

9 ROADS, TRAFFIC AND TRANSPORTATION

9.1 Introduction

This section of the EIS describes the existing roads, traffic and transportation system along the route of the proposed pipeline corridor. This section also examines the various aspects of the construction and operational phases of the pipeline which have the potential to impact on roads, traffic and transportation and the magnitude of these impacts is considered prior to mitigation. Mitigation measures are then described and the residual impact post mitigation measures are outlined.

9.2 Study Area

The route of the proposed aviation pipeline travels, for the most part, along the existing road network between Dublin Port and Dublin Airport. The proposed pipeline corridor comes under the jurisdiction of a number of public bodies including Dublin Port Company, DCC, FCC and DAA.

The study area for this section of the EIS is generally confined to the proposed development corridor and the entrances to properties immediately adjacent. In some cases the study area is widened, for example at some large junctions, to include side roads leading to and from the development corridor.

9.3 Methodology

9.3.1 Consultation

As outlined in Chapter 5 of this EIS, there has been consultation with various stakeholders in respect of roads, traffic and transportation including meetings and written communications which contributed to the preliminary routing of the pipeline. A detailed scoping letter was sent to various consultees (as described in Chapter 5 – EIS Scoping & Consultation of this EIS) including the following road, traffic and transportation related bodies:

- Department of Transport, Tourism and Sport
- Iarnrod Eireann
- Irish Aviation Authority
- National Roads Authority
- National Transport Authority
- Railway Procurement Agency
- Dublin City Council , Roads and Traffic Division
- Agis (Port Tunnel)
- Bus Eireann
- Dublin Airport Authority
- Dublin Bus
- Transport 21 Office
- Fingal County Council

Responses were received from some of the above as outlined in Chapter 5 of this EIS and these responses were considered when preparing this EIS Chapter on Roads, Traffic and Transportation. Details of the responses are presented in Appendix 5.2 of Volume 3 of the EIS. In terms of this chapter, some examples of the responses include:

- The Dublin Airport Authority (DAA) stated in a letter dated 13 May 2014 that they welcomed the proposal and outlined that the proposed construction works are unlikely to impact on the operations of the airport. Any proposed crane operations would need to be considered.
- The National Road Authority (NRA), in their letter dated 09 May 2014, made observations in relation to the M1 trenchless crossing and the crossing of the Dublin Port Tunnel.
Also the NRA confirmed that the old N32 had been reclassified as a regional road (R139) and as such the NRA had no interest in the section of the road affected.

- The National Transport Authority (NTA) requested in a letter dated 21 May 2014 that the EIS consider the impact on the proposed Bus Rapid Transit (BRT) Network, the existing Quality Bus Corridor (QBN) and the Great Dublin Cycle Network Plan.

9.3.2 Dublin City Council – Directions for the Control and Management of Roadworks in Dublin City

The Dublin City Council (DCC) document entitled 'Directions for the Control and Management of Roadworks in Dublin City' dated June 2010 is also applicable to the section of the works that fall within DCC's functional area. This document presents the requirements of DCC in relation to carrying out roadworks and in particular it outlines restrictions on roadworks for difference categories of road each of which have been assigned a 'Traffic Impact Number' (TIN) ranging from 1 to 5 with 5 being the most important/strategic traffic routes.

Difference time restrictions are imposed for each TIN and these are outlined in Chapter 3 Table 3.5 and in Section 9.6.3 below.

9.3.3 Traffic Counts

Traffic counts were commissioned at 4 no. junctions along the route of the proposed pipeline in order to get a better understanding of the amount and type of traffic using the roads and the associated trends. The traffic counts were conducted by Abacus Transportation Surveys Limited and consisted of a 24 hours automatic junction traffic count (JTC) on Tuesday 27 May 2014. This day/date was selected (a mid-week day during school term) as it gave an accurate reflection of normal traffic on the roads considered.

The location of the JTC were:

- Site 1 R107 Malahide Road junction with Oscar Traynor Road and Toniegee Road
- Site 2 R107 Malahide Road junction with Collins Avenue
- Site 3 Howth Road Junction with Copeland Avenue
- Site 4 East Wall Road Junction with M50 Port Tunnel/Bond Road and Tolka Quay Road

Separately, the NRA maintain an automatic traffic counter on the R139 (old N32) and this traffic count data was also reviewed (NRA website).

The findings of the above traffic counts are included in Section 9.4 below for the relevant section of road.

9.3.4 Methodology - Overall approach

Overall, the assessment carried out in this section of the EIS describes the existing/background environment in relation to the various modes of road transport (including cars, HGV's, buses, cyclists and pedestrians) and other forms of transport including rail, airport, port/marine. The potential impact of the proposed development on these forms of transport is considered including, where appropriate, an assessment of both the direct and indirect impacts for the construction and operational phases. Mitigation measures are outlined and the residual impacts after mitigation presented.

9.4 Existing Environment

9.4.1 Existing Road Network

The proposed pipeline will for the most part follow the route of existing road networks from Dublin Port to Dublin Airport. The roads include those within the jurisdiction of Dublin Port, Dublin City Council, Fingal County Council and Dublin Airport. Each of these sections is described in turn below working generally from Dublin Port towards Dublin Airport.

9.4.2 Existing Road Network within Dublin Port

The first circa 1.5 km of the proposed pipeline will be developed along the existing road network within Dublin Port including Tolka Quay Road and a portion of Bond Drive.

Tolka Quay Road runs east-west and carries a large proportion of traffic (very high proportion of HGVs) associated with the port operations. It consists of a dual carriageway with 2 lanes in each direction with a dividing grass median and no hard shoulder. The speed limit is generally 50km/hour. A footpath is generally present along the east bound lane of the dual carriageway.

The western end of Tolka Quay Road, for approximately 700 m between Bond Drive and Bond Road, is also a dual carriageway with 2 lanes each way and a dividing grass median. However, this section of Tolka Quay Road carries less traffic than the eastern end of Tolka Quay Road as the main flow of traffic follows Bond Drive. The western end of Tolka Quay Road ends at a quasi 'cul de sac' which terminates at a gate leading to Bond Road/East Wall Road. Under normal operations the gate is closed and it is used as an emergency exit.

Bond Drive is a single carriageway road with two lanes in each direction (no median) with a footpath either side. It is one of the main roads into and out of Dublin Port.

There are no existing cycle lanes on Tolka Quay Road or Bond Drive.

9.4.3 Existing Road Network – Dublin City Council (including Bus Networks)

This section describes the existing road network and cites the traffic impact number for the road as assigned by DCC. The presence or otherwise of footpaths and cycle lanes is outlined.

Approximately 10 km of the proposed pipeline lies within Dublin City Council's (DCC) jurisdiction and will generally follow the route of the existing public road network. Dublin City Council has assigned every road in the city a 'Traffic Impact Number' (TIN). The numbers ranging from 1 to 5 refer to the importance of the road as a strategic traffic route. Traffic Impact Number 1 and 2 are lightly trafficked routes while numbers 3, 4 and 5 are heavily trafficked routes.

The roads along which the pipeline travels and the associated TIN is stated in Table 9.1 below.

