

NATIONAL ROADS AND GREENWAYS CONFERENCE 2024

Session 5: Protection & Renewal

Chair: Stephen Smyth, Senior Manager, Pavement Asset Management Programmes, TII



Programme: Session 5

Session 5: Protection & Renewal		
Chair: Stephen Smyth, Senior Manager, Pavement Asset Management Programmes, TII		
9.00am	Sustainable Pavement Design and Construction: A case study	<i>Dimitris Michailidis, CEng, Kilsaran</i>
9.15am	Update on the new Road Safety Audit standard	<i>Martin Deegan, CEng, TRAFFICO</i>
9.30am	An introduction to Ireland's Supply Chain Sustainability School	<i>Pamela Sheridan, Operations Manager, Supply Chain Sustainability School</i>
9.45am	Speed Limit Review (2023) and implementation	<i>John McCarthy, Senior Advisor, Roads, Department of Transport</i>
10.00am	Strategic Asset Management Plan (SAMP) for National Roads.	<i>Dr Kieran Feighan, PMS Ltd and Gerard O'Dea, TII</i>
10.15am	Collaboration between ESB and Road Authorities	<i>Cormac Collins, Delivery Manager, ESB Networks</i>
10.30am	Q&A	
10.40am	Tea & Coffee	
11.10am	End of Session 5	



Sustainable Pavement Design and Construction: A case study

Dimitris Michailidis, CEng, Kilsaran





Bonneagar Iompair Éireann
Transport Infrastructure Ireland



An Roinn Iompair
Department of Transport



comhairle chontae na mí
meath county council



Kilsaran
ROAD SURFACING
& CONTRACTING

TOWARDS ZERO CARBON

Sustainable Pavement Design and Construction – A Case Study

Towards Net Zero Sustainable Pavement Design



Targets

- ✓ The transport sector has been identified as one of the most Greenhouse Gas (GHG) emissions producing sectors and the **European asphalt industry has the potential to become a key tool in the decarbonisation process of Europe** and is already active in various fields to target a climate-neutral future.
- ✓ With the ambitious goal of achieving net zero GHG emissions by 2050, one objective is to identify the technologies and practices that can be readily adopted or expanded to reduce GHG emissions associated with asphalt pavements.



European Asphalt Pavement Association

- The asphalt paving industry accounts for **14 Mt of CO₂eq per year**, around 0,35% of total emissions in the EU.

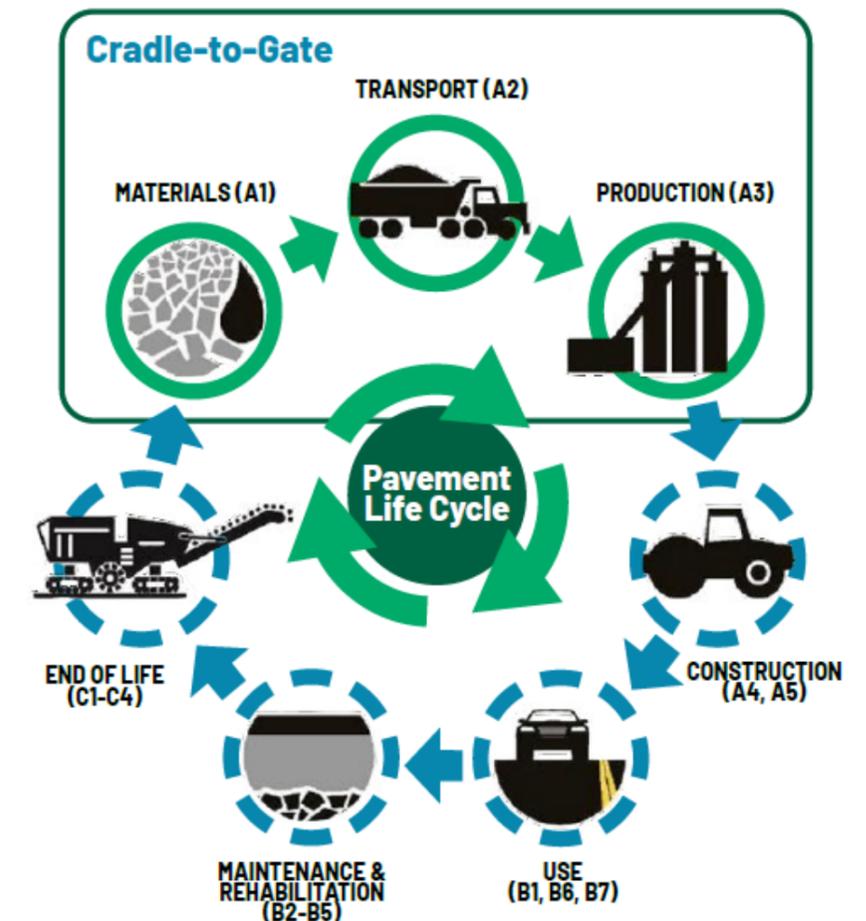


Towards Net Zero Sustainable Pavement Design



➤ With the ratification of the Paris climate agreement to avoid the uncompensated effects of climate change, 197 countries will have to dramatically reduce their greenhouse gas emissions in half by 2030. For this reason, the reduction of the environmental impacts of road construction is becoming an urgent necessity.

- ✓ GHG emissions occur during each stage of the pavement life cycle: production (A1-A3), construction (A4-A5), maintenance (B2-B5), use (B1, B6), and end of life (C2-C4).
- ✓ The production stage (cradle-to-gate) tends to have the most significant contribution to a pavement's embodied carbon emissions.

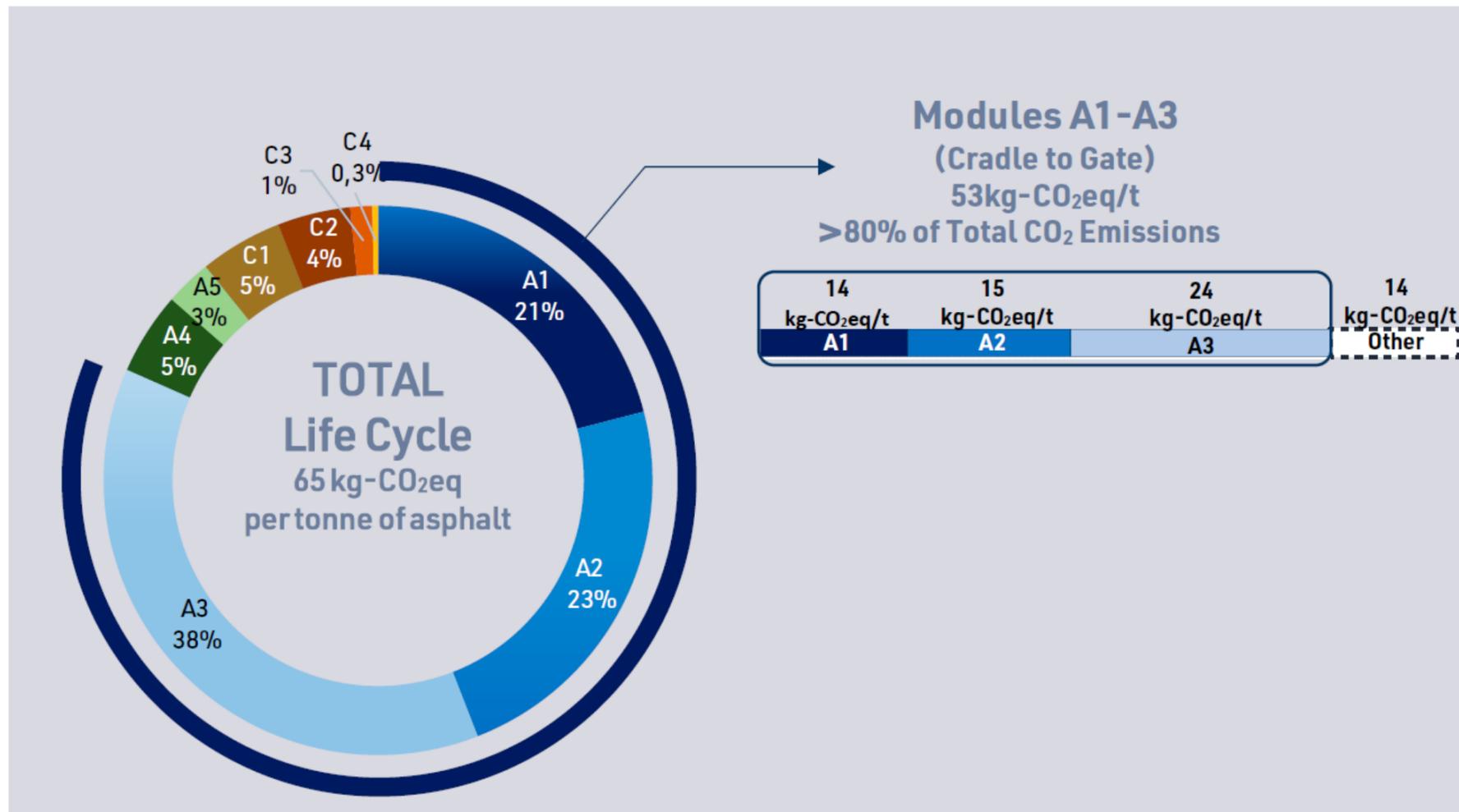


Towards Net Zero Sustainable Pavement Design

Targets

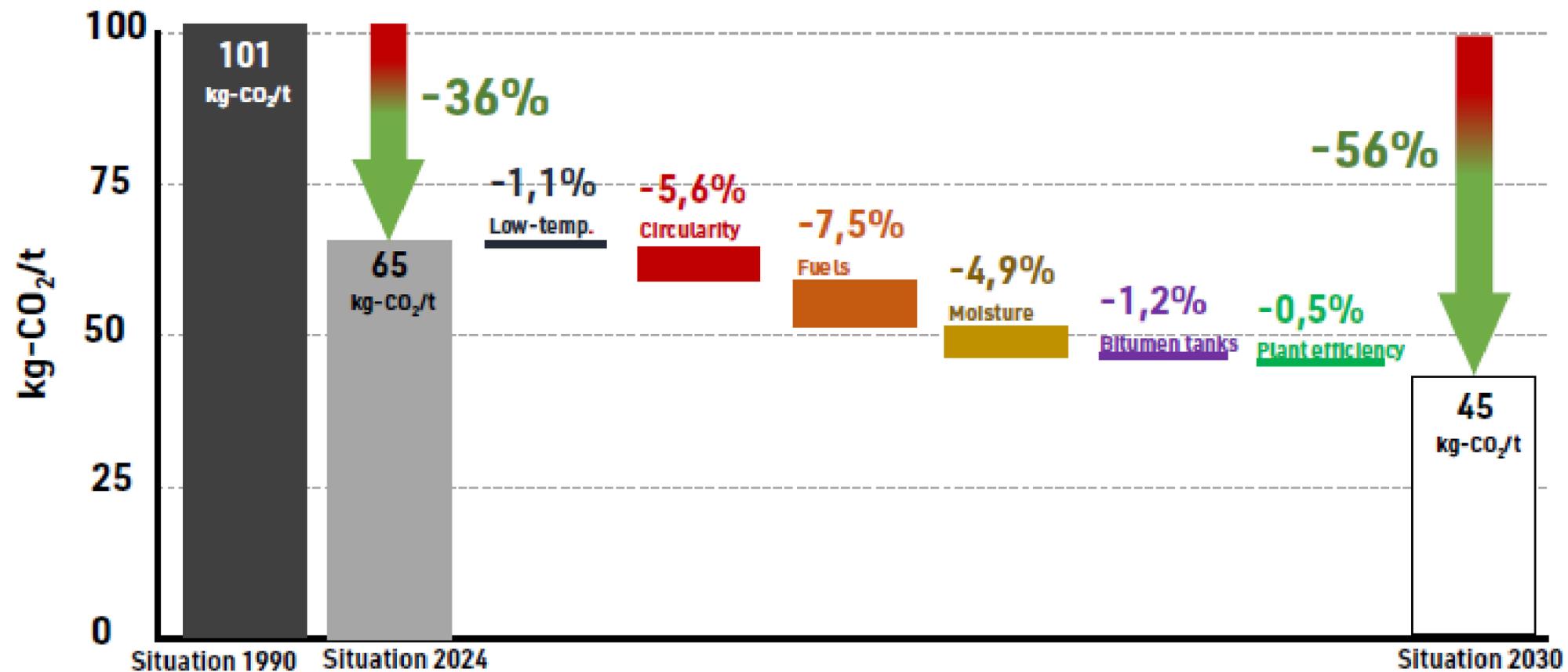


Calculations showed that the production of 1 ton of a reference asphalt results in the emission of 65 kg of CO₂eq during its whole life cycle, 53 kg of CO₂eq if emissions are already emitted before the product leaves the production plant (cradle-to-gate).



A holistic strategy by the European Asphalt Pavement
Association

Achieving the decarbonization objectives requires the implementation of a holistic strategy, with the main 2 milestones in 2030 and 2050.



Towards Net Zero



Impact reduction potential of different technologies in Ireland

Situation 2019

Efficient bitumen tanks

Situation 2022 - 2023

Low-temperature manufacturing

Moisture in aggregates

Circularity

Energy Efficient asphalt plants

IAPDM

Situation 2024 - 2030

Low-Carbon binders

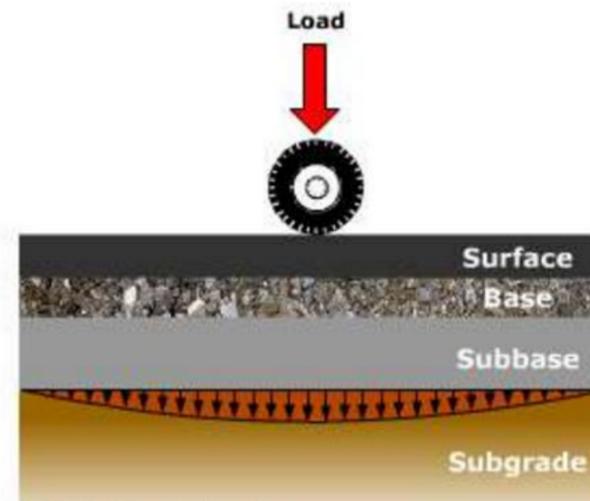
Site efficiency

Decarbonised fuels at the plant

Decarbonised transport of materials

Situation 2050

Other





Impact reduction potential of different technologies

Situation 2019

Efficient bitumen tanks

➤ Electrification of Bitumen Tanks

Environmentally Friendly: Electric heating is generally considered an environmentally friendly option compared to other heating methods. By eliminating fuel usage, it reduces emissions and minimizes environmental impact.

-1,2%
Emissions
by 2030



-1,4%
Emissions
by 2050

✓ By 2030 only electric and gas heating will be used (no diesel), while for 2050, it is considered that only electric heating will be used.





Impact reduction potential of different technologies

Situation 2022 - 2023

Low-temperature manufacturing



Road Pavements – Bituminous Materials

CC-SPW-00900
October 2023



-1,1% Emissions by 2030 → -2,2% Emissions by 2050

- Introduction of WMA in Series 900 – October 2023.
- WMA are produced at lower temperatures, typically 20-40°C lower, compared to equivalent Hot Mix Asphalts (HMA) but always above 100°C. WMA can either be produced using chemical additives or organic additives.

Pollutant	Emission factor (kg CO ₂ equivalent)	Hot mix emission rates (kg CO ₂ equiv. / hr)	Warm mix emission rates (kg CO ₂ equiv. / hr)
Carbon monoxide	1.57	5.2	12.0
Oxides of nitrogen	1	2.9	2.8
Sulphur dioxide	0.44	0.04	0.1
Volatile organic compounds	1	0.2	0.2
Total Organic Carbon	1	2.2	3.0
Carbon dioxide	1.0	2,574.2	2,321.7
Totals (kg CO₂ equiv. / hr)	--	2,584.7	2,339.8
Net improvement (%)	--	9.48	





Impact reduction potential of different technologies

Situation 2022 - 2023

-4,9%
Emissions
by 2030



-4,9%
Emissions
by 2050

Moisture in aggregates



TII Publications

GE PE DN CC OP AM RE

Notes for Guidance on CC-SPW-00900 - Road Pavements - Bituminous Materials

CC-GSW-00900
December 2023

CC Construction & Commissioning

Standards

- Protecting aggregate and RA stockpiles from rain can help to reduce moisture content and, consequently, the energy needed to dry such materials.
- Scientific literature shows that every 1% reduction in moisture content leads to a reduction in drying energy consumption of around 8 kWh.





Impact reduction potential of different technologies

Situation 2022 - 2023

-5,6%
Emissions
by 2030



-12,3%
Emissions
by 2050

Circularity



TII Publications



Road Pavements – Bituminous
Materials

CC-SPW-00900
October 2023



Significant increase in allowable RA percentage introduced in Series 900 – October 2023.

Reusing asphalt involves incorporating reclaimed asphalt from existing pavements into new mixtures, thus reducing the demand for virgin materials. This practice conserves natural resources, decreases emissions from transportation of raw materials, and cuts down emissions related to waste disposal.

