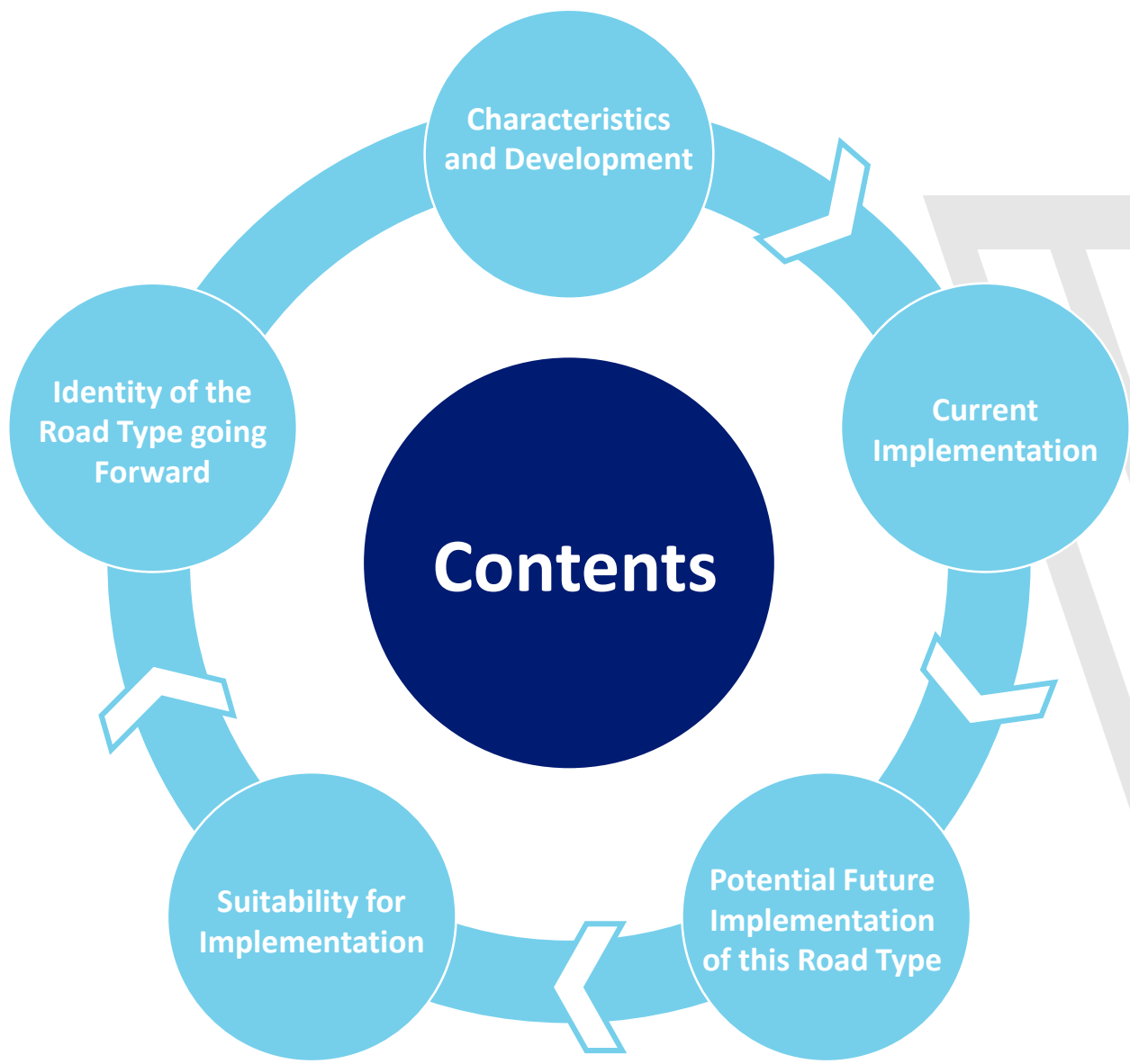
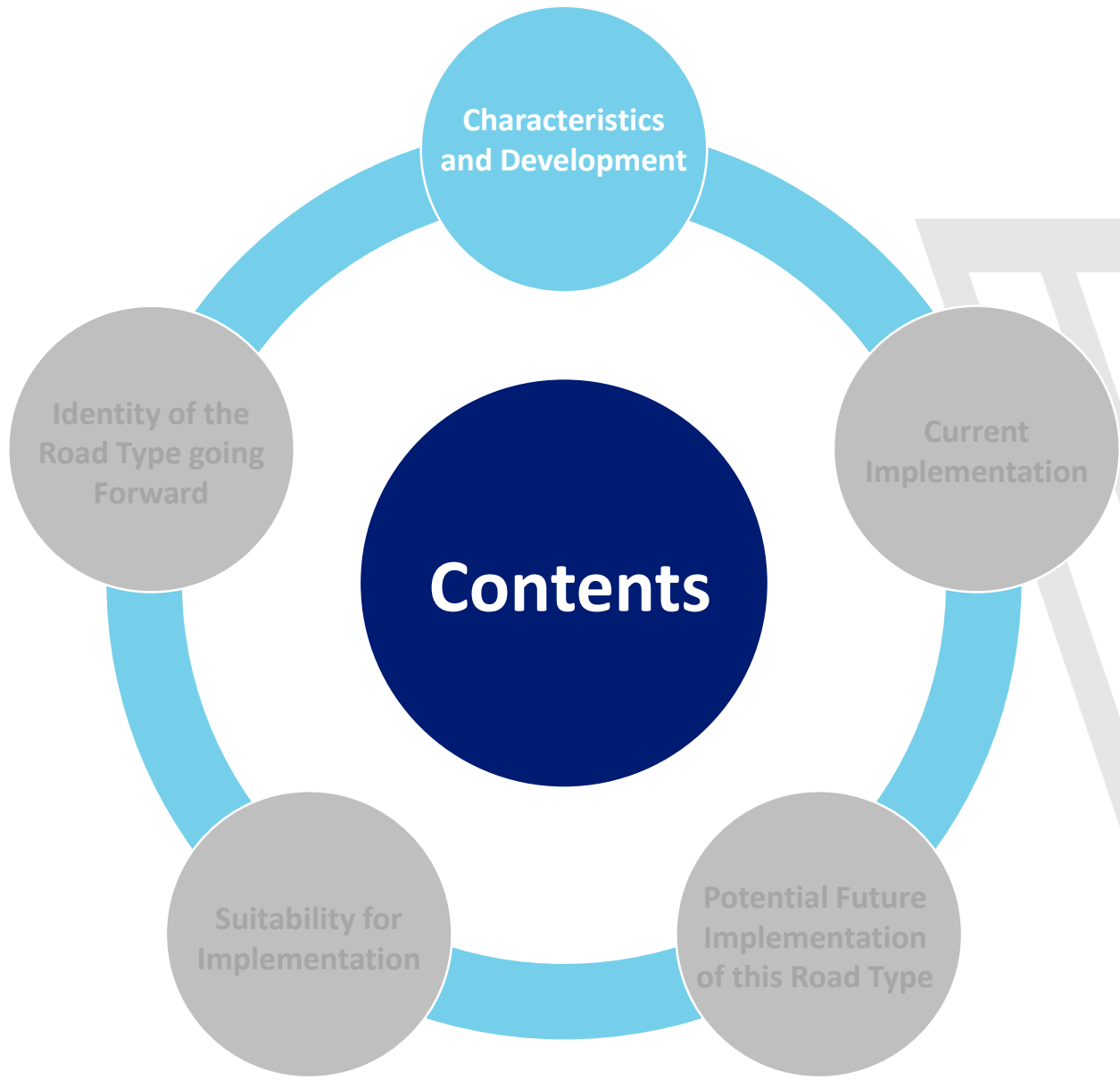


