Julianstown Village Traffic Relief Scheme
Feasibility Report



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JULIANSTOWN TRAFFIC RELIEF SCHEME

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References

TII Project Appraisal Guidelines Unit 3.0 – Feasibility Report (available at: https://cdn.tii.ie/publications/PE-PAG-02012-02.pdf)

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EXECUTIVE SUMMARY

The Julianstown Traffic Relief Scheme is a strategic initiative by Meath County Council to address excessive traffic volumes through Julianstown, a small village experiencing over 21,000 vehicles passing through per day, which is more than double the acceptable capacity for its road infrastructure. This high traffic volume results in congestion, safety risks, noise pollution, and poor conditions for active and public transport.

Despite the construction of the M1 motorway, Julianstown continues to serve as a major through-route for commuters from south Drogheda and East Meath, with 60–70% of traffic ultimately joining the M1 at Junction 7. Current traffic patterns show that the village functions more as a regional traffic corridor than a local settlement.

SYSTRA was commissioned to conduct this Feasibility Report to evaluate the need for intervention, test alignment with policy, and identify viable strategic options. Key drivers for the project include growing population and transport demand in the area, a high collision rate relative to village size, and harmful noise levels near sensitive receptors such as Whitecross National School.

Seven initial strategic options were assessed. Following a comprehensive evaluation of technical feasibility, environmental constraints, policy alignment, and effectiveness in meeting project objectives (notably reducing AADT to 8,600), three options emerged as viable for further appraisal:

- Option 4: A new M1 link road north of Julianstown and traffic management measures on R132 through Julianstown.
- Option 5: A western bypass around Julianstown and traffic management measures on R132 through Julianstown.
- Option 6: A western bypass connecting to the R150 and traffic management measures on R132 through Julianstown.

These options best meet the objectives of reducing traffic, improving safety, lowering noise levels, and protecting environmental and heritage assets. The next project phase will involve preliminary design, environmental assessment, and preparation of a Preliminary Business Case.

1 INTRODUCTION, PROJECT BACKGROUND AND DESCRIPTION

Julianstown is a small rural village in County Meath, located on the R132 corridor south of Drogheda and west of Laytown. Despite its modest population of 700, the village experiences disproportionately high levels of through-traffic, with over 21,000 vehicles per day recorded as the Average Annual Daily Traffic (AADT). This volume is excessive for a village of its size and has created serious challenges, including traffic congestion, safety concerns, air and noise pollution, and impediments to active and public transport use.

The R132 was historically part of the primary north-south route between Dublin and Belfast, until the opening of the M1 motorway in the early 2000s. However, despite these upgrades, Julianstown remains a strategic conduit for regional traffic, especially for commuters from Drogheda, Laytown, Bettystown and the surrounding areas travelling to Dublin. A majority—of 60 to 70%—of southbound traffic through Julianstown ultimately joins the M1 at Junction 7.

Meath County Council, recognising the severity and persistence of these issues, has included the Julianstown Traffic Relief Scheme in the Meath County Development Plan 2021–2027. The aim is to reduce traffic volumes through the village and improve the management of regional road traffic in East Meath. SYSTRA was commissioned to prepare this feasibility report, the purpose of which is to confirm that a feasible project exists by verifying the project need and strategic alignment and to determine a set of Strategic Options.

Initial measures already underway include Phase 1 of an interim traffic calming scheme. These works aim to lower speeds, enhance pedestrian safety, and improve the streetscape environment within the village. However, they are not designed to address the strategic traffic load currently impacting Julianstown. Therefore, an initial set of 7 long-term options had been proposed, with 3 emerging from this report as feasible options.

Traffic analysis confirms that private car usage dominates local travel patterns, and that traffic volumes will likely remain high—even with planned rail improvements such as DART+ Coastal North. Preliminary modelling suggests that without further intervention, traffic congestion, accident risk, and environmental degradation will persist or worsen as population and transport demand continue to grow.

The project aligns with multiple policy objectives at national, regional, and local levels, including the National Development Plan 2021–2030, the Greater Dublin Area Transport Strategy, and Meath County Council's Movement Strategy.

Looking ahead, the next phase will involve option selection to identify a preferred solution, design and environmental evaluation, and a Preliminary Business Case in line with Department of Transport Appraisal Framework.

2 DEFINITION OF STUDY AREAS

In accordance with Transport Infrastructure Ireland (TII)'s Project Appraisal Guidelines (Unit 3.0 – Section 3.3), two types of study areas have been defined to guide the appraisal and design process for the Julianstown Traffic Relief Scheme: the Appraisal Study Area and the Constraints Study Area. These spatial definitions ensure a structured and evidence-based approach to the assessment of transport conditions, development of strategic options, and identification of potential impacts.

Appraisal Study Area

The Appraisal Study Area defines the geographical area within which transport conditions, demand patterns, and intervention impacts will be evaluated. It reflects both the origins and destinations of traffic travelling through Julianstown and the wider influence area of potential modal shifts or reassignments.

This study area centres on Julianstown village and extends:

- **Northwards** to Drogheda, which is a key employment and residential hub generating significant commuting flows;
- **Southwards** along the R132 corridor towards Gormanston, and towards Junction 7 of the M1, capturing key desire lines to Dublin;
- **Eastwards** towards Laytown and Bettystown, rapidly growing coastal settlements whose residents regularly commute via Julianstown; and
- **Westwards** towards the M1 Corridor.

The Appraisal Study Area also includes secondary connections, public transport nodes (e.g., Laytown station), and areas where active travel potential may be unlocked through future interventions. This allows comprehensive analysis of trip patterns, infrastructure provision, and the evaluation of strategic options including demand management, modal shift, and road-based solutions. It also enables a consideration of travel demand beyond Julianstown's core, accommodating both local and regional impacts.

Figure 1. Map of the Appraisal Study Area

Constraints Study Area

The Constraints Study Area defines the spatial scope for identifying physical, environmental, and engineering limitations that may affect the feasibility of intervention options. It currently encompasses Julianstown and its immediate rural surrounds to the north and south. West to east the Constraints Study Area extends along the River Nanny from the M1 in the west to the Irish sea in the east, allowing for the identification of natural features (such as the River Nanny and surrounding floodplains), built environment constraints (including heritage buildings and village streets), and infrastructure assets.

This area may evolve iteratively as the project progresses through option development and environmental appraisal. The Constraints Study Area will

inform the design and refinement of options by highlighting features to be avoided, mitigated, or integrated, such as protected areas, local ecological sensitivities, or existing road alignments.

Summary

The Appraisal Study Area provides a broad framework for travel demand analysis, option development, and performance evaluation, while the Constraints Study Area supports the identification of risks and design considerations. Together, these study areas ensure the project remains evidence-driven, responsive to policy goals, and grounded in local and regional transport realities.

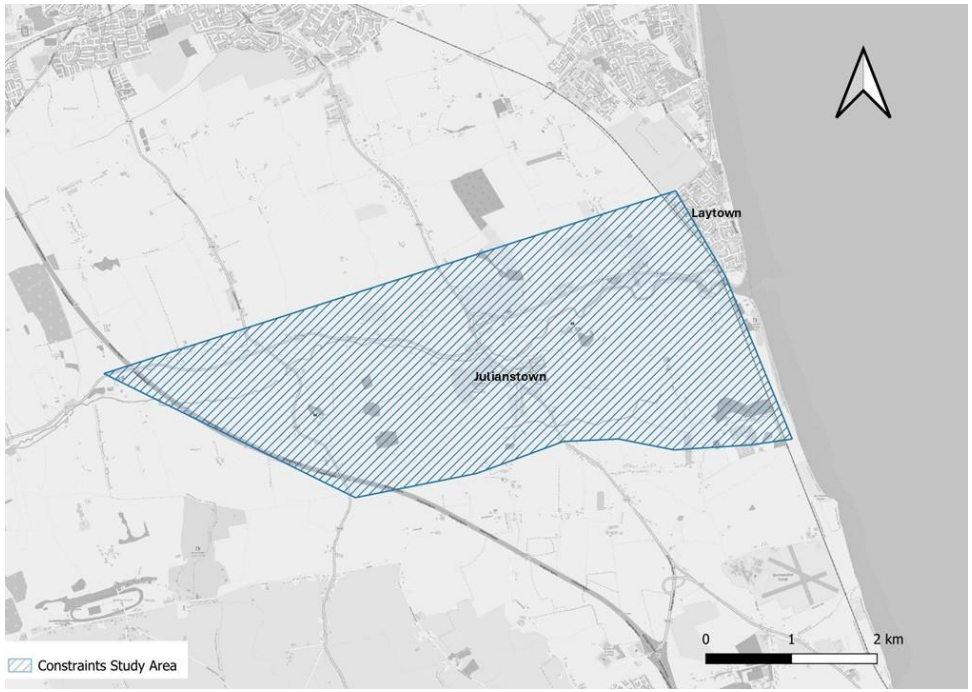


Figure 2. Constraints Study Area

3 BASELINE REVIEW OF STUDY AREA

3.1 Road Transport Provision

Julianstown is a heavily congested village, mainly due to its location and the position of the junction between the R150 and the R132. A former national road – the R132 was the N1 Dublin – Belfast before the opening of the M1 in 2003 – this road plays a vital role for traffic travelling to and from south Drogheda, East Meath (Laytown, Bettystown, Donacarney and Mornington) and also to and from Dublin.

Level of Service

Presently there is no guidance in Ireland or the UK addressing acceptable levels of traffic, in terms of capacity, for rural or urban roads. Transport Infrastructure Ireland (TII) guidance[1] (DN-GEO-0303) from 2017 on rural road link design provides guidance on the capacity of rural roads. Whilst this guidance has now been withdrawn and therefore should not be referenced in the design of rural roads, the document does give guidance on thresholds for maintaining acceptable Levels of Service (LOS) D[2] for various road types, and therefore, given that no updated quantified capacities are available, this guidance remains a useful point of reference when viewing the capacity of roads.

In the case of Julianstown, which is considered a village in a rural setting,[3] the R132 through the village currently experiences an AADT of over 20,000[4] (with an AADT of 21,201 recorded in 2024[5]). According to the aforementioned guidance on rural road link design, a Type 2 Single Carriageway - which describes the R132 in Julianstown with its 7-metre-wide carriageway with 0.5-metre hard strips - has a maximum capacity of 8,600 AADT for maintaining Level of Service (LOS) D. LOS is a measurement used to evaluate road performance in terms of traffic flow and speed. It considers factors such as vehicle speed, mobility and safety. LOS D represents the point at which traffic density and flow conditions begin to degrade noticeably, leading to increased congestion.

With an AADT of over 20,000, the R132 in Julianstown faces traffic levels that are 130% over the limit to maintain LOS D conditions, which are already at the upper limit of acceptable traffic flow. Exceeding this threshold, as is the case in Julianstown, means that the road operates at LOS E or F, especially during peak hours when the road faces traffic levels of 1,150 per hour in the peak direction and long queues become prevalent.

This level of congestion has a considerable negative impact on Julianstown and the wider region, as the R132 serves as a primary access route to the M1 for residents and businesses in south Drogheda, Laytown, and Bettystown. Commuters from these towns, as well as the residents of Julianstown face prolonged and unpredictable journey times, affecting economic productivity and quality of life. Furthermore, the constrained road space affects public transport reliability, making buses susceptible to the same delays as private vehicles, ultimately discouraging modal shift towards more sustainable transport options.

In summary, the R132 in Julianstown is significantly over capacity, with actual traffic volumes far exceeding the 8,600 AADT limit required to maintain LOS D. This results in congestion, extended journey times, and negative socio-economic impacts. A reduction of traffic to a level within the acceptable threshold of 8,600 AADT, a reduction of 57% compared to an AADT of over 20,000 currently, is

[1] https://cdn.tii.ie/publications/DN-GEO-03031-10.pdf, page 54/110
[2] https://www.tii.ie/media/dzrgu0gk/tii-national-roads-network-indicators-2023-1.pdf
[3] CSO's Urban and Rural Life in Ireland 2019, defines Rural areas as having an area type with a population less than 1,500 persons
[4] https://trafficdata.tii.ie/sitedashboard.asp?sgid=XZOA8M4LR27P0HAO3_SRSB&spid=4E30484E302E
[5] https://trafficdata.tii.ie/publicmultinodemap.asp

essential to restore the functionality of this key transport corridor and support efficient regional connectivity.

Comparison with similarly sized settlements

A comparison of Julianstown with other similar settlements has been undertaken examining traffic levels and the results are outlined in Table 1. The settlements were selected based on the following criteria:

- Similar population to Julianstown (500 – 900 residents);
- Located on a national road or a major regional road; and
- Availability of AADT data through nearby traffic counters.

Town	Population	County	Major road	AADT[6]
Julianstown	701	Meath	R132	21,201
Kinvara	721	Galway	N67	5,244
Delvin	714	Westmeath	N52	6,886
Dunmore	664	Galway	N83	4,593
Mountcharles	652	Donegal	N56	11,654
Castlefinn	730	Donegal	N15	5,002
Termonbarry	699	Roscommon	N5	5,576
Emyvale	638	Monaghan	N2	6,864
Frenchpark	572	Roscommon	N5	5,954
Ringaskiddy	575	Cork	N28	10,710
Cappoquin	778	Waterford	N72	5,310
Borris-In-Ossory	629	Laois	R445	3,799
Ballyhooly	610	Cork	N72	3,069
Rathmore	766	Kerry	N72	6,483

[6] TII Traffic Data (data for 2024)
[7] CSO Census Data 2011 East Meath
[8] CSO Census Data 2016 East Meath
[9] CSO Census Data 2022 East Meath

Table 1. TII Fixed Traffic Count Data for Comparable Towns (2024 data)

As shown in Table 1, Julianstown's traffic levels are, on average, approximately four times higher than settlements of comparable size, and twice as high as the next settlements on the list, Mountcharles and Ringaskiddy, with AADTs of 11,654 and 10,710 respectively.

3.2 Existing Population

The Appraisal Study Area consists of two main urban areas, from which most traffic through Julianstown originates, Drogheda and East Meath, consisting of Laytown, Bettystown, Donacarney and Mornington.