Table 9.1: List of Roads and Traffic Impact Numbers within Dublin City Council

Road Name	Traffic Impact Number
East Wall Road	4
Alfie Byrne Road	3
Clontarf Road	4
Howth Road	3
Copeland Avenue	3
Malahide Road R107	5
R139	4

East Wall Road (R131)

The proposed pipeline will travel along East Wall Road for a distance of approximately 860 m between Tolka Quay Road and Alfie Byrne Road. East Wall Road is a heavily trafficked route and has been assigned a traffic impact number of 4 by DCC. The road is used by traffic to/from Dublin Port/Docklands and it leads to the East Link Bridge. The section of East Wall Road which will contain the pipeline is straight and generally consists of a single carriageway with 1 (sometimes 2) lanes in each direction and a pedestrian footpath either side.

An automated junction traffic count (JTC) was carried out at the junction of East Wall Road and Bond Road/M50. The data, when analysed, indicates that the Annual Average Daily Traffic (AADT) of approximately 15,000 on the East Wall Road (just west of the junction with Bond Road/M50) with a relatively even overall daily split between eastbound and westbound traffic. The traffic patterns indicate a clear 'morning peak' in the eastbound direction between 7 am and 9 am (heading towards Dublin Port/Docklands and the Eastlink Bridge) with the peak hour traffic of 1,013 eastbound movements between 7 am and 8 am. A clear 'evening peak' is evident in the westbound direction between 4 pm and 7 pm with the peak hour traffic of 1,057 westbound movements between 5 pm and 6pm.

The trend in traffic movements on East Wall Road is presented in Figure 9.1 below.

There is at least 2 no Dublin Bus routes which run partly along this section of East Wall Road.

There are no cycle lanes along this section of East Wall Road.

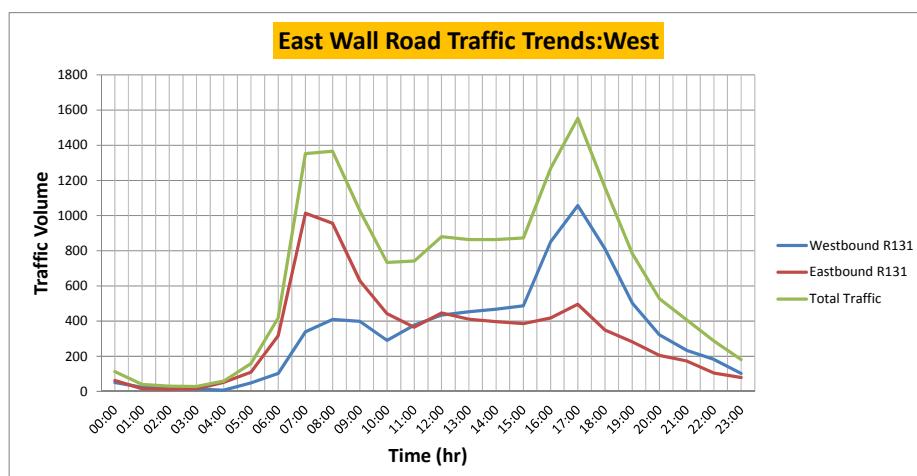


Figure 9.1: Graph showing traffic patterns on East Wall Road

Alfie Byrne Road

The proposed pipeline will follow the route of Alfie Byrne Road for its full length from East Wall Road to Clontarf Road. Alfie Byrne Road has a TIN of 3 assigned to it by DCC. The road is curved on plan and generally consists of a single carriageway road with 1 lane in each direction (with additional lanes on approaches to junctions).

It has a footpath on either one or both sides along its full length. There is also a 2 way cycle track along its full length which is categorised² as either a 'C2 Cycle Track – immediately adjacent' or a 'C1 Cycle Track - separated from road'.

The main entrance road to Eastpoint Business Park leads off Alfie Byrne Road. Eastpoint has³ over 50 companies and over 6,000 employees. A shuttle bus service runs from Eastpoint to Clontarf Road Dart Station and the Point Luas stop.

There is no scheduled Dublin Bus service along Alfie Byrne Road.

² National Transport Authority Draft Greater Dublin Area Cycle Network Plan August 2013

³ Source: Eastpoint website www.eastpoint.ie

Clontarf Road

The proposed pipeline will follow the route of Clontarf Road for approximately 370 m between Alfie Byrne Road and Howth Road. Clontarf Road runs from Marino eastwards towards Clontarf and Dollymount along the coast. It is a relatively busy road and has been assigned a TIN of 4 by DCC. Between Alfie Byrne Road and Howth Road, Clontarf Road consists of sections of both single and dual carriageway with either 1 or 2 lanes in each direction.

A bus/cycle lane runs along the west bound side with a cycle lane located on the eastbound side. The Draft Greater Dublin Area Cycle Network Plan classifies the cycle facilities on this section of Clontarf Road as 'C3 Cycle Lane – even with bus lane'.

Footpaths for pedestrians are present on both sides of the road. There is little/no potential for on street parking.

There are 2 no. regular Dublin Bus routes along this section of Clontarf Road namely the 130 and 32X services.



Figure 9.2: Clontarf Road Looking West (along westbound carriageway to rail bridge)

Howth Road

The pipeline will follow the route of Howth Road for approximately 460 m from Clontarf Road to Copeland Avenue. Howth Road runs from Clontarf Road (at southern end) north/northeast towards Howth. Howth Road has been assigned a TIN of 3 by DCC.

Along the section of Howth Road that will carry the pipeline the road generally consists of a single carriageway road with one lane in each direction. A bus lane is also in place adjacent to a stretch of the southbound lane. There is some (limited) on street parking along this section of Howth Road. A footpath for pedestrians is located on both sides of the road.

There is a limited presence of cycle lanes on this section of Howth Road and at times the cycle lane is shared with the bus lane. The Draft Greater Dublin Area Cycle Network Plan classifies the cycle facilities on this section of Howth Road as 'B1 Bus Lane – no cycle lane'.

An automated junction traffic count (JTC) was carried out at the junction of Howth Road and Copeland Avenue in May 2014.

The data, when analysed, indicates that the Annual Average Daily Traffic (AADT) is approximately 13,500 on Howth Road just south of the junction with Copeland Avenue and there is a relatively even overall split between traffic in each direction.

The traffic patterns indicate a clear morning peak southbound between 7am and 9am (peak hour 7am to 8am, 794 southbound movements) and clear evening peak northbound between 4pm and 7pm (peak hour 5 pm to 6pm, 902 northbound movements). These patterns are presented in Figure 9.4 below.

Howth Road currently forms part of the existing Quality Bus Network (QBN) and Dublin Bus operate 5 no regular bus routes along this section of Howth Road including the 29a, 31, 31A, 31B and 32.



Figure 9.3: Howth Road Looking South (taken near Junction with Copeland Av)

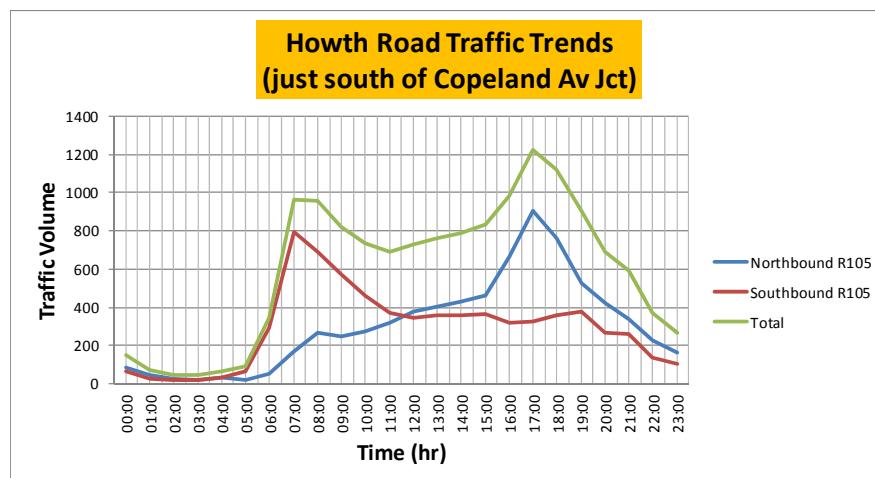


Figure 9.4: Graph showing traffic patterns on Howth Road (just south of Copeland Avenue Jct)

Copeland Avenue

The pipeline will follow along the full length of Copeland Avenue from Howth Road to Malahide Road, a distance of approximately 320 m. Copeland Avenue has been assigned a TIN of 3 by DCC. Copeland Road consists of a single carriageway with one lane in each direction. There is a footpath on both sides and there is generally an individual access to each of the circa 60 no. private dwellings along the road.