2 + 2 Dual Carriageways Experience to Date

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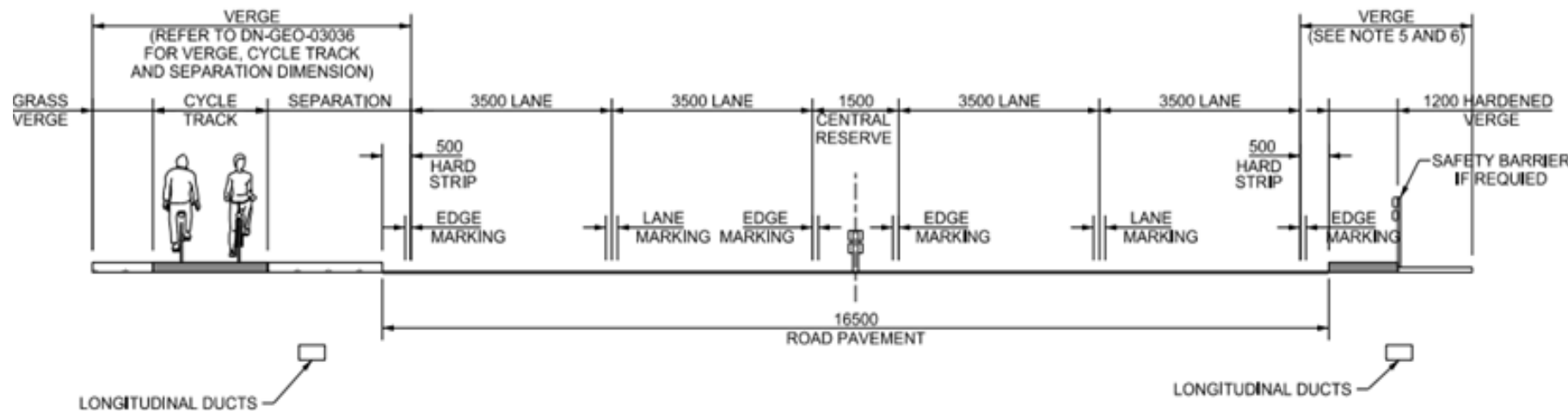
26th September 2019



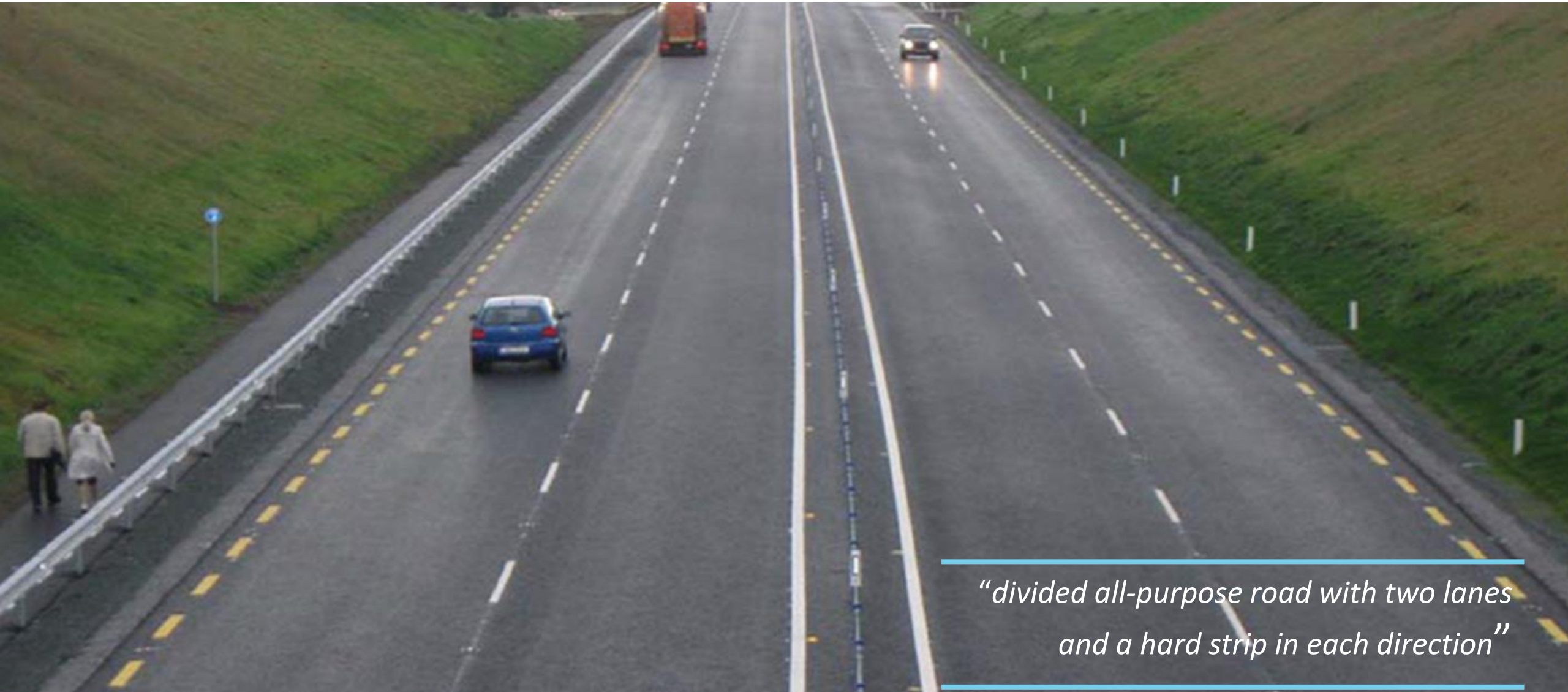


What is a 2+2 Dual Carriageway?

“divided all-purpose road with two lanes and a hard strip in each direction constructed to the geometric standards of DN-GEO-03031 Rural Road Link Design and CC-SCD-00005 Road Type and Construction – Type 2 Dual Carriageway”

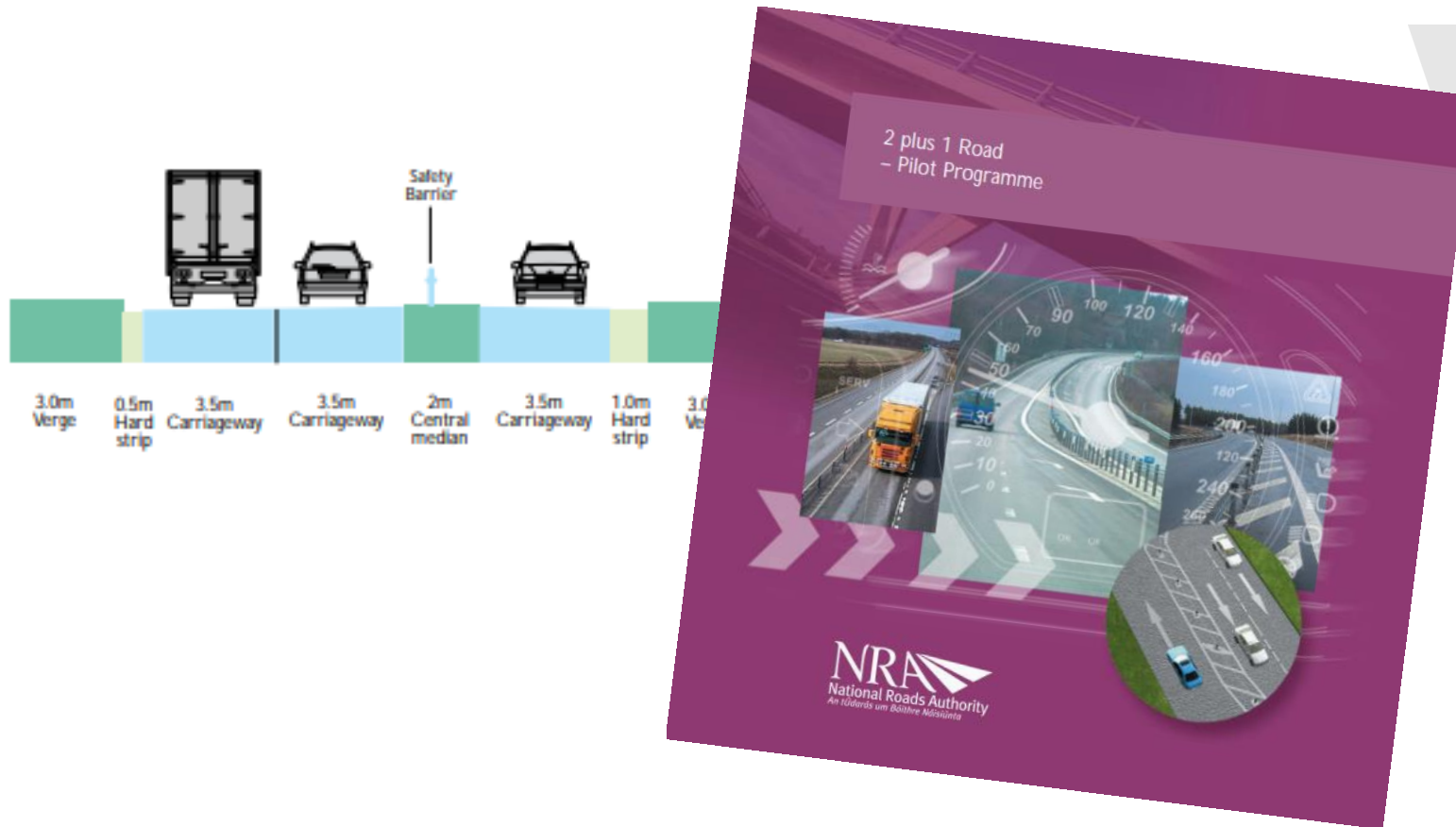


What is a 2+2 Dual Carriageway?



