6. Traffic Assessment and Route Cross-Section

6.1 Introduction

This chapter presents the updated potential traffic and transport impacts in relation to the proposed N6 Galway City Ring Road (N6 GCRR) and the related stables development at Galway Racecourse, hereafter referred to as "the Project". For a full description of the Project, see Chapter 5, Project Description.

The traffic assessment of the Project, which is contained in this chapter, has been updated from the 2018 EIAR and associated documentation, the 2019 RFI response and 2020 oral hearing. The updated assessment has taken account of the traffic considerations due to the passage of time since the 2018 EIAR and other issues. Indeed, the majority of the content of the traffic assessment has been updated since the 2018 EIAR.

The modelling approach used for the assessment is similar, in principle, to the approach undertaken in relation to the assessment contained in the 2018 EIAR, however, the assessment has been updated in a number of material respects using the following tools:

- The most recently available Western Regional Model (WRM) which forms part of the National Transport Authority's (NTA) suite of Regional Models.
- A project specific road traffic model, which has a base year of 2023, and has been validated using November 2024 traffic data, and so is reflective of latest traffic conditions within Galway city. The model also incorporates Census 2022 Place of Work, School, College or Childcare - Census of Anonymised Records (POWSCCAR) data, so is reflective of latest travel movements within the city. The objective in developing this model was to ensure that existing traffic conditions in the study area are accurately reflected and at a sufficient level of detail to allow for an accurate traffic assessment.

The full modelling approach used is discussed further in Section 6.2. This includes a detailed description of the modelling approach and tools used and how they differ from the assessments presented in the 2018 EIAR.

The 2018 assessment assumed an opening year of 2024 and a design year of 2039 for the project, but these have been revised to account for the time that has passed. An opening year of 2031 and a design year of 2046 has been assumed for this updated assessment.

As a result of the change in opening and design year assumptions, new land use forecasts have been used for the traffic impact assessment. A comparison of these new forecasts, to the previous forecasts which have been assessed is included in Section 6.2.4.3.

The level of infrastructure assumed to be in place, in the opening and design years has also been updated and are based upon the latest available information, following consultation with relevant stakeholders. These are discussed further in Section 6.4.5.1.

The current traffic conditions in the city, have also changed since the 2018 EIAR and these are also detailed in Section 6.3.

Also contained within this chapter, are the results of a Climate Action Plan scenario which has been prepared in response to An Bord Pleanála's Request for Further Information (RFI) to Galway County Council on 6 December 2023 (Ref: ABP-318220-23). As part of the RFI, a submission was requested in relation to the most recent Climate Action Plan and the implications of the new Galway City Development Plan. This chapter includes an assessment of the impacts and alignment of the project with the most recent publication of the Climate Action Plan 2024 (CAP24) and Galway City Development Plan 2023-2029. The results of this assessment are detailed in Section 6.11.

6.1.1 Chapter Structure

The strategic and local traffic and transport impacts associated with the Project are discussed, assessed and evaluated in this chapter which is set out as follows:

- Transportation Assessment Methodology (Section 6.2)
- Receiving Environment (Section 6.2.6)
- Future Environment / Project (Section 6.4)
- Assessment of the Project Using the Traffic Model (Section 6.5)
- Traffic Impact Assessment (Section 6.6)
- Forecast Traffic Flows (Section 6.7)
- Assessment of Trip Redistribution and Overcapacity Demand (Section 6.8)
- Mitigation Measures (Section 6.9)
- Residual Impacts (Section 6.10)
- Climate Action Plan Scenario (Section 6.11)
- Summary (Section 6.11)

6.1.2 Guidelines Utilised

This traffic and transport assessment has been prepared with reference to the following documents and guidelines, to the extent relevant and applicable:

- Project Appraisal Guidelines for National Roads – Transport Infrastructure Ireland
- EPA: Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (2022) Available at: https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf
- EPA: Advice Notes on Current Practice in the Preparation of Environmental Impact Statements, (2003 and 2022)
- Spatial Planning and National Roads – Guidelines for Planning Authorities - DECLG (2012)
- National Planning Framework available at https://www.npf.ie/wp-content/uploads/Project-Ireland-2040-NPF.pdf

6.1.3 Key Assessment Terminology

Presented below are some of the key terms that are used throughout this chapter to describe the traffic situation and potential impacts associated with the Project.

- **Heavy Goods Vehicles (HGVs)** are classified as Articulated / Rigid Trucks and Buses with 2 or 3 more axles and vehicles pulling.
- **Light Vehicles (LVs)** are classified as Cars, 4 Wheel Drive, Utility and Light Vans.
- **Passenger Car Unit (PCU)** is a unit of traffic volume, with 1 LV = 1 PCU and 1 HGV = Approximately 2.5 PCUs.
- **Annual Average Daily Traffic (AADT)** is an estimate of the average daily traffic volume at a location over the course of a year. Calculation of AADT involves dividing the total traffic volume in the year by the number of days in the year. The AADT is a measure of the total traffic over a road and thus is useful for indicating the cumulative impact of traffic on a road pavement. The AADT thus informs road pavement design and maintenance.

- **Peak Hour** is the time of the day that travel demand is at its highest, e.g. where there is a lot of commuter traffic, typically 8am to 9am in the morning when commuters are travelling to work and school with a corresponding peak in the evening, usually from 5pm to 6pm. The PM peak is usually less pronounced than the AM Peak period because commuters return home over a wider period of time in the evening on the return leg of the commute and school related travel typically occurs outside the evening peak.
- **Ratio of Flow to Capacity (RFC)** also referred to as **Volume over Capacity (V/C)** is a means to describe the capacity of each approach road to a junction. An RFC below 0.85 (or 0.90 for a signalised junction) implies an approach road is operating satisfactorily within capacity; between 0.85 (or 0.90 for signalised junctions) and 1.0 RFC implies the approach road is operating within capacity but at less than optimal efficiency; above 1.0 RFC the approach road is deemed to be above capacity, therefore, when a road is at capacity a slight increase in traffic volumes can have a disproportionate impact on the length of queuing and delays.
- **Transport Infrastructure Ireland (TII) Project Appraisal Guidelines (PAG)** are a set of "how to" appraisal guidelines to ensure consistency of approach across TII projects and compliance with Department of Transport requirements. The PAG suite of documents include detailed guidance on Transport Modelling, Economic Appraisal and Multi-Criteria Analysis.

6.2 Transportation Assessment Methodology

6.2.1 Introduction

This section describes the modelling approach in detail and gives a comparison back to the 2018 approach/assumptions, if different.

6.2.2 Methodology

The methodology for the transportation assessment can be summarised as follows:

- Undertake a **baseline review** in relation to the existing traffic situation, including consultation with Galway City and County Councils, Transport Infrastructure Ireland (TII) and National Transport Authority (NTA)
- Undertake **traffic modelling** to assess future year scenarios, with the Project ('Do-Something'[1]) and without the Project ('Do-Minimum'[2]) in place
- **Evaluate the traffic modelling results** which forecast the impact of existing and future traffic on the road network
- **Identify any traffic impacts**, develop and test proposed **mitigation measures** to remove and/or reduce any identified negative traffic impacts of major significance
- **Determine any residual impacts** arising from the forecast traffic combined with the proposed mitigation measures

6.2.3 Baseline Review

As a first step, a Baseline Review was produced to determine the existing traffic conditions in Galway City and surrounding areas.

The baseline review, contained within chapters 1 and 2 of the Traffic Modelling Report (included in Appendix A.6.1) includes a review of the existing i.e., November 2024, road network and the operating transport conditions for vehicular traffic, walking and cycling infrastructure and public transport services. A number of site visits were carried out during the entire period of preparation of this updated EIAR and traffic surveys were commissioned for this updated EIAR to determine the existing traffic levels and conditions.

1 'Do-Something' relates to a situation where the project is included.

2 'Do-Minimum' relates to a situation where the project is not included

The Baseline Review also included a review of demographic information and latest Census data (2022) to understand existing levels of travel demand and traffic patterns on the surrounding road infrastructure as the 2018 EIAR was based on an extract from an older model which utilised the 2011 Census data. Policy documents relating to the area and other relevant background documentation were also reviewed as there have been updates since the 2018 EIAR and since the oral hearing in 2020.

As part of the Baseline Review, extensive consultations were held with many key stakeholders including liaising with TII, Galway County Council and Galway City Council to discuss any planned infrastructure and land use changes in the area.

The 2016 Galway Transport Strategy (GTS) sets out a series of actions and measures, covering infrastructural, operational and policy elements to be implemented in Galway over a 20-year period and sets out a framework to deliver the projects in a phased manner. The 2016 GTS represents the current adopted transport strategy for Galway and its recommendations are incorporated into the Galway City Development Plan 2023-2029 and the Galway County Development Plan 2022-2028, therefore, the assessment in this updated EIAR has been undertaken with regard to the infrastructure contained in the 2016 GTS. The delivery of the proposed N6 GCRR is essential to the optimal delivery and implementation of a number of key objectives of the GTS. For the sake of completeness, it should be noted that the update of the GTS in the future Galway Metropolitan Area Transport Strategy (GMATS) will be undertaken in the context of the requirements of CAP24. Moreover, this updated EIAR provides an assessment of the proposed N6 GCRR in the context of the potential measures that may arise to fulfil the obligations of Climate Action Plan.

6.2.4 Traffic Modelling

6.2.4.1 Traffic Model Development

West Regional Model

The West Regional Model (WRM) is a strategic transport multi-modal model for counties Galway, Mayo, Roscommon, Sligo, Leitrim and Donegal, with a focus on the city of Galway. It is part of a hierarchical multi-modal transport modelling system for Ireland (known as the 'Regional Modelling System' RMS) that allows the appraisal of a wide range of potential future transport and land use options. The regional models are focussed on the travel-to-work areas of major population centres (e.g. Dublin, Cork, Galway, Limerick, and Waterford).

Local Area Model

The WRM was used as a starting point in order to build the Local Area Model (LAM) which was developed for the Project. The objective in developing the LAM was to obtain a traffic model that accurately reflects existing traffic conditions in the study area at a sufficient level of detail to allow for an accurate traffic assessment. The model software used for the highway assignment element of the model is the SATURN (Simulation Assignment of Traffic to Urban Road Networks) suite of transportation modelling programs.

The LAM was developed using surveys from November 2023 (validated with November 2024 surveys) and is, therefore, representative of current traffic levels and conditions. Given the current available WRM has a base year of 2016 (aligned to the 2016 Census), Census 2022 Place of Work, School, College or Childcare - Census of Anonymised Records (POWSCCAR) data was also used to inform movements within the city and ensure the modelling is reflective of the latest available data.

Three time period models were developed in line with standard practice as follows:

- AM Morning peak hour model (08:00 – 09:00)
- Average hour Inter-peak model (Average hour model of 10:00 – 16:00)
- PM Evening peak period model (16:00 – 17:00)

It should be noted that the modelling approach in the 2018 EIAR, used the then relevant version of the WRM to model each mode of transport (road, public transport, active travel). The WRM has four time periods (AM peak hour, PM peak hour and two interpeak models). In this update to the 2018 EIAR, the existing version of the WRM was only used to model public transport and active modes and also to estimate the level of traffic

growth as per the opening and design year land use forecasts. As mentioned, a project specific Local Area Model (LAM) was built to model all road traffic to a more accurate level of detail than the WRM, in accordance with common practice when appraising major transport schemes.

This LAM has three time periods as opposed to four within the WRM. The difference being that the WRM has two interpeak models and the LAM only has one. One interpeak model (an average hour inter peak model) is in line with best practice as outlined in TII's PAG Unit 5.1.

The approach of building a project specific LAM was taken as the existing available WRM has a base year of 2016. By building a LAM on the basis of traffic surveys undertaken in November 2023 (as verified in November 2024), ensures that the traffic assessment is representative of current traffic levels and conditions within Galway City. Full validation of the new road model was completed to ensure a good match between the observed data and the modelled traffic characteristics, and to meet the TII robust calibration and validation criteria (refer to Appendix A.6.1 Traffic Modelling Report of this updated EIAR). An example of a comparison of traffic levels on the N6, between the N83 and N84, is presented below. This data is derived from a traffic monitoring unit which Transport Infrastructure Ireland (TII) has placed on the N6 which monitors traffic each day of the year and, therefore, gives an indication of the manner in which traffic levels change over time on the N6. Plate 6.1 shows illustrates that the traffic levels on the N6 show a very similar profile between the same week which the traffic surveys were undertaken in November 2023 and the equivalent week in November 2024. Overall, the total traffic level travelling along the N6, is effectively the same as between November 2023 and November 2024, with only a 0.5% difference being observed. The bullet points below show the differences across the main morning and evening commuting hours.

- 7 – 8 a.m.: 2023 levels are 2% higher than 2024 levels
- 8 – 9 a.m.: 2023 levels are 3% lower than 2024 levels
- 4 – 5 p.m.: 2023 levels are 7% lower than 2024 levels
- 5 – 6 p.m.: 2023 levels are 1% higher than 2024 levels

Therefore, the data used in this assessment is still based on current traffic levels.

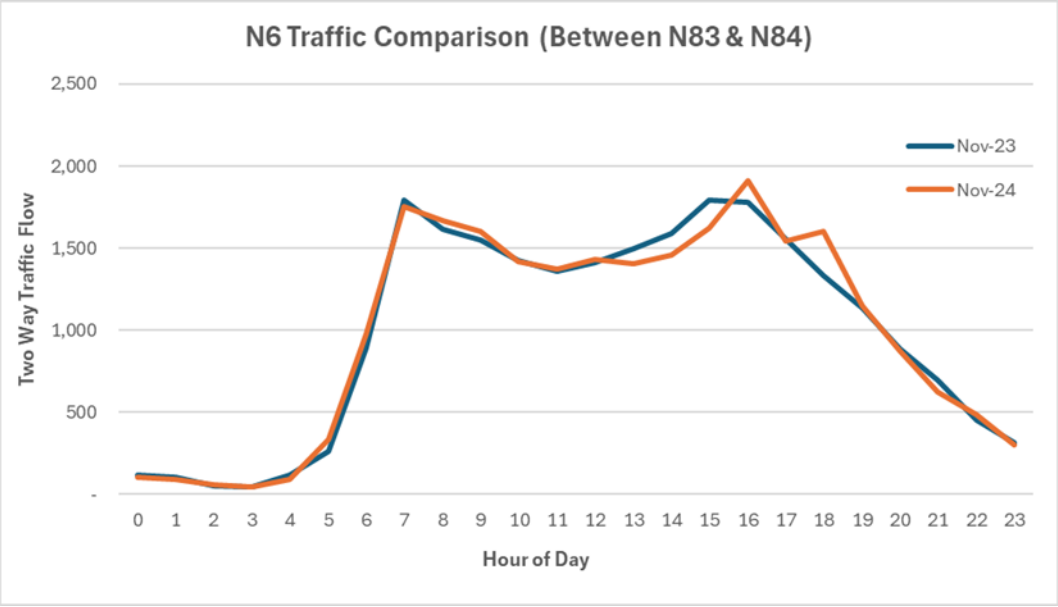


Plate 6.1 N6 Traffic Comparison 2023 Baseline to 2024

The LAM has also incorporated POWSCCAR data from the 2022 Census (not yet in the WRM) and is, therefore, representative of current traffic movements in the study area.

While the existing available version of the WRM has a base year of 2016 and is based upon data from the 2016 Census, it is still the most appropriate tool to use currently, for modelling modes such as public transport, walking and cycling, until the WRM is updated with data from the 2022 Census. According to data from the 2022 Census, the public transport mode share within Galway city has remained effectively

unchanged between 2016 and 2022, with a public transport mode share of 9.7% and 9.9% respectively. Therefore, these differences are deemed insignificant and the currently available WRM is still fit for purpose for modelling public transport today.

Further details of the modelling process are contained within the Traffic Modelling Report, contained in Appendix A.6.1.

The development of a LAM resulted in models of the area of influence of the Project, which meet the TII PAG criteria for model development. The demand for these models is derived from the WRM Demand Model, using forecasts developed by the National Transport Authority (NTA) and are discussed later within this chapter. The full model structure is illustrated in Plate 6.2.

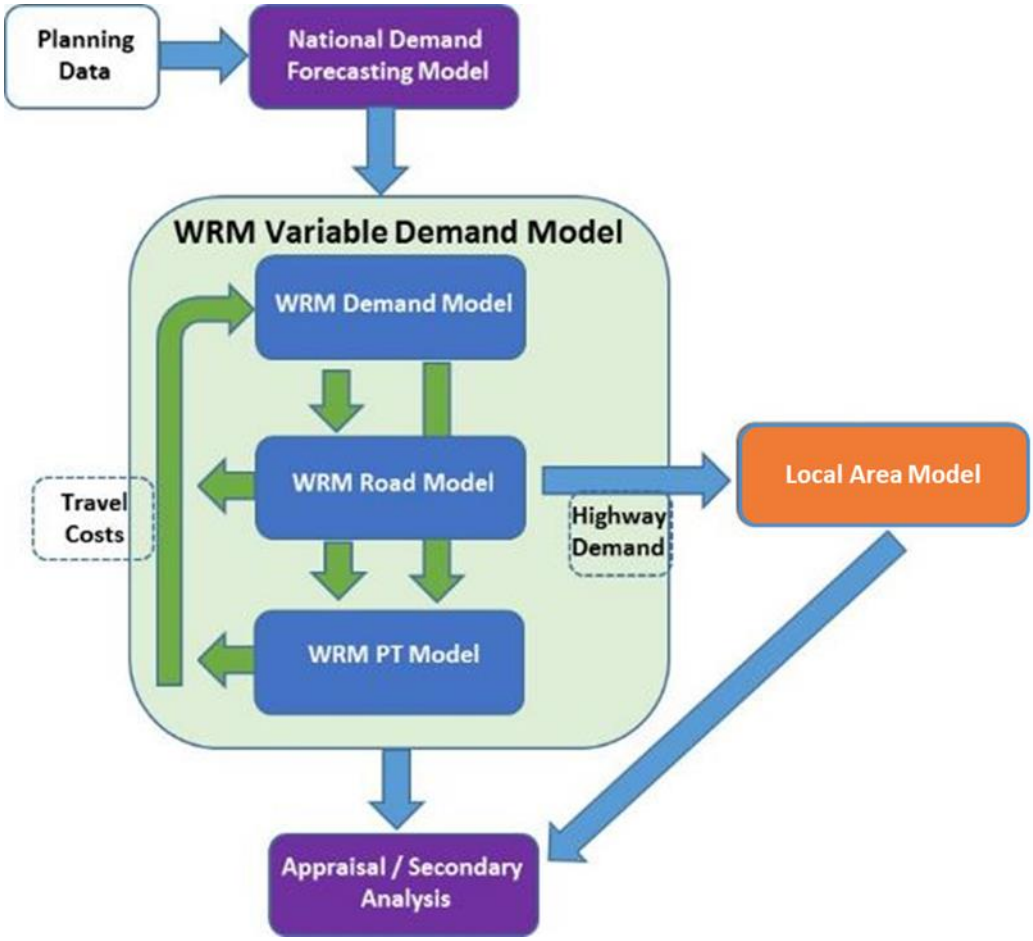


Plate 6.2 N6 GCRR Model Structure

6.2.4.2 Future Year Model Development

In order to assess the traffic impacts of the Project, two future year models were developed:

- Opening Year (2031)
- Design Year (2046)

2031 was chosen as the proposed Opening Year of the proposed N6 GCRR. As per TII Traffic and Transport Guidelines, the proposed N6 GCRR must also be assessed for a future year of 15 years after the first year of operation, and therefore 2046 is chosen on this basis. The future year 'Do-Minimum' networks include the base year network plus all schemes (road and public transport) that are already built, are committed to be built or likely to be built by 2031 and 2046. The list of schemes to be included was developed in coordination with Galway City Council, Galway County Council and TII. Therefore, the list of schemes for inclusion are mostly derived from the existing Galway Transport Strategy (GTS), which is the most recently

approved strategy for the region, which was published in 2016 and any updates arising from a review in 2024 by Galway City and County Councils.

The future year 'Do-Something' network includes the 'Do-Minimum' schemes plus the all aspects of the Project (including the Galway Racecourse stables development).

6.2.4.3 Travel Demand Forecasts

A detailed approach to forecasting travel demand has been developed in order to capture the planned growth in population and employment at a local level in Galway.

The following forecast scenario (and associated demographic forecasts) have been used on this Project in order to create future year travel demand:

- NTA Reference Case Forecasts - These forecasts are based on the NTA High Growth scenario and follow the National Planning Framework (NPF)/Regional Spatial Economic Strategy (RSES) distribution. Given these forecasts are a high growth scenario, they represent a reasonable worst case and are appropriate for use for the EIA.

In the 2018 EIAR, three land use forecasts were assessed. These are as follows:

- NTA Reference Case
- TII Central Case
- TII High

The three scenarios above contained pre-NPF land use forecasts. Normally, only one scenario would be assessed in the EIAR, however, these three scenarios were assessed in 2018 as all three scenarios were already developed and required as part of the Cost Benefit Analysis (CBA) of the project and for input into the Detailed Business Case. As part of the Business Case, multiple scenarios with varying levels of population/employment would be assessed, in order to give a greater level of confidence in the CBA results and rationale for investment.

After the Government published the NPF, which contained higher levels of projected growth for the five cities (including Galway) across the country, An Bord Pleanála requested further information and asked for the NPF forecasts to be assessed. In the RFI in 2019, two land use forecasts were assessed. These are as follows:

- TII NPF Central Case
- NTA/GCC NPF (these were developed by the NTA with some input from Galway City Council)

Table 6.1 below shows a comparison of the design year population forecasts for Galway City, for each scenario. It should be noted that the first five scenarios had a design year of 2039, as that was the original design year assumed for the proposed N6 GCRR. As part of this updated EIAR, the design year has been revised to 2046 to account for the passage of time. The figures below show that the new NTA Reference Case scenario, which is being assessed in this updated EIAR, has the highest population forecasts, approx. 135k (more than 10% increase on the NTA/GCC NPF forecasts assessed in the 2019 RFI), relative to the previously assessed forecasts.

These new NTA NPF forecasts has been adopted for the traffic impact assessment as they are the NTA's current reference case and are therefore considered the most appropriate forecasts to use for the assessment.

Table 6.1 Population Forecast Comparison for Galway City

Scenario	Forecast Year	Population Forecasts (Galway City)
NTA Reference Case (2018 EIAR)	2039	83,339
TII Central (2018 EIAR)	2039	77,666
TII High (2018 EIAR)	2039	78,304
TII NPF Central Case (RFI 2019)	2039	90,000
NTA/GCC NPF (RFI 2019)	2039	121,741
NTA NPF Reference Case (this updated EIAR)	2046	135,339

Model Application

The models and scenario described above were used to determine and assess the traffic impacts of the Project.

For further information on model development and application, please refer to the Traffic Modelling Report in Appendix A.6.1 which contains a full description of the model development and traffic impact analysis process.

6.2.5 Evaluation of traffic modelling results

The LAM is used to inform various aspects of the EIA, including but not limited to air quality and climate, noise, human beings, population and health and material assets as well as being used to determine traffic impacts associated with the Project (which is the main focus of this chapter).

The AADT flows within the study area were supplied to the design team including environmental experts and used to assess the potential environmental impact of the traffic from the Project. (i.e. air quality and climate, noise, etc.)

Key Performance Indicators (KPI) have been identified to assist in the assessment and evaluation of the Project in the peak period traffic. Each of the KPIs is quantifiable to allow the scenarios tested to be easily compared against one another to determine traffic related impacts.

The following KPIs have been used to determine traffic impacts:

- Journey Times on Key Routes
- Ratio of Flow (of Traffic) to Capacity ratio at Key Junctions (i.e. a measure of congestion levels)
- Network Statistics

These are the same KPIs which were used as per the 2018 EIAR.

Journey times on key routes have been considered to determine the traffic impact of the Project on the strategic road network. Ratio of Flow to capacity (or degree of saturation ratios) at key junctions have been considered to take account of local traffic impacts. Finally, network statistics give an overall, general, assessment of the performance of the main model area (which covers Galway City and some of the surrounding areas) for a given scenario.

All three KPIs are used for the traffic impact assessment as one KPI may reveal a traffic impact that is not picked up by another KPI. For this reason, all three KPIs are used to inform the full range of potential traffic impacts.