There has been a substantial population growth within the extended study area in recent history. The population of the Laytown-Bettystown-Mornington-Donacarney (East Meath) urban area has grown from 10,900 in 2011[7], to 11,900 in 2016[8], to 15,700 in 2022[9]. This is an increase of 4,800 or 44% between 2011 and 2022.

The population of Drogheda has grown from 38,600 in 2011[10], to 41,000 in 2016[11], to 44,100 in 2022[12]. This is an increase of 5,500 or 14% between 2011 and 2022. Given the substantial population growth within the extended study area, demand for transport has risen significantly over the past 15 years.

3.3 Future Demand Growth

Demand growth in relation to transportation is driven by population, employment, and other demographic changes. Table 2 presents the projected growth of the population, employment, and education for the area.

[10] CSO Census Data 2011 Drogheda
[11] CSO Census Data 2016 Drogheda
[12] CSO Census Data 2022 Drogheda

The future land use scenario presented in this section is based on data provided by the NTA, in collaboration with relevant local authorities. The projections are based on 2016 census data, as projections based on the 2022 data are, as of May 2025, not yet available.

The table below shows the 2016 and 2042 population, employment, and education across the study area, which are in line with regional and local planning aspirations, and with the overall objectives of the NPF and the RSES, for the area of reference.

Given the population growth forecasts, shown in Table 2, it is anticipated that demand for transport will continue rise in the coming years. Wider interventions in the delivery of sustainable transport and demand management will mitigate the impact of increasing demand for transport on traffic problems, such as improvements to the Dublin-Belfast rail corridor and DART+. However, it is anticipated that as a result of population and employment growth, and despite the improvements to public transport, transport demand on the R132 through Julianstown will continue to increase.

Table 2. Future demand growth statistics

Area	Population		Population Growth	
	2016	**2042**	**2016 to 2042 (%)**	
Drogheda	41,000	53,300	12,300	30%
East Meath	11,900	15,000	3,100	26%
Area	**Education**		**Education-Growth[13]**	
	2016	**2042**	**2016 to 2042 (%)**	
Drogheda	3,200	3,900	700	22%
East Meath	900	1,100	200	22%

Area	Employment		Employment-Growth	
	2016	2042	**2016 to 2042 (%)**	
Drogheda	16,700	21,400	4,700	28%
East Meath	4,900	6,100	1,200	24%

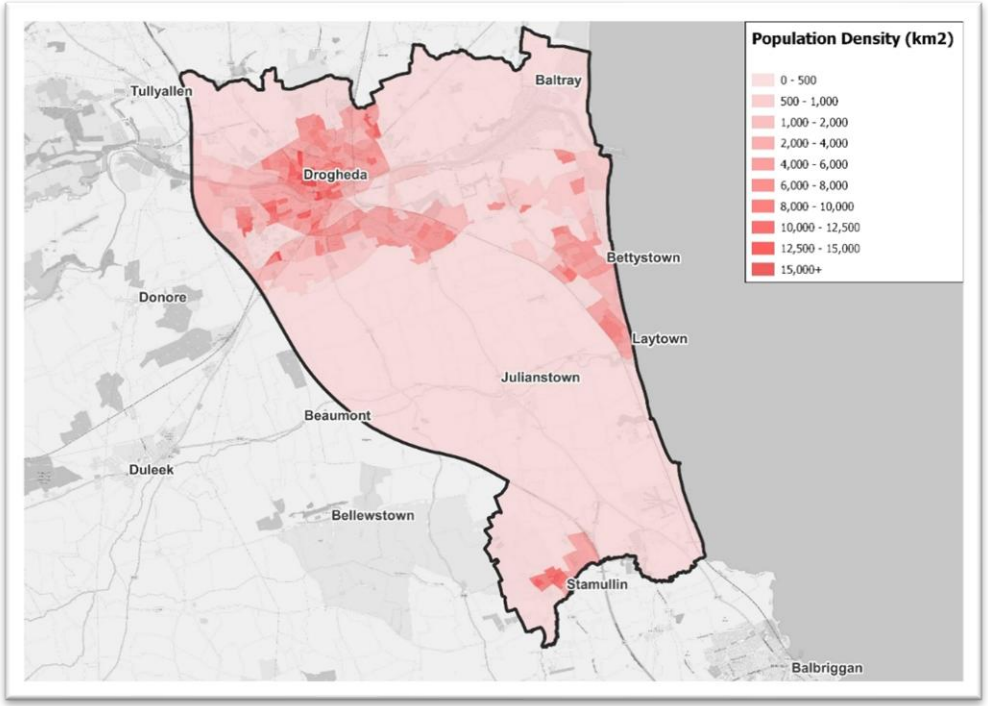


Figure 3. Proposed population densities for the study area

Figure 3 shows the anticipated population densities within the study area. Both the East Meath urban area and (the south of) Drogheda will have considerable population densities. Consequentially, in the absence of significant interventions,

these areas will drive growth of transport demand in general, and in particular the growth of vehicle movements and congestion.

3.4 Origin and Destination Analysis

Traffic flows and trips were assessed using the NTA's Eastern Regional Model and data from TomTom.

The Eastern Region Model (ERM) was used to model origin and destination trips. Northbound and southbound journeys were modelled for the AM and PM peaks, on both the R132 and on the M1. Modelling was done for 2016, the base year of the model.

In addition to analysis through the ERM model, origin/destination analysis was undertaken through the use of TomTom data, for September and October 2022.

The data was focused on weekdays only with the following specifications:

- Morning peak (6am-9am)
- Evening peak (4pm-7pm)
- 24-hours (all day).

Eastern Regional Model (ERM)

Select link analysis was completed using the 2016 base year. The data for the link analysis for the southbound AM peak is shown in Figure 4.

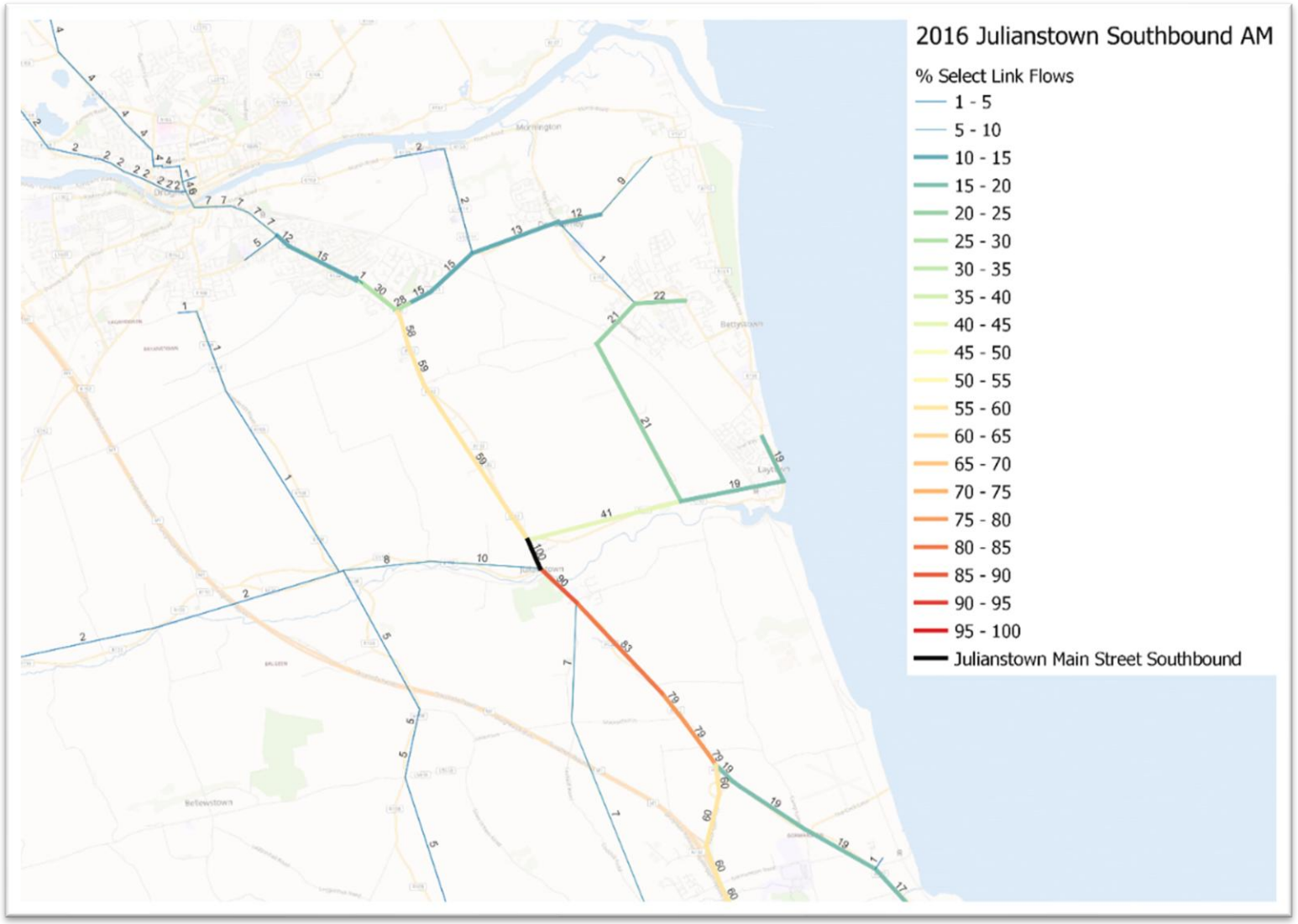


Figure 4. **ERM link analysis for southbound traffic on the R132 during the AM peak**

As shown in Figure 4, southbound traffic during the AM peak on the R132 through Julianstown originates in:

- Laytown/Bettystown: 41%
- Donacarney/Colpe/Mornington: 15%
- Southeast Drogheda: 37%
- Rest of Drogheda: 7%

South of Julianstown, this traffic disperses to the following destinations:

- M1 Junction 7: 60%
- Gormanstown/Balbriggan via the R132 corridor: 19%
- Local destinations: 21%

Northbound traffic movements in the PM peak period are shown in Figure 5. This shows similar travel patterns to the southbound traffic analysis in the AM peak period.

As shown in Figures 4 and 5, a significant majority of all traffic through Julianstown during the peak periods travels to or from the M1. To gain a further understanding of the destinations of these vehicles, the ERM was used to model traffic on the M1 during the peak periods.

Figure 6 shows southbound traffic movements on the M1 during the AM peak. Traffic passing through junction 7 has a variety of destinations:

- Approximately 15 to 20% of traffic exits at Swords through Junction 4;
- Approximately 15 to 20% exits at Dublin Airport through Junction 2;
- Approximately 25% joins the M50 at Junction 1; and
- Approximately 20% heads into Dublin city centre via either the Port Tunnel or the N1 through Drumcondra.

Northbound traffic movements on the M1 during the PM peak show similar travel patterns.

TomTom Data

The comparison of the TomTom Data and the ERM model shows similar traffic patterns. Figure 7 shows southbound travel patterns on the R132 through Julianstown during the AM peak:

- Approximately 40 to 45% of traffic originates in Laytown or Bettystown
- Approximately 10% of traffic originates in Donacarney
- Approximately 40 to 45% of traffic originates in Drogheda.

Conclusion

Both the ERM and TomTom data show that traffic through Julianstown originates mainly in East Meath – Laytown, Bettystown, Donacarney and Mornington – and south Drogheda. South of Julianstown, a majority of 60 to 70% joins the M1 at Junction 7, with approximately 10 to 20% continuing along the R132 towards Gormanston and Balbriggan.

The analysis shows that for over 90% of traffic, this route is the only reasonable option to get to their destination. Only 10% of traffic originates in parts of Drogheda where other exits of the M1, Junctions 8, 9 or 10, could offer a similar or faster journey to their destination.

Most of the traffic through Julianstown joins the M1 towards Dublin, but final destinations are varied, with significant numbers going to Swords, Dublin Airport, the M50, and Dublin city centre.

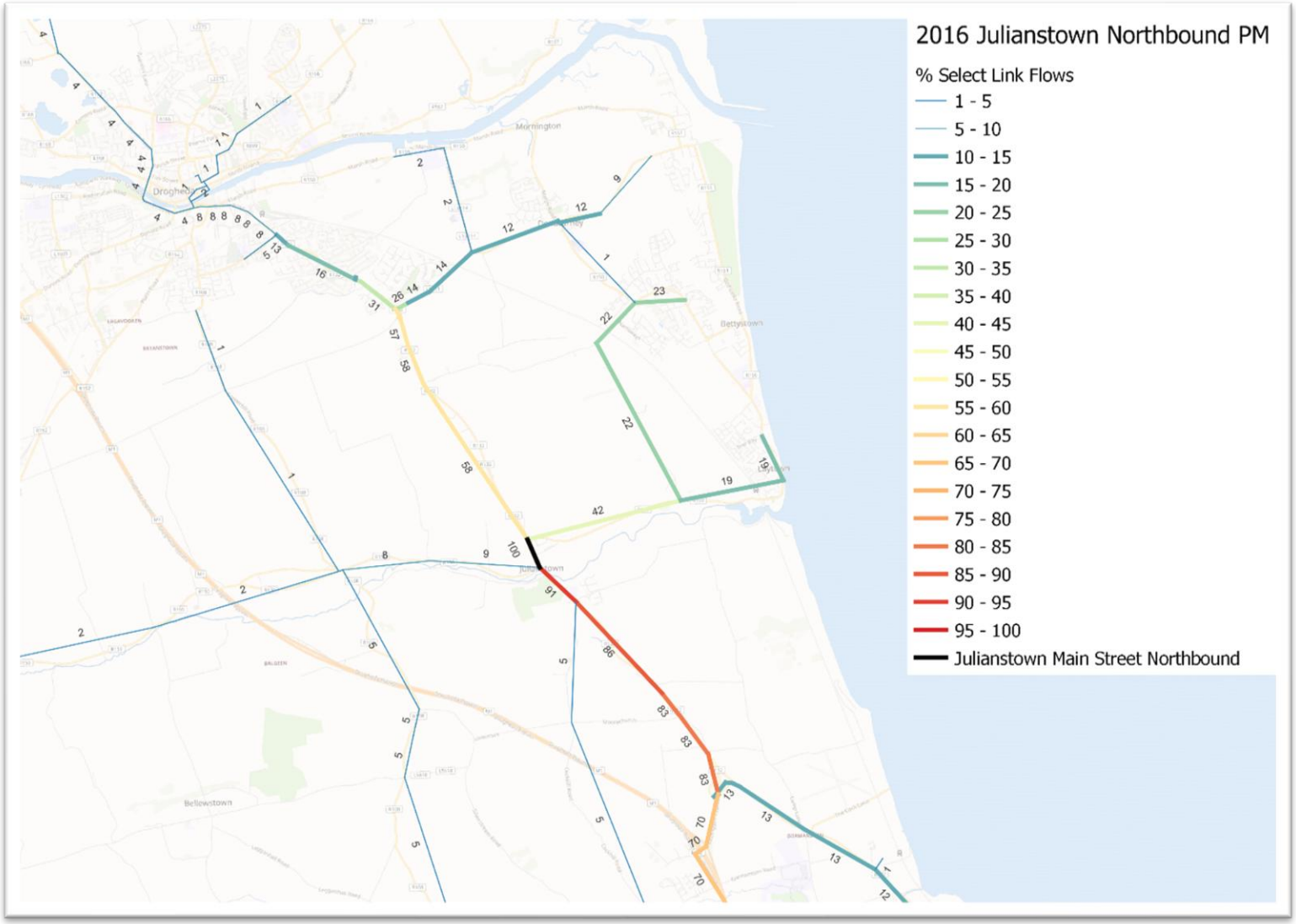


Figure 5. ERM link analysis for northbound traffic on the R132 during the PM peak

