres along the route.

While options 2-6 are in line with the GDA Cycle Network Plan, Options 2 and 4 remove sections of bus lane, which is contrary to the Smarter Travel objectives of increasing bus priority, reliability and punctuality. Option 5 increases the bus facilities along the route, with continuous bus facilities both inbound and outbound.

5.5.8 Summary

The final section of the route again has three main options, a Do Minimum option (Option 1), a Do Something Scenario, which includes partial removal of the outbound bus lane to include off-road cycle facilities, as well as a Do Maximum scenario where by buildings are impacted upon to provide bus lanes and cycle facilities in both directions. As this is a critical section of this important radial route, where much of the current congestion materialises it is considered appropriate to consider the Do Maximum Option as the preferred scheme as compromising on any one mode may result in hazardous conditions and unacceptable delays.

Capabilities on project:
Transportation

5.6 Cost Estimate

A cost estimates for each route option has been prepared using a mini-Bill of Quantities methodology with provisions under the following headings:

- i) Major basic construction items such as earthworks, drainage, pavement, kerbs, etc measured and costed based on typical rates from current similar projects, and benchmarked against the database in the NRA Cost Management Manual, which normally account for 80% of the base construction cost;
- ii) 20% factor for minor non-measured minor items to arrive at a base construction cost;
- iii) Provisions for special items such as traffic signals, structures (boardwalk, underpass, retaining wall), Public Lighting, CCTV;
- iv) 20% for contingencies and unforeseen items;
- v) 10% for preliminaries;
- = Total Construction Cost.
- + VAT at 13.5% for Construction;

Other Direct Costs:

- vi) Planning, Surveys, Design & Construction Supervision: 7.5% to 15% of construction cost, depending on scale and complexity;
- vii) Land Acquisition, at a rate of €6m/Ha for large plots of non-residential land, and €10m/Ha for small strips of residential land;
- viii) Accommodation works and Boundaries;
- ix) CPO Compensation;
- x) Legal Costs and Risk Allowances.

Cost Estimates for each option is set out in the table below and this informs the Options Assessment under the "Economy Heading" later in this Chapter.

Capabilities on project:
Transportation

Table 5.1 Cost Multi-criteria assessment of On-Road Design Options

Option	Cost Estimate (2014 Prices) - €
Option 1: Upgrade existing facilities	2,000,000
Option 2: Segregated cycle lanes, but loss of sections of outbound bus lane.	9,000,000
Option 3: Segregated cycle lanes, retaining bus lanes in each direction.	10,500,000
Option 4: As Option 2 with side road entry treatments	9,000,000
Option 5: Do Maximum; acquiring land and providing bus lanes and Cycle tracks over the full length of the scheme.	14,500,000
Option 6: Do Maximum: As Option 3, with two-way cycle track facility between Merrion Gates and Booterstown.	15,000,000

The cost estimate includes design and land costs, but excludes VAT.

5.7 Evaluation of Options

In order to compare the various options a Multi-Criteria assessment has been undertaken. The procedure for the assessment of the scheme options follow the directions of the "*Guidelines on a Common Appraisal Framework for Transport Projects and Programmes*" published by the Department for Transport, Tourism and Sport (DTTaS), under 5 general headings of Economy, Safety, Environment, Accessibility & Social Inclusion and Integration.

A number of sub-headings have been selected that are specific to this scheme so as to enable an appropriate method of assessment that will distinguish between the options under consideration. These will vary slightly between sections to reflect the different factors to be considered in the selection of the most suitable option.

The results of this feasibility stage assessment are indicated in Table 5.1 below. This indicates that while the do minimum option is often the most favourable, primarily as it effectively involves maintaining the existing carriageway as is, but fails to improve the cycle facilities and thus safety for this mode, which is the overriding purpose of this project. For this reason the optimum solution for this corridor is the Option 2/4 which substantially improves the facilities for cyclists and pedestrians and to a lesser extent buses, while maintaining capacity for other vehicles. Although it is noted that Option 3 which includes more extensive carriageway widening is only marginally less favourable. Options that involve extensive widening, particularly into the Marsh area were considered less favourable.