There is extensive on-street parking on both sides of the road and a number of speed ramps are in place for traffic calming through this residential street.



Figure 9.5: Copeland Avenue looking North

The automated junction traffic count (JTC) carried out at the junction of Howth Road and Copeland Avenue in May 2014, when analysed, indicates that the Annual Average Daily Traffic (AADT) is approximately 5,600 on Copeland Avenue with 46% of this traffic heading eastbound and 54% heading westbound. The traffic patterns indicate a morning peak and evening peak as shown on Figure 9.6 below.

There is no cycle facilities on Copeland Avenue.

There is no scheduled Dublin Bus service running along Copeland Avenue.

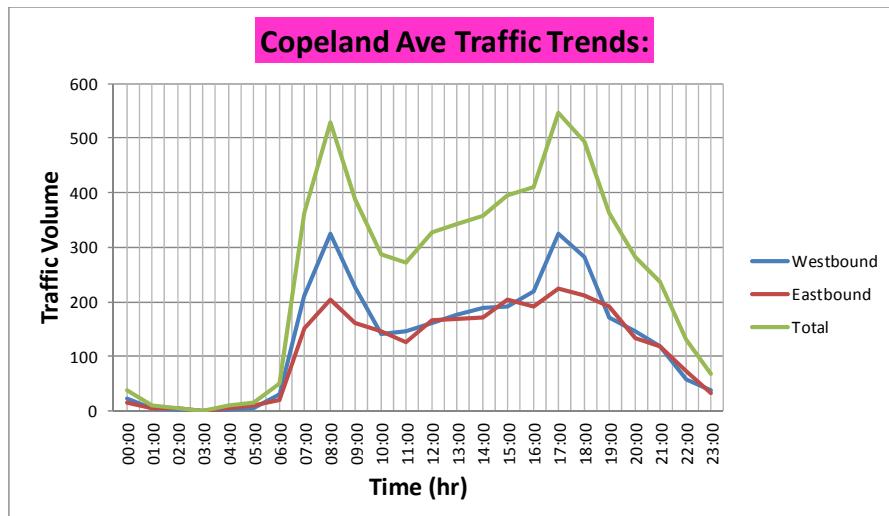


Figure 9.6: Graph showing traffic patterns on Copeland Avenue

Malahide Road R107

The proposed pipeline will follow the route of Malahide Road R107 for approximately 5 km from the junction with Copeland Avenue at the southern end to the intersection with Malahide Road R139 (old N32) at the northern end (Northern Cross). Malahide Road is a very busy road in and out of the city and has been assigned a Traffic Impact Number of 5 (highest) by DCC given its importance as a strategic traffic route. Malahide Road is also part of the existing Quality Bus Network (QBN).

Between Copeland Avenue through Donnycarney and the Artane Roundabout (roundabout with Brookfield Avenue and Ardlea Road) a distance of approximately 2.2 km, the Malahide Road generally consists of a single carriageway with a bus/cycle lane and regular traffic lane in each direction. In places additional turning lanes are in place near junctions.

A footpath is located on both sides of the road. There is generally no potential for on-street parking.

From the Artane Roundabout to Northern Cross, a distance of approximately 2.8 km, the Malahide Road generally consists of an urban dual carriageway with 2 regular traffic lanes, a bus and cycle lane in each direction separated by a grass median. A footpath for pedestrians is in place on both sides of the road. There is generally no on-street parking.

Automatic Junction Traffic Counts (JCT) were carried out on 2 separate junctions along Malahide Road in May 2014. These included the junction with Collins Avenue and at the junction with Oscar Traynor Road/Toniegee Road. The data, when analysed, indicates an AADT of approximately 26,800 on Malahide Road in the vicinity of Collins Avenue and a slightly higher AADT of approximately 27,600 on Malahide Road in the vicinity of Oscar Traynor Road and Toniegee Road.

On Malahide Road, in the vicinity of Collins Avenue, the traffic pattern indicate a clear morning peak traffic between 7 am and 9 am in a southbound direction (peak hour southbound 1,294 movements 7 am to 8 am). The evening peak traffic occurs between 4 pm and 7 pm in the northbound direction (peak hour northbound 1,471 movements 5 pm to 6 pm). These trends are indicated in Figure 9.7 below.

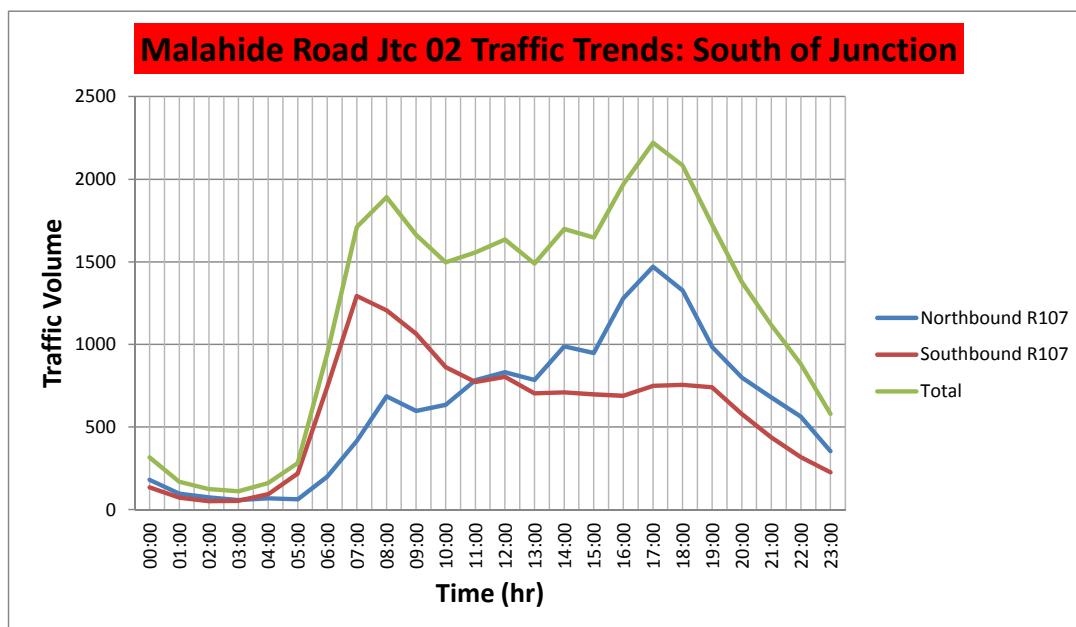


Figure 9.7: Graph showing traffic patterns on Malahide Road (just South of Collins Avenue)

Further north on Malahide Road, in the vicinity of the junction with Oscar Traynor Road near Coolock, the traffic patterns on Malahide Road are somewhat different. For example, the patterns of traffic on Malahide Road just north of the junction with Oscar Traynor Road indicate less defined peaks in the daily traffic.

