Technical Review of Feedback on EPR

Navan Railway



C789-P02-CON-X-XXX-RP-TTI-X-000002

P01_A_C01

11 November 2026

Tetra Tech, Lyrr 2, IDA Business & Technology Park, Mervue, Co. Galway, H91 H9CK

Tetra Tech Consulting Ireland Limited. Registered in Ireland: No. 665968
Registered Office: Mounttown House, 62/63 Mounttown, Road Lower, Dún Laoghaire, Co.,Dublin, A96 P8X6, Ireland

Document status

Document status					
Version	**Purpose of document**	**Authored by**	**Reviewed by**	**Approved by**	**Date**
C01	For Information	Various	CS	AD	11/11/26

Approval for issue		
AD	AD	11/11/2026

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Disclaimer

The Preferred Route presented in this report is indicative and remains subject to preliminary design, additional surveys and investigations, environmental assessment, and statutory approvals. Consequently, further refinements or modifications may arise as the project develops. IÉ and the project team will keep stakeholders informed of any material changes throughout the process.

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1.0 Introduction

1.1 Project Overview

The Navan Railway is a proposed extension of the Iarnród Éireann network. The project would provide frequent, reliable and sustainable public transport between Navan and Dublin City Centre via M3 Parkway. The delivery of a new commuter railway to Navan is identified as a key measure in the National Transport Authority's Greater Dublin Area Transport Strategy 2022–2042.

A multi-disciplinary consultant team, led by Tetra Tech, was appointed in 2024 to undertake the early stages of project development. The Navan Railway project is currently in the option selection phase. This phase is intended to inform confirmation of the Preferred Route (PR), which will then be progressed through further design and development towards a Railway Order application.

An Emerging Preferred Route (EPR) was identified following a structured option selection process undertaken in accordance with the Department of Transport's Transport Appraisal Framework. The EPR presented during Non-Statutory Public Consultation No. 1 (NSPC1) included four stations at Dunshaughlin, Kilmessan, Navan Central and Navan North.

The EPR was presented as a wide corridor within which the proposed railway, stations and associated infrastructure would be developed. The EPR presented during NSPC1 is shown in Figure 1-1.

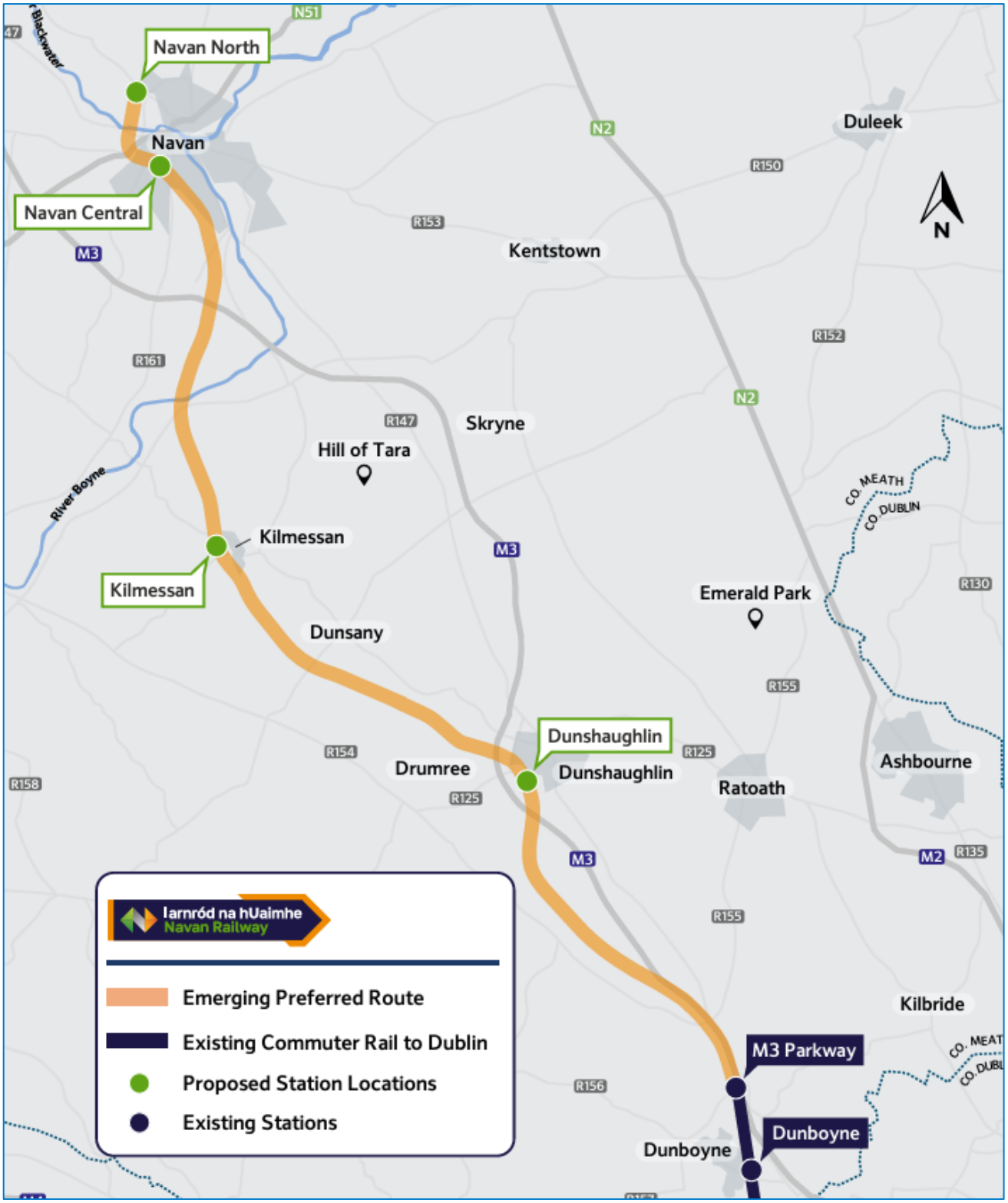


Figure 1-1: The EPR (presented at NSPC1)

1.2 Purpose of the Report

The NSPC1, which presented the EPR for the Navan Railway, ran from **20 May 2026 to 17 July 2026**. The consultation was undertaken to inform the public of the work on the project so far, obtain feedback, local knowledge and stakeholder insights on the EPR and the proposed station locations. The feedback is intended to inform the PR and the ongoing design and development of the project.

This report presents the principal consultation themes that were identified as requiring further technical assessment. It also summarises the technical work undertaken to assess whether amendments to the EPR are required before the PR is confirmed.

The specific matters assessed in this report are:

1. The EPR in the Rathregan area.
2. The proposed road-rail interface at Rathregan Court.
3. The proposed station infrastructure arrangement at Dunshaughlin Station.
4. Whether Option 8M would remain the EPR if a more direct active travel connection were provided to the Option 8B station arrangement at Dunshaughlin.
5. The EPR in the Leshemstown and Readsland area.
6. The EPR in the Dunsany area.
7. The proposed road-rail interface at Kilmessan Village.
8. Whether a Navan South Station should be included in the EPR.

The specific matters identified for further technical assessment above have been classified as either **studies** or **reviews**. A study examines alternative route options within a defined local area to determine whether the alignment of the EPR needs to be amended. A review considers a specific technical aspect of the EPR without assessing alternative route options.

A summary is provided for each of these specific matters in Section 2.0, with further information provided in the appendices.

Other matters, which are documented in the Consultation Findings Report, were also raised during NSPC1. However, the specific matters addressed in this report were those identified as being within the scope of the current technical review and requiring further consideration at this stage of project development. Other consultation matters will continue to be considered through the relevant project, design, environmental, land and stakeholder-engagement processes as the project progresses.

2.0 Summary of Proposed Amendments to the EPR

A summary of each of the proposed amendments to the EPR is provided below.

These proposed amendments should be understood as a recommendation for the next stage of project development. Any such recommendation remains subject to further technical assessment, design development, consultation and the relevant project approval processes.

2.1 Rathregan Area Study

Consultation Feedback and Scope of Study

A key theme arising from the feedback related to the proposed EPR through the Quarryland and Rathregan area, between approximately Ch. 2,000 m and Ch. 6,500 m. Concerns raised by stakeholders focused on the potential effects of the proposed railway on existing land use and the potential severance of agricultural land parcels.

Following a site inspection, a localised assessment of the EPR was undertaken to determine whether an alternative alignment in the area could reduce impacts on landowners whilst continuing to adhere to the project's technical, environmental and operational requirements.

The study compared the following three route options:

A. **The EPR**, as presented during NSPC1.

B. **The Meath County Council Rail Reservation Corridor (MCC RRC) route**

C. **A Modified 1960s railway corridor option**

Please refer to Figure 2-1 for the location of the three route options.

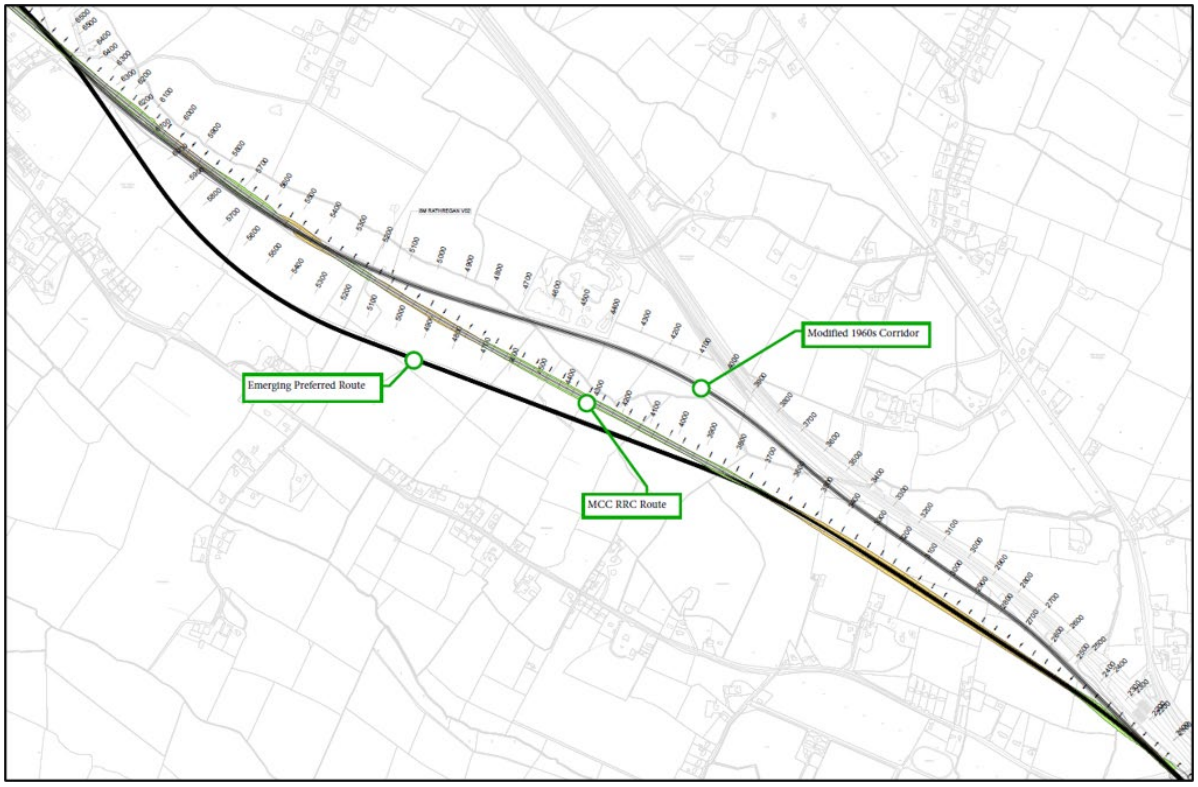


Figure 2-1: The three routes through the Rathregan localised study area

Key Findings of Study

The study considered track alignment, flood risk, environmental constraints and land severance. The study found that:

- Environmental impacts are broadly similar across all three route options, with no route demonstrating a clear environmental advantage.
- The EPR remains the least affected by flood risk, while the Modified 1960s corridor interacts more extensively with the OPW's mapped predictive flood areas and requires additional river crossings. However, current flood mapping is indicative only and is currently under review, and detailed flood modelling, which is due for completion in the next phase of the project, has not yet been completed.
- Flood modelling for a separate IÉ project in the area was reviewed. This demonstrated that the OPW's predicted flood areas are generally not as extensive as a targeted, project specific flood model.
- The EPR and MCC RRC routes would create substantial severance of existing landholdings (11 No.), generating additional accommodation structure requirements.
- The Modified 1960s corridor largely follows existing historic railway embankments and therefore minimises new land severance. Landowners expressed a strong preference for this option during site visits and engagement meetings.

Recommendation and Rationale

The recommendation is that the PR follows the Modified 1960s corridor in the vicinity of Quarryland/ Rathregan, as shown in Figure 2-1.

The study indicated that the OPW's predicted flood mapping in the area is generally conservative (and is currently under review). The Modified 1960s corridor offers the most effective response to the land-severance concerns raised during NSPC1. It would avoid the additional severance of landholdings and would make use of the existing railway corridor (that remains visible at this location) and is considered to be technically feasible.

2.2 Road-Rail Interface at Rathregan Court (L2209) Review

Consultation Feedback and Scope of Review

Feedback was received on the proposed road closure and realignment of L2209 (Rathregan Ct./ Bush Lane) presented in the EPR. Concerns were raised regarding community connectivity, access to the old cemetery, road safety, traffic displacement onto surrounding roads, and the impact on the mature trees.

The scope of this review is to develop an amended road realignment to mitigate the concerns raised at NSPC1.

Key Findings of Review

A review of an alternative road realignment to that proposed at NSPC1 was undertaken and the design was amended to mitigate the concerns raised. The resulting road alignment looked to minimise the impact on the mature trees along the road, and to reduce the footprint of the road as much as possible, achieved in part by bringing the L22091 diversion closer to the proposed railway. It is noted that due to modern safety standards, it is a last resort to propose the inclusion of level crossings, hence the requirement for grade separated solution.

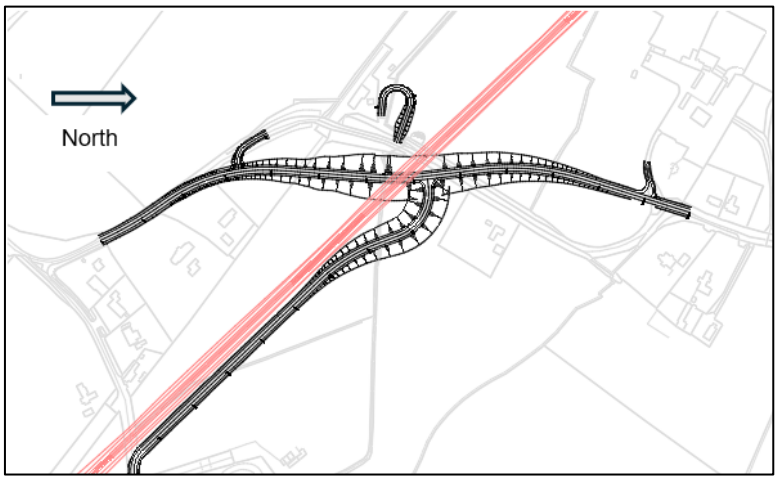


Figure 2-2: Proposed L2209 Road Alignment

The proposed road realignment preserves the mature trees as much as possible on the western side of the rail alignment, whilst maintaining the existing arch bridge at the old Batterstown train station. A new access is proposed here into the residence. Access from this residence is provided from the junction to the south of the proposed road realignment.

The alignment of the road in general is improved as the road ties back into the existing alignment beyond a set of tight bends.

Recommendation and Rationale

It is recommended that this road realignment proposal is taken forward as the preliminary design baseline concept to be developed and discussed with Meath County Council and local residents at the next project phase.

2.3 Dunshaughlin Station Infrastructure Arrangement Review

Consultation Feedback and Scope of Review

During NSPC1, the proposed Dunshaughlin Station location was generally well received, with the majority of respondents reporting that they were satisfied or very satisfied with the proposals.

Consultation feedback identified several matters for further consideration. These included the need to align the station layout and associated infrastructure with local and county planning objectives, including the potential Dunshaughlin Distributor Road identified within the Dunshaughlin Local Area Plan. Feedback also highlighted the importance of assessing multi-modal access arrangements to the station, including access by car, bus, walking and cycling.

The scope of the review was to develop a more detailed and coordinated arrangement for the park-and-ride facility and associated access infrastructure of the station. The review considered the station infrastructure configuration, the location of the park-and-ride facility, the relationship with the potential Dunshaughlin Distributor Road, access from Main Street and access from the R125. The review also included engagement with Meath County Council regarding the proposed arrangement.

Key Findings of Review

The review included high-level development and assessment of several options for arranging the proposed station infrastructure, including alternative locations for the park-and-ride facility and associated access arrangements.

The review found that locating the park-and-ride facility immediately adjacent to the western side of the station provides the most effective overall station arrangement. This configuration minimises walking distances between the station and parking areas, reduces potential interaction between station users and the proposed Dunshaughlin Distributor Road, and improves the integration of station facilities.

Under this arrangement, Main Street access would accommodate controlled bus access closer to the station, while retaining the existing laneway access to nearby private dwellings.

The preferred layout also rationalises the footprint required for railway infrastructure by consolidating station facilities within a more compact area. Locating the park-and-ride facility on the western side of the station provides convenient access for motorists travelling from the M3, the R125 and the potential Dunshaughlin Distributor Road, while reducing the need for station-bound traffic to travel through Dunshaughlin town centre. Active travel and public transport access would be maintained from both sides of the station.

Recommendation and Rationale

The recommendation is to relocate the proposed park-and-ride facility to a position directly adjacent to the station platform on the western side and provide access from the roundabout on the R125.

Access from Main Street would provide local and controlled bus access. The arrangement has been developed to retain the existing laneway access and avoid precluding the construction of the potential Dunshaughlin Distributor Road.

The recommended arrangement is shown in Figure 2-3.

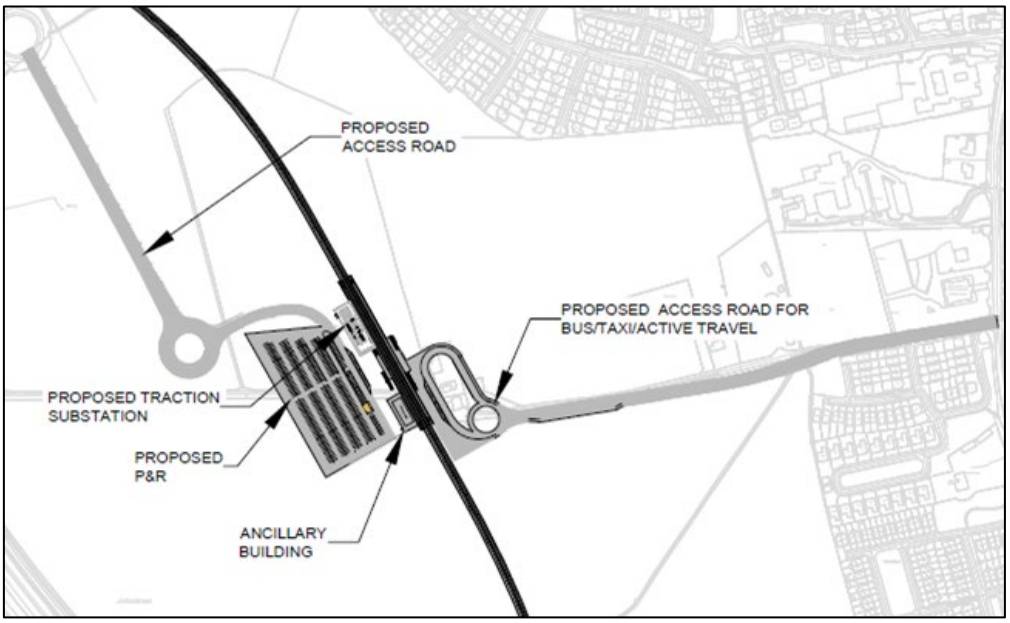


Figure 2-3: Recommended Dunshaughlin Station Arrangement

The proposed amended arrangement responds to the principal consultation issues concerning the relationship between the station, park-and-ride facility, town-centre access and the potential Dunshaughlin Distributor Road.

2.4 Dunshaughlin Station Active Travel Link Review

Consultation Feedback and Scope of Review

During NSPC1, feedback was received regarding the assumptions used to assess pedestrian and cycle accessibility to the proposed Dunshaughlin station associated with Option 8B (which at this location, is consistent with the 2011 rail reservation corridor). In particular, feedback queried whether the assessment had taken account of a potential pedestrian and cycle connection between the M3 Junction 6 services and the centre of Dunshaughlin, together with an improved crossing of the M3 on the R125 providing a direct connection to the proposed station.

The original assessment assumed that pedestrians and cyclists would access the station using the existing road network. Although the existing pedestrian and cycle facilities on the R125 crossing of the M3 are substandard, including a narrow footway on the northern side of the road, the assessment assumed that improvements would be provided to make the route suitable for pedestrian and cycle use.

A further assessment was therefore undertaken to determine whether the provision of a more direct pedestrian and cycle route to Option 8B would affect the forecast patronage, accessibility assessment or selection of the EPR.

Figure 2-4 shows the location of the potential alternative connection (providing a more direct pedestrian and cycle route to the proposed location of Dunshaughlin Station in Option 8B).

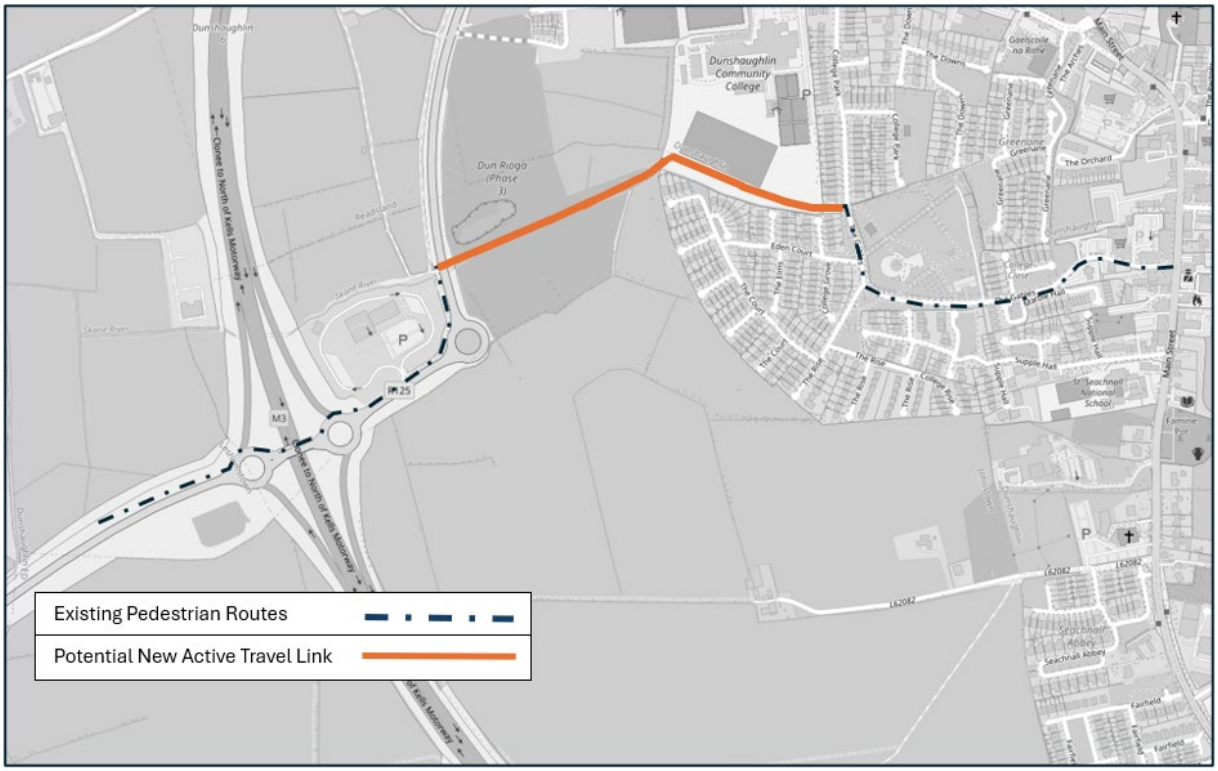


Figure 2-4: Location of potential pedestrian/cycle route connecting Option 8B to Dunshaughlin

Key Findings of Review

The findings of the review are summarised below:

- The additional modelling demonstrates that the potential active travel link, as suggested during the NSPC1 feedback, would have a positive effect on accessibility and station usage for Option 8B. However, the magnitude of this benefit is relatively modest and does not materially affect the comparative assessment of the option, with forecast patronage remaining significantly below that of Option 8M.
- The additional walk/cycle route does not result in a change to the accessibility score for Option 8B in the targeted MCA undertaken in the pOSR. The assessment confirms that, notwithstanding the provision of the more direct active travel connection, the majority of Dunshaughlin residents would still be located beyond a 20-minute walking catchment of the station. While the number of households with convenient cycle access increases, this benefit is not sufficient to materially change the overall accessibility performance of the option.

Recommendation and Rationale

The recommendation is that option 8M remains the PR.

The review demonstrates that the provision of a more direct pedestrian and cycle connection between Dunshaughlin town centre and the proposed station associated with Option 8B would not materially alter the performance of the option. Although some improvement in accessibility and patronage is forecast, the benefits are limited in scale and do not result in any change to the accessibility score assigned to Option 8B in the targeted MCA

The previous selection of Option 8M as the EPR is thus unaffected by the inclusion of a more direct foot/cycle route to Dunshaughlin Station in Option 8B.

2.5 Leshemstown/ Readsland Area Study

Consultation Feedback and Scope of Study

During NSPC1, submissions from the Leshemstown area raised concerns regarding the impact of the rail line, and associated infrastructure, in the vicinity of Leshemstown. The concerns centred around the visual impact of the rail, and associated road realignment, on the local community of Leshemstown Lane. Particularly given that the road realignment has embankments/retaining structures up to 6m in height adjacent to properties along Leshemstown Lane. Concerns were also raised on the impact of the EPR on the existing attenuation pond in the Readsland area, which serves the existing the Dun Rioga housing estate and future housing development in this area.

A localised study was undertaken to determine whether an alternative alignment could mitigate the impact of the EPR (and associated road realignment) on the local community.

The assessment compared the EPR (Variant 8M), with the alternative alignment (Variant 8N). The assessment considered each variants impact on residential properties and amenities, engineering constraints, and the local environment effects.

Please refer to Figure 2-6 for the location of the two variants.

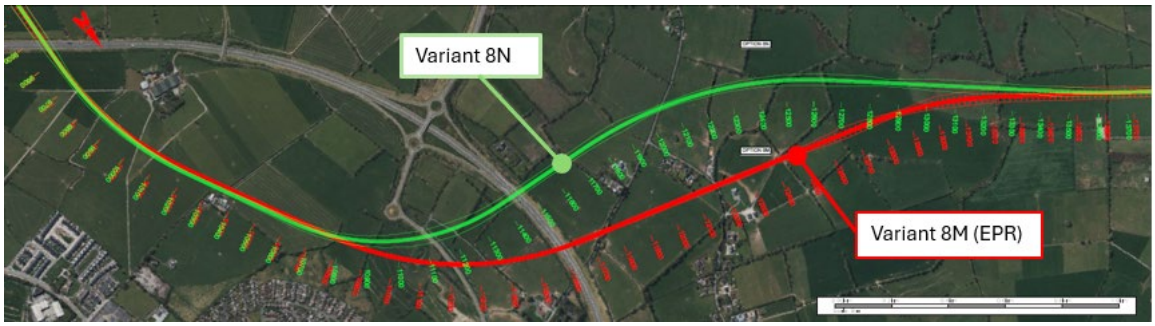


Figure 2-5: The location of the variants through the Leshemstown localised study area

Key Findings of Study

Variant 8N avoids Leshemstown Lane and crosses the Drumree Road instead. The Drumree Road would be realigned below the railway, avoiding the need for the elevated Leshemstown Lane road arrangement and associated cul-de-sac required for Variant 8M. An assessment on the reduced curve speed to the north of Dunshaughlin determined that the reduced curve speed in this location for Variant 8N does not have any material timetable impact.

