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Part 1

NRA TA 85/11
(Including Erratum No. 1)

National Roads Authority
An tÚdarás um Bóithre Náisiúnta

Guidance on Minor Improvements to National Roads (Including Erratum No. 1)

November 2011
(Including Erratum No. 1, February 2012)

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Summary:

This Technical Advice Note provides guidance on the design principles to be considered when implementing Minor Improvement and Road Safety Improvement Schemes on National Roads. It is intended for use on rural roads and is not intended for use on Maintenance Schemes.

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VOLUME 6 ROAD GEOMETRY
SECTION 1 LINKS

PART 1

NRA TA 85/11

GUIDANCE ON MINOR IMPROVEMENTS TO NATIONAL ROADS

Contents

Chapter

1 INTRODUCTION

Purpose of this NRA Technical Advice Note

1.1 The purpose of this NRA Technical Advice Note is to provide guidance on the design principles to be considered when implementing Minor Improvement and Road Safety Improvement Schemes on National Roads. It is intended for use on rural roads. This Technical Advice Note supersedes the October 2006 version of NRA IAN 85/06.

1.2 This NRA Technical Advice Note is not intended for use on roads upgraded as part of a Major Improvement Scheme, which shall be designed in accordance with the requirements of the rest of the NRA DMRB. This Technical Advice Note is intended for use on Minor Improvement Schemes proposed on existing legacy routes which have not been designed to any recognised standard. This NRA Technical Advice Note recommends improvements where safety or economic benefits have been identified.

1.3 This NRA Technical Advice Note is not intended for use on Maintenance Schemes. Maintenance Schemes are to be registered with the NRA Pavement Management System.

1.4 The principal changes from the previous Advice Note are:

- A distinction has been made between Departures from Standards required on Minor Improvement Schemes as defined by this NRA TA 85 compared to all other Road Schemes designed in accordance with the NRA DMRB. This distinction is addressed in Sections 3.39 to 3.45.
- The removal of the classification of Category 1, 2 and 3 Minor Improvement Types
- This Technical Advice Note includes guidance for Road Safety Improvement Schemes
- The Design Procedures have been removed from the Advice Note. Chapter 2 now outlines the requirements for the Preliminary Design Report
- The definition of terms as included in Sections 1.5 to 1.11
- The creation of a new Design Standards Section in Chapter 3 to include the following design elements:
  - Design Speed
  - Horizontal/Vertical Alignment
  - Passing Bays
  - Cross-Section
  - Overtaking Value
  - Junctions and Access Modifications
  - Safety Barriers
  - Drainage
  - Traffic Signs, Road Markings and Reflectors
  - Non Motorised Road Users
  - Road Safety Audits
- The introduction of worked examples in Chapter 4
- The introduction of passing bays for the upgrade of local secondary and tertiary roads

Definitions

Minor Improvement Scheme

1.5 A Minor Improvement Scheme is an upgrade to an existing section of sub-standard road less than 2km in length where a design element or combined set of design elements are improved. Minor Improvement Schemes vary in complexity, ranging from the removal of inappropriate adverse camber to the isolated improvement of sections an existing road.

Road Safety Improvement Scheme

1.6 A Road Safety Improvement Scheme[1] is a Schemes that specifically targets sections of the network with high collision rates to improve road safety. Where a design element or combined set of design elements are improved to reduce the frequency and or the severity of collisions occurring in the future.

Maintenance Schemes

1.7 Maintenance Schemes predominantly involve pavement works and other road feature maintenance works such as;

- overlay and inlay works which regulate the camber of the existing road i.e. return the camber to its original shape;
- the introduction of new traffic signs and road markings;
- edge strengthening of an existing road.

Maintenance Schemes shall be registered in a centralised database as part of the NRA Pavement Management System.

Route Consistency

1.8 Route Consistency is achieved by a route improvement appropriate to and consistent with characteristics of the existing road alignment such as the existing route geometric characteristics and traffic demand (in particular the volume of daily traffic and Heavy Commercial Vehicle (HCV) content).

Road Authority

1.9 For Minor Improvement Schemes, the Road Authority shall be the relevant Local Authority responsible for the Scheme.

Relevant Section of the NRA

1.10 For Minor Improvement Schemes, the Relevant Section of the NRA shall be the Pavement Maintenance Section of NRA Network Management.

1.11 For Road Safety Improvement Schemes, the Relevant Section of the NRA shall be the Road Safety Engineering Section.

Objectives of Minor Improvement Schemes

1.12 A Minor Improvement Scheme may form part of a Maintenance Scheme where a minor improvement measure is introduced over a short length of the Maintenance Scheme e.g. removal of a sub-standard bend.