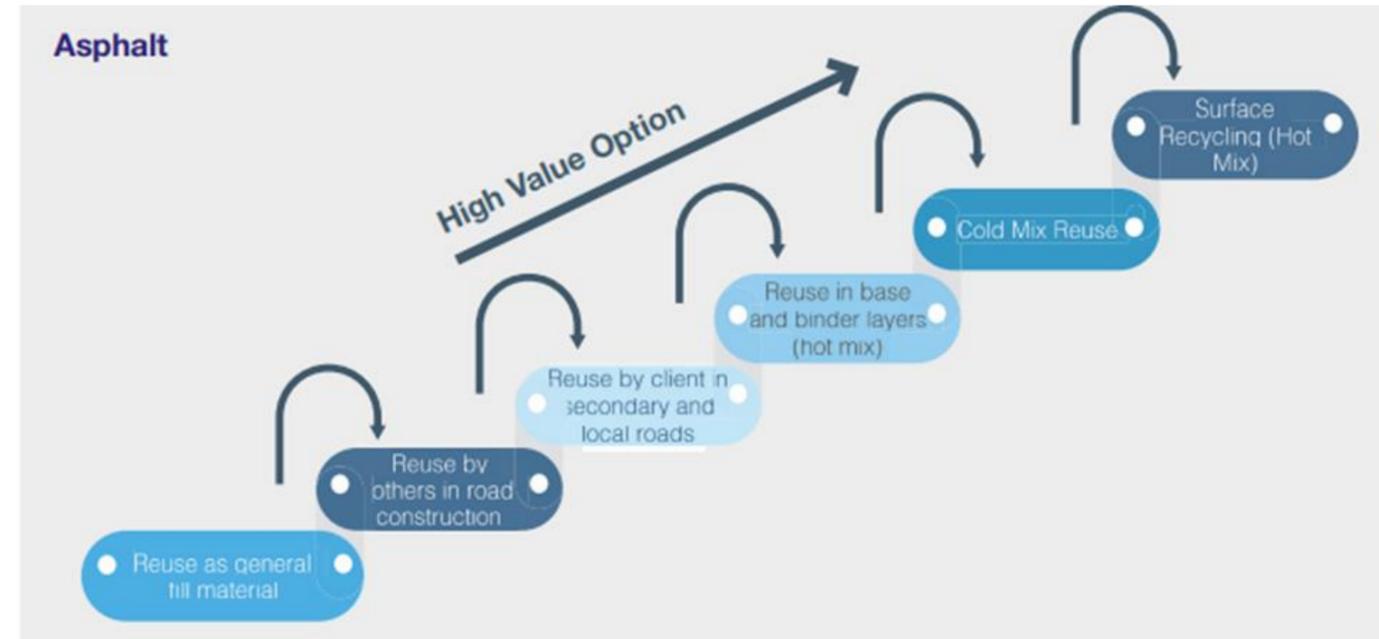
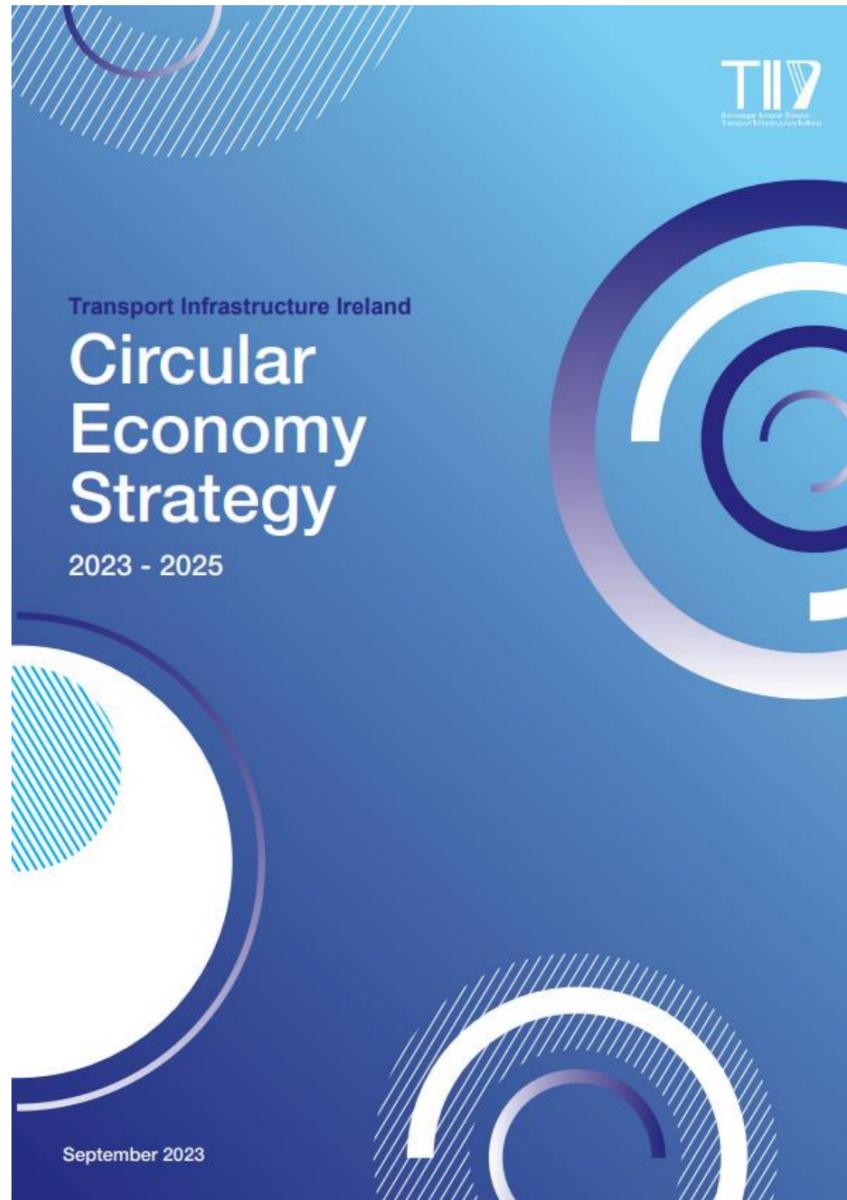




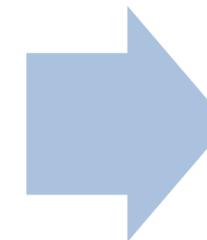
Impact reduction potential of different technologies

Situation 2022 - 2023

Circularity



Life Cycle assessment (LCA) is a method to quantify & improve environmental impacts of products, processes or systems.



The use of LCA can promote environmental sustainability of products.

- The contribution of the addition of RAP in the bituminous mixtures towards the reduction of emissions is significant.
- The most significant environmental impact is observed during material production.



Impact reduction potential of different technologies

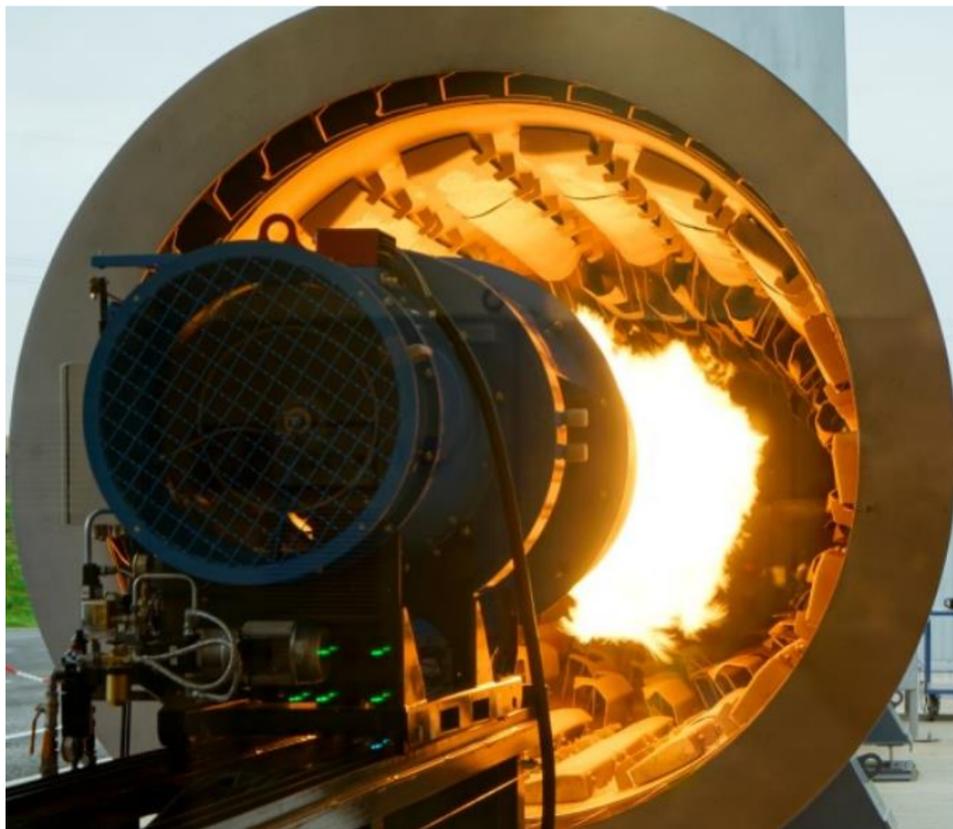
Situation 2022 - 2023

-0,5%
Emissions
by 2030



-1,1%
Emissions
by 2050

Energy Efficient asphalt plants



- ✓ Carbon emissions from asphalt plants can be reduced by implementing energy-efficient technologies, such as advanced burner systems, heat recovery, emission control technologies, automated control systems and mix storage systems to minimize inefficient plant starts and stops.



Innovative burners which use fuels made from renewable raw materials and have a neutral CO₂ balance. They include biomass to liquid fuels (BtL) and wood dust.





Impact reduction potential of different technologies

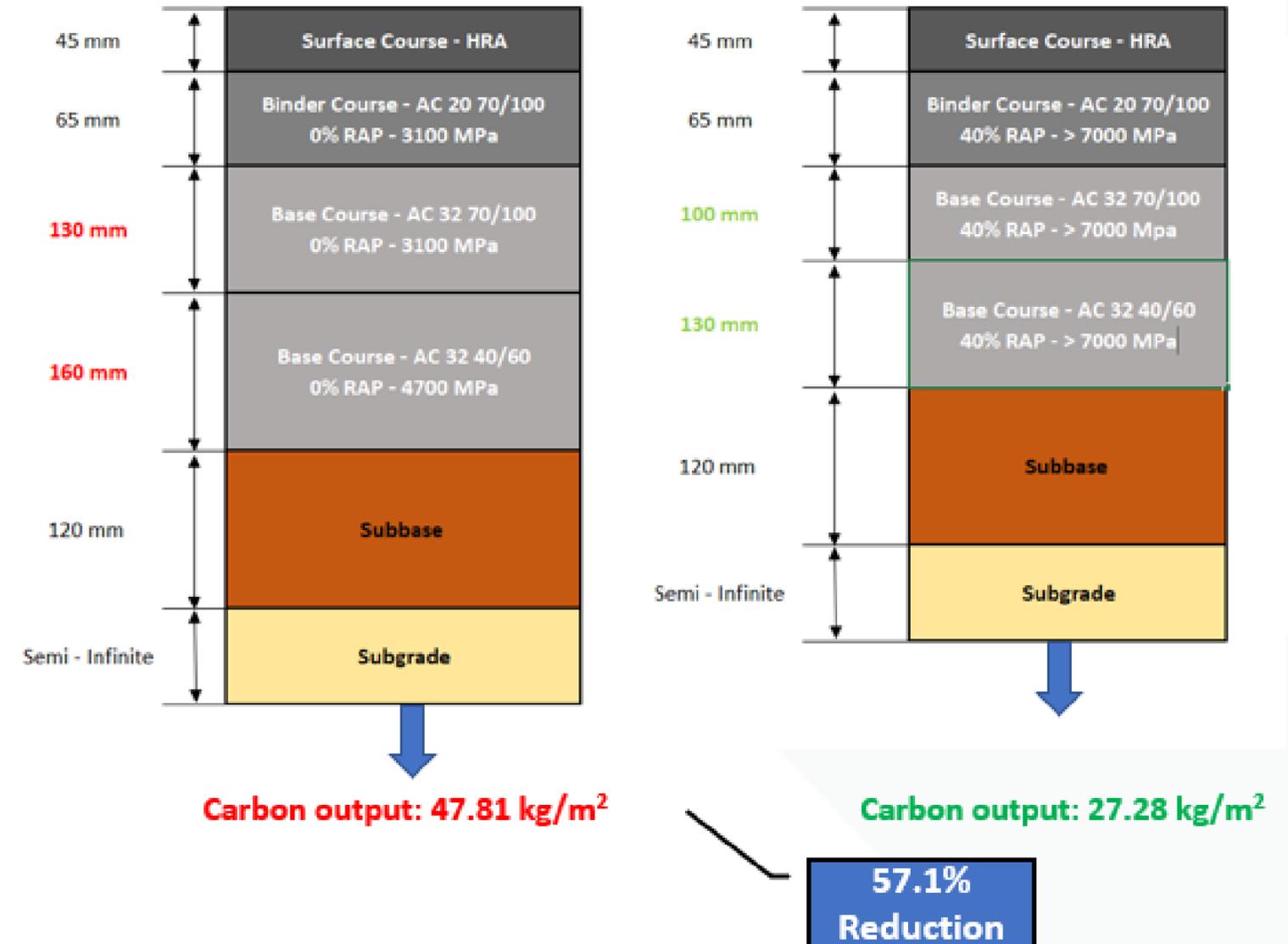
Situation 2022 - 2023

IAPDM

Although empirical procedures have performed reasonably, they are limited in their ability to benefit from the vast number of emerging new products, construction practices, and design innovations that optimize performance of the pavement system and minimize traffic interruptions and costly maintenance and rehabilitation activities.

The introduction of the Irish analytical pavement design has the potential to predict performance for different pavement design alternatives.

Development of a Sustainable Pavement Design





Impact reduction potential of different technologies

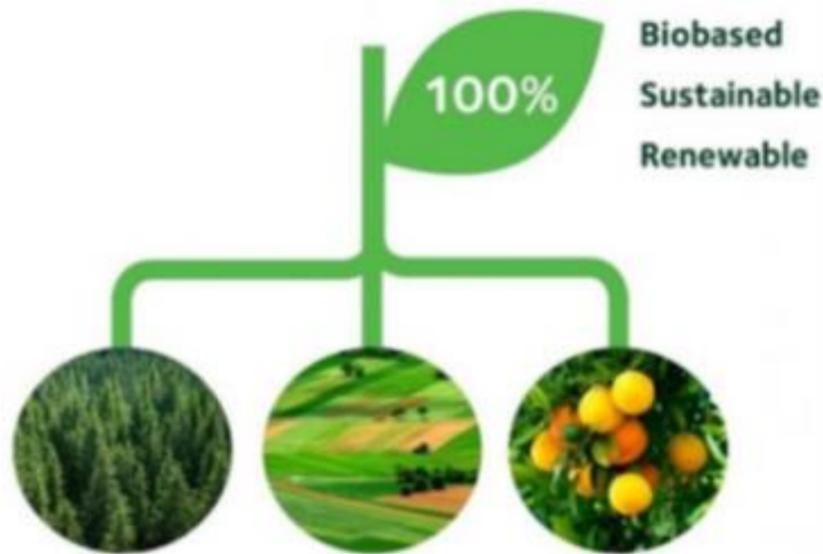
Situation 2024 - 2030

Low-Carbon binders

-N/A
Emissions
by 2030



-5,2%
Emissions
by 2050



- Replacing oil-based bitumen with alternative binders minimizes the environmental impact of extracting, transporting and refining crude oil for bitumen production.

Reduced Environmental Impact:
The production process of bio binders generally emits fewer greenhouse gases compared to the production of conventional asphalt.

Performance and Durability:
They offer good resistance to weathering, aging, and mechanical stresses. Bio binders can even enhance the lifespan of asphalt pavements by improving resistance to cracking and rutting





Impact reduction potential of different technologies

Situation 2024 - 2030

Decarbonised fuels at the plant

-7,5%
Emissions
by 2030



-14,1%
Emissions
by 2050



Fuel substitution by hydrogen:

Hydrogen can be gradually introduced into the fuel mix without changing the standard equipment configuration (up to 30% vol. of hydrogen in the blend). However, equipment adaptations would be necessary for higher concentrations of hydrogen or full substitution.



In 2030, only gas (LNG), bio-fuels and electricity (either applied directly or in the production of fuels like hydrogen) will be used, eliminating other fuels like coal and diesel. In the 2050 scenario, gas is eliminated as well, remaining only green energy sources.





Impact reduction potential of different technologies

Situation 2024 - 2030

Decarbonised transport of materials

-N/A
Emissions
by 2030



-11,4%
Emissions
by 2050



Adoption of electric or hybrid vehicles, utilizing alternative fuels like biofuels or hydrogen, and optimizing logistics to reduce empty miles and improve route planning.

Site efficiency

-N/A
Emissions
by 2030



-4,0%
Emissions
by 2050



Sustainability through digitization

- Smart construction vehicles equipped with digital systems can optimize their routes and workflows, thus reducing fuel consumption and carbon emissions.



Carbon emissions from machinery at the jobsite can be reduced by:

- Improving fuel efficiency,
- Minimize idle time and energy consumption,
- Adopt innovations in materials handling processes (conveyor systems)





Impact reduction potential of different technologies

Situation 2050

Other

After applying the previous strategies, less than 10% of CO₂eq emissions remain.

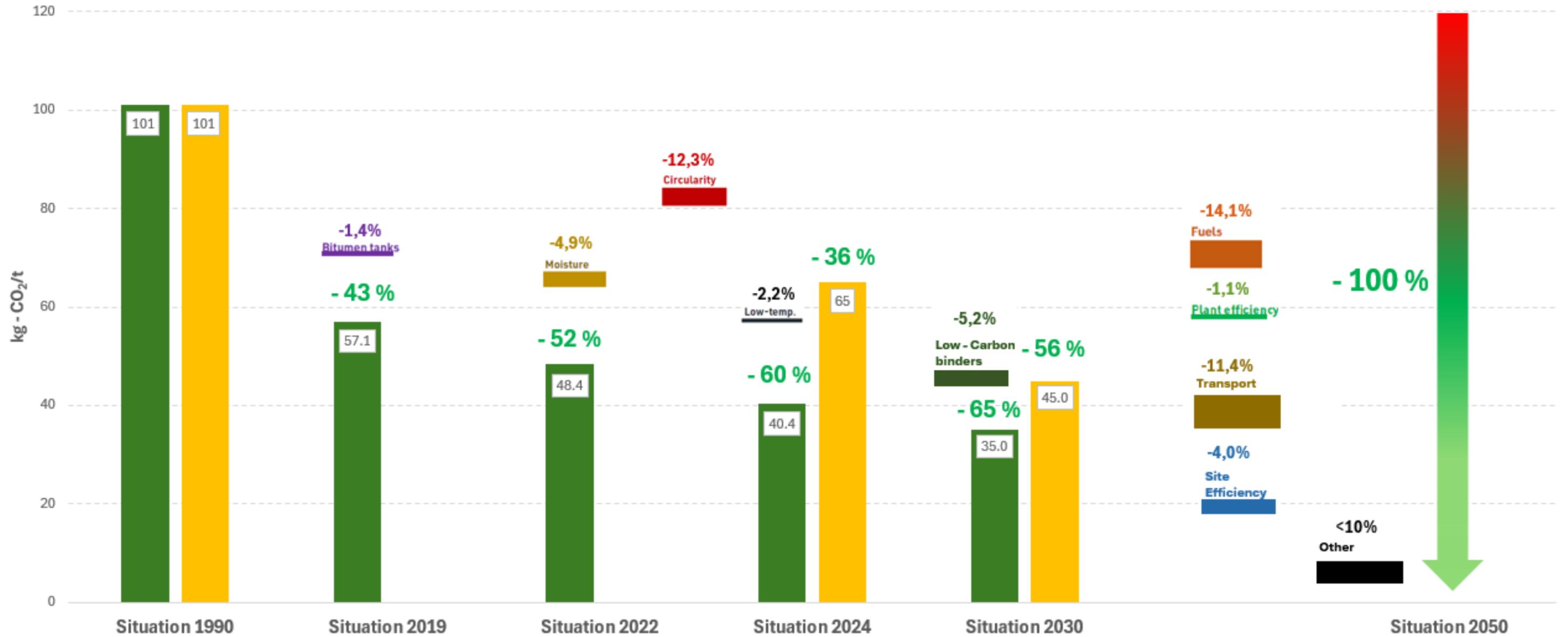
The importance of enhanced material durability to reduce the number of maintenance interventions and minimize whole-life carbon emissions.

- ❖ The majority of surface course asphalts have a much higher proportion of carbon embodied in scope 3 – approximately double that of a typical base course – due to the raw materials used. This is because surface courses have higher bitumen contents, a greater use of polymer modified bitumen (PMB) and often contain high polished stone value (PSV) aggregates, which have generally travelled further to reach the asphalt plant.
- ❖ PMBs improve flexibility, strength and resistance to fatigue and deformation to extend the life of the asphalt.
- ❖ PMB has higher embodied carbon than standard bitumen but offers benefits such as enhanced durability through increased fatigue resistance, which extends the life of the asphalt and reduces whole-life emissions. Biogenic material, and other additives can also be included that can help further reduce embodied CO₂.