*“divided all-purpose road with two lanes
and a hard strip in each direction”*

Background to Development



N20 Mallow to Rathduff - Pilot scheme (2003)

Operational safety review one year after introduction:

- Lack of head-on and overtaking collisions
- Ongoing reduction in maintenance as time passed
- Positive attitude of emergency services
- Apparent acceptance by adjacent landowners of movement restrictions

Background to Development



**A positive measure
towards self regulating roads...**

2+2 Dual Carriageway (Type 2)

Key Benefits over the 2+1 dual carriageway:

- Continuous 2 lanes in each direction
- Removes the two-lane merge section, a capacity limiting factor in itself
- Right turns eliminated

Safety benefits of divided dual carriageway for mid-range capacities

Defining Characteristics

- Suitable for Design Year Traffic Flows between **11,600** AADT and approx. **20,000** AADT
- Capacity limited by characteristics such as permitted junction types
- Mandatory Speed Limit – 100kph



Defining Characteristics – Deliberate Junction Strategy



- **Left In/Left Out Junctions**
- **Roundabouts**
- **Compact Grade Separated Junctions**

Defining Characteristics – Segregated Cycle/ Ped Facilities



Segregated Cycle/ pedestrian facilities are mandatory for 2+2 Dual Carriageway schemes:

- As a cycleway remote from the road
- Combined with the maintenance strip or verge
- Using a suitable existing alternative route (Departure from Standards)

Developments in Standards – Lane Segregating VRS

N2 lane segregating VRS - crash tested with a standard 1.5t vehicle

- No recorded incidents of head on collisions and no associated fatalities

TII review found wire rope barriers undergo significant damage even under relatively minor impacts

- require immediate repair
- increased exposure of maintenance staff



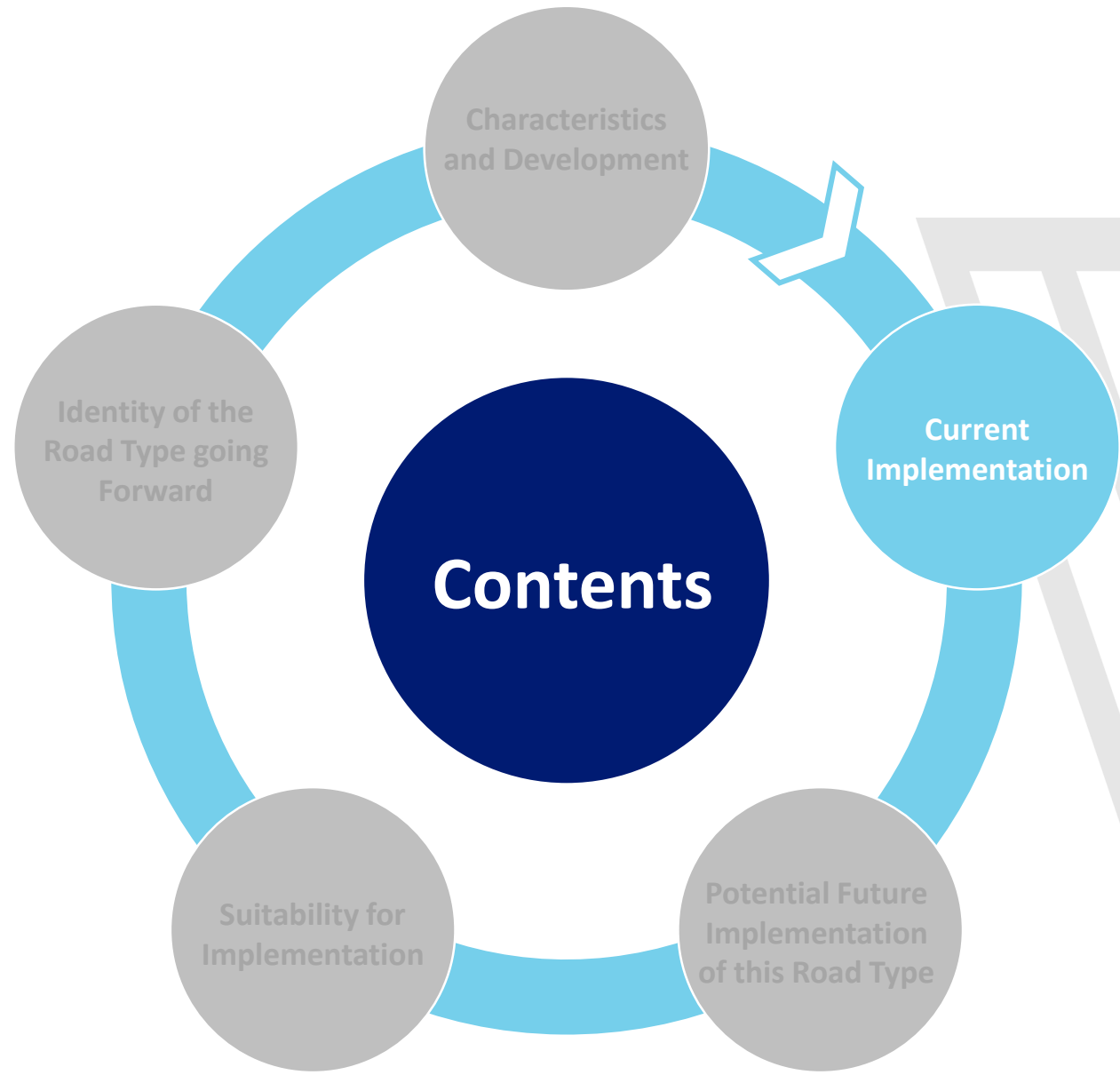
Developments in Standards – Lane Segregating VRS

Industry consultation in advance of the publication of the updated VRS design standard in 2019

- H2 barriers (crash tested with a 13t vehicle) have more recently become available

- ✓ Fit within the narrow central reserve
- ✓ Comparable cost to H1 systems
- ✓ H2 Containment in line with other central median barriers





