ARUP

Wicklow County Council

N11/M11 Bus Priority Interim Scheme

Transport Modelling Report

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This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 302905

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1. Introduction

1.1 Overview

Arup has been appointed to provide multi-disciplinary technical consultancy services for the delivery of Phase 1-4 of the TII Project Management Guidelines for the N11/M11 Bus Priority Interim Scheme (N11/M11 BPIS). The scheme aims to develop proposals for the provision of bus priority measures (both directions) during peak periods on the N11/M11 national road, which could be considered for implementation in advance of the larger, and more comprehensive N11/M11 Junction 4 to Junction 14 Improvement Scheme (which is being progressed in tandem by Wicklow County Council[1]). The targeted type of bus priority is the provision of a dedicated lane that can be used by buses/coaches during peak periods to avoid congested traffic lanes. While it is desirable that the provided lanes would be continuous, some level of discontinuity may be considered where the costs or implications of providing full continuity are considered excessive or disproportionate, within the context of an interim scheme.

The purpose of this Transport Modelling Report (TMR) is to describe the traffic forecasting that has been undertaken to inform the Phase 2 (Option Selection) of the N11/M11 BPIS. The report outlines the process of the development of the base year transport model and provides justification for the use of this model as the basis of the appraisal of the scheme options at Phase 2. The TMR also provides a basis for future year forecasting and travel demand projections.

1.2 Background and Description

The N11/M11 comprises of a motorway/dual carriageway/single carriageway for approximately 126km and runs along the east of the country connecting Dublin to Wexford. The N11/M11 forms part of the Comprehensive Trans-European Transport Network (TEN-T) providing access to and from Dublin for the southeast of the country and is a vital strategic link between Dublin and Rosslare Europort.

The section under consideration for this commission is approximately 11.5km long and extends from Loughlinstown Roundabout near Shankill, Co. Dublin in the north to N11 Junction 9 (Glenview), Co. Wicklow in the south. This section traverses two local authority boundaries, Wicklow County Council and Dún Laoghaire – Rathdown County Council. A Section 85 agreement has been entered into by both local authorities, which appoints Wicklow County Council (WCC) as the Lead Local Authority and Sponsoring Agency of the project. Transport Infrastructure Ireland (TII), acting as the Approving Authority, have appointed Kildare National Roads Office (KNRO) to project manage the delivery of the scheme.

Some sections of this portion of the N11/M11 corridor being considered fall short in terms of current road design standards, with numerous direct accesses and at grade junctions. These deficiencies impact on traffic flow conditions and result in significant congestion during the weekday morning and evening peaks and ineffective levels of service. Consequently, buses get held up in the same congestion as private cars, meaning public transport services along the commuter corridor at peak times are typically slow and unreliable.

Since the commencement of the N11/M11 BPIS in July 2020, the project has spanned two publications of the NTA's *Greater Dublin Area Transport Strategy* (hereafter, referred to as the 'GDA strategy'). The first GDA Strategy, covering the period 2016 – 2035[2], provides a framework for the planning and delivery of transport infrastructure and services within the Greater Dublin Area and identifies six regional bus corridors forming part of a Core Bus Network for the overall region.

[1] Phase 2 (Option Selection) of the N11/M11 J4-J14 Scheme concluded in late 2021, with the announcement and public display of the preferred option as described above. In January 2022, it was confirmed that funding would not be available to Wicklow County Council to progress the project to the next phase and further development of the scheme was paused. TII fully supports the future advancement of the N11/M11 J4-J14 Scheme and once funding from the Government is available, Wicklow County Council intends to recommence the planning and design of this scheme

[2] Transport Strategy for the Greater Dublin Area 2016 – 2035, National Transport Authority (2016). Available from: https://www.nationaltransport.ie/wp-content/uploads/2016/12/Transport_Strategy_for_the_Greater_Dublin_Area_2016-2035.pdf.

This core network is intended to serve significant origins and destinations within the GDA, particularly those that are not directly served by heavy and light rail. The core bus network will also provide greater opportunity for reliable and convenient interchange with other transport modes. As outlined in the GDA Strategy, in order to develop an efficient, reliable and effective bus system, the core bus network should be developed to achieve;

- Continuous priority for bus movement on the portions of the Core Bus Network;
- Enhanced bus lane provision on these corridors; and
- Removal of current delays on the bus network, enabling the bus to provide a faster alternative to car traffic along these routes.

A more efficient core bus system with faster bus journeys means that more people can be moved with the same level of vehicle and driver resources.

The N11/M11 route has been identified within the GDA Strategy as one of the core radial bus corridors. A revised transport Strategy for the GDA (titled the *Greater Dublin Area Transport Strategy 2022 – 2042*[3]*)* was published in 2022. This updated strategy reinforces the commitment of the NTA to develop the 'Regional Core Bus Corridors' for bus travel originating outside the metropolitan area.

1.3 Study Area and Extent of Scheme

The extent of the N11/M11 BPIS covers the section of existing N11/M11 route extending from Loughlinstown Roundabout in the north to Junction 9 (Glenview) in the south, as shown in Figure 1-1. This represents a scheme length of approximately 11.5 km. As noted above, this section of the corridor traverses two local authority boundaries. The northern 4.9 km of the scheme lies within the jurisdiction of Dún Laoghaire-Rathdown County Council (DLRCC) while the remaining 6.6 km lies within the jurisdiction of Wicklow County Council (WCC). The scheme covers sections of the existing route both designated as Motorway and Type 1 Dual Carriageway. It is within this 11.6km length of the existing route that the option selection process has examined the viability, type and optimal extent of bus priority to be provided. The specific area analysed within the transport modelling assessment is presented in Figure 1-2.

[3] Greater Dublin Area Transport Strategy 2022 – 2042, National Transport Authority (2022). Available from: Greater-Dublin-Area-Transport-Strategy-2022-42-1.pdf

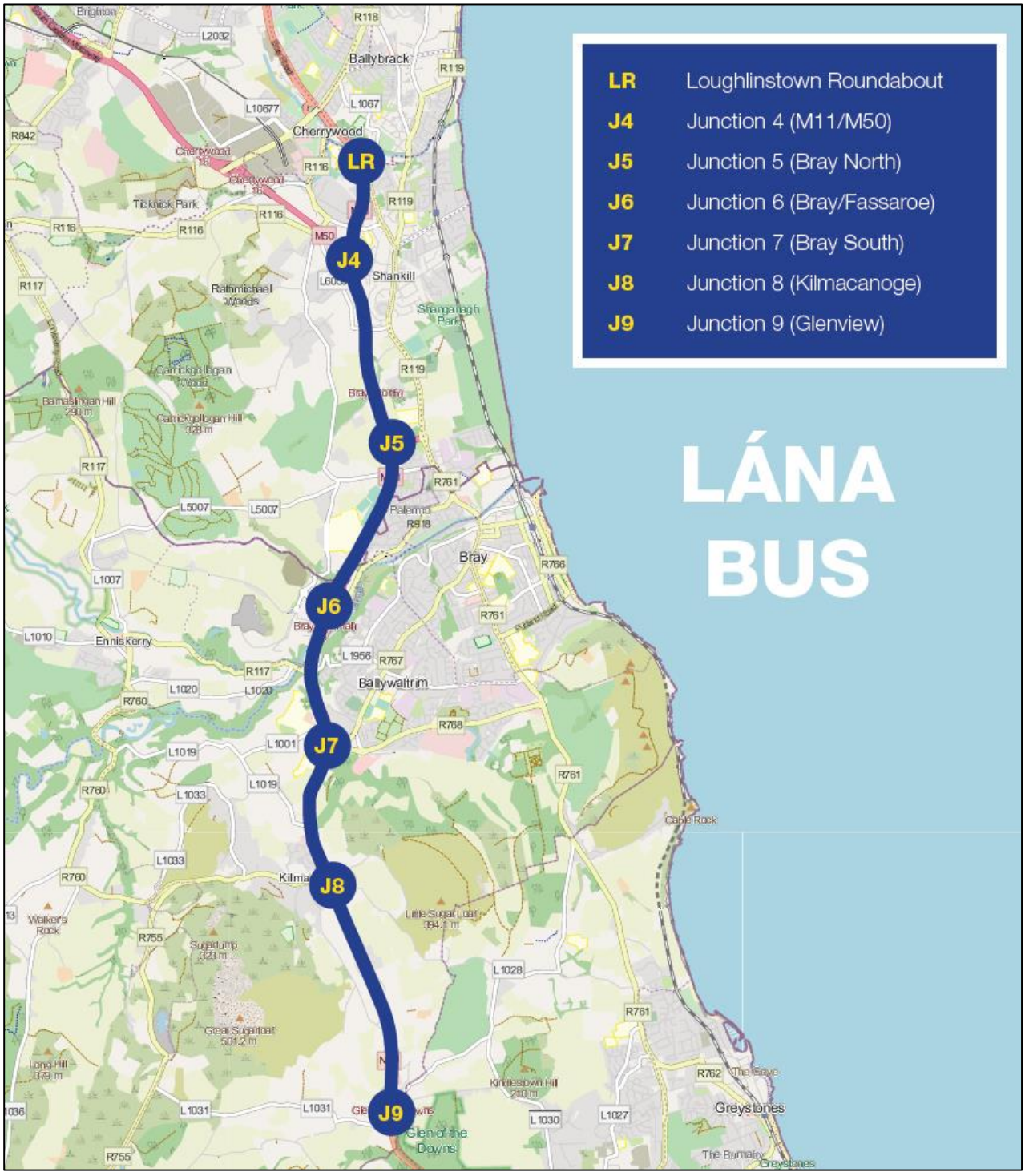


Figure 1-1 N11/M11 BPIS scheme extents

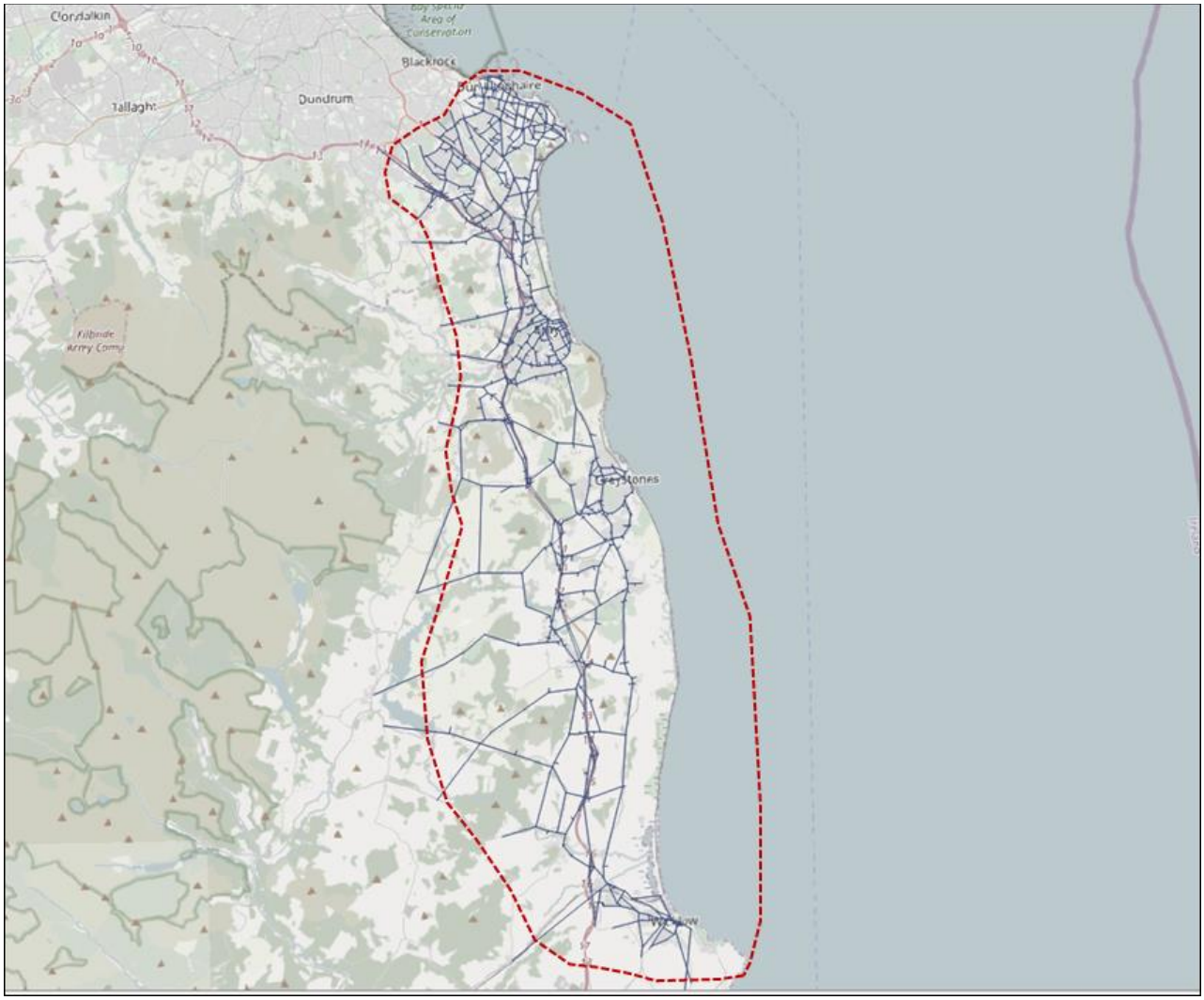


Figure 1-2 N11/M11 BPIS Local Area Model (LAM) network

1.4 Project Objectives

On the basis of the characteristics of the existing road corridor and responding to the aspirations of national and strategic policy documentation, a series of defined objectives were developed at the outset of the N11/M11 BPIS Project. In accordance with the TII Project Appraisal Guidelines and the Department of Transport Common Appraisal Framework (CAF)[4], objectives were established under each of the following criteria:

- Economy;
- Safety;
- Environment;
- Accessibility and Social Inclusion;
- Integration; and
- Physical Activity.

[4] Department of Transport Common Appraisal Framework (CAF) for Transport Projects and Programmes (October 2020). It is noted th at the Transport Appraisal Framework (TAF) was published by the Department of Transport in June 2023 and replaces the CAF. The requirements of the revised TAF guidance will be applied as the N11/M11 BPIS Project moves to the next phases (i.e. Phase 3 and subsequent phases).

The objectives, which are presented in Table 1-1, are intended to allow a focused definition of options which can be examined both quantitatively and qualitatively against a series of required outcomes. These objectives have been subject to periodic review as the project has developed and evolved, with updates made to certain objectives and new objectives added under certain criteria since project inception.

The most recent review of the Project Objectives was undertaken in February 2024, as part of the commencement of and to inform a revisit of Phase 2 in early 2024. The objectives listed in Table 1-1 are the current project objectives as defined following this most recent review undertaken in Phase 2.

Table 1-1 N11/M11 BPIS Project Objectives

Criteria	Project Specific Objective
Economy	**Economy Objective 1:** • To increase the people carrying capacity of the N11/M11 between Loughlinstown Roundabout and Junction 9 (Glenview) **Economy Objective 2:** • Deliver an interim transport solution capable of delivering value for money **Economy Objective 3:** • Generate positive economic benefits to public transport users by: – Reducing bus journey times – Improving bus journey time reliability
Safety	**Safety Objective 1:** • To deliver bus priority measures which are clearly delineated and understood by general road users and bus drivers in the environment of an inter-urban route. **Safety Objective 2:** • Ensure bus priority can be delivered without adversely impacting on the safety of all road users. **Safety Objective 3:** • To enhance the operational safety of the N11/M11 Corridor.
Environment	**Environment Objective 1:** • To provide for more sustainable transport solutions on the N11/M11 corridor, supporting a balance of alternative modes and enabling a reduction in private car dependency and reducing the carbon intensity of travel. **Environment Objective 2:** • To minimise impacts to sensitive ecological sites, well-established communities, heritage and amenity resources.
Accessibility and Social Inclusion	**Accessibility & Social Inclusion Objective 1:** • To support an increase in bus patronage along the N11/M11 corridor and enable sustainable travel to provide a faster and more reliable choice. **Accessibility & Social Inclusion Objective 2:** • To support improved access to the GDA for all transport users along the N11/M11 corridor.
Integration	**Integration Objective 1:** • To deliver an interim transport solution which does not introduce significant constraint on the subsequent development of the N11/M11 Junction 4 to Junction 14 Improvement scheme. **Integration Objective 2:** • To support integration of road-based transport with other transport modes. **Integration Objective 3:** • To complement wider government transport policy.
Physical Activity	**Physical Activity Objective:** • To provide a facility that allows for the delivery of an attractive alternative mode of transport for communities which supports the creation of a healthier urban environment for active travel, through congestion relief.

1.5 Reference Case Scenario

A number of transportation proposals for the study area, largely outlined in the National Transport Authority's (NTA) GDA Strategy have the potential to significantly impact on the future transport demand and consequent proposals for the N11/M11 Bus Priority Interim Scheme. In particular, these proposals include Bus Connects, Metrolink, M50 multi-point tolling, M11 tolling and enhancements to the heavy and light rail network.

The NTA's 'Reference Case' Eastern Regional Model (ERM) model currently includes all of the GDA Strategy schemes for the year 2042.

Given the potential impact these proposals are likely to have on the projected demand along the N11/M11 corridor and the statutory basis of the GDA Strategy, it is proposed that these schemes should be included in all tests carried out during Phase 2 (Option Selection) of the N11/M11 BPIS project.

Therefore, in effect, these schemes included in the GDA Strategy form a Reference Case option for the N11/M11 BPIS against which the performance of all other scheme options and alternatives are measured against. This Reference Case option therefore encompasses both "committed" and "planned" interventions, reflecting the projected roll-out of the GDA Strategy up to the years 2027 and 2042 as defined in the National Development Plan (NDP). It is considered that this approach provides a robust basis for evaluating the performance of scheme options and alternatives for the following reasons:

- The GDA strategy is an approved statutory plan for the area providing a framework for investment in transport within the region up to 2042
- The future year demand forecasts are aligned with National Planning Framework (NPF) population forecasts which contain significant amounts of growth for the study area corridor and Dublin city. The GDA Strategy therefore provides a consistent basis for the likely future environment that is consistent with Government plans and policies such as:
  - National Investment Framework for Transport in Ireland (NIFTI);
  - National Planning Framework (NPF); and
  - National Development Plan (NDP).

  Therefore, it provides a consistent basis for the comparative assessment of the various N11/M11 options and alternatives in Phase 2;
- The use of the GDA strategy as the basis for the Reference Case avoids bias towards which schemes to incorporate. In particular, adopting the GDA Strategy will ensure that all public transport options assessed as part of this project in Phase 2 will be given the best chance possible to meet the project objectives. Therefore, this approach will ensure that there is no bias towards schemes or proposals which enhance vehicular capacity and that the best option for all modes is selected;
- Schemes within the GDA Strategy are a means to deliver a set of objectives of the Strategy. It is a live and evolving document, but the optimal outcome of aiming to accommodate all future growth in travel demand on sustainable modes underpins the Strategy and is a firm commitment of the NTA;
- The approach will mean that the assessment of this project is aligned with the assessment of other major projects for the Greater Dublin Area, including Bus Connects and MetroLink.

It is recognised that the inclusion of "planned" measures aligning with the GDA Strategy proposals adds an element of risk to the assessment within Phase 2 as private vehicle road traffic demand on the corridor will be reduced compared to a "committed" scheme only reference case scenario. The reference case and demand levels, however, are consistent across all options, so would not impact on the selection of the Emerging Preferred Option.

During Phase 3 (Design and Environmental Evaluation), the central scenario will be based on "committed" schemes only with sensitivity analysis undertaken on the impact of "planned" schemes which are not fully committed, so this risk will be removed in subsequent phases.

Further Details on the Reference Case schemes assumed to be in place for the opening and design years, is included in Appendix A of this report.

1.6 Proposed Scheme Options

The Phase 2 Option Selection process broadly aligns with the TII Project Management Guidelines (PMGs), involving a detailed appraisal of options against a defined set of criteria in a staged process as follows.

- The **Stage 1 Appraisal** focussed on the various cross-sectional arrangements for providing bus priority on the carriageway – three options were assessed under the headings of Engineering, Environment and Economy, as follows:
  - **Option 1:** Nearside bus priority
  - **Option 2:** Offside bus priority
  - **Option 3:** Median contra-flow bus lane.

  Option 1 – Nearside Bus Priority, as illustrated in Figure 1-3, was identified as the preferred option to take forward to the Stage 2 Appraisal.



Figure 1-3 Option 1 – Nearside bus priority

- **The Stage 2 Appraisal** focussed on determining the optimum extent of bus priority which can be delivered between Loughlinstown Roundabout and Junction 9 (Glenview) which best meets the scheme objectives. For assessment purposes, the overall scheme extent was split into three Sub-Schemes (A, B & C), as follows:
  - **Sub-Scheme A** runs from Loughlinstown Roundabout to Junction 6 (Bray/Fassaroe)
  - **Sub-Scheme B** runs from Junction 6 (Bray / Fassaroe) to Junction 8 (Kilmacanogue)
  - **Sub-Scheme C** runs from Junction 8 (Kilmacanogue) to Junction 9 (Glenview)

Figure 1-4 illustrates the location and extent of each sub-scheme.

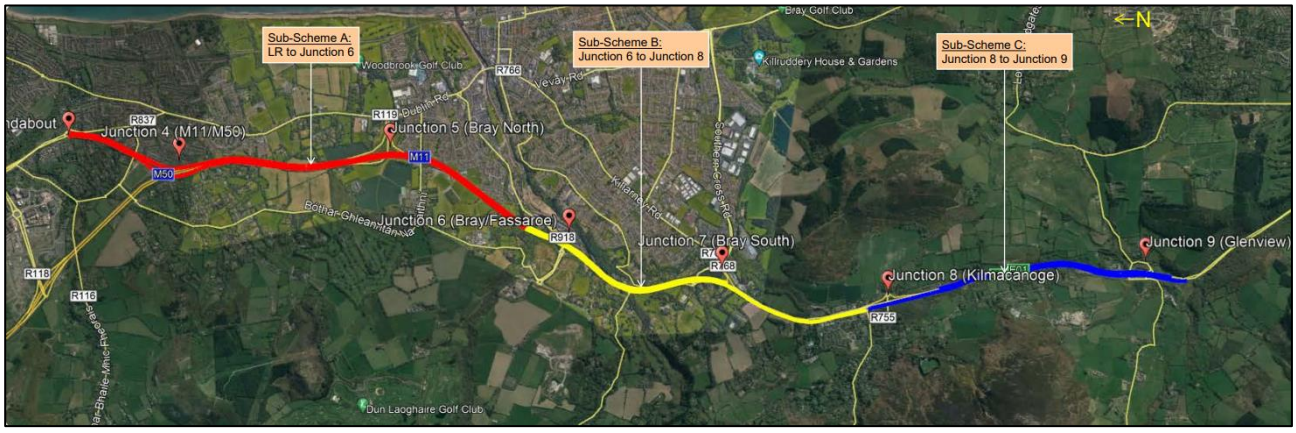


Figure 1-4 N11/M11 BPIS Sub-Scheme extents

- The **Stage 2 Appraisal** has been completed in three steps, as follows:
  - **Long-List Sifting of Options:** this focussed on developing numerous options to overcome the specific challenges to providing bus priority. The exercise primarily focussed on Sub-Schemes B and C, with a view to identifying options for closing intermediate junctions/accesses which would otherwise impede bus priority and present conflict points. This stage also sought to identify options for providing active travel facilities to avoid hard shoulder conflicts with vulnerable road users. Options were assessed against project objectives, with feasible options progressed to Stage 2A.
  - **Stage 2A:** Having advanced a number of feasible options from the long-list sifting, the focus of the Stage 2A Appraisal was to identify the preferred options for closing accesses and providing for active travel within each of Sub-Schemes B and C.
  - **Stage 2B:** Finally, the Stage 2B Appraisal sought to determine the overall optimal extent of bus priority which can be delivered between Loughlinstown Roundabout and Junction 9 (Glenview). The aim of this stage was to determine if the final scheme should consist of all sub-schemes combined, or just one or two of the sub-schemes.

This Transport Modelling Report considers the options for Sub-Schemes A, B and C as part of the Stage 2B appraisal. More detailed descriptions of the options assessed are presented in Section 6.2.

1.6.1 Junction Treatment

A key factor in the operational effectiveness of the nearside bus lane is likely to be the level of priority that can be afforded to buses as they pass through the major junctions along the route.

At major junction locations, a concept known as Through Junction Running (TJR) is proposed. This approach involves transitioning the nearside bus lane into the merge / diverge running lane and extending the lane 'through' the junction. TJR avoids the need for a bus to exit and re-enter the mainline at the junction and eliminates potentially hazardous weaving manoeuvres should the bus wish to leave the bus lane to stay on the mainline.

At diverges, the layout, as shown in Figure 1-5, has been applied. As a bus approaches the junction, bus priority ends as indicated by the end of the purple hatching. A bus must then share the auxiliary diverge lane with general diverging traffic. A bus can re-enter the mainline bus lane however by diverging from the slip road into the lane denoted by purple hatching.

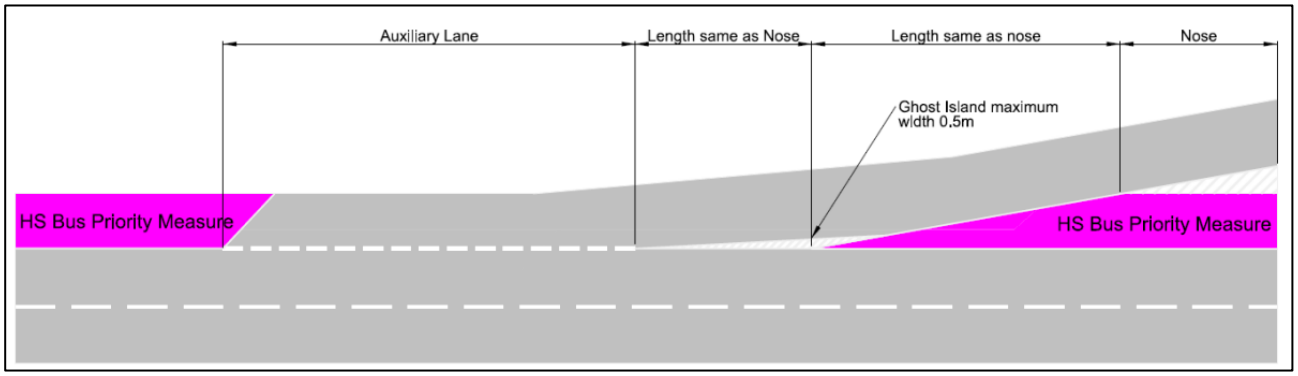


Figure 1-5 Through Junction Running (Diverges)

At major junction merges, the layout as shown in Figure 1-6 has been applied. As a bus approaches the junction merge, dedicated bus priority temporarily ends as the lane transitions into an auxiliary lane as indicated by the end of the purple hatch. A bus must then share the auxiliary lane with general merging traffic for a distance equal to twice the auxiliary lane length plus twice an auxiliary lane taper length. General traffic must merge onto the mainline. Bus priority then recommences along the mainline as denoted by the tapered purple hatching.

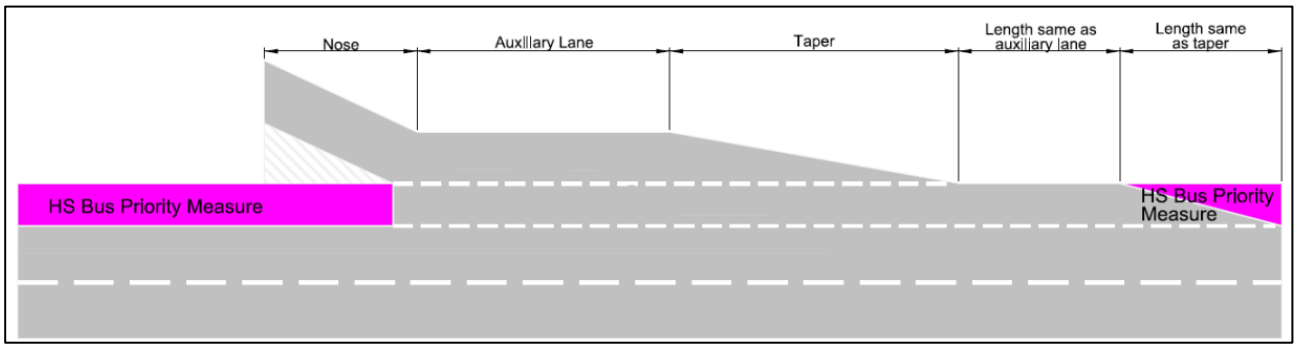


Figure 1-6 Through Junction Running (Merges)

1.7 Existing Conditions

The study area for the N11/M11 BPIS is, to a degree, already served by public transport systems including a heavy rail network along the coastline, a light rail network at the extreme northern end (Luas Green Line) and a public bus network. Notwithstanding this, the public transport mode share for all trip purposes stands at just 11%, with car mode share for all trip purposes standing at 70%[5].

This overreliance on private car use is a major contributing factor to the peak congestion problems experienced on the N11/M11 and emphasises the need to consider alternatives to traditional road capacity enhancement which may achieve the project objectives by:

- Reducing highway demand on the N11/M11 through increased mode shift to public transport; and
- Improve the transport carrying capacity of the N11/M11 by placing a design focus on maximisation of person throughput rather than vehicle throughput.

Studies undertaken in support of the scheme have highlighted the extent of operational issues affecting the capacity, reliability and safety of the N11/M11 corridor, which include:

- The existing N11/M11 was not designed to accommodate the traffic volumes it currently experiences and is heavily congested and inefficient during the AM and PM peaks. In the absence of intervention, this situation will continue to worsen.

[5] Transport Strategy for the Greater Dublin Area 2016 – 2035, National Transport Authority (2016). Available from: https://www.nationaltransport.ie/wp-content/uploads/2016/12/Transport_Strategy_for_the_Greater_Dublin_Area_2016-2035.pdf.

- The integration of the existing N11/M11 route with other transport modes is highly inadequate. Mode choice is constrained, and bus services must also negotiate heavy congestion and are therefore subject to the same unreliability of journey time – all of which make existing bus services unattractive and fosters an unsustainable dependency on the private car.

- Unreliability of journey time, particularly during the AM and PM peaks, stymies the intended function of the N11/M11 as an efficient transport corridor – including for the existing public transport services which operate along the route. This in turn detracts from investment potential in the areas of tourism, employment and recreation. Congestion issues inhibit economic prospects at a local and regional level and pose a significant quality of life constraint on those forced to use the corridor for business and social needs.

1.7.1 Existing Traffic Flows

Table 1-2 details the Average Annual Daily Traffic (AADT) flows on each section of the N11/ M11 as observed by TII permanent Traffic Monitoring Units (TMUs) across the years 2019 to 2024. These values have also been compared to the typical design capacity for the associated section of road. The location of these AADT values is shown in Figure 1-7.

Table 1-2 AADT on N11/M11 (2019 – 2024)

AADT Point	Location	AADT						Typical Capacity
		2019	2020	2021	2022	2023	2024	
1	M50 between J16 & J17	49,641	37,298	37,291	-	52,553	54,049	55,500
2	M11 between M50/M11 & Bray North Junction	78,137	53,975	64,819	75,929	78,611	80,679	82,500
3	M11 between J5 & J6	70,223	51,639	58,308	67,866	67,820	72,517	55,500
4	N11 between J8 & J9	52,462	40,222	45,974	54,119	51,153	57,567	42,000
5	N11 between J13 & J14	36,838	28,645	32,780	37,702	38,079	43,249	42,000

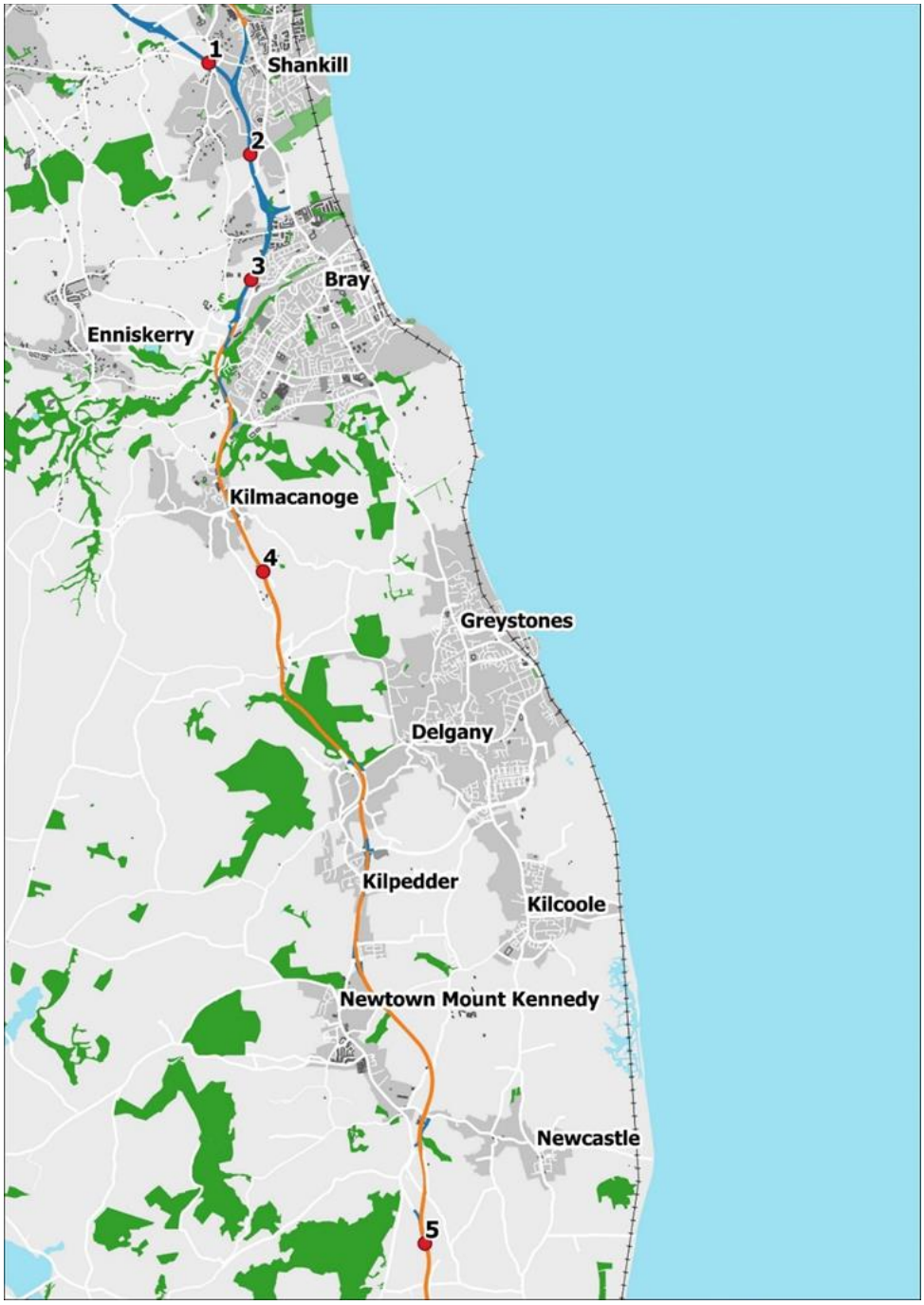


Figure 1-7 AADT locations

Analysis of permanent traffic counters along the N11/M11 shows that while volumes reduced during the period 2020 – 2021 as a result of Covid 19 restrictions, these have since recovered, with 2024 levels now exceeding 2019 at all locations measured.

Table 1-2 shows that three locations (locations 3, 4 and 5) on this section of road experience traffic flows in excess of typical capacity. These sections experience traffic levels between 3% - 37% above the recommended design capacity (level of service D). At Level of Service D, speeds begin to decline slightly with slight increase of flows and density begins to increase somewhat more quickly. Freedom to manoeuvre within the traffic stream is more noticeably limited, and the driver experiences reduced comfort levels. Traffic levels far in excess of the design capacity can be expected to result in significant delays and congestion.

1.7.2 Existing V/C Analysis

Volume over Capacity (V/C) is a commonly used index to assess the performance of links and junctions.

In general, a V/C of greater than 100% means that demand through the link/junction exceeds capacity leading to significant congestion and delay. Typically, links/junctions with V/C in excess of 85% are regarded as suffering from traffic congestion.

Link V/C data has been extracted from the N11/M11 Local Area Model for the base year (2019) AM and PM Peak Hours and is shown in Figure 1-8 and Figure 1-9.

The AM analysis shows that the majority of the N11/M11 between J4 – J10 in the northbound direction has a volume over capacity of over 75% with several sections experiencing a V/C of over 85% (between J6 and J8).

The PM analysis shows that the majority of the N11/M11 between J4 – J10 in the southbound direction has a volume over capacity of at least 75% with most sections experiencing a V/C of over 85% (particularly between J6 and J10).

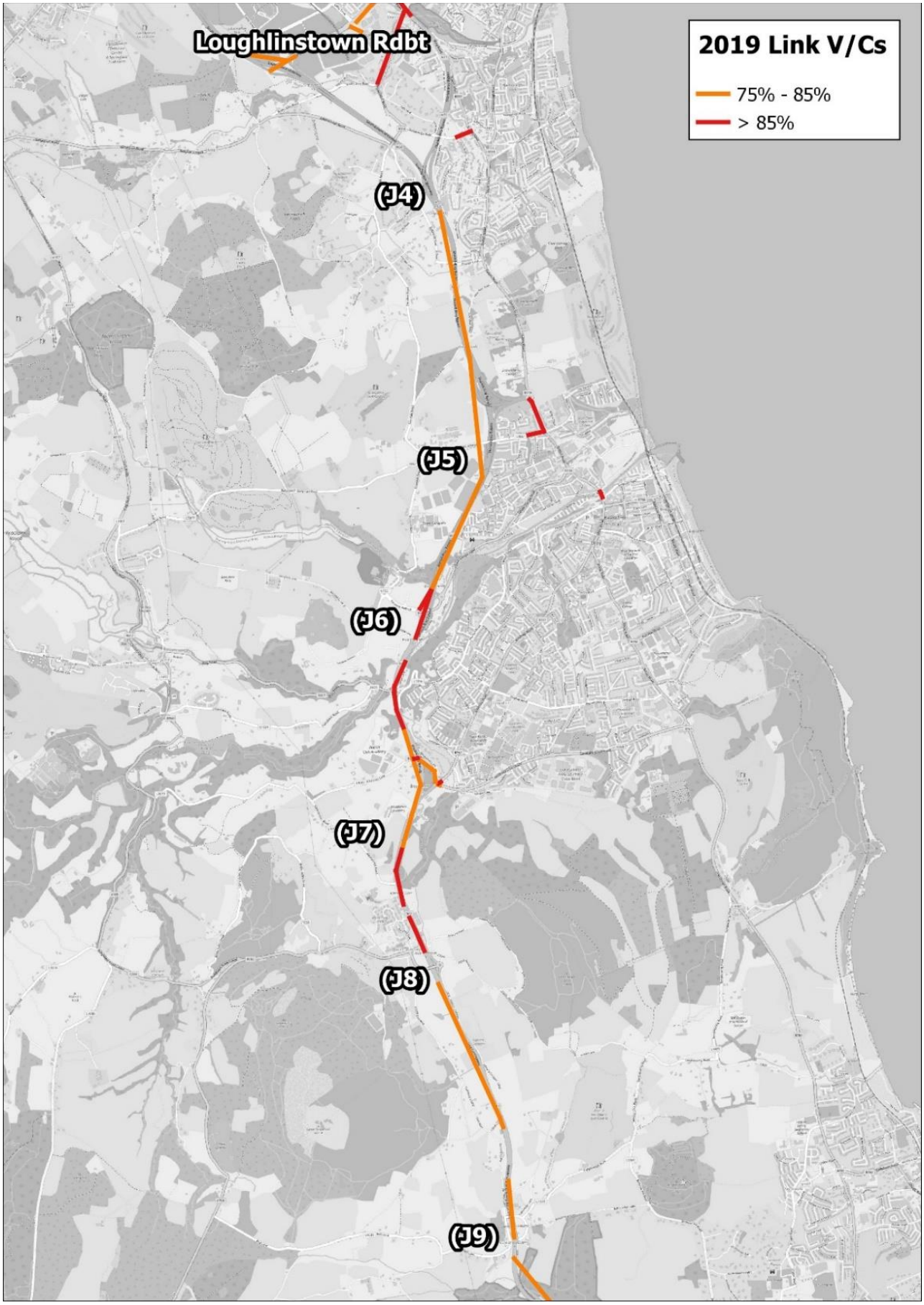


Figure 1-8 2019 AM V/C analysis



Figure 1-9 2019 PM V/C analysis

1.7.3 Journey Time and Speed Assessment

1.7.3.1 Northbound Summary

Journey time data collected using moving observer surveys (discussed in more detail in Chapter 2 of this report) showed that in the northbound direction, during the AM peak hour (08:15-09:15), the overall journey time, between Junction 14 and Junction 4, was 20 minutes equating to an average speed of 72km/h. The average journey time under free flow conditions for this journey is approximately 14 minutes, suggesting a delay of 6 minutes in the morning in the northbound direction.

It should be noted that, while the AM peak hour, in terms of total traffic volume within the study area, has been defined as 08:15-09:15, the slowest journey times along the route in the northbound direction were actually observed from 07:00-07:30, with an average journey time of 26 minutes. This indicated that the average speed for the journey at this time is 55km/h with a total of 12 minutes delay experienced. This reflects that fact that the peak hour varies along the length of the corridor, and that traffic towards the south of the N11 (e.g. Wexford, Gorey, Arklow, etc) are travelling for periods longer than one hour and will need to begin their journey quite early if they are to reach their destinations in Dublin City Centre by typical work start times (i.e. 09:00). It may also be reflective of the fact that a lot of traffic along this corridor might start their journeys earlier in order to avoid peak hour congestion further north towards Dublin City Centre.

Figure 1-10 to Figure 1-12 presents additional speed data obtained from the TII Traffic Monitoring Units (TMUs) in the northbound direction. The TMUs record spot speeds at each monitoring unit location and the figures below present mean values across the 24-hour period from data collated across 2019.

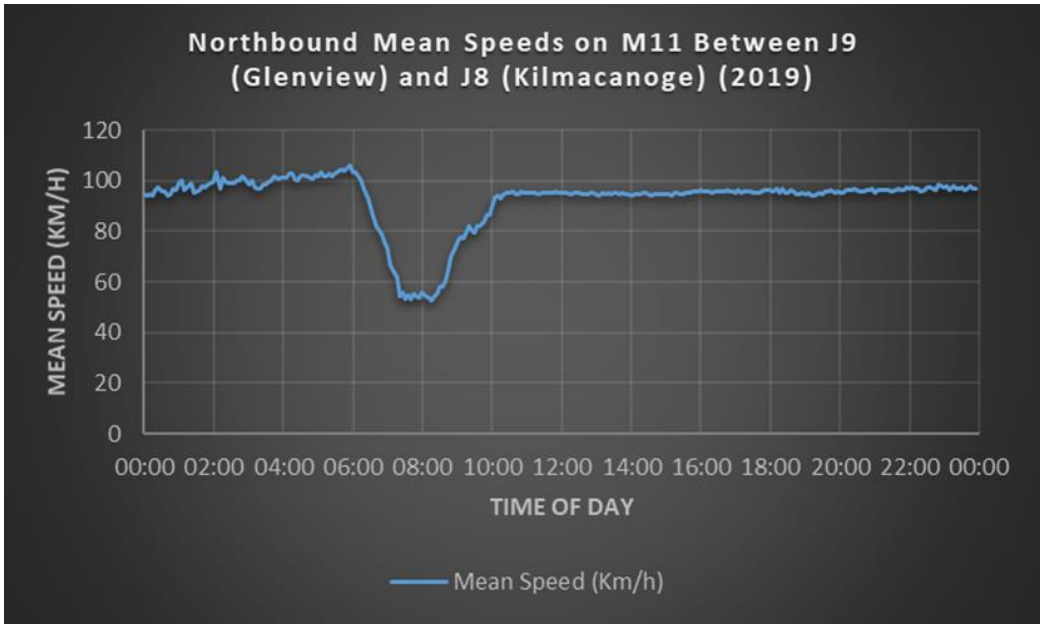


Figure 1-10 Northbound mean speeds on N11 between J9 (Glenview) and J8 (Kilmacanogue)

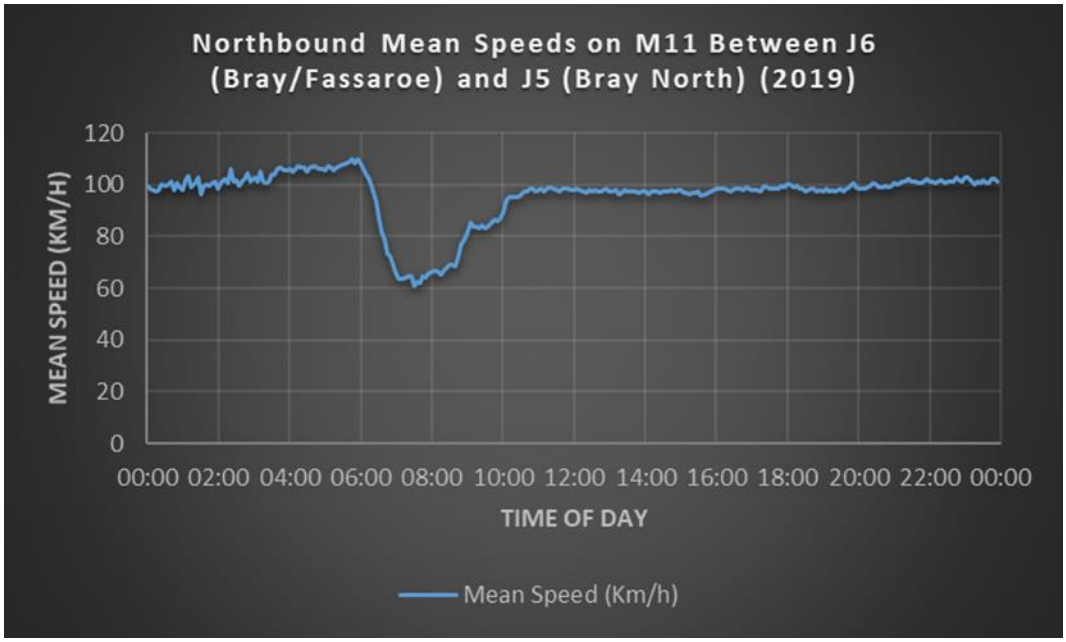


Figure 1-11 Northbound mean speeds on N11 between J6 (Bray/Fassaroe) and J5 (Bray North)

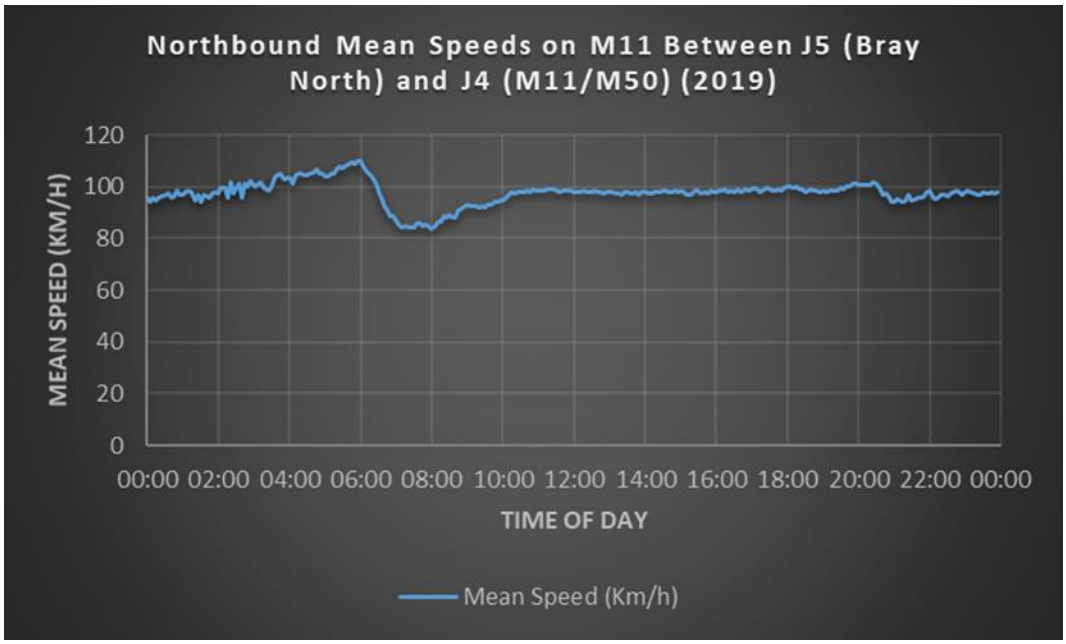


Figure 1-12 Northbound mean speeds on M11 between J5 (Bray North) and J4 (M11/M50)

The above figures are particularly useful in understanding the duration of the AM peak and the degree to which journey delay extends across the AM period. Between Junction 9 (Glenview) and Junction 8 (Kilmacanogue), speeds drop sharply from 06:00, only returning to average levels close to 10:00.

1.7.3.2 Southbound Summary

For the southbound direction the average journey time for the entire route during the PM peak was 22 minutes, equating to an average speed of 68km/h. The average journey time under free flow conditions for this journey is approximately 15 minutes, suggesting a delay of 7 minutes in the PM Peak in the southbound direction.

Figure 1-13 to Figure 1-15 presents speed data obtained from the TII TMUs in the southbound direction. The TMUs record spot speeds at each monitoring unit location and the figures below present mean values from data collated across 2019. Again, these figures provide clear evidence of the severity and duration of PM peak delay, with mean speeds dropping sharply before 16:00 and only recovering close to 19:30 between Junction 4 (M11/M50) and Junction 5 (Bray North).

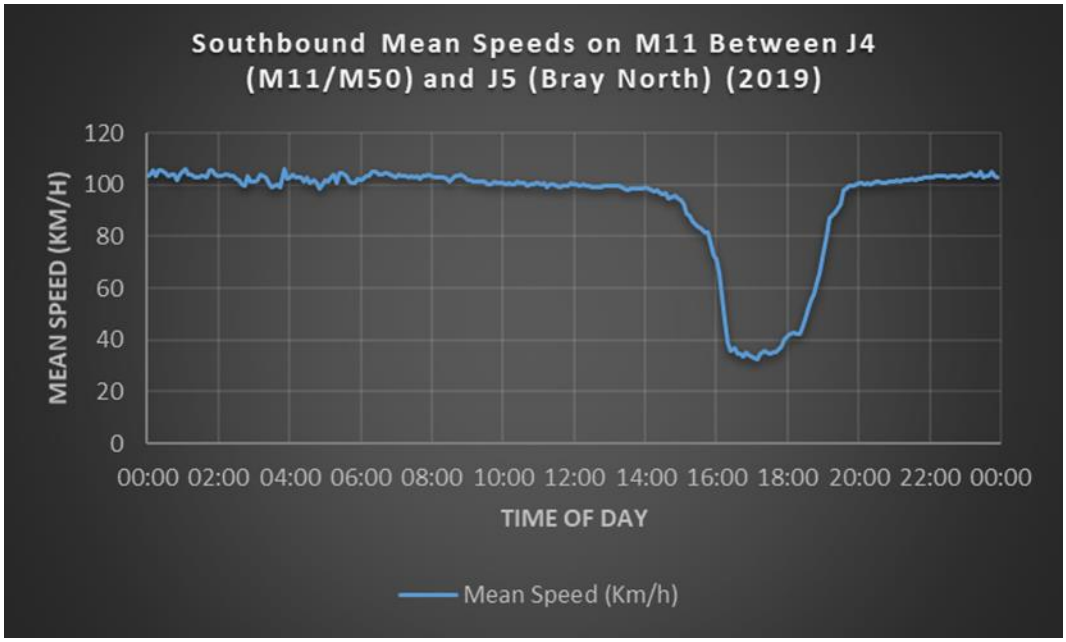


Figure 1-13 Southbound mean speeds on M11 between J4 (M11/M50) and J5 (Bray North)

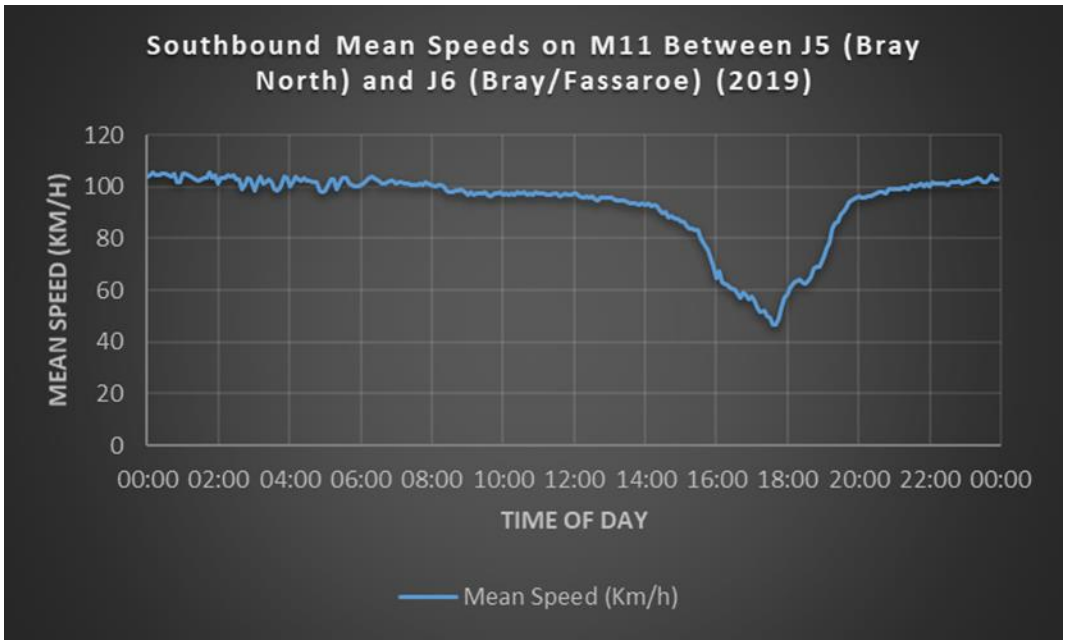


Figure 1-14 Southbound mean speeds on N11 between J5 (Bray North) and J6 (Bray/Fassaroe)

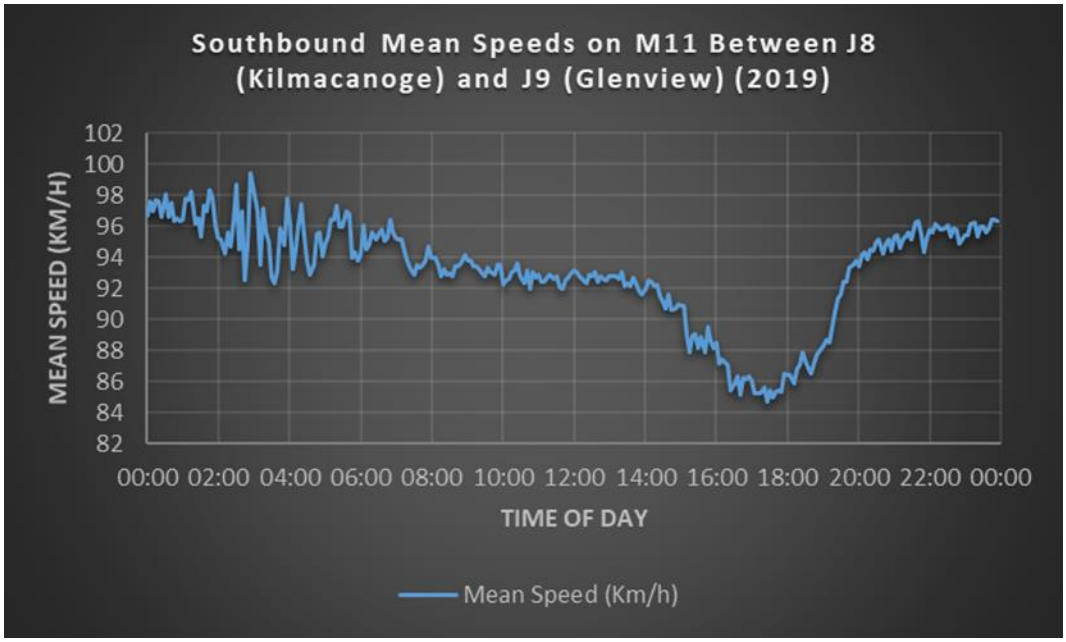


Figure 1-15 Southbound mean speeds on N11 between J8 (Kilmacanogue) and J9 (Glenview)

Unreliability of journey time, particularly during the AM and PM peaks, stymies the intended function of the N11/M11 as an efficient transport corridor – including for the existing public transport services which operate along the route. This in turn detracts from investment potential in the areas of tourism, employment and recreation. Congestion issues inhibit economic prospects at a local and regional level and pose a significant quality of life constraint on those forced to use the corridor for business and social needs.

1.7.4 Existing Bus Services and Infrastructure

An analysis of TII traffic counter data has been undertaken to estimate the number of buses using the N11/M11 route. For the purposes of quantifying the number of buses, data was extracted from the TII counter located between Junction 4 (M11/M50) and Junction 5 (Bray North). Table 1-3 presents average weekday bus volumes for the third week in April 2024 and compares this to bus volumes on other radial routes within the GDA.

Table 1-3 Bus Volumes within Greater Dublin Area

Route	Total Vehicles	Total Buses	Buses as Percentage of Total Traffic	Existing Infrastructure
N11/M11	**84,345**	**423**	**0.50%**	**No bus lanes**
M1	147,742	1,947	1.32%	No bus lanes
N2/M2	52,166	309	0.59%	No bus lanes
N3/M3	88,129	981	1.11%	Partial inbound bus lane
N4/M4	111,995	1,491	1.33%	Bus lanes
N7	124,157	783	0.63%	Inbound bus lane

It should be noted that the figures above represent 24-hour totals. Many of the services above operate during off-peak hours when the bus lane may not be in operation. During the same time period (April 2024), the average number of bus services using the N11/M11 in the peak hours only were as follows:

- AM peak (06:00 – 09:00) – 90 buses (northbound and southbound combined)
- PM peak (16:00 – 19:00) – 92 buses (northbound and southbound combined).

Of the existing bus routes serving the south eastern corridor of the GDA and wider south eastern region, a number of these presently use the N11/M11 national road and would potentially benefit from a bus priority scheme on the N11/M11 route. As indicated in Figure 1-16, these include:

- **Bus Éireann Route 2/X2:** Operates from Dublin to Wexford with 11 services per day in each direction and an additional 4 services operating Monday to Friday. Departing from Dublin Airport, the Expressway Route 2 travels via the M11 motorway to Wexford and back, passing through Dublin City, Arklow, Gorey and Enniscorthy before arriving at the O'Hanrahan Station in Wexford Town.
- **Bus Éireann Route 133:** Operates from Wicklow Town Dublin Airport with connection to Bray DART station and a single stop on the N11 dual carriageway at Kilmacanogue. Services operate hourly from 6.40am to 10.40pm.
- **Wexford Bus Route 740:** Operates hourly services from Wexford to Dublin Airport between 6.30am to 7.30pm with a single stop on the N11 dual carriageway at Kilmacanogue.
- **Wexford Bus Route 740A:** Operates services every 2 hours from Arklow to Dublin Airport between 6.30am to 7.30pm with a single stop on the N11 dual carriageway at Kilmacanogue.
- **Go Ahead Ireland Route 45A/45B:** Operates services from Kilmacanogue to Dún Laoghaire 7 days a week with services every 15 – 20 minutes during peak times.

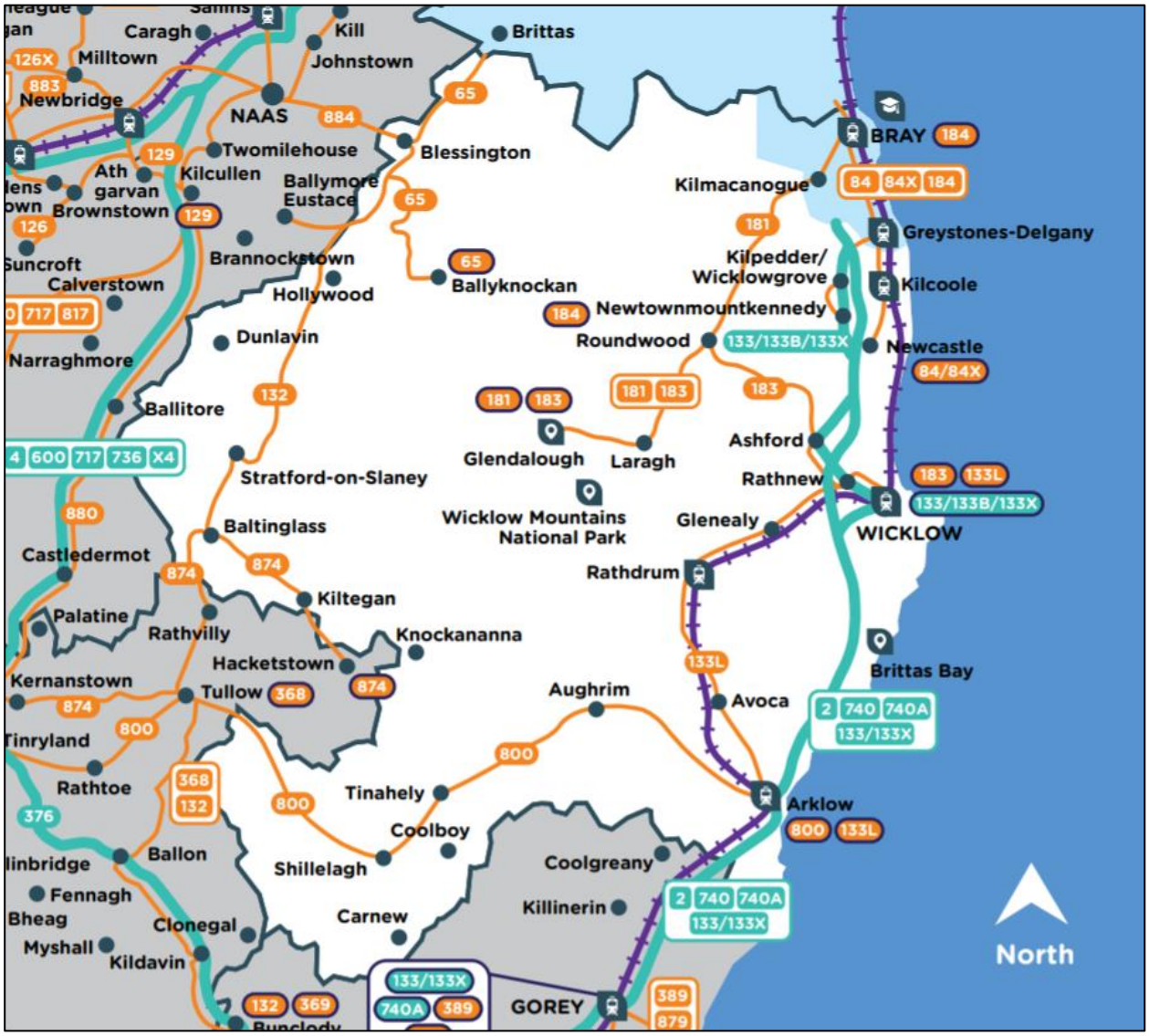


Figure 1-16 Existing Bus Services (extracted from NTA's Connecting Ireland)

In the absence of any bus priority facility, these services must navigate the same congestion and are thus subjected to the same delay and journey time uncertainty as general traffic.

The NTA compiles annual performance data for all the bus services they operate, covering Bus Éireann and Dublin Bus services in addition to those provided by private operator Go-Ahead Ireland. Performance reports have been published for the years 2023 to 2024, which evaluate both the punctuality and reliability of services and compare these on a route-by-route basis.

Punctuality figures have been extracted from the NTA performance data for 2023. Of particular interest is the Bus Éireann route 133, as this travels directly on the N11/M11 for much of its journey as far as Loughlinstown Roundabout and thus offers the best representation of bus service reliability within the study area. Punctuality is defined, as per the NTA performance report, as the percentage of buses which arrive at a bus stop between -1 minutes and +5 minutes and 59 seconds of their scheduled arrival time. Furthermore, the punctuality figures consider the number of 'on time' departures from all individual bus stops along the route for all services during the relevant period. The 133 service was deemed to be punctual between 52.8% and 60.3% of the time over the contract monitoring period[6].

1.7.5 Commuting Data Analysis

The overall population of Co. Wicklow in 2019 was 155,851, a 9.4% increase on 2016 figures, with over 60% of this population resident within the wider N11/M11 study area. Bray, the fourth largest town in Ireland, had a recorded population of 33,512 in 2022. Other major population centres close to the study area include Greystones-Delgany, Shankill/Loughlinstown and Kilmacanogue.

While labour force participation within county Wicklow is high at 61.5%, the jobs ratio of 42% (2011) is significantly lower, forcing large numbers to commute to other regions, primarily the Greater Dublin Area (GDA) to work. Data from the 2022 census indicates that there were 58,715 people travelling to work in the county in April 2022, with 37,311 people driving to work by car in 2022 and just 2,568 travelling by bus.

In August 2018, Wicklow County Council undertook a study on the commuting patterns of Wicklow residents, using both the Census of Population 2016 data and a comprehensive survey to gauge the opinions and experience of the commuting population. Key findings from this detailed commuter study include:

- 65,759 County Wicklow residents regularly commute to work (92%) or to third-level education (8%), with 56% of these leaving the county to do so
- Dublin is the most popular destination for commuters to work (46%) and commuters to third-level education (69%). In total, 24,205 commuting trips are made each day from Co. Wicklow to Dublin
- The most popular mode of transport is driving, with 68% of County Wicklow commuters to work choosing this mode of travel. Only 4% of commuters from County Wicklow choose to travel by bus or coach. Respondents cited unreliability of public transport as the main reason for choosing the car as the primary means of transport
- Dissatisfaction rates amongst commuters is extremely high – particularly in those areas where access to public transport is very limited, as shown in Figure 1-17.

[6] 2022 to 2024 Bus Éireann Punctuality Report – Route by Route. Available from: https://www.nationaltransport.ie/wp-content/uploads/2024/11/2022-to-2024-Bus-Eireann-Punctuality-Report-Route-by-Route.pdf.

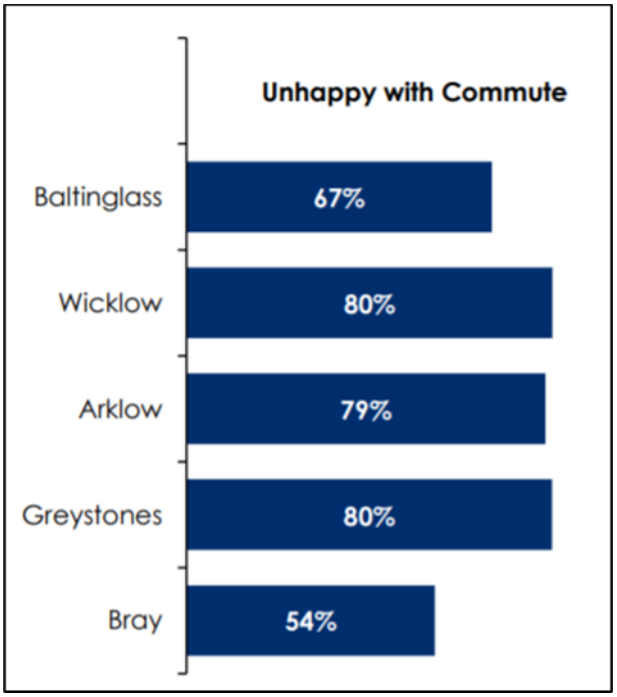


Figure 1-17 Satisfaction levels among commuters to work (Source: Wicklow Commuter Study 2018)

- When examined by origin and destination, more people from Bray and Greystones leave to work in County Dublin than remain in County Wicklow. The opposite is true for Arklow and Wicklow Town, as shown in Figure 1-18.

Destination	From Bray	From Greystones	From Arklow	From Wicklow	From Baltinglass
Bray	3,475	1,039	370	1,053	68
Greystones	440	1,701	222	891	23
Arklow	66	96	3,333	396	201
Wicklow	353	645	777	3,364	112
Baltinglass	12	11	116	26	2,400
Total County Wicklow	**4,346**	**3,492**	**4,818**	**5,730**	**2,804**
Dun Laoghaire-Rathdown	3,248	2,220	768	2,070	410
South Dublin	587	464	220	405	1,279
Dublin City	2,858	2,428	659	1,678	943
Fingal	231	178	103	186	147
Total County Dublin	**6,924**	**5,290**	**1,750**	**4,339**	**2,779**
Kildare	82	73	56	89	967
Carlow	13	<5	42	5	439
Wexford	20	20	330	62	244
All Other Destinations	117	111	112	113	205
Total Commuters to Work	**11,502**	**8,986**	**7,108**	**10,338**	**7,438**

Figure 1-18 Commuters to work by origin and destination (Source: Wicklow Commuter Study 2018)

Although not to the same extent as County Wicklow, the N11/M11 also serves as a commuting corridor for residents of County Wexford. Based on 2016 census data, 5,146 of the 58,820 Wexford residents in work commuted to either Dublin or Wicklow[7].

[7] Living-And-Working-In-Wexford | data. Available from: https://data-wexfordcoco.hub.arcgis.com/pages/living-and-working-in-wexford

1.8 Modelling Overview

Given the nature of the transport options being tested and the potential for these scenarios to result in modal shift, at the commencement of the project it was decided that the National Transport Authority's (NTA) Eastern Regional Model (ERM) should be used to assess each of the proposed options for the following reasons:

- It is a regional model covering the entire Greater Dublin Area and is therefore capable of assessing the regional impacts (as well as local impacts) likely to arise from a scheme of this scale.
- It provides a detailed representation of the urban environment within Dublin City and along the N11 Corridor.
- It provides a detailed representation of the public transport network and services and can predict demand on the different public transport services within the regions.
- It provides a representation of all major transport modes including active modes (walking and cycling) and includes accurate mode-choice modelling of residents.
- It is comprised of a variable demand model which provides a detailed representation of travel demand on the network broken down by journey purpose, mode of travel, person types, user classes and socio-economic classes. This demand is modelled at a granular (Census Small Area) level within the ERM and is critical for modelling transport demand within a mix of urban and rural areas like the N11/M11 Corridor. The ERM also provides a prediction of changes in trip destination in response to changing traffic conditions, transport provision and/or policy.

1.8.1 N11/M11 Local Area Model – Highway Modelling

While the ERM achieves an excellent level of highway calibration, the highway element of the ERM lacks sufficient detail and calibration along the N11 corridor to meet the required guidelines for model development as outlined in TII PAG Unit 5.1 Construction of Transport Models (2016). Therefore, an N11 Local Area Traffic Model (N11/M11 LAM) was developed and used to assess the traffic impacts of the options tested. The N11/M11 LAM has been calibrated and validated to Base Year (2019) conditions using a comprehensive set of traffic surveys collected along the N11 Corridor.

In order to make sure the multi-modal impacts of the options are accounted for in the highway modelling assessment, the highway demand for the assessment years for this project (2027, 2042) are informed by the ERM tests carried out for each option. Annualised external (external to the N11/M11 LAM) growth rates have been calculated by cordoning the modelled study area from the future year ERM models. Internal (zones within the N11/M11 LAM) growth rates have been based on the ERM zonal growth rates between base year and future year. This internal growth was proportioned between the disaggregated LAM zones based on base year proportions or in accordance with relevant planning information (Development Plans, LAPs, etc) where appropriate. These growth rates are then applied to the calibrated base year matrices in order to create future year highway demand matrices.

The Future year Local Area Models developed in this way have then been used to report on various road network key performance indicators such as:

- Transient Queues;
- Over Capacity Queues;
- Total Travel Times;
- Total Travel Distance; and
- Average Speed.

The following sections of this report will provide further details on the development, calibration and validation of the N11 Local Area Model.

1.8.2 Micro-Simulation Model

As the Phase 2 Option Selection process has progressed and evolved, the use of a strategic transport model alone to assess the scheme options has presented certain limitations, as follows:

- Owing to the limitations of the strategic SATURN local area model to effectively capture operational issues at a detailed level, journey time assessments undertaken using the LAM alone would incorrectly assume that buses would be able to travel through junction merges and diverges without being impeded by queuing traffic. Such issues, which are known to occur at several locations along the route, could not be accurately replicated in the strategic model.
- Further to above, the inability to capture localised delays within the strategic model generates the potential to overestimate – or in some cases underestimate – the potential bus journey time savings.
- Given the specific nature of the N11/M11 route, particularly within Sub-Schemes B and C, where the proliferation of junctions and associated weaving issues induce significant flow instability, it was considered essential that the true effects of this turbulence on bus priority be captured in the performance metrics and economic appraisal.
- The publication of TII Standard DN-GEO-03087[8] requires that bus gates must be provided unless it can be demonstrated (through modelling) that congestion on the mainline will not cause queuing on slip roads which would inhibit journey time of vehicles in the hard shoulder bus priority measures. The strategic model previously used was not suitable to undertake this type of analysis

To assess the more detailed operational performance of traffic and buses on the N11/M11 corridor with multiple junctions within a relatively short section of motorway / national road, and complex merge weave situations as a result of high volumes of traffic using the corridor at peak commuter periods, a more refined and detailed modelling platform was required i.e. Micro-simulation.

Application of micro-simulation, specifically Aimsun Software (used on this project), allows for a very detailed reflection of traffic behaviour and resulting conditions on a network of this nature by way of modelling individual vehicles and their interaction with each other and the road network.
Given the proximity of the junctions on the corridor, an accurate reflection of merge/weave behaviour is key in calibrating the base model, and in understanding the impacts of scheme proposals. Only through the use of micro-simulation techniques can this be reflected robustly.

The development of the N11/ M11 BPIS Micro-simulation model ensures a robust assessment of proposed bus priority interventions such as new sections of hard shoulder bus priority, bus gates, changes to merge and diverge lengths and provision of junction closures etc. The impact of such measures is modelled on a first principles basis in micro-simulation models, by affecting individual vehicles and how they interact within the network.

The N11/M11 LAM, which was calibrated and validated to Base Year (2019), was used as the donor model in terms of trip demand, which provided a robust starting position for the development of the micro-simulation model due to its inherent high levels of calibration and validation to observed survey data.

The Micro-simulation model has been used to more accurately extract journey time data, but has also been used to report on various further road network key performance indicators such as:

- Delay Time;
- Density;
- Flow;
- Mean Queue;
- Average Speed;

[8] DN-GEO-03087 – Hard Shoulder Bus Priority Measures on Motorways and Type 1 Dual Carriageways (TII, 2022)'. The Standard is available from: https://www.tiipublications.ie/library/DN-GEO-03087-01.pdf.

- Total Distance Travelled; and
- Total Travel Time.

The following sections of this report will provide further details on the development, calibration and validation of the N11/M11 BPIS Micro-simulation model.

2. Data Collection

2.1 Local Area Model

2.1.1 Introduction

This section provides an overview of the data collection exercise undertaken to facilitate the calibration and validation of the N11/M11 Local Area Model (LAM). Existing data sources were reviewed to identify available counts and locate gaps in observed information across the model area. This review was used to define a specification for additional counts which were commissioned for the area. The combination of new commissioned counts, and existing available information, provided a comprehensive dataset for calibration and validation.

2.1.2 Existing Data Review (Gap Analysis)

A review of existing traffic survey data available for the model area was undertaken from the following sources:

- **NTA count database:** A mixture of Automatic Traffic Counts (ATC) and Junction Turning Counts (JTC) from previous studies covering a range of years
- **Existing M11/N11 Model Data:** A series of ATCs, JTCs and Origin-Destination (O-D) surveys were carried out in the area in 2015 to inform previous studies along the N11/M11 Corridor and to aid the development of a Local Area Model of the same study area; and
- **TII Counters:** Permanent TII ATCs located on national strategic roads across the network with data publicly available online.

This data review indicated that insufficient, up to date, information was available to robustly calibrate and validate a LAM for the area as the majority of the existing data was from 2015 or earlier, which is too old to be reliably used to generate a 2019 base year model.

Therefore, on foot of the above review, a data collection exercise was commissioned to supplement existing traffic counts and provide sufficient information to robustly calibrate and validate a LAM for the area.

2.1.3 Commissioned Traffic Survey Data

Tracsis Ltd. were commissioned to undertake a programme of traffic surveys to bridge the gap identified from the existing data review. Specifically, the following surveys were required:

- Origin – Destination (ANPR) surveys at 16 sites
- Two-week ATCs at 27 sites, including each of the entry points to the model area to ensure an accurate representation of traffic entering/leaving the model in the peak hours
- JTCs at 50 sites, including all the main junctions within the model area to capture movement of vehicles during the peak periods
- Journey time Surveys along the N11/M11 between Junction 4 and Junction 14.

2.1.4 Origin Destination Surveys

Origin-destination surveys were carried out at 16 locations, as indicated in Figure 2-1.

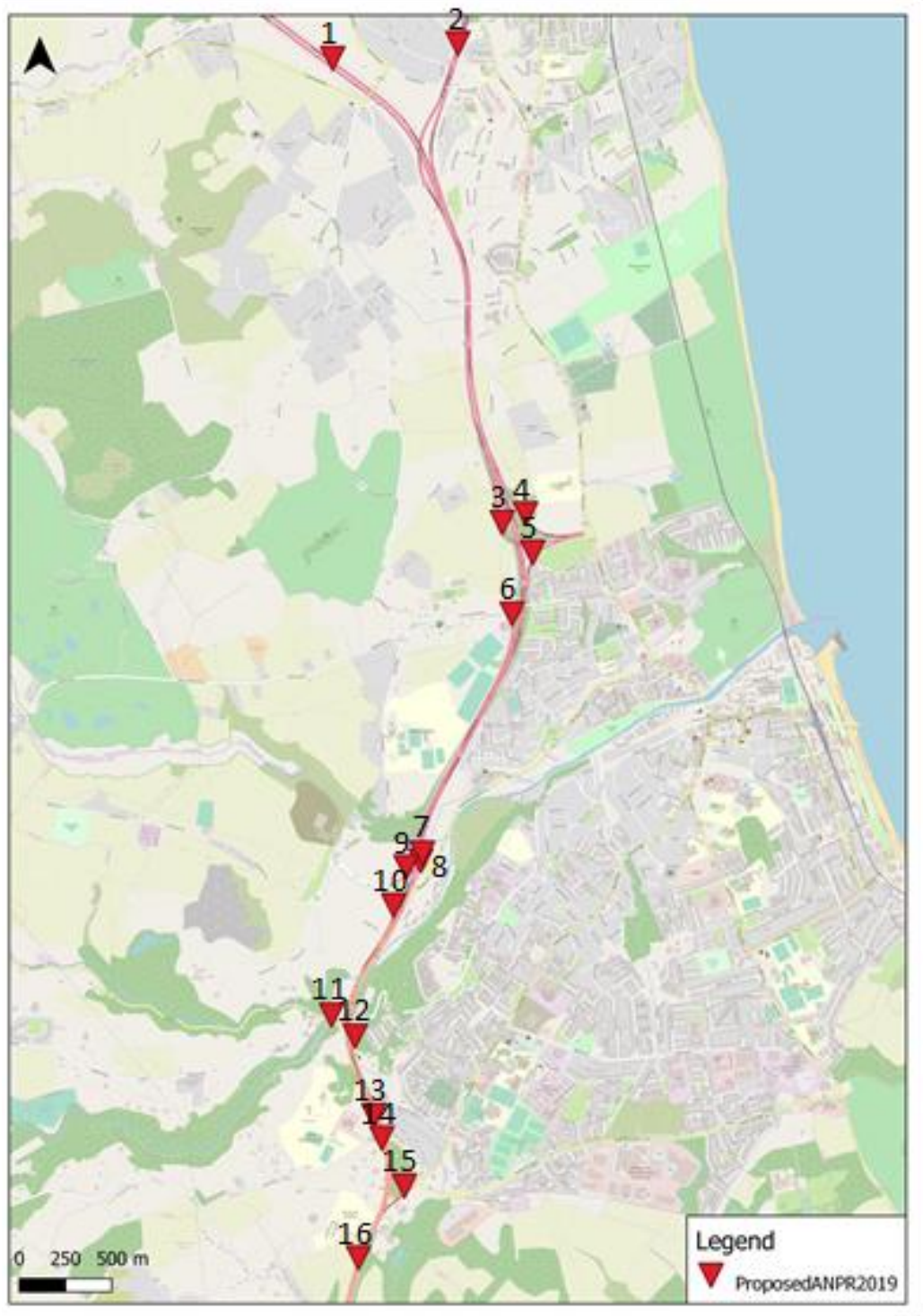


Figure 2-1 O-D survey sites

2.1.5 Automatic Traffic Counts

ATCs were undertaken at 27 locations across the network, as illustrated in Figure 2-2, over a 2-week period from Tuesday 28 May to Monday 10 June 2019. The ATC data provides information on:

- The daily and weekly profile of traffic within the study area
- Busiest time periods and locations of highest traffic demand on the network
- Any issues on the network during the survey period e.g. accidents, road closures etc.
- Typical speed of traffic on the network.

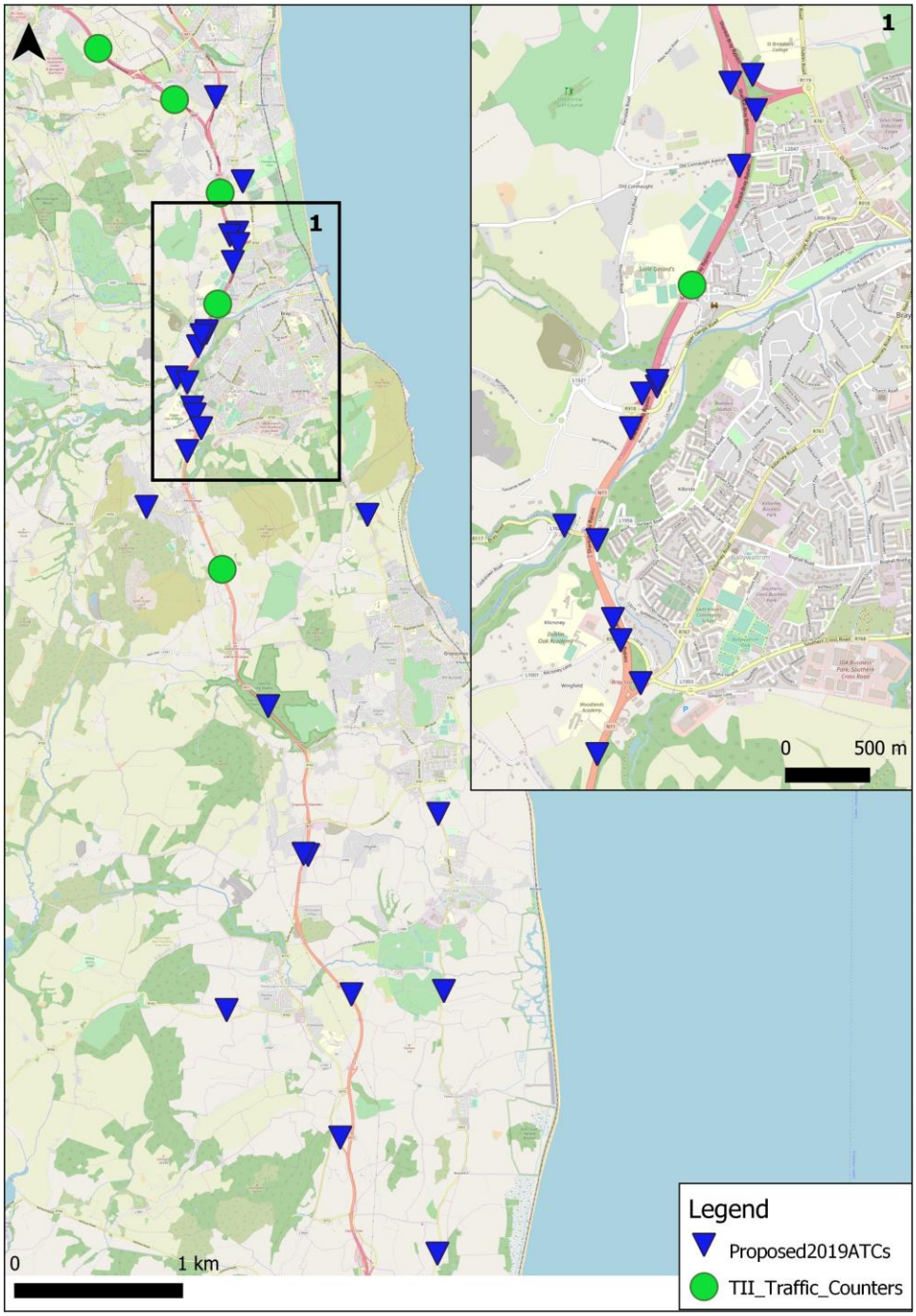


Figure 2-2 ATC survey sites

2.1.6 Junction Turning Counts

JTCs were undertaken at 50 locations across the network, illustrated in Figure 2-3. All JTC sites were surveyed during the AM peak (07:00 – 10:00), Inter-peak (13:00 – 16:00) and PM peak (16:00 – 19:00) on Wednesday 29 May 2019 and summarised by 15-minute time intervals.

As indicated in Figure 2-3, all the main junctions within the study area have been included and provide information on the volume and types of vehicles making turning movements at each location. This data is utilised within the LAM calibration to ensure that the flow of vehicles through the main junctions on the network is being represented accurately.

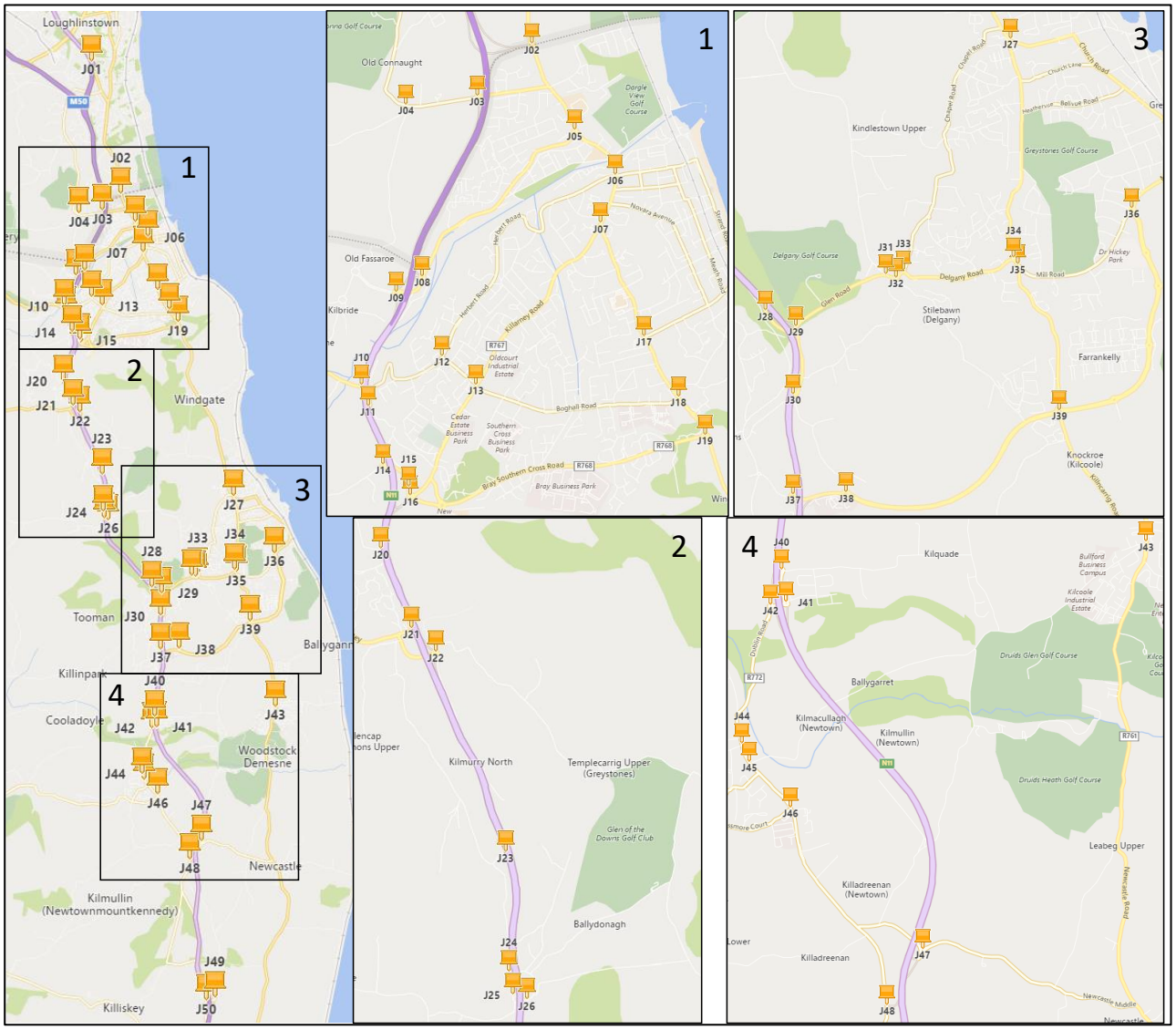


Figure 2-3 JTC survey sites

2.1.7 Count Data for Calibration and Validation

The commissioned counts provided a comprehensive dataset for calibration and validation of the N11/M11 LAM as illustrated in Figure 2-4. In summary:

- ATC and JTC data were used to create screenlines capturing flows entering the model area from the east, west and north.
- The combination of ATCs and JTCs cover all the main junctions within the model area. A certain number of the ATCs and JTCs were held back from calibration and used in the validation of the N11/M11 LAM.

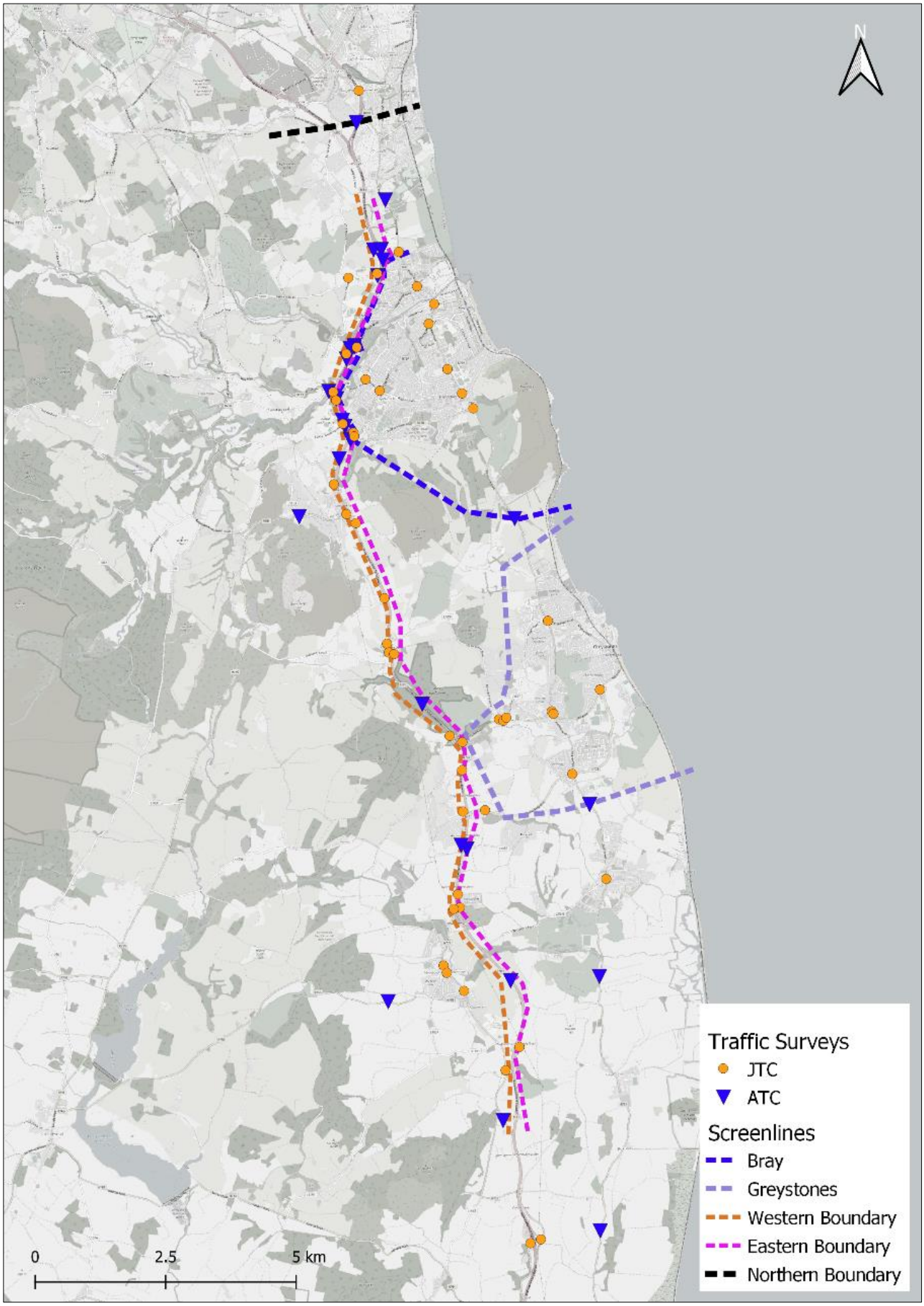


Figure 2-4 Calibration and validation count data

2.1.8 Journey Time Data

Journey time surveys were carried out along the N11/M11 between Junction 4 and Junction 14 (in both directions and split by sections) as indicated in Figure 2-5.