Variant 8N also avoids the existing Readsland attenuation pond, removing the requirement to relocate it.

The targeted MCA found that both variants are feasible, with the results of the targeted MCA shown in **Table 2-1**.

Table 2-1: Summary of MCA Results for Leshemstown Area Study

Criteria	Variant 8M	Variant 8N
Impact on Residential Properties and Amenities		**Preferred**
Engineering Constraints		**Preferred**
Local Environment		**Preferred**

Recommendation and Rationale

It is recommended that Variant 8N is taken forward as the Preferred Route through the Leshemstown and Readsland area.

The targeted MCA confirmed that Variant 8N is the preferred variant in all core criteria.

Variant 8N would minimise the net impact of the scheme on the local community. Variant 8N avoids the significant residential and amenity impacts associated with Variant 8M, including impacts on multiple dwellings, residential curtilage, agricultural buildings, and the lands associated with an established equestrian business. Variant 8N also avoids the need to relocate the existing attenuation pond.

2.6 Dunsany Area Study

Consultation Feedback and Scope of Study

A significant number of submissions raised concerns about maintaining the Emerging Preferred Route (EPR) along the original rail line through Dunsany Estate. The submissions expressed concern that the proposed Navan Railway would impact the private rewilding project within the estate. These submissions also referenced the cultural and architectural value of the Dunsany Castle Demesne ACA and emphasised the need to protect and conserve its history.

In the vicinity of Dunsany, the EPR broadly follows both the historic railway corridor and the railway preservation corridor identified in the Meath County Development Plan (CDP). The protection of this corridor is long established within the CDP which has been subject to a statutory Strategic Environmental Assessment (SEA) process under EU directive 2001/42/EC, separate to the current options selection process for the proposed Navan Rail Line.

A number of specific factors contributed to the selection of the EPR in this area:

1. The alignment is consistent with the railway preservation corridor identified by Meath County Council and largely follows the historic railway corridor that operated in this location prior to closure.
2. The route provides a more direct railway alignment between Kilmessan and Dunshaughlin, reducing overall route length, supporting shorter journey times and reducing construction and operational costs.
3. The alignment takes advantage of existing topographical conditions, avoiding the requirement for extensive cuttings, embankments and earthworks that would be required on alternative alignments further west. This reduces both construction impacts and the physical footprint of the railway corridor.
4. The alignment avoids the Architectural Conservation Area (ACA), thereby reducing potential impacts on the principal heritage and landscape assets associated with Dunsany.
5. The alignment has been positioned, insofar as practicable at this stage of design development, to remain close to the historic railway corridor and to minimise impacts on established woodland and mature trees. While the route passes through lands within the wider Dunsany Estate, it has been developed to avoid the majority of the established woodland by passing between Railway Wood and agricultural lands to the south.
6. Further design development during subsequent project stages will continue to examine opportunities to refine the alignment and reduce impacts on estate lands, trees, biodiversity and other environmental receptors, where reasonably practicable.

The study reviewed the quantum of land required for the operational railway and associated road realignments. It also examined whether alternative local alignments could provide a more appropriate route through the Dunsany area. Variant 8M, the EPR, was assessed against three local alternatives, Variants 8I, 8A and 8P, using a targeted multi-criteria assessment covering engineering and climate and local environmental effects.

Please refer to Figure 2-6 for the location of the four variants.

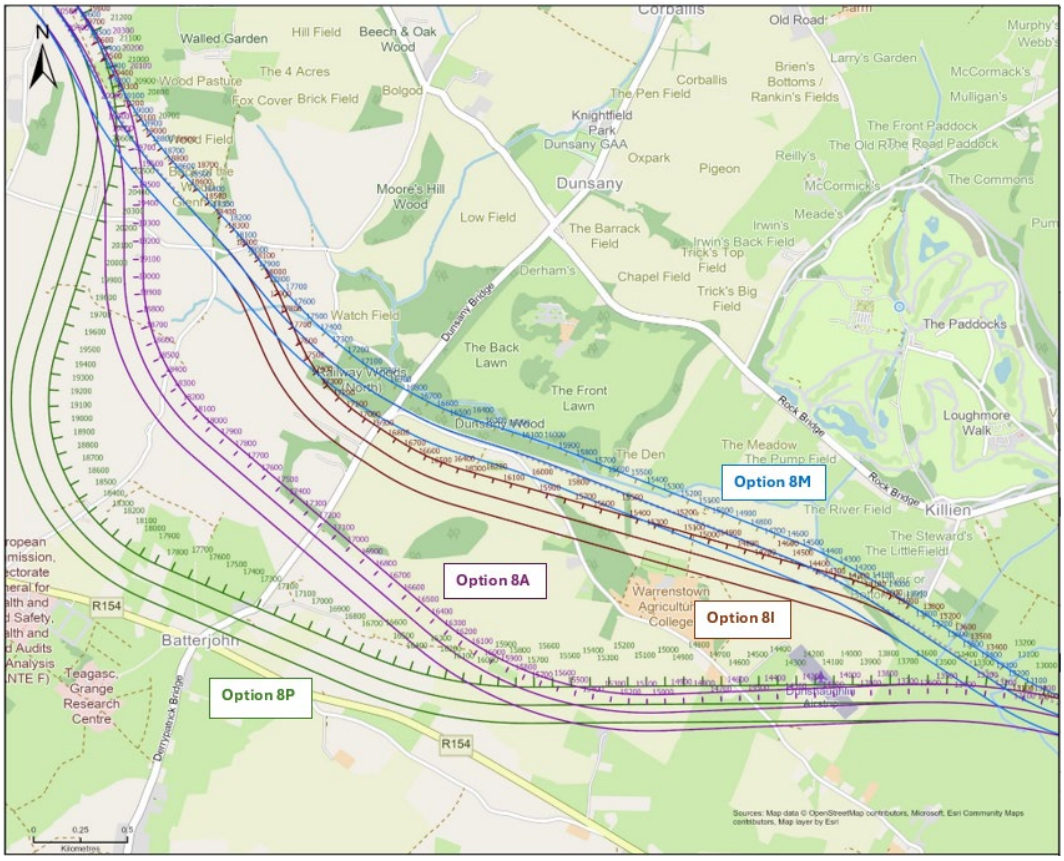


Figure 2-6: The location of the four variants through the Dunsany localised study area

Key Findings of Review

The assessment found that the existing rail reservation corridor is sufficient to accommodate the proposed operational double-track electrified railway. The required operational rail corridor is estimated to affect approximately 10 acres of land. Furthermore, approximately 4.5 acres would be required to facilitate the proposed L2207 and L22071 road realignments. The estimated permanent land requirement associated with the railway and road realignments therefore represents approximately **2%** of the rewilding area. Construction-stage land requirements have not yet been defined and will be considered as the design and construction methodology are developed.

Variant 8M is the shortest alignment at approximately 7.4 km and largely follows the disused railway corridor. This reduces earthworks, land take and construction complexity

and allows for the reuse of existing infrastructure, including Dunsany Overbridge. The alternative variants would require greater lengths of new railway, more substantial earthworks and cuttings, additional road grade-separation structures and increased interaction with overhead electricity infrastructure.

The targeted assessment found limited differences between the variants in overall climate and local environmental performance. Variant 8M was marginally preferred in relation to landscape and visual effects and archaeology and cultural heritage.

Variant 8M performed most strongly overall in the targeted MCA, with the results summarised in Table 2-2 below.

Table 2-2: Summary of MCA Results for Dunsany Area Study

	Variant 8M	Variant 8I	Variant 8A	Variant 8P
Engineering score	84	3	2	2
Environment cumulative score	28	26.5	27	25.75
Engineering average	4	3	2	2
Environment average	3.50	3.31	3.38	3.22
Total	**7.50**	**6.31**	**5.38**	**5.22**
Preference (rank)	**1st**	**2nd**	**3rd**	**4th**

Recommendation and Rationale

It is recommended that Variant 8M, the alignment presented as the EPR during NSPC1, is taken forward as the Preferred Route through the Dunsany area.

Variant 8M provides the best overall balance of engineering and environmental performance, with the targeted MCA confirming that Variant 8M remains the preference. It follows the former railway alignment the established railway reservation corridor, which underwent a SEA and minimises the extent of earthworks and new structures in comparison to the other variants.

2.7 Road-Rail Interface at Kilmessan Study

Consultation Feedback and Scope of Review

Consultation feedback on the EPR at Kilmessan identified concerns regarding the proposed road realignment of the L4010 and the associated road overbridge. In particular, respondents highlighted the potential for visual, noise and access impacts arising from the road infrastructure in addition to those associated with the proposed railway.

The review therefore examined whether the proposed L4010 road realignment developed for the EPR remains the most appropriate solution. This included the development of an alternative road alignment to review its performance against the road arrangement of the EPR and identify any potential opportunities to reduce impacts.

Key Findings of Review

An alternative road alignment was developed to the north of the L4010 to reduce the impact to the properties to the west of the proposed rail realignment. The proposed amended road realignment is shown in Figure 2-7.

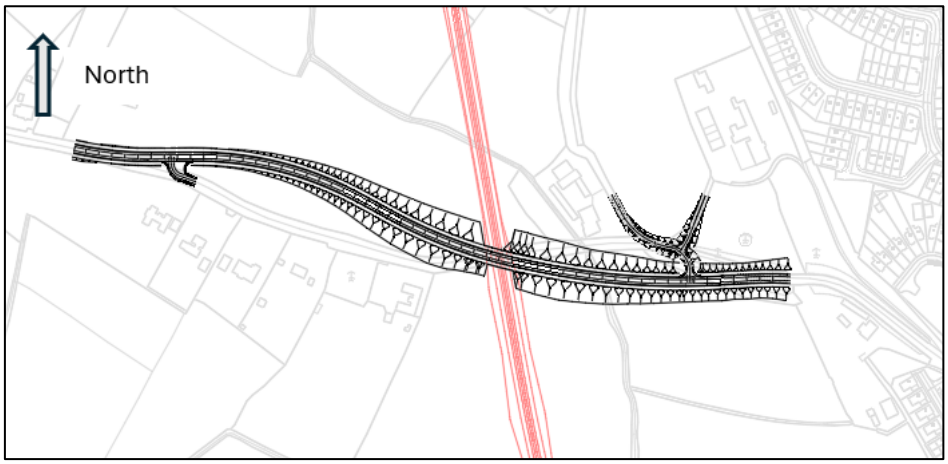


Figure 2-7: Proposed L4010 Road Alignment

The proposed road realignment begins at the historic railway overbridge to the north of Kilmessan. The road then rises to cross the proposed railway and bears to the northwest into a field on the opposite side of the L4010 to the line of housing developments on the southern side of the existing road. New accesses would be provided into the residences on both sides of the road and into the western entrance of the Station House Hotel. This road alignment is shorter in length overall to the road realignment presented at NSPC1, thus reducing land take and overall impact.

The alternative road alignment was selected because it provides more efficient, better-aligned road geometry while substantially reducing impacts on adjoining landholdings compared with the EPR arrangement presented during NSPC1. The EPR road alignment affected more landholdings than the alternative road alignment, with the alternative road alignment reducing land severance, acquisition requirements, and the overall extent of property impacts.

In addition to reducing impacts on landowners and nearby properties, the preferred alignment is shorter in overall length than the NSPC1 proposal, resulting in reduced land take and a more compact road solution while continuing to meet the operational and safety requirements of the local road network.

Recommendation and Rationale

It is recommended that this road realignment proposal is taken forward as the preliminary design baseline concept to be developed and discussed with Meath County Council and local residents at the next project phase.

2.8 Navan South Station Review

Consultation Feedback and Scope of Review

During NSPC1, feedback was received suggesting that an additional station should be provided to serve the southern areas of Navan. The proposed station, referred to as Navan South Station, would be located on the EPR, at the indicative location, shown in Figure 2-8 below, to the south of Navan.

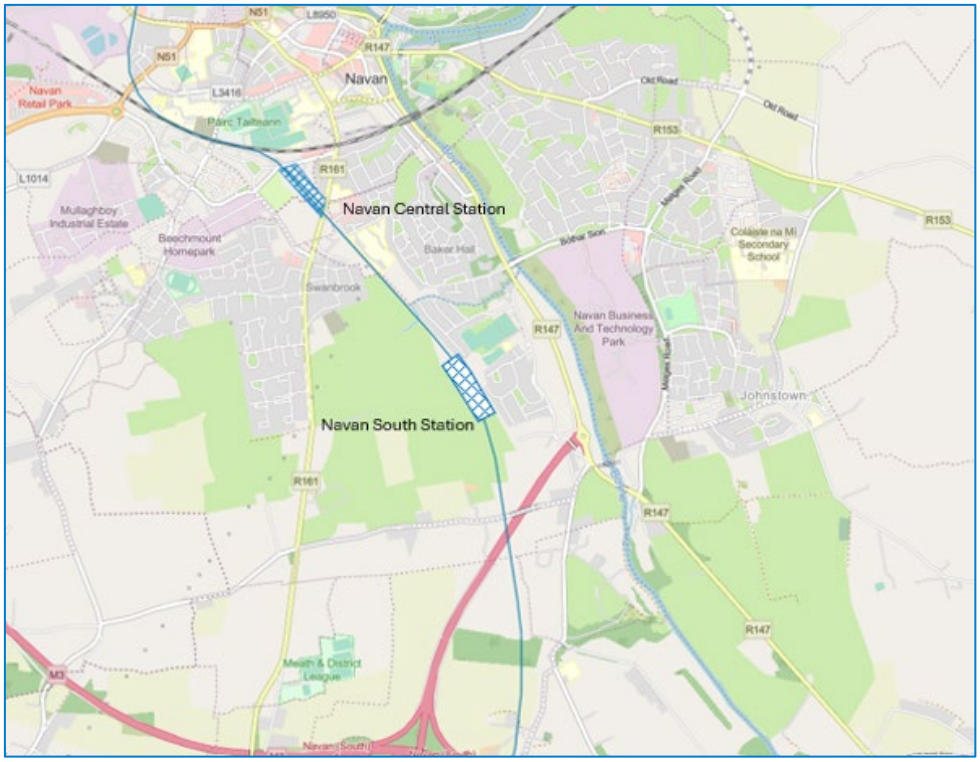


Figure 2-8: Indicative location of proposed Navan South Station

A review was undertaken to assess the potential benefits and disbenefits of including Navan South Station as part of the EPR. The assessment considered forecast patronage, accessibility, and vehicle kilometres travelled.

Key Findings of Review

The findings of the review of the potential impact on the EPR (Option 8M) of the provision of a Navan South Station are summarised in Table 2-3 below.

Table 2-3: Summary of the Impacts of a Navan South Station on Option 8M

Criteria	Discussion of Impact
Patronage	Although there would be significant usage of the Navan South Station (over 4,300 in 2050) this is largely due to users switching from Navan Central Station, and to a lesser extent Navan North Station. The increase in overall patronage is 2% in 2035 and 1% in 2050.
Accessibility	There would be a significant increase in accessibility for people able to walk to a station. The vast majority of Navan residents would be able to access a rail station within a 30-minute walk. The impact on accessibility by cycle is less significant as a majority of the population can reach Navan centre within 20 minutes.
PCU-kilometres	There will be an increase in total pcu-kilometres, compared to Option 8M without Navan South Station. The decrease achieved by Option 8M is reduced by 7.4% in 2035 and 4.4% in 2050

Recommendation and Rationale

The recommendation is that an additional station in Navan South is not included as a committed station in the PR but that the PR is amended to allow for future provision of a station in the indicative location.

Whilst an additional station in Navan South would provide an improvement in walking accessibility, particularly for residents in southern Navan and areas east of the River Boyne, its inclusion would increase journey times for other rail users, encourage additional car use through the provision of parking, increase car traffic in Navan and increase vehicle kilometres travelled.

Having regard to the balance of benefits and disbenefits, the assessment does not support amending the EPR to include Navan South Station at this stage.

3.0 The Preferred Route

Following the completion of the technical assessment of the specific matters addressed in this report, the PR has been finalised. The PR presented at NSPC2 is shown in **Figure 3-1** below.

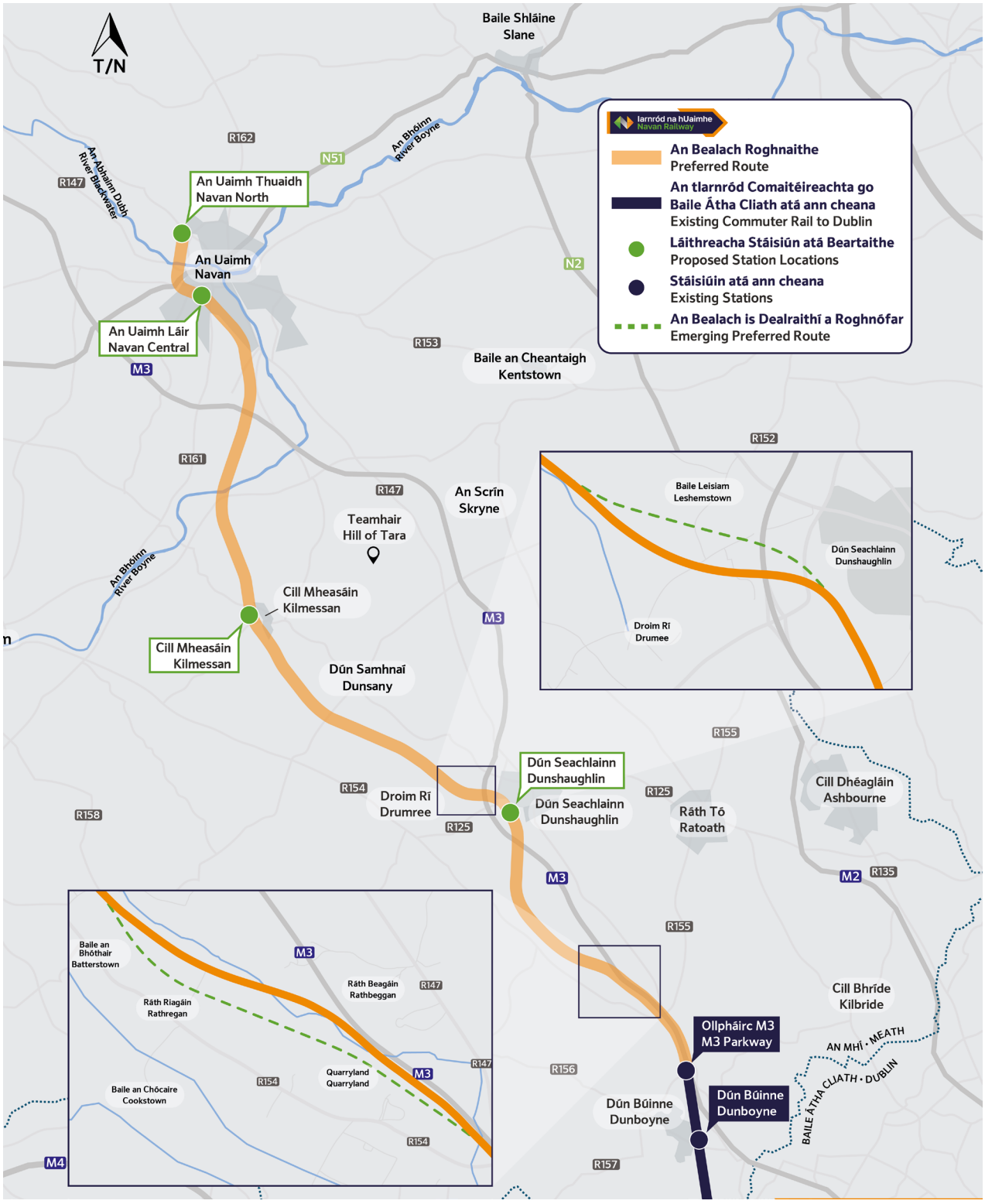


Figure 3-1: The PR (presented at NSPC2)

Appendix A Rathregan Area Study

Rathregan Area Study - EPR Review

Navan Railway



C789-P02-RN-X-XXX-TN-TTI-X-000001

P01_A_C01

11 November 2026

Tetra Tech, Lyrr 2, IDA Business & Technology Park, Mervue, Co. Galway, H91 H9CK

Tetra Tech Consulting Ireland Limited. Registered in Ireland: No. 665968
Registered Office: Mounttown House, 62/63 Mounttown, Road Lower, Dún Laoghaire, Co.,Dublin, A96 P8X6, Ireland

Document status

Document status					
Version	**Purpose of document**	**Authored by**	**Reviewed by**	**Approved by**	**Date**
C01	For Information	Various	CS	AD	11.11.26

Approval for issue		
AD	AD	11/11/2026

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Prepared by	Prepared for
Tetra Tech	Iarnród Éireann

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1.0 Introduction

1.1 Overview

The Non-Statutory Public Consultation No. 1 (NSPC1) on the Emerging Preferred Route (EPR) for Navan Railway was launched on the 20th of May 2026 to the public. NSPC1 included four public events, with one-to-one meetings also held with affected landowners.

Feedback was received through a range of means during the consultation and subsequently analysed and reported in the Consultation Findings Report, was collected, analysed and reported on. The consultation accepted submissions through various channels, outlined in the Consultation Findings Report.

A key theme arising from the feedback related to the proposed route through the Quarryland/ Rathregan area (Ch. 2,000m -> 6,500m), where stakeholders expressed concerns regarding impacts on existing land use and the potential severance of agricultural land parcels.

The EPR alignment in this area deviates from the Meath County Council Rail Reservation Corridor (MCC RCC) to avoid the Office of Public Works (OPW) Flood Zone A as far as reasonably practicable, consistent with one of the core route design principles of minimising impacts associated with identified flood zone areas.

In response to the concerns raised during the consultation, and following a site inspection, the project team undertook a local assessment to determine whether an alternative alignment in the area could reduce impacts on landowners whilst continuing to meet the project's technical, environment and operation requirements.

1.2 Scope of Assessment

The scope of this EPR review report is to examine, through analysis of a number of factors, whether alternative route alignments to alleviate some of the concerns raised by landowners. This will be done through developing several alternatives through the localised study area and then a review of a number of factors covering the following disciplines/topics:

1. Flood Risk
2. Environmental Constraints
3. Land Severance

2.0 Background

2.1 Existing Land Use and Landholdings

The land along this section of the EPR consists of fields mainly used for agricultural and equestrian purposes. The former rail corridor runs (referred to as the 1960s corridor in this technical note) through these fields in some areas with visible embankments and infrastructure remaining in these areas (See Appendix A for photographic survey). The River Tolka is a key constraint in this area, along with the M3 motorway, Meath Eco Park and Rathregan Cemetery.

2.2 OPW National Indicative Fluvial Mapping

The source of the flood mapping used in the assessment in the identification of the EPR was the OPW National Fluvial Mapping (NIFM). NIFM is a high-level dataset which is indicative only and therefore generally triggers the need for more detailed modelling to reduce uncertainty. However, NIFM is appropriate information to use for this project phase in advance of carrying out detailed modelling in the next phase. The flood extents shown on the NIFM can potentially be conservative. The flood zones A and B in the Rathregan/ Quarryland areas are shown in **Figure 1**. It is also noted that according to the OPW's flood map, the flood mapping in this area is currently under review, with an updated flood map expected in Spring 2027.

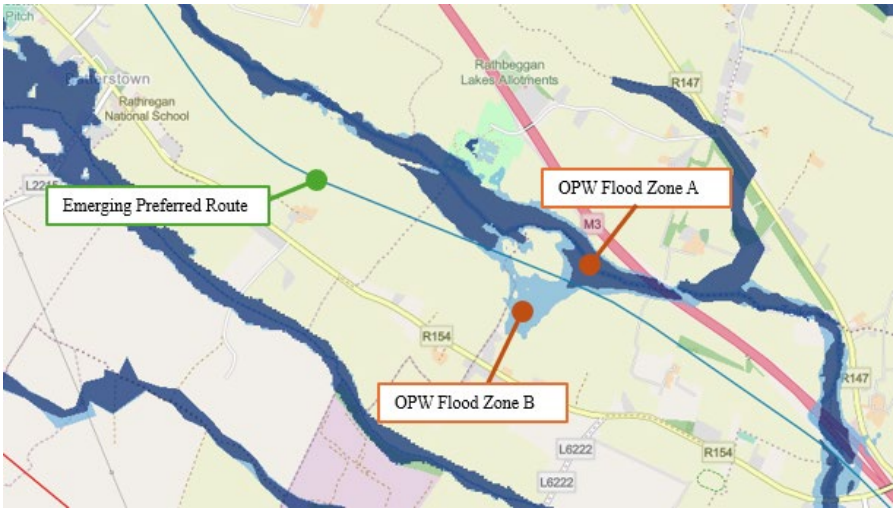


Figure 1 – EPR and OPW Flood Zone A and Zone B

2.3 Flood modelling conducted in this area by Iarnród Éireann (separate project)

Following NSPC1, the project team undertook a review of additional flood risk information relevant to the study area. As part of this exercise, a recently completed flood model developed by Iarnród Éireann (IÉ) for a separate project in the vicinity of the proposed alignment was identified and reviewed.

While this model was not developed for the Navan Railway project and therefore cannot be directly applied to the assessment of route options, it indicates that site-specific flood modelling may predict a smaller flood extent than that currently shown on the OPW NIFM. This suggests that an alignment closer to the River Tolka may have less significant flood-related impacts and mitigation requirements than previously anticipated.

Although further project-specific flood modelling will be required to validate these findings, the availability of this information, together with feedback received during NSPC1, provided an opportunity to re-examine the alignment in this area. The available flood map is shown in **Figure 2**.