Capabilities on project:
Transportation

Table 5.1 Multi-criteria assessment of On-Road Design Options

	Options						
Criterion	1	2	3	4	5	6	Notes
Economy							
Scheme Capital Cost	++	+	-	+	--	--	Cost estimates range from €2 to €15m.
Maintenance Cost	+	+	-	+	--	--	Linked to increased Road Width.
Transport Quality of Service	--	-	+	-	++	+	Some schemes lose outbound Bus Lane, one does not provide LOS A Cycle facilities.
Environmental							
Landscape and Visual Quality	++		-		--	-	Individual tree removal to northern section common to most options. Varying impacts on tree groups and built boundaries on southern section
Biodiversity	++	+	+	+	-	--	Mature tree removal may necessitate prior bat surveys. Encroachment of Booterstown Marsh pNHA/SPA (e.g. Option 6) would require further consultation with NPWS/Friends of Booterstown Marsh.
Cultural, archaeological and architectural heritage					-		All options impact structures and settings of structures included in the Record of Protected Structures including the Entrance Gates of Willow Park School, Entrance Gates at Willow Terrace, Entrance Gates of Blackrock College. Option 5 has a negative impact on 179, 181 and 183 Merrion Road and may require partial demolition of 179 Merrion Road which is included in the Record of Protected Structures.
Land use, soils and geology	++	+	-	+	--	-	Varying degree of road widening and land take required.
Water resources						-	Option 6 would impact on Botterstown Marsh.
Integration							
Transport Integration (Integration with cycle network)	--						All link well with GDA Cycle Network.
Other Government policy integration		-		-	+		Option 2 and 4 has loss of outbound bus lane.
Safety							
Pedestrian and cyclist safety	--			+			Option 1 is an upgrade of existing facilities, whereas others result in a LOS A Cycle Facility.
Preferred?		"=1"	2	"=1"			

Colour	Description
++	Significant advantages over the other options
+	Some advantages over other options
	Neutral compared to other options
-	Some disadvantages over other options
--	Significant disadvantages compared to other options

While this evaluation suggests that one option is favoured over others, in reality aspects of each and every option are brought forward to the Design Development Stage 2 outlined in the following Chapter. Input into the selection of the optimum option was obtained from key Stakeholders such as National Transport Authority, Dublin City Council, Dun Laoghaire Rathdown County Council and Dublin Bus at a number of workshops held in early 2015 and this has been fed into the Design Stage 2.

6 Design Development 2

6.1 Introduction

The aim of this project is to establish the feasibility of developing a cycle route along Rock Road/Merrion Road, as well as improving pedestrian facilities, taking cognisance of environments constraints within the study area. A total of 6 options were developed, ranging from a Do Minimum option to a Do Maximum option. Following on from the appraisal and workshop of these options, an emerging preferred option was established. However this emerging preferred option must also take into account the following parameters that emerged during the course of the final workshops in April 2015:

- A solution to the Merrion Gates Level Crossing is required as part of this project as the current arrangement is unsatisfactory for all modes, particularly in the context of increasing train paths on this line in 2016.
- Bus priority must be maintained between Ailesbury Road and Nutley Lane and must include proposed enhancements to this section (i.e. longer length of outbound bus lane).
- The two-way Cycle facility from Merrion Gates to Booterstown Station is most likely required due to limitations on the Coastal Cycle facility (Part A of this project).

The following sections outline how each of these points has been incorporated into the Emerging Preferred Option for this project.

6.2 Merrion Gates

Irish Rail and many others have undertaken studies of the Merrion Gates Level Crossing on numerous occasions and all concluded that a grade separated arrangement is the only viable solution for this location. This would eliminate the current significant safety and capacity constraint at this location which is outlined in the images below.



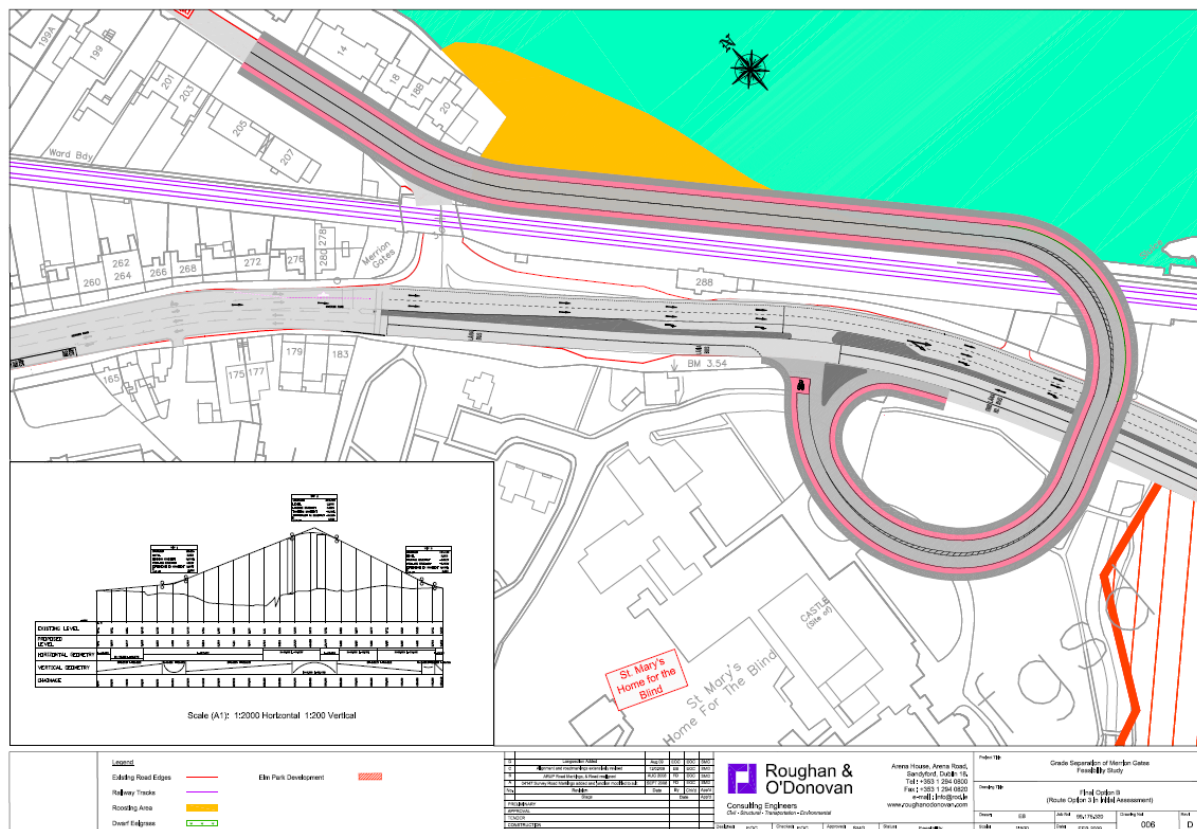
Figure 6.1 Traffic Accident at Merrion Gates (The Journal.ie - 2013) and Strand Road approaching Gates.