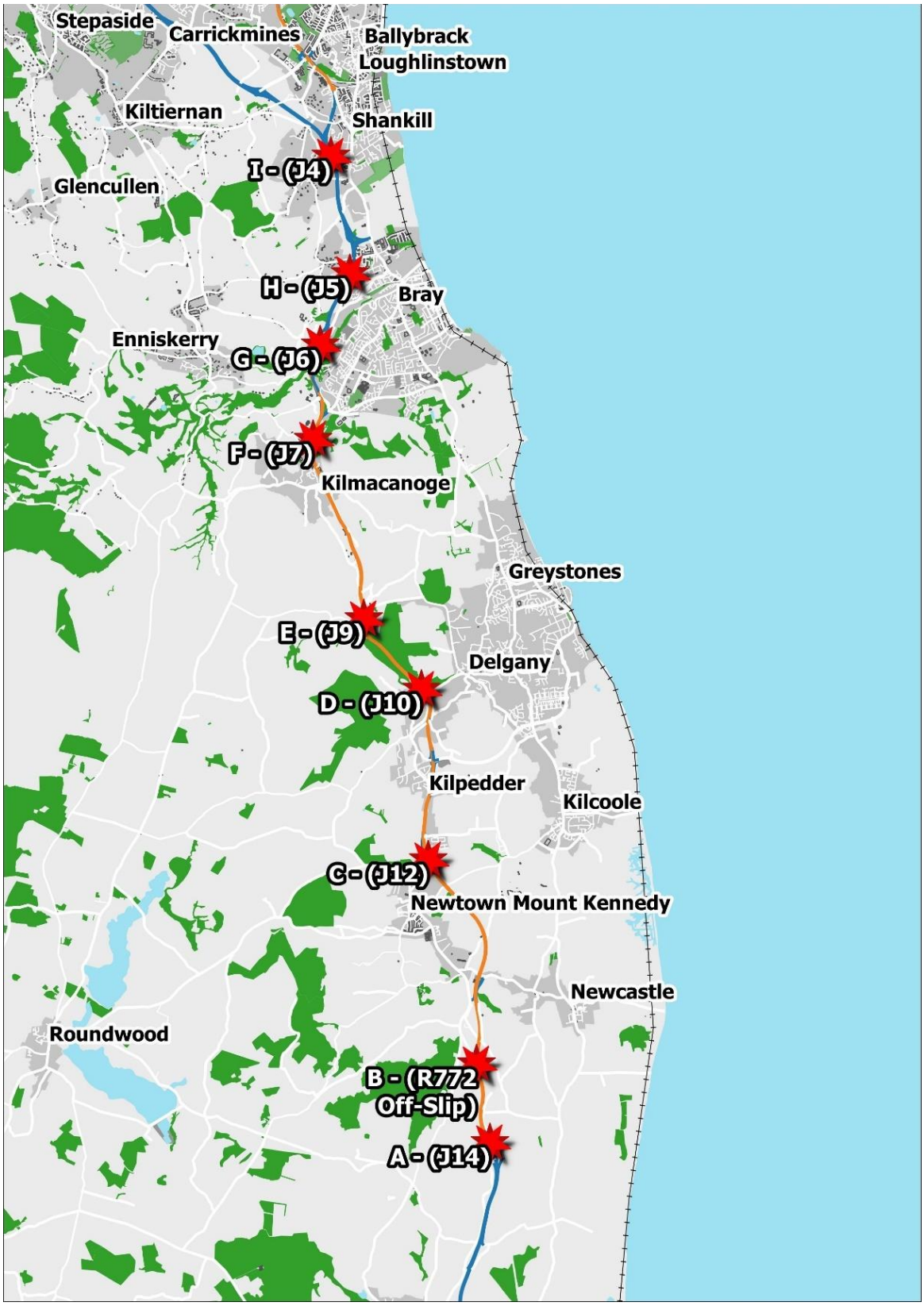


Figure 2-5 Journey time survey sites

These journey time surveys were carried out for the AM (7:00-10:00), IP (13:00-16:00) and PM (16:00-19:00) peak periods. Journey time data was broken down into 10 regular sections (from junction to junction) for each of the routes illustrated above.

The journey time data received was used to validate the LAM to ensure that it is providing a robust representation of current levels of delay on the network at the correct locations (see Chapter 5 for further details).

2.2 Micro-Simulation Model

2.2.1 Introduction

The N11/ M11 BPIS Micro-simulation model made use of a portion of the available survey data (the micro-simulation model is smaller than the LAM). This section provides an overview of how this data was used in the calibration and validation of this model.

As detailed above, a data collection exercise was commissioned to supplement existing traffic counts and provide sufficient information to robustly calibrate and validate the N11/M11 LAM for the area. This data has also been used in the development of the N11/M11 BPIS Micro-simulation model. The sub-set of this data which has been used within the micro-simulation model development is summarised below:

- Automatic Traffic Count (ATC): From 27 locations available, 19 locations across the study area were used to capture traffic volumes on the N11 and access roads
- Junction Turning Count (JTC): From the 50 locations available, 30 key junctions within the study area were used to capture turning movements; and
- Journey Time Data (JT): Data from Junction 4 to Junction 10 and in the reverse direction was used in the validation process.

The combination of commissioned counts, and existing available information, provided a comprehensive dataset for calibration and validation.

2.2.2 Automatic Traffic Counts (ATC)

ATCs were undertaken at the following 19 locations across the network, as illustrated in Figure 2-6, over a 2-week period from Tuesday 28 May to Monday 10 June 2019.

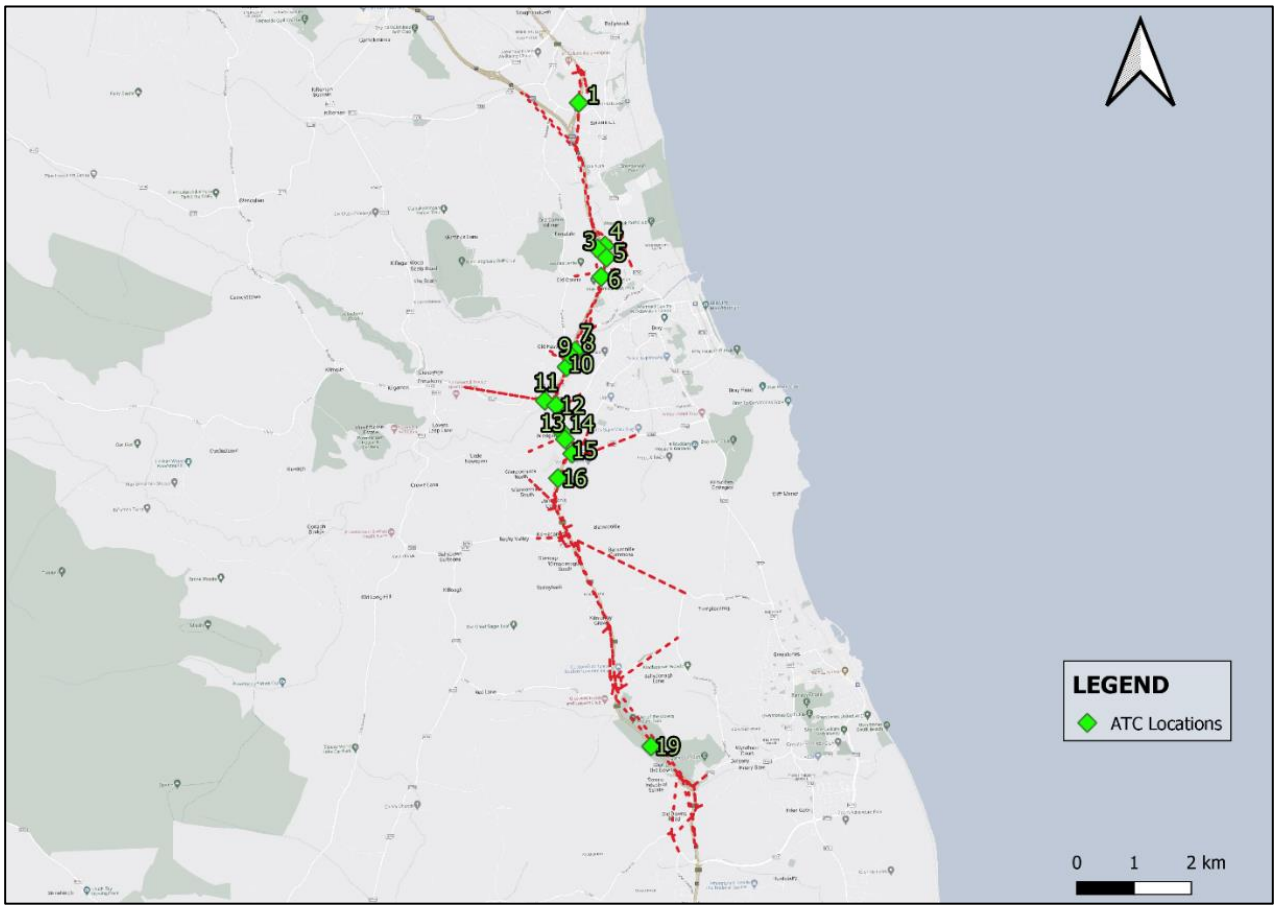


Figure 2-6 ATC survey sites in relation to micro-simulation model extent

2.2.3 Junction Turning Counts (JTC)

JTCs were undertaken at 30 locations across the network, illustrated in Figure 2-7. All JTC sites were surveyed over a 12-hour period (07:00 – 19:00) on Wednesday 29 May 2019 and summarised by 15-minute time intervals.

As indicated in Figure 2-7, all the main junctions within the study area have been included and provide information on the volume, and types of vehicles, making turning movements at each location.

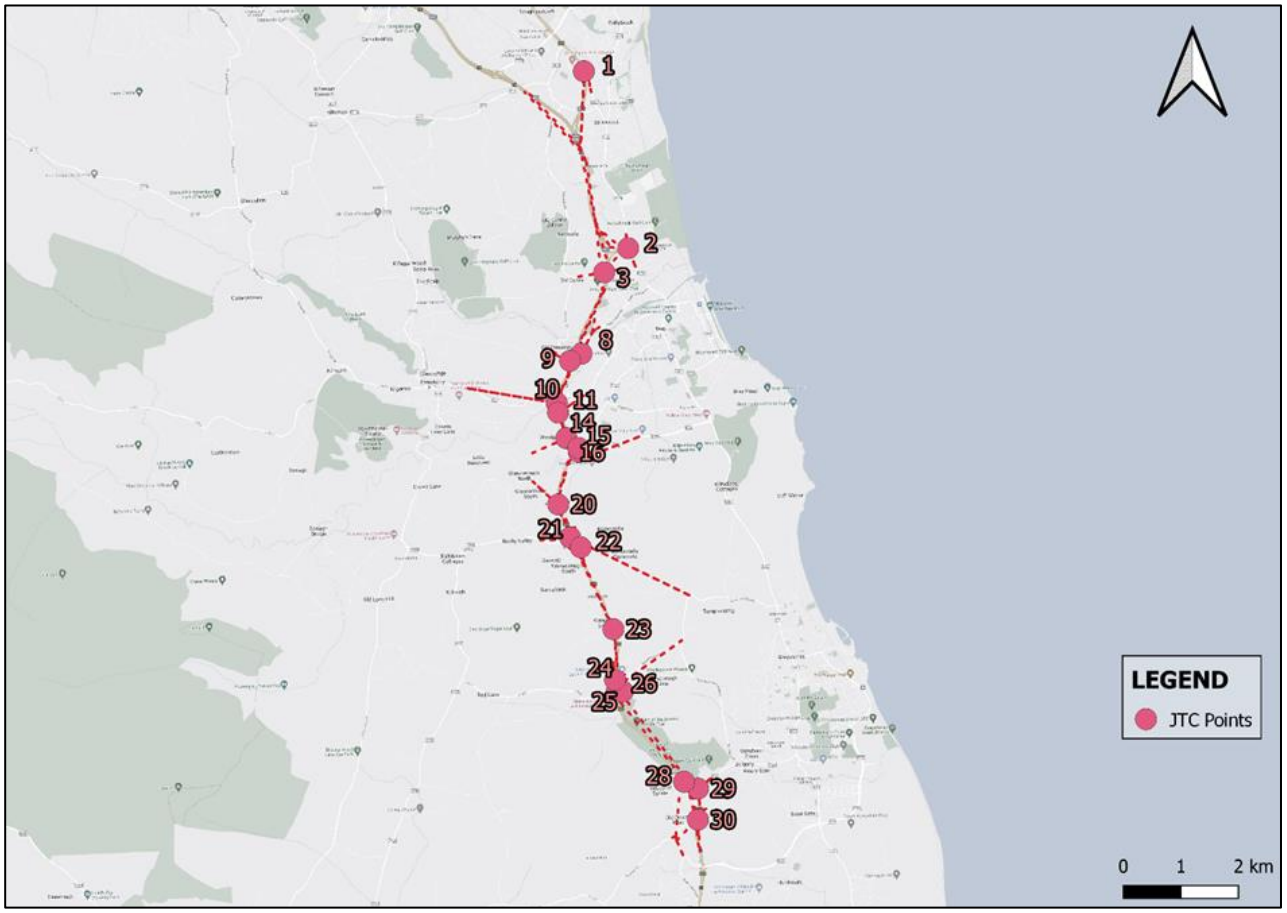


Figure 2-7 JTC site locations in relation to micro-simulation model extent

2.2.4 Count Data for Calibration and Validation

As a general rule, JTC data has been mostly used for calibration of the model with ATC data used for model validation. The initial stage in preparing the data for calibration and validation was to investigate the datasets for any inconsistencies between the count data i.e., to ensure upstream and downstream counts were consistent and not conflicting etc.

Following this review, the data was processed into calibration and validation datasets of travel movements by vehicle classification and time segment. Figure 2-8 illustrates the location of calibration and validation data used, with Table 2-1 providing the numeric split of the data which was the same for both AM and PM modelled hours.

The excellent coverage of survey data across the study area provided a robust basis for the calibration and validation of the N11/M11 BPIS Micro-simulation model.

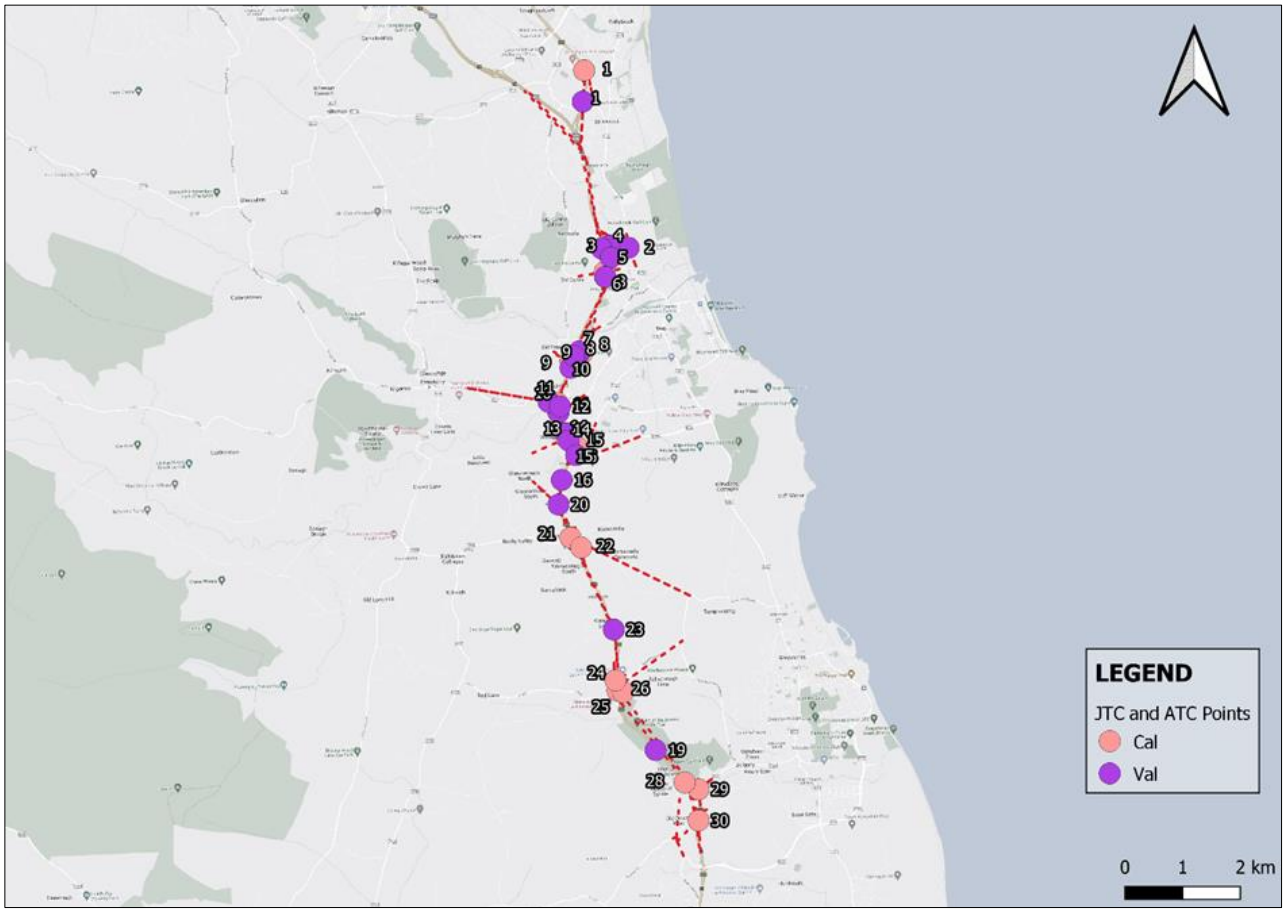


Figure 2-8 Calibration and validation count data

Table 2-1 Calibration / validation counts by type (AM and PM)

Count Type	Calibration	Calibration (%)	Validation	Validation (%)
ATC	0	0	14	31
JTC	90	100	23	51
TII TMUs	0	0	8	18
All	90	100	45	100

2.2.5 Journey Time Data

Journey time surveys were carried out along the N11/M11 between Junction 4 and Junction 14 (in both directions and split by sections) as illustrated previously in Figure 2-5. For the development of the micro-simulation model, the journey time data from sites D to I were used for the northbound direction and from sites I to D in the southbound direction.

These Journey time surveys were carried out for the AM (7:00-10:00) and PM (16:00-19:00) peak periods. Inter-peak (13:00-16:00) survey data was also collected but was not required for the micro-simulation model validation. Journey time data was broken down into 10 regular sections (from junction to junction) for each of the routes described above.

The journey time data received was used to validate the micro-simulation model to ensure that it is providing a robust representation of current levels of delay on the network and at the correct locations (see Chapter 5 for further details).

3. Model Development and Specification

3.1 Local Area Model

3.1.1 Introduction

The following sections describe the overall methodology used for developing the N11/M11 LAM. The National Transport Authority's (NTA) Regional Modelling System (RMS) was used as a basis for the LAM development, providing initial network detail and prior demand matrices. Further refinement was undertaken for the model area, and it was calibrated and validated to observed count data in-line with relevant guidelines.

3.1.2 NTA Regional Modelling System (RMS)

The NTA RMS comprises the following three main components:

- The National Demand Forecasting Model (NDFM)
- 5 Regional Models as shown in Figure 3-1 (Including the Eastern Regional Model); and
- A suite of appraisal Modules.

The NDFM takes input attributes such as land-use data, population etc., and estimates the total quantity of daily travel demand produced by, and attracted to, each of the 18,488 Census Small Areas in Ireland.

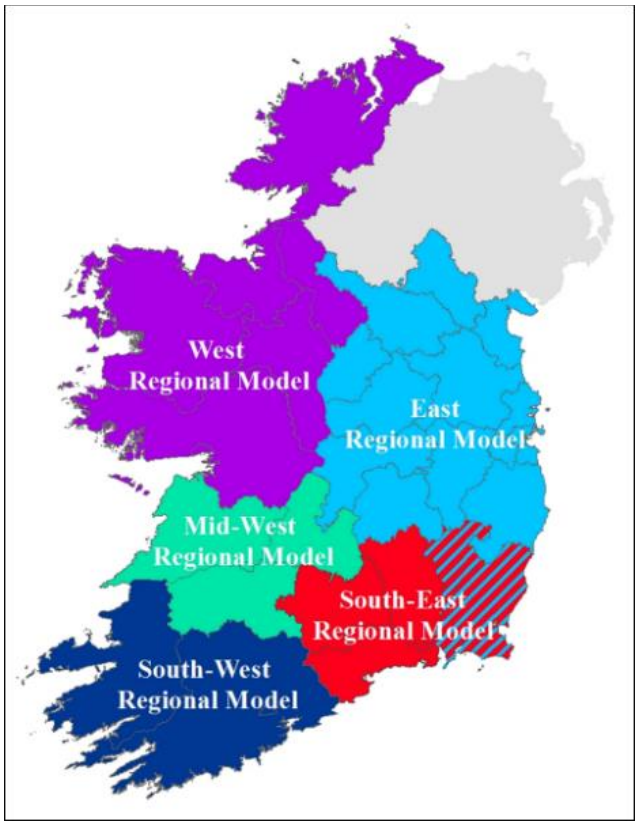


Figure 3-1 NTA RMS regional models

3.1.2.1 ERM Overview

The Eastern Regional Model (ERM) is a strategic multi-modal transport model representing travel by all the primary surface modes – including, walking and cycling (active modes), and travel by car, bus, rail, tram, light goods and heavy goods vehicles. The model broadly covers the Leinster province of Ireland including the counties of Dublin, Wicklow, Kildare, Meath, Louth, Wexford, Carlow, Laois, Offaly, Westmeath, Longford, Cavan and Monaghan

The ERM is comprised of the following key elements:

- **Trip End Integration:** The Trip End Integration module converts the 24-hour trip ends output by the NDFM into the appropriate zone system and time period disaggregation for use in the Full Demand Model (FDM)
- **The Full Demand Model (FDM):** The FDM processes travel demand, carries out mode and destination choice, and outputs origin-destination travel matrices to the assignment models. The FDM and assignment models run iteratively until an equilibrium between travel demand and the cost of travel is achieved; and
- **Assignment Models:** The Road, Public Transport, and Active Modes assignment models receive the trip matrices produced by the FDM and assign them in their respective transport networks to determine route choice and the generalised cost for each origin and destination pair.

Destination and mode choice parameters within the ERM have been calibrated using two main sources:

1. Census 2011 Place of Work, School or College - Census of Anonymised Records (2011 POWSCAR); and
2. The Irish National Household Travel Survey (2012 NHTS).

The NTA's RMS is the most sophisticated modelling tool available for assessing complex multi modal movements within an urban context. This provides a consistent framework for transport assessment.

Therefore, the ERM is the ideal tool to use as a basis for the development of the N11/M11 LAM, and to estimate the multi-modal impact of transport schemes within the model area. In addition, it provides the platform to forecast future trip demand and distribution.

3.1.3 LAM Development Methodology

The methodology for developing the N11/M11 LAM from the RMS is illustrated in Figure 3-2.

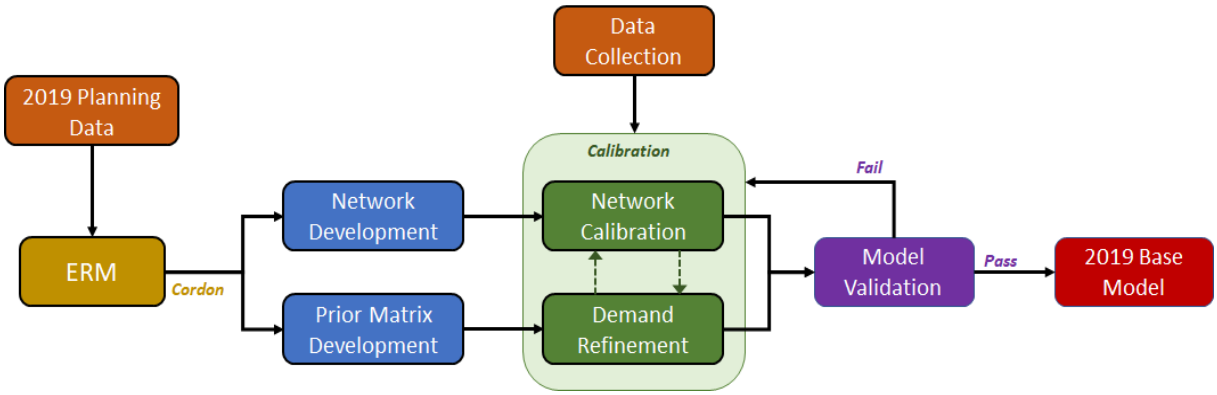


Figure 3-2 LAM development methodology

In summary:

- **2019 ERM Run:** 2016 Census planning data for population, employment and education was reviewed within the model area and updated where appropriate to 2019. This data was passed through the NDFM to generate base year demand which was run in the NTA's ERM
- **ERM Cordon:** The 2019 ERM road assignment was cordoned to extract the initial network and traffic matrix covering the N11/M11 model network extent (Figure 1-2)
- **Network and Prior Matrix Development:** The initial ERM cordoned road network was reviewed in greater detail for the study area for items including junction layouts, network speeds, missing links etc. The zone system from the ERM was disaggregated where necessary to provide a more accurate representation of traffic loading onto the road network

- **Data Collection:** Traffic survey data including link counts, junction turning counts and journey time information was collected and used to calibrate and validate the LAM (refer to Chapter 2 for further information)
- **Calibration:** Calibration is the process of adjusting the model to better represent observed data. This is normally undertaken in two steps:
    1. **Network Calibration:** adjustments to the road network based on observations extracted from traffic survey data e.g. altering turning capacities at junctions, updating link speeds etc.; and
    2. **Demand Refinement:** adjustments to the prior matrix to better represent observed travel movements from count data.

    The N11/M11 LAM was calibrated in-line with Transport Infrastructure Ireland's (TII) Project Appraisal Guidelines (PAG) and the UK Department for Transport (DfT) TAG guidance.
- **Validation:** Validation is the assessment of the validity of the calibrated model, and its robustness in representing observed traffic conditions. Calibration and validation are iterative processes. If the results of the validation checks are unsatisfactory, then adjustments will be made as required in order to achieve a better representation of reality. The N11/M11 LAM was validated in-line with TII and TAG guidance, and further information is provided in Chapter 5 of this report.

3.1.4 Model Area

The area to be analysed in detail in the N11/M11 LAM is illustrated in Figure 1-2, and was identified through the following:

- Review of all major roads and alternative routing options in the study area
- Alternative public transport options along the corridor, including rail and LUAS; and
- Internal discussions with the project team.

3.1.5 Model Time Periods

Junction Turning Counts (JTCs) were undertaken at 50 locations throughout the study area (further information is included in Chapter 2 of this report).

These JTC results were utilised to identify the typical profile of traffic demand within the study area throughout an average weekday, and the results are illustrated for all sites combined in Figure 3-3. The results show the total hourly traffic, sum of all junctions analysed, for hours beginning at 07:15 and ending at 19:00. These flows follow a typical trend with peaks in traffic volumes in the moming and evening. The JTC data suggests that the hours experiencing the highest levels of traffic are from 08:15-09:15 in the AM, and 17:00-18:00 in the PM.

Therefore, the N11/M11 LAM was developed, calibrated and validated to represent the following time periods:

- AM Morning peak period: 08:15 to 09:15
- PM Evening peak period: 17:00 to 18:00; and
- Average Interpeak Hour: (Average 13:00-16:00).

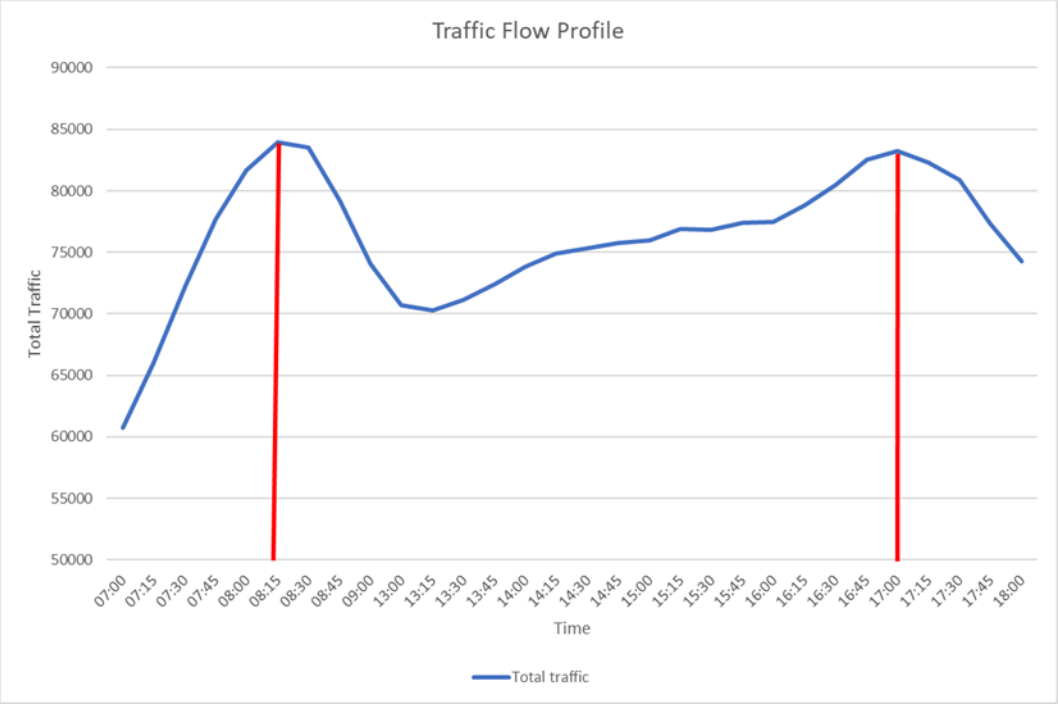


Figure 3-3 JTC Profiles

3.1.6 Demand Segmentation

The prior travel demand for the N11/M11 LAM was derived from the NTA's ERM (See Chapter 5 for more details). The ERM assignment matrices contain the following nine user classes:

1. Taxi
2. Car Employer's Business (in work time)
3. Car Commute (travel to/from work)
4. Car Education (travel to/from school)
5. Car Other (other non-work purposes such as shopping, visiting friends, etc)
6. Light Goods Vehicles (LGV)
7. Other Goods Vehicles (OGV)
8. OGV2 Permit Holder (5 or more axles and allowed drive in Dublin city centre); and
9. OGV2 (5 or more axles and not allowed drive in Dublin city centre).

Each user class has its own defined set of generalised cost parameters based on a price per kilometre and a price per minute. To ensure consistency with the larger strategic ERM, the nine user classes and their associated generalised cost parameters were retained for the N11/M11 LAM.

3.1.7 Model Software

The model software used to develop the N11/M11 LAM is the SATURN (Simulation Assignment of Traffic to Urban Road Networks) suite of transportation modelling programs.

SATURN has 6 basic functions:

1. As a combined traffic simulation and assignment model for the analysis of road-investment schemes ranging from traffic management schemes over relatively localised networks (typically of the order of 100 to 200 nodes) through to major infrastructure improvements where models with over 1,000 junctions;

2. As a "conventional" traffic assignment model for the analysis of much larger networks (e.g., up to 6,000 links in the standard PC version, 37,500 in the largest);
3. As a simulation model of individual junctions;
4. As a network editor, data base and analysis system;
5. As a matrix manipulation package for the production of, for example, trip matrices; and
6. As a trip matrix demand model covering the basic elements of trip distribution, modal split, etc.

3.1.8 Assignment Parameters

The N11/M11 LAM was developed in SATURN and the model was calibrated and validated using release versions 11.2.05 of the software. The SATURN application SATNET was used to build the various data files into an assignable road network (UFN) file.

Matrices were then assigned to the network using the SATALL application, where it iterates through assignment and simulation loops until the user defined levels of convergence are reached (RSTOP and STPGAP), or the model reaches the user defined maximum number of assignment and simulation loops (MASL). SATALL uses a converged equilibrium assignment method to assign the traffic to the road network over successive iterations, until user defined convergence criteria are achieved.

The generalised cost and assignment parameters from the ERM road model were used in the N11/M11 LAM.

3.1.9 Network Development

As mentioned previously, the NTA's ERM was utilised as a base for generating the highway network for the N11/M11 LAM. The base ERM network was developed from the HERE mapping layer which provides a detailed representation of all National Primary, Secondary, Regional and local roads in Ireland.

The N11/M11 LAM road network, extracted from a cordon of the ERM, is illustrated in Figure 3-4. A detailed review was undertaken of all model coding in the study area using digital mapping systems such as Google Earth to ensure it represented, as accurately as possible, the existing road network. This included aspects such as network speed limits, availability of bus lanes, junction layouts, pedestrian crossing points etc.

As illustrated in Figure 3-4, the ERM coding of the network in the south of the study area, near Wexford, is in SATURN buffer coding. This means that the links are modelled using speed-flow relationships, and no junction detail is included and there is no detailed modelling of delay or interaction of turning flows at junctions. This is typical for large, regional, transport models and is reflective of the fact that the focus of the ERM is on Dublin city and the immediate surrounding area.

In developing the N11/M11 LAM, additional detail was added to the ERM network to enhance the modelled road network and better represent localised access points for traffic. As part of the regional model development process for the NTA, a review of transport modelling processes was undertaken, which generated a best practice approach for coding road networks, including:

- Standardised turning saturation flows at junctions;
- Standardised speeds used on different types of road; and
- The use of flares for turns at junctions with sufficient space etc.

This best practice approach was utilised to generate the detailed traffic network for the N11/M11 LAM, reviewing existing link detail and adding junction detail.

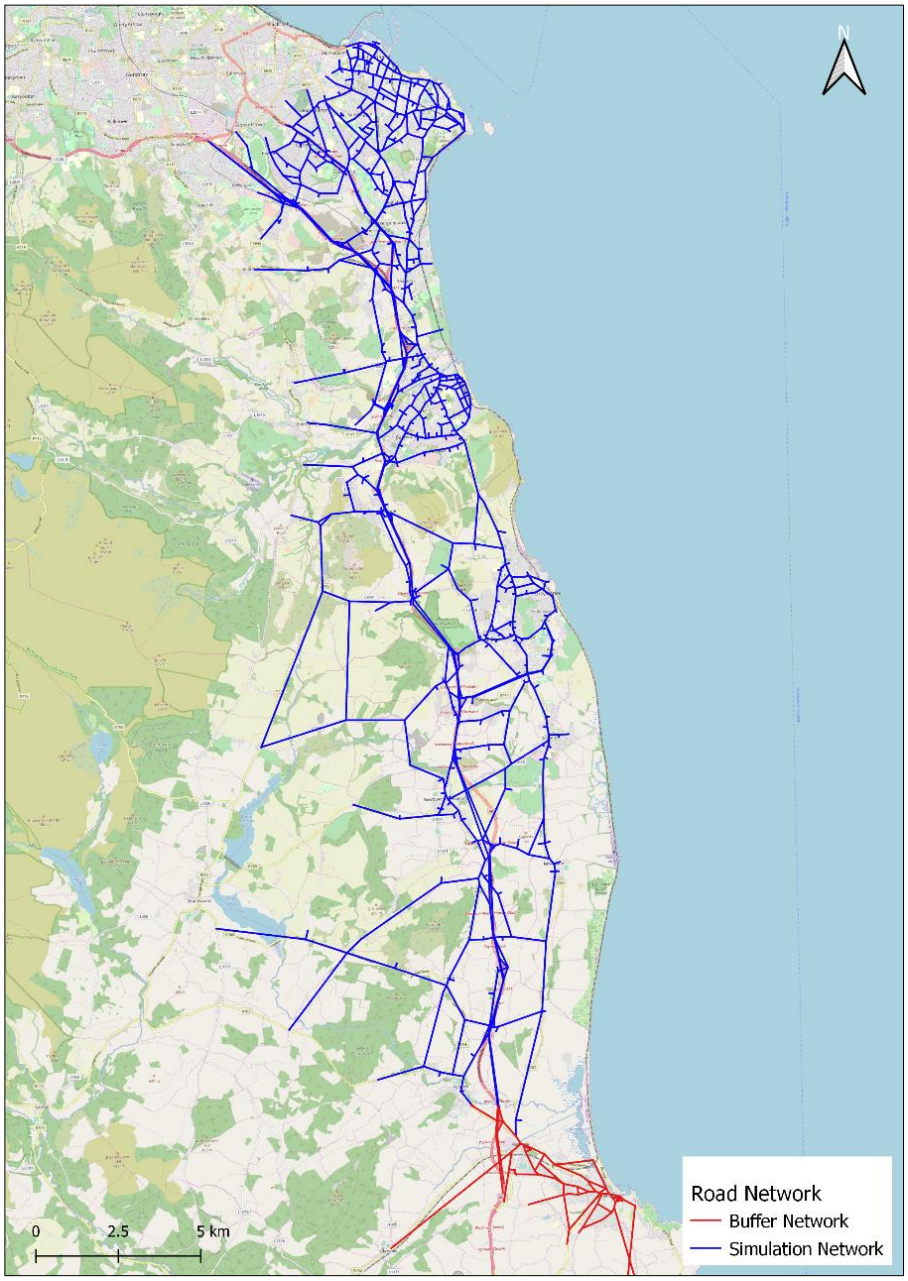


Figure 3-4 N11/M11 LAM road network

As illustrated in Figure 3-4, the ERM provides a detailed representation of all significant roads within the study area. To ensure full network coverage and route choice, all roads have been considered, from the national primary routes to minor residential streets. The short dead-end links in Figure 3-4 are "spigots" used to load traffic from the zones accurately onto the network and reflect the further developed zone system that is outlined in the following section.

3.1.10 Zone System Development

Similar to the road network described previously, the base N11/M11 LAM zone system, as shown in Figure 3-5, was adopted from the ERM. The ERM zone system was developed using the Census Small Area Population Statistics (SAPS) and Place of Work, School or College Census of Anonymised Records (POWSCAR) to get detailed information on population, employment and education centres across the model area. Other data sources such as MyPlan and Geo Directory were also used to obtain information on specified land-use zoning and location of commercial development. The following rules were then applied to generate the zone system:

- **Population, Employment and Education** – the number of zones with values of population, number of jobs and persons in education above a certain threshold should be minimised;

- **Activity Levels** – the number of zones with activity levels that have very low or very high levels of trips should be minimised;
- **Intra-zonal Trips** – threshold values should be applied to the proportion of intra-zonal trips within each zone, to avoid an underestimation of flow, congestion and delay on the network;
- **Land Use** – zones should be created with homogeneous land use and socio-economic characteristics where possible;
- **Zone Size/Shape** – zone size and the regularity of zone shape should be considered in order to avoid issues with inaccurate representation of route choice;
- **Political Geography** – it should be possible to aggregate all zones to Electoral Division (ED) level i.e. zone boundaries do not intersect ED boundaries; and
- **Special Generators/Attractors** – large generators/attractors of traffic such as Airports, Hospitals, shopping centres etc. should be allocated to separate zones.

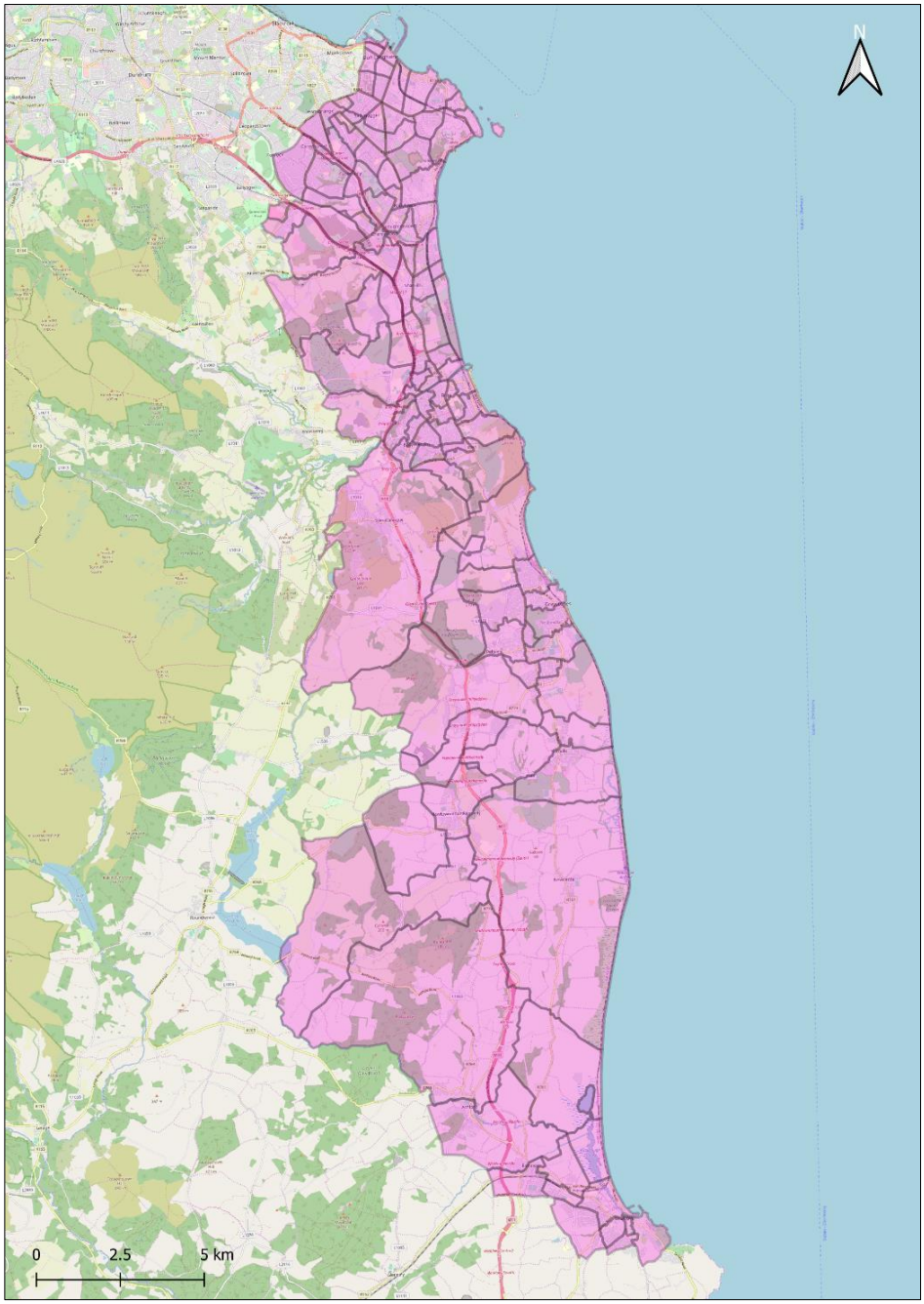


Figure 3-5 ERM zone system

In the parts of the study area close to Dublin City Centre, the ERM zones are represented in quite a high level of detail. As such, individual housing estates and key employers have been given their own zones. To the south of the study area, the ERM zones become larger and more aggregate in nature primarily due to the low levels of activity (population and employment) in these areas.

A detailed review was undertaken of all ERM zoning and centroid connectors in the study area. On foot of this review, a number of edits were applied to the ERM zone system in order to provide a more accurate representation of traffic loading onto the road network.

Figure 3-6 illustrates the zonal system developed for the study area. In total, 130 additional zones have been created, resulting in 276 internal zones within the study area and 15 external zones representing the roads that enter the area of interest. This level of detail ensures that traffic loads accurately onto both sides of the N11/M11 and the surrounding road network.

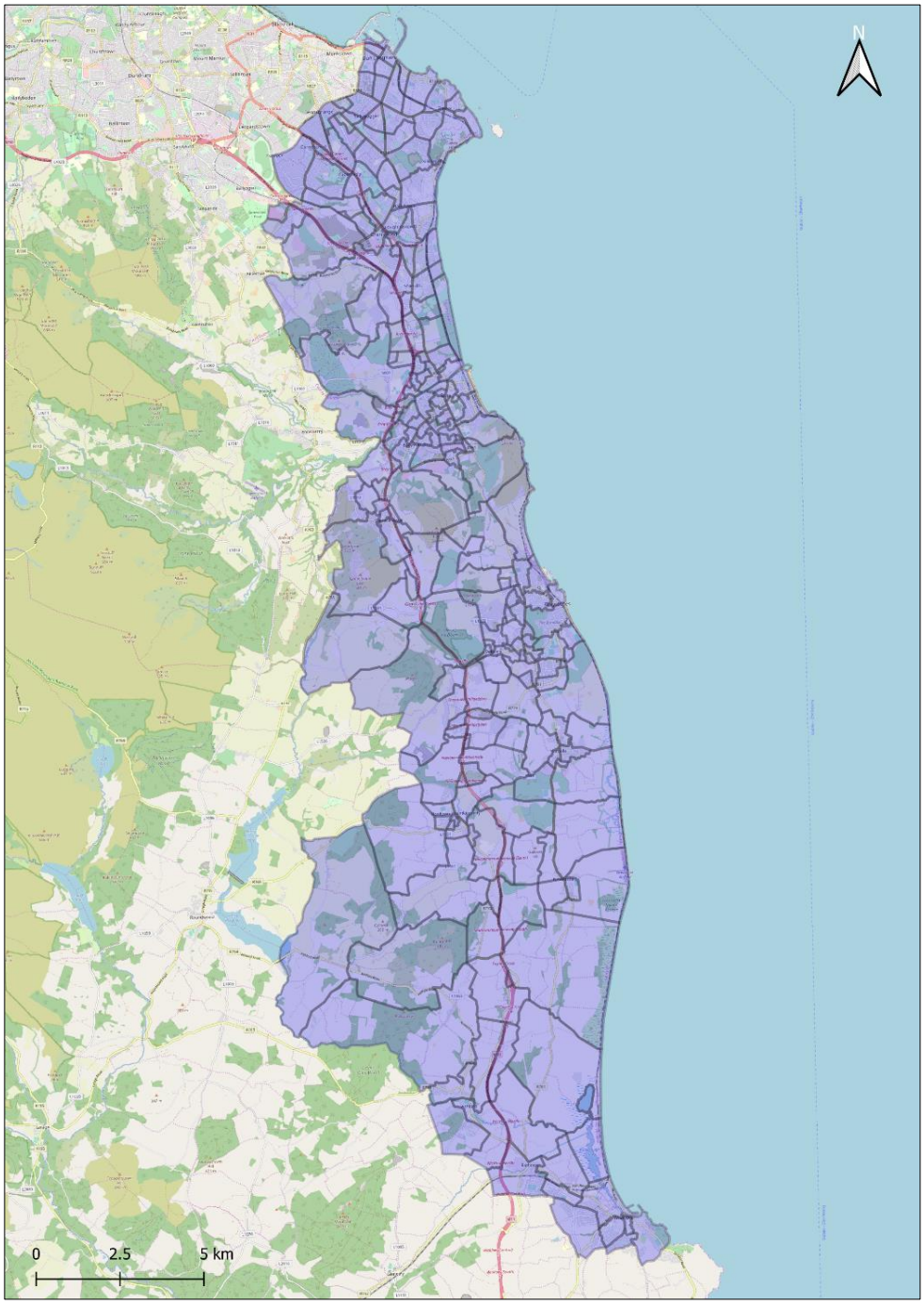


Figure 3-6 M11/M11 zone system

3.1.11 Prior Matrix Development

As noted previously in Section 3.1.2, the Full Demand Model carries out mode and trip destination choice for all zones within the ERM.

The FDM has been calibrated using Census data, and hence, provides a robust and accurate representation of trip distributions across the model network. In order to generate prior matrices for the study area, a cordon was extracted from a 2019 run of the ERM. The cordon function within SATURN facilitates the extraction of trip matrices for a subset area of the ERM, whilst still maintaining route and destination choice from the full model.

A bespoke Excel spreadsheet tool was created to disaggregate the cordoned ERM matrices to each of the 276 internal LAM zones. This tool used available data on populations, employment, and education places at Census small area level, to split trips to/from each ERM zone between the more detailed LAM zoning system. This allowed for a consistent split of demand within the study area, whilst maintaining consistency with the ERM matrix.

3.2 Micro-Simulation Model

3.2.1 Introduction

The following section describes the overall methodology used for developing the N11/M11 BPIS Micro-simulation model. The N11/M11 LAM provided the initial network detail and prior demand matrices. Further refinement was undertaken as appropriate for micro-simulation level modelling of the N11/M11 corridor, and it was calibrated and validated to observed count data in-line with relevant guidelines.

3.2.2 N11/M11 BPIS Micro-Simulation Model Development Methodology

The methodology for developing the N11/M11 BPIS Micro-simulation model is illustrated in Figure 3-7.

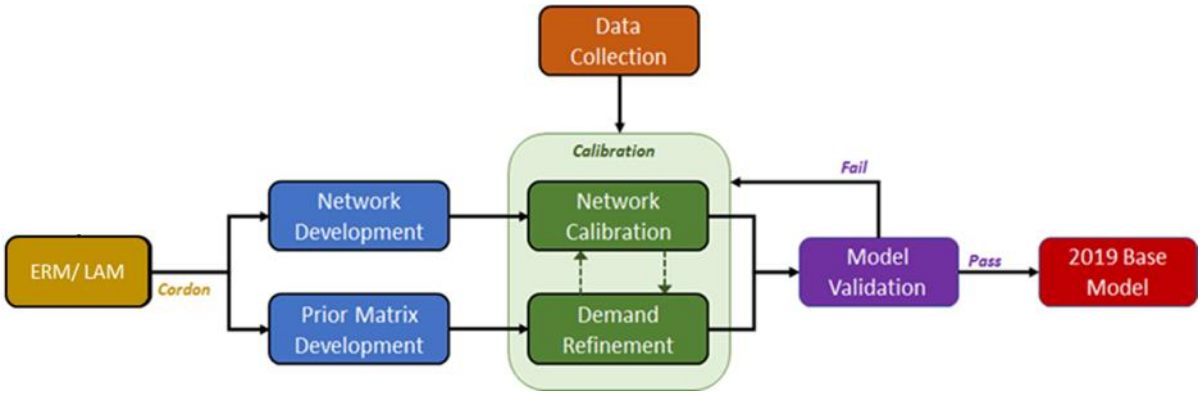


Figure 3-7 Micro-Simulation model development methodology

In Summary:

- **Network and Prior Matrix Development:** The calibrated base year N11/M11 LAM cordoned road network provided the initial prior matrices and network extent for the development of the micro-simulation model.
- **Data Collection:** Traffic survey data including link counts, junction turning counts and journey time information was collated and used to calibrate and validate the N11/M11 BPIS Micro-simulation model (refer to Chapter 2 for further information).
- **Calibration:** Calibration is the process of adjusting the model to better represent observed data. This is normally undertaken in two steps:
    1. **Network Calibration:** adjustments to the road network based on observations extracted from traffic survey data e.g. altering turning capacities at junctions, updating link speeds etc.; and
    2. **Demand Refinement:** adjustments to the prior matrix to better represent observed travel movements from count data.

The N11/M11 BPIS Micro-simulation model was calibrated in-line with Transport Infrastructure Ireland's (TII) Project Appraisal Guidelines (PAG) and the UK Department for Transport (DfT) TAG guidance.

- **Validation:** Validation is the assessment of the validity of the calibrated model, and its robustness in representing observed traffic conditions. Calibration and validation are an iterative process. If the results of the validation checks are unsatisfactory, then adjustments will be made as required to achieve a better representation of reality. N11/M11 BPIS Micro-simulation model was validated in-line with TII and TAG guidance, and further information is provided in Chapter 5 of this report.

3.2.3 Model Area

The area to be analysed in detail in the N11/M11 BPIS Micro-simulation model is illustrated in Figure 3-8 and covers all the junctions and lanes on the N11/M11 from Loughlinstown Roundabout to Junction 10 (Delgany). The model area was determined based on the extent of the sub-schemes.



Figure 3-8 N11/M11 BPIS Micro-Simulation model area

3.2.4 Model Time Periods

The N11/M11 BPIS Micro-simulation models have been developed for the morning and evening time periods.

These time periods are themselves segmented into a warmup period that is used to get vehicles into the network and initial delays represented, a set of core modelled hours from which results are extracted and a cool down period to enable vehicles loaded at the end of the core modelled hour to traverse the network.

The N11/M11 BPIS Micro-simulation model was therefore developed, calibrated and validated to represent the following time periods:

- AM Morning peak period: 07:00 to 10:00; and
- PM Evening peak period: 16:00 to 19:00.

3 peak hour models within each of these periods were developed. An additional warm-up hour (06:00-07:00) was added to ensure adequate traffic levels in the 07:00-08:00 period. Similarly, an additional 30min warm-up period was added in the PM model (15.30-16.00) to ensure delays were modelled correctly, particularly in the southbound direction from the M50 to the M11.

3.2.5 Demand Segmentation

The prior travel demand for the N11/M11 BPIS Micro-simulation model was derived from the N11/M11 LAM which in turn was derived from the NTA ERM. For the N11 microsimulation model, the nine user classes used in the N11/M11 LAM (and ERM) have been aggregated into two vehicle classes as per Table 3-1.

Table 3-1 Vehicle class definition

LAM Model User Class	Micro-Simulation Model Vehicle Class
Taxi	Lights
Car Employers Business	
Car Commute	
Car Education	
Car Other	
Light Goods Vehicle (LGV1)	
Other Goods Vehicles (OGV1)	Heavies
OGV2 Permit Holder	
OGV2 Non-Permit Holder	

3.2.6 Model Software

The model software used to develop the N11/M11 BPIS Micro-simulation model is the Aimsun Next software version 22.0.2.

3.2.7 Network Development

The N11/M11 BPIS Micro-simulation model network covers the N11/M11 corridor from Loughlinstown Roundabout in the north to Junction 10 (Delgany) to the south. It also includes all roads interacting with junctions along the N11/M11, with the network extent shown in Figure 3-9.

The model coding was applied based on internal SYSTRA coding guides which include Aimsun coding best practice approaches. A detailed review was undertaken of all model coding in the study area using digital mapping systems such as Google Earth to ensure it represented, as accurately as possible, the existing road network. This included aspects such as network speed limits, availability of bus lanes, junction layouts, merge and diverge lanes, lane widths etc.

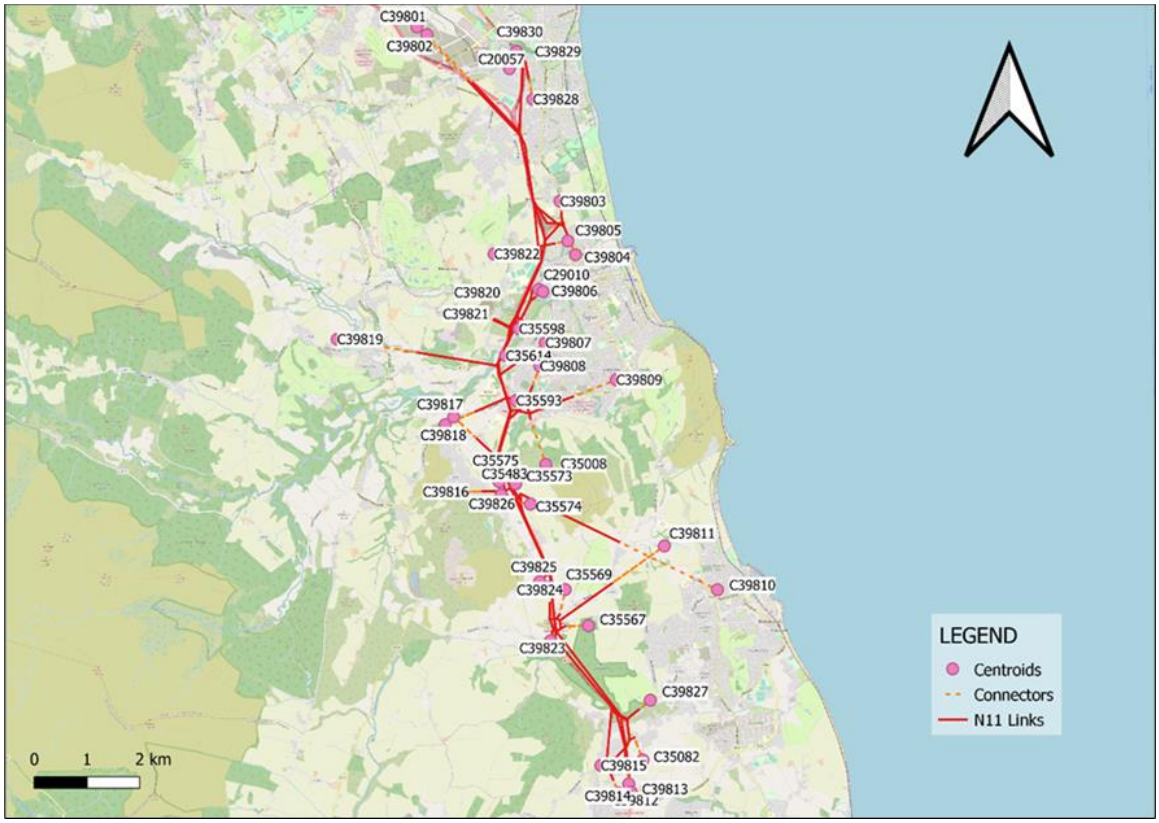


Figure 3-9 N11/M11 BPIS Micro-Simulation model network extent

As illustrated in Figure 3-9, the dashed lines are zone loading connectors and the annotation denotes the zone centroid names for the 43 zones in the model.

Public transport routes have been included as static routes representing bus services based on routes consistent with those contained within the ERM and in turn 2019 base year N11/M11 LAM. The average number of bus services using the N11/M11 in the peak hours only are as follows (which equates to an approximate 4 min headway):

- AM peak (07:00 – 10:00) – 95 buses (northbound and southbound combined)
- PM peak (16:00 – 19:00) – 92 buses (northbound and southbound combined)

The following are the bus services modelled using the N11/M11 based on 2019 data:

- Bus Éireann 2;
- Bus Éireann X2;
- Bus Éireann 133;
- Wexford Bus 740;
- Wexford Bus 740A;
- Dublin Bus 84X;
- Go Ahead 45A; and
- Go Ahead 45B.

3.2.8 Prior Matrix Development

The calibrated 2019 base year N11/M11 LAM cordoned road network provided the initial prior matrices for the development of the N11/M11 BPIS Micro-simulation model matrices.

The cordon function within SATURN facilitated the extraction of trip matrices for a subset area of the 2019 base N11/M11 LAM matching the N11/M11 BPIS Micro-simulation model extent, whilst still maintaining route and destination choice from the calibrated LAM. A bespoke Excel spreadsheet tool was created to disaggregate the cordoned LAM hourly matrices to each of the 43 N11/M11 BPIS Micro-simulation model zones.

Whilst the N11/M11 LAM covers an average 1-hr period during the AM (08:15-09:15) and PM peaks (17:00-18:00), the micro-simulation model was developed to cover three 1-hr periods during the morning period (07:00-08:00, 08:00-09:00 and 09:00-10:00) and 3 hours in the evening (16:00-17:00, 17:00-18:00 and 18:00-19:00).

The LAM 1-hr matrices were factored based on the JTC survey data to form the prior matrices for the micro-simulation model. The following factors were applied as outlined in Table 3-2.

Table 3-2 Percentage of LAM demand applied to each modelled hour

Time Period	Modelled Hour	Heavy Vehicles	Light Vehicles
AM	07:00 – 08:00	101%	85%
	08:00 – 09:00	100%	100%
	09:00 – 10:00	101%	87%
	Total Vehicles	*2,965*	*30,272*
PM	16:00 – 17:00	133%	93%
	17:00 – 18:00	100%	100%
	18:00 – 19:00	70%	88%
	Total Vehicles	*1,436*	*32,816*

4. Model Calibration

4.1 Local Area Model

4.1.1 Overview of the Calibration and Validation Process

Once the base prior matrix is created, calibration is used to improve agreement in the model between observed and modelled traffic characteristics. Generally, the components of the model that may be adjusted on the demand side are trip distribution and trip production and generation levels. This adjustment usually involves trip matrix estimation.

On the supply side (network), modelled junction and link characteristics may be altered if sufficient new information is available to justify changes to the existing network.

The N11/M11 LAM was calibrated and validated in accordance with Transport Infrastructure Ireland's (TII) Project Appraisal Guidelines (PAG) for National Roads Unit 5.1 – Construction of Transport Models (October 2016). This is a widely accepted standard in Ireland that provides robust calibration and validation criteria to which certain types of highway models should adhere.

Additionally, the N11/M11 LAM development has followed guidance from the UK's Department for Transport's Transport Analysis Guidance (TAG) unit M3-1, particularly in terms of matrix estimation controls.

The following sections of this chapter detail the calibration process undertaken to ensure that the LAM accurately reflects baseline conditions, including information on:

- Traffic Count Data;
- Calibration Steps;
- Matrix Estimation; and
- Calibration Statistics i.e. GEH and Linear Regression Analysis.

4.1.1.1 Traffic Count Data

To ensure the robustness of the developed strategic model, a series of traffic counts for the study area have been used to assist in the calibration and validation of base model flows. The following surveys were used in the process:

- Junction Turning Counts (JTC) at 50 locations;
- Automatic Traffic Counts (ATC) at 27 locations; and
- Moving Car Observer (MCO) Journey Time Surveys along the existing route in both directions.

The ATC and JTC survey locations are illustrated in Figure 2-2 and Figure 2-3 respectively. The Journey Time Surveys are discussed in further detail in Chapter 5 describing the model validation process.

Turning counts were taken at key locations and provide detailed movements within a specified junction. The locations of ATC surveys provide a record of traffic at key locations in the study area over an extended period of time (14 days). Incorporating this information enables an accurate representation of traffic flows within the model.

4.1.1.2 Calibration Steps

As an initial calibration step, all modelled movements with corresponding junction turning counts were examined to determine if the count exceeded modelled capacity. Remedial steps were then taken to permit realistic flows in the model.

Similarly, the capacity and speeds of modelled links were also checked to ensure they were broadly in line with survey information.

As the N11/M11 LAM was coded based on best practice approaches developed during the NTA Regional Model Scoping Process, the network coded was an accurate and up-to date representation of the existing road network. If required however, the following network model parameters were adjusted if there was clear reason for doing so:

- Junction type (Priority, Signalised, Roundabout);
- Road lengths;
- Signal timings;
- Link free flow travel speed;
- The number of approach lanes at each junction arm;
- Traffic lane width per junction approach, and the lane discipline adopted (including prohibited turns);
- Saturation flow through junctions;
- Assumed road capacities;

- Link based flow-delay relationships;
- Any other traffic management measures that may impact on capacity, such as bus lanes, traffic calming, parking controls and cycle-lanes;
- Zone co-ordinates; and
- Zone loading points (connections to the network).

4.1.1.3 Trip Demand Adjustment (Matrix Estimation)

Following calibration of the network, trip demand is adjusted in line with count data, so that there is an improved agreement between counts and modelled flows. The base prior matrix is fed into a SATURN programme called ME2. ME2 then adjusts origin-destination pattems to produce a trip demand matrix that better replicates traffic counts when assigned to the network. When this replication is satisfactory the matrix is said to be calibrated.

The prior matrix is adjusted only after all options for improving the network are exhausted. Any matrix adjustment must significantly improve the match between observed and modelled flows, and not introduce more trips into a zone than could realistically be expected. Controls are placed on zones to ensure that the trip demand generated is sensible and in line with census population and employment statistics.

The algorithm driving the ME2 estimation process tends to reduce long trips in place of chains of short trips, especially when counts are spread over the entire area, which may not fully reflect reality. Constraints are therefore placed on the adjustment process to protect the number of movements and distribution of the through trips contained within the original car trip matrix. By restricting such long through trips, the matrix adjustment algorithm is forced to create or re-distribute short trips.

Detailed constraints were developed for all zones within the study area to ensure that the ME2 process did not unrealistically alter trips entering/exiting the main areas of assessment. Census Small Area Population Statistics (SAPS) 2016 and land-use data (Geo-directory) were utilised to determine a range of the likely number of trips that would originate, or end, in each zone and these were used as constraints in the matrix estimation process. In Summary:

- **Residential Zones:** The trip generation values from the prior matrix (Cordoned ERM) were utilised as minimum constraints for residential zones. Land use information identified through the creation of the LAM zone system gave a breakdown on the approximate number of housing units in each residential zone.
- **Employment Zones:** Minimum constraints based on employment attractions, within the NTA planning sheet for the ERM cordon run were utilised to encourage employment zones as destinations. Maximum constraints were applied to areas within the model area to reflect the amount of on-street parking available.
- **Schools:** Minimum constraints were applied to school zones based on the NTA planning sheet. For the PM peak (17:00 - 18:00), constraints were applied to ensure that no trips were attracted to school zones to reflect the fact that all schools would be closed at this time.
- **Heavy Vehicles:** Constraints were applied on all residential and unsuitable zones to ensure that HV traffic was not assigned to inappropriate zones in the LAM. For key HV generators/attractors in the area, a possible range of values were defined based on the surveys carried out in the area.

4.1.1.4 Calibration Statistics: GEH

The GEH statistic is a measure that considers both absolute and proportional differences in flows. Thus, for high levels of flow a low GEH may only be achieved if the percentage difference in flow is small. For lower flows, a low GEH may be achieved even if the percentage difference is relatively large. GEH is formulated as:

$$GEH = \sqrt{\frac{(modelled - observed)^2}{0.5\,x\,(modelled + observed)}}$$

The reason for introducing such a statistic is the inability of either the absolute difference or the relative difference to cope over a wide range of flows. For example, an absolute difference of 100 pcu/h may be considered a big difference if the flows are of the order of 100 pcu/h, but would be unimportant for flows in the order of several thousand pcu/h. Equally a 10% error in 100 pcu/h would not be important, whereas a 10% error in, say, 3000 pcu/h might mean the difference between adding capacity to a road or not.

In general, the GEH parameter is less sensitive to the above statistical biases since a modeller would probably feel that an error of 20 in 100 would be roughly as bad as an error of 90 in 2,000, and both would have a GEH statistic of roughly 2.

As a rule of thumb in comparing assigned volumes with observed flows, a GEH parameter of 5 or less would be an acceptable fit, while GEH parameters greater than 10 would require closer attention.

The DMRB Volume 12a guidelines (Traffic Appraisal in Urban Areas) are a widely accepted standard in Ireland (with TII basing their guidelines on this document) that provides extremely robust validation criteria to which certain types of highway models should adhere. This document sets a guideline that 85% of links should have a GEH less than 5 (when measured in vehicles per hour) as shown in Table 4-1.

Table 4-1 Calibration criteria

Criteria	Acceptability Guideline
Assigned hourly flows compared with observed flows	
Individual flows within 100 v/h for flows less than 700 v/h	>85% of cases
Individual flows within 15% for flows between 700 & 2,700 v/h	
Individual flows within 400 v/h for flows greater than 2,700 v/h	
Individual flows – GEH < 5	>85% of cases
Modelled journey times compared with observed times	
Times within 15% or 1 minute if higher	>85% of cases

4.1.2 Model Calibration Results

4.1.2.1 Traffic Flow and GEH Calibration Results

Table 4-2 summarises the GEH calibration results by vehicle class (Light and Heavy vehicles) for the model after the matrix estimation process, across the three hours of modelled time periods. The full list of GEH results for each traffic count location are presented in the accompanying calibration dashboards in Appendix B.

Table 4-2 Count calibration statistics (post-calibration)

Peak	LV	HV	Total
	GEH < 5		
AM	97%	89%	96%
IP	97%	87%	96%
PM	96%	85%	96%

The figures demonstrate that an excellent calibration has been achieved in the model for the morning, evening and inter peak periods, with overall GEH<5 of 96% in all time periods, which falls well within TII standards.

4.1.2.2 Link and Turn Flow Calibration Results

TII PAG (Unit 5.1 Table 5.1.3 and 5.1.4) requires that both of the following two criteria should be met in 85% of cases:

- **Criteria 1:** links should have a GEH value of less than 5;
- **Criteria 2:**
  - where modelled flows are less than 700, the model flow should be within 100 vehicles of the count;
  - where modelled flows are between 700 and 2700 the modelled flows should be within 15% of observed flows; and
  - where modelled flows are greater than 2700 the modelled flows should be within 400 vehicles of the observed flows.

Table 4-3 presents the link count calibration for counts used in matrix estimation. The results indicate that the model is calibrated as per the requirements of TII PAG for link flows. Appendix B presents further details in relation to model calibration. To clarify, in the case of the IP where both LV and HV calibration is 100%, some total flows are slightly outside the criteria, hence a 98% match.

Table 4-3 Traffic flow calibration statistics (post-calibration)

Peak	LV	HV	Total
	Individual flows >85% of cases		
AM	100%	100%	100%
IP	100%	100%	98%
PM	98%	100%	97%

Again, these figures demonstrate that an excellent calibration has been achieved in the model for the morning, evening and inter peak periods.

4.1.2.3 Impact of Matrix Estimation on Trip Length Distribution

A further calibration step recommended by TII PAG is to compare trip length distributions for the prior and post calibrated matrices to ensure they have not been distorted to any great extent by the matrix estimation process. ME2 can sometimes generate increased short distance trips to match count information, thus distorting the profile of trip making on the network. TII PAG suggests that the coincidence ratio should be used to compare trip length distributions before and after estimation, with a desirable range between 0.7 and 1.0.

A coincidence ratio can be used to compare two distributions by examining the ratio of the total area of those distributions that coincide. The coincidence ratio is defined as:

$$CR = \frac{\sum\{Min\ (TLDs, TLDf)\}}{\sum\{Max\ (TLDs, TLDf)\}}$$

Where;

- TLDs is the source trip length frequency; and
- TLDf is the final trip length frequency.

A desirable range for the coincidence ratio is between 0.7 and 1.0 where a ratio of 1.0 suggests an identical distribution. Table 4-4 outlines the coincidence ratios for each of the calibrated time periods developed.

Table 4-4 Trip length analysis coincidence ratios

Measure of Fit	AM	PM	IP
	Total Flow	Total Flow	Total Flow
Coincidence Ratio	0.86	0.88	0.92

The coincidence ratios suggest that, while there have been some changes in trip lengths, the changes made during matrix estimation are within acceptable limits.

Figure 4-1 to Figure 4-3 graphically present the change in trip length distribution for each model period as a result of matrix estimation. These figures show that there have been some changes to the trip length distributions shown across the time periods. The changes overall are not large and therefore it is considered that Matrix Estimation has not overly distorted the trip length distribution of the prior matrices.

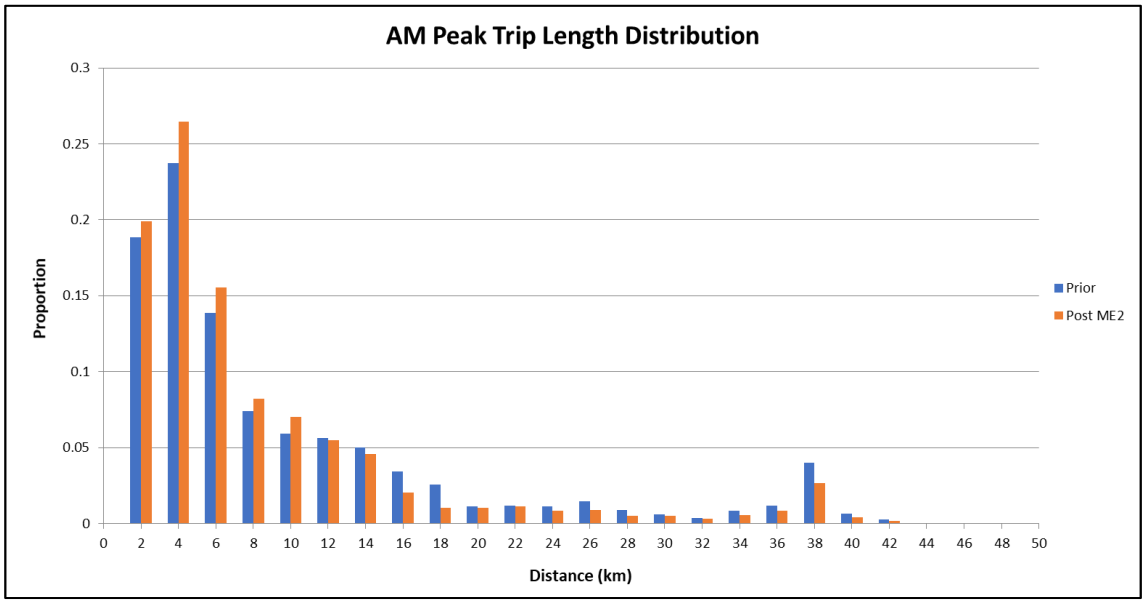


Figure 4-1 AM peak trip length distribution

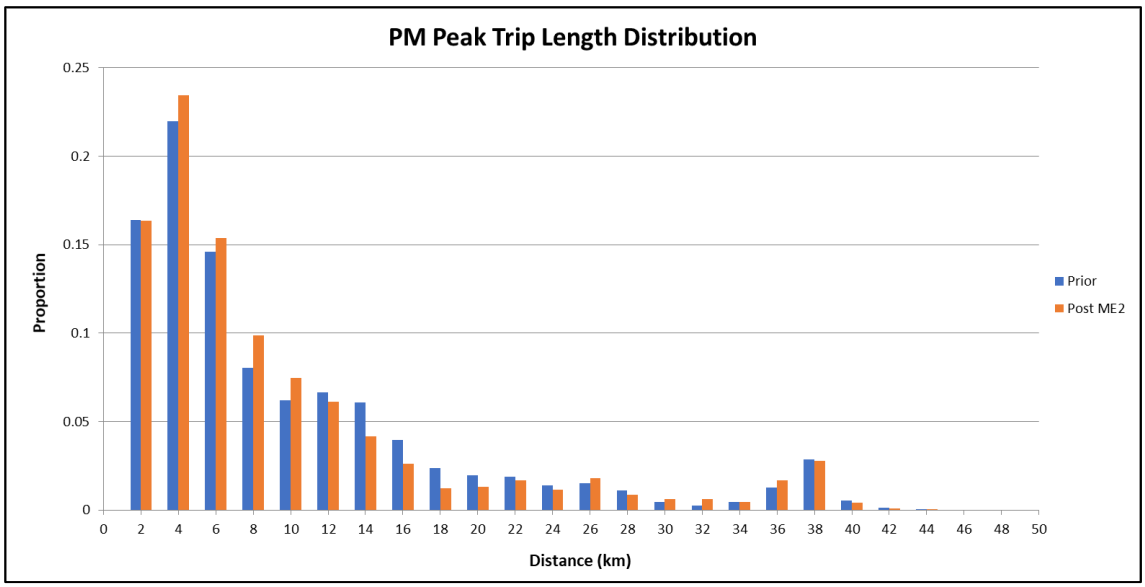


Figure 4-2 PM peak trip length distribution

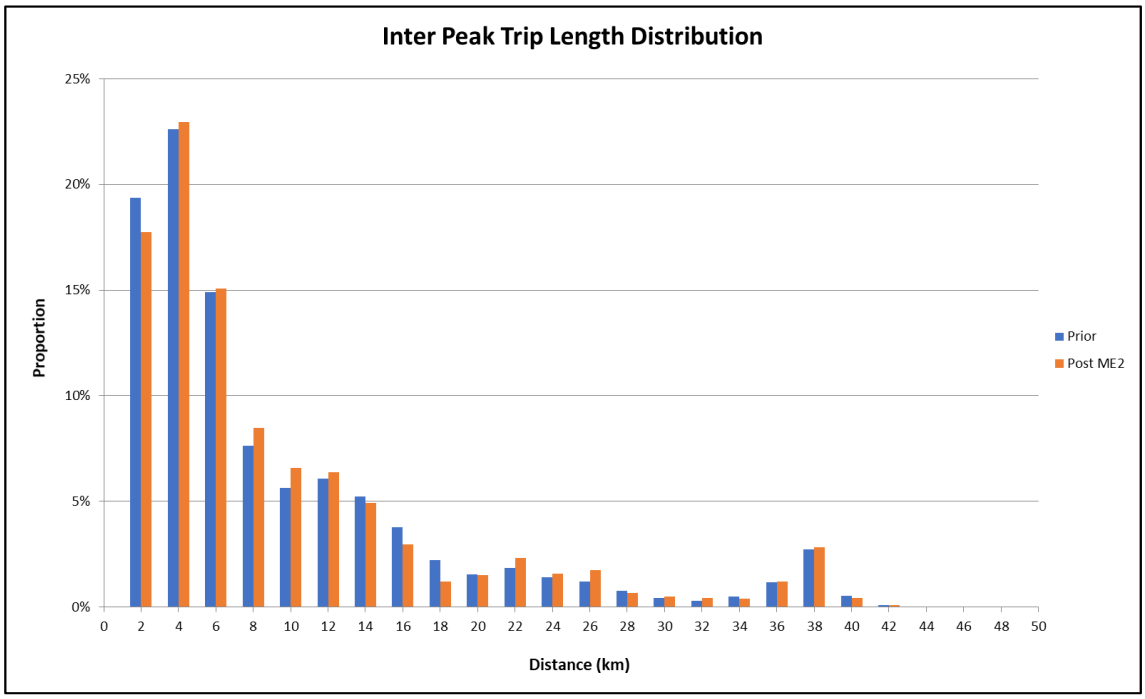


Figure 4-3 IP peak trip length distribution

4.2 Micro-Simulation Model

4.2.1 Overview of the Calibration and Validation Process

The following sections of this chapter detail the calibration process undertaken to ensure that the N11/M11 BPIS Micro-simulation model accurately reflects baseline conditions, including information on:

- Calibration Steps;
- Matrix Estimation; and
- Calibration and Validation Statistics.

4.2.1.1 Calibration Steps

As an initial calibration step, the network coding was reviewed following an initial loading of vehicle demands. This calibration review considered the following model parameters and attributes:

- Junction type (Priority, Signalised, Roundabout);
- Road section lengths;
- Link free flow travel speeds;
- The number of approach lanes at each junction arm; and
- Traffic lane width per junction approach, and the lane discipline adopted (including prohibited turns).

4.2.1.2 Trip Demand Adjustment (Matrix Estimation)

Following calibration of the network, trip demand was adjusted in line with count data, so that there is an improved agreement between counts and modelled flows. The base prior matrix was fed into the matrix correction module within Aimsun. This module then adjusts origin-destination patterns to produce a trip demand matrix that better replicates traffic counts when assigned to the network. When this replication is satisfactory the matrix is said to be calibrated.

The prior matrix was adjusted only after all options for improving the network were exhausted.

Any matrix adjustment must significantly improve the match between observed and modelled flows, and not introduce more trips into a zone than could realistically be expected. Controls were placed on zones to ensure that the trip demand generated is sensible and within specified ranges.

As mentioned previously, the prior matrix was inherited from the calibrated and validated N11/M11 LAM and therefore required limited adjustment for the 1-hr period during the AM (08:15-09:15) and PM peaks (17:00-18:00). Matrix adjustments were utilised for the shoulder hours to ensure a good match with observed flows.

4.2.2 Model Calibration Results

4.2.2.1 Traffic Flow and GEH Calibration Results

Table 4-5, Table 4-6 and Table 4-7 summarise the GEH calibration results by vehicle class (Light and Heavy Goods Vehicles and Total) for the model after the matrix estimation process, across three hours of each modelled time periods. The full list of GEH results for each traffic count location are presented in the accompanying calibration dashboards in Appendix B.

Table 4-5 Count calibration statistics (post-calibration) – light vehicles

GEH	AM 07:00 – 08:00	AM 08:00 – 09:00	AM 09:00 – 10:00	PM 16:00 – 17:00	PM 17:00 – 18:00	PM 18:00 – 19:00
GEH<5	91%	94%	91%	87%	94%	93%
GEH<10	100%	100%	100%	100%	100%	100%

The figures demonstrate that an excellent calibration has been achieved in the model for light vehicles in all time periods, all within TII PAG standards.

Table 4-6 Count calibration statistics (post-calibration) – heavy goods vehicles

GEH	AM 07:00 – 08:00	AM 08:00 – 09:00	AM 09:00 – 10:00	PM 16:00 – 17:00	PM 17:00 – 18:00	PM 18:00 – 19:00
GEH<5	98%	98%	96%	92%	100%	100%
GEH<10	100%	100%	100%	100%	100%	100%

The figures demonstrate that an excellent calibration has been achieved in the model for heavy vehicles in all time periods, all within TII PAG standards.

Table 4-7 Count calibration statistics (post-calibration) – total

GEH	AM 07:00 – 08:00	AM 08:00 – 09:00	AM 09:00 – 10:00	PM 16:00 – 17:00	PM 17:00 – 18:00	PM 18:00 – 19:00
GEH<5	91%	96%	90%	86%	94%	94%
GEH<10	100%	100%	100%	100%	100%	100%

4.2.2.2 Link and Turn Flow Calibration Results

TII PAG (Unit 5.1, Table 5.1.3 and 5.1.4) requires that both of the following two criteria should be met in 85% of cases:

- **Criteria 1:** links should have a GEH value of less than 5
- **Criteria 2:**
  - where modelled flows are less than 700, the model flow should be within 100 vehicles of the count

- where modelled flows are between 700 and 2700 the modelled flows should be within 15% of observed flows; and
- where modelled flows are greater than 2700 the modelled flows should be within 400 vehicles of the observed flows.

Table 4-8 presents the link count calibration for counts used in matrix estimation. The results indicate that the model is calibrated as per the requirements of TII PAG for link flows. Appendix C presents further details in relation to model calibration.

Table 4-8 Traffic flow calibration statistics (post-calibration)

Time Segment		Light Vehicles	Heavy Vehicles	Total
Morning Peak	07:00 to 08:00	98%	100%	98%
	08:00 to 09:00	98%	100%	98%
	09:00 to 10:00	97%	100%	96%
Evening Peak	16:00 to 17:00	92%	100%	89%
	17:00 to 18:00	97%	100%	97%
	18:00 to 19:00	98%	100%	98%

Again, these figures demonstrate that an excellent calibration has been achieved in the model by vehicle type and for all time periods.

5. Model Validation

5.1 Local Area Model

5.1.1 Introduction

The validation of the model uses additional comparative measures against which the robustness of the calibrated model may be judged. Calibration and validation are separate concepts, however, in reality these two elements are part of an iterative process. If the results of the validation checks are not satisfactory, then the modeller will review the inputs and coding within the model and adjust as required in order to achieve a better representation of reality.

It is important that the information used in calibrating the model, including count data for matrix estimation, is kept separate from that used for validation if it is to be a true independent test of the model. As such, the following two main data sources were used in the validation of the N11/M11 LAM:

- Automatic Traffic Counts (ATCs) not utilised during model calibration; and
- Observed journey times on key routes as illustrated in Figure 2-5 previously.

TII PAG unit 5.1 (table 5.1.5) provides guidance criteria for model validation which is very similar to those described previously for calibration in Section 4.1 and are outlined in Table 5-1.

Table 5-1 Validation criteria

Criteria	Acceptability Guideline
Assigned hourly flows compared with observed flows	
Individual flows within 100 v/h for flows less than 700 v/h	>85% of cases
Individual flows within 15% for flows between 700 & 2,700 v/h	

Criteria	Acceptability Guideline
Individual flows within 400 v/h for flows greater than 2,700 v/h	
Individual flows – GEH < 5	>85% of cases
Modelled journey times compared with observed times	
Times within 15% or 1 minute if higher	>85% of cases

The following sections of this chapter present the results of the validation checks carried out on the N11/M11 LAM to ensure that it is providing a robust representation of existing traffic conditions within the model area.

5.1.2 Traffic Flow Validation

Traffic flow validation was carried out for traffic counts not initially included within calibration.

Table 5-2 summarises the traffic flow and GEH validation results for the N11/M11 LAM for each of the modelled time periods. The results demonstrate that a good level of validation has been achieved for each modelled period, with GEH and flow comparison values falling within TII standards. This provides further confidence that a good match has been achieved between modelled and observed flows, indicating that the N11/M11 LAM provides a robust representation of 2019 base year traffic conditions.

Table 5-2 Traffic count validation statistics

Criteria		AM			PM			IP		
		LV	HV	Total	LV	HV	Total	LV	HV	Total
Individual flows	>85% of cases	98%	95%	98%	93%	99%	96%	95%	97%	100%
GEH Statistics – GEH < 5	>85% of cases	94%	85%	92%	87%	85%	87%	85%	86%	85%

5.1.3 Journey Time Validation

As outlined in Table 5-1, TII guidelines recommend that modelled journey times should be within +/- 15% of the observed time, or 1 minute if higher, in more than 85% of cases. Table 5-3 to Table 5-8 detail the overall results for the cumulative route totals (both northbound and southbound along the N11) and the individual timing sections. The results show an excellent match to TII guidelines, with cumulative route totals and all of the individual sections satisfying the TII PAG criteria for each time period. For reference, the route sections (A-B etc.) are shown in Figure 2-5.

Table 5-3 Journey time validation (Northbound) – AM

Route Section	A-B	B-C	C-D	D-E	E-F	F-G	G-H	H-I	Total
Observed (seconds)	67	247	400	531	793	956	1,073	1,185	5,252
Modelled (seconds)	62	235	437	598	853	973	1,042	1,153	5,354
Difference (seconds)	5	12	-37	-67	-60	-17	31	32	-102
Difference	-8%	-5%	9%	13%	8%	2%	-3%	-3%	2%
Pass	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 5-4 Journey time validation (Northbound) – PM

Route Section	A-B	B-C	C-D	D-E	E-F	F-G	G-H	H-I	Total
Observed (seconds)	62	231	368	438	591	668	730	816	3,904
Modelled (seconds)	67	253	388	477	657	726	785	889	4,241
Difference (seconds)	-5	-22	-20	-39	-66	-58	-55	-73	-337
Difference	8%	10%	5%	9%	11%	9%	7%	9%	9%
Pass	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 5-5 Journey time validation (Northbound) – IP

Route Section	A-B	B-C	C-D	D-E	E-F	F-G	G-H	H-I	Total
Observed (seconds)	59	229	362	432	581	661	724	811	3,859
Modelled (seconds)	64	245	379	463	663	732	789	889	4,223
Difference (seconds)	-5	-16	-17	-31	-82	-71	-65	-78	-364
Difference	8%	7%	5%	7%	14%	11%	9%	10%	9%
Pass	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 5-6 Journey time validation (Southbound) – AM

Route Section	H-I	G-H	F-G	E-F	D-E	C-D	B-C	A-B	Total
Observed (seconds)	96	149	222	380	458	590	792	820	3,507
Modelled (seconds)	99	156	237	445	526	659	832	892	3,845
Difference (seconds)	-3	-7	-15	-65	-68	-69	-40	-72	-338
Difference	3%	5%	7%	17%	15%	12%	5%	9%	10%
Pass	✓	✓	✓	X	✓	✓	✓	✓	✓

Table 5-7 Journey time validation (Southbound) – PM

Route Section	H-I	G-H	F-G	E-F	D-E	C-D	B-C	A-B	Total
Observed (seconds)	354	418	526	744	874	1039	1259	1290	6,504
Modelled (seconds)	369	452	543	729	811	941	1114	1173	6,132
Difference (seconds)	-15	-34	-17	15	63	98	145	117	372
Difference	4%	8%	3%	-2%	-7%	-9%	-12%	-9%	-6%
Pass	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 5-8 Journey time validation (Southbound) – IP

Route Section	H-I	G-H	F-G	E-F	D-E	C-D	B-C	A-B	Total
Observed (seconds)	212	269	354	522	605	743	949	975	4,629
Modelled (seconds)	227	300	394	593	695	836	1,011	1,070	5,125
Difference (seconds)	-15	-31	-40	-71	-90	-93	-62	-95	-496
Difference	7%	11%	11%	14%	15%	13%	7%	10%	11%
Pass	✓	✓	✓	✓	✓	✓	✓	✓	✓

5.1.3.1 AM Results

The results in Figure 5-1 and Figure 5-2 indicate a good correlation between modelled and observed journey times in the AM peak with delay being experienced at the correct locations on the network. In the figures below, the joumey time routes have been broken into sections, with existing junctions forming the breaking point of each section. These sections are also shown in Figure 2-5 of this report. As shown below, all sections of the route modelled fall within 15%, or within 60 seconds, of the observed journey times as per TII guidelines.