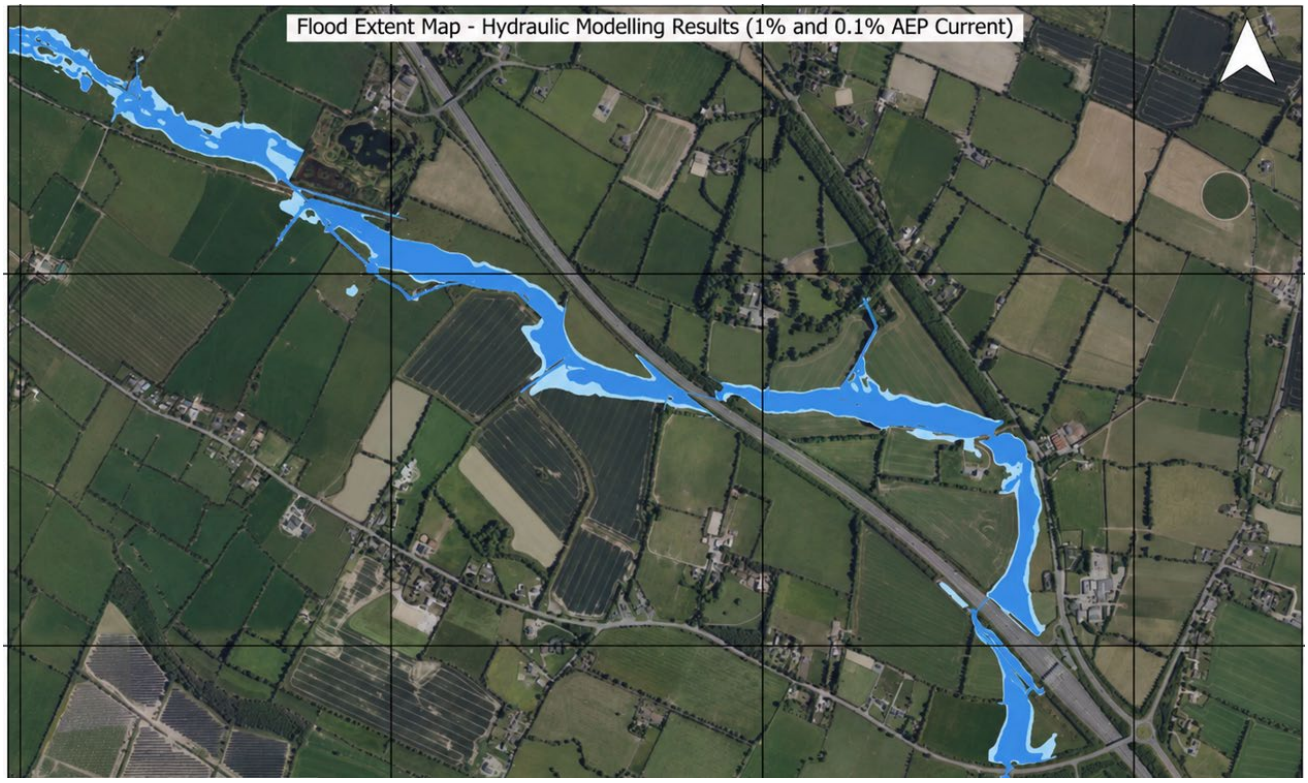


Figure 2 – Site Specific Flood Model for Separate Project

3.0 Consideration of Alternatives

3.1 Emerging Preferred Route (EPR)

The EPR through Quarryland/ Rathregan is shown in Figure 3.

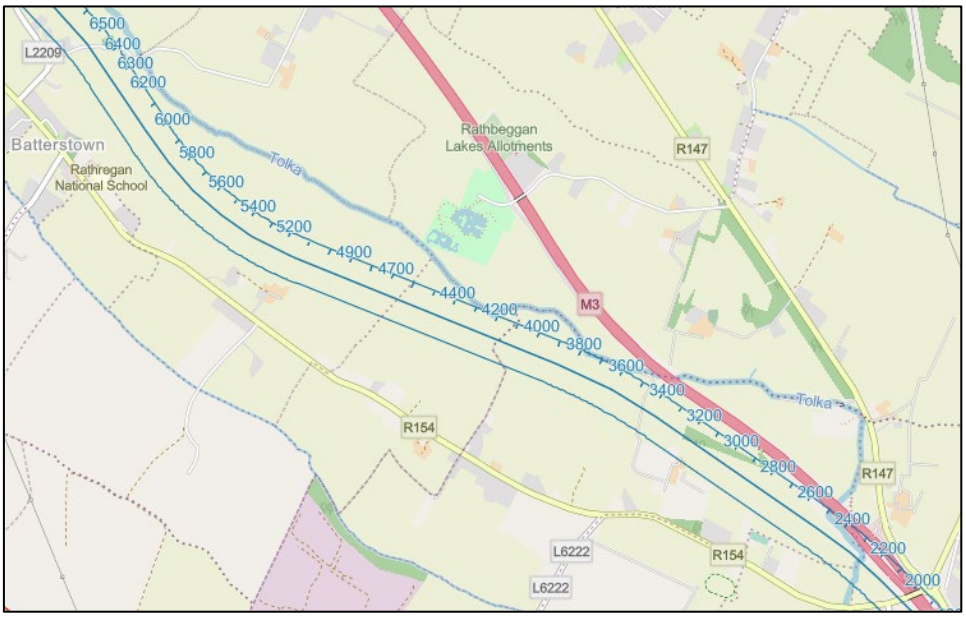


Figure 3 – EPR though localised study area

The rationale behind the route alignment deviating from the Meath County Council Rail Reservation Corridor (MCC RRC), and encroaching to the South-West, is to avoid the OPW Flood Area A as much as reasonably practicable. Avoiding the flood risk area where possible and practical is one of the first principles when designing the route.

3.2 Meath County Council Rail Reservation Corridor

The MCC RRC is shown in Figure 4. It varies from the current EPR route by traversing closer to the river Tolka but is kept to the south side of the river.

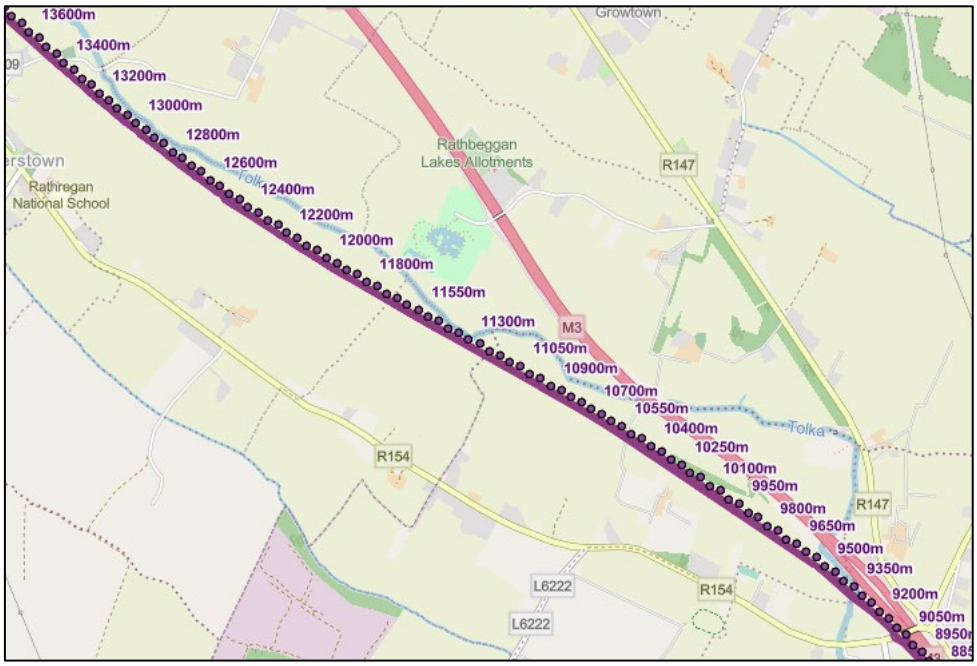


Figure 4 – MCC RRC Route though localised study area

3.3 Modified 1960s Corridor

A large part of the 1960s rail corridor is extant in the area. This is in the form of a clearly visible railway corridor, with embankments, hedgerows and an accommodation structure (see Appendix A for photos). The construction of the M3 motorway severed some parts of the 1960s corridor, making it unsuitable for the reintroduction of a new railway along the exact same alignment. Figure 5 shows the 1960s corridor through the chainage extents being reviewed in this study.

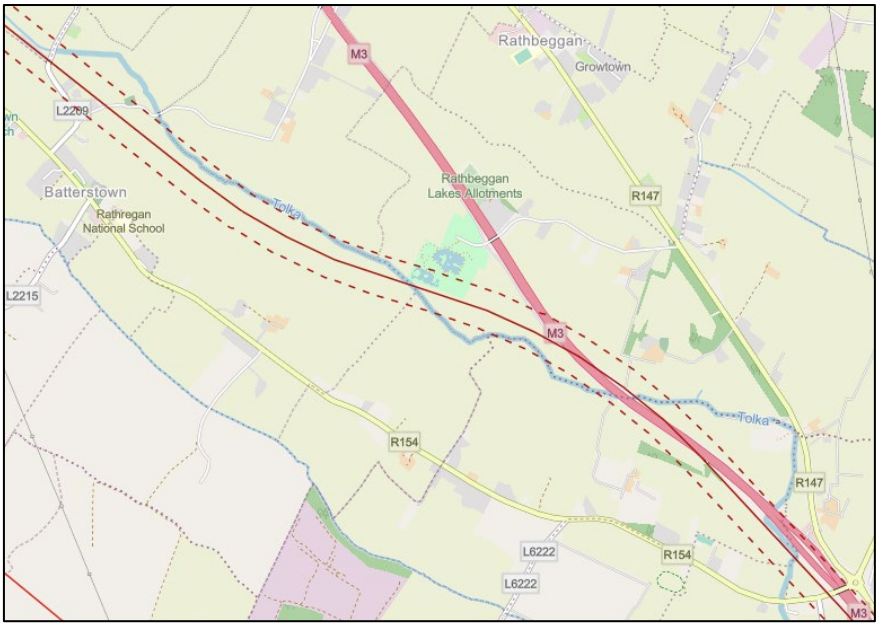


Figure 5 – 1960s Route though localised study area

Given the encroachment of the M3 on the 1960s corridor, an option to follow as much of the extant 1960 corridor as possible was developed. This option along with the original 1960s corridor is shown in Figure 6 for comparison.

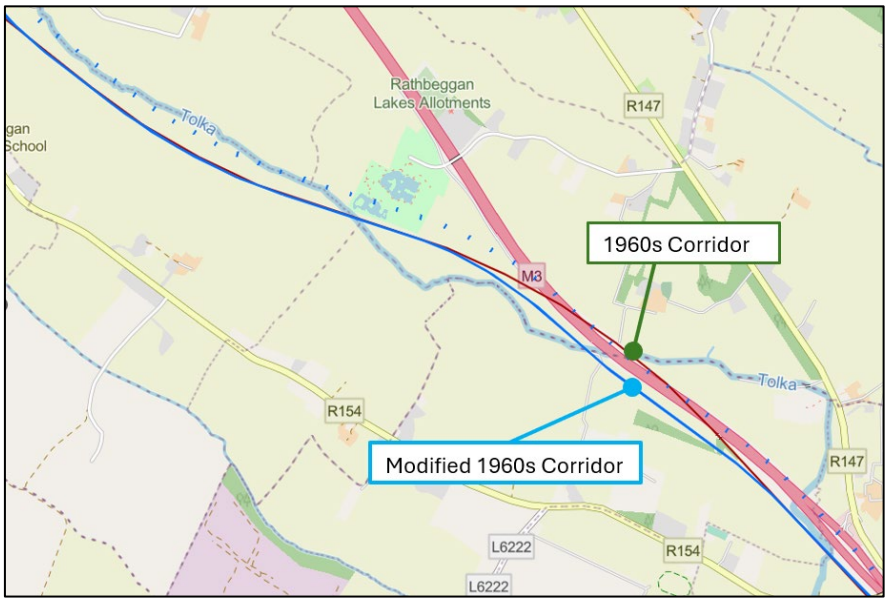


Figure 6 – 1960s Corridor and Modified 1960s Corridor

Whilst this route crosses the River Tolka twice, the watercourse, as is shown in Figure A.8 of Appendix A, is not a major watercourse at this location.

This route uses the same crossing of the R154 as the other two options, however, it follows adjacent to the M3 as much as possible and rejoins the 1960s corridor to the southern boundary of the Meath Eco Park and then follows the extant corridor, before joining a common point between all three options – the road crossing at Rathregan cemetery, i.e. the limit of this study area.

3.4 Summary of Alternatives

The three alternatives taken forward for review are shown in Figure 7.

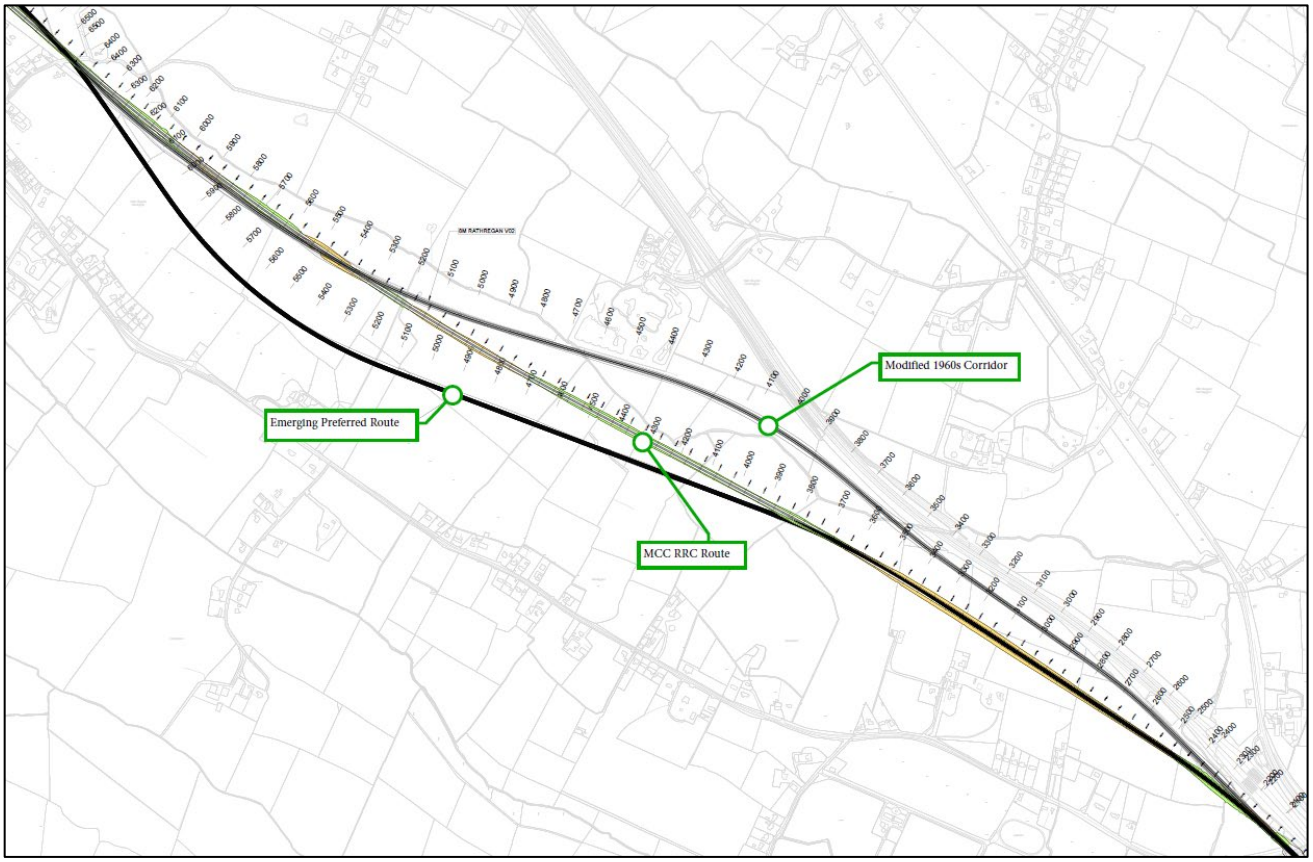


Figure 7 – Three routes through localised study area

4.0 Route Options Assessment

4.1 Flood Assessment

The three routes have been assessed for the distance they traverse the OPW NIFM Flood Zones A and B and the site-specific flood mapping. **Table 1** which summarises the lengths traversing the OPW NIFM Flood Zones. **Table 2** summarises the length over which the alternatives considered cross the flood zones identified in the separate project's flood analysis.

Table 1 – Interaction with OPW NIFM Flood Zones

EPR	MCC RRC[1]	Modified 1960s Corridor
Overlap with flood zones - 2100-2500, 3500-4600	Overlap with flood zones at 9200-9450, 10750-10950, 11150-11750, 12650-12750	Overlap with flood zones- 2100-2500, 3400-4900 and 5600

Table 2 – Interaction with Site Specific Flood Mapping

EPR	MCC RRC	Modified 1960s Corridor
Overlap with flood zones - 2250-2350, 3750-3850	Overlap with flood zones at 9300-9400, 10750-10900, 11675	Overlap with flood zones- 2250-2450, 3450-3600, 3900-4100, and 4450-4700

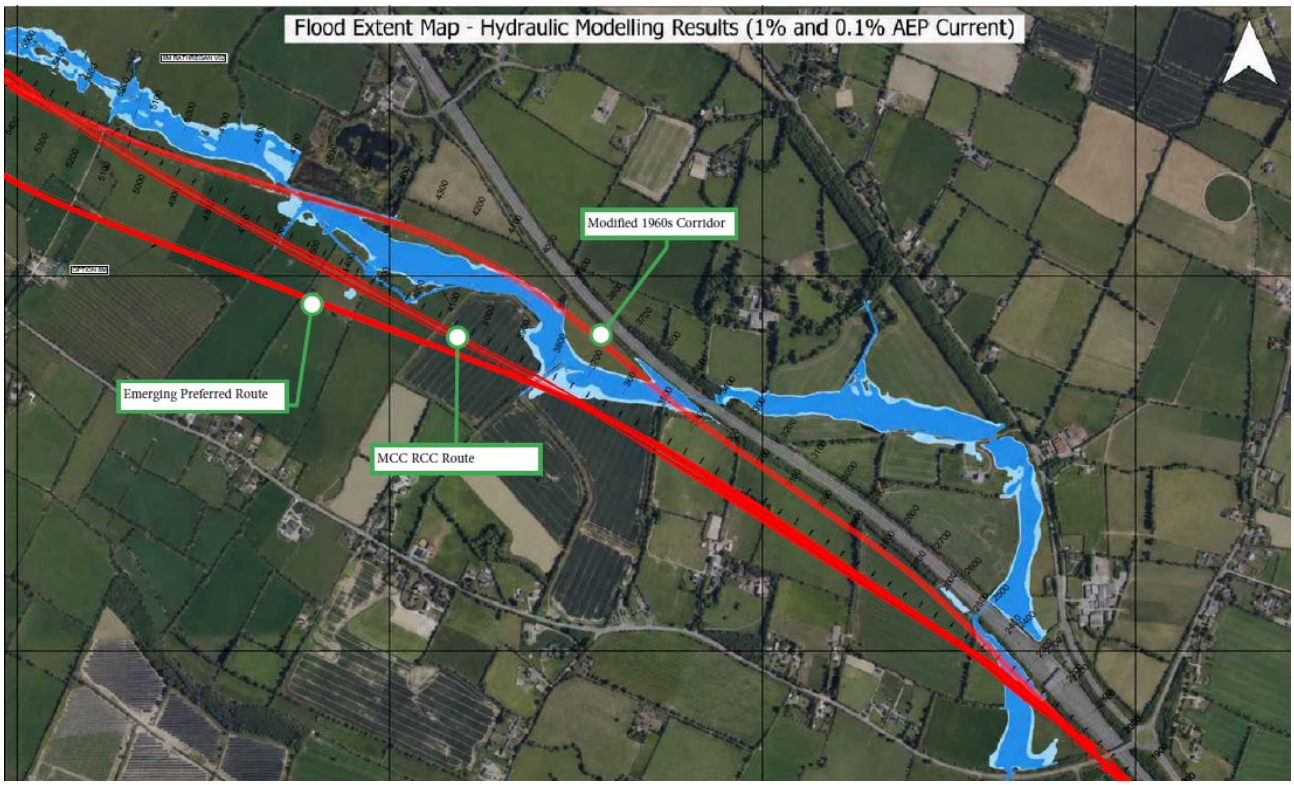


Figure 8 – Routes Interaction with Site Specific Flood Mapping

[1] Note – chainages for the MCC RRC are expressed in the project chainage system used at that time.

Comparing **Table 2** to **Table 1** demonstrates that there is less interaction with the flooding areas for the site-specific flood mapping carried out for a separate project. Once the detailed flood modelling, which will be undertaken in the next phase of the project, is complete, the full impact of flooding and required mitigations on the various routes will be better understood and defined. **Table 3** outlines the summary of the flooding assessment.

Table 3 – Flooding Assessment Summary

	EPR	MCC RRC	Modified 1960s Corridor
Summary	Avoids the vast majority of the predicted flood extent for the site-specific flood model data, and the NIFM flood zones.	Crosses the predicted flood zone a number of times, however generally when perpendicular to the required river crossings.	Crosses the predicted flood zone a number of times, however generally when perpendicular to the required river crossings. Skirts the edge of the predicted flood zone.
Rank	Preferred	Intermediate	Less Preferred

The EPR is deemed the preferred option in relation to the flood assessment criteria, however, it can be concluded that there is confidence that project specific modelling in the area will likely show the flooding extents in the area are not as extensive as shown in NIFM.

4.2 Environmental Constraints

A high-level review of the environmental constraints through the area was undertaken. The summary of which is set out in Table 4.

Table 4 - Environmental Constraints Summary

Constraint Classification	EPR	MCC RRC	Modified 1960s Corridor
Cultural Heritage	Partial overlap of corridor with SMR Zone for ME044-028---- Deserted medieval settlement at Rathegan (Ch 5100-5200)	Partial overlap of corridor with SMR Zone for ME044-028---- Deserted medieval settlement at Rathegan (Ch 5100-5200)	Minimal overlap of corridor with SMR Zone for ME044-028---- Deserted medieval settlement at Rathegan (Ch 5100-5200)
Cultural Heritage	Full overlap with SMR and SMR zone of ME044-023----Mound barrow	None identified	Partial overlap with SMR zone of ME044-023---- Mound barrow
Hydrology & Hydrogeology	Route alignment intersected by River Tolka_010 twice at Ch 2300 and 3800	Route alignment intersected by River Tolka_010 twice at Ch 9300 and 10900m	Route alignment intersected by River Tolka_010 three times at Ch 2300, 3600 and 4600
Hydrology & Hydrogeology	Corridor intersected by River Tolka at Ch 3700 and 4200	None identified	None identified
Landscape	Corridor overlaps with high sensitivity LCA10-The Ward Lowlands from Ch 2000 to 4700	Corridor overlaps with high sensitivity LCA10-The Ward Lowlands from Ch 9100 to 11800	Corridor overlaps with high sensitivity LCA10-The Ward Lowlands from Ch 2000 to 4800
Soils & Geology	Overlap with alluvium soils at Ch 2300-2400, 3600-3800 and 4100-4500	Overlap with alluvium soils at Ch 9350-9400, 10850-10900 and 11250-11600	Overlap with alluvium soils at Ch 2300, 3500-3600, 3900-4200 and 4500-4800

It can be seen that each route has similar environmental constraints under the different categories, thus it can be concluded that the high-level environmental review impact is generally neutral.

4.3 Land Impact and Severance Assessment

A review of land ownership and existing land parcel boundaries was undertaken to assess the potential impact of the three alignment options on affected landholdings within the Quarryland/ Rathregan area. The assessment was informed by folio and land parcel information obtained from the Property Registration Authority's Landdirect.ie online service, together with a review of the proposed alignments and existing site conditions. The assessment considered the extent to which each option would divide existing landholdings, create severed or isolated parcels, affect access to agricultural and equine lands, and generate a requirement for accommodation works or structures to maintain access between land parcels. Particular consideration was given to the existing severance created by the M3 motorway and the historic 1960s railway corridor. The three options — the EPR, MCC RRC and Modified 1960s Corridor — were compared against the identified landholdings to establish their relative impacts. The assessment also considered feedback received directly from affected landowners during consultation meetings and the subsequent joint site visit. The findings are presented as a comparative assessment as outlined in **Table 5**.

Table 5 – Landholdings Assessment

	EPR	MCC RRC	Modified 1960s Corridor
Summary	Creates additional severance between M3 and the railway corridor, more than the MCC RCC. Approximately 164 acres of land severed between the existing 1960s railway corridor and the EPR, passing through 11 landholdings. Requires at least four accommodation structures, and potentially an additional structure following information provided in NSPC1, indicating some landholdings may be split in ownership in the near future. Strongly objected to by local landowners during NSPC1.	Creates additional severance between M3 and the railway corridor. Approximately 92 acres of land severed between the existing 1960s railway corridor and the MCC RCC, passing through 11 landholdings. Requires at least three accommodation structures to maintain access to severed landholdings, but potentially an additional structure following information provided in NSPC1, indicating some landholdings may be split in ownership in the near future. Some objections to this route by local landowners during the July 2026 site walkover.	Follows the existing 1960s railway corridor, minimising additional land fragmentation. Land severance is minimised. Approx. 11 acres severed between existing 1960s railway corridor and modified 1960s corridor. Impacted landowners are mainly the same as the EPR except for one new land holding, with a total of 9 landholdings passed through. This additional landholding was severed by construction of the M3. Reduces the requirement for accommodation structures, although potentially two structures may be required across the Tolka River. Strongly supported by local landowners during the July 2026 site walkover.
Rank	Less Preferred	Intermediate	**Preferred**

For the Modified 1960s corridor option, whilst following the M3 does cause land severance, it is the least impactful compared to the other two options. The route largely follows the existing railway embankment and land severance caused by the extant 1960s corridor. This will likely reduce the required number of accommodation structures, as land between the M3 and rail corridor would become sterilised requiring a statutory acquisition process. Albeit the number of structures reduced may be offset by the required structures crossing the Tolka River flood zone (potentially two). A high-level estimate of cost based on the shortlist cost estimates shows that the costs will be neutral for the required underbridges over the Tolka river vs the accommodation overbridges required for the severed land (*ca.* €4 million (ex. add-ons) in both cases).

It is also noted that the Modified 1960s corridor option brings the alignment closer to Meath Eco Park, compared to the MCC RRC and the EPR as presented to the public in NSPC1.

A site visit was carried out in July 2026 to meet landowners and carry out a technical walkover of the area in question. From that walkover, it was clear that the 1960s extant corridor is still present and any alignment options along it were likely feasible from an engineering perspective. The walkover also gave the technical team the opportunity to listen to landowner concerns, review any constraints and carry out a photographic survey. A strong preference from landowners in the area was to utilise the 1960s corridor as much as possible. The survey photographs are included in Appendix A of this study.

4.4 Summary of Assessment

A summary of the assessment carried out is presented in Table 6. It can be seen that there are very minor differences between the options, with the EPR being the preferred option from a flood assessment perspective, but the Modified 1960s Corridor being preferred in terms of land impact and severance. Flood risk is carried by all options, but mitigations can be put in place and the flood mapping has been shown to be conservative.

On this basis, the Modified 1960s Corridor is the preferred option as it minimises the impact on land holdings and severance.

Table 6 – Summary of Assessment

Criteria	EPR	MCC RRC	Modified 1960s Corridor
Flooding	Preferred	Intermediate	Less Preferred
Environment	Neutral	Neutral	Neutral
Land Impact and Severance	Less Preferred	Intermediate	Preferred

5.0 Conclusions and Recommendations

Feedback received during NSPC1 identified significant concerns regarding land severance in the Quarryland/ Rathregan area (Ch. 2,000m –> 6,500m), particularly the fragmentation of agricultural landholdings arising from the proposed EPR. The EPR deviates from the MCC RRC route to avoid OPW Flood Area A as far as reasonably practicable.

The project team engaged directly with affected landowners through meetings and site visits to understand their concerns, examine existing site conditions and explore alternative alignments. This included undertaking a comparative assessment of the EPR, the MCC RRC and the Modified 1960s Corridor, which largely follows the existing historic railway reservation and offers an opportunity to minimise additional land severance.

The comparative assessment identified the Modified 1960s Corridor as the preferred option, as it minimises the impact on land holdings and severance and the flood risk mapping is generally conservative, with mitigation measures being able to be put in place in any case.

The environmental assessment shows similar constraints and impacts across the options.

Available flood analysis undertaken for another IÉ project, together with LiDAR survey information for the area, provides confidence to amend the EPR in this area to follow the Modified 1960s Corridor, with this alignment becoming the Preferred Route.