Towards Net Zero

Kilsaran - Towards Net Zero,
A1 - A3, GWP CO₂ eq/t

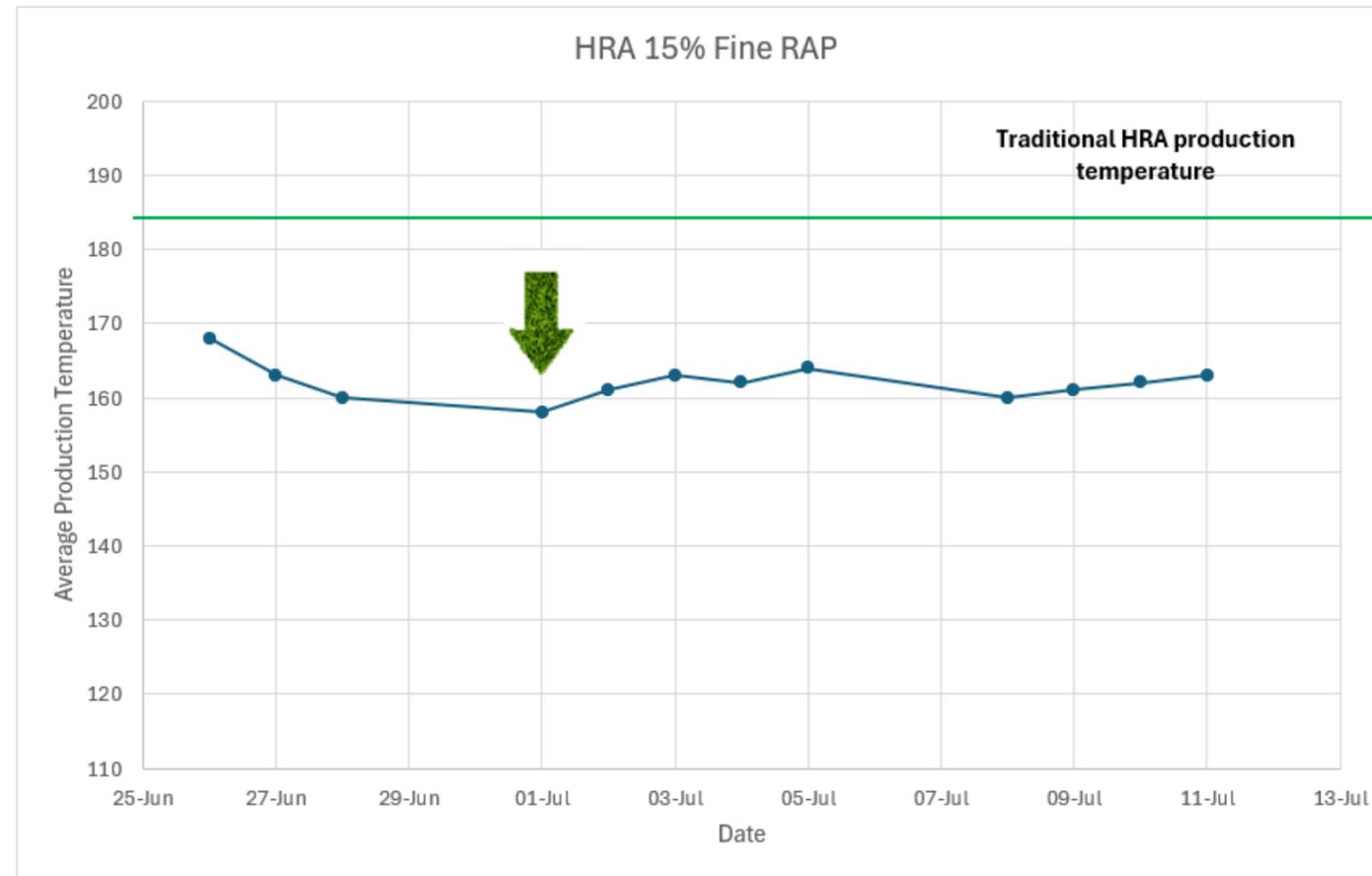
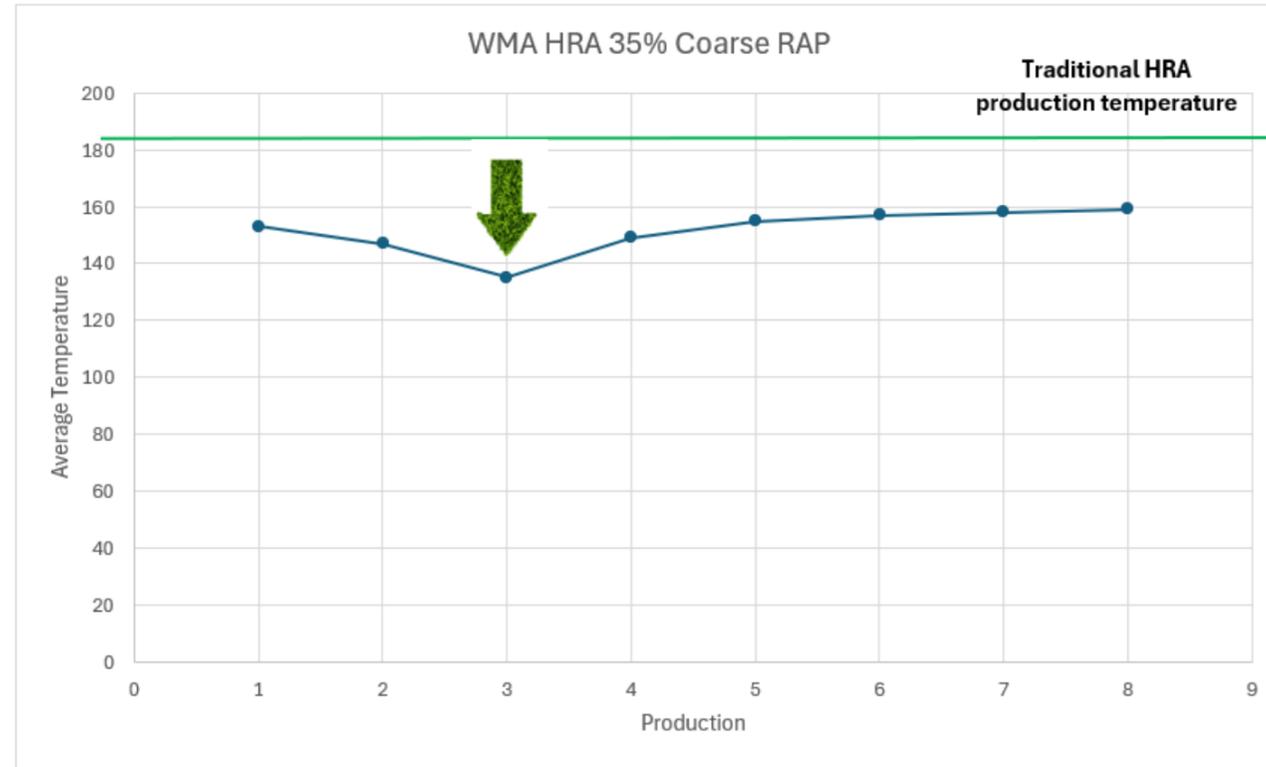


Case Study – M7 Kildare Bypass Pavement Scheme



Sustainable Materials
HRA 35% RAP
HRA 15% RAP

PRODUCTION

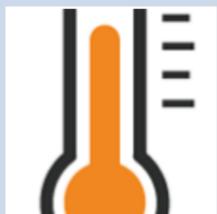




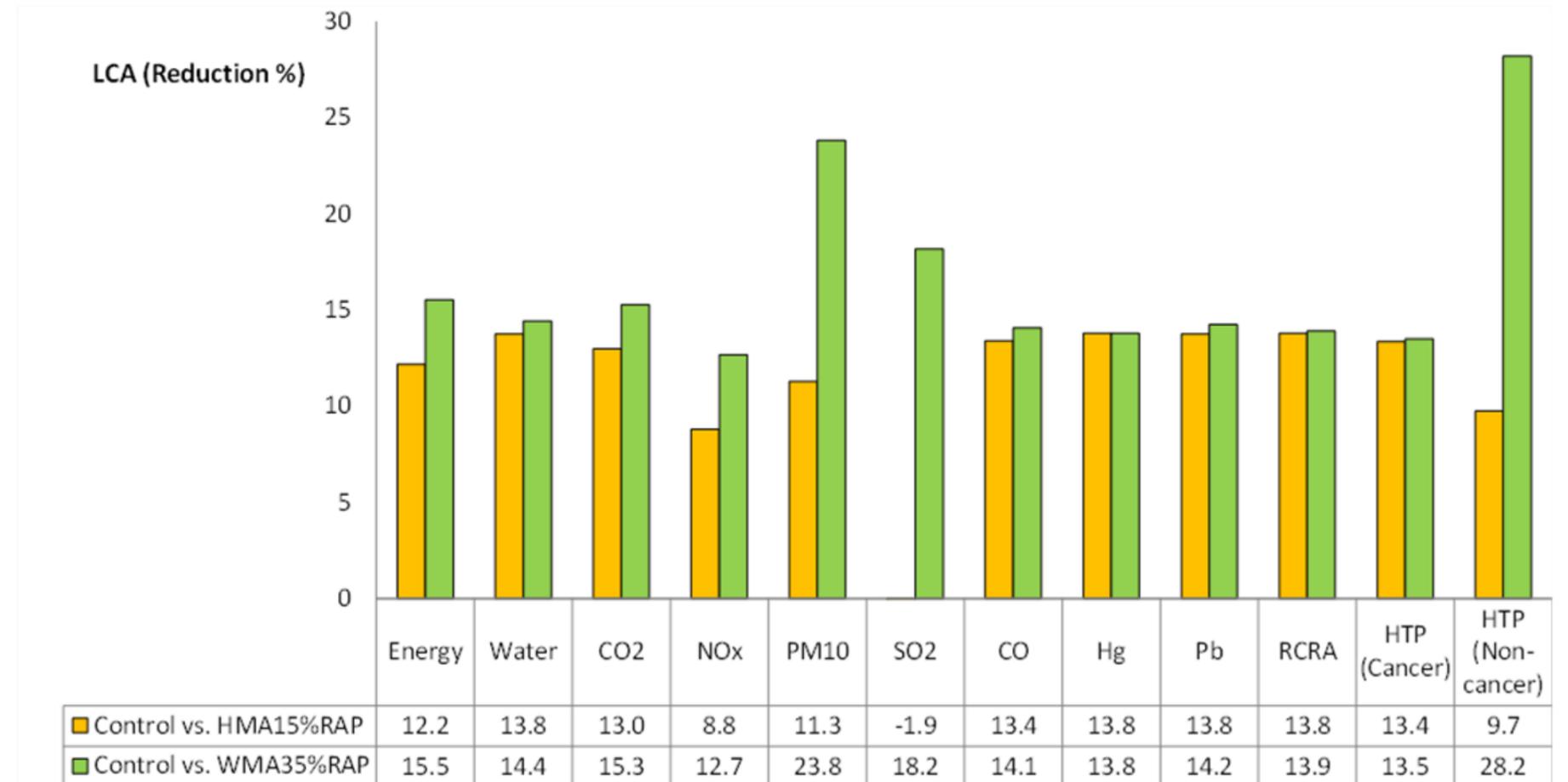
Impact reduction potential of different technologies



Significant reduction in emissions due to the use of RAP. In most cases ranged from 13 % to 13.8 % for the “HMA 15% RAP” in comparison to the “Control” mix.



The use of WMA mixture with addition of 35% RAP resulted in more pronounced results in terms of reduced energy consumption and carbon emissions



Case Study – M7 Kildare Bypass Pavement Scheme EPD Comparison



TII Publications



**Complementary Product
Category Rules for Bituminous
Mixtures (c-PCR Bituminous
Mixtures)**

DN-PAV-03077
May 2024

What are EPD's?

Environmental Product Declarations (EPD) are a standardized way of providing data about the environmental impacts of a product through the product life cycle.

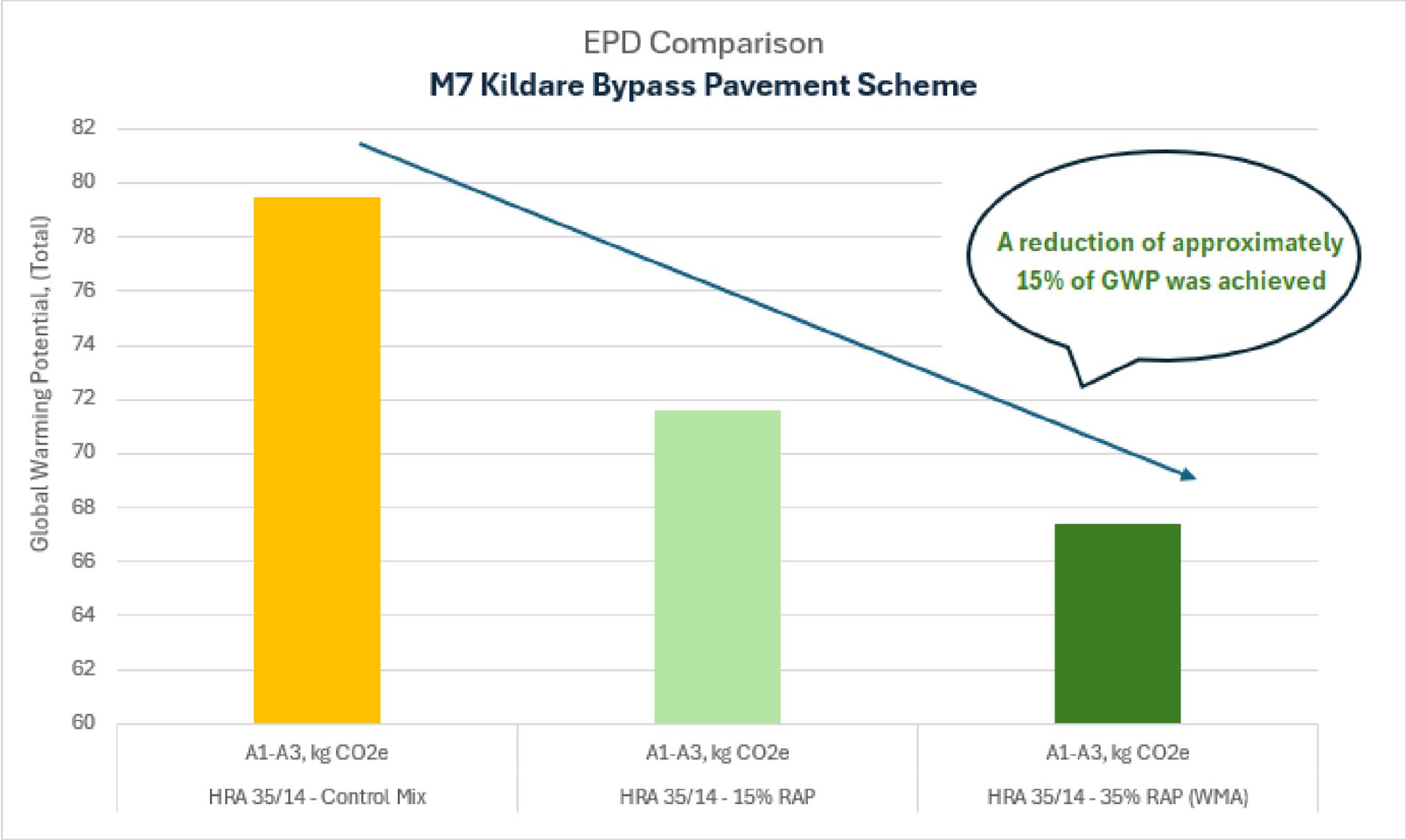
What Are the Benefits of EPDs?

- Provide verifiable and transparent information on life-cycle environmental impact data for materials or products.
- Allow meaningful comparisons of the environmental performance of materials.
- Identify areas for environmental performance improvement, encouraging industry efficiency.





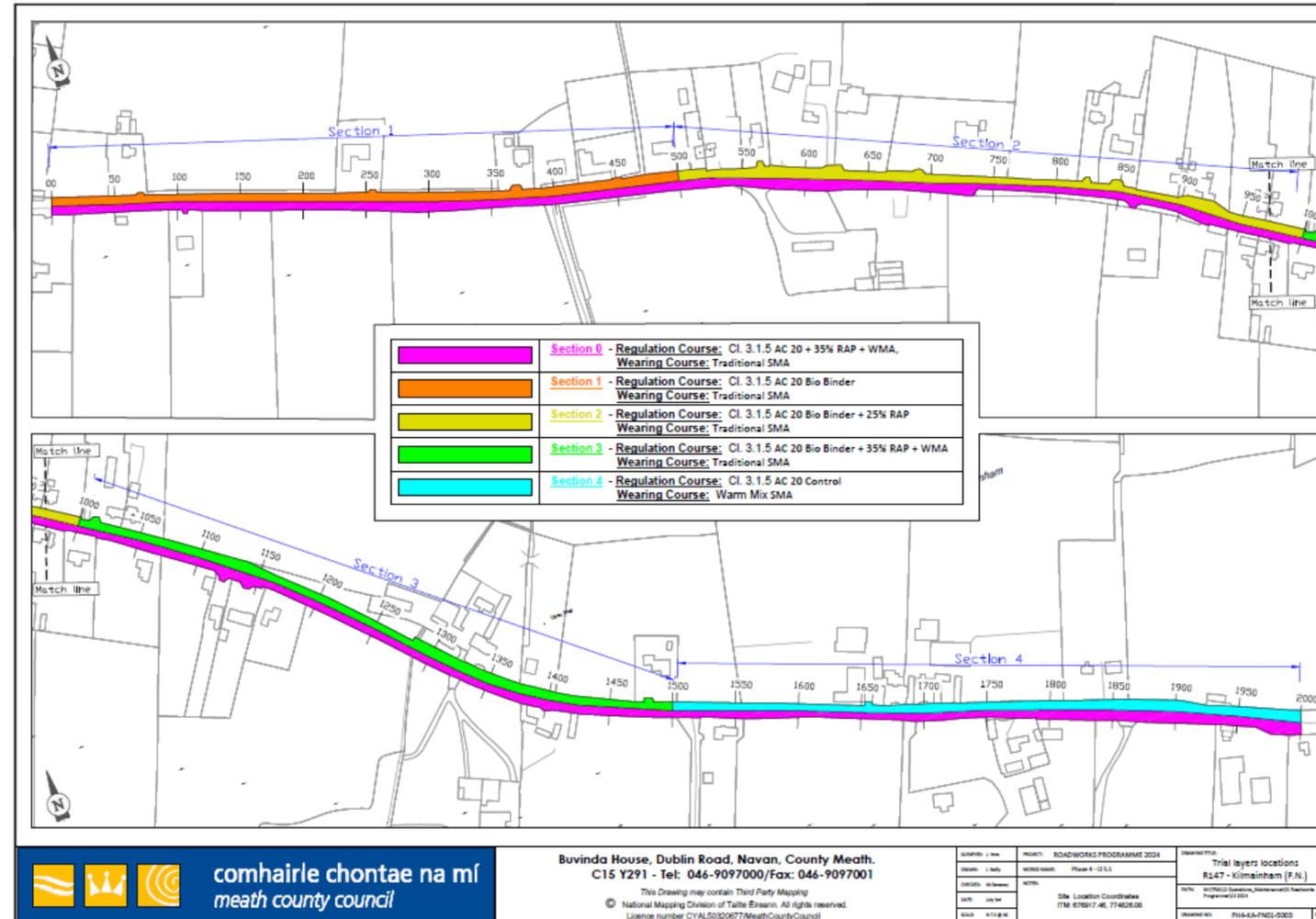
EPD Comparison





Case Study – R 147 Kilmainham Trial

MATERIALS

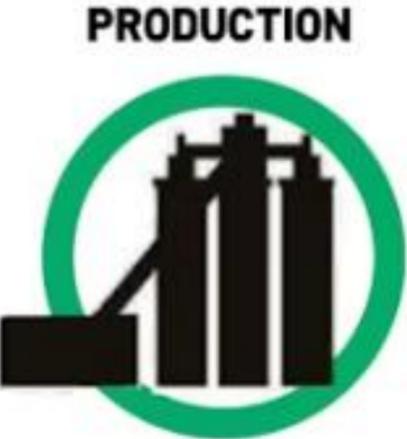


	Section 1 - Regulation Course: Cl. 3.1.5 AC 20 Bio Binder Wearing Course: Traditional SMA
	Section 2 - Regulation Course: Cl. 3.1.5 AC 20 Bio Binder + 25% RAP Wearing Course: Traditional SMA
	Section 3 - Regulation Course: Cl. 3.1.5 AC 20 Bio Binder + 35% RAP + WMA Wearing Course: Traditional SMA
	Section 4 - Regulation Course: Cl. 3.1.5 AC 20 Control Wearing Course: Warm Mix SMA