The impacts of the Project, both at the strategic and at local levels, are rated as positive, negligible, minor, moderate or major, as appropriate and these categories are described as follows (taken from 2022 EPA EIAR Guidelines as referenced in Section 6.1.2):

- **Positive:** effects improve conditions

- **Negligible:** effects that are of such low importance that they are not material to decision-making
- **Minor Significance:** effects that are of low importance in the decision-making process
- **Moderate Significance:** effects of the project that may be judged to be important at a local scale (i.e. in the planning context) only
- **Major Significance:** effects of the project which are of greater than local scale importance (i.e. strategic significance)

The likelihood (low, medium or high) and duration (short, medium or long term) of the predicted impacts is also assessed and noted. As per EPA guidelines (2022), short-term equates to 1-7 years, medium term is between 7 and 15 years and long term is between 15 and 60 years. This method of rating impacts allows the traffic modelling scenarios to be compared in a clear, concise and measurable way.

Mitigation measures of traffic impacts of major significance identified are developed and are further evaluated, if required.

The remaining residual impacts are also considered.

6.2.6 Identification and Scale of impacts

Three Key Performance Indicators (KPI) have been identified above are relevant to the assessment and evaluation process which will determine the traffic impact of the Project on these roads during peak hours:

- **Journey times** on key routes – to understand strategic impacts
- **Network Statistics** – Network wide indicators of congestion and delay
- **Ratio of Flow to Capacity (RFC)** at Key Junctions – to understand local impacts, congestion and queues

Using these KPIs, the traffic impact of the project is assessed at both a strategic and local level.

6.2.6.1 Journey Times

To develop an understanding of the potential impact of the Project on key routes serving Galway City and its environs, the projected change in vehicular journey times was assessed. Journey times represent a good basis for strategic traffic impact assessment as they provide a mechanism to quantify the traffic impact along a full route. The journey times KPI is based on a comparison between the 'Do-Minimum' journey times and the 'Do-Something' journey times. Both the percentage change and absolute change in journey times (seconds) is considered to determine the impact, as shown in Table 6.2 below.

The journey time routes used for the assessment of impact are shown in Plate 6.3. The Journey Times is KPI, therefore, assesses the strategic traffic impact of the project.

Table 6.2 Representation of Negative Impact on Vehicle Journey Times

		Absolute Difference (seconds)			
		<60	60-120	120-240	>240
% Change	<5%	Negligible	Negligible	Minor	Moderate
	5-10%	Negligible	Minor	Moderate	Moderate
	10-20%	Minor	Minor	Moderate	Major
	>20%	Minor	Moderate	Major	Major

A Green Box would indicate a positive impact between the Do-Minimum and Do-Something Scenario

Plate 6.3 Journey Time Routes

The data in Table 6.2 should be interpreted as follows: – the impact is considered "Major" if the change in journey time, when comparing the 'Do-Minimum' and 'Do-Something' scenarios, is greater than 240 seconds and the percentage change is greater than 10% or the time increase is between 120 – 240 seconds and percentage change is greater than 20%.

In situations where the journey times decrease, i.e. the change in journeys time when comparing the 'Do-Minimum' to the 'Do-Something' scenarios is negative, this impact is described as 'Positive'.

Journey times on key routes have been considered in order to determine the traffic impacts on the strategic road network.

6.2.6.2 Network Statistics

To further quantify the impact of the Project on the strategic road network the model network statistics are assessed. These statistics provide information on the following parameters (averaged):

- Average Speed – Measured in kilometres per hour (km/h)
- Average Delay – Measured in total delay for all vehicles
- Total Network Travel Time – Measures in total travel time for all vehicles
- Total Vehicle Distance Travelled – Measured in total kilometres for all vehicles

The Network Statistics KPI therefore presents an indication of the overall performance of the model network for a given scenario.

As there are several related parameters to consider for this criterion, and in order to avoid confusion, the Network Statistics KPI is measured in absolute terms. i.e. there is either a positive or negative impact on overall network statistics.

6.2.6.3 Ratio of Flow to Capacity at Key Junctions

To further understand the potential impact on junction operations of the Project, the Ratio (of traffic flow) over capacity (RFC) at key junctions along the existing N6 corridor have been analysed and compared across scenarios.

RFC is a standard reference for measuring traffic congestion at a junction. It is standard practice to consider that a junction is congested when traffic flows are at 85% of the estimated capacity of a priority junction, or 90% of a signalised junction. At traffic flows above 90% of capacity the delays at a junction become erratic and are difficult to control. A value of 100% means that demand and capacity are equal and no further traffic can progress through the junction without experiencing delays.

A Ratio of Flow to Capacity analysis has been undertaken using information from the Project Local Area Model for each modelling scenario. This analysis considered all approaches to key junctions along the N6/R338 corridor, illustrated in Plate 6.4 below.

Plate 6.4 N6/R338 Key Junctions

The scale of the impact is based on the threshold values described above and it is the change in these values arising from the impact of the project (Do-Something) which indicates the extent of localised impact at the junctions assessed. – Table 6.3 below, refers to roundabouts and other priority junctions and Table 6.4 refers to signalised junctions and summarises how the change in the value of these parameters indicates the performance impact.

Table 6.3 Impact on RFC at Key Junctions (Roundabout)

RFC	Do-Something			
Do-Minimum	<75%	75-85%	85-90%	>90%
<75%	Negligible	Moderate	Major	Major
75-85%	Positive	Minor	Moderate	Major
85-90%	Positive	Positive	Minor	Major
>90%	Positive	Positive	Positive	Minor

It is assumed that if a roundabout is currently operating well within capacity (e.g. <75%) and the additional traffic associated with the Project causes the junction to be congested (i.e. over 85%) there is a traffic impact of major significance. Conversely if the junction currently has congestion issues (e.g. 85-90%) and the traffic from the Project causes an increase in congestion, but within the same parameter value band (i.e. 85-90%) the impact of the Project is considered to be of minor significance.

Table 6.4 Impact on RFC at Key Junctions (Signalised)

RFC	Do-Something			
Do-Minimum	<80%	80-90%	90-95%	>95%
<80%	Negligible	Moderate	Major	Major
80-90%	Positive	Minor	Moderate	Major
90-95%	Positive	Positive	Minor	Major
>95%	Positive	Positive	Positive	Minor

It is assumed that, if a signalised junction is currently operating well within capacity (e.g. <80%) and the additional traffic associated with the Project causes the junction to be congested (i.e. over 90%), then the traffic impact is of major significance. However, if the junction currently has congestion issues (e.g. 90-95%) and the traffic from the Project causes an increase in congestion, but within the same parameter value band (i.e. 90-95%) the impact on junction performance is considered to be minor significance, i.e. little change – still congested.

6.2.7 Rating Impacts

The impact of the Project under each scenario is rated using the assessment KPI framework detailed above as follows:

- **Step 1:** The relative changes between the 'Do-Minimum' and 'Do-Something' scenarios are categorised as positive, negligible, minor, moderate or major (as above)
- **Step 2:** The likelihood of the negative impacts occurring are rated as either low, medium or high
- **Step 3:** The duration of negative impacts is rated as short, medium or long term. As per EPA guidelines, short-term equates to 1-7 years, medium term is between 7 and 15 years and long term is between 15 and 60 years

This method of rating impacts allows the 'Do-Minimum' and 'Do-Something' scenarios to be compared in a clear, concise and measurable way.

6.3 Receiving Environment

6.3.1 Existing Road Network

The existing road network is shown on Plate 6.5. The existing road network within Galway city is similar to the network described in the 2018 EIAR. Since 2018, the N6 within the city, has undergone a number of junction upgrades which have involved converting roundabouts to signalised junctions, which incorporate dedicated pedestrian movements. Outside of city area, the major changes to have taken place, are the opening of the N59 Moycullen Bypass and the M18 which provides a motorway standard connection between Tuam and Shannon, in County Clare.

The existing N6 is a four-lane carriageway between Coolagh, Briarhill and the N59 Moycullen Road at the Browne Roundabout, with varying median width, and several signalised junctions and two at-grade roundabouts. There are various forms of at-grade junctions including roundabouts, signals and priority junctions on the R338 from its junction with the N59 Moycullen Road at the Browne Roundabout to the R336 Coast Road.

The M6 motorway becomes the N6 National Road to the east of Galway City and is the primary access to Galway City from the east. The existing N6 connects to the local road network at the Coolagh Roundabout, an at-grade junction which experiences congestion during the morning peak hour, noting that drone footage

was obtained at this roundabout in 2018[3] and further updated in November 2024 which shows a continuation of the congestion of 2018. Extracts from this updated footage are included in Chapter 3 of this updated EIAR. The existing N6 then turns north to Briarhill Junction, again which experiences congestion during morning peak hour as per 2018 drone footage[4], an at-grade signalised junction, which connects to R339 Monivea Road and onto Parkmore Road. This footage was also repeated in November 2024 with similar results. This junction experiences capacity problems (refer to Section 6.3.5 below) during both the morning and evening peak hour due to the volume of traffic trying to access/egress the Industrial Estates at Parkmore, Ballybrit and Briarhill.

The existing N6 continues as a dual carriageway to the at-grade signalised junction at the Ballybane Junction and onto the N83 Tuam Road[5], again a signalised junction. This particular junction experiences delays at peak hours due to the high level of conflicting traffic volumes at the junction. The dual carriageway continues to the previously named Kirwan Roundabout, i.e. the junction of the existing N6 and the N84 Headford Road, which is now a signalised junction. This junction also experiences delays at peak hour due to the high level of conflicting traffic volumes. The section of the N6 between the N83 and the N84, has an Average Annual Daily Traffic (AADT) level of approximately 22,000.

The existing N6 over the Quincentenary Bridge carries approximately 40,000 vehicles per each workday (as per 2024 traffic count data). This volume decreases on the west of the river as traffic accesses the university and the hospital at the existing N6/Newcastle Road and existing N6/N59 Browne Roundabout Junction. To the west of the Browne Roundabout junction is the R338 Seamus Quirke Road, which is a single carriageway plus bus lanes, with frontage, retail accesses, cyclists and high pedestrian usage.

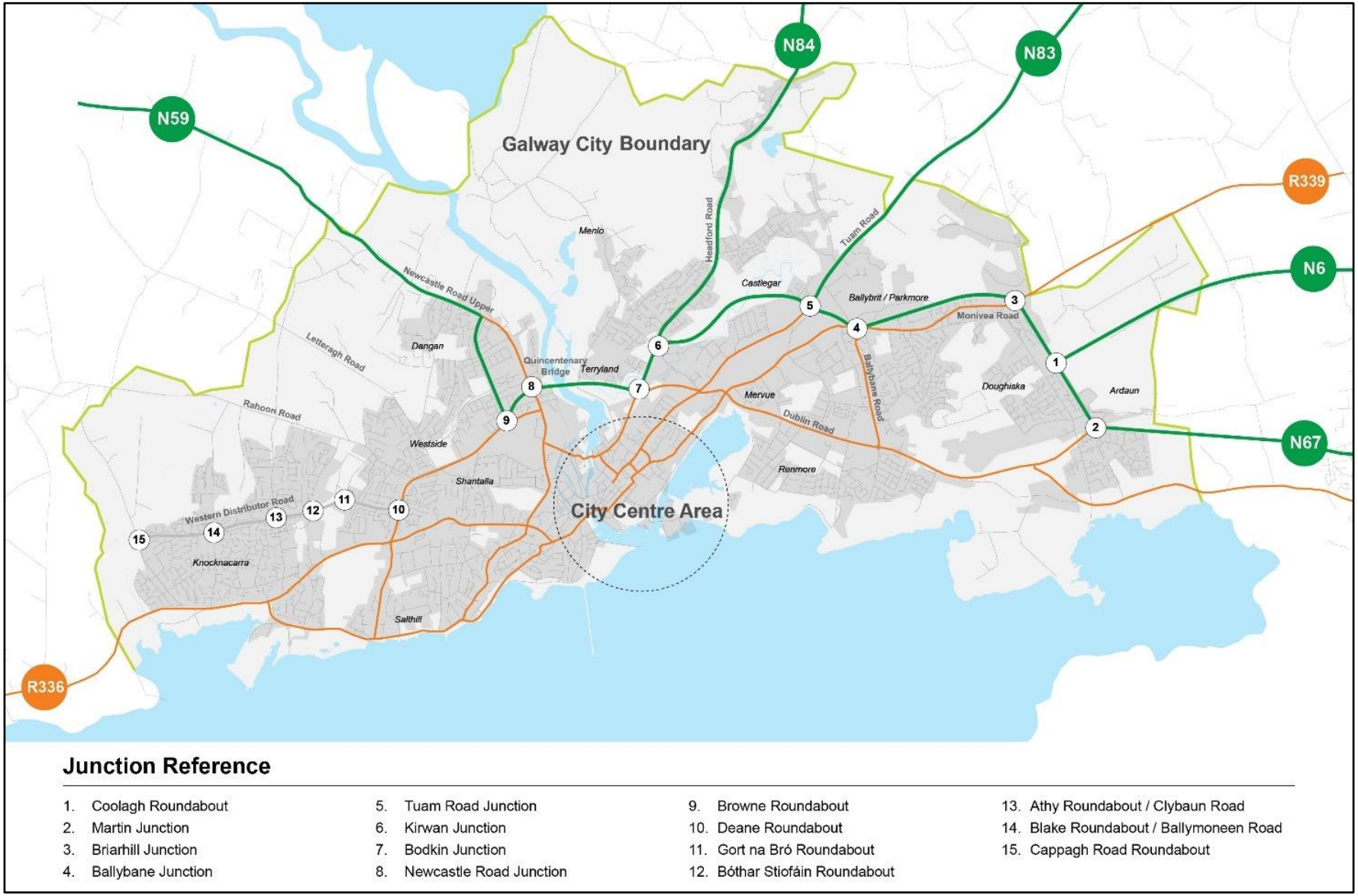
The R338 then connects to the R336 Coast Road by continuing south along Threadneedle Road. There are two major secondary schools, and three primary schools in the vicinity of Threadneedle Road, all of which contribute to delay.

Therefore, the existing N6 weaves a route through many at-grade junctions from east to west around Galway City. The proximity of the junctions and the frequency of these junctions does not facilitate movement of vehicles in a timely manner or in a reliable manner. It also hinders and discourages modal shift as the public transport vehicles are also experiencing similar delays and such congested streets are perceived as dangerous for cyclists and pedestrians.

[3] https://n6galwaycityringroad.ie/media/Drone%20Footage%20Coolagh%20Roundabout.mp4

[4] https://n6galwaycityringroad.ie/media/Drone%20Footage%20Briarhill%20Junction.mp4

[5] Formally known as the N17 Tuam Road



Junction Reference

1. Coolagh Roundabout
2. Martin Junction
3. Briarhill Junction
4. Ballybane Junction
5. Tuam Road Junction
6. Kirwan Junction
7. Bodkin Junction
8. Newcastle Road Junction
9. Browne Roundabout
10. Deane Roundabout
11. Gort na Bró Roundabout
12. Bóthar Stiofáin Roundabout
13. Athy Roundabout / Clybaun Road
14. Blake Roundabout / Ballymoneen Road
15. Cappagh Road Roundabout

Plate 6.5 Existing Road Network in 2025

6.3.2 Existing Travel Patterns

The following section details some of the existing travel patterns and data, across the city and metropolitan area. The data contained within this section is new compared with the 2018 EIAR as it incorporates data from the latest Census (2022) and other available sources.

Plate 6.6 shows the population density across Galway City in 2022 for each Census Small Area boundary. Population density is calculated by dividing the population (according to the 2022 Census) by the area. It shows that both sides of the city have a high population density, but the western side is more densely populated than the eastern side.

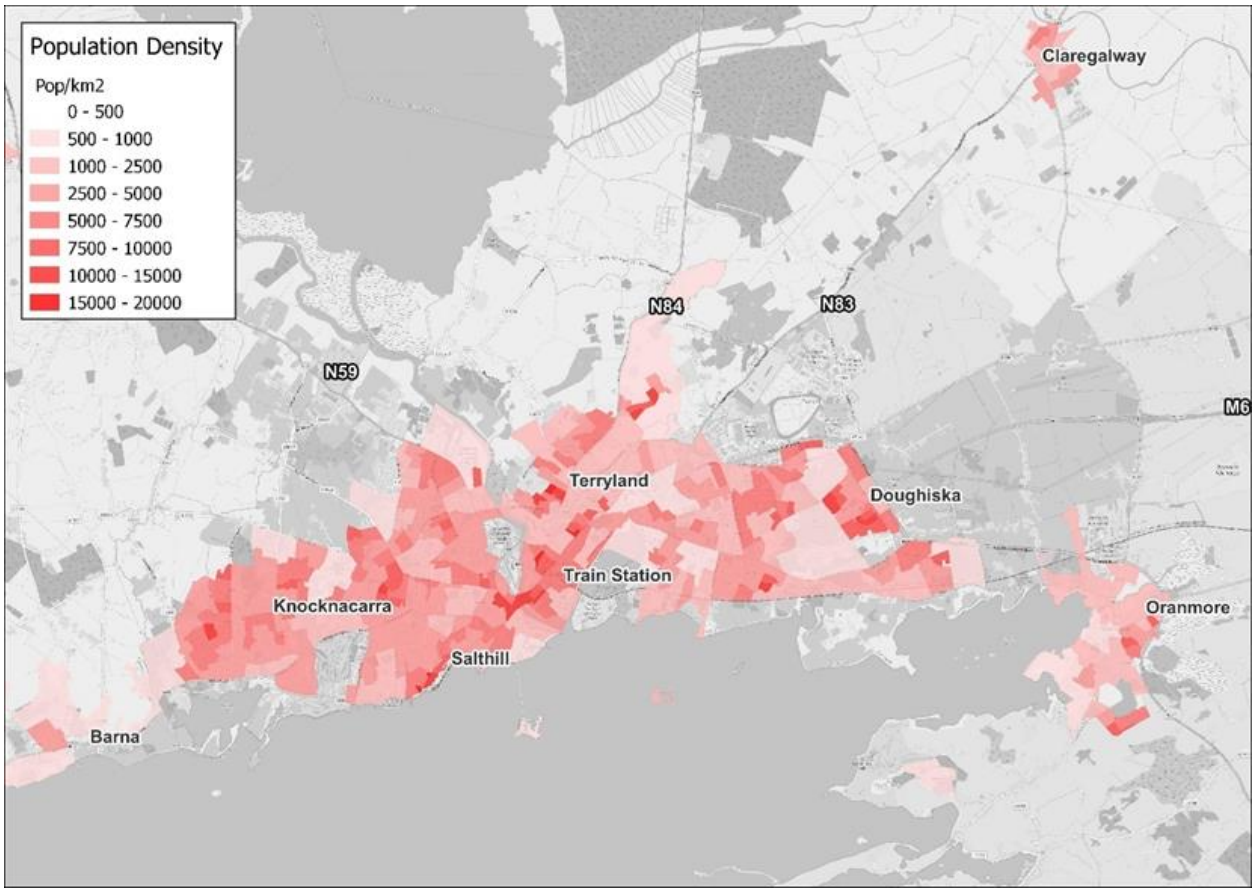


Plate 6.6 2022 Population Density

Plate 6.7 shows the level of employment across Galway city in 2022 for each Census Small Area boundary. It shows that the majority of jobs are located on the eastern side of the city, with the major business parks like Parkmore and Ballybrit, having the highest level of jobs. This creates a problem in terms of transport as the large number of people living on the western side of the city need to cross the River Corrib each day for work, which places an importance on the river crossings, particularly the Quincentenary Bridge. The hospital and the university on the western side of the river are also major employers and attract traffic.

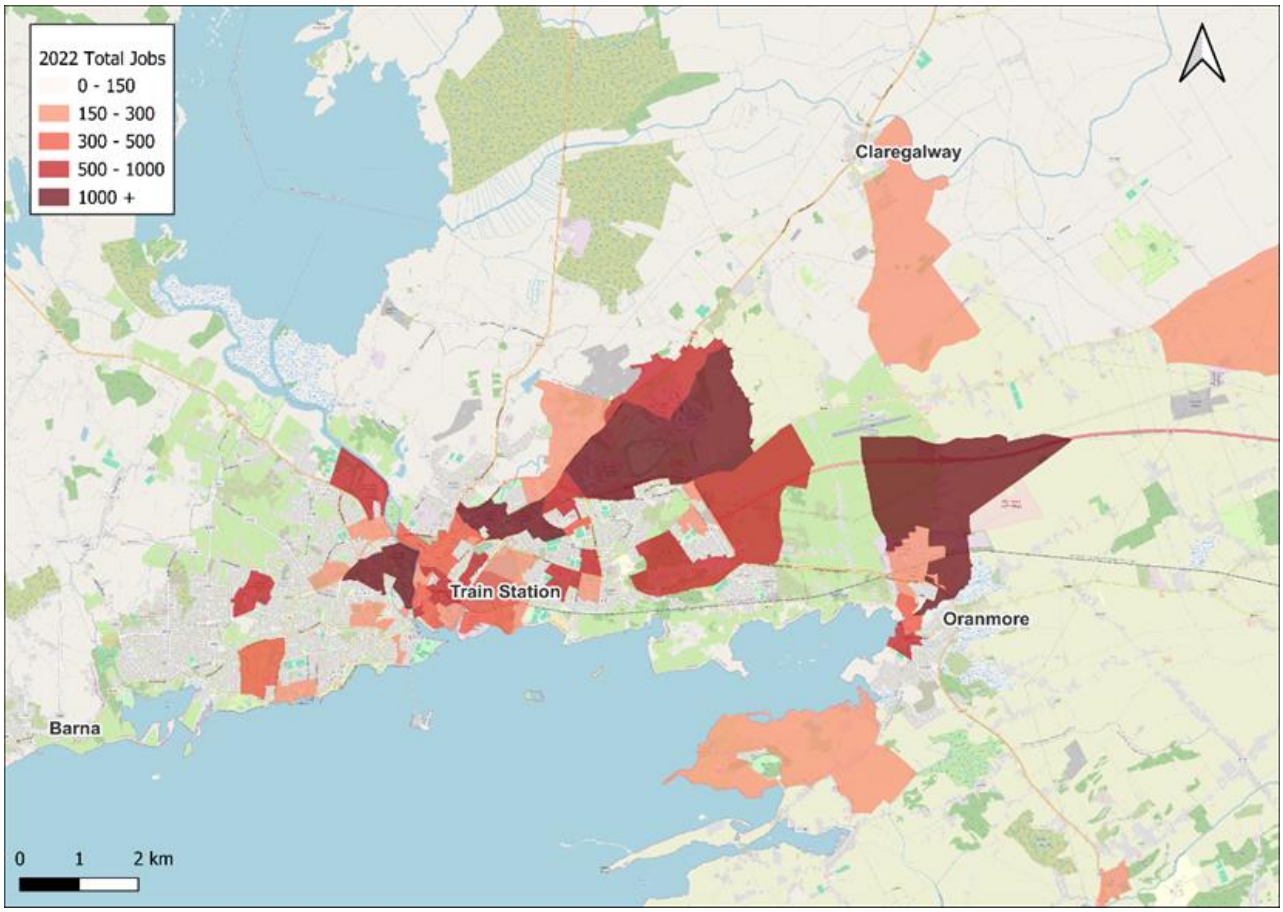


Plate 6.7 2022 Jobs Levels

Plate 6.8 shows the car mode share for the city area according to the 2022 Census. It shows that there is a high dependency on cars as a mode of transport for those who live on the edge of the city, particularly on the western side. It also shows that there is a high dependency on cars for those who live outside the city boundary. This highlights the importance of the national road network around Galway City as a means of travel, for those who live within the metropolitan area and wider county area but work within Galway City.