A morning peak is evident between 7 am and 10 am in the southbound direction (peak hour 1,223 movements southbound 8 am to 9 am). Between 11 am and 7 pm, the flow of traffic remains at a relatively constant 900 movements per hour (approximately) in each direction. These trends are indicated in Figure 9.8 below.

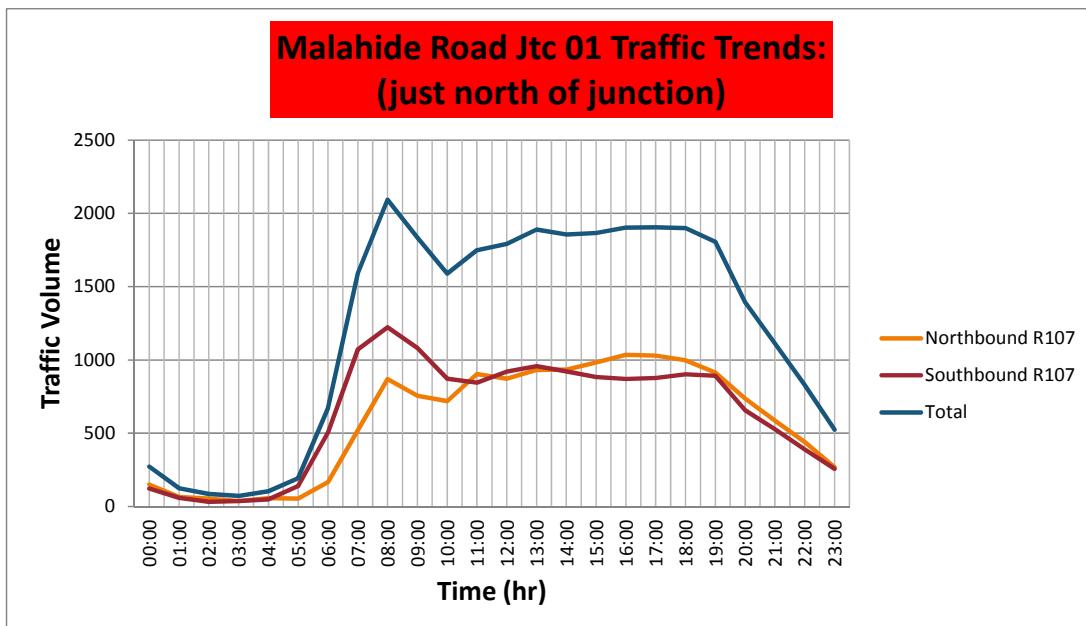


Figure 9.8: Graph showing traffic patterns on Malahide Road (just north of junction with Oscar Traynor Road)

Malahide Road currently forms part of the existing Quality Bus Corridor (QBN) and the road is served extensively by Dublin Bus with approximately 16 no bus stops along the section of Malahide Road from Copeland Avenue to Northern Cross. The bus routes which operate on Malahide Road include 14, 15, 27, 27A, 27B, 27X, 42, 43 and 104.

The Draft Greater Dublin Area Cycle Network Plan generally classifies the cycle facilities along Malahide Road as either 'B1 - Bus Lane (no cycle lane)' or 'C3 – Cycle Lane (even with Bus Lane)'.

R139 Malahide Road (old N32)

The pipeline will follow the route of the R139 (previously known as the N32), for a distance of approximately 2.7 km from the R107 Malahide Road (Northern Cross) junction to the Clonshaugh Road junction (roundabout near Bewley's Hotel Dublin Airport). The R139 (called the N32 in DCC's List) has been assigned a TIN of 4 by DCC. The R139 is a busy road which leads directly on to the M50/M1 interchange. Along the R139, the proposed pipeline will move from the functional area of DCC to that of FCC. The R139 generally consists of a single carriageway with a bus lane and one regular traffic lane in each direction separated by a hatched median. There is a footpath for pedestrians on both sides of the road.

There is general no cycle lane present and the Draft Greater Dublin Area Cycle Network Plan classifies the cycle facilities along the R139 as 'B1 - Bus Lane (no cycle lane)'.



Figure 9.9: Photo of the R139 Looking East

The National Roads Authority (NRA) maintain a permanent traffic counter on the R139 (old N32) approximately 0.5 km east of the Clonshaugh Road Roundabout. The 2013 AADT⁴ was 36,421. The peak morning traffic occurs westbound between 8 am and 9 am (1,728 movements westbound) while the peak evening traffic occurs eastbound traffic occurs between 5 pm and 6 pm (1,663 movements eastbound).

There no scheduled Dublin Bus services along the R139.

Clonshaugh Road

The proposed pipeline will travel along the route of Clonshaugh Road for a distance of approximately 1.3 km from R139 (near Bewleys Hotel) to the Athletic Union Sports Grounds. Clonshaugh Road consists of a short (circa 100 m long) section of dual carriageway with 2 lanes in each direction between the roundabouts on the R139 and that immediately outside Bewleys Hotel entrance. Elsewhere Clonshaugh Road consists of a rural single carriageway road with one lane in each direction with a hard shoulder of limited width. There is generally no footpath in place and the section of road has a pair of sharp bends just south of the Athletic Union Sports Grounds. There are no cycle facilities and no scheduled Dublin Bus Service along Clonshaugh Road.



Figure 9.10: Photo of Clonshaugh Road looking North

⁴ Source: NRA Website

M1 Motorway

The proposed pipeline will cross under the M1 motorway approximately 500 m south of Junction 2 (airport junction) using trenchless techniques. There is no proposal for any works on the motorway.

Roads within and immediately adjacent to Dublin Airport

Between the M1 crossing and the fuel depot at Dublin Airport, the proposed pipeline crosses the line of some internal airport roads in the vicinity of the long term car parks before and the Eastlands Care Hire Compound crossing beneath the R132 Swords Road (and the adjacent footpath and cycle lane) by means of a trenchless road crossing and terminating at the fuel depot.

9.4.4 Cycling

Existing Cycling Facilities

The presence or otherwise of cycle lanes has been described above with the general description of the road network. This was done as the cycle lanes, where present, are often part of the road and consist of bus lanes shared by cyclists.

The above section also presents the classification of the cycle facilities as outlined in the National Transport Authority Draft Greater Dublin Area Cycle Network Plan (August 2013). Some maps from this Draft plan, showing the existing cycle facilities in the study area are provided in Appendix 9.2 of this EIS.

Future Cycling Facilities

The proposed future network of cycling facilities is also outlined in the National Transport Authority Draft Greater Dublin Area Cycle Network Plan (August 2013) and these maps are again reproduced in Appendix 9.2 of this EIS. Table 9.2 below shows the type of the proposed cycle network along the route of the proposed pipeline.

Table 9.2: Proposed Future Cycle Network along pipeline route

Road (along the pipeline route)	Cycle Network Proposed
Tolka Quay Road	none
Bond Drive	none
East Wall Road	secondary
Alfie Byrne Road	secondary with greenway adjacent
Clontarf Road	secondary
Howth Road	primary
Copeland Avenue	secondary
Malahide Road	primary
N32	none
Clonshaugh Road	none

The categorisation of the proposed cycle network is presented in Table 9.3 below.