Appendix A – Technical Team Walkover Photos



Figure A.1 – View toward Tolka Crossing and 8M and 2011 Severed land at Ch. 2,200



Figure A.2 – View towards R154 from Ch. 2,200



Figure A.3 – View toward North at 1960s Corridor at Ch. 2,300



Figure A.4 – View toward North at 1960s Corridor at Ch. 2,600



Figure A.5 – View toward severed field at Ch. 3,000



Figure A.6 – View towards Ch. 3,200



Figure A.7 – View North toward Severed Field at Ch. 4650



Figure A.8 – View North upstream of Tolka at Ch. 4650



Figure A.9 – Farm Bridge Crossing Tolka at Ch. 4,750 showing 1960s Corridor Level



Figure A.10 – View Down Chainage on 1960s Corridor at Ch. 5,200



Figure A.11 – View Up Chainage at 1960s Corridor at Ch. 5,600



Figure A.12 –View Down Chainage at Ch. 5,600 on 1960s Corridor



Figure A.13 – Historic Underpass of 1960s Corridor at Ch. 5,620



Figure A.14 – View North of Severed Field at Ch. 6,000 for EPR



Figure A.15 – View South towards Severed Field at Ch. 6,000



Figure A.16 – View North-East toward Ringfort at Ch. 6,100

Appendix B Dunshaughlin Station Active Travel Link Review

Navan Line

Dunshaughlin Station Active Travel Link Review

Date: 21 October 2026
To: IÉ
From: MDC
Pages: 8

This Position Paper considers the potential impact on the choice of preferred option of the provision of improved pedestrian and cycle access to the Dunshaughlin Station for Option 8B. In particular it considers whether the previous modelling and multi-criteria analysis would have seen a different result were this access included.

Background

The identification of an Emerging Preferred Route (EPR) for the Navan Line has been carried out applying the guidance set out in the Transport Appraisal Framework (TAF). A brief summary of the process applied, where all options were compared against a Do-Minimum, is set out below. More detail is provided in the Preliminary Option Selection Report (pOSR).

Longlist Appraisal:

- A longlist of 21 potential options was developed based on their feasibility and their likelihood of achieving the scheme objectives.
- Following an initial sifting exercise based on further analysis of feasibility and achieving scheme objectives 13 of these longlist options was identified for further analysis
- The 13 options were appraised using a Multi Criteria Analysis (MCA) based on metrics developed from the scheme objectives.
- The longlist MCA identified five shortlisted options (eight taking account of slight route variations into Navan) to be taken forward for further, more detailed, analysis. Option 8B was one of the five.

Shortlist Appraisal

Appraisal of the shortlist options was carried out applying TAF guidance.

- An initial analysis of the five options was carried out against the following criteria:
    - Transport and Accessibility Appraisal
        - Accessibility
        - Social
        - Land Use
        - Safety
        - Climate Change
        - Local Environment
    - Cost Effectiveness Analysis

The analysis found that:

- The two strongest performing options were 13A and 8B, which follow similar routes predominantly west of the M3. These options performed significantly better than alternative options (which are predominantly east of the M3) in terms of their impact on the local environment.
- The principal differences between options 13A and 8B arise at Dunshaughlin where the alignment and station location materially influence performance (see Figure 1, below).
- Option 13A performs slightly better in terms of patronage and accessibility, while Option 8B performs more strongly in relation to environmental interaction and cost.
- Both options 13A and 8B had only marginal differences in their appraisal scores and it was concluded that the outcomes were not sufficiently distinct to confirm a clear preference.

Given the lack of a clear preference it was concluded that Options 13A and 8B should be taken forward for further, more targeted appraisal before an EPR could be selected.

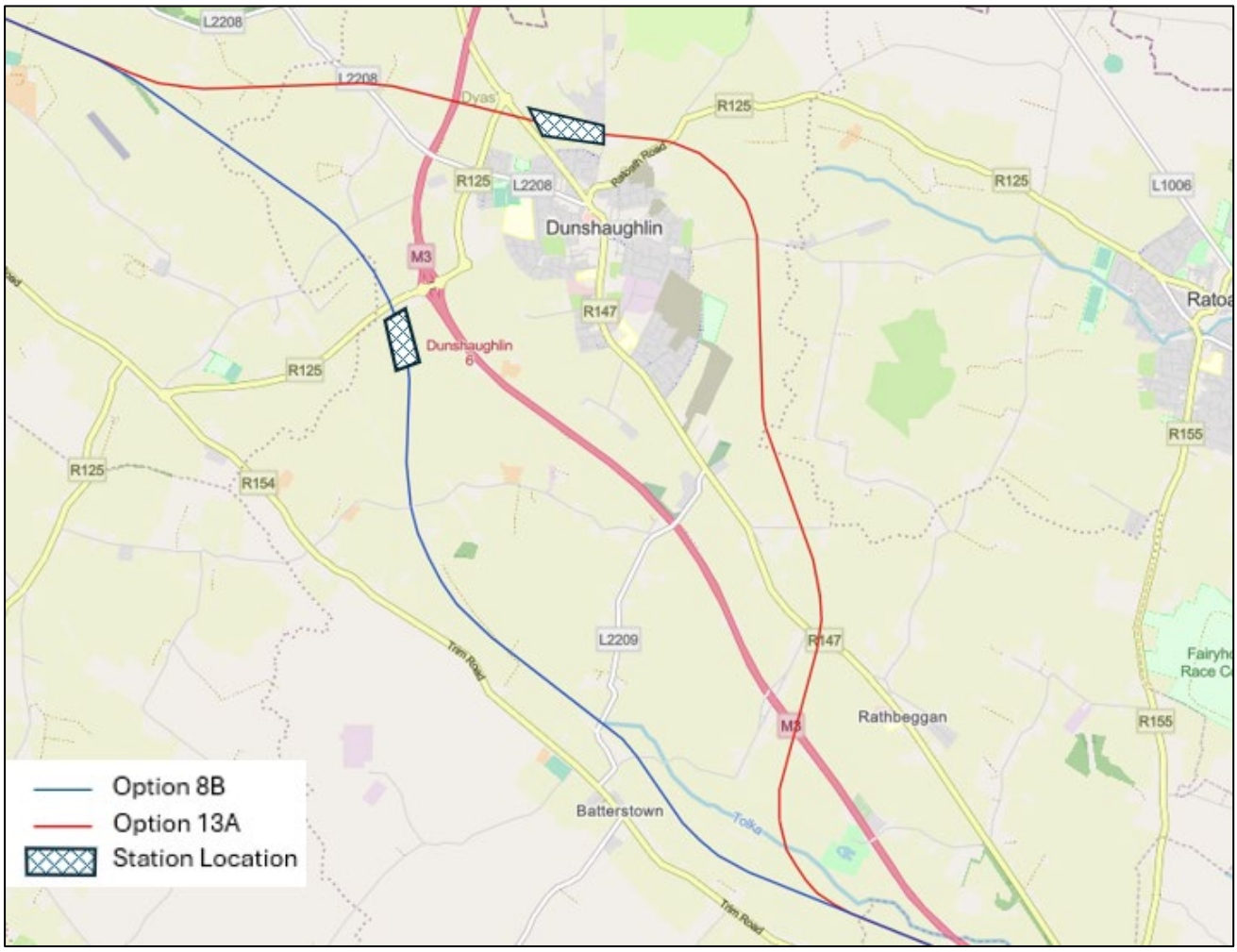


Figure 1: Alignments for Options 13A and 8B in the vicinity of Dunshaughlin

Targeted MCA

During the targeted appraisal of Options 13A and 8B a third option was developed – 8M. This option is an intermediate corridor between 8B and 13A at Dunshaughlin with a number of potential advantages:

- It preserves the operational advantages of a near-town station and strengthens policy alignment with compact growth and access to strategic employment sites.
- It reduces the need for deep temporary works beneath the M3 and avoids clashing with a high-pressure pipeline.
- It reduces programme risk, avoids complex utility diversion and more predictable cost estimates while keeping environmental and heritage exposure at acceptable levels.

The alignments for Options 13A, 8B and 8M in the vicinity of Dunshaughlin are presented below.



Figure 2: Alignments for Options 13A, 8B and 8M in the vicinity of Dunshaughlin

All three options subject to the targeted MCA (8B, 8M and 13A) were assessed using the National Transport Authority's (NTA) Eastern Regional Model (ERM). The following forecast patronage figures were determined for the scheme opening year (2035) and 15-years post opening (2050).

Table 1: Forecast daily boarding and alighting numbers for stations between Navan North and M3 Parkway (inclusive)

	2035 Forecast	2050 Forecast
Option 8B	13,148	17,131
Option 13A	15,744	20,619
Option 8M	14,786	19,453

The targeted MCA was carried out against the following criteria:

- **Environment**

  Climate
  Air Quality
  Noise and Vibration
  Biodiversity
  Water Resources
  Landscape and Visual
  Population
  Soils and Geology
  Architectural Heritage
  Archaeology
  Property

- **Transport Planning**

  Accessibility to station for residents – walk/cycle, bus, and car
  Accessibility to future developments – walk/cycle, bus, and car
  Connectivity to existing public transport
  Compliance with policy

- **Constructability**

  Buildability
  Delivery uncertainty

Each option was scored on a scale of 1 to 7, where 7 represents the best possible performance against a sub-criterion. These were then adjusted such that the total potential score for each overarching criterion (Environment, Transport Planning and Constructability) was 33.3; thus each was weighted equally in a total score out of 100. The scoring is summarised below.

Table 2: Targeted MCA – summary scores

	Option 8B	Option 13A	Option 8M
Environment Score (out of 33)	18.0	18.0	18.0
Transport Planning Score (out of 33)	12.6	19.2	24.4
Constructability Score (out of 33)	18.9	4.7	14.1
Total marks achieved (out of 100)	50	42	57
Emerging Preference (rank)	2nd	3rd	1st

Although Option 8B scored highest in terms of constructability, Option 8M scored much higher against transport planning criteria and was identified as the EPR.

Alternative Analysis of access to 8B

A query was raised, in the feedback of the first public consultation, regarding how the accessibility analysis was carried out for Option 8B. The assumptions regarding how pedestrian and cyclists could access the Dunshaughlin Station for Option 8B were queried, and in particular whether account had been taken of a potential pedestrian/cycle route connecting the M3 Junction 6 services to the centre of Dunshaughlin. This could be combined with a new pedestrian/cycle route on the R125 crossing the M3 and connecting directly to the proposed station, which is on the alignment of the reserved rail corridor.

The indicative route of the potential pedestrian/cycle route is presented below.

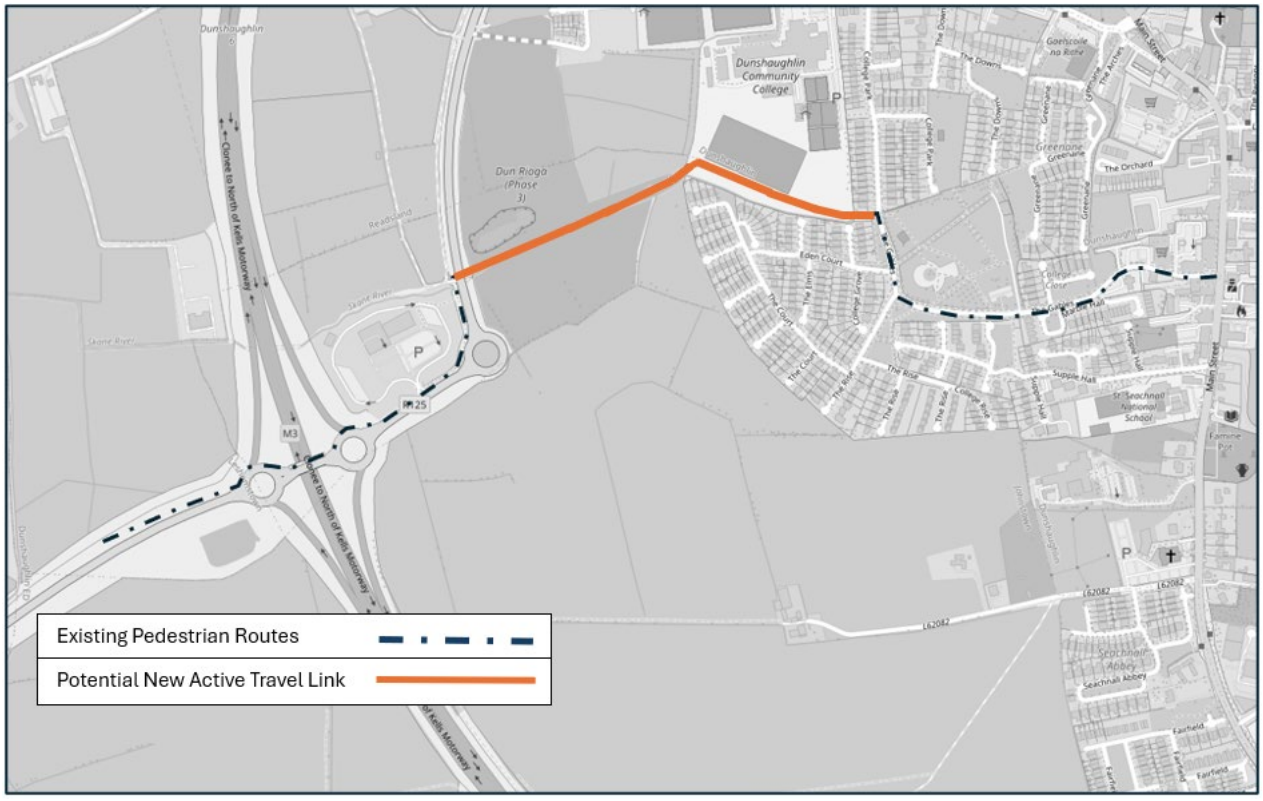


Figure 3: Location of potential pedestrian/cycle route connecting option 8B to Dunshaughlin

In the original analysis, that was carried out to determine the EPR, it was assumed that pedestrians and cyclists would need to use the existing road network to the north. Although currently the route across the M3 (R125) is substandard for pedestrians and cyclists (with a very narrow footway on the north side of the road), the analysis assumed improvements would be provided to make this a viable route as presented below.

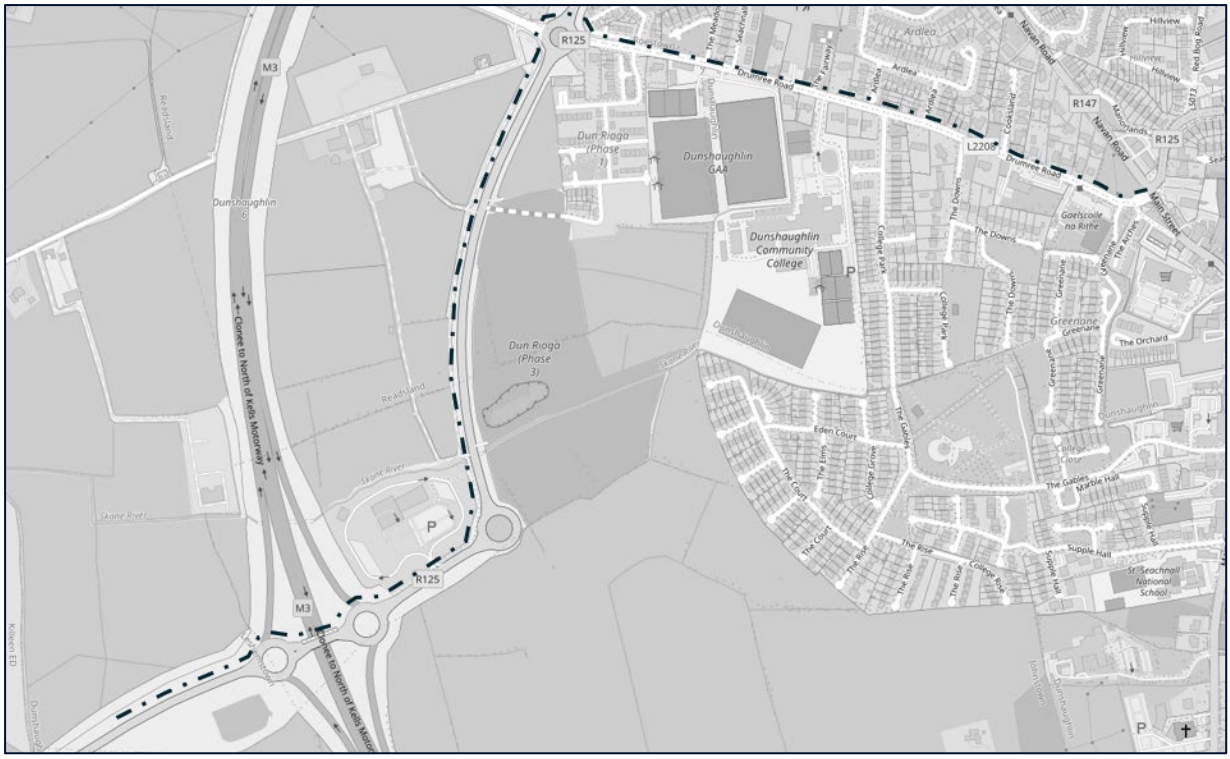


Figure 4: Location of current pedestrian/cyclist route connecting Option 8B to Dunshaughlin

The existing route is considerably longer (both in time and distance) than the proposed alternative for users coming from the centre of Dunshaughlin; analysis was therefore undertaken to determine whether the previous assessment may have underestimated the attractiveness of the station to pedestrians and cyclists. This analysis covered both patronage (using the ERM) and accessibility (using an MCA).

Impact of Additional Pedestrian/Cycle Route

Patronage

The ERM has been used to determine whether the provision of an alternative pedestrian/cycle route is likely to impact on patronage. A new model run, with the added pedestrian/cycle route added, has been carried out and the changes in patronage are presented below, together with forecast patronage for the EPR (Option 8M).

Table 3: Forecast patronage – daily boarding and alighting for Option 8B

Station	Option 8B		Amended Option 8B		EPR Option 8M	
	2035	2050	2035	2050	2035	2050
Navan North	2,059	2,931	2,060	2,920	2,051	2,902
Navan Central	5,945	7,550	5,996	7,558	6,090	7,674
Kilmessan	1,677	2,074	1,666	2,061	1,595	1,979
Dunshaughlin	2,188	2,898	2,616	3,729	3,905	5,413
M3 Parkway	2,643	3,541	2,634	3,537	2,666	3,542
Total	**14,512**	**18,994**	**14,972**	**19,804**	**16,308**	**21,511**

From the above it can be seen that the addition of a new pedestrian/cycle route between the proposed station and Dunshaughlin centre does increase boarding and alighting at Dunshaughlin – by 20% in 2035 and 29% in 2050. The overall increase across all stations is 3% in 2035 and 4% in 2050.

Whilst easier access for pedestrians and cyclists does show that Option 8B patronage would increase, Option 8M still has considerably higher boarding and alighting figures, including at Dunshaughlin itself.

Targeted MCA

The addition of a new pedestrian/cycle route will impact on just one of the criteria for the targeted MCA (as described above and in more detail in the OSR):

- Accessibility to existing residential areas – Walk/Cycle

The accessibility to land allocated for future development will not be affected by the additional pedestrian/cycle route as the previous analysis assumed that a pedestrian route connecting new developments to the station would be provided as part of future developments.

The table below presents the original analysis result together with the amended results taking into account the additional walk/cycle route.

Table 4: Analysis of accessibility – walk/cycle

Sub-Criteria	Indicator	Original Option	Updated Option
Accessibility to existing residential areas	Population within 10 min of station by walk	77	77
	Population within 20 min of station by walk	142	195
	Population within 10 min of station by cycle	872	1,804
	Population within 20 min of station by cycle	6,340	7,118

From the above it can be seen that the additional walk/cycle route makes little difference to accessibility for walk trips using these criteria. This is because, regardless of the proposed route, nearly all of Dunshaughlin is over 20 minutes' walk from the station site. For cycle trips there is greater improvement in accessibility, particularly for trips or 10 minutes or less. The impact is less for the 20 minute catchment because most of Dunshaughlin is within that catchment regardless.

The method applied to develop a score for each criterion is set out in the Preliminary Option Selection Report (pOSR), and is briefly summarised below.

- A seven-point scale was applied where 1 is high negative and 7 is high positive
- The scores were based on the number of people 10 and 20 minutes travel from the proposed station
- A weighting of 2 was applied to the population within 10 minutes' travel from the proposed station, to reflect the drop-off in attractiveness as travel time increases
- Separate scores were applied for walking and cycling with a combined score developed that is heavily weighted to walking – based on the mode share targets for walk and cycle trips in Dunshaughlin

- A score of 7 would be applied for a station in the town centre, with the remaining scores determined applying a linear scale

Applying this methodology to the amended figures above for Option 8B gives scores set out in the table below.

Table 5: Impact of additional walk/cycle route on option scores – Option 8B

Sub-Criteria	Indicator	Score	
		Original Option	Updated Option
Accessibility to existing residential areas	Walk/cycle	1	1

The additional walk/cycle route does not result in a change to the accessibility scores for Option 8B. Although there is some increase in the number of households who could reasonably cycle to the station, the scoring reflects the small proportion of rail travellers who will cycle to the station rather than walk. As a result, the scoring is unchanged, with the lowest possible score as very few people are within walking distance of the station. The previous selection of Option 8M as the EPR is thus unaffected by the inclusion of a more direct foot/cycle route.

Summary

The analysis carried out demonstrates that the inclusion of a more direct foot/cycle route between Dunshaughlin Station and the centre has a very limited beneficial impact on overall patronage of Option 8B – increases of 3% in 2035 and 4% in 2050. The patronage remains much lower (both overall and for Dunshaughlin) than with Option 8M.

The impact on accessibility, applying the criteria used in the targeted MCA used to determine the EPR, is positive but small and does not affect the scoring of Option 8B.

It can be concluded that the previous selection of Option 8M as the Emerging Preferred Route is unaffected by the inclusion of a more direct foot/cycle route to Dunshaughlin Station in Option 8B.

Appendix C Leshemstown /Readsland Area Study

Leshemstown Area Study – EPR Review

Navan Railway



C789-P02-RN-X-XXX-RP-TTI-X-000006

P01_A_C01

10 November 2026

Tetra Tech, Lyrr 2, IDA Business & Technology Park, Mervue, Co. Galway, H91 H9CK

Tetra Tech Consulting Ireland Limited. Registered in Ireland: No. 665968
Registered Office: Mounttown House, 62/63 Mounttown, Road Lower, Dún Laoghaire, Co.,Dublin, A96 P8X6, Ireland

Document status

Document status					
Version	**Purpose of document**	**Authored by**	**Reviewed by**	**Approved by**	**Date**
C01	For Information	Various	CS	AD	10.11.26

Approval for issue		
AD		10.11.2026

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1.0 Introduction

1.1 Consultation Feedback

The Non-Statutory Public Consultation No. 1 (NSPC1) on the Emerging Preferred Route (EPR) for Navan Railway was launched on the 20th of May 2026 to the public.

All feedback received during the consultation, was collected, analysed and reported on in the Consultation Findings Report. The consultation accepted submissions through various channels, outlined in the Consultation Findings Report.

A number of submissions received during the consultation raised concerns about impact of the rail line, and associated infrastructure, in the vicinity of Leshemstown. The concerns centred around the impact of the rail, and associated road realignment, on the local community of Leshemstown Lane. This was particularly given that the road realignment has embankments/retaining structures of up to 6m in height adjacent to properties along Leshemstown Lane, which would have a significant impact on the residential and visual amenity and local landscape character of the area.

Concerns were also raised on the impact of the EPR on the existing attenuation pond in the Readsland area, which serves the existing the Dun Rioga housing estate and proposed future housing development in this area.

In response to the NSPC1 feedback a review was undertaken on the alignment in the Leshemstown area to ensure that the alignment that will be brought forward to form part of the Preferred Route (PR) minimises the net impact of the scheme on the local community. This report summarises the outcome of that review.

1.2 Purpose of Assessment

The purpose of this localised assessment is to examine whether the route that will be brought forward to form part of the PR, in the vicinity of Leshemstown, can be amended from that outlined in the EPR to minimise the impact of the scheme on the local community. The localised assessment covers the area from Chainages 9,400 to 13,700.

Whilst the track alignment of the EPR and associated road realignment are technically feasible in the area of Leshemstown, the scheme is located close to a cluster of houses along Leshemstown Lane (see **Figure 2-1**). The localised route alternative explored in this report, looks at the feasibility of relocating the scheme away from Leshemstown Lane to mitigate the impact of the EPR (and associated road realignment) on these properties.

2.0 Alternative Routes Considered

2.1 Rationale for EPR in this Area

The rationale for the EPR as presented in NSPC1 was as follows:

1. To bring Dunshaughlin station as close to the town as possible to minimise the distance from the main street, thereby increasing patronage and encouraging active travel.
2. To place the station in a zone identified for commercial development.

The rail curvature in the area has been designed to allow trains to travel at a speed of 145kph, consistent with the scheme as a whole and within the capability of the proposed rolling stock. The general engineering preference for the location of a station would be on a straight length of track. Hence the track alignment in this area consists of a set of curves and a straight between the two proposed M3 crossings.

2.2 Development of the Alternative Route

Any alternative route that is developed must avoid the local constraints in the area. These constraints are shown in Figure 2-1 (with the EPR shown for reference).

In addition to these local constraints, the alternative route should focus on minimising impact to existing properties, which is the purpose of the development of this alternative.

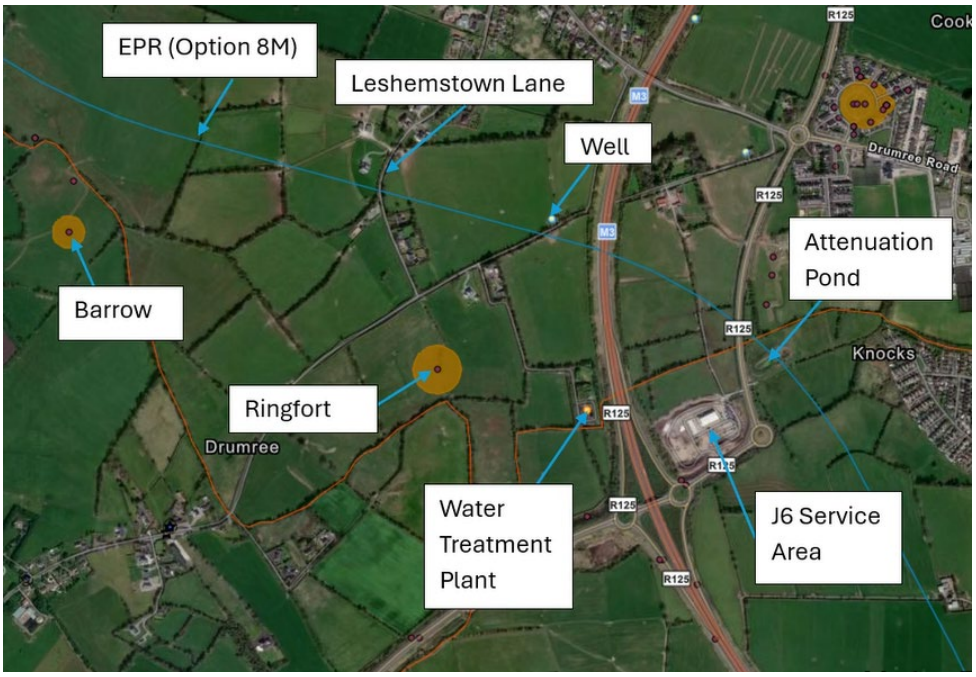


Figure 2-1: Mapped Constraints at Leshemstown

Based on the constraints shown in Figure 2-1, it is clear that the only additional feasible variant that avoids these constraints, including the surrounding properties, would lie south of the EPR whilst remaining north of the M3 Junction 6 service area, water treatment plant, ringfort, and barrow.