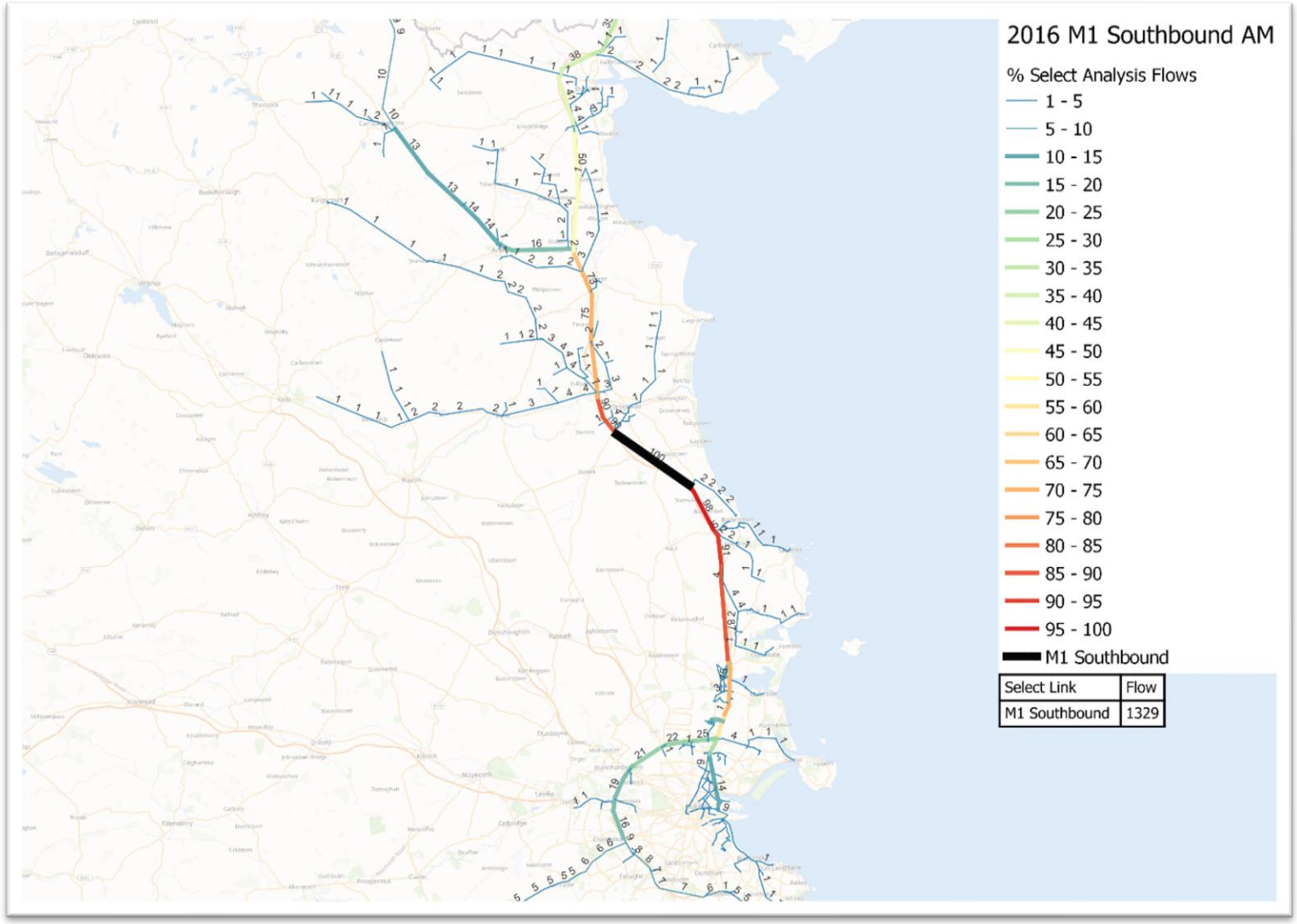


Figure 6. ERM link analysis for southbound traffic on the M1 during the AM peak

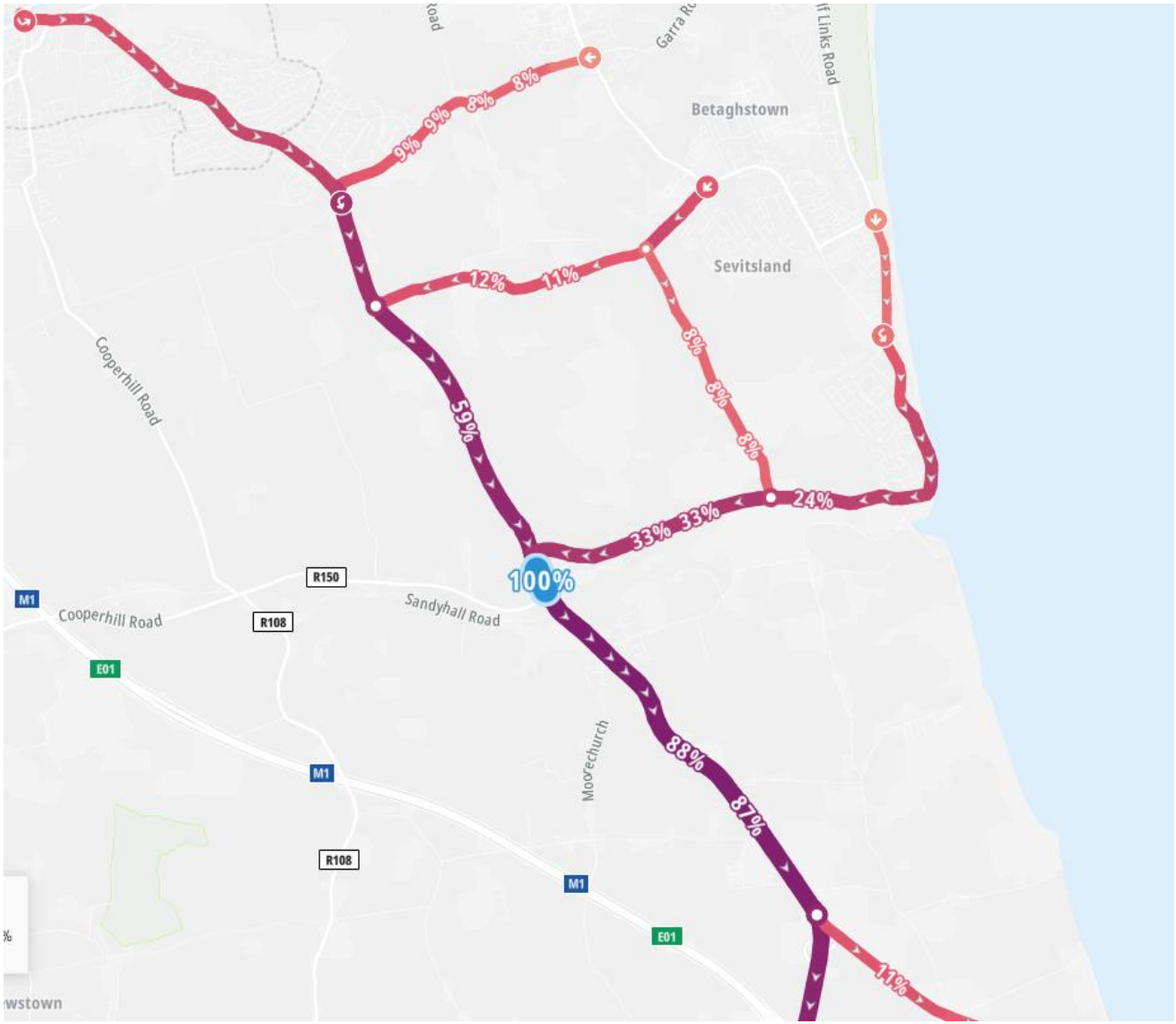


Figure 7. TomTom link analysis for southbound traffic on the R132 during the AM peak

3.5 Road Safety

Road Accident Data

A review of available collision data for the R132 through Julianstown from the time period of 2005 to 2016, shows that there have been 25 minor injury type collisions, and 3 serious injury type collisions which have resulted in 4 serious injury casualties and 42 minor injury casualties over this 12-year period.

Based on the very high AADT for the R132 at this location, the Personal Injury Collison Rate for the section of the road is not above the expected level[14], however for a village with a population of 700 people an average of 2.08 minor injury collisions and 0.25 serious injury collision annually (including pedestrian casualties) is considered a cause for concern.

Over the five years between 2017 and 2022 there have been 30 accidents in the area resulting in 25 material damage collisions, 4 minor injuries collisions and 1 collision resulting in serious injury.

3.6 Noise Pollution

Modelled noise data indicates that current noise levels along the R132 in Julianstown are greater than 70 decibels on average (dB)[15], which is considered to be harmful for prolonged exposure, especially for children.

In Julianstown, the local school is located directly on the main road, exposing children to elevated noise levels daily. According to the European Environment Agency (EEA)[16], prolonged exposure to high noise levels in children can lead to:

- Impaired cognitive development, affecting concentration and learning abilities.
- Increased stress and anxiety levels.
- Higher risk of sleep disturbances and associated health issues.

Moreover, adults in the village can also experience negative effects of noise pollution, including sleep disturbances, which can lead to chronic fatigue, decreased productivity, and overall reduced well-being. Noise pollution has been linked to increased levels of stress hormones such as cortisol, which can contribute to long-term health complications if left unaddressed.

In terms of the perception of noise, the following thresholds of perception were identified by the Design Manual for Roads and Bridges (DMRB, UK)[17] :

- A 3 dB(A) decrease represents the threshold to a perceptible improvement, as changes below 3db(A) are generally not perceptible.
- A 5 dB(A) decrease represents a significant improvement.

Noise pollution correlates directly with traffic levels. As per the DMRB guidance, the relationship between AADT and noise levels follows a logarithmic pattern, rather than a linear one. Therefore, the following applies:

- To reduce noise by 3 dB → AADT must be cut by +-50%.
- To reduce noise by 5 dB → AADT must be cut by +-70%.

Therefore, in order to achieve a perceptible to significant reduction in traffic noise in Julianstown, AADT's would need to be reduced to 6,000 to 10,000 through the village, down from over 20,000 currently.

[14] As set out in TII Project Appraisal Guidelines Unit 6.11, Table 22. https://cdn.tii.ie/publications/PE-PAG-02030-07.pdf

[15] https://tii.maps.arcgis.com/apps/StorytellingSwipe/index.html?appid=f721e0edc1bb420b8d2f926a7c7f41f6

[16] https://www.eea.europa.eu/en/analysis/publications/the-effect-of-environmental-noise-on-children

[17] Design Manual for Roads and Bridge (DMRB) Volume 11 Section 3 Part 7 HD 213/11.

3.7 Public Transport Provision

As discussed in section 3.4, traffic through Julianstown mainly originates in East Meath – Laytown, Bettystown, Donacarney and Mornington – and south Drogheda. South of Julianstown, a majority of up to 70% joins the M1 at Junction 7, with most of this traffic headed for Swords, Dublin Airport, the M50, and Dublin city centre.

The following section will describe the existing public transport alternatives for these traffic flows.

Drogheda

Drogheda is served by a number of direct public transport services connecting Drogheda to destinations along the M1 and R132 corridors and along the Dublin Belfast Rail Line.

Bus Eireann's 100X is the main express bus service between Dublin, Dublin Airport, Drogheda and Dundalk. This service runs hourly and has a journey time of 35 minutes between Drogheda bus station and Dublin Airport, and journey times of 55 minutes between Drogheda and Dublin city centre.

Bus Eireann's 101 bus service connects Drogheda bus station to Dublin's city centre via Julianstown, Balbriggan, Balrothery, Swords, Santry, Whitehall and Drumcondra. The service runs at 20-minute intervals during the peak, and 30-minute intervals during the off-peak. The total journey time is approximately 2 hours.

The 101X service supplements the 101 service, connecting Termonabbey via Drogheda bus station and Balbriggan to Dublin city centre through the Dublin Port Tunnel. This service runs 5 times southbound during the AM peak, and 4 times northbound during the PM peak. This peak service runs non-stop between Balbriggan and Dublin city centre and has journey times ranging between 1hr 5 minutes and 1hr 20 minutes between Drogheda bus station and Dublin's city centre.

Matthew's Bus operates an additional express bus service 900 between Dundalk, Drogheda and Dublin city centre (O'Connell Street) via Drumcondra. This service runs hourly with a half hourly service during peak times in the peak direction. The service does not serve Drogheda bus station, but it does serve the town centre through a stop at George's Street. The bus service has a journey time of 1 hour between George's Street and O'Connell Street.