Table 9.3: Proposed Cycle Route Network Categorisation

(source: Draft Greater Dublin Area Cycle Network Plan)

Cycle Route Network Categorisation

NETWORK	ROUTE CATEGORY	DESCRIPTION
Urban Cycle Network	Primary	Main cycle arteries that cross the urban area and carry most cycle traffic
	Secondary	Link between principal cycle routes and local zones
	Feeder	Cycle routes within local zones and/or connections from zones to the network levels above
Inter Urban Cycle Network	Links the towns and city across rural areas and includes the elements of the National Cycle Network within the GDA	
Green Route Network	Cycle routes developed predominately for tourist, recreational and leisure purposes but may also carry elements of the utility cycle route network above. Many National Cycle Routes will be of this type.	

It is not clear what timeline is associated with the development of the proposed cycle network.

9.4.5 Proposed Bus Rapid Transit Network (BRT)

The National Transport Authority (NTA), as part of the Greater Dublin Area Investment Programme, has proposed to introduce a Bus Rapid Transit Network (BRT) for Dublin City. BRT is a high-quality, high-capacity, and effective form of public transport which runs on conventional roads and utilises priority bus lanes. The proposed buses are articulated vehicles of length 18 m with a capacity of 125 passengers.

The NTA has proposed 3 BRT schemes⁵:

- Blanchardstown to UCD
- Swords to City Centre
- Clongriffin to Tallaght

Of these three schemes the proposed Clongriffin to Tallaght line partly follows the proposed pipeline route and this BRT route is proposed to run directly along the Malahide road. The proposed route starts at the north end in the Belmayne estate located off the Malahide Road. It then travels southwards along the Malahide Road to Fairview, with seven BRT stops located along this section of the route.

An application for planning approval for the Swords to City Centre scheme is to be submitted to An Bord Pleanála early in 2015⁶. The construction dates are not known.

9.5 Summary of Key Possible Impacts

This section considers the potential impact of the proposed development without mitigation for both the construction and operational phases. Both direct and indirect impacts are considered where possible.

⁵ Source: NTA <http://www.nationaltransport.ie/bus-rapid-transit>

⁶ Source : NTA Report on public consultation <http://static.rasset.ie/documents/news/swiftway-public-consultation-report-june-2014.pdf>

9.5.1 Construction Stage Impacts – General

As described in Chapter 3 - Description of the Proposed Development the pipeline will be constructed, for the most part (est. 96% of its length), using conventional pipe laying techniques i.e. open cut trenching within a corridor along the existing road network. The proposed construction works will therefore impact on the existing use of the road network including cars, trucks, buses, cyclists and pedestrians.

The construction works, which are estimated to last for approximately 10 months, will be progressed as described in Chapter 3 – Description of the Proposed Development using 4 separate ‘crews’ working separately along the length of the pipeline. Each work sites will measure approximately 72 m long x 4 m wide.

Aside from the dedicated construction compound(s), it is proposed to carry out all the necessary works (including storage of ‘task essential’ materials and welfare facilities) within this works area. It is proposed to lay an average of 24 m (2 no. 12 m long pipe sections) each day before each works site is moved ahead as the pipeline advances.

9.5.2 Construction Traffic - Trip Generation

In order to assess the impact of the proposed construction works on traffic it is necessary to estimate the amount of construction traffic that will be generated. Table 9.4 below presents an estimate of the construction stage traffic that will be generated in the case of a typical works sites. It is estimated that approximately 45 trips per day will occur at each of the works sites (180 trips in total). Most of these trips will be associated with HGVs but some will be associated with LGVs (cars, jeeps and vans).

Table 9.4: Typical Construction Stage Trip Generation for Work Sites

Category	Purpose	Vehicle Type	No. of Vehicles	No. of Trips/vehicle	Total trip/day / works site	No. of Work Sites	Total No of Trips
Traffic Management vehicle (flat bed or similar)	TM Mobilisation (start of shift)	HGV	2	2	4	4	16
Traffic Management vehicle (flat bed or similar)	TM Demobilisation (end of shift)	HGV	2	2	4	4	16
Traffic Management vehicle (flat bed or similar)	Maintain TM	HGV	2	1	2	4	8
Low Loader	Plant Transport (excavator, road saw, whacker etc.)	HGV	1	2	2	4	8
Tipper Truck/Grab Wagon	Removal/Haulage of Spoil	HGV	2	2	4	4	16
Tipper Truck	Delivery of Bedding Material	HGV	1	2	2	4	8
Concrete Truck	Delivery of Concrete Lean Mix	HGV	1	2	2	4	8
Flat Bed with Hiab	Delivery of pipe, welding equipment etc.	HGV	1	2	2	4	8
Flat Bed with Hiab	Temp. Road Reinstatement	HGV	1	2	2	4	8
Van and trailer	Refuelling, fitters vehicle	LGV	1	1	1	4	4
Van, car or jeep	General workers vehicles	LGV	5	2	10	4	40

Category	Purpose	Vehicle Type	No. of Vehicles	No. of Trips/ vehicle	Total trip/day / works site	No. of Work Sites	Total No of Trips
Van, car or jeep	Supervisory Staff (Engineers, Health & Safety, Council staff etc.)	LGV	5	2	10	4	40
		Total No. of Trips per Works Site			45	Total (all 4 work sites)	180

9.5.3 Construction Traffic – Trip Distribution

By their nature, the locations of the works areas, will move as the pipeline is constructed. This means that the distribution of the construction traffic will also change as the works are implemented. However, the following information is noteworthy:

- 1 - 2 no temporary construction compounds will be established for the purpose of providing pipe and plant storage. The anticipated location of these construction depots is at Dublin Port and Malahide Road but this will be finalised at construction stage. A significant portion of the construction traffic will consist of vehicles travelling between the compounds and the individual works sites e.g. pipe transport, traffic management materials, general workers and supervisory personnel.
- Excavated spoil material will be directly transported from the work sites to appropriately licenced/permited landfill in the greater Dublin area. The choice of disposal site will depend on the availability of suitable sites when the works are taking place and the haulage distance to such sites.
- Concrete, bedding and paving materials will be transported to the work sites from available quarries in the general area.

9.5.4 Construction Traffic - Impacts

The estimated volumes of additional construction traffic associated with the works are relatively small (45 trip/day per work site) when compared to the numbers of vehicles using the roads each day (several thousand vehicles per day). However, without mitigation there is the potential for this construction traffic to have a direct temporary negative impact on other road users and neighbouring properties in particular in respect of the following:

- Parking - Illegal and inappropriate parking of workers vehicles leading to congestion/delay and hazards
- Speed – inappropriate speed (either too low or too high) on the public roads by vehicles associated with the project leading to congestion/delay and hazards
- Manoeuvres – inappropriate turning or access/egress manoeuvres leading congestion/delay and hazards
- Cleanliness – debris from loads and tyres being lost to the public road leading to hazardous road conditions or lack of road cleanliness.

The above items are common to all sections of the proposed pipeline project and are relatively common place for roadworks projects. Mitigation measures will be necessary and these are discussed in Section 9.6 below.

9.5.5 Construction Stage Impacts – Traffic Congestion and Delays

In terms of construction stage impacts, the proposed development has the greatest potential to cause traffic congestion and delays because of the need to work on or adjacent to the existing road network. These direct and indirect construction stage impacts are discussed in the sections below under various sections of the works.

Dublin Port

The congestion and delays that could be caused by the construction of the proposed pipeline within Dublin Port has the potential to have a direct temporary significant negative impact on the traffic in to, out of and within the Port especially due to proposed works along Bond Drive and Tolka Quay Road (east of Bond Drive). Should traffic congestion occur this could have an indirect temporary moderate negative impact on the Port operations including marine traffic (e.g. loading and unloading ships/ferries etc.).