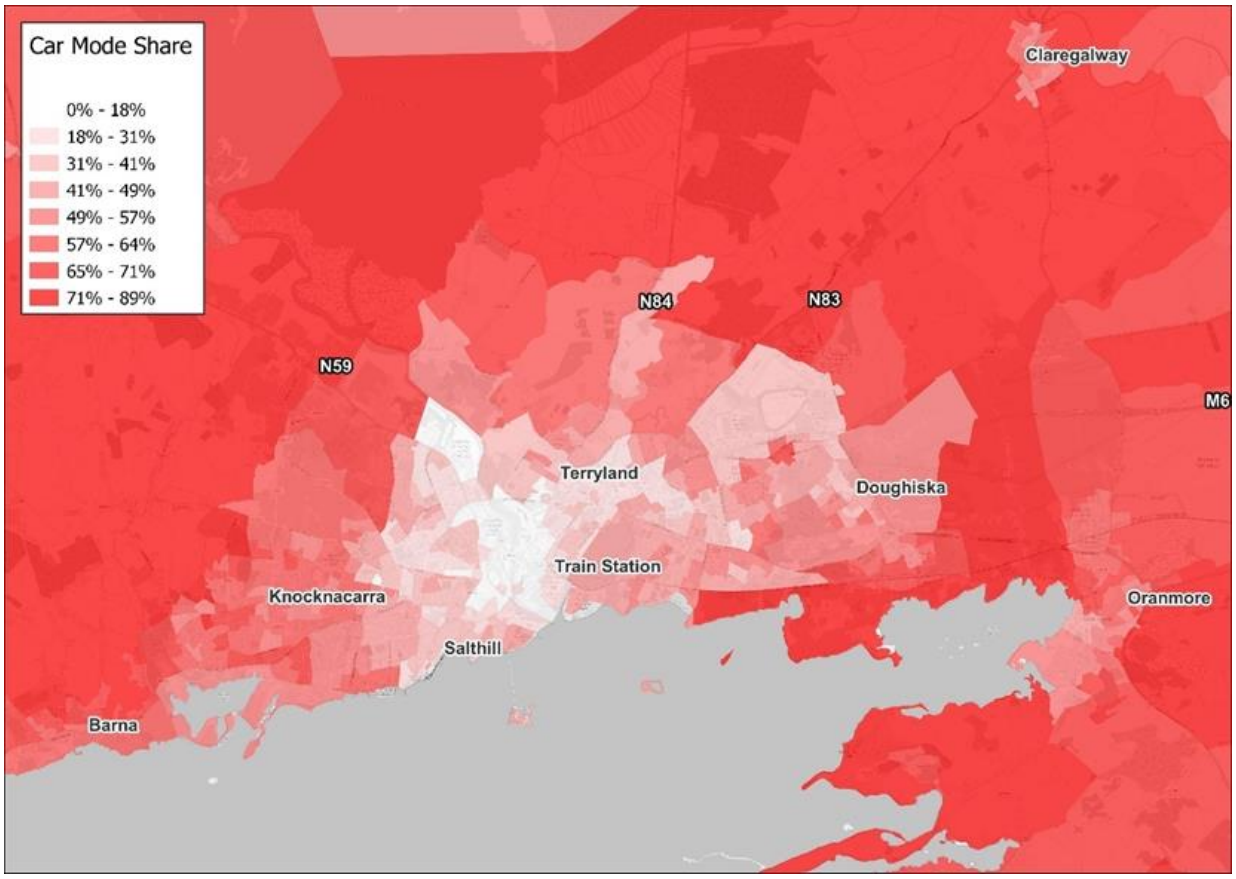


Plate 6.8 2022 Car Mode Share

Plate 6.9 shows the public transport mode share for the city area according to the 2022 Census. It shows that public transport use is currently relatively low across the study area. On the eastern side of the city, public transport use on average is between 10% - 15%, although some areas have increased levels of 20%. On the western side of the city, public transport use on average is below 10%.

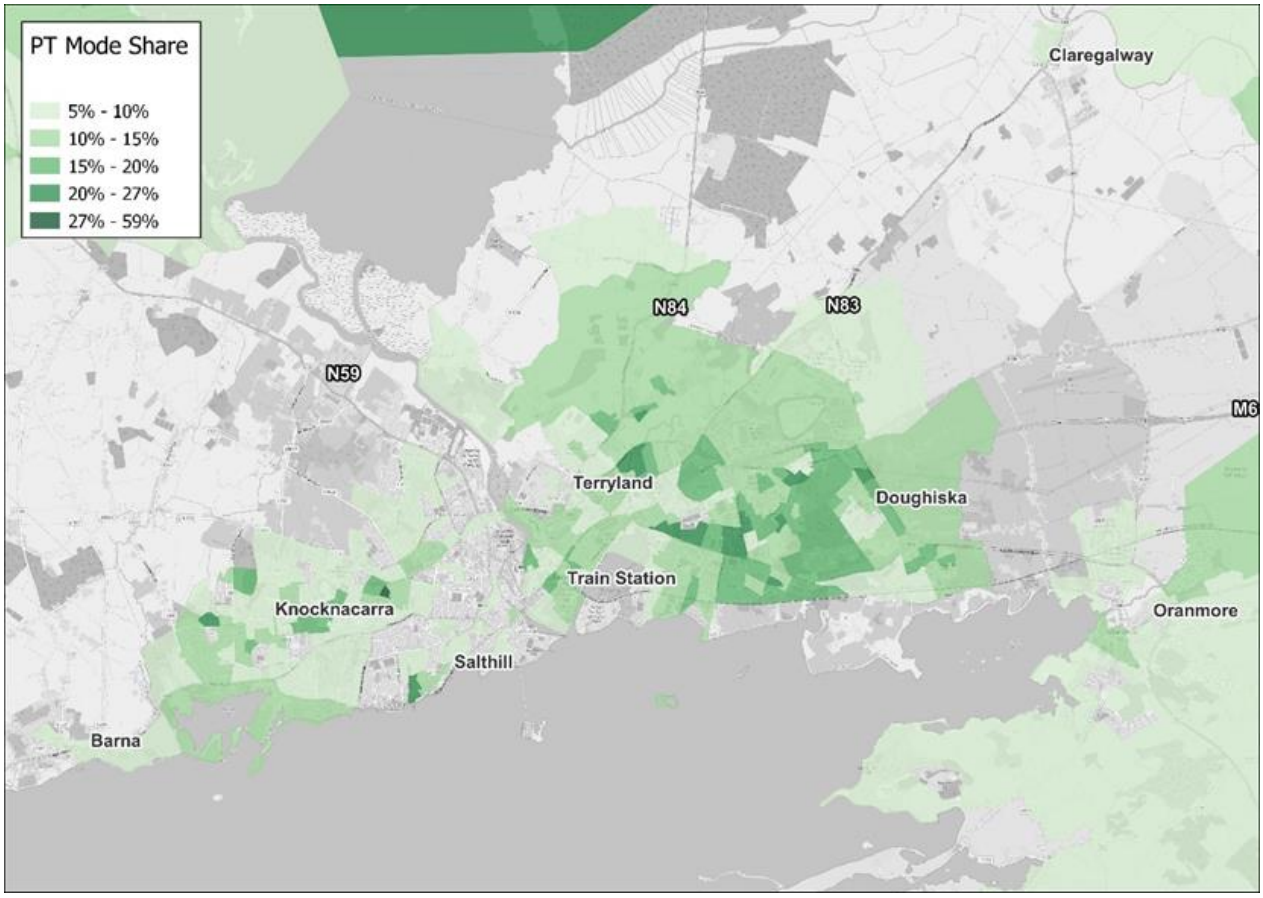


Plate 6.9 2022 Public Transport (PT) Mode Share

Plate 6.10 shows the walking mode share for the city area according to the 2022 Census. As expected, the walking mode share is quite high in the centre of the city, given its central location and access to services, facilities etc. The highest walking mode share is observed on the UoG campus, where students live on site near the university. On the western edge of the city, there are large areas which have a walking mode share of less than 6% and do not show up on the map. Again, this highlights the low number of jobs within a reasonable walking distance for those living on the western side of the city and the importance of other modes for those needing to cross the city each day.

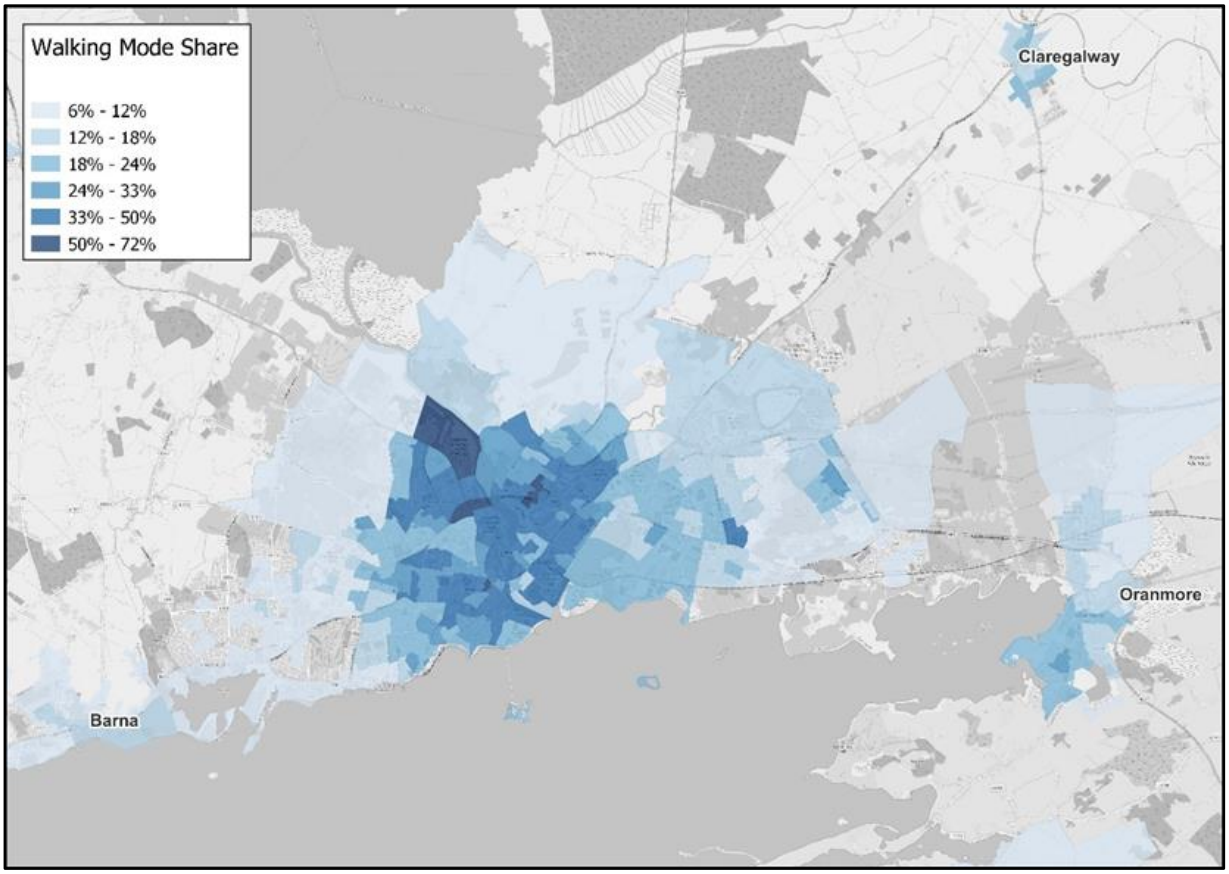


Plate 6.10 2022 Walking Mode Share

Plate 6.11 shows the daily traffic profile across all bridge crossings in Galway City. The graph shows the total volume of traffic by hour, that uses each of the four bridge crossings in Galway City (and the Quincentenary Bridge on its own). The morning and evening peak hours are labelled in the graph, and these correspond to 8 – 9a.m. and 4 – 5p.m

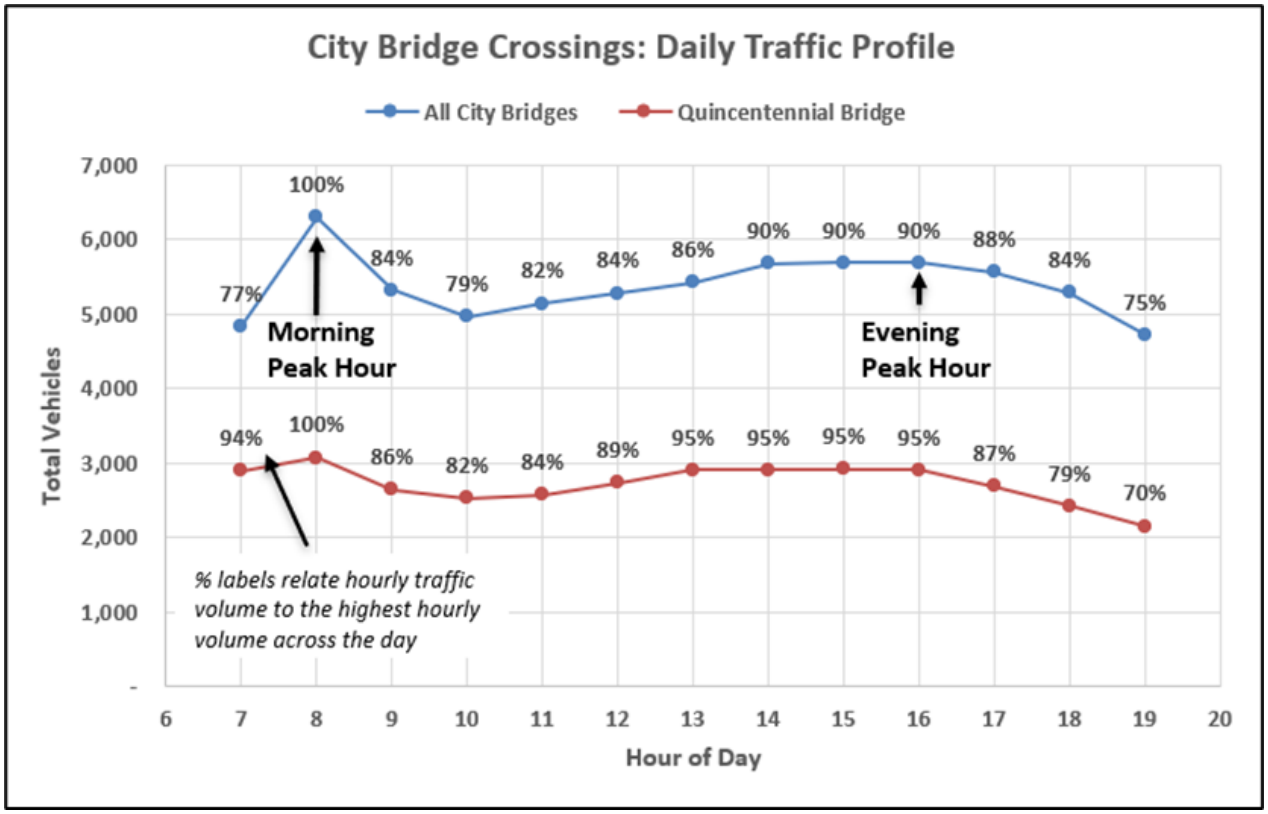


Plate 6.11 2023 Daily Traffic Profile on Bridge Crossing in Galway City

The morning peak hour has the largest volume of traffic, over all four bridges and on the Quincentenary Bridge (red line in Plate 6.11) on its own. Each hour also has a percentage label which relates that hour's volume to the highest hour volume across the day.

As mentioned above, the morning peak hour: 8 – 9 a.m., has the largest volume of traffic across the day and hence why it has a percentage of 100%. This graph shows that while the 8 – 9 a.m. hour is the highest on the Quincentenary Bridge, the hours of 7 – 8 a.m. and 1 – 5 p.m. all have hourly traffic volumes which are approx. 95% of the morning peak hour value. Also, between the hours 9 a.m. – 1 p.m. and 5 – 6 p.m., the traffic volume on the bridge is between approx. 85% - 90% of the morning peak hour value. This shows that on the Quincentenary Bridge, the traffic volumes remain high across an 11-hour window during an average weekday, relative to the most congested hour which is the morning peak hour.

For the four bridge crossings over the River Corrib (the blue line in Plate 6.11), there is a similar pattern as with the morning peak hour: 8 – 9 a.m., having the largest volume of traffic across the day and hence why is has a percentage of 100%. While the 8 – 9 a.m. hour is the highest across all four bridges combined, the hours of 1 – 6 p.m. all have hourly traffic volumes which are approx. 90% of the morning peak hour value. Also, between the hours 9 a.m. – 1 p.m. and 6 – 7 p.m., the traffic volume on all bridges is approx. 85% of the morning peak hour value. This shows that across all four bridges, the traffic volumes remain high across a 12-hour window during an average weekday, relative to the most congested hour which is the morning peak hour.

This data demonstrates that traffic volumes crossing the River Corrib on an average workday remain high across a 12-hour window, as illustrated by the relatively flat profile line across the day. A typical traffic profile would show two spikes for the morning and evening peak hours, with the hours in between, showing a clear reduction compared with the peak hour volumes. However, as illustrated by the data in Plate 6.11, there is a relatively flat profile across the day and given the known peak hour congestion issues in the city, the data highlights a consistent traffic problem throughout the day. It highlights the importance of the river

crossings to residents on both sides of the city each day, not just to travel to work or school which would take place during certain hours, but for all travel purposes, as highlighted by the consistently high volumes across a 12-hour window.

It should be noted that these current consistent volumes do not account for all of the significant growth which is planned for the city as per the government's National Planning Framework (NPF). The NPF has a target of 50% growth for Galway city's population, above 2016 levels.

It should also be noted that the BusConnects Galway Cross-City Link, which was approved by An Bord Pleanála in October 2024, will restrict access to general traffic on the Salmon Weir Bridge between the hours of 7 a.m. to 7 p.m. This restriction would create a sustainable transport corridor in the Eyre Square area and help facilitate the large increase in cross city bus services planned as part of the NTA's BusConnects Programme for the city (50% increase in services).

Currently, during the hours of 7 a.m. to 7 p.m. on an average weekday, the Salmon Weir Bridge has traffic volumes of approx. 12,000, which accounts for approx. 20% of the traffic volumes across all four bridges during those hours. A significant portion of these 12,000 vehicles would be likely to use the Quincentenary Bridge instead in the future to cross the city, if the Cross-City Link scheme was approved even though the Quincentenary Bridge currently suffers from severe congestion issues, especially during the peak hours.

These factors highlight the importance of the Project as a critical and complementary component of the 2016 Galway Transport Strategy, which is required to provide another river crossing and contribute to off-setting the restriction on the Salmon Weir Bridge and facilitate the BusConnects Programme in the city and contribute to the attainment of population growth by 50% up to 2040 as aligned with NPF targets.

6.3.3 Existing AADT on key links

The following Average Annual Daily Traffic (AADT) flows were estimated based on traffic counts undertaken by Galway City Council during the month of November 2024:

- N6 between Coolagh Roundabout and Monivea Road – 35,900 AADT
- N6 at Galway Racecourse (between Briarhill and Ballybrit Business Park junctions) – 34,500 AADT
- N6 between Tuam Road and Kirwan Junction – 22,800 AADT
- N6 River Corrib Crossing – 41,300 AADT

The 2018 EIAR included AADT estimates for the same locations, but for the year 2013. A comparison of these values, with their equivalent 2024 values is shown below in Table 6.5. The values in the table show increases of between 2% and 77% along the N6, which highlights the worsening traffic issues in Galway City, compared to the conditions described in the 2018 EIAR.

Table 6.5 AADT Traffic Volumes (November 2024 versus 2013)

Location	2013 AADT Estimates	2024 AADT Estimates	% Diff
N6 between Coolagh Roundabout and Monivea Road	21,400	35,900	+ 77%
N6 at Galway Racecourse (between Briarhill and Ballybrit Business Park junctions)	19,900	34,500	+ 74%
N6 between Tuam Road and Kirwan Junction	22,400	22,800	+ 2%
N6 River Corrib Crossing at Quincentenary Bridge	34,600	41,300	+ 19%

Existing Peak Hour Flows and Level of Service

Average weekday peak hour traffic flows on the existing N6 and within the Galway urban area have been derived from the November 2024 traffic surveys and are presented in Table 6.6.

Table 6.6 Peak Hur Traffic Volumes (November 2024)

Road	C'way	Direction	AM Peak (08:00 -09:00)	PM Peak (17:00 -18:00)
Parkmore Road	Single	Northbound	555	239
		Southbound	432	796
Wolfe Tone Bridge	Single	Eastbound	876	411
		Westbound	710	847
Tuam Road	Single	Northbound	692	752
		Southbound	671	576
Salmon Weir Bridge	Singe	Eastbound	412	427
		Westbound	683	663
Old Dublin Road	Single	Eastbound	434	517
		Westbound	373	579
N6 Bothar na dTreabh	Dual	Eastbound	922	1200
		Westbound	1657	937
Headford Road	Dual	Northbound	450	608
		Southbound	519	452
N6 (East of Coolagh Roundabout)	Dual	Eastbound	557	1661
		Westbound	1552	844
N6 Quincentenary Bridge	Dual	Eastbound	1604	1264
		Westbound	1435	1506

TA 79/99 of the UK DMRB is used to determine the capacity of urban roads. This standard is not formally implemented in Ireland but is considered as an indication of best practice. Within this standard, classifications such as Urban Motorways or Urban All-Purpose roads are used, with further sub-classification of Urban All Purpose Roads as UAP1 to UAP4. The existing N6 in Galway can be defined as a UAP2 which refers to a "good standard single/dual carriageway road with frontage access and two side roads per km". From TA 79/99, a 2 lane UAP2 road has a capacity of approximately 1,470 vehicles per hour for a 7.3m wide 2 lane single carriageway. This capacity increases to 3,200 vehicles per hour for a 7.3m wide 2 lane dual carriageway. This does not account for capacity issues at the junctions.

When the existing volumes are compared against the theoretical capacity, the 4 lane single carriageway section of the existing N6 over the Quincentenary Bridge has a morning peak hour volume of approx. 3,050 vehicles which is just below the capacity threshold defined in TA 79/99, which results in congestion on the route and a reduced level of service. The Quincentenary Bridge is a key part of the city network, which enables users to cross the city each day and is likely to come under more pressure when the approved BusConnects Cross-City Link is in place, as this scheme restricts access to general traffic during the hours of 7 a.m. and 7 p.m. in other areas of the city, including over the Salmon Weir Bridge. The factor is considered

in the increase in traffic outlined in the Cross City Link EIAR[6], which predicts a 20% increase in traffic in the AM peak hour (Table 6.83) and a 16% increase in the PM peak hour (Table 6.86) on the Quincentenary Bridge in the project's assumed opening year of 2023.

6.3.4 Journey Time Reliability Assessment

Peak hour congestion on the road network in Galway, predominantly caused by junction capacity issues, results in increased journey times in peak periods in Galway which, in turn, leads to a reduction in journey time reliability in the city during these periods.

An analysis of journey times on several key routes around Galway and its environs was carried out to show the variance in journey times between the peak and off-peak periods in the base year. The analysis was undertaken using Google Map's API function. The key routes are shown on Plate 6.12. The difference between the peak and off-peak journey times is a measure of the level of congestion during the peak and increasing congestion results in worsening journey time reliability.

Plate 6.12 Journey Time Reliability Routes

Travel times on each of the routes in the inbound direction in the morning peak period versus the off-peak period are tabulated in Table 6.7 below.

This assessment of journey time shows that the travel times on these key routes in the morning peak hour can show up to 40% increase on their off-peak travel times counterparts. This highlights the current traffic problems which residents within the city and metropolitan area experience on a daily basis.

[6] https://files.galwaycity.ie/gccfiles/?r=/download&path=L0RlcGFydG1lbnRzL1RyYW5zcG9ydC9HVFMgUHJvamVjdHMvQ3Jvc3MtQ2l0eSBMaW5rL0Nyb3NzIENpdHkgTGluayBXZWJzaXRlL0VJQVIvVm9sdW1lIDIvQ2hhcHRlciAwNiAtIFRyYWZmaWMgJiBUcmFuc3BvcnQxLnBkZg%3D%3D

Table 6.7 Journey Time Reliability

		2024 Journey Times (minutes)			
		Off-peak average hour	Morning peak hour	Difference	% Difference
Inbound	Route 1 IN	9-18	10-24	1-6	5-15%
	Route 2 IN	12-16	16-35	4-19	14-37%
	Route 3 IN	7-12	12-24	5-12	26-33%
	Route 4 IN	7-12	9-22	2-10	13-29%
	Route 5 IN	6-12	8-26	2-14	14-37%
	Route 6 IN	6-7	8-16	1-9	7-39%

6.3.5 Junction Capacity Assessment

In the urban area, the ratio of volume to capacity on a road is a key contributor to road congestion. Therefore, an assessment of the ratio of flow to capacity was undertaken across the network as shown on Plate 6.13. Data was extracted from the 2023 AM Peak Base Year traffic model to show the volume-to-capacity ratio.