Drogheda also has a railway station, Drogheda MacBride, with services operated by Irish Rail. Drogheda benefits from being a stop for the hourly Enterprise intercity service between Dublin and Belfast, which runs non-stop to Dublin and has a journey time of 36 minutes between Drogheda and Dublin Connolly, although journey times are considerably longer in the southbound direction during the AM peak due to congestion on the line.

The station also sees a total of 33 commuter services depart towards Dublin every weekday. During the off-peak hours there are 2 trains per hour. However, these are not evenly spread over the hour, with 40- and 20-minute gaps between the services. There are additional services during the peak. The commuter services generally serve all stations between Drogheda and Malahide, and then run non-stop to Dublin Connolly, with one train per hour continuing onwards to Tara Street, Dublin Pearse and Grand Canal Dock. Journey times are approximately 1 hour between Drogheda and Dublin Connolly.

The public transport services for Drogheda to destinations along the M1 corridor are summarised in Table 3.

SERVICE	ROUTE	WEEKDAY SERVICES PER HOUR		NUMBER OF SERVICES PER DAY PER DIRECTION
		Peak	Off Peak	
100X	Dundalk – Drogheda – Dublin Airport – Dublin City Centre	1	1	16
101	Drogheda – Julianstown – Balbriggan – Balrothery – Swords – Santry – Whitehall – Drumcondra – Dublin City Centre	3	2	45
101X	Drogheda – Julianstown – Balbriggan – Dublin City Centre	3-4	N/A	4
900	Dundalk – Drogheda – Dublin City Centre	2	1	21
Intercity Rail	Belfast – Portadown – Newry – Dundalk – Drogheda – Dublin	1	1	15
Commuter Rail	Drogheda – Laytown – Gormanston – Balbriggan – Skerries – Rush and Lusk – Donabate – Malahide – Dublin	4	2	33

Table 3. Public Transport Services Drogheda to destinations along the M1 corridor

East Meath

East Meath is served by a bus and rail service, connecting the area to Dublin.

Matthew's Bus runs a direct bus service from East Meath to Dublin. This bus service departs in Grangerath in south Drogheda and serves Donacarney, Bettystown, Laytown and Julianstown, before running to Drumcondra and O'Connell Street via the M1/N1. This service runs hourly, with additional services creating a half-hourly service during the peak. Journey times between Grangerath and O'Connell Street are approximately 1 hour.

East Meath is also served by a commuter rail station in Laytown. This station is served by the same commuter route as Drogheda MacBride, which operates as described above. Journey times between Laytown and Dublin Connolly are approximately 55 minutes. Passengers from Donacarney, Mornington and Bettystown can use the D1 and D2 local bus services to connect at the railway station in Laytown. However, as the rail service is not evenly spread over the hour, connections are not optimised and can be extensive.

There are currently no direct bus services from East Meath to Swords, Dublin Airport and other destinations along the M1 corridor. Upgrades to public transport services (including to/from East Meath and Swords/Dublin Airport) will be included as a sensitivity test during further appraisal.

The public transport services for East Meath to Dublin are summarised in Table 4.

SERVICE	ROUTE	WEEKDAY SERVICES PER HOUR		NUMBER OF SERVICES PER DAY PER DIRECTION
		Peak	Off Peak	
910	Grangerath – Donacarney – Bettystown – Laytown – Julianstown – Dublin City Centre	2	1	21
Commuter Rail	Drogheda – Laytown – Gormanston – Balbriggan – Skerries – Rush and Lusk – Donabate – Malahide – Dublin	4	2	33

Table 4. Public Transport Services East Meath to Dublin

4 ENVIRONMENTAL CONSTRAINTS STUDY

4.1 Introduction

The following chapter establishes the environmental, heritage and archaeological considerations for the Julianstown Traffic Relief Scheme. It identifies the baseline environment and any potentially sensitive receptors.

Where sensitive receptors are identified, the principle of mitigation by avoidance is preferable and will be integrated into any future transportation schemes/ plans.

4.2 Special Protection Areas

There is one site in the extended study area which is designated as a Special Protection Area (SPA), the River Nanny Estuary SPA.

Ireland is required under the terms of the EU Birds Directive (2009/147/EC) to designate Special Protection Areas (SPAs) for the protection of:

- Listed rare and vulnerable species
- Regularly occurring migratory species
- Wetlands, especially those of international importance, which attract large numbers of migratory birds each year.

The River Nanny Estuary SPA comprises the estuary of the River Nanny up to a point approximately 1.2km from the R132 (as the crow flies), as well as a strip of approximately 4.8km along the Irish coast from the north of Laytown down to the Gormanston army camp, as displayed in Figure 8.

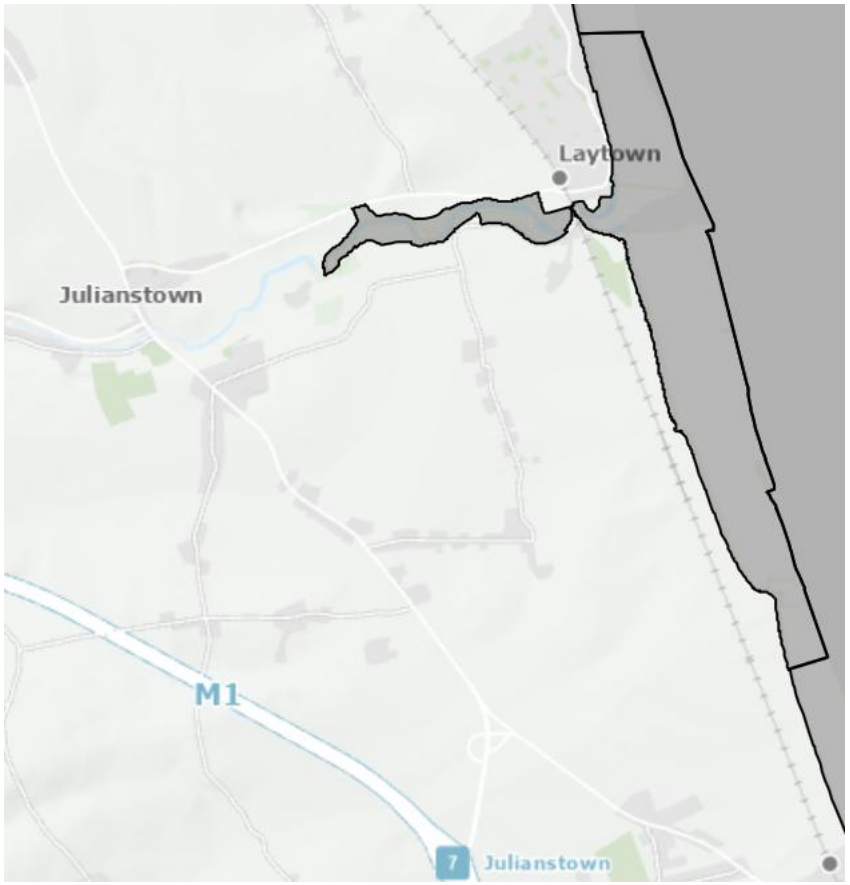


Figure 8. The extent of the River Nanny Estuary SPA

4.3 Proposed National Heritage Areas

There is one proposed National Heritage Area (pNHA) in the extended study area, the Laytown Dunes/Nanny Estuary pNHA.

The basic designation for a wildlife area is the Natural Heritage Area (NHA). This is an area considered important for the habitats present or which holds species of plants and animals whose habitat needs protection.

To date 148 areas have been designated as Natural Heritage Areas. In addition, there are 630 proposed NHAs (pNHAs), which were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated. These sites are of significance for wildlife and habitats.

Despite the lack of formal (statutory) designation, pNHAs are subject to limited protection, including the recognition of the ecological value of pNHAs by Planning and Licencing Authorities.

The extent of the Laytown Dunes/Nanny Estuary pNHA is shown in Figure 9.

Figure 9. The extent of the Laytown Dunes/Nanny Estuary pNHA

4.4 Protected and Invasive Species

A number of protected and invasive species have been recorded in the extended study area, as recorded within the National Biodiversity Data Centre (NBDC), OS Tile O17 (NBDC 2025). The list of protected and invasive species can be found in Appendix A.

4.5 Hydrology

The River Nanny flows through the extended study area, from its source near Navan, through Duleek and Julianstown, to Laytown, where it enters the Irish Sea.

The coastal area of the extended study area has a medium flood risk, whereas the River Nanny has a medium to high flood risk (Catchment Flood Risk Assessment Management (CFRAM) Programme maps). There is a significant number of locations, both north and south of the river, that have seen recurring flood events. All but one of these locations are situated east of the R132, as shown in Figure 10.

Figure 10. Locations of recurring flood events in the extended study area

4.6 Heritage and Archaeology

The National Monument Service provides access to the Archaeological Survey of Ireland (ASI) database[18]. This database is also known as the Sites and Monuments Record (SMR) and it was accessed to identify features of archaeological interest in the extended study area. There are a number of protected archaeological features within the area, the locations of which are shown in Figure 11. The density of archaeologically significant sites is significantly higher east of the R132, compared to west of the R132, at the point where it crosses the River Nanny.

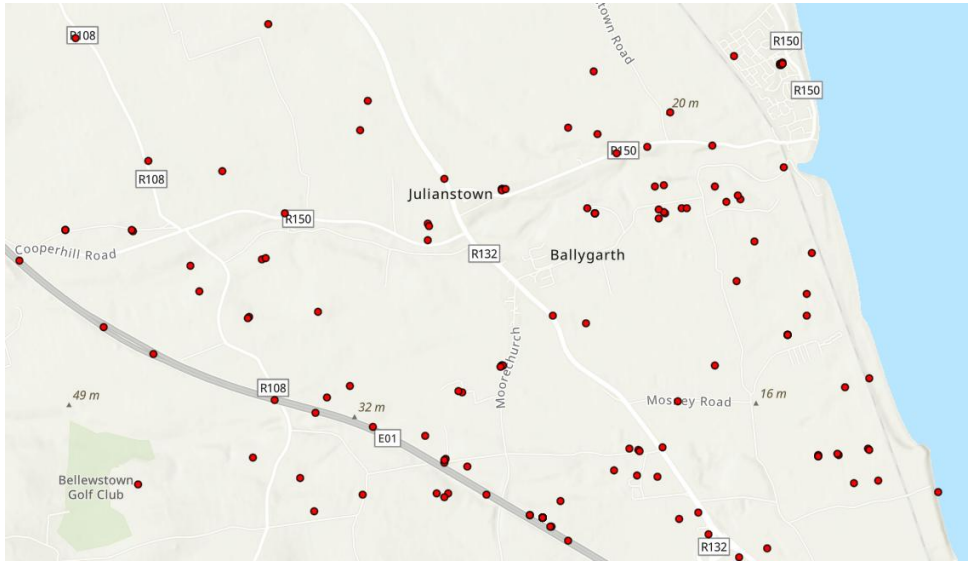


Figure 11. Locations of heritage sites in the extended study area

[18] ASI database

The village of Julianstown is an Architectural Conservation Area. An Architectural Conservation Area (ACA) is a place, area, group of structures or townscape that is of special architectural, historical, archaeological, technical, social, cultural, or scientific interest. It is a mechanism which aims to identify and protect areas of special significance.

There are certain implications for development within an ACA - protection generally relates to the external appearance of structures and features of the streetscape. The aim of ACA designation is not to prevent development, but rather to guide sensitive, good quality development which will enhance the historical character of the area.

The boundary of the Julianstown Architectural Conservation Area (ACA) extends from the southern side of the bridge across the River Nanny and includes the former mill on the north bank, a short stretch of approximately 150m of the Duleek Road (R150) to the west behind the mill, and the houses on the R132 north of the bridge up to the R132/Hillcrest junction. The boundaries of the ACA are shown on the map in Figure 12.

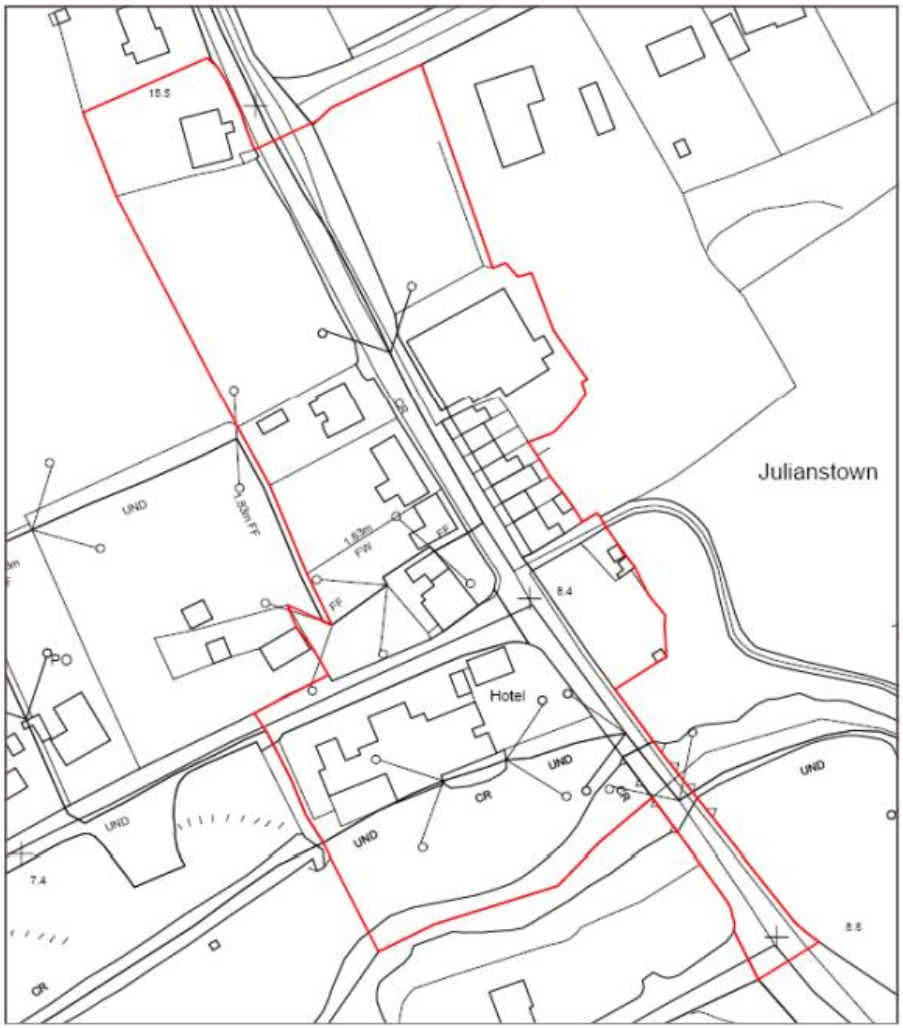


Figure 12. Boundary of the Julianstown ACA

4.7 Conclusions

The extended study area has been assessed in terms of environmental facets including designated sites, ecological receptors, hydrology, cultural heritage and archaeology, and sensitive receptors have been identified where present. In summary:

- The River Nanny Estuary is protected east of the R132, both as a Special Protection Area (SPA) and as a proposed National Heritage Area (pNHA)
- There are a number of protected and invasive species in the extended study area;
- There is a significant number of locations, both north and south of the River Nanny, that have seen recurring flood events. All but one of these locations are situated east of the R132;
- There are a number of protected archaeological features within the area. The density of archaeologically significant sites is significantly higher east of the R132, compared to west of the R132; and
- The village of Julianstown is an Architectural Conservation Area.