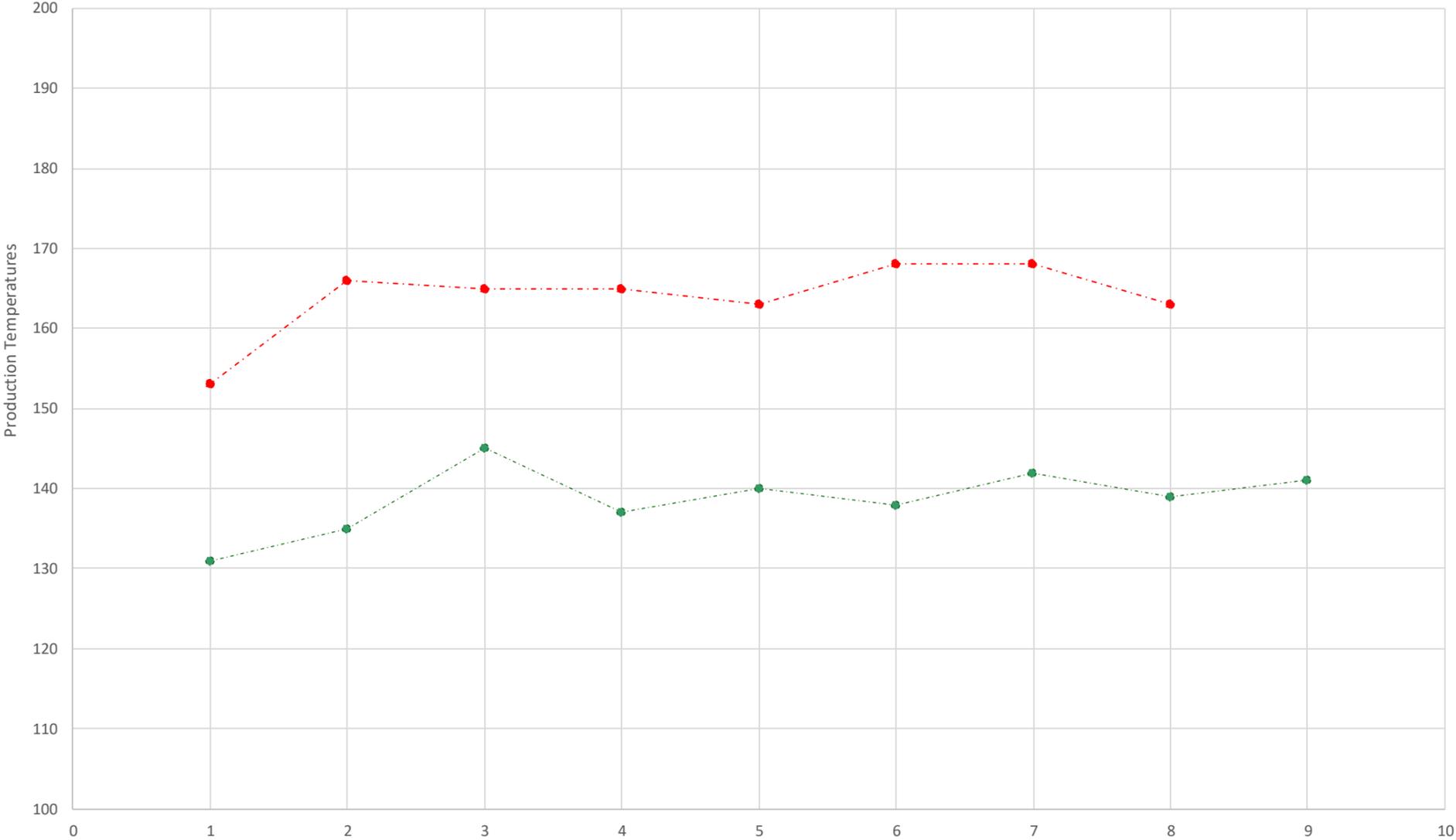


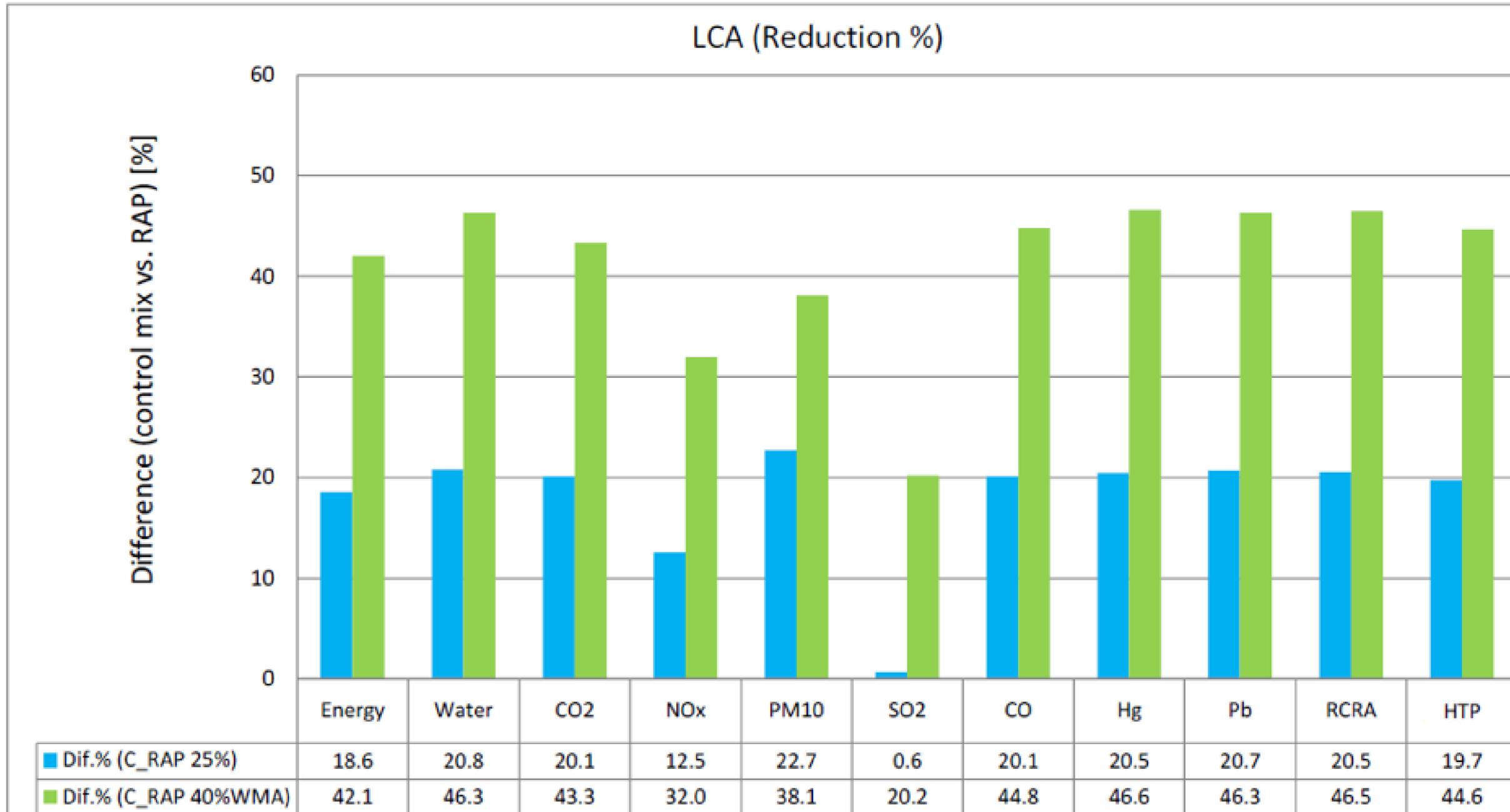


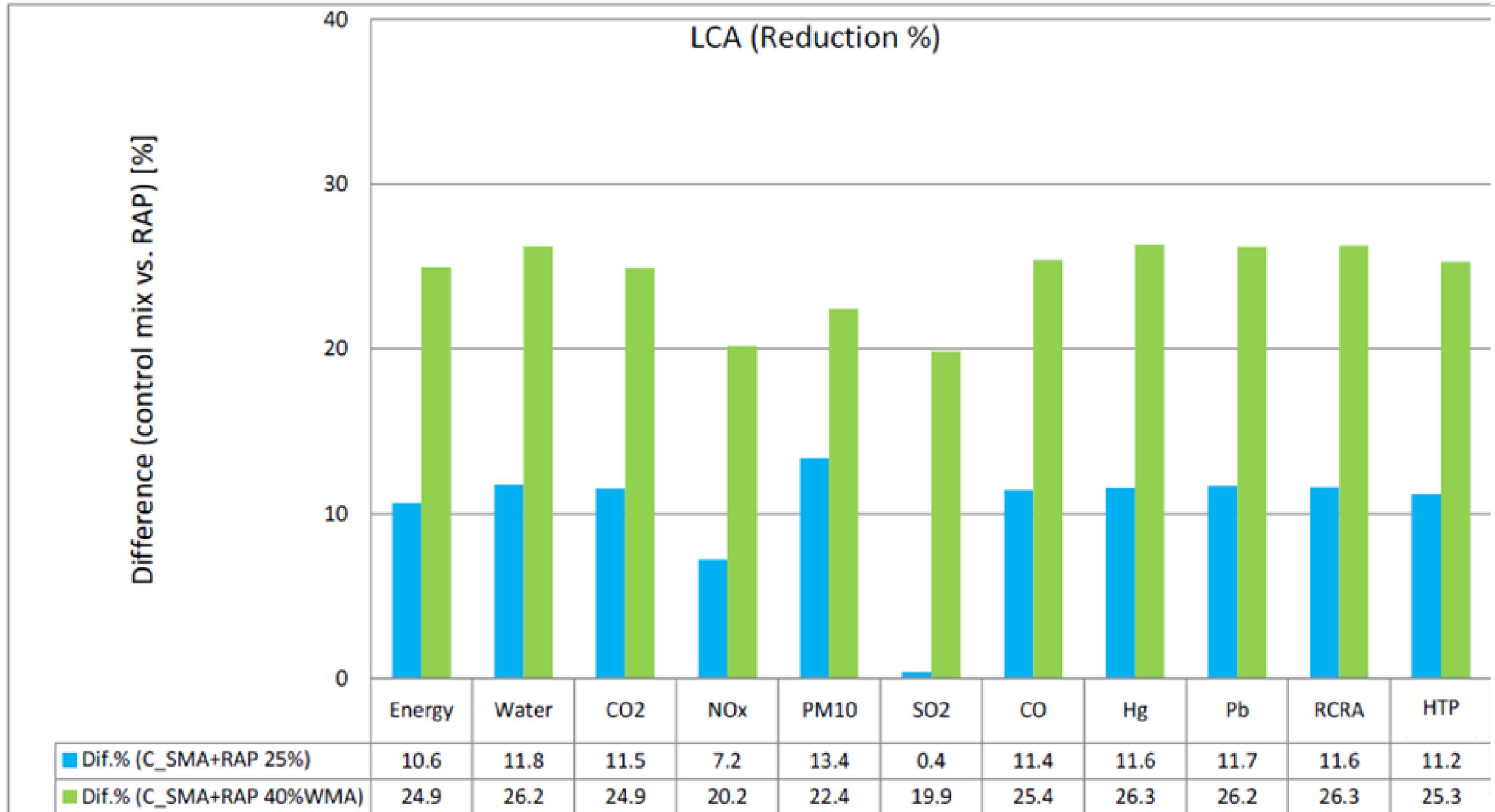
Sustainable Materials



AC 20 Dense BioBinder 25% RAP vs BioBinder 40% RAP WMA









The long-term durability of asphalt pavements is a key aspect to sustainability, as longer lifetime means less maintenance, less use of materials, less energy, and certainly, less impacts on the environment.



An asphalt pavement is 100% recyclable, requiring that future recyclability must be ensured when new materials or wastes are added into bitumen.



The asphalt industry is committed to reducing its carbon footprint and different levers are already available to help reduce emissions now.



To maximize the benefits, industry, national government and local authorities need to work together to share successes and promote new innovative methods of road design and construction.





Increase the use of WMAs

Adoption of energy efficiency initiatives, such as the use of warm mix asphalt (WMA) technologies to reduce mix production temperatures.

Increase the use of RAP

Increase use of reclaimed asphalt pavement (RAP) to reduce the impacts of raw material manufacturing.

Bitumen innovation

Use of biobased materials that remove carbon dioxide from the atmosphere during the life of the feedstock material, then sequester biogenic carbon into the pavement.





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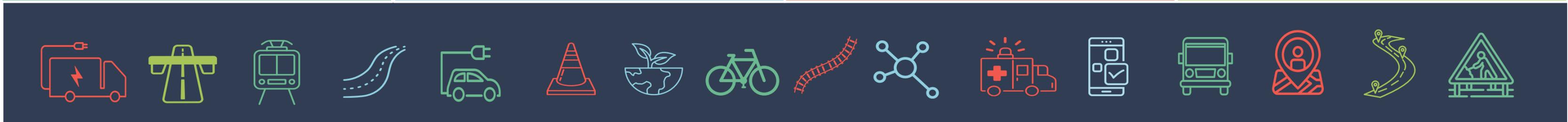
TOWARDS
**ZERO
CARBON**

Thank you

**Sustainable Pavement Design and Construction – A
Case Study**

Update on the new Road Safety Audit standard

Martin Deegan, CEng, TRAFFICO



Title:

Update to The Road Safety Audit Standard

Speaker:

Martin Deegan
t r a f f i c o



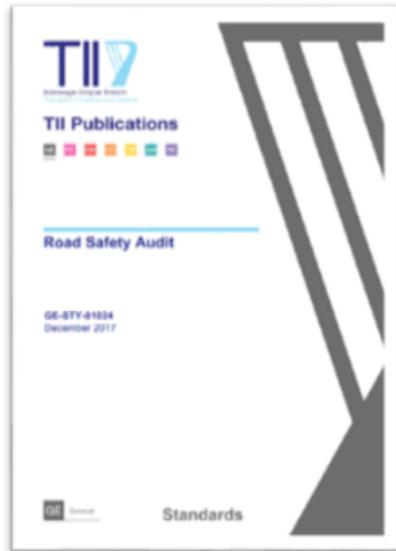
Update to the Road Safety Audit Standard

Topics Coverage

- Which Standards Are Being Updated
- Why Do We Need an Update?
- Overview of Changes to the Road Safety Audit Standards
- Remedies Being Sought for Specific Problem Areas
- The New Road Safety Audit Approval System
- Road Safety Auditor Training



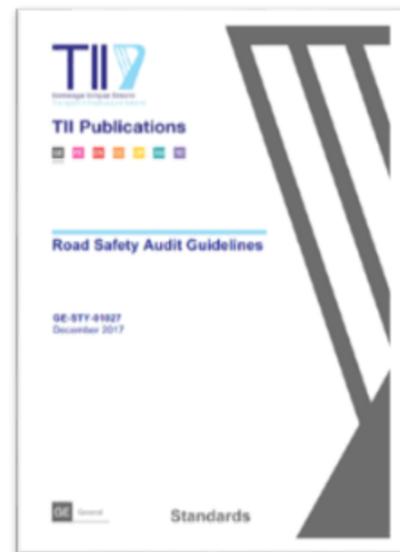
Which Standards Are Being Updated



Standard Name: **GE-STY-01024 Road Safety Audit**

Published: **December 2017**

This Standard sets out the **requirements** for Road Safety Audits on the National Road Network.



Standard Name: **GE-STY-01027 Road Safety Audit Guidelines**

Published: **December 2017**

This Guideline sets out the **process** for undertaking Road Safety Audits on the National Road Network.



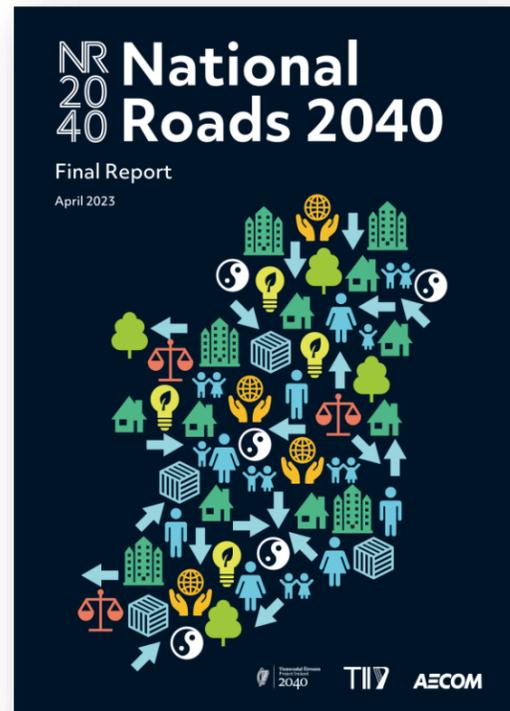
Why Do We Need an Update?

Compliance European Regulations & Irish Law

- **Europe: RISM Directive 2019 / 1936** – (Road Safety Infrastructure Management management) Safe Systems approach to minimising fatalities.
- **Europe: Ten T Directive 2024/1679** – improvement of quality of services, social conditions for transport workers and accessibility for all users.
- **Ireland: S.I. No. 612/2021** - European Communities (Road Infrastructure Safety Management) Regulations 2021. Now specifically applies to all road users, including vulnerable road users.

Why Do We Need an Update?

Meet Objectives Set Out in National Roads 2040 (April 2023)



The Road Safety Audit Standards will be updated to reflect Government prioritisation of:

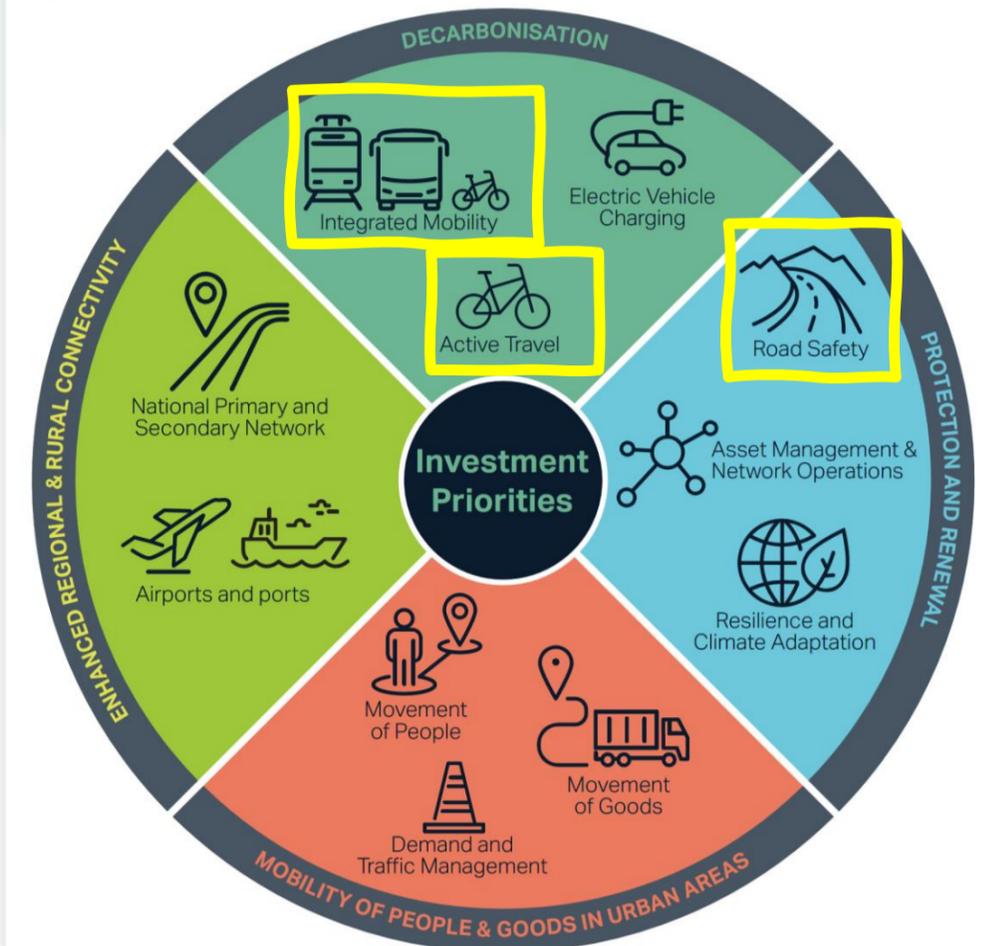
- Road Safety
- Integrated mobility
- Active Travel

5 NATIONAL ROADS INVESTMENT PRIORITIES AND PORTFOLIOS

TII has assessed National Roads needs the need for the National Roads network to deliver align with on relevant National Strategic Outcomes and has also identified several strategic issues for the network. These considerations have influenced the NR2040 Investment Priorities.