2.3 Localised Route Alternatives

The two localised alternative alignments (variants) in the vicinity of Leshemstown to be assessed are shown on **Figure 2-2**, with a description of each below.

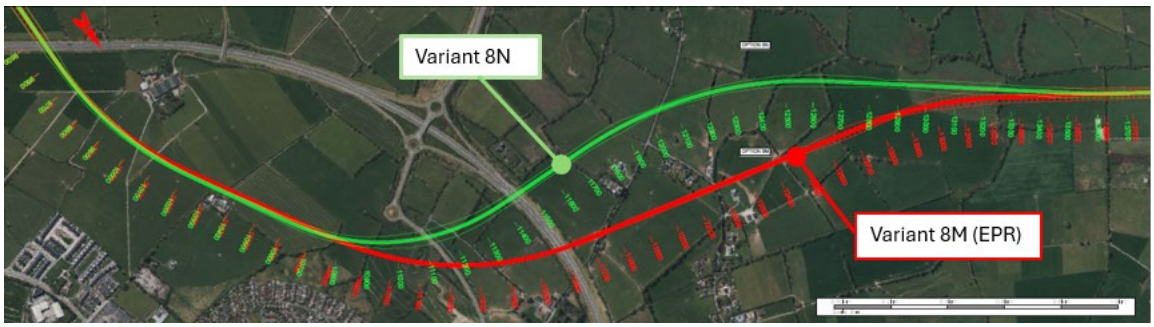


Figure 2-2: Alternative Alignments (variants) at Leshemstown

Variant 8M (EPR): The EPR alignment in the vicinity of Leshemstown and has a length of approximately 4.3km. The proposed alignment reflects a design speed of 145kph and the resultant track alignment curve north of Dunshaughlin station sets a track bearing which passes through the middle of Leshemstown Lane. It is necessary to put the lane over the railway at this location as the track is at grade, resulting in the lane being elevated to a height of 6m in front of the linear residential development along the lane.

Variant 8N: This variant also has a length of approximately 4.3km, but the alignment has a reduced design speed of 110kph to the north of Dunshaughlin station, allowing the track bearing to change and cross the M3 further south than variant 8M. This avoids Leshemstown Lane and crosses the Drumree Road. The new curve recognises that the train would be slowing or accelerating in proximity to the station location in normal operation allowing a reduced speed curve at this point.

The start and end chainage of each variant, together with the length of each section, is presented in Table 2-1**:** below.

Table 2-1: Chainage and Length of Variants at Leshemstown

Variant Reference	Start Chainage	End Chainage	Length (m)
Variant 8M (EPR)	9,400	13,677	4,277
Variant 8N	9,400	13,700	4,300

2.4 Journey Time Review of Variant 8N

An assessment on the reduced curve speed to the north of Dunshaughlin was reviewed in terms of the impact on journey times for the overall route of Variant 8N. The assessment found that from Dunshaughlin station towards Navan there is no difference in journey time between Variant 8M and 8N, as the reduced speed is outside of the acceleration profile of the train leaving Dunshaughlin station.

From Navan towards Dunshaughlin, the deceleration profile of the train locates the train just inside the curve as it starts to brake. However, the maximum impact was found to be around 2 – 3 seconds, which is deemed tolerable from an operational perspective and is within the accuracy of the modelling.

Therefore, the reduced curve speed in this location for Variant 8N has no material impact on timetabled journey times.

3.0 MCA

3.1 Assessment Approach

To compare the variants a focused review has been undertaken. The MCA has considered the following core criteria:

- Impact on residential properties and amenities;
- Engineering Constraints; and
- Local Environment

3.2 Impact on Residential Properties and Amenities

Variant 8M (EPR)

The proposed railway alignment would significantly impact residential properties and amenities in the Leshemstown area. Three residential properties and two farm buildings are located within 100 m of the centreline of the railway alignment, with the nearest residential property situated approximately 30 m from the railway. The alignment would also sever the lands associated with an established equestrian business.

As the railway crosses Leshemstown Lane at grade, a road realignment is required to maintain local connectivity. The road realignment option included in the EPR (Option A) would substantially impact adjacent properties. It would require demolishing and relocating an existing farmyard and associated agricultural buildings and would require significant embankments and/or retaining structures adjacent to residential properties south of the railway.

An alternative road realignment (Option B) was also explored, located to the east of the residential properties of Leshemstown Lane. This option would avoid demolition of the farmyard but would significantly affect the curtilage and garden area of the dwelling north of the railway and require substantial embankments and/or retaining structures immediately behind the residential properties.

Consequently, both road realignment options would cause adverse visual effects and impacts on residential amenity. In combination with the proximity of the railway, the severance of the lands associated with an equestrian business, and the direct effects on nearby residential properties, the overall impact on residential properties and amenity is considered significant.

See Figure 3-1 for the location of the two alternative road realignment options associated with Variant 8M.

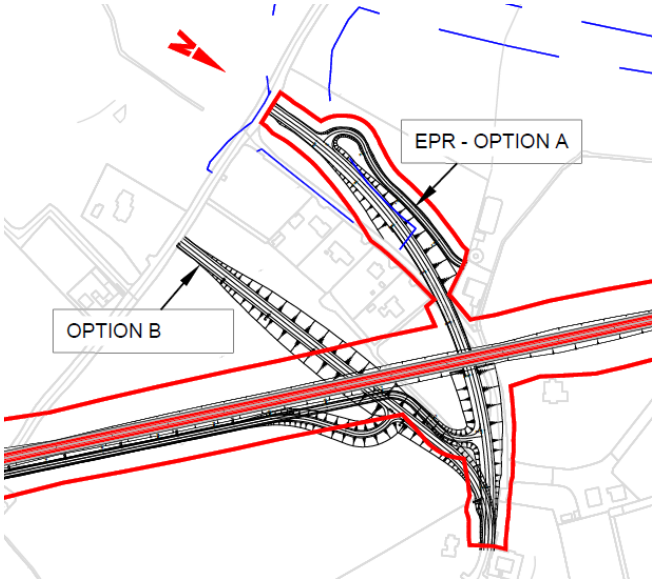


Figure 3-1: Road Realignment Options of Variant 8M

Summary: The alignment affects three residential properties in close proximity to the railway, severs the lands associated with an established equestrian business and requires a road realignment that would introduce substantial embankments and retaining structures adjacent to residential properties and potential demolition of a farmyard. Both road realignment options result in significant visual and residential amenity impacts.

Variant 8N

The railway alignment would cross Drumree Road and, along with the associated road realignment, would affect substantially fewer residential properties that Variant 8M (the EPR). One residential property is located to the north of the railway at a distance of approximately 100 m from the railway centreline and a farm building is located within 100 m of the centreline of the railway alignment.

The principal impact associated with this variant relates to the severance of agricultural landholdings. The railway would divide a number of farmland parcels, potentially affecting farm access, field management, and agricultural operations. However, these impacts could potentially be mitigated through the provision of accommodation works and appropriate access arrangements.

Summary: This variant avoids the significant residential and amenity impacts associated with Variant 8M, including impacts on multiple dwellings, residential curtilage, agricultural buildings, and the lands associated with an established equestrian business.

The primary impact of this variant relates to the severance of several agricultural land parcels.

In consideration of the above, Variant 8N is the preferred variant in this criterion.

3.3 Engineering Constraints

The engineering constraints of each variant are discussed in turn below.

Variant 8M (EPR)

The key constraints include the M3 motorway, River Skane and the existing attenuation pond in Readsland. Although moving the attenuation pond is technically feasible, it would require additional coordination during the construction phase to ensure the existing pond is retained until the transfer to a new pond can be made. These constraints are known and deemed manageable within standard engineering practice but will require further investigations and assessments in the next design stage.

Variant 8N

Variant 8N avoids the existing attenuation pond, removing the requirement for relocation.

The alignment also crosses the Drumree Road instead of Leshemstown Lane. It crosses above the road level which results in a road realignment below the railway, which removes the requirement for high embankments at Leshemstown Lane, and does not create a cul-de-sac.

As confirmed in Section 2.4, the reduced curve speed in this location for Variant 8N does not have any material timetable impact. Therefore, as the Variant 8N has a greater separation from the linear development along Leshemstown Lane, and avoids the existing attenuation pond, it is deemed to be the more desirable alignment with regard to constructability.

Therefore, Variant 8N is the preferred variant with regards to engineering constraints.

3.4 Local Environment

The core environmental criteria assessed was Landscape and Visual.

All other criteria were either scoped out of this assessment, as they were not applicable for consideration in a focused segment assessment such as this e.g. waste, or were assessed and it was determined that there was no material difference between the variants.

3.4.1 Landscape and Visual

The analysis of the variants for landscape and visual has considered changes to protected views, location within designated sensitive landscape character areas, changes to topography and visual impacts on sensitive visual receptors. The advantages and disadvantages of each variant are presented in Table 3-1 below.

Table 3-1: LVIA Advantages and Disadvantages

Variant	Advantages	Disadvantages/Risks
8M	No difference between variants on impact on protected views.	This variant has the greatest number of residents of dwellings in close proximity to the line. Additionally, it requires Leshemstown Lane to be raised to accommodate a rail underpass. The elevation of this road and its embankments is likely to compound the visual impact on residents of dwellings in close proximity to the line as well as an impact on local landscape character. Approx. 77.5% of this variant corridor passes through LCA 12, the most critical LCA within the landscape and visual study area, parts of which are to be designated as a Landscape Conservation Area. For two thirds of its length this variant will be more than 2 meters higher than 8N therefore resulting in a larger footprint. This is also likely to increase the zone of visual influence and create changes to the local landscape character.
8N	No difference between variants on impact on protected views. Variant with least proposed vertical elevation. Approx. 51% of this variant corridor segment passes through LCA 12 compared to 77.5% of variant 8M. This variant will have the least visual impact on residents of dwellings in close proximity to the line.	None

Both variants will have impacts on landscape character and visual amenity, however, Variant 8M scores more negatively. This variant will pass though more of sensitive LCA 12 than variant 8N. The required raising of Leshemstown Lane for 8M will have an impact on local landscape character and a significant impact on nearby sensitive visual receptors (residents of adjacent properties).

Overall Variant 8M will be more elevated above ground level, for two thirds of its length more than 2m, resulting in greater impacts on visual amenity and landscape character.

Therefore, Variant 8N is the preferred variant for landscape and visual.

3.4.2 Summary Conclusion Local Environment Assessment

Table 3-2 below summarises the results of the local environment assessment around Leshemstown.

Table 3-2: Summary Assessment

Environmental Discipline	Variant 8M	Variant 8N
Landscape and Visual		**Preferred**

Based on assessment Variant 8N is considered preferred. This is primarily related to the greater separation from the linear development along Leshemstown Lane, the removal of the requirement to take the lane over the railway at this location thereby reducing the footprint of the scheme and reducing the visual impacts associated with the overbridge.

The assessment of the two variants has indicated 8N is the preferred environmental variant in this local MCA.

3.5 Summary of MCA

The following table summarises the results of the assessment

Table 3-3: Summary of MCA

Criteria	Variant 8M	Variant 8N
Impact on Residential Properties and Amenities		**Preferred**
Engineering Constraints		**Preferred**
Local Environment		**Preferred**

In summary, the assessment results of the MCA show that Variant 8N is the preferred variant in all criteria.

4.0 Conclusions and Recommendations

Variant 8N was developed as an alternative to Variant 8M, the Emerging Preferred Route alignment, in response to consultation feedback concerning the potential effects of the proposed railway and associated road realignment in the Leshemstown area.

A targeted multi-criteria assessment was undertaken to compare the two variants in relation to residential properties and amenities, engineering constraints, and the local environment. The assessment found that Variant 8N is the preferred variant across each of these assessment categories.

Compared with Variant 8M, Variant 8N provides greater separation from the linear development along Leshemstown Lane. It also avoids the requirement to realign the road of Leshemstown Lane over the railway. This removes the need for substantial embankments and retaining structures, of up to approximately 6m in height, adjacent to residential properties. As a result, Variant 8N would reduce the likely effects on residential and visual amenity and local landscape character.

Variant 8N would also cross Drumree Road rather than Leshemstown Lane and would avoid the need to relocate the existing attenuation pond at Readsland. Although Variant 8N would result in the severance of some agricultural land parcels, the assessment concludes that the associated effects could potentially be addressed through accommodation works and appropriate access arrangements.

The reduced design speed required for Variant 8N has been assessed and would not result in a material effect on the operational timetable or journey times.

It is therefore recommended that Variant 8N is progressed as the Preferred Route through the Leshemstown area in the next phase of the project.

Appendix D Dunsany Area Study

Dunsany Area Study – EPR Review

Navan Railway



C789-P02-RN-X-XXX-RP-TTI-X-000004

P01_A_C01

11 November 2026

Tetra Tech, Lyrr 2, IDA Business & Technology Park, Mervue, Co. Galway, H91 H9CK

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Document status

Document status					
Version	**Purpose of document**	**Authored by**	**Reviewed by**	**Approved by**	**Date**
C01	For Information	Various	CS	AD	11.11.26

Approval for issue		
AD		11.11.2026

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1.0 Introduction

1.1 Overview

The Non-Statutory Public Consultation No. 1 (NSPC1) on the Emerging Preferred Route (EPR) for Navan Railway was launched on the 20th of May 2026 to the public. NSPC1 included four public events, with one-to-one meetings also held with affected landowners.

All feedback received during the consultation, was collected, analysed and reported on. The consultation accepted submissions through various channels, outlined in the Consultation Findings Report.

A significant number of submissions raised concerns about maintaining the Emerging Preferred Route (EPR) along the original rail line through Dunsany Estate. The submissions expressed concern that the proposed Navan Railway would impact the private rewilding project within the estate. These submissions also referenced the cultural and architectural value of the Dunsany Castle Demesne ACA and emphasised the need to protect and conserve its history. Some submissions also queried why the EPR was not located to the east of the M3, closer to the towns of either Ratoath or Ashbourne or whether a localised route change could be made to avoid the Dunsany Estate.

As part of the process of reviewing NSPC1 feedback, a review was undertaken on the alignment through the Dunsany Estate, to ensure the optimum alignment is brought forward to form part of the Preferred Route.

1.1.1 Rationale for EPR following the Original Railway Corridor and 2011 Draft Railway Order Route in this Area

The Emerging Preferred Route (EPR) was identified through a comprehensive and structured option selection process undertaken in accordance with the Department of Transport's Transport Appraisal Framework (TAF). More than 20 route options were developed and assessed against engineering, environmental, operational and socio-economic criteria. Following a progressive assessment process, these options were reduced to a shortlist of five viable alignments located both east and west of the M3 Motorway.

As documented in the Preliminary Option Selection Report (pOSR), the EPR was selected because it achieved the best overall balance between engineering feasibility, operational performance, environmental considerations and potential impacts on communities and landowners. Alternative options located closer to, and to the east of, the M3 Motorway and through the Tara-Skryne Valley were assessed and were found to present greater engineering challenges and/or greater environmental impacts.

In the vicinity of Dunsany, the EPR broadly follows both the historic railway corridor and the railway preservation corridor identified in the Meath County Development Plan (CDP). The protection of this corridor is long established within the CDP which has been subject to a statutory Strategic Environmental Assessment (SEA) process under EU directive 2001/42/EC, separate to the current options selection process for the proposed Navan Rail Line.

A number of specific factors contributed to the selection of the EPR in this area:

1. The alignment is consistent with the railway preservation corridor identified by Meath County Council and largely follows the historic railway corridor that operated in this location prior to closure.
2. The route provides a more direct railway alignment between Kilmessan and Dunshaughlin, reducing overall route length, supporting shorter journey times and reducing construction and operational costs.
3. The alignment takes advantage of existing topographical conditions, avoiding the requirement for extensive cuttings, embankments and earthworks that would be required on alternative alignments further west. This reduces both construction impacts and the physical footprint of the railway corridor.
4. The alignment avoids the Architectural Conservation Area (ACA), thereby reducing potential impacts on the principal heritage and landscape assets associated with Dunsany.
5. The alignment has been positioned, insofar as practicable at this stage of design development, to remain close to the historic railway corridor and to minimise impacts on established woodland and mature trees. While the route passes through lands within the wider Dunsany Estate, it has been developed to avoid the majority of the established woodland by passing between Railway Wood and agricultural lands to the south.
6. Further design development during subsequent project stages will continue to examine opportunities to refine the alignment and reduce impacts on estate lands, trees, biodiversity and other environmental receptors where reasonably practicable.

For these reasons, the EPR was considered to represent the most balanced option when assessed against the full range of project objectives and constraints. While some impacts on lands within the Dunsany Estate cannot be entirely avoided, the selected alignment minimises those impacts to the greatest extent reasonably practicable while delivering a viable railway corridor between Dublin and Navan.

1.2 Scope of Assessment

The scope of this assessment is to:

- assess the extent of land required, and potential implications, to accommodate the operational railway corridor through the Dunsany Estate;
- examine, through analysis of a number of factors, whether a better local alternative route exists through the area to be brought forward to form part of the PR. This will be undertaken by developing various localised route alternatives and assessing these against each other and the EPR (Variant 8M).

2.0 Land Requirement Assessment

To inform the assessment, a review was undertaken to determine the potential quantum of land in the Dunsany Estate required to accommodate the operational railway, associated drainage, maintenance access requirements and local road realignments. This review confirmed that the proposed electrified railway can be accommodated within the railway reservation corridor identified in the Meath CDP (reservation corridor included in the 2013-2019 CDP and maintained in the current 2021-2027 CDP), together with limited additional lands required for associated infrastructure such as road realignments. The corridor already contains infrastructure constraints, including sections of the MCC sewer network.

Based on the EPR, the permanent operational railway corridor through the Dunsany area would require approximately **10** acres of land. A further approximately **4.5** acres would be required to accommodate the associated local road realignments. The total permanent land requirement is therefore estimated to be approximately **14.5** acres.

While some permanent land-take is unavoidable, this requirement should be considered in the context of the overall scale of the Estate. The Estate is reportedly 1600 acres (rewildingeurope.com) and information published on the Dunsany Estate website (dunsany.estate) indicates that approximately 750 acres of the estate are managed as part of a rewilding initiative. The estimated permanent land requirement associated with the railway and road realignments represents approximately **2%** of the 750 acres associated with the rewilding initiative.

The selection of the EPR in this area was informed by the presence of both the historic railway corridor and the railway reservation corridor. While the EPR remains indicative and will continue to be refined through future design stages, the current assessment indicates that the railway can largely be accommodated within this established corridor, thereby limiting the extent of additional land required from the surrounding estate.

The EPR alignment avoids the Dunsany Architectural Conservation Area and largely avoids direct impacts on demesne lands.

It is recognised that linear infrastructure has the potential to affect ecological systems through habitat fragmentation, disturbance during construction and operation, changes in wildlife movement patterns and alterations to the character of the receiving environment. Accordingly, future stages of project development will assess both the direct and indirect ecological effects of the proposed railway on biodiversity, flora and fauna. Environmental assessment and ecological surveys will inform the identification of appropriate mitigation measures if required.

While the current assessment indicates that the permanent land requirement would affect only a small proportion of the overall lands in the area, the ecological value of the wider Dunsany Estate is recognised. As the project progresses through subsequent design stages, opportunities to avoid, reduce and mitigate potential effects on biodiversity will continue to be considered and developed.

3.0 Local Route Alternative Assessment

3.1 Localised Route Alternatives

During NSPC1, feedback was received suggesting that alternative railway alignments should be explored in the Dunsany area. In response to this feedback, a review of the Emerging Preferred Route (EPR) was undertaken to determine whether a more favourable localised alignment could be identified.

As part of this review, it was determined that any localised route alternatives should be developed to the south of the Dunsany Demesne. This approach reflects the presence of significant environmental, landscape and cultural heritage constraints associated with the Dunsany Demesne and the Dunsany Architectural Conservation Area (ACA).

Routes located further north would result in a greater encroachment into the Dunsany Demesne and associated heritage and landscape assets and were therefore not considered appropriate for further development as local route alternatives. Accordingly, the option development process focused on a series of localised alignments south of the demesne that could reasonably achieve the project objectives while remaining operationally and technically feasible.

A total of four localised alternative alignments (variants) were identified in the vicinity of Dunsany. These are shown on Figure 3-1 and the start and end chainage of each, together with the length of each section, are presented in Table 3-1.

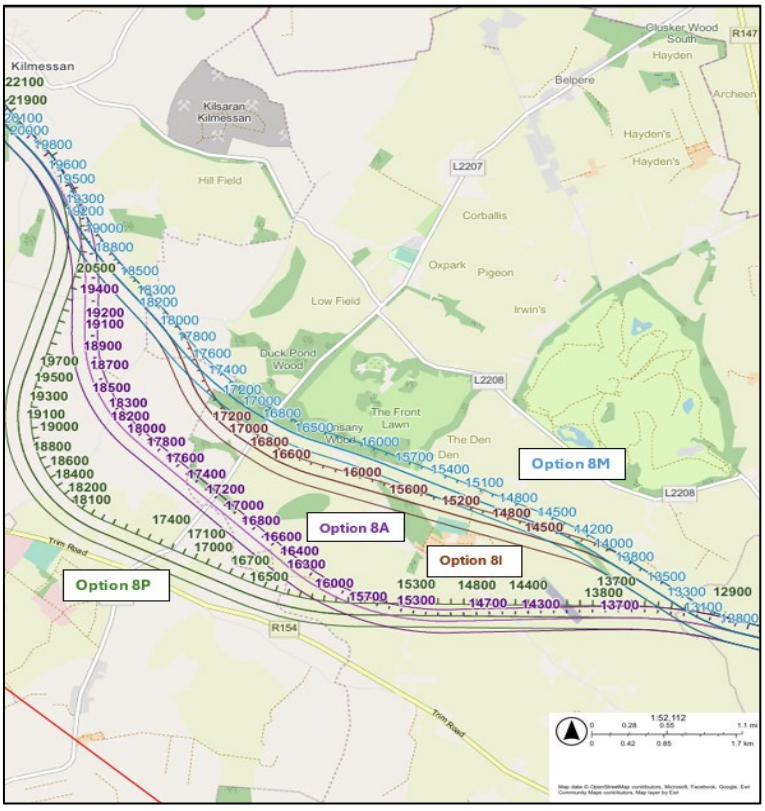


Figure 3-1 Alternative Alignments (variants) at Dunsany

Table 3-1 Chainage and Length of Variants at Dunsany

Variant Reference	Start Chainage	End Chainage	Length (m)
Variant 8M (EPR)	12600m	20000m	7436m
Variant 8I	12600m	20140m	7575m
Variant 8A	12600m	20845m	8281m
Variant 8P	12600m	21700m	9113m

Variant 8M (EPR): This variant is the current EPR alignment in the vicinity of Dunsany and has a length of approx. 7.4km. The route hugs the tree line at the edge of Dunsany Demesne, crossing Dunsany Bridge in the vicinity of the Black Lodge. The alignment in this location is within Dunsany Estate lands but avoid the demesne and the Architectural Conservation Area (ACA) designation associated with Dunsany. It runs in front of a small group of houses opposite Railway Wood.

Variant 8I: This variant is slightly to the west of Variant 8M, moving further away from the tree line and has a length of approx. 7.6km. A portion of the alignment is still within the Dunsany Estate lands but it also avoids the demesne and the ACA designated area. The modified alignment runs behind the properties opposite Railway Wood and involves additional landowners.

Variant 8A: This variant lies between variants 8I and 8P and has a length of approx. 8.3km. It crosses the Skane River and a local access road before crossing the L2207 and a powerline in quick succession in the vicinity of Batterjohn. It crosses two more local roads before rejoining the EPR alignment to the north. It is noted that variant 8A largely follows the longlist Option 10 which was assessed in the shortlisting of options for the scheme.

Variant 8P: This variant is the longest of the variants at 9.1km, swinging out to run alongside the R154. It crosses the Skane River and a local access road before crossing the L2207 and a powerline twice in quick succession in the vicinity of Batterjohn. It crosses two more local roads before rejoining the EPR alignment to the north.

3.2 Multi-Criteria Analysis Approach

A focused Multi-Criteria Analysis (MCA) was undertaken to compare the four local route variants identified during the review. The MCA provides a structured framework for assessing the relative performance of each variant and identifying the variant that best balances engineering and environmental considerations whilst achieving the objectives of the project.

The assessment was undertaken at a level of detail appropriate to the current stage of project development and was informed by engineering design information, mapping, Geographic Information System (GIS) datasets and specialist environmental inputs.

The MCA considered the following principal criteria:

- **Engineering**

The Engineering criterion considered the technical feasibility, engineering complexity and delivery risk associated with each variant.

- **Climate and Local Environment**

The Climate and Local Environment criteria considered the potential environmental effects associated with each variant.

Environmental specialists undertook a review of each variant using available environmental information, mapping, aerial imagery and GIS datasets to identify environmental constraints and compare the relative environmental effects of the alternative alignments.

The assessment was undertaken on a comparative basis, with each variant evaluated against the same criteria and sub-criteria. Specialist technical input was applied to identify the relative advantages and disadvantages of each option and to inform selection of the preferred local route variant.

These criteria are in line with the Department of Transports Transport Appraisal Framework (TAF) and specifically the Transport and Accessibility Appraisal (TAA) as has been done for the wider options selection.

The scoring system applied to the MCA is consistent with the seven-point scale adopted for the assessments at the longlist and detailed appraisal stage, as outlined in Table 3-2.

Table 3-2 Targeted MCA Scoring Table

Scale	Criterion
7 – High Positive Impact	The option is likely to significantly improve conditions in the relevant criteria
6 – Positive Impact	The option is to improve conditions in the relevant criteria
5 – Slight Positive Impact	The option is to somewhat improve conditions in the relevant criteria
4 – Neutral Impact	The option will result in no changes to conditions in the relevant criteria
3 – Slight Negative Impact	The option is to somewhat worsen conditions in the relevant criteria
2 – Negative Impact	The option is to worsen conditions in the relevant criteria
1 – High Negative Impact	The option is likely to significantly worsen conditions in the relevant criteria

3.3 Multi-Criteria Analysis

3.3.1 Engineering Assessment Criteria

The Engineering assessment considered the engineering complexity, construction feasibility and delivery risk associated with each variant. Key considerations included earthworks requirements, the need for new structures, interfaces with existing infrastructure, land-take requirements and opportunities to re-use existing railway infrastructure.

It should be noted that the assessment has been undertaken using the information available at the current stage of project development. While some uncertainty remains regarding local ground conditions, hydrological characteristics and the condition of existing structures, sufficient information is available to enable a comparative assessment of the relative constructability of the variants.

The results of the engineering assessment are provided below:

Variant 8M (EPR)

Variant 8M largely follows the disused railway corridor and therefore requires the least deviation from an established transport corridor. This reduces the extent of earthworks and land-take relative to the alternative variants. It also allows the re-use of existing railway infrastructure, most notably the Dunsany Overbridge, which lowers the construction complexity compared with the other greenfield routes.

Key engineering considerations include achieving OHLE clearances at Dunsany Overbridge and the alignment's proximity to the River Skane floodplain. The alignment also crosses beneath existing ESB 220 kV overhead lines at one location and will require the diversion of the foul sewer that follows the disused corridor for a section of the proposed alignment. While these constraints will require further assessment and design development, they are considered manageable through established engineering solutions.

Overall, Variant 8M presents the lowest level of engineering complexity and construction risk of the four variants. The opportunity to re-use existing infrastructure and minimise new structures and earthworks results in the most favourable constructability performance. Consequently, Variant 8M is assigned a score of **4**.