5 STRATEGIC ALIGNMENT

5.1 Policy Context

All United Nations Member States, including Ireland, adopted the 2030 Agenda for Sustainable Development in 2015 which included Sustainable Development Goals (SDGs). There is a strong correlation between the United Nations (UN) SDGs and the National Strategic Outcomes (NSOs) of the National Planning Framework 2040. The alignment of the project with NSOs is described in this section.

Julianstown Traffic Relief aims to address a combination of the following SDG's:

- **SDG 3: Good Health and Well-Being;** reducing harmful emissions and in turn the reduction of severance and an inhospitable environment for active modes due to congestion will help ensure healthy lives and promote well-being for people of all ages.

- **SDG 8: Decent Work and Economic Growth;** Improving access to employment and services to promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

- **SGD 10: Reduced Inequalities;** By providing enhanced connectivity, a reduction in barriers to travel and accessibility to employment, education and services.

Addressing the harmful impacts of traffic in Julianstown will support the health and well-being of the local population. Reducing traffic delays and improving reliability, including for public transport, will improve access to education and employment and support the economy.

Table 5 below outlines the key existing national, regional, and local polices, plans, and guidelines, relevant to the scheme.

Table 5. Planning and Policy Documents

National Level
○ Project Ireland 2040: National Planning Framework (First Revision April 2025) and National Development Plan 2021-2030 (Review 2025)
○ National Investment Framework for Transport in Ireland 2021
○ Climate Action Plan / National Adaptation Framework / Sectoral Adaptation Plan for Transport Infrastructure
○ 2022 National Sustainable Mobility Policy
○ Our Journey Towards Vision Zero: Road Safety Strategy 2021-2030
Regional Level
○ NTA's Greater Dublin Areas Transport Strategy 2022 – 2042
○ Eastern and Midland Regional Spatial and Economic Strategy 2019 – 2021
Local Level
○ Meath County Development Plan 2021 - 2027

5.2 National Policy

Project Ireland 2040: National Planning Framework (First Revision April 2025) (Government of Ireland, 2025)
A key future policy priority for the Eastern and Midland Region included in Project Ireland 2040 is: "A focused approach to compact, sequential and sustainable development of the larger urban areas along the Dublin – Belfast economic and transport corridor, along which there are settlements with significant populations such as Dundalk and Drogheda."

Julianstown Traffic Relief is aligned with the 10 key NSO's as follows:

- **NSO 3: Strengthened Rural Economies and Communities-** the scheme will directly benefit the community of Julianstown making it a healthier, more attractive place to live and attend school.
- **NSO 5: Sustainable Mobility-** there is the potential to address the barrier that traffic volumes pose to active modes and to improve bus journey times and reliability together with better access to bus stops.
- **NSO 8: Transition to a Carbon-Neutral and Climate Resilient Society-** care will need to be taken in the design and consideration of options to avoid growth in car traffic demand, particularly in the short term when the proportion of vehicles powered by internal combustion engines is high.
- **NSO 10: Access to Quality Childcare, Education and Health Services-** improved connectivity and journey times will enhance access to services and reduce the barriers to travel.

The option development and consideration of the Julianstown Traffic Relief Project will need to be aligned with the core principles set out by NPF 2040. There is potential to support an increase in sustainable travel locally such as safe routes to Whitecross National School and to address some of the inequality created by high car dependency, particularly in rural areas.

Project Ireland 2040: National Development Plan Review 2025 (Government of Ireland, 2025)
Projects completed to date under the original NDP include the Bettystown to Laytown regional road. Investment in roads to address safety issues, deliver traffic management and to support the local community is aligned with the NDP.

National Investment Framework for Transport in Ireland (Dept of Transport, 2021)
The alignment of options to deliver Julianstown Traffic Relief Scheme will have to be considered within the NIFTI criteria. This will include improving conditions for active travel and public transport through the village whilst prioritising use of existing infrastructure.

Climate Action Plan 2025 (Department of the Environment, Climate and Communications, 2023)
The impact of Julianstown Traffic Relief Scheme on transport emissions will require careful consideration. Current travel patterns in the area are very dependent on cars and measures to support journeys by active modes and public transport will align with CAP 2025.

National Sustainable Mobility Policy (DoT, 2022)
Local interventions to improve mobility of the population in Julianstown will align with the National Sustainable Mobility Policy. Options that deliver traffic relief whilst improving conditions for active modes and public transport relative to car will perform best against policy themes.

Our Journey Towards Vision Zero: Road Safety Strategy 2021-2030
Julianstown Traffic Relief Scheme will assist in the implementation of the Road Safety Strategy, through the reduction of congestion and risk of collisions.

5.3 Regional Policy

Regional Spatial and Economic Strategies (RSES)
Julianstown is centrally located in this region. RSES is focusing on and intends to improve the economies locally and attract investment by improving the quality of life within the region.

The growth in population envisaged within the RSES for the region generally, and for Drogheda, Bettystown and Laytown in particular will increase demand for transport along the corridor to Dublin including on the R132 through Julianstown. The Julianstown Traffic Relief Scheme will need to take into account the additional transport demand and the impact on the local population, environment and wider economy.

Greater Dublin Area Transport Strategy 2022- 2042 (National Transport Authority 2022)
The objectives for the Julianstown Traffic Relief Scheme align with objectives set in the GDA by the NTA with aims for improving transport options and connectivity through Julianstown leading to a better quality of life for the local population and supporting a strong and stable economy and inclusive transport system given the function of the strategic regional road to provide for connectivity to isolated areas. The high volumes of buses routed along the R132 will benefit from interventions which would strengthen public transport along the corridor.

5.4 Local Policy

Meath County Development Plan 2021- 2027 (Meath County Council 2021)
The policies (MOV POL) contained in the Movement Strategy relevant to the Julianstown Traffic Relief Scheme are as follows:

- **MOV POL 9***:* To ensure that the design and planning of transport infrastructure and services accords with the principles of sustainable safety, in order that the widest spectrum of needs, including pedestrians, cyclists, the ageing population and those with mobility impairments are taken into account.

- **MOV POL 30***:* To liaise with the NTA and TII (where appropriate) on appropriate control measures within its remit, designed to better manage the demand for road space to allow the efficient movement of essential traffic.

- **MOV POL 32***:* To ensure the protection of the existing roads infrastructure while improving the capacity and safety of the road network to meet future demands.

The key objectives under the movement strategy (MOV OBJ) are:

- **MOV OBJ 28:** To revise road junction layouts, where appropriate, to provide dedicated pedestrian and cycling crossings, reduce pedestrian crossing distances, provide more direct pedestrian routes, and reduce the speed of turning traffic.

- **MOV OBJ 35:** To support the installation of appropriate traffic management measures on a case-by-case basis on the approach roads to all schools throughout the county in the interest of road safety.

- **MOV OBJ 49:** To support essential public road infrastructure including, bypasses of local towns and villages and proposed national road schemes and where necessary reserve the corridors of any such proposed routes free of development, which would interfere with the provision of such proposals. A list of such schemes is included in the Development Plan with reference to the R132 Julianstown Bypass. Each of these projects will be subject to the outcome of an Appropriate Assessment process.

- **MOV OBJ 50**: To continue to deliver targeted capacity road upgrades within the County to eliminate congestion blackspots.

- **MOV OBJ 55**: To promote the delivery of the following key strategic road Bryanstown Link Road (Drogheda).

- **MOV OBJ 66**: To assess the potential for, and, if appropriate, introduce, HGV management measures in town centres.

Consideration of Julianstown Traffic Relief Scheme is an objective of the current Meath County Development Plan. The main policies and objectives set out in the Development Plan will be cascaded down to the project with a focus on the reduction of the congestion, traffic calming and traffic management whilst supporting the role of the essential road network.

The Meath CDP sets out the following Movement Objectives for Julianstown**:**

- **JUL OBJ 8:** To seek to introduce traffic management and traffic calming through Julianstown in order to provide an enhanced and safer environment for the village.

- **JUL OBJ 9:** To provide/upgrade pedestrian crossing facilities such as a raised junction treatment at key locations.

- **JUL OBJ 10:** To improve linkages along the R150 between Julianstown and Laytown including the improvement of cyclist and pedestrian connectivity and facilities between both centres.

- **JUL OBJ 11:** To examine the feasibility and progress the design and delivery of a preferred option for the Julianstown Bypass in conjunction with relevant stakeholders.

The policies and objectives set out in the Meath CDP will be cascaded down to the project with a focus on pedestrian improvements and the reduction of the congestion, traffic calming and traffic management.

6 PROJECT RATIONALE

The case for investment in the Julianstown Traffic Relief Scheme is underpinned by a detailed baseline review of the existing and future conditions in and around Julianstown, as presented in Chapter 3 of this report.

6.1 Existing Transport Provision

Julianstown lies on the R132, a road once part of the national primary route between Dublin and Belfast. Despite the opening of the M1 motorway, the R132 through Julianstown still carries in excess of 20,000 vehicles per day—far beyond its design capacity of 8,600 AADT. This results in severe congestion, particularly during peak hours, with the road operating at Level of Service E or F, below the lowest acceptable Level of Service D. The R132 remains a key connector for traffic from East Meath and south Drogheda to the M1 and onwards to Dublin, placing disproportionate pressure on Julianstown.

The existing road infrastructure is not aligned with its role and traffic volume. The overuse of a road through a village for heavy regional traffic is unsustainable and undermines connectivity and local quality of life.

6.2 Existing Population

Population growth in the surrounding areas—particularly Laytown, Bettystown, Donacarney, Mornington, and Drogheda—has driven increased transport demand. Between 2011 and 2022, East Meath's population grew by 44% and Drogheda's by 14%, resulting in intensified commuter flows along the R132 corridor.

Rapid urban expansion without matching transport upgrades has created a situation where a rural village is effectively a corridor with levels of traffic comparable to motorways, justifying the need for structural transport intervention.

6.3 Future Demand Growth

Projections for 2042 forecast a continued rise in population, employment, and education-related travel in East Meath and Drogheda. Even with rail and bus service improvements, traffic volumes on the R132 are expected to rise.

Anticipated growth will amplify the already critical transport pressures on Julianstown. Investment is needed not only to manage existing strain but also to accommodate and mitigate future demand.

6.4 Origin and Destination Analysis

Detailed modelling from both the Eastern Regional Model and TomTom data confirms that most traffic through Julianstown originates in East Meath and south Drogheda, and that over 60% of this traffic joins the M1 at Junction 7. The analysis also shows that for more than 90% of drivers, there is no practical alternative to passing through Julianstown to reach their destinations.

The traffic through Julianstown is largely not local, and the village is functioning as a de facto interchange for the regional network. This reinforces the strategic case for diverting through traffic and restoring Julianstown's local function.

6.5 Road Safety

Between 2017 and 2022, Julianstown recorded 30 accidents. For a small village, this frequency is a serious concern. The area's school, located directly on the R132, is especially exposed.

The combination of excessive through-traffic and vulnerable road users in a constrained village environment poses an unacceptable safety risk. Reducing traffic volumes would directly reduce this risk.

6.6 Noise Pollution

Noise levels on the R132 through Julianstown are consistently above 70 decibels (dB), exceeding thresholds considered harmful by health authorities such as the European Environment Agency (EEA), particularly for prolonged exposure. This is especially concerning in the context of Julianstown, where sensitive receptors such as schools and residential areas are located directly adjacent to the road.

Whitecross National School, attended by over 400 pupils—including children with additional needs in Autism Spectrum Disorder (ASD) classes—is situated immediately beside the R132. Pupils and staff are therefore exposed daily to levels of environmental noise which are associated with impaired cognitive development, increased stress, anxiety, and sleep disturbances. Adults in the area face similar risks, with noise exposure linked to cardiovascular stress, chronic fatigue, and decreased quality of life.

The documented levels of traffic noise, especially around a school and residential properties, present a public health and wellbeing concern. Investment is justified not only on transport grounds but also from an environmental health perspective. Reducing traffic volumes through Julianstown would directly lower ambient noise levels, contributing to a safer, more supportive environment for children and the wider community.

6.7 Constraints

If the preferred solution for the Julianstown Traffic Relief Scheme requires the development of additional transport infrastructure, this might require a crossing of the River Nanny, which is likely to have a considerable cost implication for the project.

As discussed in section 4.7, the following environmental constraints have been identified for the project:

- The River Nanny Estuary is protected east of the R132, both as a Special Protection Area (SPA) and as a proposed National Heritage Area (pNHA).
- There are a number of protected and invasive species in the extended study area.
- There is a significant number of locations, both north and south of the River Nanny, that have seen recurring flood events. All but one of these locations are situated east of the R132.
- There are a number of protected archaeological features within the area. The density of archaeologically significant sites is significantly higher east of the R132, compared to west of the R132.
- The village of Julianstown is an Architectural Conservation Area.