1.13 Minor Improvement Schemes shall meet the following design objectives, principles and procedures;

[1] *Amended as per Erratum No. 1*

- The objective of a minor improvement to an existing road is to achieve a localised improvement appropriate to, and consistent with, the characteristics of the adjacent sections of the route having regard to road user demand, collision history and design speed
- Minor Improvement Schemes should be designed to improve road safety and make better use of the existing road network.
- Many existing National Roads in Ireland are legacy routes with sub-standard design features with respect to the NRA DMRB Standards. The objective of a Minor Improvement Scheme should be to upgrade some, but not all, of these existing deficiencies within existing environmental and budget constraints.;

1.14 Examples of such minor improvements might include;

- Applying superelevation in accordance with NRA TD 9 to existing horizontal curvature with minimal or no improvement to the horizontal alignment.
- Improving vertical curvature without achieving full NRA TD 9 vertical alignment standards. Where necessary, Departures from Standard shall be recorded and approved by the relevant Road Authority (see also Sections 3.39 to 3.45 of this NRA Technical Advice Note).
- Upgrading of the road cross-section to comply with the requirements of NRA TD 27 with minimal or no improvement to horizontal or vertical alignment standards.
- Sightline improvements at junction's both public and private entrances,
- Sightline improvements on sub standard horizontal curves

Objectives of Road Safety Improvement Schemes

1.15 The objective of a Road Safety Improvement scheme to an existing road or an existing site is to achieve a reduction in the frequency, and severity of collisions which have occurred on this section of the network. Road Safety Improvement schemes should be appropriate to and consistent with the characteristics of the adjacent sections of the route having regard to collision history, road user demand and design speed.

1.16 Road Safety Improvement Schemes should be designed to improve road safety and make better use of the existing road network.

1.17 Many existing National Roads in Ireland are legacy routes with sub-standard design features with respect to the NRA DMRB Standards. The objective of a Road Safety Improvement Scheme should be to target design features which could affect a reduction in the frequency and or severity of collisions which are occurring at these sections of the network, within existing environmental and budgetary constraints. Examples of such Road Safety Improvements might include those listed in Para 1.14 and the following;

- Sightline improvements at junctions and accesses
- Sightline improvements on sub standard horizontal curves

2 PRELIMINARY DESIGN REPORT

2.1 The NRA Design Procedures for Minor Improvement Schemes and Road Safety Improvement Schemes require the preparation of the Preliminary Design Report, including Relaxations and Departures from Standards.

2.2 The purpose of the Preliminary Design Report is to address and present issues relating to compliance with the relevant parts of the NRA DMRB for the options considered. This is to ensure that the standards to be applied to the options, in particular the preferred option, are acceptable and that all proposed Relaxations and Departures are identified and approved by the relevant Road Authority. A copy of the Preliminary Design Report shall be issued to the NRA Standards Section for their information.

2.3 A Preliminary Design Report will typically contain analysis of the following:

- Need for the proposed scheme. This should highlight the safety and/or capacity issues which are to be addressed i.e. existing pavement condition, existing horizontal/vertical alignment elements, existing cross-section, etc. An illustrative, non-exhaustive list of the data to be gathered is included in Table 2/1. Existing constraints including environmental constraints should also be identified.

- Specific objectives of the proposed scheme.

- Collision History and Records.

- Design Speed Calculations (as per NRA TD 9).

- Options considered

- Constraints

- Geometric features (existing and proposed); horizontal alignment, vertical alignment, cross-section, gradients, cross-falls, superelevation, stopping sight distances, full overtaking sight distances, etc.

- Safety Barrier requirements

- Drainage requirements

- Traffic Signs and Road Marking requirements

- Junction treatment

- Requirements of Non Motorised Users.

- Relaxations and Departures proposed and approved by the relevant Road Authority responsible for the Scheme. Refer to Section 3.39 to 3.44 for further details.

- Road Safety Audit as per NRA HD 19

- An example of a Preliminary Design Report summary and checklist is included in Appendix A.

Pavement Condition	Safety	Construction	Design Speed	Future Land Use	Capacity/ Operational	Environmental Constraints	Local Constraints	Drainage	Other
IRI	Lighting	Statutory Undertakers	Speed Survey	County/Town Development Plan	Traffic Count Source	Site Visit	Accommodation Works	Carriage-way Drainage	Map of Previous Improvements & Year carried out
SCRIM	Signing & Lining	Publicly & Privately Owned services	Road Type	Major Realignment/ Bypass	NRA Traffic Figures	Archaeology	Site Visit	Watermain Leaks	FOSD
Visual	Collision Statistics	Overseeing Organisation	Carriageway Width	Zoning	AADT	Ecology	Domestic Access	Site Visit	SSD
FWD	Collision Analysis		Alignment Constraints (Ac)	Planning	% HGV		Kerbs & Footpaths	Sub-Surface Drainage	Location/Grid Reference
Core Samples	Horizontal & Vertical Alignment		Layout Constraints (Lc)		% Overtaking		Public Utilities		Route No.
Soft Spots	Low-Cost Collision Grant – Simultaneously		Horizontal & Vertical Alignment		NRA Website		Structures		Existing Signing & Lining
	High-Cost Collision Grant – Simultaneously		Individual Access Points				Water Courses		Mandatory Speed Limit
	Safety Barrier Requirements								
	Stage 1 Safety Assessment								

Table 2/1 A non-exhaustive list of the probable data required when assessing a Minor Improvement Scheme.

3 DESIGN STANDARDS

3.1 All Minor Improvement Schemes and Road Safety Improvement Schemes shall be designed in accordance with the NRA Design Manual for Roads and Bridges, with the following exceptions:

Alterations to Horizontal Alignment

3.2 Alterations to the horizontal alignment shall be consistent with the existing road network for 2km either side of the proposed scheme.