Current Implementation of 2+2

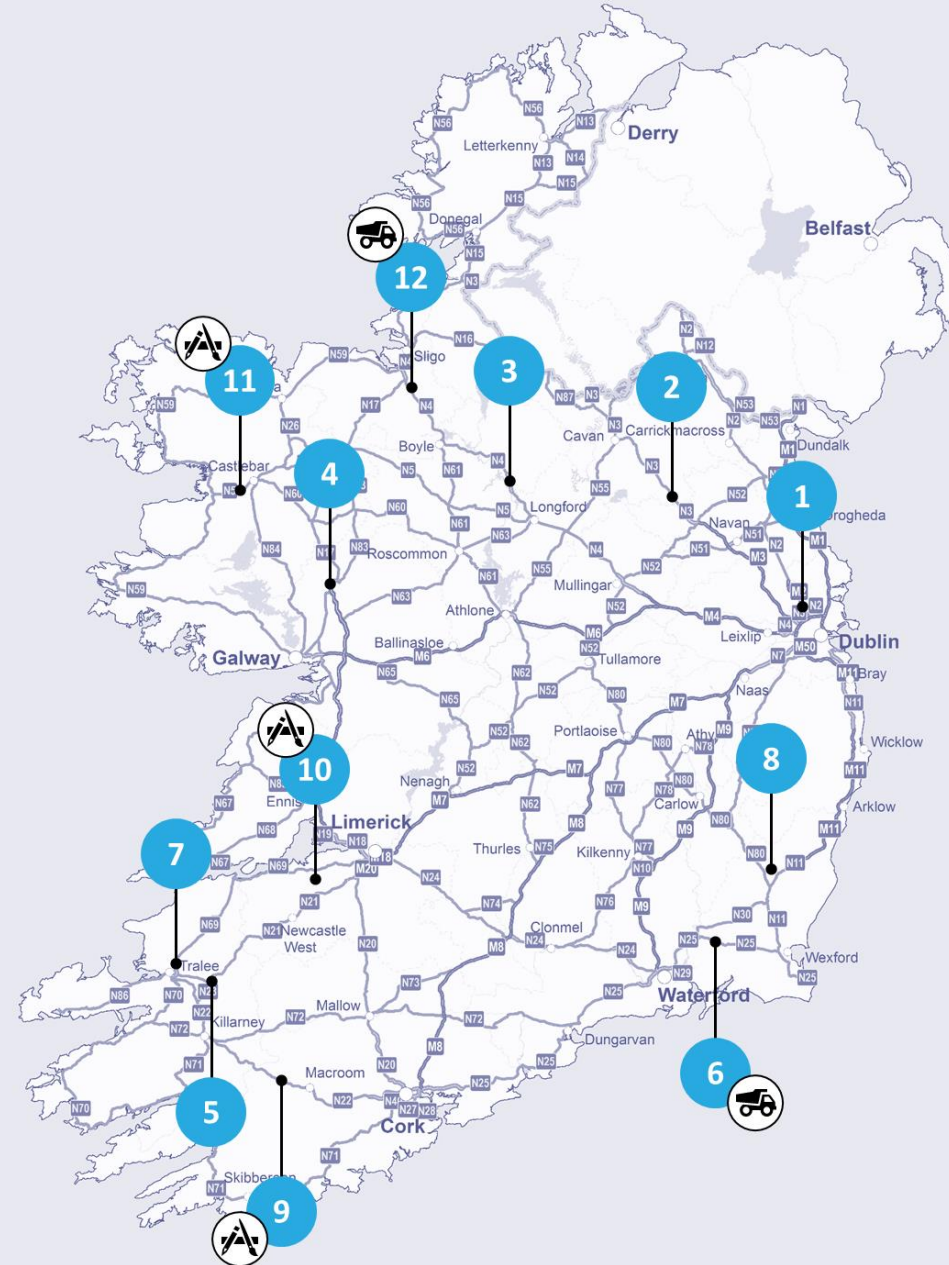
Ref.	Road Project	Length (km)
1	N2 Tyrrelstown to Cherryhound Interchange	4.5
2	N3 Kells Athboy	9.5
3	N4 Dromod Roosky	10
4	N17 Tuam Bypass	4.2
5	N21 Castleisland Bypass	3.4
6	N25 New Ross Bypass	9.5
7	N69/ N22/ N70 Tralee Bypass	8
8	N80 Link (Part of recently opened M11 Enniscorthy Bypass)	4.1
9	N22 Macroom to Ballyvourney (Design)	22
10	N21 Limerick to Foynes (Planning)	23
11	N5 Westport to Turlogh (Design)	24
12	N4 Collooney to Castlebaldwin	14
Total		136.2

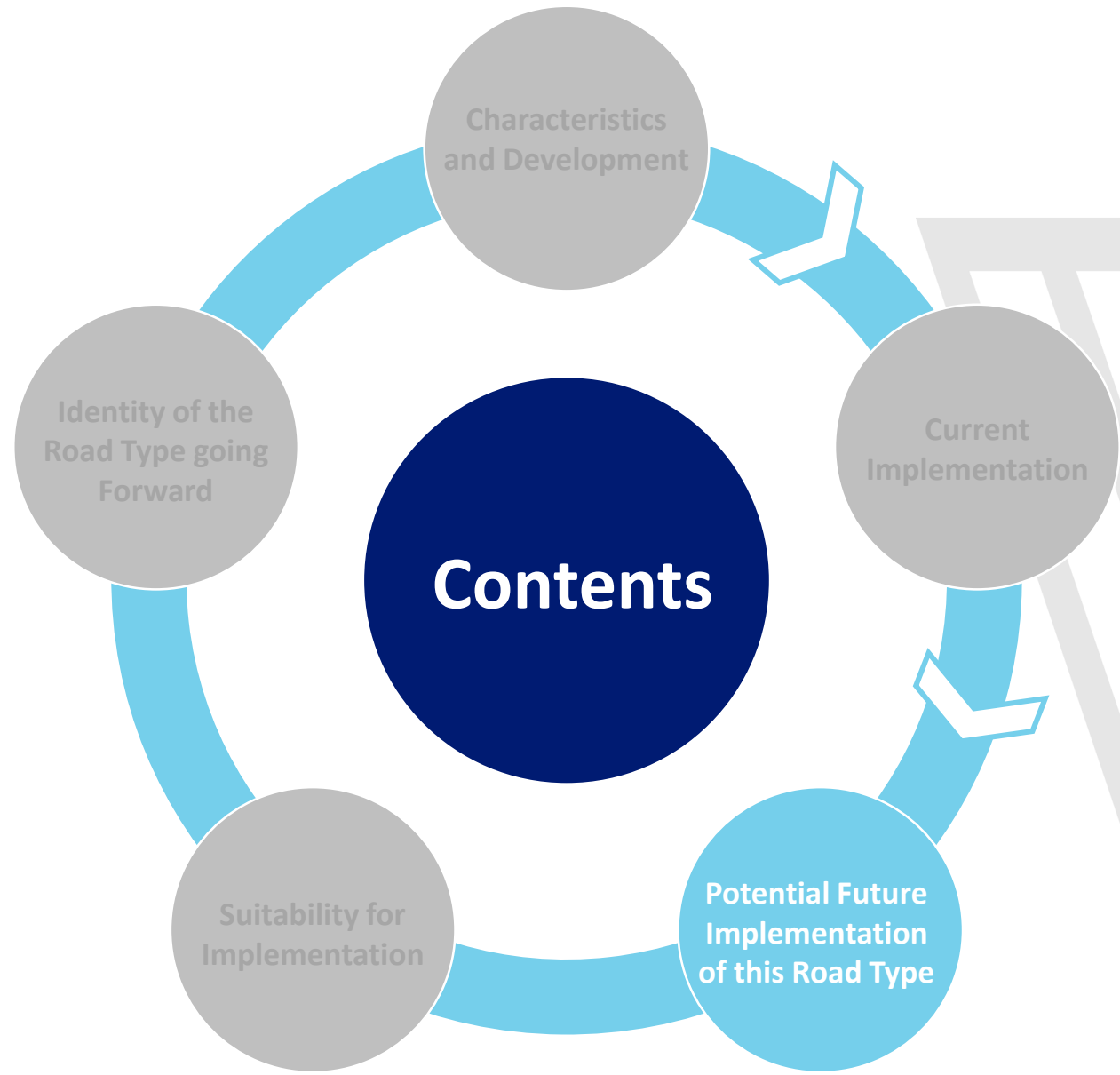


Planning / Design



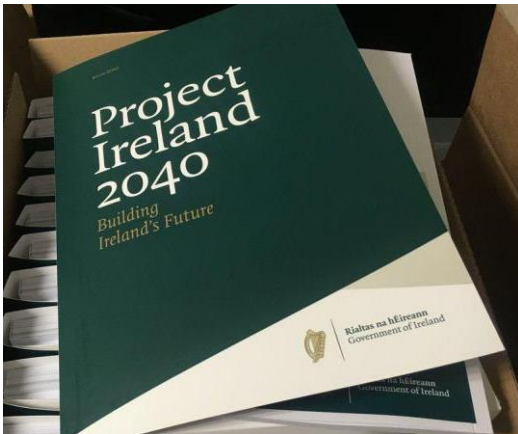
Construction





National Development Plan 2017 to 2028

The NDP details the investment priorities required for the successful implementation of the National Planning Framework (NPF).