The NR2040 Investment Priorities align with the four NIFTI Investment Priorities and are presented in Figure 5.1.

Figure 5.1 NR2040 Investment Priorities and Portfolios

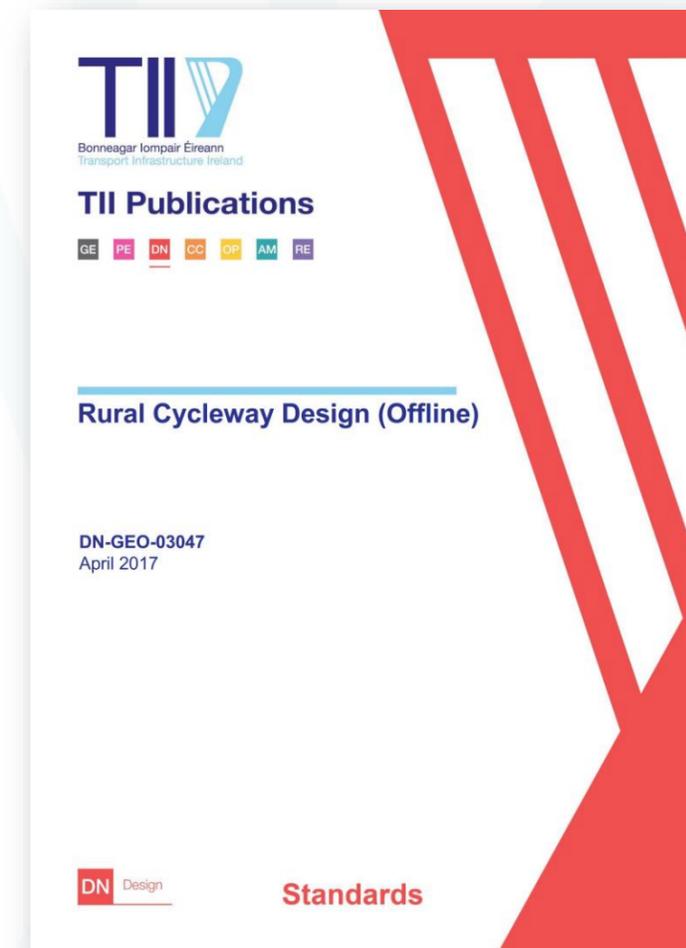


Why Do We Need an Update?

Making Provision for TII's Responsibility to Deliver Greenways

The current Road Safety Audit Standards do not provide practitioners with sufficient direction relating to:

- Greenways
- Or the Rural Cycle Network

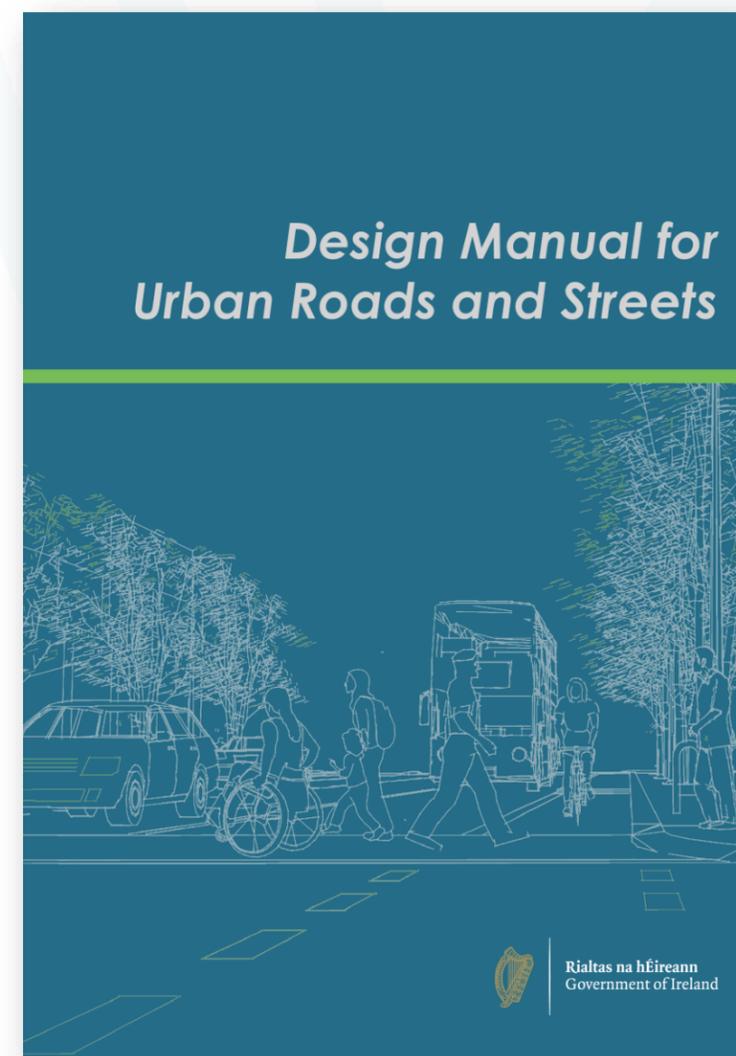


Why Do We Need an Update?

Urban Renewal or DMURS Schemes – Protecting the National Road Network

To ensure impacts on National Road Network are minimised, the revised Road Safety Audit Standards will offer guidance on how to successfully accommodate:

- Urban renewal schemes.
- DMURS Schemes.
- The DoT **NGS Circular 3 of 2022** which sets out the essential common requirement for RSA's & QA's on public roads in Ireland.



Road Safety Audit (GE-STY-01024)

Changes to Appendix A: Scheme Type & Audit Stage

A considerable amount of the standard changes are likely to focus on Appendix A. This will include:

- Compliance with Appendix A will become a mandatory requirement for schemes which effect National Roads.
- A reduction in schemes suitable for **Stage 1&2** Audits.
- More schemes types being considered for **Stage F** Audits
- Clarification on RSA Stages required for Active Travel Schemes.

TII Publications
Road Safety Audit

GE-STY-01024
December 2017

No Audit is required on like-for-like repair or replacement of existing road infrastructure						
Example Scheme Description						
	Pavement repair such as patching, edge strengthening which does not result in widening the carriageway, inlay works with similar materials.	No Audit Required				
	Pavement overlay which does not change the cross section, vertical alignment, camber or superelevation	No Audit Required				
	Surface rejuvenation such as mechanical abrasion etc.	No Audit Required				
	Surface dressing of an existing carriageway	No Audit Required				
	Replacement of a worn road sign with a new road sign of the same type	No Audit Required				
	Replacement of a damaged road sign with a new road sign of the same type	No Audit Required				
	Refreshment of existing worn road markings	No Audit Required				
	Replacement of worn or missing road studs	No Audit Required				
	Replacement of a length of damaged safety barrier with barrier of the same or similar type.	No Audit Required				

Audit is required on any piece of road infrastructure which requires a design						
Example Scheme Description	Audit Stages Required X – Required (X) – Alternative to St1 and St2					
	F	1	2	1 & 2	3	4
New Alignment	Off-line road scheme with multiple options.	X	X	X	X	X
	On-line road scheme – Minor land take required		X	X		X
	On-line road scheme – No land take required				X	X
	New junction or access onto the road		X	X	(X)	X
Realignment	Realignment of bend				X	X
	Realignment of junction				X	X
	Alteration of type of junction control, such as traffic signals, mini roundabout etc.				X	X
	Sight line Improvements				X	X
Pavement Improvements	Change to the existing cross section, widening or narrowing the pavement				X	X
	Change to the existing vertical alignment				X	X
	Change to the existing pavement which affects the horizontal or vertical alignment of public or private entrances				X	X
	Change to existing camber or superelevation				X	X
Signing & Road Markings	Installation of road signs: Single installation, multiple installations, or addition or amendment to sign on existing supports				X	X
	Installation of road markings which results in a change to the existing road marking layout and/or its meaning				X	X
Safety Barrier	Installation of new safety barrier				X	X
	Upgrade to an existing safety barrier				X	X
	Upgrade of an existing terminal				X	X

Page 10



Road Safety Audit (GE-STY-01024)

Changes to Appendix A: Scheme Type & Audit Stage

A considerable amount of the standard changes will focus on Appendix A. This will include:

- **Road Safety Impact Assessment** will now become part of the Stage F suite of Audits.
- Clarification on RSA Stages required for **Private Developments Schemes**.
- Greater clarity provided on how other **State Agency Schemes** which impact upon National Roads should be audited.

TII Publications
Road Safety Audit

GE-STY-01024
December 2017

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	Replacement of a worn road sign with a new road sign of the same type	No Audit Required				
	Replacement of a damaged road sign with a new road sign of the same type	No Audit Required				
	Refreshment of existing worn road markings	No Audit Required				
	Replacement of worn or missing road studs	No Audit Required				
	Replacement of a length of damaged safety barrier with barrier of the same or similar type.	No Audit Required				

Audit is required on any piece of road infrastructure which requires a design						
Example Scheme Description	Audit Stages Required					
	X – Required (X) – Alternative to St1 and St2					
	F	1	2	1 & 2	3	4
New Alignment	Off-line road scheme with multiple options.	X	X	X		
	On-line road scheme – Minor land take required		X	X		X
	On-line road scheme – No land take required				X	X
	New junction or access onto the road		X	X	(X)	X
Realignment	Realignment of bend				X	X
	Realignment of junction				X	X
	Alteration of type of junction control, such as traffic signals, mini roundabout etc.				X	X
	Sight line Improvements				X	X
Pavement Improvements	Change to the existing cross section, widening or narrowing the pavement				X	X
	Change to the existing vertical alignment				X	X
	Change to the existing pavement which affects the horizontal or vertical alignment of public or private entrances				X	X
	Change to existing camber or superelevation				X	X
Signing & Road Markings	Installation of road signs: Single installation, multiple installations, or addition or amendment to sign on existing supports				X	X
	Installation of road markings which results in a change to the existing road marking layout and/or its meaning				X	X
Safety Barrier	Installation of new safety barrier				X	X
	Upgrade to an existing safety barrier				X	X
	Upgrade of an existing terminal				X	X

Page 10



Road Safety Audit Standards

General Issues Being Addressed in the Revised RSA Standard

- Clarifications on the Road Safety Audit Process i.e. terminology, the role of the Client, Designer and Audit Team, Exception Reports etc.
- The essential need for the Road Safety Audit Feedback form to be completed by the Designer, Audit Team Leader and Client.
- Effectively managing impacts of private development and other State Agency schemes on the TII National Road Network.



The Road Safety Audit Approval System (RSAAS)

Functions of the RSAAS

The (RSAAS) manages 2 primary functions:

1. Validation of Safety Auditors to undertake Audits on the National Network.
2. Approval of Audit Teams for proposed audits on National Roads.



The Road Safety Audit Approval System (RSAAS)

How to Register using the RSAAS

- Go to TII Web Application Portal:
<https://web.tii.ie/index.html>
- Select 'Road Safety Audits' from the drop-down menu.

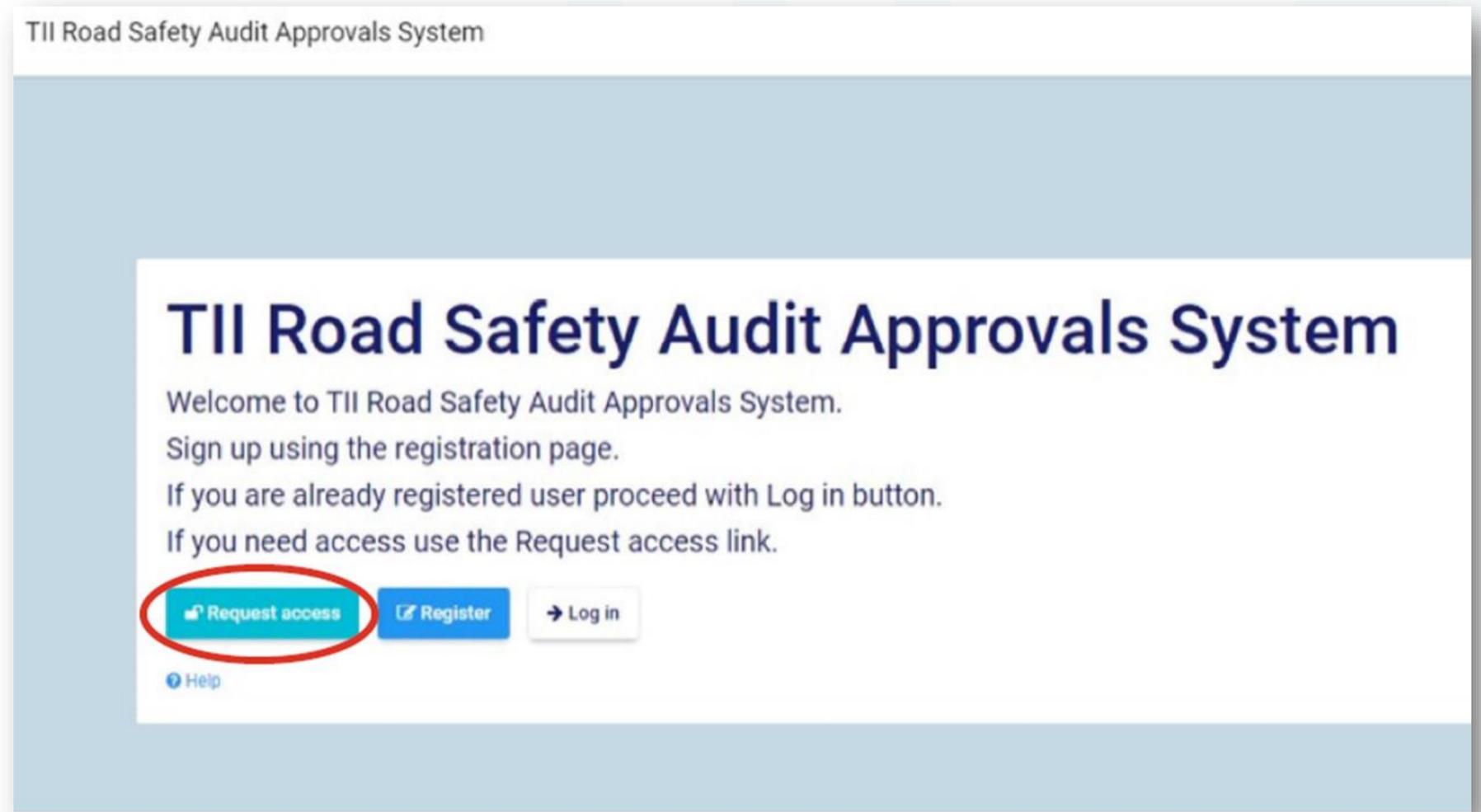
The screenshot displays the TII Web Application Portal interface. At the top left is the TII logo and 'Transport Infrastructure Ireland'. The top right navigation bar includes 'HOME', 'SYSTEMS', and 'ACCOUNT'. The main content area features a large heading 'TII Web Application Portal' and a sub-heading 'Use of this site is for authorised persons only and requires registration'. Below this, a note states: 'Authorised users can access the relevant systems by clicking on the Systems drop-down menu above. If you have been invited to register click the Register menu option to complete the registration process.' The 'SYSTEMS' drop-down menu is open, listing various systems. The 'Road Safety Audits' option is highlighted with a red rectangular box. Other visible options include 'Departures From Standards', 'TII Local Authority Portal', 'Project Reporting System', 'Project Reporting System - DOT', 'Defects Management System', 'Road Works System', 'Network Safety Analysis (HD15)', 'Pilots & Trials System', 'Cross-span bridge management', 'Framework Approvals', 'Surface Dressing Design Tool', 'Irish Analytic Pavement Design Method (IAPDM)', 'Carbon Tool', 'Road Emissions Model', 'TII Geo App', 'Project Risk Management', 'Speed Limit Applications', and 'Aggregate Register'. The footer contains the TII logo, 'Transport Infrastructure Ireland', a link to the Privacy Statement, a link to Terms & Conditions, and a copyright notice for 2021.



The Road Safety Audit Approval System (RSAAS)

How to Register using the RSAAS

- Select 'Request Access' to commence the registration process.



The Road Safety Audit Approval System (RSAAS)

Closing Points on the RSAAS

- The Client (scheme creator), Designer, Audit Team Leader & Audit Team Member must be separate individuals i.e. cannot complete dual roles in the RSAAS.
- The Client, Designer, Audit Team Leader & Audit Team Member have to complete the registration process for the RSAAS to be available for selection.
- The Audit Team Leader and Audit Team Member also have to be approved by TII for the completion of road safety audits on National Roads. This process is completed by the auditors and TII Road Safety on the RSAAS.



Road Safety Auditor Training Opportunities

Road Safety Audit Team Member Training

Contact Traffico for the Practical Road Safety Auditing Course:

- Email: hello@traffico.ie
- Web: <https://traffico.ie/Traffico-training-mainpage.html>

Road Safety Audit Team Leader Training

Contact ITS Sligo for the Certificate in Road Safety Audit & Engineering:

- Email: admissions.sligo@atu.ie
- Web: <https://www.itssligo.ie/courses/certificate-in-road-safety-audit-and-engineering/>



Update to the Road Safety Audit Standards

What Did We Cover?

- Which Standards Are Being Updated
- Why Do We Need an Update?
- Overview of Changes to the Road Safety Audit Standards
- Remedies Being Sought for Specific Problem Areas
- The New Road Safety Audit Approval System
- Road Safety Auditor Training



Thank you for listening!