3.3 Design Organisations shall consider the impact of any realignment on existing accesses and junctions and shall ensure appropriate measures are included to mitigate these impacts.

3.4 Design Organisations shall ensure that the proposed horizontal alignment design does not introduce new safety problems along the section of road to be improved.

3.5 Where adverse camber is present on an existing road, the alignment should be designed to provide superelevation in accordance with NRA TD 9. Where this cannot be achieved, superelevation should be consistent with the level of superelevation provided on adjacent sections as a minimum, and shall be recorded as a Departure to be approved by the relevant Road Authority. Design Organisations shall make every effort to ensure that the applied superelevation does not adversely affect existing drainage requirements and vehicular accesses or junctions within the section. Where this cannot be achieved, mitigation measures shall be introduced. The degree of superelevation may sometimes be dictated by the length of straight road between two curves. See Example 5 in Chapter 4 for reference.

3.6 Where localised carriageway widening is to be provided, the Design Organisation shall ensure that the widening is introduced as per the requirements of NRA TD 9 where possible.

Calculation of Design Speed

3.7 For minor improvements on existing roads, Design Speed is related to road characteristics and is not directly related to Mandatory Speed Limits.

3.8 The road alignment shall be designed to ensure that standards of curvature, visibility, superelevation etc. are provided for a Design Speed which shall be consistent with the anticipated vehicle speeds on the road.

3.9 The design speed should be calculated for the section of road being improved and for the 2km either side of the minor improvement using the method contained in Chapter 1 of NRA TD 9 for National Roads and Chapter 11 of NRA TD 9 for Regional and Local Roads affected by a National Roads Scheme.

Alterations to Vertical Alignments

3.10 Alterations to the vertical alignment shall be carried out to satisfy the Desirable Minimum requirements of NRA TD 9 where feasible.

3.11 Where it is not possible to meet the Desirable Minimum requirements of NRA TD 9, the Design Organisation shall record Departures approved by the relevant Road Authority.

3.12 Design Organisations shall ensure that the proposed vertical design does not inadvertently introduce hidden dips into

the alignment. See Example 9 in Chapter 4 for an example of a hidden dip.

Cross-Section

3.13 For minor improvements, the selected cross-section should comply with Table 6/1 of NRA TD 9 where possible.

3.14 The selection of cross-section should also consider the future route strategy for the existing road. However, it may not be economically feasible to provide a full cross-section in accordance with NRA TD 9 and NRA TD 27 for a minor improvement, unless it represents an initial stage of a phased improvement strategy. Any reduction in cross-section shall be recorded as a Departure to be approved by the relevant Road Authority.

Overtaking Value

3.15 Minor improvements shall be integrated with contiguous sections of the existing road to provide the best improvement to overtaking opportunities that can be economically devised.

3.16 A principle objective of some minor improvements may be to provide enhanced overtaking opportunity. In this case, the proposed scheme should attempt to achieve the minimum overtaking value specified in Table 7/3 of NRA TD 9.

3.17 Where it is not possible to improve overtaking opportunities, the Design Organisation shall ensure that overtaking and non-overtaking sections within the minor improvement are clearly identified by use of appropriate traffic signs and road markings. Road markings shall be in accordance with the requirements of the Traffic Signs Manual.

3.18 Where overtaking sections cannot be applied in accordance with NRA TD 9 due to the presence of ghost island junctions, Design Organisations should consider the application of nearside overtaking sections at junction locations in accordance with the requirements of Figures 2/3 and 2/4 of NRA TD 41-42. See Example 1 in Chapter 4 for reference.

Junctions and Access Modifications

3.19 Minor improvements involving upgrades to existing junctions, e.g. provision of a right-turn lane, shall comply with the requirements of NRA TD 9 and NRA TD 41-42 where possible.

3.20 All junctions and accesses affected by minor improvements shall be assessed for compliance with NRA TD 9 and NRA TD 41-42. Forward visibility and visibility splays at junctions and accesses, which are currently below NRA DMRB standards, shall not be adversely affected by minor improvements and where possible should be improved. Departures shall be submitted to the relevant Road Authority where required. Departures shall not be permitted to reduce visibilities below standard where existing visibilities are above NRA DMRB standards.

Safety Barriers

3.21 For Minor improvements, where the Design Speed is 100kph or greater, the requirements of NRA TD 19 shall apply. For such schemes, the Design Organisation shall also review the operational characteristics of any existing barriers for compliance with NRA TD 19 and shall replace those which do not satisfy these characteristics.

3.22 The operational characteristics of any existing safety barriers which are retained as part of a minor improvement shall not be affected by the proposed scheme.

3.23 It is likely that some existing National Roads with Design Speeds of 100kph or greater, where a minor

improvement is proposed, do not currently comply with the provisions of NRA TD 19. It may not be possible to provide the standards of NRA TD 19 in a cost effective manner on a minor improvement. In such circumstances, the Designer shall assess the hazard and the appropriate measures required to control the risk.