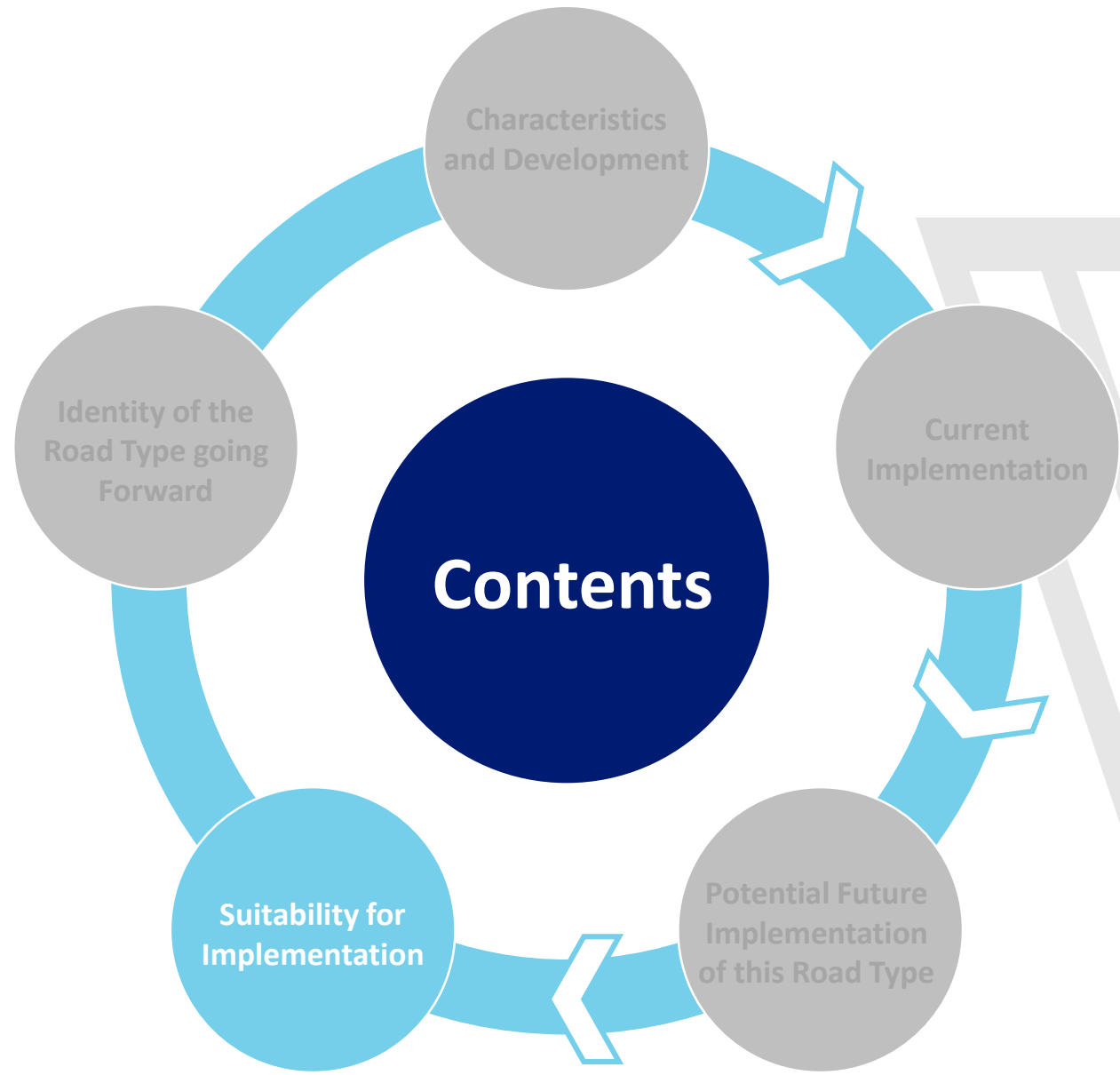
Sections of the national road network highlighted for pre-appraisal and early planning:

- N2 Clontibret to the Border
- N2 Rath Roundabout to Kilmoon Cross
- N2 Ardee to south of Castleblaney
- N3 Virginia Bypass
- N4 Mullingar to Longford
- N4 Carrick on Shannon
- N11 Oilgate to Rosslare
- N13 Ballybofey Stranorlar Bypass
- N13/N14/N56 Letterkenny Bypass and Dual Carriageway to Manorcunningham
- N14 Manorcunningham to Lifford
- N17 Knock to Collooney
- N21 Newcastle West Bypass
- N21 Abbeyfeale
- N24 Cahir to Limerick Junction
- N24 Waterford to Cahir
- N25 Waterford to Glenmore
- N25 Carrigtohill to Middleton
- N52 Tullamore to Kilbeggan
- N3 Clonee to M50

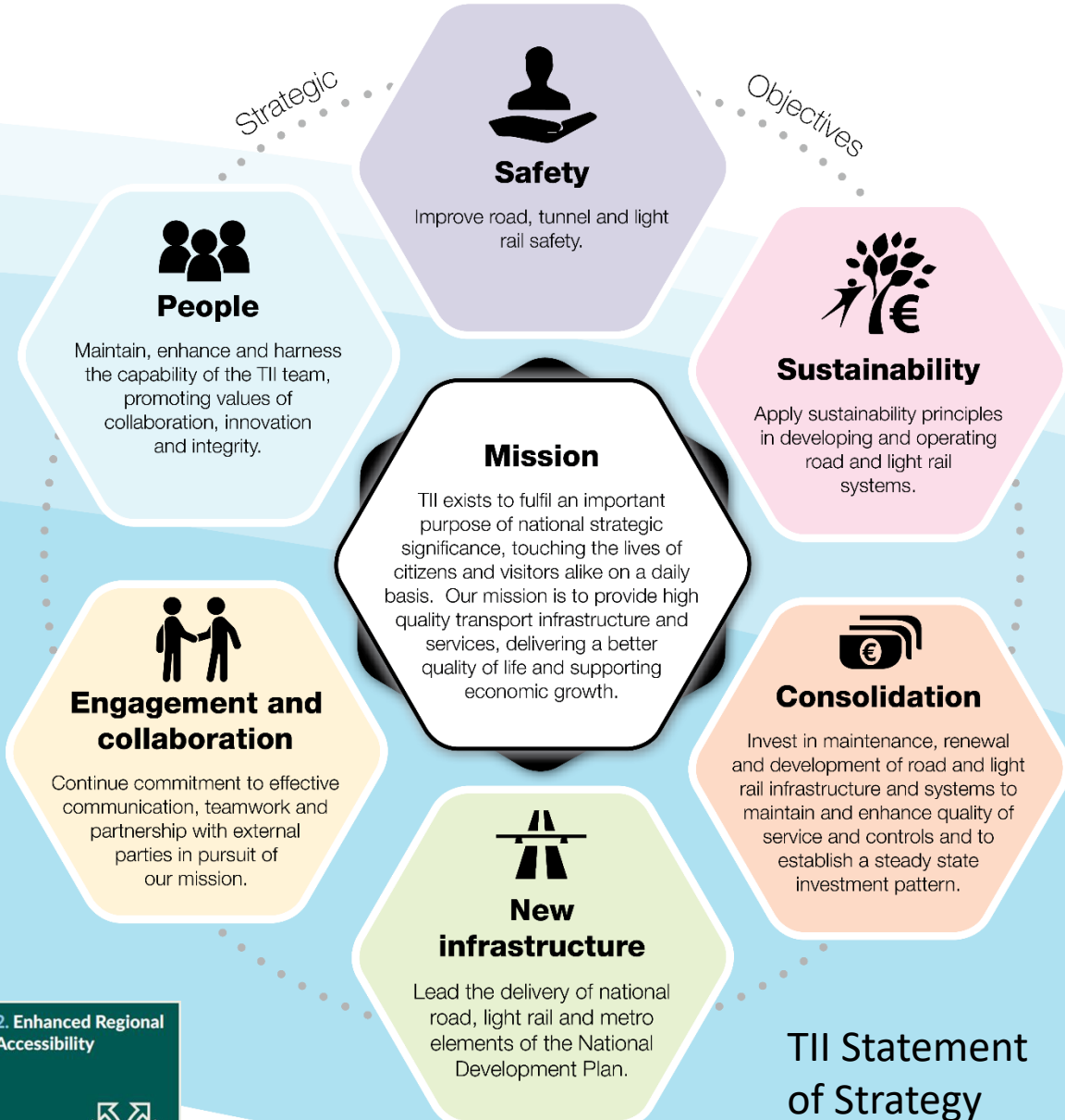
Early Planning Phase Potential Schemes – Traffic Only

Proposed Scheme	AADT (2018)
N2 Clontibret to the Border	10,356
N2 Rath Roundabout to Kilmoon Cross	15,980
N2 Ardee to south of Castleblaney	10,513
N3 Virginia Bypass	12,274
N4 Mullingar to Longford	13,292
N4 Carrick on Shannon	7,454
N11 Oilgate to Rosslare	13,942
N13 Ballybofey Stranorlar Bypass	7,223
N13/N14/N56 Letterkenny Bypass and Dual Carriageway to Manorcunningham	11,242
N14 Manorcunningham to Lifford	21,053
N17 Knock to Collooney	12,119
N21 Newcastle West Bypass	6,947
N21 Abbeyfeale	10,772
N24 Cahir to Limerick Junction	10,772
N24 Waterford to Cahir	6,563
N25 Waterford to Glenmore	13,989
N25 Carrigtohill to Middleton	12,403
N52 Tullamore to Kilbeggan	38,362
N3 Clonee to M50	13,927
	52,053