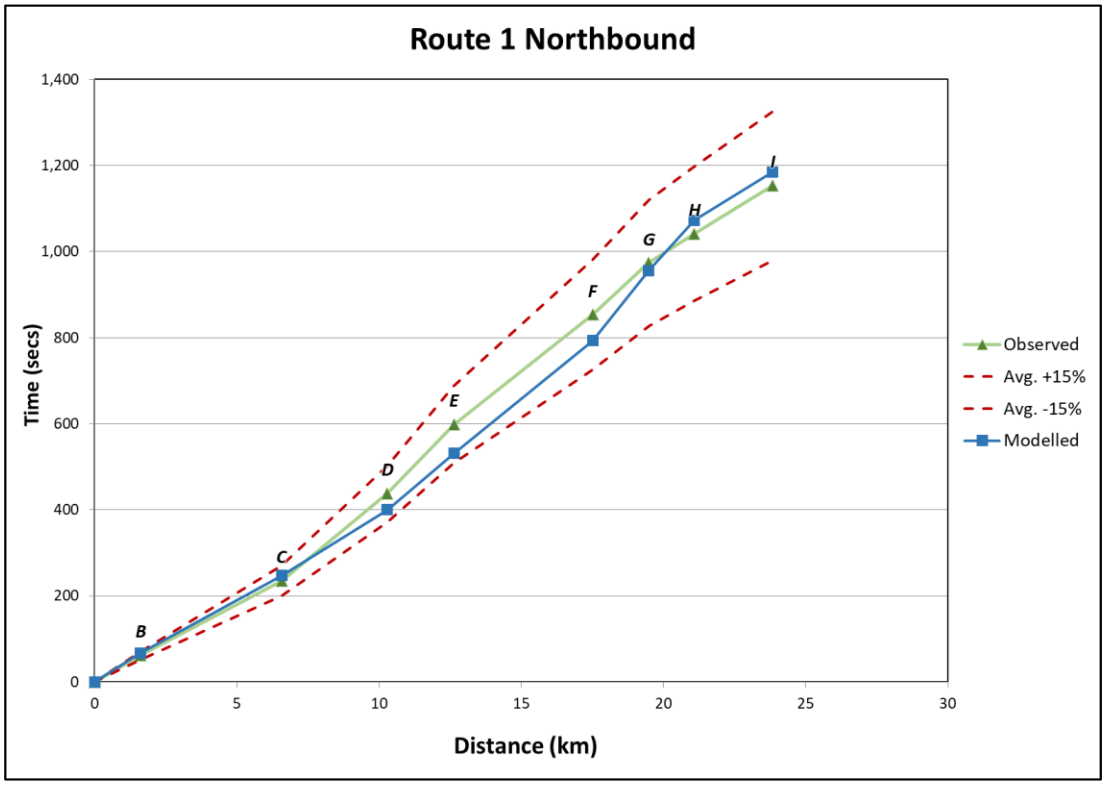


Figure 5-1 N11/M11 northbound AM peak journey time validation

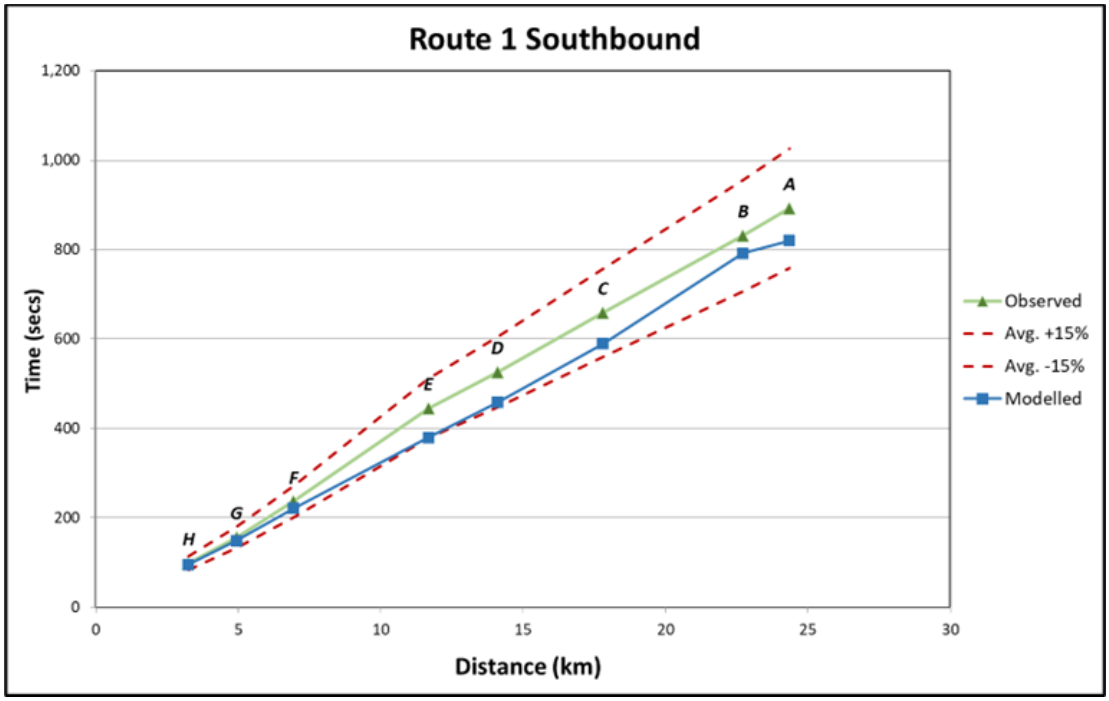


Figure 5-2 N11/M11 southbound AM peak journey time validation

The results outlined above indicate that the modelled journey times in the AM peak satisfy the DMRB and TII guidelines. The results indicate an excellent match with the northbound direction only 3% greater than the observed data and southbound times within 8%.

5.1.3.2 PM Results

As per the AM peak, the results in Figure 5-3 and Figure 5-4 indicate a good correlation between modelled and observed journey times in the PM peak.

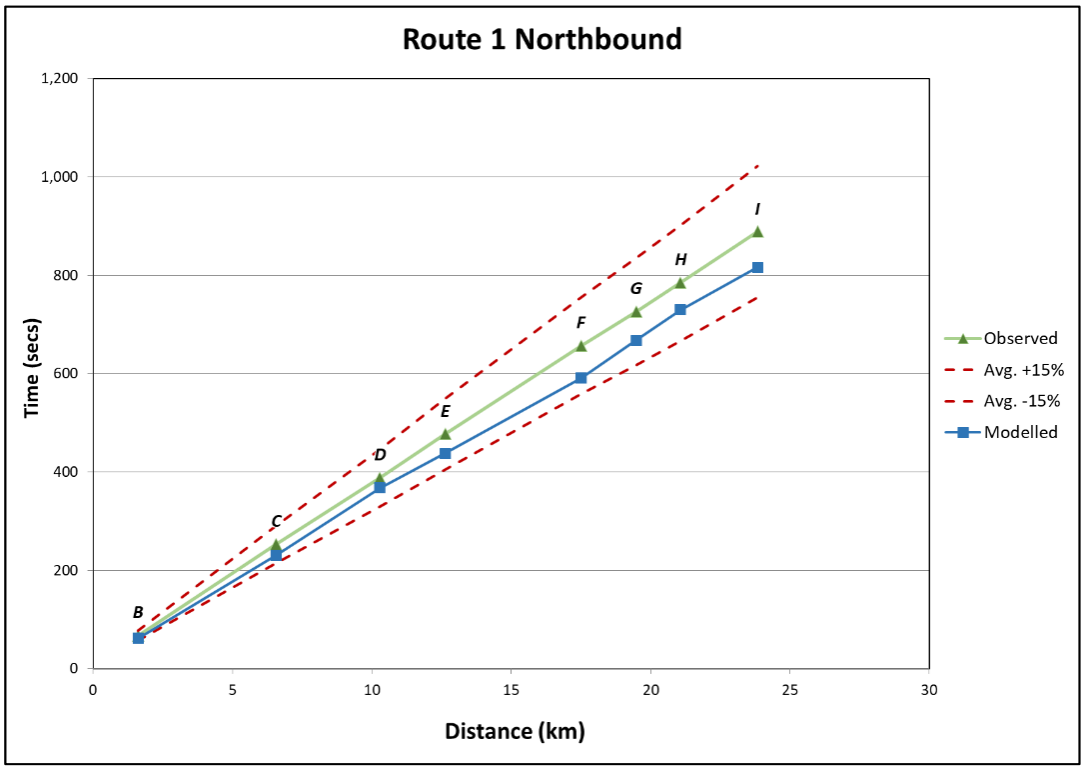


Figure 5-3 N11/M11 northbound PM peak journey time validation



Figure 5-4 N11/M11 southbound PM peak journey time validation

The results outlined above indicate that the modelled journey times in the PM peak satisfy the DMRB and TII guidelines. The results indicate a good match with the northbound direction being 8% less and the southbound direction being 10% more than the observed data.

5.1.3.3 Inter-peak Results

Figure 5-5 and Figure 5-6 illustrate the correlation between observed and modelled journey times along the entire route in both directions during the inter-peak period.

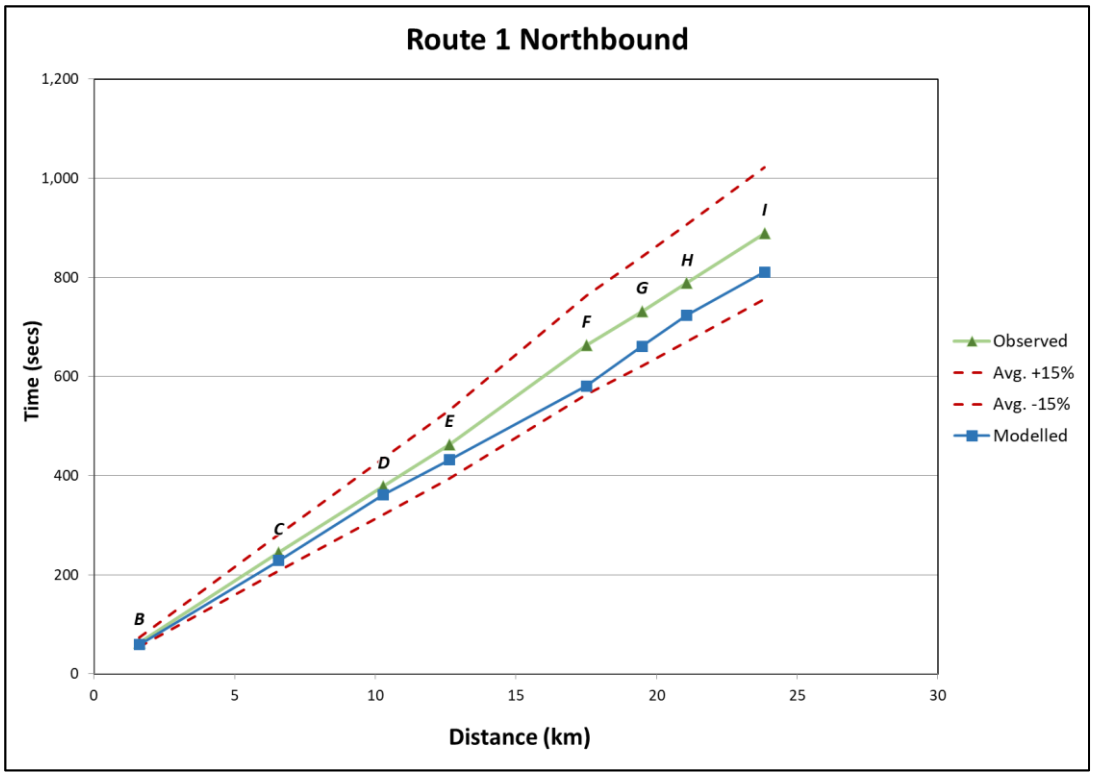


Figure 5-5 N11/M11 northbound IP journey time validation



Figure 5-6 N11/M11 southbound IP journey time validation

The results outlined above indicate that the modelled journey times in the Inter-peak satisfy the DMRB and TII guidelines. The results indicate a good match with the northbound and southbound directions being only 9% less than the observed data.

5.1.4 Validation Summary

The previous two chapters provide an overview of the calibration and validation of the N11/M11 local area traffic model which has been developed to assess the proposed options for the N11/M11 BPIS. In summary:

- The NTA's ERM was used as a basis for development of the N11/M11 Local Area Model with additional network and zonal detail added to more accurately represent localised traffic movements.
- The model has been calibrated and validated in-line with TII Project Appraisal Guidelines and meets all specified criteria for both the AM, PM and Inter-peaks.
- The N11/M11 LAM is fit for purpose, and represents AM, PM and Inter-peak period base year traffic conditions well, as demonstrated statistically through calibration and validation.

5.2 Micro-Simulation Model

5.2.1 Introduction

It is important that the information used in calibrating the model, including count data for matrix estimation, is kept separate from that used for validation if it is to be a true independent test of the model. As such, the following data sources were used in the validation of the N11/M11 BPIS Micro-simulation model:

- Automatic Traffic Counts (ATCs);
- Junction Turning Counts (JTCs) not utilised during model calibration; and
- TII Traffic Counters located on the N11/M11 and the M50.

Observed journey times on key routes as illustrated in Figure 2-5 previously.

5.2.2 Traffic Flow Validation

The following section of this chapter presents the results of the validation checks carried out on the N11/M11 BPIS Micro-simulation model to ensure that it is providing a robust representation of existing traffic conditions within the model area. As mentioned previously, traffic flow validation was carried out for traffic counts not initially included within the calibration dataset.

Table 5-9 to Table 5-11 summarise the traffic flow and GEH validation results for the N11/M11 BPIS Micro-simulation model for each of the modelled time periods. The results demonstrate that a good level of validation has been achieved for all modelled periods, with GEH and flow comparison values falling within TII standards. This provides further confidence that a good match has been achieved between modelled and observed flows, indicating that the N11 microsimulation model provides a robust representation of 2019 base year traffic conditions.

Table 5-9 Count validation statistics (post-calibration) – light vehicles

GEH	AM 07:00 – 08:00	AM 08:00 – 09:00	AM 09:00 – 10:00	PM 16:00 – 17:00	PM 17:00 – 18:00	PM 18:00 – 19:00
GEH<5	93%	96%	96%	87%	87%	98%
GEH<10	100%	100%	100%	100%	100%	100%

Table 5-10 Count validation statistics (post-calibration) – heavy vehicles

GEH	AM 07:00 – 08:00	AM 08:00 – 09:00	AM 09:00 – 10:00	PM 16:00 – 17:00	PM 17:00 – 18:00	PM 18:00 – 19:00
GEH<5	93%	96%	96%	87%	93%	87%
GEH<10	100%	100%	100%	100%	100%	100%

Table 5-11 Count validation statistics (post-calibration) – all vehicles

GEH	AM 07:00 – 08:00	AM 08:00 – 09:00	AM 09:00 – 10:00	PM 16:00 – 17:00	PM 17:00 – 18:00	PM 18:00 – 19:00
GEH<5	91%	96%	98%	87%	89%	98%
GEH<10	100%	100%	100%	100%	100%	100%

Table 5-12 presents the link flow validation. The results indicate that the model is validated as per the requirements of TII PAG for link flows. Appendix C presents further details in relation to model validation.

Table 5-12 Traffic flow validation statistics (post-calibration)

Time Segment		Light Vehicles	Heavy Vehicles	All Vehicles
Morning Peak	07:00 to 08:00	96%	100%	96%
	08:00 to 09:00	98%	100%	98%
	09:00 to 10:00	96%	98%	96%
Evening Peak	16:00 to 17:00	87%	100%	87%
	17:00 to 18:00	89%	100%	89%
	18:00 to 19:00	98%	100%	98%

Again, these figures demonstrate that an excellent level of validation has been achieved in the model by vehicle type and for all time periods.

5.2.3 Journey Time Validation

As outlined in Table 5-1, TII guidelines recommend that modelled journey times should be within +/- 15% of the observed time, or 1 minute if higher, in more than 85% of cases. For the N11/M11 BPIS Micro-simulation model journey time validation was undertaken for the 07:00-08:00, 08:00 to 09:00, 16:00 to 17:00 and 17:00 to 18:00 periods.

Table 5-13 details the overall results for the cumulative route totals (both northbound and southbound along the N11/M11) as well as the results for the individual timing sections.

The results show an excellent match to TII PAG guidelines, with cumulative route totals and all of the individual sections satisfying the TII PAG criteria for each time period. Table 5-14 to Table 5-21 provide the detailed breakdown modelled times in the northbound and southbound direction respectively, for each period. Sections E-I are illustrated in Figure 2-5.

Table 5-13 Journey time validation statistics (post-calibration)

PAG Criteria	AM 07:00 – 08:00	AM 08:00 – 09:00	PM 16:00 – 17:00	PM 17:00 – 18:00
Cumulative Routes	100%	100%	100%	100%
Individual Sections	100%	88%	100%	88%

Table 5-14 Journey time validation (Northbound) – AM (07:00 – 08:00)

Route Section	E-F	F-G	G-H	H-I	Total
Observed (seconds)	371	201	81	124	776
Modelled (seconds)	370	192	64	108	735
Difference (seconds)	1	9	17	16	41
Difference	0%	4%	21%	13%	5%
Pass	✓	✓	×	✓	✓

Table 5-15 Journey time validation (Northbound) – AM (08:00 – 09:00)

Route Section	E-F	F-G	G-H	H-I	Total
Observed (seconds)	198	80	62	105	444
Modelled (seconds)	203	86	61	103	453
Difference (seconds)	-5	-6	1	2	-9
Difference	3%	8%	2%	2%	2%
Pass	✓	✓	✓	✓	✓

Table 5-16 Journey time validation (Northbound) – PM (16:00 – 17:00)

Route Section	E-F	F-G	G-H	H-I	Total
Observed (seconds)	174	70	58	106	408

Route Section	E-F	F-G	G-H	H-I	Total
Modelled (seconds)	190	72	57	99	418
Difference (seconds)	-16	-2	1	7	-10
Difference	9%	2%	3%	6%	2%
Pass	✓	✓	✓	✓	✓

Table 5-17 Journey time validation (Northbound) – PM (17:00 – 18:00)

Route Section	E-F	F-G	G-H	H-I	Total
Observed (seconds)	238	69	59	104	470
Modelled (seconds)	187	69	56	97	409
Difference (seconds)	51	0	3	7	61
Difference	21%	0%	5%	7%	13%
Pass	×	✓	✓	✓	✓

Table 5-18 Journey time validation (Southbound) – AM (07:00 – 08:00)

Route Section	I-H	H-G	G-F	F-E	Total
Observed (seconds)	104	60	82	179	426
Modelled (seconds)	109	58	73	190	431
Difference (seconds)	-5	2	9	-11	-5
Difference	5%	4%	11%	6%	1%
Pass	✓	✓	✓	✓	✓

Table 5-19 Journey time validation (Southbound) – AM (08:00 – 09:00)

Route Section	I-H	H-G	G-F	F-E	Total
Observed (seconds)	92	54	81	172	400
Modelled (seconds)	118	55	71	190	434
Difference (seconds)	-26	-1	10	-18	-34
Difference	28%	3%	12%	10%	9%
Pass	×	✓	✓	✓	✓

Table 5-20 Journey time validation (Southbound) – PM (16:00 – 17:00)

Route Section	I-H	H-G	G-F	F-E	Total
Observed (seconds)	508	140	172	231	1051
Modelled (seconds)	536	129	160	211	1036
Difference (seconds)	-28	11	12	20	15
Difference	5%	8%	7%	9%	1%
Pass	✓	✓	✓	✓	✓

Table 5-21 Journey time validation (Southbound) – PM (17:00 – 18:00)

Route Section	I-H	H-G	G-F	F-E	Total
Observed (seconds)	369	83	91	186	729
Modelled (seconds)	373	90	93	205	762
Difference (seconds)	-4	-7	-2	-19	-33
Difference	1%	8%	3%	10%	4%
Pass	✓	✓	✓	✓	✓

5.2.4 Visual Model Validation Checks

Chapter 1 details the existing transport conditions on the N11/M11 based on analysis of survey data and TII TMU data. During model development, in addition to the analysis of survey data; site visits were undertaken to identify issues, particularly relating to weaving / merging / diverging and queue locations that are particularly important to more detailed micro-simulation modelling. Figure 5-7 and Figure 5-8 summarise the observed issues in the northbound in the AM and southbound in the PM periods.

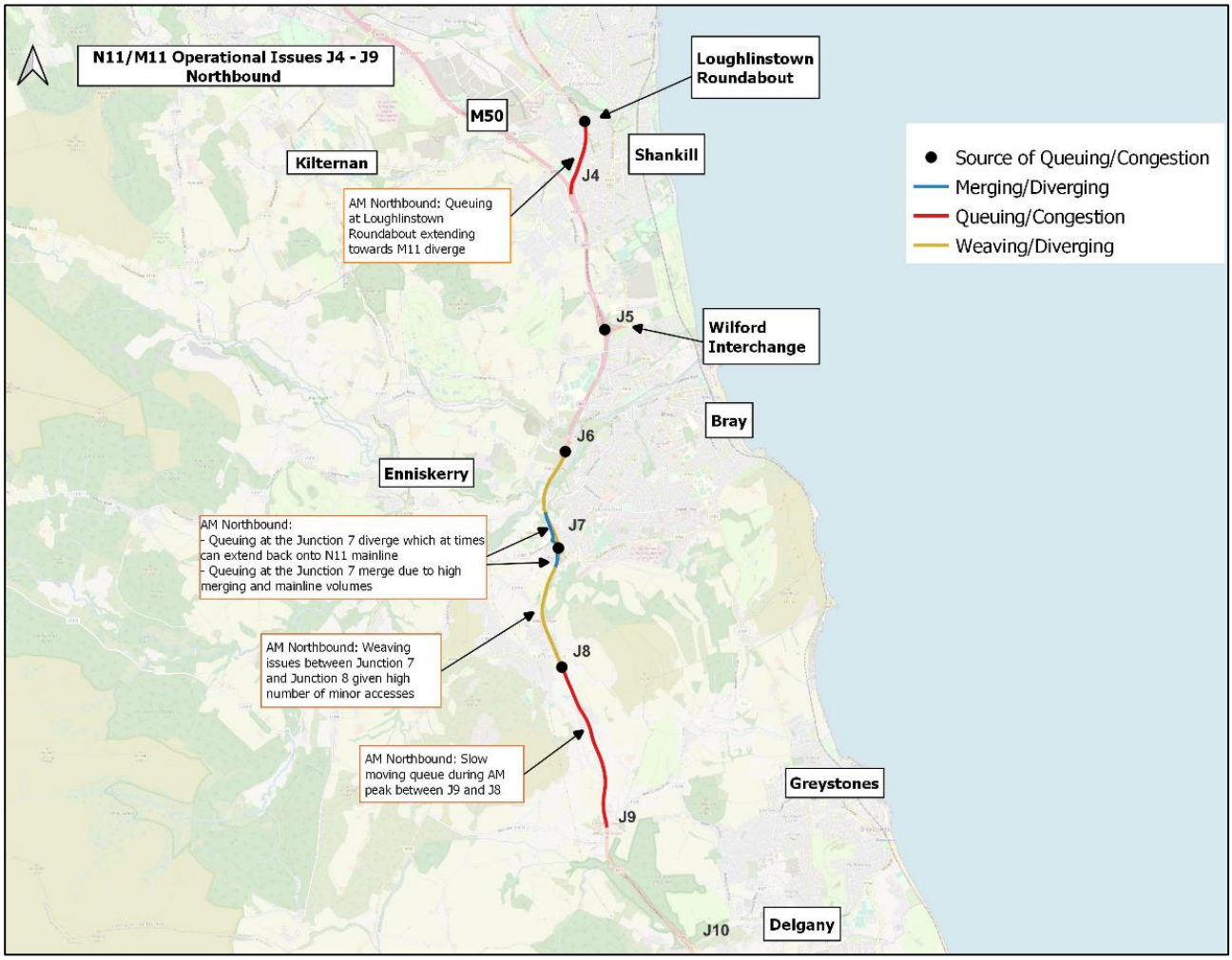


Figure 5-7 N11/M11 northbound AM peak baseline issues

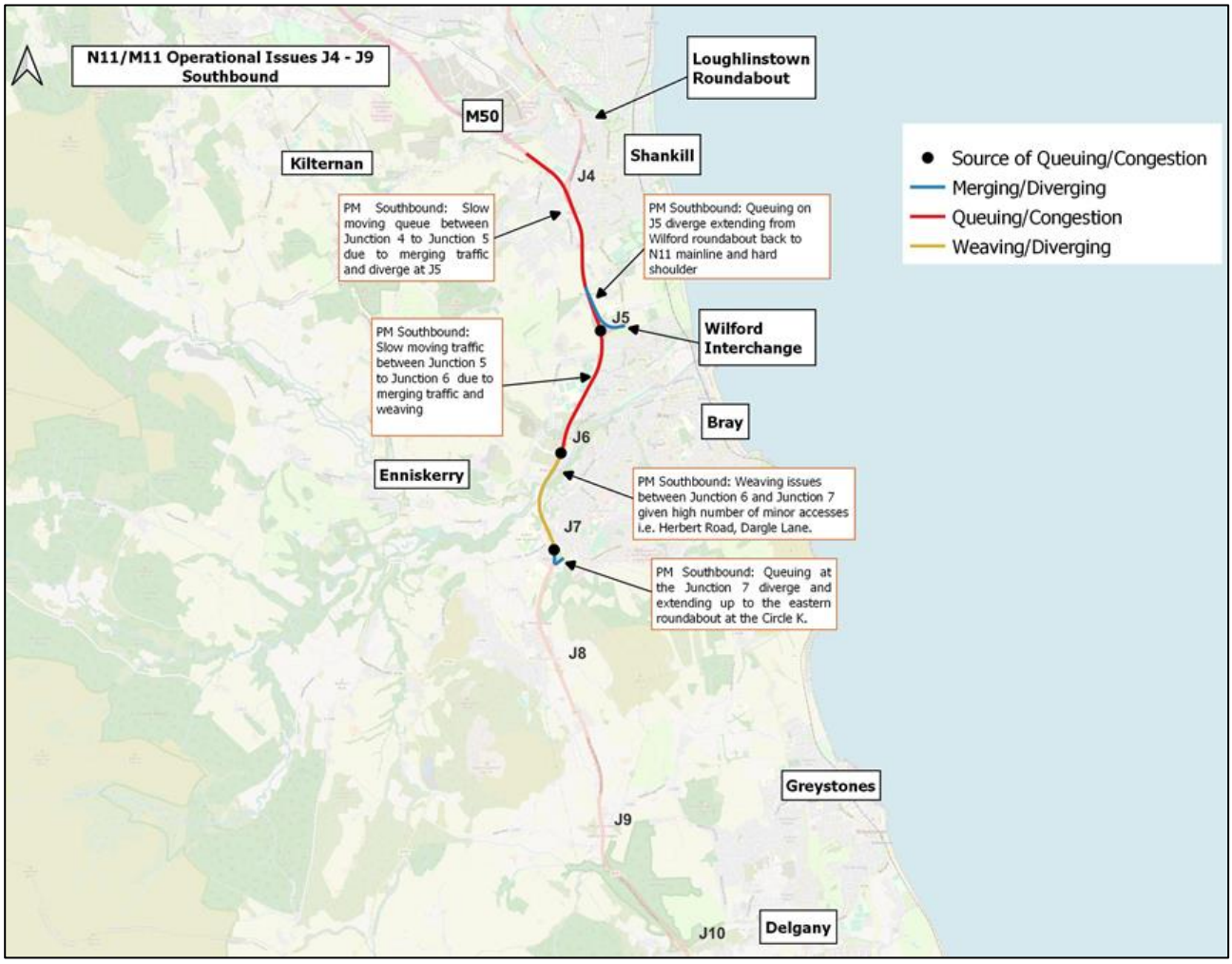


Figure 5-8 N11/M11 southbound PM peak baseline issues

Based on the above information it was important that the N11/M11 BPIS Micro-simulation model was able to replicate the observed traffic conditions and during the correct point within the modelled periods. For example, the worst congestion issues northbound between Junction 8 (Glenview) and Junction 9 (Kilmacanogue) occur early in the morning period, whilst the highest level of delay on the approach to the Loughlinstown Roundabout occurs later in the morning period.

Figure 5-9 and Figure 5-10 illustrate speeds within the model at the times indicated in the top right of each image for AM and PM respectively. For the two morning peak images the model is replicating the speed reductions northbound between Junction 9 (Glenview) and Junction 7 (Bray South) with the resulting slower moving queue beginning to clear around 07:50 with queueing then building on the approach to Loughlinstown Roundabout.

In the evening peak, the significant congestion issues from the M50 southbound to Junction 6 are well replicated with this queueing dissipating later in the evening period, with delays at Junction 7 diverge evident, as observed on the site visits.

This visual sense check of the model in operation provides further confidence that not only is the N11/M11 BPIS Micro-simulation calibrated and validated well statistically, but it is also replicating the issues observed on the ground.

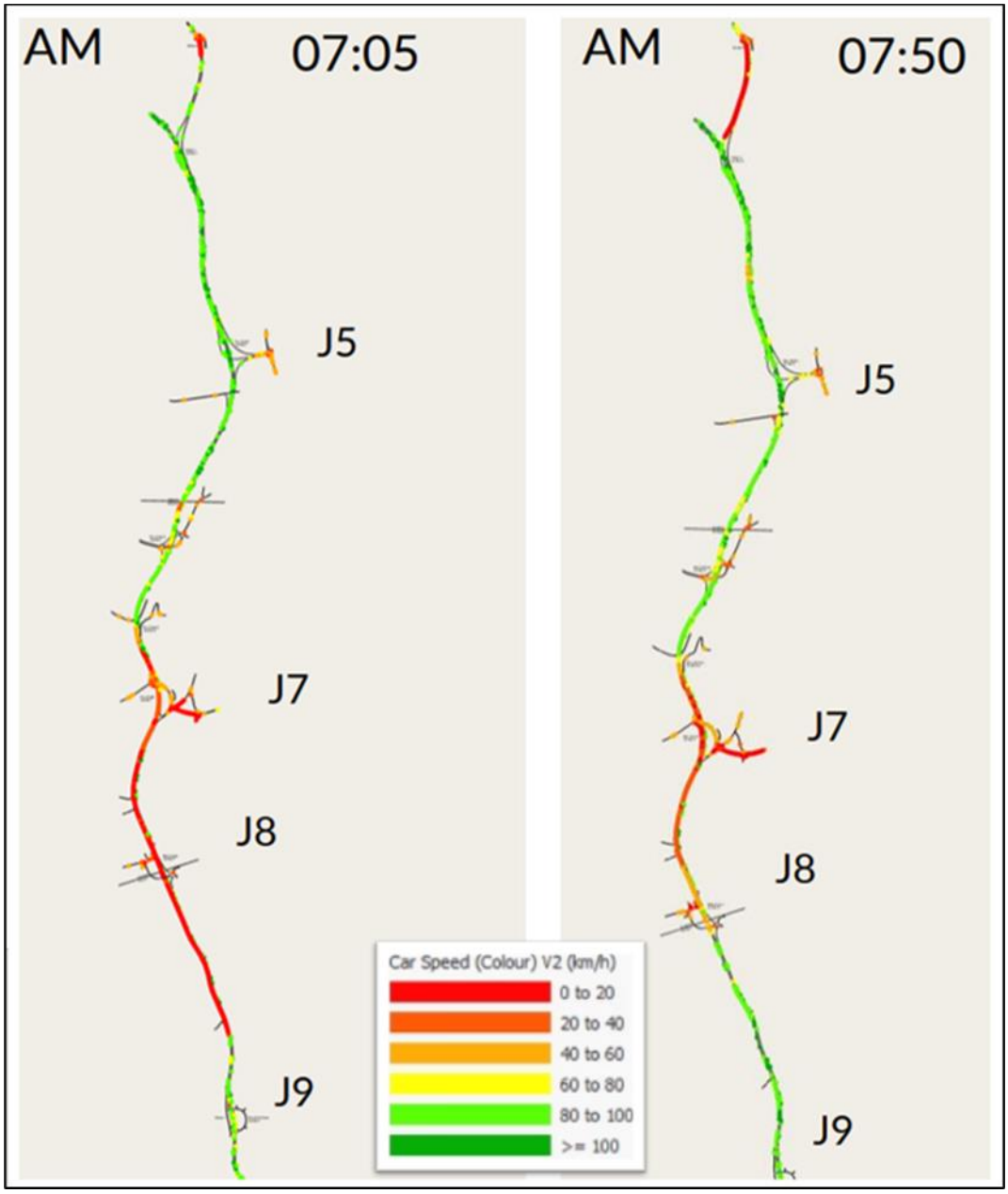


Figure 5-9 Microsimulation model speed plots (AM)

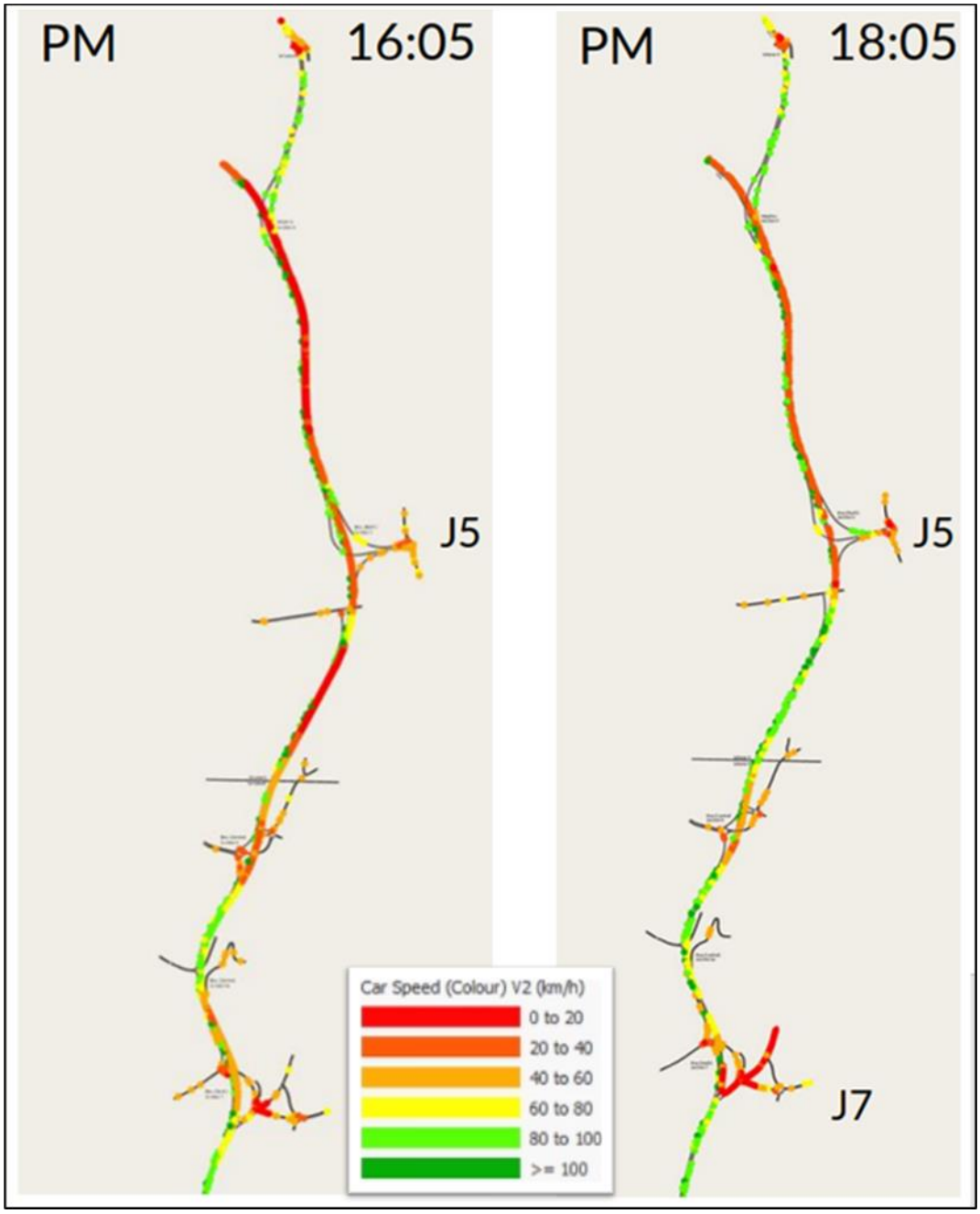


Figure 5-10 Microsimulation model speed plots (PM)

5.2.5 Validation Summary

The previous two chapters provide an overview of the calibration and validation of the N11/M11 BPIS Micro-simulation model which has been developed to assess the proposed options for the N11/M11 BPIS. In summary:

- The N11/M11 Local Area Model was first calibrated and validated and then cordoned to provide initial matrices for the N11/M11 BPIS Micro-simulation model.
- The Micro-Simulation model has also been calibrated and validated in-line with TII Project Appraisal Guidelines and meets all specified criteria for both the AM and PM periods and the individual hours within these periods
- This model is fit for purpose and represents the AM and PM period base year traffic conditions well, as demonstrated statistically through calibration and validation.
- It provides a robust basis for assessing the proposed scheme options as:

- The model realistically represents journey times; and
- The study area is covered by a large number of calibration counts, which have been matched well within the modelling.

6. Future Year Model Development

6.1 Introduction

This section sets out the development of the future year ERM and N11/M11 LAM models for the scheme opening year (2027) and design year (2042). These forecast years will be used for assessing the performance of the sub-schemes and for input into the design process.

6.2 Future Year Network Development

6.2.1 Reference Case (Do-Minimum) Scenario

The Do-Minimum scenario includes for recent changes to the N11/M11 corridor or committed (with funding) transport schemes to be undertaken on the corridor. For modelling purposes, the only scheme of relevance, and added to the base year network, was the recent addition of a segregated 50km/h parallel lane provided in the southbound direction through Kilmacanogue.

6.2.2 Do-Something Scenarios

As noted in Section 1.6, the Stage 2 Appraisal has focused on determining the optimum extent of bus priority which can be delivered between Loughlinstown Roundabout and Junction 9 (Glenview) which best meets the scheme objectives. For assessment purposes, the overall scheme extent was split into three Sub-Schemes (A, B & C), as follows:

- **Sub-Scheme A** runs from Loughlinstown roundabout in the north to Junction 6 (Bray / Fassaroe)
- **Sub-Scheme B** runs from Junction 6 (Bray / Fassaroe) to Junction 8 (Kilmacanogue); and
- **Sub-Scheme C** runs from Junction 8 (Kilmacanogue) to Junction 9 (Glenview).

The Sub-Scheme splits were chosen to reflect the fact that certain sections of the existing N11/M11 are more suitable and readily amenable to bus priority provision than other sections (for example, Sub-Scheme A is all motorway, but Sub-Schemes B & C include many minor accesses, permit pedestrians/cyclists and the standard of geometry is poor). As such, the costs, benefits, engineering complexity and safety implications of providing bus priority differ across the sub-schemes. Full details of the Stage 2 assessment process are documented in the Option Selection Report.

Each sub-scheme involves providing hard shoulder bus priority along the nearside of the carriageway (in the northbound and/or southbound directions). Additionally, the proposed design includes for additional measures within certain sub-schemes, including the closure of some existing minor junctions and accesses, the provision of Active Travel facilities and the proposed upgrade of Junction 7 (Bray South). The description of the three sub-schemes that have been assessed within this TMR are outlined in Sections 6.2.2.1 to 6.2.2.3 below. In summary, the following future year Do-Something scenarios have been analysed in Phase 2:

- 2027 Opening Year Do-Something Scenarios:
  - Sub-Scheme A
  - Sub-Scheme B
  - Sub-Scheme C
  - All Sub-Schemes combined.

- 2042 Design Year Do-Something Scenarios:
  - Sub-Scheme A
  - Sub-Scheme B
  - Sub-Scheme C
  - All Sub-Schemes combined.

The extents of the sub-schemes are shown in Figure 6-1 and detailed drawing layouts for each of the sub-schemes are included in Appendix D.

6.2.2.1 Sub-Scheme A

Sub-Scheme A runs from Loughlinstown roundabout in the north to Junction 6 (Bray / Fassaroe). The sub-scheme covers the northern 4.87 km of M11 motorway to its termination at Junction 6 and as such there are no existing direct accesses or intermediate junctions onto the carriageway. Consequently, bus priority measures can be provided in the hard shoulders northbound and southbound without significant constraint to the overall extent of bus priority which may be achieved. The motorway classification also means that non-motorised users are prohibited, with the result that conflicts between buses using the hard shoulder and vulnerable pedestrians and cyclists will not occur. Accordingly, there is no requirement to provide dedicated active travel facilities within Sub-Scheme A.

The emerging preferred option in this sub-scheme proposes the provision of northbound and southbound bus priority measures within the hard shoulders with widening proposed in places to achieve desirable minimum Stopping Sight Distance (SSD) and to meet the cross-sectional requirements of DN-GEO-03087. Dedicated bus priority is temporarily suspended to enable provision of the Through Junction Running (TJR) detail at Junction 5 (Bray North). In addition, priority signalling is proposed at the Junction 5 Southbound Merge ramp, to enable buses to pass more efficiently through the merge area.

6.2.2.2 Sub-Scheme B

Sub-Scheme B runs from Junction 6 (Bray / Fassaroe) to Junction 8 (Kilmacanogue). The sub-scheme covers a 3.78 km section of the N11 dual carriageway. Several direct accesses and intermediate junctions currently exist. To maximise the extent of bus priority within the hard shoulders, these accesses and intermediate junctions must be closed with alternative off-line links and access roads required to maintain access. Furthermore, as a dual carriageway must accommodate all road users, provision of Active Travel facilities is required.

The emerging preferred option for the sub-scheme proposes the provision of dedicated bus priority measures within the hard shoulders in the southbound direction with the implementation of the TJR detail at major junctions. In the southbound direction, it is proposed that the following minor junctions/accesses will be permanently closed:

- Access to Silverbridge Halting Site
- L152 Dargle Lane Junction
- L1956 Herbert Road Junction
- One private residential access.

To provide an alternative means of access to Silverbridge and Dargle Lane, an extension of the access road serving the existing residential/commercial development at La Vallee is proposed, which will terminate at a cul de sac at Dargle Lane. This access road includes a two-way active travel facility, which is proposed to extend as far south as Junction 7 (Bray South) via a combination of dedicated and shared-use space (partially using Ballywaltrim Lane).

South of Junction 7 (Bray South), no further dedicated bus priority is proposed in the southbound direction, as there is insufficient space to accommodate bus priority facilities downstream of the Junction 7 merge and through Kilmacanogue Village, following the construction of the southbound segregated service road.

In the northbound direction commencing from Junction 8 (Kilmacanogue), a one-way segregated service road, starting in advance of the Junction 8 northbound diverge and extending through Kilmacanogue Village as far as the access to Glencormick (L1019) and Avoca, is proposed. To the north of these accesses, no further dedicated bus priority is proposed northbound within Sub-Scheme B, given the need to provide auxiliary lanes along the N11 mainline to accommodate weaving movements between Glencormick (L1019) / Avoca and Junction 7, and between Junction 7 and Junction 6.

In the northbound direction between Junction 8 and Junction 6, it is proposed that the following minor junctions/accesses will be permanently closed:

- Private Access (Woodlands Academy)
- R117 Junction 6a (Enniskerry)
- Private Access (Dublin Oak Academy).

To provide an alternative means of access to the R117 Enniskerry Road, a one-way segregated service road (northbound) between Junction 7 (Bray South) and Junction 6 (Bray/Fassaroe) is proposed, with the R117 connecting to the service road via a left in – left out junction.

Within Sub-Scheme B, a significant upgrade of Junction 7 (Bray South) is also proposed, which includes the provision of improved grade separation and new merge and diverge layouts.

6.2.2.3 Sub-Scheme C

Sub-Scheme C runs from Junction 8 (Kilmacanogue) to Junction 9 (Glenview). The sub-scheme covers a 2.9 km section of the N11 dual carriageway to the scheme termination at Junction 9. Again, several direct accesses and intermediate junctions exist along the sub-scheme. To maximise the extent of bus priority within the hard shoulders, these accesses and intermediate junctions must be closed with alternative off-line link and access roads required to maintain access. Furthermore, as a dual carriageway must accommodate all road users, provision of Active Travel facilities is required.

The emerging preferred option for the sub-scheme proposes the provision of northbound bus priority measures within the hard shoulder, commencing downstream of the Junction 9 (Glenview) merge. No bus priority is proposed in the southbound direction, with the existing N11 mainline configuration to be retained. It is also proposed that the following minor junctions/accesses will be permanently closed:

- L95111 Moorepark Diverge and Merge
- All existing private residential and field accesses.

It is also proposed to provide an off-road active travel facility to the east of the existing mainline, commencing at the existing Junction 8 Eastern Roundabout and extending as far south as Junction 9 Glenview) via a combination of dedicated and shared-use space (partially using the L5530 Kilmurry Cottages Road).

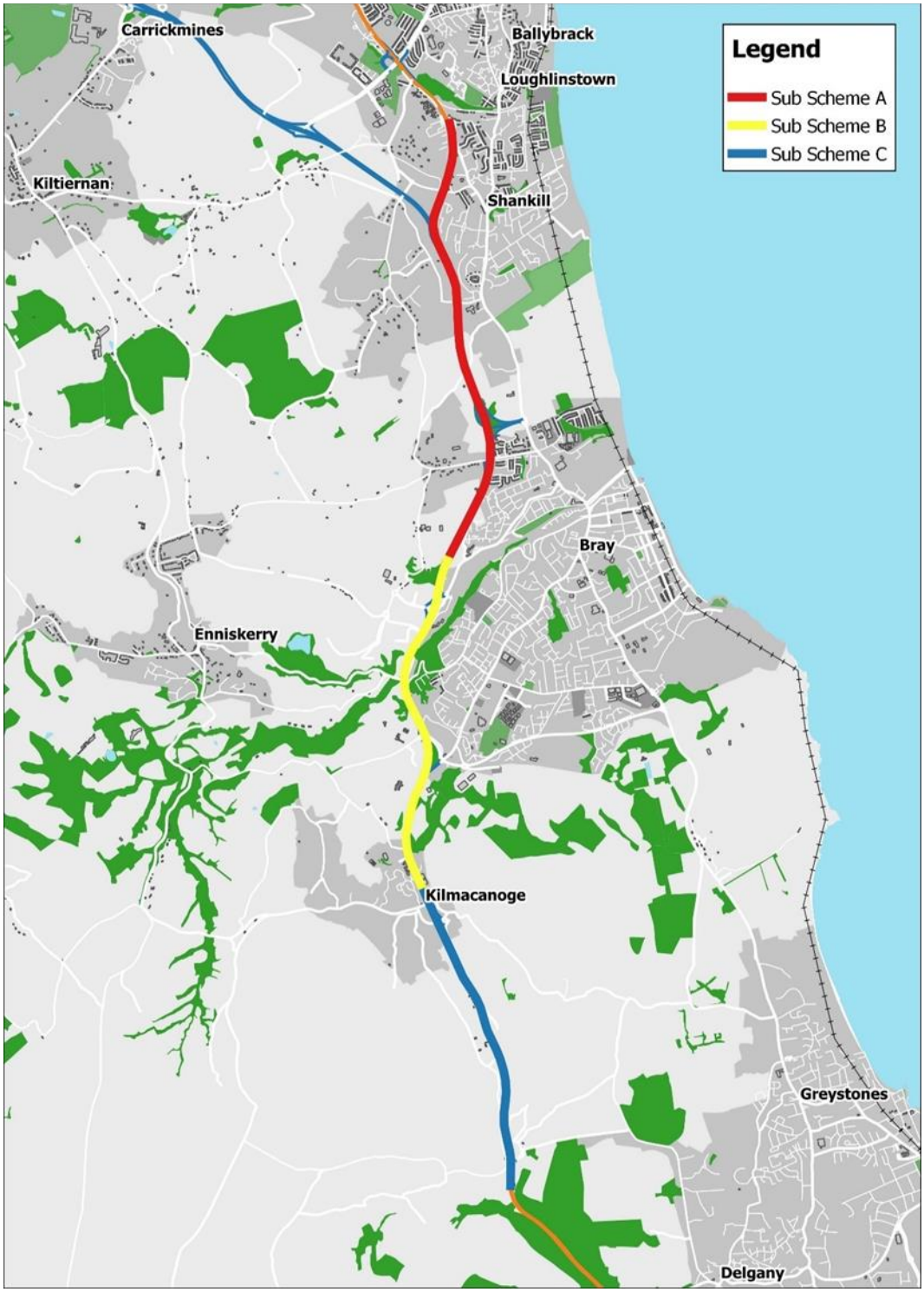


Figure 6-1 Sub-Scheme extents

6.3 Future Year Travel Demand Estimation

6.3.1 Overview

A detailed approach to forecasting travel demand has been adopted for the N11/M11 BPIS in order to capture the planned growth in population and employment at a local level for all settlements along the corridor. The future growth in travel demand for the N11/M11 LAM has been carried out in accordance with the Zone Based Growth approach described in TII PAG Unit 5.3 Travel Demand Projections using the NTA's Future Year East Regional Model (ERM).

The ERM Future year travel demand is based on forecasts of population, employment and education data as defined by the National Transport Authority at the Census Small Area (CSA) level. The National Demand Forecasting Model converts this forecast planning data to trip forecasts (in total productions and attractions per zone) for input to the ERM. The travel demand for the assessment years for this project (2027, 2042) have been derived by linear interpolation of the NTA's 2026 and 2040 NPF reference scenarios.

Annualised external (external to the N11/M11 LAM) growth rates have been calculated by cordoning the modelled study area from the future year ERM models. Internal (zones within the N11/M11 LAM) growth rates have been based on the ERM zonal growth rates between base year and future year. This internal growth was proportioned between the disaggregated LAM zones based on base year proportions or in accordance with relevant planning information (Development Plans, LAPs, etc) where appropriate.

Forecast year demand also takes account of large developments proposed for the area, such as the Old Connaught LAP accessed via Old Connaught Avenue and the Fassaroe Strategic Housing Development.

A single growth scenario has been adopted for this phase of the project appraisal in order to compare the different options against each other on an equal basis. Once a preferred option is selected, low, medium and high growth scenarios will be prepared, and the preferred option will be tested in these additional scenarios.

6.3.2 Population and Employment Forecasts

The National Planning Framework (NPF) 2040 has recently been published as a guide to the high-level strategic planning and development of Ireland over the next 20+ years. The NPF, and accompanying National Development Plan (NDP), provide a single policy to guide strategic development and infrastructure investment at a national level. The NPF and NDP also set the context for each of Ireland's three regional assemblies to develop their regional and spatial strategies taking account of, and co-ordinating, local authority County and City Development Plans in a manner that will ensure National, Regional and Local plans align.

Given the Statutory basis of the NPF, it has been decided to align our population forecasts for this project with those set out in the NPF.

A Land Use Spreadsheet, including demographic (population, employment, etc.) forecasts, has been developed by the NTA for input into the National Demand Forecasting Model (NDFM). The NDFM converts this forecast planning data to trip forecasts (in total productions and attractions per zone) for input to the ERM. During the development of these land use spreadsheets, the population targets from the NPF were distributed geographically among the Census Small Areas most likely to experience population growth under existing policy. Table 6-1 summarises the population forecasts developed for the model study area for the NPF growth scenario.

Table 6-1 Study area population forecasts

Area	2016	2027	2042
N11/M11 LAM Extent	156,083	181,867	217,026
Dublin City (inside M50)	856,403	957,677	1,095,779
Bray	31,044	32,900	35,430
Greystones	17,350	18,999	21,248
Wicklow	9,747	11,811	14,626

Similar to the population forecasts, the land use spreadsheets developed by the NTA include a set of employment forecasts for each Census Small Area. These assumptions are aligned with the NPF population forecasts and also incorporate any relevant local and regional policy.

6.3.3 Future Year Matrix Development

As discussed above, the forecast year matrices have been based on growth between the base and future year cordons from the East Regional Model.

The cordon models have 146 zones (including externals) as per Figure 3-6 and include demand from NPF planning data forecasts. Upon producing these cordon models, the demand was disaggregated to our LAM zones (276 in total), which resulted in a set of trip end growth factors compared to the base year cordons. These growth factors were applied to the row and column totals of the existing base year matrices (which is calibrated and validated to a local level) to give future year trip ends. Trip Ends were factored to the average of the row-total-sum and column-total-sum, and then a Furness process was applied to factor the base year matrices to the future year trip ends.

6.4 Car Ownership

Table 6-2 presents the percentages of car ownership for households within the N11/M11 LAM extents for the design year as calculated from the NTA's car ownership model.

Table 6-2 Percentage of households with access to a car

Area	HH with no access to car	HH with at least one car
N11/M11 LAM Extent	7%	93%

6.5 Goods Vehicle Growth

For the NTA's Regional Models and therefore the N11/M11 LAM, Goods vehicle growth is assumed to increase broadly in line with economic growth forecasts. CSO Gross Domestic Product (GDP) forecasts have been used to derive a growth factor for HGV traffic for each of the Future Years Assessed.

6.6 Future Year Parameters

The following parameters all impact how the demand model adjusts the travel demand matrices in response to changes in travel costs.

Vehicle Operating Costs

Vehicle Operating Costs (VOCs) were assumed to remain constant in real terms through time, as recommended in the TII PAG.

6.7 Future Year Matrix Totals

A comparison of the N11/M11 LAM peak hour trip matrix totals for the Base Year, 2027 Opening Year and 2042 Design Year scenarios are outlined in Table 6-3 and Table 6-4, in terms of PCU's (passenger car units).

Table 6-3 Matrix totals 2027 Opening Year

Time Period	Unit	2019	2027
AM	PCUs	39,309	45,507
IP	PCUs	28,445	37,368
PM	PCUs	35,562	40,747

Table 6-4 Matrix totals 2042 Design Year

Time Period	Unit	2019	2027
AM	PCUs	39,309	50,012
IP	PCUs	28,445	41,674
PM	PCUs	35,562	44,714

6.8 Future Year Matrix Analysis

The TII PAG requires a quantitative assessment of the impact of the traffic forecasting process to be undertaken to ensure that the process of applying traffic growth factors does not unduly distort the trip matrix. These checks include assessing the following criteria:

- Trip Length Distribution;
- Trip End Growth; and
- Zone to Zone Growth.

6.8.1 Trip Length Distribution

Figure 6-2 to Figure 6-4 show the change in trip length distribution between the 2019 Base and 2042 Design Year for car trips in the morning peak hour, inter-peak hour and PM peak hour respectively. The AM and Inter peak results show a slight increase in short trips and a corresponding small decrease in longer distance trips, while the PM results show a very similar distribution.

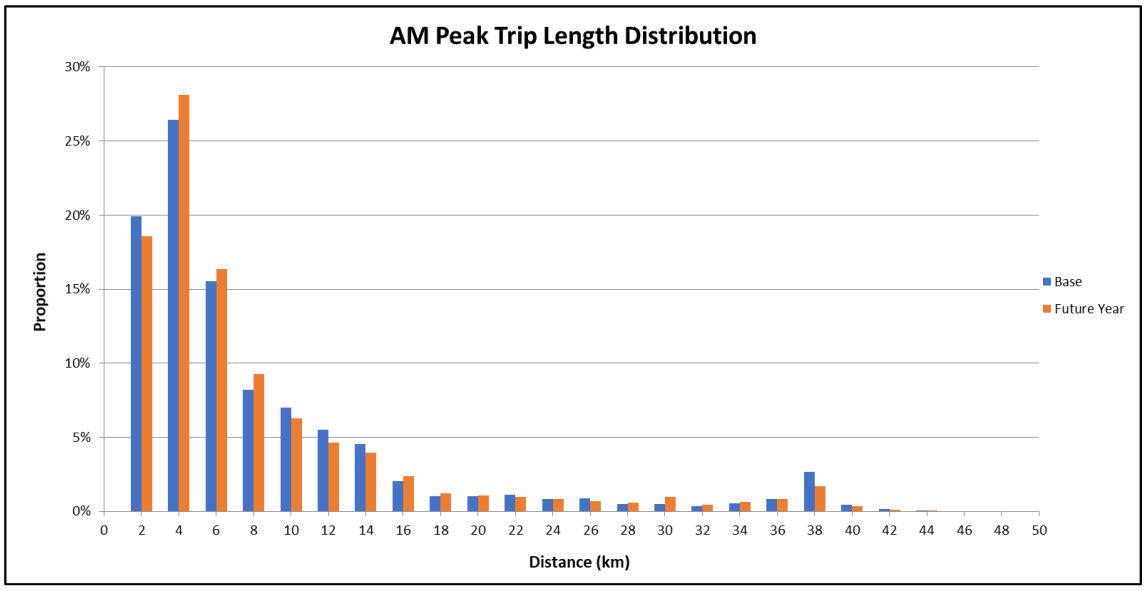


Figure 6-2 Change in trip length distribution (light vehicles) – AM peak

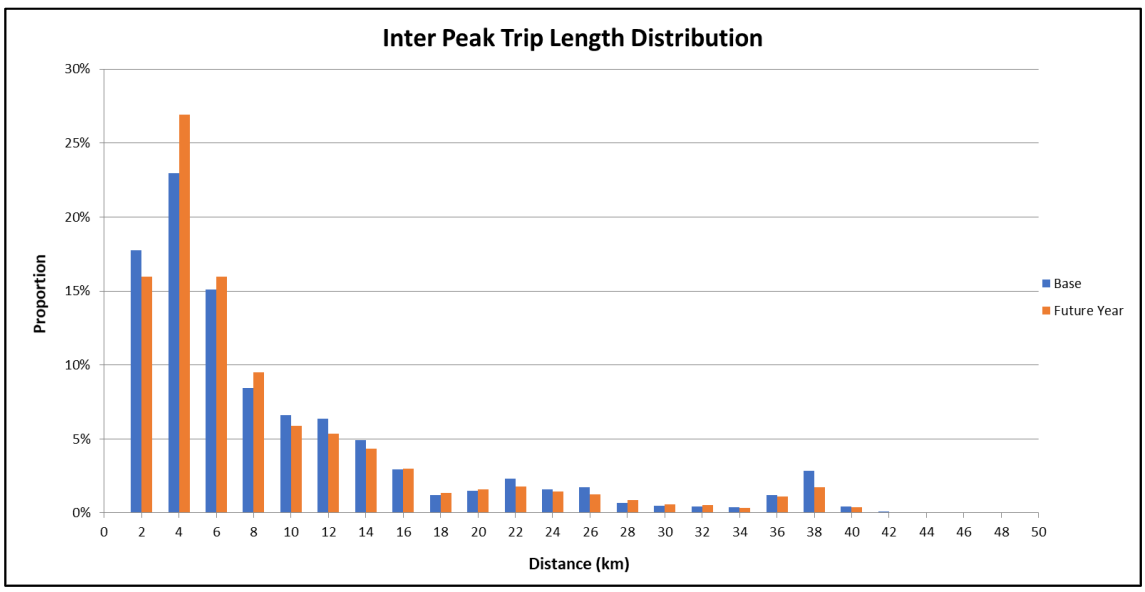


Figure 6-3 Change in trip length distribution (light vehicles) – IP peak

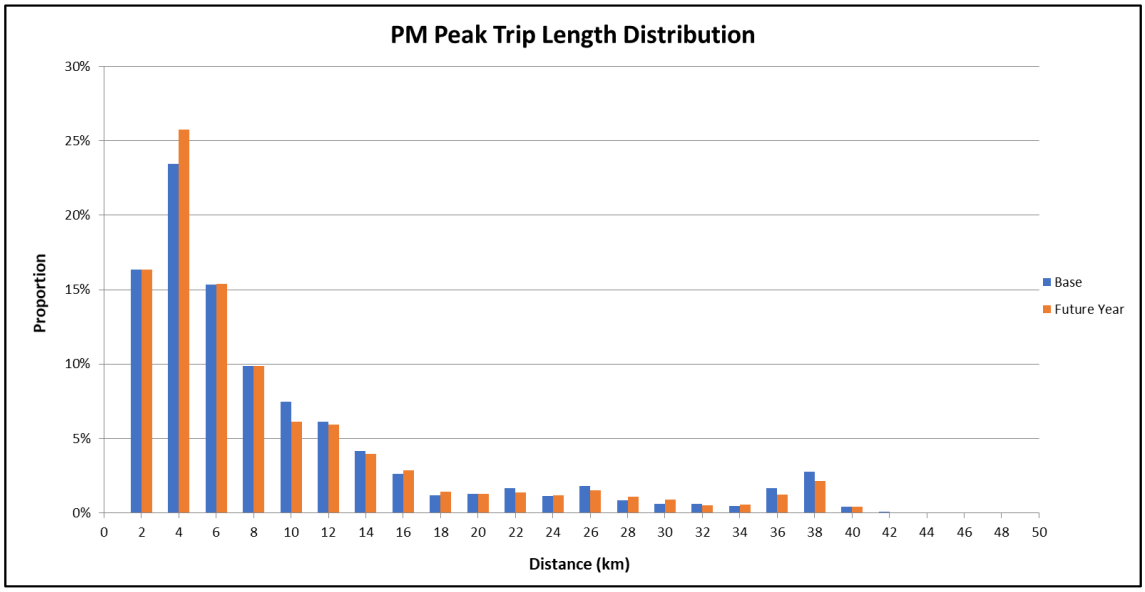


Figure 6-4 Change in trip length distribution (light vehicles) – PM peak

6.8.2 Trip End Growth

An assessment of the Trip End Growth (TEG) between the Base and Design Year demand in the three time periods was undertaken to assess if there were any significant changes in demand at trip end level when compared to the overall growth between the Base and Design Year demand.

In order to assess the true magnitude of TEG, the GEH statistic was applied to the Base and Design Year trip ends in order to take account of not only the absolute difference between the Base and Design Year demand, but also the magnitude of the difference.

Figure 6-5 to Figure 6-9 illustrate the GEH (>10) between the Base and Design Year demand in the AM, IP and PM Peak respectively. The PAG guidance on the GEH statistic indicates that any GEH statistic above 10 warrants further investigation. The figures show several origin and destination zones with a GEH statistic above 10 for LGVs in all time periods, while we see a smaller number of HGV zones with a GEH statistic above 10.

A review was undertaken to assess the origin and destination trips end growth where a GEH of 10 or more was calculated. This review revealed that the largest GEH values were found to be related to areas which will see a significant increase in growth due to planned developments by 2042. The largest three are related to the planned development in the Cherrywood area which is outside of our study area but still included in the LAM matrices. All three have low values in the base year which then resulted in very high GEH values following the addition of the planned development in the future year. Similarly, the remainder of the Origin zones that have a TEG > 10, have relatively low base year values (<50 pcus) but experience an absolute increase of up to 150 pcus by the design year. All of these increases relate to planned developments as per the NPF demographic growth forecasts prepared by the NTA's planning team.

A review of the AM zones for HGVs indicated that the zones with a GEH over 10 were external movements passing through the model, using the M50 and the M11 (three origin zones >10 were the M50 northbound and two external zones in South Dublin while the two destination zones >10 were the M50 northbound and one exit zone in South Dublin).

A review of the PM and Inter-Peak matrices revealed a similar pattern to the AM peak, in that zones which experienced a large increase in Trip End Growth were those where there are planned developments in the future, in line with existing planning policy and guidance including the National Planning Framework. The majority of these cases relate to a number of very large developments which are planned for the study area including, Cherrywood, Old Connaught LAP lands and Fassaroe.

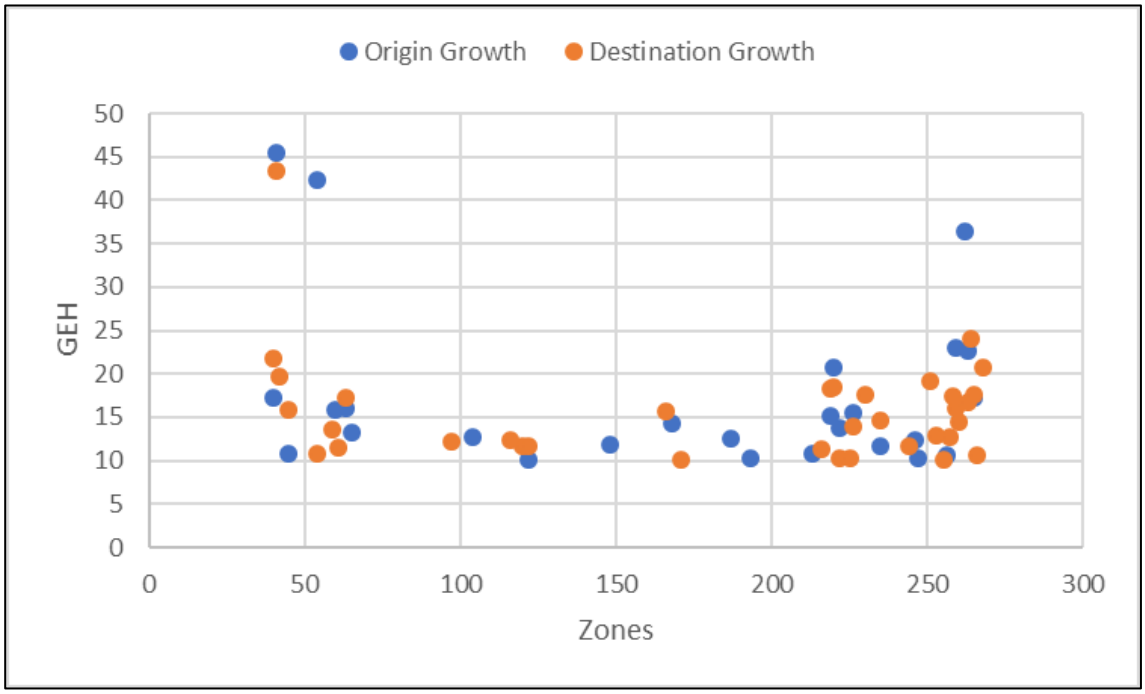


Figure 6-5 AM LGV trip end growth (2019 to 2042)

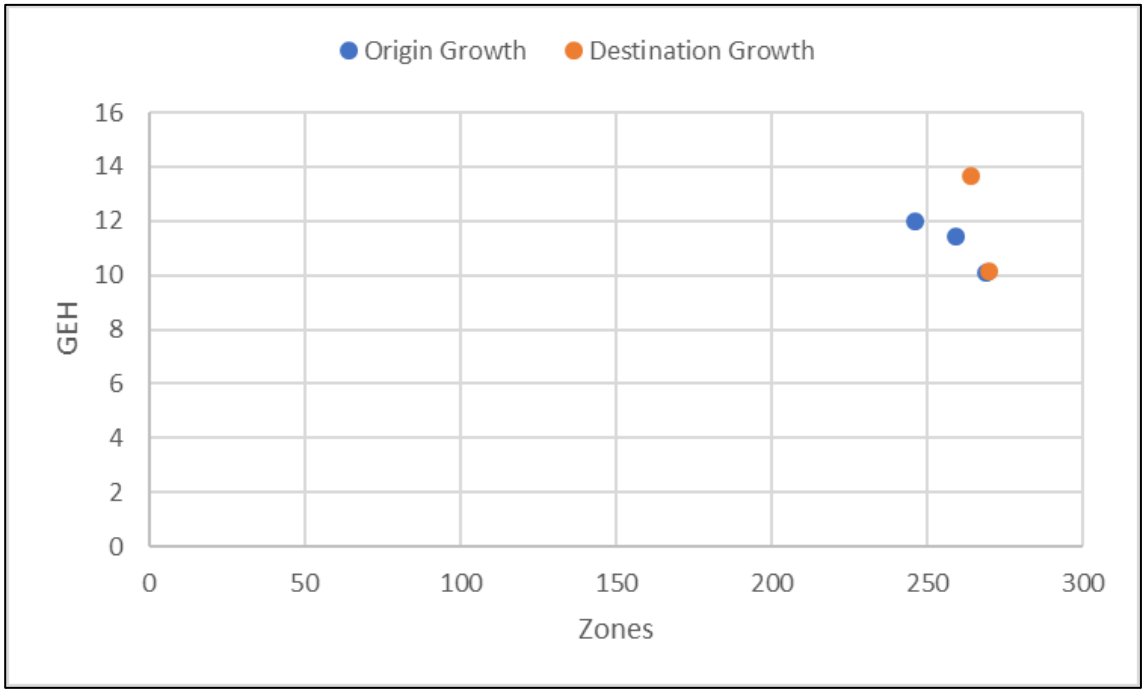


Figure 6-6 AM HGV trip end growth (2019 to 2042)

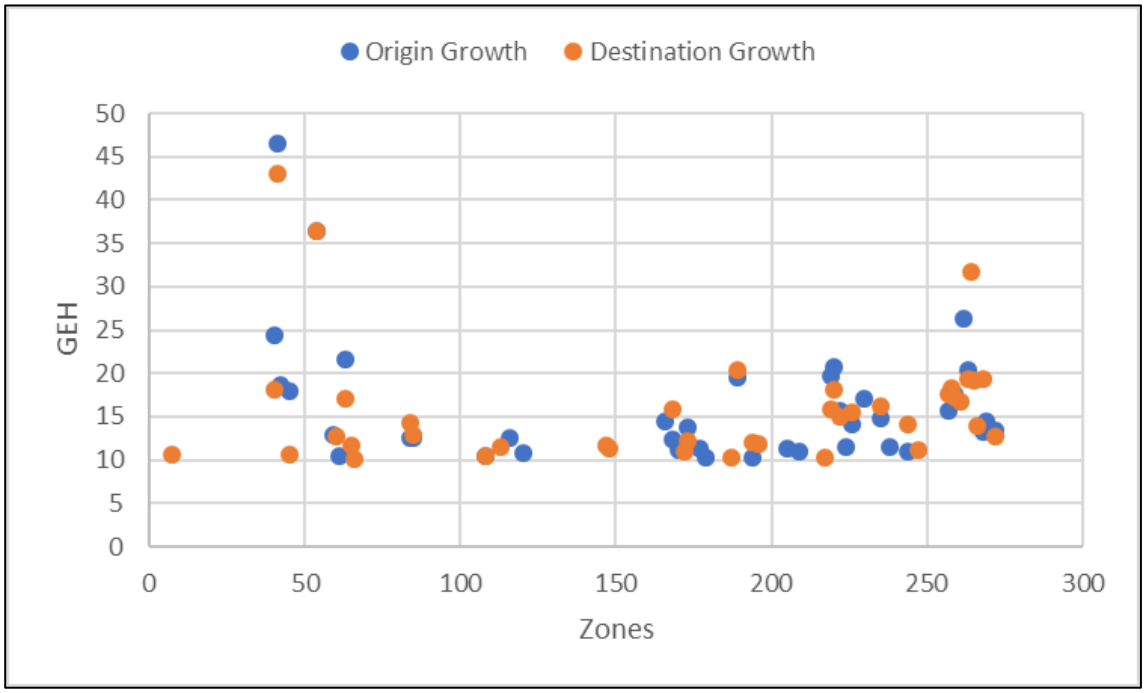


Figure 6-7 PM LGV trip end growth (2019 to 2042)

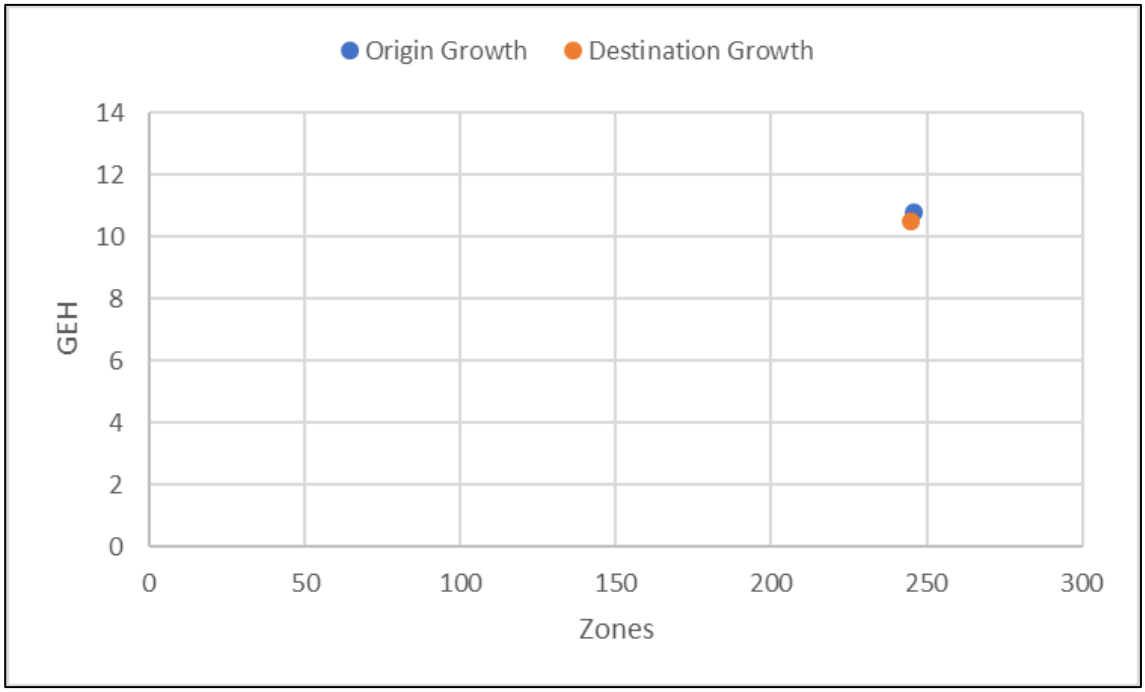


Figure 6-8 PM HGV trip end growth (2019 to 2042)

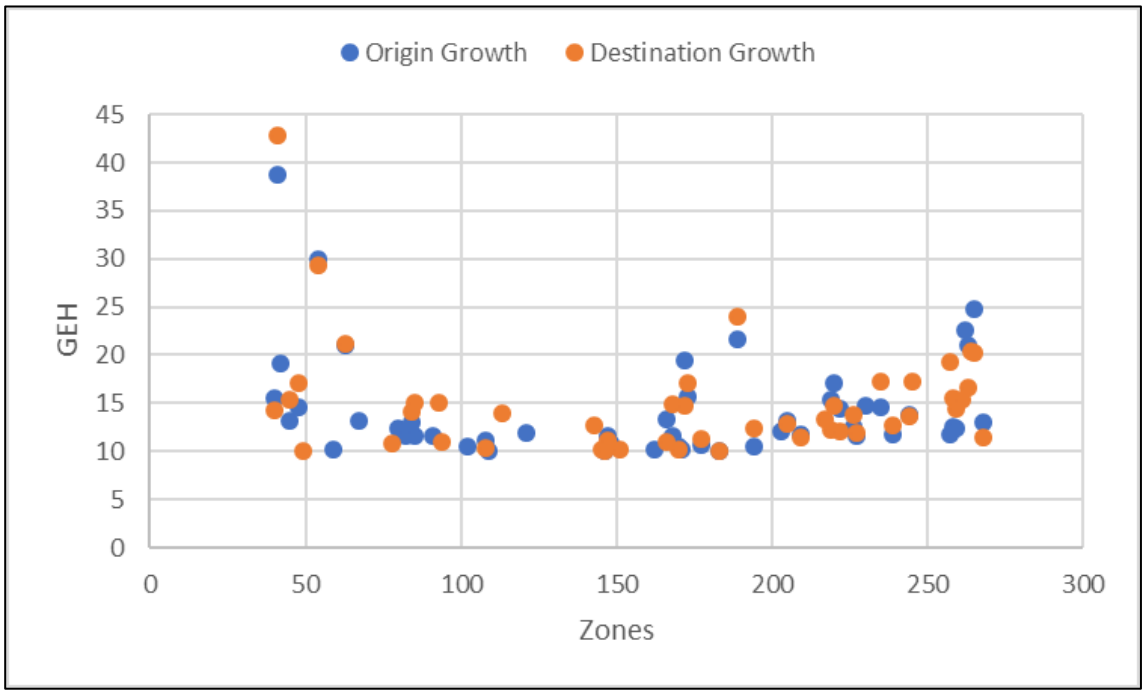


Figure 6-9 IP LGV trip end growth (2019 to 2042)

6.8.3 Zone to Zone Growth

The same procedure as used for Trip End Growth was also undertaken for zone-to-zone growth. The GEH statistic for each origin-destination pair was assessed to show any significant outliers or issues in the AM, IP and PM Peak demand.

The GEH statistic on a zone-to-zone basis for each period is shown in Figure 6-10 to Figure 6-15. In the AM the Light vehicles figure shows that 19 Origin-Destination pairs have a GEH >10. This accounts for approximately 0.02% of the total movements within the model. Investigation into these movements revealed that over 60% related to traffic travelling to/from planned large developments in the Cherrywood area. The remaining pairs involve movements from/to external zones which are informed by the ERM future year models.

In the Interpeak period, the Light vehicles figure shows that 12 Origin-Destination pairs have a GEH >10. Again, this accounts for less than 0.02% of all movements within the model. Similar, to the AM, around 58% of these 12 movements relate to traffic travelling to/from planned developments in the Cherrywood area. The remaining pairs involve movements from/to external zones.

In the PM the Light vehicles figure shows that 16 Origin-Destination pairs have a GEH >10 accounting for 0.02% of movements within the model. Approximately 88% of these 16 movements relate to traffic travelling to/from planned large developments in the Cherrywood area. The remaining pairs involve movements from/to external zones.

The Heavy vehicle figures for all time periods show that there are no GEH statistics greater than 10.

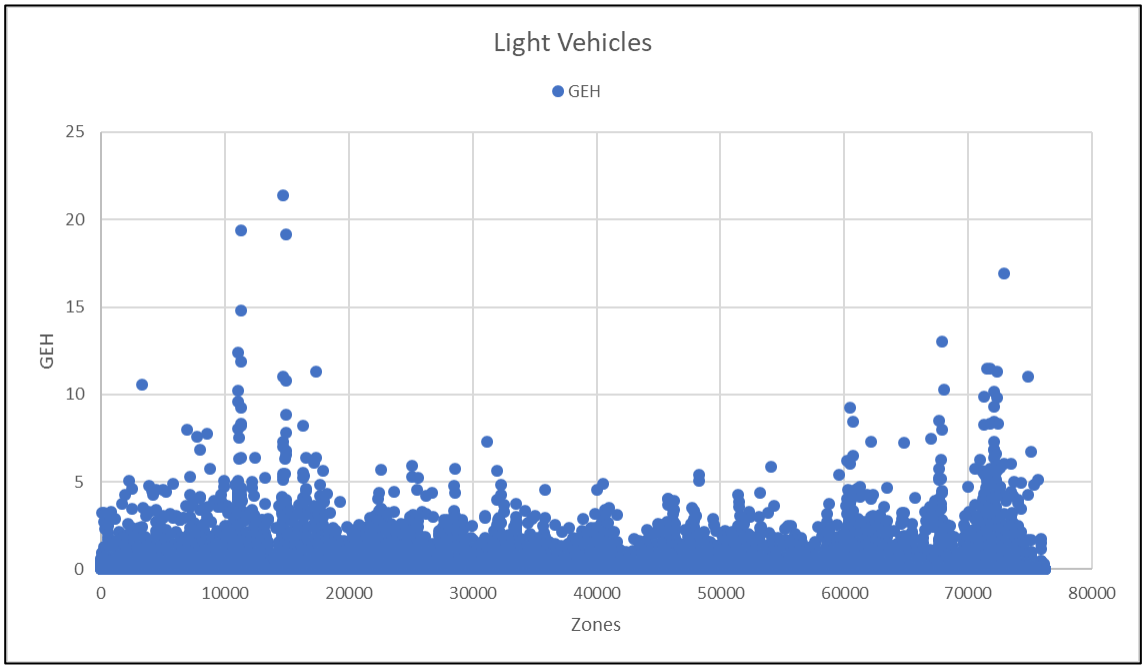


Figure 6-10 AM light vehicle zone to zone growth (2019 to 2042)

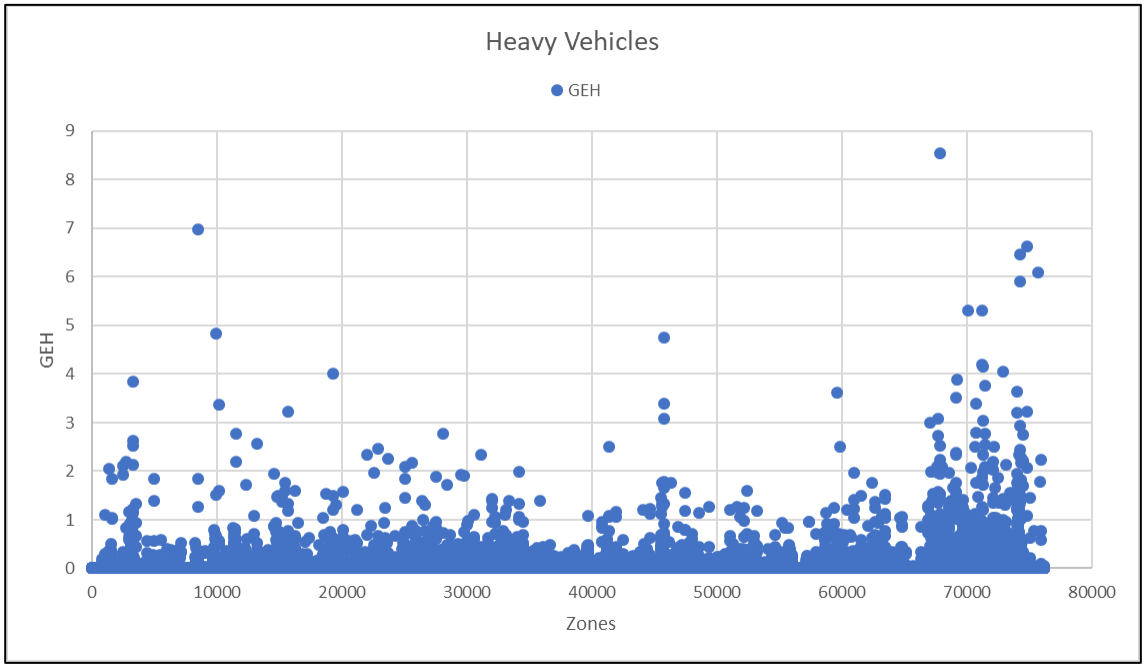


Figure 6-11 AM heavy vehicle zone to zone growth (2019 to 2042)

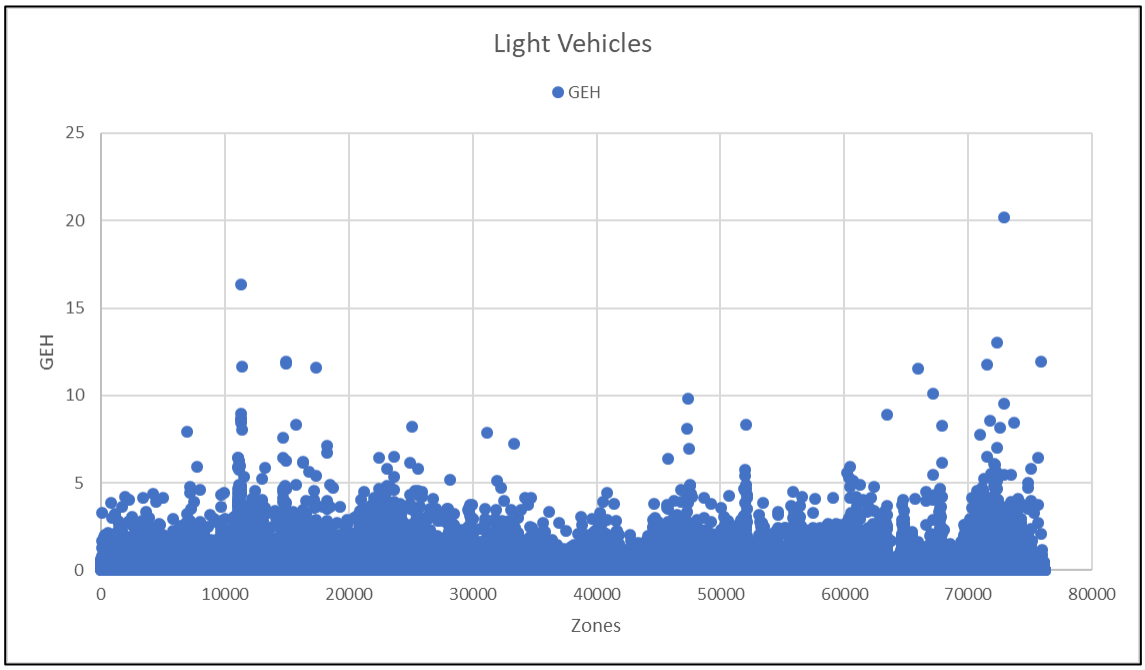


Figure 6-12 IP light vehicle zone to zone growth (2019 to 2042)

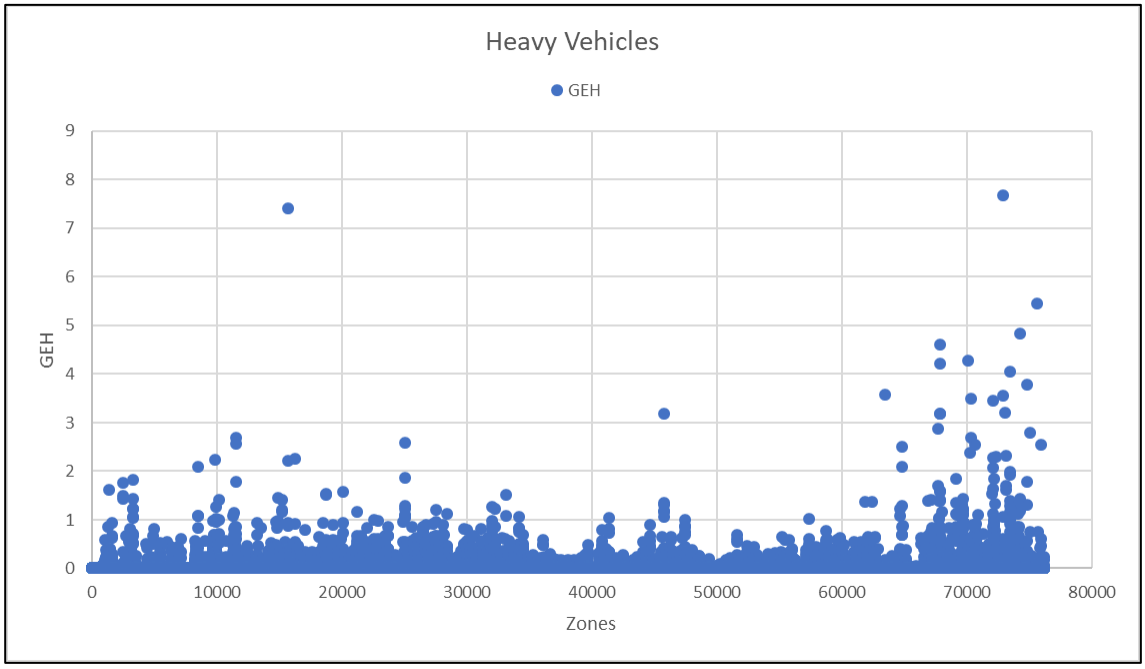


Figure 6-13 IP heavy vehicle zone to zone growth (2019 to 2042)

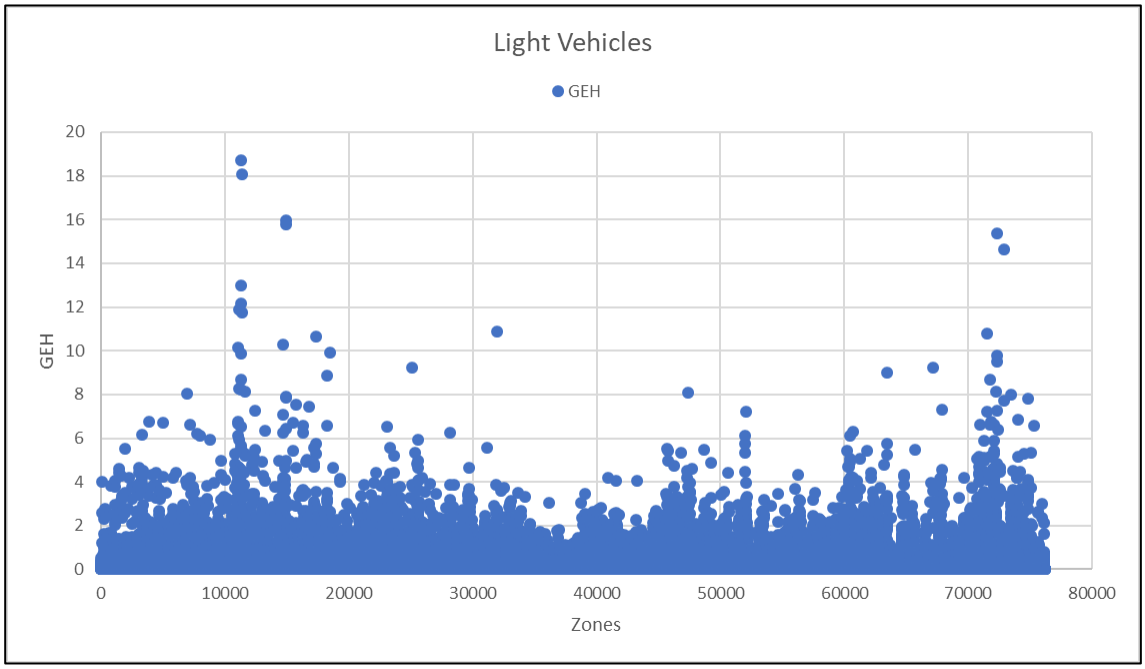


Figure 6-14 PM light vehicle zone to zone growth (2019 to 2042)

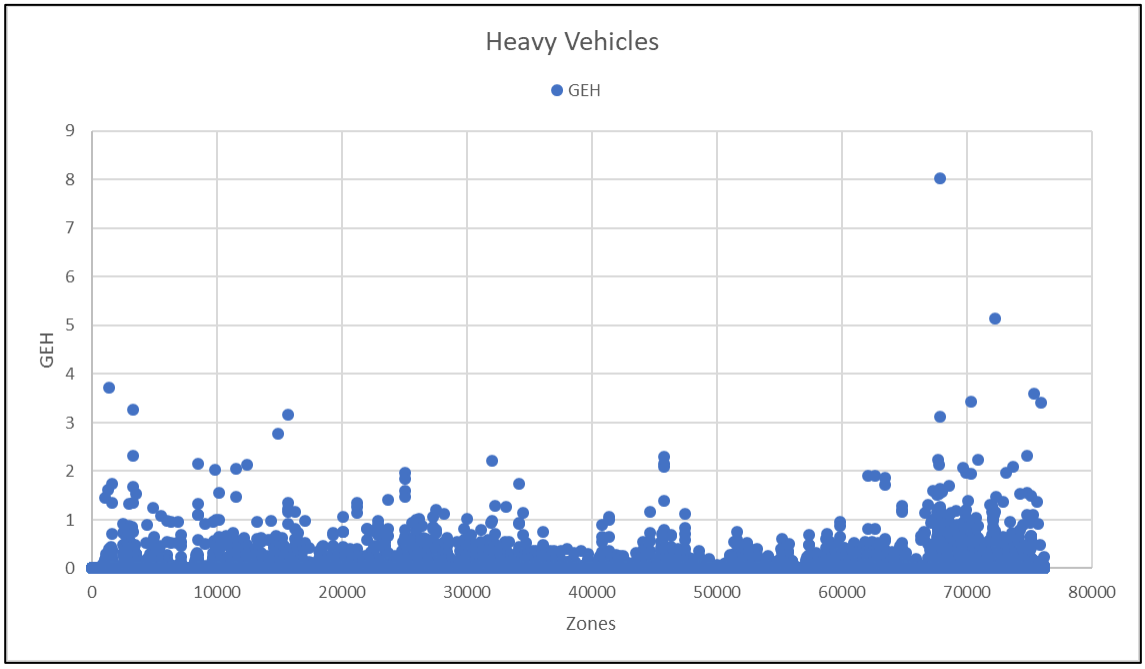


Figure 6-15 PM heavy vehicle zone to zone growth (2019 to 2042)

7. Analysis of the Sub-Schemes

7.1 Introduction

This section provides an overview of the performance of each sub-scheme tested based on the following key performance indicators:

- Bus Journey Times;
- Network Performance Indicators (inclusive of all trips); and
- AADT Flows

7.2 Journey Times Assessment

The bus journey times have been extracted from the micro-simulation model for the 2042 Design Year for the following four Do-Something scenarios and compared to the Do-Minimum bus journey times along the same sub-scheme sections:

- Sub-scheme A;
- Sub-scheme B;
- Sub-scheme C; and
- Combination of all 3 sub-schemes.

The sub-scheme extents for the Stage 2 Project Appraisal Matrix are shown in Figure 7-1.



Figure 7-1 Stage 2 Project Appraisal Matrix Sub-Scheme Extents

7.2.1 Bus Speeds

Included in this assessment is the advice from TII Publication DN-GEO-03087, which states that where there is no physical barrier between the bus priority measures and the general traffic lane, the speed differential between buses and the traffic in the adjacent lane is a primary factor in the safe operation of schemes. Accordingly, the document recommends that, "Designers should consider limiting the maximum speed differential when modelled to 20km/h". Given there is no physical barrier between general traffic and the bus lanes included in each Sub-Scheme, bus speeds within the micro-simulation modelling were broadly limited over each sub-scheme section to only travel 20km/h above that of general traffic on average. In addition, bus speeds have been capped at a maximum speed of 80km/h.

7.2.2 Sub-Scheme Journey Times Results

The following section presents the results of the Bus Journey Time assessment comparing each of the Sub-Schemes with the Do-Minimum travel times along the same section of roadway. The results are presented Northbound and Southbound for the AM 3-hour period (7-8am, 8-9am and 9-10am) and the PM 3-hour period (5-6pm, 6-7pm and 7-8pm).

Note that the Do-Minimum journey times are extracted for the bus travelling with general traffic on the mainline, whilst the Do-Something bus journey times are based on the bus using the new bus priority measures infrastructure within each sub-scheme.