Martin Deegan

traffico
ROAD SAFETY ENGINEERING

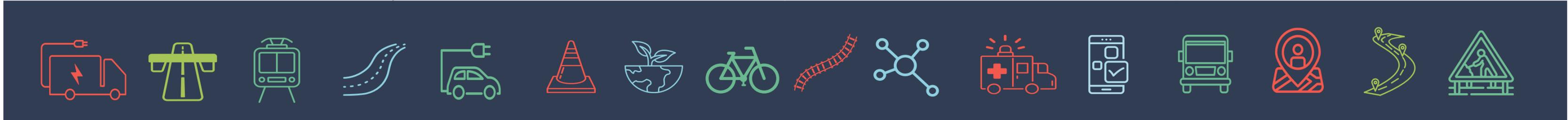
e: hello@traffico.ie

w: www.traffico.ie



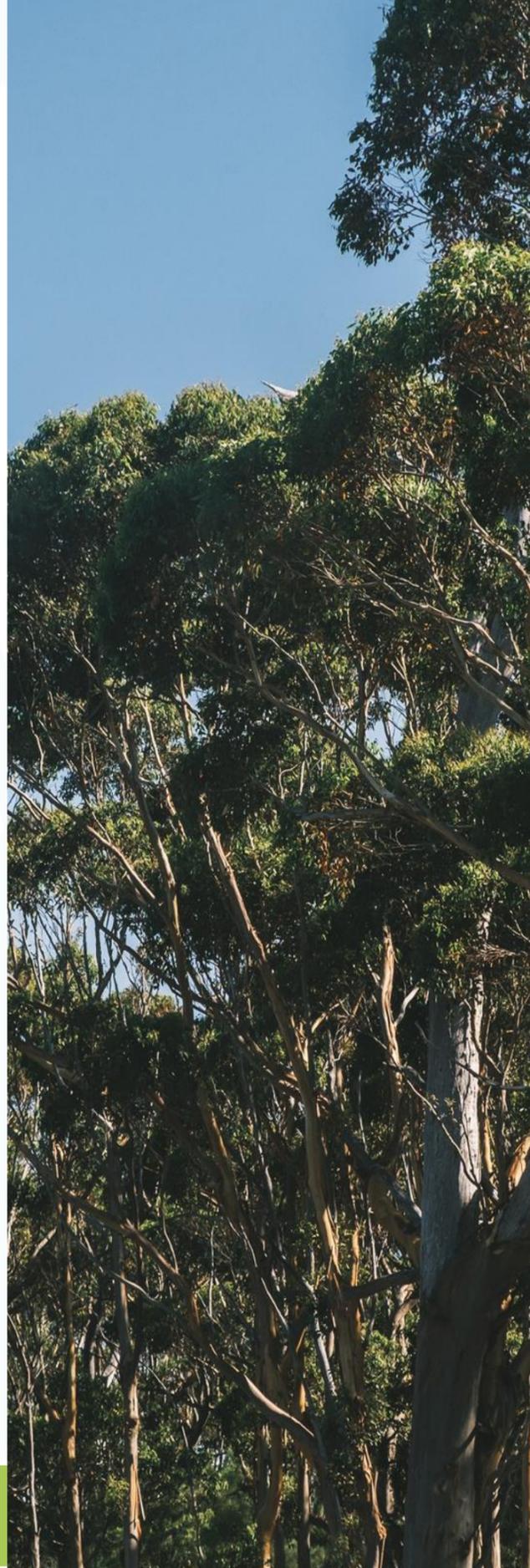
An introduction to Ireland's Supply Chain Sustainability School

Pamela Sheridan, Operations Manager, Supply Chain Sustainability School



Fostering Sustainability in the Construction Industry: Insights from the Supply Chain Sustainability School

Pamela Sheridan



Overview

- Introduction to the School
- Key Initiatives and Partnerships
- Membership and Community Engagement
- Education and Resources



Introduction to the School

The Supply Chain Sustainability School was established to address a critical need for sustainability education within the construction industry.

Our goal is to share knowledge that spans across various sustainability topics, directly impacting how we approach construction projects today.



“An industry where everyone will have the skills and knowledge to deliver a sustainable future.”



Values

Our approach is founded on four shared values:

01



Collaborative

We share knowledge and resources.

02



Impactful

We deliver measurable benefits.

03



Inspirational

We inspire and enable our industry to drive positive change.

04



Inclusive

We exemplify respect for the planet, our colleagues and wider society.

The Structure of the School



Led by Partners who guide strategic decisions.



Partners actively shape the School's daily operations and development.



Current Partners

ARUP

CAIRN

 CONSTRUCTION
INDUSTRY
FEDERATION

 Energy for
generations

 Gas
Networks
Ireland

Glenveagh 

 Iarnród Éireann
Irish Rail

IPUT
REAL ESTATE
DUBLIN

 PAUL
John Paul Construction

 Kingspan®

 kirby
engineering & construction

 MURPHY
WORLD-CLASS INFRASTRUCTURE

 PARK
DEVELOPMENTS

 roadstone
A CRH COMPANY

 SAINT-GOBAIN

 BUILDERS
SISK
CONTRACTORS

 Skanstec
POWERING THE FUTURE

 TII
Bonneagar Iompair Éireann
Transport Infrastructure Ireland

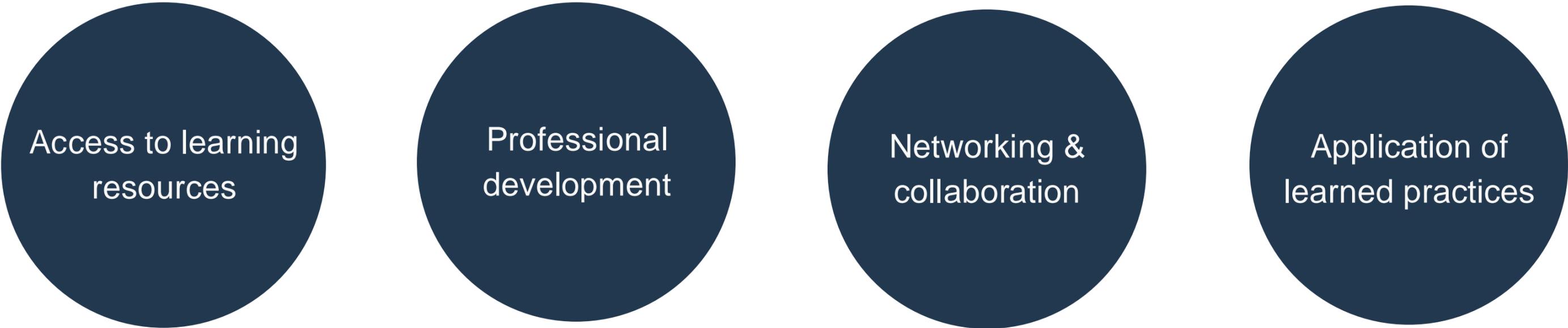
 Uisce
Éireann
Irish Water

 TII
Bonneagar Iompair Éireann
Transport Infrastructure Ireland



Membership

Membership in the Supply Chain Sustainability School provides free access to a wide range of learning resources designed to enhance understanding and implementation of sustainability practices in the built environment.



Access to learning
resources

Professional
development

Networking &
collaboration

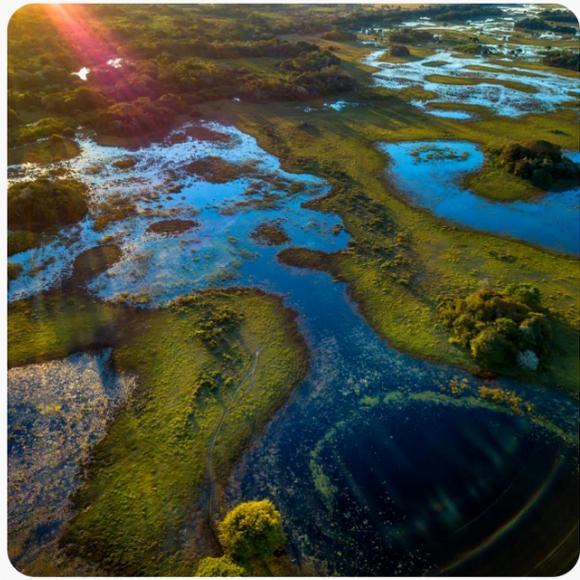
Application of
learned practices

How to Join and Benefit from the School

The journey from signing up to leveraging the full suite of benefits the Supply Chain Sustainability School offers is designed to be straightforward and impactful, focusing on practical tools and resources that support continuous sustainability growth.



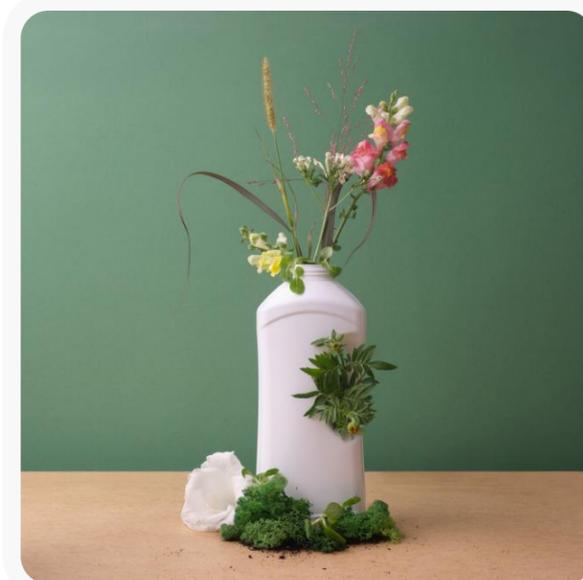
Sustainability Learning Overview



Introduction to
Biodiversity



Sustainability Strategy



Introduction to Climate
Change and Carbon



Community
Engagement





Case study: Sisk

Leading Sustainability Through Collaboration

-● **Sisk's Sustainability Ambition:**
 - Lead industry in sustainable operation management.
 - Partnerships with supply chains; sharing sustainability goals.
 - Focus on lifecycle sustainability from project inception to completion.

-● **Sisk's Role in Supply Chain Sustainability School:**
 - Integral in establishing the School for industry-wide upskilling.
 - Promotes webinars, workshops, and engagement for workforce development.
 - Advocates for the industry's transition to a sustainable, carbon-free future.



Next Steps: Engage with our sustainability initiative



Individuals & Organizations:

Register and complete a confidential self-assessment to identify learning areas for targeted sustainability education.



Prospective Partners

Submit an inquiry to discuss and potentially collaborate on sustainability initiatives.



Engage

Access specialized resources and opportunities for education, professional development, and collaboration for wider environmental and social impact.

THANK YOU

SUPPLY CHAIN SUSTAINABILITY
SCHOOL

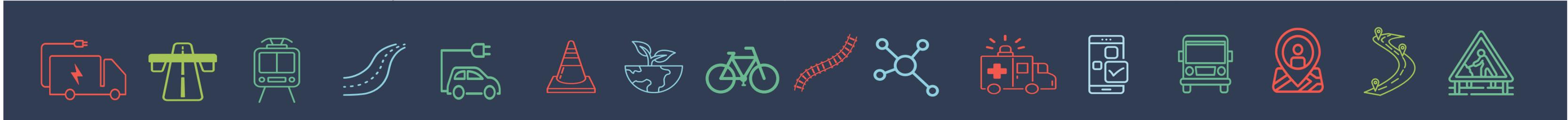
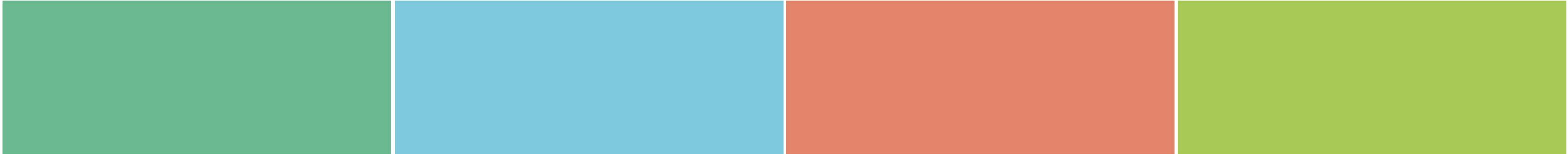
 01 5240891

 info@supplychainschool.ie

 www.supplychainschool.ie

Speed Limit Review (2023) and implementation

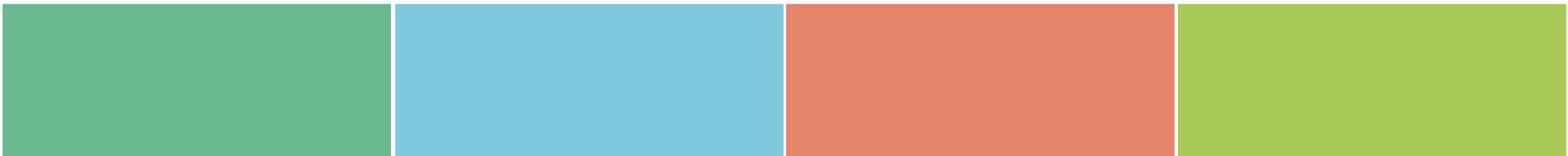
John McCarthy, Senior Advisor, Roads, Department of Transport



Strategic Asset Management Plan (SAMP) for National Roads.

Dr Kieran Feighan, PMS Ltd

Gerard O'Dea, TII



01

Introduction/overview

- TII's Journey in Asset Management

02

Strategic Asset Management Plan (SAMP) for the National Road Network

- Overview of Managed and Concession Network – SAMP

03

Next steps in Asset Management

- Development of Local Authority SAMP / Tunnels / MSA
- Carbon Reduction in Pavements
- Active Travel Asset Management

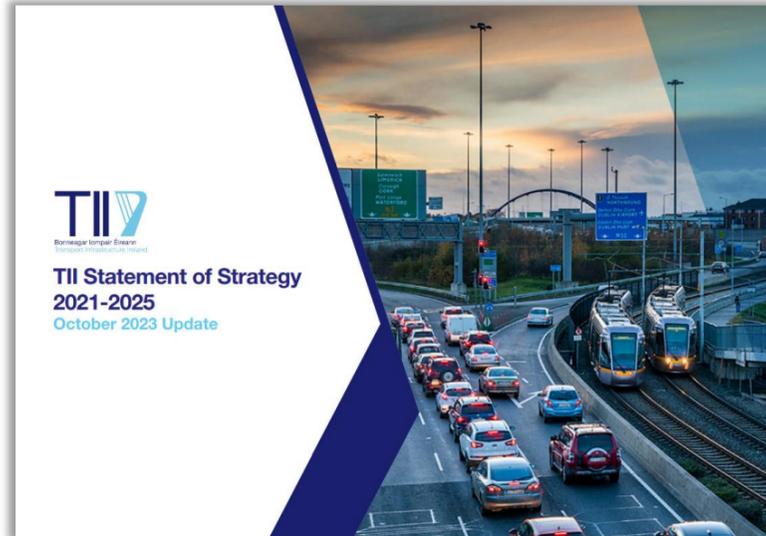


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Transport Infrastructure Ireland

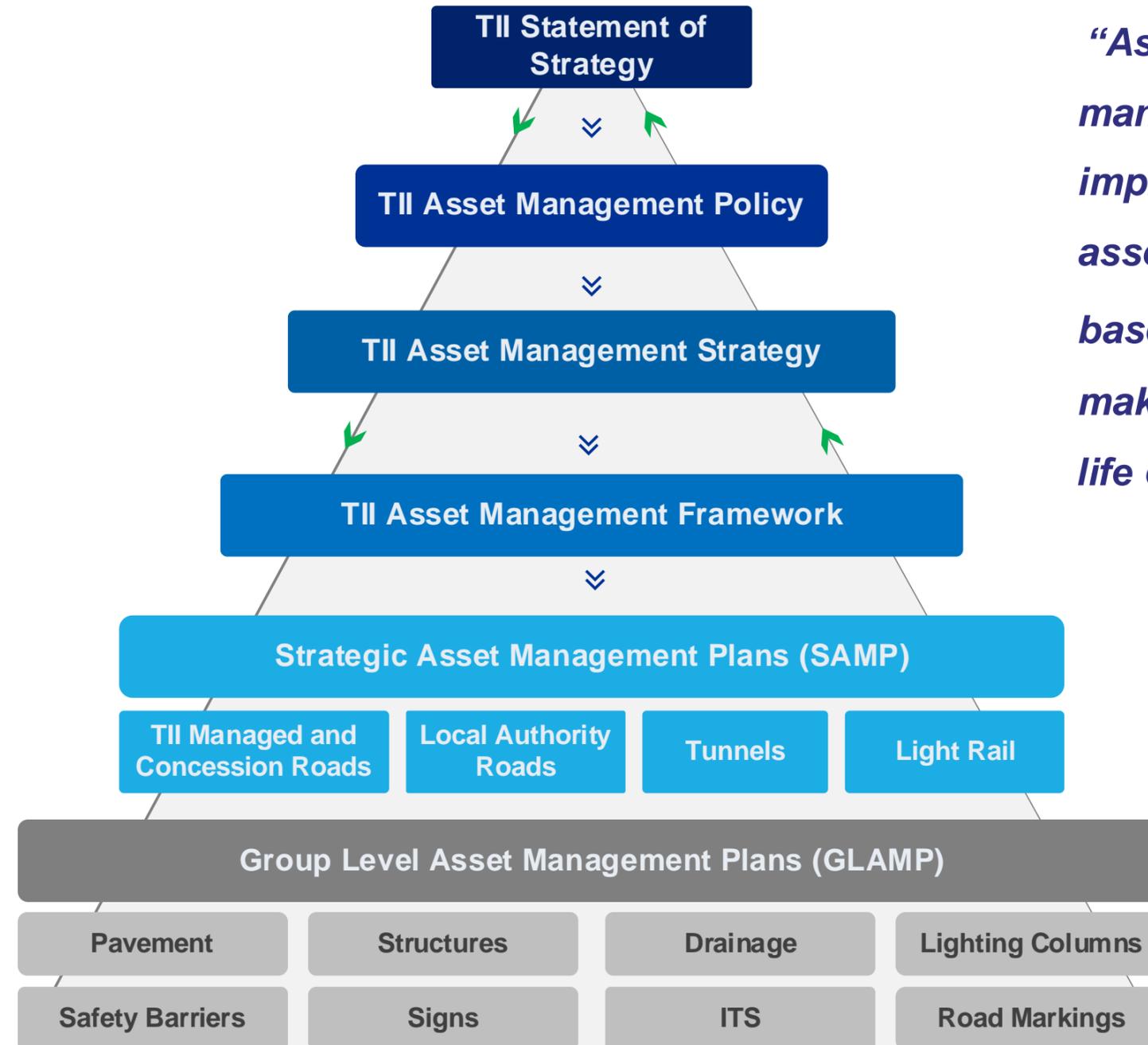
01 | Introduction



TII Asset Management Structure – Line of Sight



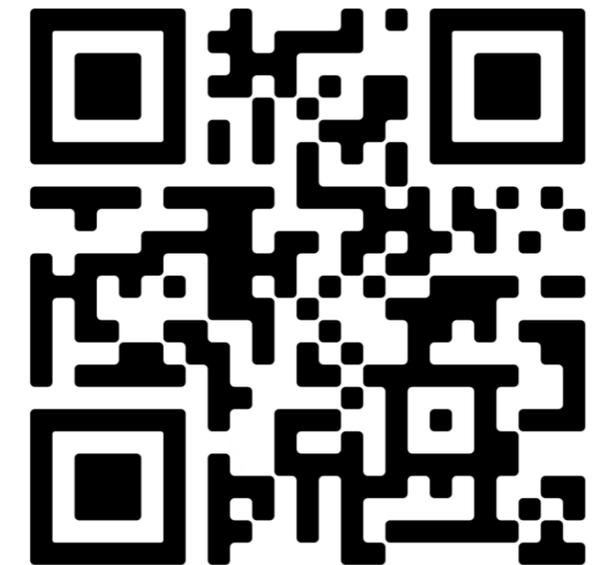
“Assets will be managed in a sustainable manner through the development, implementation, and maintenance of an asset management approach that is risk-based and data-driven, enabling us to make informed decisions throughout the life of our assets”



Goals

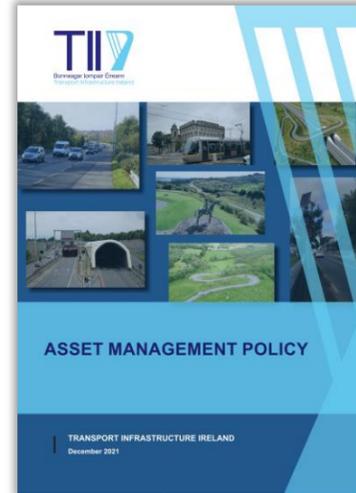
Existing Infrastructure
Operate, maintain and extend the life of national roads and light railway infrastructure to ensure the safety and efficiency of our transport networks, ensure appropriate management of environmental resources and contribute to the transition to a low-carbon and climateresilient society.