- 8 Schemes fall into the Type 2 Dual Carriageway AADT Range
- Divided roads preferable for high speed roads
- Upper limit is approximate
- Potential Future Implementation



Suitability Assessment of 2+2 Dual Carriageway



2. Enhanced Regional Accessibility

TII Statement of Strategy

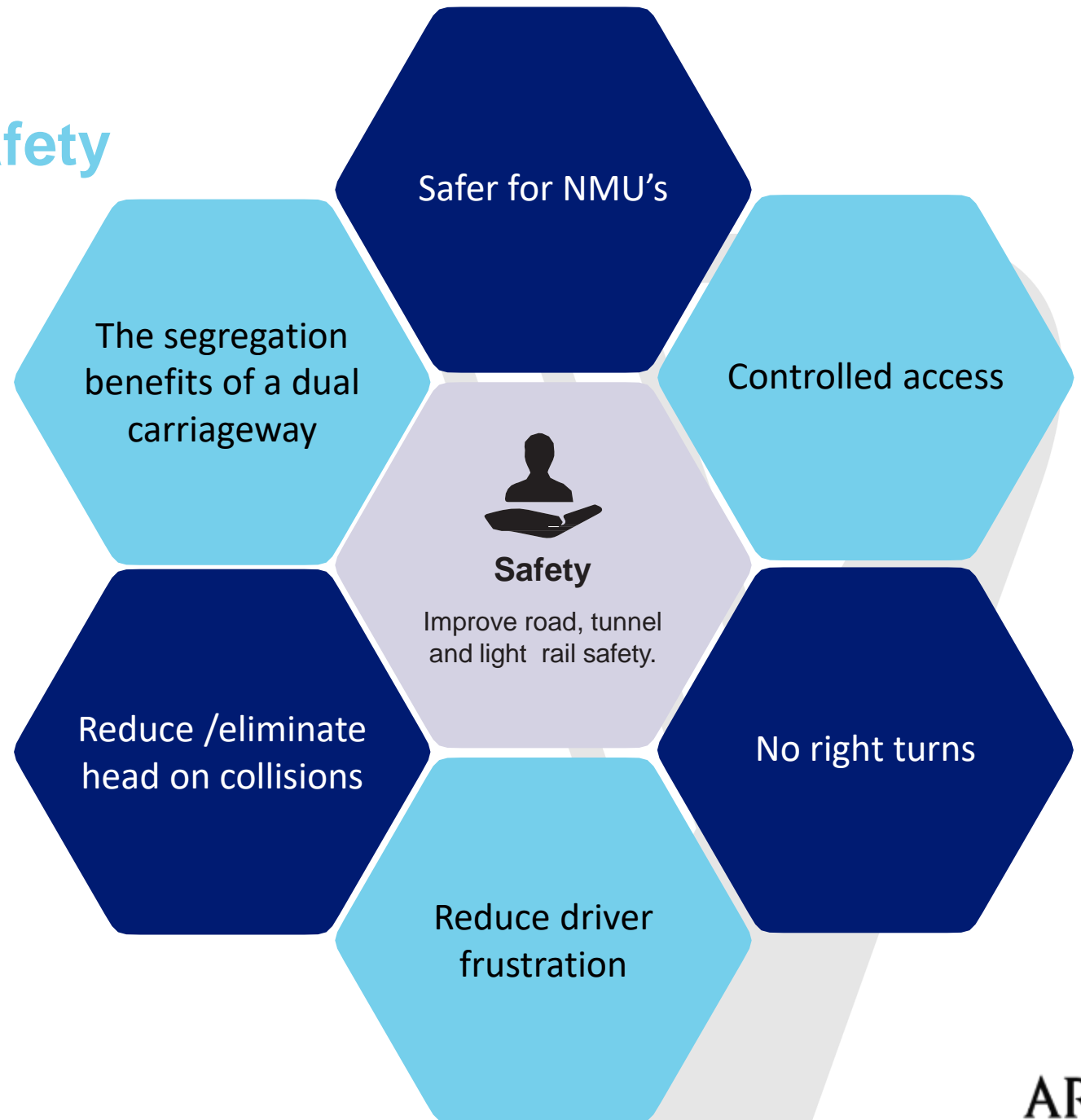
Suitability Assessment - Safety

**Type 2 Dual Carriageways
exhibit the following benefits
over single carriageways:**



Suitability Assessment - Safety

Type 2 Dual Carriageways exhibit the following benefits over single carriageways:



Suitability Assessment - Safety

Head on collisions have a direct impact on the number of high severity collisions

29.9%

of all fatal collisions

January 2014 to
December 2016



0

Fatalities since
introduction of 2+2
Dual Carriageways
in Ireland on this
road type

Safer for NMU's

The segregation
between dual

Controlled access



Safety

improve road, tunnel
and light rail safety.

No right turns

Reduce driver
frustration

Suitability Assessment - Economy

2+2 Dual Carriageway

16.5m

Paving width

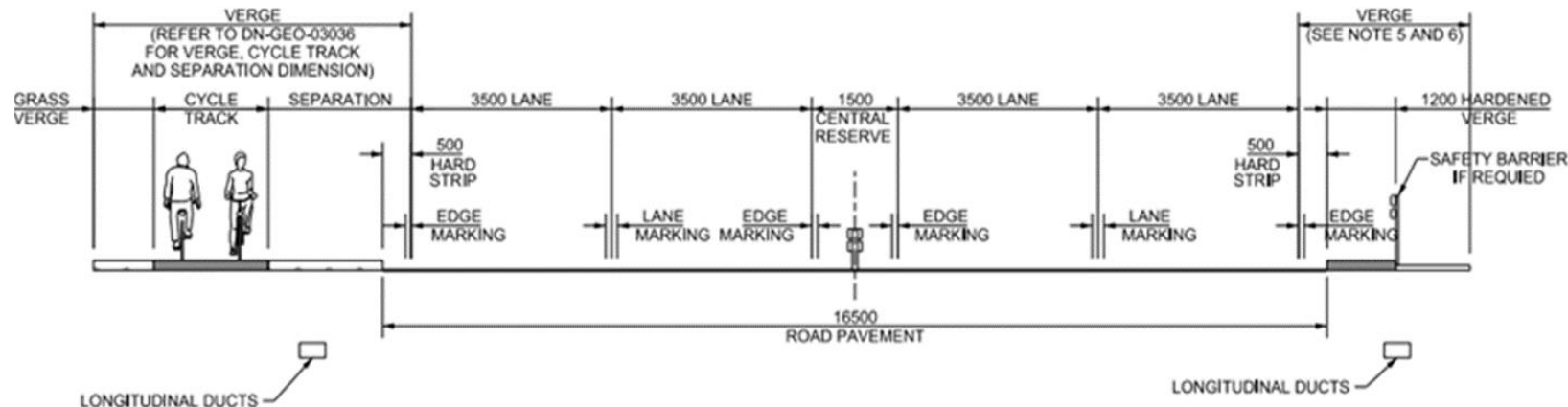
5m

Narrower than
standard
Motorway

4.2m

Wider than a
Type 1 Single
Carriageway

- Permitted junction types
- Greater flexibility in geometric design when compared to both motorway and single carriageway
- Clear zone reduced due to the lower design speed



Suitability Assessment - Economy

Inherent wider economic benefits of dual carriageways:

- improve efficiency, journey time and journey time reliability
- improves market connectivity and promotes employment and economic growth

Essential to fulfil the NDP programme of investment and achieving “Enhanced Regional Accessibility”



New infrastructure

Lead the cost efficient and effective delivery of national road, light rail and metro elements of the National Development Plan.