7.2.2.1 Sub-Scheme A

Sub-Scheme A runs from Loughlinstown roundabout in the north to Junction 6 (Bray / Fassaroe). The bus journey time results extracted for each direction and time period along Sub-Scheme A are shown in Figure 7-2 to Figure 7-5.

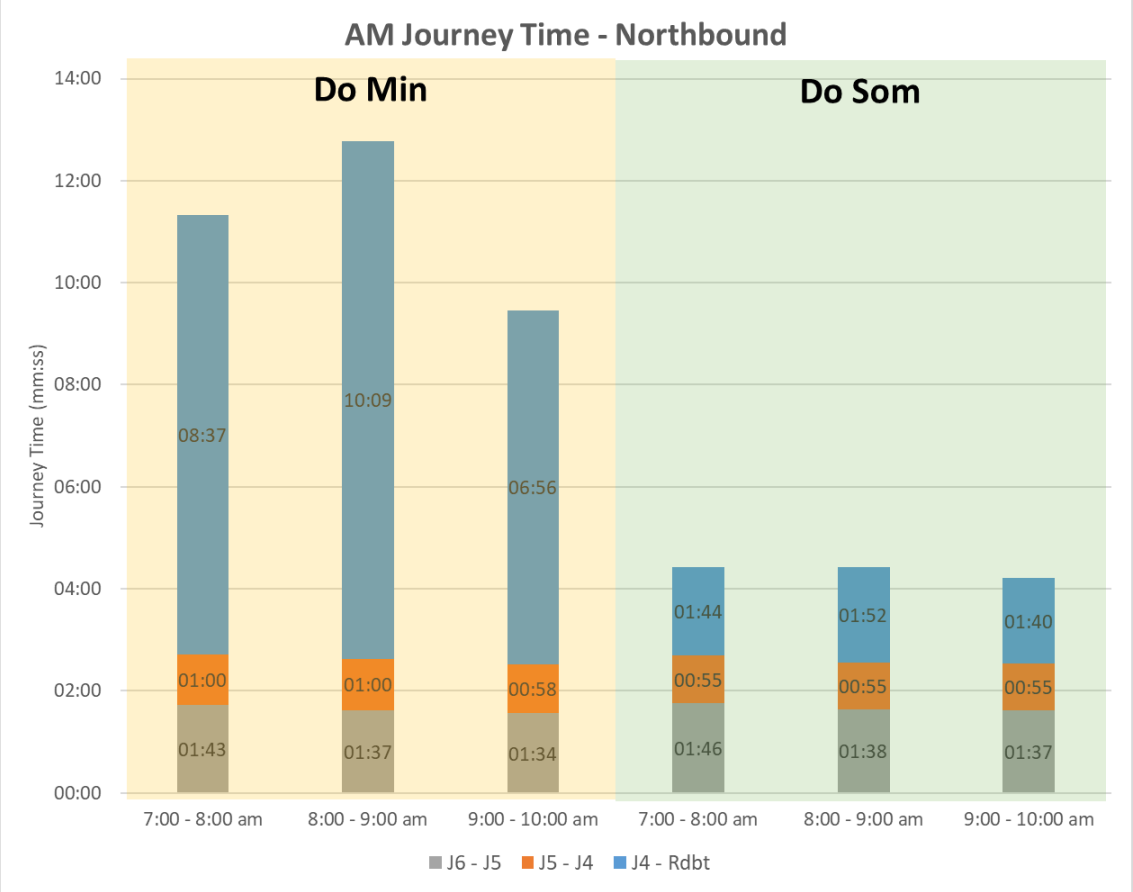


Figure 7-2 Sub-Scheme A – AM northbound bus journey time results

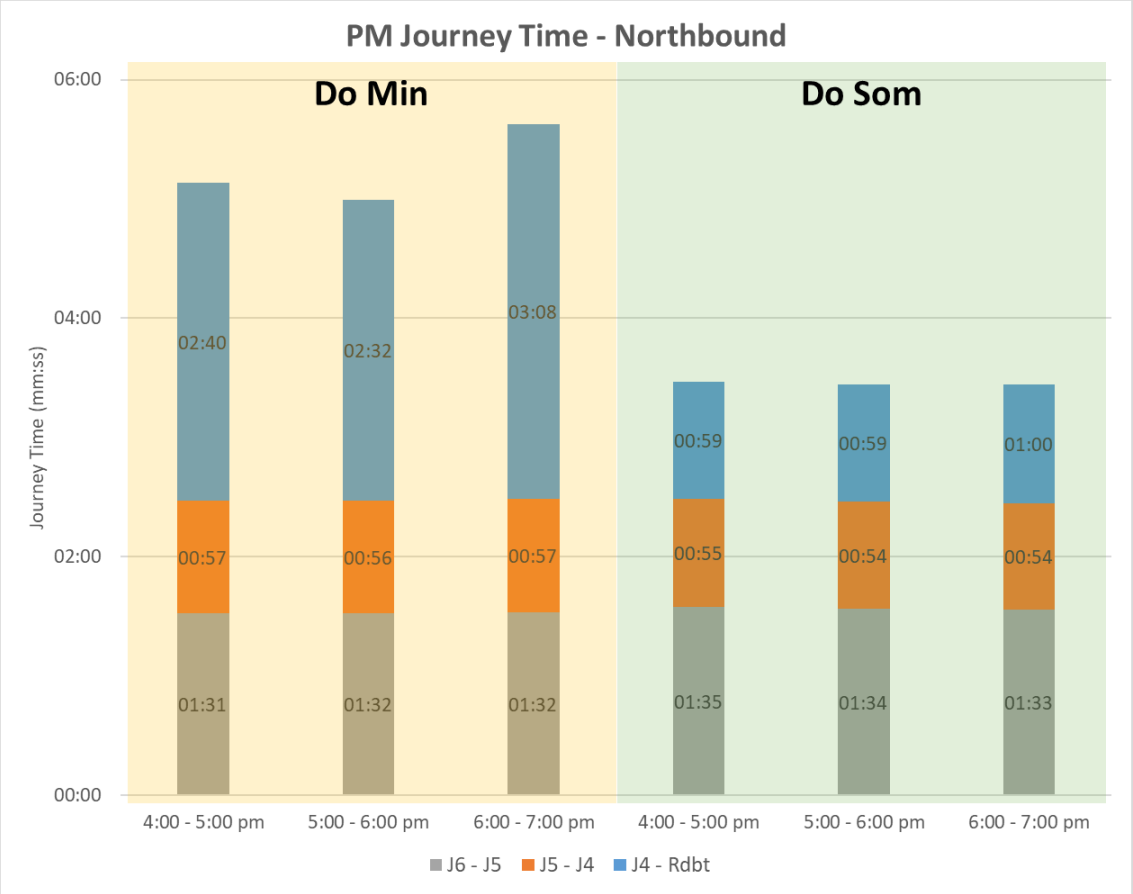


Figure 7-3 Sub-Scheme A – PM northbound bus journey time results

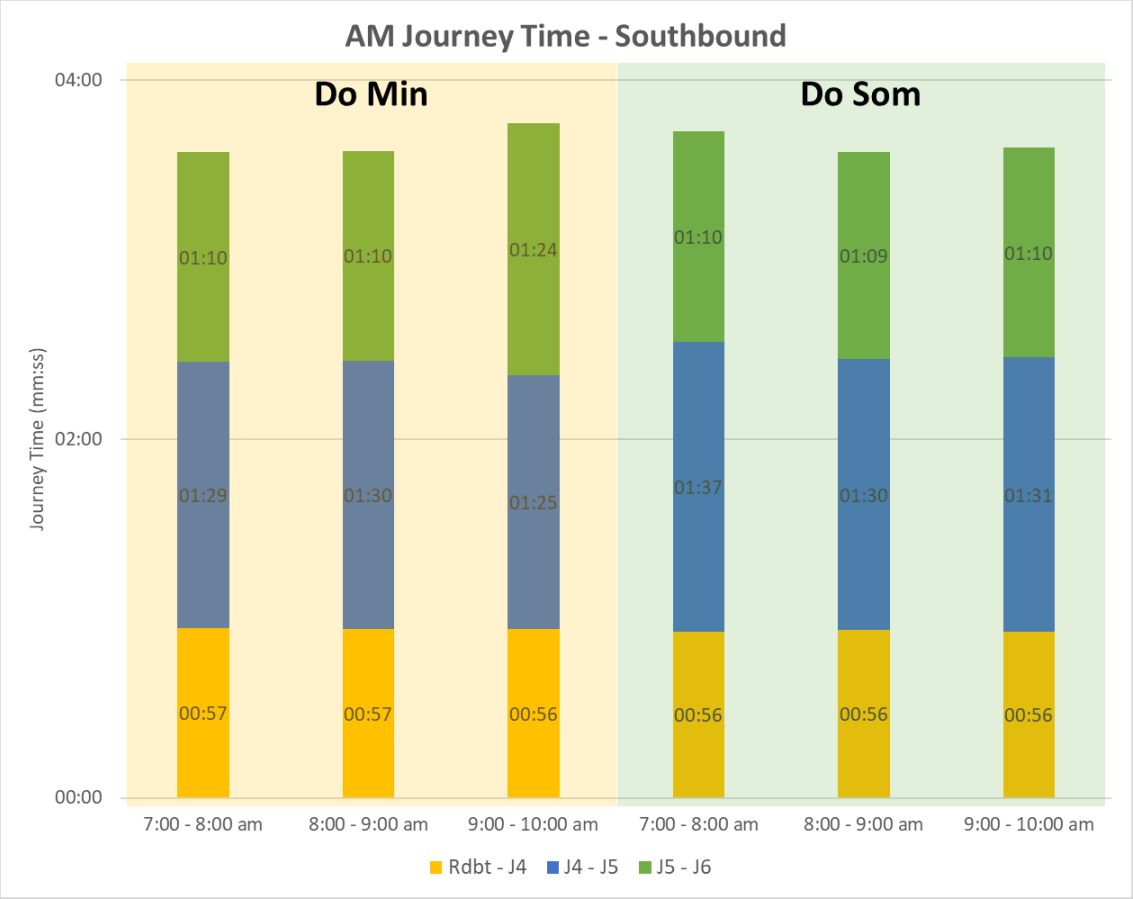


Figure 7-4 Sub-Scheme A – AM southbound bus journey time results

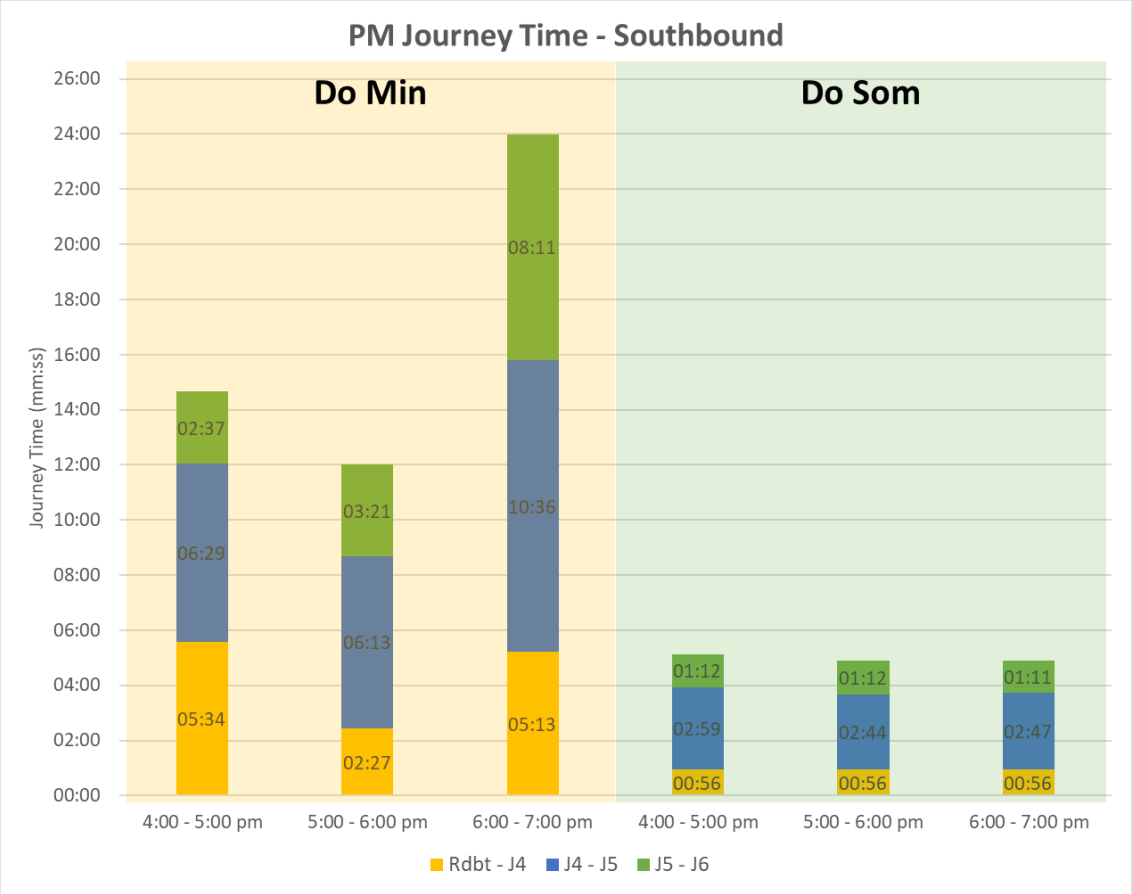


Figure 7-5 Sub-Scheme A – PM southbound bus journey time results

For Sub-Scheme A, potential bus journey time savings of approximately 7 mins (-61%) in the AM period northbound are expected. This is predominantly due to the additional bus priority on the approach to the Loughlinstown Roundabout. Bus journey time benefits of almost 12 mins (-72%) are expected in the PM period southbound. Significant benefits accrue from Junction 4 (M50) through to Junction 6. Some benefits occur in the PM period northbound (2 minutes, -34%) and no change in the AM period southbound due to free flow conditions in these directions.

7.2.2.2 Sub-Scheme B

Sub-Scheme B runs from Junction 6 (Bray / Fassaroe) to Junction 8 (Kilmacanogue). The bus journey time results extracted for each direction and time period along Sub-scheme B are shown in Figure 7-6 to Figure 7-9.

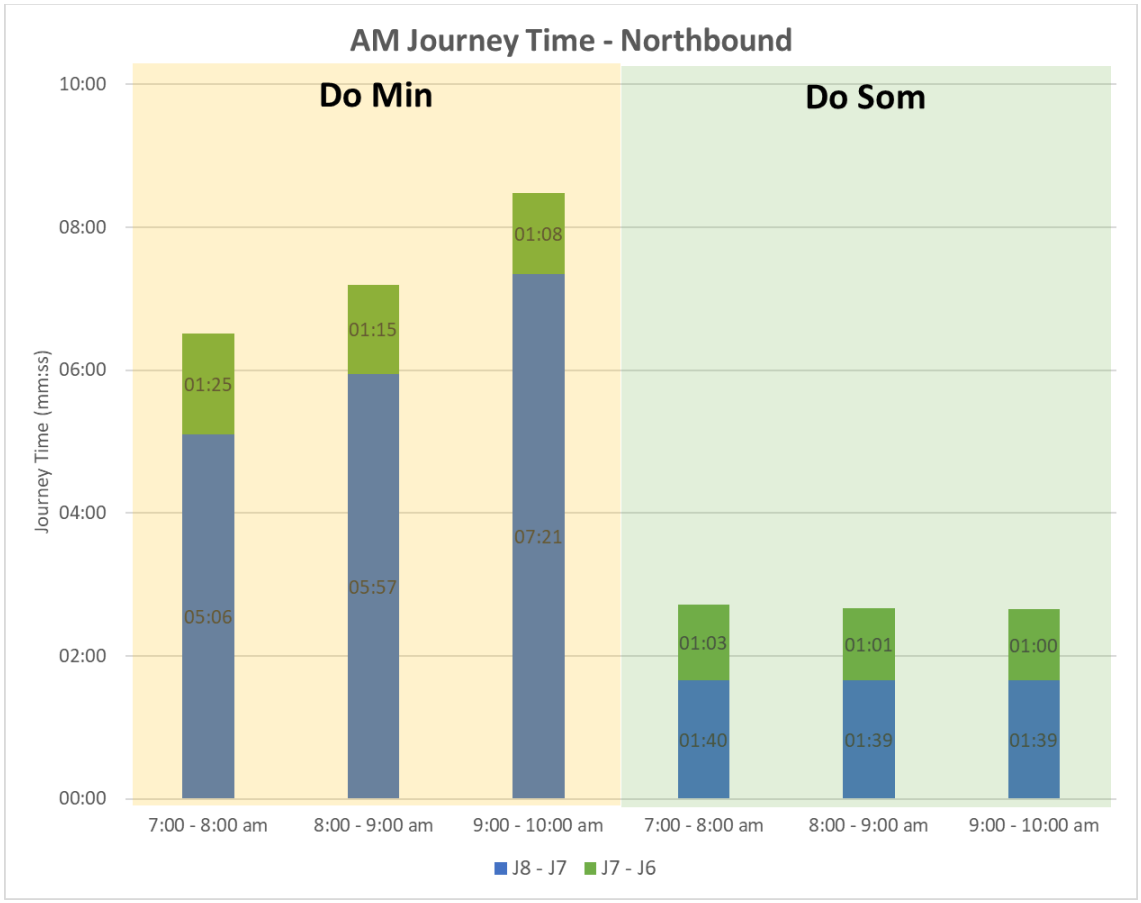


Figure 7-6 Sub-Scheme B – AM northbound bus journey time results



Figure 7-7 Sub-Scheme B – PM northbound bus journey time results

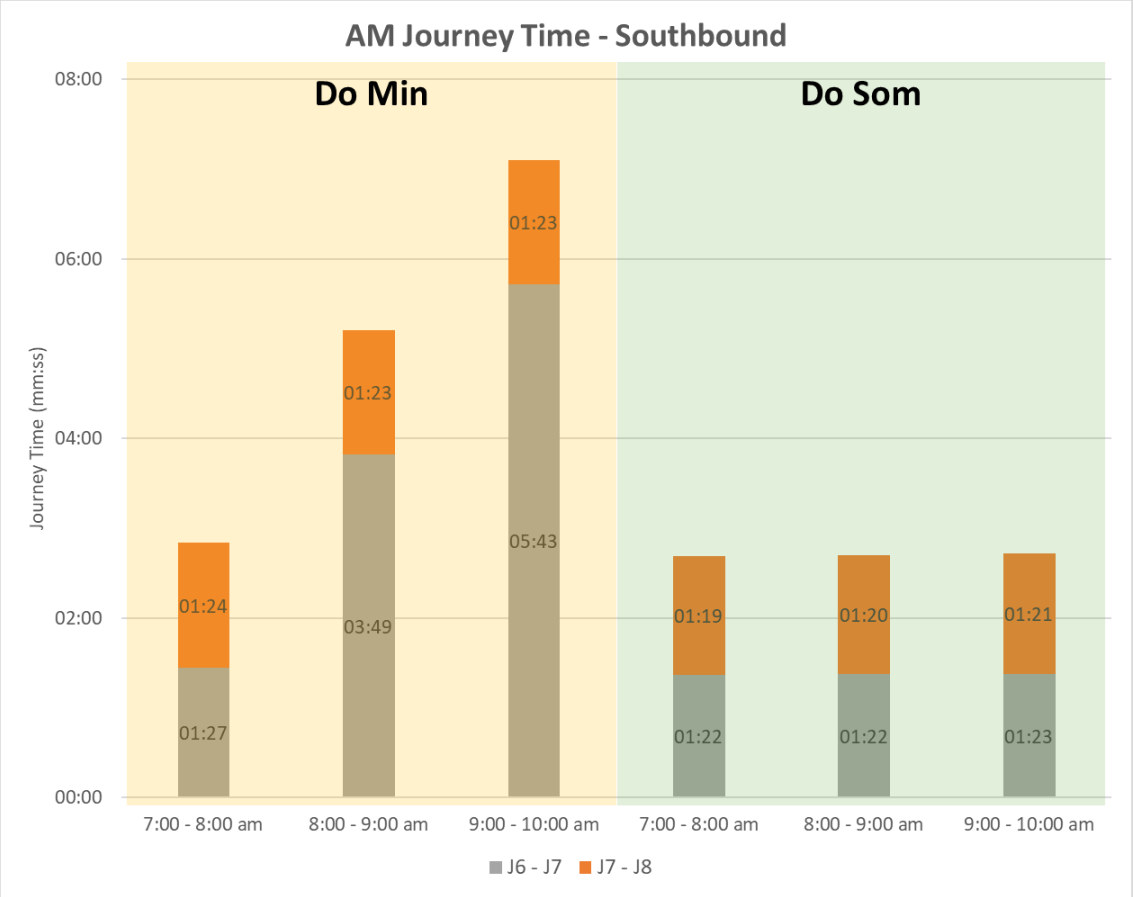


Figure 7-8 Sub-Scheme B – AM southbound bus journey time results

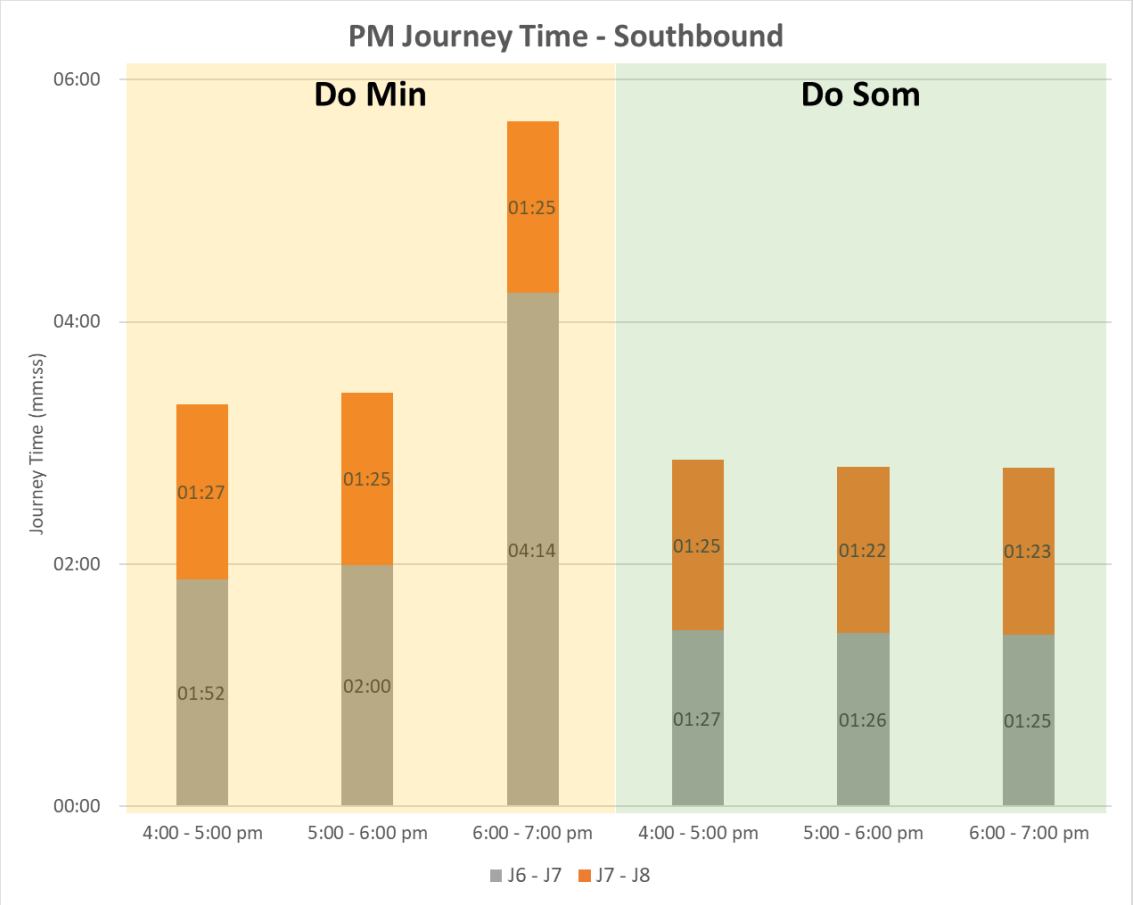


Figure 7-9 Sub-Scheme B – PM southbound bus journey time results

For Sub-Scheme B, potential bus journey time savings of almost 5 minutes (-64%) in the AM period northbound are expected. Southbound bus journey time benefits of approximately 2 minutes (-46%) and 1 minute (-32%) are expected in the AM and PM respectively. There are no benefits in northbound bus joumey times during the PM peak period, as journey times increase 9% (13 seconds).

The significant improvement in bus journey times, particularly in the AM peak northbound – where no dedicated bus priority is proposed, reflects the overall significant improvement in mainline flow through this area as a result of the reconfiguration of Junction 7 (Bray South) and the closure of accesses at R117, Dargle Lane, Herbert Road.

7.2.2.3 Sub-Scheme C

Sub-Scheme C runs from Junction 8 (Kilmacanogue) to Junction 9 (Glenview). The sub-scheme covers a 2.9km section of the N11 dual carriageway to the scheme termination at Junction 9. The bus journey time results extracted for each direction and time period along Sub-scheme C are shown in Figure 7-10 to Figure 7-13.

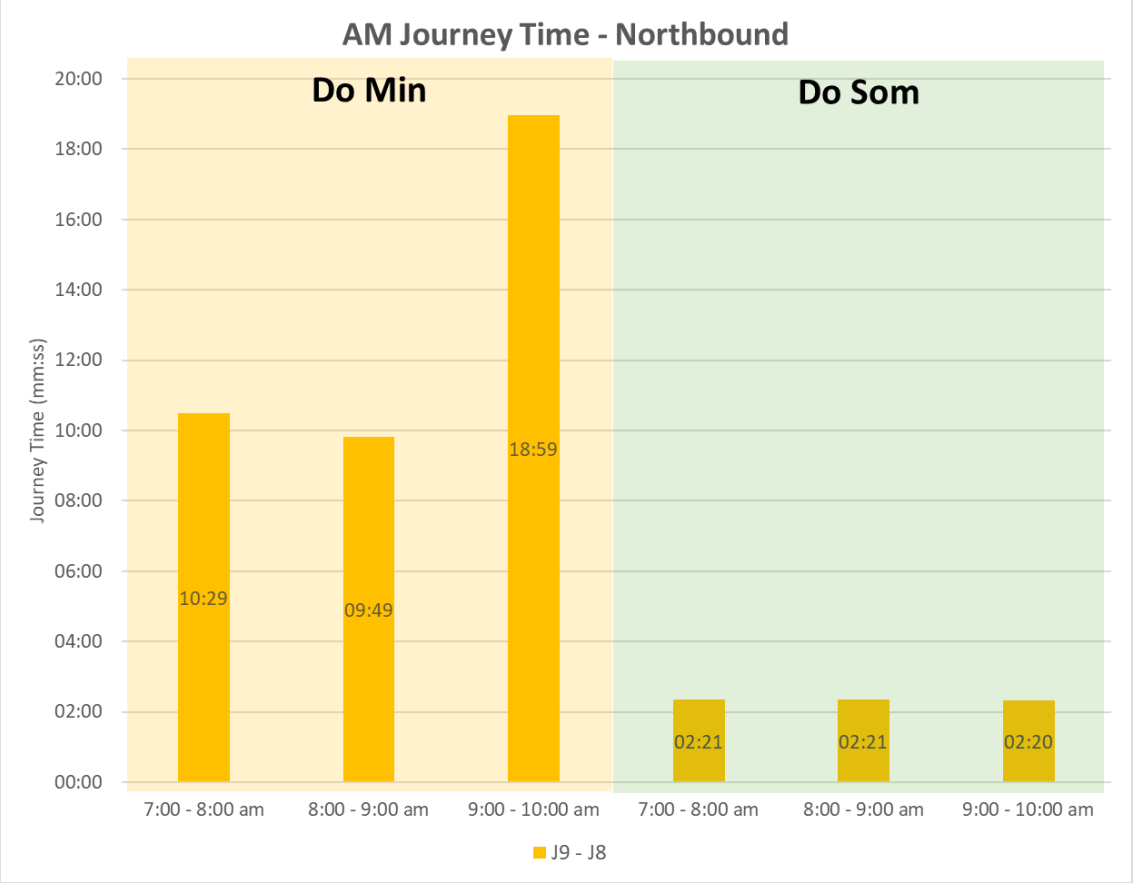


Figure 7-10 Sub-Scheme C – AM northbound bus journey time results

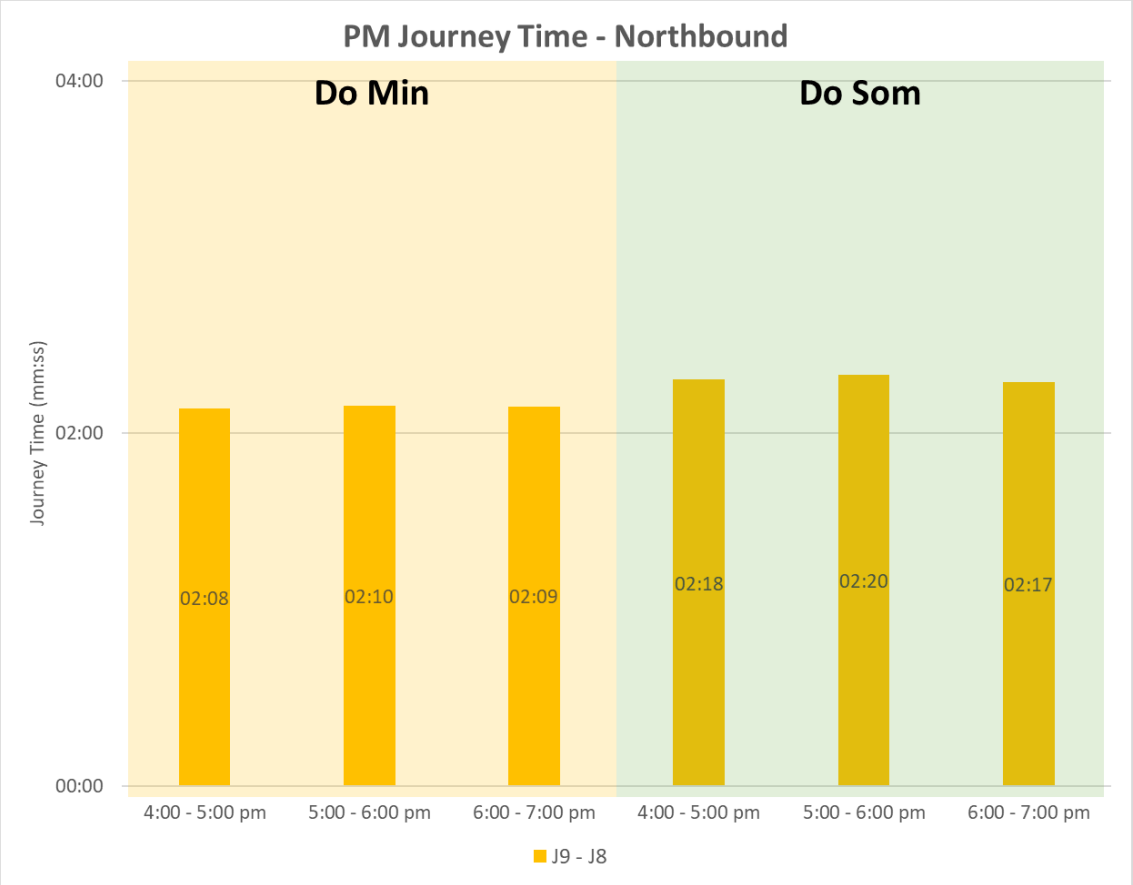


Figure 7-11 Sub-Scheme C – PM northbound bus journey time results

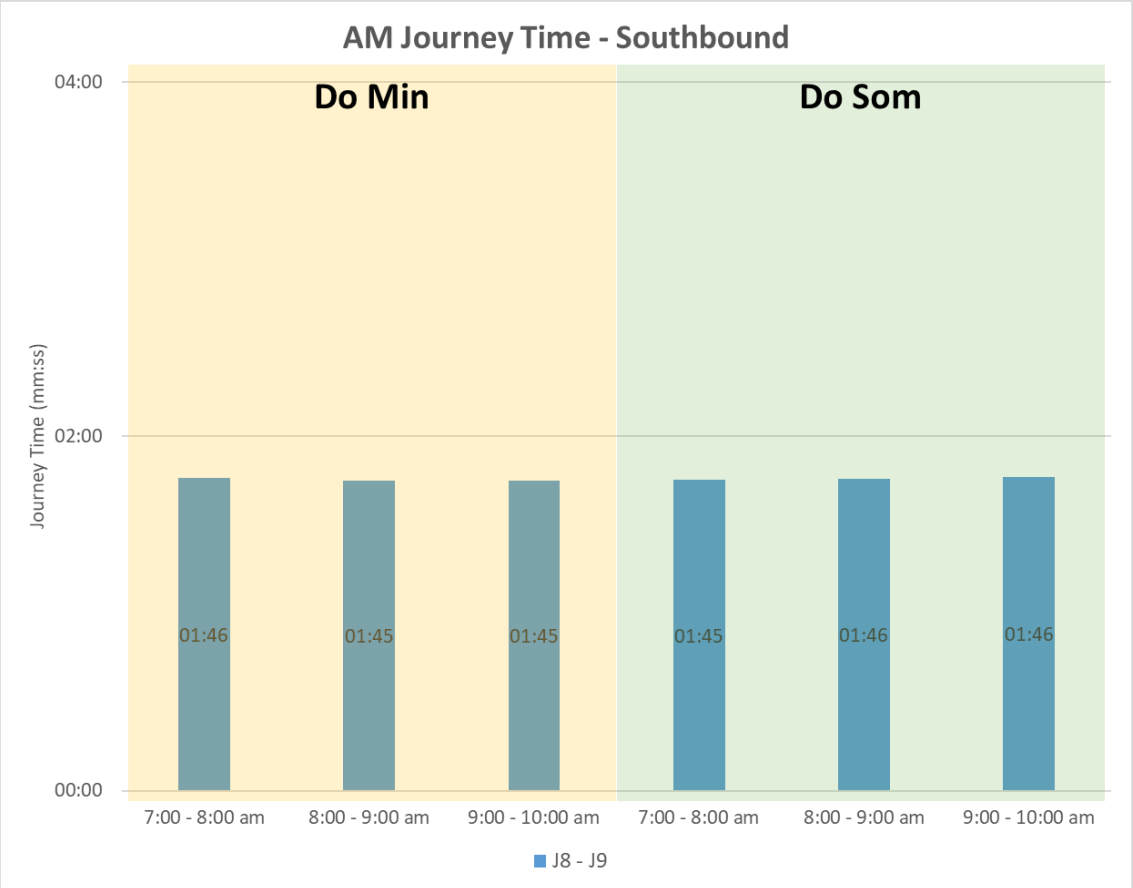


Figure 7-12 Sub-Scheme C – AM southbound bus journey time results

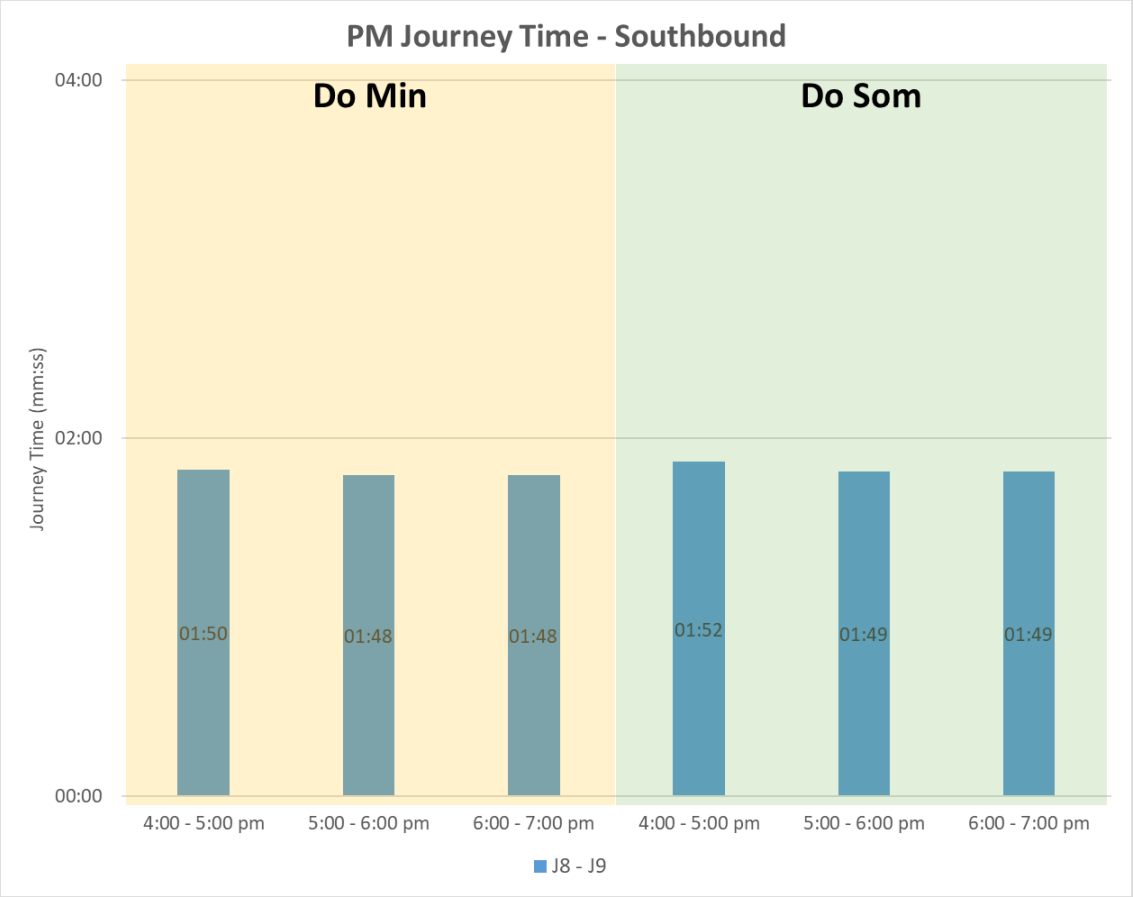


Figure 7-13 Sub-Scheme C – PM southbound bus journey time results

For Sub-Scheme C, potential bus journey time savings of approximately 11 minutes (-82%) are expected in the AM period northbound. It is expected that this saving would increase further during times of total flow breakdown as occurs during early morning peak times when queuing extends beyond Junction 9. Limited bus journey time benefits (0-2 seconds / 0-1%) are expected in the southbound direction across all time periods, as conditions are generally free flow along this section in the Do-Minimum. For the northbound direction there is a 9 second (7%) increase in journey times in the PM period.

7.2.2.4 All Sub-Schemes Combined

The bus journey time results extracted for each direction and time period along the full extent of Sub-Schemes A, B and C from Loughlinstown Roundabout to Junction 9 (Glenview) are shown in Figure 7-14 to Figure 7-17.

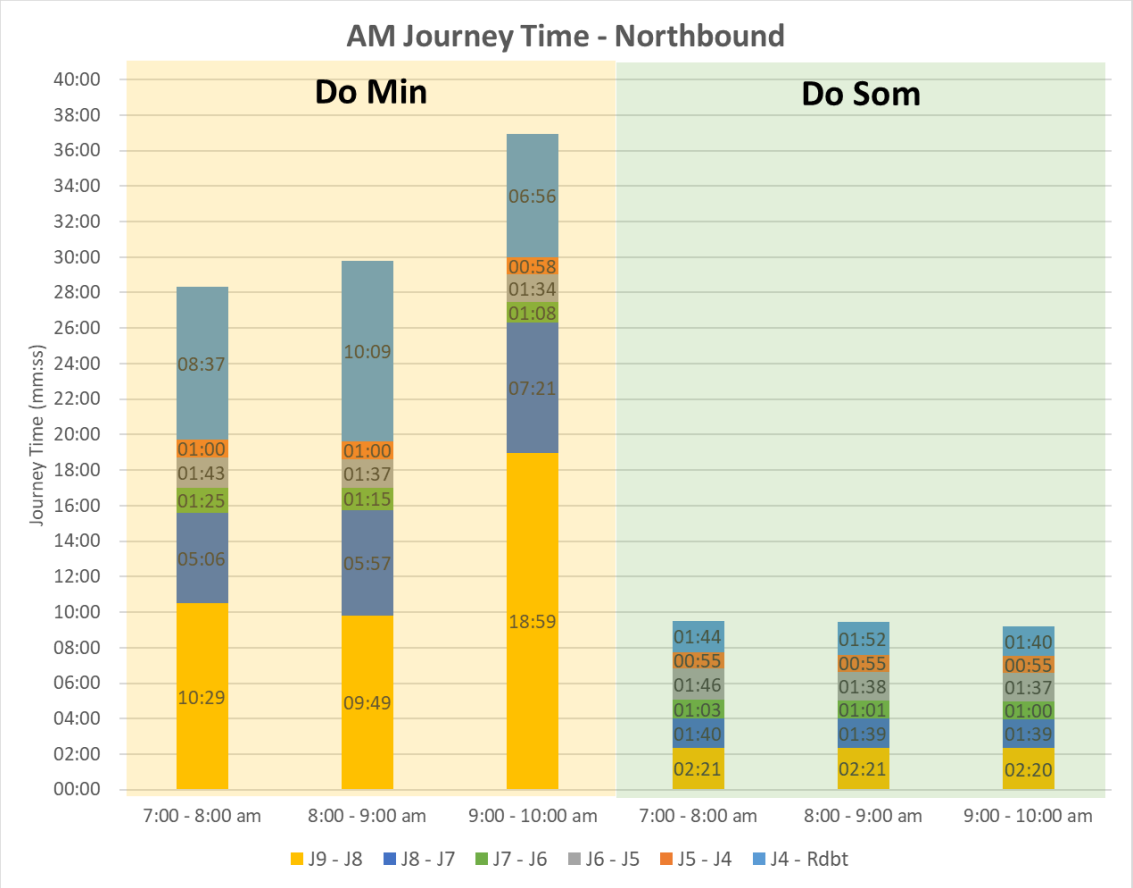


Figure 7-14 All Sub-Schemes combined – AM northbound bus journey time results

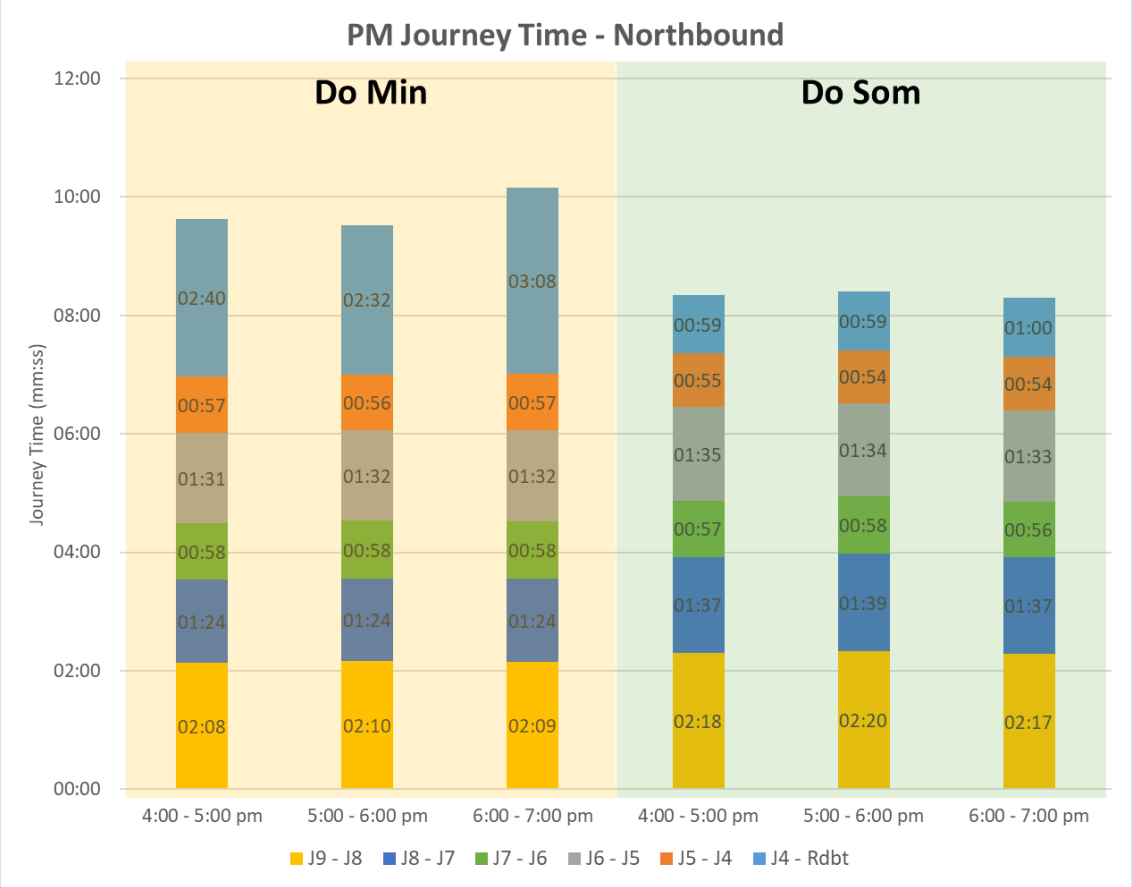


Figure 7-15 All Sub-Schemes combined – PM northbound bus journey time results

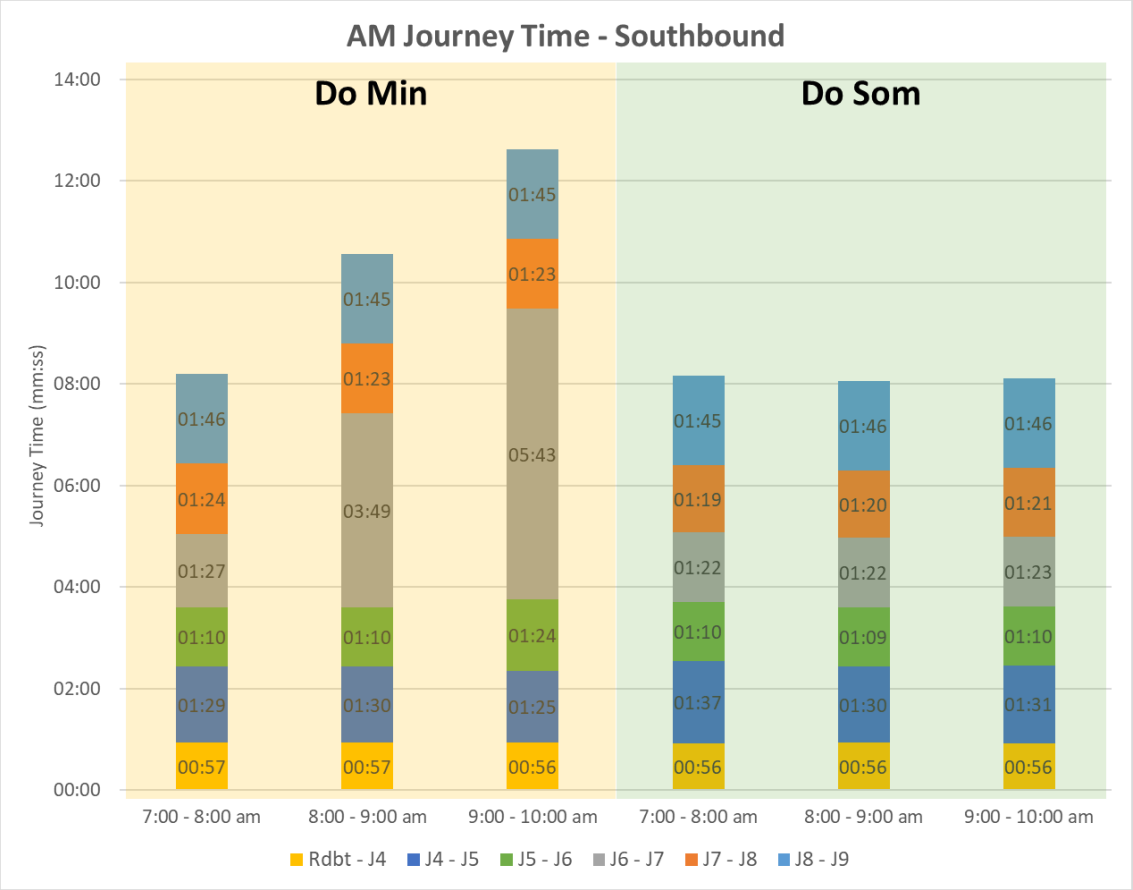


Figure 7-16 All Sub-Schemes combined – AM southbound bus journey time results

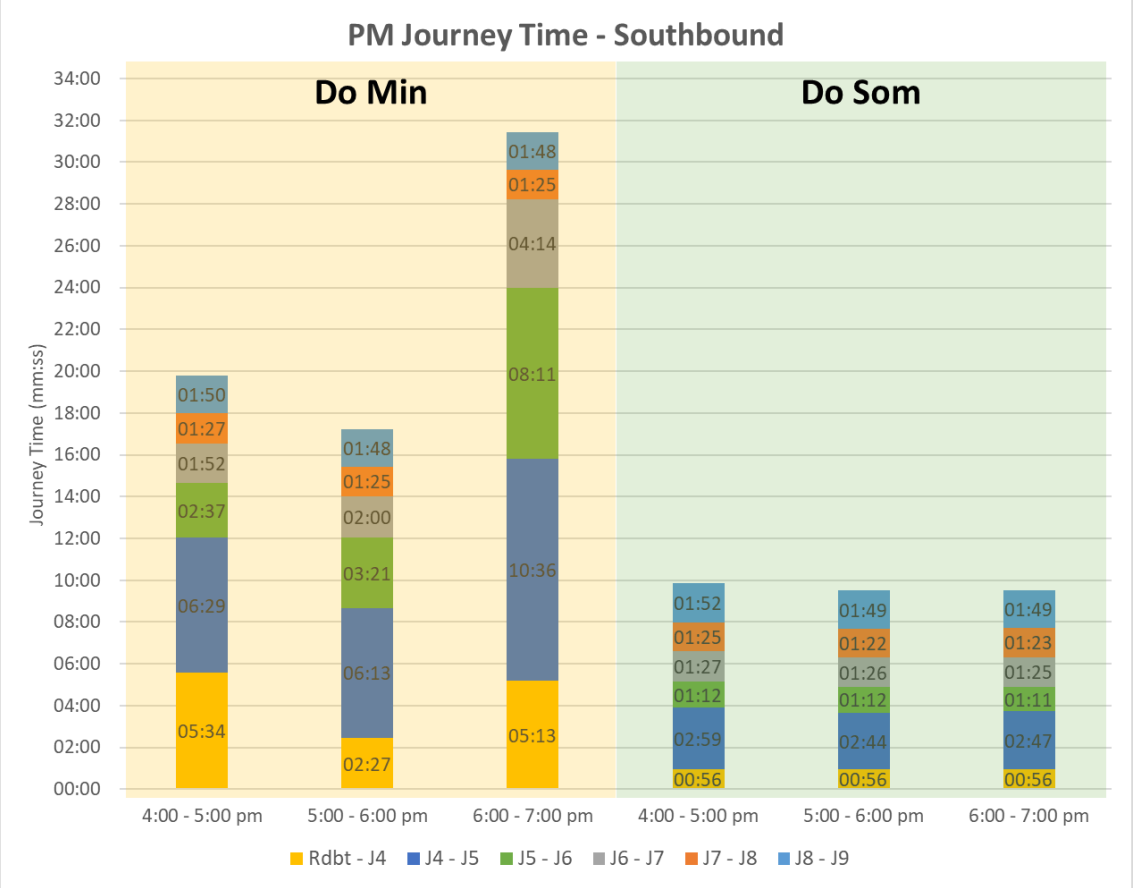


Figure 7-17 All Sub-Schemes combined – PM southbound bus journey time results

When All Sub-Schemes are combined and operational, potential bus journey time savings of approximately 22 mins (-71%) are expected in the AM period northbound. In the AM period southbound, bus journey time savings of 2 minutes (-22%) are expected.

In reality, the bus journey savings will differ slightly depending on the actual time the trip is undertaken. As discussed in Section 5.2.4, this is because a transient or moving queue is present across the morning period, with delays experienced along different sections of the N11/M11 at different times across the morning. To capture this, Table 7-1 presents a summary of the total journey time saving (all Sub-Schemes combined) across the AM period northbound, together with the percentage contribution made by each individual sub-scheme to delivering this reduction.

Table 7-1 Individual Sub-Scheme contributions to total bus journey time saving (AM northbound)

AM Time Period	AM Northbound Journey Time (Mins)			Individual Contribution of Sub-Schemes in Delivering Total Journey Time Saving		
	Do-Minimum	Do-Something	Journey Time Saving	Sub-Scheme A	Sub-Scheme B	Sub-Scheme C
All Schemes Combined (07:00 – 08:00)	28:19	09:29	-18:50	37%	20%	43%
All Schemes Combined (08:00 – 09:00)	29:47	09:27	-20:20	41%	22%	37%
All Schemes Combined (09:00 – 10:00)	36:55	09:11	-27:43	19%	21%	60%

From Table 7-1, Sub-Scheme C contributes with 43% of the total journey time saving across each AM peak hour for the period between 07:00 – 08:00, while Sub-Schemes A and B contribute with 37% and 20% respectively. For the period between 08:00 – 09:00, Sub-Scheme A contributes the most with 41% of individual contributions, with Sub-Schemes B and C representing 22% and 37% respectively. For the last period between 09:00 to 10:00, the contribution of Sub-Scheme C rises to 60%, with Sub-Schemes A and B representing 19% and 21% individual contributions of the total journey time savings, respectively. Overall, when averaging all time periods, Sub-Scheme C represents half the individual contribution to time savings (50%), Sub-Scheme A represents 30% and Sub-Scheme B represents 20%.

Bus journey time benefits of over 13 mins (-58%) are expected in the PM period southbound. Limited changes in bus journey times (1 min / -15%) are expected in the northbound direction in the PM period, as conditions are generally free flow along this section in the Do-Minimum. Again, the bus journey savings will differ slightly depending on the actual time the trip is undertaken for the same reasons as discussed above. Table 7-2 presents a summary of the total journey time saving (all Sub-Schemes combined) across the PM period southbound, together with the percentage contribution made by each individual sub-scheme to delivering this reduction.

Table 7-2 Individual Sub-Scheme contributions to total bus journey time saving (PM southbound)

PM Time Period	PM Southbound Journey Time (Mins)			Individual Contribution of Sub-Schemes in Delivering Total Journey Time Saving		
	Do-Minimum	Do-Something	Journey Time Saving	Sub-Scheme A	Sub-Scheme B	Sub-Scheme C
All Schemes Combined (16:00 – 17:00)	19:48	09:52	-09:56	95%	5%	0%
All Schemes Combined (17:00 – 18:00)	17:14	09:30	-07:44	92%	8%	0%
All Schemes Combined (18:00 – 19:00)	31:26	09:31	-21:55	87%	13%	0%

It is evident from Table 7-2 that Sub-Scheme A contributes to the greatest extent to the total journey time saving across each PM peak hour, accounting for 95% of total savings in the period between 16:00 – 17:00, 92% for the period between 17:00 – 18:00 and 87% for the period between 18:00 – 19:00. By comparison, Sub-Scheme B only contributes with 5% of the total journey time savings between 16:00 – 17:00, 8% between 17:00 – 18:00 and 13% for the period between 18:00 – 19:00. Across all PM peak hours, the contribution of Sub-Scheme C in delivering the total journey time saving is negligible (0%).

7.3 Network Performance Indicators (Local Area Model)

Table 7-3 to Table 7-5 present a summary of the network performance statistics for the scenarios modelled for the 2042 Design Year in the AM, Inter-peak and PM peaks. It should be noted that the results presented cover the entire LAM network, hence the impact of transport scenarios delivered along the N11/M11 corridor may be viewed, in some cases, as relatively marginal in consideration of the entire network. The following network statistics are presented for each scenario:

- **Transient Queues:** represents time spent in queues at junctions which are not over capacity, for example, at a signalised junction where the queue is able to clear during a single cycle. This is presented in total pcu.hours which is essentially the volume of vehicles on the network multiplied by the time spent in transient queues.
- **Over-capacity queues:** occur where the volume of turning movements exceed junction capacity, such that a permanent queue build – for example at a signalised junction where a queue is unable to clear in a single cycle. Similar to transient queues, over-capacity queues are presented in total pcu.hours.
- **Total Travel Time:** represents the total travel time for all vehicles on the network in the modelled period measured in pcu.hours.
- **Total Travel Distance:** represents the total distance travelled by vehicles on the road network in the modelled period measured in pcu.kms.
- **Average Speed:** represents the average speed of all vehicles travelling on the network within the modelled time period measured in km/h.

Table 7-3 Network performance indicators from LAM (AM peak – 2042 Design Year)

	Do-Minimum	Do-Something	DS/DM
Transient Queues (pcu.hrs)	2,144	1,179	-45%
Over Capacity Queues (pcu-hrs)	552	435	-21%
Total Travel Times (pcu.hrs)	8,388	8,001	-5%
Total Travel Distance (pcu.kms)	354,911	364,838	3%
Average Speed (km/h)	42.3	45.6	8%

An analysis of the AM network performance statistics indicates that the Do-Something scenario shows clear improvements in traffic flow, with reduced queues (transient queues are significantly reduced by 45% and over capacity queues decrease by 21%), slightly lower travel times (-5%), and higher average speeds (increase of 8%). The slight increase in total travel distance can be partly attributed to the new access to the R117 in the Do-Something scenario, which requires vehicles to use Junction 7 to access the proposed parallel road before reaching the R117. In contrast, the Do-Minimum scenario has a direct connection between the R117 and the N11 mainline.

Table 7-4 Network performance indicators from LAM (PM peak – 2042 Design Year)

	Do-Minimum	Do-Something	DS/DM
Transient Queues (pcu.hrs)	1,792	1,548	-14%
Over Capacity Queues (pcu-hrs)	654	656	0%
Total Travel Times (pcu.hrs)	8,014	7,713	-4%
Total Travel Distance (pcu.kms)	342,570	343,345	0%
Average Speed (km/h)	42.7	44.5	4%

An analysis of the PM network performance statistics reveals a positive improvement in overall traffic flow. Transient queues have been reduced by 14%, overall travel time has decreased slightly by 4%, with average speed across the network increasing by 4%. During the PM peak, the new access to the R117 does not significantly affect travel distance. The route to reach the R117 in the southbound direction is nearly the same in both scenarios, as vehicles must make a U-turn at Junction 7 to access the R117 in the present scenario.

Table 7-5 Network performance indicators from LAM (IP peak – 2042 Design Year)

	Do-Minimum	Do-Something	DS/DM
Transient Queues (pcu.hrs)	979	958	-2%
Over Capacity Queues (pcu-hrs)	15	18	19%
Total Travel Times (pcu.hrs)	5,587	5,593	0%
Total Travel Distance (pcu.kms)	302,721	303,748	0%
Average Speed (km/h)	54.2	54.2	0%

The inter-peak results are relatively modest in comparison to the other peak periods, which makes sense given the lower traffic volumes. Most of the performance indicators are nearly the same across both scenarios. There is a 19% increase in over capacity queues, but since the overall numbers are still low, there is no real reason for concern with that indicator.

7.4 Network Performance Indicators (Micro-Simulation Model)

Table 7-6 and Table 7-7 provide a summary of network performance statistics derived from the Micro-Simulation Model for the 2042 Design Year during AM and PM peaks. These results cover the entire road network for the three-hour AM period (7-10am) and the three-hour PM period (4-7pm). The following performance indicators are presented for each scenario:

- **Delay Time:** The difference between the expected travel time (under ideal conditions) and the actual travel time. Average of all vehicles and expressed as time per kilometre.
- **Density:** The average number of vehicles per kilometre of lane for the whole network.
- **Flow:** The average hourly number of vehicles exiting the network during the simulation period.
- **Mean Queue:** The average number of vehicles in queue within the network during the simulation period.
- **Average Speed:** The average speed for all vehicles that have left the system. This is calculated using the mean journey speed for each vehicle.
- **Total Distance Travelled:** The cumulative kilometres travelled by all vehicles that have crossed the network.
- **Total Travel Time:** The total travel time experienced by all vehicles that have crossed the network.

Table 7-6 Network performance indicators from Micro-Simulation model (AM peak – 2042 Design Year)

	Do-Minimum	Do-Something	DS/DM
Delay Time (sec/km)	60	19	-68%
Density (veh/km)	22	11	-51%
Flow (veh/hr)	10,996	11,734	7%
Mean Queue (veh)	701	59	-92%
Average Speed (km/h)	48	66	39%
Total Distance Travelled (km)	301,257	341,818	13%
Total Travel Time (hrs)	8,771	5,226	-40%

The AM network performance statistics indicate that the Do-Something scenario significantly enhances traffic efficiency compared to the Do-Minimum scenario. Key improvements include a 68% reduction in delay time per kilometre, a 51% decrease in vehicle density, and a 92% reduction in mean queue length, demonstrating a significant reduction in congestion. Average speed rises by 39%, while network flow increases by 7%. Despite the 13% increase in total distance travelled (as explained before, this partially due to the new access to the R117), total travel time falls by 40%, highlighting the overall effectiveness of the proposed scheme.

Table 7-7 Network performance indicators from Micro-Simulation model (PM peak – 2042 Design Year)

	Do-Minimum	Do-Something	DS/DM
Delay Time (sec/km)	52	13	-75%
Density (veh/km)	17	9	-49%
Flow (veh/hr)	10,021	10,551	5%
Mean Queue (veh)	568	48	-92%
Average Speed (km/h)	49	66	33%
Total Distance Travelled (km)	277,398	303,557	9%
Total Travel Time (hrs)	6,981	4,371	-37%

Similar to the AM peak, the PM network performance statistics also show notable efficiency improvements in the Do-Something scenario. All indicators demonstrate positive changes, except for a slight increase in total distance travelled, which can be attributed to the new road and layout of the proposed scheme.

The proposed upgrade to Junction 7 (Bray South) contributes significantly to the overall improvements in network performance, as discussed in more detail in Section 7.5.

7.5 Network Operational Impacts of Junction 7 (Bray South) Upgrade

As noted previously in Section 6.2.2.2, the emerging preferred option for the scheme includes a significant upgrade of Junction 7 (Bray South) within Sub-Scheme B, which includes the provision of improved grade separation and new merge and diverge layouts. In conjunction with the improved junction layout, a continuous auxiliary lane is proposed northbound between the Junction 7 merge and Junction 6 diverge. The proposed layout of the Junction 7 upgrade is shown in on the scheme layout drawings in Appendix D.

Junction 7 plays a critical role in the flow of traffic across the network, with its performance significantly influencing congestion patterns and queue lengths both upstream and downstream on the N11/M11 and on the regional and local roads serving the junction.

At present, the junction acts as a major bottleneck on the corridor. Conflicting movements at the east and west roundabouts are a significant contributor to congestion in the area and a major source of delay on the network.

Using data from the micro-simulation model, the figures below compare the Do-Minimum and Do-Something scenarios, highlighting the effectiveness of proposed upgrades, particularly at Junctions 7 and 8.

The diagrams use a colour-coded scale to represent different speed ranges in kilometres per hour (km/h), illustrating variations in traffic flow and queue levels across the three-hour period. The colours indicate the following levels of congestion:

- **Red: Very Congested** – Speeds below 20 km/h, indicating severe queuing or stop-start traffic.
- **Dark Orange: Congested** – Speeds between 20 and 40 km/h, showing areas with significant traffic delays.
- **Light Orange and Yellow: Lightly Congested** – Speeds between 40 and 80 km/h, where traffic is moving but not at optimal speeds.
- **Green: Free-flowing** – Speeds above 80 km/h, free-flowing traffic.

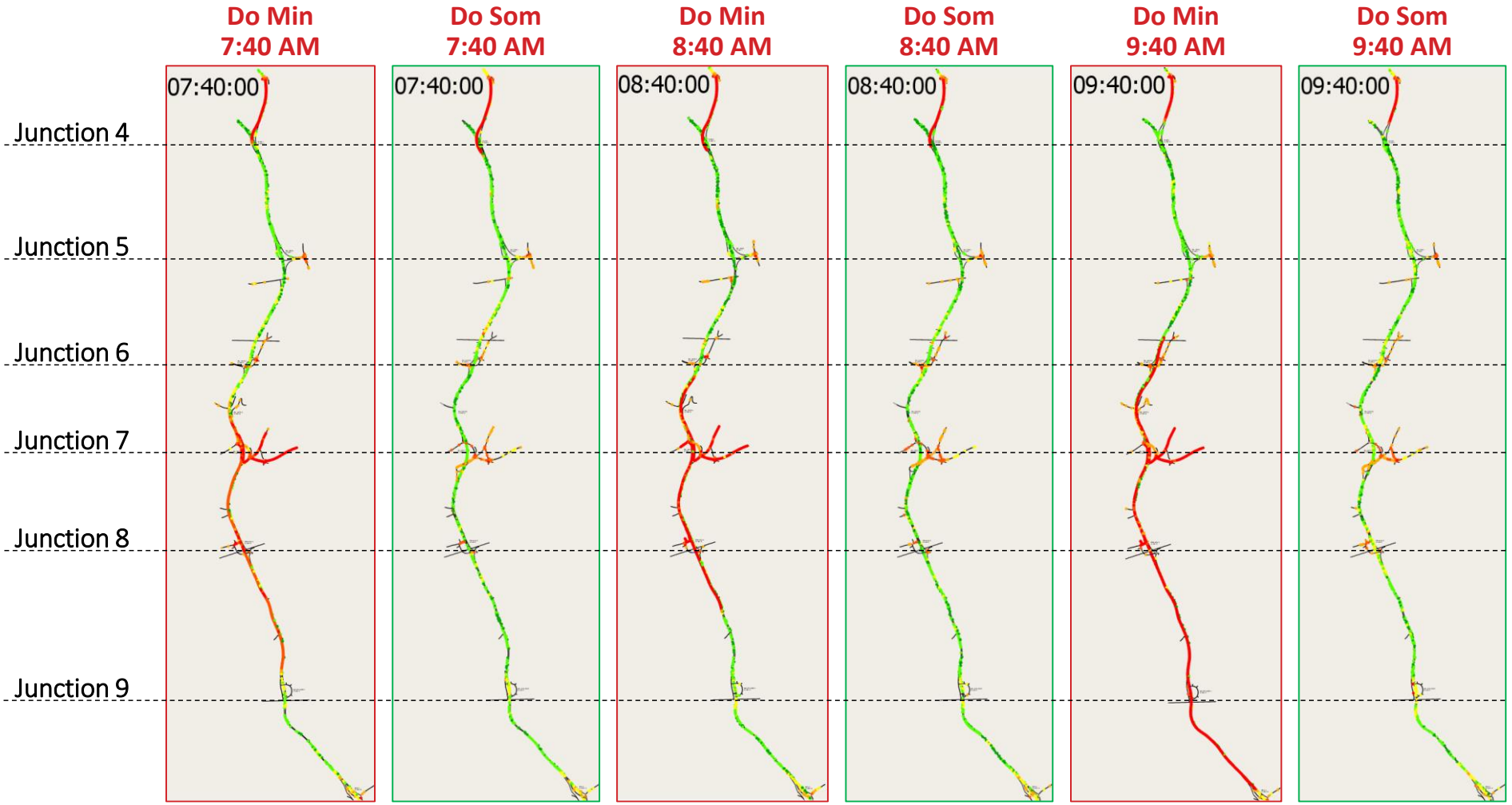


Figure 7-18 Peak period queuing comparison (2042 AM Peak)

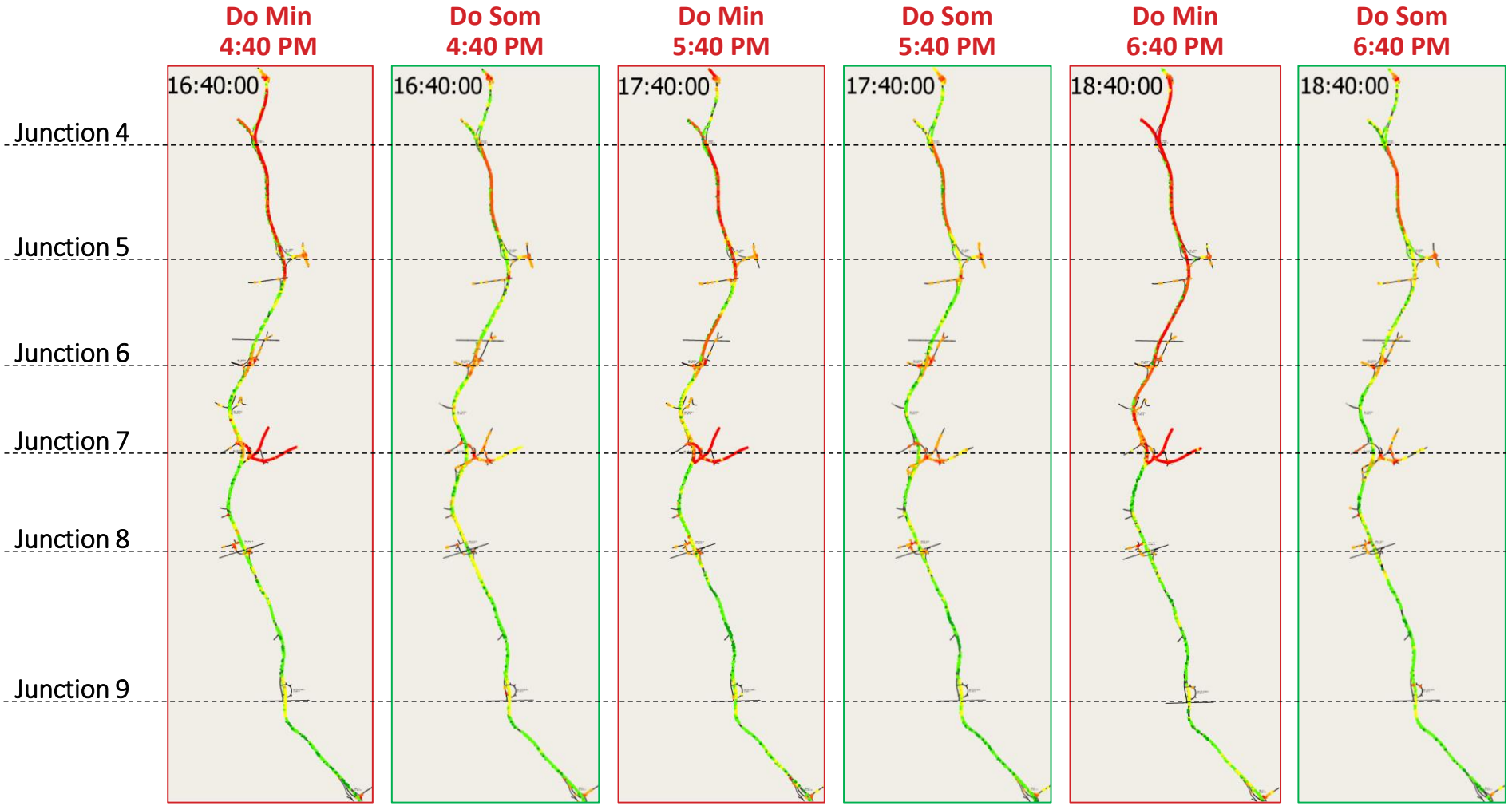


Figure 7-19 Peak period queuing comparison (2042 PM Peak)

During the AM peak in the Do-Minimum Scenario, queues begin forming at Junction 7 in the northbound direction and quickly affect Junction 8 and beyond. Significant queuing is also evident on the major approach roads to Junction 7, including the R767 Killarney Road and the R768 Southern Cross Road. By the second hour, northbound queues reduce slightly, but Junction 7 starts also impacting the southbound direction. In the final hour, queues extend southbound from Junction 6 to Junction 7 and northbound from Junction 10 to Junction 8. As can be observed in Figure 7-18, the proposed upgrades at Junction 7 and Junction 8 effectively resolve these queueing issues in the Do-Something Scenario, with the colour-coded diagrams aligning with the DS/DM performance indicator differences presented in Table 7-6.

As previously mentioned, bus journey time savings in the northbound direction during the AM period averaged over 15 minutes (-75%) across the three-hour period between Junctions 9 and 6. In the southbound direction, even though it is not the predominant flow, the time savings averaged 2 minutes and 20 seconds (-63%) across the three-hour period. These diagrams and results effectively highlight how the combined impact of bus priority facilities, improvements to Junction 7 and 8, and minor junction closures, has on bus journey times and overall network performance.

During the PM peak, queues initially form between Junctions 4 and 5 southbound (mainly due to the weaving issues between these two junctions), and then impact Junctions 6 and 7 during the second hour, spreading from Junction 4 to Junction 7 southbound in the last hour. No significant issues are observed northbound during this peak. Queues are also evident across the three-hour period on the R767 Killarney Road and the R768 Southern Cross Road. The proposed upgrades at Junction 7, along with the addition of bus priority signalling at Junction 5, largely resolve the queueing issues in the Do-Something scenario.

Bus journey time savings in the southbound direction during the PM peak averaged 13 minutes (-63%) across the three-hour period between Junctions 4 and 7. In the northbound direction (non-predominant flow), time savings averaged around 1.5 minutes (-21%) across the same period. Once again, the proposed upgrades at Junction 7 demonstrate a significant impact on overall network performance, aligning with the DS/DM performance indicator differences presented in Table 7-7.

7.6 AADT Forecasts

To estimate the annual average daily traffic (AADT) using Peak Hour Model outputs, factors were developed that allowed extrapolation of peak hour traffic flows to AADT.

The Localised Period Count method for AADT calculation has been applied using the 27 ATC count locations throughout the study area (14 days, starting in May 2019). This method combines localised count data with nearby TII permanent counters in order to estimate AADTs.

TII PAG recommends a daily flow profile is generated for the weekday for which the short period traffic counts have been collated. In this case the short period data will be peak hour model outputs. The peak hour models have been developed to represent the "average weekday", therefore, a daily profile for the average weekday was generated using two weeks of ATC data gathered from May 2019.

Data from the ATCs (and Permanent Counter) was then classified into Peak (comprising AM Peak and/or PM Peak) and Inter Peak periods. In performing this task, the following bands were used.

- AM Peak Period: The period from 06:00 to 10:00
- PM Peak Period: The period from 16:00 to 20:00
- Inter Peak Period: The period from 20:00 to 06:00 and 10:00 to 16:00.

To estimate the flow for a defined period (e.g. the AM peak) from the short period count, the procedure is as follows:

$$AM_x = \left(\frac{Q_x}{Q_{PTC}}\right) \times AM_{PTC}$$

Where:

- AM_x = Annual Average AM Peak (06:00 – 10:00) traffic flow at location x

- AM_{PTC} = Annual Average AM Peak (06:00 – 10:00) traffic flow at Permanent Traffic Counter
- Q_x = Short Period AM Peak traffic flow
- Q_{PTC} = Short Period AM Peak traffic flow at Permanent Counter, this should relate to same Short Period as Q_x.

The same process is applied to the IP and PM peaks and the result for all periods (AM, PM and IP) is aggregated to give a value of AADT as follows:

$$AADT_x = (AM_x) + (IP_x) + (PM_x)$$

The above calculations were performed for the 27 locations of the ATC surveys illustrated in Figure 2-2, providing AADT values for each of these locations. Similarly, this analysis provided a relationship between the short period count (i.e. Modelled Peak Hour) and the Peak Period (06:00-10:00) at each site and for each time period (AM, IP and PM). A regression analysis was then preformed at all locations to calculate the appropriate expansion factor to be applied to model flows to estimate future year AADTs. Table 7-8 shows the expansion factors calculated by time period and user class.

Table 7-8 AADT expansion factors

Time Period	LV	HV
AM	2.7	3.1
IP	5.5	5.8
PM	2.8	3

The design year AADT flows are presented in Table 7-9 for locations across the study area as shown in Figure 7-20 and Figure 7-21.

Table 7-9 Design Year (2042) AADTs

AADT Point	Location	Do-Minimum		Do-Something		DS/DM	
		AADT	%HGV	AADT	%HGV	AADT	%HGV
1	M11 Between J4 & Loughlinstown Roundabout	32,761	3%	32,655	3%	0%	0%
2	N11 between Junction 4 & 5	83,499	4%	84,952	4%	2%	0%
3	N11 between Junction 5 & 6	73,492	4%	74,272	4%	1%	0%
4	N11 between Junction 6 & 6a	81,738	4%	77,543	4%	-5%	0%
5	N11 between Junction 6a & 7	80,174	4%	77,543	4%	-3%	0%
6	N11 between Junction 7 & 8	69,486	4%	70,344	4%	1%	0%
7	N11 between Junction 8 & 9	59,916	4%	60,288	4%	1%	0%
8	R768 Junction 7 Overbridge	19,043	2%	5,013	2%	-74%	0%
9	R768 Southern Cross Road (West)	16,979	2%	17,792	2%	5%	0%
10	R767 Killarney Road (South of Kilbride Lane)	15,301	1%	21,049	1%	38%	0%
11	R768 Southern Cross Road (East)	16,629	2%	17,406	1%	5%	0%
12	R761 Greystones Road	16,320	1%	15,471	1%	-5%	0%
13	R761 Vevay Road (South)	11,537	0%	11,715	1%	2%	0%

AADT Point	Location	Do-Minimum		Do-Something		DS/DM	
		AADT	%HGV	AADT	%HGV	AADT	%HGV
14	Boghall Road	10,352	0%	9,220	0%	-11%	0%
15	R767 Killarney Road (North of Kilbride Lane)	7,962	1%	8,935	1%	12%	0%
16	R766 Putland Road	8,135	0%	7,806	0%	-4%	0%
17	R761 Vevay Road (North)	13,540	1%	12,930	1%	-5%	0%
18	Kilbride Lane	5,227	1%	8,037	0%	54%	-1%
19	Herbert Road (North of Kilbride Lane)	7,205	1%	7,315	1%	2%	0%
20	Fassaroe Lane	4,433	0%	4,563	0%	3%	0%
21	Herbert Road (at N11 Junction)	7,762	1%	0	0%	-100%	-1%
22	R117 Enniskerry Road	5,627	1%	5,280	1%	-6%	0%
23	R761 Fran O'Toole Bridge	17,879	2%	19,119	2%	7%	0%
24	Herbert Road (Bray Town Centre)	5,413	1%	5,936	1%	10%	0%
25	R918 Upper Dargle Road	4,125	1%	4,263	1%	3%	-1%
26	R761 Dublin Road	18,398	3%	18,906	3%	3%	0%
27	M11 Junction 5 merge/diverge	19,526	4%	19,790	3%	1%	0%
28	R119 Dublin Road	12,416	2%	12,318	2%	-1%	0%
29	Old Connaught Avenue (West)	5,755	1%	6,101	1%	6%	0%
30	Ferndale Road	4,305	1%	4,742	1%	10%	0%
31	L1001 Kilcroney Lane	2,324	1%	2,234	2%	-4%	0%
32	Junction 7 northbound merge (new)	-	-	9,945	2%	-	-
33	Junction 7 northbound diverge (new)	-	-	7,080	1%	-	-
34	Junction 7 southbound merge (new)	-	-	7,853	1%	-	-
35	Junction 7 southbound diverge (new)	-	-	11,637	2%	-	-
36	Junction 7 to Junction 6 parallel service road northbound – south of R117 (new)	-	-	3,438	2%	-	-
37	Junction 7 to Junction 6 parallel service road northbound – north of R117 (new)	-	-	3,478	2%	-	-
38	N11 between Junction 7 & 8	63,641	4%	58,402	4%	-8%	0%
39	Junction 8/Kilmacanogue parallel service road northbound (new)	-	-	5,991	1%	-	-

The analysis of AADTs generally shows slight differences between the Do-Minimum and the Do-Something scenarios, with the exception of the following locations where more significant differences are evident:

- **N11/M11 Mainline (Points 1–7):** Traffic volumes are slightly higher along most of these points in the Do-Something Scenario. However, points 4 and 5 show reductions due to the proposed new parallel road which connects Junction 7 to R117 (AADT Point 36) and onwards to junction 6 (AADT Point 37). This new road diverts part of traffic off the N11 mainline to serve trips heading to and from the R117 Enniskerry Road.
- **R768 Junction 7 Overbridge (Point 8):** The Do-Something AADT is significantly lower here due to the new Junction 7 layout. The new northbound diverge (Point 33) and merge (Point 32) divert traffic that use the bridge in the Do-Minimum Scenario. The combined traffic on the new northbound merge, diverge, and over the bridge is 16% higher in the Do-Something scenario, which demonstrates the improved efficiency of the proposed Junction 7 upgrade.
- **Herbert Road (at N11 Junction) (Point 21):** Traffic on Herbert Road drops to zero in the Do-Something scenario due to the proposed junction closure. This closure redirects vehicles to other routes and impacts the flow on nearby roads such as Killarney Road and Kilbride Lane.
- **Bray South (R767 Killarney Rd, R768 Southern Cross Rd and Kilbride Lane):** Traffic volumes on these roads are higher in the Do-Something scenario. This increase can be attributed to the closure of Herbert Road, which diverts traffic to Junction 7, and improvements at Junction 7 that resolve queueing issues on Killarney Road and Southern Cross Road.
- **Junction 8 (Points 38 and 39):** Traffic on the N11 mainline at Junction 8 reduced due to the new one-way segregated parallel service road northbound from the Junction 8 diverge and through Kilmacanogue Village. When the volume on this new parallel road (AADT point 39) is included, traffic increases by 1% along this section of the scheme in the Do-Something Scenario.

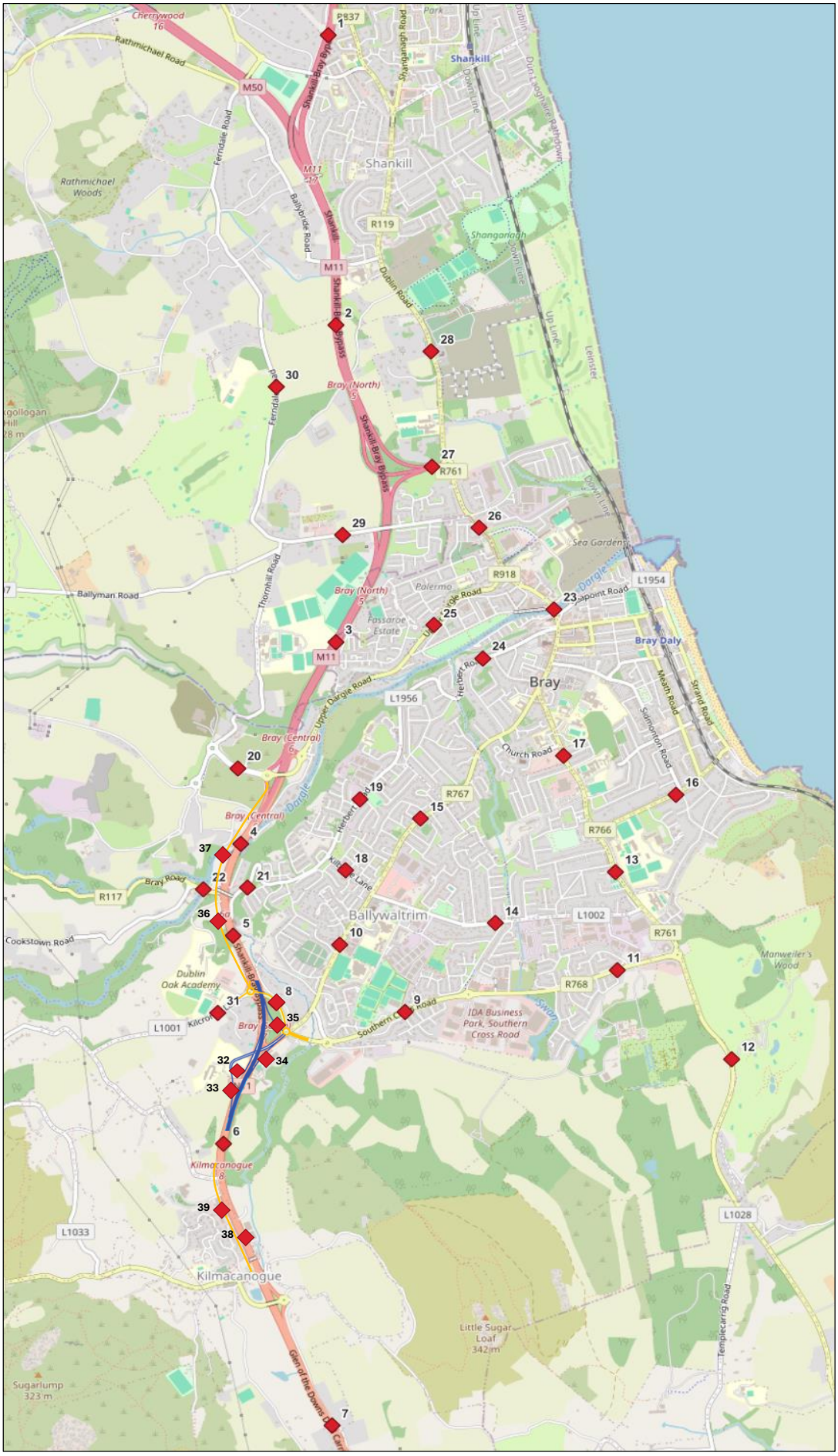


Figure 7-20 N11/M11 AADT points

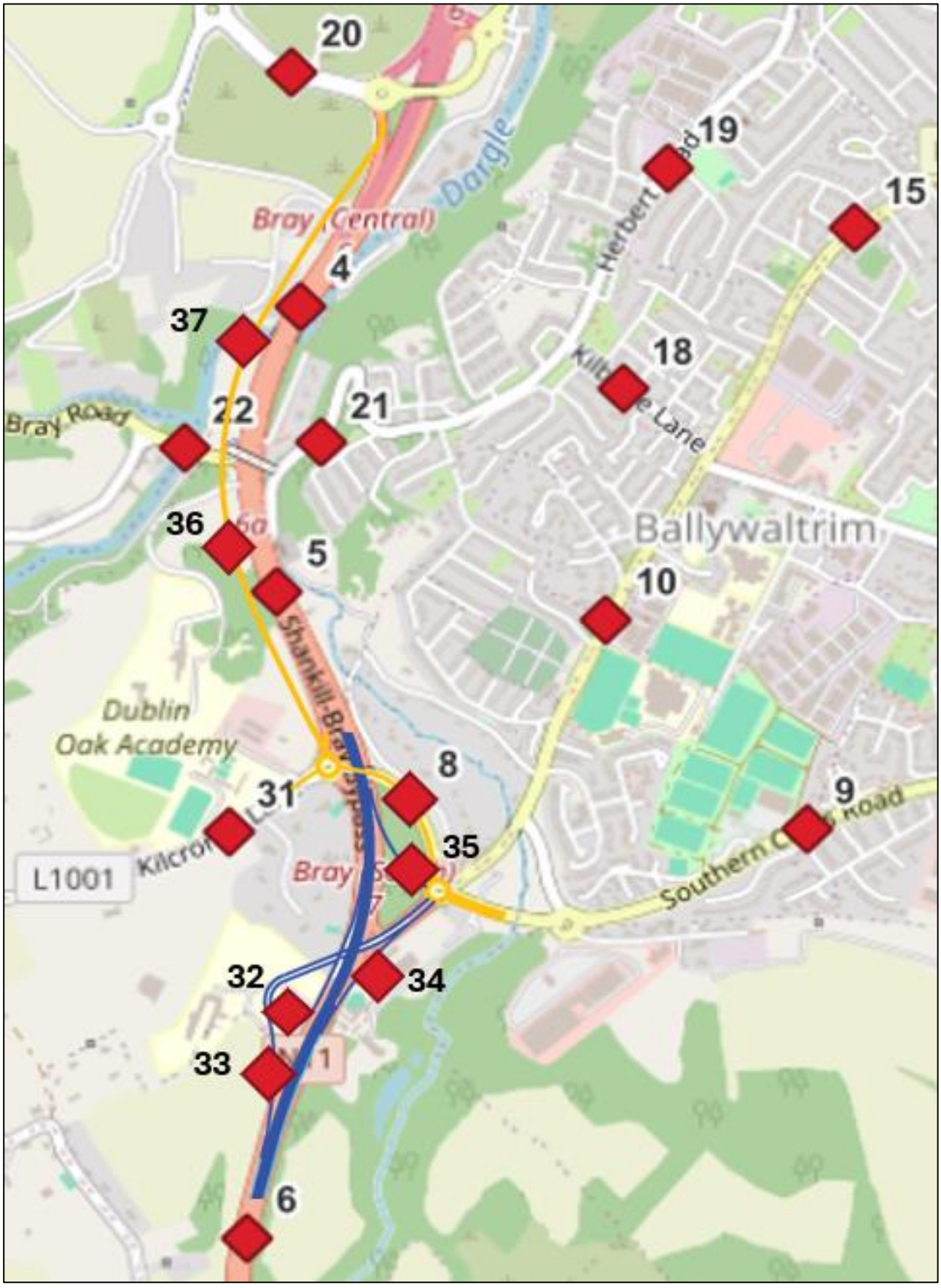


Figure 7-21 Junction 6 to Junction 7 AADT points

8. Summary

8.1 Purpose of the Report

This Transport Modelling Report documents the development of the N11 Local Area Traffic Model and the Micro-simulation Model in accordance with TII Project Appraisal Guidance.

The LAM has been used to inform the Phase 2 Option Selection process for the N11/M11 Bus Priority Interim Scheme, forecasting the traffic flows and associated impacts of different sub-schemes. Outputs from the model have also been used to inform the economic and environmental appraisal of the sub-schemes tested.

The Micro-simulation model has been used to inform a reassessment of Sub-Schemes A, B and C in order to inform which of these sub-schemes should be progressed as part of the overall preferred option for the N11/M11 Bus Priority Interim Scheme.

8.2 Model Development

The LAM has been developed, calibrated and validated to reflect the observed base year (2019) traffic conditions for the following time periods:

- AM Morning peak period: 08:15 to 09:15;
- PM Evening peak period: 17:00 to 18:00; and
- Average Interpeak Hour: (Average 13:00-16:00).

The micro-simulation model has also been developed, calibrated and validated to reflect the observed base year (2019) traffic conditions but AM and PM peaks only:

- AM Morning peak period: 07:00 to 10:00; and
- PM Evening peak period: 16:00 to 19:00.

Both models have been calibrated and validated in-line with TII Project Appraisal Guidelines and conforms to all calibration and validation criteria specified in PAG Unit 5.1 for each period modelled.

8.3 Future Year Models

The report also details the development of the future year models used in the Phase 2 (Option Selection). Again, the model meets all TII requirements and criteria with regard to forecasting and future year model development. The Future Year models were developed for an opening year of 2027 and design year of 2042.

8.4 Scheme Assessment Summary

Three Sub-Schemes (A, B and C) have been brought forward from previous appraisal and assessed against the Do-Minimum scenario using the Future Year Models. The following indicators have been used to assess the performance of each sub-scheme:

- Journey Times
- Network Performance Indicators; and
- AADT Flows.

8.4.1 Sub-Scheme A

Sub-Scheme A which runs from Loughlinstown roundabout to Junction 6 (Bray / Fassaroe), generally represents the best performing scenario under the majority of the KPIs. A summary of the transport modelling analysis indicates that Sub-Scheme A can be expected to achieve:

- In comparison to the Do-Minimum scenario, Sub-Scheme A achieves an average potential 6 minutes 50 seconds savings for buses that travel along the entire section of bus lane provided in the AM northbound direction. In the design year Do Nothing scenario, buses would travel at an average speed of approx. 28km/h between points H and I (J6 and J4). Following the introduction of the bus lane included in Sub-Scheme A, buses could then travel at a maximum safe speed of approx. 70 km/h.

- In the PM southbound direction, Sub-Scheme A achieves a potential 11 minutes 55 seconds savings for buses that travel along the entire section of bus lane provided (highest saving across all sub-schemes in the southbound direction in the PM). This saving is mostly achieved over the section J – I (from J4 to just after the J5 southbound merge).