These constraints lead to the following conclusions:

East of the R132

The area to the east of the village should be avoided for any new infrastructure for the following reasons:

- It contains both the River Nanny Estuary SPA and the Laytown Dunes/Nanny Estuary pNHA, both of which protect highly sensitive ecological zones.
- This area also includes multiple recurring flood events, making it challenging and costly from a flood resilience and engineering standpoint.
- The high density of archaeological sites further increases the environmental risk profile of eastern options.

Given the density and severity of these constraints, any development east of Julianstown would face substantial environmental, planning, and financial barriers. The principle of mitigation by avoidance should be applied and therefore new infrastructure should not be located in this area if possible.

Julianstown village

Julianstown itself is designated as an Architectural Conservation Area (ACA). While this does not prevent development outright, it imposes controls on the external appearance and character of structures within the village core.

Developing infrastructure capable of accommodating 20,000+ AADT within this ACA would fundamentally conflict with the village's heritage character. Furthermore, spatial limitations within the village core make it practically difficult to implement effective and safe solutions at this scale.

Given these issues, and applying the principle of mitigation by avoidance, new infrastructure should not be located within the ACA. However, this excludes placemaking for active travel and upgrading the existing infrastructure in line with the NIFTI hierarchy in such a way that the Julianstown ACA is enhanced.

7 OBJECTIVES

7.1 POD Objectives

The Project Objectives listed in Table 6 were identified within the Project Outline Document (POD). These objectives are neutral and mode agnostic. However, they are 'SMART enabled', meaning they can be made Specific, Measurable, Achievable, Realistic and Timebound, when required in future stages. In the preparation of this Feasibility Report, KPI's have been identified that can be used to identify the options performance against the objectives. The project objectives and KPIs will be further developed at later stages of the project.

Table 6. Project Objectives

CRITERIA		PROJECT OBJECTIVES	KPI(S)	CONSIDERATION IN FEASIBILTY REPORT
Transport User Benefits and Other Economic Impacts	1	Reduce the impact of congestion at Julianstown on strategic regional network traffic	• Level of Service of D or better along the R132 through Julianstown	Likely reduction in volume of traffic through Julianstown reflecting LoS D or better
	2	Improve the reliability of transport for trips through Julianstown	• Reliability of public transport (bus) and other vehicular traffic through Julianstown	Qualitative assessment of likely impact on reliability for bus and other vehicular traffic
Accessibility	3	Improve access to education and employment for those who rely on the regional road through Julianstown	• Access to Whitecross Primary School for active modes (catchment mapping) • Journey time to work and education, primarily for commutes to and from Julianstown and surrounding areas	Qualitative assessment of improved access to Whitecross Primary School Qualitative assessment of potential to improve journey times to work and education
Safety	4	Reduce the risk of road traffic accidents within Julianstown Village	• Risk of road traffic accidents	Likely reduction in vehicular volumes through Julianstown and potential for safety measures
Local Environment	5	Reduce the impact of traffic on noise pollution	• Level of traffic noise within Julianstown	Likely reduction in volume of traffic through Julianstown that results in a perceivable reduction in traffic noise
	6	Manage the impact of transport infrastructure provision on the local environment including architectural conservation, biodiversity, land take and water	• Impact on the local environment	Likely extent of work in environmentally sensitive areas

8 GENERATION OF STRATEGIC OPTIONS

8.1 Options as Identified in the POD

The Project Outline Document (POD) initially identified multiple Do-Something Options each of which is described and discussed in this Chapter.

OPTION 1 TRAFFIC MANAGEMENT: PUBLIC TRANSPORT PRIORITY ENHANCEMENT

Route 101 Bus Eireann connects Drogheda and Julianstown with approximately 46 buses per day operating over 24 hours. The route, mostly on the R132 road, runs every 20 to 30 minutes from Drogheda bus station to Talbot Street in Dublin City Centre.

Option 1 comprises the signalisation of the junctions of the R132 and R150, along with the R132/L16161 (Ballygarth Road) junction to the south of Julianstown. Bus priority would be provided through signal control and would be further enhanced through the provision of bus lanes on the R132 on approach to the junctions north and south of Julianstown so that buses are not delayed in traffic.

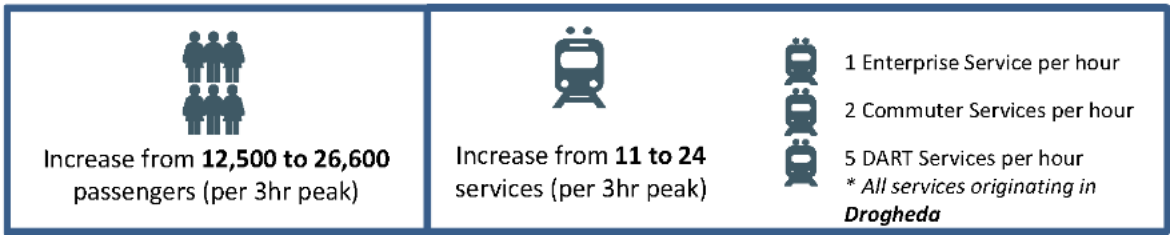
Suitable provision for active travel would be included in Option 1 following the principles that have been applied to BusConnects infrastructure design. The newly signalised junctions would incorporate pedestrian crossings. The capacity for vehicular traffic would be reduced through Julianstown through control of the new traffic lights.

Construction and land costs would largely be dependent on the scale of road widening required to provide the new bus priority and active mode infrastructure.

NIFTI Modal Hierarchy		NIFTI Intervention Hierarchy		Comment
Active Travel	✓	Maintain	✓	Option 1 scores high on both the NIFTI Modal and Intervention Hierarchies. It supports active travel and prioritisation of public transport. In terms of intervention, the focus would be on improving existing infrastructure on the R132 and maintaining infrastructure elsewhere. Option 1 aligns with the NIFTI priority of Protection and Renewal by improving safety in Julianstown Village. This option also supports the NIFTI priority for decarbonisation through the provision of public transport priority and improvements in active mode infrastructure.
Public Transport	✓	Optimise	✗	
Private Vehicles	✗	Improve	✓	
		New	✗	

OPTION 2 STRATEGIC PUBLIC TRANSPORT ENHANCEMENT

Julianstown is well served by high frequency bus, with the wider area also well served by rail connections to Dublin. There is potential benefit in increasing services, particularly on the rail corridor. DART+ Coastal North proposes to more than double rail services between Drogheda and Dublin providing for an increase in passenger carrying capacity from 12,500 to 26,600. Under the plans, there could be as many as 8 train services per hour providing a frequency of every 7.5 minutes.



In addition to DART+ Coastal North, longer term potential investment in rail is identified within the Draft All Island Strategic Rail Review (AISRR). Long term interventions identified in the AISRR include a new rail line between Clongriffin and Drogheda, a rail spur to Dublin Airport and four tracking between Clongriffin and Dublin Connolly. These interventions would provide a very large increase in rail capacity within the study area.

The existing bus services are largely focused on connectivity to Dublin City Centre. There are no direct bus services between Bettystown / Laytown and Dublin Airport or Swords. Public transport journey times between these large trip generators and the study area do not compare favourably with car journey times of the order of 30 to 45 minutes and public transport journey times approximately 80 minutes and requiring a transfer.

Option 2 comprises enhancements to strategic public transport services comprising:

- Delivery of DART+ Coastal North
- Delivery of interventions identified in the AISRR
- New direct bus service between Bettystown/Laytown and Swords/Dublin Airport every 15 minutes
- Doubling in frequency of existing bus services in the corridor (101, 101X, 910 and D2)

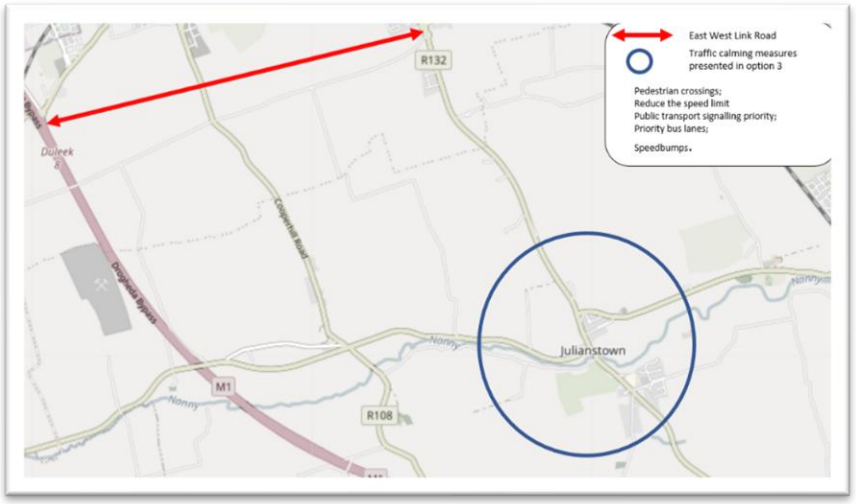
NIFTI Modal Hierarchy		NIFTI Intervention Hierarchy		Comment
Active Travel	✗	Maintain	✗	Option 2 scores high on the NIFTI Modal Hierarchy. It supports significantly improved provision of public transport. In terms of intervention, the focus would be on delivering rail interventions that have been identified through previous studies, and as such is in line with transport policy and strategy. Option 2 mainly comprises new infrastructure or services, though some improvements are also incorporated. Option 2 would incur relatively high costs both in terms of capital investment and ongoing public transport subsidy.
Public Transport	✓	Optimise	✗	
Private Vehicles	✗	Improve	✓	
		New	✓	

OPTION 3 EAST WEST LINK ROAD AND TRAFFIC MANAGEMENT MEASURES ON R132 THROUGH JULIANSTOWN

Option 3 would comprise a new east west road link to the south of Drogheda connecting Junction 8 on the M1 with the R132 at the roundabout with Colpe Road and traffic management measures on the R132 through Julianstown. This new link would take the form of a single carriageway in each direction and pedestrian and cycle facilities as appropriate. This link is incorporated into Meath County Development Plan's land use zoning objectives map, and it has the potential to provide wider benefits to meeting the future demands from the significant development lands in south Drogheda. The Development Plan does reference the need for a thorough examination, this should include a detailed cost benefit analysis given the likely investment costs. In addition, traffic management measures on the R132 through Julianstown will be introduced. These will include measures such as traffic signalisation and speed ramps, as well as improvements to infrastructure for active travel such as widened footpaths, pedestrian crossings and cycle lanes.

Previous traffic modelling to evaluate this scenario revealed traffic displacement from the existing junction to the new south Drogheda distributor road via the R152. There was little change in traffic through Julianstown, and the total vehicle kilometres travelled, and travel time were only slightly affected (drops of 0.05% and 0.31%, respectively). A minor positive impact on M1 tolls resulted in a 0.1 percent annual increase, however the modelling will need to be reviewed in later appraisal stages.

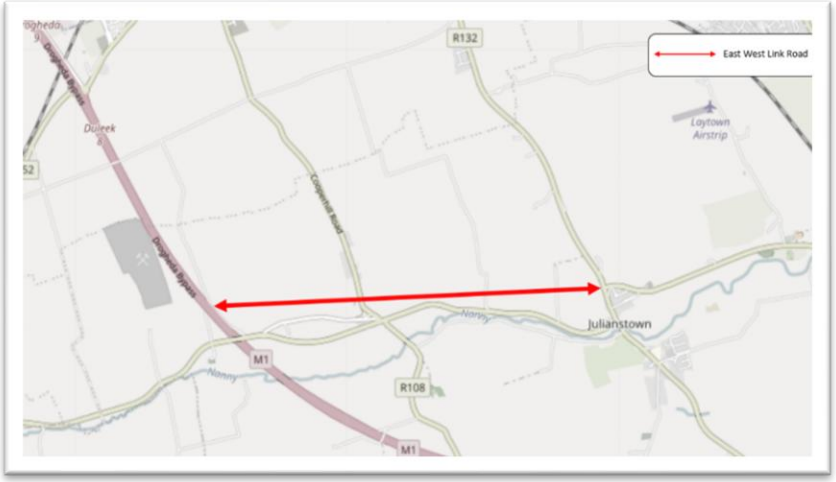
This option will include significant traffic management measures through Julianstown. It will provide improvements to the public realm in Julianstown through the delivery of measures such as traffic signalisation and speed ramps, as well as improvements to infrastructure for active travel such as widened footpaths, pedestrian crossings and cycle lanes. The proposed traffic management measures through Julianstown will be designed to serve two key functions. Firstly, to prioritise the needs of active travel and public transport users, as well as enhancing the public realm in the village centre. Secondly, to further reduce traffic speeds through the Village - thereby ensuring that the alternative link road, whilst longer in length, remains the more attractive route for vehicular traffic.



NIFTI Modal Hierarchy		NIFTI Intervention Hierarchy		Comment
Active Travel	✓	Maintain	✗	In terms of NIFTI Modal Hierarchy, this option provides an alternative road access to the M1 for private vehicles. However, the option also comprises additional traffic management measures in Julianstown to create a more attractive environment for pedestrians, cyclists and public transport. Therefore, it is considered to have a positive impact for both active travel and public transport. Option 3 aligns with the NIFTI priority for the movement of people and goods in urban areas through concentrating the new road and active travel infrastructure within Drogheda providing wider benefits for accessibility for the planned future population in this growth area. The provision of traffic management and active mode infrastructure within Julianstown Village supports the NIFTI priority for decarbonisation.
Public Transport	✓	Optimise	✓	
Private Vehicles	✓	Improve	✗	
		New	✓	

OPTION 4 NEW LINK ROAD FROM THE M1 TO THE R132 NORTH OF JULIANSTOWN AND TRAFFIC MANAGEMENT MEASURES ON R132 THROUGH JULIANSTOWN

Option 4 would comprise of a new link road from the R150 Laytown junction (at the north end of Julianstown) to the M1 with a new interchange provided on the M1. This link could utilise existing sections of the R150 along with the bridge over the M1. To reduce costs, the M1 interchange could be developed as a southbound on-ramp and northbound off-ramp only. This would provide an alternative route for traffic travelling through Julianstown to and from the M1 at Junction 7



However, this new link would not be the most direct route southbound, particularly for traffic travelling to/from the Bettystown area. The proposed junction with the M1 would be located north of the toll point, and as such traffic using this link to travel southbound would still be required to pay the toll. The benefit of providing the new proposed southbound on/northbound off M1 junction north of the existing toll point is that it would reduce the possibility of traffic displacement from the M1 to avoid existing tolls.