Suitability Assessment – Sustainability

FOSD not required on dual carriageways

**Single carriageways - 30% (online improvements)
50% (new builds)**

- substantial earthworks and verge widening

Geometric design requirements less onerous:

- 2+2 - desirable max 4% gradient (5% relaxation)
- Motorway - desirable max 3% gradient (4% relaxation)

Permitted junction types

- **Reduced Environmental Impact**



Suitability Assessment – Vulnerable Road Users

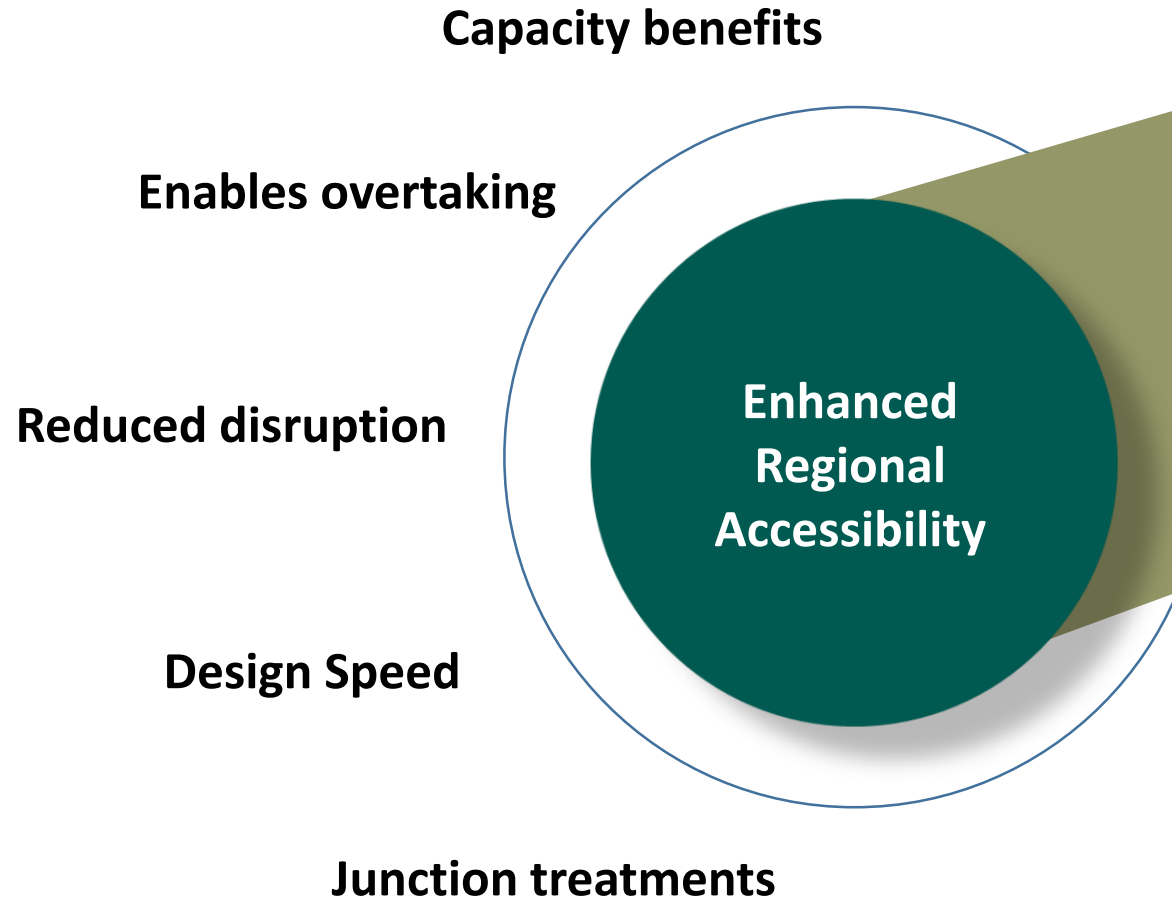
Cycle/ pedestrian facilities mandatory for all 2+2 Dual Carriageway schemes

The TII PAG Unit 13.0 - Pedestrian and Cyclist Facilities:

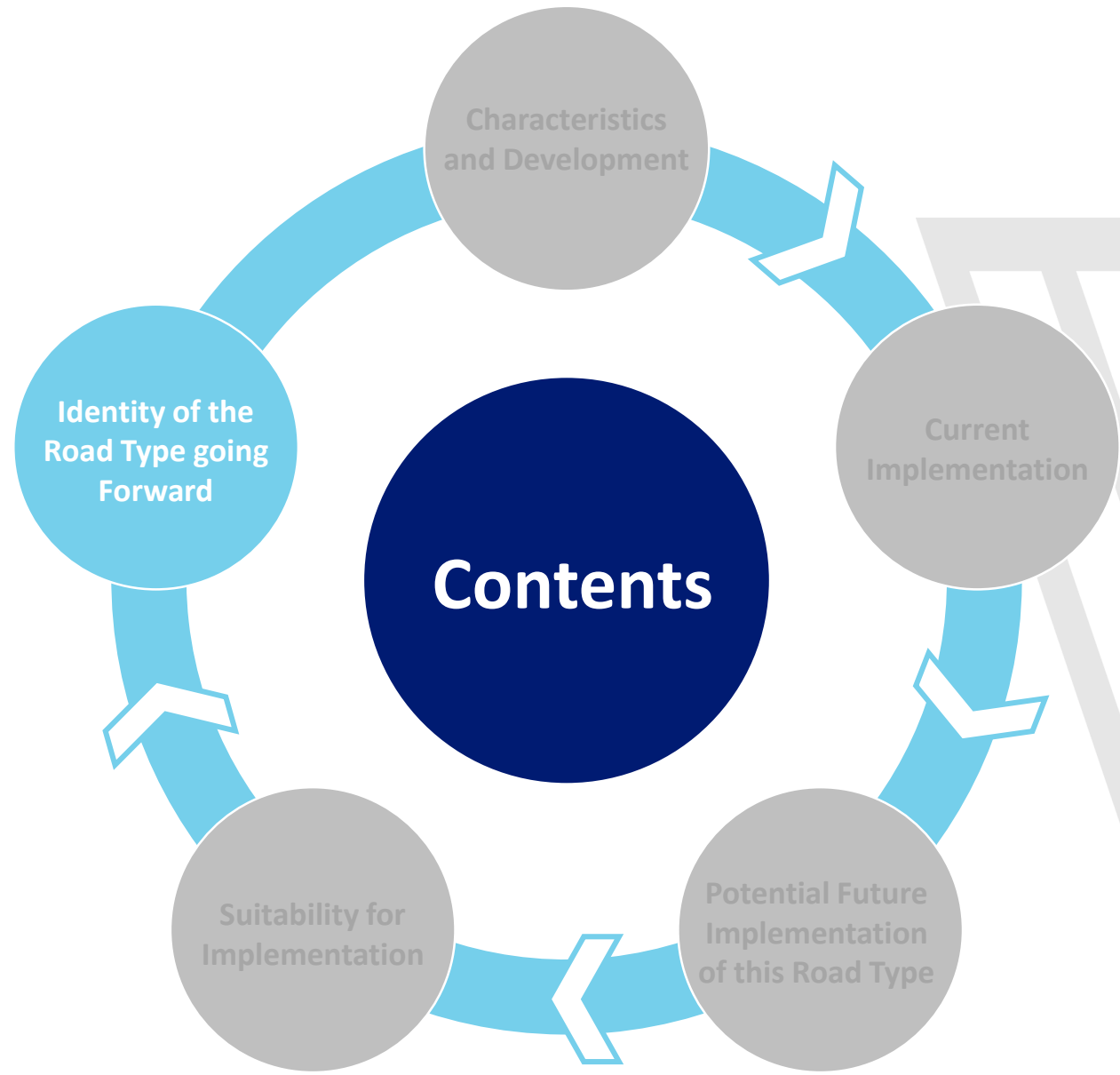
- method for assessing benefits of improving pedestrian/ cyclist facilities as part of road scheme appraisal
- Segregated facilities promote sustainable travel modes
- Amenity value not specifically provided for on Type 1 Single Carriageway nor permitted on Motorways
- Aligns with the principle of the imminent update to the EU RISM Directive



Suitability Assessment - Reliability




**Project
Ireland 2040**
*Building Ireland's
Future*



Identity of the 2+2

How do TII ensure planning authorities are fully aware of this road type and associated benefits?

How can the general public be made aware of the defining characteristics of this road type?

Implement an appropriate branding and awareness campaign:

- Brand Name or Term related to this road type?
- Specific Road Signage?
- Specific Road Marking Arrangement?



LUAS



Identity of the 2+2 – Branding







Identity of the 2+2 – Why Expressway?

The term Expressway or similar is used in other countries to describe “limited access roads”

High-speed roads that have many or most characteristics of a motorway

- limited or no access to adjacent property
- some degree of separation of opposing traffic flow
- use of grade separated interchanges to some extent
- prohibition of some modes of transport such as bicycles or horses
- very few or no intersecting cross-streets

Country	Road Name	Cross Section	Speed	Access Control	Junction Type	Segregation	Further Comments	Signage
Austria	Schnellstraße		100-130 kph			Often Undivided	Small Curve Radii Fewer Bridges and Tunnels Follow Given Topography	
Belgium	Autoweg	2 or More Lanes	If 2+2 with Segregation Speed is 120kph			Separated by Roadside or Space not Accessible to Vehicles	Traffic Lights Allowed	
Croatia	Brza Cesta “Fast Road”	Without Emergency Lane 2+2 Dual Carriageway	110kph	Limited Access	Usually Grade Separated		Expressways not Tolled Distinguish from Motorways through No Emergency Lane	
Czech Republic	Rychlostní Silnice	Dual Carriageway with Smaller Emergency Lane	110kph					

Identity of the 2+2 - Signage

Should the road type have dedicated sign?