- In general, Sub-Scheme A has the biggest impact on the two-way AADTs with the biggest increase (compared to the Do-Minimum values) occurring between J4 and J5 (approx. 1,453 vehicles higher) which has a bus lane provided in both directions as part of the scheme. Similarly, it has the largest decrease in AADTs between J6 and J6a of 4,195 less vehicles. This is because of the proposed parallel road connecting junction 7 to R117 and then to Junction 6. This new road is used for traffic going to and coming from R117.

8.4.2 Sub-Scheme B

Sub-Scheme B which runs from Junction 6 (Bray / Fassaroe) to Junction 8 (Kilmacanogue), generally represents the second-best performing scenario under the majority of the KPIs. A summary of the transport modelling analysis indicates that Sub-Scheme B can be expected to achieve:

- In comparison to the Do-Minimum scenario, Sub-Scheme B achieves a potential 4 minutes 43 seconds saving for buses that travel along the entire section of bus lane provided in the AM northbound direction. In the design year Do Nothing scenario, buses would travel at an average speed of 28 km/h. Following the introduction of the bus lane included in Sub-Scheme B, buses could then travel at a maximum safe speed of approximately 76 km/h.

- In the PM southbound direction, Sub-Scheme B achieves a potential 1 minute 19 seconds savings for buses that travel along the entire section of bus lane provided. In the design year Do-Minimum scenario, buses would travel at an average speed over 58 km/h. Following the introduction of the bus lane included in Sub-Scheme B, buses could then travel at a maximum capped safe speed of 80 km/h.

- For Sub-Scheme B, the biggest reduction in AADT occurs between J6a and J7 (approx. 2,631 vehicles lower) This is because of the proposed parallel road connecting junction 7 to R117 and then to junction 6. This new road is used for traffic going to and coming from R117. Between J7 and J8, there is an increase in AADTs of 858 vehicles.

8.4.3 Sub-Scheme C

Sub-Scheme C which runs from Junction 8 (Kilmacanogue) to Junction 9 (Glenview), achieves strong performance in the northbound direction under the majority of the KPIs. A summary of the transport modelling analysis indicates that Sub-Scheme C can be expected to achieve:

- In comparison to the Do-Minimum scenario, Sub-Scheme C achieves a potential 10 minutes 45 seconds saving for buses that travel along the entire section of bus lane provided in the AM northbound direction (highest saving across all Sub-Schemes in the northbound direction in the AM). In the design year Do Nothing scenario, buses would travel at an average speed of approx. 28 km/h. Following the introduction of the bus lane included in Sub-Scheme C, buses could then travel at a maximum safe speed of approx. 65km/h.

- In the PM southbound direction, Sub-Scheme C achieves a marginal 2 second savings for buses that travel along the entire section of bus lane provided (lowest saving across all Sub-Schemes in the southbound direction in the PM). In the design year Do-Minimum scenario, buses would travel at an average speed of approximately 81km/h. Following the introduction of the bus lane included in Sub-Scheme C, buses could then travel at a maximum capped safe speed of 80km/h.
- Sub-Scheme C has the least impact on the two-way AADTs with an increase occurring between Junction 8 and Junction 9 (approx. 372 vehicles higher), compared to the Do-Minimum scenario.

8.4.4 All Sub-Schemes Combined

A summary of the transport modelling analysis indicates that including all sub-schemes combined can achieve:

- In comparison to the Do-Minimum scenario, implementing all sub-schemes achieves a potential 22 minutes 18 seconds saving for buses that travel along the entire section of bus lane provided in the AM northbound direction. In the design year Do Nothing scenario, buses would travel at an average speed of 22 km/h. Following the introduction of the bus lane included in all schemes, buses could then travel at an average speed of 74 km/h.
- In the PM southbound direction, implementing all sub-schemes achieves a potential 13 minutes 12 seconds savings for buses that travel along the entire section of bus lane provided. In the design year Do-Minimum scenario, buses would travel at an average speed over 32 km/h. Following the introduction of the bus lane included in Sub-Scheme B, buses could then travel at a maximum capped safe speed of 71 km/h.
- The AM network performance statistics reveal that the Do-Something scenario greatly improves traffic efficiency over the Do-Minimum scenario. Key enhancements include a 68% reduction in delay time per kilometre, a 51% decrease in vehicle density, and a 92% reduction in the average queue length, supposing less congestion. Average speed increases by 39%, and network flow rises by 7%, allowing more vehicles to travel efficiently. Although total distance travelled increases by 13% due to new access road to the R117, total travel time decreases by 40%, showcasing the scheme's effectiveness.
- Similar improvements are observed in the PM peak, with all indicators showing positive changes except for a slight increase in total distance travelled, linked to the new road layout.

Appendix A

Reference Case Schemes

1. REFERENCE CASE: GDA STRATEGY / NDP

1.1.1 A number of transport proposals for the Study Area (largely outlined within the GDA Strategy and National Development Plan) have the potential to have a significant impact on proposals for the N11/M11 Bus Priority Scheme scheme. In particular these include Bus Connects, MetroLink, M50 Multi-Point Tolling and M11 Tolling.

1.1.2 The National Transport Authorities' "Reference Case" ERM model runs currently include all of the GDA strategy Schemes for 2042. Furthermore, the interim year reference case of 2028 includes all of the schemes from the GDA strategy anticipated to be in place by 2028.

1.1.3 Given the impact these proposals are likely to have on the projected demand along the N11/M11 corridor, and the statutory basis of the GDA strategy, it is proposed that these schemes be considered for inclusion in all tests carried out during Phase 2 of the N11/M11 Bus Priority Scheme project.

1.1.4 In effect, these schemes would then form a Reference Case scenario, against which all project scheme options will be assessed. This Reference Case scenario will reflect the projected roll-out of the GDA Strategy up to 2027 and 2042 as defined in the National Development Plan (NDP). The following sections outline the schemes assumed to be in place for the opening and design years, based on a review of the NTA's reference case modelling assumptions.

Opening Year (2027)

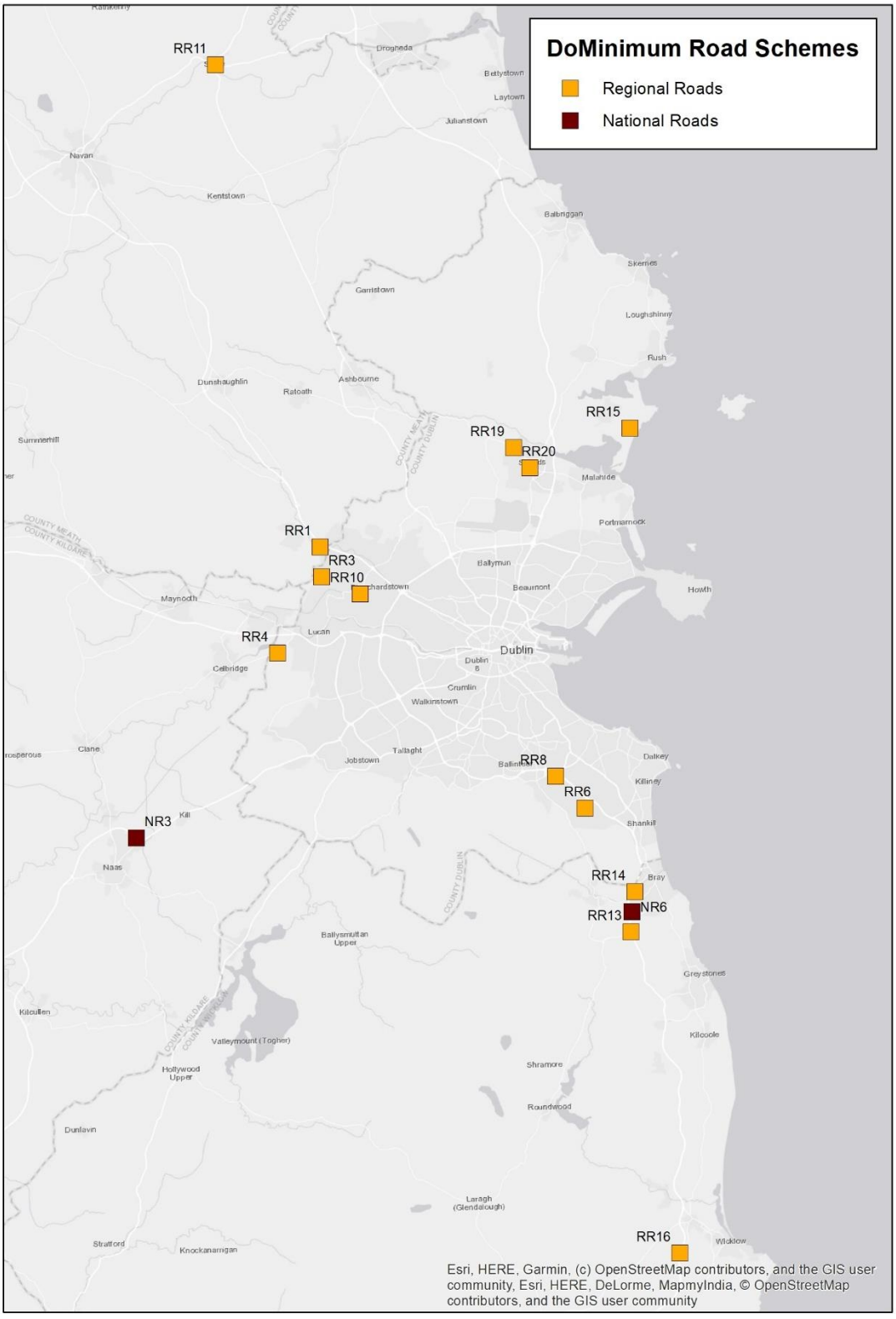
1.1.5 All GDA strategy schemes assumed to be in place in the Opening Year (2027) assessment are outlined below.

Road Schemes

1.1.6 From a review of GDA Strategy models, Proposed Road Schemes included in the 2027 reference case include the following:

- BRT 1 to 3 (see PT schemes coding for more details)
- CBC 2 to 10 (see PT schemes coding for more details)
- RR 1: N3 Castaheany Interchange
- RR 3: N3-N4: Barnhill to Leixlip Interchange
- RR 4: North-South Road – west of Adamstown SDZ linking N7 to N4 and on to Fingal
- RR 6: Glenamuck Distributor Road
- RR 8: Leopardstown Link Road Phase 2
- RR 10: Porterstown Distributor Link Road
- RR 11: Slane bypass
- RR 15: R126 Donabate Relief Road: R132 to Portrane Demesne
- RR 19: Oldtown – Mooretown Western Distributor Link Road
- RR 20: Swords Relief Road at Lord Mayors
- NR 3: Widening of the M7 between Junction 9 (Naas North) and Junction 11 (M7/M9)

Figure 1. 2027 Reference Case Road Schemes



Public Transport schemes

1.1.7 Details on additional Public Transport schemes anticipated for implementation up to 2027 as part of the GDA Strategy are provided in this section.

Heavy Rail schemes

HR1: Phoenix Park Tunnel

1.1.8 The reopening of the Phoenix Park Tunnel to passengers in November 2016 is included in the PT coding. Two different services are coded:

- Kildare – Grand Canal Dock & Vice versa
- Newbridge – Grand Canal Dock & Vice versa

1.1.9 2 trains per hour in the peak time (AM & PM) and 1 train per hour in the interpeak (LT & SR). Capacities coded are the same as on the Portlaoise service: 380 Seating capacity and 680 Crush capacity.

HR3: City Centre Re-signalling - DART Frequency of 5 Minutes

1.1.10 Same services coded as in Base Year 2012. Frequencies increased to meet to the 5min headway limit on the Connolly-Dún Laoghaire section at peak time (AM, PM) and 10min interpeak (LT, SR).

HR6: Additional Rail Station (Pelletstown)

1.1.11 Introduction of a new Rail station (N=99414) between Ashtown and Broomsbridge on the Dublin-Sligo line. Footbridge to provide access from the North side of the canal. Walk links added for access to the station from both sides of the canal. All services Maynooth-Dublin and M3 Parkway - Dublin to stop at Pelletstown. Journey Times increased by 1min. Same services as Base Year 2012.

HR8: Electrification to Drogheda-Malahide on the Northern line

1.1.12 Electrification of the rail tracks between Malahide and Drogheda. All current DART services from/to Malahide to be extended to Drogheda. Journey Times assumed to be the same as the current commuter diesel train journey times. Services coded on Drogheda-Malahide section are

- Drogheda – Bray: 2 per hour (AM & PM) / 1 per hour (LT &SR)
- Drogheda – Greystones: 2 per hour (AM & PM) / 1 per hour (LT &SR)
- Dundalk – Pearse: 2 per hour (AM & PM) / 1 per hour (LT &SR)
- Belfast – Connolly: 1 per hour

Light Rail schemes

LR2: Luas Green Line Capacity Enhancement

1.1.13 Luas capacity increased on the Green Line: 96 seating / 380 crush (55m tram sets) VS. 68 /319 in Base Year 2012 (45m tram sets)

LR4: Luas Cross City

- Extension of the Luas Green line to Broomsbridge. Service patterns:
- Sandyford – Parnell St. Headways: 5.5min (AM&PM) – 12min (LT&SR)
- Bride's Glen – Broomsbridge Headways: 6min (AM&PM) – 12min (LT&SR)
- Capacity (per tram): 96 seating / 380 crush

Core Bus Corridors (CBC)

1.1.14 A total of nine Core Bus Corridors have been coded in the road network following the Regional Model Saturn coding guide. Drawings of the routes and junction layouts were

provided by the NTA. No modifications to the 2012 Bus services (except local rerouting to take account of road network modifications). No extra bus services have been added. CBCs included are:

- CBC 2: Ballymun - From the Ikea in Ballymun to the Liffey at Church Street via Mobhi Road / Phibsborough.
- CBC 3: Finglas - From the Tyrrelstown North of Finglas to Phibsborough to tie in to the Ballymun CBC.
- CBC 4: Lucan - From the N4 East of Leixlip to Quays at Fr Matthew Bridge.
- CBC 5: Ballyfermot - From Fonthill Rd at Liffey Valley Centre to Christchurch.
- CBC 6: Clondalkin - From Clondalkin (Fonthill Road) to Christchurch.
- CBC 7: Greenhills - From the Square Tallaght to Christchurch via Walkinstown.
- CBC 8: Rathfarnham - From Rathfarnham (Grange Road Stone Mason's Way Junction) to Christchurch.
- CBC 9: Bray - From Bray (Killarney Road Church Road Junction) to UCD.
- CBC 10: Dún Laoghaire - From Dún Laoghaire to Merrion Square.

Core Orbital Buses (COB*)*

1.1.15 Six orbital services have been included in the strategy. Routes have been provided by the NTA. Same characteristics have been defined for all of them: 10min headway (in all time periods) and standard double-decker bus capacities (74 seating / 88 crush). Orbital services coded are:

- COB 1: Dún Laoghaire – Dundrum
- COB 2: Dundrum / UCD – Tallaght
- COB 3: Dundrum – Finglas
- COB 4: Ranelagh – Drumcondra
- COB 5: Tallaght – Blanchardstown
- COB 6: Blanchardstown – Kilbarrack

Bus Rapid Transit

1.1.16 Three Bus Rapid Transits coded in the strategy. Same characteristics have been defined for all of them:

- Bus capacities: 71 seating / 90 crush
- Dublin Bus Fare system applied
- In-Vehicle time factor: 1.00 (same as Luas sub mode, Dublin Bus: 1.50)
- Runtime factor (same as regional buses):
  - AM: 1.11 (Dublin Bus: 1.14)
  - LT: 1.14 (Dublin Bus: 1.20)
  - SR: 1.18 (Dublin Bus: 1.27)
  - PM: 1.12 (Dublin Bus: 1.22)
- Boarding penalty: 10min (same as other sub modes)

1.1.17 BRTs and frequencies coded are:

- BRT 1: UCD to Little Pace (Blanchardstown) - 3min (AM & PM) / 6min (LT & SR)
- BRT 2: Clongriffin to Rathfarnham - 3min (AM & PM) / 6min (LT & SR)
- BRT 3A: City Centre to Airport – 8min (AM & PM) / 12min (LT & SR)
- BRT 3B: City Centre to Swords (doesn't go through the airport) – 4min (AM & PM) / 8min (LT & SR)

Bus Connects

1.1.18 In addition to the above PT schemes, which are outlined in the GDA strategy, it is also proposed to include Bus Connects in the reference case models. Bus Connects is a major investment programme to improve public transport in Dublin. It aims to overhaul the current bus system in Dublin through a programme of integrated actions to deliver a more efficient, reliable and better bus system for more people.

1.1.19 It is proposed to use existing ERM coding of the Bus Connects services when carrying out NTA reference Case Scenario runs.

Design Year (2042)

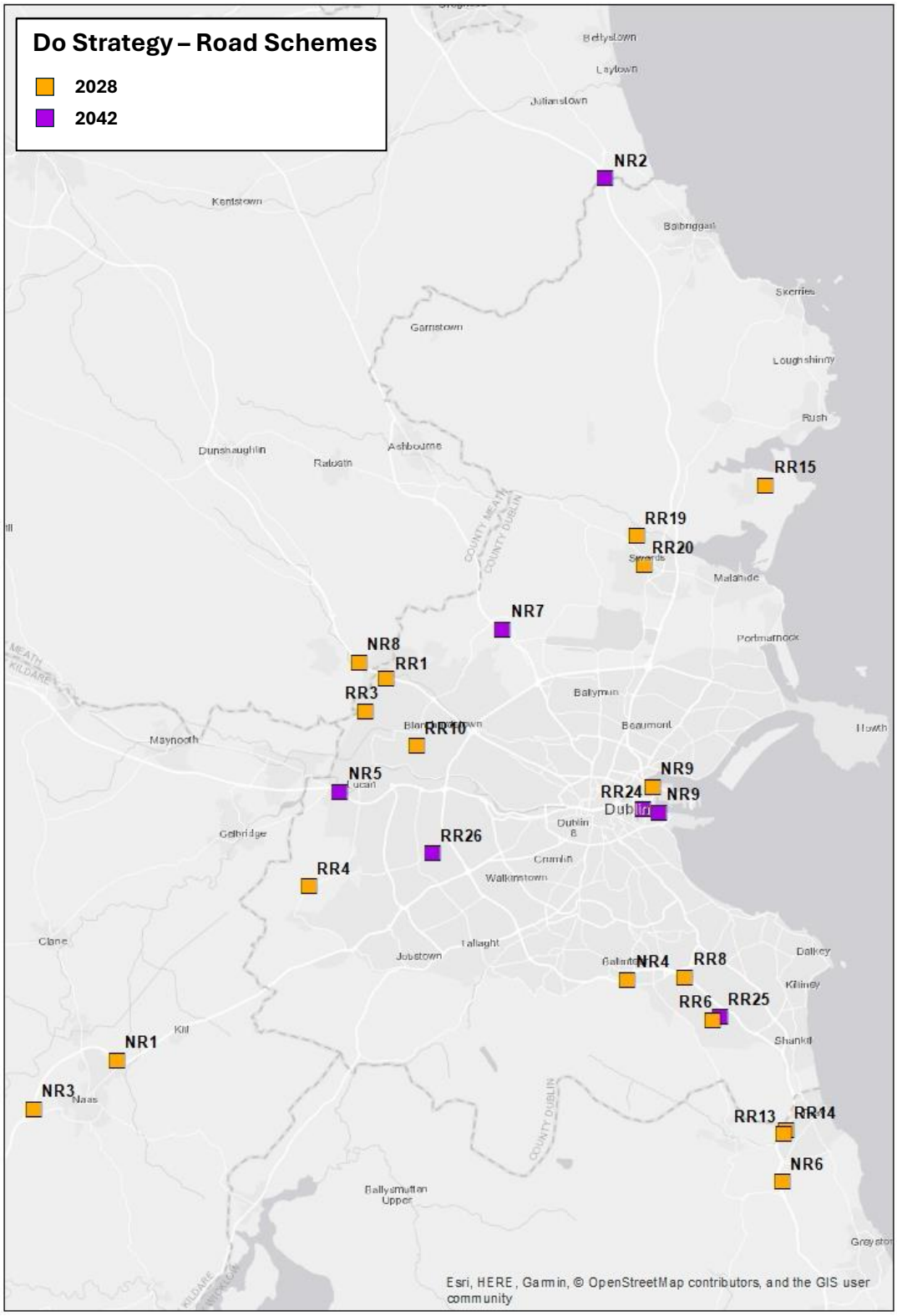
1.1.20 All GDA strategy schemes assumed to be in place in the Design Year (2042) assessment are outlined below.

Road Schemes

1.1.21 From a review of GDA Strategy models, Proposed Road Schemes, which are scheduled to occur after 2028 and are included in the 2042 reference case include the following:

- CBC 1 (see PT schemes coding for more details)
- RR24: Poolbeg development network modifications
- RR25: Cherrywood development network modifications
- RR26: Clonburris development network modifications
- NR 1: Widening of the N7 to 3 lanes between junction with the M50 and the M7. No junctions were rationalised or re-configured due to lack of information at the time the scheme was coded. This was based on the previous GDA Strategy coding.
- NR 2: Widening of the 2-lane section of the M1 to 3 lanes between Drogheda and junction with the M50, in both direction. No junctions were rationalised or re-configured due to lack of information at the time the scheme was coded. This was based on the previous GDA Strategy coding.
- NR 4: Widening of the M50 to three lanes in each direction between Junction 14 (Sandyford) and Junction 17 (M11). No junctions were rationalised or re-configured due to lack of information at the time the scheme was coded. This scheme overlaps with NR 6 (2028) at junction 14 (M50/N11).
- NR 5: Reconfiguration of the N4 from its junction with the M50 to Leixlip to rationalise accesses and to provide additional capacity at the Quarryvale junction
- NR 7: Enhancements of the N2/M2 national route inclusive of a bypass of Slane, to provide for additional capacity on the non-motorway sections of this route, and to address safety issues in Slane village associated with, in particular, heavy goods vehicles
- NR 8: Widening of the N3 between Junction1 (M50) and Junction 4 (Clonee), plus related junction and necessary changes to the existing national road network
- NR 9: Development of a road link connecting from the southern end of the Dublin Port Tunnel to the South Port area, which will serve the South Port and adjoining development areas, intended primarily for goods access and remove goods vehicle from East-Link (Thomas Clarke) bridge.
- DM 1: Multi point tolling on the M50. Same values coded as in previous 2042 Strategy coding
- DM 2: National Traffic Management Strategy. Same values coded as in previous 2042 Strategy coding.

Figure 2. 2042 Reference Case Road schemes



Public Transport schemes

1.1.22 Details on additional Public Transport schemes anticipated for implementation between 2027 and 2042, as part of the GDA Strategy, are provided below.

Heavy Rail schemes

HR4: DART Expansion programme

1.1.23 The DART Expansion programme is a comprehensive scheme for all heavy rail commuter lines in the Greater Dublin Area, including electrifications to Drogheda, Maynooth and Hazelhatch. Services coded have been imported from the full DART expansion configuration (NTA project ER058). Modifications from the 2028 Strategy coding are:

- Hazelhatch – Clongriffin (DART Underground)
  - Headways: 7.5 min (AM & PM) – 12 min (LT & SR)
  - Capacities: 512 seating / 1,382 crush
- Hazelhatch – Drogheda (DART Underground)
  - Headways: 7.5 min (AM & PM) – 12 min (LT & SR)
  - Capacities: 512 seating / 1,382 crush
- Maynooth – Bray
  - Headways: 5 min (AM & PM) – 7.5 min (LT & SR)
  - Capacities: 512 seating / 1,382 crush
- Maynooth – Greystones
  - Headways: 30 min (AM & PM) – 60 min (LT & SR)
  - Capacities: 512 seating / 1,382 crush
- Shuttle service Drogheda – Dundalk
  - Headways: 30 min (AM & PM) – 60 min (LT & SR)
  - Capacities: 370 seating / 1,321 crush
- Shuttle service Howth – Howth Junction
  - Headways: 10 min (AM & PM) – 20 min (LT & SR)
  - Capacities: 256 seating / 691 crush
- Shuttle service M3 Parkway – Clonsilla
  - Headways: 15 min (AM & PM) – 30 min (LT & SR)
  - Capacities: 185 seating / 660 crush

Light Rail schemes

LR1: Metro North

1.1.24 Metro Line linking Swords to Dublin city Centre via Dublin Airport. Route, stations location, journey times, frequencies and capacities based on the 2010 RPA Metro North study (LR7):

- 33min Swords (Estuary) to St. Stephen's Green end-to-end journey times
- 3min (AM & PM) / 6min (LT & SR)
- Capacity (per metro): 125 seating / 500 crush

LR3 / LR6: Metro Extension to Bray

1.1.25 Metro Line (as LR1) extension to Bray, using existing Luas Green line and a new built section between Bride's Glen and Bray. Main characteristics are:

- The total end-to-end Journey Times is approximately 87 minutes from Estuary to Bray
- 2min frequency for all time periods

- Capacity (per metro): 120 seating / 470 crush
- In-Vehicle Time Factor: 1.00 (same as Luas mode)
- Boarding penalties: 10min (same as all other sub modes)
- Luas Green line shortened to Charlemont – Charlestown (see LR5)

LR5: Luas Extension to Finglas

1.1.26 Extension of the existing Luas Green line North to Charlestown. Service pattern affected by LR6 (Metro Extension to Bray) as Charlemont-Bride's Glen section used for Metro services Swords-Bray.

- Charlemont – Charlestown services
- 38min end-to-end journey times
- 6min (AM & PM) / 12min (LT & SR)
- Capacity (per Luas): 96 seating / 380 crush

LR7: Lucan Luas

1.1.27 New built Luas line between Lucan and College Green. Main characteristics are:

- 42min end-to-end journey times
- 4min frequency for all time periods
- Capacity (per Luas): 72 seating / 292 crush

LR8: Luas Extension to Poolbeg

1.1.28 Extension of the existing Luas Red line East to Poolbeg. Main characteristics are:

- Tallaght – Poolbeg services
- 58min end-to-end journey times
- 6min (AM & PM) / 10min (LT & SR)
- Capacity (per Luas): 72 seating / 292 crush
- New Light Rail & Active Modes bridge crossing beside East-Link (Thomas Clarke) bridge.

<u>Core Bus Corridors (CBC)</u>

1.1.29 A total of ten Core Bus Corridors have been coded in the road network following the Regional Model Saturn coding guide. Drawings of the routes and junction layouts were provided by the NTA. No modifications to the 2012 Bus services (except local rerouting to take account of road network modifications). No extra bus services have been added. CBCs included are:

- CBC 1: Clontarf to Ringsend
- CBC 2: Ballymun - From the Ikea in Ballymun to the Liffey at Church Street via Mobhi Road / Phibsborough.
- CBC 3: Finglas - From the Tyrrelstown North of Finglas to Phibsborough to tie in to the Ballymun CBC.
- CBC 4: Lucan - From the N4 East of Leixlip to Quays at Fr Matthew Bridge.
- CBC 5: Ballyfermot - From Fonthill Rd at Liffey Valley Centre to Christchurch.
- CBC 6: Clondalkin - From Clondalkin (Fonthill Road) to Christchurch.
- CBC 7: Greenhills - From the Square Tallaght to Christchurch via Walkinstown.
- CBC 8: Rathfarnham - From Rathfarnham (Grange Road Stone Mason's Way Junction) to Christchurch.
- CBC 9: Bray - From Bray (Killarney Road Church Road Junction) to UCD.
- CBC 10: Dún Laoghaire - From Dún Laoghaire to Merrion Square.

Appendix B

Calibration & Validation Counts (LAM)

Appendix B

Calibration and Validation Counts - LAM

AM PEAK

Site	Road Name	CalVal	Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
			LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
A1	M11 (North)	Val	705	189	893	775	58	834	71	-130	-60	10%	-69%	-7%	2.6	11.7	2.0	✓ 1	● 0	✓ 1
A1	M11 (North)	Val	1301	322	1623	1476	82	1557	175	-240	-65	13%	-75%	-4%	4.7	16.9	1.6	✓ 1	● 0	✓ 1
A10	M11 NB off-ramp - Junction 6	Val	402	126	528	416	78	461	14	-48	-67	4%	-38%	-13%	0.7	4.8	3.0	✓ 1	✓ 1	✓ 1
A11	N11 x R117 - Junction 6A	Val	188	57	245	218	27	225	30	-30	-20	16%	-53%	-8%	2.1	4.7	1.3	✓ 1	✓ 1	✓ 1
A11	N11 x R117 - Junction 6A	Val	161	51	212	169	22	183	8	-29	-29	5%	-57%	-14%	0.6	4.8	2.1	✓ 1	✓ 1	✓ 1
A12	N11 x Herbert Road - Junction 6A	Val	318	56	373	363	25	366	45	-31	-7	14%	-55%	-2%	2.4	4.9	0.3	✓ 1	✓ 1	✓ 1
A12	N11 x Herbert Road - Junction 6A	Val	200	16	216	223	2	225	23	-14	10	12%	-85%	4%	1.6	4.5	0.6	✓ 1	✓ 1	✓ 1
A13	N11 NB on-ramp - Junction 7	Val	1115	212	1327	1205	59	1265	90	-152	-62	8%	-72%	-5%	2.6	13.1	1.7	✓ 1	● 0	✓ 1
A14	N11 NB off-ramp - Junction 7	Val	189	53	242	344	23	364	155	-31	122	82%	-58%	51%	9.5	5.0	7.0	● 0	✓ 1	● 0
A18	R761 - Rathdown Upper (Bray)	Val	586	101	686	635	14	649	49	-87	-38	8%	-86%	-5%	2.0	11.4	1.5	✓ 1	✓ 1	✓ 1
A18	R761 - Rathdown Upper (Bray)	Val	311	82	393	346	44	382	36	-38	-11	12%	-46%	-3%	2.0	4.8	0.6	✓ 1	✓ 1	✓ 1
A18	N11 after Junction 7	Val	2539	900	3439	3142	254	3396	603	-646	-43	24%	-72%	-1%	11.3	26.9	0.7	● 0	● 0	✓ 1
A2	Dublin Road - near M11 Junction 5	Val	307	112	419	347	22	369	41	-90	-49	13%	-81%	-12%	2.3	11.1	2.5	✓ 1	✓ 1	✓ 1
A2	Dublin Road - near M11 Junction 5	Val	379	91	470	437	14	450	58	-78	-20	15%	-85%	-4%	2.9	10.7	0.9	✓ 1	✓ 1	✓ 1
A20	R761 between to R774 and Kilcoole	Val	477	129	606	482	21	503	4	-107	-103	1%	-83%	-17%	0.2	12.4	4.4	✓ 1	● 0	● 0
A20	R761 between to R774 and Kilcoole	Val	398	88	486	419	48	455	21	-41	-31	5%	-46%	-6%	1.0	5.0	1.4	✓ 1	✓ 1	✓ 1
A20	R755 - N11 Junction 8	Val	289	76	365	98	12	110	-191	-65	-255	-66%	-84%	-70%	13.7	9.7	16.5	● 0	✓ 1	● 0
A21	Kilpedder East - between N11 junctions 11 and 12	Cal	56	42	98	49	0	49	-6	-42	-49	-11%	-99%	-50%	0.9	9.1	5.7	✓ 1	✓ 1	✓ 1
A21	R755 - N11 Junction 8	Cal	99	44	143	107	44	151	8	0	8	8%	1%	6%	0.8	0.0	0.7	✓ 1	✓ 1	✓ 1
A22	Kilpedder West - between N11 junctions 11 and 12	Cal	27	11	38	6	0	6	-21	-11	-32	-79%	-98%	-85%	5.3	4.5	6.8	✓ 1	✓ 1	✓ 1
A22	Kilpedder West - between N11 junctions 11 and 12	Cal	18	3	21	18	0	18	1	-3	-2	4%	-98%	-12%	0.2	2.5	0.6	✓ 1	✓ 1	✓ 1
A26	R772 - N11 NB off-ramp (Timmore)	Cal	223	69	291	223	14	237	1	-55	-54	0%	-79%	-19%	0.0	8.5	3.3	✓ 1	✓ 1	✓ 1
A3	M11 NB on-ramp - Junction 5	Cal	563	96	659	548	39	587	-15	-57	-72	-3%	-59%	-11%	0.6	7.0	2.9	✓ 1	✓ 1	✓ 1
A4	M11 SB off-ramp - Junction 5	Val	369	126	494	396	79	445	27	-46	-49	7%	-37%	-10%	1.4	4.6	2.3	✓ 1	✓ 1	✓ 1
A5	M11 SB on-ramp - Junction 5	Cal	188	50	238	249	28	277	61	-22	39	33%	-45%	16%	4.1	3.6	2.4	✓ 1	✓ 1	✓ 1
A6	M11 NB off-ramp - Junction 5	Val	266	40	306	274	21	296	8	-19	-11	3%	-47%	-3%	0.5	3.4	0.6	✓ 1	✓ 1	✓ 1
A7	M11 SB off-ramp - Junction 6	Val	139	51	190	134	22	136	-5	-29	-54	-4%	-57%	-29%	0.4	4.8	4.2	✓ 1	✓ 1	✓ 1
A8	M11 SB on-ramp - Junction 6	Val	358	74	432	366	38	399	8	-36	-33	2%	-49%	-8%	0.4	4.9	1.6	✓ 1	✓ 1	✓ 1
A9	M11 NB on-ramp - Junction 6	Val	194	57	251	189	35	224	-4	-23	-27	-2%	-40%	-11%	0.3	3.3	1.7	✓ 1	✓ 1	✓ 1
D37-38	N11 Junction 11 - West Side Roundabout	Val	217	61	278	208	57	265	-9	-4	-12	-4%	-6%	-4%	0.6	0.5	0.8	✓ 1	✓ 1	✓ 1
D37-38	N11 Junction 11 - West Side Roundabout	Val	257	16	273	257	11	268	0	-5	-5	0%	-32%	-2%	0.0	1.4	0.3	✓ 1	✓ 1	✓ 1
J1	Roundabout - M11/Dublin Road (R837)	Cal	1102	62	1164	1072	66	1138	-30	4	-26	-3%	7%	-2%	0.9	0.5	0.8	✓ 1	✓ 1	✓ 1
J1	Roundabout - M11/Dublin Road (R837)	Cal	441	22	463	435	20	454	-6	-2	-8	-1%	-9%	-2%	0.3	0.4	0.4	✓ 1	✓ 1	✓ 1
J1	Roundabout - M11/Dublin Road (R837)	Cal	107	2	109	105	1	105	-2	-1	-4	-2%	-61%	-3%	0.2	1.0	0.3	✓ 1	✓ 1	✓ 1
J1	Roundabout - M11/Dublin Road (R837)	Cal	1943	95	2038	1901	95	1996	-42	1	-41	-2%	1%	-2%	1.0	0.1	0.9	✓ 1	✓ 1	✓ 1
J1	Roundabout - M11/Dublin Road (R837)	Cal	293	16	309	287	15	303	-6	-1	-7	-2%	-6%	-2%	0.3	0.2	0.4	✓ 1	✓ 1	✓ 1
J1	Roundabout - M11/Dublin Road (R837)	Cal	147	2	149	113	0	113	-34	-2	-36	-23%	-97%	-24%	3.0	1.9	3.1	✓ 1	✓ 1	✓ 1
J10	N11 - R117	Cal	3	0	3	0	0	0	-3	0	-3	-100%	-	-100%	2.4	-	2.4	✓ 1	✓ 1	✓ 1
J10	N11 - R117	Cal	2042	320	2362	1952	317	2269	-90	-3	-93	-4%	-1%	-4%	2.0	0.2	1.9	✓ 1	✓ 1	✓ 1
J10	N11 - R117	Cal	4	0	4	0	0	0	-4	0	-4	-100%	-	-100%	2.8	-	2.8	✓ 1	✓ 1	✓ 1
J10	N11 - R117	Cal	3990	312	4302	3786	287	4072	-204	-25	-230	-5%	-8%	-5%	3.3	1.5	3.5	✓ 1	✓ 1	✓ 1
J10	N11 - R117	Cal	191	34	225	218	7	225	27	-27	0	14%	-80%	0%	1.9	6.0	0.0	✓ 1	✓ 1	✓ 1
J10	N11 - R117	Cal	170	26	196	169	14	183	-1	-12	-13	-1%	-46%	-7%	0.1	2.7	1.0	✓ 1	✓ 1	✓ 1
J11	N11- Herbert Rd	Cal	361	2	363	363	4	366	2	2	4	0%	99%	1%	0.1	1.1	0.2	✓ 1	✓ 1	✓ 1
J11	N11- Herbert Rd	Cal	1656	327	1983	1590	313	1903	-66	-14	-80	-4%	-4%	-4%	1.7	0.8	1.8	✓ 1	✓ 1	✓ 1
J11	N11- Herbert Rd	Cal	228	0	228	223	2	225	-5	2	-3	-2%	-	-1%	0.4	2.2	0.2	✓ 1	✓ 1	✓ 1
J12	Herbert Rd/Kilbride Ln	Cal	44	8	52	44	5	49	0	-3	-3	0%	-38%	-6%	0.0	1.2	0.4	✓ 1	✓ 1	✓ 1
J12	Herbert Rd/Kilbride Ln	Cal	140	0	140	118	1	119	-22	1	-21	-16%	-	-15%	1.9	1.4	1.8	✓ 1	✓ 1	✓ 1
J12	Herbert Rd/Kilbride Ln	Cal	88	3	91	89	3	92	1	0	1	1%	4%	1%	0.1	0.1	0.1	✓ 1	✓ 1	✓ 1
J12	Herbert Rd/Kilbride Ln	Cal	66	0	66	62	1	62	-4	1	-4	-6%	-	-5%	0.5	1.1	0.5	✓ 1	✓ 1	✓ 1
J12	Herbert Rd/Kilbride Ln	Cal	301	0	301	307	1	308	6	1	7	2%	-	2%	0.3	1.0	0.4	✓ 1	✓ 1	✓ 1
J12	Herbert Rd/Kilbride Ln	Cal	138	0	138	135	3	139	-3	3	1	-2%	-	1%	0.2	2.6	0.1	✓ 1	✓ 1	✓ 1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	354	13	367	355	10	365	1	-3	-2	0%	-25%	-1%	0.1	1.0	0.1	✓ 1	✓ 1	✓ 1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	10	2	12	10	0	10	0	-2	-2	1%	-96%	-15%	0.0	1.8	0.5	✓ 1	✓ 1	✓ 1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	113	2	115	132	16	148	19	14	33	17%	738%	29%	1.7	4.7	2.9	✓ 1	✓ 1	✓ 1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	293	18	311	275	4	278	-18	-14	-33	-6%	-79%	-11%	1.1	4.3	1.9	✓ 1	✓ 1	✓ 1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	202	24	226	203	16	218	1	-8	-8	0%	-35%	-3%	0.0	1.9	0.5	✓ 1	✓ 1	✓ 1

AM PEAK

Site	Road Name	CalVal	Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
			LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	230	11	241	234	8	241	4	-3	1	2%	-26%	0%	0.2	0.9	0.1	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	13	0	13	21	2	24	8	2	11	64%	-	81%	2.0	2.1	2.5	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	187	10	197	181	8	189	-6	-1	-7	-3%	-13%	-4%	0.4	0.4	0.5	1	1	1
J14	N11 Junction 7 - West Side Roundabout	Cal	1226	86	1312	1211	60	1271	-15	-26	-42	-1%	-31%	-3%	0.4	3.1	1.2	1	1	1
J14	N11 Junction 7 - West Side Roundabout	Cal	101	10	111	94	10	104	-7	1	-6	-7%	8%	-6%	0.7	0.2	0.6	1	1	1
J14	N11 Junction 7 - West Side Roundabout	Cal	383	27	410	401	28	428	18	1	19	5%	4%	5%	0.9	0.2	0.9	1	1	1
J14	N11 Junction 7 - West Side Roundabout	Cal	42	4	46	42	4	46	0	0	0	1%	2%	1%	0.0	0.0	0.0	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	12	0	12	9	0	9	-3	0	-3	-28%	-	-26%	1.0	0.6	1.0	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	376	27	403	392	27	419	16	1	17	4%	3%	4%	0.8	0.1	0.8	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	124	5	129	114	5	119	-10	0	-10	-8%	5%	-8%	0.9	0.1	0.9	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	1112	80	1192	1097	55	1152	-15	-25	-40	-1%	-31%	-3%	0.5	3.0	1.2	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	42	0	42	39	0	39	-3	0	-3	-7%	-	-7%	0.5	0.4	0.5	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	67	0	67	68	0	68	1	0	1	2%	-	2%	0.1	0.6	0.2	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	576	54	630	582	55	637	6	1	8	1%	3%	1%	0.3	0.2	0.3	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	199	26	225	194	18	212	-5	-8	-13	-3%	-31%	-6%	0.4	1.7	0.9	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	420	27	447	431	27	458	11	1	12	3%	3%	3%	0.5	0.2	0.5	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	663	37	700	639	19	658	-24	-18	-42	-4%	-49%	-6%	0.9	3.4	1.6	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	468	58	526	460	47	506	-8	-11	-19	-2%	-19%	-4%	0.4	1.5	0.9	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	1199	78	1277	1165	55	1220	-34	-23	-57	-3%	-29%	-4%	1.0	2.8	1.6	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	316	30	346	321	31	352	5	2	7	2%	5%	2%	0.3	0.3	0.3	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	413	42	455	432	44	476	19	2	21	5%	5%	5%	0.9	0.3	1.0	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	210	6	216	222	2	224	12	-4	8	6%	-70%	4%	0.8	2.1	0.6	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	126	2	128	128	0	128	2	-2	0	2%	-100%	0%	0.2	1.9	0.0	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	154	2	156	154	0	154	0	-2	-2	0%	-94%	-1%	0.0	1.8	0.1	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	389	6	395	388	14	402	-1	8	7	0%	139%	2%	0.0	2.6	0.4	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	146	0	146	146	0	146	0	0	0	0%	-	0%	0.0	-	0.0	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	322	12	334	327	12	339	5	0	5	1%	-2%	1%	0.3	0.1	0.2	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	434	16	450	437	15	453	3	-1	2	1%	-6%	1%	0.2	0.3	0.1	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	211	0	211	213	0	213	2	0	2	1%	-	1%	0.1	-	0.1	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	398	7	405	395	14	409	-3	8	4	-1%	113%	1%	0.2	2.3	0.2	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	140	12	152	136	0	136	-4	-12	-16	-3%	-96%	-11%	0.4	4.7	1.4	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	152	4	156	152	0	152	0	-4	-4	0%	-100%	-2%	0.0	2.8	0.3	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	115	8	123	115	7	122	0	-1	-1	0%	-14%	-1%	0.0	0.4	0.1	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	360	18	378	350	6	357	-10	-12	-22	-3%	-66%	-6%	0.5	3.4	1.1	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	262	4	266	285	11	297	23	8	31	9%	199%	12%	1.4	2.8	1.8	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	432	13	445	419	5	423	-13	-9	-22	-3%	-66%	-5%	0.6	3.0	1.1	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	241	15	256	240	4	243	-1	-12	-13	-1%	-77%	-5%	0.1	3.8	0.8	1	1	1
J2	M11 Junction 5 - Dublin Rd Roudabout	Cal	513	47	560	533	45	578	20	-2	18	4%	-4%	3%	0.9	0.3	0.8	1	1	1
J2	M11 Junction 5 - Dublin Rd Roudabout	Cal	886	42	928	933	74	1007	47	32	79	5%	76%	9%	1.6	4.2	2.5	1	1	1
J2	M11 Junction 5 - Dublin Rd Roudabout	Cal	403	13	416	394	15	409	-9	2	-8	-2%	11%	-2%	0.5	0.4	0.4	1	1	1
J2	M11 Junction 5 - Dublin Rd Roudabout	Cal	382	28	410	392	26	419	10	-1	9	3%	-4%	2%	0.5	0.2	0.4	1	1	1
J2	M11 Junction 5 - Dublin Rd Roudabout	Cal	779	37	816	797	67	864	18	29	48	2%	78%	6%	0.7	4.0	1.6	1	1	1
J20	N11- Jameson's Corner	Cal	52	2	54	52	2	54	0	0	0	0%	5%	0%	0.0	0.1	0.0	1	1	1
J20	N11- Jameson's Corner	Cal	4	3	7	0	0	0	-4	-3	-7	-100%	-100%	-100%	2.8	2.4	3.7	1	1	1
J20	N11- Jameson's Corner	Cal	30	4	34	30	4	34	0	0	0	-1%	6%	0%	0.1	0.1	0.0	1	1	1
J20	N11- Jameson's Corner	Cal	7	0	7	7	1	8	0	1	1	0%	-	9%	0.0	1.1	0.2	1	1	1
J21	N11 Junction 8 - West Side Roundabout	Cal	44	2	46	42	27	69	-2	25	23	-5%	1305%	49%	0.3	6.6	3.0	1	1	1
J21	N11 Junction 8 - West Side Roundabout	Cal	561	26	587	465	8	473	-96	-18	-114	-17%	-69%	-19%	4.2	4.4	4.9	1	1	0
J21	N11 Junction 8 - West Side Roundabout	Cal	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	208	13	221	211	14	224	3	0	3	1%	1%	1%	0.2	0.1	0.2	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	54	4	58	51	4	55	-3	0	-2	-5%	12%	-4%	0.4	0.2	0.3	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	87	0	87	83	4	87	-4	4	0	-5%	-	0%	0.4	2.7	0.0	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	19	0	19	19	0	19	0	0	0	0%	-	0%	0.0	0.2	0.0	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	55	4	59	52	4	57	-3	1	-2	-5%	13%	-4%	0.4	0.2	0.3	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	5	0	5	0	0	0	-5	0	-5	-100%	-	-100%	3.2	-	3.2	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	6	0	6	6	0	6	0	0	0	1%	-	4%	0.0	0.6	0.1	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	304	13	317	308	17	325	4	4	7	1%	28%	2%	0.2	0.9	0.4	1	1	1

AM PEAK

Site	Road Name	CalVal	Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
			LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
J23	N11 - Quill Rd	Val	17	12	29	0	0	0	-17	-12	-29	-100%	-100%	-100%	5.8	4.8	7.5	✓ 1	✓ 1	✓ 1
J23	N11 - Quill Rd	Val	15	14	29	15	5	20	0	-10	-10	0%	-68%	-34%	0.0	3.2	2.0	✓ 1	✓ 1	✓ 1
J23	N11 - Quill Rd	Val	2738	271	3009	2713	271	2984	-25	1	-25	-1%	0%	-1%	0.5	0.0	0.5	✓ 1	✓ 1	✓ 1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	6	0	6	6	0	6	0	0	0	0%	-	1%	0.0	0.1	0.0	✓ 1	✓ 1	✓ 1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	2	0	2	0	0	0	-2	0	-2	-93%	-	-93%	1.8	-	1.8	✓ 1	✓ 1	✓ 1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	10	0	10	12	5	17	2	5	7	21%	-	68%	0.6	3.0	1.9	✓ 1	✓ 1	✓ 1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	85	15	100	39	2	41	-46	-13	-59	-54%	-85%	-59%	5.9	4.4	7.0	✓ 1	✓ 1	✓ 1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	10	0	10	5	0	5	-5	0	-5	-48%	-	-48%	1.7	-	1.7	✓ 1	✓ 1	✓ 1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	45	0	45	55	3	59	10	3	14	23%	-	30%	1.4	2.6	1.9	✓ 1	✓ 1	✓ 1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	21	0	21	25	2	27	4	2	6	21%	-	29%	0.9	1.9	1.3	✓ 1	✓ 1	✓ 1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	17	0	17	17	0	17	0	0	0	1%	-	1%	0.0	0.3	0.0	✓ 1	✓ 1	✓ 1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	45	13	58	0	0	0	-45	-13	-58	-100%	-100%	-100%	9.5	5.2	10.8	✓ 1	✓ 1	✓ 1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	28	2	30	27	1	29	-1	-1	-1	-2%	-27%	-4%	0.1	0.4	0.2	✓ 1	✓ 1	✓ 1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	40	2	42	39	2	41	-1	0	-1	-3%	23%	-2%	0.2	0.3	0.1	✓ 1	✓ 1	✓ 1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	35	0	35	35	2	37	0	2	2	0%	-	5%	0.0	1.8	0.3	✓ 1	✓ 1	✓ 1
J26	N11 Junction 9 - Ballydongh Road Y Junction	Cal	68	16	84	68	10	78	0	-7	-7	0%	-40%	-8%	0.0	1.8	0.8	✓ 1	✓ 1	✓ 1
J26	N11 Junction 9 - Ballydongh Road Y Junction	Cal	48	0	48	50	7	57	2	7	9	4%	-	18%	0.3	3.6	1.2	✓ 1	✓ 1	✓ 1
J26	N11 Junction 9 - Ballydongh Road Y Junction	Cal	1226	230	1456	1173	257	1430	-53	27	-26	-4%	12%	-2%	1.5	1.7	0.7	✓ 1	✓ 1	✓ 1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	328	19	347	328	19	347	0	0	0	0%	2%	0%	0.0	0.1	0.0	✓ 1	✓ 1	✓ 1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	159	15	174	159	15	174	0	0	0	0%	-1%	0%	0.0	0.0	0.0	✓ 1	✓ 1	✓ 1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	270	2	272	272	6	278	2	4	6	1%	219%	2%	0.1	2.1	0.4	✓ 1	✓ 1	✓ 1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	104	0	104	44	0	44	-60	0	-60	-57%	-	-57%	6.9	0.1	6.9	✓ 1	✓ 1	✓ 1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	318	5	323	292	4	296	-26	-1	-27	-8%	-13%	-8%	1.5	0.3	1.5	✓ 1	✓ 1	✓ 1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	74	6	80	73	0	73	-1	-6	-7	-2%	-100%	-9%	0.2	3.4	0.8	✓ 1	✓ 1	✓ 1
J28	N11 Junction 10 - West Side Y Junction	Cal	83	2	85	88	0	88	5	-2	3	7%	-100%	4%	0.6	1.9	0.4	✓ 1	✓ 1	✓ 1
J28	N11 Junction 10 - West Side Y Junction	Cal	363	9	372	341	0	341	-22	-9	-30	-6%	-100%	-8%	1.2	4.1	1.6	✓ 1	✓ 1	✓ 1
J29	N11 Junction 10 - Glen Road Roundabout	Cal	88	2	90	93	0	93	5	-2	4	6%	-96%	4%	0.6	1.8	0.4	✓ 1	✓ 1	✓ 1
J29	N11 Junction 10 - Glen Road Roundabout	Cal	181	6	187	181	6	187	0	1	1	0%	10%	0%	0.0	0.2	0.0	✓ 1	✓ 1	✓ 1
J29	N11 Junction 10 - Glen Road Roundabout	Cal	445	8	453	433	8	440	-12	0	-12	-3%	0%	-3%	0.6	0.0	0.6	✓ 1	✓ 1	✓ 1
J29	N11 Junction 10 - Glen Road Roundabout	Cal	15	0	15	16	0	16	1	0	1	5%	-	6%	0.2	0.4	0.2	✓ 1	✓ 1	✓ 1
J3	M11 Junction 5 - Old Connaught Ave/M11 NB Off-ramp Junction	Cal	136	16	152	142	20	162	6	3	10	5%	21%	6%	0.5	0.8	0.8	✓ 1	✓ 1	✓ 1
J3	M11 Junction 5 - Old Connaught Ave/M11 NB Off-ramp Junction	Cal	135	6	141	102	15	117	-33	9	-24	-25%	165%	-17%	3.1	2.9	2.1	✓ 1	✓ 1	✓ 1
J3	M11 Junction 5 - Old Connaught Ave/M11 NB Off-ramp Junction	Cal	215	14	229	208	15	222	-7	1	-6	-3%	8%	-3%	0.5	0.3	0.4	✓ 1	✓ 1	✓ 1
J3	M11 Junction 5 - Old Connaught Ave/M11 NB Off-ramp Junction	Cal	215	6	221	173	6	179	-42	0	-42	-20%	5%	-19%	3.0	0.1	3.0	✓ 1	✓ 1	✓ 1
J30	N11 Junction 10 - East Side Y Junction	Cal	1	2	3	0	0	0	-1	-2	-3	-100%	-100%	-100%	1.4	1.9	2.4	✓ 1	✓ 1	✓ 1
J30	N11 Junction 10 - East Side Y Junction	Cal	94	0	94	93	13	107	-1	13	13	-1%	-	14%	0.1	5.2	1.3	✓ 1	✓ 1	✓ 1
J30	N11 Junction 10 - East Side Y Junction	Cal	1055	248	1303	1026	257	1283	-29	9	-20	-3%	4%	-2%	0.9	0.6	0.6	✓ 1	✓ 1	✓ 1
J31	Glen Rd (R762)/Bellevue Court	Cal	73	0	73	73	0	73	0	0	0	0%	-	0%	0.0	0.5	0.0	✓ 1	✓ 1	✓ 1
J31	Glen Rd (R762)/Bellevue Court	Cal	14	0	14	12	2	14	-2	2	0	-15%	-	-3%	0.6	1.8	0.1	✓ 1	✓ 1	✓ 1
J31	Glen Rd (R762)/Bellevue Court	Cal	167	2	169	172	2	174	5	0	5	3%	-10%	3%	0.4	0.1	0.4	✓ 1	✓ 1	✓ 1
J31	Glen Rd (R762)/Bellevue Court	Cal	30	0	30	29	0	29	-1	0	-1	-4%	-	-4%	0.2	0.2	0.2	✓ 1	✓ 1	✓ 1
J31	Glen Rd (R762)/Bellevue Court	Cal	445	4	449	421	6	427	-24	2	-22	-5%	57%	-5%	1.2	1.0	1.0	✓ 1	✓ 1	✓ 1
J31	Glen Rd (R762)/Bellevue Court	Cal	241	8	249	246	6	252	5	-1	3	2%	-17%	1%	0.3	0.5	0.2	✓ 1	✓ 1	✓ 1
J32	R762/Priory Rd	Val	298	8	306	303	6	308	5	-2	3	2%	-27%	1%	0.3	0.8	0.2	✓ 1	✓ 1	✓ 1
J32	R762/Priory Rd	Val	16	0	16	16	1	17	0	1	1	0%	-	5%	0.0	1.3	0.2	✓ 1	✓ 1	✓ 1
J32	R762/Priory Rd	Val	556	8	564	533	7	540	-23	0	-24	-4%	-4%	-4%	1.0	0.1	1.0	✓ 1	✓ 1	✓ 1
J32	R762/Priory Rd	Val	61	0	61	53	0	53	-8	0	-8	-12%	-	-12%	1.0	0.2	1.0	✓ 1	✓ 1	✓ 1
J32	R762/Priory Rd	Val	61	0	61	61	0	61	0	0	0	-1%	-	0%	0.1	0.9	0.0	✓ 1	✓ 1	✓ 1
J32	R762/Priory Rd	Val	61	0	61	64	5	69	3	5	8	5%	-	13%	0.4	3.2	1.0	✓ 1	✓ 1	✓ 1
J33	Church Rd (R762)/Convent Rd	Cal	13	0	13	13	0	13	0	0	0	-2%	-	-2%	0.1	0.1	0.1	✓ 1	✓ 1	✓ 1
J33	Church Rd (R762)/Convent Rd	Cal	237	4	241	232	5	237	-5	1	-4	-2%	20%	-2%	0.3	0.4	0.3	✓ 1	✓ 1	✓ 1
J33	Church Rd (R762)/Convent Rd	Cal	8	0	8	8	0	8	0	0	0	1%	-	3%	0.0	0.6	0.1	✓ 1	✓ 1	✓ 1
J33	Church Rd (R762)/Convent Rd	Cal	378	4	382	354	3	356	-24	-1	-25	-6%	-27%	-7%	1.3	0.6	1.3	✓ 1	✓ 1	✓ 1
J33	Church Rd (R762)/Convent Rd	Cal	159	2	161	165	3	168	6	1	7	4%	74%	5%	0.5	0.9	0.6	✓ 1	✓ 1	✓ 1
J33	Church Rd (R762)/Convent Rd	Cal	205	6	211	202	7	209	-3	2	-1	-1%	28%	-1%	0.2	0.6	0.1	✓ 1	✓ 1	✓ 1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	245	10	255	251	10	261	6	1	7	2%	8%	3%	0.4	0.2	0.4	✓ 1	✓ 1	✓ 1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	109	0	109	108	0	108	-1	0	-1	-1%	-	-1%	0.1	0.1	0.1	✓ 1	✓ 1	✓ 1

AM PEAK

Site	Road Name	CalVal	Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
			LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	341	4	345	285	4	289	-56	0	-56	-16%	-7%	-16%	3.2	0.1	3.2	1	1	1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	470	11	481	443	4	448	-27	-7	-34	-6%	-63%	-7%	1.2	2.6	1.6	1	1	1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	86	4	90	87	0	87	1	-4	-3	1%	-100%	-3%	0.1	2.7	0.3	1	1	1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	310	8	318	311	6	317	1	-2	0	0%	-23%	0%	0.1	0.7	0.0	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	286	2	288	286	4	289	0	2	1	0%	103%	1%	0.0	1.2	0.1	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	272	12	284	277	12	289	5	0	5	2%	0%	2%	0.3	0.0	0.3	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	389	5	394	369	0	369	-20	-4	-25	-5%	-91%	-6%	1.0	2.7	1.3	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	54	2	56	55	2	56	1	0	1	2%	-15%	1%	0.1	0.2	0.1	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	406	13	419	360	7	367	-46	-6	-52	-11%	-45%	-12%	2.4	1.9	2.6	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	38	0	38	39	0	39	1	0	1	3%	-	4%	0.2	0.7	0.2	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	476	16	492	474	14	488	-2	-2	-4	0%	-12%	-1%	0.1	0.5	0.2	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	809	8	817	815	5	820	6	-3	3	1%	-34%	0%	0.2	1.0	0.1	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	309	4	313	320	4	324	11	1	11	3%	17%	4%	0.6	0.3	0.6	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	800	4	804	808	8	816	8	4	12	1%	114%	2%	0.3	1.8	0.4	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	377	14	391	386	14	401	9	0	9	2%	1%	2%	0.5	0.0	0.5	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	417	10	427	414	1	416	-3	-8	-11	-1%	-87%	-3%	0.1	3.5	0.5	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	411	19	380	373	9	382	-38	-11	1	-9%	-55%	0%	1.9	2.8	0.1	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	389	72	461	383	64	447	-6	-9	-14	-1%	-12%	-3%	0.3	1.0	0.7	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	431	24	455	429	26	454	-2	2	0	-1%	9%	0%	0.1	0.4	0.0	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	373	69	442	406	71	477	33	2	35	9%	3%	8%	1.7	0.2	1.6	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	128	15	143	126	18	144	-2	3	0	-2%	17%	0%	0.2	0.7	0.0	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	92	8	100	93	8	101	1	1	2	1%	8%	2%	0.1	0.2	0.2	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	624	54	678	619	67	686	-5	13	9	-1%	25%	1%	0.2	1.7	0.3	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	597	56	653	651	65	716	54	9	63	9%	15%	10%	2.2	1.1	2.4	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	648	85	733	637	83	720	-11	-2	-13	-2%	-2%	-2%	0.4	0.2	0.5	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	630	85	715	663	82	745	33	-3	30	5%	-4%	4%	1.3	0.4	1.1	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	20	41	61	6	1	7	-14	-40	-54	-71%	-96%	-88%	4.0	8.6	9.3	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	11	43	54	11	1	12	0	-43	-43	0%	-98%	-79%	0.0	9.1	7.4	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	332	21	353	346	21	368	14	0	15	4%	2%	4%	0.8	0.1	0.8	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	431	27	458	437	27	464	6	1	6	1%	3%	1%	0.3	0.1	0.3	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	633	22	655	627	29	656	-6	7	1	-1%	31%	0%	0.2	1.3	0.0	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	684	60	744	670	65	734	-14	4	-10	-2%	7%	-1%	0.5	0.6	0.4	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	415	14	429	377	9	386	-38	-5	-43	-9%	-34%	-10%	1.9	1.4	2.1	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	554	22	576	554	24	578	0	2	2	0%	7%	0%	0.0	0.3	0.1	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	502	41	543	497	44	541	-5	3	-2	-1%	7%	0%	0.2	0.5	0.1	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	49	0	49	50	0	50	1	0	1	1%	-	2%	0.1	0.3	0.1	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	79	0	79	79	1	80	0	1	1	0%	-	2%	0.0	1.7	0.1	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	145	0	145	141	1	142	-4	1	-3	-3%	-	-2%	0.3	1.5	0.2	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	256	19	275	240	19	259	-16	0	-16	-6%	-1%	-6%	1.0	0.0	1.0	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	93	5	98	90	1	91	-3	-4	-7	-3%	-76%	-7%	0.3	2.1	0.7	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	81	18	99	93	21	114	12	3	15	15%	15%	15%	1.3	0.6	1.5	1	1	1
J40	N11 Junction 12 - Ballyronan Road Roundabout	Cal	340	6	346	328	7	335	-12	1	-10	-3%	20%	-3%	0.6	0.5	0.6	1	1	1
J40	N11 Junction 12 - Ballyronan Road Roundabout	Cal	22	3	25	22	3	25	0	0	0	-1%	2%	-1%	0.1	0.0	0.1	1	1	1
J40	N11 Junction 12 - Ballyronan Road Roundabout	Cal	17	0	17	18	0	18	1	0	1	9%	-	9%	0.3	0.1	0.3	1	1	1
J40	N11 Junction 12 - Ballyronan Road Roundabout	Cal	89	0	89	86	0	86	-3	0	-3	-3%	-	-3%	0.3	0.5	0.3	1	1	1
J40	N11 Junction 12 - Ballyronan Road Roundabout	Cal	290	9	299	282	10	292	-8	1	-7	-3%	13%	-2%	0.5	0.4	0.4	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	24	2	26	24	1	25	0	-1	-1	0%	-55%	-4%	0.0	0.9	0.2	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	289	9	298	282	10	292	-7	1	-6	-2%	13%	-2%	0.4	0.4	0.3	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	76	0	76	76	0	76	0	0	0	-1%	-	-1%	0.1	-	0.1	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	40	2	42	40	1	41	0	-1	-1	0%	-58%	-3%	0.0	0.9	0.2	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	18	0	18	18	0	18	0	0	0	3%	-	3%	0.1	0.1	0.1	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	17	0	17	17	0	17	0	0	0	0%	-	0%	0.0	-	0.0	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	346	9	355	338	10	348	-8	1	-7	-2%	12%	-2%	0.4	0.3	0.4	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	33	0	33	33	0	33	0	0	0	0%	-	0%	0.0	-	0.0	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	407	27	434	406	28	435	-1	2	1	0%	6%	0%	0.0	0.3	0.0	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	345	12	357	338	10	348	-7	-2	-9	-2%	-16%	-2%	0.4	0.6	0.5	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	367	23	390	365	26	391	-2	3	1	-1%	14%	0%	0.1	0.7	0.1	1	1	1

AM PEAK

Site	Road Name	CalVal	Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
			LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
J42	N11 Junction 12 - West Side Roundabout	Cal	40	2	42	40	1	41	0	-1	-1	0%	-58%	-3%	0.0	0.9	0.2	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	298	6	304	290	7	297	-8	1	-7	-3%	15%	-2%	0.5	0.3	0.4	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	257	14	271	255	15	271	-2	1	-1	-1%	6%	0%	0.1	0.2	0.0	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	118	12	130	118	6	124	0	-6	-6	0%	-49%	-4%	0.0	1.9	0.5	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	248	7	255	245	7	252	-3	0	-3	-1%	3%	-1%	0.2	0.1	0.2	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	11	0	11	11	0	11	0	0	0	0%	-	1%	0.0	0.5	0.0	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	148	0	148	148	2	150	0	2	2	0%	-	1%	0.0	2.1	0.2	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	7	0	7	23	0	23	16	0	16	227%	-	229%	4.1	0.6	4.1	1	1	1
J44	Main St (R772)/R765	Cal	184	17	201	181	18	199	-3	0	-2	-1%	2%	-1%	0.2	0.1	0.2	1	1	1
J44	Main St (R772)/R765	Cal	101	0	101	23	1	24	-78	1	-77	-77%	-	-76%	9.9	1.5	9.8	1	1	1
J44	Main St (R772)/R765	Cal	226	22	248	227	23	250	1	1	2	0%	6%	1%	0.1	0.3	0.1	1	1	1
J44	Main St (R772)/R765	Cal	31	0	31	27	1	28	-4	1	-3	-12%	-	-9%	0.7	1.3	0.5	1	1	1
J44	Main St (R772)/R765	Cal	172	0	172	151	3	154	-21	3	-18	-12%	-	-11%	1.7	2.4	1.4	1	1	1
J44	Main St (R772)/R765	Cal	40	2	42	30	2	32	-10	0	-10	-25%	5%	-24%	1.7	0.1	1.6	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	56	5	61	55	4	59	-1	-1	-2	-1%	-19%	-3%	0.1	0.4	0.2	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	171	18	189	156	16	172	-15	-3	-17	-9%	-14%	-9%	1.2	0.6	1.3	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	45	4	49	45	4	49	0	0	0	0%	8%	1%	0.0	0.2	0.1	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	58	2	60	51	2	53	-7	0	-7	-12%	5%	-12%	1.0	0.1	0.9	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	220	13	233	209	20	229	-11	8	-3	-5%	60%	-1%	0.7	1.9	0.2	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	130	7	137	128	6	134	-2	-1	-2	-1%	-11%	-2%	0.1	0.3	0.2	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	86	14	100	85	13	97	-1	-2	-3	-2%	-11%	-3%	0.2	0.4	0.3	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	72	17	89	71	17	88	-1	0	-1	-1%	-1%	-1%	0.1	0.1	0.1	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	123	6	129	123	5	128	0	-1	-1	0%	-15%	-1%	0.0	0.4	0.1	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	52	2	54	41	2	43	-11	0	-11	-21%	5%	-20%	1.6	0.1	1.6	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	5	0	5	5	0	5	0	0	0	0%	-	0%	0.0	-	0.0	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	4	0	4	1	0	1	-3	0	-3	-77%	-	-77%	2.0	-	2.0	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	286	17	303	286	13	299	0	-4	-4	0%	-24%	-1%	0.0	1.1	0.2	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	28	0	28	28	0	28	0	0	0	-1%	-	-1%	0.0	-	0.0	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	80	12	92	77	6	84	-3	-5	-8	-3%	-45%	-9%	0.3	1.8	0.8	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	109	14	123	109	14	123	0	0	0	0%	-2%	0%	0.0	0.1	0.0	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	125	10	135	125	11	136	0	2	2	0%	20%	1%	0.0	0.6	0.2	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	113	7	120	114	7	121	1	0	2	1%	4%	1%	0.1	0.1	0.1	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	148	12	160	148	8	156	0	-3	-3	0%	-26%	-2%	0.0	1.0	0.3	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	61	2	63	60	2	62	-1	0	-1	-2%	16%	-2%	0.2	0.2	0.1	1	1	1
J48	N11 Junction 13 - West Side T Junction	Cal	50	5	55	50	2	51	0	-3	-4	-1%	-66%	-6%	0.0	1.8	0.5	1	1	1
J48	N11 Junction 13 - West Side T Junction	Cal	30	2	32	35	3	37	5	1	6	16%	36%	17%	0.9	0.5	0.9	1	1	1
J48	N11 Junction 13 - West Side T Junction	Cal	21	2	23	35	3	39	14	1	16	68%	70%	68%	2.7	0.8	2.8	1	1	1
J48	N11 Junction 13 - West Side T Junction	Cal	293	17	310	291	16	308	-2	-1	-3	-1%	-5%	-1%	0.1	0.2	0.1	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	62	13	75	61	4	66	-1	-8	-9	-1%	-64%	-12%	0.1	2.8	1.0	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	50	14	64	49	1	51	-1	-13	-14	-1%	-91%	-21%	0.1	4.7	1.8	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	18	0	18	18	1	19	0	1	1	2%	-	7%	0.1	1.4	0.3	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	53	14	67	49	1	50	-4	-14	-18	-7%	-96%	-26%	0.5	5.1	2.3	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	11	0	11	15	0	15	4	0	4	37%	-	39%	1.1	0.6	1.2	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	4	0	4	4	1	5	0	1	1	2%	-	17%	0.0	1.1	0.3	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	399	23	422	400	24	424	1	1	2	0%	5%	1%	0.0	0.3	0.1	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	51	0	51	54	1	56	3	1	5	6%	-	9%	0.4	1.7	0.6	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	0	0	0	2	0	2	2	0	2	-	-	-	2.0	0.3	2.0	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	0	0	0	0	0	0	0	0	0	-	-	-	0.6	0.3	0.7	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	0	0	0	0	1	1	0	1	1	-	-	-	0.8	1.0	1.3	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	539	22	561	561	46	607	22	24	46	4%	111%	8%	0.9	4.2	1.9	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	1	0	1	1	0	1	0	0	0	-2%	-	3%	0.0	0.3	0.0	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	43	4	47	0	0	0	-43	-4	-47	-100%	-100%	-100%	9.3	2.8	9.7	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	5	0	5	2	0	2	-3	0	-3	-53%	-	-52%	1.4	0.3	1.3	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	78	4	82	72	4	76	-6	0	-6	-8%	8%	-8%	0.8	0.1	0.7	1	1	1
J50	N11 Junction 14 - West Side Roundabout	Val	107	22	129	79	5	80	-28	-17	-50	-26%	-76%	-38%	2.9	4.6	4.9	1	1	1
J50	N11 Junction 14 - West Side Roundabout	Val	121	25	146	120	8	123	-1	-17	-23	-1%	-68%	-16%	0.1	4.2	2.0	1	1	1
J50	N11 Junction 14 - West Side Roundabout	Val	72	13	85	64	4	69	-8	-8	-16	-11%	-64%	-19%	0.9	2.8	1.8	1	1	1

AM PEAK

Site	Road Name	CalVal	Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
			LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
J50	N11 Junction 14 - West Side Roundabout	Val	154	38	192	155	13	159	1	-24	-33	1%	-65%	-17%	0.1	4.8	2.5	1	1	1
J50	N11 Junction 14 - West Side Roundabout	Val	159	35	194	130	15	135	-29	-20	-59	-18%	-58%	-31%	2.4	4.1	4.6	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	78	8	86	51	3	54	-27	-4	-32	-35%	-58%	-37%	3.4	1.9	3.8	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	330	18	348	331	18	349	1	0	0	0%	-1%	0%	0.0	0.0	0.0	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	53	2	55	52	2	54	-1	0	-1	-2%	5%	-2%	0.2	0.1	0.2	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	331	19	350	365	43	408	34	24	58	10%	128%	17%	1.8	4.4	3.0	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	55	4	59	52	3	54	-3	-1	-4	-6%	-33%	-7%	0.4	0.7	0.6	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	24	0	24	24	0	24	0	0	0	0%	-	1%	0.0	0.7	0.0	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	236	0	236	236	2	238	0	2	2	0%	-	1%	0.0	2.0	0.1	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	90	0	90	93	0	93	3	0	3	4%	-	4%	0.3	0.1	0.3	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	19	0	19	19	0	19	0	0	0	0%	-	0%	0.0	-	0.0	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	344	13	357	334	13	347	-10	0	-10	-3%	-2%	-3%	0.6	0.1	0.6	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	139	6	145	140	6	146	1	0	2	1%	5%	1%	0.1	0.1	0.1	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	253	2	255	252	14	266	-1	12	11	0%	611%	4%	0.0	4.2	0.7	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	52	0	52	50	0	50	-2	0	-2	-4%	-	-3%	0.3	1.0	0.2	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	176	12	188	194	29	223	18	16	34	10%	130%	18%	1.3	3.6	2.4	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	66	0	66	18	0	18	-48	0	-48	-73%	-	-73%	7.4	-	7.4	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	383	8	391	363	41	403	-20	33	13	-5%	435%	3%	1.0	6.7	0.6	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	286	9	295	306	51	356	20	42	62	7%	488%	21%	1.1	7.7	3.4	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	99	2	101	100	16	117	1	14	16	2%	759%	16%	0.1	4.8	1.5	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	543	50	593	520	45	565	-23	-5	-28	-4%	-10%	-5%	1.0	0.7	1.1	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	95	5	100	120	5	125	25	0	25	26%	8%	25%	2.4	0.2	2.3	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	222	36	258	212	36	247	-10	0	-10	-5%	0%	-4%	0.7	0.0	0.6	1	1	1
J9	M11 Junction 6 - West Side Roundabout	Cal	222	36	258	212	36	247	-10	0	-10	-5%	0%	-4%	0.7	0.0	0.6	1	1	1
J9	M11 Junction 6 - West Side Roundabout	Cal	170	83	253	164	1	165	-6	-82	-88	-3%	-99%	-35%	0.4	12.7	6.1	1	1	1
J9	M11 Junction 6 - West Side Roundabout	Cal	539	47	586	520	45	565	-19	-2	-21	-3%	-4%	-4%	0.8	0.3	0.9	1	1	1
J9	M11 Junction 6 - West Side Roundabout	Cal	72	55	127	83	1	84	11	-53	-43	15%	-98%	-34%	1.2	10.1	4.2	1	1	1
N1	Stonebridge Road/Ferndale Road	Val	201	7	208	198	7	205	-3	0	-3	-1%	4%	-1%	0.2	0.1	0.2	1	1	1
N1	Stonebridge Road/Ferndale Road	Val	341	4	345	285	1	286	-56	-3	-59	-17%	-74%	-17%	3.2	1.8	3.3	1	1	1
N2	R119	Val	412	8	420	408	10	419	-4	3	-1	-1%	37%	0%	0.2	0.9	0.0	1	1	1
N2	R119	Val	513	18	531	519	20	539	6	2	8	1%	12%	2%	0.3	0.5	0.4	1	1	1
T1	M50 Between Jn16 Cherrywood and Jn17 M50/M11, Shankill, Co. Dublin	Val	1172	255	1427	1091	250	1341	-81	-5	-86	-7%	-2%	-6%	2.4	0.3	2.3	1	1	1
T1	M50 Between Jn16 Cherrywood and Jn17 M50/M11, Shankill, Co. Dublin	Val	2608	226	2834	2536	226	2762	-72	0	-72	-3%	0%	-3%	1.4	0.0	1.4	1	1	1

Inter Peak

Site	Road Name		Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
		CalVal	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
A1	M11 (North)	Val	993	309	1302	1232	115	1347	240	-194	45	24%	-63%	3%	7.2	13.4	1.2	0	0	1
A1	M11 (North)	Val	745	174	919	867	137	1004	122	-37	85	16%	-21%	9%	4.3	3.0	2.7	0	1	1
A10	M11 NB off-ramp - Junction 6	Val	261	114	376	300	2	302	38	-112	-73	15%	-98%	-20%	2.3	14.7	4.0	1	0	1
A11	N11 x R117 - Junction 6A	Val	171	56	227	210	25	213	38	-31	-15	22%	-55%	-6%	2.8	4.9	1.0	1	1	1
A11	N11 x R117 - Junction 6A	Val	185	72	257	158	0	158	-27	-71	-99	-15%	-99%	-38%	2.1	11.9	6.8	1	1	1
A12	N11 x Herbert Road - Junction 6A	Val	246	48	294	286	20	296	40	-28	2	16%	-58%	1%	2.4	4.8	0.1	1	1	1
A12	N11 x Herbert Road - Junction 6A	Val	104	17	121	113	2	114	9	-15	-7	9%	-88%	-6%	0.9	4.9	0.6	1	1	1
A13	N11 NB on-ramp - Junction 7	Val	731	227	957	843	22	865	112	-205	-93	15%	-90%	-10%	4.0	18.4	3.1	0	0	1
A14	N11 NB off-ramp - Junction 7	Val	292	73	365	355	6	361	63	-67	-4	22%	-92%	-1%	3.5	10.7	0.2	1	1	1
A17	R755 - N11 Junction 8	Cal	165	59	224	121	5	126	-44	-54	-98	-27%	-92%	-44%	3.7	9.6	7.4	1	1	1
A17	R755 - N11 Junction 8	Cal	173	55	229	108	3	111	-66	-52	-118	-38%	-94%	-52%	5.6	9.6	9.1	1	1	0
A18	R761 - Rathdown Upper (Bray)	Val	414	92	506	448	2	449	33	-90	-57	8%	-98%	-11%	1.6	13.2	2.6	1	1	1
A18	R761 - Rathdown Upper (Bray)	Val	445	96	541	440	1	441	-5	-95	-100	-1%	-99%	-19%	0.3	13.6	4.5	1	1	0
A2	Dublin Road - near M11 Junction 5	Val	320	88	409	321	54	335	0	-34	-74	0%	-39%	-18%	0.0	4.1	3.9	1	1	1
A2	Dublin Road - near M11 Junction 5	Val	346	93	439	399	59	428	53	-35	-11	15%	-37%	-3%	2.8	4.0	0.5	1	1	1
A20	R761 between to R774 and Kilcoole	Val	354	89	443	404	54	418	50	-35	-24	14%	-39%	-6%	2.6	4.1	1.2	1	1	1
A20	R761 between to R774 and Kilcoole	Val	407	105	512	423	17	440	16	-88	-73	4%	-84%	-14%	0.8	11.3	3.3	1	1	1
A21	Kilpedder East - between N11 junctions 11 and 12	Cal	41	27	67	24	0	24	-17	-27	-44	-42%	-100%	-65%	3.0	7.3	6.5	1	1	1
A22	Kilpedder West - between N11 junctions 11 and 12	Cal	38	8	46	13	0	13	-25	-8	-32	-65%	-99%	-71%	4.8	3.9	5.9	1	1	1
A22	Kilpedder West - between N11 junctions 11 and 12	Cal	29	5	34	12	0	12	-16	-5	-22	-57%	-100%	-63%	3.6	3.2	4.5	1	1	1
A24	Newcastle Road (R761) -near Druids Glen Golf Club	Val	75	19	93	103	3	105	28	-16	11	38%	-86%	12%	3.0	4.9	1.1	1	1	1
A24	Newcastle Road (R761) -near Druids Glen Golf Club	Val	95	28	123	126	10	127	31	-18	4	32%	-64%	3%	2.9	4.1	0.3	1	1	1
A25	R765 - Monalin	Val	36	11	47	79	1	80	43	-10	33	119%	-94%	69%	5.7	4.3	4.1	1	1	1
A25	R765 - Monalin	Val	43	13	57	69	0	69	26	-13	13	59%	-97%	22%	3.4	4.9	1.6	1	1	1
A26	R772 - N11 NB off-ramp (Timmore)	Cal	102	46	148	124	8	132	22	-38	-16	22%	-83%	-11%	2.1	7.3	1.3	1	1	1
A27	R761 - Killoughter Lane	Cal	30	6	35	31	0	31	1	-5	-4	4%	-91%	-12%	0.2	3.0	0.7	1	1	1
A27	R761 - Killoughter Lane	Cal	35	11	46	15	0	16	-19	-11	-30	-56%	-97%	-66%	3.9	4.5	5.4	1	1	1
A3	M11 NB on-ramp - Junction 5	Cal	415	115	530	466	99	565	51	-16	35	12%	-14%	7%	2.4	1.5	1.5	1	1	1
A4	M11 SB off-ramp - Junction 5	Val	441	121	563	491	73	533	50	-48	-29	11%	-40%	-5%	2.3	4.9	1.2	1	1	1
A5	M11 SB on-ramp - Junction 5	Cal	190	57	246	233	17	250	43	-40	3	23%	-71%	1%	3.0	6.6	0.2	1	1	1
A6	M11 NB off-ramp - Junction 5	Val	153	36	189	172	12	172	19	-24	-17	12%	-66%	-9%	1.5	4.8	1.3	1	1	1
A7	M11 SB off-ramp - Junction 6	Val	135	79	214	156	48	164	21	-32	-50	16%	-40%	-23%	1.8	4.0	3.7	1	1	1
A8	M11 SB on-ramp - Junction 6	Val	331	97	429	420	2	422	88	-95	-7	27%	-98%	-2%	4.6	13.5	0.3	1	1	1
A9	M11 NB on-ramp - Junction 6	Val	93	64	157	145	35	150	52	-29	-7	56%	-45%	-4%	4.8	4.1	0.6	1	1	1
D37-38	N11 Junction 11 - West Side Roundabout	Val	282	46	329	318	26	344	35	-20	15	12%	-43%	5%	2.0	3.3	0.8	1	1	1
D37-38	N11 Junction 11 - West Side Roundabout	Val	227	24	251	238	5	241	11	-18	-9	5%	-78%	-4%	0.7	4.8	0.6	1	1	1
J1	Roundabout - M11/Dublin Road (R837)	Cal	1629	85	1714	1688	118	1806	59	32	92	4%	38%	5%	1.5	3.2	2.2	1	1	1
J1	Roundabout - M11/Dublin Road (R837)	Cal	347	18	366	363	6	370	16	-12	4	5%	-66%	1%	0.9	3.4	0.2	1	1	1
J1	Roundabout - M11/Dublin Road (R837)	Cal	114	1	114	72	0	72	-42	-1	-42	-37%	-100%	-37%	4.3	1.1	4.4	1	1	1
J1	Roundabout - M11/Dublin Road (R837)	Cal	1147	68	1215	1210	134	1344	63	67	129	5%	98%	11%	1.8	6.6	3.6	1	1	1
J1	Roundabout - M11/Dublin Road (R837)	Cal	444	19	463	470	12	482	26	-7	20	6%	-37%	4%	1.2	1.8	0.9	1	1	1
J1	Roundabout - M11/Dublin Road (R837)	Cal	116	1	117	78	0	78	-39	-1	-39	-33%	-100%	-34%	3.9	1.1	4.0	1	1	1
J10	N11 - R117	Cal	5	0	5	0	0	0	-5	0	-5	-100%	-	-100%	3.3	-	3.3	1	1	1
J10	N11 - R117	Cal	2731	292	3023	3009	285	3294	278	-6	272	10%	-2%	9%	5.2	0.4	4.8	1	1	1
J10	N11 - R117	Cal	3	0	3	0	0	0	-3	0	-3	-100%	-	-100%	2.6	-	2.6	1	1	1
J10	N11 - R117	Cal	1970	291	2261	2163	266	2429	193	-25	168	10%	-9%	7%	4.2	1.5	3.5	1	1	1
J10	N11 - R117	Cal	187	27	214	210	3	213	23	-24	-1	12%	-89%	-1%	1.6	6.2	0.1	1	1	1
J10	N11 - R117	Cal	197	34	231	160	2	162	-37	-32	-69	-19%	-93%	-30%	2.8	7.4	4.9	1	1	1
J11	N11- Herbert Rd	Cal	272	9	282	286	10	296	13	1	15	5%	13%	5%	0.8	0.4	0.9	1	1	1
J11	N11- Herbert Rd	Cal	2444	288	2733	2723	275	2998	279	-13	266	11%	-5%	10%	5.5	0.8	5.0	1	1	1
J11	N11- Herbert Rd	Cal	107	2	109	113	1	114	7	-1	6	6%	-42%	5%	0.6	0.7	0.5	1	1	1
J12	Herbert Rd/Kilbride Ln	Cal	64	1	65	64	0	64	0	-1	-1	1%	-69%	-1%	0.0	1.0	0.1	1	1	1
J12	Herbert Rd/Kilbride Ln	Cal	88	1	89	94	1	95	6	0	6	7%	-10%	7%	0.6	0.1	0.6	1	1	1
J12	Herbert Rd/Kilbride Ln	Cal	71	3	74	74	1	74	3	-2	1	5%	-82%	1%	0.4	1.8	0.1	1	1	1
J12	Herbert Rd/Kilbride Ln	Cal	43	0	43	43	0	43	0	0	0	-1%	-	-1%	0.1	0.4	0.1	1	1	1
J12	Herbert Rd/Kilbride Ln	Cal	178	3	181	178	3	181	0	0	0	0%	1%	0%	0.0	0.0	0.0	1	1	1
J12	Herbert Rd/Kilbride Ln	Cal	102	8	110	111	7	118	10	-1	8	9%	-17%	8%	0.9	0.5	0.8	1	1	1

Inter Peak

Site	Road Name		Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
		CalVal	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	326	14	340	339	5	344	13	-9	3	4%	-66%	1%	0.7	3.0	0.2	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	9	0	9	9	0	9	0	0	0	-5%	-	-5%	0.1	-	0.1	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	125	4	129	128	0	128	3	-4	-1	2%	-94%	-1%	0.2	2.5	0.1	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	276	17	293	294	3	297	18	-14	4	6%	-83%	1%	1.1	4.5	0.2	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	240	11	252	249	4	252	8	-7	1	3%	-66%	0%	0.5	2.7	0.1	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	219	10	230	211	0	211	-9	-10	-18	-4%	-95%	-8%	0.6	4.2	1.2	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	16	1	17	19	2	21	3	1	4	17%	208%	24%	0.7	1.2	0.9	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	153	10	162	161	5	166	8	-5	4	5%	-48%	2%	0.7	1.7	0.3	1	1	1
J14	N11 Junction 7 - West Side Roundabout	Cal	838	63	901	868	23	890	30	-41	-11	4%	-64%	-1%	1.0	6.2	0.4	1	1	1
J14	N11 Junction 7 - West Side Roundabout	Cal	72	3	76	76	4	79	3	1	4	5%	20%	5%	0.4	0.3	0.4	1	1	1
J14	N11 Junction 7 - West Side Roundabout	Cal	378	21	399	397	9	405	18	-12	6	5%	-58%	2%	0.9	3.1	0.3	1	1	1
J14	N11 Junction 7 - West Side Roundabout	Cal	59	2	61	59	2	61	0	0	0	0%	-8%	0%	0.0	0.1	0.0	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	17	3	20	15	0	15	-2	-3	-5	-9%	-99%	-24%	0.4	2.5	1.1	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	367	17	384	382	9	390	15	-9	6	4%	-51%	2%	0.8	2.5	0.3	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	808	61	869	868	29	890	59	-32	21	7%	-53%	2%	2.0	4.8	0.7	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	26	4	30	28	0	28	2	-3	-1	8%	-93%	-4%	0.4	2.4	0.2	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	48	3	50	30	0	30	-18	-2	-20	-37%	-89%	-40%	2.8	1.9	3.1	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	731	44	775	781	19	800	50	-24	25	7%	-56%	3%	1.8	4.3	0.9	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	429	20	449	424	6	431	-5	-14	-19	-1%	-69%	-4%	0.2	3.8	0.9	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	392	21	413	410	9	419	18	-12	5	4%	-58%	1%	0.9	3.1	0.3	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	430	26	455	452	18	471	23	-7	15	5%	-29%	3%	1.1	1.6	0.7	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	647	44	690	649	7	657	3	-36	-34	0%	-83%	-5%	0.1	7.2	1.3	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	860	61	921	898	28	921	37	-33	0	4%	-54%	0%	1.3	4.9	0.0	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	338	19	357	362	16	379	24	-3	21	7%	-15%	6%	1.3	0.7	1.1	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	572	34	606	608	11	616	36	-23	10	6%	-67%	2%	1.5	4.8	0.4	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	236	7	243	226	0	226	-10	-7	-17	-4%	-100%	-7%	0.7	3.6	1.1	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	87	2	89	87	0	87	0	-2	-2	0%	-100%	-2%	0.0	1.9	0.2	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	149	2	151	151	0	151	2	-2	0	2%	-100%	0%	0.2	2.1	0.0	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	356	6	362	358	2	360	2	-4	-2	0%	-62%	-1%	0.1	1.9	0.1	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	82	0	82	83	0	83	1	0	1	2%	-	2%	0.1	-	0.1	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	384	8	392	401	2	402	17	-6	10	4%	-81%	3%	0.8	3.0	0.5	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	449	12	460	461	2	463	12	-10	2	3%	-87%	0%	0.6	4.0	0.1	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	222	5	227	222	0	222	0	-5	-5	0%	-100%	-2%	0.0	3.2	0.3	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	346	6	352	352	2	355	7	-4	3	2%	-62%	1%	0.4	1.8	0.2	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	142	11	153	145	0	145	3	-11	-8	2%	-98%	-5%	0.2	4.6	0.7	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	179	4	182	132	0	132	-47	-4	-50	-26%	-100%	-28%	3.7	2.8	4.0	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	139	12	151	143	0	143	4	-12	-8	3%	-98%	-5%	0.3	4.7	0.6	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	232	5	237	236	2	238	5	-4	1	2%	-69%	0%	0.3	2.0	0.1	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	366	19	385	374	0	375	9	-19	-11	2%	-100%	-3%	0.5	6.2	0.5	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	193	4	197	219	2	221	26	-2	24	13%	-42%	12%	1.8	1.0	1.6	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	252	16	268	256	2	256	4	-13	-12	1%	-86%	-4%	0.2	4.5	0.7	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	291	14	305	295	1	295	4	-13	-10	1%	-92%	-3%	0.2	4.6	0.6	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	303	13	316	302	0	302	-1	-13	-14	0%	-99%	-4%	0.1	5.0	0.8	1	1	1
J2	M11 Junction 5 - Dublin Rd Roudabout	Cal	615	23	638	637	52	689	22	29	51	4%	127%	8%	0.9	4.7	2.0	1	1	1
J2	M11 Junction 5 - Dublin Rd Roudabout	Cal	746	32	778	783	104	887	37	71	108	5%	220%	14%	1.3	8.6	3.8	1	1	1
J2	M11 Junction 5 - Dublin Rd Roudabout	Cal	365	17	382	391	28	419	25	11	37	7%	69%	10%	1.3	2.4	1.8	1	1	1
J2	M11 Junction 5 - Dublin Rd Roudabout	Cal	323	11	335	329	6	335	5	-5	1	2%	-43%	0%	0.3	1.7	0.0	1	1	1
J2	M11 Junction 5 - Dublin Rd Roudabout	Cal	651	38	689	699	115	814	47	78	125	7%	205%	18%	1.8	8.9	4.6	1	1	0
J20	N11- Jameson's Corner	Cal	20	2	21	20	0	20	0	-2	-1	1%	-94%	-6%	0.0	1.6	0.3	1	1	1
J20	N11- Jameson's Corner	Cal	10	1	11	11	0	11	1	-1	0	6%	-100%	-3%	0.2	1.4	0.1	1	1	1
J20	N11- Jameson's Corner	Cal	147	2	149	141	1	143	-6	-1	-6	-4%	-37%	-4%	0.5	0.6	0.5	1	1	1
J20	N11- Jameson's Corner	Cal	6	0	6	6	0	6	0	0	0	0%	-	0%	0.0	0.2	0.0	1	1	1
J21	N11 Junction 8 - West Side Roundabout	Cal	52	6	58	53	0	53	0	-6	-5	1%	-97%	-9%	0.1	3.2	0.7	1	1	1
J21	N11 Junction 8 - West Side Roundabout	Cal	298	16	314	312	23	335	14	8	22	5%	47%	7%	0.8	1.7	1.2	1	1	1
J21	N11 Junction 8 - West Side Roundabout	Cal	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	320	16	337	349	27	377	29	11	40	9%	69%	12%	1.6	2.4	2.1	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	66	4	70	68	0	68	2	-4	-2	2%	-94%	-3%	0.2	2.6	0.3	1	1	1