Asset Management Policy, Strategy, Framework, SAMP published to www.tii.ie/assetmanagement



TII's Journey in Asset Management

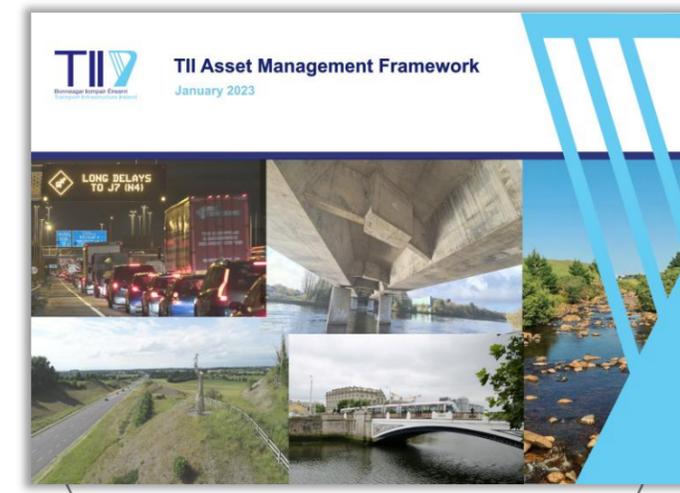
AM Policy



AM Strategy



AM Framework

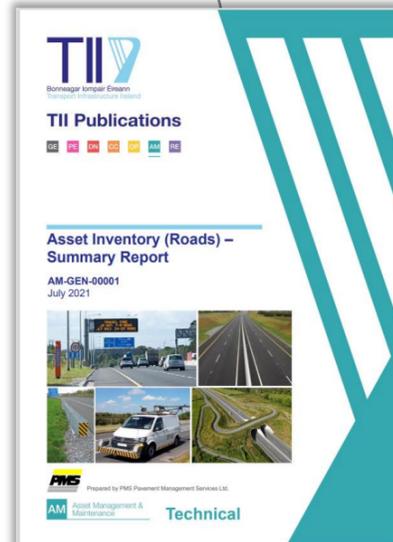


July 2021

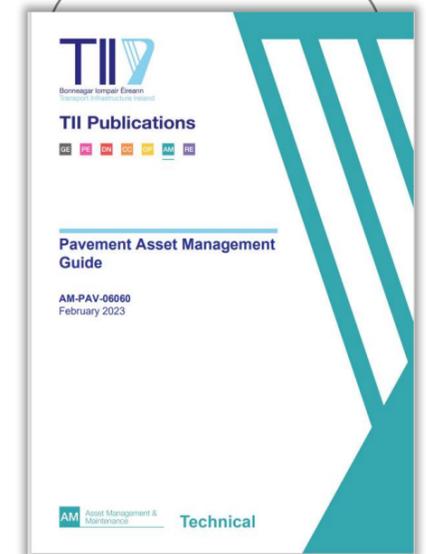
Dec 2021

Jan 2023

Feb 2023



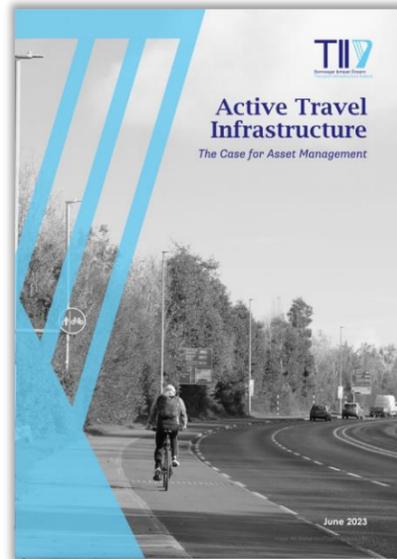
Asset Inventory & Valuation (Roads)



Pavement Asset Management Guide

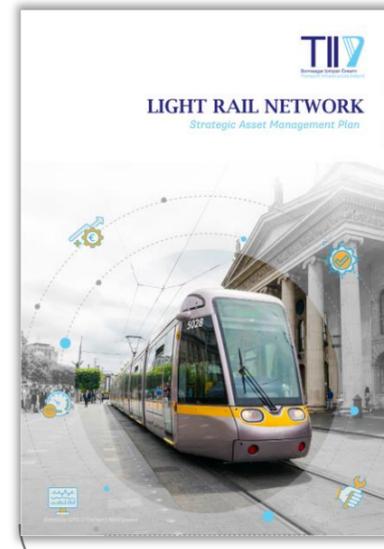
TII's Journey in Asset Management

Active Travel Asset Management Case

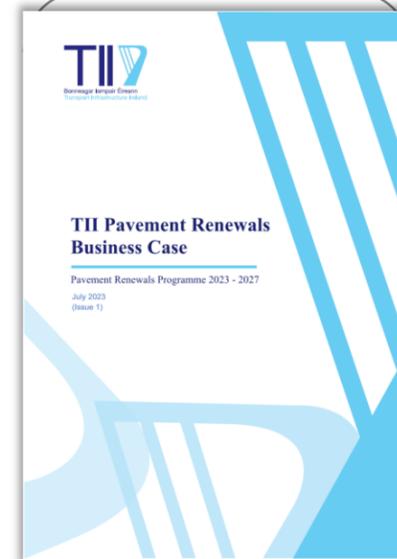


June 2023

Light Rail SAMP

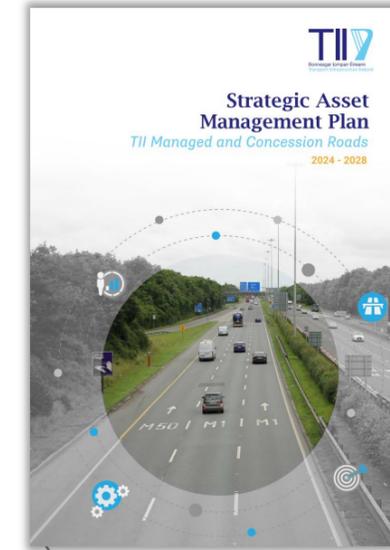


July 2023



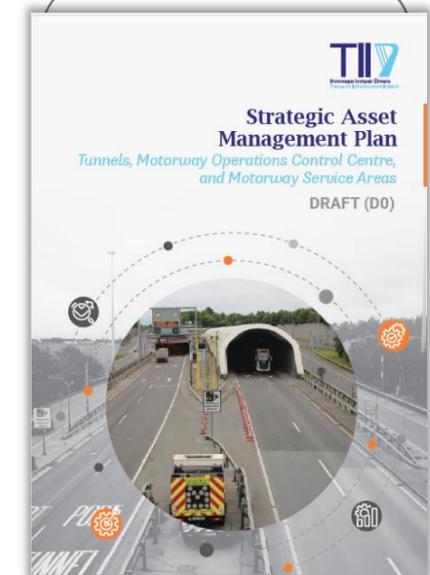
Pavement Renewals Business Case 2023-2027

TII Managed and Concession Roads SAMP



Dec 2023

2024 In Progress



Tunnels, MOCC, and MSA SAMP

TII Asset Management Objectives





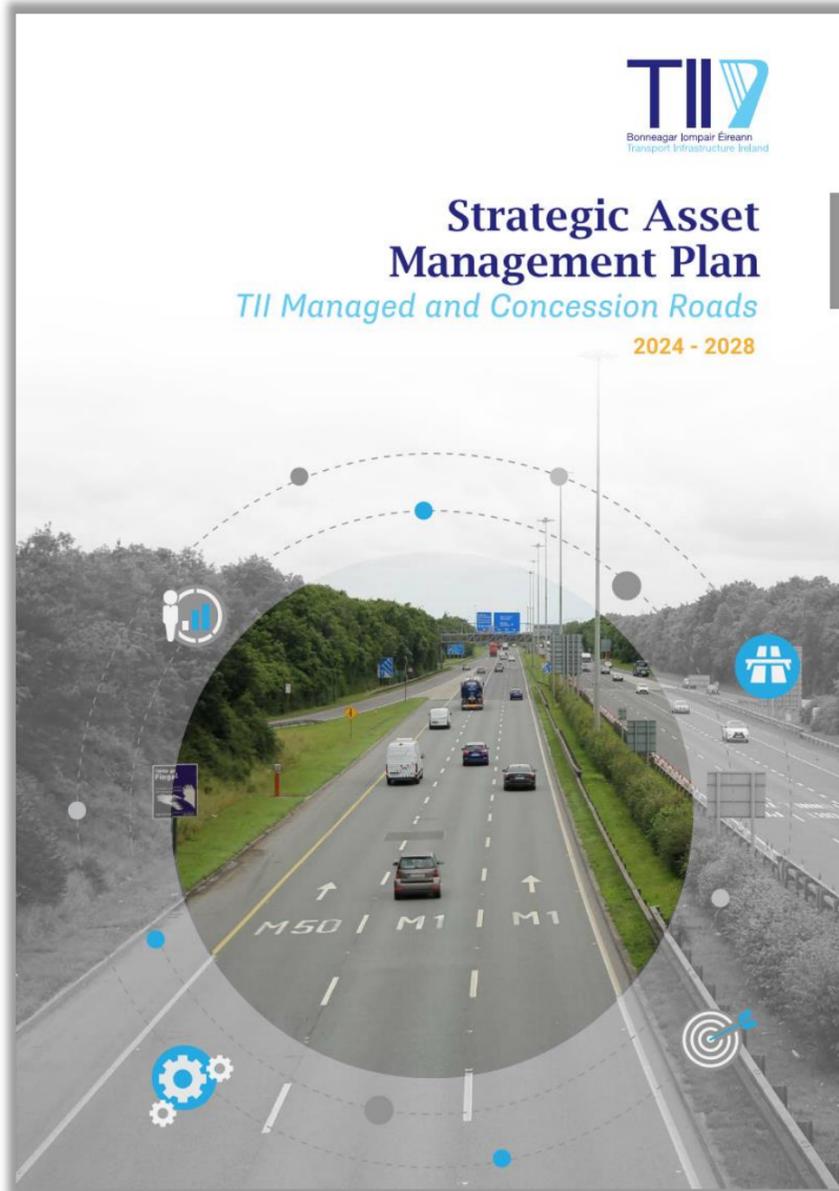
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Transport Infrastructure Ireland

02 | Strategic Asset Management Plan (SAMP) - Managed and Concession Network



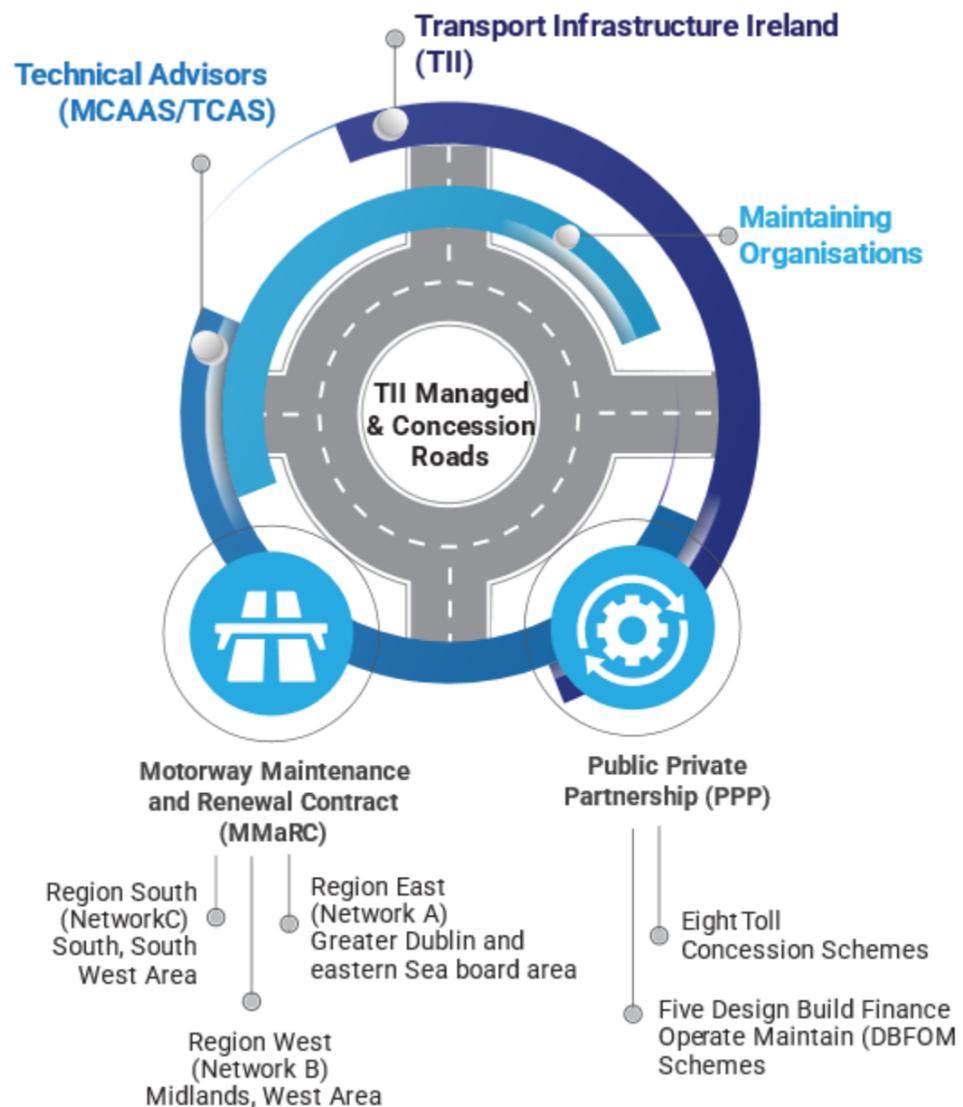
Strategic Asset Management Plan – 2024 - 2028

TII Managed and Concession Network



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Governance and Management Structure



3 MMaRC Networks Contracts - 887 km
(incl. Tasked Maintenance Areas (TMAs))



13 PPP Contracts - 461 km



Gross Replacement Cost – excess of € 20 billion

Snapshot of TII Managed and Concession Network



1. Land & Earthworks

Total Area Land of c. **9,000 ha** with Embankments (Fill vol **64 million m³** and Cut vol **84 million m³**)



2. Pavements

Almost **1,350** Centerline-km with **237** Interchanges and Paved Area of more than **30 million m²**



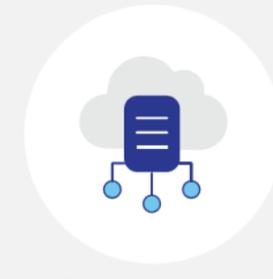
3. Structures

1,282 Road Bridges, **54** Foot Bridges, **71** Retaining Walls, and **1,500** Culverts, with Total Deck Area over **870,000 m²**



7. Road Lighting, Traffic Signs & Markings

15,000 Road Lighting Columns, **28,300** Traffic Signs, and more than **8,300 km** of Road Markings



8. Intelligence Transport Systems (ITS)

More than **1,225** Traffic Signals, **272** VMS, **1,539** ERTs and over **2,750** Other ITS assets



9. Toll Plazas

16 Toll Plazas with Canopy Area **8,500 m²** and **128** Traffic Lanes



4. Drainage Systems

Over **1,950 km** Linear Drainage Systems with more than **69,000** Drainage Point Items, and **520** Attenuation Areas



5. Fencing & Noise Barriers

More than **2,500 km** Boundary Fencing / Noise Barrier, and c. **2,500 km** Safety Barrier



6. Pedestrian & Cycle Facilities

156km of Pedestrian/Cycle Facilities, and over **700km** of Kerbing



10. Depots & Buildings

26 Depots with Land Area **23 ha** and Buildings with Total Floor Area more than **25,500 m²**



11. Winter Service Facilities

106 Winter Service Fleet, **363** Other Vehicles/Plants, and over **110,000 Tonnes** Salt Storage and **270,000 litres** Fuel Storage Facilities



12. Staffing

454 Full-time and **179** Part-time Personnel

AM Objectives and KPI Themes

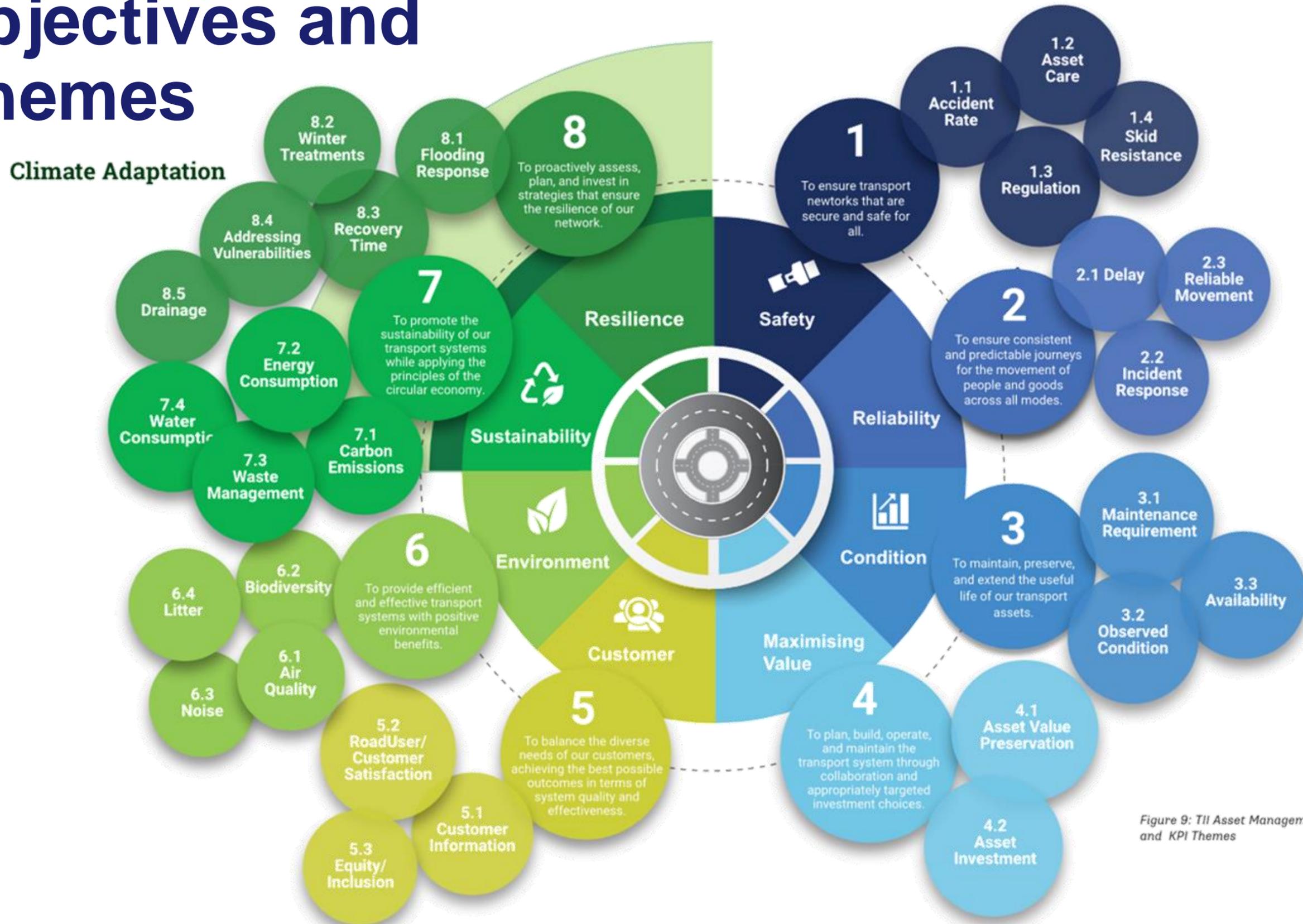


Figure 9: TII Asset Management Objectives and KPI Themes



Safety

To ensure transport networks that are secure and safe for all.

Themes	Basis for Indicators	Potential Metric	Implementation
Accident Rate	Collision/fatality/injury statistics	Contractor lost time accident frequency rate	Present
Asset Care	Procedural compliance for identification, rectification of hazards	Percentage of safety inspections and patrols carried out	Present
		Average defect repair time - Cat 1 / Cat 2 / Overall	Present
Regulation	Compliance with regulations/standards for safety critical assets - e.g. condition of statutory signs	Sign retroreflectivity	Future
Skid Resistance	Annual skid resistance monitoring programme	Percentage of traffic on roads with SC value within 5 points of IL	Present



Reliability

To ensure consistent and predictable journeys for the movement of people and goods across all modes.