3.24 Where Design Organisations do not consider the application of the requirements of NRA TD 19 to be feasible on existing National Roads with Design Speeds of 100kph or greater, they shall consider alternative actions. Actions to be considered include;

- removal of the hazard
- relocation of the hazard to a safer position
- redesign of the hazard to reduce the danger to road users
- provide warning signage in advance of the hazard
- mitigate the presence of the hazard by improved road edge delineation (may be considered in conjunction with warning signage) , e.g. earth bunding
- redesign of the road layout to lower the risk

3.25 For minor improvements with a Design Speed less than 100kph, safety barriers will generally not be required, unless the Design Organisation considers there to be a specific hazard which warrants the protection of a safety barrier.

3.26 For schemes with Design Speeds less than 100kph, where Design Organisations consider that a particular hazard is of concern, they shall perform a risk assessment of the hazard to determine whether safety barriers are required.

3.27 This risk assessment shall include the following details;

- Collision History of the existing road
- Identification of hazards
- Impact of the proposed works
- Percentage of HCV traffic
- Risk to others, e.g. adjacent properties, Non Motorised Road Users
- Scheme location, is the road improvement adjacent to a river, railway line, curve, culvert?
- Proximity of roads users to identified hazards in proposed scheme, i.e. are roads users closer to or further away from hazard?
- Alternative actions as outlined in Section 3.24.

3.28 The Preliminary Design Report, outlined in Chapter 2 should contain a record of the risk assessment process described above.

Drainage

3.29 The performance of pavement foundations, earthworks and structures can be adversely affected by inadequate drainage. The Design Organisation responsible for the minor improvement shall ensure that surface and sub-surface drainage provisions in accordance with HD 33, as amended by the NRA, are included in the design.

3.30 Where existing road drainage provisions are to be incorporated (in part or in full) into minor improvement, an assessment of the adequacy of the drainage system shall be made by the Design Organisation. This assessment shall include a review of the superelevation and longitudinal gradient design to ensure

appropriate drainage is provided. Roll over areas in particular shall be checked to avoid flat spots in the design. The assessment shall be recorded in the Preliminary Design Report along with any Departures from Standard.

Traffic Signs, Road Markings and Reflectors

3.31 The Design Organisation shall ensure that improvements to existing signs, road markings and reflectors shall comply with the requirements of the Traffic Signs Manual where possible.

Non Motorised Road Users

3.32 The Design Organisation responsible for minor improvements shall address the needs of Non Motorised Road Users.

3.33 An assessment of existing Non Motorised Road User demand should be carried out on the existing section of road. This should include an assessment of existing footways/cycle tracks in the vicinity of the minor improvement and whether the relevant Local Authority intends to provide footways/cycle tracks along the route in future.

3.34 Where footways/cycle tracks are required, the verge shall be widened accordingly to accommodate these features.

Road Safety Audits

3.35 All schemes shall be subject to Road Safety Audits during design and at completion of construction to identify potential safety hazards which may affect road users. Measures may be necessary to mitigate identified problems. Road Safety Audits should be carried out in accordance with NRA HD 19.

Structures

The Design Organisation shall ensure that all structures impacted on by the Scheme shall be notified to the Bridge Management Section of the National Roads Authority (NRA) and where appropriate all procedures are followed as outlined within NRA BD2.

Passing Bays

3.36 Where the minor improvement involves the upgrade of a Local Secondary or Tertiary road with an existing carriageway width of 5.3m or less, it may be appropriate to provide passing bays instead of full carriageway widening along the length of the scheme. This will allow these narrow roads with low traffic volumes to be improved in a sustainable manner at a reasonable cost.

3.37 Where passing bays are required, they shall be introduced to increase the road width to a maximum width of 6.5m. The full passing bay width shall be provided over a distance of 20m. Entry and exit transitional tapers shall be 10m in length. Where required, the maximum distance between passing laybys, measured from tip of taper to tip of taper, shall be 250m.

3.38 Where feasible, the location of passing bays shall be such that from any point on the road at least one passing bay is visible and adjacent bays are inter-visible to comply with the Stopping Sight Distance requirements of Table 11/3 of NRA TD 9.

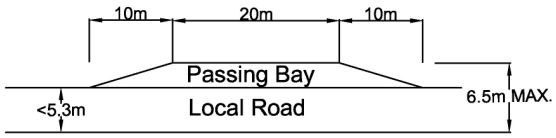


Figure 3/1 – Typical Passing Bay

Relaxations and Departures from Standard

3.39 NRA TD 9 discusses the philosophy relating to Departures and Relaxations and provides details on the circumstances where they should be applied. This NRA Technical Advice Note acknowledges that on minor improvements Design Organisations may have difficulty achieving Desirable Minimum NRA DMRB design criteria within the existing physical, economic or environmental constraints.

Departures from NRA DMRB Standards

3.40 For minor improvements to be cost-effective, it may be necessary for existing features and design elements to be retained in the design which do not meet the full requirements of the NRA DMRB. It is vitally important that Design Organisations identify such features and where appropriate, Relaxations and Departures from Standard shall be recorded and approved by the relevant Road Authority responsible for the scheme.