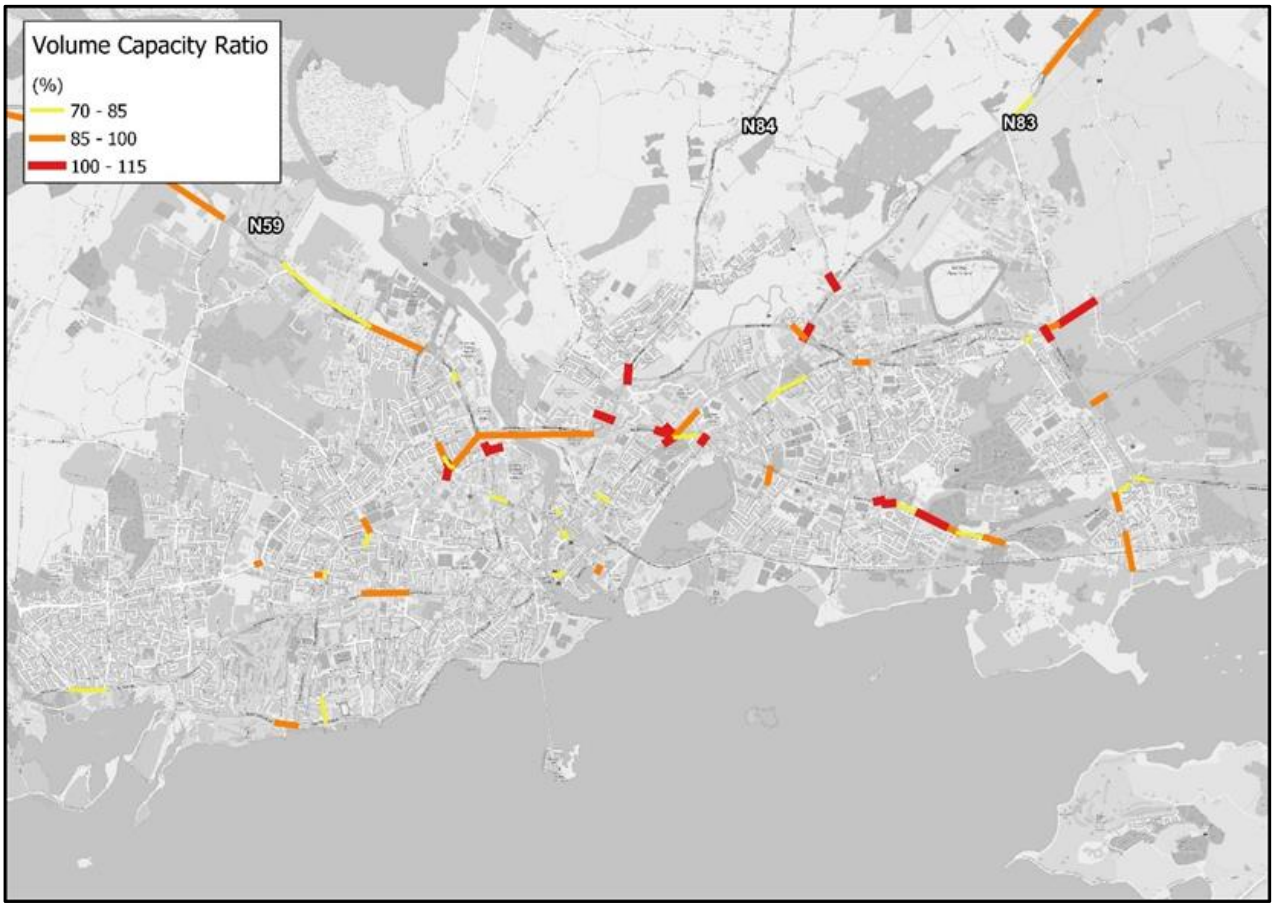


Plate 6.13 Volume/Capacity Rations across Network

The ranges used are 70% - 85%, 85% - 100% and 100 – 115%. Roads with a V/C greater than 1 are over capacity. Ideally roads should operate at a V/C ratio of < 85%, which would allow 15% spare capacity in the junction to cope with an unexpected event or natural growth. Plate 6.13 shows that a number of areas are over capacity in the morning peak hour, like the N83 and N84 approaches to the N6, the N6 southern approach to the Briarhill junction, sections of the Dublin Road corridor and the Browne and Joyce roundabouts. Other areas which are very close to capacity are the Quincentenary Bridge and other sections of the mainline N6.

6.3.6 Other Modes

6.3.6.1 Introduction

This section describes the other modes of transport which residents within the city and metropolitan area use on a daily basis. As the majority of the walking, cycling and buses run on the existing road network without segregated facilities or dedicated priority, the existing road network was described in advance of the situation for the other modes. This section is similar to the 2018 EIAR but has been updated, where necessary, to account for any changes.

6.3.6.2 Existing Bus Network Conditions

Galway City is served by Bus Éireann and a small number of private operators. The city bus infrastructure is discontinuous, with priority measures only provided along sections of key corridors and not continuous over any significant portion of the network. As such the city bus network is subject to delay, impacting the attractiveness of the bus as a mode of choice.

In addition to the city bus network, a number of regional bus service providers operate to and from the city. Regional, intercity and private tourist coach services are subject to delays due to infrastructural deficiencies approaching and within the city centre, where the principal destinations are located at Ceannt Station, Fairgreen Coach Station, Eyre Square/Merchants Road and Galway Cathedral. These delays, along with multiple centralised destinations in the city centre and a lack of cohesion with the city bus routes and ticketing systems, discourage use of regional bus services for commuters from surrounding towns and villages which are served directly by regional buses.

National coach services benefit from high-quality road connectivity from the east and south, using the M6 and the M17/M18. Similar to the regional services, there are numerous operators providing intercity services to and from the city, with a resultant high number of arrivals and departures daily from Ceannt Station and Fairgreen Station.

These services are also subject to delays due to infrastructural deficiencies approaching and within the city centre, which discourages use of public transport between cities, and may impact on tourism in Galway City if accessibility of the city is not improved.

6.3.6.3 Existing Rail Network

Galway City is served by the existing single-track heavy commuter rail line from the east, terminating in the city centre at Ceannt Station. The rail line connects to Oranmore/Garraun and Athenry to the east. From Athenry there is a connection to the Western Rail Corridor service from Limerick and Ennis, and the main line continues east to Dublin. Galway County Council and Galway City Council recently granted planning permission to Iarnród Éireann for a one kilometre section of double track at Oranmore Station as well as a new second 185m long platform, which will allow additional train services between Galway and Athenry once complete.

There are nine daily services scheduled from Ceannt Station to Heuston, and nine scheduled return services from Heuston to Ceannt, with journey time being as short as 130 minutes.

There are eight scheduled daily services between Ceannt Station and Colbert Station in Limerick, and five scheduled return services, with journey time being as short as 102 minutes on one service and taking 2 hours or greater for the remainder of the services.

Ceannt Station is currently undergoing a redevelopment and includes the following upgrades:

- Increasing the number of platforms from two to five
- New southern entrance
- New façade, roof and renovations to the existing northern elevation
- Infrastructure works including track and re-signalling to support the increase in the number of platforms and services

6.3.6.4 Existing Pedestrian Network

The existing pedestrian network is very similar to that which was described in the 2018 EIAR. The main changes to that network, are the addition of the walking and cycling bridge, adjacent to the existing Salmon Weir Bridge and the Wolfe Tone pedestrian bridge attached to the southern side of the existing bridge, both of which were proposed as part of the Galway Transport Strategy.

The majority of the study area is provided with pedestrian facilities of varying quality. Within the city centre, there are pedestrian-only streets which are a key asset to the local economy, in particular the tourism/shopping thoroughfare of William Street, Shop Street and Quay Street. Other pedestrian facilities of note include the city canal network and the promenade at Salthill.

There have also been major junction improvement schemes in recent years which have considerably improved the pedestrian offering across the city and suburbs.

However, there remains numerous locations throughout the study area where the quality of the pedestrian facilities is poor. At certain locations in the city centre, private and public vehicular traffic impacts on the safety and comfort of pedestrians. There are streets throughout the city with substandard or missing footpaths, limited or no crossing facilities, and permeability issues resulting from the manner in which residential areas have been developed. Some suburban residential areas are accessible by direct routes, but these are substandard and not suitable for use by mobility impaired pedestrians, while others have no footpaths provided for pedestrian access to main thoroughfares. The absence of permeability within housing areas often leads to excessively circuitous trips for pedestrians to walk a relatively short distance. All of these factors discourage walking as a mode for short trips.

6.3.6.5 Existing Cycle Network

The existing segregated cycle network is very similar to that which was described in the 2018 EIAR. The main change to that network, is the addition of the walking and cycling bridge, adjacent to the existing Salmon Weir Bridge which was proposed as part of the Galway Transport Strategy.

Although the city's generally flat topography is conducive to cycling as a suitable mode of travel, the current mode share of 5% is relatively low. Similar to the bus network, the existing network of cycle infrastructure is limited and discontinuous. Plate 6.14 shows the extent of the current cycle network.

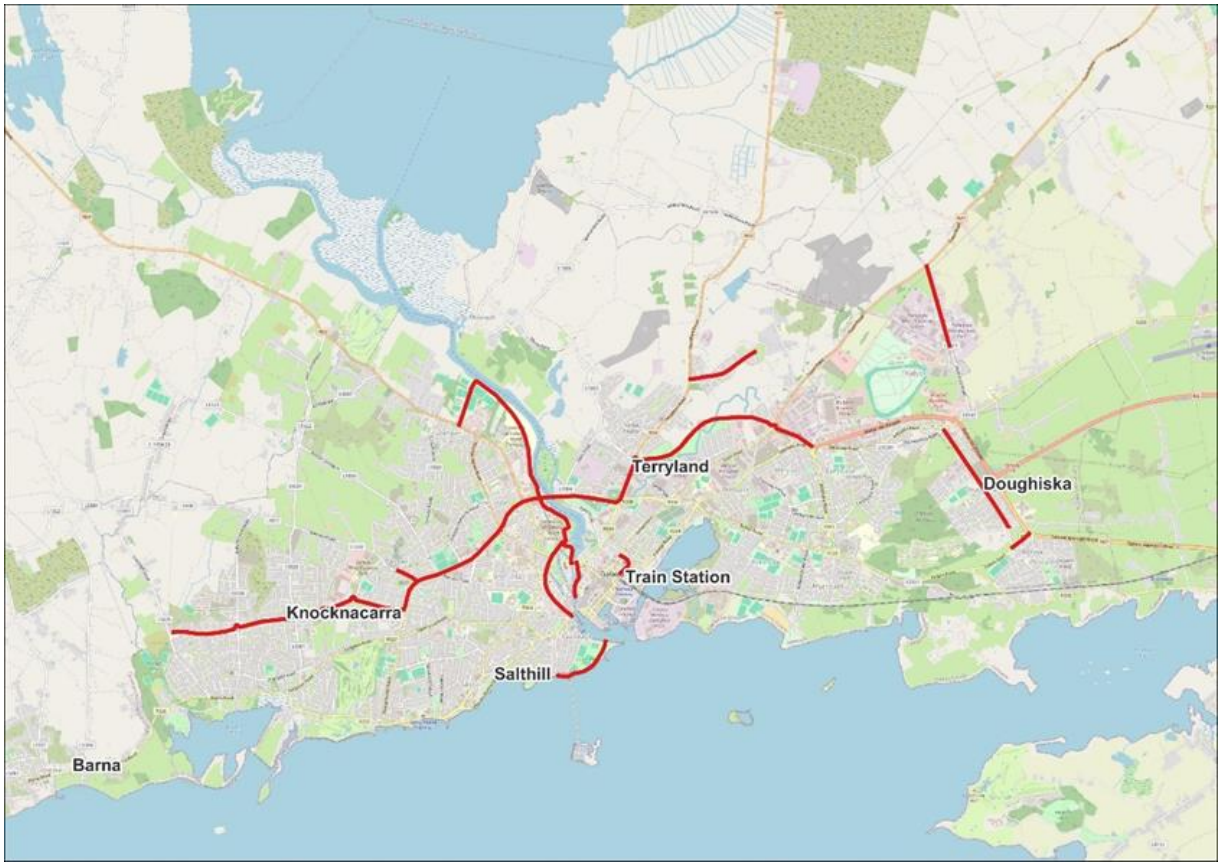


Plate 6.14 Extent of Existing Cycle Network Infrastructure

The volume of vehicular traffic on the narrow city centre streets of Galway City also contributes to an environment that is neither appealing nor perceived as particularly safe for cycling. While there have been numerous improvements in recent years to the cycle network, not least the roll-out of the Bike Share Scheme, and several schemes in development aimed at enhancing the network, the cycling environment remains limited. The cycling environment is particularly limited in areas outside the city, where many towns and villages are within cycling distance of the city and each other, such as Bearna, Oranmore, Moycullen and Claregalway.

6.4 Future Environment / Project

6.4.1 Introduction

This section of the chapter details the future environment and details of the Project. Section 6.4.2 looks at the characteristics of the Project, with a focus on the proposed N6 GCRR. This includes the selection of the road type, cross-section and junction strategy. These elements remain the same as per the 2018 EIAR.

Section 6.4.5 looks at the remaining elements of the future network and the schemes/infrastructure which are likely to be in place by the updated opening and design years. These have been updated since the 2018 EIAR following consultation with relevant stakeholders.

6.4.2 Characteristics of the Project

Phase 2 of the Project, as described in detail in Chapter 5, Description of the Project, comprises the construction of the proposed N6 GCRR which is a single carriageway from the western side of Bearna as far as the Ballymoneen Road and a dual carriageway from Ballymoneen Road to the eastern tie in with the existing N6 at Coolagh, Briarhill, and associated link roads, side roads, junctions and structures, which matches the 2018 EIAR. Phase 2 of the Project also incorporates some facilities for non-motorised users which have been identified as part of the Galway Transport Strategy as per the 2018 EIAR and are expected to be retained in the GMATS update.

Phase 1, 3 and 4 of the Project provide replacement temporary and permanent stables for Galway Racecourse. The traffic generated in the operational phase by these phases is minimal, however, it is included in the overall traffic data for the Traffic Impact Assessment of the Project in Section 6.6.

6.4.2.1 Proposed Road Type and Cross-Section

From the R336 Coast Road to Ballymoneen the mainline carriageway of the proposed N6 GCRR is a Type 1 Single Carriageway in accordance with TII DMRB DN-GEO-03036 (Cross Sections and Headroom). The design speed of the mainline over this area is 80km/h, and the cross-section is as outlined within Chapter 5, Description of the Project.

From Ballymoneen Road to the eastern tie in with the existing N6 at Coolagh, Briarhill, the mainline of the proposed N6 GCRR is a Standard Dual Carriageway Urban Motorway (D2UM) in accordance with TII DMRB DN-GEO-03036. The design speed of the mainline over this area is 100km/h and cross-section is as outlined within Chapter 5, Description of the Project.

The section of the proposed N6 GCRR between the N83 Tuam Road and N84 Headford Road Junctions is a 3-lane dual carriageway. The total length of this section is approximately 1,850m.

The proposed road type and cross-section remains as per the 2018 EIAR.

6.4.3 Selection of Road Type

The appropriate cross-section/road type of the proposed N6 GCRR was determined based on a number of influencing factors which are discussed below.

6.4.3.1 TEN-T Network

As discussed in Chapter 2, Planning and Policy Context and Chapter 3, Need for the Project, the proposed N6 GCRR forms part of the Trans European Transport Network (TEN-T) Comprehensive Network which has implications on the choice of cross-section as set out below.

The TEN-T requires that all roads that form part of the network, as a minimum, be a high-quality road. Regulation (EU) No 2024/1679 sets out the requirements for high quality roads that shall form part of the network, both Core and Comprehensive, and states under Article 30(1), the following:

"Member states shall ensure that the roads are designed built or upgraded and maintained with high quality and safety standards."

A review of the most recent updated TEN-T regulations was undertaken. The design as proposed in the 2018 EIAR is compliant with the most current TEN-T regulations.

6.4.4 Incremental Assessment

An incremental assessment was undertaken to determine the carriageway cross-section, design speed and the extent of the proposed N6 GCRR. The objective of this assessment was to examine the alternative cross-sections available, alternative design speeds and alternative scheme extents in order to determine the most suitable combination.

The incremental assessment identified the following as the most suitable combination for the proposed N6 GCRR remains as proposed in the 2018 EIAR:

- Single carriageway with a design speed of 80km/h from the R336 to Ballymoneen Road
- Type 1 Divided Road with a design speed of 100km/h from Ballymoneen Road to the N59 Junction
- Urban motorway with a design speed of 100km/h from N59 Junction to the existing N6. It has been determined that the section of the proposed N6 GCRR between the N84 Headford Road and N83 Tuam Road is to be 3 lanes in each direction, the remaining sections are 2 lanes in each direction

This combination was selected as the most suitable for the following reasons:

- It provides a high level of provision for the transportation infrastructure in Galway City and environs

- The combination complies with the TEN-T regulations noted as it allows access to be restricted to junctions only
- The combination can accommodate the forecast traffic volumes for the Design Year

6.4.4.1 Junction Strategy

The objectives considered in determining the junction strategy include the following:

- Restriction of access to junctions as the proposed N6 GCRR is of strategic importance and part of the TEN-T Comprehensive Network
- Connectivity to National and Regional road network
- Serve existing travel demand by all modes
- Junctions located so as to relieve traffic congestion
- Sufficient junctions to provide a minimum level of accessibility to the region to support further economic, social and territorial development
- Junction form to deliver capacity as experience has shown that the network breaks down due to junction failure due to capacity problems
- Promote a mobility that is efficient and safe

The junction strategy of the proposed N6 GCRR has been designed to meet these objectives. The strategy meets the objectives for the following reasons:

- Provides a high-quality road with limited access in accordance with TEN-T designation
- Provides connectivity to the national roads via junctions to maximise the transfer of cross-city movements to the new road infrastructure, thus releasing and freeing the existing city centre zone from congestion caused by traffic trying to access a city centre bridge to cross the River Corrib
- Improves connectivity to the Western Region i.e. the county areas and hinterland beyond the city zone
- Caters for the strong demand between zones on either side of the city
- Facilitates crossing the River Corrib without negotiating the city centre
- Provides this additional river crossing with connectivity back to the city either side of the River Corrib Bridge and provides essential city street links to better distribute traffic
- Attracts traffic from the city centre zone thus facilitating reallocation of road space to public transport leading to improve journey time reliability for public transport, supporting a mobility that is efficient and safer environment for active modes
- Facilitates improved city centre environment for all due to reduced congestion, thus encouraging walking and cycling as safe transport modes.

6.4.5 Future Transportation Network

6.4.5.1 Future Schemes

The future year Do-Minimum network includes the 2023 base network plus all of the schemes that are already built, are committed, or are likely to be built by 2031 and 2046 (Opening and Design Years). As mentioned in Section 6.2.4 above, the list of schemes for inclusion are mostly derived from the existing Galway Transport Strategy (GTS) which is the most recent approved strategy, which was published in 2016 and reviewed in 2024 with Galway City and County Council and TII. This list of schemes is included in Appendix B to the Traffic Modelling Report which is in Appendix A.6.1 of this updated EIAR. The key schemes are also outlined below:

- Galway Cross-City Link BusConnects Scheme to upgrade bus priority and cycle provision through the city centre from University Road to Dublin Road
- Galway Dublin Road BusConnects Scheme to upgrade bus priority and pedestrian and cycle provision through the Dublin Road corridor
- BusConnects Network for Galway City Centre
- Additional other sections of bus lanes with provision for cyclists
- 30km/h limit in city centre and other changes to speed limits on national roads

The 2016 Galway Transport Strategy (GTS) was developed by Galway City and County Councils, in partnership with the NTA. It aims to address the current and future transport requirements of the city and its connectivity to surrounding towns and villages, including Bearna, Oranmore, Moycullen and Claregalway. It sets out a series of actions and measures, covering infrastructural, operational and policy elements to be implemented in Galway over a 20-year period. It is the adopted transport strategy for Galway and its recommendations are incorporated into the Galway City Development Plan 2023-2029. Therefore the assessment in this updated EIAR has been undertaken with regard to the infrastructure contained in the 2016 GTS.

It identified that Galway has a transport problem due to its reliance on the private car, which has been influenced by the existing public transport network, limited cycling facilities, a large rural hinterland and being the key gateway in and out of Connemara. Combined with an over-reliance on the private car, Galway has a road and street network which is ill-suited to the high traffic flows currently prevalent and contributing to increased congestion and delay, affecting quality of life and impacting on the functionality of the city. To address these deficiencies, a fundamental shift is needed towards sustainable travel, reducing the dependency on the private car and taking action to make Galway more accessible and connected, enhancing quality of life within the city for all. Galway City Council are seeking to make Galway an exemplar of Smarter Travel in Ireland. The proposed N6 GCRR forms a critical element of the GTS as the main road component of the overall transport solution for Galway City and its environs.

The GTS outlines a host of proposed measures for active travel, public transport and general traffic in Galway. Some of the key proposals included in the Strategy are listed below:

- BusConnects Network Redesign which increases bus services in Galway City by approx. 50%
- BusConnects Cross City Link which includes a Public Transport Corridor through the City Centre along the Salmon Weir Bridge, Eglington Street and College Road and involves restricting access to general traffic on the Salmon Weir Bridge between 7 a.m. and 7 p.m. (which was approved by An Bord Pleanála in October 2024, Case reference: HA61.314597[7])
- BusConnects Galway Dublin Road

These schemes contained within the GTS form the core scenario assessed for this updated EIAR.

As outlined in the 'Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)[8], the EIAR must include a *'description of the likely evolution of the environmental factor in the absence of the project'*. This predicted changing baseline is referred to as the *'likely future receiving environment'*.

As per the Environmental Protection Agency (EPA) guidelines, the likely receiving environment should *"cumulatively consider the effects of projects which already have consent but are not yet implemented. It may also be appropriate to consider other projects that are planned but not yet permitted".* This alternative *"should describe consequences that are reasonably likely to occur. It ought not be used to exaggerate or catastrophise environmental consequences that may occur without the proposed project".*

[7] https://www.pleanala.ie/en-ie/case/314597

[8] https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf

In line with the above EPA Guidance, the core scenario as described in this chapter includes for known planned or permitted infrastructure or measures that have a scheme definition and are proposed to be implemented by the opening and design year of the proposed N6 GCRR. Whilst CAP24 sets ambitious targets for transport emissions reductions, it does not yet have a specific scheme definition for the various demand management measures that will be required, so it was not possible to include specific CAP24 measures as part of the core Do-Minimum for Environmental Impact Assessment (EIA) purposes. However, as referenced in Section 6.1, an assessment of impacts and alignment of the project with the Climate Action Plan 2024 (CAP24) is detailed in Section 6.11.

A full list of the proposals contained within the core EIA scenario are contained within the Traffic Modelling Report in Appendix A.6.1.

6.5 Assessment of Project using the Traffic Model

6.5.1 Travel Demand Forecasts

Section 6.2.4 discusses the travel demand forecasts which were used, for the traffic impact assessment.

6.5.2 Assessment Years

In addition to the Base Year (2023), two assessment years were modelled, these were 2031 and 2046 as set out in Section 6.2.4.2 above.

For each of the modelled years, the road network and travel demand included in the traffic model reflects the projected infrastructure and population growth scheduled to be in place at that particular time.

The Do-Minimum scenarios are used to represent the base situation against which other scenarios are compared. This comparison demonstrates the impact of the project, when compared to the 'Do-Something' scenarios with the project in place.

6.5.3 Scenarios Tested: Modelled Scenarios

As previously described, the future year 'Do-Minimum' network includes the 2023 base network plus all the schemes that are already built, or are committed, or likely to be built by 2031 and 2046.

The future year 'Do-Something' networks include the Do-Minimum schemes plus the project. The following are a list of scenarios which have been modelled:

- 2031 Opening Year Do-Minimum
- 2031 Opening Year Do-Something
- 2046 Design Year Do-Minimum
- 2046 Design Year Do-Something

In the 2018 EIAR, a sensitivity test was also modelled based upon the 2016 Galway Transport Strategy (GTS), in circumstances where the GTS was published after the 2018 EIAR core scenarios were completed. Different circumstances now pertain including, in particular, the fact that many elements of the GTS infrastructure are now built, committed, or likely to be built, and are included in the Do-Minimum scenarios.

As mentioned in Section 6.1, a Climate Action Plan scenario has been modelled as a sensitivity test, in order to respond to An Bord Pleanála's Request for Further Information (RFI) to Galway County Council on 6 December 2023 (Ref: ABP-318220-23). This sensitivity test is assessed using different KPIs to those which were presented in Section 6.2.5, due to the CAP24 document having specific KPIs and targets for the transport sector and thus, these need to be assessed in order to make a submission in relation to the CAP24. The details of these KPIs and results of this sensitivity test are presented in Section 6.11 of this chapter.