Inter Peak

Site	Road Name		Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
		CalVal	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
J22	N11 Junction 8 - East Side Roundabout	Cal	14	1	14	95	2	112	82	1	98	597%	213%	685%	11.1	1.2	12.3	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	11	0	11	11	0	11	0	0	0	4%	-	4%	0.1	0.2	0.1	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	73	5	77	77	0	77	4	-4	0	6%	-93%	0%	0.5	2.8	0.0	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	12	2	14	107	2	130	95	1	116	771%	38%	831%	12.3	0.4	13.7	1	1	0
J22	N11 Junction 8 - East Side Roundabout	Cal	14	1	15	15	0	15	1	-1	0	6%	-94%	1%	0.2	1.0	0.0	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	325	15	340	343	22	365	18	7	25	6%	45%	7%	1.0	1.6	1.3	1	1	1
J23	N11 - Quill Rd	Val	8	12	20	0	0	0	-8	-12	-20	-100%	-100%	-100%	4.0	4.9	6.3	1	1	1
J23	N11 - Quill Rd	Val	11	14	25	8	1	8	-3	-13	-17	-25%	-93%	-67%	0.9	4.8	4.2	1	1	1
J23	N11 - Quill Rd	Val	1418	252	1669	1665	230	1895	247	-22	226	17%	-9%	14%	6.3	1.4	5.3	0	1	1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	6	1	7	6	0	6	0	-1	-1	0%	-100%	-9%	0.0	1.1	0.2	1	1	1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	3	0	3	2	0	2	-1	0	-1	-48%	-	-48%	1.0	-	1.0	1	1	1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	5	1	6	5	0	5	0	-1	-1	0%	-94%	-10%	0.0	1.0	0.3	1	1	1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	78	12	90	92	4	96	15	-8	6	19%	-67%	7%	1.6	2.9	0.7	1	1	1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	1	1	2	1	0	1	0	-1	-1	-21%	-100%	-47%	0.3	1.1	0.7	1	1	1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	48	1	49	49	2	51	1	0	2	3%	25%	3%	0.2	0.3	0.2	1	1	1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	16	1	17	17	1	18	1	0	1	6%	-6%	6%	0.3	0.1	0.2	1	1	1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	26	2	28	26	0	26	0	-2	-2	0%	-97%	-7%	0.0	1.9	0.4	1	1	1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	39	9	48	48	3	51	9	-6	3	22%	-64%	6%	1.3	2.3	0.4	1	1	1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	27	2	29	29	0	29	2	-2	1	9%	-79%	3%	0.4	1.4	0.2	1	1	1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	43	3	47	46	1	47	3	-2	0	6%	-75%	0%	0.4	1.7	0.0	1	1	1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	35	1	36	33	0	34	-2	0	-2	-5%	-38%	-6%	0.3	0.3	0.4	1	1	1
J26	N11 Junction 9 - Ballydongh Road Y Junction	Cal	71	12	83	84	2	86	13	-10	3	18%	-84%	4%	1.4	3.8	0.3	1	1	1
J26	N11 Junction 9 - Ballydongh Road Y Junction	Cal	52	1	52	52	1	53	0	1	1	1%	80%	2%	0.1	0.5	0.1	1	1	1
J26	N11 Junction 9 - Ballydongh Road Y Junction	Cal	1852	218	2070	2070	234	2304	218	16	234	12%	7%	11%	4.9	1.1	5.0	1	1	1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	323	13	336	336	11	348	14	-2	12	4%	-14%	4%	0.8	0.5	0.6	1	1	1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	202	6	208	208	7	215	6	1	7	3%	15%	3%	0.4	0.4	0.5	1	1	1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	284	9	293	293	11	305	9	2	11	3%	26%	4%	0.5	0.7	0.7	1	1	1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	62	4	66	44	0	44	-18	-4	-22	-29%	-100%	-33%	2.5	2.6	2.9	1	1	1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	221	8	229	229	5	234	8	-3	5	4%	-38%	2%	0.5	1.2	0.3	1	1	1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	29	3	32	13	0	13	-16	-3	-19	-55%	-100%	-59%	3.5	2.4	4.0	1	1	1
J28	N11 Junction 10 - West Side Y Junction	Cal	54	2	57	54	0	54	0	-2	-2	0%	-100%	-4%	0.0	2.1	0.3	1	1	1
J28	N11 Junction 10 - West Side Y Junction	Cal	230	3	233	231	0	231	2	-3	-1	1%	-100%	-1%	0.1	2.5	0.1	1	1	1
J29	N11 Junction 10 - Glen Road Roundabout	Cal	57	2	60	55	0	55	-2	-2	-4	-4%	-100%	-7%	0.3	2.1	0.6	1	1	1
J29	N11 Junction 10 - Glen Road Roundabout	Cal	241	6	247	246	7	253	6	1	7	2%	16%	3%	0.4	0.4	0.4	1	1	1
J29	N11 Junction 10 - Glen Road Roundabout	Cal	276	8	284	282	1	283	7	-7	-1	2%	-93%	0%	0.4	3.6	0.1	1	1	1
J29	N11 Junction 10 - Glen Road Roundabout	Cal	32	2	34	32	0	33	1	-2	-1	2%	-92%	-3%	0.1	1.7	0.2	1	1	1
J3	M11 Junction 5 - Old Connaught Ave/M11 NB Off-ramp Junction	Cal	153	11	164	157	1	157	3	-10	-7	2%	-95%	-4%	0.3	4.2	0.5	1	1	1
J3	M11 Junction 5 - Old Connaught Ave/M11 NB Off-ramp Junction	Cal	102	4	107	108	0	109	6	-4	2	6%	-94%	2%	0.6	2.7	0.2	1	1	1
J3	M11 Junction 5 - Old Connaught Ave/M11 NB Off-ramp Junction	Cal	145	7	152	152	2	154	8	-6	2	5%	-75%	1%	0.6	2.6	0.2	1	1	1
J3	M11 Junction 5 - Old Connaught Ave/M11 NB Off-ramp Junction	Cal	74	4	78	63	0	63	-11	-4	-15	-14%	-98%	-19%	1.3	2.8	1.8	1	1	1
J30	N11 Junction 10 - East Side Y Junction	Cal	5	0	5	0	0	0	-5	0	-5	-100%	-	-100%	3.1	-	3.1	1	1	1
J30	N11 Junction 10 - East Side Y Junction	Cal	79	3	83	82	1	83	3	-3	0	3%	-79%	0%	0.3	1.8	0.0	1	1	1
J30	N11 Junction 10 - East Side Y Junction	Cal	1608	238	1846	1830	228	2058	222	-10	213	14%	-4%	12%	5.4	0.6	4.8	1	1	1
J31	Glen Rd (R762)/Bellevue Court	Cal	66	1	67	67	0	67	1	-1	0	2%	-98%	0%	0.1	1.5	0.0	1	1	1
J31	Glen Rd (R762)/Bellevue Court	Cal	23	3	26	26	0	26	3	-3	0	14%	-99%	2%	0.6	2.3	0.1	1	1	1
J31	Glen Rd (R762)/Bellevue Court	Cal	58	3	61	60	1	61	1	-2	0	2%	-63%	0%	0.2	1.2	0.0	1	1	1
J31	Glen Rd (R762)/Bellevue Court	Cal	21	2	24	22	0	23	1	-2	-1	5%	-91%	-4%	0.2	1.8	0.2	1	1	1
J31	Glen Rd (R762)/Bellevue Court	Cal	248	4	252	256	0	256	8	-3	5	3%	-87%	2%	0.5	2.3	0.3	1	1	1
J31	Glen Rd (R762)/Bellevue Court	Cal	267	6	273	279	7	286	13	1	13	5%	13%	5%	0.8	0.3	0.8	1	1	1
J32	R762/Priory Rd	Val	312	7	318	321	5	326	10	-2	8	3%	-25%	3%	0.5	0.7	0.4	1	1	1
J32	R762/Priory Rd	Val	24	1	25	25	2	26	0	1	2	1%	194%	6%	0.1	1.1	0.3	1	1	1
J32	R762/Priory Rd	Val	294	6	300	300	1	301	6	-5	1	2%	-79%	0%	0.3	2.6	0.1	1	1	1
J32	R762/Priory Rd	Val	50	0	50	50	0	50	0	0	0	1%	-	1%	0.1	0.1	0.1	1	1	1
J32	R762/Priory Rd	Val	15	0	15	16	0	16	0	0	0	3%	-	3%	0.1	0.4	0.1	1	1	1
J32	R762/Priory Rd	Val	19	0	19	19	0	19	0	0	0	-1%	-	1%	0.1	0.9	0.0	1	1	1
J33	Church Rd (R762)/Convent Rd	Cal	11	0	11	11	0	11	0	0	0	3%	-	3%	0.1	0.1	0.1	1	1	1
J33	Church Rd (R762)/Convent Rd	Cal	118	2	120	120	1	121	3	-1	1	2%	-68%	1%	0.2	1.2	0.1	1	1	1

Inter Peak

Site	Road Name		Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
		CalVal	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
J33	Church Rd (R762)/Convent Rd	Cal	12	0	12	12	0	12	1	0	1	5%	-	6%	0.2	0.1	0.2	1	1	1
J33	Church Rd (R762)/Convent Rd	Cal	228	4	232	230	1	231	2	-4	-2	1%	-83%	-1%	0.1	2.3	0.1	1	1	1
J33	Church Rd (R762)/Convent Rd	Cal	116	4	119	119	1	120	3	-3	0	3%	-77%	0%	0.3	1.9	0.0	1	1	1
J33	Church Rd (R762)/Convent Rd	Cal	217	3	220	222	5	226	5	1	6	2%	45%	3%	0.3	0.7	0.4	1	1	1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	257	11	267	267	1	269	11	-10	1	4%	-90%	0%	0.7	4.0	0.1	1	1	1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	79	1	79	62	0	62	-17	-1	-17	-21%	-100%	-22%	2.0	1.1	2.0	1	1	1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	263	10	273	273	1	275	10	-9	1	4%	-88%	1%	0.6	3.8	0.1	1	1	1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	235	7	242	240	0	241	5	-6	-1	2%	-94%	0%	0.3	3.4	0.1	1	1	1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	75	2	77	51	0	51	-23	-2	-25	-31%	-100%	-33%	2.9	1.9	3.1	1	1	1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	255	3	258	260	4	264	5	1	6	2%	36%	2%	0.3	0.6	0.4	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	255	3	258	260	4	264	6	1	7	2%	35%	3%	0.3	0.5	0.4	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	257	11	267	267	1	268	10	-10	1	4%	-90%	0%	0.6	4.0	0.0	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	271	3	274	273	0	274	3	-3	0	1%	-93%	0%	0.2	2.3	0.0	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	79	2	81	80	0	80	1	-2	-1	1%	-97%	-1%	0.1	1.9	0.1	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	227	14	241	240	1	242	13	-12	1	6%	-90%	0%	0.8	4.5	0.0	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	65	1	65	66	0	66	1	-1	1	2%	-91%	1%	0.2	1.0	0.1	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	560	13	573	573	3	576	13	-10	3	2%	-80%	0%	0.6	3.7	0.1	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	406	10	416	396	3	398	-11	-7	-17	-3%	-71%	-4%	0.5	2.7	0.9	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	288	3	291	241	3	244	-47	1	-46	-16%	37%	-16%	2.9	0.5	2.8	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	501	9	510	512	6	518	11	-2	8	2%	-28%	2%	0.5	0.9	0.4	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	413	11	424	423	3	426	10	-8	2	2%	-76%	0%	0.5	3.2	0.1	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	340	5	346	275	0	275	-66	-5	-71	-19%	-100%	-21%	3.7	3.3	4.0	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	166	18	183	181	3	182	16	-15	-1	9%	-85%	-1%	1.2	4.7	0.1	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	230	42	273	267	22	289	37	-20	16	16%	-48%	6%	2.3	3.6	1.0	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	238	26	263	265	6	269	27	-19	6	11%	-75%	2%	1.7	4.8	0.3	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	274	42	317	315	26	341	41	-16	24	15%	-39%	8%	2.4	2.8	1.3	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	110	12	122	83	4	87	-27	-8	-35	-24%	-69%	-29%	2.7	2.9	3.4	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	82	4	86	48	4	52	-34	0	-34	-42%	7%	-40%	4.3	0.1	4.1	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	488	56	544	549	30	579	61	-26	35	13%	-47%	6%	2.7	4.0	1.5	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	467	51	517	520	29	548	53	-22	31	11%	-44%	6%	2.4	3.5	1.3	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	520	72	592	582	36	613	62	-36	21	12%	-50%	4%	2.6	4.9	0.9	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	501	66	567	553	34	582	52	-32	15	10%	-48%	3%	2.2	4.5	0.6	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	10	19	29	8	10	8	-2	-9	-21	-21%	-48%	-74%	0.7	2.4	5.0	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	7	20	27	8	0	8	0	-20	-19	2%	-100%	-72%	0.1	6.3	4.7	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	316	18	335	334	3	336	18	-15	1	6%	-82%	0%	1.0	4.6	0.1	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	405	21	426	425	11	437	20	-10	10	5%	-48%	2%	1.0	2.5	0.5	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	471	22	493	496	20	516	25	-1	23	5%	-7%	5%	1.1	0.3	1.0	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	509	58	567	569	31	600	59	-27	32	12%	-47%	6%	2.6	4.1	1.3	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	288	23	311	310	12	312	22	-11	2	8%	-47%	1%	1.3	2.5	0.1	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	434	20	455	454	14	468	20	-6	13	5%	-31%	3%	0.9	1.5	0.6	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	510	29	539	540	20	560	30	-9	21	6%	-32%	4%	1.3	1.9	0.9	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	50	1	51	51	0	51	1	-1	0	2%	-98%	0%	0.1	1.6	0.0	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	46	3	49	49	0	49	3	-3	0	7%	-94%	1%	0.5	2.3	0.0	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	59	1	60	57	0	57	-1	-1	-3	-2%	-96%	-4%	0.2	1.5	0.3	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	148	9	157	158	2	160	10	-7	3	7%	-79%	2%	0.8	3.1	0.2	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	40	0	40	42	0	42	2	0	2	5%	-	5%	0.3	0.6	0.3	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	80	8	88	87	1	87	7	-8	-1	9%	-93%	-1%	0.8	3.7	0.1	1	1	1
J40	N11 Junction 12 - Ballyronan Road Roundabout	Cal	354	23	377	379	11	390	25	-12	13	7%	-53%	3%	1.3	3.0	0.7	1	1	1
J40	N11 Junction 12 - Ballyronan Road Roundabout	Cal	39	1	40	40	0	40	1	0	1	3%	-72%	2%	0.2	0.7	0.1	1	1	1
J40	N11 Junction 12 - Ballyronan Road Roundabout	Cal	11	1	13	12	0	12	1	-1	0	9%	-99%	-2%	0.3	1.6	0.1	1	1	1
J40	N11 Junction 12 - Ballyronan Road Roundabout	Cal	69	3	72	72	1	73	3	-2	1	4%	-79%	2%	0.4	1.6	0.1	1	1	1
J40	N11 Junction 12 - Ballyronan Road Roundabout	Cal	335	22	357	359	10	370	24	-12	12	7%	-54%	3%	1.3	3.0	0.7	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	21	5	26	22	0	22	1	-5	-4	5%	-99%	-14%	0.2	3.1	0.8	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	341	21	363	359	10	370	18	-11	7	5%	-52%	2%	1.0	2.8	0.4	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	35	1	36	35	0	35	0	-1	-1	-1%	-100%	-3%	0.1	1.1	0.2	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	45	5	50	47	0	47	2	-5	-3	5%	-99%	-6%	0.3	3.3	0.5	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	11	1	13	12	0	12	1	-1	0	9%	-99%	-2%	0.3	1.6	0.1	1	1	1

Inter Peak

Site	Road Name		Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
		CalVal	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	28	0	28	28	0	28	1	0	1	3%	-	3%	0.1	-	0.1	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	361	21	382	378	10	388	17	-11	6	5%	-52%	2%	0.9	2.8	0.3	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	16	5	21	18	0	18	2	-5	-3	13%	-99%	-14%	0.5	3.2	0.7	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	283	25	308	307	9	316	24	-16	8	8%	-65%	3%	1.4	3.9	0.4	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	357	22	379	378	10	388	21	-12	10	6%	-53%	3%	1.1	2.9	0.5	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	264	25	289	288	9	297	24	-16	8	9%	-66%	3%	1.5	4.0	0.5	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	45	5	50	47	0	47	3	-5	-3	6%	-99%	-6%	0.4	3.3	0.4	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	308	22	330	329	10	340	21	-12	10	7%	-54%	3%	1.2	3.0	0.5	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	234	15	248	242	7	249	9	-8	1	4%	-52%	0%	0.6	2.3	0.1	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	115	3	117	118	2	120	4	-1	3	3%	-36%	2%	0.3	0.6	0.2	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	210	11	221	221	6	227	11	-5	6	5%	-45%	3%	0.7	1.7	0.4	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	11	1	12	12	0	12	1	-1	0	12%	-91%	1%	0.4	1.4	0.0	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	110	5	114	115	2	117	5	-3	3	5%	-53%	2%	0.5	1.4	0.2	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	9	1	9	10	0	11	2	-1	1	21%	-86%	14%	0.6	0.9	0.4	1	1	1
J44	Main St (R772)/R765	Cal	242	12	254	254	7	262	12	-5	7	5%	-41%	3%	0.8	1.6	0.5	1	1	1
J44	Main St (R772)/R765	Cal	87	1	88	88	0	88	0	0	0	0%	-42%	0%	0.0	0.4	0.0	1	1	1
J44	Main St (R772)/R765	Cal	208	15	223	223	6	229	15	-8	7	7%	-56%	3%	1.0	2.5	0.4	1	1	1
J44	Main St (R772)/R765	Cal	17	1	18	17	0	17	0	-1	-1	-1%	-98%	-5%	0.1	1.1	0.2	1	1	1
J44	Main St (R772)/R765	Cal	81	1	82	82	0	82	1	-1	0	1%	-68%	0%	0.1	0.9	0.0	1	1	1
J44	Main St (R772)/R765	Cal	23	1	24	23	0	23	0	-1	-1	0%	-92%	-2%	0.0	1.0	0.1	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	45	4	49	50	3	53	5	-2	3	11%	-37%	7%	0.7	0.9	0.5	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	215	9	224	228	5	232	13	-5	8	6%	-51%	4%	0.9	1.8	0.6	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	46	4	50	50	2	53	5	-2	3	11%	-44%	6%	0.7	1.0	0.4	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	50	5	55	55	0	56	5	-4	0	9%	-90%	1%	0.6	2.6	0.1	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	177	11	188	189	4	193	12	-7	5	7%	-62%	3%	0.9	2.5	0.4	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	45	4	50	49	1	50	4	-4	0	8%	-88%	-1%	0.5	2.5	0.0	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	86	11	97	95	4	99	9	-7	2	11%	-65%	3%	1.0	2.6	0.2	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	68	4	72	73	3	76	4	-1	4	6%	-19%	5%	0.5	0.4	0.4	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	142	5	146	147	1	148	5	-3	2	4%	-72%	1%	0.4	2.0	0.1	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	46	8	54	54	1	55	8	-8	0	17%	-92%	1%	1.1	3.6	0.1	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	5	0	5	5	0	5	0	0	0	7%	-	7%	0.2	-	0.2	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	5	1	6	5	0	5	0	-1	-1	0%	-100%	-11%	0.0	1.1	0.3	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	154	13	167	163	2	166	9	-11	-1	6%	-82%	-1%	0.8	3.9	0.1	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	16	0	16	16	0	16	0	0	0	0%	-	0%	0.0	-	0.0	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	68	8	76	76	2	78	8	-7	2	12%	-81%	2%	1.0	3.0	0.2	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	134	20	154	154	5	159	21	-15	5	15%	-76%	4%	1.7	4.3	0.4	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	161	23	184	184	5	189	23	-17	5	14%	-77%	3%	1.7	4.7	0.4	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	67	9	76	76	2	78	9	-7	2	14%	-79%	3%	1.1	3.1	0.3	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	88	12	100	100	2	102	12	-11	2	14%	-87%	2%	1.3	4.1	0.2	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	75	7	82	82	2	84	7	-5	2	10%	-71%	3%	0.8	2.4	0.2	1	1	1
J48	N11 Junction 13 - West Side T Junction	Cal	56	5	61	61	1	62	5	-4	1	9%	-85%	1%	0.7	2.5	0.1	1	1	1
J48	N11 Junction 13 - West Side T Junction	Cal	22	3	25	25	0	25	3	-3	1	15%	-87%	3%	0.7	2.0	0.2	1	1	1
J48	N11 Junction 13 - West Side T Junction	Cal	34	2	36	36	1	38	3	-1	2	8%	-30%	6%	0.4	0.4	0.3	1	1	1
J48	N11 Junction 13 - West Side T Junction	Cal	125	18	143	152	10	163	28	-7	20	22%	-42%	14%	2.3	2.0	1.6	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	105	22	127	117	0	117	12	-22	-10	11%	-100%	-8%	1.1	6.6	0.9	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	90	15	105	91	1	91	0	-14	-14	0%	-92%	-14%	0.0	4.8	1.5	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	28	0	28	28	0	28	0	0	0	0%	-	1%	0.0	0.7	0.1	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	92	18	110	95	10	95	3	-8	-14	4%	-43%	-13%	0.3	2.1	1.4	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	26	2	28	29	0	29	3	-2	1	11%	-90%	3%	0.5	1.8	0.1	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	108	23	131	120	0	120	12	-23	-11	11%	-100%	-8%	1.1	6.7	1.0	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	2	0	2	3	0	3	0	0	1	12%	-	31%	0.2	0.9	0.4	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	521	11	532	534	31	574	13	20	43	2%	184%	8%	0.6	4.4	1.8	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	84	3	86	4	3	7	-79	0	-79	-95%	4%	-92%	12.0	0.1	11.6	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	2	0	2	3	1	4	1	1	2	60%	-	111%	0.7	1.3	1.1	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	1	0	1	1	0	1	0	0	0	52%	-	53%	0.4	0.1	0.4	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	2	0	2	2	0	2	0	0	0	25%	-	28%	0.3	0.3	0.3	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	575	18	593	591	4	666	16	-14	73	3%	-77%	12%	0.7	4.2	2.9	1	1	1

Inter Peak

Site	Road Name		Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
		CalVal	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	0	0	0	1	0	1	0	0	0	92%	-	95%	0.4	0.1	0.5	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	88	1	89	0	0	0	-88	-1	-89	-100%	-100%	-100%	13.3	1.1	13.3	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	74	3	77	83	7	90	9	4	13	12%	176%	17%	1.0	2.0	1.4	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	2	0	2	1	0	2	-1	0	0	-27%	-	-24%	0.4	0.3	0.4	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	72	3	75	52	1	53	-20	-2	-22	-27%	-66%	-29%	2.5	1.4	2.7	1	1	1
J50	N11 Junction 14 - West Side Roundabout	Val	74	20	94	75	5	76	2	-15	-18	2%	-74%	-19%	0.2	4.2	2.0	1	1	1
J50	N11 Junction 14 - West Side Roundabout	Val	92	23	114	95	5	95	3	-18	-20	3%	-78%	-17%	0.3	4.7	1.9	1	1	1
J50	N11 Junction 14 - West Side Roundabout	Val	158	36	195	162	12	162	3	-24	-33	2%	-67%	-17%	0.3	4.9	2.5	1	1	1
J50	N11 Junction 14 - West Side Roundabout	Val	155	38	193	167	13	167	12	-24	-25	8%	-65%	-13%	0.9	4.9	1.9	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	116	5	121	9	3	11	-107	-2	-109	-92%	-47%	-91%	13.6	1.2	13.5	0	1	0
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	348	12	360	360	21	381	12	9	21	3%	78%	6%	0.6	2.3	1.1	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	76	1	77	77	6	82	1	4	6	1%	352%	7%	0.1	2.4	0.6	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	373	11	384	384	51	435	11	40	51	3%	369%	13%	0.6	7.2	2.5	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	86	3	89	90	1	90	4	-2	2	4%	-77%	2%	0.4	1.7	0.2	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	35	1	35	36	0	36	1	-1	0	3%	-98%	1%	0.1	1.1	0.0	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	141	1	141	140	5	146	0	4	4	0%	704%	3%	0.0	2.6	0.4	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	70	1	71	67	0	67	-4	-1	-4	-5%	-100%	-6%	0.4	1.1	0.5	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	17	1	17	15	0	15	-2	-1	-2	-10%	-100%	-14%	0.4	1.1	0.6	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	252	8	259	267	11	278	15	3	19	6%	46%	7%	0.9	1.1	1.1	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	212	9	221	221	3	224	9	-6	3	4%	-72%	1%	0.6	2.7	0.2	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	216	6	222	219	18	237	2	12	15	1%	204%	7%	0.2	3.5	1.0	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	27	0	27	27	0	27	0	0	0	0%	-	0%	0.0	0.2	0.0	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	192	8	199	201	9	211	10	2	11	5%	20%	6%	0.7	0.5	0.8	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	22	0	22	0	0	0	-22	0	-22	-100%	-	-100%	6.6	-	6.6	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	294	11	305	315	8	323	21	-3	18	7%	-31%	6%	1.2	1.1	1.0	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	258	11	269	300	5	305	42	-6	36	16%	-55%	13%	2.5	2.2	2.1	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	46	1	46	58	2	60	12	1	14	27%	205%	30%	1.7	1.1	1.9	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	368	54	422	425	2	427	57	-52	6	16%	-96%	1%	2.9	9.7	0.3	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	48	1	49	54	2	56	6	2	7	12%	287%	15%	0.8	1.5	1.0	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	103	54	156	151	5	156	48	-48	0	47%	-90%	0%	4.3	8.9	0.0	1	1	1
J9	M11 Junction 6 - West Side Roundabout	Cal	102	54	156	151	5	156	48	-48	0	47%	-90%	0%	4.3	8.9	0.0	1	1	1
J9	M11 Junction 6 - West Side Roundabout	Cal	147	74	222	184	0	184	37	-74	-38	25%	-100%	-17%	2.8	12.2	2.6	1	1	1
J9	M11 Junction 6 - West Side Roundabout	Cal	369	53	422	425	2	427	56	-51	6	15%	-96%	1%	2.8	9.6	0.3	1	1	1
J9	M11 Junction 6 - West Side Roundabout	Cal	60	79	139	65	0	65	5	-79	-74	8%	-100%	-54%	0.6	12.6	7.4	1	1	1
T1	M50 Between Jn16 Cherrywood and Jn17 M50/M11, Shankill, Co. Dublin	Val	1696	238	1935	1814	205	2019	118	-33	85	7%	-14%	4%	2.8	2.2	1.9	1	1	1
T1	M50 Between Jn16 Cherrywood and Jn17 M50/M11, Shankill, Co. Dublin	Val	1470	275	1745	1693	231	1924	224	-45	179	15%	-16%	10%	5.6	2.8	4.2	0	1	1

PM PEAK

Site	Road Name	CalVal	Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
			LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
A1	M11 (North)	Val	1688	40	1728	1713	61	1775	25	21	47	1%	54%	3%	0.6	3.0	1.1	1	1	1
A1	M11 (North)	Val	866	134	1000	1039	95	1085	173	-38	85	20%	-29%	8%	5.6	3.6	2.6	0	1	1
A10	M11 NB off-ramp - Junction 6	Val	365	82	446	409	3	412	44	-79	-34	12%	-96%	-8%	2.3	12.1	1.7	1	1	1
A11	N11 x R117 - Junction 6A	Val	143	28	171	158	8	166	15	-20	-4	11%	-71%	-3%	1.2	4.7	0.3	1	1	1
A11	N11 x R117 - Junction 6A	Val	287	49	335	231	21	231	-56	-28	-104	-20%	-58%	-31%	3.5	4.8	6.2	1	1	0
A12	N11 x Herbert Road - Junction 6A	Val	361	51	412	322	23	324	-39	-29	-88	-11%	-56%	-21%	2.1	4.7	4.6	1	1	1
A12	N11 x Herbert Road - Junction 6A	Val	121	12	133	141	2	143	20	-10	10	17%	-87%	8%	1.8	4.0	0.9	1	1	1
A13	N11 NB on-ramp - Junction 7	Val	712	110	822	820	66	846	108	-44	24	15%	-40%	3%	3.9	4.7	0.8	0	1	1
A14	N11 NB off-ramp - Junction 7	Val	309	49	358	348	25	353	39	-25	-5	13%	-50%	-2%	2.2	4.0	0.3	1	1	1
A16	N11 after Junction 7	Val	1542	435	1976	1746	137	1883	205	-298	-93	13%	-68%	-5%	5.0	17.6	2.1	1	0	1
A16	N11 after Junction 7	Val	2488	872	3360	3363	136	3498	875	-737	138	35%	-84%	4%	16.2	32.8	2.4	0	0	1
A17	R755 - N11 Junction 8	Cal	274	59	334	261	5	265	-13	-55	-68	-5%	-92%	-20%	0.8	9.7	3.9	1	1	1
A17	R755 - N11 Junction 8	Cal	227	56	283	117	3	120	-110	-53	-162	-48%	-94%	-57%	8.4	9.7	11.4	0	1	0
A18	R761 - Rathdown Upper (Bray)	Val	345	59	404	431	33	444	86	-26	40	25%	-44%	10%	4.4	3.8	1.9	1	1	1
A18	R761 - Rathdown Upper (Bray)	Val	598	68	666	517	38	525	-81	-30	-141	-14%	-44%	-21%	3.4	4.1	5.8	1	1	0
A19	N11 between junctions 9 and 10	Val	2594	738	3332	3175	141	3316	581	-597	-16	22%	-81%	0%	10.8	28.5	0.3	0	0	1
A2	Dublin Road - near M11 Junction 5	Val	267	60	327	278	35	283	11	-25	-44	4%	-42%	-14%	0.7	3.6	2.5	1	1	1
A2	Dublin Road - near M11 Junction 5	Val	481	101	582	501	10	511	20	-91	-71	4%	-90%	-12%	0.9	12.2	3.0	1	1	1
A20	R761 between to R774 and Kilcoole	Val	430	77	507	400	41	410	-30	-36	-97	-7%	-47%	-19%	1.5	4.7	4.5	1	1	1
A20	R761 between to R774 and Kilcoole	Val	563	86	650	482	49	492	-81	-37	-158	-14%	-43%	-24%	3.5	4.5	6.6	1	1	0
A21	Kilpedder East - between N11 junctions 11 and 12	Cal	46	20	65	60	0	60	14	-20	-6	31%	-100%	-8%	1.9	6.3	0.7	1	1	1
A22	Kilpedder West - between N11 junctions 11 and 12	Cal	28	3	32	16	0	16	-12	-3	-16	-44%	-99%	-49%	2.6	2.5	3.2	1	1	1
A22	Kilpedder West - between N11 junctions 11 and 12	Cal	25	9	33	25	0	25	1	-9	-8	2%	-100%	-25%	0.1	4.2	1.5	1	1	1
A24	Newcastle Road (R761) -near Druids Glen Golf Club	Val	74	16	90	131	2	132	57	-14	42	77%	-90%	47%	5.6	4.9	4.0	1	1	1
A24	Newcastle Road (R761) -near Druids Glen Golf Club	Val	147	28	175	136	12	138	-12	-16	-37	-8%	-57%	-21%	1.0	3.6	3.0	1	1	1
A25	R765 - Monalin	Val	41	10	51	65	1	66	24	-10	15	60%	-93%	29%	3.4	4.1	1.9	1	1	1
A25	R765 - Monalin	Val	70	24	93	76	5	77	6	-18	-17	9%	-77%	-18%	0.7	4.8	1.8	1	1	1
A26	R772 - N11 NB off-ramp (Timmore)	Cal	113	40	153	121	7	129	8	-32	-24	7%	-81%	-16%	0.8	6.6	2.0	1	1	1
A27	R761 - Killoughter Lane	Cal	36	4	39	74	1	75	39	-3	36	110%	-79%	92%	5.3	1.9	4.8	1	1	1
A27	R761 - Killoughter Lane	Cal	50	14	63	83	1	84	33	-12	21	67%	-92%	33%	4.1	4.6	2.4	1	1	1
A3	M11 NB on-ramp - Junction 5	Cal	414	76	490	418	50	468	5	-26	-22	1%	-34%	-4%	0.2	3.3	1.0	1	1	1
A4	M11 SB off-ramp - Junction 5	Val	538	82	621	642	47	669	103	-35	48	19%	-43%	8%	4.3	4.4	1.9	0	1	1
A5	M11 SB on-ramp - Junction 5	Cal	467	73	541	430	9	439	-37	-64	-102	-8%	-88%	-19%	1.8	10.0	4.6	1	1	0
A6	M11 NB off-ramp - Junction 5	Val	146	20	166	146	4	146	0	-16	-19	0%	-82%	-12%	0.0	4.7	1.6	1	1	1
A7	M11 SB off-ramp - Junction 6	Val	142	34	176	70	20	80	-71	-15	-96	-50%	-43%	-55%	6.9	2.9	8.5	1	1	1
A8	M11 SB on-ramp - Junction 6	Val	597	86	684	781	4	785	184	-83	101	31%	-95%	15%	7.0	12.3	3.7	0	1	0
A9	M11 NB on-ramp - Junction 6	Val	109	22	130	139	4	143	30	-18	12	28%	-82%	9%	2.7	5.0	1.1	1	1	1
D37-38	N11 Junction 11 - West Side Roundabout	Val	487	35	522	552	11	552	65	-23	31	13%	-68%	6%	2.9	4.9	1.3	1	1	1
D37-38	N11 Junction 11 - West Side Roundabout	Val	384	12	396	389	0	389	5	-11	-6	1%	-98%	-2%	0.2	4.6	0.3	1	1	1
J1	Roundabout - M11/Dublin Road (R837)	Cal	2585	37	2622	2678	64	2742	93	27	120	4%	72%	5%	1.8	3.8	2.3	1	1	1
J1	Roundabout - M11/Dublin Road (R837)	Cal	240	6	246	241	6	248	1	1	2	1%	10%	1%	0.1	0.2	0.1	1	1	1
J1	Roundabout - M11/Dublin Road (R837)	Cal	109	0	109	59	0	59	-50	0	-50	-46%	-	-46%	5.5	0.2	5.5	1	1	1
J1	Roundabout - M11/Dublin Road (R837)	Cal	1367	12	1379	1386	50	1436	19	38	57	1%	305%	4%	0.5	6.8	1.5	1	1	1
J1	Roundabout - M11/Dublin Road (R837)	Cal	786	6	792	772	2	773	-14	-4	-18	-2%	-66%	-2%	0.5	1.9	0.7	1	1	1
J1	Roundabout - M11/Dublin Road (R837)	Cal	86	0	86	86	0	86	0	0	0	0%	-	0%	0.0	0.2	0.0	1	1	1
J10	N11 - R117	Cal	1	0	1	0	0	0	-1	0	-1	-100%	-	-100%	1.4	-	1.4	1	1	1
J10	N11 - R117	Cal	3581	125	3706	3754	152	3905	173	27	200	5%	22%	5%	2.9	2.3	3.2	1	1	1
J10	N11 - R117	Cal	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	1	1	1
J10	N11 - R117	Cal	1969	108	2077	2061	150	2211	92	42	134	5%	39%	6%	2.0	3.7	2.9	1	1	1
J10	N11 - R117	Cal	144	0	144	158	8	166	14	8	22	10%	-	16%	1.2	4.0	1.8	1	1	1
J10	N11 - R117	Cal	327	8	335	231	1	231	-96	-7	-103	-29%	-92%	-31%	5.8	3.4	6.1	1	1	0
J11	N11- Herbert Rd	Cal	337	5	342	322	3	324	-15	-2	-17	-5%	-45%	-5%	0.8	1.1	1.0	1	1	1
J11	N11- Herbert Rd	Cal	3285	113	3398	3432	149	3581	147	36	183	4%	32%	5%	2.5	3.1	3.1	1	1	1
J11	N11- Herbert Rd	Cal	123	0	123	141	2	143	18	2	20	15%	-	16%	1.6	1.8	1.7	1	1	1
J12	Herbert Rd/Kilbride Ln	Cal	71	0	71	56	0	56	-15	0	-15	-21%	-	-21%	1.9	1.0	1.9	1	1	1
J12	Herbert Rd/Kilbride Ln	Cal	122	2	124	163	1	164	41	-1	41	34%	-43%	33%	3.5	0.7	3.4	1	1	1
J12	Herbert Rd/Kilbride Ln	Cal	75	0	75	75	1	76	0	1	1	0%	-	1%	0.0	1.1	0.1	1	1	1

PM PEAK

Site	Road Name	CalVal	Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
			LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
J12	Herbert Rd/Kilbride Ln	Cal	56	0	56	66	0	66	10	0	10	18%	-	19%	1.3	0.5	1.3	1	1	1
J12	Herbert Rd/Kilbride Ln	Cal	208	5	213	172	0	172	-36	-5	-41	-17%	-98%	-19%	2.6	3.0	2.9	1	1	1
J12	Herbert Rd/Kilbride Ln	Cal	147	0	147	146	2	149	-1	2	2	0%	-	1%	0.1	2.1	0.1	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	338	5	343	316	7	322	-22	2	-20	-7%	37%	-6%	1.2	0.7	1.1	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	27	0	27	30	0	30	3	0	3	11%	-	11%	0.6	0.1	0.6	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	121	0	121	131	0	131	10	0	10	8%	-	8%	0.9	0.8	0.9	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	323	4	327	327	3	330	4	-1	3	1%	-29%	1%	0.2	0.6	0.2	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	253	0	253	253	4	257	0	4	4	0%	-	2%	0.0	3.0	0.3	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	235	4	239	233	1	234	-2	-3	-5	-1%	-85%	-2%	0.1	2.2	0.3	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	15	0	15	16	0	16	1	0	1	6%	-	7%	0.2	0.6	0.3	1	1	1
J13	Killarney Rd (R767)/Kilbride Ln/Boghall Rd	Cal	176	0	176	163	3	165	-13	3	-11	-8%	-	-6%	1.0	2.4	0.8	1	1	1
J14	N11 Junction 7 - West Side Roundabout	Cal	833	21	854	829	42	871	-4	21	17	0%	100%	2%	0.1	3.8	0.6	1	1	1
J14	N11 Junction 7 - West Side Roundabout	Cal	148	0	148	172	5	177	24	5	29	16%	-	19%	1.9	3.3	2.3	1	1	1
J14	N11 Junction 7 - West Side Roundabout	Cal	464	6	470	469	8	476	5	2	7	1%	33%	1%	0.2	0.7	0.3	1	1	1
J14	N11 Junction 7 - West Side Roundabout	Cal	55	0	55	59	19	78	4	19	23	7%	-	41%	0.5	6.1	2.8	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	26	0	26	18	0	19	-8	0	-7	-29%	-	-29%	1.6	0.3	1.6	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	435	6	441	450	8	458	15	2	17	4%	32%	4%	0.7	0.7	0.8	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	36	2	38	30	0	30	-6	-2	-8	-18%	-92%	-21%	1.1	1.7	1.4	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	792	19	811	799	42	841	7	23	30	1%	119%	4%	0.3	4.1	1.0	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	35	0	35	27	0	27	-8	0	-8	-23%	-	-23%	1.5	0.3	1.5	1	1	1
J15	N11 Junction 7 - R768/Ballywaltrim Lane	Cal	44	0	44	43	0	43	-1	0	-1	-2%	-	-1%	0.1	0.4	0.1	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	741	9	750	717	23	740	-24	14	-9	-3%	165%	-1%	0.9	3.6	0.3	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	494	12	506	508	7	515	14	-5	8	3%	-44%	2%	0.6	1.8	0.4	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	471	8	479	477	8	485	6	0	6	1%	-1%	1%	0.3	0.0	0.3	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	493	9	502	484	18	502	-9	9	0	-2%	110%	0%	0.4	2.6	0.0	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	644	25	669	667	14	681	23	-10	13	4%	-42%	2%	0.9	2.4	0.5	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	837	21	858	843	42	885	6	21	27	1%	100%	3%	0.2	3.7	0.9	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	351	4	355	345	10	356	-6	7	1	-2%	172%	0%	0.3	2.5	0.1	1	1	1
J16	N11 Junction 7 - East Side Roundabout	Cal	667	12	679	650	3	653	-17	-9	-26	-3%	-74%	-4%	0.7	3.3	1.0	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	239	4	243	256	0	256	17	-4	13	7%	-99%	5%	1.1	2.7	0.8	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	94	0	94	86	0	86	-8	0	-8	-9%	-	-9%	0.9	-	0.9	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	168	0	168	163	0	163	-5	0	-5	-3%	-	-3%	0.4	-	0.4	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	334	0	334	339	2	341	5	2	7	1%	-	2%	0.3	2.2	0.4	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	97	0	97	97	0	97	0	0	0	0%	-	0%	0.0	-	0.0	1	1	1
J17	Vevay Rd (R761)/Putland Rd	Cal	381	5	386	365	9	374	-16	4	-12	-4%	78%	-3%	0.8	1.5	0.6	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	473	4	477	445	9	453	-28	5	-23	-6%	128%	-5%	1.3	1.9	1.1	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	182	4	186	184	0	184	2	-4	-1	1%	-99%	-1%	0.2	2.7	0.1	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	356	2	358	363	2	365	7	1	8	2%	30%	2%	0.4	0.4	0.4	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	121	5	126	124	0	124	3	-4	-2	2%	-93%	-1%	0.3	2.8	0.1	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	162	0	162	153	0	153	-9	0	-9	-5%	-	-5%	0.7	-	0.7	1	1	1
J18	Vevay Rd (R761)/Boghall Rd	Cal	164	4	168	145	0	146	-19	-3	-22	-11%	-91%	-13%	1.5	2.4	1.8	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	289	2	291	275	9	284	-14	7	-7	-5%	371%	-3%	0.9	3.0	0.4	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	338	4	342	337	0	337	-1	-4	-5	0%	-99%	-1%	0.1	2.7	0.3	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	204	0	204	209	3	212	5	3	8	3%	-	4%	0.4	2.4	0.6	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	230	13	243	249	12	261	19	-2	18	8%	-11%	7%	1.3	0.4	1.1	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	271	7	278	276	0	276	5	-7	-1	2%	-99%	0%	0.3	3.6	0.1	1	1	1
J19	Vevay Rd (R761)/Southern Cross Rd (R768)	Cal	377	2	379	359	2	360	-18	0	-19	-5%	-16%	-5%	1.0	0.2	1.0	1	1	1
J2	M11 Junction 5 - Dublin Rd Roudabout	Cal	637	18	655	744	27	771	107	9	116	17%	50%	18%	4.1	1.9	4.3	0	1	0
J2	M11 Junction 5 - Dublin Rd Roudabout	Cal	698	16	714	702	28	750	4	12	36	1%	75%	5%	0.2	2.6	1.3	1	1	1
J2	M11 Junction 5 - Dublin Rd Roudabout	Cal	536	10	546	511	14	525	-25	4	-21	-5%	43%	-4%	1.1	1.2	0.9	1	1	1
J2	M11 Junction 5 - Dublin Rd Roudabout	Cal	249	10	259	263	3	266	14	-6	8	6%	-67%	3%	0.9	2.5	0.5	1	1	1
J2	M11 Junction 5 - Dublin Rd Roudabout	Cal	896	14	910	848	59	907	-48	44	-3	-5%	308%	0%	1.6	7.3	0.1	1	1	1
J20	N11- Jameson's Corner	Cal	20	2	22	19	0	20	-1	-2	-2	-3%	-91%	-10%	0.1	1.7	0.5	1	1	1
J20	N11- Jameson's Corner	Cal	23	0	23	24	0	24	1	0	1	3%	-	3%	0.1	-	0.1	1	1	1
J20	N11- Jameson's Corner	Cal	118	0	118	120	1	121	2	1	3	2%	-	2%	0.2	1.2	0.3	1	1	1
J20	N11- Jameson's Corner	Cal	7	0	7	7	0	8	0	0	1	2%	-	9%	0.1	0.9	0.2	1	1	1
J21	N11 Junction 8 - West Side Roundabout	Cal	50	9	59	67	3	70	17	-6	11	34%	-67%	19%	2.2	2.4	1.4	1	1	1

PM PEAK

Site	Road Name	CalVal	Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
			LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
J21	N11 Junction 8 - West Side Roundabout	Cal	187	6	193	193	1	193	6	-5	1	3%	-87%	0%	0.4	2.8	0.0	1	1	1
J21	N11 Junction 8 - West Side Roundabout	Cal	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	289	19	308	284	6	285	-5	-14	-23	-2%	-71%	-8%	0.3	3.9	1.3	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	165	0	165	152	4	156	-13	4	-9	-8%	-	-5%	1.0	2.8	0.7	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	10	0	10	2	0	2	-8	0	-8	-84%	-	-81%	3.5	0.8	3.3	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	9	0	9	9	0	9	0	0	0	2%	-	2%	0.1	0.2	0.1	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	175	0	175	176	4	180	1	4	5	1%	-	3%	0.1	2.9	0.4	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	20	2	22	20	0	20	0	-2	-2	-1%	-99%	-10%	0.1	1.9	0.5	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	15	0	15	15	0	15	0	0	0	-1%	-	-1%	0.0	0.2	0.0	1	1	1
J22	N11 Junction 8 - East Side Roundabout	Cal	283	17	300	285	3	286	2	-14	-15	1%	-84%	-5%	0.1	4.6	0.9	1	1	1
J23	N11 - Quill Rd	Val	7	0	7	0	0	0	-7	0	-7	-100%	-	-100%	3.7	-	3.7	1	1	1
J23	N11 - Quill Rd	Val	9	0	9	9	0	9	0	0	0	1%	-	1%	0.0	0.3	0.0	1	1	1
J23	N11 - Quill Rd	Val	1390	108	1498	1503	139	1642	113	31	145	8%	29%	10%	3.0	2.8	3.6	1	1	1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	7	0	7	6	0	6	-1	0	-1	-17%	-	-16%	0.5	0.2	0.4	1	1	1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	5	0	5	5	0	5	0	0	0	1%	-	1%	0.0	-	0.0	1	1	1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	2	0	2	14	0	14	12	0	12	584%	-	586%	4.2	0.3	4.2	1	1	1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	62	0	62	74	3	78	12	3	16	20%	-	25%	1.5	2.6	1.9	1	1	1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	5	0	5	5	0	5	0	0	0	-1%	-	-1%	0.0	-	0.0	1	1	1
J24	N11 Junction 9 - Kilmurry South/Ballydongh Road Junction	Cal	59	3	62	64	3	66	5	0	4	8%	-12%	7%	0.6	0.2	0.6	1	1	1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	19	3	22	24	2	25	5	-1	4	26%	-48%	16%	1.1	0.9	0.7	1	1	1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	25	0	25	25	0	25	0	0	0	0%	-	0%	0.0	0.2	0.0	1	1	1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	30	0	30	34	3	36	4	3	6	12%	-	21%	0.6	2.3	1.1	1	1	1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	38	0	38	38	0	38	0	0	0	0%	-	0%	0.0	0.7	0.0	1	1	1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	43	2	45	46	1	46	3	-1	1	6%	-65%	3%	0.4	1.1	0.2	1	1	1
J25	N11 Junction 9 - Kilmurry South T Junction	Cal	45	0	45	45	1	46	0	1	1	0%	-	2%	0.0	1.4	0.1	1	1	1
J26	N11 Junction 9 - Ballydongh Road Y Junction	Cal	67	0	67	88	1	89	21	1	22	31%	-	33%	2.4	1.6	2.5	1	1	1
J26	N11 Junction 9 - Ballydongh Road Y Junction	Cal	69	3	72	59	3	62	-10	0	-10	-14%	-6%	-14%	1.2	0.1	1.2	1	1	1
J26	N11 Junction 9 - Ballydongh Road Y Junction	Cal	2917	76	2993	3116	118	3254	199	42	261	7%	55%	9%	3.6	4.3	4.7	1	1	1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	295	0	295	255	4	259	-40	4	-36	-14%	-	-12%	2.4	2.8	2.2	1	1	1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	254	2	256	249	3	252	-5	1	-4	-2%	60%	-2%	0.3	0.7	0.2	1	1	1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	285	7	292	293	8	301	8	1	9	3%	15%	3%	0.5	0.4	0.5	1	1	1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	52	0	52	53	0	53	1	0	1	2%	-	2%	0.1	-	0.1	1	1	1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	203	0	203	210	4	214	7	4	11	3%	-	6%	0.5	2.9	0.8	1	1	1
J27	Rathdown Rd (R762)/Kindlestown Rd (R761)	Cal	26	0	26	27	0	27	1	0	1	6%	-	6%	0.3	-	0.3	1	1	1
J28	N11 Junction 10 - West Side Y Junction	Cal	52	2	54	53	0	53	1	-2	-1	1%	-100%	-2%	0.1	1.9	0.2	1	1	1
J28	N11 Junction 10 - West Side Y Junction	Cal	193	0	193	210	0	210	17	0	17	9%	-	9%	1.2	-	1.2	1	1	1
J29	N11 Junction 10 - Glen Road Roundabout	Cal	50	0	50	51	0	51	1	0	1	3%	-	3%	0.2	-	0.2	1	1	1
J29	N11 Junction 10 - Glen Road Roundabout	Cal	296	6	302	325	11	336	29	5	35	10%	94%	12%	1.7	1.8	1.9	1	1	1
J29	N11 Junction 10 - Glen Road Roundabout	Cal	215	0	215	232	1	233	17	1	18	8%	-	8%	1.1	1.5	1.2	1	1	1
J29	N11 Junction 10 - Glen Road Roundabout	Cal	45	0	45	45	0	45	0	0	0	0%	-	1%	0.0	0.5	0.0	1	1	1
J3	M11 Junction 5 - Old Connaught Ave/M11 NB Off-ramp Junction	Cal	240	2	242	173	1	174	-67	-1	-68	-28%	-48%	-28%	4.6	0.8	4.7	1	1	1
J3	M11 Junction 5 - Old Connaught Ave/M11 NB Off-ramp Junction	Cal	99	6	105	114	0	115	15	-5	10	15%	-92%	9%	1.5	3.0	0.9	1	1	1
J3	M11 Junction 5 - Old Connaught Ave/M11 NB Off-ramp Junction	Cal	117	9	126	149	3	152	32	-6	26	28%	-71%	21%	2.8	2.6	2.2	1	1	1
J3	M11 Junction 5 - Old Connaught Ave/M11 NB Off-ramp Junction	Cal	29	3	32	32	0	32	3	-3	0	9%	-98%	-1%	0.5	2.3	0.1	1	1	1
J30	N11 Junction 10 - East Side Y Junction	Cal	1	0	1	0	0	0	-1	0	-1	-99%	-	-99%	1.4	-	1.4	1	1	1
J30	N11 Junction 10 - East Side Y Junction	Cal	60	0	60	63	1	64	3	1	4	5%	-	7%	0.4	1.6	0.6	1	1	1
J30	N11 Junction 10 - East Side Y Junction	Cal	2624	101	2725	2805	130	2934	181	29	210	7%	28%	8%	3.5	2.7	3.9	1	1	1
J31	Glen Rd (R762)/Bellevue Court	Cal	47	0	47	81	0	81	34	0	34	72%	-	72%	4.2	0.4	4.2	1	1	1
J31	Glen Rd (R762)/Bellevue Court	Cal	14	0	14	16	0	16	2	0	2	13%	-	14%	0.5	0.5	0.5	1	1	1
J31	Glen Rd (R762)/Bellevue Court	Cal	48	0	48	44	1	45	-4	1	-3	-8%	-	-6%	0.6	1.5	0.4	1	1	1
J31	Glen Rd (R762)/Bellevue Court	Cal	15	0	15	16	0	17	1	0	2	10%	-	11%	0.4	0.4	0.4	1	1	1
J31	Glen Rd (R762)/Bellevue Court	Cal	195	0	195	216	1	217	21	1	22	11%	-	11%	1.5	1.4	1.5	1	1	1
J31	Glen Rd (R762)/Bellevue Court	Cal	342	2	344	360	11	371	18	9	27	5%	479%	8%	1.0	3.6	1.4	1	1	1
J32	R762/Priory Rd	Val	365	2	367	399	1	401	34	0	34	9%	-22%	9%	1.7	0.3	1.7	1	1	1
J32	R762/Priory Rd	Val	25	0	25	41	10	51	16	10	26	66%	-	105%	2.9	4.4	4.2	1	1	1
J32	R762/Priory Rd	Val	231	0	231	247	2	248	16	2	17	7%	-	8%	1.0	1.9	1.1	1	1	1
J32	R762/Priory Rd	Val	75	0	75	75	0	75	0	0	0	0%	-	0%	0.0	0.2	0.0	1	1	1

PM PEAK

Site	Road Name	CalVal	Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
			LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
J32	R762/Priory Rd	Val	11	0	11	14	0	14	3	0	3	24%	-	25%	0.7	0.5	0.8	1	1	1
J32	R762/Priory Rd	Val	24	0	24	24	0	24	0	0	0	1%	-	2%	0.0	0.7	0.1	1	1	1
J33	Church Rd (R762)/Convent Rd	Cal	15	0	15	15	0	15	0	0	0	-1%	-	-1%	0.0	0.2	0.0	1	1	1
J33	Church Rd (R762)/Convent Rd	Cal	86	0	86	100	1	101	14	1	15	16%	-	17%	1.4	1.4	1.5	1	1	1
J33	Church Rd (R762)/Convent Rd	Cal	21	0	21	21	0	21	0	0	0	0%	-	0%	0.0	0.2	0.0	1	1	1
J33	Church Rd (R762)/Convent Rd	Cal	212	0	212	222	1	223	10	1	11	5%	-	5%	0.7	1.3	0.7	1	1	1
J33	Church Rd (R762)/Convent Rd	Cal	122	0	122	124	0	125	2	0	3	2%	-	2%	0.2	1.0	0.3	1	1	1
J33	Church Rd (R762)/Convent Rd	Cal	264	2	266	299	1	300	35	-1	34	13%	-33%	13%	2.1	0.5	2.0	1	1	1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	310	2	312	302	2	304	-8	1	-8	-3%	26%	-3%	0.5	0.3	0.4	1	1	1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	91	0	91	80	0	80	-11	0	-11	-12%	-	-12%	1.2	-	1.2	1	1	1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	309	0	309	315	3	318	6	3	9	2%	-	3%	0.3	2.3	0.5	1	1	1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	246	0	246	250	1	251	4	1	5	2%	-	2%	0.3	1.4	0.3	1	1	1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	102	0	102	102	0	102	0	0	0	0%	-	0%	0.0	0.1	0.0	1	1	1
J34	Roundabout - Delgany Rd (R762)/Mill Rd	Cal	228	2	230	254	1	255	26	-1	25	11%	-45%	11%	1.7	0.7	1.6	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	260	0	260	293	1	294	33	1	34	13%	-	13%	2.0	1.4	2.0	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	278	4	282	263	2	266	-15	-1	-16	-5%	-35%	-6%	0.9	0.8	1.0	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	289	0	289	296	0	296	7	0	7	2%	-	2%	0.4	0.7	0.4	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	109	0	109	109	0	109	0	0	0	0%	-	0%	0.0	0.5	0.0	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	270	0	270	270	3	273	0	3	3	0%	-	1%	0.0	2.5	0.2	1	1	1
J35	Roundabout - Killncarig Rd (R761)/Mill Rd (R762)	Val	55	0	55	55	0	55	0	0	0	-1%	-	0%	0.1	0.6	0.0	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	681	2	683	682	4	686	1	2	4	0%	129%	1%	0.0	1.4	0.1	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	396	3	399	398	5	403	2	2	5	1%	72%	1%	0.1	1.1	0.2	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	269	0	269	293	1	294	24	1	25	9%	-	9%	1.4	1.3	1.5	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	462	3	465	494	6	500	32	3	35	7%	99%	7%	1.5	1.4	1.6	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	549	2	551	544	4	549	-5	2	-2	-1%	129%	0%	0.2	1.4	0.1	1	1	1
J36	Roundabout - Mill Rd (R762)/R774	Cal	335	0	335	336	0	336	1	0	1	0%	-	0%	0.0	0.1	0.0	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	199	9	208	200	0	201	1	-8	-7	1%	-95%	-3%	0.1	3.8	0.5	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	276	26	302	302	17	319	26	-9	17	9%	-33%	6%	1.5	1.8	1.0	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	304	7	311	311	12	323	7	5	13	2%	80%	4%	0.4	1.7	0.7	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	343	24	367	375	22	397	32	-2	30	9%	-9%	8%	1.7	0.5	1.5	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	133	2	135	135	12	147	2	10	12	1%	517%	9%	0.2	3.8	1.0	1	1	1
J37	N11 Junction 11 - East Side Roundabout	Cal	95	2	97	97	5	102	2	3	5	3%	141%	5%	0.2	1.5	0.5	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	761	30	791	837	11	848	76	-18	58	10%	-61%	7%	2.7	4.0	2.0	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	675	28	703	716	21	737	41	-7	34	6%	-23%	5%	1.5	1.3	1.3	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	791	41	832	864	12	876	73	-29	43	9%	-70%	5%	2.5	5.6	1.5	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	727	36	763	764	22	786	37	-13	24	5%	-38%	3%	1.4	2.5	0.9	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	39	10	49	39	0	39	0	-10	-9	0%	-100%	-20%	0.0	4.4	1.4	1	1	1
J38	N11 Junction 11 - West Side Roundabout	Cal	17	14	31	17	0	17	0	-13	-13	0%	-100%	-44%	0.0	5.2	2.8	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	360	4	364	352	3	355	-8	-1	-8	-2%	-18%	-2%	0.4	0.4	0.4	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	593	8	601	600	14	614	7	6	13	1%	80%	2%	0.3	1.9	0.5	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	484	20	504	507	17	524	23	-3	20	5%	-15%	4%	1.0	0.7	0.9	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	793	26	819	837	21	858	44	-5	39	6%	-18%	5%	1.5	1.0	1.4	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	331	0	331	337	4	341	6	4	10	2%	-	3%	0.3	2.8	0.5	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	539	6	545	559	12	571	20	7	27	4%	114%	5%	0.9	2.2	1.1	1	1	1
J39	Roundabout - Kilcoole Rd (R761)/R774	Cal	681	21	702	684	18	702	3	-3	0	1%	-15%	0%	0.1	0.7	0.0	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	138	0	138	101	0	101	-37	0	-37	-27%	-	-27%	3.4	0.2	3.4	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	126	0	126	254	0	254	128	0	128	102%	-	102%	9.3	0.2	9.3	0	1	0
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	51	0	51	52	0	52	1	0	1	2%	-	2%	0.1	0.5	0.1	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	86	12	98	129	3	131	43	-9	34	50%	-78%	35%	4.1	3.4	3.2	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	34	0	34	25	0	25	-10	0	-9	-28%	-	-28%	1.8	0.2	1.8	1	1	1
J4	M11 Junction 5 - Old Connaught Ave/Thornhill Road Junction	Cal	72	2	74	58	1	59	-14	-1	-15	-20%	-51%	-20%	1.7	0.8	1.8	1	1	1
J40	N11 Junction 12 - Ballyronan Road Roundabout	Cal	442	11	453	491	4	494	49	-7	42	11%	-63%	9%	2.2	2.5	1.9	1	1	1
J40	N11 Junction 12 - Ballyronan Road Roundabout	Cal	58	0	58	39	0	39	-19	0	-19	-32%	-	-32%	2.7	0.5	2.7	1	1	1
J40	N11 Junction 12 - Ballyronan Road Roundabout	Cal	14	0	14	15	0	15	1	0	1	6%	-	6%	0.2	-	0.2	1	1	1
J40	N11 Junction 12 - Ballyronan Road Roundabout	Cal	70	2	72	97	0	97	27	-2	25	39%	-91%	35%	3.0	1.7	2.8	1	1	1
J40	N11 Junction 12 - Ballyronan Road Roundabout	Cal	444	9	453	448	4	451	4	-5	-1	1%	-55%	0%	0.2	1.9	0.1	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	29	0	29	29	0	29	0	0	0	-1%	-	-1%	0.1	0.3	0.1	1	1	1

PM PEAK

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			LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	447	9	456	448	4	451	1	-5	-4	0%	-55%	-1%	0.0	1.9	0.2	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	39	0	39	39	0	39	0	0	0	-1%	-	-1%	0.0	-	0.0	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	65	0	65	70	0	70	5	0	5	7%	-	7%	0.6	0.3	0.6	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	14	0	14	15	0	15	1	0	1	6%	-	6%	0.2	-	0.2	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	48	0	48	50	0	50	2	0	2	4%	-	4%	0.3	-	0.3	1	1	1
J41	N11 Junction 12 - Garden Village Court Roundabout	Val	460	9	469	463	4	467	3	-5	-2	1%	-55%	0%	0.1	1.9	0.1	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	20	3	23	22	0	22	2	-3	-1	8%	-99%	-6%	0.3	2.4	0.3	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	336	2	338	336	6	342	0	5	5	0%	237%	1%	0.0	2.2	0.2	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	459	9	468	463	4	467	4	-5	-1	1%	-55%	0%	0.2	1.9	0.0	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	322	2	324	325	6	331	3	4	7	1%	235%	2%	0.2	2.2	0.4	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	70	0	70	70	0	70	0	0	0	0%	-	0%	0.0	0.3	0.0	1	1	1
J42	N11 Junction 12 - West Side Roundabout	Cal	395	12	407	403	4	407	8	-8	1	2%	-67%	0%	0.4	2.8	0.0	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	247	6	253	242	4	246	-5	-2	-6	-2%	-32%	-3%	0.3	0.8	0.4	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	143	5	148	147	2	150	4	-3	2	3%	-52%	1%	0.4	1.3	0.1	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	245	19	264	261	5	265	16	-15	1	6%	-76%	0%	1.0	4.3	0.1	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	9	0	9	9	0	10	0	0	1	5%	-	8%	0.2	0.7	0.2	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	148	5	153	152	2	154	4	-3	1	3%	-61%	1%	0.3	1.6	0.1	1	1	1
J43	Newcastle Rd (R761)/Woodstock Rd	Cal	8	0	8	21	0	21	13	0	13	167%	-	168%	3.5	0.4	3.5	1	1	1
J44	Main St (R772)/R765	Cal	300	7	307	309	5	314	9	-2	7	3%	-29%	2%	0.5	0.8	0.4	1	1	1
J44	Main St (R772)/R765	Cal	122	0	122	98	0	98	-24	0	-24	-20%	-	-20%	2.3	0.7	2.3	1	1	1
J44	Main St (R772)/R765	Cal	254	3	257	258	5	262	4	2	6	1%	66%	2%	0.2	1.0	0.3	1	1	1
J44	Main St (R772)/R765	Cal	20	0	20	20	0	20	0	0	0	1%	-	1%	0.0	0.3	0.0	1	1	1
J44	Main St (R772)/R765	Cal	74	0	74	74	0	75	0	0	1	1%	-	1%	0.0	0.9	0.1	1	1	1
J44	Main St (R772)/R765	Cal	8	0	8	8	0	8	0	0	0	0%	-	1%	0.0	0.5	0.0	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	43	0	43	44	2	46	1	2	3	3%	-	7%	0.2	1.8	0.4	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	264	9	273	273	3	276	9	-5	3	3%	-63%	1%	0.5	2.2	0.2	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	48	0	48	49	2	51	1	2	3	1%	-	5%	0.1	1.9	0.4	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	73	3	76	75	1	76	2	-2	0	3%	-74%	0%	0.3	1.6	0.0	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	224	3	227	229	3	232	5	0	5	2%	5%	2%	0.3	0.1	0.3	1	1	1
J45	Main St (R772)/Woodstock Rd	Val	65	0	65	66	0	67	1	0	2	2%	-	3%	0.2	1.0	0.2	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	103	4	107	108	2	110	5	-2	4	5%	-46%	3%	0.5	1.0	0.4	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	95	0	95	96	2	99	1	2	4	1%	-	4%	0.1	2.2	0.4	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	189	8	197	195	2	197	6	-6	0	3%	-76%	0%	0.4	2.7	0.0	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	49	2	51	51	1	52	2	-1	1	4%	-48%	2%	0.3	0.8	0.1	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	7	0	7	7	0	7	0	0	0	0%	-	0%	0.0	-	0.0	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	10	0	10	10	0	10	0	0	0	-3%	-	-3%	0.1	-	0.1	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	173	5	178	178	2	179	5	-3	1	3%	-64%	1%	0.3	1.7	0.1	1	1	1
J46	Main St (R772)/Rossmore Court	Cal	18	0	18	18	0	18	0	0	0	0%	-	0%	0.0	-	0.0	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	69	2	71	71	5	77	2	3	6	4%	174%	8%	0.3	1.8	0.7	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	205	5	210	213	12	225	8	7	15	4%	155%	7%	0.6	2.6	1.1	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	225	11	236	235	12	247	10	2	11	4%	15%	5%	0.7	0.5	0.7	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	73	2	75	75	2	77	2	0	2	3%	-11%	3%	0.3	0.1	0.3	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	86	4	90	88	5	93	2	2	4	2%	42%	4%	0.2	0.7	0.4	1	1	1
J47	N11 Junction 13 - East Side Roundabout	Cal	76	6	82	81	1	82	5	-4	0	6%	-75%	0%	0.5	2.3	0.0	1	1	1
J48	N11 Junction 13 - West Side T Junction	Cal	38	0	38	38	0	38	0	0	0	0%	-	1%	0.0	0.8	0.1	1	1	1
J48	N11 Junction 13 - West Side T Junction	Cal	11	0	11	33	1	34	22	1	23	203%	-	209%	4.8	1.1	4.9	1	1	1
J48	N11 Junction 13 - West Side T Junction	Cal	41	0	41	70	7	77	29	7	36	70%	-	88%	3.9	3.8	4.7	1	1	1
J48	N11 Junction 13 - West Side T Junction	Cal	134	14	148	154	10	163	20	-4	16	15%	-28%	11%	1.6	1.1	1.3	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	125	6	131	127	0	127	2	-6	-4	1%	-99%	-3%	0.1	3.4	0.4	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	101	11	112	76	0	76	-25	-11	-35	-24%	-100%	-32%	2.6	4.6	3.6	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	21	2	23	11	0	11	-10	-2	-12	-49%	-98%	-53%	2.6	1.9	2.9	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	103	9	112	92	0	92	-11	-9	-20	-11%	-100%	-17%	1.1	4.2	1.9	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	20	0	20	22	0	22	2	0	2	12%	-	12%	0.5	0.1	0.5	1	1	1
J49	N11 Junction 14 - East Side Roundabout	Cal	128	6	134	131	0	131	3	-6	-3	2%	-99%	-2%	0.2	3.4	0.3	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	2	0	2	2	0	2	0	0	0	11%	-	20%	0.2	0.6	0.3	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	547	9	556	527	22	549	-20	13	-7	-4%	153%	-1%	0.9	3.4	0.3	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	82	0	82	137	2	138	55	2	56	67%	-	69%	5.2	1.8	5.4	1	1	1

PM PEAK

Site	Road Name	CalVal	Observed Flow			Modelled Flow			Difference Num.			Difference %			GEH			IndFlows		
			LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL	LV	HV	TOTAL
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	4	0	4	4	0	5	0	0	1	11%	-	14%	0.2	0.5	0.3	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	0	0	0	1	0	1	1	0	1	-	-	-	1.7	0.2	1.7	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	1	0	1	1	0	1	0	0	0	13%	-	20%	0.1	0.4	0.2	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	565	2	567	564	17	582	-1	15	15	0%	768%	3%	0.0	4.8	0.6	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	1	0	1	1	0	1	0	0	0	7%	-	9%	0.1	0.2	0.1	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	117	0	117	0	0	0	-117	0	-117	-100%	-	-100%	15.3	-	15.3	0	1	0
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	66	0	66	72	2	75	6	2	9	10%	-	13%	0.8	2.2	1.1	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	1	0	1	1	0	1	0	0	0	9%	-	15%	0.1	0.3	0.1	1	1	1
J5	Dublin Rd (R761)/Upper Dargle Rd	Val	79	0	79	47	1	48	-32	1	-31	-41%	-	-39%	4.0	1.5	3.9	1	1	1
J50	N11 Junction 14 - West Side Roundabout	Val	62	14	76	62	1	62	0	-12	-13	1%	-92%	-17%	0.0	4.6	1.6	1	1	1
J50	N11 Junction 14 - West Side Roundabout	Val	75	16	91	77	2	77	2	-14	-15	2%	-88%	-16%	0.2	4.7	1.6	1	1	1
J50	N11 Junction 14 - West Side Roundabout	Val	169	25	194	149	10	149	-20	-15	-45	-12%	-60%	-23%	1.6	3.6	3.5	1	1	1
J50	N11 Junction 14 - West Side Roundabout	Val	180	19	199	173	3	173	-7	-16	-26	-4%	-84%	-13%	0.5	4.9	1.9	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	101	2	103	99	2	100	-2	0	-3	-2%	-10%	-3%	0.2	0.1	0.3	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	389	5	394	368	12	379	-21	7	-14	-5%	144%	-4%	1.1	2.4	0.7	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	99	0	99	117	4	121	18	4	22	18%	-	23%	1.8	2.9	2.1	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	367	2	369	375	14	389	8	12	20	2%	624%	5%	0.4	4.2	1.0	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	87	0	87	86	1	87	-1	1	0	-1%	-	0%	0.1	1.4	0.0	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	36	0	36	39	0	39	3	0	3	9%	-	9%	0.5	0.1	0.5	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	115	0	115	114	2	116	-1	2	1	-1%	-	1%	0.1	2.0	0.1	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	85	0	85	83	0	83	-2	0	-2	-3%	-	-3%	0.2	-	0.2	1	1	1
J6	Main St (R761)/Herbert Rd/Quinsborough Rd	Cal	17	0	17	18	0	18	1	0	1	8%	-	8%	0.3	-	0.3	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	282	2	284	268	10	277	-14	8	-6	-5%	402%	-2%	0.8	3.2	0.4	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	277	4	281	291	3	294	14	-1	13	5%	-17%	5%	0.8	0.3	0.8	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	167	2	169	172	6	178	5	4	9	3%	216%	5%	0.4	2.1	0.7	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	17	0	17	16	0	17	-1	0	0	-3%	-	-2%	0.1	0.8	0.1	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	182	5	187	183	4	188	1	0	1	1%	-7%	1%	0.1	0.1	0.1	1	1	1
J7	Main St (R761)/Killarney Rd (R767)/Vevay Rd (R761)	Val	12	0	12	5	0	5	-7	0	-7	-58%	-	-58%	2.4	-	2.4	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	339	5	344	346	12	358	7	7	14	2%	145%	4%	0.4	2.4	0.8	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	314	5	319	323	6	329	9	1	11	3%	23%	3%	0.5	0.5	0.6	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	115	0	115	129	2	131	14	2	16	12%	-	14%	1.3	1.9	1.4	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	657	17	674	834	3	837	177	-14	162	27%	-83%	24%	6.5	4.5	5.9	0	1	0
J8	M11 Junction 6 - East Side Roundabout	Cal	94	2	96	97	1	98	3	-1	2	3%	-34%	2%	0.3	0.5	0.2	1	1	1
J8	M11 Junction 6 - East Side Roundabout	Cal	115	23	138	131	4	135	16	-19	-3	14%	-84%	-2%	1.5	5.3	0.2	1	1	1
J9	M11 Junction 6 - West Side Roundabout	Cal	115	23	138	131	4	135	16	-19	-3	14%	-84%	-2%	1.5	5.3	0.2	1	1	1
J9	M11 Junction 6 - West Side Roundabout	Cal	283	31	314	464	0	464	181	-31	150	64%	-100%	48%	9.3	7.8	7.6	0	1	0
J9	M11 Junction 6 - West Side Roundabout	Cal	659	17	676	834	3	837	175	-14	160	26%	-83%	24%	6.4	4.5	5.8	0	1	0
J9	M11 Junction 6 - West Side Roundabout	Cal	37	32	69	31	0	31	-6	-32	-37	-15%	-100%	-54%	0.9	8.0	5.3	1	1	1
T1	M50 Between Jn16 Cherrywood and Jn17 M50/M11, Shankill, Co. Dublin	Val	1634	85	1719	1693	121	1814	59	36	95	4%	42%	6%	1.5	3.5	2.3	1	1	1
T1	M50 Between Jn16 Cherrywood and Jn17 M50/M11, Shankill, Co. Dublin	Val	1280	108	1387	1254	156	1410	-25	48	23	-2%	45%	2%	0.7	4.2	0.6	1	1	1

Appendix C

Calibration and Validation Counts (Micro-simulation)

Appendix C

Calibration and Validation Counts - Micro-Simulation

				0708AM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_AM	Dif #	Dif %	IndFlows	GEH
1	O_1_A	JTC	Cal	641	631	-10	-2%	✓	0.40	59	67	8	14%	✓	1.01	700	698	-2	0%	✓	0.08
2	O_1_B	JTC	Cal	480	502	22	5%	✓	0.99	24	24	0	0%	✓	0.00	504	526	22	4%	✓	0.97
3	O_1_C	JTC	Cal	1622	1,410	-212	-13%	✓	5.44	46	36	-10	-22%	✓	1.56	1668	1446	-222	-13%	✓	5.63
4	O_1_D	JTC	Cal	71	89	18	25%	✓	2.01	0	0	0	0%	✓	0.00	71	89	18	25%	✓	2.01
5	D_1_A	JTC	Cal	2018	1,897	-121	-6%	✓	2.73	73	60	-13	-18%	✓	1.59	2091	1957	-134	-6%	✓	2.98
6	D_1_B	JTC	Cal	219	223	4	2%	✓	0.27	18	13	-5	-28%	✓	1.27	237	236	-1	0%	✓	0.07
7	D_1_C	JTC	Cal	441	395	-46	-10%	✓	2.25	37	53	16	43%	✓	2.39	478	448	-30	-6%	✓	1.39
8	D_1_D	JTC	Cal	136	118	-18	-13%	✓	1.60	1	1	0	0%	✓	0.00	137	119	-18	-13%	✓	1.59
9	O_2_A	JTC	Cal	211	234	23	11%	✓	1.54	16	6	-10	-63%	✓	3.02	227	240	13	6%	✓	0.85
10	O_2_B	JTC	Val	1013	1,086	73	7%	✓	2.25	34	37	3	9%	✓	0.50	1047	1123	76	7%	✓	2.31
11	O_2_C	JTC	Val	293	344	51	17%	✓	2.86	30	31	1	3%	✓	0.18	323	375	52	16%	✓	2.78
12	D_2_A	JTC	Val	257	321	64	25%	✓	3.76	33	26	-7	-21%	✓	1.29	290	347	57	20%	✓	3.19
13	D_2_B	JTC	Val	367	444	77	21%	✓	3.82	37	29	-8	-22%	✓	1.39	404	473	69	17%	✓	3.30
15	O_3_A	JTC	Cal	97	75	-22	-23%	✓	2.37	4	11	7	175%	✓	2.56	101	86	-15	-15%	✓	1.55
16	O_3_B	JTC	Cal	136	214	78	57%	✓	5.90	7	6	-1	-14%	✓	0.39	143	220	77	54%	✓	5.72
17	O_3_C	JTC	Cal	51	39	-12	-24%	✓	1.79	8	14	6	75%	✓	1.81	59	53	-6	-10%	✓	0.80
18	D_3_A	JTC	Cal	145	151	6	4%	✓	0.49	13	19	6	46%	✓	1.50	158	170	12	8%	✓	0.94
19	D_3_C	JTC	Cal	139	177	38	27%	✓	3.02	6	12	6	100%	✓	2.00	145	189	44	30%	✓	3.40
20	O_8_A	JTC	Cal	221	215	-6	-3%	✓	0.41	8	13	5	63%	✓	1.54	229	228	-1	0%	✓	0.07
21	O_8_B	JTC	Cal	79	81	2	3%	✓	0.22	3	8	5	167%	✓	2.13	82	89	7	9%	✓	0.76
22	O_8_C	JTC	Cal	179	233	54	30%	✓	3.76	23	45	22	96%	✓	3.77	202	278	76	38%	✓	4.91
23	O_8_D	JTC	Cal	56	81	25	45%	✓	3.02	12	4	-8	-67%	✓	2.83	68	85	17	25%	✓	1.94
24	D_8_A	JTC	Cal	152	174	22	14%	✓	1.72	1	15	14	1400%	✓	4.95	153	189	36	24%	✓	2.75
25	D_8_B	JTC	Cal	53	59	6	11%	✓	0.80	1	1	0	0%	✓	0.00	54	60	6	11%	✓	0.79
26	D_8_C	JTC	Cal	213	231	18	8%	✓	1.21	16	18	2	13%	✓	0.49	229	249	20	9%	✓	1.29
27	D_8_D	JTC	Cal	117	146	29	25%	✓	2.53	28	36	8	29%	✓	1.41	145	182	37	26%	✓	2.89
28	O_9_B	JTC	Cal	211	232	21	10%	✓	1.41	16	18	2	13%	✓	0.49	227	250	23	10%	✓	1.49
29	O_9_C	JTC	Cal	180	243	63	35%	✓	4.33	19	19	0	0%	✓	0.00	199	262	63	32%	✓	4.15
30	O_9_D	JTC	Cal	39	53	14	36%	✓	2.06	29	30	1	3%	✓	0.18	68	83	15	22%	✓	1.73
31	D_9_A	JTC	Cal	210	231	21	10%	✓	1.41	19	13	-6	-32%	✓	1.50	229	244	15	7%	✓	0.98
32	D_9_B	JTC	Cal	180	231	51	28%	✓	3.56	24	44	20	83%	✓	3.43	204	275	71	35%	✓	4.59
33	D_9_D	JTC	Cal	40	66	26	65%	✓	3.57	21	10	-11	-52%	✓	2.79	61	76	15	25%	✓	1.81
34	O_10_A	JTC	Cal	1220	1,164	-56	-5%	✓	1.62	143	122	-21	-15%	✓	1.82	1363	1286	-77	-6%	✓	2.12
35	O_10_B	JTC	Cal	3	0	-3	-100%	✓	2.45	0	0	0	0%	✓	0.00	3	0	-3	-100%	✓	2.45
36	O_10_C	JTC	Cal	3836	4,480	644	17%	✗	9.99	128	134	6	5%	✓	0.52	3964	4614	650	16%	✗	9.93
37	O_10_D	JTC	Cal	113	117	4	4%	✓	0.37	11	17	6	55%	✓	1.60	124	134	10	8%	✓	0.88
38	D_10_A	JTC	Cal	3858	4,473	615	16%	✗	9.53	129	114	-15	-12%	✓	1.36	3987	4587	600	15%	✗	9.16
39	D_10_B	JTC	Cal	2	0	-2	-100%	✓	2.00	0	0	0	0%	✓	0.00	2	0	-2	-100%	✓	2.00
40	D_10_C	JTC	Cal	1221	1,163	-58	-5%	✓	1.68	143	122	-21	-15%	✓	1.82	1364	1285	-79	-6%	✓	2.17
41	D_10_D	JTC	Cal	91	127	36	40%	✓	3.45	10	37	27	270%	✓	5.57	101	164	63	62%	✓	5.47
42	O_11_A	JTC	Val	1209	1,162	-47	-4%	✓	1.37	140	122	-18	-13%	✓	1.57	1349	1284	-65	-5%	✓	1.79
43	O_11_B	JTC	Val	145	124	-21	-14%	✓	1.81	3	2	-1	-33%	✓	0.63	148	126	-22	-15%	✓	1.88
44	D_11_B	JTC	Val	131	127	-4	-3%	✓	0.35	1	2	1	100%	✓	0.82	132	129	-3	-2%	✓	0.26
45	D_11_C	JTC	Val	1223	1,161	-62	-5%	✓	1.80	142	122	-20	-14%	✓	1.74	1365	1283	-82	-6%	✓	2.25
46	O_14_B	JTC	Cal	1208	1,222	14	1%	✓	0.40	29	23	-6	-21%	✓	1.18	1237	1245	8	1%	✓	0.23
47	O_14_C	JTC	Cal	207	259	52	25%	✓	3.41	11	27	16	145%	✓	3.67	218	286	68	31%	✓	4.28
48	O_14_D	JTC	Cal	59	71	12	20%	✓	1.49	0	0	0	0%	✓	0.00	59	71	12	20%	✓	1.49
49	D_14_A	JTC	Cal	1231	1,252	21	2%	✓	0.60	29	23	-6	-21%	✓	1.18	1260	1275	15	1%	✓	0.42
50	D_14_B	JTC	Cal	219	265	46	21%	✓	2.96	11	27	16	145%	✓	3.67	230	292	62	27%	✓	3.84
51	D_14_D	JTC	Cal	24	35	11	46%	✓	2.03	0	0	0	0%	✓	0.00	24	35	11	46%	✓	2.03
52	O_15_A	JTC	Cal	217	263	46	21%	✓	2.97	11	27	16	145%	✓	3.67	228	290	62	27%	✓	3.85
53	O_15_B	JTC	Cal	98	126	28	29%	✓	2.65	2	2	0	0%	✓	0.00	100	128	28	28%	✓	2.62
54	O_15_C	JTC	Cal	1178	1,184	6	1%	✓	0.17	28	24	-4	-14%	✓	0.78	1206	1208	2	0%	✓	0.06
55	D_15_A	JTC	Cal	1220	1,221	1	0%	✓	0.03	28	24	-4	-14%	✓	0.78	1248	1245	-3	0%	✓	0.08
56	D_15_B	JTC	Cal	38	54	16	42%	✓	2.36	2	20	18	900%	✓	5.43	40	74	34	85%	✓	4.50

				0708AM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_AM	Dif #	Dif %	IndFlows	GEH
57	D_15_C	JTC	Cal	235	297	62	26%	✓	3.80	11	9	-2	-18%	✓	0.63	246	306	60	24%	✓	3.61
58	O_16_A	JTC	Cal	231	297	66	29%	✓	4.06	11	9	-2	-18%	✓	0.63	242	306	64	26%	✓	3.87
59	O_16_B	JTC	Cal	609	627	18	3%	✓	0.72	15	5	-10	-67%	✓	3.16	624	632	8	1%	✓	0.32
60	O_16_C	JTC	Cal	550	618	68	12%	✓	2.81	23	18	-5	-22%	✓	1.10	573	636	63	11%	✓	2.56
61	O_16_D	JTC	Cal	392	420	28	7%	✓	1.39	37	27	-10	-27%	✓	1.77	429	447	18	4%	✓	0.86
62	D_16_A	JTC	Cal	1199	1,185	-14	-1%	✓	0.41	28	24	-4	-14%	✓	0.78	1227	1209	-18	-1%	✓	0.52
63	D_16_B	JTC	Cal	171	249	78	46%	✓	5.38	22	10	-12	-55%	✓	3.00	193	259	66	34%	✓	4.39
64	D_16_C	JTC	Cal	301	357	56	19%	✓	3.09	28	24	-4	-14%	✓	0.78	329	381	52	16%	✓	2.76
65	D_16_D	JTC	Cal	111	163	52	47%	✓	4.44	8	2	-6	-75%	✓	2.68	119	165	46	39%	✓	3.86
66	O_20_B	JTC	Val	73	78	5	7%	✓	0.58	11	3	-8	-73%	✓	3.02	84	81	-3	-4%	✓	0.33
67	O_20_C	JTC	Val	8	17	9	113%	✓	2.55	1	1	0	0%	✓	0.00	9	18	9	100%	✓	2.45
68	D_20_A	JTC	Val	66	71	5	8%	✓	0.60	7	2	-5	-71%	✓	2.36	73	73	0	0%	✓	0.00
69	D_20_B	JTC	Val	0	7	7	0%	✓	3.74	1	1	0	0%	✓	0.00	1	8	7	700%	✓	3.30
70	D_20_C	JTC	Val	15	17	2	13%	✓	0.50	4	1	-3	-75%	✓	1.90	19	18	-1	-5%	✓	0.23
71	O_21_A	JTC	Cal	17	15	-2	-12%	✓	0.50	0	0	0	0%	✓	0.00	17	15	-2	-12%	✓	0.50
72	O_21_B	JTC	Cal	101	140	39	39%	✓	3.55	10	4	-6	-60%	✓	2.27	111	144	33	30%	✓	2.92
73	O_21_C	JTC	Cal	438	440	2	0%	✓	0.10	24	51	27	113%	✓	4.41	462	491	29	6%	✓	1.33
74	D_21_A	JTC	Cal	519	519	0	0%	✓	0.00	31	50	19	61%	✓	2.99	550	569	19	3%	✓	0.80
75	D_21_C	JTC	Cal	37	77	40	108%	✓	5.30	3	4	1	33%	✓	0.53	40	81	41	103%	✓	5.27
76	O_22_A	JTC	Cal	50	87	37	74%	✓	4.47	3	4	1	33%	✓	0.53	53	91	38	72%	✓	4.48
77	O_22_D	JTC	Cal	36	31	-5	-14%	✓	0.86	1	8	7	700%	✓	3.30	37	39	2	5%	✓	0.32
78	O_22_E	JTC	Cal	85	74	-11	-13%	✓	1.23	10	4	-6	-60%	✓	2.27	95	78	-17	-18%	✓	1.83
79	D_22_A	JTC	Cal	6	7	1	17%	✓	0.39	1	0	-1	-100%	✓	1.41	7	7	0	0%	✓	0.00
80	D_22_C	JTC	Cal	37	24	-13	-35%	✓	2.35	1	8	7	700%	✓	3.30	38	32	-6	-16%	✓	1.01
81	D_22_D	JTC	Cal	135	124	-11	-8%	✓	0.97	12	8	-4	-33%	✓	1.26	147	132	-15	-10%	✓	1.27
82	O_23_B	JTC	Val	2588	2,667	79	3%	✓	1.54	101	90	-11	-11%	✓	1.13	2689	2757	68	3%	✓	1.30
83	O_23_C	JTC	Val	11	26	15	136%	✓	3.49	6	4	-2	-33%	✓	0.89	17	30	13	76%	✓	2.68
84	D_23_A	JTC	Val	2577	2,662	85	3%	✓	1.66	102	94	-8	-8%	✓	0.81	2679	2756	77	3%	✓	1.48
85	D_23_C	JTC	Val	22	26	4	18%	✓	0.82	5	0	-5	-100%	✓	3.16	27	26	-1	-4%	✓	0.19
86	O_24_A	JTC	Cal	1	5	4	400%	✓	2.31	0	0	0	0%	✓	0.00	1	5	4	400%	✓	2.31
87	O_24_B	JTC	Cal	55	49	-6	-11%	✓	0.83	2	12	10	500%	✓	3.78	57	61	4	7%	✓	0.52
88	O_24_C	JTC	Cal	59	70	11	19%	✓	1.37	3	2	-1	-33%	✓	0.63	62	72	10	16%	✓	1.22
89	D_24_A	JTC	Cal	29	37	8	28%	✓	1.39	0	8	8	0%	✓	4.00	29	45	16	55%	✓	2.63
90	D_24_B	JTC	Cal	38	41	3	8%	✓	0.48	3	2	-1	-33%	✓	0.63	41	43	2	5%	✓	0.31
91	D_24_C	JTC	Cal	48	46	-2	-4%	✓	0.29	2	4	2	100%	✓	1.15	50	50	0	0%	✓	0.00
92	O_25_A	JTC	Val	46	46	0	0%	✓	0.00	2	3	1	50%	✓	0.63	48	49	1	2%	✓	0.14
93	O_25_B	JTC	Val	48	55	7	15%	✓	0.98	2	1	-1	-50%	✓	0.82	50	56	6	12%	✓	0.82
94	O_25_C	JTC	Val	48	65	17	35%	✓	2.26	1	1	0	0%	✓	0.00	49	66	17	35%	✓	2.24
95	D_25_A	JTC	Val	61	70	9	15%	✓	1.11	3	2	-1	-33%	✓	0.63	64	72	8	13%	✓	0.97
96	D_25_B	JTC	Val	56	56	0	0%	✓	0.00	1	2	1	100%	✓	0.82	57	58	1	2%	✓	0.13
97	D_25_C	JTC	Val	25	40	15	60%	✓	2.63	1	1	0	0%	✓	0.00	26	41	15	58%	✓	2.59
98	O_26_A	JTC	Cal	778	813	35	4%	✓	1.24	103	72	-31	-30%	✓	3.31	881	885	4	0%	✓	0.13
99	O_26_B	JTC	Cal	15	37	22	147%	✓	4.31	4	1	-3	-75%	✓	1.90	19	38	19	100%	✓	3.56
100	D_26_B	JTC	Cal	19	29	10	53%	✓	2.04	2	3	1	50%	✓	0.63	21	32	11	52%	✓	2.14
101	D_26_C	JTC	Cal	774	821	47	6%	✓	1.66	105	70	-35	-33%	✓	3.74	879	891	12	1%	✓	0.40
102	O_28_B	JTC	Cal	73	86	13	18%	✓	1.46	1	0	-1	-100%	✓	1.41	74	86	12	16%	✓	1.34
103	O_28_C	JTC	Cal	317	354	37	12%	✓	2.02	4	4	0	0%	✓	0.00	321	358	37	12%	✓	2.01
104	D_28_A	JTC	Cal	317	354	37	12%	✓	2.02	4	4	0	0%	✓	0.00	321	358	37	12%	✓	2.01
105	O_29_A	JTC	Cal	321	284	-37	-12%	✓	2.13	6	4	-2	-33%	✓	0.89	327	288	-39	-12%	✓	2.22
106	O_29_B	JTC	Cal	68	98	30	44%	✓	3.29	0	0	0	0%	✓	0.00	68	98	30	44%	✓	3.29
107	O_29_C	JTC	Cal	79	140	61	77%	✓	5.83	5	3	-2	-40%	✓	1.00	84	143	59	70%	✓	5.54
108	D_29_A	JTC	Cal	135	167	32	24%	✓	2.60	2	1	-1	-50%	✓	0.82	137	168	31	23%	✓	2.51
109	D_29_B	JTC	Cal	333	355	22	7%	✓	1.19	9	6	-3	-33%	✓	1.10	342	361	19	6%	✓	1.01
110	O_30_A	JTC	Cal	715	681	-34	-5%	✓	1.29	108	67	-41	-38%	✓	4.38	823	748	-75	-9%	✓	2.68

				0708AM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_AM	Dif #	Dif %	IndFlows	GEH
111	O_30_B	JTC	Cal	21	24	3	14%	✓	0.63	6	5	-1	-17%	✓	0.43	27	29	2	7%	✓	0.38
112	D_30_B	JTC	Cal	4	32	28	700%	✓	6.60	0	2	2	0%	✓	2.00	4	34	30	750%	✓	6.88
113	D_30_C	JTC	Cal	0	6	6	0%	✓	3.46	0	1	1	0%	✓	1.41	0	7	7	0%	✓	3.74
114	D_30_D	JTC	Cal	735	690	-45	-6%	✓	1.69	114	74	-40	-35%	✓	4.13	849	764	-85	-10%	✓	2.99
117	3_W	ATC	Val	743	785	42	6%	✓	1.52	57	17	-40	-70%	✓	6.60	800	802	2	0%	✓	0.06
118	4_E	ATC	Val	279	344	66	24%	✓	3.71	55	31	-24	-44%	✓	3.66	334	375	42	12%	✓	2.20
119	5_W	ATC	Val	70	114	45	64%	✓	4.65	13	2	-11	-84%	✓	3.90	82	116	34	41%	✓	3.42
120	6_N	ATC	Val	131	214	83	63%	✓	6.29	18	6	-12	-67%	✓	3.50	150	220	71	47%	✓	5.19
121	7_E	ATC	Val	73	81	8	11%	✓	0.93	18	4	-14	-78%	✓	4.29	91	85	-6	-7%	✓	0.66
122	8_W	ATC	Val	137	146	9	7%	✓	0.77	27	36	9	35%	✓	1.67	164	182	19	11%	✓	1.41
123	9_N	ATC	Val	193	230	37	19%	✓	2.53	20	13	-7	-33%	✓	1.61	213	243	30	14%	✓	2.01
124	10_N	ATC	Val	192	243	51	27%	✓	3.46	32	19	-13	-41%	✓	2.60	224	262	38	17%	✓	2.43
125	11_E	ATC	Val	115	117	2	2%	✓	0.17	20	17	-3	-13%	✓	0.59	135	134	-1	0%	✓	0.06
126	11_W	ATC	Val	95	127	32	34%	✓	3.04	20	37	18	90%	✓	3.29	115	164	50	43%	✓	4.19
127	12_N	ATC	Val	112	127	15	13%	✓	1.36	7	2	-5	-71%	✓	2.30	119	129	10	8%	✓	0.90
128	12_S	ATC	Val	141	124	-17	-12%	✓	1.43	10	2	-8	-79%	✓	3.13	150	126	-24	-16%	✓	2.04
131	15_E	ATC	Val	347	420	73	21%	✓	3.73	36	27	-9	-25%	✓	1.60	383	447	64	17%	✓	3.14
132	15_W	ATC	Val	109	163	54	49%	✓	4.61	24	2	-22	-92%	✓	6.10	133	165	32	24%	✓	2.61
137	TII_M50_N	TII	Val	2998	3,271	273	9%	✓	4.88	52	77	25	48%	✓	3.11	3050	3348	298	10%	✓	5.27
138	TII_M50_S	TII	Val	1003	939	-64	-6%	✓	2.05	93	66	-27	-29%	✓	3.03	1096	1005	-91	-8%	✓	2.81
139	TII_J4_J5_N	TII	Val	4580	5,040	460	10%	✗	6.63	61	119	58	95%	✓	6.11	4641	5159	518	11%	✗	7.40
140	TII_J4_J5_S	TII	Val	1404	1,330	-74	-5%	✓	2.00	98	119	21	21%	✓	2.02	1502	1449	-53	-4%	✓	1.38
141	TII_J5_J6_N	TII	Val	3887	4,463	576	15%	✗	8.91	65	108	43	66%	✓	4.62	3952	4571	619	16%	✗	9.48
142	TII_J5_J6_S	TII	Val	1199	1,106	-93	-8%	✓	2.74	95	89	-6	-6%	✓	0.63	1294	1195	-99	-8%	✓	2.81
143	TII_J8_J9_N	TII	Val	2480	2,657	177	7%	✓	3.49	66	94	28	42%	✓	3.13	2546	2751	205	8%	✓	3.98
144	TII_J8_J9_S	TII	Val	834	812	-22	-3%	✓	0.77	81	72	-9	-11%	✓	1.03	915	884	-31	-3%	✓	1.03