As with Option 3, this option will include significant traffic management measures through Julianstown. It will ensure significant improvements to the public realm in Julianstown through the delivery of measures such as traffic signalisation and speed ramps, as well as improvements to infrastructure for active travel such as widened footpaths, pedestrian crossings and cycle lanes. The proposed traffic management measures through Julianstown will be designed to serve two key functions. Firstly, to prioritise the needs of active travel and public transport users, as well as enhancing the public realm in the village centre. Secondly, to further reduce traffic speeds through the Village - thereby ensuring that the alternative link road, whilst longer in length, remains the more attractive route for vehicular traffic.

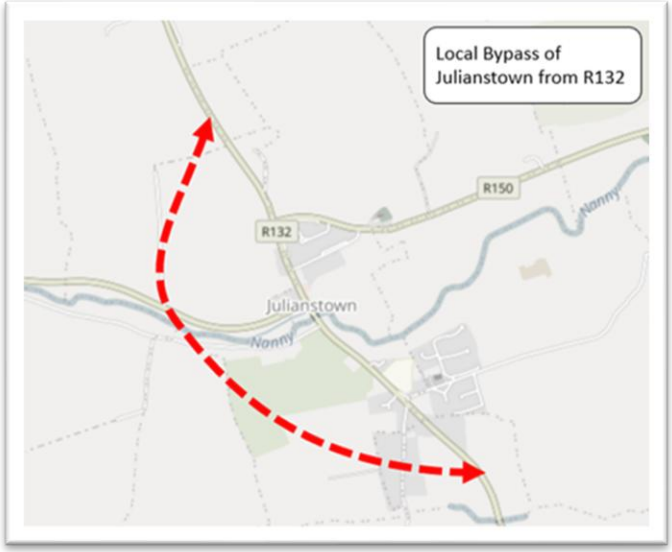
Traffic modelling will need to be undertaken to understand the potential for this option to reduce traffic volumes through Julianstown and achieve the overall objectives for the Traffic Relief Scheme. Bus based public transport would benefit from Option 4 due to decreases in journey times and improvements in reliability as they travel through Julianstown with additional priority and potentially lower traffic conditions.

NIFTI Modal Hierarchy		NIFTI Intervention Hierarchy		Comment
Active Travel	✓	Maintain	×	In terms of NIFTI Modal Hierarchy, this option provides an alternative road access to the M1 for private vehicles. However, the option also comprises additional traffic management measures in Julianstown to create a more attractive environment for pedestrians, cyclists and public transport. Therefore, it is considered to have a positive impact for both active travel and public transport.
Public Transport	✓	Optimise	✓	
Private Vehicles	✓	Improve	×	Option 4 would incur significant investment costs, requiring both land acquisition and major new infrastructure. This cost could be reduced through optimising the existing R150 infrastructure as much as possible along with the delivery of a smaller M1 interchange (southbound on/northbound off)
		New	✓	Option 4 requires further consideration in terms of its potential to achieve the overall study objectives given the fact that it's not the most direct route for traffic travelling southbound.

OPTION 5 NEW ROAD LINK ON THE WESTERN SIDE OF JULIANSTOWN AND TRAFFIC MANAGEMENT MEASURES ON R132 THROUGH JULIANSTOWN

Option 5 would comprise a new road link parallel to the R132 creating a bypass around the village to the west. The capacity and design of the road and the connecting junctions with the R132 would be subject to further design.

Option 5 could be combined with Option 1 which would likely increase the potential benefits for the local population in Julianstown and encourage use of the new road link by through traffic. Previous analysis indicated that this option could remove the majority of traffic from Julianstown Village with as much as an 80% reduction in traffic volumes.



As with Options 3 and 4, this option will include significant traffic management measures through Julianstown. It will ensure significant improvements to the public realm in Julianstown through the delivery of measures such as traffic signalisation and speed ramps, as well as improvements to infrastructure for active travel such as widened footpaths, pedestrian crossings and cycle lanes. The proposed traffic management measures through Julianstown will be designed to serve two key functions. Firstly, to prioritise the needs of active travel and public transport users, as well as enhancing the public realm in the village centre. Secondly, to further reduce traffic speeds through the Village - thereby ensuring that the alternative link road, whilst longer in length, remains the more attractive route for vehicular traffic. Bus based public transport would benefit from Option 5 due to reduction in journey times and improvements in reliability as they travel through Julianstown in significantly lower traffic conditions.

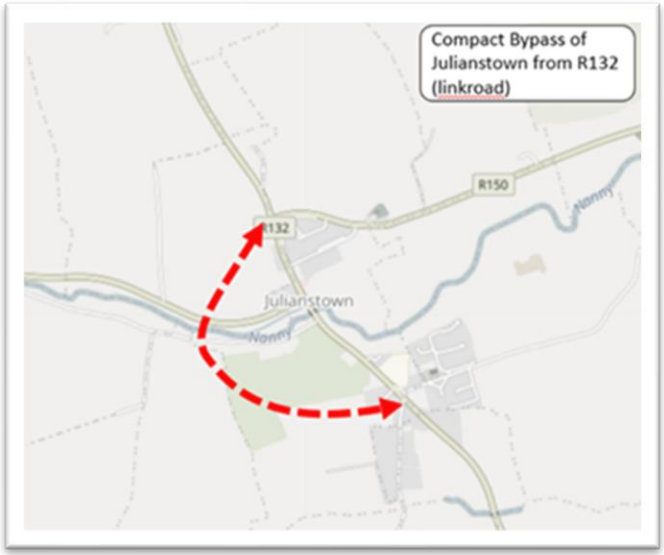
NIFTI Modal Hierarchy		NIFTI Intervention Hierarchy		Comment
Active Travel	✓	Maintain	✗	In terms of NIFTI Modal Hierarchy, this option provides an alternative road access to the M1 for private vehicles. However, the options also comprises additional traffic management measures in Julianstown to create a more attractive environment for pedestrians, cyclists and public transport. Therefore, it is considered to have a positive impact for both active travel and public transport. Option 5 would incur relatively high costs due to the provision of new infrastructure including a new bridge crossing over the River Nanny. Combining Option 5 with Option 1 would improve the performance in terms of the NIFTI modal and hierarchy interventions. Option 5 would support the NIFTI priority for enhanced regional and rural connectivity and warrants further consideration.
Public Transport	✓	Optimise	✗	
Private Vehicles	✓	Improve	✗	
		New	✓	

Option 6 NEW ROAD LINK ON THE WESTERN SIDE OF JULIANSTOWN CONNECTING AT R150 EASTWARDS AND TRAFFIC MANAGEMENT MEASURES ON R132 THROUGH JULIANSTOWN

Option 6 is similar to Option 5 in that it would comprise of a new road link parallel to the R132 creating a bypass around the village to the west. Option 6 would connect directly with the R150 to the west, providing more direct access to the Laytown / Bettystown area. The capacity and design of the road and the connecting junctions with the R132 would be subject to further design.

As with Options 3, 4 and 5, this option will include significant traffic management measures through Julianstown. It will ensure significant improvements to the public realm in Julianstown through the delivery of measures such as traffic signalisation and speed ramps, as well as improvements to infrastructure for active travel such as widened footpaths, pedestrian crossings and cycle lanes. The proposed traffic management measures through Julianstown will be designed to serve two key functions. Firstly, to prioritise the needs of active travel and public transport users, as well as enhancing the public realm in the village centre. Secondly, to further reduce traffic speeds through the Village - thereby ensuring that the alternative link road, whilst longer in length, remains the more attractive route for vehicular traffic.

Option 6 could be combined with Option 1 which would likely increase the potential benefits for the local population in Julianstown and encourage use of the new road link by through traffic. Bus based public transport would benefit from Option 6 due to decreases in journey times and improvements in reliability as they travel through Julianstown in significantly lower traffic conditions.



NIFTI Modal Hierarchy		Intervention Hierarchy		Comment
Active Travel	✓	Maintain	✗	In terms of NIFTI Modal Hierarchy, this option provides an alternative road access to the M1 for private vehicles. However, the options also comprises additional traffic management measures in Julianstown to create a more attractive environment for pedestrians, cyclists and public transport. Therefore, it is considered to have a positive impact for both active travel and public transport. Option 6 includes Phase 2 of the planned Julianstown Traffic Calming Scheme which would improve the attractiveness of active travel locally. The provision of an alternative vehicular route around Julianstown will also provide opportunities for further road space reallocation and traffic management within the village to create a safer environment for pedestrians and cyclists (e.g. traffic signals, footpath widening, HGV ban etc.) Option 6 would incur relatively high costs due to the provision of new infrastructure including a new bridge crossing over the River Nanny. Combining Option 6 with Option 1 would improve the performance in terms of the NIFTI modal and hierarchy interventions. Option 6 would support the NIFTI priority for enhanced regional and rural connectivity and warrants further consideration.
Public Transport	✓	Optimise	✗	
Private Vehicles	✓	Improve	✗	
		New	✓	

Option 7 Reduction in the Road Toll on the M1

Option 7 considers the impact of road tolling on route choice and the possibility that a proportion of the traffic through Julianstown is due to road toll avoidance. Previous analysis has indicated that, should the toll on the M1 be reduced or removed, the vast majority of traffic would continue to route via Julianstown. Nonetheless, it is worth considering the level of benefit that may result from changes in the toll structure.

The M1 toll is operated by Celtic Roads Group under a Public Private Partnership (PPP) toll concession. The contract was signed on the 9th February 2004 and extends for 30 years (i.e. the contract expires in ten years' time in February 2034).

If the reduction/removal of the M1 toll leads to lower traffic conditions in Julianstown, then this option would benefit Bus based public transport due to decreases in journey times and improvements in reliability. In addition, buses using the M1 would benefit from the reduction in toll charges.

Option 7 includes Phase 2 of the planned Traffic Calming Scheme which will create a more attractive environment for walking and cycling locally in Julianstown.

NIFTI Modal Hierarchy		NIFTI Intervention Hierarchy		Comment
Active Travel	✓	Maintain	✓	There is a risk that the delivery of Option 7 in and of itself would improve the relative attractiveness of travel by private car which would not support the NIFTI priority for decarbonisation. Combining Option 7 with Option 1 would improve the performance in terms of the NIFTI modal and hierarchy interventions. Option 7 warrants further consideration to understand the impact it can have on traffic volumes through Julianstown and achieving the overarching objectives for the Traffic Relief Scheme. It would not bring rise to any additional capital investment, but could have implications in terms of revenue foregone and the cost of contractual implications.
Public Transport	✓	Optimise	✗	
Private Vehicles	✓	Improve	✗	
		New	✗	

8.2 Eliminated Options from the POD stage

Of the options described above, options 2 and 7 were eliminated during the POD stage.

Option 2 was eliminated because the cost of the strategic public transport enhancements, which aim to improve rail services along the entire Dublin to Belfast corridor, are very high compared to the scale of the issues in Julianstown alone. Option 2 would therefore not represent value for money to meet the Julianstown Traffic Relief Scheme objectives in isolation.

Option 7 was eliminated for 2 reasons. First, the costs of removing the toll on the M1 would be prohibitively high, [redacted]. Secondly, traffic analysis shows that less than 10% of the journeys through Julianstown during the peak hours have origins/destinations for which going through the toll plaza would result in a shorter journey time. In other words, for more than 90%, the route through Julianstown is, under normal circumstances, the shortest itinerary, and therefore removing the toll on the M1 is not expected to result in the required reduction of traffic through Julianstown.

8.3 Remaining Options

As a result, the following do-something options are still under consideration at this stage in the process, shown in Table 7.

OPTION	DESCRIPTION	VEHICLE TRAFFIC INTERVENTION	PUBLIC TRANSPORT INTERVENTION	ACTIVE TRAVEL INTERVENTION
1	**Traffic Management: Public Transport Priority Enhancement**	N/A	Bus lanes north and south of Julianstown + bus priority at traffic lights	Placemaking for AT as a result of reduced traffic volumes through Julianstown
3	**East West Link Road with Traffic Calming Measures of Traffic on R132**	New link road from R132 at Southgate roundabout to M1 at Junction 8	N/A	Placemaking for AT as a result of reduced traffic volumes through Julianstown
4	**New Link Road from the M1 to the R132 North of Julianstown and traffic management measures on R132 through Julianstown**	New link road from R132 at the R132/Laytown Road junction to new M1 junction north of toll plaza	N/A	Placemaking for AT as a result of reduced traffic volumes through Julianstown
5	**New Road Link on the Western Side of Julianstown and traffic management measures on R132 through Julianstown**	New bypass from approximately 500m south of Whitecross Primary School to approximately 450m north of the R132/Laytown Road junction	N/A	Placemaking for AT as a result of reduced traffic volumes through Julianstown
6	**New Road Link on the Western Side of Julianstown Connecting at R150 Eastwards and traffic management measures on R132 through Julianstown**	New bypass from Whitecross Primary School to the R132/Laytown Road junction	N/A	Placemaking for AT as a result of reduced traffic volumes through Julianstown

Table 7. Remaining Do-something options

9 STRATEGIC OPTIONS ASSESSMENT

To assess which strategic options will proceed to stage 2, the options were assessed on the basis of their ability to achieve the project objectives. This assessment draws on the evidence and conclusions presented earlier in the Feasibility Report. This assessment is summarised in Table 9.

The scoring system applied was a pass/fail (green or red) as to whether or not they had the ability to achieve the project objectives. Each of the options were assessed individually against the objectives (not comparatively). Further appraisal, including modelling, will allow for a more detailed assessment.

9.1 Objectives 2, 3, 4, and 6

While quantitative data is not available at this stage, a qualitative assessment came to the conclusion that it can reasonably be expected that all options would be able to achieve objectives 2, 3, 4 and 6 to varying extents, listed in Table 8 below.

CRITERIA	PROJECT OBJECTIVES	
Transport User Benefits and Other Economic Impacts	2	Improve the reliability of transport for trips through Julianstown
Accessibility	3	Improve access to education and employment for those who rely on the regional road through Julianstown
Safety	4	Reduce the risk of road traffic accidents within Julianstown Village
Local Environment	6	Manage the impact of transport infrastructure provision on the local environment including architectural conservation, biodiversity, land take and water

Table 8. Project Objectives 2, 3, 4 and 6

Regarding Objectives 2, 3 and 4, Option 1 would be expected to achieve this through traffic management, while the other Options would be expected to achieve these objectives by diverting traffic away from Julianstown.