6.6 Traffic Impact Assessment

6.6.1 Operational Impact Assessment

The results of the strategic and local traffic impacts for each scenario are described under each KPI below. In summary, the scenarios compared are:

- 2031 Opening Year Do-Minimum
- 2031 Opening Year Do-Something
- 2046 Design Year Do-Minimum
- 2046 Design Year Do-Something

6.6.1.1 Journey Time Analysis

The tables below detail the results of the journey time comparison as extracted from the 2031 and 2046 traffic models. Plate 6.3 illustrates each of the journey time routes which have been analysed.

Table 6.8 2031 AM Peak Journey Time Results (mins.)

Route #	Description	DM	DS	Diff (s)	% Diff	Impact
1	Route 1 - Inbound	21.2	14.2	-7.0	-33%	Positive
2	Route 1 - Outbound	11.1	10.9	-0.2	-2%	Positive
3	Route 2 - Inbound	24.9	20.3	-4.6	-18%	Positive
4	Route 2 - Outbound	37.1	30.5	-6.6	-18%	Positive
5	Route 3 - Inbound	7.8	5.0	-2.8	-36%	Positive
6	Route 3 - Outbound	5.1	5.0	-0.1	-2%	Positive
7	Route 4a - Inbound	30.4	15.7	-14.7	-48%	Positive
8	Route 4a - Outbound	27.1	16.0	-11.1	-41%	Positive
9	Route 4b - Inbound	19.9	12.6	-7.3	-37%	Positive
10	Route 4b - Outbound	14.0	10.5	-3.5	-25%	Positive
11	Route 5 - Inbound	48.3	39.2	-9.2	-19%	Positive
12	Route 5 - Outbound	19.3	18.5	-0.8	-4%	Positive
13	Route 6 - Inbound	33.7	26.6	-7.1	-21%	Positive
14	Route 6 - Outbound	28.3	25.6	-2.7	-9%	Positive
15	Route 7 - Inbound	12.6	14.9	-2.4	19%	Moderate
16	Route 7 - Outbound	13.5	11.0	-2.5	-18%	Positive
17	Route 8 - Inbound	17.6	16.4	-1.1	-6%	Positive
18	Route 8 - Outbound	12.4	12.0	-0.3	-3%	Positive
19	Route 9 - Inbound	9.5	9.5	-	-0%	Negligible
20	Route 9 - Outbound	9.5	9.5	-	-0%	Negligible
21	Route 10 - Inbound	12.0	11.3	-0.8	-6%	Positive

Route #	Description	DM	DS	Diff (s)	% Diff	Impact
22	Route 10 - Outbound	17.5	11.0	-6.5	-37%	Positive
23	Route 11 - Inbound	22.6	18.3	-4.3	-19%	Positive
24	Route 11 - Outbound	21.9	17.0	-4.9	-22%	Positive

Table 6.9 2031 PM Journey Time Results (mins.)

Route #	Description	DM	DS	Diff (s)	% Diff	Impact
1	Route 1 - Inbound	12.0	10.9	-1.1	-9%	Positive
2	Route 1 - Outbound	16.8	12.9	-4.0	-24%	Positive
3	Route 2 - Inbound	20.4	21.9	1.5	7%	Minor
4	Route 2 - Outbound	22.7	21.6	-1.1	-5%	Positive
5	Route 3 - Inbound	5.0	4.8	-0.2	-3%	Positive
6	Route 3 - Outbound	5.5	5.2	-0.3	-6%	Positive
7	Route 4a - Inbound	26.3	13.9	-12.3	-47%	Positive
8	Route 4a - Outbound	30.4	15.6	-14.8	-49%	Positive
9	Route 4b - Inbound	10.9	10.1	-0.8	-7%	Positive
10	Route 4b - Outbound	20.2	15.1	-5.1	-25%	Positive
11	Route 5 - Inbound	29.6	23.1	-6.5	-22%	Positive
12	Route 5 - Outbound	19.8	16.7	-3.1	-16%	Positive
13	Route 6 - Inbound	25.8	23.7	-2.1	-8%	Positive
14	Route 6 - Outbound	26.3	27.5	1.2	5%	Negligible
15	Route 7 - Inbound	15.5	9.2	-6.3	-40%	Positive
16	Route 7 - Outbound	22.1	18.8	-3.3	-15%	Positive
17	Route 8 - Inbound	19.9	12.8	-7.1	-36%	Positive
18	Route 8 - Outbound	20.8	19.2	-1.6	-8%	Positive
19	Route 9 - Inbound	9.5	9.5	0.0	0%	Negligible
20	Route 9 - Outbound	9.5	9.5	0.0	0%	Negligible
21	Route 10 - Inbound	15.5	10.4	-5.1	-33%	Positive
22	Route 10 - Outbound	10.2	11.5	1.3	12%	Minor
23	Route 11 - Inbound	14.2	12.8	-1.4	-10%	Positive
24	Route 11 - Outbound	20.0	16.8	-3.1	-16%	Positive

The 2031 AM peak results above show that, in general, the opening of the Project has a significant positive impact on the majority of journey time routes analysed. Only Route 7 in the inbound direction shows an

increase with a moderate impact. It is noted that Route 7 covers the N83 Tuam Road corridor and the increase is due to the introduction of new signalised junctions on the N83, as a result of the Project's design. Meanwhile, the Route 9 journey times show no change compared to the Do-Minimum.

In this regard it should be noted that the impact of the Project is hugely beneficial for reducing traffic congestion in Galway City in the AM Peak and for reducing journey times.

The 2031 PM peak results show a similar trend to the AM peak, in that the opening of the Project has a significant positive impact on the majority of journey time routes analysed.

A number of routes (Routes 6 and 9) show negligible impacts, with increases in journey times of less than 5% across the entire route.

Route 2 inbound and Route 10 outbound experience a minor impact, in circumstances where the journey time has increased by 60 seconds across the entire route. The increase on Route 2 is caused by the addition of signalised junctions, which require traffic to slow down where previously it was not necessary. The increase on Route 10 is caused by more traffic passing through the network in the Do-Something LAM due to improvements in congestion. Along this route, there is a higher level of traffic heading outbound at the R339/Parkmore Road junction in the Do-Something, as traffic in the Do-Minimum scenario is queued upstream and cannot progress along it's intended route. Therefore, while there is an increase in journey time, it is the result of the project relieving a bottleneck within the city, which means traffic can progress more smoothly across the city.

In this regard it should be noted that the impact of the Project is hugely beneficial for reducing traffic congestion in Galway City in the PM Peak and for reducing journey times

Table 6.10 2046 AM Peak Journey Time Results (mins.)

Route #	Description	DM	DS	Diff (s)	% Diff	Impact
1	Route 1 - Inbound	27.3	18.1	-9.2	-34%	Positive
2	Route 1 - Outbound	11.3	11.0	-0.2	-2%	Positive
3	Route 2 - Inbound	29.7	24.3	-5.4	-18%	Positive
4	Route 2 - Outbound	44.5	33.5	-11.0	-25%	Positive
5	Route 3 - Inbound	16.3	7.3	-9.0	-55%	Positive
6	Route 3 - Outbound	5.5	5.1	-0.4	-6%	Positive
7	Route 4a - Inbound	36.9	16.7	-20.2	-55%	Positive
8	Route 4a - Outbound	25.9	18.8	-7.1	-27%	Positive
9	Route 4b - Inbound	25.7	15.3	-10.4	-41%	Positive
10	Route 4b - Outbound	17.2	11.8	-5.4	-31%	Positive
11	Route 5 - Inbound	58.0	50.1	-7.9	-14%	Positive
12	Route 5 - Outbound	20.1	21.4	1.3	-7%	Minor
13	Route 6 - Inbound	41.2	30.2	-10.9	-27%	Positive
14	Route 6 - Outbound	29.9	27.6	-2.3	-8%	Positive
15	Route 7 - Inbound	13.9	16.5	2.6	19%	Moderate
16	Route 7 - Outbound	20.1	13.4	-6.7	-33%	Positive
17	Route 8 - Inbound	21.7	18.5	-3.2	-15%	Positive

Route #	Description	DM	DS	Diff (s)	% Diff	Impact
18	Route 8 - Outbound	15.1	12.8	-2.3	-15%	Positive
19	Route 9 - Inbound	10.5	9.5	-1.0	-9%	Positive
20	Route 9 - Outbound	9.5	9.5	0.0	0%	Positive
21	Route 10 - Inbound	12.6	15.2	2.7	21%	Major
22	Route 10 - Outbound	15.4	11.5	-4.0	-26%	Positive
23	Route 11 - Inbound	22.6	20.2	-2.4	-11%	Positive
24	Route 11 - Outbound	26.8	20.2	-6.6	-25%	Positive

Table 6.11 2046 PM Peak Journey Time Results (mins.)

Route #	Description	DM	DS	Diff (s)	% Diff	Impact
1	Route 1 - Inbound	12.4	10.9	-1.5	-12%	Positive
2	Route 1 - Outbound	19.6	13.8	-5.8	-29%	Positive
3	Route 2 - Inbound	22.2	24.2	2.0	9%	Minor
4	Route 2 - Outbound	26.2	23.1	-3.1	-12%	Positive
5	Route 3 - Inbound	5.1	4.9	-0.2	-5%	Positive
6	Route 3 - Outbound	5.9	5.3	-0.6	-9%	Positive
7	Route 4a - Inbound	30.3	16.4	-13.9	-46%	Positive
8	Route 4a - Outbound	35.3	17.6	-17.7	-50%	Positive
9	Route 4b - Inbound	12.7	10.4	-2.3	-18%	Positive
10	Route 4b - Outbound	22.9	17.4	-5.5	-24%	Positive
11	Route 5 - Inbound	32.2	24.9	-7.3	-23%	Positive
12	Route 5 - Outbound	20.4	17.0	-3.4	-17%	Positive
13	Route 6 - Inbound	28.1	23.9	-4.2	-15%	Positive
14	Route 6 - Outbound	28.7	29.0	0.4	1%	Negligible
15	Route 7 - Inbound	16.2	10.3	-5.9	-36%	Positive
16	Route 7 - Outbound	26.1	22.7	-3.4	-13%	Positive
17	Route 8 - Inbound	21.9	13.0	-8.8	-40%	Positive
18	Route 8 - Outbound	22.2	20.0	-2.3	-10%	Positive
19	Route 9 - Inbound	9.5	9.5	0.0	0%	Negligible
20	Route 9 - Outbound	9.5	9.5	0.0	0%	Negligible
21	Route 10 - Inbound	15.0	11.0	-4.0	-27%	Positive

Route #	Description	DM	DS	Diff (s)	% Diff	Impact
22	Route 10 - Outbound	13.1	13.3	0.2	2%	Negligible
23	Route 11 - Inbound	17.7	13.2	-4.5	-25%	Positive
24	Route 11 - Outbound	23.4	21.1	-2.3	-10%	Positive

The 2046 AM peak results above show that, in general, the opening of the Project has a significant positive impact on the majority of journey time routes analysed.

The increase on Route 10 is caused by more traffic passing through the network in the Do-Something (DS) LAM. Along this route there is a higher level of traffic heading inbound at the R339/Parkmore Road junction in the DS, as traffic in the Do-Minimum scenario is queued upstream and cannot progress along it's intended route. Therefore, while there is an increase in journey time, it is the result of the project relieving a bottleneck within the city, which means traffic can progress more smoothly across the city. Route 5 outbound experiences a minor impact, where the journey time has increased by 79 seconds across the entire route. The increase on Route 5 is caused by the addition of signalised junctions on the N83, which require traffic to slow down where previously it was not necessary.

In this regard it should be noted that, once again, the impact of the Project is hugely beneficial for reducing traffic congestion in Galway City in the AM Peak and for reducing journey times.

The 2046 PM peak results show a similar trend to the AM peak, in that the opening of the Project has a significant positive impact on the majority of journey time routes analysed.

A number of routes (Routes 6, 9, 10) show negligible impacts, with increases in journey times of less than 5% across the entire route. Route 2 inbound experiences a minor impact, where the journey time has increased by 120 seconds across the entire route. Again, the increase on Route 2 is caused by the addition of signalised junctions, which require traffic to slow down where previously it was not necessary.

In this regard, as with other results identified above, the impact of the project is hugely beneficial for reducing traffic congestion in Galway City in the PM Peak and for reducing journey times.

6.6.1.2 Network Statistics (2031 and 2046)

The tables below present Network Statistics for the peak hours.

Table 6.12 Network Performance Indicators - Monitoring Peak Hour

Scenario	Total Vehicle Distance (pcu. Kms)	Total Network Travel Time (pcu. Hrs)	Total Network Delay (pcu. Hrs)	Average Vehicle Speed (kph)	Impact
2031 Do-Minimum	234,792	11,062	5,567	19.0	-
2031 Do-Something	252,674	9,271	3,560	27.0	Positive
2046 Do-Minimum	264,575	13,831	7,870	16.0	-
2046 Do-Something	280,109	12,110	5,672	23.0	Positive

Table 6.13 Network Performance Indicators - Evening Peak Hour

Scenario	Total Vehicle Distance (pcu. Kms)	Total Network Travel Time (pcu. Hrs)	Total Network Delay (pcu. Hrs)	Average Vehicle Speed (kph)	Impact
2031 Do-Minimum	229,153	9,442	4,240	21.9	-
2031 Do-Something	240,733	7,825	2,450	30.8	Positive
2046 Do-Minimum	255,354	11,343	5,672	19.6	-
2046 Do-Something	268,746	9,695	3,599	27.7	Positive

The tables above demonstrate that the Do-Something scenario reduces the network delay considerably relative to the Do-Minimum and provides a higher average speed in all time periods in both the Opening and Design Year. The consequent reduction in delay (between 30% - 45% reduction in peak hours), removes several bottlenecks which were present in the Do-Minimum scenarios, and which prevented traffic from finishing their journeys within the hours which were modelled. The reduction in delay time, in turn, results in approx. 15% less time spent driving as illustrated by the reduction in total travel time saved by the implementation of the Project.

The scheme does, however, result in an increase in vehicle kilometres, between 5% - 7% compared with the Do-Minimum scenarios, due to a combination of factors, the first being that there is a certain level of induced traffic. Section 6.8 of this chapter specifically looks at induced traffic and the impact of the Project.

The Project results in an increase of approx. 2%, in both peak hour car mode shares. Peak hour design year mode shares for the Do-Minimum and Do-Something scenarios, are presented in Section 6.8 of this chapter, which looks at induced traffic and the impact of the Project. This chapter also presents the results of a Climate Action Plan scenario which has been prepared in response to An Bord Pleanála's Request for Further Information (RFI) to Galway County Council. The results of this assessment, which are outlined in Section 6.11, show that when the Project is combined with demand management measures which will contribute to achieving the Climate Action Plan targets, there will be a reduction in vehicle kilometres travelled.

Overall, this analysis indicates that the Project will have a significantly positive impact in both Opening and Design Years.

6.6.1.3 Ratio of Flow to Capacity Results (2031 and 2046)

The tables below summarise the junction evaluations in 2031 and 2046 for both the AM and PM peak hours.

Table 6.14 Number of Junction Approaches at or over Capacity - AM Peak

		2031			2046		
		DM	DS	Impact	DM	DS	Impact
Key Junctions (N6 / R338)	RFC > 90%	22	17	Positive	28	23	Positive
Entire Network	RFC > 90%	147	107	Positive	207	166	Positive

Table 6.15 Number of Junction Approaches at or over Capacity - PM Peak

		2031			2046		
		DM	DS	Impact	DM	DS	Impact
Key Junctions (N6 / R338)	RFC > 90%	22	16	Positive	24	20	Positive
Entire Network	RFC > 90%	104	76	Positive	143	121	Positive

The data in the above tables demonstrate that, with the implementation of the Project, there is a large decrease in the number of links in the network which have an RFC of over 90%. In 2031, for example, there is a decrease of approx. 25% across both peak hours in the number of number of links in the network which have an RFC over 90%. For the key junctions, there is an equivalent decrease of approx. 30% in both peak hours.

Whereas, in 2046, there is a decrease of approx. 20% across both peak hours in the number of number of links in the network which have an RFC over 90%. For the key junctions, there is an equivalent decrease of between 15% - 20% across both peak hours.

6.6.1.4 Summary of Impact Significance 2031

In 2031 the Project does not result in any traffic impacts of major significance. In terms of the assessment against the three key performance indicators [KPIs] used, the Project will have a significant positive impact.

6.6.1.5 Summary of Impact Significance 2046

In 2046 the Project results in significant positive impacts when assessed against two of the three key performance indictors used (network statistics and ratio of flow to capacity results). The other KPI, journey times also show positive impacts across the majority of the 24 routes assessed. There is only one route in the AM peak, out of the 24, which shows a major impact. The route in question, (Route 10 in the inbound direction) covers the R339 on the eastern side of Galway City, and the increase along this route is caused by the implementation of the Project relieving a bottleneck outside of the route. This release of traffic then leads to a queue upstream, along the route in question. Aside from this single exception, the three key performance indicators used, show that the Project is rated as having a positive impact.

6.6.2 Construction Impacts

Construction traffic impacts, and associated mitigation measures, of the Project are considered in detail in Chapter 7, Construction Activities. Construction of the Project will add additional traffic to the road network for the duration of the construction works, as a result of materials supply and disposal, movement of site equipment and travel demand from site workers and visitors. The likelihood of these impacts occurring is high but those impacts will be short-term in nature and subject to mitigation measures, including using the route alignment as an internal haul route in Phase 2 of the Project. Dedicated haulage routes have also been identified, which confine traffic to the routes which are capable of carrying such traffic, and are outlined in Chapter 7, Construction Activities.

However, it should be noted that existing traffic movements on the national and regional road network will not generally be restricted by the proposed construction works. The Project will ensure the minimum possible disturbance to local residents and existing traffic, with minimal use of the local road network and any instance of use of the local road network highlighted and assessed as part of this EIA.

Night time working will be generally avoided, however, it will be necessary to work night shifts during certain critical stages during the Project, such as for bridge works and road tie-in points. It is anticipated that, over the expected 60-month construction phase, there will be 10 weeks of night time working in Phase 2. Night time working is not expected for the 12-month period for the construction of Phases 1,3 and 4.

Existing cyclist and pedestrian movements will be facilitated throughout the construction period.

During construction, detailed traffic management plans including all mitigation measures and environmental measures set out in this updated EIAR and incorporating any specific additional requirements of statutory

authorities and any conditions imposed by An Bord Pleanála, will be implemented and will clearly set out any temporary traffic restrictions.

6.6.3 Cumulative Impacts

6.6.3.1 Transport Schemes

As detailed in Sections 6.4, all core modelling scenarios (Do-Minimum and Do-Something) have taken into account planned and permitted transport schemes for Galway City and its environs and those likely to be completed for the various years assessed. All the future traffic forecasts include for future developments, associated population and transport demand; therefore it is inherently a cumulative assessment. These include schemes like BusConnects Cross City Link, which has been recently approved, and BusConnects Galway Dublin Road Scheme which was submitted for planning approval on 14 February 2025. However, in circumstances where the Dublin Road scheme has yet to be approved, the following section details the results of excluding the aforementioned scheme from the Do-Minimum and Do-Something scenarios.

6.6.3.2 Journey Time Analysis (Without Dublin Road Scheme)

The tables below detail the results of the journey time comparison as extracted from the 2031 and 2046 traffic models *without* the Dublin Road Scheme included. Plate 6.3 illustrates each of the journey time routes which have been analysed.

Table 6.16 2031 AM Peak Journey Time Results without Dublin Road Bus Scheme

Route #	Description	DM	DS	Diff (s)	% Diff	Impact
1	Route 1 - Inbound	21.3	13.9	-7.4	-35%	Positive
2	Route 1 - Outbound	11.1	10.9	-0.2	-2%	Positive
3	Route 2 - Inbound	25.1	20.3	-4.8	-19%	Positive
4	Route 2 - Outbound	37.1	30.5	-6.7	-18%	Positive
5	Route 3 - Inbound	7.8	5.0	-2.8	-26%	Positive
6	Route 3 - Outbound	5.1	5.0	-0.1	-2%	Positive
7	Route 4a - Inbound	30.3	15.9	-14.4	-48%	Positive
8	Route 4a - Outbound	27.4	15.8	-11.5	-42%	Positive
9	Route 4b - Inbound	19.6	13.3	-6.3	-32%	Positive
10	Route 4b - Outbound	13.9	10.4	-3.5	-25%	Positive
11	Route 5 - Inbound	49.2	39.2	-10.0	-20%	Positive
12	Route 5 - Outbound	19.5	18.5	-1.0	-5%	Positive
13	Route 6 - Inbound	33.8	28.2	-5.6	-17%	Positive
14	Route 6 - Outbound	28.1	25.6	-2.4	-9%	Positive
15	Route 7 - Inbound	12.4	15.1	2.7	21%	Major
16	Route 7 - Outbound	13.1	10.9	-2.2	-16%	Positive
17	Route 8 - Inbound	17.3	16.5	-0.8	-5%	Positive
18	Route 8 - Outbound	12.2	12.0	-0.2	-2%	Positive
19	Route 9 - Inbound	9.5	9.5	0.0	0%	Negligible

Route #	Description	DM	DS	Diff (s)	% Diff	Impact
20	Route 9 - Outbound	9.5	9.5	0.0	0%	Negligible
21	Route 10 - Inbound	12.2	11.4	-0.9	-7%	Positive
22	Route 10 - Outbound	17.0	11.2	-5.8	-34%	Positive
23	Route 11 - Inbound	24.8	21.6	-3.3	-13%	Positive
24	Route 11 - Outbound	21.4	16.5	-5.0	-23%	Positive

Table 6.17 2031 PM Peak Journey Time Results without Dublin Road Bus Scheme

Route #	Description	DM	DS	Diff (s)	% Diff	Impact
1	Route 1 - Inbound	12.0	10.8	-1.1	-9%	Positive
2	Route 1 - Outbound	16.7	12.9	-3.8	-23%	Positive
3	Route 2 - Inbound	20.4	22.2	1.8	9%	Minor
4	Route 2 - Outbound	22.7	21.6	-1.1	-5%	Positive
5	Route 3 - Inbound	5.0	4.8	-0.2	-3%	Positive
6	Route 3 - Outbound	5.5	5.2	-0.3	-6%	Positive
7	Route 4a - Inbound	26.2	14.6	-11.6	-44%	Positive
8	Route 4a - Outbound	30.1	15.5	-14.6	-48%	Positive
9	Route 4b - Inbound	10.8	10.0	-0.8	-8%	Positive
10	Route 4b - Outbound	18.7	15.1	-3.6	-19%	Positive
11	Route 5 - Inbound	29.9	22.1	-7.8	-26%	Positive
12	Route 5 - Outbound	20.3	16.7	-3.5	-17%	Positive
13	Route 6 - Inbound	25.8	23.6	-2.2	-9%	Positive
14	Route 6 - Outbound	26.3	27.6	1.2	5%	Negligible
15	Route 7 - Inbound	15.8	9.2	-6.6	-42%	Positive
16	Route 7 - Outbound	21.2	19.5	-1.7	-8%	Positive
17	Route 8 - Inbound	19.9	12.8	-7.1	-36%	Positive
18	Route 8 - Outbound	20.5	19.2	-1.3	-6%	Positive
19	Route 9 - Inbound	9.5	9.5	0.0	0%	Negligible
20	Route 9 - Outbound	9.5	9.5	0.0	0%	Negligible
21	Route 10 - Inbound	15.5	10.0	-5.5	-35%	Positive
22	Route 10 - Outbound	10.2	11.1	1.0	9%	Negligible
23	Route 11 - Inbound	14.1	12.4	-1.7	-12%	Positive
24	Route 11 - Outbound	18.5	15.5	-3.0	-16%	Positive

The 2031 AM peak results above show that, in general, the opening of the Project without the BusConnects Dublin Road scheme still has a significant positive impact on the majority of journey time routes analysed. Only Route 7 in the inbound direction shows an increase with a major impact and Route 7 is the only route in respect of which there is a change in impact rating compared to the core scenario. The particular change in this instance is due to a slight increase in the journey time, from 19% increase in the core scenario to a 21% increase in this scenario and, thus crosses the 20% threshold, resulting in a "major" rating rather than a "moderate" rating in the core scenario. Route 7 covers the N83 Tuam Road corridor and the increase is due to the introduction of new signalised junctions on the N83, as a result of the Project's design. Meanwhile the Route 9 journey times show no change compared to the Do-Minimum.

In this regard, it should be noted that the impact of the Project, even without the BusConnects Dublin Road scheme is still hugely beneficial for reducing traffic congestion in Galway City in the AM Peak and for reducing journey times.