Variant 8I

Compared with Variant 8M, Variant 8I departs from the disused railway corridor and requires substantially greater earthworks, including cuttings of up to 14 m in depth. While these cuttings may provide some benefit from an earthworks balance perspective, they introduce increased geotechnical risk, drainage requirements and potential dewatering challenges, particularly given the proximity of the alignment to flood-prone areas.

The variant requires two new road-over-rail structures to provide grade separation. One of these crossings has a more complex interaction with local roads and the existing Dunsany Overbridge, increasing design and construction complexity. The alignment also crosses beneath an existing ESB 220 kV overhead line at one location.

Overall, Variant 8I is less favourable than Variant 8M because it requires significant earthworks and additional structures. However, it performs more favourably than Variants 8A and 8P due to the lower number of structures and reduced extent of engineering intervention. Consequently, Variant 8I is assigned a score of **3**.

Variant 8A

Variant 8A deviates further west than Variant 8I and therefore departs more substantially from the historic railway corridor. The alignment requires extensive earthworks, including cuttings of up to 18m in depth, representing the greatest excavation requirements of all variants assessed. While these earthworks may provide advantages in terms of earthworks balance, they increase geotechnical complexity and the potential requirement for drainage and groundwater management measures.

The variant requires four new road-over-rail structures to maintain connectivity across the route. This represents a significant increase in engineering intervention compared with Variants 8M and 8I. In addition, the alignment crosses beneath an existing ESB 220 kV overhead line.

While the increased route length is not considered a significant engineering constraint in isolation, the combination of extensive earthworks, multiple new structures and departure from existing infrastructure corridors increases construction complexity and delivery risk.

Overall, Variant 8A performs significantly less favourably than Variants 8M and 8I under the Constructability criterion and is assigned a score of **2**.

Variant 8P

Variant 8P represents the furthest deviation west of the existing railway corridor and requires substantial new infrastructure. The alignment includes extensive earthworks, with cuttings of up to 14 m in depth, resulting in similar geotechnical, drainage and constructability challenges to those identified for Variant 8I.

The variant requires four new road-over-rail structures and crosses beneath existing ESB 220 kV overhead lines on three occasions, resulting in greater interaction with third-party infrastructure than any other variant. These interfaces would increase construction constraints and require additional coordination with ESB Networks.

Variant 8P is also the longest of the four variants assessed, requiring additional track, railway systems and associated infrastructure.

Overall, Variant 8P is considered one of the least favourable options from an engineering perspective because of the extent of engineering intervention required and the number of utility interfaces. Consequently, Variant 8P is assigned a score of **2**.

Summary

From an engineering perspective, Variant 8M performs most favourably as it largely utilises the existing railway corridor and existing infrastructure, thereby minimising engineering complexity and construction risk. Variant 8I performs moderately well but requires substantially greater earthworks and additional structures. Variants 8A and 8P perform least

favourably due to their extensive earthworks requirements, multiple new structures and increased engineering complexity.

Scheme Cost

As part of the review, Order-of-Magnitude capital cost estimates were also prepared for each variant to provide an indication of the relative cost implications associated with the alternative alignments. Whilst cost has not been separately scored within the MCA, the comparative estimates broadly support the findings of the Engineering assessment. Variants requiring greater engineering intervention, including additional structures, larger earthworks and increased interfaces with existing infrastructure, generally result in higher capital costs.

The cost ranges presented in Table 3-3 constitute option comparison working cost estimates only. They were developed based on the low level of design maturity appropriate for this project phase and are intended solely to enable a consistent, like-for-like comparison of the variants under consideration. As such, the estimates are preliminary in nature and are subject to a high level of uncertainty.

The comparative cost estimates are summarised below in Table 3-3.

Table 3-3 Cost Estimates for Variants

Variant	Cost Estimate (million Euro)
Variant 8M (EPR)	50.1
Variant 8I	54.6
Variant 8A	62.2
Variant 8P	71.1

Notes on Order of Magnitude Costs

1. The figures above are Order of Magnitude CAPEX and Land/Property Costs between the local study chainages. Add-ons for inflation, VAT, etc are not included.

2. Earthworks costs have been excluded as these should be looked at holistically across the route rather than in isolation, however it is noted that variants 8A and 8P have the largest volume of earth cut of the four variants.

The cost estimates indicate that Variant 8M is the lowest-cost option, while Variant 8P is the highest-cost option. The relative cost ranking mirrors the engineering assessment and provides additional support for the overall engineering ranking of the variants.

3.3.2 Climate and Local Environment Criteria

This assessment has been undertaken to inform the options stage of the process and is based on the best available information at this time. Further detailed surveys and assessments across all relevant environmental disciplines will be undertaken during the future phases of this project. An Environmental Impact Assessment (EIA) and an Appropriate Assessment (AA) process will be undertaken in the next phase of the project.

3.3.2.1 Climate Mitigation and Adaptation

For the purpose of the climate appraisal for the variants, consideration was given to climate adaptation and climate mitigation in line with TAA requirements. Climate adaptation focusses on interaction with the flood plain (sq. km) and specifically Flood Zone A which presents the greatest risk for sensitive land uses such as residential and for infrastructure provision. Climate mitigation focusses on the lowest carbon option which, for the purpose of the assessment, was based on the output of the Whole Life Carbon Analysis (WLCA) of each option. Summary information for the four variants is presented in Table 3-4 and Table 3-5.

Table 3-4 Summary Information Informing Analysis of Climate

Variant Reference	Truncated 8M	Truncated 8I	Truncated 8A	Truncated 8P
Length of centreline (m)	7436	7575	8281	9113
Route variant within the Flood Zone A (sq. km)	0.27	0.16	0.04	0.03
Total Carbon emissions* (based on full route)	c. 51,000 tCO_2e	c. 52,000 tCO_2e	c. 57,000 tCO_2e	c. 57,000 tCO_2e

*The Total Carbon emissions have been developed based on the low level of design maturity appropriate for this project phase.

Table 3-5 Climate Advantages and Disadvantages

Variant	Advantages	Disadvantages/Risks
8M	Shortest length at 7436m. No new structures required as bridge already in place at Dunsany.	Some loss of trees at Dunsany Wood and Railway Wood to facilitate alignment. Greatest area of interaction with Flood Zone A but further analysis of Flood Risk Assessment (FRA) is required as part of detailed project specific FRA.
8I	Second shortest variant at 7575m. Avoids wooded area at Dunsany Wood and Railway Woods.	Would have marginally higher carbon emissions than 8M based on slightly longer length but would perform better than 8A or 8P. Impacts on isolated pockets of woodland. Requires new structure at Dunsany Bridge. Intermediate area of interaction with Flood Zone A but further analysis of Flood Risk

Variant	Advantages	Disadvantages/Risks
		Assessment (FRA) is required as part of detailed project specific FRA
8A	Intermediate length at 8281m. Avoids wooded area at Dunsany Wood and Railway Woods. Low level of interaction with Flood Zone A but further analysis of Flood Risk Assessment required as part of detailed project specific FRA	Higher carbon emissions than 8M or 8I based on longer length but would perform better than 8P. Impacts on isolated pockets of woodland. Requires new structures in addition to longer route length.
8P	Longest variant at 9113m. Avoids wooded area at Dunsany Wood and Railway Woods. Low level of interaction with flood Zone A but further analysis of Flood Risk Assessment required	Higher carbon emissions due to longer length compared to all other variants. Requires new structures in addition to longer route length.

Table 3-6 Climate Preference

Variant	MCA Ranking	Preference
8M	**Neutral**	**Preferred** as shortest length and needs fewer new structures and lowest emissions at c. 51,000 tCO_2e (across full route) but greatest area of flood zone A identified.
8I	**Neutral**	Intermediate – slightly longer than 8M, requires new structures and some flood zone A identified.
8A	**Neutral**	Intermediate– slightly longer than 8M or 8I and requires new structures. Smallest flood risk area identified.
8P	**Neutral**	Less preferred as longest length and requires new structures which will both have associated carbon emissions. Very low flood zone A identified.
The preferred variant for Climate is **Variant 8M** as it is both the shortest variant at 7436m and requires no new structures compared to the other variants and therefore has the lowest associated carbon emissions. Additional assessment of flood risk is however required.		

3.3.2.2 Population

It is noted that variants in the vicinity of Dunsany in the context of the overall scheme would have no material impact on the location of train stations or park and ride facilities and would have a negligible impact on journey time (worst case approx. 40 seconds). In this context the variants are assumed to have no discernible impact in regard to ridership, daily passenger car units (PCUs), Park and Ride usage and journey time. The consideration of Population for the purpose of this variant analysis has therefore been scoped out.

3.3.2.3 Air Quality

It is noted that the variants in the vicinity of Dunsany would not have a material impact on air quality in isolation. Consideration of issues including modal shift, access to stations etc. are addressed at a route wide scale and are not appropriately scaled down for segment analysis. As the proposal is an electrified rail line, the traditional transport related emissions are not a constraint in the analysis. The key emission of concern for the rail corridor would relate to construction related activities which will be temporary in nature. The consideration of Air Quality for the purpose of this variant analysis has therefore been scoped out.

3.3.2.4 Noise and Vibration

The assessment of the variants for noise and vibration involves the identification of noise sensitive locations for each of the variants and provides an assessment of the likely impacts. High-level rail noise predictions were undertaken for each variant. Predicted noise levels for Noise Sensitive Locations (NSLs) within a 350 m buffer of the proposed variants, excluding those NSLs that would be directly impacted for construction are considered. The predicted noise levels were compared against the operational rail noise criteria (55 dB $L_{Aeq,16hr}$ for daytime periods and 45 dB $L_{Aeq,8hr}$ for nigh-time periods) for the scheme. The number of NSLs with predicted noise levels greater than the operational rail noise criteria was used for the analysis.

Summary information for the four variants is presented in Table 3-7 below.

Table 3-7 Noise and Vibration Advantages and Disadvantages

Variant	Advantages	Disadvantages/Risks
8M	No NSLs with predicted daytime noise levels greater than 55 dB LAeq,16hr. Low number of NSLs with predicted night-time noise levels greater than 45 dB LAeq,8hr.	Highest number of NSLs with predicted night-time noise levels greater than 45 dB $L_{Aeq,8hr}$ compared to the other options. Given its rural location, it is likely that the existing background and ambient noise levels will be low and the introduction of a new noise source may be more pronounced.
8I	No NSLs with predicted daytime noise levels greater than 55 dB LAeq,16hr. Low number of NSLs with predicted night-time noise levels greater than 45 dB LAeq,8hr.	May not be practical to provide mitigation measures for single locations and this could result in significant effects at these NSLs. Given its rural location, it is likely that the existing background and ambient noise levels will be low and the introduction of a new noise source may be more pronounced.
8A	No NSLs with predicted daytime noise levels greater than 55 dB LAeq,16hr. Low number of NSLs with predicted night-time noise levels greater than 45 dB LAeq,8hr.	May not be practical to provide mitigation measures for single locations and this could result in significant effects at these NSLs. Given its rural location, it is likely that the existing background and ambient noise levels

Variant	Advantages	Disadvantages/Risks
		will be low and the introduction of a new noise source may be more pronounced.
8P	No NSLs with predicted daytime and night-time noise levels greater than 55 dB LAeq,16hr and 45 dB LAeq,8hr respectively. Variant with the lowest number of NSLs with predicted night-time noise levels greater than 45 dB LAeq,8hr.	Should the number of rail movements increase the number of impacted NSLs would likely increase more rapidly compared to other variants due to its proximity to Batterjohn. Larger population in proximity to the proposed rail line and there is potential an increased number of dwellings with construction noise impacts due to the higher predicted noise from the construction activity compared to the operational phase. However, construction works will be temporary.

Table 3-8 Noise and Vibration Preference

Variant	MCA Ranking	Preference
8M	**Neutral**	**Preferred**
8I	**Neutral**	**Preferred**
8A	**Neutral**	**Preferred**
8P	**Neutral**	**Preferred**
Focusing on the part of the route corridor that differs between Variant 8M, Variant 8I, Variant 8A and Variant 8P, there are four NSLs with predicted noise levels above the 45 dB $L_{Aeq,8hr}$ night-time criterion for Variant 8P, two NSLs with predicted noise levels greater than 45 dB $L_{Aeq,8hr}$ night-time criterion for Variant 8I, one NSL with predicted noise levels greater than 45 dB $L_{Aeq,8hr}$ night-time criterion for Variant 8A, and zero NSLs with predicted noise levels greater than 45 dB $L_{Aeq,8hr}$ night-time criterion for Variant 8P. There are no NSLs with predicted daytime noise levels above the 55 dB $L_{Aeq,16hr}$ daytime criterion. There is very little difference between **Variant 8M, 8A, 8I and 8P**.		

3.3.2.5 Landscape and Visual

The analysis of the variants for landscape and visual has considered changes to protected views, interactions with sensitive landscape characters, changes to topography and impact on sensitive receptors. At this stage of the landscape and visual assessment the focus for has been on residents within the 0-50 m band of the proposed route corridor options. While it is possible that residents in the 50-100 m and 100-200 m distance bands from the proposed corridor centrelines will also be impacted, the likelihood of screening by topography or vegetation is far greater, in addition to the impact being mitigated by greater distance from the rail line itself. The advantages and disadvantages of each variant are presented in Table 3-9 below.

Table 3-9 LVIA Advantages and Disadvantages

Variant	Advantages	Disadvantages/Risks
8M	No part of the route passes through LCAs of high sensitivity. This route is approximately 925m from Designated View No. 77 (View of Killeen Castle/Skane Valley from the direction of Warrenstown College) at its nearest point. The ground level will be elevated by approximate 6.5m between the designated view and Killeen Castle. However, due to intervening screening by vegetation and relative height difference between the view location and variants it is unlikely that views to the castle or the Skane Valley will be affected. Changes in topography particularly elevations that contrast with the topography of the local landscape can have a significant impact on landscape character. Variant 8M most closely follows the existing topography. At the eastern start of this variant there is a 1.35 km section that is raised 5m above existing ground level with the greatest increase in height of approx. 10 metres at Chainage 13100 approx. 2.5 km east of the south-eastern corner of the Dunsany ACA. Along the southern boundary of the ACA the greatest increase in ground level will be 2.5 m at the south-western corner of the ACA. This variant has the smallest footprint area of 126.41 acres resulting in the least ground disturbance	Visually impacts a number of residents of dwellings in close proximity to the line.
8I	No part of the route passes through LCAs of high sensitivity.	At the eastern start of this variant there is a 1.35km section that is raised 5m above existing ground level with the greatest increase in height

Variant	Advantages	Disadvantages/Risks
	This route is approximately 895 m from Designated View No. 77 at its nearest point. The ground level will be elevated by approximate 6.5m at the sightline between the designated view and Killeen Castle. However, due to intervening screening by vegetation and relative height difference between the view location and variant it is unlikely that the view to the castle or the Skane valley will be affected. This variant will not visually impact residents of dwellings in close proximity to the line (within 50m from the option centreline). This variant has the second smallest footprint area of 148.3 acres resulting in the second least ground disturbance.	of approx. 10m at Chainage 13,100 approx. 2.5km east of the south-eastern corner of the Dunsany ACA. Between Chainage 17,000 and 17,300 there is another 400 meters section raised 5m above existing ground level. There is one significant cutting greater than 10m below ground level over a 525m stretch with the lowest point of -13.4 at Chainage 16,300.
8A	Visually impacts a low number of residents of dwellings in close proximity to the line	21% of the route passes through LCA 12, which is not just of high sensitivity, but also the most critical LCA within the study area, parts of which are to be designated as a Landscape Conservation Area. This route is 275m from Designated View No. 77 at its nearest point. The ground level will be elevated by approximate 9m at the sightline between the designated view and Killeen Castle. While it will not block the view of the castle, it will obscure views over the Skane Valley and significantly affect this designated view. This variant has the greatest divergence from existing local topography. The level of the most easterly 1.2km of this variant will increase by over 10 m with the greatest height increase of 14.5m at Chainage 13,900. Further west along this variant, between Chainages 16,850 and 17,750 there are another 900m that will be raised by more than 10 m with the highest point at Chainage 17,550 of 14m. This route will also have the deepest cutting of approx. 750m at more than 15m below existing ground level with the lowest point being -18.3m at Chainage 15,160. This variant has the second greatest footprint area of 193.7 acres resulting in the second greatest ground disturbance

Variant	Advantages	Disadvantages/Risks
8P	None	17% of the route passes through LCA 12, which is not just of high sensitivity, but also the most critical LCA within the study area, parts of which are to be designated as a Landscape Conservation Area. This route is 275m from Designated View No. 77 at its nearest point. The ground level will be elevated by approximate 9m at the sightline between the designated view and Killeen Castle. While it will not block the view of the castle, it will obscure views over the Skane Valley and significantly affect this designated view. Visually impacts a number of residents of dwellings in close proximity to the line. Similar to Variant 8A there will be a level increase in the most easterly 1.15km by over 10m with the greatest height increase at Chainage 13,900 of 14.5 m. There will also be 450 m of cutting of 10m or lower with the lowest point at -13.2 m at Chainage 15000. This variant has the greatest footprint area of 231.27 acres resulting in the greatest ground disturbance.

Table 3-10 Landscape and Visual Preference

Variant	MCA Ranking	Preference
8M	**Slight Negative**	**Preferred**
8I	**Slight Negative**	**Intermediate**
8A	**High Negative**	**Less preferred**
8P	**High Negative**	**Less preferred**

Variants 8M and 8I will not pass through areas of high sensitivity or have impacts on Designated View No. 77 in the Meath County Development Plan. Additionally, as both these variants are shorter they have smaller footprints than Variants 8A and 8P resulting in less ground disturbance and vegetation clearance.

Changes in topography, particularly elevations, that contrast with the topography of the local landscape can have a significant impact on landscape character. The landscape through which these variants are passing is gently undulating. The introduction of significantly elevated horizontally level areas diverging from the existing topography over large areas will potentially have a profound effect on local landscape character. Variant 8A will have the greatest impact, closely followed by Variants 8P. Both Variants 8A and 8P will have section of over one kilometre in length where the ground level will be raised by over ten metres (broadly equivalent to rows of

three-story houses in height). Variants 8I will have minor to medium impact on local topography and Variants 8M will result in only minor changes to the topography.

Although Variants 8M and 8I have been scored the same, **Variant 8M** is the preferred variant for landscape and visual due to its reduced impact on local topography and ground disturbance.

3.3.2.6 Biodiversity

The analysis of the variants for biodiversity has considered information relating to vegetation clearance, new crossings of hedgerow and woodland (length and area), habitat fragmentation and use of greenfield. The advantages and disadvantages of each variant are presented in Table 3-11 below.

Table 3-11 Biodiversity Advantages and Disadvantages

Variant	Advantages	Disadvantages/Risks
8M	The advantage of Variant 8M over 8A, 8I, and 8P is its reuse of the existing decommissioned rail line and reduction of greenfield use. This option is also the shortest in length and has the overall smallest footprint.	The disadvantage of Variant 8M over variants 8I, 8A, and 8P is the interaction with mature trees and woodland associated with the Dunsany Estate.
8I	The advantage of Variant 8I over variants 8A, 8P, and 8M is the avoidance of mature trees and woodland associated with the Dunsany Estate.	The disadvantage of Variant 8I over 8A, 8P, and 8M is the interaction with additional woodland at chainage 15,400-15,800.
8A	The advantage of 8A over 8I, and 8M is the avoidance of mature trees and woodland associated with the Dunsany Estate.	The disadvantage of Variant 8A over 8P, 8I, and 8M is the increased land-take associated with a longer variant. Variant 8A also interacts with features at Glane Great woodland fragments.
8P	The advantage of 8P over 8A, 8I, and 8M is the avoidance of mature trees and woodland associated with the Dunsany Estate, and the avoidance of any potential severance of features at Glane great woodland fragments.	The disadvantage of 8P over 8A, 8I, and 8M is the increased land-take associated with a longer variant.

Table 3-12 Biodiversity Preference

Variant	MCA Ranking	Preference
8M	**Slight Negative**	**Less preferred**
8I	**Slight Negative**	**Intermediate**
8A	**Slight Negative**	**Preferred**

8P	**Slight Negative**	**Preferred**
Although the four variants all score as slight negative, the preferred variants for biodiversity are **Variant 8A and 8P** as they both avoid removal of mature woodland and avoid potential severance associated with the Dunsany woodland fragments.		

3.3.2.7 Water Resources and Hydrology

The analysis of the variants for Water has considered information relating to new crossings of waterbodies including those with connectivity to the River Boyne, presence of Karst features, intrusion on floodplain and proximity to public water supplies. The advantages and disadvantages of each variant are presented in Table 3-13 below.

Table 3-13 Water Resources and Hydrology Advantages and Disadvantages

Variant	Advantages	Disadvantages/Risks
8M	Crosses a very small area of ground where rock is at or near the surface (5,749m²)	Crosses a large portion of floodplain (the largest of all 4 variants) and the longest lengths of EPA mapped watercourse (3 separate watercourses, Skane 010, Skane_020 and Skane_030) a total of 2,744m.
8I	Crosses a small portion of ground where rock is at or near the surface (32,849m²) compared to 8M (5,749m²)	Crosses a large portion of floodplain (the 2nd largest of all 4 variants) and crosses 1,948m of EPA mapped watercourses (Skane 010, Skane_020 and Skane_030)
8A	Avoids crossing large portion of floodplain and crosses the shortest length (1,436m) of EPA mapped watercourse (3 separate watercourses, Skane_10, Skane_020, Skane_030).	Crosses a portion of ground where rock is at or near the surface (115,022m²) compared to 8M (5,749m²)
8P	Avoids crossing a large portion of floodplain and avoids crossing any ground where rock is at or near the surface.	Crosses 2,025m of EPA mapped watercourses (3 separate watercourses Skane_010, Boycetown_010, Skane_030)

Table 3-14 Water Resources and Hydrology Preference

Variant	MCA Ranking	Preference
8M	**Slight Negative**	**Less Preferred**
8I	**Slight Negative**	**Intermediate**
8A	**Slight Negative**	**Preferred**
8P	**Slight Negative**	**Intermediate**

Variant 8A is the preferred variant for water resources and hydrology because it avoids crossing a large portion of flood zone A and crosses the shortest length of EPA-mapped watercourses, reducing the potential for impacts on surface-water features, floodplain function and watercourse connectivity. Although it crosses the largest area where rock is at or near the surface, this impact is considered less significant overall than the greater floodplain and watercourse interactions associated with the other variants.

Variant 8M is the least preferred variant for water resources and hydrology because it crosses the largest area of flood zone A and the longest length of EPA-mapped watercourse crossings. These characteristics create the greatest potential for impacts to surface-water receptors, floodplain storage and drainage patterns. Variants 8I and 8P are intermediate variants: Variant 8I crosses a significant area of flood zone A and a larger area of EPA mapped watercourses at 1,948m, while Variant 8P avoids areas where rock is at or near the surface and it also has 2,025m of watercourse intersection.

3.3.2.8 Soils and Geology

It is noted that the variants in the vicinity of Dunsany would have no material impact on soils and geology in isolation. Consideration of issues include overlap with areas of extreme groundwater vulnerability and soft ground. Any potential impacts to groundwater vulnerability can be readily mitigated during the construction stage. At construction stage, for crossing areas of soft ground, there may be requirement for additional geotechnical testing, removal and replacement with more suitable load bearing materials. The consideration of Soils and Geology for the purpose of this variant analysis has therefore been scoped out.

3.3.2.9 Architectural Heritage

Architectural considerations for the short variant sections have focussed on reuse of original rail infrastructure as well as impacts to same; impact of the corridor on demesne or any protected features. The advantages and disadvantages of each variant are presented in Table 3-15 below.

Table 3-15 Architectural Heritage Advantages and Disadvantages

Variant	Advantages	Disadvantages/Risks
8M	Reuse of original railway alignment.	Potential impact due to the close proximity of the alignment to the Dunsany Demesne. Potential impact due to the modifications required to Dunsany railway overbridge.
8I	None	The route would pass through the northern part of the Warrenstown demesne.
8A	None	None
8P	None	None

Table 3-16 Architectural Heritage Preference

Variant	MCA Ranking	Preference
8M	**Slight negative**	Less Preferred
8I	**Slight negative**	Less Preferred
8A	**Neutral**	Preferred
8P	**Neutral**	Preferred
Variant 8M runs along the former track bed of the former railway, which is a positive impact on architectural heritage. However, it has the potential to impact the Dunsany Demesne due to the close proximity of the alignment to Dunsany Demesne. It also has the potential to impact on the existing railway overbridge should any modifications be required to be arch bridge. Variant 8I runs through the northern part of Warrenstown Demesne, which is listed in the NIAH garden survey under reference 5209. While much of the northern part of the demesne is now under plantation, an original area of mixed woodland survives at the northern tip of the demesne and would be impacted by the alignment. Variant 8I would also sever the original driveway and entrance gate from the house that it serves and has served since the early nineteenth century. No items of architectural heritage interest have been identified along the routes of variants **8A or 8P** therefore these are considered preferred for this segment.		

3.3.2.10 Archaeology and Cultural Heritage

The advantages and disadvantages of each variant are presented in Table 3-17 below.

Table 3-17 Archaeology and Cultural Heritage Advantages and Disadvantages

Variant	Advantages	Disadvantages/Risks
8M	There are no recorded monuments in this variant. Shortest variant where archaeological potential is reduced due to disturbance from construction of original railway. Return to the industrial heritage character of much of the original railway.	Archaeological potential related to possible enclosure (AAP96), possible field system (AAP71) and riverine potential (AAP58, AAP59, AAP99, AAP60, AAP68, AAP69, AAP71). Travels through the later extant of Dunsany Demesne.
8I	Second shortest variant.	The direct impact to the remains of St John's Well (RMP ME037-028001), the potential dewatering of the replacement roadside well and the potential for the required junction with the road to extend to the replacement well mean the impact may be as high as Moderate to Significant negative. Archaeological potential related to possible enclosures (AAP96, AAP99), a possible field system (AAP71), Warrenstown Demesne (AAP99) and riverine potential (AAP58, AAP59, AAP99, AAP68, AAP69, AAP71). Travels through the original and later extent of Warrenstown Demesne.
8A	None	There are two RMP/SMR sites within Variant 8A. A fulacht fiadh and burial (SMR ME038-057, ME038-057001) were fully excavated (Licence 05E0398) but there is the potential for further features to survive beyond the Limit of Excavation (LOE) within the corridor. Second longest route variant with archaeological potential related to possible enclosures (AAP96, AAP97), a possible field system (AAP71) and riverine potential (AAP58, AAP59, AAP98, AAP104, AAP71).
8P	None	There are two RMP/SMR sites within Variant 8P. A fulacht fiadh and burial (SMR ME038-057, ME038-057001) were excavated (Licence 05E0398) but there is the potential

Variant	Advantages	Disadvantages/Risks
		for further features to survive beyond the Limit of Excavation (LOE) within the corridor. The longest variant with archaeological potential related to a possible enclosure (AAP96), a possible field system (AAP71) and riverine potential (AAP58, AAP59, AAP100, AAP101, AAP102, AAP103, AAP71).

Table 3-18 Archaeology and Cultural Heritage Preference

Variant	MCA Ranking	Preference
8M	**Neutral**	**Preferred**
8I	**Negative**	**Less Preferred**
8A	**Slight Negative**	**Intermediate**
8P	**Slight Negative**	**Intermediate**
Variant 8I has the potential to impact a recorded monument and the continuity of ritual practice which dates to at least the 17th century, this is the least preferred variant for archaeology and cultural heritage with a rating of moderately negative. Due to the previous disturbance related to the construction of the original railway, the **Variant 8M** is the preferred variant for archaeology and cultural heritage with a rating of Neutral or Not significant. Variants 8A and 8P avoid impacting recorded monuments (the two monuments in these variants are fully excavated and resolved), but the potential impacts relate to the undisturbed greenfield and areas of archaeological potential. They are therefore of intermediate preference with a rating of slight negative.		