Motorways and the Port Tunnel

The proposed pipeline will cross under the M1 motorway approximately 500 m south of Junction 2 (airport junction) using trenchless techniques. Using this technique means that the construction of the proposed pipeline is not expected to have any impact on the M50 or its traffic.

The proposed pipeline crosses over the Port Tunnel which runs beneath Alfie Byrne Road. Open cut methods will be used along this section and there will be no direct impact on the Tunnel itself.

The proposed pipeline crosses under the junction of the M50/Bond Road and East Wall Road which is one of the main roads leading to and from the southern mouth of the Dublin Port Tunnel.

However, a section of pipeline (circa 90 m in length from Tolka Quay Road to East Wall Road) was installed at this point under an 'advanced works' contract during the development of the Dublin Port Tunnel. This advanced work means that no trenching will be required across the junction and there is not likely to be any impacts on the Port Tunnel or the traffic leading to and from same.

Dublin City and Fingal Road Network

The proposed pipeline construction works will impact on the normal flow of traffic using the public road network along which the pipeline travels including East Wall Road, Alfie Byrne Road, Clontarf Road, Howth Road, Copeland Avenue, Malahide Road R107, the R139 and Clonshaugh Road. As described in Section 9.4 above, many of these roads carry large volumes of traffic each day, in particular the Malahide Road R107 (AADT approximately 27,000) and the R139 (AADT approximately 36,000). Furthermore there are extensive bus routes operating on some of the affected roads.

Without appropriate mitigation measures, the proposed construction of the pipeline has the potential to lead to traffic congestion/disruption resulting in a direct temporary significant negative impact on road users and properties which are accessed off the proposed pipeline route and this could result in to an indirect temporary significant negative impact on families, businesses and institutions which rely on the road and transport network to operate effectively.

9.5.6 Construction Stage Impacts –Dart, Rail and LUAS Lines

The proposed pipeline does not cross the line of the LUAS so there is not anticipated to be any direct or indirect impacts on the LUAS. The nearest LUAS stop is 'The Point' terminus located over 500 m away from the pipeline at its nearest point.

The proposed pipeline will cross under the Dart and Irish Rail lines on Clontarf Road. This crossing occurs immediately northeast of Clontarf Road Station, where the rail line passes over Clontarf Road on a 'rail over road' bridge. As such the construction of the proposed pipeline under and along Clontarf Road is unlikely to have any direct impact on the rail line itself. The car park and pedestrian access to Clontarf Road Station is located off Clontarf Road and the construction works could temporary block this entrance therefore the works have the potential to cause a direct temporary significant negative impact on rail commuters using Clontarf Station and an indirect temporary slight negative impact on the rail system.

The Metro North project runs to the south west of Dublin Airport with a depot and a stop proposed at Dardisatown. This project is currently on hold.

9.5.7 Construction Stage Impacts – Dublin Airport

The proposed pipeline terminates at the aviation fuel storage area in Dublin Airport approximately 500m from Airport Terminal 2. The proposed pipeline crossing under the R132 Swords Road will be carried out using trenchless techniques and therefore there will be no impact on the traffic using the R132 Swords Road during the construction works.

The pipeline will travel close to the existing long term car parking facilities east of Dublin Airport and will be laid mainly in the road with a limited section in existing hardstands to the south of the Eastlands Car Hire Compound. The construction of the proposed pipeline may have a direct temporary moderate negative impact on those using the long term car park and car hire facilities as well as the ALSAA sports grounds leading to an indirect temporary slight negative impact on the ancillary operations of the airport.

Given the location of the proposed pipeline there is not likely to be any impact on the main operations of the airport during the construction phase. However, all works within the Dublin Airport campus will need to be coordinated with the airport authorities.

9.5.8 Construction Stage Impacts – Pedestrians

The presence or otherwise of footpaths for pedestrians along the existing road network is described in Section 9.4 above. The proposed pipeline may in certain circumstances be required to be constructed under existing footpaths or the size of the proposed works area may extend onto the existing footpath rendering the footpath temporarily inaccessible to pedestrians. The majority of pedestrians are, within reason, adaptable to temporary changes in the layout of pedestrian footpaths provided that reasonable alternatives are provided. However, in other cases temporary closures to footpaths can be more disruptive include those with impaired mobility/sight or, for example, those pushing prams.

Depending on the final alignment of the pipeline within the planning corridor, the construction of the pipeline has, without appropriate mitigation measures being in place, the potential to have a direct temporary moderate to significant negative impact on pedestrians. The potential for impact on pedestrians is clearly greatest in the more populated area of the proposed development along Clontarf Road, Howth Road, Copeland Avenue and Malahide Road.

9.5.9 Construction Stage Impacts – Cyclists

The existing cycle lanes along the route of the proposed pipeline are identified, where present, in Section 9.4 which describes the existing environment. The anticipated impacts on cyclists are similar to those of other road users and pedestrians in that normal cycle route could be temporarily closed thereby temporarily negatively impacting cyclists.

9.5.10 Construction Stage Impacts – Bus Rapid Transit (BRT)

The construction dates for the Bus Rapid Transit project are not clear at this point. There is unlikely to be any impact of the pipeline construction works on the BRT project. This is discussed in cumulative impacts below.

9.5.11 Operational Stage Impacts

Once constructed and commissioned, the buried pipeline will have no impact on the road networks under normal operating conditions. There will be some operational traffic associated with staff operating and maintaining the inlet station at Dublin Port, the fuel depot at Dublin Airport and to a lesser degree the emergency shutdown valves and the leak detection system along the pipeline.

In the unlikely event of a leak in the pipeline (see Chapter 3 for discussion), the repair and clean up works will almost certainly require road works and these works will (should they be required) have a direct temporary negative impact on the road network.

The nature of the impact will depend on the location, timing and extent of the leak and any such repair works would be carried out as emergency works (including 'Emergency Roadworks') in accordance with the final Emergency Response Plan for the pipeline.

The operation of the pipeline will allow for the transfer of aviation fuel from Dublin Port to Dublin Airport without the use of fuel tankers.

As described in Chapter 2, transporting the fuel by road tanker (at current demand) results in approximately 15,000 tanker trips per year on a continuous 24 hour – 7 days a week rota. The amount of road haulage is predicated to increase in line with the projected growth of the airport passenger numbers as described in Chapter 2. The proposed pipeline has the potential to remove a significant number of these tankers from the road network, however it does not preclude road supply by fuel suppliers nor road supply in emergency situations.

Overall the pipeline will result in direct long term slight positive impact on the traffic between Dublin Port and Dublin Airport.

9.5.12 Cumulative impacts

There is a possibility that the construction programme for the pipeline could overlap with the construction programme for another project e.g. installation of other utilities, other road works, the development of the Bus Rapid Transit (BRT) project or the North Fringe Sewer Project. Should this occur then there is the potential for cumulative impacts to arise. However, the timeline for other projects is not known and therefore it is not possible to accurately quantify the impact. It should be noted, however, that other projects will also be required to apply for road opening licences. So consultation with the local authority will ensure that the risk of multiple projects working in the same areas is minimised/avoided under the road opening licence application stage.

9.6 Mitigation Measures for Road, Traffic and Transportation

This section outlines the mitigation measures to avoid or reduce the potential impact of the proposed development.

A significant amount of 'mitigation by design' has already been included in the preliminary design and route selection of the proposed pipeline. This section presents the proposed mitigation measures for both the construction and operational phase of the pipeline.