The 2031 PM peak results show a similar trend to the AM peak, in that the opening of the Project without the BusConnects Dublin Road scheme still has a significant positive impact on the majority of journey time routes analysed.

A number of routes (Route 6, 9 and 10) show negligible impacts, with increases in journey times of less than 5% across the entire route.

Route 2 inbound experiences a minor impact, where the journey time has increased by 60 seconds across the entire route. The increase on Route 2 is caused by the addition of signalised junctions, which require traffic to slow down where previously it was not necessary.

Route 10 in the outbound direction has improved its impact rating from a minor rating in the core scenario, to a negligible rating, due to a lower increase, down from 12% in the core scenario to 9% and, thus, crossing the 10% threshold. The increase, albeit categorised as negligible, is due to more traffic passing through the network in the Do-Something LAM due to improvements in congestion. Along this route, there is a higher level of traffic heading outbound at the R339/Parkmore Road junction in the Do-Something, as traffic in the Do-Minimum scenario is queued upstream and cannot progress along it's intended route. Therefore, while there is an increase in journey time, it is the result of the project relieving a bottleneck within the city, which means traffic can progress more smoothly across the city.

In this regard it should be noted that the impact of the Project, even without the BusConnects Dublin Road scheme is still hugely beneficial for reducing traffic congestion in Galway City in the PM Peak and for reducing journey times.

Overall, the journey times in 2031, have effectively remained the same without the BusConnects Dublin Road scheme compared to the core scenario with only one route in each peak hour, seeing it's impact rating change.

Table 6.18 2046 AM Peak Journey Time Results without Dublin Road Bus Scheme

Route #	Description	DM	DS	Diff (s)	% Diff	Impact
1	Route 1 - Inbound	27.3	18.5	-8.9	-32%	Positive
2	Route 1 - Outbound	11.3	11.0	-0.2	-2%	Positive
3	Route 2 - Inbound	29.7	24.5	-5.2	-17%	Positive
4	Route 2 - Outbound	45.1	33.7	-11.3	-25%	Positive
5	Route 3 - Inbound	16.3	7.6	-8.7	53%	Positive
6	Route 3 - Outbound	5.5	5.1	-0.4	-7%	Positive
7	Route 4a - Inbound	36.9	16.6	-20.3	-55%	Positive
8	Route 4a - Outbound	25.8	18.4	-7.4	-29%	Positive
9	Route 4b - Inbound	26.1	16.9	-9.2	-35%	Positive

Route #	Description	DM	DS	Diff (s)	% Diff	Impact
10	Route 4b - Outbound	17.8	11.5	-6.2	-35%	Positive
11	Route 5 - Inbound	60.1	48.9	-11.2	-19%	Positive
12	Route 5 - Outbound	20.3	20.2	-0.1	0%	Positive
13	Route 6 - Inbound	40.9	30.3	-10.6	-26%	Positive
14	Route 6 - Outbound	29.9	25.7	-4.2	-14%	Positive
15	Route 7 - Inbound	14.6	16.9	2.4	16%	Moderate
16	Route 7 - Outbound	21.3	13.5	-7.8	-37%	Positive
17	Route 8 - Inbound	21.5	19.0	-2.5	-12%	Positive
18	Route 8 - Outbound	15.1	12.7	-2.4	-16%	Positive
19	Route 9 - Inbound	10.3	9.5	-0.7	-7%	Positive
20	Route 9 - Outbound	9.5	9.5	0.0	0%	Positive
21	Route 10 - Inbound	13.3	15.3	2.0	15%	Moderate
22	Route 10 - Outbound	15.7	11.5	-4.1	-26%	Positive
23	Route 11 - Inbound	25.3	25.8	0.5	2%%	Negligible
24	Route 11 - Outbound	27.0	19.6	-7.4	-27%	Positive

Table 6.19 2046 PM Peak Journey Time Results without Dublin Road Bus Scheme

Route #	Description	DM	DS	Diff (s)	% Diff	Impact
1	Route 1 - Inbound	12.4	10.9	-1.5	-12%	Positive
2	Route 1 - Outbound	19.6	13.9	-5.8	-29%	Positive
3	Route 2 - Inbound	22.2	24.2	2.0	9%	Minor
4	Route 2 - Outbound	26.1	23.4	-2.8	-11%	Positive
5	Route 3 - Inbound	5.1	4.9	-0.2	-4%	Positive
6	Route 3 - Outbound	5.8	5.3	-0.5	-9%	Positive
7	Route 4a - Inbound	30.2	17.1	-13.2	-43%	Positive
8	Route 4a - Outbound	35.0	17.0	-18.0	-51%	Positive
9	Route 4b - Inbound	12.6	10.3	-2.3	-18%	Positive
10	Route 4b - Outbound	21.5	17.4	-4.1	-19%	Positive
11	Route 5 - Inbound	32.3	23.0	-9.3	-29%	Positive
12	Route 5 - Outbound	20.9	17.2	-3.6	-17%	Positive
13	Route 6 - Inbound	28.1	24.0	-4.1	-14%	Positive

Route #	Description	DM	DS	Diff (s)	% Diff	Impact
14	Route 6 - Outbound	28.7	29.1	0.4	2%	Negligible
15	Route 7 - Inbound	16.7	10.4	-6.3	-38%	Positive
16	Route 7 - Outbound	25.1	23.2	-1.9	-8%	Positive
17	Route 8 - Inbound	22.0	13.1	-8.9	-41%	Positive
18	Route 8 - Outbound	22.6	20.2	-2.4	-11%	Positive
19	Route 9 - Inbound	9.5	9.5	0.0	0%	Negligible
20	Route 9 - Outbound	9.5	9.5	0.0	0%	Negligible
21	Route 10 - Inbound	15.1	10.6	-4.	-30%	Positive
22	Route 10 - Outbound	11.8	12.5	0.7	6%	Negligible
23	Route 11 - Inbound	18.2	12.8	-5.4	-30%	Positive
24	Route 11 - Outbound	21.7	22.0	0.3	1%	Negligible

The 2046 AM peak results above show that, in general, the opening of the Project without the BusConnects Dublin Road scheme still has a significant positive impact on the majority of journey time routes analysed. In this scenario, three routes have changed their impact rating –

- Route 5 in the outbound direction has improved from a minor impact in the core scenario, to a positive impact
- Route 10 in the inbound direction has improved from a major impact in the core scenario, to a moderate impact
- Route 11 in the inbound direction has changed from a positive impact in the core scenario, to a negligible impact

Route 11 in the inbound direction, which covers the Dublin Road has seen it' impact rating downgraded, due to more traffic using the route in the morning, in order to enter the city. In the BusConnects Dublin Road scheme, several new signalised junctions are introduced along the corridor through the new design and by removing this scheme, these junctions change back to priority junctions, and thus attracting a slight increase in traffic.

The 2046 PM peak results above show that, in general, the opening of the Project without the BusConnects Dublin Road scheme still has a significant positive impact on the majority of journey time routes analysed. In this scenario, one route has changed its impact rating –

- Route 11 in the outbound direction has changed from a positive impact in the core scenario, to a negligible impact

Route 11 in the outbound direction, which covers the Dublin Road, has seen its impact rating change, due to more traffic using the route in the evening, in order to exit the city. In the BusConnects Dublin Road scheme, several new signalised junctions are introduced along the corridor through the new design and by removing this scheme, these junctions change back to priority junctions, and thus attracting a slight increase in traffic.

Overall, it should be noted that the impact of the Project without the BusConnects Dublin Road scheme still is hugely beneficial for reducing traffic congestion in Galway City in both the AM and PM Peak and for reducing journey times. Also, the journey times in 2046, have effectively remained the same compared to the core scenario with only three routes in the AM and one route in PM hour, seeing it's impact rating change.

6.6.3.3 Network Statistics (Without Dublin Road Scheme)

The tables below present Network Statistics for the peak hours.

Table 6.20 Network Performance Indicators - Morning Peak Hour

Scenario	Total Vehicle Distance (pcu. Kms)	Total Network Travel Time (pcu. Hrs)	Total Network Delay (pcu. Hrs)	Average Vehicle Speed (kph)	Impact
2031 Do-Minimum	235,506	11,061	5,560	19.2	-
2031 Do-Something	260,292	9,259	3,546	27.2	Positive
2046 Do-Minimum	265,318	13,852	7,903	16.2	-
2046 Do-Something	298,925	12,099	5,654	23.2	Positive

Table 6.21 Network Performance Indicators - Evening Peak Hour

Scenario	Total Vehicle Distance (pcu. Kms)	Total Network Travel Time (pcu. Hrs)	Total Network Delay (pcu. Hrs)	Average Vehicle Speed (kph)	Impact
2031 Do-Minimum	229,349	9,380	4,132	22.1	-
2031 Do-Something	245,648	7,824	2,439	30.7	Positive
2046 Do-Minimum	255,440	11,317	5,611	19.7	-
2046 Do-Something	279,903	9,666	3,563	27.7	Positive

It is clear from the data presented in Tables 6.20 and 6.21 that, by excluding the BusConnects Dublin Road scheme from both the Do-Minimum and Do-Something scenarios, the results remain effectively unchanged compared to the core scenarios which have the scheme included. Given that the results are, effectively, unchanged with the BusConnects Dublin Road scheme excluded, the same conclusions which were outlined in Section 6.6.1, are still applicable.

The overall analysis indicates that if the BusConnects Dublin Road scheme is excluded from the assumptions, the Project will still have a significantly positive impact in both Opening and Design Years.

6.6.3.4 Ratio of Flow to Capacity Results (Without Dublin Road Scheme)

The tables below summarise the junction evaluations in 2031 and 2046 for both the AM and PM peak hours.

Table 6.22 Number of Junction Approaches at or over Capacity - AM Peak

		2031			2046		
		DM	DS	Impact	DM	DS	Impact
Key Junctions (N6 / R338)	RFC > 90%	24	17	Positive	27	25	Positive
Entire Network	RFC > 90%	150	106	Positive	203	160	Positive

Table 6.23 Number of Junction Approaches at or over Capacity - PM Peak

		2031			2046		
		DM	DS	Impact	DM	DS	Impact
Key Junctions (N6 / R338)	RFC > 90%	22	17	Positive	24	19	Positive
Entire Network	RFC > 90%	110	78	Positive	150	121	Positive

The data set out in Table 6.22 and Table 6.23 show that, with the introduction of the Project without the BusConnects Dublin Road scheme, there is a large decrease in the number of links in the network which have an RFC of over 90%. In 2031, there is a predicted decrease of approx. 30% across both peak hours in the number of number of links in the network which have an RFC over 90%. For the key junctions, there is an equivalent decrease of approx. 25% - 30% in both peak hours.

In 2046, there is a predicted decrease of approx. 20% across both peak hours in the number of number of links in the network which have an RFC over 90%. For the key junctions, there is an equivalent decrease of between 10% - 20% across both peak hours.

Overall, this analysis indicates that if the BusConnects Dublin Road scheme is excluded from the assumptions, the Project will still have a significantly positive impact in both Opening and Design Years.

6.6.4 Conclusion

In summary, if the BusConnects Dublin Road scheme, which has yet to be approved, is excluded from both the Do-Minimum and Do-Something scenarios, the Project will still have a significant positive impact as the results remain largely unchanged compared to the core scenario.

6.7 Forecast Traffic Flows

6.7.1.1 AADT Forecasts

AADT estimates for the core EIAR scenario have been calculated using the Local Area Model and in accordance with TII Project Appraisal Guidelines. To further demonstrate the benefits, or positive impacts, of the Project and to help quantify the level of traffic redistribution, forecast traffic flows are presented in this section.

Plate 6.15 illustrates the location of AADT points with corresponding 2046 AADT values shown in Table 6.24. The AADT flows were calculated using demand flows from the LAM. This method was used as the overall level of congestion in the Do-Minimum scenario was very high, with the increased levels of population in Galway City, as per NPF targets which include a 50% increase to 2040, from 2016 levels. Also, the Do-Minimum scenario includes transport schemes like BusConnects Cross City Link which restricts access to general traffic on the Salmon Weir Bridge during the hours of 7 a.m. and 7 p.m., which places an increased pressure on the other bridges, particularly the Quincentenary Bridge. As mentioned in 6.3.3 the capacity of the Quincentenary Bridge is currently just below the capacity of a road of its type in the morning peak hour. So, in the forecast Do-Minimum scenarios, there is a high level of latent demand which cannot travel to its destination in the hours modelled. In that context, it was necessary to use demand flows in the AADT calculations so as not to ensure a robust assessment of the total traffic demand in the Do-Minimum scenario. The demand flow output includes the level of latent demand which is queued at a point in the network but which would use a certain route if congestion did not impede it.

Further details on the methodology used to calculate AADTs, is available in the Traffic Modelling Report contained within Appendix A.6.1.

Table 6.24 illustrates that, in the 2046 Do-Something scenario, there is significant demand for the Project with AADTs in excess of 50,000 forecast for certain sections. Table 6.24 also shows that traffic does increase, in certain section of the network, mainly in the vicinity of the Project, as traffic enters and exits it. In general, traffic across the city shows significant reductions because of the introduction of the Project and allows traffic to reroute their journey, outside of the city via the Project. Traffic on the N6 decreases significantly as well, as evidenced by the reduction on Quincentenary Bridge (33% reduction) which will help improve the resilience of the network.

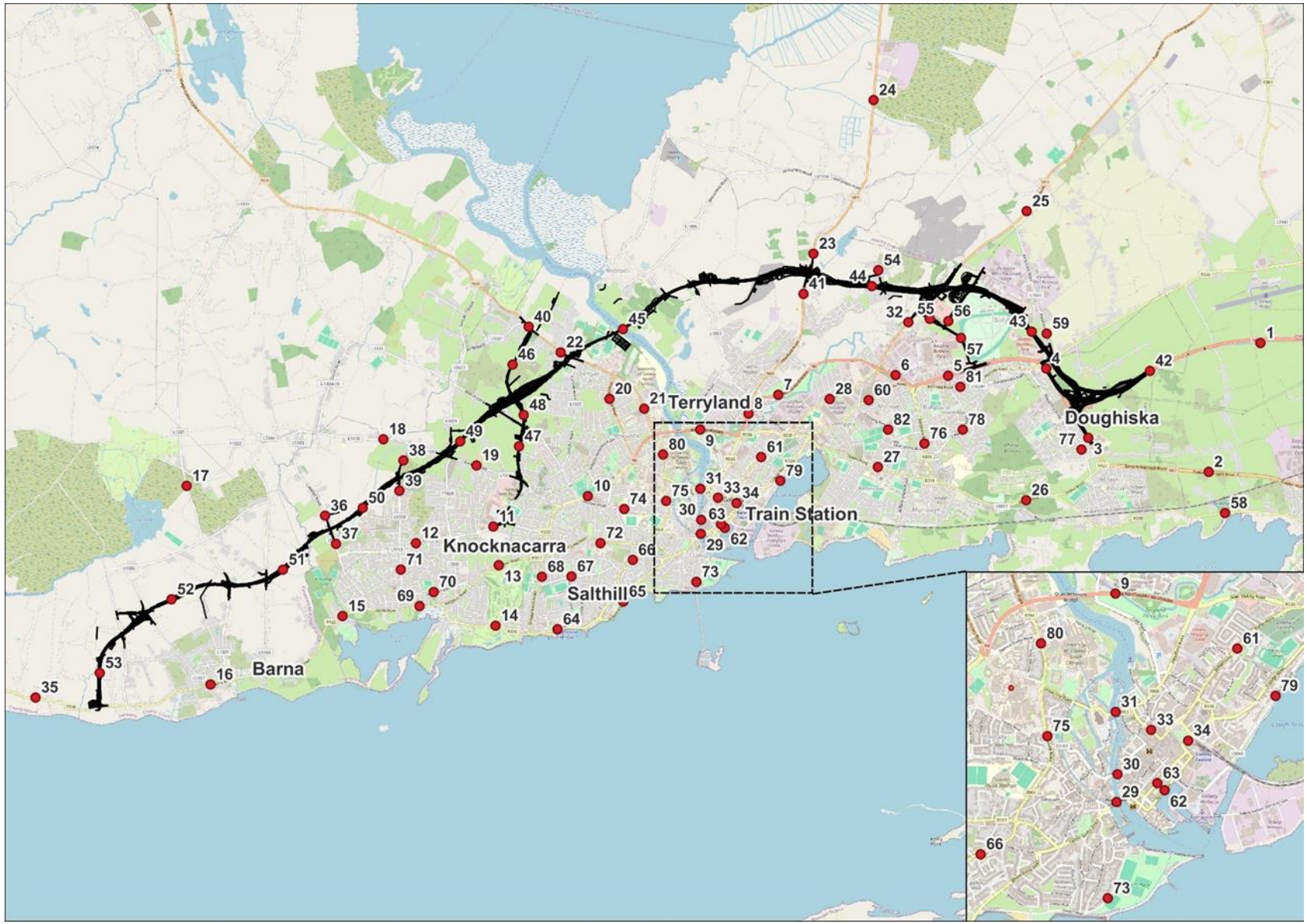


Plate 6.15 AADT Locations

Table 6.24 AADT 2046 Design Year

AADT Point	Location	2046 Do-Minimum		2046 Do-Something		% Diff
		AADT	%HGV	AADT	%HGV	
1	N6 South of Galway Airport	40,292	5%	59,654	4%	48%
2	R446 West of Oranmore Business Park	31,323	1%	28,939	2%	-8%
3	R446 South of N6 Roundabout	29,541	2%	31,799	2%	8%
4	N6 South of Briarhill	51,991	4%	30,207	4%	-42%
5	N6 Near Ballybrit Business Park	51,724	3%	41,464	3%	-20%
6	N6 between N17 and R865	42,433	2%	31,487	2%	-26%
7	N6 Between N84 and N17	36,522	3%	26,486	2%	-27%
8	N6 East of Quincentenary Bridge	37,385	4%	31,889	3%	-15%
9	N6 - On Quincentenary Bridge	65,637	2%	43,967	1%	-33%
10	R338 at Westside Playing fields	23,037	3%	16,014	2%	-30%
11	Western Distributor Road between Clybaun Road and R338	18,703	1%	10,651	0%	-43%
12	Western Distributor Road between Clybaun Road and Ballymoneen Road	14,339	1%	11,668	0%	-19%
13	R337 Kingston Road, Kingston	18,105	1%	9,986	0%	-45%
14	R336. Salthill Road Upper. Galway Golf Course.	17,082	1%	14,753	1%	-14%
15	R336. Barna Road. Barna Woods	19,148	1%	9,083	1%	-53%
16	R336. Barna Road. Barna. Creagan bus stop	14,060	1%	6,894	2%	-51%
17	L1321. At Loughinch. South East of Bearna Golf Club	4,180	0%	4,608	0%	10%
18	Boleybeg Road. Between Cappagh Road and Ballymoneen Road	6,865	0%	4,187	0%	-39%
19	Rahoon Road. Between Clybaun Road and Bothar Stiofain	8,134	1%	7,095	1%	-13%
20	N59. Thomas Hynes Road. Between Hazel Park and Cherry Park	8,174	2%	7,562	0%	-7%
21	N59. Upper Newcastle Road. Between R338 and Corrib Village	14,148	2%	10,452	1%	-26%
22	N59. Barnacranny. Between Chestnut Lane and Circular Road	19,316	2%	17,816	0%	-8%
23	N84. South of Ballindooly. Ballindooly Lough	12,690	4%	18,705	4%	47%
24	N84. North of Ballindooly	16,794	4%	18,805	4%	12%

AADT Point	Location	2046 Do-Minimum		2046 Do-Something		% Diff
		AADT	%HGV	AADT	%HGV	
25	N17. Tuam Road. North East of Parkmore Road	24,455	4%	23,944	5%	-2%
26	R338. Dublin Road. West of Junction with Coast Road	22,577	3%	20,963	3%	-7%
27	R338. Dublin Road. Between Renmore Road and Michael Collins Road	27,189	3%	22,526	4%	-17%
28	R336. Tuam Road. Mervue Business Park	24,141	3%	17,905	3%	-26%
29	Wolfe Tone Bridge	26,863	2%	19,647	2%	-27%
30	O'Briens Bridge	12,947	1%	9,517	1%	-26%
31	Salmon Weir Bridge	381	100%	368	100%	-3%
32	N17 Tuam Road. North East of School Road	26,446	4%	23,371	3%	-12%
33	Eglington Street	393	100%	383	100%	-2%
34	R336 South of Eyre Square	11,772	2%	10,544	3%	-10%
35	R336 West of N6	14,110	1%	16,258	1%	15%
36	Cappagh Road - North of GCRR	6,847	0%	4,863	0%	-29%
37	Cappagh Road - South of GCRR	6,847	0%	13,158	1%	92%
38	Ballymoneen Road - North of GCRR	4,089	0%	9,260	1%	126%
39	Ballymoneen Road - South of GCRR	4,089	0%	9,496	0%	132%
40	N59 - North of GCRR Link Road	18,936	2%	20,308	2%	7%
41	N84 South of GCRR	12,690	4%	17,085	2%	35%
42	GCRR - Briarhill Junction	-	-	59,618	4%	-
43	GCRR - Parkmore	-	-	46,719	2%	-
44	GCRR - Between N17 and N84	-	-	54,936	2%	-
45	GCRR - New Corrib Crossing	-	-	52,758	2%	-
46	GCRR - N59 Link Road	-	-	14,473	3%	-
47	GCRR - Rahoon Link Road	-	-	9,320	1%	-
48	GCRR - Letteragh Link Road	-	-	20,803	1%	-
49	GCRR - Between Ballymoneen and N59 Interchange	-	-	29,270	1%	-
50	GCRR - Between Ballymoneen and Cappagh Road	-	-	18,534	1%	-

AADT Point	Location	2046 Do-Minimum		2046 Do-Something		% Diff
		AADT	%HGV	AADT	%HGV	
51	GCRR - Between Moycullen Road and Cappagh Road	-	-	18,425	0%	-
52	GCRR - at Truskey West	-	-	10,040	1%	-
53	GCRR - North of R336 Junction	-	-	10,040	1%	-
54	School Road (Castlegar National School)	4,116	3%	1,397	6%	-66%
55	Parkmore Link Road - N83 Link	-	-	16,928	1%	-
56	Parkmore Link Road (North)	-	-	16,021	1%	-
57	Parkmore Link Road (South)	-	-	14,827	1%	-
58	Coast Road (Oranmore Train Station)	20,563	1%	18,593	1%	-10%
59	Parkmore Road	30,831	2%	19,660	2%	-36%
60	Monivea Road (Crown Square development)	17,016	4%	14,247	4%	-16%
61	R336 Bohermore	16,609	3%	15,439	3%	-7%
62	Dock Road	24,742	2%	20,352	2%	-18%
63	Merchants Road	21,133	1%	18,194	2%	-14%
64	Upper Salthill Road (Salthill Promenade)	18,017	1%	14,464	1%	-20%
65	Seapoint Promenade	13,272	1%	9,389	1%	-29%
66	Lower Salthill Road	13,566	1%	11,199	1%	-17%
67	Dr Mannix Road (St. Enda's National School)	9,157	0%	6,459	0%	-29%
68	Threadneedle Road (St. Enda's Secondary School)	12,257	0%	11,174	0%	-9%
69	Barna Road	19,419	1%	13,543	1%	-30%
70	Shangort Road (McGrath's Field Park)	5,655	2%	3,144	3%	-44%
71	Ballymoneen Road	9,125	1%	6,467	2%	-29%
72	Taylor's Hill Road (Taylor's Hill Primary School)	13,970	1%	8,900	1%	-36%
73	Gratton Road	7,948	1%	3,886	2%	-51%
74	Shantalla Road (Scoil Bhride)	14,150	1%	12,545	1%	-11%
75	Newcastle Road (Scoil Chroi Iosa)	19,074	1%	15,676	1%	-18%
76	Ballybane Road	15,997	4%	17,744	3%	11%

AADT Point	Location	2046 Do-Minimum		2046 Do-Something		% Diff
		AADT	%HGV	AADT	%HGV	
77	Doughiska Road	10,715	2%	10,772	2%	1%
78	Castlepark Road	10,715	2%	10,772	2%	1%
79	Lough Atalia Road	27,459	3%	22,010	3%	-20%
80	Lower Newcastle Road (adjacent to UoG campus)	22,395	1%	19,525	2%	-13%
81	Monivea Road	12,225	4%	10,540	4%	-14%
82	Connolly Avenue	8,245	3%	7,943	3%	-4%

The data contained in the tables above also illustrate reductions on other parts of the network, which are planned to serve new bus routes as part of the NTA's BusConnects network, which is planned to be implemented between 2025 and 2026. A number of these roads, currently have no bus lanes, or any planned bus priority infrastructure under the current GTS. Buses along these roads would need to travel with general traffic.