3.3.2.11 Material Assets- Property

The advantages and disadvantages of each variant are presented in Table 3-19 below.

Table 3-19 Material Assets - Property Advantages and Disadvantages

Variant	Advantages	Disadvantages/Risks
8M	There are no properties or outbuildings likely to be directly impacted by construction within this segment of Variant 8M.	None
8I	There are no properties or outbuildings likely to be directly impacted by construction within this segment of Variant 8I.	None
8A	There are no properties that are likely to be directly impacted by construction within this segment of Variant 8A.	There are 2 no. outbuildings that are likely to be directly impacted by construction within this segment of Variant 8A.
8P	None	There are 4 no. properties and 3 no. outbuildings that are likely to be directly impacted by construction within this segment of Variant 8P.

Table 3-20 Material Assets Preference

Variant	MCA Ranking	Preference
8M	**Neutral**	**Preferred**
8I	**Neutral**	**Preferred**
8A	**Neutral**	**Intermediate**
8P	**Slight Negative**	**Less Preferred**
In summary, Variants 8M, 8I and 8A are scored neutral as these variants have no properties that are likely to be directly impacted by construction. For Variant 8P, 4 no. properties have been identified that are likely to be directly impacted. **Variants 8M and 8I** are marginally preferred over variants 8A and 8P as they do not directly impact any properties or outbuildings.		

3.3.2.12 Summary Conclusion of Climate and Local Environment Assessment

The table below summarises the results of the localised MCA around Dunsany. Based on MCA rankings, Variant 8M continues to perform marginally better than the alternatives under climate and local environment criteria. Limited differences were identified under the various environmental and climate factors for the segments, and this is reflected in the scoring which is the same or within the same band for many of the factors.

Those that show a definite difference in ranking include Landscape and Visual, which identifies the two variants to the west (8M and 8I) as slight negative compared to those to the west (8A and 8P), which are identified as highly negative comparatively. Variant 8M is marginally preferred over 8I. This is reflective of the vertical profile of the variants and visibility with Protected View 77, with the preference favouring those to the east.

Archaeology and cultural heritage also record clear differences in rankings with Variant 8M identified as neutral or not significant. This reflects the reuse of the previous rail corridor which reduces the potential for undiscovered archaeology due to the previous disturbance related to the construction of the original railway. The potential for undiscovered archaeology would be higher on variants 8P, 8A and 8I with 8I lower in the ranking at negative because it also has potential to impact on a recorded monument.

Architectural Heritage records 8M as slight negative in the comparative assessment. Despite the reuse of the railway which is positive, there are concerns for the impact of the ancillary infrastructure e.g. electrification infrastructure may require modifications on the Dunsany Bridge as part of the reuse.

Table 3-21 Summary Assessment

Environmental Discipline	Variant 8M	Variant 8I	Variant 8A	Variant 8P
Climate	Neutral	Neutral	Neutral	Neutral
Noise and Vibration	Neutral	Neutral	Neutral	Neutral
Landscape and Visual	Slight Negative	Slight Negative	High Negative	High Negative
Biodiversity	Slight Negative	Slight Negative	Slight Negative	Slight Negative
Water Resources	Slight Negative	Slight Negative	Slight Negative	Slight Negative
Architectural Heritage	Slight Negative	Slight Negative	Neutral	Neutral
Archaeology and Cultural Heritage	Neutral	Negative	Slight Negative	Slight Negative
Material Assets - Property	Neutral	Neutral	Neutral	Slight Negative

The assessment of the four variants has indicated that there are few material differences in terms of environment between the variants. Variant 8M however remains marginally preferred for key disciplines of landscape and visual and archaeology.

3.4 Summary of MCA

3.4.1 Summary of MCA

The following table summarises the scoring for the appraisal. A cumulative score was derived from the assessment of the core parameters for each variant (Engineering and Environment). This cumulative score was then used to calculate the average achieved under each core criterion (Engineering and Environment), assuming equal balance between their performance, i.e. 50% weighting.

Table 3-22 Summary of MCA Scores

	Variant 8M	Variant 8I	Variant 8A	Variant 8P
Engineering score	4	3	2	2
Environment cumulative score	28	26.5	27	25.75
Engineering average	4	3	2	2
Environment average	3.50	3.31	3.38	3.22
Total	**7.50**	**6.31**	**5.38**	**5.22**
Preference (rank)	**1st**	**2nd**	**3rd**	**4th**

Table 3-22 presents the scoring from each variant across the examined criteria.

The quantitative outcome of the targeted MCA is clear for the Dunsany alternatives, with Variant 8M (the EPR) scoring the highest and thus ranking as the preference.

Variant 8M performs most favourably in the engineering criterion, as it largely utilises the existing railway corridor and existing infrastructure, thereby minimising engineering complexity and construction risk. All other variants also require substantially greater earthworks and additional structures.

From an environment perspective, the assessment of the four variants has indicated that there are few material differences in terms of environmental criteria between the variants. The EPR however remains marginally preferred for key environment disciplines of landscape and visual, and archaeology.

3.4.2 Sensitivity Test on 8M and 8I

The two highest scoring variants within the MCA are 8M and 8I, with the environmental scoring showing there are very few material differences between the variants.

As presented in Table 3-21, one of the main differentiators is the 'Archaeology and Cultural Heritage' environmental discipline. This is due to potential direct impact to the remains of the recorded monument of St John's Well (RMP ME037-028001) as well as impact to Warrenstown Demesne with Variant 8I.

A sub-variant (8R) was therefore explored to determine if the St John's Well could be avoided by creating a hybrid of variants 8M and 8I. This sub-variant has been designed to ensure a 145kph design speed is achieved.

Sub-variant 8R is show in Figure 3-2 below.

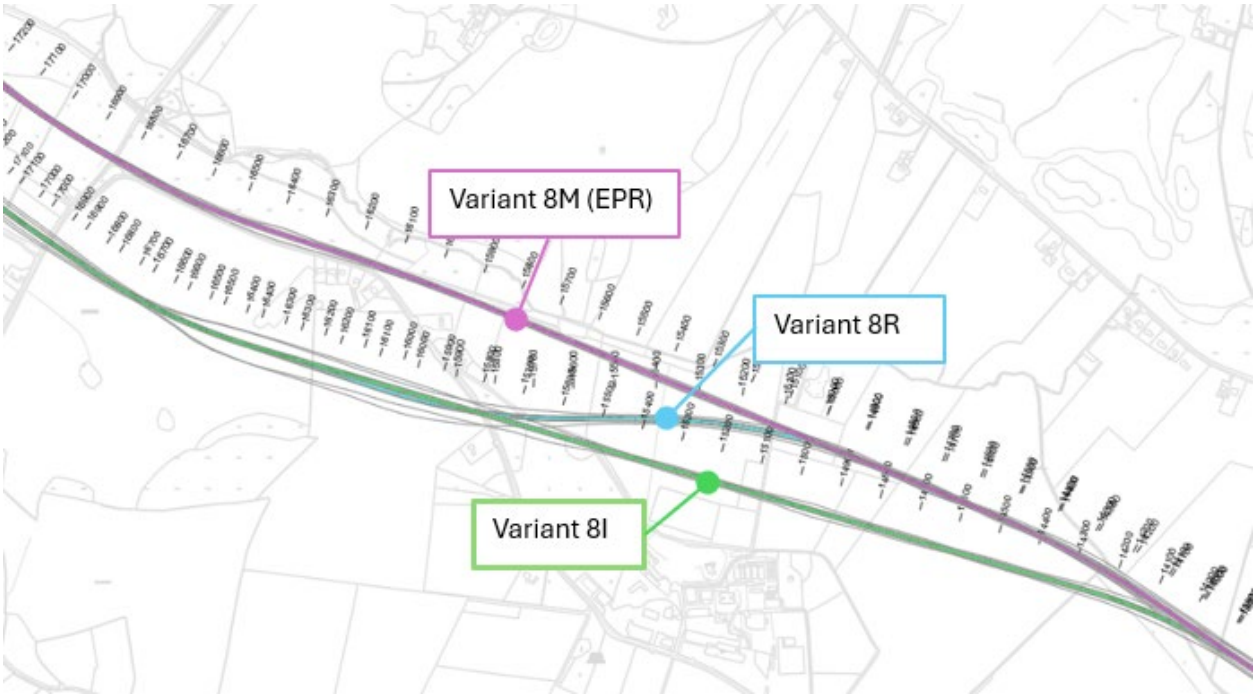


Figure 3-2 Sub-variant 8R at Dunsany

The rising topography to the west of variant 8M results in Variant 8R having an 8.4m cut adjacent to the location of St John's Well. There is therefore still a risk that de-watering of the well may take place with this variant. This, in combination with sub-variant 8R still traveling through Warrenstown Demesne, would result in Variant 8R still being rated lower than Variant 8M for the 'Archaeology and Cultural Heritage' environmental discipline.

Variant 8M (the EPR) therefore would still score the highest in the targeted MCA.

4.0 Conclusions and Recommendations

The assessment presented in the preceding sections has reviewed the quantum of land impacted by the rail corridor through the Dunsany Estate, showing that the land take required by the operational electrified railway will be in the order of **10 acres.** Additional land will be required in the order of **4.5 acres** to facilitate the road realignment along the L2207 and L22071. The estimated permanent land requirement associated with the railway and road realignments represents approximately **2%** of the 750 acres associated with the rewilding initiative.

The assessment also reviewed three alternative alignments in addition to the EPR (Variant 8M), namely variants 8A, 8P and 8I, and a targeted MCA was undertaken to determine the preferred alignment in this area. The MCA has shown that the EPR (Variant 8M) remains the preferred alignment compared to the other variants.

As a result, it is recommended that the EPR (Variant 8M), which follows the original railway corridor, and railway reservation corridor, as outlined in the Meath CDP, is taken forward as the Preferred Route into the next project phase.

Appendix E Navan South Station Review

Navan Line

Navan South Station Review

Date: 09 November 2026
To: IÉ
From: MDC
Pages: 13

This Position Paper considers the potential positive and negative impacts of the addition of a Navan South Station to the Emerging Preferred Route (EPR) – Option 8M.

Background

The identification of an EPR for the Navan Line was carried out applying the guidance set out in the Transport Appraisal Framework (TAF). The work carried out to identify the EPR is set out in the preliminary Option Selection Report (pOSR).

The analysis carried out identified Option 8M as the EPR; the location of the route and proposed stations is presented below.

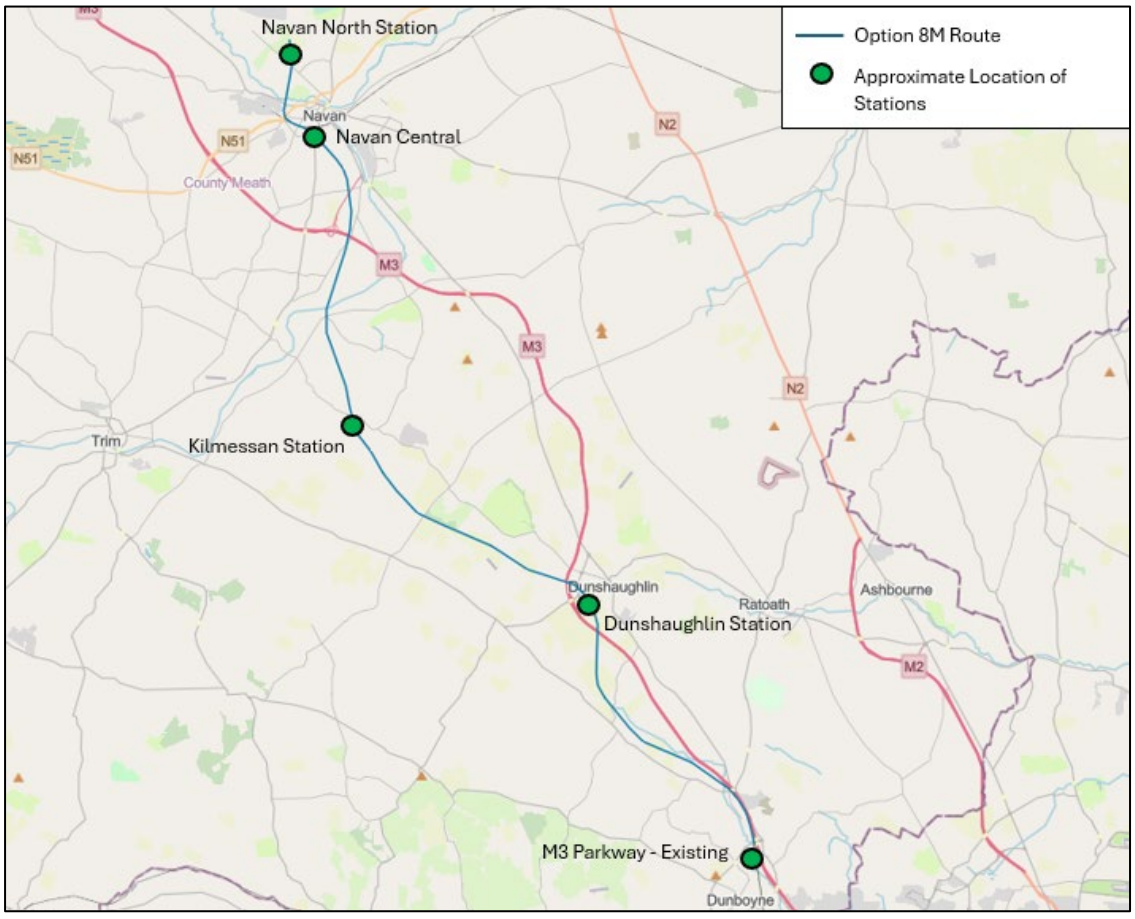


Figure 1: Location of Option 8M with approximate station locations

Potential benefits and disbenefits of Navan South Station

During the first non-statutory public consultation (NSPC1), carried out following identification of the EPR, it was suggested that an additional station would better cater for southern and eastern parts of Navan, especially Johnstown. An indicative location for such a station ("Navan South Station") is presented below.

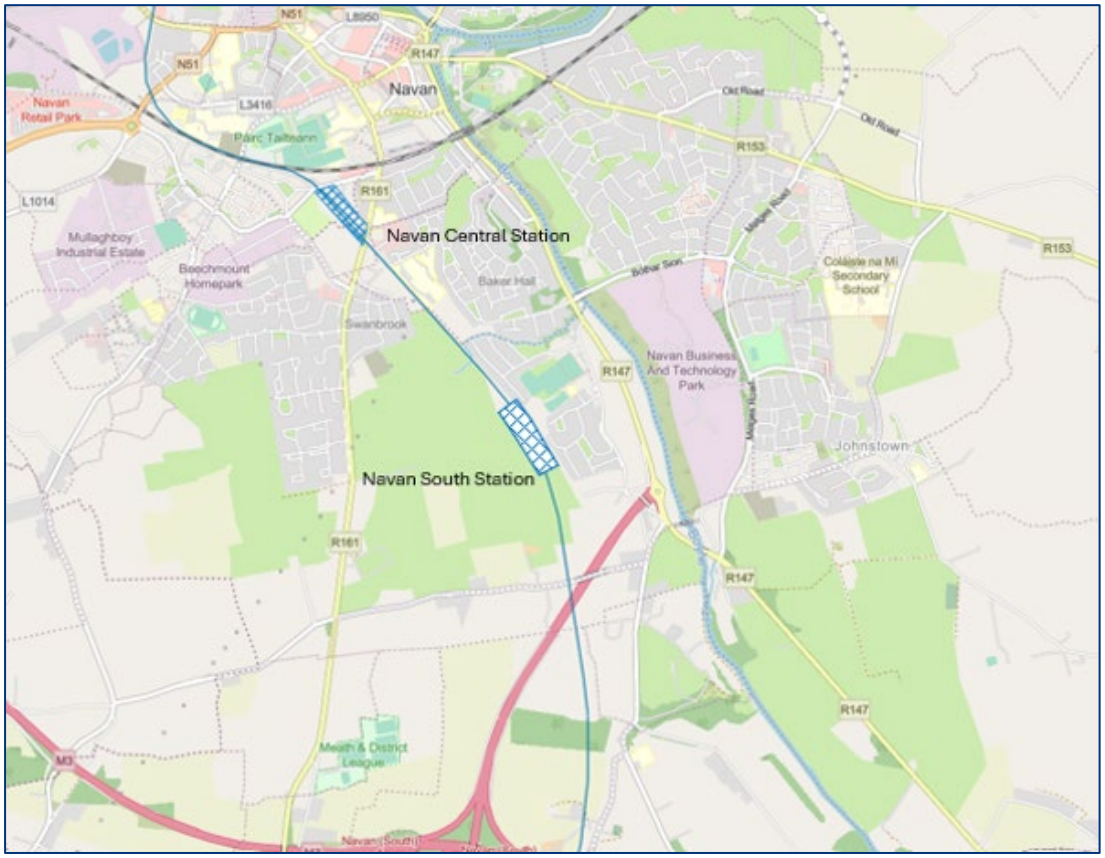


Figure 2: Indicative location of proposed Navan South Station

There are potential benefits to providing a Navan South Station and these are briefly summarised below.

- The site is likely to be attractive to trips using the M3 northwest of Navan (such as those to/from Kells). Such trips would be able to access the rail line at Navan North or Central stations, but the potential Navan South Station is easier and quicker to access (by about three minutes)
- The site would be accessible within a 30-minute walk of all of Johnstown, Navan Business and Technology Park, and a significant proportion of Athlumney Wood. These are areas that require greater than 30-minutes' walk to access the proposed Navan Central Station
- The site would directly serve land currently allocated for a Strategic Employment Site (MP10) identified below, providing additional patronage.

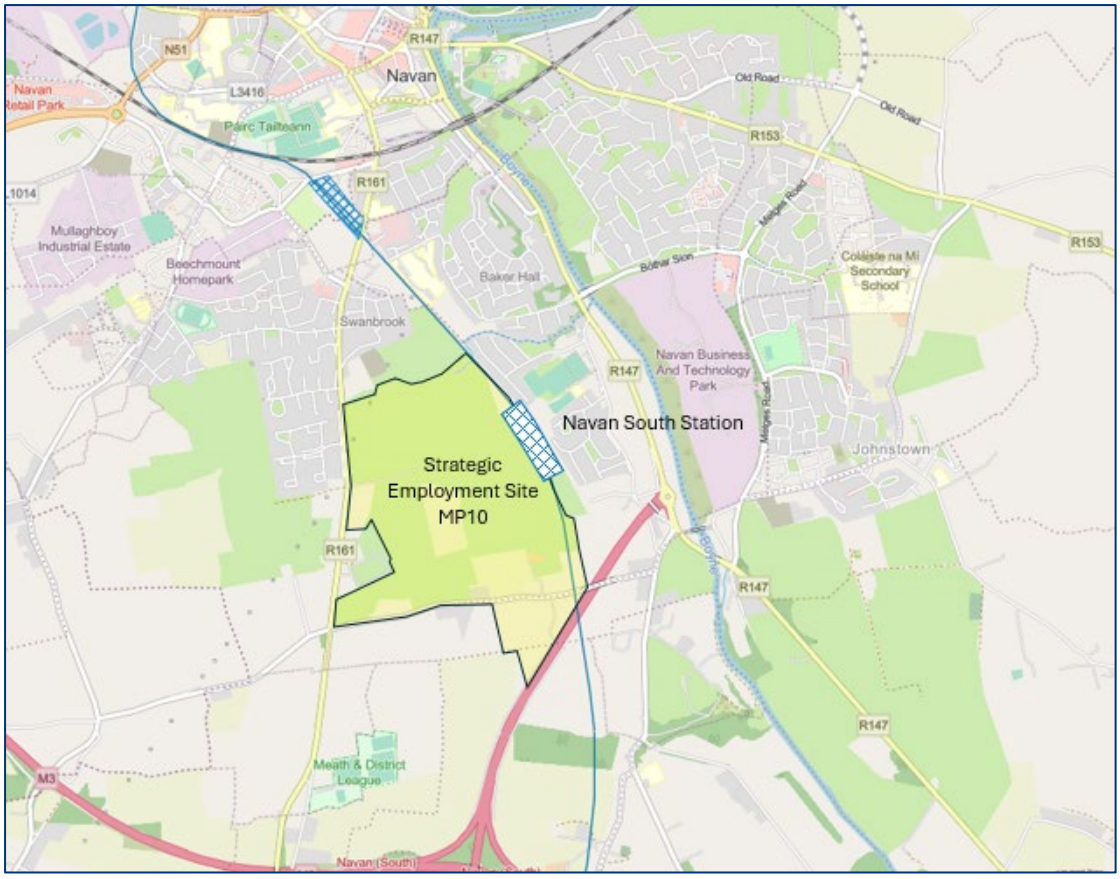


Figure 3: Approximate location of strategic employment site (MP10)

There are also potential undesirable impacts of providing a Navan South Station and these are briefly summarised below:

- Navan South would have car parking, and is therefore likely to attract users who would otherwise use Navan Central Station via sustainable modes of travel (bus/walk/cycle). This could potentially result in increased vehicle-kilometres travelled within Navan and reduce the project's effectiveness against its objectives
- Drawing users away from Navan Central Station may have an impact on the viability of passenger services (such as staffing), and businesses that would otherwise benefit from footfall in the public realm around the station
- The introduction of a new station would increase travel times for passengers between Navan North/Central stations and all other stations to Dublin and beyond. This will make rail travel slightly less attractive for everyone not using the suggested Navan South Station
- The provision of a new station would increase overall scheme costs (albeit this is likely to be relatively minor as a percentage of overall scheme costs)

Assessment

In terms of determining whether the potential new station is likely to be justified, we have considered a series of questions as follows. The answers, which are discussed in the subsequent sections of this note, will demonstrate whether or not the benefits outweigh the drawbacks.

Will the additional station impact on achievement of scheme objectives?

The project sub-objectives are briefly set out below together with the potential impacts of an additional station.

Table 1: Potential impact on project sub-objectives

Project Sub-Objective	Potential Impact of Station
Enable consolidation of compact sustainable economic development and population growth in the study area	The site will directly serve a Strategic Employment Site (MP10), parts of which would otherwise not be within 30 minutes walking distance of a station.
Reduce reliance on the private car, congestion and related environmental impacts. Deliver sustainable travel options attractive to users (including in terms of journey time, punctuality, frequency, inclusivity, comfort and personal security) when they are choosing how to access employment, education and services in Navan, the Dublin Metropolitan Area, and elsewhere in the study area.	The extent to which the station will help achieve this objective will depend on the proportion of users arriving by car that otherwise would have accessed a different station by a more sustainable mode. This will be determined by considering modal share at each station and overall vehicle kilometres travelled.
Contribute towards national, regional and local policy goals in relation to 2050 decarbonisation targets	The extent to which the station will help achieve this objective will be determined by the overall impact on vehicle-kilometres travelled.
Minimise the impact during delivery and operation of the scheme on the local environment, mitigating any residual impacts	An additional station will impact on the local environment, particularly during construction. As the site is allocated as a strategic employment site it is assumed that any impacts will be mitigated and any residual impacts will be minor.
Contribute to transport safety by reducing the annual vehicle mileage on the road network (with a corresponding reduction in the number of recorded collisions total vehicle mileage) and limiting any increase in the number of conflict points	Provision of a new station will increase local traffic and require new junctions, both of which could potentially increase collisions. Overall vehicle mileage on the network is also a factor.

Will the additional station increase rail patronage?

Although the station would attract users a significant proportion of these might still have used the service in the absence of the additional station. The service as a whole will be slightly less attractive to potential users whose travel time is increased because of the new additional station.

Modelling of Navan South Station

The potential Navan South Station has been modelled using the National Transport Authority's (NTA) Eastern Regional Model (ERM) for 2035 and 2050, using the same trip matrices as used in the analysis of options set out in the pOSR. The model output used in this analysis is taken from the park and ride adjusted models. Car parking provision of 1,000 is modelled to ensure capacity does not constrain forecast patronage – this assumption would be refined during future phases of work if the station were progressed. Planning assumptions are the same as those applied in the option modelling detailed in the pOSR.

It should be noted that the proposed Strategic Employment site (Figure 3), and trips it will generate, are only included in the 2050 analysis as the development is not expected to be operational by 2035.

The proposed location for the Navan South Station is not accessible in the ERM network. To realistically assess potential demand new road and pedestrian/cycle links connecting the station to the existing transport network have been coded into the ERM.

Impact of Navan South Station

Patronage:

The forecast impact of the additional Navan South Station on patronage is presented in the table below.

The new station attracts a substantial number of trips (3,100 in 2035 and 4,300 in 2050), but these are primarily diverted from other stations. The greatest diversions are from Navan Central Station – likely due to the absence of parking at Navan Central and the provision parking at Navan South.

There is also significant diversion of passengers from Navan North Station, likely to be trips from Kells/M3 for whom Navan South Station is a quicker, more convenient destination than Navan North.

There is also a small degree of diversion from the three remaining stations – Kilmessan, Dunshaughlin, and M3 Parkway. These will be travellers for whom Navan South is more convenient (by car) than those choices.

Table 2: Forecast patronage for Option 8M and Option 8M with Navan South Station

Station	Option 8M		Option 8M – Navan South Station		Change	
	2035	2050	2035	2050	2035	2050
Navan North	2,051	2,902	1,711	2,315	-17%	-20%
Navan Central	6,090	7,674	4,138	5,043	-32%	-34%
Navan South	-	-	3,143	4,318	-	-
Kilmessan	1,595	1,979	1,474	1,775	-8%	-10%
Dunshaughlin	3,905	5,413	3,657	4,936	-6%	-9%
M3 Parkway	2,666	3,542	2,571	3,421	-4%	-3%
Total	**16,308**	**21,511**	**16,694**	**21,808**	**2%**	**1%**

Given the level of diversion, even though Navan South would take (if included in the scheme) nearly 20% of all passengers, the increase over the line as a whole is small: just 2% (386) in 2035 and 1% (297) in 2050.

Given that the station will serve a Strategic Employment Site (included in the 2050 model but not the 2035 model) it might be expected that the increase from 2035 to 2050 would be greater for a Navan South Station than other stations. This expectation can be checked from the model results, using the forecast changes between 2035 and 2050 shown in the table below.

Table 3: Changes in forecast patronage between 2035 and 2050 – Option 8M and 8M with Navan South Station

Station	Option 8M	Option 8M with Navan South Station
	Percentage Increase	Percentage Increase
Navan North	41%	35%
Navan Central	26%	22%
Navan South	-	37%
Kilmessan	24%	20%
Dunshaughlin	39%	35%
M3 Parkway	33%	33%
Total	32%	31%

The above shows that Navan South Station does have the highest percentage increase from 2035 to 2050 for the analysis of Option 8M with Navan South Station. The two next largest changes (Navan North Station and Dunshaughlin Station) are also locations where significant nearby development is proposed.

Additional analysis has been carried out by interrogating the ERM to determine the origins of users of the Navan South Station. Origin information for rail users is not directly output from the ERM, but information on changes in public transport users for zones, and larger areas, can be determined. This data can then be used to infer changes in travel patterns resulting from Navan South Station. These changes (calculated on a daily basis) are presented in Figure 4 below.