9.6.1 Mitigation by Route Selection, Advance Works and Design

Extensive work has already been carried out during the design and route selection for the proposed pipeline in order to avoid potential impacts where possible. These mitigation measures are presented below:

- Route Selection – the route selection process has taken great care to avoid areas heavily congested with existing services and to avoid narrow roads. This will minimise the potential for road closures and allow the pipeline to be constructed expeditiously. Further details in respect of the route corridor selection process are described in Chapter 2 – Background to the Development of this EIS.
- Construction Methodology – a number of short sections of the pipeline (including M1 and Swords Road crossings) will be constructed using trenchless techniques which means that the potential impact in terms of road and transportation is either greatly reduced or removed altogether.
- Advance Works (pipeline pre installation) – a section of the pipeline was installed across the junction of East Wall Road and the M50 Port Tunnel/Bond Road during the construction works for the Port Tunnel. This means that the road works on this busy junction are avoided
- Construction Programme – Any works in Dublin Airport will be subject to agreement with DAA to avoid Airports peak periods where possible.

9.6.2 Mitigation by Route Proving

An important mitigation measure on this type of pipeline project is known as 'route proving'. While the overall route corridor of the proposed pipeline is established, the precise alignment of the pipeline within the corridor is not yet defined. As each works site advances along the length of the pipeline a route proving exercise will be undertaken at the front end or just ahead of the works site in order to locate and mark existing services. The route proving process allows for the alignment of the pipeline to be diverted around any upcoming obstacles thereby preventing unnecessary delays in the main pipe laying operations.

9.6.3 Construction Stage Mitigation Measures – Traffic Management

Traffic Management Plan

The implementation of effective traffic management is vital for the successful completion of this project and in order to minimise the impact of the development on the existing road network. A Traffic Management Plan (TMP) has been prepared by GMC Utilities Group and Freeflow Traffic Management Services. GMC Utilities Group is a leading civil and mechanical engineering company with significant experience in the management and installation of underground utilities in the Greater Dublin Area. Separately, Freeflow Traffic Management Services is a specialist in the design and implementation of traffic management and are an approved DCC contractor.

The TMP includes a written report supported by a series of 18 no. traffic management drawings which detail the proposed traffic management approach for 18 key locations along the route of the proposed pipeline. The TMP and the associated drawings are included in Appendix 9.1 of Volume 3 of the EIS. The TMP should be read in conjunction with and to complement the Construction Plan which is included in Appendix 3.3 of Volume 3 of the EIS.

An example of one of the traffic management drawings is presented in Figure 9.11 below, in this case showing how traffic management will be executed on the Malahide Road at the Santry Road Junction. This drawing, and the others in Appendix 9.1, have been prepared in line with Chapter 8 of the Traffic Signs Manual (the standard used for traffic signs, markings, temporary works etc.) and clearly shows the location of cones, barriers and signage for the effective management of traffic and pedestrians for a particular location.

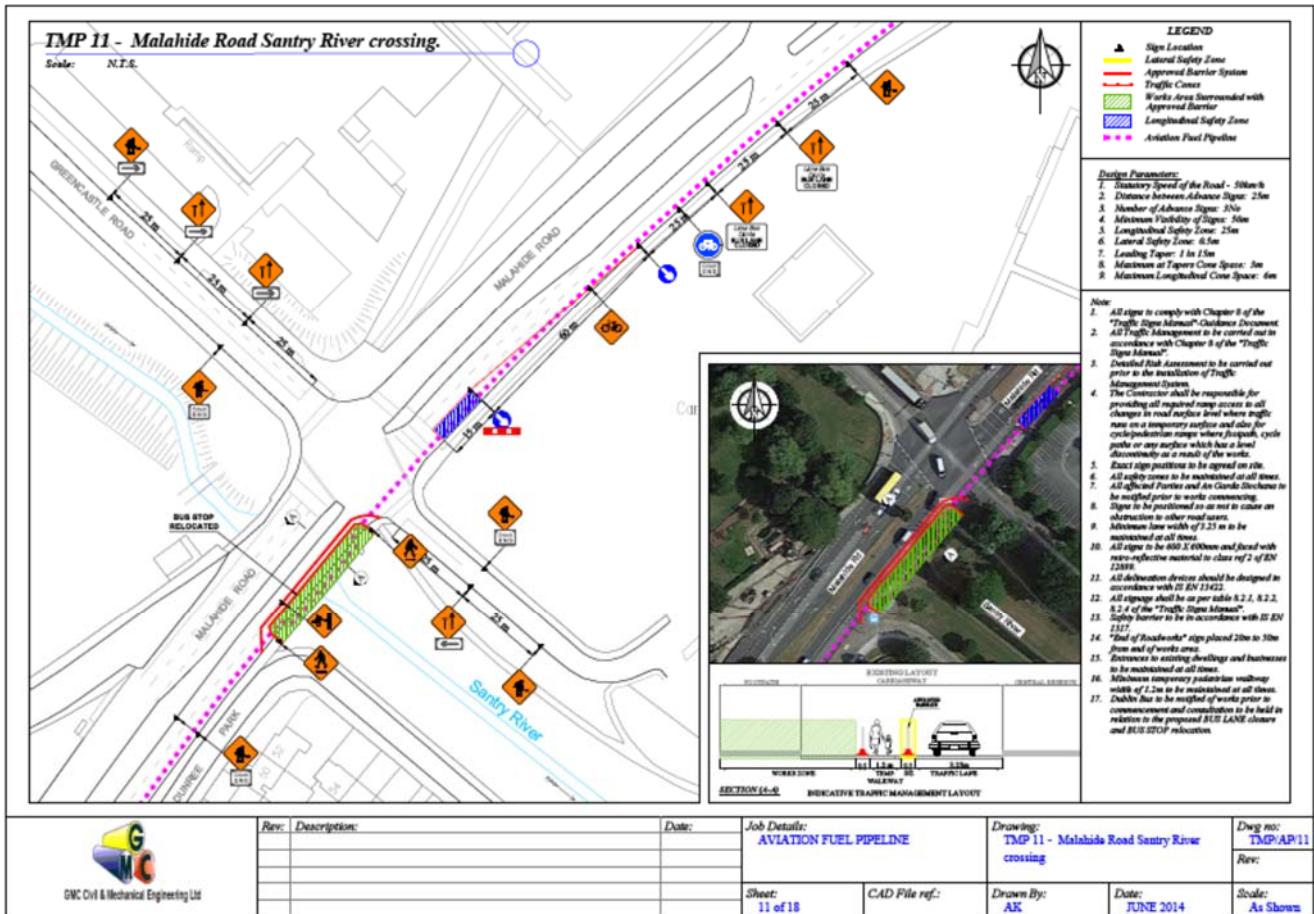


Figure 9.11: Example of a Traffic Management Drawing

In addition to the Traffic Management Plan presented in Appendix 9.1 the following mitigation measures will be implemented:

- An experienced Traffic Management Coordinator will be appointed by the Contractor to coordinate the overall approach to traffic and pedestrian management and to act as the main point of contact for the local authorities prior to and during the construction works. The Traffic Management Coordinator will be a senior member of the Contractors team and will have the authority to act on behalf of the Contractor in respect of traffic management and the overall project.
 - All staff involved in the deployment, alteration and removal of roadworks signing, lighting and guarding shall be appropriately experienced and trained e.g. CSCS Signing, Lighting and Guarding Accreditation
 - A letter drop will take place to every house and business in the vicinity of the proposed works at an agreed period of time before works commence. The extent of the letter drop will be agree in advance with the local authority to maximise its effectiveness in advising members of the public of the roadworks. The letter drop will include information about the location, nature, extent and timeline of the works and a contact name and phone number of personnel responsible for traffic and pedestrian management
 - All staff will receive a site induction before working on the project and this induction will include a detailed section on traffic management and how it applies to this project
 - All procedures in relation to specific restrictions on working hours and the proposals in respect of parking and access/egress etc. will be communicated to each member of staff working on that element of the work by the responsible member of the Contractors team.