3.41 A copy of the Preliminary Design Report including a summary of all recorded Departures and Relaxations shall be issued to the NRA Standards Section for their information and to the Relevant Section of the NRA for Consultation. An example of a Preliminary Design Report summary and checklist is included in Appendix A.

3.42 Departures from Standard for minor improvements are more likely to be granted where it can be demonstrated that the existing road layout does not have a history of safety problems and where the proposed minor improvement can be demonstrated not to increase the potential for safety problems to develop.

3.43 The Design Organisation shall ensure that the proposed minor improvement does not result in the introduction of new Departures on the adjacent sections of existing road.

3.44 All Departures from Standard shall include a completed Departure Application Form (as attached in Appendix B) together with the accompanying information as detailed in this Technical Advice Note.

Departures from NRA Specification for Road Works

3.45 Departures are also required for the use of technical specifications other than those included in the NRA Specification for Road Works and Road Construction Details. All Departures relating to the NRA Specification for Road Works and Road Construction Details shall still be submitted directly to the NRA for approval.

4 WORKED EXAMPLES

4.1 It is important that Design Organisations correctly identify problems, and their causes, before attempting to produce solutions. A number of notional examples follow which are intended to illustrate the scale and type of improvement measures/options:

Example 1: Improvements to Overtaking Section

Example 2: Improvements to Existing Cross Section

Example 3: Route Enhancement

Example 4: Relocation of Junction

Example 5: Removal of Adverse Camber

Example 6: Junction Improvements

Example 7: Junction Redesign

Example 8: Sign Relocation and Site Clearance

Example 9: Vertical Alignment Improvement

Example 10: Curve Widening

4.2 Layouts provided in this chapter are intended for guidance only and are not exhaustive.

Example 1: Improvements to Overtaking Section

4.3 An existing rural road contains a ghost-island junction on an overtaking section. The ghost-island is causing an obstruction to overtaking manoeuvres. An assessment of traffic figures reveals that the right turning movements could be accommodated by a simple junction in place of the ghost-island junction.

4.4 The proposed Minor Improvement Scheme involves replacement of the existing ghost-island junction with a simple junction. The existing pavement width is utilised to provide nearside overtaking in accordance with NRA TD 41-42.

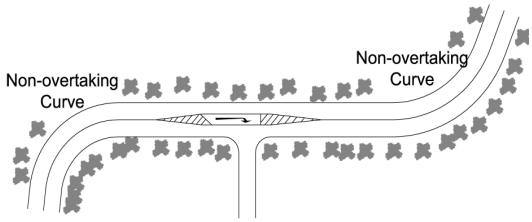


Figure 4/1 - Example 1 Existing Alignment With Ghost Island

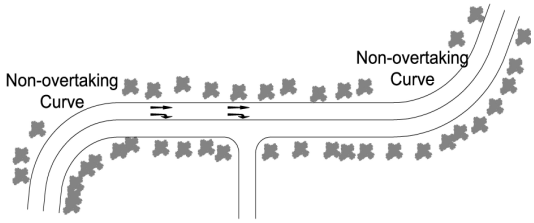


Figure 4/2 - Example 1 Proposed Alignment With Nearside Overtaking Opportunity

Example 2: Improvements to Existing Cross Section

4.5 The existing rural road cross section does not comply with the requirements of the NRA DMRB with a narrow carriageway and no hard strips present. The existing road boundaries consist of hedges directly adjacent to the carriageway and agricultural land borders both sides of the road.

4.6 The proposed Minor Improvement Scheme involves the widening of the carriageway to provide the minimum cross-section warranted by the measured AADT figures. The works involve the repositioning of the road boundary fencelines to allow the construction of the additional pavement works. Redesign and reconstruction of the road drainage is also required as part of the works.

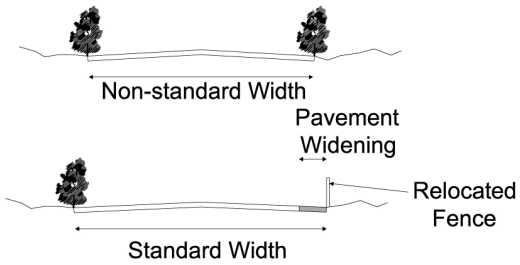


Figure 4/3 - Example 2

Example 3: Route Enhancement

4.7 The existing road consists of a series of substandard curves adjacent to sections of reasonably straight road alignment. The section of road is at a location where a number of collisions have occurred.

4.8 The proposed Minor Improvement Scheme involves the realignment of the road to remove the substandard alignment and replacement with an alignment consistent with the adjacent sections of road.