Table 6.25 below illustrates several of these roads, their AADT reductions and the services planned to use these roads in the NTA's BusConnects network for the city.

Table 6.25 AADT Reductions along BusConnects Route without existing or planned Bus Priority Measures

AADT #	Road	BusConnects Routes & Midday Frequencies	AADT Reduction
13	Kingston Road	10A (30min)	45%
15	Barna Road	424 (60min)	53%
28	Tuam Road (Mervue)	3 (20min)	26%
8	N6 Terryland	7 (20min)	15%
21	Upper Newcastle Road	4 (15min at peak hours)	26%
29	Wolfe Tone Bridge	7 (20min)	27%
14	R336 Upper Salthill Road	7 (20min) & 10A (30 min)	14%
65	Seapoint Promenade	7 (20min)	29%
72	Taylor's Hill Road (Taylor's Hill Primary School)	10 (15min)	36%
64	Upper Salthill Road (Salthill Promenade)	1 (10 – 12min), 7 (20min) & 10A (30min)	20%
60	Monivea Road (Crown Square development)	1 (10 – 12min)	16%
58	Coast Road (Oranmore Train Station)	10B (30min)	10%
75	Newcastle Road (Scoil Chroi Iosa)	1 (10 – 12min)	18%
70	Shangort Road (McGrath's Field Park)	9B (20min)	29%
71	Ballymoneen Road	9B (20min)	36%

The table above shows significant AADT reductions on both sides of the city, when the Project is implemented and illustrates the benefits which the Project can have in reducing traffic volumes along bus routes which would need to travel alongside general traffic. These reductions would help provide more reliable journey times for bus users across the city where there is no current or planned bus priority infrastructure.

Table 6.24 also illustrates the reduction in the levels of traffic near schools/universities in the city which should make these areas safer and improve air quality outside of schools. The following roads, which have schools situated on them, see reductions in traffic:

- School Road (Castlegar National School) – 66% reduction
- Dr Mannix Road (St. Enda's National School) – 29% reduction
- Threadneedle Road (St. Enda's Secondary School) – 9% reduction
- Taylor's Hill Road (Taylor's Hill Primary School) – 36% reduction
- Shantalla Road (Scoil Bhride) – 11% reduction
- Newcastle Road (Scoil Chroi Iosa) – 18% reduction
- Lower Newcastle Road (adjacent to UoG campus) – 13% reduction
- O'Briens bridge (St. Patricks Primary School) – 26%

6.8 Assessment of Trip Redistribution and Overcapacity Demand

This section discusses induced traffic, explaining its nature, including its various components, and also provides an assessment of each component with supporting model outputs. This section provides further supporting analysis on the vehicle kilometre increases which were presented in Section 6.6.1.2.

6.8.1 What is Induced Traffic?

When a new transport facility or service becomes available the users of the transport system can alter their behaviour in a number of ways:

- Change their **route** (Diverted Traffic)
- Change their **mode of travel**
- Change their **destination** to one easily reachable using the new system
- Change their trip **origin** to one that results in a longer trip (urban sprawl)
- Change their trip making **frequency**
- Change their **time of travel**

Induced traffic, or "new traffic", attracted by a capacity expansion is therefore comprised of several components or behavioural responses. Each of these components and their expected response to additional road capacity is detailed in Table 6.26 below.

Table 6.26 Behavioural Responses to Components of Induced Traffic

Type of Generated Traffic	Expected Outcome
Diverted Traffic	The provision of a new road will reduce journey times on the network, thereby attracting motorists away from more congested / slower routes
Mode Change	The provision of a new road will reduce journey times by road resulting in a shift towards travel by car
Destination Change	Reduced journey times allow drivers to choose destinations (Such as schools or places of work) further away from their home, leading to increased vehicle kilometres travelled
Time of travel Change	The provision of a new road will reduce traffic congestion in the peak travel periods which in turn releases the 'suppressed' trips of motorists who currently defer their journey to off-peak periods to avoid congestion
Trip Frequency Increase	The provision of a new road will improve travel times, which can encourage more trips to be made
Origin Change (resulting from different land use pattern)	The provision of a new road will improve travel times enabling motorists to live further away from their place of work or other end destinations. This can lead to dispersed land use patterns, which is often referred to as 'Urban-sprawl'

6.8.2 How has induced traffic resulting from the Project been assessed?

A key component of the transport modelling suite used to assess the project is the NTA's Western Regional Model (WRM). The WRM 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. The WRM also provides a prediction of changes in trip destination in response to changing traffic conditions, transport provision and/or policy, which is in line with modelling best practice, including TII and WebTAG[9] guidance, which dictates that a variable demand model should be used to assess the impacts of a scheme such as the Project.

The variable demand modelling approach allows for the majority of the induced traffic components to be accounted for in the scheme appraisal. Table 6.27 below details each of the components of induced travel and how they are accounted for in the transport modelling process.

Table 6.27 Modelling of Induced Travel Components

Type of Generated Traffic	Included in Appraisal?	Details
Diverted Traffic	Yes	The LAM assignment determines likely re-routing resulting from the project
Mode Change	Yes	The Multi-modal component of the WRM models the likely mode shift responses to the project
Destination Change	Yes	The Demand Model component of the WRM models how destinations change resulting from the changes in generalised cost of travel following introduction of the project
Time of travel Change	Yes (For overall daily movements) No (For Additional Peak hour traffic)	The WRM models all time periods throughout the day. Therefore, trips moving from one-time period to another will not change the overall Average Annual Daily Traffic (AADT) forecasts which have been produced to assess the project

[9] Transport Analysis Guidance from the UK Department of Transport

Type of Generated Traffic	Included in Appraisal?	Details
		However, the WRM does not directly model the impact of additional trip making in a peak hour as a result of the provision of increased road capacity An estimation of the potential increase in trip making in the peak hour resulting from the introduction of the project has been derived based on evidence from similar schemes delivered in Ireland
Trip Frequency Increase	No	Changes in trip frequency as a result of increases or decreases in the generalised cost of travel are not modelled within the WRM. However, evidence from the assessment of Household Data indicates that the provision of new transport infrastructure does not result in a noticeable increase in trip frequency during peak periods, but instead influences the choice of travel mode
Origin Change (resulting from different land use pattern)	No	Within this updated EIAR, the forecast growth in population and employment was based on forecasts derived by the NTA aligned to National Planning Framework (NPF) forecasts. The WRM model assessments undertaken for this updated EIAR have the same land use assumptions in place with and without the project. As per the NPF, there are specific targets for the city which are designed with the compact growth of the city in mind and therefore different land use patterns have not been assessed as they would contradict the NPF.

6.8.3 What are the proposed Project effects in Galway?

6.8.3.1 Diverted Traffic

The purpose of the Project is to serve the forecast demand for strategic travel on national roads while also freeing up capacity within the city centre to support priority for sustainable travel measures. Therefore, traffic diverted from national/regional routes within the city centre onto the Project is generally a positive impact and demonstrates that the Project is serving its intended purpose, which includes removing volumes of traffic from those routes to facilitate the effective implementation of other elements of the GTS.

6.8.3.2 Traffic Diversion

Plate 6.16 below shows how traffic flows will change in the AM peak hour, when the Project is in place. Green lines on this map show roads where traffic flows will reduce, and blue lines show roads where traffic will increase.

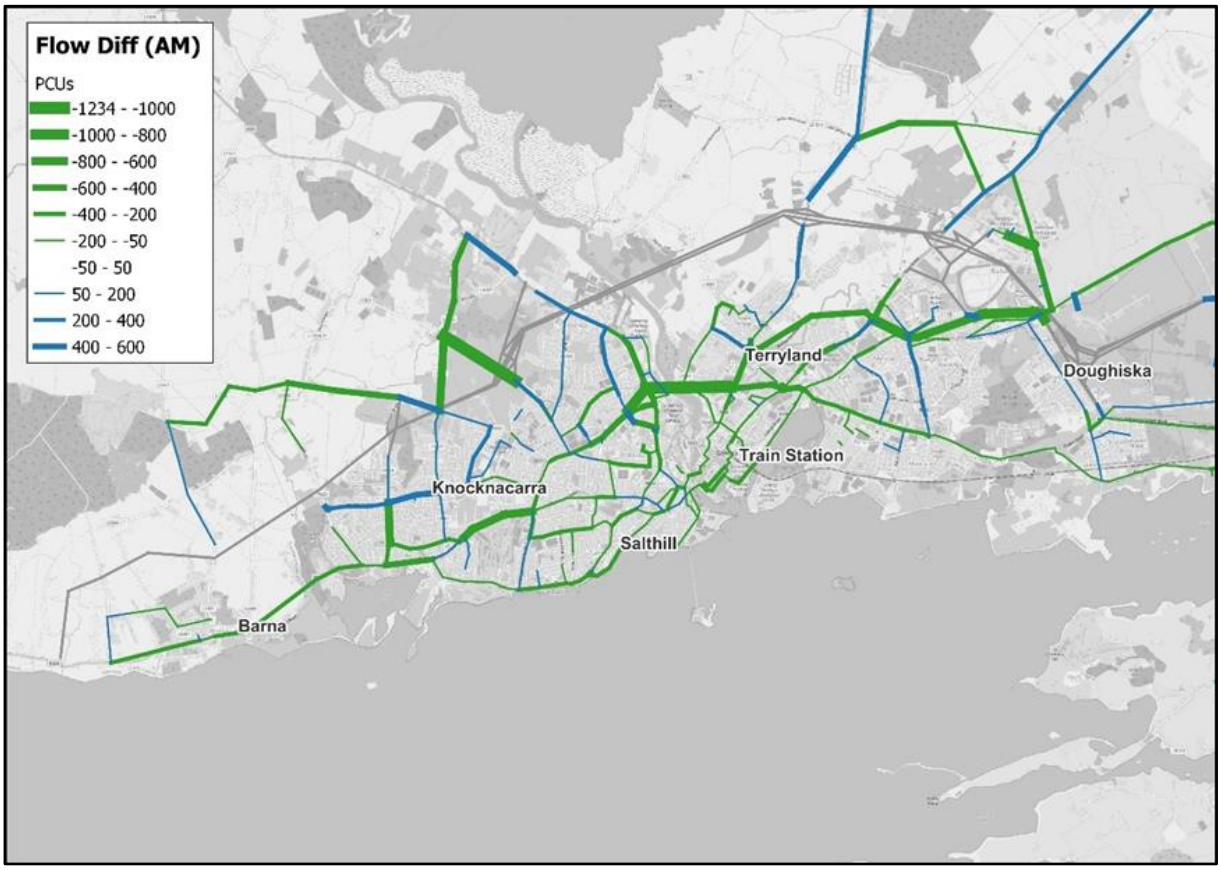


Plate 6.16 Do-Something Flow Difference Plot

Thus, Plate 6.16 shows that there will be some increases in traffic on the radial routes leading into Galway, close to the new junctions, and that there will be a significant reduction in traffic in the city centre as traffic diverts onto the project. Importantly, the implementation of the Project will result in a 33% reduction in traffic on the Quincentenary Bridge (and a 25% reduction in HGV kilometres within the existing N6/R338 cordon), freeing up capacity within the city centre to support priority for sustainable travel measures and lead to better air quality, which is a significant positive impact.

6.8.3.3 Local and National Road Traffic

To examine the origin and destination for users of the Project, a select link analysis has been performed on the proposed N6 GCRR between its interchange with the N59 and N84. The analysis enables detailed examination of any location along the Project alignment, in this case the crossing over the River Corrib, and to illustrate where drivers begin and end their journey. The results of this analysis are shown in Plate 6.17 and Plate 6.18 below for the AM peak period in the eastbound and westbound direction, respectively.

The results demonstrate the manner in which the Project will generally facilitate long distance, strategic trips on the national road network, instead of local trips which could otherwise be made by walking, cycling or public transport (as indicated by the green lines (traffic flows) occurring on the major roads predominantly rather than local roads). For example, in the eastbound direction 56% of trips crossing the River Corrib at this point exit Galway City on the national road network. In the westbound direction, 25% of those crossing the River Corrib at this point exit Galway City on the N59 or R336.

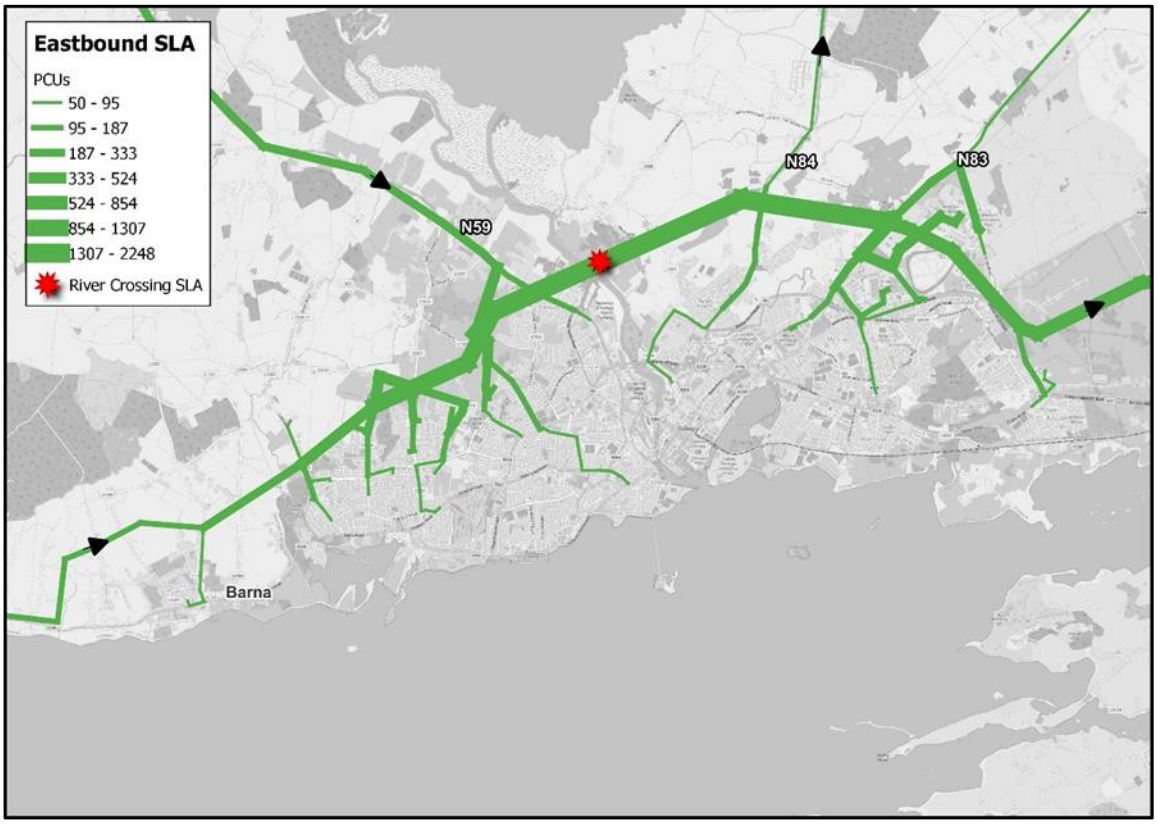


Plate 6.17 AM Eastbound Select Link Analysis showing the Origin and Destination of Traffic on the N6 GCRR over the River Corrib

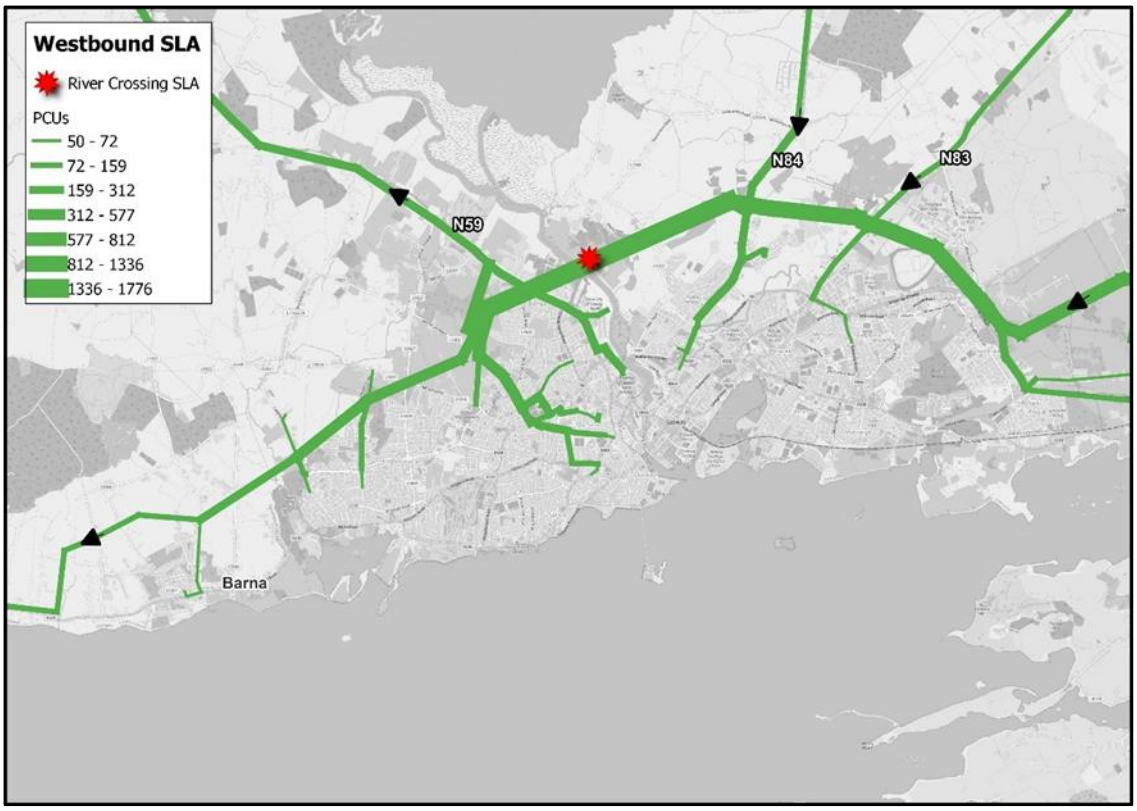


Plate 6.18 AM Westbound Select Link Analysis showing the Origin and Destination of Traffic on the N6 GCRR over the River Corrib

6.8.3.4 Mode Shift

All modes of travel (walking, cycling, public transport and car) are modelled in the WRM. The demand model component of the WRM is capable of modelling how people may change their mode of travel response to the increased capacity and reduced travel times provided by the new infrastructure i.e. the Project. The tables below outline the peak hour mode shares for the "with and without scheme scenarios", under NPF growth assumptions for Galway City which will see a 50% increase in the city's population.

The results of the analysis indicate that the implementation of the Project in the 'Do-Something' scenario will result in an approx. 2% increase in car use (after the 50% increase in the city's population) when compared to the 'Do-Minimum' Scenario. What is not evident from reading this table in isolation are the factors behind the choice of mode decisions. In the Do-Minimum Scenario, significant levels of traffic congestion create a barrier to travel, constraining the economic growth of the city. The overall delay on the road network in the Do-Minimum Scenario is between 40% - 60% higher than the Do-Something Scenario with the Project in place. This highlights the positive impact of the project, in terms of reducing the level of congestion in the city, which would increase in the future as the city's population grows.

In the Do-Minimum scenario, movements across the city for both car traffic and public transport are significantly constrained and would severely restrict the sustainable growth of the city, as set out in the NPF.

However, with the implementation of the Project, these restrictions on connectivity and growth are removed resulting in significant positive impacts, including:

- It will facilitate sustainable modes of travel, and create a favourable environment for sustainable travel, by removing car and HGV traffic volumes from the city centre
- It will provide a safer environment for vulnerable road users
- It will lead to a healthier environment for residents and visitors to Galway due to a reduction in harmful emissions in the city centre

It should be noted that the WRM bases mode choice decisions on the total journey times by each mode. As the model does not consider other factors/benefits influencing a person's choice of travel, such as safer and healthier environment, then the mode shares presented above can be considered a robust or worst-case scenario.

Table 6.28 AM 2046 Mode Share Percentages

Option	% Car	% Public Transport	% Walk	% Cycle
Do-Minimum	50.1%	15.1%	29.8%	5.0%
Do-Something	52.0%	14.3%	29.2%	4.6%

Table 6.29 PM 2046 Mode Share Percentages

Option	% Car	% Public Transport	% Walk	% Cycle
Do-Minimum	57.6%	12.9%	25.1%	4.4%
Do-Something	59.5%	11.8%	24.6%	4.1%

It should be noted that while the Project does result in a small increase in car mode share when implemented on its own, it is demonstrated in Section 6.11 below that, when the Project is implemented alongside demand management measures (which are designed to contribute to meeting CAP24 targets), the car mode share remains effectively unchanged (0.1% increase as illustrated in Plate 6.21). The significance of this factor is that the Project does *not* facilitate a mode shift to car when the demand management measures outlined in the Section 6.11 for the purposes of aligning to CAP24, are introduced.

6.8.3.5 Destination Change

The demand model element of the WRM is capable of modelling the manner in which trip destinations might change in response to the increased capacity and reduced travel times facilitated by the Project. In order to demonstrate the manner in which trip destinations would change because of the Project, an analysis was undertaken of the manner in which trips to major destinations, such as places of employment, in Galway would change following the implementation of the Project.

Plate 6.19 below demonstrates the manner in which the trip length distribution of trips to one of the major destinations in Galway (Parkmore Industrial Estate) is forecast to change with the introduction of the Project. Without the Project in place (Do-Minimum Scenario), there are more trips to this part of the Parkmore Industrial Estate from the eastern side of Galway City and County, as is evident from the higher percentage of trips in the 2km and 6km bands because, by 2046, congestion has increased to such a degree that it discourages some people travelling long distances into Parkmore or even from the western side of Galway City into Parkmore.

However, with the implementation of the Project (Do-Something Scenario) this congestion is removed which is a positive benefit, allowing people to change their destination as indicated by the increase in the proportion of trips travelling longer distances to Parkmore (10km and 12km bands).

Whilst the Do-Minimum Scenario results in shorter trip lengths and a slight increase in walking and cycling, the severe level of congestion experienced in this scenario by all transport modes would suppress travel movements either side of the River Corrib, as is evidenced by the substantial increase in journey times noted above. This factor would ultimately result in isolation of areas of the city and county, leading to further relocation of activities away from the city core, reduction in the range of employment opportunities and an overall reduction in the quality of life of the residents of the city. The introduction of the Project will prevent this from happening and will:

- Improve connectivity between the east and west side of Galway City (and county)
- Improve access to key resources and services
- Avoid the need to duplicate services due to a lack of connectivity between east and west of the city

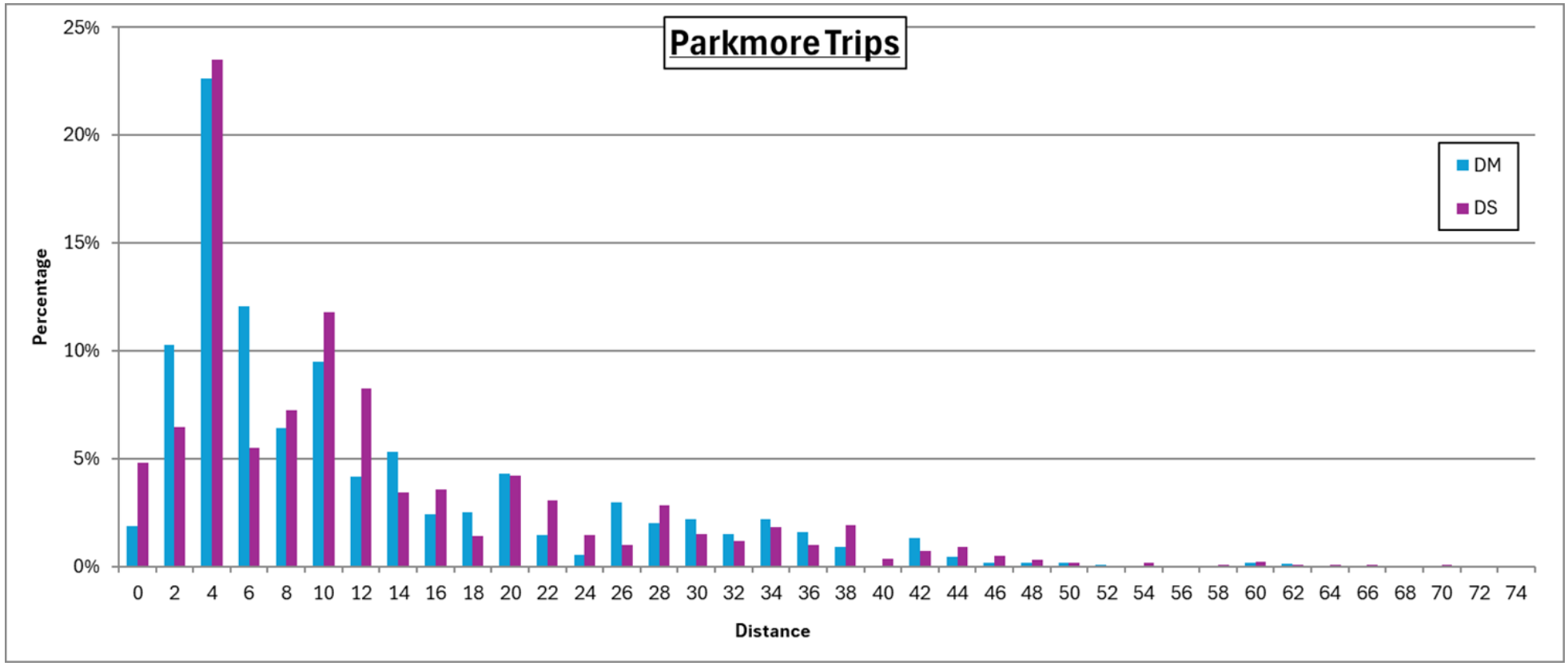


Plate 6.19 Trip Length Distribution (Car Trips) - 2046 AM

6.8.3.6 Time of Travel Changes

Increased congestion in the peak hour can encourage people to defer trips (leave earlier or later to avoid peak period traffic congestion) in what is known as "peak spreading". Conversely, the removal of congestion in the peak hour following the introduction of the proposed Project could encourage people to switch to travel in the peak period. In this instance, the extra trips that take place in the peak hour are not "new trips" but trips which have moved from one time-period to another.