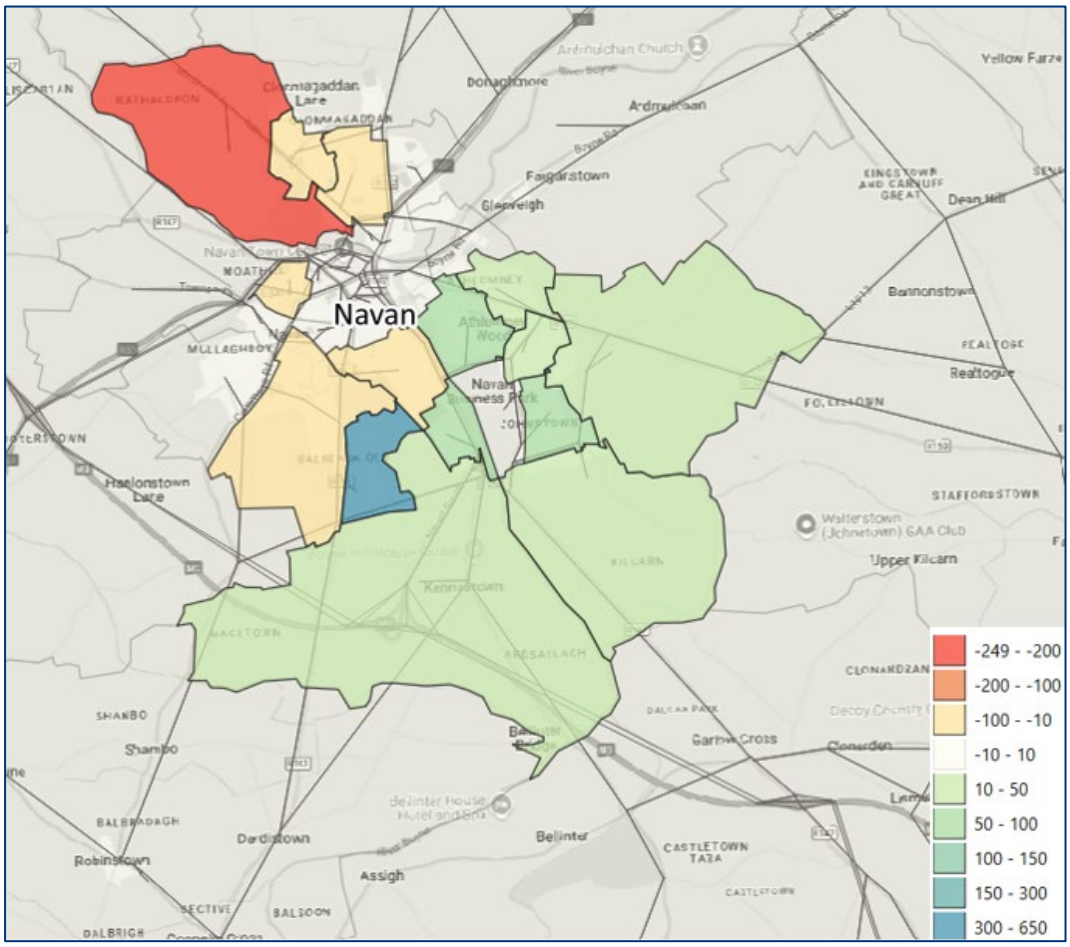


Figure 4: Daily change in 2050 public transport trips originating in zones with addition of Navan South Station

When interpreting the data presented in Figure 6 it should be noted that, for park and ride trips, the origin zone is taken to be the zone where the park and ride is located rather than the start location for the trip. This results in the large changes in the zones containing Navan North Station (showing Red) and Navan South Station (blue) as passengers switch from one to the other.

The zones located immediately south and west of the town centre show relatively minor reductions in PT trips. This is likely due to a combination of trips transferring from Navan North Station to Navan South Station (due to parking provision) and a reduction in those using rail as a result of the increased travel times due to the addition of Navan South Station.

There is also a relatively minor reduction in PT trips from zones immediately east of Navan North Station. This is likely due to a reduction in those using rail as a result of the increased travel times due to the addition of Navan South Station.

The zones with increased PT trips are located immediately east of the station, east of the river Boyne, and south of Navan. These are the locations where new PT trips are generated using Navan South Station.

To summarise, the main impacts of Navan South Station on patronage are:

- Substantial transfer of trips to Navan South Station from Navan Central Station, and to a lesser extent from Navan North Station
- New rail trips from locations immediately east of the station, east of the river Boyne, and south of Navan
- Some reduction in rail trips from locations east of Navan North Station and immediately south and west of the town centre

Additional analysis of the model output has also been carried out, focussing on the impact of Navan South Station on park and ride trips. The following figure presents the locations of the main areas from where people are driving to Navan South Station.

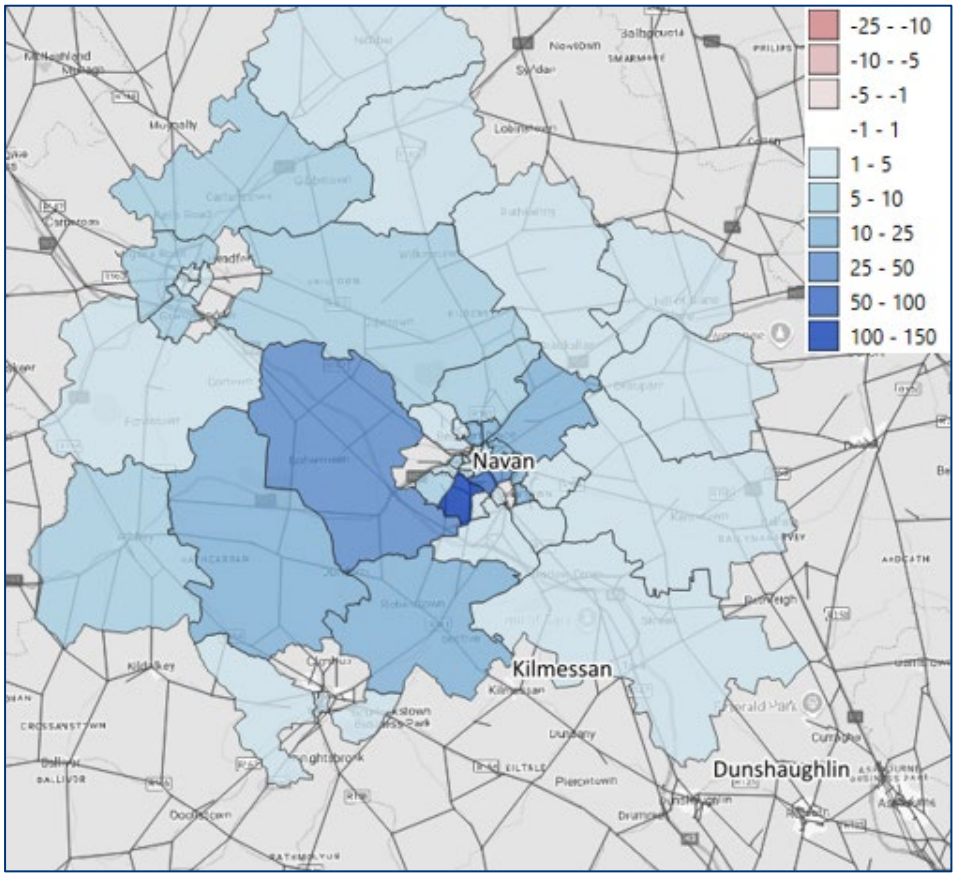


Figure 5: Origin location of park and ride trips to Navan South Station

The above figure illustrates that the majority of the modelled park and ride trips to Navan South Station are from the following areas:

- Southwest Navan,

- Navan east of the river Boyne,
- Areas west of Navan – extending to Kells and Athboy

The following figure illustrates the impact of Navan South Station on park and ride trips to Navan North Station for the main origin zones.

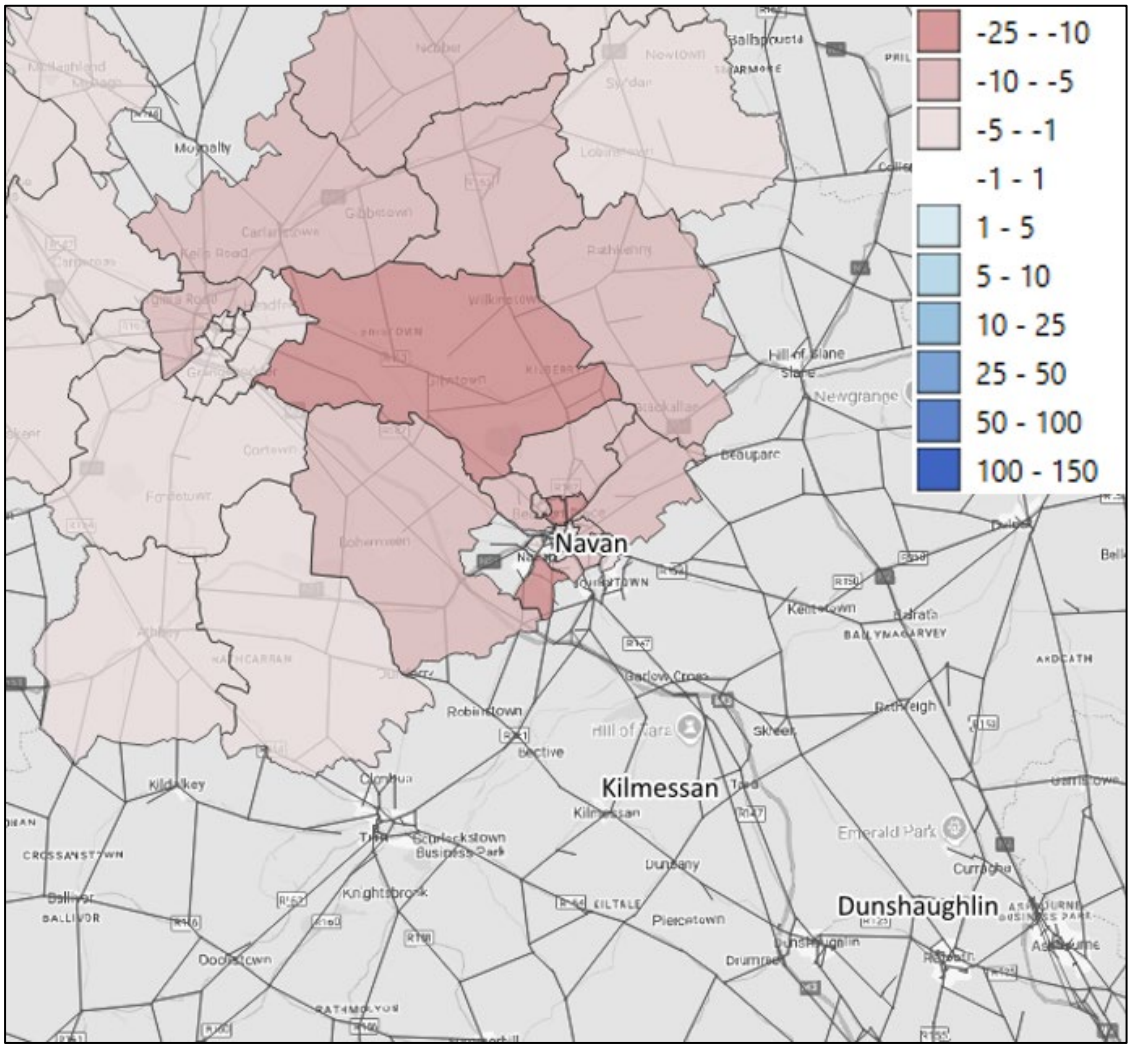


Figure 6: Impact of Navan South on park and ride trips to Navan North (Origin Zones)

The above figure illustrates that Navan South Station results in reduced park and ride trips using Navan North Station. The model zones affected are generally the same as those where park and ride trips are using Navan South, as shown in Figure 5. This indicates that a significant element of the reduction in patronage at Navan North is due to park and ride users switching to Navan South.

The following figure illustrates the impact of Navan South Station on park and ride trips to Dunshaughlin Station for the main origin zones. It illustrates that inclusion of the Navan South station results in a slight reduction in the number of park and ride trips using Dunshaughlin station. The zones affected are generally the same as those west, east, and south of Navan from where park and ride trips are using Navan South.

Although the individual zonal reductions in park and ride trips using Dunshaughlin are low, the cumulative effect is notable.

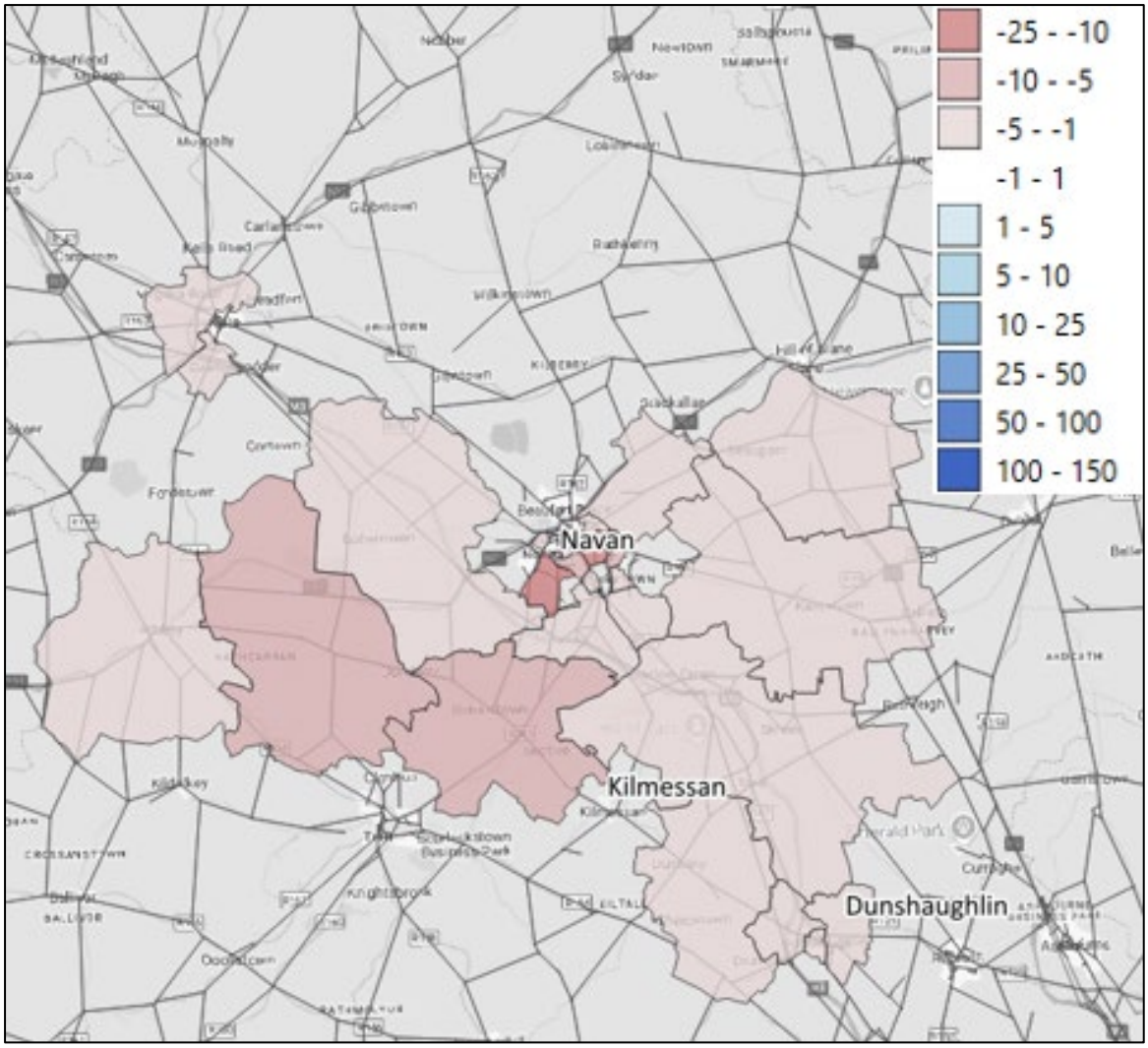


Figure 7: Impact of Navan South on park and ride trips to Dunshaughlin (Origin Zones)

To summarise, the main impacts of Navan South Station on park and ride trips (noting that those are not associated with Navan Central) are:

- A large transfer of trips from Navan North to Navan South
- A smaller but still notable transfer of trips from Dunshaughlin to Navan South, primarily made up of longer distance trips with good access to Navan South

Accessibility

The population within reasonable walking and cycling distance of a station in Navan has been assessed for the EPR with and without the proposed Navan South Station. This identifies the improvement in accessibility due to the proposed Navan South Station.

The results of the accessibility analysis, which is based on existing population from census data, are presented in the table below.

Table 4: Accessibility for Option 8M with and without Navan South Station

Time	Travel Time	Catchment Population	
		Walk	Cycle
Option 8M – no Navan South Station	10 minutes	4,608	27,140
	20 minutes	15,410	36,128
	30 minutes	24,206	41,915
Option 8M – with Navan South Station	10 minutes	6,108	31,408
	20 minutes	19,485	36,571
	30 minutes	32,647	42,469
Impact of Navan South Station	10 minutes	33%	16%
	20 minutes	26%	1%
	30 minutes	35%	1%

Figures 8 and **9** below illustrate the greater accessibility for cycle/walk trips due to a Navan South Station.

The analysis shows that the proposed Navan South Station will have a relatively limited impact on accessibility by cycle, particularly for 20- and 30-minutes travel time. This is a result of the majority of the town being within 20 minutes' cycle time of the centre of Navan regardless.

The impact on walk accessibility is much more noticeable with an increase of approximately one-third. The provision of a Navan South Station results in the majority of the Navan population having access to a station within a 30-minute walk. The main improvement in accessibility is provided in areas south of the station and east of the River Boyne – such as Johnstown, Kentstown Road and Navan Business Park.

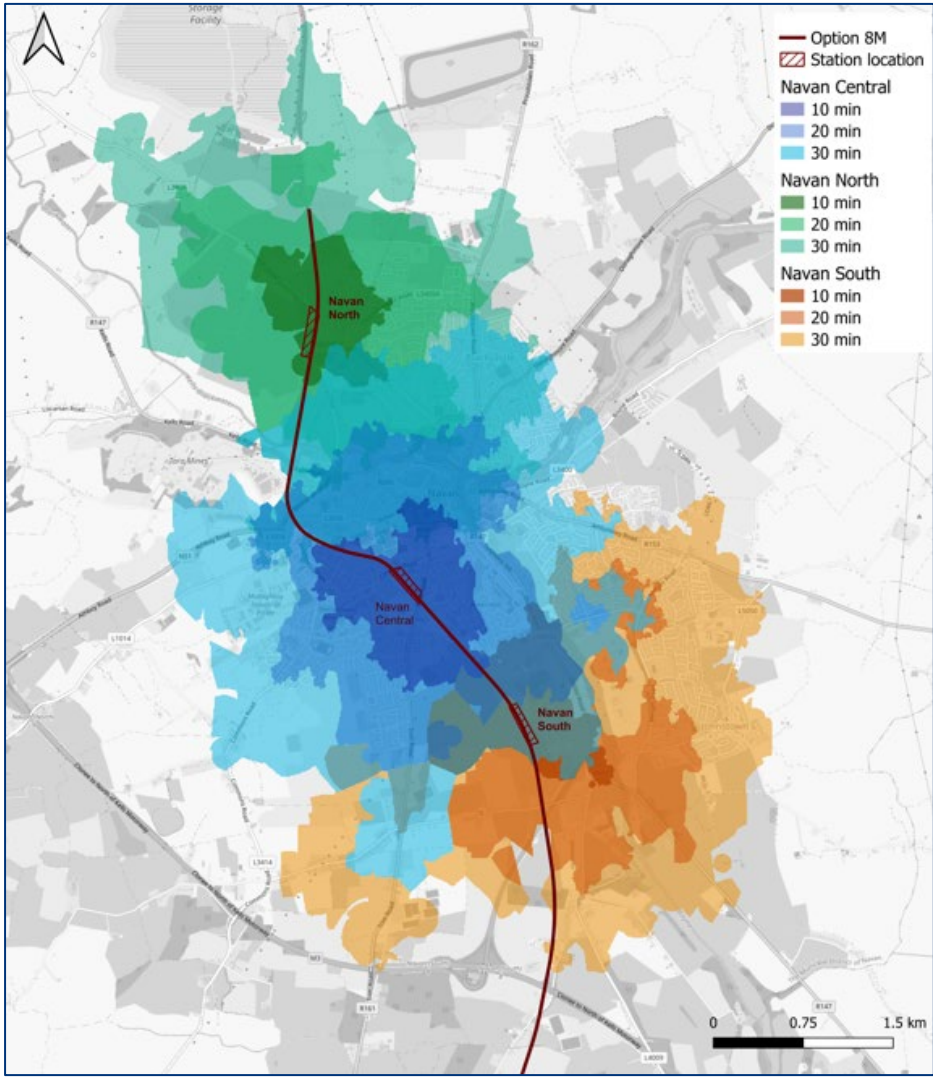


Figure 8: Navan accessibility – walk

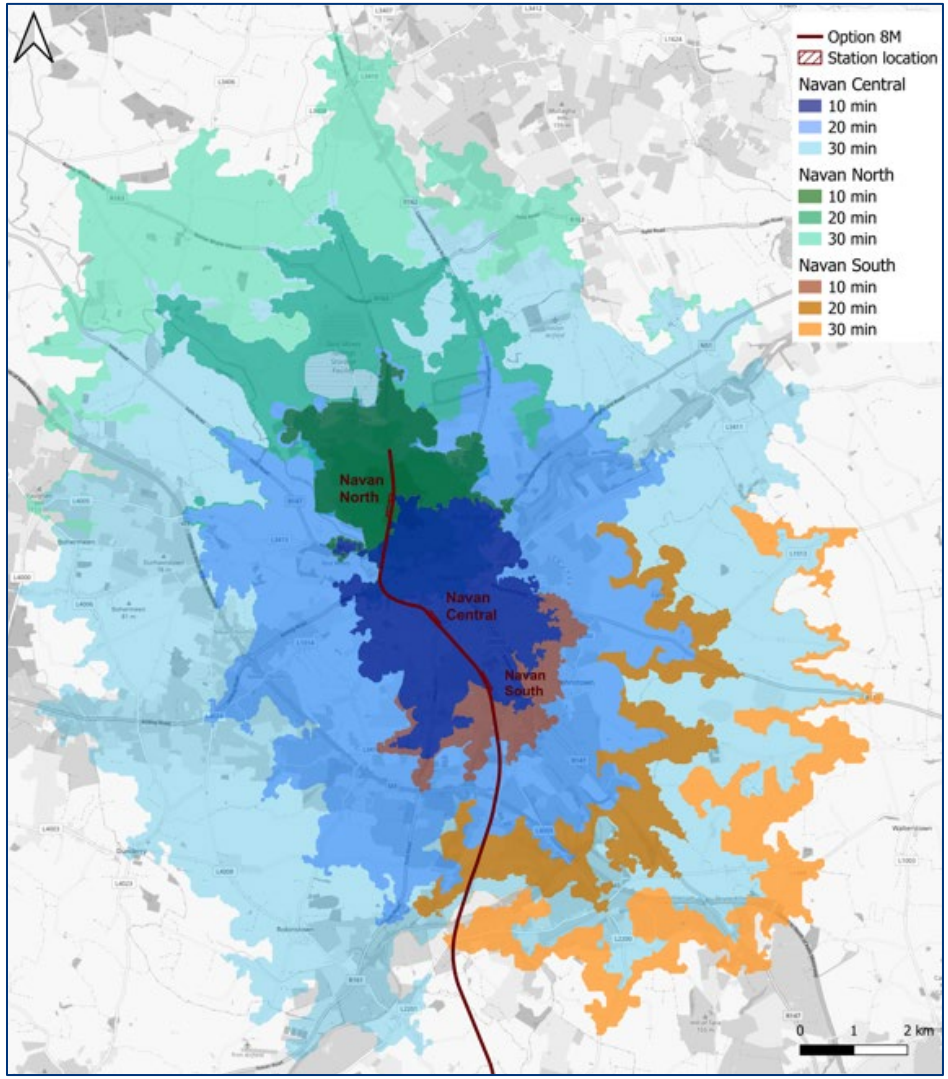


Figure 9: Navan accessibility – cycle

PCU-Kilometres Travelled

The impact of the additional Navan South Station on overall pcu-kilometres travelled (excluding walk/cycle trips) has been assessed using the ERM. A summary of the impacts on pcu-kilometres travelled across the ERM modelled network[1] is presented in the table below.

Table 5: Impact of Navan South Station on pcu-kilometres travelled per weekday

Modelled Year	No Navan South Station Change in pcu-kms	With Navan South Station Change in pcu-kms	Impact of Navan South Station Difference
2035	-89,506	-82,855	+6,651
2050	-165,036	-157,749	+7,287

The implementation of the rail line greatly reduces vehicle-kilometres travelled on the highway network. This is expected, as travellers transfer from car to rail. Inclusion of a Navan South is shown to *reduce* this effect by around 7% in 2035 and 4% in 2050. The higher level of pcu-kms is related in large part to the availability of car parking at Navan South, as opposed to Navan Central (with no parking provision).

Provision of Navan South Station will therefore have a negative impact on greenhouse gas emissions and air quality within Navan.

Caveats

The analysis of Navan South Station impacts has been carried out primarily using the current ERM, maintained by NTA. Whilst this represents the most appropriate methodology, it is possible that planning assumptions (as integrated into the ERM) could change in the future.

Summary

A detailed analysis of the potential impact on the EPR (Option 8M) of the provision of a Navan South Station for has been carried out using the ERM.

The results of this analysis are summarised below.

[1] The ERM models the transport network in the following counties – Carlow, Cavan, Dublin, Kildare, Laois, Louth, Meath, Monaghan, Offaly, Wicklow, Westmeath, and Wexford

Table 6: Summary of the impacts of a Navan South Station on Option 8M

Criteria	Discussion of Impact
Patronage	Although there would be significant usage of the Navan South Station (over 4,300 in 2050) this is largely due to users switching from Navan Central Station, and to a lesser extent Navan North Station. The increase in overall patronage is 2% in 2035 and 1% in 2050.
Accessibility	There would be a significant increase in accessibility for people able to walk to a station. The vast majority of Navan residents would be able to access a rail station within a 30-minute walk. The impact on accessibility by cycle is less significant as a majority of the population can reach Navan centre within 20 minutes.
PCU-kilometres	There will be an increase in total pcu-kilometres, compared to Option 8M without Navan South Station. The decrease achieved by Option 8M is reduced by 7.4% in 2035 and 4.4% in 2050

A brief summary of the positive and negative impacts of the provision of Navan South Station is presented below.

Positive Impacts:

- The station will attract new rail users, increasing overall patronage by 2% in 2035 and 1% in 2050. In Navan, the majority of new rail trips will be from areas in the south of the town, and east of the river Boyne
- Accessibility to a rail station for those able to walk is significantly improved – virtually all of the town will be within a 30-minute walk from a rail station

Negative Impacts:

- Although overall patronage is forecast to increase, the majority of users of Navan South Station will switch from existing stations – particularly Navan Central Station. This may have an impact on the viability of passenger services (such as staffing), and businesses that would otherwise benefit from footfall in the public realm around the station.
- By drawing users away from Navan Central Station (where no parking is provided) there will be an increase in car traffic in Navan. This results in a localised increase in vehicle-kilometres travelled, contrary to the project objectives.
- The new station results in increased travel times for rail users travelling between Navan North/Central Stations and all other stations to Dublin and beyond. This limits the extent to which new rail trips are attracted to Navan South Station.

Whilst the increased accessibility would be of benefit, on balance this does not outweigh the negative impacts. Therefore it is recommended that Navan South *not* be included in the Preferred Route (PR). There would however be merit in making a slight amendment to allow for such a station in the future should circumstances change.