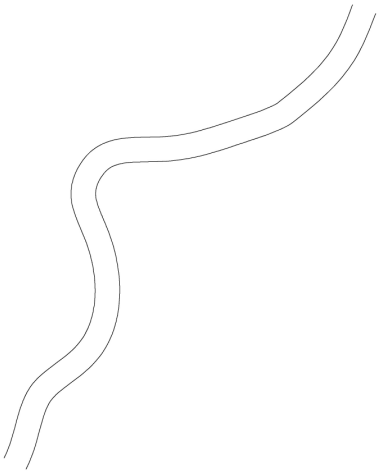


Figure 4/4 - Example 3 Substandard Curve

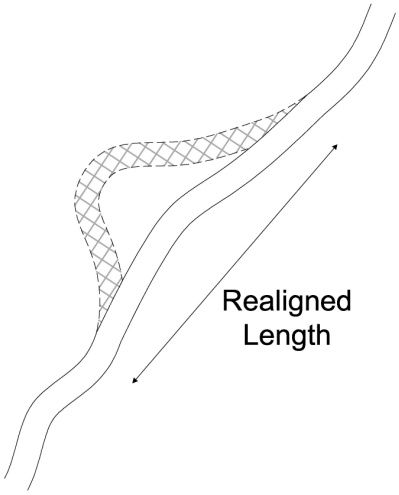


Figure 4/5 - Example 3 Realigned Road

Example 4: Relocation of Junction

4.9 The existing road consists of a ghost island junction located on a straight section of road providing access to a number of properties. The straight section of alignment lies between two curves forming non-overtaking sections of alignment.

4.10 The proposed Minor Improvement Scheme involves the relocation of the junction towards one of the non-overtaking sections of the alignment,

increasing the overtaking opportunity for road users on the straight section of road. Some clearance of obstructions between the road edge and the road boundary is required at the new junction location to ensure visibility requirements are maintained.

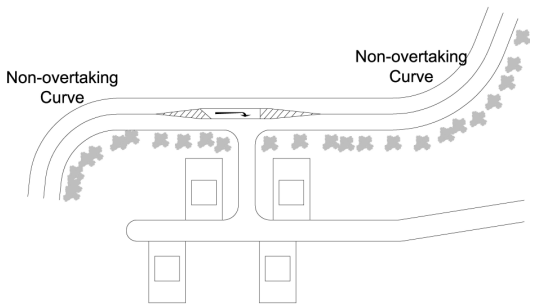


Figure 4/6 - Example 4 Existing Junction

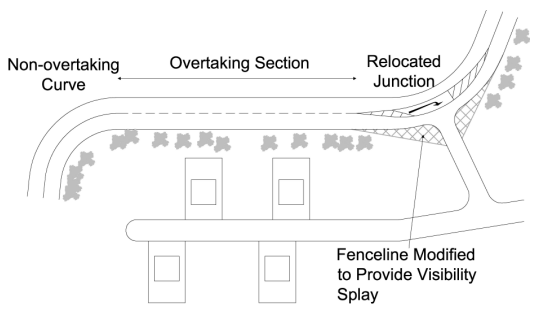


Figure 4/7 - Example 4 Relocated Junction

Example 5: Removal of Adverse Camber

4.11 An existing alignment consists of back to back curves with adverse camber unsuited to the Design Speed of the road.

4.12 The proposed Minor Improvement Scheme involves the introduction of appropriate superelevation as described in Section 3.5 by means of overlay to the existing pavement. A number of existing accesses require modification to tie-in to the new road edge levels. The degree of superelevation applied may be dictated by the length of straight road between the two curves.

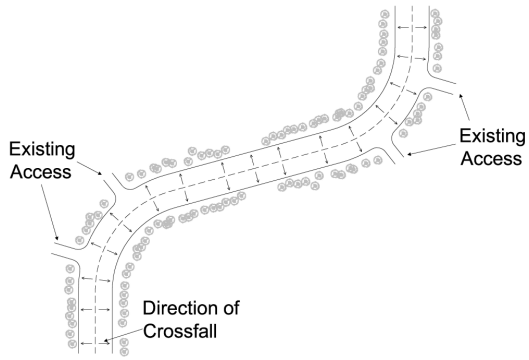


Figure 4/8 - Example 5 Adverse Camber

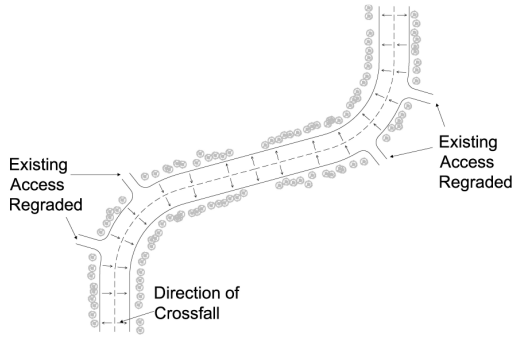


Figure 4/9 - Example 5 Superelevation

Example 6: Junction Improvements

4.13 An existing simple junction is located on the inside of a bend with inadequate visibility splay and sub standard forward visibility.

4.14 The proposed Minor Improvement Scheme involves the redesign of the junction to incorporate a ghost island right-turn lane. This requires pavement widening at the junction location. Additional signage is also required. The fenceline at the junction is modified and the verge is cleared to provide the required visibility splay for the calculate Design Speed.