Specific Pedestrian Related Mitigation Measures

- Pedestrians will be protected from the works by the erection of barriers and signage around the works area
- Where pedestrian footpaths are impacted by the works, alternative temporary arrangement will be put in place
- Subject to the agreement of the local authority, special provision will be made for pedestrians with impaired mobility. The requirement for special provisions will be dealt with on a case-by-case basis with due regard to the location, timeframe and availability of alternatives.

Buses and Bus Stops

- Buses and Bus Stops - Where the works area is likely to impede or block an existing bus stop, alternative temporary provisions will be planned and put in place in advance of the works so that the bus service can work effectively. Any such temporary provisions will be identified in the traffic management plan and method statements and the nature of the changes agreed with the bus company involved.

Planning and Execution of Roadworks including Road Opening Licences

- Road Opening Licences will be applied for and obtained from the relevant local authority before the works are commenced on site. The Contractor will adhere to any conditions set out by the local authority on all such licences.
- Except for the working time restrictions, which are discussed separately below, all roadworks within DCC's functional area will, unless otherwise agreed, follow the requirements of the Directions for the Control and Management of Roadworks in Dublin City (DCMR) and no works will take place without the necessary direction/permit/consents and road opening licences being in place.
- In the case of the works within the jurisdiction of FCC Dublin Port or Dublin Airport Authority the same approach will be taken and no works will take place without all necessary permits and permissions being in place.

Working Hours

- Approximately 60% of the proposed pipeline is located along roads that Dublin City Council (DCC) has classified with a Traffic Impact Number (TIN) of either 4 or 5. The permitted working hours on such roads, as stated in the Directions for the Control and Management of Roadworks in Dublin City (DCMR), are limited to the following:

TIN 4	Monday to Wednesday	19:30 to 23:00 hours
	Thursday to Friday	21:00 to 23:00 hours
	Saturday and Sunday	09:00 to 23:00 hours
	Public Holidays	09:00 to 23:00 hours
TIN 5	Monday to Wednesday	19:30 to 23:00 hours
	Thursday to Friday	21:00 to 23:00 hours
	Saturday	09:00 to 12:00 hours & 18:30 to 23:00 hours
	Sunday	09:00 to 23:00 hours
	Public Holidays	09:00 to 23:00 hours

However, the DCMR also provide for relaxations in the restrictions as stated in Section 2.7 of that document, which reads:

'In exceptional cases where, because of the nature of the roadworks being carried out it is, in the judgement of the Roadworks Control Unit, not feasible to comply with the general restrictions set out above or compliance would result in the imposition of excessive costs on the utility/company concerned, and where alternative traffic management measures (e.g. road closure) would be inappropriate, consideration may be given to relaxing these general restrictions. The prior written consent of the Roadworks Control Unit must be obtained for the relaxation of any of these general restrictions in any exceptional case.'

In order to progress the timely and efficient construction of the proposed pipeline and to ensure the viability of the project, the developer will be seeking a relaxation from DCC in respect of the allowable working times for most sections of the pipeline.

Typically, traffic volumes decline during the summer months when schools/colleges are off and many people take annual leave. Therefore, construction works will focus on the more heavily trafficked sections during July and August when traffic volumes are reduced due to school holidays.

Works Site Mobilisation and Demobilisation

- At each works site, every effort will be made to complete the necessary pipe laying works in a single mobilisation in order to minimise the length of time at any one location. The conditions of the road opening licence will be strictly adhered to in terms of working times and any other related restrictions. It is anticipated that that a range of options will be implemented in relation to mobilisation and demobilisation of the works site between working shifts. These will include:
 - a) Demobilisation on completion – in this case the traffic management measures would remain in place around the works site until the works are complete. Such a scenario can only take place if a partial/full lane closure is allowed in the road opening licence. This option will generally not be appropriate in heavy trafficked areas
 - b) Partial Demobilisation – this would involve reducing the length of the works area from 72 m long to 20 m long approximately. Steel plates will be put in place over 5 m approximately of the trench before the area is opened to traffic. In line with the conditions of the road opening licence, the works area would be expanded to the full 72 m length for the next section of pipeline
 - c) Full demobilisation – in this case the works area will be completely removed including materials and traffic management and trench backfilled/reinstated or made safe with secure steel plates to allow normal traffic to flow. This full demobilisation is envisaged where the works overlap with busy bus lanes or crossing busy junctions. Again the conditions of the road opening licence will dictate the approach adopted.

9.7 Residual Impacts after Mitigation

9.7.1 Construction Stage Residual Impacts

Notwithstanding the proposed construction stage mitigation measures outlined above, it is not possible to avoid or remove the impacts completely. The anticipated residual impact are discussed below.

The amount of additional construction traffic relating to the project is relatively small and following mitigation, is likely to be create a temporary slight negative residual impact on the existing traffic in the immediate vicinity of each works site. These works sites will move as the pipeline progresses, therefore the location of the impact will also move.

With the implementation of the mitigation measures outline above, there is anticipated to be a temporary imperceptible negative impact on rail, port and airport operations and on the M1 motorway and the Port Tunnel as a result of the construction works.

The proposed pipeline will necessitate roadworks on some relatively busy roads and these road works will have an impact on the existing traffic (including cars, buses, cyclists and pedestrians) using these roads. With the implementation of the mitigation measures described above, and provided that the pipeline is generally installed under the road carriageway and not the footpath (which is the general proposal), it is anticipated that a temporary slight negative residual impact will result on pedestrians.

As the pipeline will be largely constructed along the carriageway of the roads affected, even with the implementation of the proposed mitigation measures, there is likely to be temporary moderate or moderate/significant residual impact on the existing traffic including cars, buses and cyclists.

9.7.2 Operational Stage Residual Impacts

It is anticipated that the operational stage of the project will result in a long term slight positive impact owing to the potential of the proposed pipeline to remove over 15,000 annual HGV movements from the road network between Dublin Port and the airport.

9.8 Do Nothing Impact

If the proposed development was not to proceed there would be no construction stage impacts.

The existing practice of fuel haulage by road tanker would continue into the future. The potential to reduce the number of tankers used in the transportation of fuel from the port to the airport would not be realised if the pipeline project did not proceed.

9.9 References

1. National Transport Authority Draft Greater Dublin Area Cycle Network Plan August 2013
2. Eastpoint website www.eastpoint.ie
3. NRA Traffic and Transport Assessment Guidelines May 2014
4. National Cycling Manual www.cyclemanual.ie
5. Directions for the Control & management of Roadworks in Dublin City, DCC, June 2010
6. Draft Greater Dublin Area Cycle Network Plan, National Transport Authority, August 2013
7. NRA traffic data website <https://www.nratrafficdata.ie>
8. NRA Project Appraisal Guidelines Unit 16.1 Estimating AADT on National Roads, August 2012
9. NRA Project Appraisal Guidelines Unit 16.2 Expansion Factors for Short Period Traffic Counts, August 2012.