Capabilities on project:
Transportation

A feasibility study undertaken in 2009 for Iarnród Éireann by Roughan and O'Donovan looked at various options of providing a grade separated facility to cater for the traffic movement at Merrion Gates (attached in Appendix J). It looked at all feasible options, with many dismissed on grounds such as environmental disturbance and construction complexity. However three options were brought forward for detailed consideration including:

- Option A: Continuation of Strand Road southward with an elevated loop through the Strand Area and southbound slip roads onto Rock Road.
- Option B: Continuation of Strand Road southward with westward loop across railway and Rock Road with connection to Rock Road through the St. Mary's complex.
- Option C: Link north of existing crossing through grounds of former Forfás premises and Merrion Church.

Option A was eliminated due to its much more significant environmental impact and as such both Options B and C were identified as viable options worthy of further consideration.



Capabilities on project:
Transportation

- Within the Office Site some car parking would be removed, although a connection between the two sides of the car park, beneath the proposed road, will allow the two car parks to remain connected; and
- Within the Church Lands the road will run close to the existing boundary and will result in the removal of a row of car parking.

The principal drawbacks of this option are as follows:

- Visual impact and disruption to Merrion Church and the Office Building (former Forfas complex).
- Traffic Disruption as traffic will have to pass through a narrower section of Merrion Road.

The primary advantage of this proposal would be the removal of the at-grade crossing of a busy rail line, resulting in substantial safety benefits. In addition the proposal will have significant traffic benefit for the surrounding area and will also provide an opportunity to provide a high quality pedestrian and cycle route along the old Strand Road, which is a significant constraint along this section of the proposed coastal route.

6.3 Enhanced Bus Priority (Ailesbury Road to Merrion Gates)

Bus Priority on this section of the route is relatively poor at present with buses delayed for considerable period, as a result enhancements are warranted. The addition of a new junction to accommodate the grade separated crossing over the DART Line will clearly generate significantly more vehicle movements in this location which will have a negative impact on bus movements through this area. For this reason this section of the route was re-examined to identify enhancements that would be necessary to accommodate the additional traffic accessing the proposed bridge and also to minimise delays to buses on this section. The enhancements would need to facilitate the following:

- Allow buses to pass through this area without being impacted by traffic movements or parking, i.e. extend bus lanes over its entire length;
- Right turn lane required to facilitate turning movements over the proposed bridge (to avoid use of the bus lane by northbound vehicles); and
- Alternative parking for the terraced houses on the southbound carriageway as parking could not be facilitated during the day (as it is at present) as a result of the increased traffic movements on this section.

A design that includes all of these is outlined on the Emerging Preferred Scheme Drawings in Appendix J. This scheme includes continuous bus and cycle facilities through this pinch-point, a substantial parking area in the vicinity of the existing level crossing and a lengthy right turn lane for the bridge traffic signals. However, the scheme will have significant impacts, including:

- A small number of buildings, or parts of buildings, will need to be acquired to facilitate the widened alignment;
- The frontage (walls and gardens) of a number of listed buildings will be impacted by the proposed works; and
- The trees along this section, which have been identified as having a high value, will need to be removed.