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				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_AM	Dif #	Dif %	IndFlows	GEH
1	O_1_A	JTC	Cal	1096	943	-153	-14%	✓	4.79	54	60	6	11%	✓	0.79	1150	1003	-147	-13%	✓	4.48
2	O_1_B	JTC	Cal	472	485	13	3%	✓	0.59	30	26	-4	-13%	✓	0.76	502	511	9	2%	✓	0.40
3	O_1_C	JTC	Cal	1550	1,505	-45	-3%	✓	1.15	45	42	-3	-7%	✓	0.45	1595	1547	-48	-3%	✓	1.21
4	O_1_D	JTC	Cal	113	106	-7	-6%	✓	0.67	1	2	1	100%	✓	0.82	114	108	-6	-5%	✓	0.57
5	D_1_A	JTC	Cal	1983	1,979	-4	0%	✓	0.09	78	70	-8	-10%	✓	0.93	2061	2049	-12	-1%	✓	0.26
6	D_1_B	JTC	Cal	278	259	-19	-7%	✓	1.16	19	13	-6	-32%	✓	1.50	297	272	-25	-8%	✓	1.48
7	D_1_C	JTC	Cal	821	661	-160	-19%	✗	5.88	31	48	17	55%	✓	2.70	852	709	-143	-17%	✗	5.12
8	D_1_D	JTC	Cal	149	139	-10	-7%	✓	0.83	2	0	-2	-100%	✓	2.00	151	139	-12	-8%	✓	1.00
9	O_2_A	JTC	Cal	376	315	-61	-16%	✓	3.28	17	2	-15	-88%	✓	4.87	393	317	-76	-19%	✓	4.03
10	O_2_B	JTC	Val	911	1,002	91	10%	✓	2.94	38	47	9	24%	✓	1.38	949	1049	100	11%	✓	3.16
11	O_2_C	JTC	Val	434	413	-21	-5%	✓	1.02	30	29	-1	-3%	✓	0.18	464	442	-22	-5%	✓	1.03
12	D_2_A	JTC	Val	387	387	0	0%	✓	0.00	36	26	-10	-28%	✓	1.80	423	413	-10	-2%	✓	0.49
13	D_2_B	JTC	Val	534	527	-7	-1%	✓	0.30	33	23	-10	-30%	✓	1.89	567	550	-17	-3%	✓	0.72
15	O_3_A	JTC	Cal	218	204	-14	-6%	✓	0.96	5	10	5	100%	✓	1.83	223	214	-9	-4%	✓	0.61
16	O_3_B	JTC	Cal	377	367	-10	-3%	✓	0.52	8	4	-4	-50%	✓	1.63	385	371	-14	-4%	✓	0.72
17	O_3_C	JTC	Cal	118	116	-2	-2%	✓	0.18	5	13	8	160%	✓	2.67	123	129	6	5%	✓	0.53
18	D_3_A	JTC	Cal	249	229	-20	-8%	✓	1.29	10	16	6	60%	✓	1.66	259	245	-14	-5%	✓	0.88
19	D_3_C	JTC	Cal	464	459	-5	-1%	✓	0.23	8	11	3	38%	✓	0.97	472	470	-2	0%	✓	0.09
20	O_8_A	JTC	Cal	293	251	-42	-14%	✓	2.55	7	19	12	171%	✓	3.33	300	270	-30	-10%	✓	1.78
21	O_8_B	JTC	Cal	106	100	-6	-6%	✓	0.59	5	12	7	140%	✓	2.40	111	112	1	1%	✓	0.09
22	O_8_C	JTC	Cal	491	533	42	9%	✓	1.86	21	21	0	0%	✓	0.00	512	554	42	8%	✓	1.82
23	O_8_D	JTC	Cal	144	125	-19	-13%	✓	1.64	12	22	10	83%	✓	2.43	156	147	-9	-6%	✓	0.73
24	D_8_A	JTC	Cal	353	401	48	14%	✓	2.47	6	32	26	433%	✓	5.96	359	433	74	21%	✓	3.72
25	D_8_B	JTC	Cal	86	90	4	5%	✓	0.43	5	7	2	40%	✓	0.82	91	97	6	7%	✓	0.62
26	D_8_C	JTC	Cal	242	225	-17	-7%	✓	1.11	14	22	8	57%	✓	1.89	256	247	-9	-4%	✓	0.57
27	D_8_D	JTC	Cal	353	293	-60	-17%	✓	3.34	20	13	-7	-35%	✓	1.72	373	306	-67	-18%	✓	3.64
28	O_9_B	JTC	Cal	242	224	-18	-7%	✓	1.18	14	22	8	57%	✓	1.89	256	246	-10	-4%	✓	0.63
29	O_9_C	JTC	Cal	405	466	61	15%	✓	2.92	24	22	-2	-8%	✓	0.42	429	488	59	14%	✓	2.76
30	O_9_D	JTC	Cal	184	183	-1	-1%	✓	0.07	30	19	-11	-37%	✓	2.22	214	202	-12	-6%	✓	0.83
31	D_9_A	JTC	Cal	265	269	4	2%	✓	0.24	23	38	15	65%	✓	2.72	288	307	19	7%	✓	1.10
32	D_9_B	JTC	Cal	493	534	41	8%	✓	1.81	21	21	0	0%	✓	0.00	514	555	41	8%	✓	1.77
33	D_9_D	JTC	Cal	73	67	-6	-8%	✓	0.72	24	4	-20	-83%	✓	5.35	97	71	-26	-27%	✓	2.84
34	O_10_A	JTC	Cal	1967	1,815	-152	-8%	✓	3.50	136	94	-42	-31%	✓	3.92	2103	1909	-194	-9%	✓	4.33
35	O_10_B	JTC	Cal	5	0	-5	-100%	✓	3.16	0	0	0	0%	✓	0.00	5	0	-5	-100%	✓	3.16
36	O_10_C	JTC	Cal	4079	4,098	19	0%	✓	0.30	153	103	-50	-33%	✓	4.42	4232	4201	-31	-1%	✓	0.48
37	O_10_D	JTC	Cal	176	180	4	2%	✓	0.30	10	14	4	40%	✓	1.15	186	194	8	4%	✓	0.58
38	D_10_A	JTC	Cal	4109	4,142	33	1%	✓	0.51	150	108	-42	-28%	✓	3.70	4259	4250	-9	0%	✓	0.14
39	D_10_B	JTC	Cal	3	0	-3	-100%	✓	2.45	0	0	0	0%	✓	0.00	3	0	-3	-100%	✓	2.45
40	D_10_C	JTC	Cal	1969	1,815	-154	-8%	✓	3.54	136	94	-42	-31%	✓	3.92	2105	1909	-196	-9%	✓	4.38
41	D_10_D	JTC	Cal	146	139	-7	-5%	✓	0.59	13	8	-5	-38%	✓	1.54	159	147	-12	-8%	✓	0.97
42	O_11_A	JTC	Val	1956	1,812	-144	-7%	✓	3.32	137	94	-43	-31%	✓	4.00	2093	1906	-187	-9%	✓	4.18
43	O_11_B	JTC	Val	237	236	-1	0%	✓	0.07	0	2	2	0%	✓	2.00	237	238	1	0%	✓	0.06
44	D_11_B	JTC	Val	360	326	-34	-9%	✓	1.84	5	4	-1	-20%	✓	0.47	365	330	-35	-10%	✓	1.88
45	D_11_C	JTC	Val	1833	1,723	-110	-6%	✓	2.61	132	92	-40	-30%	✓	3.78	1965	1815	-150	-8%	✓	3.45
46	O_14_B	JTC	Cal	1225	1,231	6	0%	✓	0.17	39	35	-4	-10%	✓	0.66	1264	1266	2	0%	✓	0.06
47	O_14_C	JTC	Cal	309	291	-18	-6%	✓	1.04	18	7	-11	-61%	✓	3.11	327	298	-29	-9%	✓	1.64
48	O_14_D	JTC	Cal	125	128	3	2%	✓	0.27	3	15	12	400%	✓	4.00	128	143	15	12%	✓	1.29
49	D_14_A	JTC	Cal	1238	1,243	5	0%	✓	0.14	38	27	-11	-29%	✓	1.93	1276	1270	-6	0%	✓	0.17
50	D_14_B	JTC	Cal	384	342	-42	-11%	✓	2.20	19	12	-7	-37%	✓	1.78	403	354	-49	-12%	✓	2.52
51	D_14_D	JTC	Cal	37	60	23	62%	✓	3.30	3	18	15	500%	✓	4.63	40	78	38	95%	✓	4.95
52	O_15_A	JTC	Cal	387	343	-44	-11%	✓	2.30	19	12	-7	-37%	✓	1.78	406	355	-51	-13%	✓	2.61
53	O_15_B	JTC	Cal	204	156	-48	-24%	✓	3.58	4	4	0	0%	✓	0.00	208	160	-48	-23%	✓	3.54
54	O_15_C	JTC	Cal	1138	1,196	58	5%	✓	1.70	38	30	-8	-21%	✓	1.37	1176	1226	50	4%	✓	1.44
55	D_15_A	JTC	Cal	1227	1,232	5	0%	✓	0.14	40	34	-6	-15%	✓	0.99	1267	1266	-1	0%	✓	0.03
56	D_15_B	JTC	Cal	80	108	28	35%	✓	2.89	0	2	2	0%	✓	2.00	80	110	30	38%	✓	3.08

				0809AM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_AM	Dif #	Dif %	IndFlows	GEH
57	D_15_C	JTC	Cal	422	354	-68	-16%	✓	3.45	21	10	-11	-52%	✓	2.79	443	364	-79	-18%	✓	3.93
58	O_16_A	JTC	Cal	415	354	-61	-15%	✓	3.11	21	10	-11	-52%	✓	2.79	436	364	-72	-17%	✓	3.60
59	O_16_B	JTC	Cal	642	648	6	1%	✓	0.24	20	7	-13	-65%	✓	3.54	662	655	-7	-1%	✓	0.27
60	O_16_C	JTC	Cal	410	518	108	26%	✗	5.01	28	26	-2	-7%	✓	0.38	438	544	106	24%	✗	4.78
61	O_16_D	JTC	Cal	558	557	-1	0%	✓	0.04	32	29	-3	-9%	✓	0.54	590	586	-4	-1%	✓	0.16
62	D_16_A	JTC	Cal	1163	1,195	32	3%	✓	0.93	38	30	-8	-21%	✓	1.37	1201	1225	24	2%	✓	0.69
63	D_16_B	JTC	Cal	321	336	15	5%	✓	0.83	23	15	-8	-35%	✓	1.84	344	351	7	2%	✓	0.38
64	D_16_C	JTC	Cal	387	385	-2	-1%	✓	0.10	25	17	-8	-32%	✓	1.75	412	402	-10	-2%	✓	0.50
65	D_16_D	JTC	Cal	154	171	17	11%	✓	1.33	15	10	-5	-33%	✓	1.41	169	181	12	7%	✓	0.91
66	O_20_B	JTC	Val	84	93	9	11%	✓	0.96	8	1	-7	-88%	✓	3.30	92	94	2	2%	✓	0.21
67	O_20_C	JTC	Val	12	13	1	8%	✓	0.28	0	1	1	0%	✓	1.41	12	14	2	17%	✓	0.55
68	D_20_A	JTC	Val	44	54	10	23%	✓	1.43	7	1	-6	-86%	✓	3.00	51	55	4	8%	✓	0.55
69	D_20_B	JTC	Val	4	2	-2	-50%	✓	1.15	0	1	1	0%	✓	1.41	4	3	-1	-25%	✓	0.53
70	D_20_C	JTC	Val	48	50	2	4%	✓	0.29	1	0	-1	-100%	✓	1.41	49	50	1	2%	✓	0.14
71	O_21_A	JTC	Cal	4	15	11	275%	✓	3.57	0	0	0	0%	✓	0.00	4	15	11	275%	✓	3.57
72	O_21_B	JTC	Cal	87	123	36	41%	✓	3.51	8	1	-7	-88%	✓	3.30	95	124	29	31%	✓	2.77
73	O_21_C	JTC	Cal	565	596	31	5%	✓	1.29	16	8	-8	-50%	✓	2.31	581	604	23	4%	✓	0.94
74	D_21_A	JTC	Cal	618	667	49	8%	✓	1.93	23	9	-14	-61%	✓	3.50	641	676	35	5%	✓	1.36
75	D_21_C	JTC	Cal	38	66	28	74%	✓	3.88	1	1	0	0%	✓	0.00	39	67	28	72%	✓	3.85
76	O_22_A	JTC	Cal	103	102	-1	-1%	✓	0.10	0	3	3	0%	✓	2.45	103	105	2	2%	✓	0.20
77	O_22_D	JTC	Cal	49	79	30	61%	✓	3.75	4	3	-1	-25%	✓	0.53	53	82	29	55%	✓	3.53
78	O_22_E	JTC	Cal	168	247	79	47%	✓	5.48	10	5	-5	-50%	✓	1.83	178	252	74	42%	✓	5.05
79	D_22_A	JTC	Cal	5	8	3	60%	✓	1.18	0	0	0	0%	✓	0.00	5	8	3	60%	✓	1.18
80	D_22_C	JTC	Cal	47	110	63	134%	✓	7.11	4	3	-1	-25%	✓	0.53	51	113	62	122%	✓	6.85
81	D_22_D	JTC	Cal	277	311	34	12%	✓	1.98	10	8	-2	-20%	✓	0.67	287	319	32	11%	✓	1.84
82	O_23_B	JTC	Val	2641	2,687	46	2%	✓	0.89	107	72	-35	-33%	✓	3.70	2748	2759	11	0%	✓	0.21
83	O_23_C	JTC	Val	19	24	5	26%	✓	1.08	4	4	0	0%	✓	0.00	23	28	5	22%	✓	0.99
84	D_23_A	JTC	Val	2640	2,695	55	2%	✓	1.06	105	76	-29	-28%	✓	3.05	2745	2771	26	1%	✓	0.50
85	D_23_C	JTC	Val	20	20	0	0%	✓	0.00	6	0	-6	-100%	✓	3.46	26	20	-6	-23%	✓	1.25
86	O_24_A	JTC	Cal	6	6	0	0%	✓	0.00	0	0	0	0%	✓	0.00	6	6	0	0%	✓	0.00
87	O_24_B	JTC	Cal	88	76	-12	-14%	✓	1.33	6	8	2	33%	✓	0.76	94	84	-10	-11%	✓	1.06
88	O_24_C	JTC	Cal	59	63	4	7%	✓	0.51	2	4	2	100%	✓	1.15	61	67	6	10%	✓	0.75
89	D_24_A	JTC	Cal	27	13	-14	-52%	✓	3.13	0	8	8	0%	✓	4.00	27	21	-6	-22%	✓	1.22
90	D_24_B	JTC	Cal	47	58	11	23%	✓	1.52	2	4	2	100%	✓	1.15	49	62	13	27%	✓	1.75
91	D_24_C	JTC	Cal	79	74	-5	-6%	✓	0.57	6	0	-6	-100%	✓	3.46	85	74	-11	-13%	✓	1.23
92	O_25_A	JTC	Val	78	73	-5	-6%	✓	0.58	6	1	-5	-83%	✓	2.67	84	74	-10	-12%	✓	1.13
93	O_25_B	JTC	Val	38	35	-3	-8%	✓	0.50	2	2	0	0%	✓	0.00	40	37	-3	-8%	✓	0.48
94	O_25_C	JTC	Val	68	93	25	37%	✓	2.79	2	3	1	50%	✓	0.63	70	96	26	37%	✓	2.85
95	D_25_A	JTC	Val	59	63	4	7%	✓	0.51	3	4	1	33%	✓	0.53	62	67	5	8%	✓	0.62
96	D_25_B	JTC	Val	77	67	-10	-13%	✓	1.18	7	1	-6	-86%	✓	3.00	84	68	-16	-19%	✓	1.84
97	D_25_C	JTC	Val	48	71	23	48%	✓	2.98	0	1	1	0%	✓	1.41	48	72	24	50%	✓	3.10
98	O_26_A	JTC	Cal	1213	1,164	-49	-4%	✓	1.42	99	70	-29	-29%	✓	3.15	1312	1234	-78	-6%	✓	2.19
99	O_26_B	JTC	Cal	45	85	40	89%	✓	4.96	2	2	0	0%	✓	0.00	47	87	40	85%	✓	4.89
100	D_26_B	JTC	Cal	57	35	-22	-39%	✓	3.24	8	1	-7	-88%	✓	3.30	65	36	-29	-45%	✓	4.08
101	D_26_C	JTC	Cal	1201	1,210	9	1%	✓	0.26	93	71	-22	-24%	✓	2.43	1294	1281	-13	-1%	✓	0.36
102	O_28_B	JTC	Cal	93	119	26	28%	✓	2.53	2	0	-2	-100%	✓	2.00	95	119	24	25%	✓	2.32
103	O_28_C	JTC	Cal	343	357	14	4%	✓	0.75	3	1	-2	-67%	✓	1.41	346	358	12	3%	✓	0.64
104	D_28_A	JTC	Cal	343	357	14	4%	✓	0.75	3	1	-2	-67%	✓	1.41	346	358	12	3%	✓	0.64
105	O_29_A	JTC	Cal	405	384	-21	-5%	✓	1.06	4	4	0	0%	✓	0.00	409	388	-21	-5%	✓	1.05
106	O_29_B	JTC	Cal	98	128	30	31%	✓	2.82	1	0	-1	-100%	✓	1.41	99	128	29	29%	✓	2.72
107	O_29_C	JTC	Cal	184	193	9	5%	✓	0.66	4	2	-2	-50%	✓	1.15	188	195	7	4%	✓	0.51
108	D_29_A	JTC	Cal	272	246	-26	-10%	✓	1.62	5	1	-4	-80%	✓	2.31	277	247	-30	-11%	✓	1.85
109	D_29_B	JTC	Cal	415	460	45	11%	✓	2.15	4	5	1	25%	✓	0.47	419	465	46	11%	✓	2.19
110	O_30_A	JTC	Cal	1004	1,009	5	0%	✓	0.16	93	67	-26	-28%	✓	2.91	1097	1076	-21	-2%	✓	0.64

				0809AM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_AM	Dif #	Dif %	IndFlows	GEH
111	O_30_B	JTC	Cal	87	123	36	41%	✓	3.51	2	4	2	100%	✓	1.15	89	127	38	43%	✓	3.66
112	D_30_B	JTC	Cal	4	29	25	625%	✓	6.15	1	0	-1	-100%	✓	1.41	5	29	24	480%	✓	5.82
113	D_30_C	JTC	Cal	8	9	1	13%	✓	0.34	0	0	0	0%	✓	0.00	8	9	1	13%	✓	0.34
114	D_30_D	JTC	Cal	1083	1,106	23	2%	✓	0.70	94	74	-20	-21%	✓	2.18	1177	1180	3	0%	✓	0.09
117	3_W	ATC	Val	603	615	12	2%	✓	0.49	38	26	-12	-31%	✓	2.04	640	641	1	0%	✓	0.03
118	4_E	ATC	Val	385	413	28	7%	✓	1.40	55	29	-26	-47%	✓	3.95	440	442	3	1%	✓	0.12
119	5_W	ATC	Val	187	199	12	7%	✓	0.89	19	3	-16	-84%	✓	4.82	206	202	-4	-2%	✓	0.26
120	6_N	ATC	Val	300	367	67	22%	✓	3.69	19	4	-15	-79%	✓	4.42	319	371	52	16%	✓	2.82
121	7_E	ATC	Val	126	126	0	0%	✓	0.00	20	22	2	12%	✓	0.51	146	148	2	2%	✓	0.19
122	8_W	ATC	Val	340	293	-47	-14%	✓	2.61	29	13	-16	-55%	✓	3.46	368	306	-62	-17%	✓	3.39
123	9_N	ATC	Val	216	270	54	25%	✓	3.44	26	38	12	48%	✓	2.19	242	308	66	27%	✓	3.98
124	10_N	ATC	Val	376	467	91	24%	✓	4.45	47	22	-25	-53%	✓	4.21	422	489	67	16%	✓	3.12
125	11_E	ATC	Val	156	180	24	15%	✓	1.85	20	14	-6	-28%	✓	1.34	176	194	19	11%	✓	1.36
126	11_W	ATC	Val	159	139	-20	-12%	✓	1.61	21	8	-13	-62%	✓	3.41	180	147	-33	-18%	✓	2.56
127	12_N	ATC	Val	318	326	8	3%	✓	0.46	24	4	-20	-83%	✓	5.29	341	330	-11	-3%	✓	0.63
128	12_S	ATC	Val	208	237	29	14%	✓	1.97	7	2	-5	-69%	✓	2.18	214	239	25	12%	✓	1.65
131	15_E	ATC	Val	382	553	171	45%	✗	7.92	41	29	-12	-30%	✓	2.08	423	582	159	38%	✗	7.08
132	15_W	ATC	Val	185	171	-14	-8%	✓	1.06	36	10	-26	-72%	✓	5.45	221	181	-40	-18%	✓	2.84
137	TII_M50_N	TII	Val	2743	2,705	-38	-1%	✓	0.73	87	100	13	15%	✓	1.34	2830	2805	-25	-1%	✓	0.47
138	TII_M50_S	TII	Val	1213	1,227	14	1%	✓	0.40	110	78	-32	-29%	✓	3.30	1323	1305	-18	-1%	✓	0.50
139	TII_J4_J5_N	TII	Val	4276	4,207	-69	-2%	✓	1.06	102	146	44	43%	✓	3.95	4378	4353	-25	-1%	✓	0.38
140	TII_J4_J5_S	TII	Val	1974	1,882	-92	-5%	✓	2.10	109	126	17	16%	✓	1.57	2083	2008	-75	-4%	✓	1.66
141	TII_J5_J6_N	TII	Val	4040	3,952	-88	-2%	✓	1.39	98	123	25	26%	✓	2.38	4138	4075	-63	-2%	✓	0.98
142	TII_J5_J6_S	TII	Val	1785	1,654	-131	-7%	✓	3.16	111	104	-7	-6%	✓	0.68	1896	1758	-138	-7%	✓	3.23
143	TII_J8_J9_N	TII	Val	2409	2,694	285	12%	✓	5.64	93	75	-18	-19%	✓	1.96	2502	2769	267	11%	✓	5.20
144	TII_J8_J9_S	TII	Val	1266	1,169	-97	-8%	✓	2.78	89	68	-21	-24%	✓	2.37	1355	1237	-118	-9%	✓	3.28

				0910AM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_AM	Dif #	Dif %	IndFlows	GEH
1	O_1_A	JTC	Cal	1025	965	-60	-6%	✓	1.90	74	59	-15	-20%	✓	1.84	1099	1024	-75	-7%	✓	2.30
2	O_1_B	JTC	Cal	374	372	-2	-1%	✓	0.10	28	29	1	4%	✓	0.19	402	401	-1	0%	✓	0.05
3	O_1_C	JTC	Cal	1382	1,617	235	17%	✗	6.07	39	52	13	33%	✓	1.93	1421	1669	248	17%	✗	6.31
4	O_1_D	JTC	Cal	76	107	31	41%	✓	3.24	2	1	-1	-50%	✓	0.82	78	108	30	38%	✓	3.11
5	D_1_A	JTC	Cal	1692	1,957	265	16%	✗	6.20	72	79	7	10%	✓	0.81	1764	2036	272	15%	✗	6.24
6	D_1_B	JTC	Cal	316	274	-42	-13%	✓	2.45	23	14	-9	-39%	✓	2.09	339	288	-51	-15%	✓	2.88
7	D_1_C	JTC	Cal	729	693	-36	-5%	✓	1.35	46	47	1	2%	✓	0.15	775	740	-35	-5%	✓	1.27
8	D_1_D	JTC	Cal	120	139	19	16%	✓	1.67	2	0	-2	-100%	✓	2.00	122	139	17	14%	✓	1.49
9	O_2_A	JTC	Cal	352	310	-42	-12%	✓	2.31	24	24	0	0%	✓	0.00	376	334	-42	-11%	✓	2.23
10	O_2_B	JTC	Val	800	891	91	11%	✓	3.13	44	44	0	0%	✓	0.00	844	935	91	11%	✓	3.05
11	O_2_C	JTC	Val	404	416	12	3%	✓	0.59	21	40	19	90%	✓	3.44	425	456	31	7%	✓	1.48
12	D_2_A	JTC	Val	354	377	23	6%	✓	1.20	24	25	1	4%	✓	0.20	378	402	24	6%	✓	1.22
13	D_2_B	JTC	Val	543	538	-5	-1%	✓	0.22	36	36	0	0%	✓	0.00	579	574	-5	-1%	✓	0.21
15	O_3_A	JTC	Cal	121	69	-52	-43%	✓	5.34	4	11	7	175%	✓	2.56	125	80	-45	-36%	✓	4.44
16	O_3_B	JTC	Cal	189	220	31	16%	✓	2.17	6	8	2	33%	✓	0.76	195	228	33	17%	✓	2.27
17	O_3_C	JTC	Cal	112	107	-5	-4%	✓	0.48	10	16	6	60%	✓	1.66	122	123	1	1%	✓	0.09
18	D_3_A	JTC	Cal	233	208	-25	-11%	✓	1.68	12	22	10	83%	✓	2.43	245	230	-15	-6%	✓	0.97
19	D_3_C	JTC	Cal	189	188	-1	-1%	✓	0.07	8	13	5	63%	✓	1.54	197	201	4	2%	✓	0.28
20	O_8_A	JTC	Cal	218	213	-5	-2%	✓	0.34	10	16	6	60%	✓	1.66	228	229	1	0%	✓	0.07
21	O_8_B	JTC	Cal	72	72	0	0%	✓	0.00	4	10	6	150%	✓	2.27	76	82	6	8%	✓	0.68
22	O_8_C	JTC	Cal	468	516	48	10%	✓	2.16	32	19	-13	-41%	✓	2.57	500	535	35	7%	✓	1.54
23	O_8_D	JTC	Cal	99	126	27	27%	✓	2.55	19	20	1	5%	✓	0.23	118	146	28	24%	✓	2.44
24	D_8_A	JTC	Cal	338	422	84	25%	✓	4.31	11	30	19	173%	✓	4.20	349	452	103	30%	✗	5.15
25	D_8_B	JTC	Cal	74	74	0	0%	✓	0.00	7	6	-1	-14%	✓	0.39	81	80	-1	-1%	✓	0.11
26	D_8_C	JTC	Cal	126	175	49	39%	✓	3.99	20	18	-2	-10%	✓	0.46	146	193	47	32%	✓	3.61
27	D_8_D	JTC	Cal	319	254	-65	-20%	✓	3.84	27	11	-16	-59%	✓	3.67	346	265	-81	-23%	✓	4.63
28	O_9_B	JTC	Cal	131	175	44	34%	✓	3.56	19	18	-1	-5%	✓	0.23	150	193	43	29%	✓	3.28
29	O_9_C	JTC	Cal	440	486	46	10%	✓	2.14	29	21	-8	-28%	✓	1.60	469	507	38	8%	✓	1.72
30	O_9_D	JTC	Cal	75	65	-10	-13%	✓	1.20	24	1	-23	-96%	✓	6.51	99	66	-33	-33%	✓	3.63
31	D_9_A	JTC	Cal	125	141	16	13%	✓	1.39	16	17	1	6%	✓	0.25	141	158	17	12%	✓	1.39
32	D_9_B	JTC	Cal	467	516	49	10%	✓	2.21	31	19	-12	-39%	✓	2.40	498	535	37	7%	✓	1.63
33	D_9_D	JTC	Cal	54	72	18	33%	✓	2.27	25	4	-21	-84%	✓	5.51	79	76	-3	-4%	✓	0.34
34	O_10_A	JTC	Cal	1834	1,836	2	0%	✓	0.05	170	142	-28	-16%	✓	2.24	2004	1978	-26	-1%	✓	0.58
35	O_10_B	JTC	Cal	3	0	-3	-100%	✓	2.45	0	0	0	0%	✓	0.00	3	0	-3	-100%	✓	2.45
36	O_10_C	JTC	Cal	3693	3,664	-29	-1%	✓	0.48	195	215	20	10%	✓	1.40	3888	3879	-9	0%	✓	0.14
37	O_10_D	JTC	Cal	181	229	48	27%	✓	3.35	17	14	-3	-18%	✓	0.76	198	243	45	23%	✓	3.03
38	D_10_A	JTC	Cal	3660	3,671	11	0%	✓	0.18	189	200	11	6%	✓	0.79	3849	3871	22	1%	✓	0.35
39	D_10_B	JTC	Cal	6	0	-6	-100%	✓	3.46	0	0	0	0%	✓	0.00	6	0	-6	-100%	✓	3.46
40	D_10_C	JTC	Cal	1831	1,835	4	0%	✓	0.09	170	142	-28	-16%	✓	2.24	2001	1977	-24	-1%	✓	0.54
41	D_10_D	JTC	Cal	214	221	7	3%	✓	0.47	23	30	7	30%	✓	1.36	237	251	14	6%	✓	0.90
42	O_11_A	JTC	Val	1829	1,831	2	0%	✓	0.05	178	142	-36	-20%	✓	2.85	2007	1973	-34	-2%	✓	0.76
43	O_11_B	JTC	Val	133	124	-9	-7%	✓	0.79	0	2	2	0%	✓	2.00	133	126	-7	-5%	✓	0.62
44	D_11_B	JTC	Val	269	207	-62	-23%	✓	4.02	4	4	0	0%	✓	0.00	273	211	-62	-23%	✓	3.99
45	D_11_C	JTC	Val	1693	1,752	59	3%	✓	1.42	174	140	-34	-20%	✓	2.71	1867	1892	25	1%	✓	0.58
46	O_14_B	JTC	Cal	1111	1,101	-10	-1%	✓	0.30	57	60	3	5%	✓	0.39	1168	1161	-7	-1%	✓	0.21
47	O_14_C	JTC	Cal	370	352	-18	-5%	✓	0.95	10	5	-5	-50%	✓	1.83	380	357	-23	-6%	✓	1.20
48	O_14_D	JTC	Cal	75	76	1	1%	✓	0.12	4	8	4	100%	✓	1.63	79	84	5	6%	✓	0.55
49	D_14_A	JTC	Cal	1119	1,106	-13	-1%	✓	0.39	58	50	-8	-14%	✓	1.09	1177	1156	-21	-2%	✓	0.61
50	D_14_B	JTC	Cal	401	378	-23	-6%	✓	1.17	12	8	-4	-33%	✓	1.26	413	386	-27	-7%	✓	1.35
51	D_14_D	JTC	Cal	36	49	13	36%	✓	1.99	1	15	14	1400%	✓	4.95	37	64	27	73%	✓	3.80
52	O_15_A	JTC	Cal	402	378	-24	-6%	✓	1.22	12	8	-4	-33%	✓	1.26	414	386	-28	-7%	✓	1.40
53	O_15_B	JTC	Cal	82	85	3	4%	✓	0.33	1	2	1	100%	✓	0.82	83	87	4	5%	✓	0.43
54	O_15_C	JTC	Cal	1097	1,095	-2	0%	✓	0.06	55	58	3	5%	✓	0.40	1152	1153	1	0%	✓	0.03
55	D_15_A	JTC	Cal	1107	1,101	-6	-1%	✓	0.18	56	60	4	7%	✓	0.53	1163	1161	-2	0%	✓	0.06
56	D_15_B	JTC	Cal	56	70	14	25%	✓	1.76	0	0	0	0%	✓	0.00	56	70	14	25%	✓	1.76

				0910AM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_AM	Dif #	Dif %	IndFlows	GEH
57	D_15_C	JTC	Cal	418	390	-28	-7%	✓	1.39	12	8	-4	-33%	✓	1.26	430	398	-32	-7%	✓	1.57
58	O_16_A	JTC	Cal	418	389	-29	-7%	✓	1.44	12	8	-4	-33%	✓	1.26	430	397	-33	-8%	✓	1.62
59	O_16_B	JTC	Cal	548	534	-14	-3%	✓	0.60	29	33	4	14%	✓	0.72	577	567	-10	-2%	✓	0.42
60	O_16_C	JTC	Cal	596	587	-9	-2%	✓	0.37	33	57	24	73%	✓	3.58	629	644	15	2%	✓	0.59
61	O_16_D	JTC	Cal	590	555	-35	-6%	✓	1.46	40	30	-10	-25%	✓	1.69	630	585	-45	-7%	✓	1.83
62	D_16_A	JTC	Cal	1102	1,096	-6	-1%	✓	0.18	56	58	2	4%	✓	0.26	1158	1154	-4	0%	✓	0.12
63	D_16_B	JTC	Cal	333	329	-4	-1%	✓	0.22	25	16	-9	-36%	✓	1.99	358	345	-13	-4%	✓	0.69
64	D_16_C	JTC	Cal	490	485	-5	-1%	✓	0.23	21	18	-3	-14%	✓	0.68	511	503	-8	-2%	✓	0.36
65	D_16_D	JTC	Cal	227	161	-66	-29%	✓	4.74	12	37	25	208%	✓	5.05	239	198	-41	-17%	✓	2.77
66	O_20_B	JTC	Val	95	76	-19	-20%	✓	2.05	3	4	1	33%	✓	0.53	98	80	-18	-18%	✓	1.91
67	O_20_C	JTC	Val	22	15	-7	-32%	✓	1.63	1	1	0	0%	✓	0.00	23	16	-7	-30%	✓	1.59
68	D_20_A	JTC	Val	65	35	-30	-46%	✓	4.24	4	2	-2	-50%	✓	1.15	69	37	-32	-46%	✓	4.40
69	D_20_B	JTC	Val	9	2	-7	-78%	✓	2.98	0	1	1	0%	✓	1.41	9	3	-6	-67%	✓	2.45
70	D_20_C	JTC	Val	43	54	11	26%	✓	1.58	0	2	2	0%	✓	2.00	43	56	13	30%	✓	1.85
71	O_21_A	JTC	Cal	17	15	-2	-12%	✓	0.50	1	0	-1	-100%	✓	1.41	18	15	-3	-17%	✓	0.74
72	O_21_B	JTC	Cal	133	161	28	21%	✓	2.31	9	5	-4	-44%	✓	1.51	142	166	24	17%	✓	1.93
73	O_21_C	JTC	Cal	501	556	55	11%	✓	2.39	14	7	-7	-50%	✓	2.16	515	563	48	9%	✓	2.07
74	D_21_A	JTC	Cal	577	629	52	9%	✓	2.12	22	7	-15	-68%	✓	3.94	599	636	37	6%	✓	1.49
75	D_21_C	JTC	Cal	74	102	28	38%	✓	2.98	2	5	3	150%	✓	1.60	76	107	31	41%	✓	3.24
76	O_22_A	JTC	Cal	26	32	6	23%	✓	1.11	0	2	2	0%	✓	2.00	26	34	8	31%	✓	1.46
77	O_22_D	JTC	Cal	59	20	-39	-66%	✓	6.21	1	1	0	0%	✓	0.00	60	21	-39	-65%	✓	6.13
78	O_22_E	JTC	Cal	252	188	-64	-25%	✓	4.31	23	4	-19	-83%	✓	5.17	275	192	-83	-30%	✓	5.43
79	D_22_A	JTC	Cal	8	12	4	50%	✓	1.26	0	0	0	0%	✓	0.00	8	12	4	50%	✓	1.26
80	D_22_C	JTC	Cal	54	48	-6	-11%	✓	0.84	3	1	-2	-67%	✓	1.41	57	49	-8	-14%	✓	1.10
81	D_22_D	JTC	Cal	284	173	-111	-39%	✗	7.34	22	6	-16	-73%	✓	4.28	306	179	-127	-42%	✗	8.16
82	O_23_B	JTC	Val	2529	2,477	-52	-2%	✓	1.04	143	176	33	23%	✓	2.61	2672	2653	-19	-1%	✓	0.37
83	O_23_C	JTC	Val	11	22	11	100%	✓	2.71	6	4	-2	-33%	✓	0.89	17	26	9	53%	✓	1.94
84	D_23_A	JTC	Val	2532	2,479	-53	-2%	✓	1.06	147	180	33	22%	✓	2.58	2679	2659	-20	-1%	✓	0.39
85	D_23_C	JTC	Val	8	20	12	150%	✓	3.21	2	0	-2	-100%	✓	2.00	10	20	10	100%	✓	2.58
86	O_24_A	JTC	Cal	10	6	-4	-40%	✓	1.41	0	0	0	0%	✓	0.00	10	6	-4	-40%	✓	1.41
87	O_24_B	JTC	Cal	83	68	-15	-18%	✓	1.73	5	6	1	20%	✓	0.43	88	74	-14	-16%	✓	1.56
88	O_24_C	JTC	Cal	54	66	12	22%	✓	1.55	3	7	4	133%	✓	1.79	57	73	16	28%	✓	1.98
89	D_24_A	JTC	Cal	5	9	4	80%	✓	1.51	0	6	6	0%	✓	3.46	5	15	10	200%	✓	3.16
90	D_24_B	JTC	Cal	56	64	8	14%	✓	1.03	3	7	4	133%	✓	1.79	59	71	12	20%	✓	1.49
91	D_24_C	JTC	Cal	86	67	-19	-22%	✓	2.17	5	0	-5	-100%	✓	3.16	91	67	-24	-26%	✓	2.70
92	O_25_A	JTC	Val	83	68	-15	-18%	✓	1.73	5	0	-5	-100%	✓	3.16	88	68	-20	-23%	✓	2.26
93	O_25_B	JTC	Val	65	43	-22	-34%	✓	2.99	1	3	2	200%	✓	1.41	66	46	-20	-30%	✓	2.67
94	O_25_C	JTC	Val	63	102	39	62%	✓	4.29	1	4	3	300%	✓	1.90	64	106	42	66%	✓	4.56
95	D_25_A	JTC	Val	53	67	14	26%	✓	1.81	2	7	5	250%	✓	2.36	55	74	19	35%	✓	2.37
96	D_25_B	JTC	Val	86	70	-16	-19%	✓	1.81	4	0	-4	-100%	✓	2.83	90	70	-20	-22%	✓	2.24
97	D_25_C	JTC	Val	72	76	4	6%	✓	0.46	1	0	-1	-100%	✓	1.41	73	76	3	4%	✓	0.35
98	O_26_A	JTC	Cal	1187	1,183	-4	0%	✓	0.12	126	139	13	10%	✓	1.13	1313	1322	9	1%	✓	0.25
99	O_26_B	JTC	Cal	37	86	49	132%	✓	6.25	3	5	2	67%	✓	1.00	40	91	51	128%	✓	6.30
100	D_26_B	JTC	Cal	52	28	-24	-46%	✓	3.79	5	1	-4	-80%	✓	2.31	57	29	-28	-49%	✓	4.27
101	D_26_C	JTC	Cal	1172	1,245	73	6%	✓	2.10	124	142	18	15%	✓	1.56	1296	1387	91	7%	✓	2.48
102	O_28_B	JTC	Cal	59	119	60	102%	✓	6.36	5	0	-5	-100%	✓	3.16	64	119	55	86%	✓	5.75
103	O_28_C	JTC	Cal	321	308	-13	-4%	✓	0.73	4	2	-2	-50%	✓	1.15	325	310	-15	-5%	✓	0.84
104	D_28_A	JTC	Cal	321	307	-14	-4%	✓	0.79	4	2	-2	-50%	✓	1.15	325	309	-16	-5%	✓	0.90
105	O_29_A	JTC	Cal	366	378	12	3%	✓	0.62	8	5	-3	-38%	✓	1.18	374	383	9	2%	✓	0.46
106	O_29_B	JTC	Cal	61	123	62	102%	✓	6.46	4	0	-4	-100%	✓	2.83	65	123	58	89%	✓	5.98
107	O_29_C	JTC	Cal	195	172	-23	-12%	✓	1.70	4	4	0	0%	✓	0.00	199	176	-23	-12%	✓	1.68
108	D_29_A	JTC	Cal	230	251	21	9%	✓	1.35	8	2	-6	-75%	✓	2.68	238	253	15	6%	✓	0.96
109	D_29_B	JTC	Cal	392	420	28	7%	✓	1.39	8	7	-1	-13%	✓	0.37	400	427	27	7%	✓	1.33
110	O_30_A	JTC	Cal	989	1,067	78	8%	✓	2.43	125	135	10	8%	✓	0.88	1114	1202	88	8%	✓	2.59

				0910AM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_AM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_AM	Dif #	Dif %	IndFlows	GEH
111	O_30_B	JTC	Cal	72	120	48	67%	✓	4.90	4	5	1	25%	✓	0.47	76	125	49	64%	✓	4.89
112	D_30_B	JTC	Cal	6	12	6	100%	✓	2.00	0	0	0	0%	✓	0.00	6	12	6	100%	✓	2.00
113	D_30_C	JTC	Cal	4	9	5	125%	✓	1.96	0	1	1	0%	✓	1.41	4	10	6	150%	✓	2.27
114	D_30_D	JTC	Cal	1058	1,175	117	11%	✓	3.50	129	143	14	11%	✓	1.20	1187	1318	131	11%	✓	3.70
117	3_W	ATC	Val	487	508	22	4%	✓	0.96	49	44	-5	-11%	✓	0.76	536	552	16	3%	✓	0.70
118	4_E	ATC	Val	388	416	28	7%	✓	1.41	62	40	-22	-35%	✓	3.06	450	456	7	1%	✓	0.31
119	5_W	ATC	Val	149	193	44	30%	✓	3.36	21	4	-17	-81%	✓	4.78	170	197	27	16%	✓	2.01
120	6_N	ATC	Val	163	220	57	35%	✓	4.11	15	8	-7	-47%	✓	2.06	178	228	50	28%	✓	3.50
121	7_E	ATC	Val	120	125	5	4%	✓	0.48	22	20	-2	-8%	✓	0.37	141	145	4	3%	✓	0.31
122	8_W	ATC	Val	281	254	-27	-10%	✓	1.64	36	11	-25	-69%	✓	5.13	317	265	-52	-16%	✓	3.03
123	9_N	ATC	Val	115	141	26	23%	✓	2.31	23	17	-6	-27%	✓	1.38	138	158	20	14%	✓	1.64
124	10_N	ATC	Val	343	485	143	42%	✗	7.01	59	21	-38	-64%	✓	5.97	401	506	105	26%	✗	4.92
125	11_E	ATC	Val	165	229	64	39%	✓	4.59	25	14	-11	-44%	✓	2.52	190	243	53	28%	✓	3.61
126	11_W	ATC	Val	195	221	26	13%	✓	1.80	35	30	-5	-14%	✓	0.88	230	251	21	9%	✓	1.35
127	12_N	ATC	Val	201	206	5	2%	✓	0.35	15	4	-11	-74%	✓	3.65	216	210	-6	-3%	✓	0.43
128	12_S	ATC	Val	120	123	3	2%	✓	0.26	7	2	-5	-71%	✓	2.36	127	125	-2	-2%	✓	0.19
131	15_E	ATC	Val	406	555	149	37%	✗	6.81	54	30	-24	-44%	✓	3.66	459	585	126	27%	✗	5.50
132	15_W	ATC	Val	201	161	-40	-20%	✓	2.94	43	37	-6	-14%	✓	0.97	244	198	-46	-19%	✓	3.07
137	TII_M50_N	TII	Val	2409	2,398	-11	0%	✓	0.22	118	185	67	57%	✓	5.44	2527	2583	56	2%	✓	1.11
138	TII_M50_S	TII	Val	1135	1,251	116	10%	✓	3.36	105	148	43	41%	✓	3.82	1240	1399	159	13%	✓	4.38
139	TII_J4_J5_N	TII	Val	3777	3,628	-149	-4%	✓	2.45	127	228	101	80%	✗	7.58	3904	3856	-48	-1%	✓	0.77
140	TII_J4_J5_S	TII	Val	1830	1,935	105	6%	✓	2.42	107	191	84	79%	✓	6.88	1937	2126	189	10%	✓	4.19
141	TII_J5_J6_N	TII	Val	3321	3,338	17	1%	✓	0.29	133	197	64	48%	✓	4.98	3454	3535	81	2%	✓	1.37
142	TII_J5_J6_S	TII	Val	1628	1,709	81	5%	✓	1.98	120	151	31	26%	✓	2.66	1748	1860	112	6%	✓	2.64
143	TII_J8_J9_N	TII	Val	2559	2,476	-83	-3%	✓	1.65	109	180	71	65%	✓	5.91	2668	2656	-12	0%	✓	0.23
144	TII_J8_J9_S	TII	Val	1195	1,183	-12	-1%	✓	0.35	108	140	32	30%	✓	2.87	1303	1323	20	2%	✓	0.55

				0405PM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_PM	Dif #	Dif %	IndFlows	GEH
1	O_1_A	JTC	Cal	2396	2,313	-83	-3%	✓	1.71	67	71	4	6%	✓	0.48	2463	2384	-79	-3%	✓	1.60
2	O_1_B	JTC	Cal	254	256	2	1%	✓	0.13	15	5	-10	-67%	✓	3.16	269	261	-8	-3%	✓	0.49
3	O_1_C	JTC	Cal	792	733	-59	-7%	✓	2.14	26	19	-7	-27%	✓	1.48	818	752	-66	-8%	✓	2.36
4	O_1_D	JTC	Cal	182	174	-8	-4%	✓	0.60	1	0	-1	-100%	✓	1.41	183	174	-9	-5%	✓	0.67
5	D_1_A	JTC	Cal	1129	1,178	49	4%	✓	1.44	46	25	-21	-46%	✓	3.52	1175	1203	28	2%	✓	0.81
6	D_1_B	JTC	Cal	629	637	8	1%	✓	0.32	19	19	0	0%	✓	0.00	648	656	8	1%	✓	0.31
7	D_1_C	JTC	Cal	1806	1,587	-219	-12%	✓	5.32	43	52	9	21%	✓	1.31	1849	1639	-210	-11%	✓	5.03
8	D_1_D	JTC	Cal	60	65	5	8%	✓	0.63	1	0	-1	-100%	✓	1.41	61	65	4	7%	✓	0.50
9	O_2_A	JTC	Cal	503	443	-60	-12%	✓	2.76	24	14	-10	-42%	✓	2.29	527	457	-70	-13%	✓	3.16
10	O_2_B	JTC	Val	694	694	0	0%	✓	0.00	21	35	14	67%	✓	2.65	715	729	14	2%	✓	0.52
11	O_2_C	JTC	Val	545	634	89	16%	✓	3.67	8	16	8	100%	✓	2.31	553	650	97	18%	✓	3.96
12	D_2_A	JTC	Val	284	293	9	3%	✓	0.53	17	5	-12	-71%	✓	3.62	301	298	-3	-1%	✓	0.17
13	D_2_B	JTC	Val	647	709	62	10%	✓	2.38	27	14	-13	-48%	✓	2.87	674	723	49	7%	✓	1.85
15	O_3_A	JTC	Cal	111	128	17	15%	✓	1.56	2	3	1	50%	✓	0.63	113	131	18	16%	✓	1.63
16	O_3_B	JTC	Cal	138	125	-13	-9%	✓	1.13	2	2	0	0%	✓	0.00	140	127	-13	-9%	✓	1.13
17	O_3_C	JTC	Cal	162	141	-21	-13%	✓	1.71	1	1	0	0%	✓	0.00	163	142	-21	-13%	✓	1.70
18	D_3_A	JTC	Cal	258	236	-22	-9%	✓	1.40	2	3	1	50%	✓	0.63	260	239	-21	-8%	✓	1.33
19	D_3_C	JTC	Cal	153	158	5	3%	✓	0.40	3	3	0	0%	✓	0.00	156	161	5	3%	✓	0.40
20	O_8_A	JTC	Cal	272	246	-26	-10%	✓	1.62	7	8	1	14%	✓	0.37	279	254	-25	-9%	✓	1.53
21	O_8_B	JTC	Cal	44	66	22	50%	✓	2.97	1	20	19	1900%	✓	5.86	45	86	41	91%	✓	5.07
22	O_8_C	JTC	Cal	451	591	140	31%	✗	6.13	23	8	-15	-65%	✓	3.81	474	599	125	26%	✗	5.40
23	O_8_D	JTC	Cal	139	92	-47	-34%	✓	4.37	11	11	0	0%	✓	0.00	150	103	-47	-31%	✓	4.18
24	D_8_A	JTC	Cal	288	280	-8	-3%	✓	0.47	8	11	3	38%	✓	0.97	296	291	-5	-2%	✓	0.29
25	D_8_B	JTC	Cal	69	75	6	9%	✓	0.71	1	0	-1	-100%	✓	1.41	70	75	5	7%	✓	0.59
26	D_8_C	JTC	Cal	112	94	-18	-16%	✓	1.77	13	4	-9	-69%	✓	3.09	125	98	-27	-22%	✓	2.56
27	D_8_D	JTC	Cal	447	546	99	22%	✓	4.44	20	31	11	55%	✓	2.18	467	577	110	24%	✗	4.81
28	O_9_B	JTC	Cal	107	94	-13	-12%	✓	1.30	13	4	-9	-69%	✓	3.09	120	98	-22	-18%	✓	2.11
29	O_9_C	JTC	Cal	306	424	118	39%	✗	6.18	19	23	4	21%	✓	0.87	325	447	122	38%	✗	6.21
30	O_9_D	JTC	Cal	189	205	16	8%	✓	1.14	24	27	3	13%	✓	0.59	213	232	19	9%	✓	1.27
31	D_9_A	JTC	Cal	100	107	7	7%	✓	0.69	14	29	15	107%	✓	3.23	114	136	22	19%	✓	1.97
32	D_9_B	JTC	Cal	451	590	139	31%	✗	6.09	23	8	-15	-65%	✓	3.81	474	598	124	26%	✗	5.36
33	D_9_D	JTC	Cal	51	25	-26	-51%	✓	4.22	19	17	-2	-11%	✓	0.47	70	42	-28	-40%	✓	3.74
34	O_10_A	JTC	Cal	3516	4,043	527	15%	✗	8.57	93	121	28	30%	✓	2.71	3609	4164	555	15%	✗	8.90
35	O_10_B	JTC	Cal	2	0	-2	-100%	✓	2.00	0	0	0	0%	✓	0.00	2	0	-2	-100%	✓	2.00
36	O_10_C	JTC	Cal	1960	2,090	130	7%	✓	2.89	113	111	-2	-2%	✓	0.19	2073	2201	128	6%	✓	2.77
37	O_10_D	JTC	Cal	220	216	-4	-2%	✓	0.27	6	7	1	17%	✓	0.39	226	223	-3	-1%	✓	0.20
38	D_10_A	JTC	Cal	2050	2,174	124	6%	✓	2.70	111	108	-3	-3%	✓	0.29	2161	2282	121	6%	✓	2.57
39	D_10_B	JTC	Cal	4	0	-4	-100%	✓	2.83	0	0	0	0%	✓	0.00	4	0	-4	-100%	✓	2.83
40	D_10_C	JTC	Cal	3514	4,043	529	15%	✗	8.61	93	120	27	29%	✓	2.62	3607	4163	556	15%	✗	8.92
41	D_10_D	JTC	Cal	130	142	12	9%	✓	1.03	8	9	1	13%	✓	0.34	138	151	13	9%	✓	1.08
42	O_11_A	JTC	Val	3549	4,043	494	14%	✗	8.02	106	119	13	12%	✓	1.23	3655	4162	507	14%	✗	8.11
43	O_11_B	JTC	Val	94	87	-7	-7%	✓	0.74	1	3	2	200%	✓	1.41	95	90	-5	-5%	✓	0.52
44	D_11_B	JTC	Val	352	378	26	7%	✓	1.36	6	10	4	67%	✓	1.41	358	388	30	8%	✓	1.55
45	D_11_C	JTC	Val	3291	3,749	458	14%	✗	7.72	101	112	11	11%	✓	1.07	3392	3861	469	14%	✗	7.79
46	O_14_B	JTC	Cal	727	749	22	3%	✓	0.81	27	32	5	19%	✓	0.92	754	781	27	4%	✓	0.97
47	O_14_C	JTC	Cal	302	361	59	20%	✓	3.24	13	5	-8	-62%	✓	2.67	315	366	51	16%	✓	2.76
48	O_14_D	JTC	Cal	105	135	30	29%	✓	2.74	2	4	2	100%	✓	1.15	107	139	32	30%	✓	2.89
49	D_14_A	JTC	Cal	694	720	26	4%	✓	0.98	26	27	1	4%	✓	0.19	720	747	27	4%	✓	1.00
50	D_14_B	JTC	Cal	379	445	66	17%	✓	3.25	15	7	-8	-53%	✓	2.41	394	452	58	15%	✓	2.82
51	D_14_D	JTC	Cal	61	75	14	23%	✓	1.70	1	7	6	600%	✓	3.00	62	82	20	32%	✓	2.36
52	O_15_A	JTC	Cal	382	444	62	16%	✓	3.05	14	7	-7	-50%	✓	2.16	396	451	55	14%	✓	2.67
53	O_15_B	JTC	Cal	53	53	0	0%	✓	0.00	0	1	1	0%	✓	1.41	53	54	1	2%	✓	0.14
54	O_15_C	JTC	Cal	742	750	8	1%	✓	0.29	28	31	3	11%	✓	0.55	770	781	11	1%	✓	0.40
55	D_15_A	JTC	Cal	729	750	21	3%	✓	0.77	27	32	5	19%	✓	0.92	756	782	26	3%	✓	0.94
56	D_15_B	JTC	Cal	56	47	-9	-16%	✓	1.25	2	0	-2	-100%	✓	2.00	58	47	-11	-19%	✓	1.52
57	D_15_C	JTC	Cal	392	448	56	14%	✓	2.73	13	7	-6	-46%	✓	1.90	405	455	50	12%	✓	2.41
58	O_16_A	JTC	Cal	392	447	55	14%	✓	2.69	13	7	-6	-46%	✓	1.90	405	454	49	12%	✓	2.36

				0405PM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_PM	Dif #	Dif %	IndFlows	GEH
59	O_16_B	JTC	Cal	441	461	20	5%	✓	0.94	20	18	-2	-10%	✓	0.46	461	479	18	4%	✓	0.83
60	O_16_C	JTC	Cal	631	633	2	0%	✓	0.08	25	67	42	168%	✓	6.19	656	700	44	7%	✓	1.69
61	O_16_D	JTC	Cal	663	738	75	11%	✓	2.83	11	40	29	264%	✓	5.74	674	778	104	15%	✗	3.86
62	D_16_A	JTC	Cal	732	750	18	2%	✓	0.66	28	31	3	11%	✓	0.55	760	781	21	3%	✓	0.76
63	D_16_B	JTC	Cal	342	380	38	11%	✓	2.00	13	32	19	146%	✓	4.01	355	412	57	16%	✓	2.91
64	D_16_C	JTC	Cal	549	631	82	15%	✓	3.38	12	8	-4	-33%	✓	1.26	561	639	78	14%	✓	3.18
65	D_16_D	JTC	Cal	504	507	3	1%	✓	0.13	16	60	44	275%	✓	7.14	520	567	47	9%	✓	2.02
66	O_20_B	JTC	Val	150	114	-36	-24%	✓	3.13	4	0	-4	-100%	✓	2.83	154	114	-40	-26%	✓	3.46
67	O_20_C	JTC	Val	20	29	9	45%	✓	1.82	0	1	1	0%	✓	1.41	20	30	10	50%	✓	2.00
68	D_20_A	JTC	Val	142	123	-19	-13%	✓	1.65	4	0	-4	-100%	✓	2.83	146	123	-23	-16%	✓	1.98
69	D_20_B	JTC	Val	2	6	4	200%	✓	2.00	0	1	1	0%	✓	1.41	2	7	5	250%	✓	2.36
70	D_20_C	JTC	Val	26	14	-12	-46%	✓	2.68	0	0	0	0%	✓	0.00	26	14	-12	-46%	✓	2.68
71	O_21_A	JTC	Cal	18	18	0	0%	✓	0.00	0	0	0	0%	✓	0.00	18	18	0	0%	✓	0.00
72	O_21_B	JTC	Cal	88	115	27	31%	✓	2.68	8	2	-6	-75%	✓	2.68	96	117	21	22%	✓	2.03
73	O_21_C	JTC	Cal	244	316	72	30%	✓	4.30	9	22	13	144%	✓	3.30	253	338	85	34%	✓	4.94
74	D_21_A	JTC	Cal	293	316	23	8%	✓	1.32	14	22	8	57%	✓	1.89	307	338	31	10%	✓	1.73
75	D_21_C	JTC	Cal	54	134	80	148%	✓	8.25	3	2	-1	-33%	✓	0.63	57	136	79	139%	✓	8.04
76	O_22_A	JTC	Cal	6	2	-4	-67%	✓	2.00	1	1	0	0%	✓	0.00	7	3	-4	-57%	✓	1.79
77	O_22_D	JTC	Cal	92	95	3	3%	✓	0.31	8	3	-5	-63%	✓	2.13	100	98	-2	-2%	✓	0.20
78	O_22_E	JTC	Cal	319	351	32	10%	✓	1.75	14	0	-14	-100%	✓	5.29	333	351	18	5%	✓	0.97
79	D_22_A	JTC	Cal	16	19	3	19%	✓	0.72	1	0	-1	-100%	✓	1.41	17	19	2	12%	✓	0.47
80	D_22_C	JTC	Cal	84	73	-11	-13%	✓	1.24	11	3	-8	-73%	✓	3.02	95	76	-19	-20%	✓	2.05
81	D_22_D	JTC	Cal	315	351	36	11%	✓	1.97	11	1	-10	-91%	✓	4.08	326	352	26	8%	✓	1.41
82	O_23_B	JTC	Val	1393	1,447	54	4%	✓	1.43	89	68	-21	-24%	✓	2.37	1482	1515	33	2%	✓	0.85
83	O_23_C	JTC	Val	1	6	5	500%	✓	2.67	4	0	-4	-100%	✓	2.83	5	6	1	20%	✓	0.43
84	D_23_A	JTC	Val	1384	1,453	69	5%	✓	1.83	86	68	-18	-21%	✓	2.05	1470	1521	51	3%	✓	1.32
85	D_23_C	JTC	Val	10	0	-10	-100%	✓	4.47	7	0	-7	-100%	✓	3.74	17	0	-17	-100%	✓	5.83
86	O_24_A	JTC	Cal	11	16	5	45%	✓	1.36	0	0	0	0%	✓	0.00	11	16	5	45%	✓	1.36
87	O_24_B	JTC	Cal	72	68	-4	-6%	✓	0.48	3	4	1	33%	✓	0.53	75	72	-3	-4%	✓	0.35
88	O_24_C	JTC	Cal	45	59	14	31%	✓	1.94	2	4	2	100%	✓	1.15	47	63	16	34%	✓	2.16
89	D_24_A	JTC	Cal	8	15	7	88%	✓	2.06	0	0	0	0%	✓	0.00	8	15	7	88%	✓	2.06
90	D_24_B	JTC	Cal	50	55	5	10%	✓	0.69	2	4	2	100%	✓	1.15	52	59	7	13%	✓	0.94
91	D_24_C	JTC	Cal	70	73	3	4%	✓	0.35	3	4	1	33%	✓	0.53	73	77	4	5%	✓	0.46
92	O_25_A	JTC	Val	65	74	9	14%	✓	1.08	3	4	1	33%	✓	0.53	68	78	10	15%	✓	1.17
93	O_25_B	JTC	Val	39	40	1	3%	✓	0.16	3	3	0	0%	✓	0.00	42	43	1	2%	✓	0.15
94	O_25_C	JTC	Val	72	67	-5	-7%	✓	0.60	0	3	3	0%	✓	2.45	72	70	-2	-3%	✓	0.24
95	D_25_A	JTC	Val	43	60	17	40%	✓	2.37	2	4	2	100%	✓	1.15	45	64	19	42%	✓	2.57
96	D_25_B	JTC	Val	65	81	16	25%	✓	1.87	0	4	4	0%	✓	2.83	65	85	20	31%	✓	2.31
97	D_25_C	JTC	Val	68	40	-28	-41%	✓	3.81	4	2	-2	-50%	✓	1.15	72	42	-30	-42%	✓	3.97
98	O_26_A	JTC	Cal	2846	3,260	414	15%	✗	7.49	81	136	55	68%	✓	5.28	2927	3396	469	16%	✗	8.34
99	O_26_B	JTC	Cal	67	54	-13	-19%	✓	1.67	2	4	2	100%	✓	1.15	69	58	-11	-16%	✓	1.38
100	D_26_B	JTC	Cal	65	65	0	0%	✓	0.00	2	1	-1	-50%	✓	0.82	67	66	-1	-1%	✓	0.12
101	D_26_C	JTC	Cal	2848	3,246	398	14%	✓	7.21	81	138	57	70%	✓	5.45	2929	3384	455	16%	✗	8.10
102	O_28_B	JTC	Cal	51	44	-7	-14%	✓	1.02	1	0	-1	-100%	✓	1.41	52	44	-8	-15%	✓	1.15
103	O_28_C	JTC	Cal	215	281	66	31%	✓	4.19	4	0	-4	-100%	✓	2.83	219	281	62	28%	✓	3.92
104	D_28_A	JTC	Cal	214	282	68	32%	✓	4.32	4	0	-4	-100%	✓	2.83	218	282	64	29%	✓	4.05
105	O_29_A	JTC	Cal	203	197	-6	-3%	✓	0.42	5	1	-4	-80%	✓	2.31	208	198	-10	-5%	✓	0.70
106	O_29_B	JTC	Cal	53	65	12	23%	✓	1.56	0	0	0	0%	✓	0.00	53	65	12	23%	✓	1.56
107	O_29_C	JTC	Cal	304	410	106	35%	✗	5.61	3	14	11	367%	✓	3.77	307	424	117	38%	✗	6.12
108	D_29_A	JTC	Cal	316	347	31	10%	✓	1.70	3	14	11	367%	✓	3.77	319	361	42	13%	✓	2.28
109	D_29_B	JTC	Cal	244	325	81	33%	✓	4.80	5	1	-4	-80%	✓	2.31	249	326	77	31%	✓	4.54
110	O_30_A	JTC	Cal	2557	2,828	271	11%	✓	5.22	99	125	26	26%	✓	2.46	2656	2953	297	11%	✓	5.61
111	O_30_B	JTC	Cal	76	62	-14	-18%	✓	1.69	3	1	-2	-67%	✓	1.41	79	63	-16	-20%	✓	1.90
112	D_30_B	JTC	Cal	5	40	35	700%	✓	7.38	0	0	0	0%	✓	0.00	5	40	35	700%	✓	7.38
113	D_30_C	JTC	Cal	4	15	11	275%	✓	3.57	0	0	0	0%	✓	0.00	4	15	11	275%	✓	3.57
114	D_30_D	JTC	Cal	2626	2,845	219	8%	✓	4.19	102	126	24	24%	✓	2.25	2728	2971	243	9%	✓	4.55
117	3_W	ATC	Val	398	413	15	4%	✓	0.75	41	36	-5	-11%	✓	0.73	438	449	11	2%	✓	0.51

				0405PM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_PM	Dif #	Dif %	IndFlows	GEH
118	4_E	ATC	Val	527	634	107	20%	✗	4.43	45	18	-27	-60%	✓	4.83	573	652	80	14%	✓	3.21
119	5_W	ATC	Val	334	354	20	6%	✓	1.09	37	10	-27	-73%	✓	5.62	371	364	-7	-2%	✓	0.37
120	6_N	ATC	Val	128	125	-3	-2%	✓	0.22	12	2	-10	-84%	✓	3.82	140	127	-13	-9%	✓	1.10
121	7_E	ATC	Val	134	92	-42	-31%	✓	3.95	25	11	-14	-56%	✓	3.30	159	103	-56	-35%	✓	4.89
122	8_W	ATC	Val	421	546	125	30%	✗	5.68	47	31	-16	-34%	✓	2.56	468	577	109	23%	✗	4.76
123	9_N	ATC	Val	97	107	10	10%	✓	0.97	24	29	6	23%	✓	1.07	121	136	15	13%	✓	1.35
124	10_N	ATC	Val	285	422	137	48%	✗	7.27	49	24	-25	-51%	✓	4.16	335	446	112	33%	✗	5.64
125	11_E	ATC	Val	216	216	0	0%	✓	0.02	30	7	-23	-77%	✓	5.40	246	223	-23	-9%	✓	1.50
126	11_W	ATC	Val	140	143	3	2%	✓	0.25	12	9	-3	-23%	✓	0.83	152	152	0	0%	✓	0.03
127	12_N	ATC	Val	320	378	58	18%	✓	3.11	29	10	-19	-66%	✓	4.33	349	388	39	11%	✓	2.03
128	12_S	ATC	Val	99	87	-12	-12%	✓	1.19	8	3	-5	-63%	✓	2.13	107	90	-17	-15%	✓	1.66
131	15_E	ATC	Val	509	738	230	45%	✗	9.19	55	40	-15	-27%	✓	2.15	563	778	215	38%	✗	8.29
132	15_W	ATC	Val	453	507	54	12%	✓	2.47	55	60	6	10%	✓	0.73	507	567	60	12%	✓	2.57
137	TII_M50_N	TII	Val	1470	1,408	-62	-4%	✓	1.63	62	127	65	105%	✓	6.69	1532	1535	3	0%	✓	0.08
138	TII_M50_S	TII	Val	1927	1,733	-194	-10%	✓	4.53	54	36	-18	-33%	✓	2.68	1981	1769	-212	-11%	✓	4.90
139	TII_J4_J5_N	TII	Val	2214	2,149	-65	-3%	✓	1.39	73	149	76	104%	✓	7.21	2287	2298	11	0%	✓	0.23
140	TII_J4_J5_S	TII	Val	3377	3,589	212	6%	✓	3.59	51	97	46	90%	✓	5.35	3428	3686	258	8%	✓	4.33
141	TII_J5_J6_N	TII	Val	1934	1,860	-74	-4%	✓	1.70	78	115	37	47%	✓	3.77	2012	1975	-37	-2%	✓	0.83
142	TII_J5_J6_S	TII	Val	3294	3,545	251	8%	✓	4.29	58	97	39	67%	✓	4.43	3352	3642	290	9%	✓	4.90
143	TII_J8_J9_N	TII	Val	1397	1,452	55	4%	✓	1.46	65	69	4	6%	✓	0.49	1462	1521	59	4%	✓	1.53
144	TII_J8_J9_S	TII	Val	2898	3,276	378	13%	✓	6.80	70	136	66	94%	✓	6.50	2968	3412	444	15%	✗	7.86

				0506PM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_PM	Dif #	Dif %	IndFlows	GEH
1	O_1_A	JTC	Cal	2585	2,506	-79	-3%	✓	1.57	50	47	-3	-6%	✓	0.43	2635	2553	-82	-3%	✓	1.61
2	O_1_B	JTC	Cal	240	223	-17	-7%	✓	1.12	14	21	7	50%	✓	1.67	254	244	-10	-4%	✓	0.63
3	O_1_C	JTC	Cal	997	917	-80	-8%	✓	2.59	17	14	-3	-18%	✓	0.76	1014	931	-83	-8%	✓	2.66
4	O_1_D	JTC	Cal	109	111	2	2%	✓	0.19	0	0	0	0%	✓	0.00	109	111	2	2%	✓	0.19
5	D_1_A	JTC	Cal	1367	1,302	-65	-5%	✓	1.78	32	17	-15	-47%	✓	3.03	1399	1319	-80	-6%	✓	2.17
6	D_1_B	JTC	Cal	786	770	-16	-2%	✓	0.57	18	20	2	11%	✓	0.46	804	790	-14	-2%	✓	0.50
7	D_1_C	JTC	Cal	1692	1,578	-114	-7%	✓	2.82	31	44	13	42%	✓	2.12	1723	1622	-101	-6%	✓	2.47
8	D_1_D	JTC	Cal	86	112	26	30%	✓	2.61	0	0	0	0%	✓	0.00	86	112	26	30%	✓	2.61
9	O_2_A	JTC	Cal	536	544	8	1%	✓	0.34	23	38	15	65%	✓	2.72	559	582	23	4%	✓	0.96
10	O_2_B	JTC	Val	698	717	19	3%	✓	0.71	27	13	-14	-52%	✓	3.13	725	730	5	1%	✓	0.19
11	O_2_C	JTC	Val	548	640	92	17%	✓	3.77	7	26	19	271%	✓	4.68	555	666	111	20%	✗	4.49
12	D_2_A	JTC	Val	249	303	54	22%	✓	3.25	19	5	-14	-74%	✓	4.04	268	308	40	15%	✓	2.36
13	D_2_B	JTC	Val	637	718	81	13%	✓	3.11	26	26	0	0%	✓	0.00	663	744	81	12%	✓	3.05
15	O_3_A	JTC	Cal	117	146	29	25%	✓	2.53	4	2	-2	-50%	✓	1.15	121	148	27	22%	✓	2.33
16	O_3_B	JTC	Cal	128	138	10	8%	✓	0.87	4	0	-4	-100%	✓	2.83	132	138	6	5%	✓	0.52
17	O_3_C	JTC	Cal	240	237	-3	-1%	✓	0.19	1	0	-1	-100%	✓	1.41	241	237	-4	-2%	✓	0.26
18	D_3_A	JTC	Cal	339	348	9	3%	✓	0.49	4	0	-4	-100%	✓	2.83	343	348	5	1%	✓	0.27
19	D_3_C	JTC	Cal	146	172	26	18%	✓	2.06	5	2	-3	-60%	✓	1.60	151	174	23	15%	✓	1.80
20	O_8_A	JTC	Cal	314	311	-3	-1%	✓	0.17	3	6	3	100%	✓	1.41	317	317	0	0%	✓	0.00
21	O_8_B	JTC	Cal	115	124	9	8%	✓	0.82	0	2	2	0%	✓	2.00	115	126	11	10%	✓	1.00
22	O_8_C	JTC	Cal	657	769	112	17%	✗	4.19	11	10	-1	-9%	✓	0.31	668	779	111	17%	✗	4.13
23	O_8_D	JTC	Cal	121	76	-45	-37%	✓	4.53	9	13	4	44%	✓	1.21	130	89	-41	-32%	✓	3.92
24	D_8_A	JTC	Cal	339	328	-11	-3%	✓	0.60	5	14	9	180%	✓	2.92	344	342	-2	-1%	✓	0.11
25	D_8_B	JTC	Cal	94	89	-5	-5%	✓	0.52	1	1	0	0%	✓	0.00	95	90	-5	-5%	✓	0.52
26	D_8_C	JTC	Cal	115	133	18	16%	✓	1.62	9	6	-3	-33%	✓	1.10	124	139	15	12%	✓	1.31
27	D_8_D	JTC	Cal	659	732	73	11%	✓	2.77	8	11	3	38%	✓	0.97	667	743	76	11%	✓	2.86
28	O_9_B	JTC	Cal	115	133	18	16%	✓	1.62	9	6	-3	-33%	✓	1.10	124	139	15	12%	✓	1.31
29	O_9_C	JTC	Cal	413	522	109	26%	✗	5.04	11	24	13	118%	✓	3.11	424	546	122	29%	✗	5.54
30	O_9_D	JTC	Cal	283	290	7	2%	✓	0.41	13	9	-4	-31%	✓	1.21	296	299	3	1%	✓	0.17
31	D_9_A	JTC	Cal	115	139	24	21%	✓	2.13	10	6	-4	-40%	✓	1.41	125	145	20	16%	✓	1.72
32	D_9_B	JTC	Cal	659	770	111	17%	✗	4.15	11	10	-1	-9%	✓	0.31	670	780	110	16%	✗	4.09
33	D_9_D	JTC	Cal	37	31	-6	-16%	✓	1.03	12	23	11	92%	✓	2.63	49	54	5	10%	✓	0.70
34	O_10_A	JTC	Cal	3582	3,752	170	5%	✓	2.81	66	101	35	53%	✓	3.83	3648	3853	205	6%	✓	3.35
35	O_10_B	JTC	Cal	0	0	0	0%	✓	0.00	0	0	0	0%	✓	0.00	0	0	0	0%	✓	0.00
36	O_10_C	JTC	Cal	2113	2,136	23	1%	✓	0.50	59	75	16	27%	✓	1.95	2172	2211	39	2%	✓	0.83
37	O_10_D	JTC	Cal	327	327	0	0%	✓	0.00	7	21	14	200%	✓	3.74	334	348	14	4%	✓	0.76
38	D_10_A	JTC	Cal	2296	2,306	10	0%	✓	0.21	66	90	24	36%	✓	2.72	2362	2396	34	1%	✓	0.70
39	D_10_B	JTC	Cal	1	0	-1	-100%	✓	1.41	0	0	0	0%	✓	0.00	1	0	-1	-100%	✓	1.41
40	D_10_C	JTC	Cal	3581	3,753	172	5%	✓	2.84	66	101	35	53%	✓	3.83	3647	3854	207	6%	✓	3.38
41	D_10_D	JTC	Cal	144	153	9	6%	✓	0.74	0	6	6	0%	✓	3.46	144	159	15	10%	✓	1.22
42	O_11_A	JTC	Val	3622	3,750	128	4%	✓	2.11	63	102	39	62%	✓	4.29	3685	3852	167	5%	✓	2.72
43	O_11_B	JTC	Val	123	138	15	12%	✓	1.31	0	1	1	0%	✓	1.41	123	139	16	13%	✓	1.40
44	D_11_B	JTC	Val	337	349	12	4%	✓	0.65	2	13	11	550%	✓	4.02	339	362	23	7%	✓	1.23
45	D_11_C	JTC	Val	3408	3,541	133	4%	✓	2.26	61	90	29	48%	✓	3.34	3469	3631	162	5%	✓	2.72
46	O_14_B	JTC	Cal	833	822	-11	-1%	✓	0.38	12	18	6	50%	✓	1.55	845	840	-5	-1%	✓	0.17
47	O_14_C	JTC	Cal	346	409	63	18%	✓	3.24	6	4	-2	-33%	✓	0.89	352	413	61	17%	✓	3.12
48	O_14_D	JTC	Cal	148	158	10	7%	✓	0.81	0	0	0	0%	✓	0.00	148	158	10	7%	✓	0.81
49	D_14_A	JTC	Cal	808	813	5	1%	✓	0.18	12	18	6	50%	✓	1.55	820	831	11	1%	✓	0.38
50	D_14_B	JTC	Cal	464	509	45	10%	✓	2.04	6	4	-2	-33%	✓	0.89	470	513	43	9%	✓	1.94
51	D_14_D	JTC	Cal	55	71	16	29%	✓	2.02	0	0	0	0%	✓	0.00	55	71	16	29%	✓	2.02
52	O_15_A	JTC	Cal	461	509	48	10%	✓	2.18	6	4	-2	-33%	✓	0.89	467	513	46	10%	✓	2.08
53	O_15_B	JTC	Cal	71	52	-19	-27%	✓	2.42	1	0	-1	-100%	✓	1.41	72	52	-20	-28%	✓	2.54
54	O_15_C	JTC	Cal	838	850	12	1%	✓	0.41	11	18	7	64%	✓	1.84	849	868	19	2%	✓	0.65
55	D_15_A	JTC	Cal	828	824	-4	0%	✓	0.14	12	18	6	50%	✓	1.55	840	842	2	0%	✓	0.07
56	D_15_B	JTC	Cal	70	74	4	6%	✓	0.47	0	0	0	0%	✓	0.00	70	74	4	6%	✓	0.47
57	D_15_C	JTC	Cal	472	515	43	9%	✓	1.94	6	4	-2	-33%	✓	0.89	478	519	41	9%	✓	1.84
58	O_16_A	JTC	Cal	471	515	44	9%	✓	1.98	7	4	-3	-43%	✓	1.28	478	519	41	9%	✓	1.84
59	O_16_B	JTC	Cal	493	459	-34	-7%	✓	1.56	7	8	1	14%	✓	0.37	500	467	-33	-7%	✓	1.50
60	O_16_C	JTC	Cal	644	719	75	12%	✓	2.87	19	20	1	5%	✓	0.23	663	739	76	11%	✓	2.87

				0506PM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_PM	Dif #	Dif %	IndFlows	GEH
61	O_16_D	JTC	Cal	741	724	-17	-2%	✓	0.63	10	29	19	190%	✓	4.30	751	753	2	0%	✓	0.07
62	D_16_A	JTC	Cal	837	850	13	2%	✓	0.45	12	18	6	50%	✓	1.55	849	868	19	2%	✓	0.65
63	D_16_B	JTC	Cal	351	401	50	14%	✓	2.58	12	14	2	17%	✓	0.55	363	415	52	14%	✓	2.64
64	D_16_C	JTC	Cal	667	667	0	0%	✓	0.00	10	19	9	90%	✓	2.36	677	686	9	1%	✓	0.34
65	D_16_D	JTC	Cal	494	487	-7	-1%	✓	0.32	9	12	3	33%	✓	0.93	503	499	-4	-1%	✓	0.18
66	O_20_B	JTC	Val	138	135	-3	-2%	✓	0.26	4	2	-2	-50%	✓	1.15	142	137	-5	-4%	✓	0.42
67	O_20_C	JTC	Val	32	34	2	6%	✓	0.35	0	0	0	0%	✓	0.00	32	34	2	6%	✓	0.35
68	D_20_A	JTC	Val	141	144	3	2%	✓	0.25	3	1	-2	-67%	✓	1.41	144	145	1	1%	✓	0.08
69	D_20_B	JTC	Val	7	7	0	0%	✓	0.00	0	0	0	0%	✓	0.00	7	7	0	0%	✓	0.00
70	D_20_C	JTC	Val	22	18	-4	-18%	✓	0.89	1	1	0	0%	✓	0.00	23	19	-4	-17%	✓	0.87
71	O_21_A	JTC	Cal	22	26	4	18%	✓	0.82	0	0	0	0%	✓	0.00	22	26	4	18%	✓	0.82
72	O_21_B	JTC	Cal	90	85	-5	-6%	✓	0.53	3	3	0	0%	✓	0.00	93	88	-5	-5%	✓	0.53
73	O_21_C	JTC	Cal	214	247	33	15%	✓	2.17	10	2	-8	-80%	✓	3.27	224	249	25	11%	✓	1.63
74	D_21_A	JTC	Cal	249	247	-2	-1%	✓	0.13	10	2	-8	-80%	✓	3.27	259	249	-10	-4%	✓	0.63
75	D_21_C	JTC	Cal	77	110	33	43%	✓	3.41	3	3	0	0%	✓	0.00	80	113	33	41%	✓	3.36
76	O_22_A	JTC	Cal	10	2	-8	-80%	✓	3.27	0	1	1	0%	✓	1.41	10	3	-7	-70%	✓	2.75
77	O_22_D	JTC	Cal	175	178	3	2%	✓	0.23	1	5	4	400%	✓	2.31	176	183	7	4%	✓	0.52
78	O_22_E	JTC	Cal	289	301	12	4%	✓	0.70	11	0	-11	-100%	✓	4.69	300	301	1	0%	✓	0.06
79	D_22_A	JTC	Cal	20	19	-1	-5%	✓	0.23	1	0	-1	-100%	✓	1.41	21	19	-2	-10%	✓	0.45
80	D_22_C	JTC	Cal	165	156	-9	-5%	✓	0.71	1	5	4	400%	✓	2.31	166	161	-5	-3%	✓	0.39
81	D_22_D	JTC	Cal	283	301	18	6%	✓	1.05	10	1	-9	-90%	✓	3.84	293	302	9	3%	✓	0.52
82	O_23_B	JTC	Val	1397	1,443	46	3%	✓	1.22	51	61	10	20%	✓	1.34	1448	1504	56	4%	✓	1.46
83	O_23_C	JTC	Val	9	10	1	11%	✓	0.32	0	0	0	0%	✓	0.00	9	10	1	11%	✓	0.32
84	D_23_A	JTC	Val	1399	1,455	56	4%	✓	1.48	51	61	10	20%	✓	1.34	1450	1516	66	5%	✓	1.71
85	D_23_C	JTC	Val	7	0	-7	-100%	✓	3.74	0	0	0	0%	✓	0.00	7	0	-7	-100%	✓	3.74
86	O_24_A	JTC	Cal	12	11	-1	-8%	✓	0.29	0	0	0	0%	✓	0.00	12	11	-1	-8%	✓	0.29
87	O_24_B	JTC	Cal	64	108	44	69%	✓	4.74	0	2	2	0%	✓	2.00	64	110	46	72%	✓	4.93
88	O_24_C	JTC	Cal	65	105	40	62%	✓	4.34	3	2	-1	-33%	✓	0.63	68	107	39	57%	✓	4.17
89	D_24_A	JTC	Cal	7	20	13	186%	✓	3.54	0	0	0	0%	✓	0.00	7	20	13	186%	✓	3.54
90	D_24_B	JTC	Cal	66	101	35	53%	✓	3.83	3	2	-1	-33%	✓	0.63	69	103	34	49%	✓	3.67
91	D_24_C	JTC	Cal	68	103	35	51%	✓	3.79	0	2	2	0%	✓	2.00	68	105	37	54%	✓	3.98
92	O_25_A	JTC	Val	73	103	30	41%	✓	3.20	1	2	1	100%	✓	0.82	74	105	31	42%	✓	3.28
93	O_25_B	JTC	Val	44	90	46	105%	✓	5.62	3	1	-2	-67%	✓	1.41	47	91	44	94%	✓	5.30
94	O_25_C	JTC	Val	87	87	0	0%	✓	0.00	0	1	1	0%	✓	1.41	87	88	1	1%	✓	0.11
95	D_25_A	JTC	Val	64	104	40	63%	✓	4.36	3	2	-1	-33%	✓	0.63	67	106	39	58%	✓	4.19
96	D_25_B	JTC	Val	68	108	40	59%	✓	4.26	0	2	2	0%	✓	2.00	68	110	42	62%	✓	4.45
97	D_25_C	JTC	Val	72	68	-4	-6%	✓	0.48	1	0	-1	-100%	✓	1.41	73	68	-5	-7%	✓	0.60
98	O_26_A	JTC	Cal	2984	3,060	76	3%	✓	1.38	40	77	37	93%	✓	4.84	3024	3137	113	4%	✓	2.04
99	O_26_B	JTC	Cal	71	63	-8	-11%	✓	0.98	3	2	-1	-33%	✓	0.63	74	65	-9	-12%	✓	1.08
100	D_26_B	JTC	Cal	69	77	8	12%	✓	0.94	0	2	2	0%	✓	2.00	69	79	10	14%	✓	1.16
101	D_26_C	JTC	Cal	2986	3,046	60	2%	✓	1.09	43	78	35	81%	✓	4.50	3029	3124	95	3%	✓	1.71
102	O_28_B	JTC	Cal	52	51	-1	-2%	✓	0.14	1	0	-1	-100%	✓	1.41	53	51	-2	-4%	✓	0.28
103	O_28_C	JTC	Cal	193	278	85	44%	✓	5.54	0	0	0	0%	✓	0.00	193	278	85	44%	✓	5.54
104	D_28_A	JTC	Cal	193	277	84	44%	✓	5.48	0	0	0	0%	✓	0.00	193	277	84	44%	✓	5.48
105	O_29_A	JTC	Cal	215	221	6	3%	✓	0.41	2	2	0	0%	✓	0.00	217	223	6	3%	✓	0.40
106	O_29_B	JTC	Cal	50	61	11	22%	✓	1.48	0	2	2	0%	✓	2.00	50	63	13	26%	✓	1.73
107	O_29_C	JTC	Cal	341	411	70	21%	✓	3.61	5	9	4	80%	✓	1.51	346	420	74	21%	✓	3.78
108	D_29_A	JTC	Cal	346	364	18	5%	✓	0.96	5	11	6	120%	✓	2.12	351	375	24	7%	✓	1.26
109	D_29_B	JTC	Cal	260	327	67	26%	✓	3.91	2	2	0	0%	✓	0.00	262	329	67	26%	✓	3.90
110	O_30_A	JTC	Cal	2625	2,619	-6	0%	✓	0.12	52	70	18	35%	✓	2.30	2677	2689	12	0%	✓	0.23
111	O_30_B	JTC	Cal	64	72	8	13%	✓	0.97	2	2	0	0%	✓	0.00	66	74	8	12%	✓	0.96
112	D_30_B	JTC	Cal	6	33	27	450%	✓	6.11	0	2	2	0%	✓	2.00	6	35	29	483%	✓	6.41
113	D_30_C	JTC	Cal	2	21	19	950%	✓	5.60	0	0	0	0%	✓	0.00	2	21	19	950%	✓	5.60
114	D_30_D	JTC	Cal	2684	2,651	-33	-1%	✓	0.64	54	70	16	30%	✓	2.03	2738	2721	-17	-1%	✓	0.33
117	3_W	ATC	Val	414	457	43	10%	✓	2.07	32	10	-22	-68%	✓	4.75	445	467	22	5%	✓	1.01
118	4_E	ATC	Val	538	640	102	19%	✗	4.20	34	26	-8	-24%	✓	1.52	573	666	93	16%	✓	3.76
119	5_W	ATC	Val	467	419	-48	-10%	✓	2.30	31	36	6	18%	✓	0.95	498	455	-43	-9%	✓	1.96
120	6_N	ATC	Val	146	138	-8	-5%	✓	0.67	8	0	-8	-100%	✓	4.04	154	138	-16	-10%	✓	1.34
121	7_E	ATC	Val	142	76	-66	-46%	✓	6.29	14	13	-1	-9%	✓	0.36	156	89	-67	-43%	✓	6.05

				0506PM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_PM	Dif #	Dif %	IndFlows	GEH
122	8_W	ATC	Val	597	725	128	21%	✗	4.97	36	11	-25	-69%	✓	5.16	633	736	103	16%	✗	3.92
123	9_N	ATC	Val	109	139	30	28%	✓	2.73	9	6	-3	-33%	✓	1.10	118	145	27	23%	✓	2.39
124	10_N	ATC	Val	365	523	159	43%	✗	7.52	34	23	-11	-32%	✓	2.06	399	546	148	37%	✗	6.79
125	11_E	ATC	Val	287	328	41	14%	✓	2.36	20	21	1	3%	✓	0.15	307	349	42	14%	✓	2.32
126	11_W	ATC	Val	143	153	10	7%	✓	0.81	12	6	-6	-48%	✓	1.86	155	159	4	3%	✓	0.35
127	12_N	ATC	Val	361	349	-12	-3%	✓	0.62	21	13	-8	-39%	✓	2.01	382	362	-20	-5%	✓	1.04
128	12_S	ATC	Val	121	138	17	14%	✓	1.52	5	1	-4	-80%	✓	2.31	126	139	13	11%	✓	1.16
131	15_E	ATC	Val	590	728	138	23%	✗	5.38	44	29	-15	-34%	✓	2.46	634	757	123	19%	✗	4.68
132	15_W	ATC	Val	506	487	-19	-4%	✓	0.85	34	12	-22	-65%	✓	4.61	540	499	-41	-8%	✓	1.81
137	TII_M50_N	TII	Val	1318	1,308	-10	-1%	✓	0.28	51	71	20	39%	✓	2.56	1369	1379	10	1%	✓	0.27
138	TII_M50_S	TII	Val	1365	1,729	364	27%	✗	9.25	29	50	21	72%	✓	3.34	1394	1779	385	28%	✗	9.67
139	TII_J4_J5_N	TII	Val	2253	2,226	-27	-1%	✓	0.57	57	81	24	42%	✓	2.89	2310	2307	-3	0%	✓	0.06
140	TII_J4_J5_S	TII	Val	2957	3,302	345	12%	✓	6.17	39	94	55	141%	✓	6.74	2996	3396	400	13%	✓	7.08
141	TII_J5_J6_N	TII	Val	2019	1,916	-103	-5%	✓	2.32	54	71	17	31%	✓	2.15	2073	1987	-86	-4%	✓	1.91
142	TII_J5_J6_S	TII	Val	3009	3,093	84	3%	✓	1.52	44	102	58	132%	✓	6.79	3053	3195	142	5%	✓	2.54
143	TII_J8_J9_N	TII	Val	1409	1,448	39	3%	✓	1.03	44	61	17	39%	✓	2.35	1453	1509	56	4%	✓	1.46
144	TII_J8_J9_S	TII	Val	3054	3,057	3	0%	✓	0.05	40	75	35	88%	✓	4.62	3094	3132	38	1%	✓	0.68