Regarding Objective 6, all options avoid the construction of new infrastructure in the area east of the R132 and within the Julianstown ACA, and all options are deemed to be able to avoid protected structures, thereby meeting this Objective.

9.2 Objectives 1 and 5

Objectives 1 and 5 are listed in Table 9 below.

CRITERIA	PROJECT OBJECTIVES	
Transport User Benefits and Other Economic Impacts	1	Reduce the impact of congestion at Julianstown on strategic regional network traffic
Local Environment	5	Reduce the impact of traffic on noise pollution

Table 9. Project Objectives 1 and 5

As discussed in Section 3.1, a reduction of traffic to a level within the desirable level of 8,000 AADT, a reduction of 60% compared to an AADT of over 20,000 currently, would provide for a Level of Service D on the R132 through Julianstown. A significant reduction in traffic through Julianstown is required to achieve Objective 1.

As discussed in Section 3.6, in order to achieve a perceptible to significant reduction in traffic noise in Julianstown, AADT's would need to be reduced to 6,000 to 10,000 through the village, down from over 20,000 currently. A significant reduction in traffic is required to achieve Objective 5.

Previous work from the POD stage[19], which aimed to determine an acceptable level of traffic for the R132 through Julianstown, concluded that combining both the issues of congestion and noise leads to a conclusion that the AADT on the R132 through Julianstown should be reduced to under 8,000 AADT.

Therefore, in order to assess the options against Objectives 1 and 5, the choice was made to assess the options against their ability to meet the previously defined benchmark of 8,000 AADT.

Option 1

Option 1 does not perform well against the 8,000 AADT benchmark. The poor performance is due to the limited mode shift that this option is expected to generate. While enhancing the bus services along this corridor could result in a limited mode shift, it is not expected that the extent of the mode shift that could be achieved through Option 1 will approach the level of mode shift required to achieve the benchmark of 8,000 AADT through Julianstown.

Option 3

Option 3 also does not perform well against the 8,000 AADT benchmark. As set out in the POD, previous traffic modelling to evaluate this scenario revealed there was little change in traffic through Julianstown, and travel times were only slightly affected. Although the POD stated that modelling would have to be reviewed in later stages, it is deemed extremely unlikely that additional modelling would reveal that this option can achieve the 60% reduction in traffic that is required by the objectives. This is most likely due to the fact that, due to its relatively northern position, just south of Drogheda, the link road is unlikely to divert traffic from East Meath.

Option 4

Option 4 will likely perform well against the 8,000 AADT benchmark. Combined with additional traffic calming measures in Julianstown, the new link road will provide an alternative route away from Julianstown for traffic from the R132/Laytown Road junction to the M1. As such, this option could result in sufficient traffic through Julianstown being diverted to this new link road, and consequentially result in the required reduction in traffic levels through Julianstown. However, it should be noted that as this traffic would join the M1 north of the toll plaza, additional modelling would need to take place to

[19] Julianstown Traffic Relief Scheme – Acceptable Levels of Traffic Not

determine whether the time savings are of sufficient magnitude to reduce traffic through Julianstown to the levels required.

Options 5 and 6

Both Options 5 and 6 will provide an alternative route for traffic to the west of Julianstown. Combined with traffic calming measures in Julianstown, it could reasonably be expected that an alternative route to the west of Julianstown would be the more appealing route for vehicle traffic, allowing a sufficient quantity of traffic to be diverted away from Julianstown, resulting in the required reduction in AADT in the village.

9.3 Conclusion

With a greater understanding of the issues outlined in this Feasibility Report, the assessment has identified that Options 1 and 3 are not expected to achieve two of the main objectives. As such, these options will not be brought forward to subsequent stages of the project.

The next section of the Feasibility Report explores the remaining options (4, 5 and 6) with consideration of engineering, environmental and economic issues.

Strategic options	Objective 1: Reduce the impact of congestion at Julianstown on strategic regional network traffic	Objective 2: Improve the reliability of transport for trips through Julianstown	Objective 3: Improve access to education and employment for those who rely on the regional road through Julianstown	Objective 4: Reduce the risk of road traffic accidents within Julianstown Village	Objective 5: Reduce the impact of traffic on noise pollution	Objective 6: Manage the impact of transport infrastructure provision on the local environment including architectural conservation, biodiversity, land take and water	Proceed to feasibility assessment?	Justification
Option 1: Traffic Management: Public Transport Priority Enhancement							No	Negative scores for objectives 1 and 5
Option 3: East West Link Road and Traffic Management Measures on R132 through Julianstown							No	Negative scores for objectives 1 and 5
Option 4: New Link Road from the M1 to the R132 North of Julianstown and Traffic Management Measures on R132 through Julianstown							Yes	Positive scores for objectives 1-6
Option 5: New Road Link on the Western Side of Julianstown and Traffic Management Measures on R132							Yes	Positive scores for objectives 1-6

Strategic options	Objective 1: Reduce the impact of congestion at Julianstown on strategic regional network traffic	Objective 2: Improve the reliability of transport for trips through Julianstown	Objective 3: Improve access to education and employment for those who rely on the regional road through Julianstown	Objective 4: Reduce the risk of road traffic accidents within Julianstown Village	Objective 5: Reduce the impact of traffic on noise pollution	Objective 6: Manage the impact of transport infrastructure provision on the local environment including architectural conservation, biodiversity, land take and water	Proceed to feasibility assessment?	Justification
through Julianstown								
Option 6: New Road Link on the Western Side of Julianstown connecting at R150 Eastwards and Traffic Management Measures on R132 through Julianstown							Yes	Positive scores for objectives 1-6

Table 10. Strategic Options Assessment Summary Table

10 FEASIBILITY ASSESSMENT

To ensure a comprehensive and sustainable approach, the remaining options for the Julianstown Traffic Relief Scheme were considered under three key feasibility themes: Engineering, Economic and Environmental.

Utilising these criteria, it was assessed whether the options are feasible from an engineering perspective, whether they are expected to be good value for money, and whether they will have a major impact on the local environment.

The assessment applied a Red-Amber-Green scoring system, with Green meaning no challenges, Amber meaning minor challenges, and Red meaning significant challenges. The results of this assessment are shown in Table 11.

Strategic options	Engineering	Economy	Environment	Proceed to Phase 2
Option 4: New Link Road from the M1 to the R132 North of Julianstown and Traffic Management Measures on R132 through Julianstown				Yes
Option 5: New Road Link on the Western Side of Julianstown and Traffic Management Measures on R132 through Julianstown				Yes
Option 6: New Road Link on the Western Side of Julianstown Connecting at R150 Eastwards and Traffic Management Measures on R132 through Julianstown				Yes

Table 11. Feasibility Assessment Results

10.1 Option 4

Option 4 faces two challenges, resulting in an amber scoring for Engineering and Economy. Regarding engineering, the new link road considered under option 4 would pass through an area where mitigating measures have been implemented in 2008 which has subsequently prevented previous flooding. However, whilst mitigated, the issue of flooding would still have to be taken into consideration, leading to potentially higher costs.

Regarding economy, the Project Outline Document set out that options 4, 5 and 6 all have expected costs of [redacted]

However, the benefits of option 4 are less certain, leading to an amber scoring on the economy criteria. As mentioned in section 9.3, it can be expected that the new link road will deliver faster journey times than the current route through Julianstown, which is limited at 50kph and sees heavy congestion, despite the considerably longer route. However, motorists using this link road would join the M1 north of the toll plaza, meaning motorists would have to pay the toll. It is therefore less certain how many motorists will prefer this route, particularly during the off-peak, and therefore it is likely that the economic benefits of the scheme will be lower than options 5 and 6.

Option 4 performs well against the local environment criterion. As discussed in section 9.3, the new infrastructure would avoid negative impacts on the SPA, the pNHA and the Julianstown ACA, meaning the impact on the local environment would be limited.

10.2 Options 5 and 6

Options 5 and 6 perform well against all three criteria. Regarding Engineering, both options would require a bridge across the River Nanny, which would increase complexity and costs.

However, the efficiency of the route is likely to bring about economic benefits. There are also fewer long-term climate resilience issues compared to option 4. Regarding the economy criterion, as both options are expected to deliver on the objectives against manageable costs, both option 5 and 6 perform well.

Like option 4, options 5 and 6 perform well on the environment criterion, as they avoid the SPA, pNHA, and Julianstown ACA, making their impact on the local environment limited.

10.3 Conclusion

Despite options 5 and 6 performing better at this stage of the project, it is recommended that all three options proceed to phase 2.

All options will include traffic management measures through Julianstown village, including significant improvements for active travel, public transport and the public realm.

A more detailed assessment will be required to determine the costs and benefits of each option, while none of the options should be regarded as unfeasible based on available information at this stage.

11 APPRAISAL PLAN

During the POD stage, an appraisal plan was identified. An Appraisal Plan is required as part of the Phase 0 Project/Programme Outline Document (POD), which outlines at a high level the approach to the modelling and appraisal of the project.

This approach is set out below. It is identical to the appraisal plan from the POD stage, except for a change to the sensitivity testing.

11.1 Introduction

This chapter presents an overview of the process to filter potential options and arrive at a preferred option at the Preliminary Business Case (PBC) stage and a high-level consideration of the appraisal plan, including the economic and financial appraisal, sensitivity analysis and risk and contingency.

11.2 Appraisal of long list

In accordance with the DPENDR's Infrastructure Guidelines (IG) and the Department of Transport's Transport Appraisal Framework (TAF), the Preliminary Business Case (PBC) identifies a preferred option.

At PBC stage, a Cost-Benefit Analysis (CBA) and Transport and Accessibility Appraisal (TAA) will be required, as the estimated cost of (one or more of) the options is valued at €30m or greater. The TAA scoping tab will be provided before proceeding to the PBC stage.

Within the preparation of the Preliminary Business Case, the prevailing values for parameters will be used in compliance with guidance. This includes parameter values contained within Module 8 of the Transport Appraisal Framework which are likely to have a significant bearing on the economic appraisal of the project, such as discount rates, shadow price of public funds, value of travel time and journey time reliability.

11.3 Appraisal of short list

Cost Preparation

For the PBC, the following cost estimates will be required:

- Target Cost (TC) – This is the realistic estimate of the Final Outturn for the project based on assumptions made, identified risks and defined scope of work inclusive of VAT and inflation.

- Total Scheme Budget (TSB) – This is the formal cost estimate for the project incorporating the identified core cost elements, an appropriate contingency in respect of these elements, and an allowance for future inflation to the completion of the project. In addition, a programme level contingency, known as "Programme Risk", will be included to cover the situation of exceptional items occurring on isolated projects.

Consideration of Appraisal Tools

To inform the Cost Benefit Analysis it would be beneficial to build on the analysis undertaken within previous studies. However, care will be taken to ensure the data used to inform the PBC are as up-to-date as possible.

Traffic Modelling

The extent of traffic modelling should be commensurate with the scale of the project and the need for quantified impacts to be assessed to inform the decision-making process. The NTA's Eastern Regional Model (ERM) has provided useful information for the purposes of the preparation of the POD. Depending on the further design and consideration of options, the ERM could be suitable to assess the likely impact of the project. The Appraisal Tools component of the ERM

includes modules for TUBA[20] and COBALT[21]. Transport Infrastructure Ireland's economic appraisal tool for active modes, TEAM, could further strengthen the appraisal to reflect active mode impacts.

As a minimum, junction modelling should be prepared using suitable tools such as LinSIG or ARCADY to assess the impact of options on the major junctions within the study area.

A local area model in SATURN or similar should be considered and would provide for the use of TUBA (Transport User Benefits Appraisal) for the monetisation of impacts and COBALT to assess safety aspects. The economic parameters in TUBA would in this instance be taken from the CAF guidance as appropriate.

Sensitivity Testing

Sensitivity testing will need to be undertaken as part of the PBC in line with the requirements of TAF. Scenarios with higher than estimated costs and lower than anticipated demand should be presented.

The following scenario's will be included for sensitivity testing:

- While removal of the toll, option 7 from the POD longlist, was not considered a proportional or cost-effective solution to the issues in Julianstown, it was deemed appropriate to include the removal of the toll on the M1 as a sensitivity test
- Whilst it is proposed that DART+ is not included in the Do-Minimum, this project is subject to planning and designs may evolve prior to implementation. A sensitivity test with DART+ would be appropriate.
- Upgrades to the public transport network connections from south Drogheda and East Meath to destinations along the M1 corridor, including to/from East Meath and Swords/Dublin Airport will be included as a sensitivity test. This sensitivity test will also serve assess the long term benefits of bus connections to/from the MetroLink corridor.
- While option 2 from the POD longlist – the implementation of the interventions from the All Island Strategic Rail Review, as well as an extensive upgrade of the bus network in the area – was not considered a proportional solution to the issues in Julianstown, it was deemed appropriate to include option 2 as a sensitivity test

[20] TUBA (transport users benefit appraisal) is software developed by the UK's Department for Transport to undertake the economic appraisal of transport schemes in accordance with the DfT's cost-benefit analysis guidance.

[21] COBALT (Cost Benefit Analysis – Light Touch) is software developed by the UK's Department for Transport to assess road traffic accident benefits of road schemes

12 SUMMARY OF PHASE 2 OPTIONS

The following options have been selected to proceed to Phase 2:

- Option 4 – New Link Road from the M1 to the R132 North of Julianstown and traffic management measures on R132 through Julianstown.
- Option 5 – 'Long' Bypass on the Western Side of Julianstown and traffic management measures on R132 through Julianstown.
- Option 6 – 'Short' Bypass on the Western Side of Julianstown, connecting at R150 Eastwards and traffic management measures on R132 through Julianstown.

All three options have the potential to meet the project's objectives and are considered feasible and strategically aligned, justifying their progression to Phase 2.

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Lima, Mexico, Rio de Janeiro, Santiago, São Paulo

North America:
Little Falls, Los Angeles, Montreal, New-York, Philadelphia, Washington

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