One of the primary outputs from the transport modelling of the Project is Average Annual Daily Traffic (AADT) estimates for the various roads in the study area. These AADT estimates are also used in the environmental appraisal by air, climate and noise specialists. AADT estimates are made for 24-hour periods and therefore trips shifting from one period to another, within the same 24-hour period, will not change the 24-hour traffic forecast.

Notwithstanding this factor, it is possible that an increase in trips during the peak hours may lead to traffic impacts. In order to test this possibility, analysis of historical traffic trends on the M50 was undertaken to determine the likely shift in traffic from outside the peak to the peak hour. The capacity of the M50 was significantly increased in 2012 following years of significant congestion. The M50 upgrade consisted of increasing the number of lanes in each direction from 2 to 3 and upgrading several interchanges to free-flow. By observing the manner in which this M50 upgrade enhanced capacity (and reduced journey times) impacted upon the proportion of traffic travelling in the peak hour, it is possible to apply a similar change to the peak hour factors used in the WRM. The M50 analysis revealed a 20%-30% increase in the proportion of traffic travelling during the peak hour immediately following the upgrade of the road.

A sensitivity test has been carried out to determine the impact of a similar change in peak hour factor following the introduction of the proposed Project. Applying this updated peak hour factor to the 2046 Do-Something Scenario will lead to an increase in total delay experienced on the network but average speeds across the metropolitan area are still approx. 20% higher compared with the Do-Minimum scenario.

Such a re-timing of trips into the peak hours is possible, and likely, to occur as a result of the reduced congestion. This is reflective of the fact that the proposed Project will achieve its objectives and will have the following wider economic and social benefits:

- It will provide shorter travel times for all trips
- Improve journey time reliability

6.8.3.7 Trip Frequency Change

In theory, trip making from a particular zone may increase or decrease as a result of changes in total travel time by all modes. Certain models contain a trip frequency module which simulates this interaction. However, in general, if all modes of travel (including walking and cycling) are included in a model (which is the case for the WRM), then it is not necessary to include a trip frequency response because any increase in trips by one mode is usually the result of mode shift from alternative modes. In particular, peak hour trip frequency is considered to be insensitive to changes in the generalised cost of travel, as demand for travel is largely derived by activity at the end destination (for example trips to school or place of work) as opposed to the capacity of the transport network.

Some increased frequency can occur for other, inter-peak, trip purposes such as tourism, leisure and business. An increase in such trips (tourism or shopping) arising from the implementation of the project would have considerable economic benefits for the city of Galway and the Western Region.

6.8.3.8 Origin Changes (Land Use Changes)

A transport project may result in an alteration of land use patterns by facilitating economic development that would not have been possible otherwise or by new developments locating in areas which are easily accessed by the new route. These altered land use patterns in turn may lead to additional or "induced" traffic as a result of the Project.

Current land use policy, as set out in the National Planning Framework, provides a legislative framework for spatial planning which constrains future development in compact urban settlements supported by public

transport. All local and regional planning authorities must legally adhere to the NPF and, therefore, the forecast modelling of both the Do-Minimum and Do-Something Scenarios is based on population and employment forecasts aligned to the NPF principles.

The NPF guidelines must be adhered to, and unsustainable land use patterns as described above will not be permitted to take place, with or without the Project in place. As recognised in the NPF, the implementation of the package of strategic transport measures contained in the GTS, in tandem with compact growth delivered in the city centre and along public transport corridors, is critical to the proper planning and sustainable development of the Galway Metropolitan Area.

6.8.3.9 Induced Traffic Summary

As outlined in the sections above, the modelling approach adopted for the Project has assessed most components of induced traffic and, therefore, this has been accounted for in the development, design and assessment of the Project.

As noted above, the planned growth of the city, as set out under NPF, without an additional river crossing will result in a severe level of congestion experienced by all transport modes which would suppress travel movements either side of the River Corrib. This factor would ultimately result in isolation of areas of the city and county, leading to further relocation of activities away from the city core, reduction in the range of employment opportunities and an overall reduction in the quality of life of the residents of the city. Such a scenario fails to meet the sustainable development goals of the NPF. Accordingly, the need for an additional river crossing is clear.

The assessment of induced traffic has shown that the implementation of the Project will result in improved journey times across the network for all modes including public transport, removal of traffic from the city centre, improvement in the city centre environment and improved safety across the city. Table 6.30 below demonstrates the manner in which each of the components of induced travel will result in positive impacts for Galway and the Western Region.

Table 6.30 Induced Demand Summary and Impacts of the Project

Type of generated traffic	Benefits	Outcome
Diverted Traffic	Safer Environment for vulnerable road users Improved air quality in city centre	Reduction in overall traffic across the network following the project being implemented i.e. Quincentenary Bridge (33%), R336 Barna Road (50%), R337 Kingston Road (45%), R338 Seamus Quirke Road (30%), Parkmore Road (37%), N59 Upper Newcastle Road (26%), O'Briens Bridge (26%), Wolfe Tone Bridge (27%)
Mode Change	Safer Environment for vulnerable road users	25% decrease in HGV kilometres within N6/R338 cordon during peak times
Destination Change	Improves East-West connectivity of the city and region Improved access to key services	Up to 40% less delay across city network thereby improving access to key services such as hospitals and education
Time of travel Change	Shorter travel times for all modes and purposes will lead to an improved quality of life and economic benefits with people spending less time in traffic	Approximate 15% reduction in average journey times in peak period
Trip Frequency Increase	Reductions in Journey Times into, and around the city, combined with a decrease in traffic and improved city centre environment may lead to increased leisure and tourist trips in the region	Wider social and economic benefits not quantified in the Cost Benefit Appraisal
Origin Change (resulting from different land use pattern)	National Planning Framework will ensure that future land use planning takes place in a consolidated and sustainable manner in all scenarios (with and without the project)	Placing developments along sustainable transport corridors will lead to an increase in sustainable travel within the city

Whilst the delivery of the Project in isolation will, of itself, contribute to the attainment of the Project objectives as set out in Chapter 3 of this updated EIAR, its delivery in the context of the Galway Transport Strategy, the National Planning Framework (as envisaged) and the Climate Action Plan, will help mitigate any potential negative effects of induced traffic. The outcomes presented in the table above are all significant positive impacts.

The delivery of the Project as a core component of the Galway Transport Strategy will provide more space and priority in the city centre for sustainable modes of travel, where priority or segregation cannot be provided due to a lack of space.

With respect to the potential impacts of the Project on urban sprawl, the National Planning Framework sets a major new policy emphasis on concentrating future growth within brownfield sites in urban areas and along public transport corridors in order to promote sustainable travel patterns. Recent large-scale proposed developments in the city centre, such as the large scale Office/Retail development at Bonham Quay and the redevelopment of Céannt Station as a large mixed-use development, are aligned with these NPF sustainable development principles.

The delivery of the city and county's future population in compact urban forms in accordance with the requirements of the NPF will support investment in sustainable infrastructure and limit urban sprawl within Galway City and its environs.

In the context of the Climate Action Plan, while the project does results in a small increase in car mode share when implemented on its own, when the Project is implemented alongside demand management measures required to align to CAP24, the car mode share remains unchanged. This factor demonstrates that the Project does not facilitate a mode shift to car when demand management measures are introduced.

6.9 Mitigation Measures

6.9.1 Construction Phase

As noted, the construction of the Project will cause temporary short term traffic impacts on the local road network. The Construction Environmental Management Plan, included in Appendix A.7.5 of this report, shall ensure that construction traffic impacts are minimised through the control of site access/ egress routes and site access locations, identification of suitable haul routes, minimisation of use of local roads. Moreover, the detail required in the Construction Traffic Management Plan (CTMP), to manage and control the traffic impacts of the construction works, is also provided in Section 12 of Appendix A.7.5. The CTMP sets out limits and monitoring measures for all issues relating to construction traffic including but not limited to site access and egress, construction compounds, traffic management signage and speed limits, provision for pedestrians and cyclists, lighting, parking, vehicle and road cleaning, road closures and communications.

6.9.2 Operational Phase

In summary, the traffic modelling indicates that for the Opening (2031) and Design (2046) Years there are no traffic impacts of major significance and therefore no mitigation measures are required. The outcomes presented in Table 6.30 above are all significant positive impacts.

6.10 Residual Impacts

6.10.1 Construction Phase

With the implementation of the mitigation measures that have been identified, there will be no major impacts during the construction phase of the Project.

6.10.2 Operational Phase

The Project will result in significant changes to the local, regional and national road network and traffic flows. The modelling work undertaken to assess the traffic impacts of the Project confirms that there will be an overall positive traffic benefit. Further, by freeing up road space in the City Centre and its environs, the Project will provide benefits to existing and new public transport services and walking and cycling routes on

the adjoining local and regional road network and other measures proposed by the existing Galway Transport Strategy.

As demonstrated in the analysis contained in this chapter, the residual impacts of the implementation of the Project – which are positive benefits – include:

- The Project is hugely beneficial for reducing traffic congestion in Galway City in the AM and PM Peak and for reducing journey times
- The Project reduces the network delay considerably (between 30% - 45% reduction in peak hours) by removing several bottlenecks
- The Project will result in a 33% reduction in traffic on the Quincentenary Bridge and a 25% reduction in HGV kilometres within the existing N6/R338 cordon, freeing up capacity within the city centre to support priority for sustainable travel measures
- AADT reductions outside of schools leading to improved air quality in these locations
- Removal of traffic from the city centre especially HGVs resulting in improvement in improved safety across the city
- Project will result in improved journey times across the network for all modes including public transport
- AADT reductions along roads which are planned to serve new bus routes as part of the NTA's BusConnects network and which have no current bus lanes, or any planned bus priority infrastructure under the current GTS
- The existing N6/R338 spine experiences journey time savings of approx. 40% during peak periods
- Project leads to between 20% - 30% reduction in the number of junctions operating at or close to capacity across the metropolitan area

Indeed, there are no residual negative traffic impacts anticipated.

6.11 Climate Action Plan Scenario

6.11.1 Introduction

An Bord Pleanála issued a Request for Further Information (RFI) to Galway County Council on 6 December 2023 (Ref: ABP-318220-23). As part of the RFI, a submission was requested in relation to the most recent Climate Action Plan and the implications of the new Galway City Development Plan. The RFI submission details the results of this assessment and, for ease of reference, this section includes a high-level summary of the some of the key outcomes. For further details on this assessment, reference should be made to the document titled *Obligations under Section 15 of the Climate Action and Low Carbon Development Act 2015 (as amended) and submissions in relation to the Climate Action Plan 2024* included in Part IV of the 2025 RFI Response Report.

6.11.2 Climate Action Plan 2024

The Climate Action Plan 2024 (CAP24) was initially published on 20 December 2023 and the final version was approved by Government on 21 May 2024. Therefore, as at the date of submission of this updated EIAR, CAP24 is the most recent approved Climate Action Plan and is used for this assessment.

CAP24 is the third annual update to Ireland's Climate Action Plan. The purpose of the Climate Action Plan is to lay out a roadmap of actions which will ultimately lead to Ireland meeting its national climate objective of pursuing and achieving, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy. CAP24 aligns with the legally binding economy-wide carbon budgets and sectoral emissions ceilings that were agreed by Government in July 2022.

CAP24 contains the following Key Performance Indicator's (KPI) in relation to the transport sector:

- A 50% reduction in transport-related emissions compared to 2018 levels, is targeted by 2030
- A 20% reduction in total vehicle kilometres compared to a 2030 Business-as-Usual (BaU) scenario

The Business-as-Usual (BaU) scenario effectively means a continuation of current trends/policy, i.e., in the absence of CAP.

CAP24 targets a 20% reduction in the 2030 BaU level of vehicle kilometres, as opposed to a 20% reduction in the current or 2018 level of total vehicle kilometres (as applied to emission reduction targets).

It should also be noted that these are national targets and they do not mean that any individual project should, of itself, result in 20% less kilometres travelled. Regional targets and projected outcomes for Galway or other areas are not included in CAP24.

The BaU scenario is a forecast 2030 scenario which assumes a certain level of transport infrastructure, based upon schemes which are likely to be built by 2030 in line with the National Development Plan. It does not include for committed transport schemes only, which could be defined as those that already have been through statutory approval processes and have planning permission to proceed.

Within CAP, this BaU scenario is used as the benchmark for the vehicle kilometre reduction KPI and is then compared against a CAP Do-Something scenario which contains a suite of demand management measures, of a scale which would change travel behaviours and travel mode choices and ultimately achieve the 20% reduction in total vehicle kilometres target.

In order to assess the project in the context of CAP24, these two KPIs have been quantified in a transport modelling exercise and the results presented below.

6.11.3 Climate Action Plan Assessment Results

6.11.3.1 Emissions Reduction

The emissions reduction KPI is measured by comparing the levels between the 2030 CAP DS scenario and the 2018 scenario. The geographical area used for the comparison, was taken as the Area of Influence[10] of the Project. The area is shown in Plate 6.20 below.

[10] The area over which the project results in changes in traffic flows

Plate 6.20 Project Area of Influence - Used for Emissions Reduction

When comparing the CAP Do Something scenario to the 2018 scenario, there is an approx. 43% reduction in vehicle emissions for the above geographical area. While this figure falls short of meeting the 50% target set out in CAP24, it does show that a significant emissions reduction can be achieved with the Project in place, whilst also catering for an approx. 30% increase in the population level across the metropolitan area by 2030, versus 2016 levels.

6.11.3.2 Vehicle Kilometre Reduction

The vehicle kilometre reduction KPI is measured by comparing the kilometres travelled in the 2030 CAP Do Something scenario against the 2030 BaU scenario. As previously mentioned, the BaU scenario also includes the proposed N6 GCRR. The same geographical area was used in line with the emission reduction KPI. Table 6.31 below shows the comparison of kilometres travelled by vehicle type, over a full 24-hour day.

Table 6.31 Vehicle Kilometre Reduction Comparison

Vehicle Type	2030 BaU	2030 CAP DS	Diff (%)
Cars	5,804,590	4,770,659	-18%
LGVs	432,041	427,581	-1%
HGVs	456,865	453,370	-1%
Total	6,693,494	5,651,608	-16%

The table above shows that the reduction in car kilometres is 18%, while the total vehicle kilometre reduction is 16%. Again, whilst these figures fall just short of the 20% national target set out in CAP24, they

do show a significant reduction whilst also catering for an approx. 30% increase in the population level across the metropolitan area by 2030, versus 2016 levels.

6.11.3.3 Mode Share Comparison

An additional mode share KPI, was extracted, both with and without the Project, to gain a greater understanding it's function and impact under each scenario. Plate 6.21 below shows the mode share comparison for the metropolitan area in the AM peak hour.

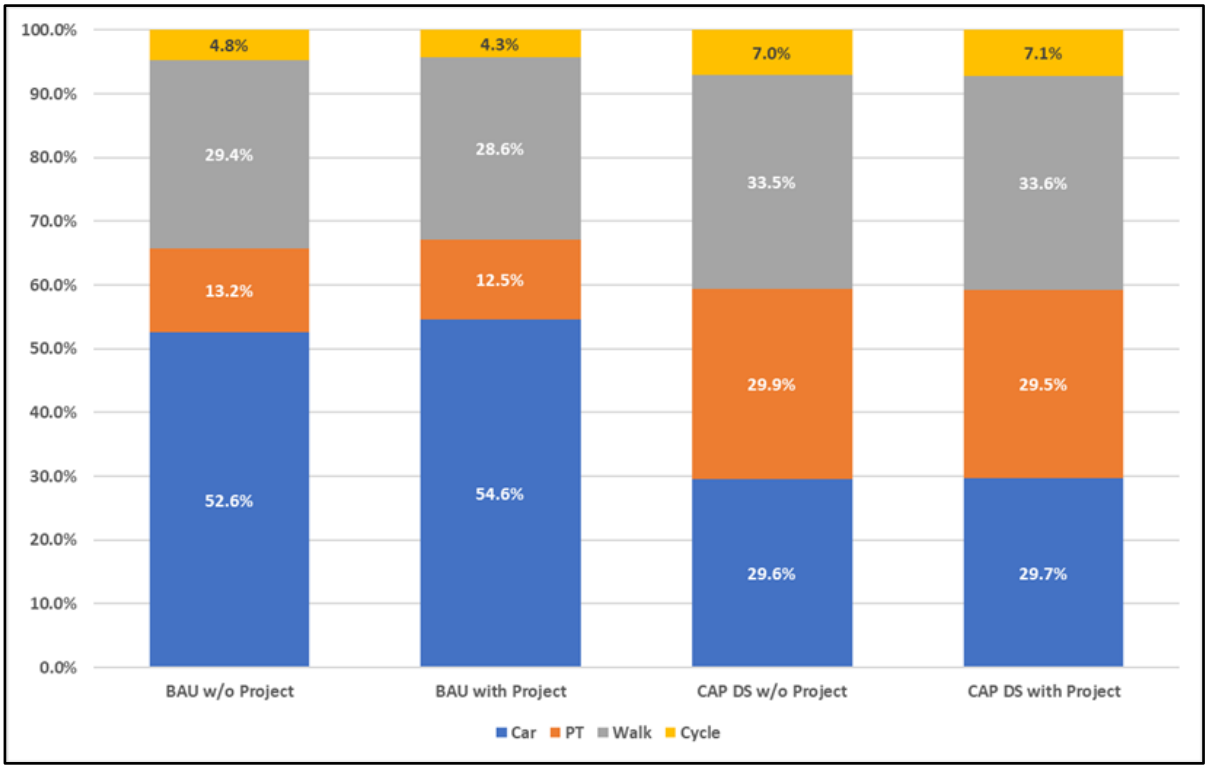


Plate 6.21 Mode Share Comparison - Impact of Project

In the BaU scenario (first two bars in graph), the car mode share (blue bars) within the metropolitan area sees a 2% increase (52.6% vs 54.6%) when the Project is included. Whilst following the inclusion of the CAP DS demand management measures (third and fourth bar in graph), the car mode share decreases by approximately 25% to only 29.6% (blue bar, previously was 52.6% in BaU without project and 54.6% in BaU with project) in the without Project scenario. This 2% increase in car mode share between the "with Project" and "without project" BaU scenarios i.e. no CAP, is due to a combination of reasons, the first being that there is a level of induced traffic. Section 6.8 of this chapter specifically looks at induced traffic and the impact of the Project.

In the "with Project" CAP DS scenario, the car mode share (blue bar) remains effectively unchanged (29.7%) when compared with the equivalent "without Project" scenario (29.6%), which means that the Project does not facilitate a mode shift to car when the demand management measures are introduced. Section 6.8 above examines some of the underlying reasons by looking at the profile of drivers who continue to use the Project, when the CAP DS demand management measures are introduced.

6.12 Summary

The detailed analysis which has been carried out, as detailed in this chapter, clearly demonstrates that the implementation of the Project will result in significant benefits in terms of junction operation, network performance and journey time savings. By providing an alternative route around the city, the Project will result in reduced traffic levels and congestion in the city centre.

There will be one traffic impact of significance as a result of the introduction of the Project on one route, when measured against one of the key performance indicators. As referenced in Section 6.6.1.1, this factor is

related to a journey time on one route in the 2046 AM peak and , which results in an increase in journey time along one route which is caused by the Project relieving bottlenecks within the city and enabling traffic to progress more smoothly through the network.

The RFC analysis in the peak travel periods shows that the Project leads to between 20% - 30% reduction in the number of junctions operating at or close to capacity across the metropolitan area. Similarly, journey times on key routes around, and into, the city are reduced during peak periods because of the introduction of the Project. For example, the existing N6/R338 spine, experiences journey time savings of approx. 40% during peak periods, following the introduction of the Project.

The project in isolation, does lead to an increase in vehicle kilometres travelled as illustrated by the 5% - 7% increase during the peak hours. There is also an increase in the car mode share of 2% in both peak hours. These increases were further analysed in Section 6.8, which examined the reasons behind induced traffic.

However, and significantly, the results from the Climate Action Plan sensitivity test demonstrated that, when the Project is implemented alongside demand management measures, which are designed to help meet CAP24 targets, the car mode share remains unchanged. Accordingly, the Project does not facilitate a mode shift to car when the demand management measures outlined in the Section 6.11, are introduced.

As an important component of the 2016 Galway Transport Strategy, the Project will tackle the city's congestion issues and resultant negative impacts. In particular, by reducing the number of cars and HGVs on the roads within the city centre and its environs, the Project will improve streetscapes and the increased use of active modes and on the public transport system will be facilitated. As a result, more sustainable travel modes will be supported and encouraged.

In the absence of the Project, however, traffic conditions in the city centre will continue to deteriorate resulting in a situation whereby crossing the city becomes increasingly difficult. Such restricted movement will lead to changes to where people live and work over time, with people choosing to live and work on one side of the city or another, as the delay experienced travelling across the city becomes too great. This change in travel behaviour, or suppression of trip making, will constrain the economic development of Galway City and its environs. The Project will provide the required capacity for all modes of transport in Galway to support economic growth into the future.

Overall, having considered all factors relevant to update the analysis contained in the 2018 EIAR, the conclusion is that the Project will result in significant positive impacts when assessed against relevant KPIs and will result in reduced traffic levels and congestion within the city and will provide a better quality of life for the city's inhabitants and provide a much safer environment in which to live.

Indeed, one illustration of overall environmental benefits is provided by the AADT reductions outside of schools, which will improve air quality in these locations. In terms of transport benefits, the AADT reductions along roads which are planned to serve new bus routes as part of the NTA's BusConnects network and which have no current bus lanes will contribute to more reliable journey times for bus users across the city where there is no current or planned bus priority infrastructure.

As per An Bord Pleanála's Request for Further Information (RFI) to Galway County Council on 6 December 2023 (Ref: ABP-318220-23), a submission was requested in relation to the most recent Climate Action Plan and the implications of the new Galway City Development Plan. The submission included an assessment of the Project against the targets set out in CAP24 for the transport sector. The assessment was undertaken with regard to the infrastructure contained in the 2016 Galway Transport Strategy (GTS), as the 2016 GTS represents the current adopted transport strategy for Galway and its recommendations are incorporated into the Galway City Development Plan 2023-2029.

The results of the assessment showed that when demand management measures were introduced, there was an approx. 43% reduction in vehicle emissions, compared with 2018 for the area assessed. For the vehicle kilometre reduction KPI in CAP24, the results showed that a 16% total reduction could be achieved against the Business as Usual scenario.

The data set out in this chapter demonstrates that significant reductions can be achieved as a result of implementing the Project in relation to attaining national targets, with the Project in place, even in the context of simultaneously catering for an approx. 30% increase in the population level across the metropolitan area by 2030, versus 2016 levels.