				0607PM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_PM	Dif #	Dif %	IndFlows	GEH
1	O_1_A	JTC	Cal	2316	2,478	162	7%	✓	3.31	47	62	15	32%	✓	2.03	2363	2540	177	7%	✓	3.57
2	O_1_B	JTC	Cal	305	304	-1	0%	✓	0.06	21	4	-17	-81%	✓	4.81	326	308	-18	-6%	✓	1.01
3	O_1_C	JTC	Cal	772	811	39	5%	✓	1.39	18	20	2	11%	✓	0.46	790	831	41	5%	✓	1.44
4	O_1_D	JTC	Cal	81	46	-35	-43%	✓	4.39	0	0	0	0%	✓	0.00	81	46	-35	-43%	✓	4.39
5	D_1_A	JTC	Cal	1172	1,186	14	1%	✓	0.41	40	24	-16	-40%	✓	2.83	1212	1210	-2	0%	✓	0.06
6	D_1_B	JTC	Cal	706	705	-1	0%	✓	0.04	18	18	0	0%	✓	0.00	724	723	-1	0%	✓	0.04
7	D_1_C	JTC	Cal	1503	1,634	131	9%	✓	3.31	28	45	17	61%	✓	2.81	1531	1679	148	10%	✓	3.69
8	D_1_D	JTC	Cal	93	112	19	20%	✓	1.88	0	0	0	0%	✓	0.00	93	112	19	20%	✓	1.88
9	O_2_A	JTC	Cal	467	443	-24	-5%	✓	1.13	22	6	-16	-73%	✓	4.28	489	449	-40	-8%	✓	1.85
10	O_2_B	JTC	Val	604	636	32	5%	✓	1.29	19	11	-8	-42%	✓	2.07	623	647	24	4%	✓	0.95
11	O_2_C	JTC	Val	510	514	4	1%	✓	0.18	5	20	15	300%	✓	4.24	515	534	19	4%	✓	0.83
12	D_2_A	JTC	Val	268	272	4	1%	✓	0.24	17	13	-4	-24%	✓	1.03	285	285	0	0%	✓	0.00
13	D_2_B	JTC	Val	561	580	19	3%	✓	0.80	23	18	-5	-22%	✓	1.10	584	598	14	2%	✓	0.58
15	O_3_A	JTC	Cal	114	130	16	14%	✓	1.45	0	1	1	0%	✓	1.41	114	131	17	15%	✓	1.54
16	O_3_B	JTC	Cal	159	137	-22	-14%	✓	1.81	3	0	-3	-100%	✓	2.45	162	137	-25	-15%	✓	2.04
17	O_3_C	JTC	Cal	208	205	-3	-1%	✓	0.21	0	0	0	0%	✓	0.00	208	205	-3	-1%	✓	0.21
18	D_3_A	JTC	Cal	313	312	-1	0%	✓	0.06	1	0	-1	-100%	✓	1.41	314	312	-2	-1%	✓	0.11
19	D_3_C	JTC	Cal	168	161	-7	-4%	✓	0.55	2	1	-1	-50%	✓	0.82	170	162	-8	-5%	✓	0.62
20	O_8_A	JTC	Cal	244	284	40	16%	✓	2.46	2	4	2	100%	✓	1.15	246	288	42	17%	✓	2.57
21	O_8_B	JTC	Cal	63	113	50	79%	✓	5.33	0	2	2	0%	✓	2.00	63	115	52	83%	✓	5.51
22	O_8_C	JTC	Cal	498	577	79	16%	✓	3.41	5	3	-2	-40%	✓	1.00	503	580	77	15%	✓	3.31
23	O_8_D	JTC	Cal	171	119	-52	-30%	✓	4.32	8	11	3	38%	✓	0.97	179	130	-49	-27%	✓	3.94
24	D_8_A	JTC	Cal	301	313	12	4%	✓	0.68	4	12	8	200%	✓	2.83	305	325	20	7%	✓	1.13
25	D_8_B	JTC	Cal	85	99	14	16%	✓	1.46	0	2	2	0%	✓	2.00	85	101	16	19%	✓	1.66
26	D_8_C	JTC	Cal	77	123	46	60%	✓	4.60	8	1	-7	-88%	✓	3.30	85	124	39	46%	✓	3.82
27	D_8_D	JTC	Cal	513	555	42	8%	✓	1.82	3	4	1	33%	✓	0.53	516	559	43	8%	✓	1.85
28	O_9_B	JTC	Cal	78	122	44	56%	✓	4.40	8	1	-7	-88%	✓	3.30	86	123	37	43%	✓	3.62
29	O_9_C	JTC	Cal	324	359	35	11%	✓	1.89	5	19	14	280%	✓	4.04	329	378	49	15%	✓	2.61
30	O_9_D	JTC	Cal	194	243	49	25%	✓	3.31	3	0	-3	-100%	✓	2.45	197	243	46	23%	✓	3.10
31	D_9_A	JTC	Cal	72	116	44	61%	✓	4.54	2	1	-1	-50%	✓	0.82	74	117	43	58%	✓	4.40
32	D_9_B	JTC	Cal	495	576	81	16%	✓	3.50	5	3	-2	-40%	✓	1.00	500	579	79	16%	✓	3.40
33	D_9_D	JTC	Cal	29	37	8	28%	✓	1.39	9	16	7	78%	✓	1.98	38	53	15	39%	✓	2.22
34	O_10_A	JTC	Cal	3834	3,875	41	1%	✓	0.66	76	70	-6	-8%	✓	0.70	3910	3945	35	1%	✓	0.56
35	O_10_B	JTC	Cal	4	0	-4	-100%	✓	2.83	0	0	0	0%	✓	0.00	4	0	-4	-100%	✓	2.83
36	O_10_C	JTC	Cal	1727	1,761	34	2%	✓	0.81	48	61	13	27%	✓	1.76	1775	1822	47	3%	✓	1.11
37	O_10_D	JTC	Cal	270	268	-2	-1%	✓	0.12	4	14	10	250%	✓	3.33	274	282	8	3%	✓	0.48
38	D_10_A	JTC	Cal	1874	1,897	23	1%	✓	0.53	48	69	21	44%	✓	2.75	1922	1966	44	2%	✓	1.00
39	D_10_B	JTC	Cal	5	0	-5	-100%	✓	3.16	0	0	0	0%	✓	0.00	5	0	-5	-100%	✓	3.16
40	D_10_C	JTC	Cal	3833	3,874	41	1%	✓	0.66	76	71	-5	-7%	✓	0.58	3909	3945	36	1%	✓	0.57
41	D_10_D	JTC	Cal	123	132	9	7%	✓	0.80	4	5	1	25%	✓	0.47	127	137	10	8%	✓	0.87
42	O_11_A	JTC	Val	3881	3,875	-6	0%	✓	0.10	66	71	5	8%	✓	0.60	3947	3946	-1	0%	✓	0.02
43	O_11_B	JTC	Val	109	128	19	17%	✓	1.75	2	3	1	50%	✓	0.63	111	131	20	18%	✓	1.82
44	D_11_B	JTC	Val	408	412	4	1%	✓	0.20	0	1	1	0%	✓	1.41	408	413	5	1%	✓	0.25
45	D_11_C	JTC	Val	3582	3,591	9	0%	✓	0.15	68	73	5	7%	✓	0.60	3650	3664	14	0%	✓	0.23
46	O_14_B	JTC	Cal	673	741	68	10%	✓	2.56	18	16	-2	-11%	✓	0.49	691	757	66	10%	✓	2.45
47	O_14_C	JTC	Cal	248	318	70	28%	✓	4.16	8	6	-2	-25%	✓	0.76	256	324	68	27%	✓	3.99
48	O_14_D	JTC	Cal	120	142	22	18%	✓	1.92	0	6	6	0%	✓	3.46	120	148	28	23%	✓	2.42
49	D_14_A	JTC	Cal	643	726	83	13%	✓	3.17	18	21	3	17%	✓	0.68	661	747	86	13%	✓	3.24
50	D_14_B	JTC	Cal	344	419	75	22%	✓	3.84	8	7	-1	-13%	✓	0.37	352	426	74	21%	✓	3.75
51	D_14_D	JTC	Cal	54	57	3	6%	✓	0.40	0	0	0	0%	✓	0.00	54	57	3	6%	✓	0.40
52	O_15_A	JTC	Cal	352	419	67	19%	✓	3.41	9	7	-2	-22%	✓	0.71	361	426	65	18%	✓	3.28
53	O_15_B	JTC	Cal	46	49	3	7%	✓	0.44	1	0	-1	-100%	✓	1.41	47	49	2	4%	✓	0.29
54	O_15_C	JTC	Cal	692	756	64	9%	✓	2.38	18	16	-2	-11%	✓	0.49	710	772	62	9%	✓	2.28
55	D_15_A	JTC	Cal	667	739	72	11%	✓	2.72	18	16	-2	-11%	✓	0.49	685	755	70	10%	✓	2.61
56	D_15_B	JTC	Cal	62	62	0	0%	✓	0.00	1	0	-1	-100%	✓	1.41	63	62	-1	-2%	✓	0.13
57	D_15_C	JTC	Cal	361	422	61	17%	✓	3.08	9	7	-2	-22%	✓	0.71	370	429	59	16%	✓	2.95
58	O_16_A	JTC	Cal	371	423	52	14%	✓	2.61	8	7	-1	-13%	✓	0.37	379	430	51	13%	✓	2.54
59	O_16_B	JTC	Cal	354	349	-5	-1%	✓	0.27	12	13	1	8%	✓	0.28	366	362	-4	-1%	✓	0.21
60	O_16_C	JTC	Cal	554	627	73	13%	✓	3.00	17	23	6	35%	✓	1.34	571	650	79	14%	✓	3.20

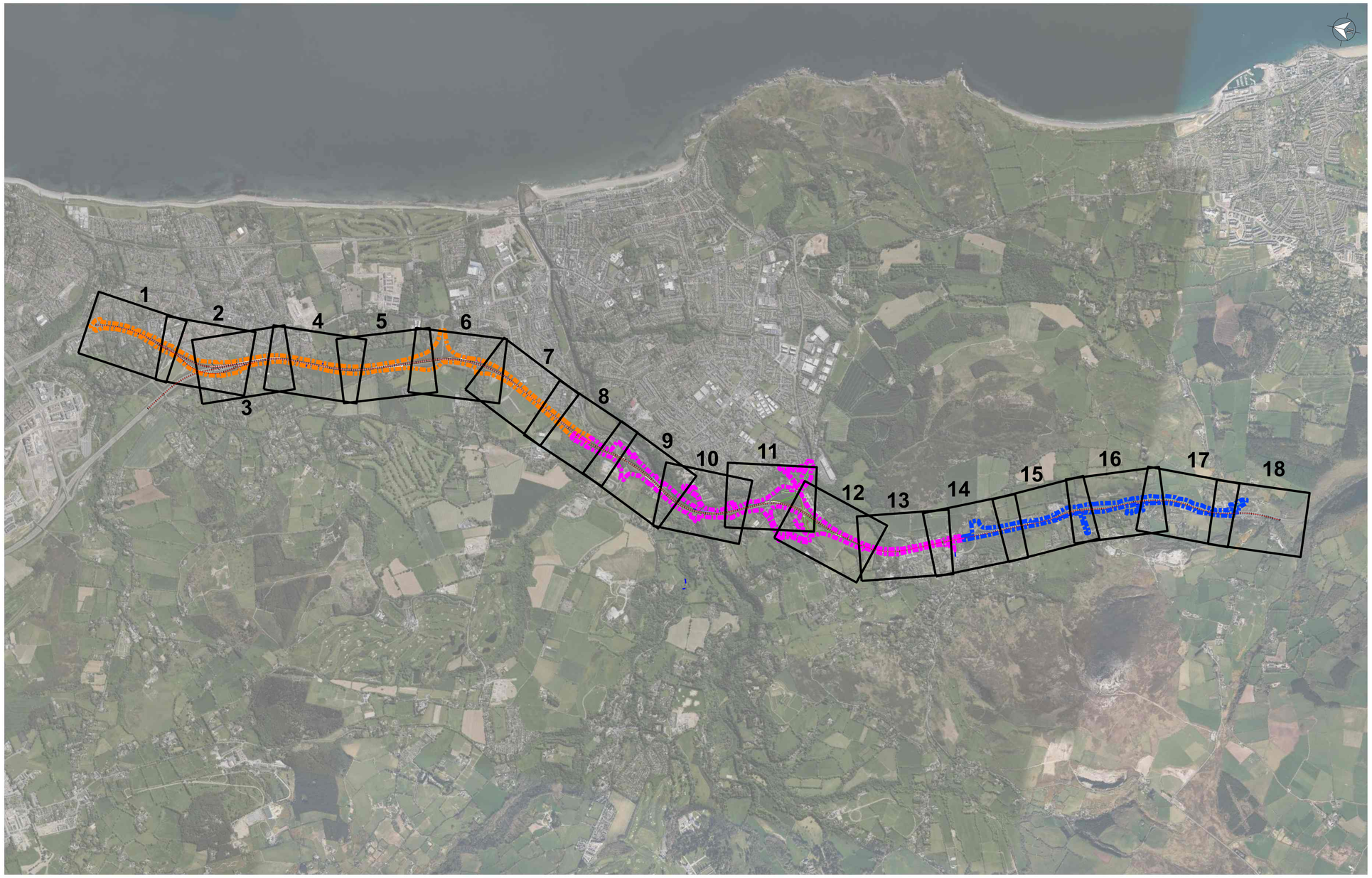
				0607PM																	
				LV						HV						Total					
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_PM	Dif #	Dif %	IndFlows	GEH
61	O_16_D	JTC	Cal	864	736	-128	-15%	✓	4.53	15	22	7	47%	✓	1.63	879	758	-121	-14%	✓	4.23
62	D_16_A	JTC	Cal	693	756	63	9%	✓	2.34	17	16	-1	-6%	✓	0.25	710	772	62	9%	✓	2.28
63	D_16_B	JTC	Cal	361	308	-53	-15%	✓	2.90	9	12	3	33%	✓	0.93	370	320	-50	-14%	✓	2.69
64	D_16_C	JTC	Cal	727	698	-29	-4%	✓	1.09	14	17	3	21%	✓	0.76	741	715	-26	-4%	✓	0.96
65	D_16_D	JTC	Cal	362	391	29	8%	✓	1.49	12	20	8	67%	✓	2.00	374	411	37	10%	✓	1.87
66	O_20_B	JTC	Val	38	39	1	3%	✓	0.16	2	0	-2	-100%	✓	2.00	40	39	-1	-3%	✓	0.16
67	O_20_C	JTC	Val	19	25	6	32%	✓	1.28	0	0	0	0%	✓	0.00	19	25	6	32%	✓	1.28
68	D_20_A	JTC	Val	42	50	8	19%	✓	1.18	2	0	-2	-100%	✓	2.00	44	50	6	14%	✓	0.88
69	D_20_B	JTC	Val	5	6	1	20%	✓	0.43	0	0	0	0%	✓	0.00	5	6	1	20%	✓	0.43
70	D_20_C	JTC	Val	10	8	-2	-20%	✓	0.67	0	0	0	0%	✓	0.00	10	8	-2	-20%	✓	0.67
71	O_21_A	JTC	Cal	21	20	-1	-5%	✓	0.22	1	0	-1	-100%	✓	1.41	22	20	-2	-9%	✓	0.44
72	O_21_B	JTC	Cal	69	81	12	17%	✓	1.39	2	4	2	100%	✓	1.15	71	85	14	20%	✓	1.59
73	O_21_C	JTC	Cal	179	253	74	41%	✓	5.04	11	3	-8	-73%	✓	3.02	190	256	66	35%	✓	4.42
74	D_21_A	JTC	Cal	213	254	41	19%	✓	2.68	13	3	-10	-77%	✓	3.54	226	257	31	14%	✓	1.99
75	D_21_C	JTC	Cal	56	102	46	82%	✓	5.18	1	4	3	300%	✓	1.90	57	106	49	86%	✓	5.43
76	O_22_A	JTC	Cal	12	2	-10	-83%	✓	3.78	0	0	0	0%	✓	0.00	12	2	-10	-83%	✓	3.78
77	O_22_D	JTC	Cal	147	153	6	4%	✓	0.49	2	4	2	100%	✓	1.15	149	157	8	5%	✓	0.65
78	O_22_E	JTC	Cal	288	416	128	44%	✗	6.82	9	3	-6	-67%	✓	2.45	297	419	122	41%	✗	6.45
79	D_22_A	JTC	Cal	16	16	0	0%	✓	0.00	1	0	-1	-100%	✓	1.41	17	16	-1	-6%	✓	0.25
80	D_22_C	JTC	Cal	140	139	-1	-1%	✓	0.08	2	4	2	100%	✓	1.15	142	143	1	1%	✓	0.08
81	D_22_D	JTC	Cal	290	411	121	42%	✗	6.46	8	3	-5	-63%	✓	2.13	298	414	116	39%	✗	6.15
82	O_23_B	JTC	Val	1181	1,134	-47	-4%	✓	1.38	27	45	18	67%	✓	3.00	1208	1179	-29	-2%	✓	0.84
83	O_23_C	JTC	Val	2	9	7	350%	✓	2.98	0	0	0	0%	✓	0.00	2	9	7	350%	✓	2.98
84	D_23_A	JTC	Val	1174	1,142	-32	-3%	✓	0.94	27	45	18	67%	✓	3.00	1201	1187	-14	-1%	✓	0.41
85	D_23_C	JTC	Val	9	0	-9	-100%	✓	4.24	0	0	0	0%	✓	0.00	9	0	-9	-100%	✓	4.24
86	O_24_A	JTC	Cal	9	8	-1	-11%	✓	0.34	0	0	0	0%	✓	0.00	9	8	-1	-11%	✓	0.34
87	O_24_B	JTC	Cal	71	83	12	17%	✓	1.37	0	0	0	0%	✓	0.00	71	83	12	17%	✓	1.37
88	O_24_C	JTC	Cal	53	65	12	23%	✓	1.56	2	2	0	0%	✓	0.00	55	67	12	22%	✓	1.54
89	D_24_A	JTC	Cal	3	16	13	433%	✓	4.22	0	0	0	0%	✓	0.00	3	16	13	433%	✓	4.22
90	D_24_B	JTC	Cal	59	64	5	8%	✓	0.64	2	2	0	0%	✓	0.00	61	66	5	8%	✓	0.63
91	D_24_C	JTC	Cal	71	76	5	7%	✓	0.58	0	0	0	0%	✓	0.00	71	76	5	7%	✓	0.58
92	O_25_A	JTC	Val	71	75	4	6%	✓	0.47	0	0	0	0%	✓	0.00	71	75	4	6%	✓	0.47
93	O_25_B	JTC	Val	32	50	18	56%	✓	2.81	2	1	-1	-50%	✓	0.82	34	51	17	50%	✓	2.61
94	O_25_C	JTC	Val	82	77	-5	-6%	✓	0.56	0	1	1	0%	✓	1.41	82	78	-4	-5%	✓	0.45
95	D_25_A	JTC	Val	51	65	14	27%	✓	1.84	2	2	0	0%	✓	0.00	53	67	14	26%	✓	1.81
96	D_25_B	JTC	Val	51	77	26	51%	✓	3.25	0	0	0	0%	✓	0.00	51	77	26	51%	✓	3.25
97	D_25_C	JTC	Val	83	60	-23	-28%	✓	2.72	0	0	0	0%	✓	0.00	83	60	-23	-28%	✓	2.72
98	O_26_A	JTC	Cal	2954	3,005	51	2%	✓	0.93	48	73	25	52%	✓	3.21	3002	3078	76	3%	✓	1.38
99	O_26_B	JTC	Cal	57	53	-4	-7%	✓	0.54	2	2	0	0%	✓	0.00	59	55	-4	-7%	✓	0.53
100	D_26_B	JTC	Cal	88	81	-7	-8%	✓	0.76	0	0	0	0%	✓	0.00	88	81	-7	-8%	✓	0.76
101	D_26_C	JTC	Cal	2923	2,976	53	2%	✓	0.98	50	75	25	50%	✓	3.16	2973	3051	78	3%	✓	1.42
102	O_28_B	JTC	Cal	47	49	2	4%	✓	0.29	0	0	0	0%	✓	0.00	47	49	2	4%	✓	0.29
103	O_28_C	JTC	Cal	198	209	11	6%	✓	0.77	0	0	0	0%	✓	0.00	198	209	11	6%	✓	0.77
104	D_28_A	JTC	Cal	198	210	12	6%	✓	0.84	0	0	0	0%	✓	0.00	198	210	12	6%	✓	0.84
105	O_29_A	JTC	Cal	209	198	-11	-5%	✓	0.77	2	0	-2	-100%	✓	2.00	211	198	-13	-6%	✓	0.91
106	O_29_B	JTC	Cal	47	60	13	28%	✓	1.78	0	0	0	0%	✓	0.00	47	60	13	28%	✓	1.78
107	O_29_C	JTC	Cal	373	377	4	1%	✓	0.21	2	12	10	500%	✓	3.78	375	389	14	4%	✓	0.72
108	D_29_A	JTC	Cal	381	388	7	2%	✓	0.36	2	12	10	500%	✓	3.78	383	400	17	4%	✓	0.86
109	D_29_B	JTC	Cal	248	247	-1	0%	✓	0.06	2	0	-2	-100%	✓	2.00	250	247	-3	-1%	✓	0.19
110	O_30_A	JTC	Cal	2580	2,613	33	1%	✓	0.65	58	64	6	10%	✓	0.77	2638	2677	39	1%	✓	0.76
111	O_30_B	JTC	Cal	52	57	5	10%	✓	0.68	2	0	-2	-100%	✓	2.00	54	57	3	6%	✓	0.40
112	D_30_B	JTC	Cal	5	27	22	440%	✓	5.50	0	0	0	0%	✓	0.00	5	27	22	440%	✓	5.50
113	D_30_C	JTC	Cal	3	19	16	533%	✓	4.82	0	0	0	0%	✓	0.00	3	19	16	533%	✓	4.82
114	D_30_D	JTC	Cal	2625	2,637	12	0%	✓	0.23	60	65	5	8%	✓	0.63	2685	2702	17	1%	✓	0.33
117	3_W	ATC	Val	364	369	5	1%	✓	0.26	17	0	-17	-100%	✓	5.74	381	369	-12	-3%	✓	0.59
118	4_E	ATC	Val	503	514	11	2%	✓	0.49	22	20	-2	-7%	✓	0.33	525	534	10	2%	✓	0.41
119	5_W	ATC	Val	292	375	84	29%	✓	4.57	15	7	-8	-52%	✓	2.33	306	382	76	25%	✓	4.09
120	6_N	ATC	Val	146	137	-9	-6%	✓	0.72	7	0	-7	-100%	✓	3.65	152	137	-15	-10%	✓	1.26
121	7_E	ATC	Val	149	119	-30	-20%	✓	2.56	7	11	4	53%	✓	1.27	156	130	-26	-17%	✓	2.16

				0607PM																
				LV						HV						Total				
ID	DetectorName	SrvType	CalVal	Survey	Model_LV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_HV_PM	Dif #	Dif %	IndFlows	GEH	Survey	Model_TOTAL_PM	Dif #	Dif %	IndFlows	GEH
122	8_W	ATC	Val	405	555	150	37%	✗	6.85	21	4	-17	-81%	✓	4.84	426	559	133	31%	✗	5.99
123	9_N	ATC	Val	75	116	42	56%	✓	4.25	6	1	-5	-83%	✓	2.67	81	117	37	45%	✓	3.67
124	10_N	ATC	Val	292	358	66	23%	✓	3.68	24	19	-5	-22%	✓	1.15	316	377	61	19%	✓	3.28
125	11_E	ATC	Val	224	268	44	20%	✓	2.82	13	14	1	5%	✓	0.18	237	282	45	19%	✓	2.78
126	11_W	ATC	Val	122	132	10	8%	✓	0.87	7	5	-2	-32%	✓	0.94	130	137	8	6%	✓	0.65
127	12_N	ATC	Val	350	412	62	18%	✓	3.19	15	1	-14	-93%	✓	4.95	365	413	48	13%	✓	2.44
128	12_S	ATC	Val	97	129	32	33%	✓	2.98	5	3	-2	-42%	✓	1.07	103	132	30	29%	✓	2.72
131	15_E	ATC	Val	690	733	43	6%	✓	1.62	43	22	-21	-49%	✓	3.71	733	755	22	3%	✓	0.81
132	15_W	ATC	Val	334	391	57	17%	✓	2.98	25	20	-5	-20%	✓	1.05	359	411	52	14%	✓	2.63
137	TII_M50_N	TII	Val	1078	1,109	31	3%	✓	0.94	24	33	9	38%	✓	1.69	1102	1142	40	4%	✓	1.19
138	TII_M50_S	TII	Val	1800	2,002	202	11%	✓	4.63	37	44	7	19%	✓	1.10	1837	2046	209	11%	✓	4.74
139	TII_J4_J5_N	TII	Val	1824	1,907	83	5%	✓	1.92	21	55	34	162%	✓	5.52	1845	1962	117	6%	✓	2.68
140	TII_J4_J5_S	TII	Val	3493	3,630	137	4%	✓	2.30	40	87	47	118%	✓	5.90	3533	3717	184	5%	✓	3.06
141	TII_J5_J6_N	TII	Val	1659	1,664	5	0%	✓	0.12	22	53	31	141%	✓	5.06	1681	1717	36	2%	✓	0.87
142	TII_J5_J6_S	TII	Val	3550	3,457	-93	-3%	✓	1.57	36	77	41	114%	✓	5.45	3586	3534	-52	-1%	✓	0.87
143	TII_J8_J9_N	TII	Val	1161	1,148	-13	-1%	✓	0.38	22	45	23	105%	✓	3.97	1183	1193	10	1%	✓	0.29
144	TII_J8_J9_S	TII	Val	3036	3,015	-21	-1%	✓	0.38	31	74	43	139%	✓	5.93	3067	3089	22	1%	✓	0.40

Appendix D

Scheme Layout Drawings

A1



FOR INFORMATION

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N11/ M11

Tionscadal Éireann Project Ireland 2040

Clients

Comhairle Contae Chill Mhantáin Wicklow County Council

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Job Title
N11/M11 Bus Priority Interim Scheme

Scale at A1
1:20 000 @A1

Date
April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title
Phase 2 Preferred Option Scheme Layout Keyplan

Drawing Status
For Information

Drawing No
265455-ARP-GEN-BIS-DR-CH-0000

Issue
P01

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FOR INFORMATION

LEGEND - PLAN

- Fill Slopes
- Proposed Road Geometry
- Cut Slopes
- Proposed Junction / Access Closure
- Sub-Scheme A Boundary
- Sub-Scheme B Boundary
- Sub-Scheme C Boundary
- Hard Shoulder Bus Priority Measure
- Active Travel Facility
- Existing Culvert
- Proposed Retaining Wall
- SGXX Sign Gantry
- VMSXX Variable Message Sign

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Transaction Project Ireland 2040

Clients

Transport Infrastructure Ireland
An Roinn Iompair Department of Transport
Comhairle Contae Chill Mhantáin Wicklow County Council
dlr Comhairle Contae Átha Cliath
KILDARE NRO NATIONAL ROADS OFFICE
NTA Údarás Náisiúnta Iompair National Transport Authority

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Job Title
N11/M11 Bus Priority Interim Scheme

Scale at A1 1:1250 @ A1

Date April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title
Phase 2 Preferred Option Scheme Layout Sheet 1 of 18

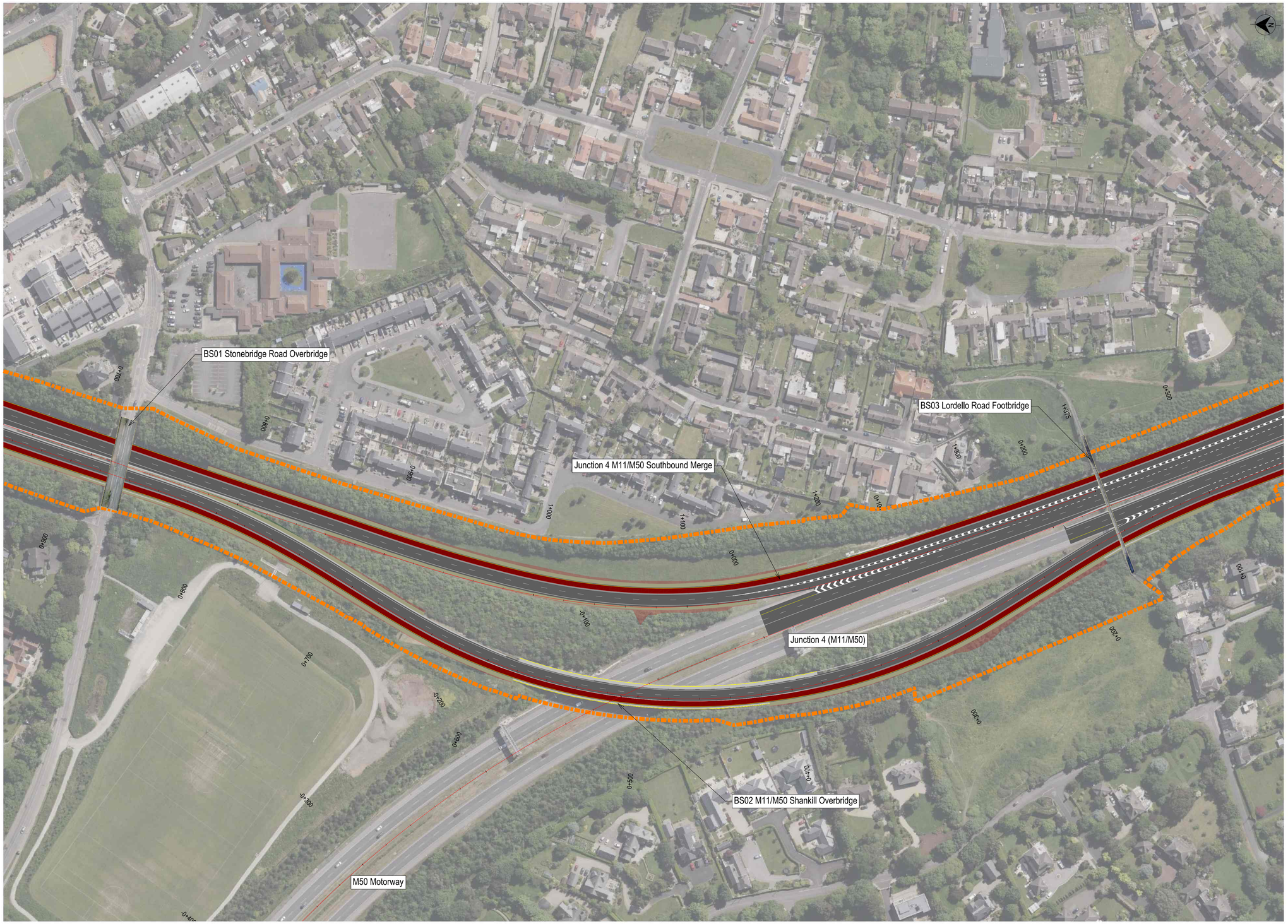
Drawing Status
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Drawing No 265455-ARP-GEN-BIS-DR-CH-0001 | Issue P01

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An Roinn Iompair Department of Transport

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Job Title
N11/M11 Bus Priority Interim Scheme

Scale at A1
1:250 @ A1

Date
April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title
Phase 2 Preferred Option Scheme Layout Sheet 2 of 18

Drawing Status
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Drawing No
265455-ARP-GEN-BIS-DR-CH-0002

Issue
P01

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Job Title
N11/M11 Bus Priority Interim Scheme

Scale at A1 1:1250 @ A1

Date April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title
Phase 2 Preferred Option Scheme Layout Sheet 3 of 18

Drawing Status
For Information

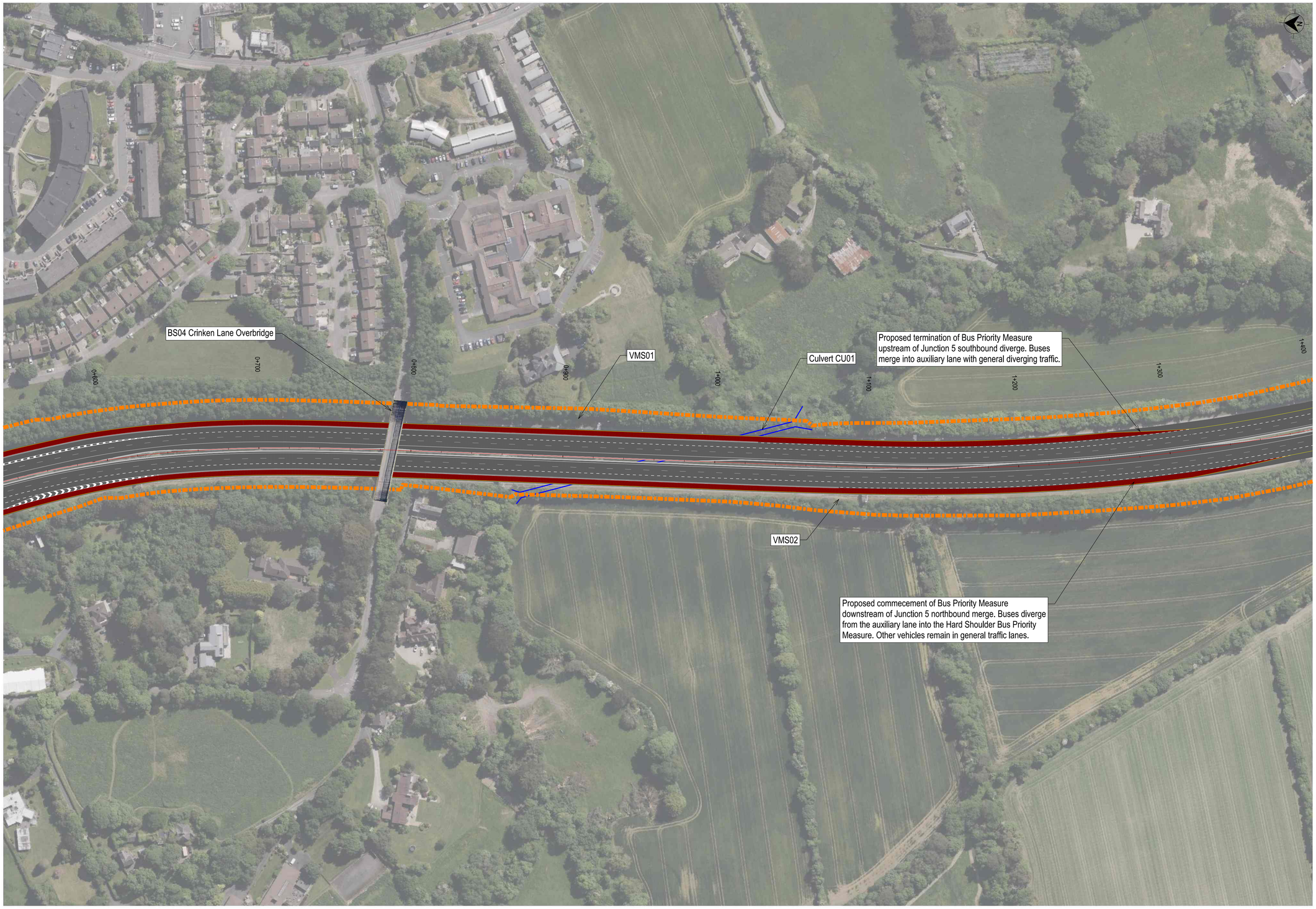
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Issue P01

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- Fill Slopes
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Job Title
N11/M11 Bus Priority Interim Scheme

Scale at A1 1:1250 @ A1

Date April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title
Phase 2 Preferred Option Scheme Layout Sheet 4 of 18

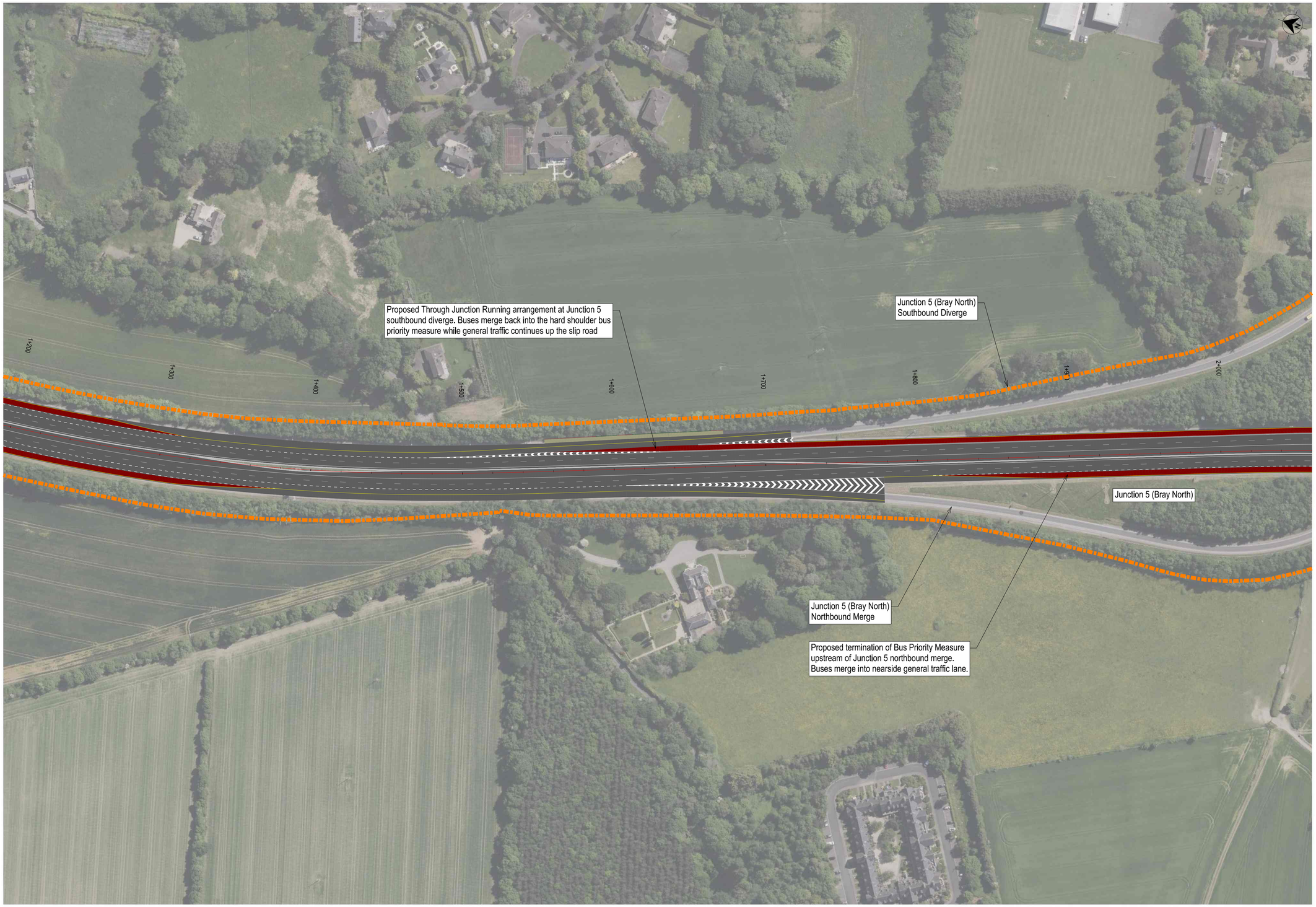
Drawing Status
For Information

Drawing No 265455-ARP-GEN-BIS-DR-CH-0005 | Issue P01

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A1



FOR INFORMATION

LEGEND - PLAN

- Fill Slopes
- Proposed Road Geometry
- Cut Slopes
- Proposed Junction / Access Closure
- Sub-Scheme A Boundary
- Sub-Scheme B Boundary
- Sub-Scheme C Boundary
- Hard Shoulder Bus Priority Measure
- Active Travel Facility
- Existing Culvert
- Proposed Retaining Wall
- SGXX Sign Gantry
- VMSXX Variable Message Sign

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N11/ M11

Clients: An Roinn Iompair Department of Transport; Comhairle Contae Chill Mhantáin Wicklow County Council; dlr Comhairle Contae Átha Cliath County Council; KILDARE nro NATIONAL ROADS OFFICE; NTA Údarás Náisiúnta Iompair National Transport Authority

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Scale at A1: 1:1250 @ A1

Date: April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title: **Phase 2 Preferred Option Scheme Layout Sheet 5 of 18**

Drawing Status: **For Information**

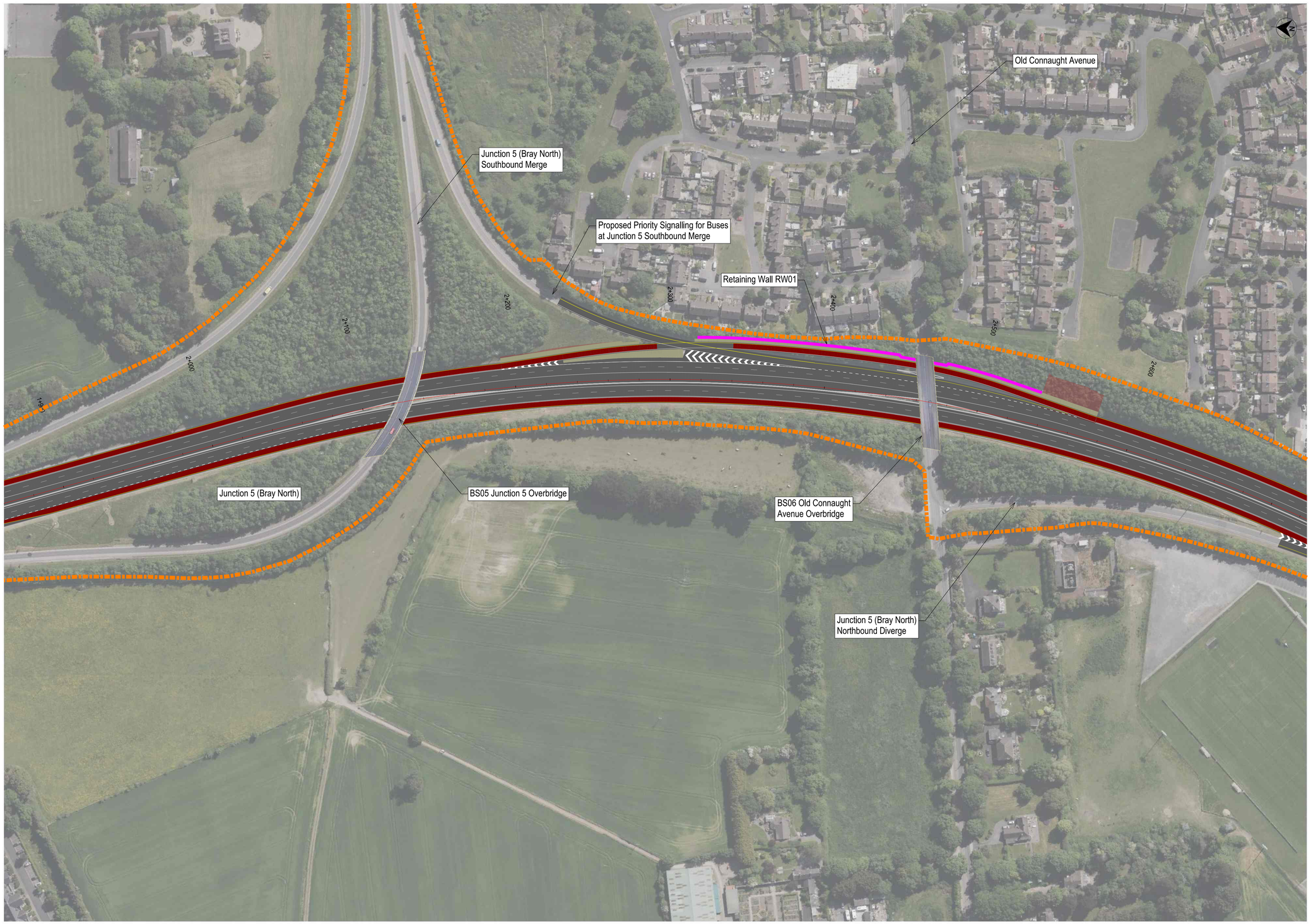
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Issue: **P01**

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A1



FOR INFORMATION

LEGEND - PLAN

- Fill Slopes
- Proposed Road Geometry
- Cut Slopes
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- Sub-Scheme A Boundary
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Scale at A1 1:1250 @ A1

Date April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title
Phase 2 Preferred Option Scheme Layout Sheet 6 of 18

Drawing Status
For Information

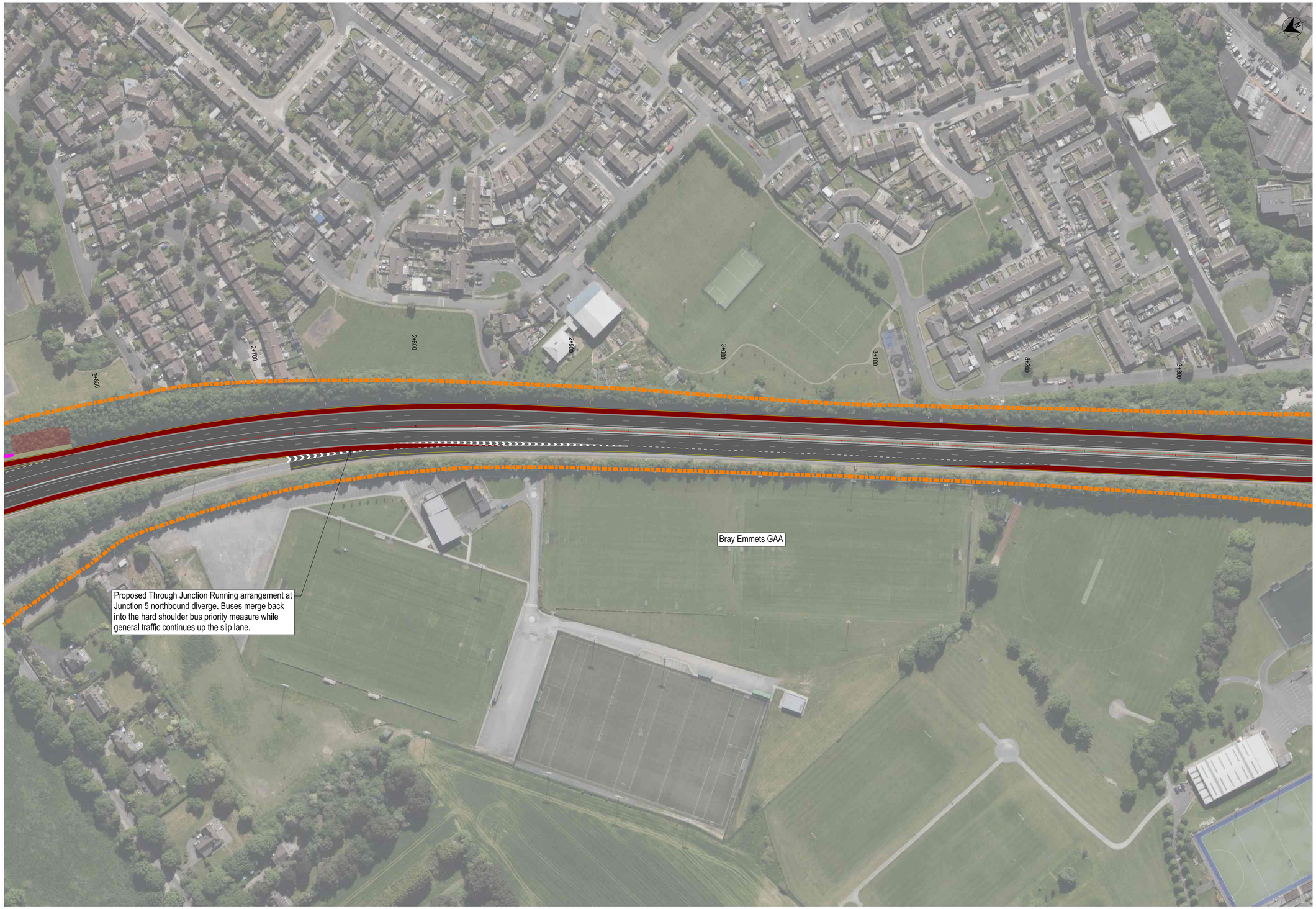
Drawing No 265455-ARP-GEN-BIS-DR-CH-0007

Issue P01

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FOR INFORMATION

LEGEND - PLAN

- Fill Slopes
- Proposed Road Geometry
- Cut Slopes
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- Sub-Scheme A Boundary
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Scale at A1 1:1250 @ A1

Date April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title
Phase 2 Preferred Option Scheme Layout Sheet 7 of 18

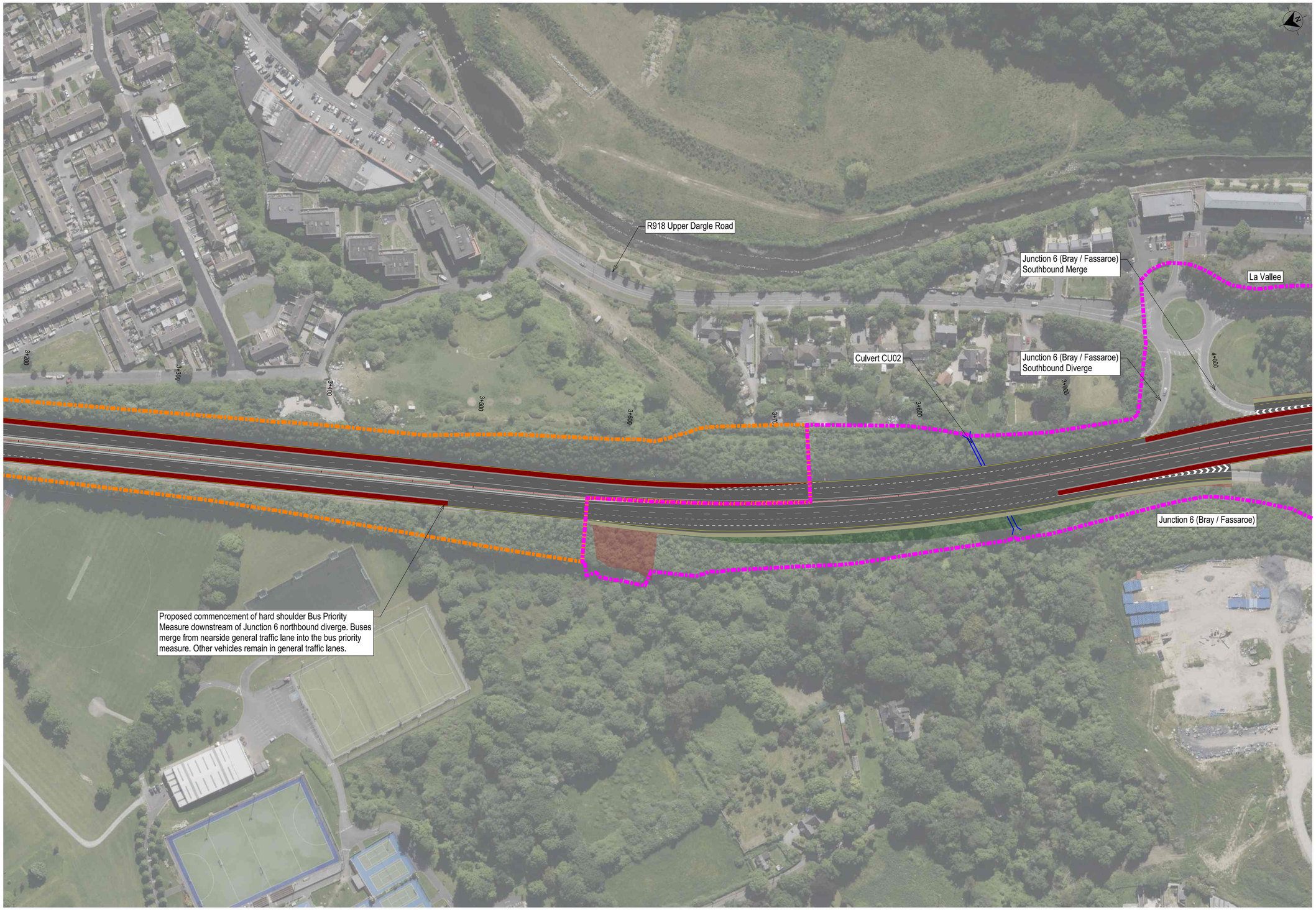
Drawing Status
For Information

Drawing No 265455-ARP-GEN-BIS-DR-CH-0008 | Issue P01

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FOR INFORMATION

LEGEND - PLAN

- Fill Slopes
- Proposed Road Geometry
- Cut Slopes
- Proposed Junction / Access Closure
- Sub-Scheme A Boundary
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Scale at A1: 1:1250 @ A1

Date: April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title: **Phase 2 Preferred Option Scheme Layout Sheet 8 of 18**

Drawing Status: **For Information**

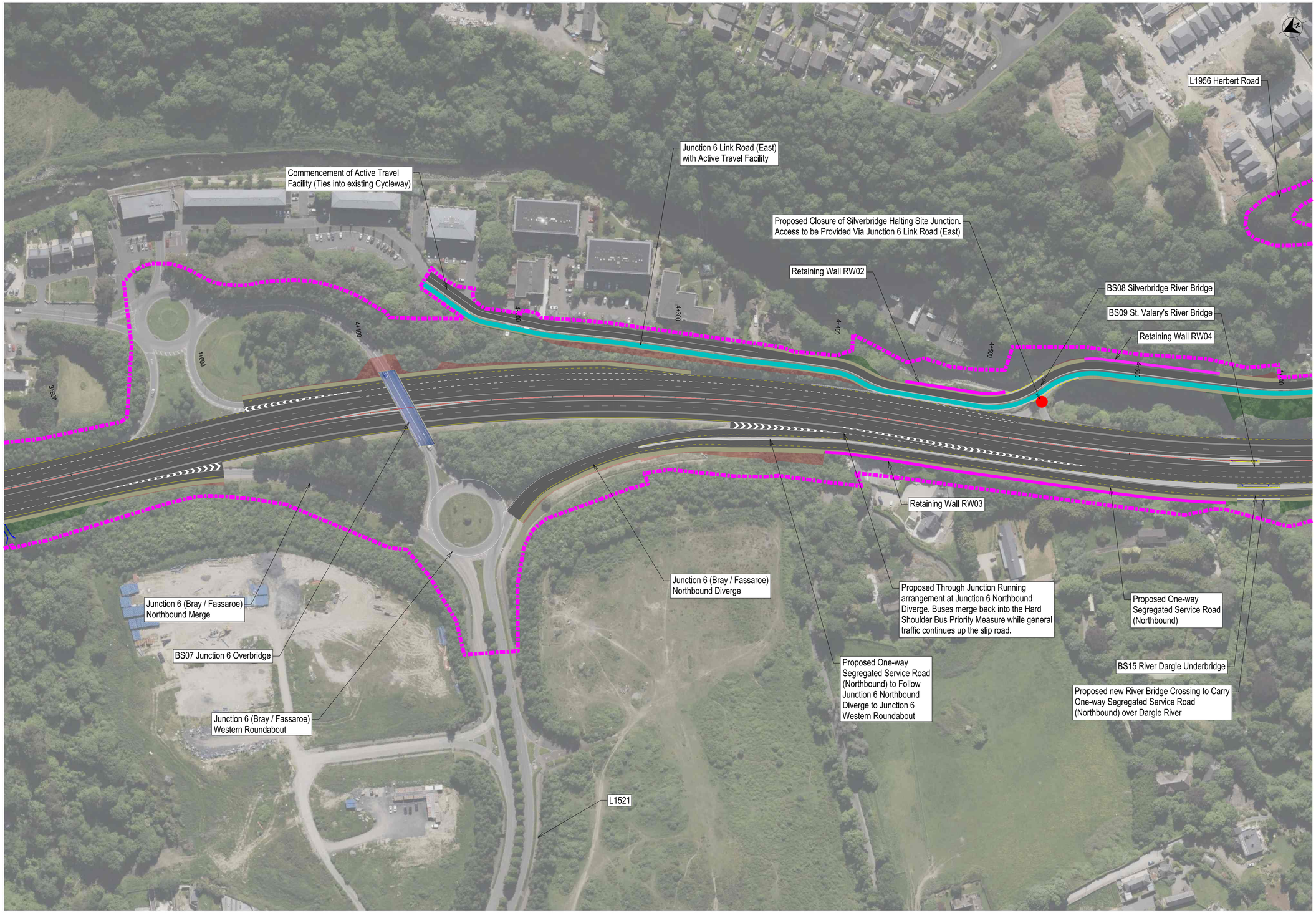
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Issue: **P01**

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FOR INFORMATION

LEGEND - PLAN

- Fill Slopes
- Proposed Road Geometry
- Cut Slopes
- Proposed Junction / Access Closure
- Sub-Scheme A Boundary
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Scale at A1: 1:1250 @ A1

Date: April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title: **Phase 2 Preferred Option Scheme Layout Sheet 9 of 18**

Drawing Status: **For Information**

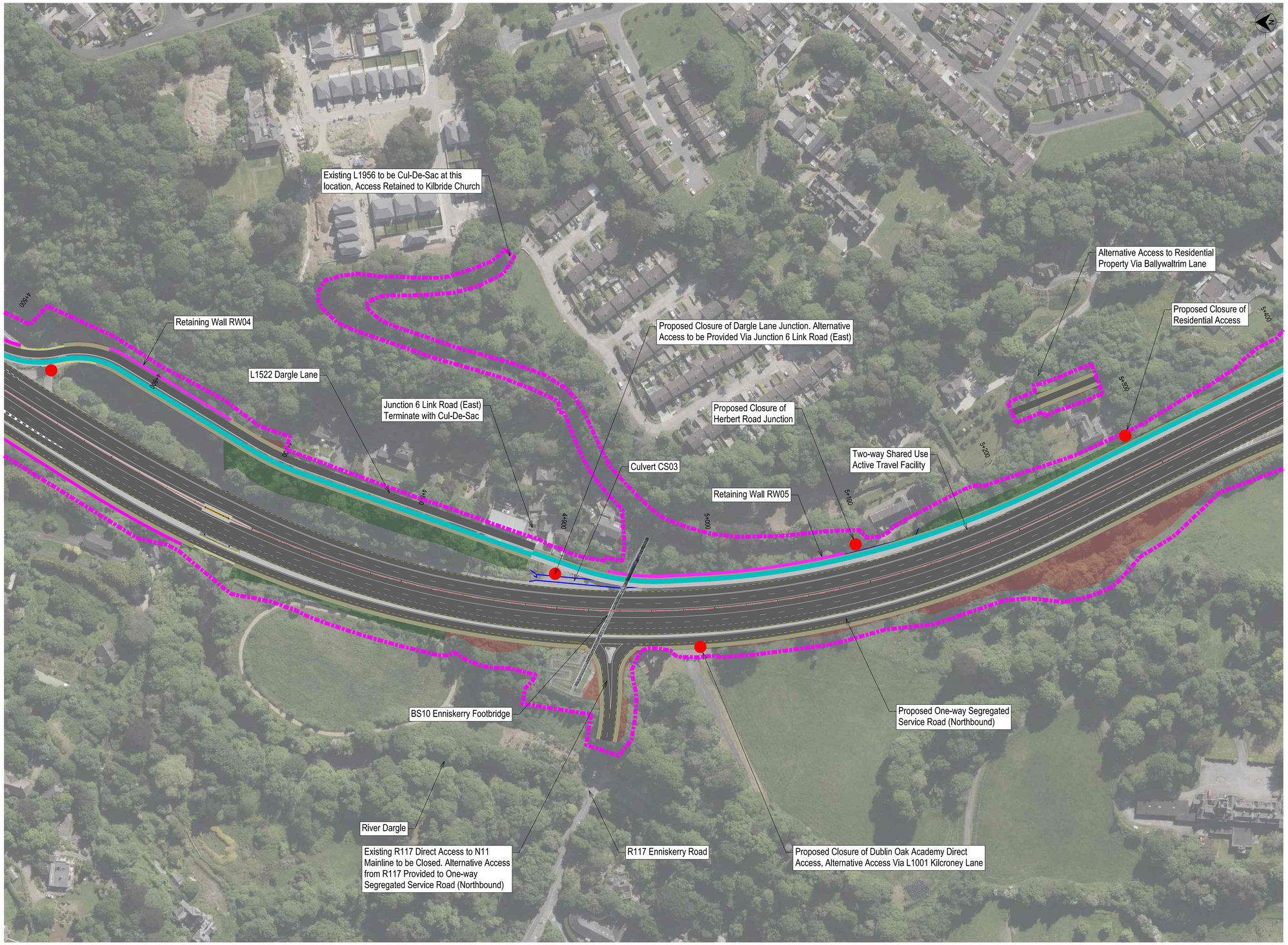
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Issue: **P01**

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FOR INFORMATION

LEGEND - PLAN

- Fill Slopes
- Proposed Road Geometry
- Cut Slopes
- Proposed Junction / Access Closure
- Sub-Scheme A Boundary
- Sub-Scheme B Boundary
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Job Title: N11/M11 Bus Priority Interim Scheme

Scale at A1: 1:250 @ A1

Date: April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title: **Phase 2 Preferred Option Scheme Layout Sheet 10 of 18**

Drawing Status: **For Information**

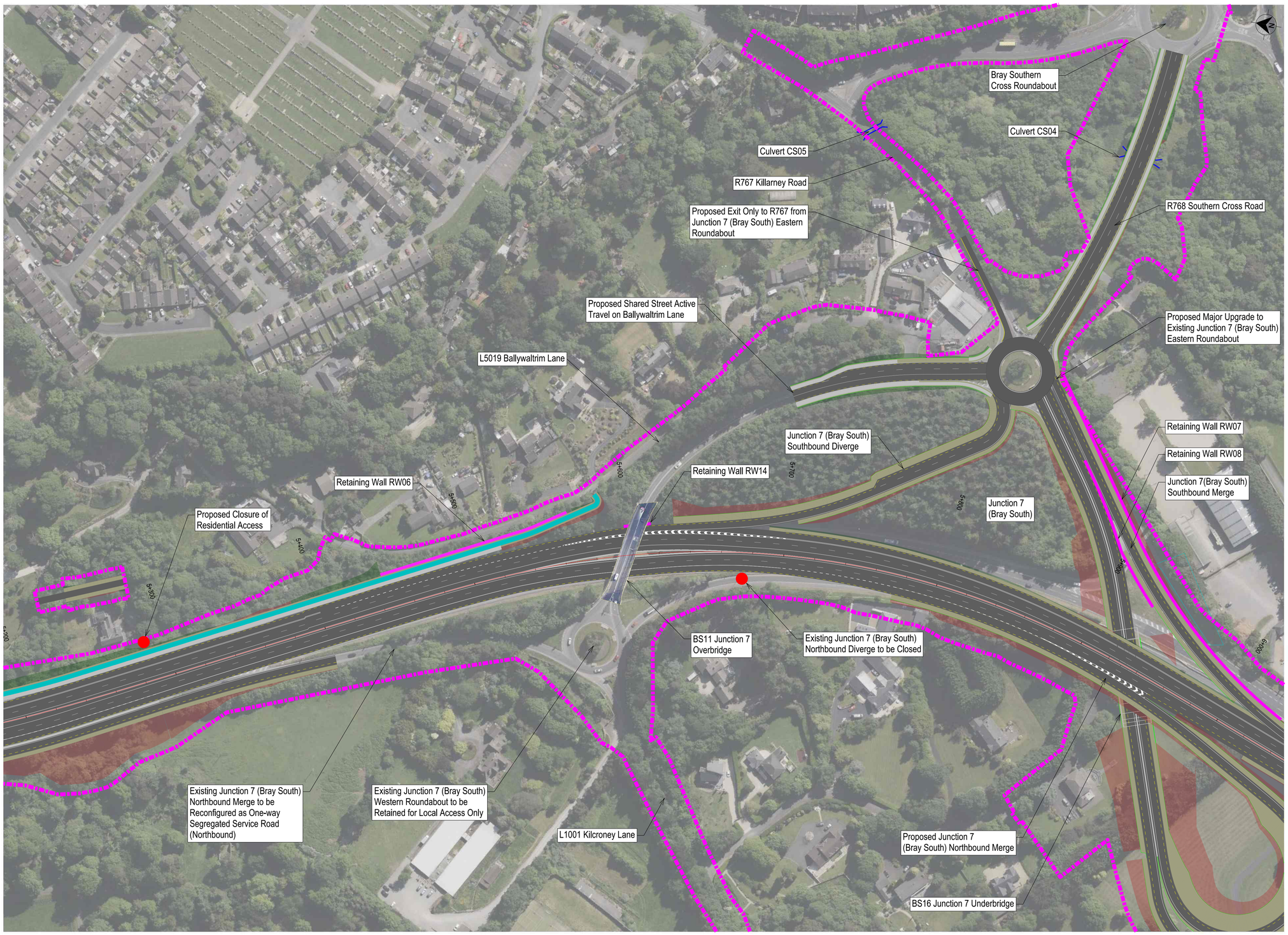
Drawing No: **265455-ARP-GEN-BIS-DR-CH-0011**

Issue: **P01**

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A1



FOR INFORMATION

LEGEND - PLAN

- Fill Slopes
- Proposed Road Geometry
- Cut Slopes
- Proposed Junction / Access Closure
- Sub-Scheme A Boundary
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Scale at A1: 1:1250 @ A1

Date: April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title: **Phase 2 Preferred Option Scheme Layout Sheet 11 of 18**

Drawing Status: **For Information**

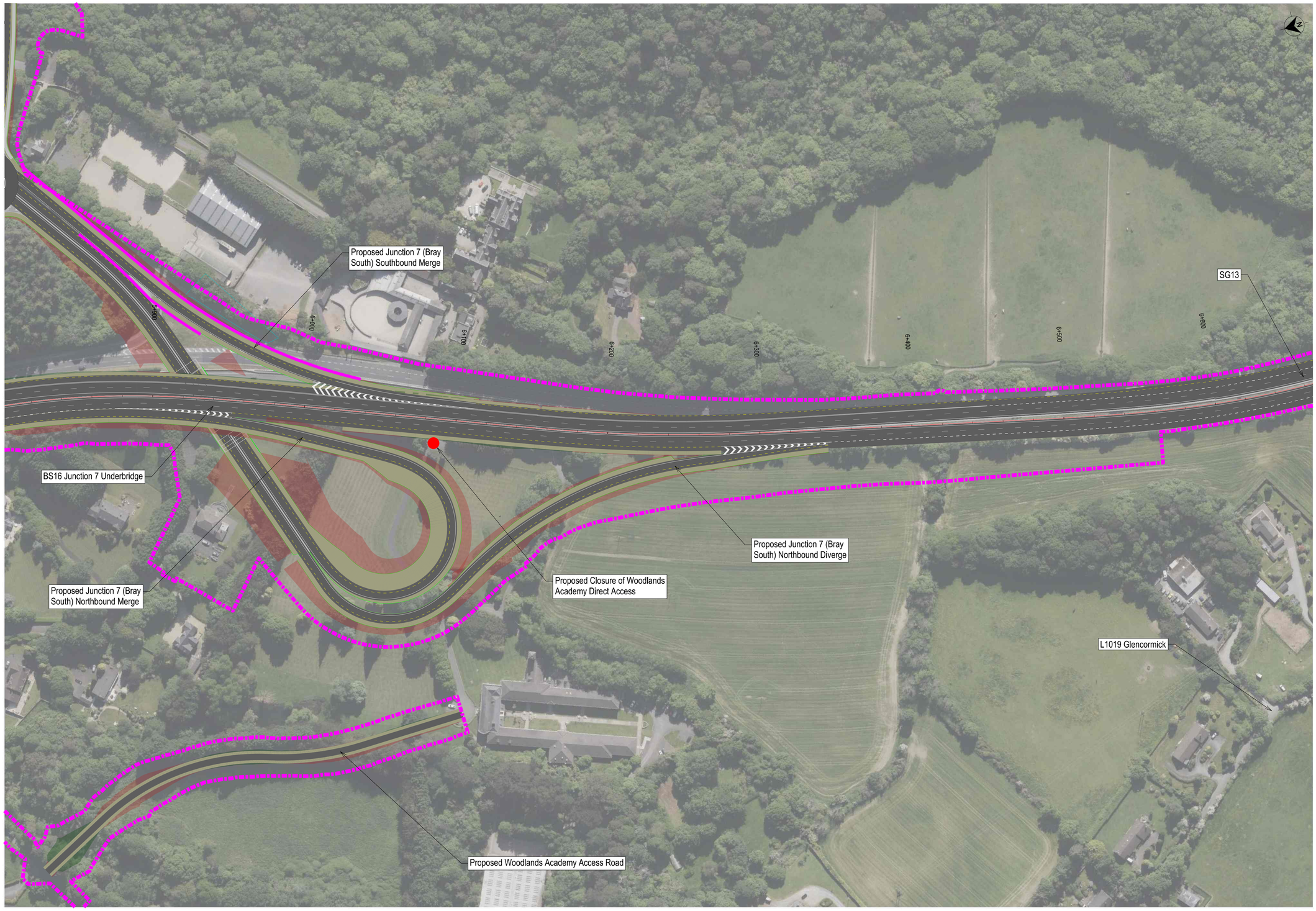
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Issue: **P01**

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A1



FOR INFORMATION

LEGEND - PLAN

- Fill Slopes
- Proposed Road Geometry
- Cut Slopes
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- Sub-Scheme A Boundary
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Job Title
N11/M11 Bus Priority Interim Scheme

Scale at A1
1:1250 @ A1

Date
April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title
Phase 2 Preferred Option Scheme Layout Sheet 12 of 18

Drawing Status
For Information

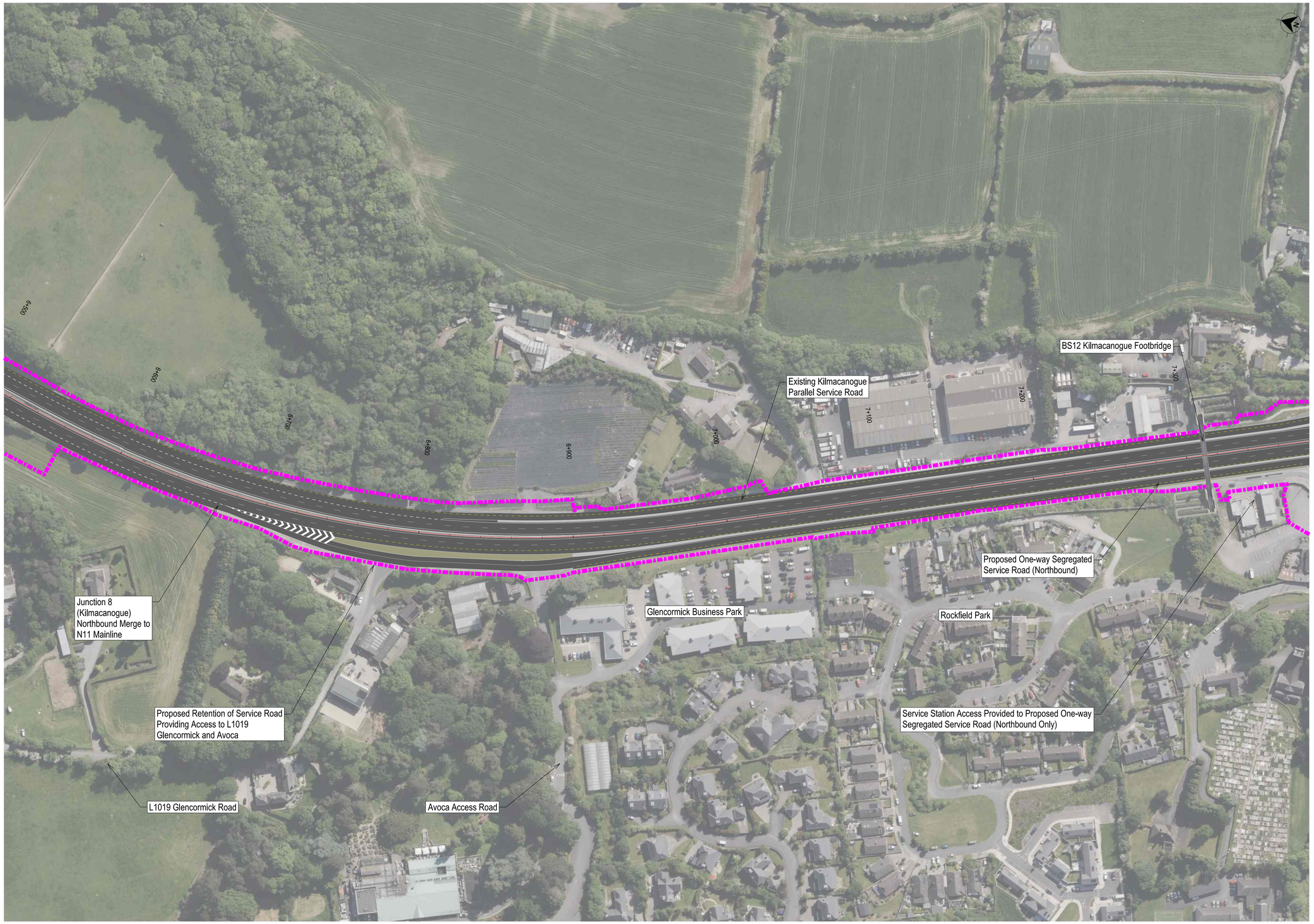
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Issue
P01

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FOR INFORMATION

LEGEND - PLAN

- Fill Slopes
- Proposed Road Geometry
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Job Title: N11/M11 Bus Priority Interim Scheme

Scale at A1: 1:250 @ A1

Date: April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title: **Phase 2 Preferred Option Scheme Layout Sheet 13 of 18**

Drawing Status: **For Information**

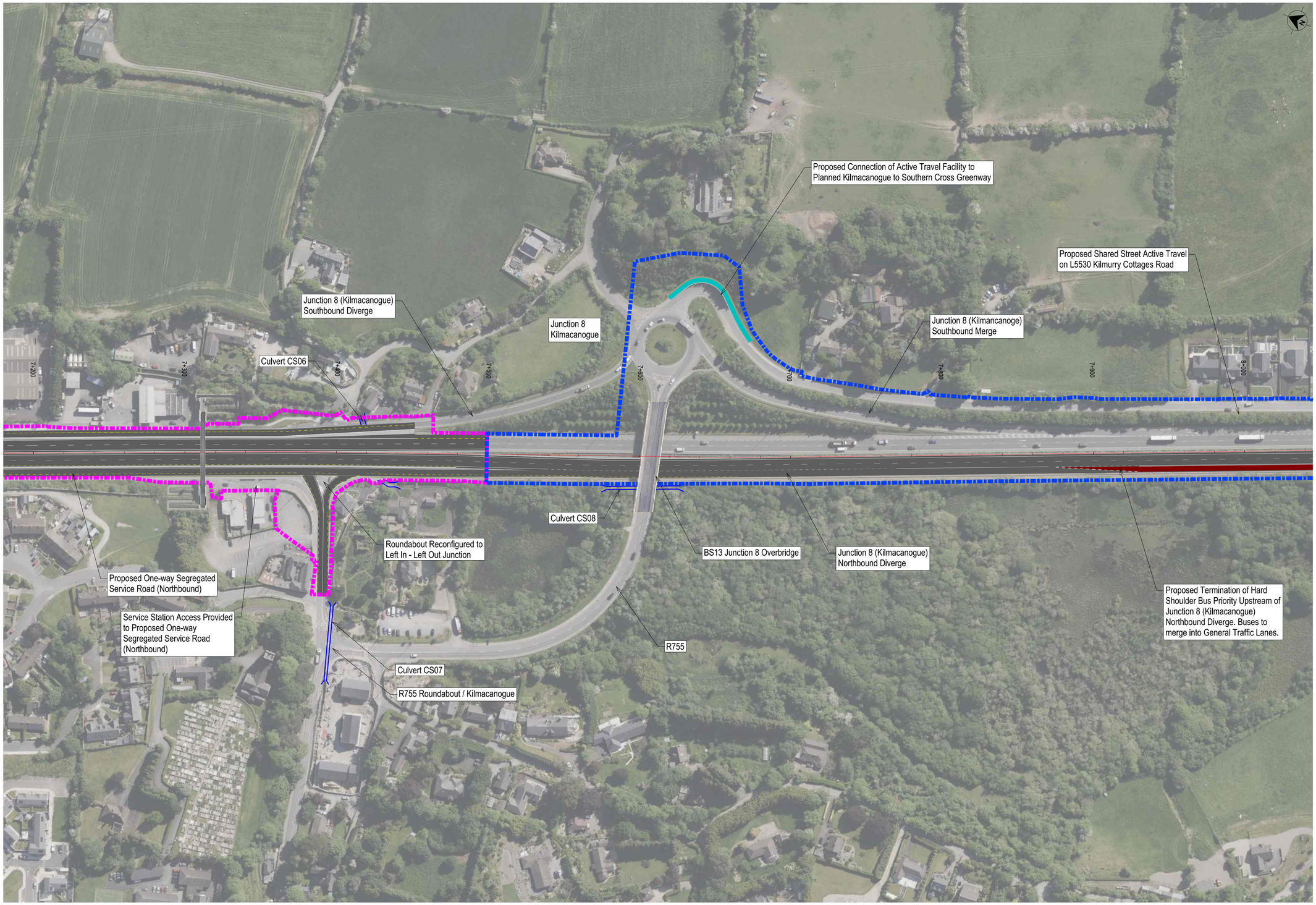
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Issue: **P01**

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A1



FOR INFORMATION

LEGEND - PLAN

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Job Title: N11/M11 Bus Priority Interim Scheme

Scale at A1: 1:250 @ A1

Date: April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title
Phase 2 Preferred Option Scheme Layout Sheet 14 of 18

Drawing Status
For Information

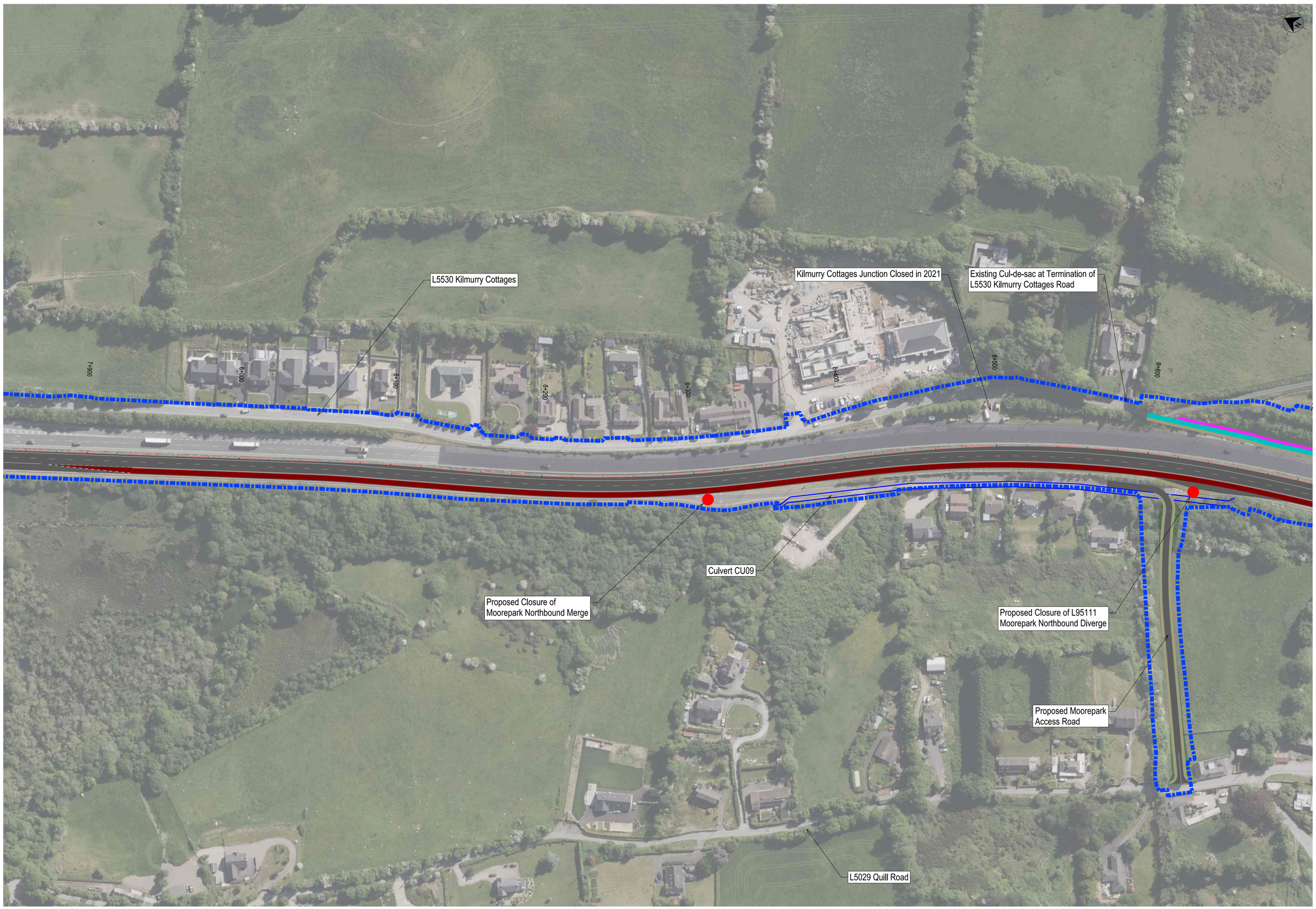
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FOR INFORMATION

LEGEND - PLAN

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Clients: TII Transport Infrastructure Ireland; An Roinn Iompair Department of Transport; Comhairle Contae Chill Mhantáin Wicklow County Council; dlr Comhairle Contae Átha Cliath County Council; KILDARE nro NATIONAL ROADS OFFICE; NTA Údarás Náisiúnta Iompair National Transport Authority

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Job Title: N11/M11 Bus Priority Interim Scheme

Scale at A1: 1:1250 @ A1

Date: April 2025

Issue	Date	By	Chkd	Appd
P01	10/04/2025	EAM	MA	AC

Drawing Title: **Phase 2 Preferred Option Scheme Layout Sheet 15 of 18**

Drawing Status: **For Information**

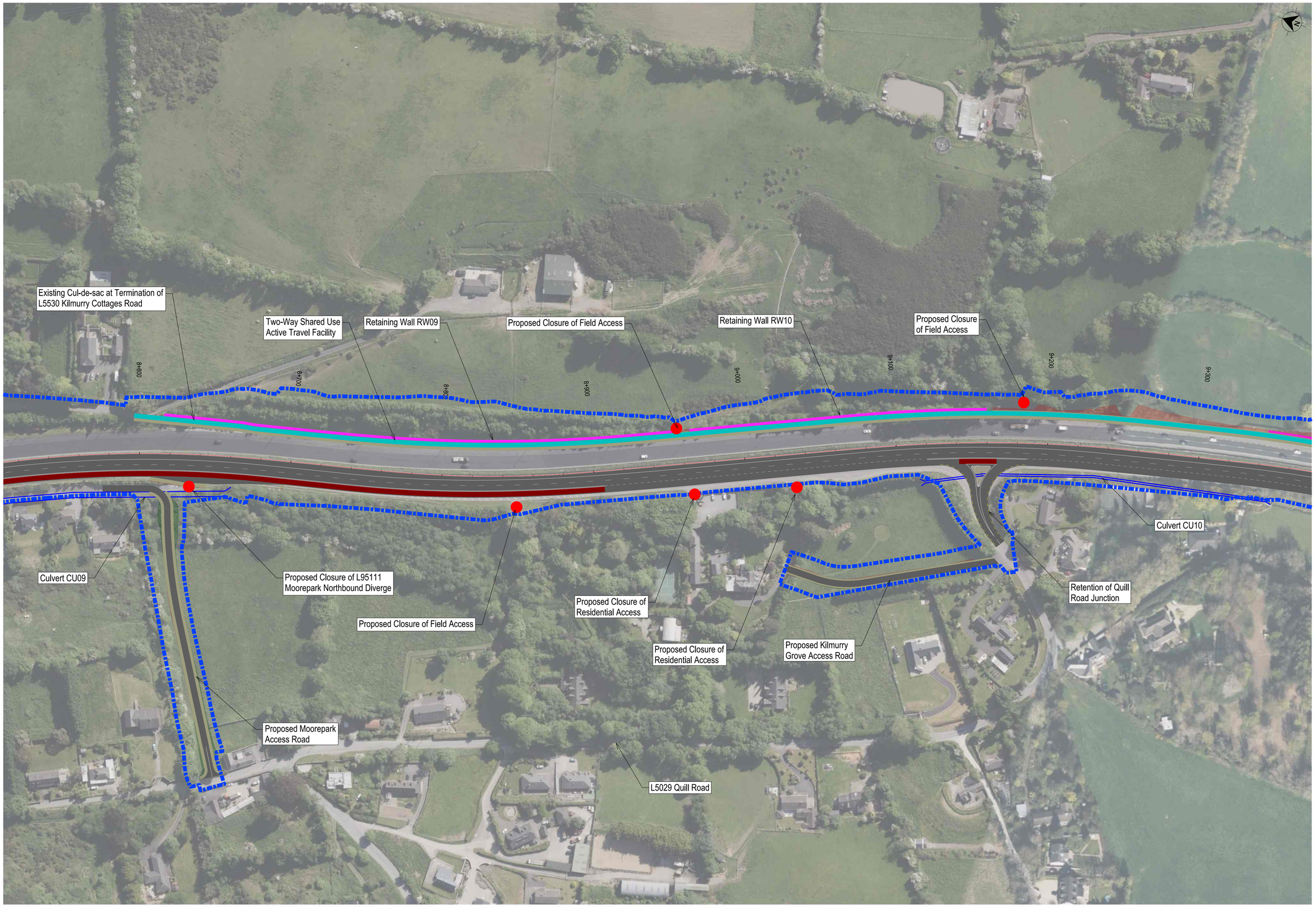
Drawing No: **265455-ARP-GEN-BIS-DR-CH-0016**

Issue: **P01**

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A1



FOR INFORMATION

LEGEND - PLAN

- Fill Slopes
- Proposed Road Geometry
- Cut Slopes
- Proposed Junction / Access Closure
- Sub-Scheme A Boundary
- Sub-Scheme B Boundary
- Sub-Scheme C Boundary
- Hard Shoulder Bus Priority Measure
- Active Travel Facility
- Existing Culvert
- Proposed Retaining Wall
- SGXX Sign Gantry
- VMSXX Variable Message Sign

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N11/ M11

Tionscadal Éireann Project Ireland 2040

Clients

An Roinn Iompair Department of Transport

Comhairle Contae Chill Mhantáin Wicklow County Council

Comhairle Contae Chill Dara Kildare County Council

NTA National Transport Authority

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Drawing Title
Phase 2 Preferred Option Scheme Layout Sheet 16 of 18

Drawing Status
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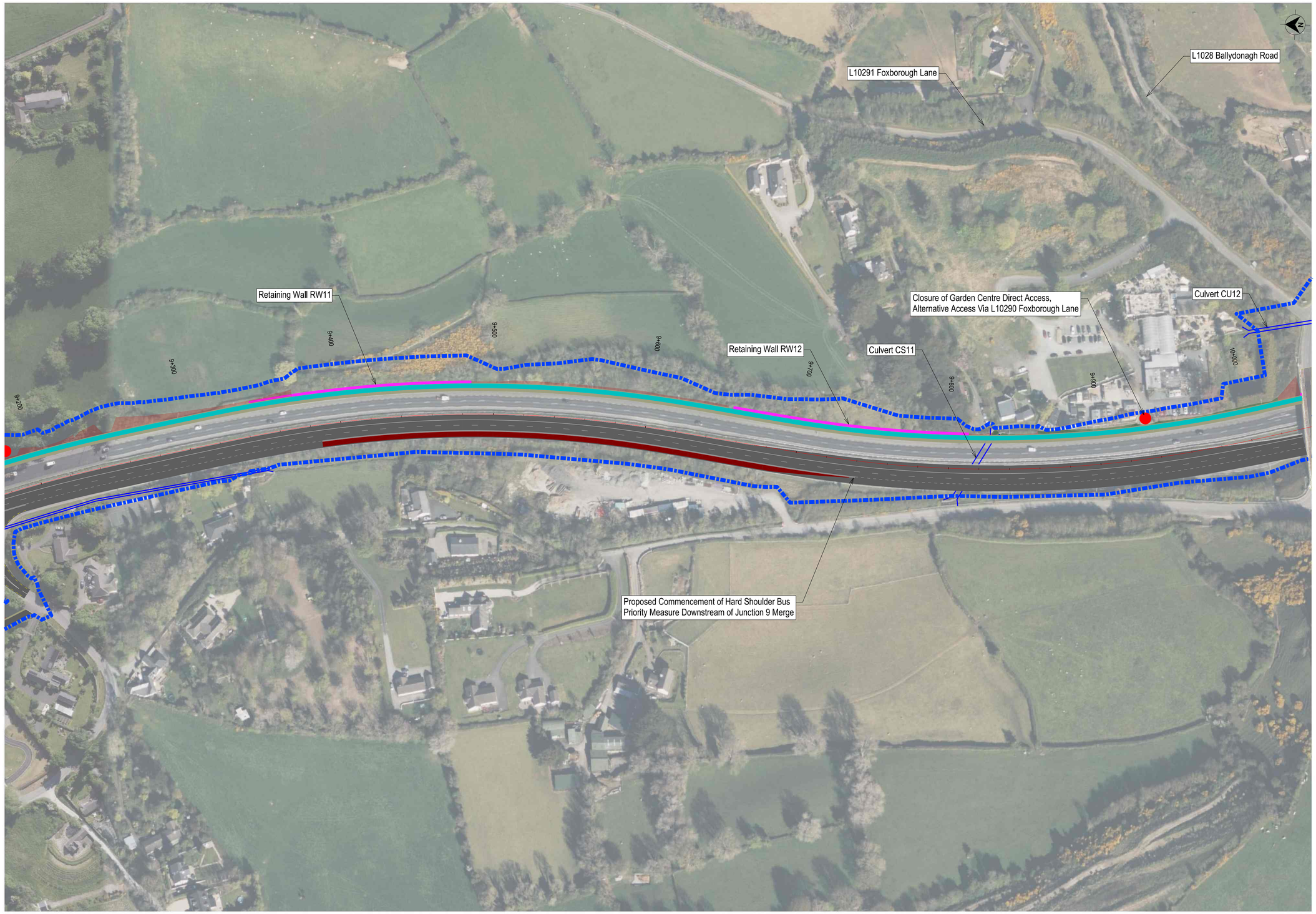
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Clients

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Comhairle Contae Chill Mhantáin Wicklow County Council

dlr Comhairle Contae Átha Cliath

KILDARE nro NATIONAL ROADS OFFICE

NTA Údarás Náisiúnta Iompair National Transport Authority

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Drawing Title
Phase 2 Preferred Option Scheme Layout Sheet 17 of 18

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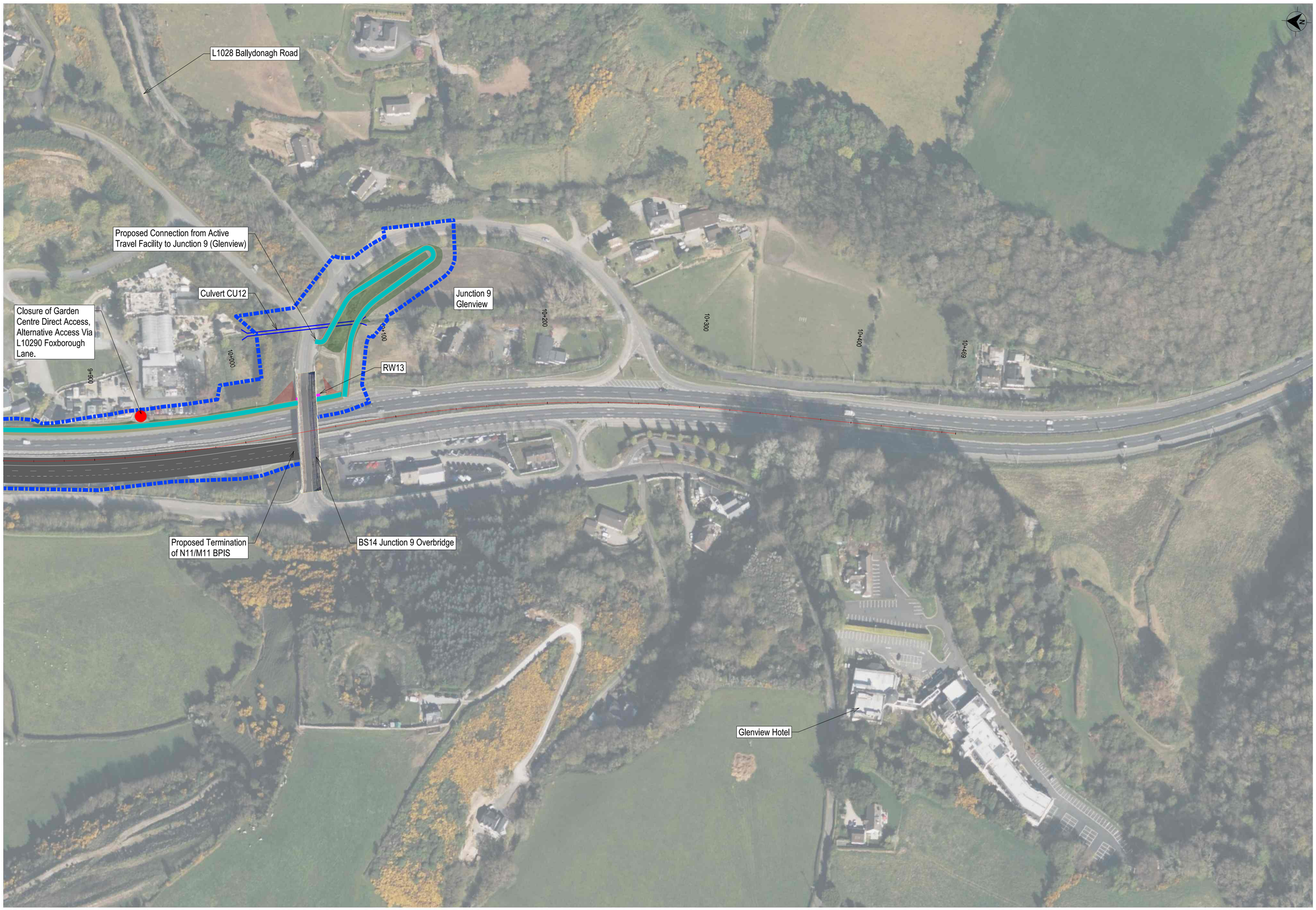
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