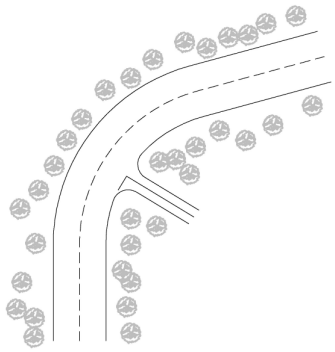


Figure 4/10 - Example 6 Existing Junction

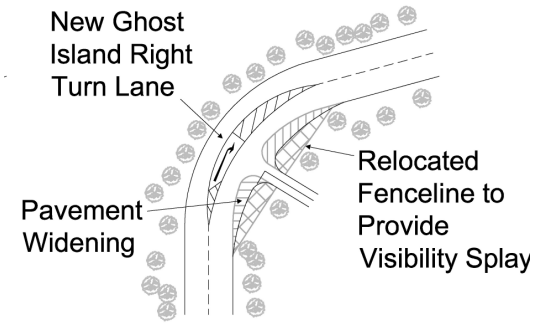


Figure 4/11 - Example 6 Improved Junction

Example 7: Junction Redesign

4.15 The existing road layout consists of a junction between a main road and a minor road. The minor road junction with the main road is at an acute angle resulting in substandard visibility splay at the junction.

4.16 The proposed Minor Improvement Scheme involves the redesign of the junction to form a skew junction in accordance the requirements of NRA TD 41-42. These works will involve the modification of existing fencelines at the junction location to ensure adequate visibility splays are provided.

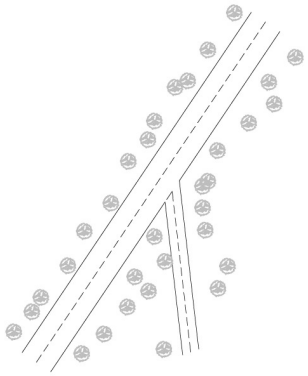


Figure 4/12 - Example 7 Existing Junction

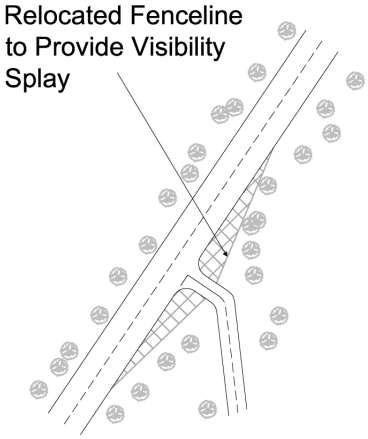


Figure 4/13 - Example 7 Junction Redesign

Example 8: Sign Relocation and Site Clearance

4.17 The visibility splay for an existing road junction has been compromised by the growth of nearby trees which have also obscured road signs on the junction approaches.

4.18 The proposed Minor Improvement Scheme involves the removal of some trees and the relocation of a number of signs to provide the required visibility and advance warning.

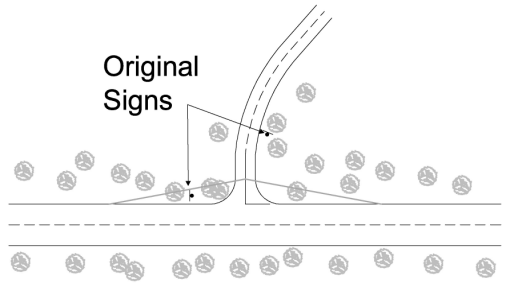


Figure 4/14 - Example 8 Inadequate Visibility

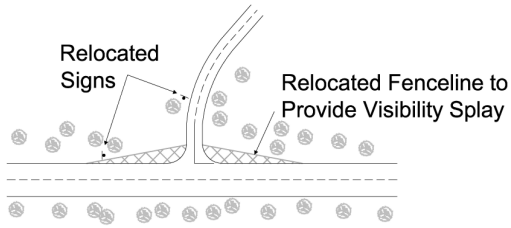


Figure 4/15 - Example 8 Visibility Provided

Example 9: Vertical Alignment Improvement

4.19 The vertical profile of an existing road contains a hidden dip which is caused by an existing sub-standard vertical alignment limiting visibility to oncoming traffic.

4.20 The proposed Minor Improvement Scheme involves the redesign of the vertical profile to remove the hidden dip.

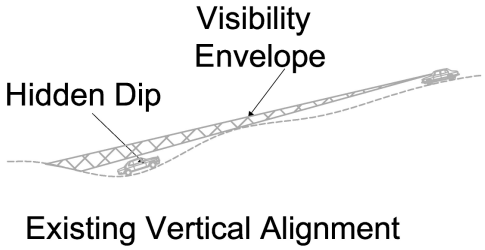


Figure 4/16 - Example 9 Hidden Dip

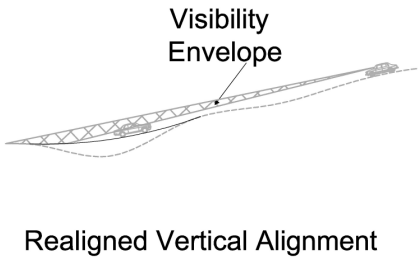


Figure 4/17 - Example 9 Vertical Reprofiled

Example 10: Curve Widening

4.21 The existing road contains substandard curves without curve widening and with inadequate road markings. The existing pavement width makes it difficult for HCVs to pass each other comfortably.

4.22 The proposed Minor Improvement Scheme involves the introduction of curve widening in accordance with NRA TD 9. This requires the acquisition of some private lands to accommodate the pavement widening. Appropriate road markings are also provided.