Capabilities on project:
Transportation

It must be noted that the design has been through a number of iterations to limit these impacts. These impacts will need to be carefully assessed if this scheme is brought forward for further development.

It is also noted that a detailed micro-simulation model needs to be developed for this area so as the traffic impacts can be carefully assessed and the design optimised to cater for the predicted traffic movements.

6.4 Two-way Cycle facility from Merrion Gates to Blackrock

As a result of the environmental limitations on Dublin Bay (Part A Project) it is necessary to provide a high quality connection from Merrion Gates through to Blackrock DART Station along the Rock Road and through Blackrock Park.

A two-way cycle facility along the Rock Road was originally proposed under Option 6 of this report, however this impacted on the Marsh area and as a result had a negative environmental impact. As part of this design enhancement process the original design was reviewed and modifications made to lane widths and other space requirements in order to avoid entering Booterstown Marsh. This has allowed the provision of a two-way facility along the southbound carriageway, linking Merrion Gates to Booterstown DART Station. At Booterstown DART Station the track will enter Blackrock Park and follow a widened shared facility to Deepwell (House with narrow lane between it and Blackrock DART Station). The wall to the rear of Deepwell will be set back to provide a generous space between the DART Stations and the boundary.

As a result a high quality fully segregated pedestrian/cycle facility can be provided from Merrion Gates to Blackrock.

7 Emerging Preferred Scheme

This section outlines the Emerging Preferred Scheme and should be read in conjunction with the drawings which are included in Appendix J and the photomontages which have been developed for this study. The cost for this project is estimated at approximately € 22million; including land costs, but excluding VAT. This cost estimate includes an allowance of €7million for the new bridge over the DART Line. The project is estimated to take approximately 2 years to design and obtain the required planning permissions and a further 2 years to construct. The scheme is summarised as follows:

Section 1: Frascati Road to Circus Field:

Removal of a section of underutilised outbound bus lane, between Circus Field and Blackrock Clinic entrance, and the provision of fully segregated cycle facilities in both directions will result in significantly enhanced facilities for cyclists without impacting on bus movements. In order to improve access to Blackrock Clinic a right turn lane is proposed, thus the current PM Peak ban can be eliminated. The widening would require the provision of a retaining wall at Blackrock Park, although this may to be required in any case in the years ahead to maintain the structural integrity of the adjoining road.

In order to facilitate these enhancements land take will be required from the Blackrock Clinic and Blackrock College.



Figure 7.1 Before and After Photomontage in front of Blackrock College

Capabilities on project:
Transportation

Section 2: Circus Field to Trimleston Avenue:

Segregated cycle facilities will be provided throughout this section, with on-road facilities provided through junctions. In addition a two-way cycle track is provided from Booterstown to Merrion Gates, on the northern side of the road. The outbound bus lane will be available over most of this section. A right turn ban is proposed into Willow Park School, while raised entry treatments are proposed across all minor roads.

No land take is required with this option, although some space will need to be obtained from Blackrock Park.



Figure 7.2 Before and After Photomontage at Booterstown Junction

Capabilities on project:
Transportation

Section 3: Trimleston Avenue to Merrion Gates:

Segregated cycle facilities are provided on either side of the road, with a two-way facility provided on the eastern side of the road. Bus Lanes are provided along both sides of the road throughout this section, a significant enhancement to the current situation. The right turn lane into the Elms (outbound) has been reduced in length as it is currently significantly underutilised. In addition it is suggested that the access is reduced to a layout that is more suitable for this urban location. A car park is provided in the space that becomes available as a result of the closure of the Merrion Gates. In addition, illegal movements into St. Marys Development have been restricted with the provision of a barrier between the inbound and outbound lanes.

Land will be required from a number of landowners on both sides of the road, although the quantity and impact will be low in all cases.



Figure 7.3 Before and After Photomontage at Tara Towers Hotel

Capabilities on project:
Transportation



Figure 7.4 Before and After Photomontage at Merrion Gates

Section 4: Merrion Gates to Ailesbury Road:

Segregated cycle facilities are proposed throughout this section, in addition to continuous bus lanes, providing significantly enhanced facilities for sustainable modes. The closure of Merrion Gates requires the provision of a new bridge adjacent to Merrion Church and also the widening of Merrion Road to facilitate the provision of a right turn lane to this new junction. Parking to the front of the Terraced houses (Outbound) will be removed as part of this scheme, with alternative parking provided within a new car park further along the corridor (short walk).

The proposals in this location have a significant impact on the surrounding area with many notable trees removed, and some properties needing to be expropriated. However the benefits that will be accrued as a result of the road safety enhancements and reduced traffic delay to bus passengers, train passengers and motorists will be significant.

Capabilities on project:
Transportation



Figure 7.5 Before and After Photomontage at Merrion Church

Capabilities on project:
Transportation



Figure 7.6 Before and After Photomontage at Ailesbury Road