- 15 European countries exhibit similar signage for start and end of Expressways or “Limited Access Roads”



Belgium



Germany



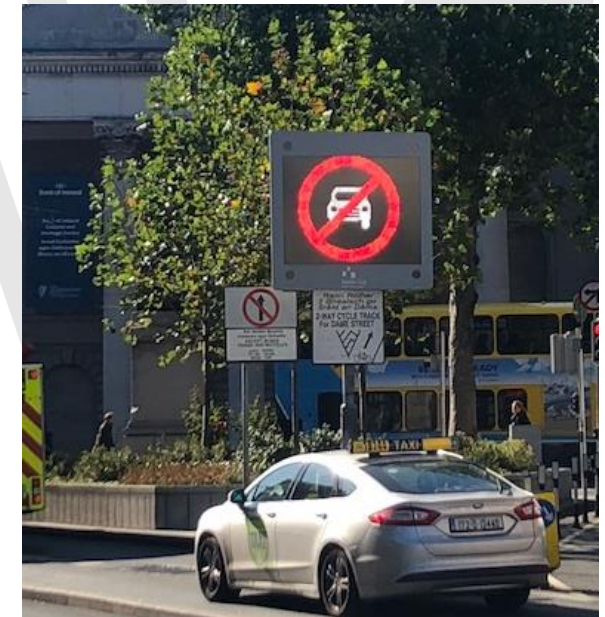
Netherlands



Czech Republic



If Expressway is a term to be used in Ireland, can a similar symbol be applied?



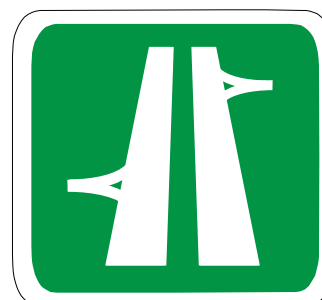
Identity of the 2+2 - Signage

Should the road type have dedicated sign?



Identity of the 2+2 - Signage

Should the road type have dedicated sign?



Identity of the 2+2 - Signage

Should the road type have dedicated sign?



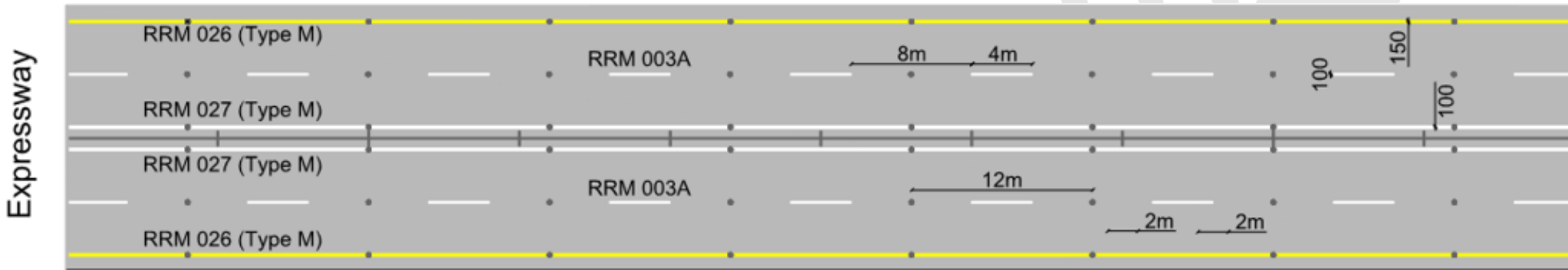
Identity of the 2+2 - Road Markings

Should specific road markings be specified for this road type?

Should a continuous yellow (RRM 026) on the edge of carriageway of 2+2's be introduced?

- Line type currently reserved for use on Motorways

Further identify the road type as a high-quality road similar to a motorway?





Identity of the 2+2 – Items Requiring further Consideration

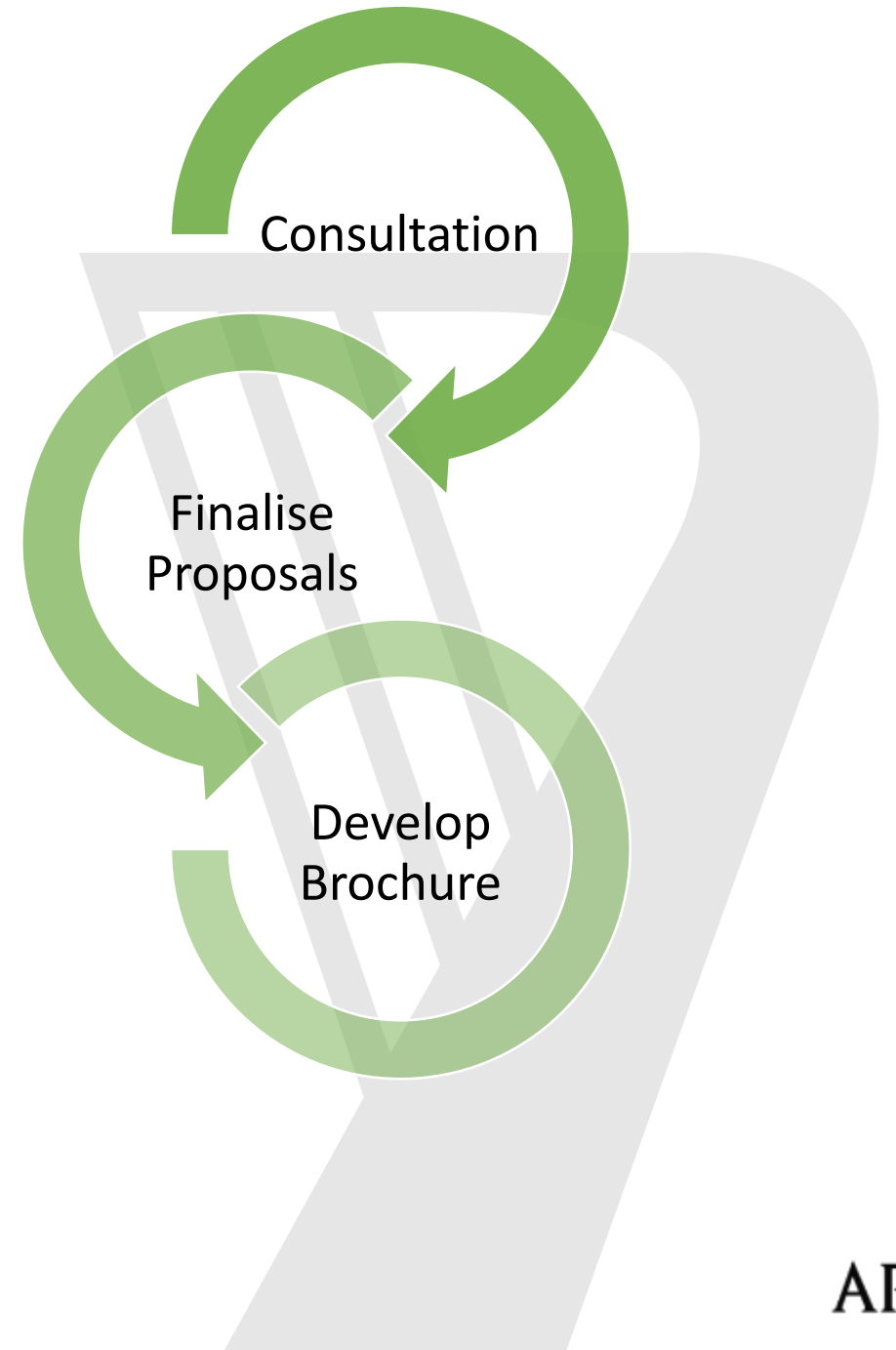
- Term used in TII Publications (Standards) i.e. a branding only?
- Roads Act and requirement for amendments to regulations?
- Planning implications – Protected Road?
- Traffic Signs Manual
- TEN-T Express Roads

Identity of 2+2 - Way Forward



Public Awareness Campaign

- In conjunction with the Road Safety Authority





Option 1



Option 2



Option 3

Thank you

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26th September 2019