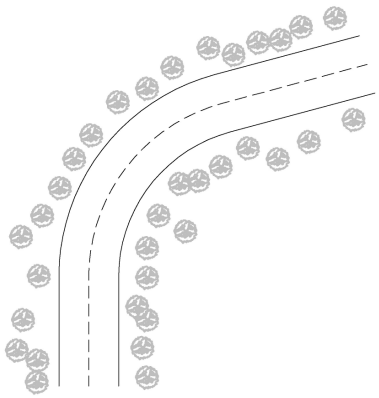


Figure 4/18 - Example 10 Existing Curve

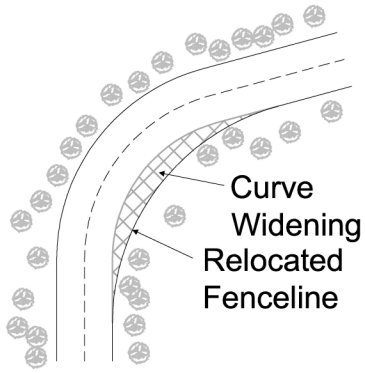
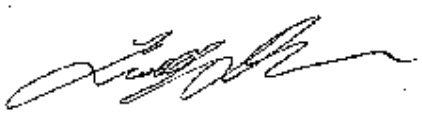


Figure 4/19 - Example 10 Curve Widened

5. ENQUIRIES

5.1 All technical enquiries or comments on this Standard should be sent in writing to:

Head of Engineering
National Roads Authority
St Martin's House
Waterloo Road
Dublin 4



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Tim Ahern
Head of Engineering

National Roads Authority

Design Manual for Roads and Bridges (NRA DMRB)

ERRATUM No. 1 (February 2012) to NRA Addendum to NRA TA 85/11 – Guidance on Minor Improvements to National Roads Dated November 2011

NRA TA 85/11 – Guidance on Minor Improvements to National Roads Dated November 2011 is amended as follows:-

1. Page 2, Paragraph 1.6
Delete the words "Minor Improvement Scheme" and replace with "Road Safety Improvement Scheme".

APPENDIX A: PRELIMINARY DESIGN REPORT SUMMARY AND CHECKLIST EXAMPLE

APPENDIX A – MINOR IMPROVEMENT SCHEME: PRELIMINARY DESIGN REPORT SUMMARY AND CHECKLIST EXAMPLE

Preliminary Design Report Elements Considered (See Chapter 2 and Chapter 3 of NRA TA 85 for further details)	Please indicate if the following were addressed:	Departures Required? Provide a Brief Description for each element below.	Brief Description of Mitigation Proposed.
Need, objectives, constraints and options considered for the Scheme	Yes, 3 options considered	X	X
Collision History and Record	2 Fatalities on section	X	X
Design Speed Calculations (as per NRA TD 9)	70km/h	X	X
Alteration to Horizontal?	Yes	1) 3 step horizontal in combination with 2 step SSD. 2) 3% superelevation provided instead of 7%; constrained by adjacent bends	Cautionary Speed Signs and Supplementary Plates in accordance with Clause 6.3.7 of the Traffic Signs Manual to be provided in advance of the bend.
Alteration to Vertical?	No	N/A	N/A
Cross-Section Chosen & Current Traffic Volumes	Type 2 Single 8000 AADT	No	N/A
Junctions and accesses assessed?	Yes	1) 1 junction and 2 accesses – visibility below standard SSD but improvement on existing. Constrained by existing houses.	Solid white line
Safety Barrier Assessment done?	Yes	X	Delineation of Road Edge required to alert drivers of high embankment.
Drainage Considered?	Yes		Drainage ditch provided on road edge.
Traffic Signage?	Yes	X	X
NMUs Considered?	No	X	X
Road Safety Audit Completed?	Yes	X	X
Departures prepared &signed off by Head of Road Design Section?	Yes	2 Horizontal Alignment and junction Departures	X

X

Head of Road Design Section

APPENDIX B: DEPARTURE APPLICATION FORM

APPENDIX B – APPLICATION FOR A DEPARTURE FROM THE NRA DESIGN MANUAL FOR ROADS AND BRIDGES DURING THE TENDER STAGE ONLY

General Information:		
Route:	Scheme:	Contract Type: (e.g. PPP /D&B/ Traditional)
Design Speed	Traffic Flow and Composition (if applicable):	
Carriageway Type/Cross Section		

Applicant Information:	
Applicant Name:	Contact Person and Contact Details:
Applicants Departure Reference No.	

Departure Information:
Departure Location and Chainage:
Departure Category *(e.g. Road Design, Structures etc.)*
Departure Type *(e.g. Horizontal Geometry, Vertical Geometry, Cross Section, etc.)*
Standard Required by NRA DMRB
Standard Provided
Departure Justification
Other Departures or Relaxations at same location

NRA DMRB References:	
NRA DMRB/MCDRW Reference (e.g. TD 9/05 etc):	NRA DMRB Paragraph/Table/Figure:
Additional Information and Supporting Documentation List:	

RECOMMENDATION AND APPROVAL (FOR NRA USE ONLY)	
Recommendation on Application	
Signature:	Date:
National Roads Authority Approval	
Signature:	Date:
Head of Engineering	
NRA Reference Number:	