Themes	Basis for Indicators	Potential Metric	Implementation
Delay	Minimise delay caused by lane closures	Static lane closures exceeding permitted contract times	Present
		Average additional delay due to roadworks, compared to a benchmark journey time before roadworks were in place.	Future
	Overall measure of travel time	Difference between the observed travel time and the speed limit travel time	Future
Incident Response	Efficiency of incident response	Incident response times	Present
		Percentage of incidents responded to within target time for each category of response	Present
Reliable Movement	Importance of reliability to freight movement	Freight travel time reliability	Future
	Network availability/non availability	Percentage of time that network is available for uncongested use	Future



Condition

To maintain, preserve, and extend the useful life of our transport assets.

Themes	Basis for Indicators	Potential Metric	Implementation
Maintenance Requirement	Condition mapped against acceptable level	Asset condition (Percentage in desired condition/ acceptable condition)	Present
Observed Condition	Asset condition	Pavement surface health	Present
		Pavement surface safety (skid resistance)	Present
		Pavement structural health	Present
		Bridge condition rating	Present
		VRS - condition rating and defect reporting	Future
		Lighting - condition rating and defect reporting	Future
Availability	Asset performing as expected	Street lighting operational	Present
	Measure of availability	Percentage of time that roadside technology assets are available and functioning.	Present



Maximising Value

To plan, build, operate, and maintain the transport system, through collaboration and appropriately targeted investment choices.

Themes	Basis for Indicators	Potential Metric	Implementation
Asset Value Preservation	Investment vs. depreciation cost	Change in asset € value	Future
Asset Investment	Level of funding compared with funding needs	Asset Sustainability Index (% needs funded), ASI (Maintenance), ASI (Renewals) etc.	Present



Customer

To Balance the diverse needs of our customers, achieving the best possible outcomes in terms of system quality and effectiveness.

Themes	Basis for Indicators	Potential Metric	Implementation
Customer Information	Accuracy and timeliness of information	Use of and accuracy of ITS signage messaging	Present
Road User / Customer Satisfaction	Customer experience of network	Perceived quality of the maintenance of roads based on annual survey of road users	Future
		Percentage of drivers who are satisfied with their journey on the MMARC/PPP road network	Future
		Percentage nighttime works to minimise disruption to users on high occupancy routes	Future
Equity/ Inclusion	Awareness of customer needs	Percentage of customer facing staff that have completed disability awareness training	Present



Environment

To provide efficient and effective transport systems with positive environmental benefits.

Themes	Basis for Indicators	Potential Metric	Implementation
Air Quality	Proportion of network in exceedance of air quality targets	Percent length of managed motorway network in exceedance of the legal nitrogen dioxide (NO2) limits	Future
Biodiversity	Management of invasive plant species	No. or area of invasive alien plant species treatments required	Future
		Biodiversity enhancement	Reduction/modification to grass cutting regime
			Implement biodiversity accounting metric
Noise	Noise Measurement	The number of households within mitigated Noise Important Areas where noise complies with noise requirements through funded projects	Future
		Inspection and maintenance of environmental noise barriers	Present
Litter	Clean roadsides	Compliance with litter collection activities	Present

Climate Adaptation



Sustainability

To promote the sustainability of our transport systems while applying the principles of the circular economy.

Themes	Basis for Indicators	Potential Metric	Implementation
Carbon Emissions	Need to reduce carbon emissions from baseline	Scope 1 CO2 emissions from MMARC/PPP activities	Present
		Scope 2 CO2 emissions from MMARC/PPP activities	Present
		CO2 emissions associated with the maintenance fleet	Future
Energy Consumption	Increase direct renewable energy output	kWh of energy generated through own renewable sources	Present/Future
	Need to reduce energy consumption	Reduction in total energy consumed in MMARC/PPP activities	Present
		kWh of energy used for public lighting	Present
Waste Management	Circular economy	Percentage of waste materials re-used or recycled	Present
Water Consumption	Water reduction	Percentage of water used collected from rainwater	Present



Resilience

To proactively assess, plan, and invest in strategies that ensure the resilience of our network.

Themes	Basis for Indicators	Potential Metric	Implementation
Flooding Response	Flood risk management	Number of reported flooding incidents	Present
		Lane closure duration on the managed motorway network due to flooding	Future
Winter Treatments	Winter network resilience	Percentage of winter service treatments carried out in compliance with the required timescale	Present
Recovery Time	Mitigating climate change	Time to restore minimum required performance level after disruption	Future
Addressing Vulnerabilities	Addressing resilience	Percentage of investments addressing identified vulnerabilities (may need Vulnerability Index)	Future
Drainage	Mitigating climate change	Percentage length of carriageway that is not susceptible to carriageway surface water problems	Present

Carbon Reduction, Climate Adaptation and Asset Management

AM Objective	Potential Metrics (Present)	Potential Metrics (Future)
Sustainability	<ul style="list-style-type: none"> • Scope 1 CO2 emissions rel. to baseline • Scope 2 CO2 emissions rel. to baseline • Maintenance fleet converted to EV (%) • Reduction in total energy consumed • Proportion of lighting that is LED • Percentage of water from collected rainfall • CO2 emissions associated with the maintenance fleet 	<ul style="list-style-type: none"> • kWh of energy generated through own renewable sources
Resilience	<ul style="list-style-type: none"> • Number of reported flooding incidents • Percentage of winter service treatments in compliance with required timescale • Percent carriageway length not susceptible to carriageway surface water problems 	<ul style="list-style-type: none"> • Lane Closure duration due to flooding • Time to restore minimum required performance level after disruption • Percent of investment addressing identified vulnerabilities

- Sustainability objective: Key Performance Indicators relating to **Carbon Emissions, Energy Consumption, Waste Management and Water Consumption** on the managed motorway network are introduced
- Resilience objective, KPIs relating to **Flooding Response, Drainage, Winter Maintenance, Addressing Vulnerabilities and Recovery Time** have been developed

Summary of Improvement Actions

Areas	Actions	Climate	Sustainability	Risk
 <p>Pavement</p>	Review and update trigger levels and KPIs, integrating whole-of-life analysis with a focus on embedded carbon.	✓		
	Consider expanding annual condition inspections to assess additional lane characteristics.			✓
	Monitor the composition of bituminous binders to ensure future achievement of surface lifespans.			✓
	Evaluate the feasibility of replacing bituminous binder with bio binders for carbon reduction, considering longevity effects.	✓		✓
	Innovatively use rejuvenators on the MMaRC and PPP networks to extend effective surface life.		✓	
	Consider increased use of high PSV recycled aggregate in surface layers for sustainability and circular economy benefits.		✓	
	Continue to develop innovative tests for aggregate skid resistance to expand sources of high skid resistance aggregates.		✓	
 <p>Structures</p>	Develop a costed asset renewal programme for bridge components to secure funding for life cycle interventions.			✓
	Implement periodic repainting of steel bridge elements to prevent corrosion and maintain structural integrity.			✓
	Prepare for bridges' handover from PPP to direct TII management. Develop policies and allocate resources for maintenance transfer, including assessment timing and funding.			✓
	Establish a separate management structure for large-span cable-stayed structures from inspection through post-handover maintenance.			✓
	Implement dTIMS bridge management software for prioritised repair and rehabilitation, enabling long-term forecasting under varied funding scenarios.			
	Conclude research on probabilistic-based bridge performance modelling, using the EIRSPAN database for lifecycle cost analysis of road network structures.			

Areas	Actions	Climate	Sustainability	Risk
 <p>Geotech Assets</p>	<p>Implement Asset Management concepts for geotechnical assets, including slopes, embankments, walls, and unstable subgrades, to effectively measure and manage life-cycle risk, performance, and investment.</p>		✓	✓
 <p>Intelligent Transport Systems (ITS) Assets</p>	<p>Evaluate emerging tolling technologies within the evolving landscape of telematics and Intelligent Transportation Systems (ITS)..</p>		✓	✓
	<p>Periodically review the necessity of maintaining a network of roadside telephones in a mobile phone-saturated environment.</p>			
	<p>Regularly review asset lifespans, adopting maintenance approach reflecting technological advancements and power sources.</p>			✓
	<p>Continuously reassess Variable Messaging Systems (VMS), especially regarding ongoing developments in Connected Autonomous Vehicles (CAV) technology.</p>			
	<p>Continue developing and utilising degradation models in the Asset & Fault Management System (AFMS) to guide timely and cost-effective interventions for TII's ITS equipment.</p>			✓
 <p>Drainage and Hidden Assets</p>	<p>Map and classify current drainage assets, including gullies, channels, chambers, drains, and pipes, for climate adaptation purposes.</p>	✓	✓	✓
	<p>Perform vulnerability mapping and establish a programme to address high-risk areas identified in the assessment.</p>	✓	✓	✓
	<p>Evaluate existing culvert capacity considering future rainfall predictions.</p>	✓	✓	✓
	<p>Assess the risk of Bridge Scour under present and anticipated climatic conditions.</p>	✓		✓
	<p>Formulate a Bridge Scour Mitigation Programme as needed, which may include retrofitting measures for existing bridges.</p>	✓		✓
	<p>Develop comprehensive ducting mapping, including location and capacity details over time, to support effective asset management.</p>	✓		✓

Areas	Actions	Climate	Sustainability	Risk
 <p>Road Signing and Delineation</p>	Assess biodiversity measures' impact on drivers' sight-lines, addressing inappropriate planting obscuring visibility.	✓	✓	
	Evaluate sign cleaning cycle (frequency and effectiveness) to optimise lifespan and visibility day and night.			✓
	Review how retroreflectivity surveys can strategically target road marking replacement in addition to cyclical approaches.			✓
	Evaluate and adjust winter maintenance activities in anticipation of a reduced number of frost days due to projected warming.	✓	✓	✓
	Assess increased rainfall impact on surface water layer thickness. Review road marking material specifications and consider alternatives for varying water thicknesses due to intensified rainfall.			
	Prioritise consistent and detectable lane markings and delineators to ensure reliable CAV navigation.	✓	✓	✓
 <p>Landscaping</p>	Support long-term landscape management through consistent implementation of short-term maintenance and operational procedures.	✓		
	Facilitate successful landscape management through robust contact requirements and reviews	✓		
	Ensure planning and design guidance creates resilient, functional, and self-sustainable landscapes.		✓	
	Map the landscape to establish baseline data, enabling ongoing reporting to monitor landscape as resources change.		✓	
	Investigate the value of existing or planned TII landscapes concerning carbon storage and sequestration.		✓	
	Develop action plans for extreme weather events in landscape management, including winter storms and summer droughts.	✓	✓	✓
 <p>Lighting</p>	Continue with the 'Switch-Off Programme' and monitoring of both treated and control sites.	✓	✓	
	Investigate and monitor speed impacts, maintaining the policy of installing new road markings and studs when removing or switching off lighting.			✓
	Proceed with phased removal of redundant lighting poles at MMarC and PPP junctions, prioritizing locations without safety barrier protection for lighting poles.	✓		

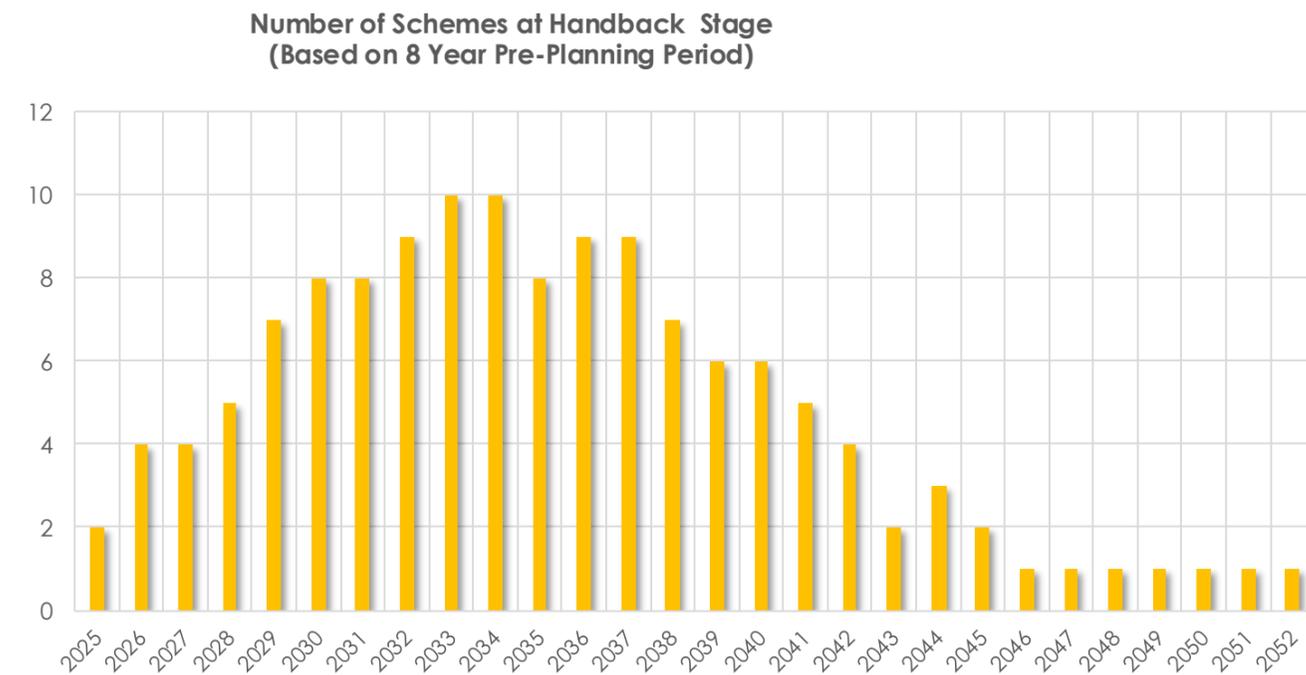
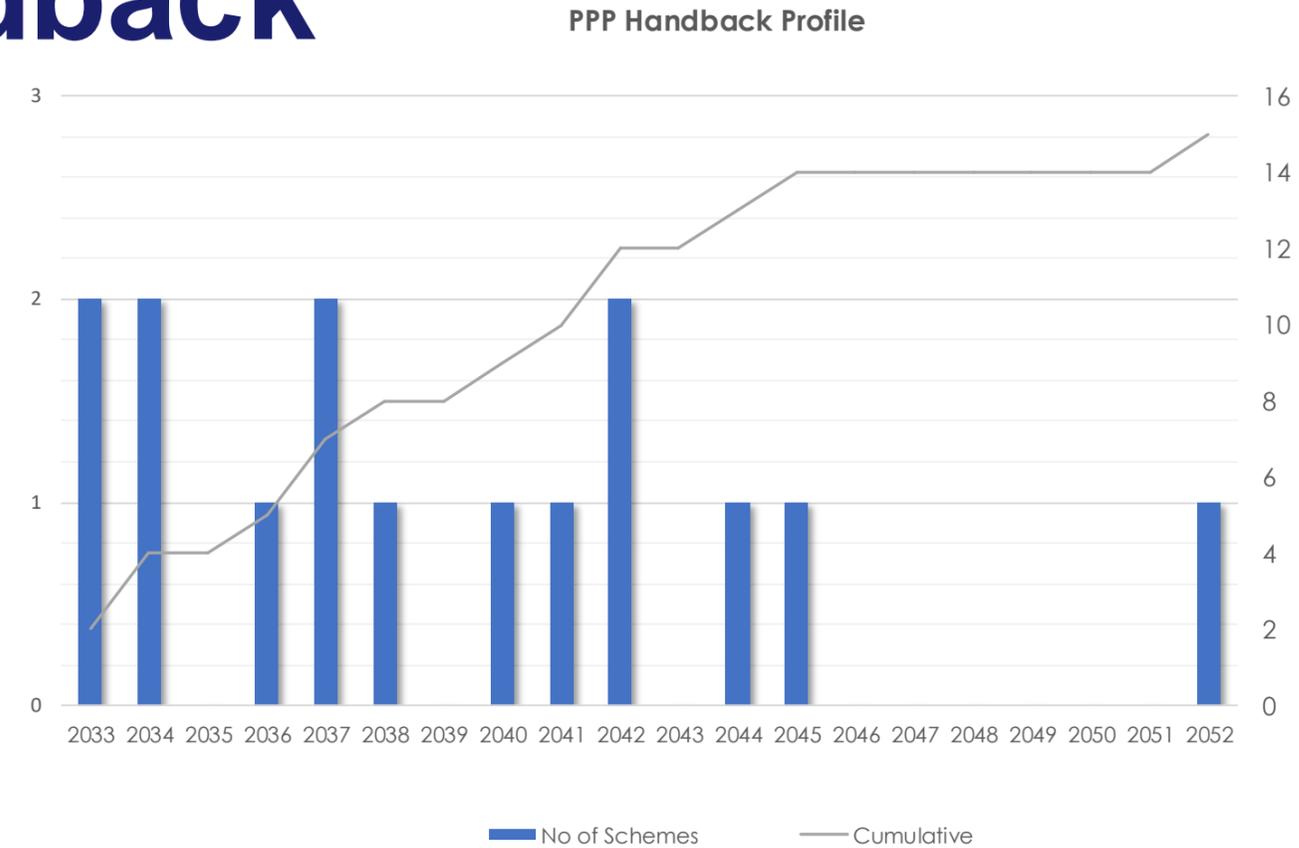
Areas	Actions	Climate	Sustainability	Risk
 <p>Biodiversity</p>	Develop a biodiversity accounting metric for new projects and track progress on project-specific biodiversity enhancements.		✓	
	Establish the biodiversity baseline of the entire TII Network using the biodiversity accounting metric.		✓	
	Implementation of targeted research, mitigation, and, where applicable compensation.		✓	
	Identification and mitigation, where feasible, of priority species collision hotspots on the existing road network.		✓	
	Eradicate, control and prevent the spread of Invasive Alien Species on new projects and the existing network.		✓	
 <p>Asset Management Information & Systems</p>	Integrate asset age and condition information from TII systems like dTIMS and EIRSPAN/dTIMS with selected outputs from MMaRC and PPP databases, and maintenance contractors.		✓	
	Establish automated processes with FME technology for seamless integration across systems, enhancing data analysis capabilities.			✓
	Expand MapRoad system use to MMaRC contracts for easy recording and geo-referencing of detailed project information. Encourage PPP operators to adopt same approach.			✓
	Capture geo-referenced and detailed records of maintenance and renewal activities for various asset types on a routine basis.		✓	
	Develop a standardised coding system for all assets, potentially aligning with TII Specifications for Road Works Series, for detailed expenditure breakdown by asset type.			
 <p>Lifecycle Planning</p>	Develop a holistic cost-benefit analysis approach, considering factors beyond the asset's lifespan, such as safety, traffic delays, and embodied carbon.			
	Incorporate costs related to embodied and emitted carbon directly resulting from road construction or maintenance, including road user effects from these activities.	✓		✓
	Endeavour to minimise all relevant and quantifiable costs over the asset life cycle while maintaining the required performance.	✓		✓

Areas	Actions	Climate	Sustainability	Risk
 <p>Reporting</p>	Assess additional data collection needs to support enhanced programs for signs, road markings, VRS, and other assets on MMARC and PPP sections.			✓
	Enhance data collection, reporting, and analysis to align with existing and proposed KPIs for the eight Asset Management objectives.	✓	✓	✓
	Prioritise Climate Adaptation objectives, focusing on Sustainability and Resilience KPIs.	✓	✓	
	Establish a systematic approach for monitoring and reporting progress in carbon reduction, responding to the growing requirement in these areas.	✓		
	Implement projects identified in TII's Climate Action Roadmap to reduce scope 2 emissions by 2030 on managed motorway sections.	✓	✓	
	Continuously measure, monitor, and improve performance related to scope 1, 2, and 3 emissions on the managed motorway network.	✓	✓	
	Analyse multi-year KPI data to set meaningful targets aligned with TII's established goals, particularly in areas such as Climate Adaptation and Response.			✓
	For newly proposed KPIs, assess trends and compare with international benchmarks before establishing realistic targets.			✓

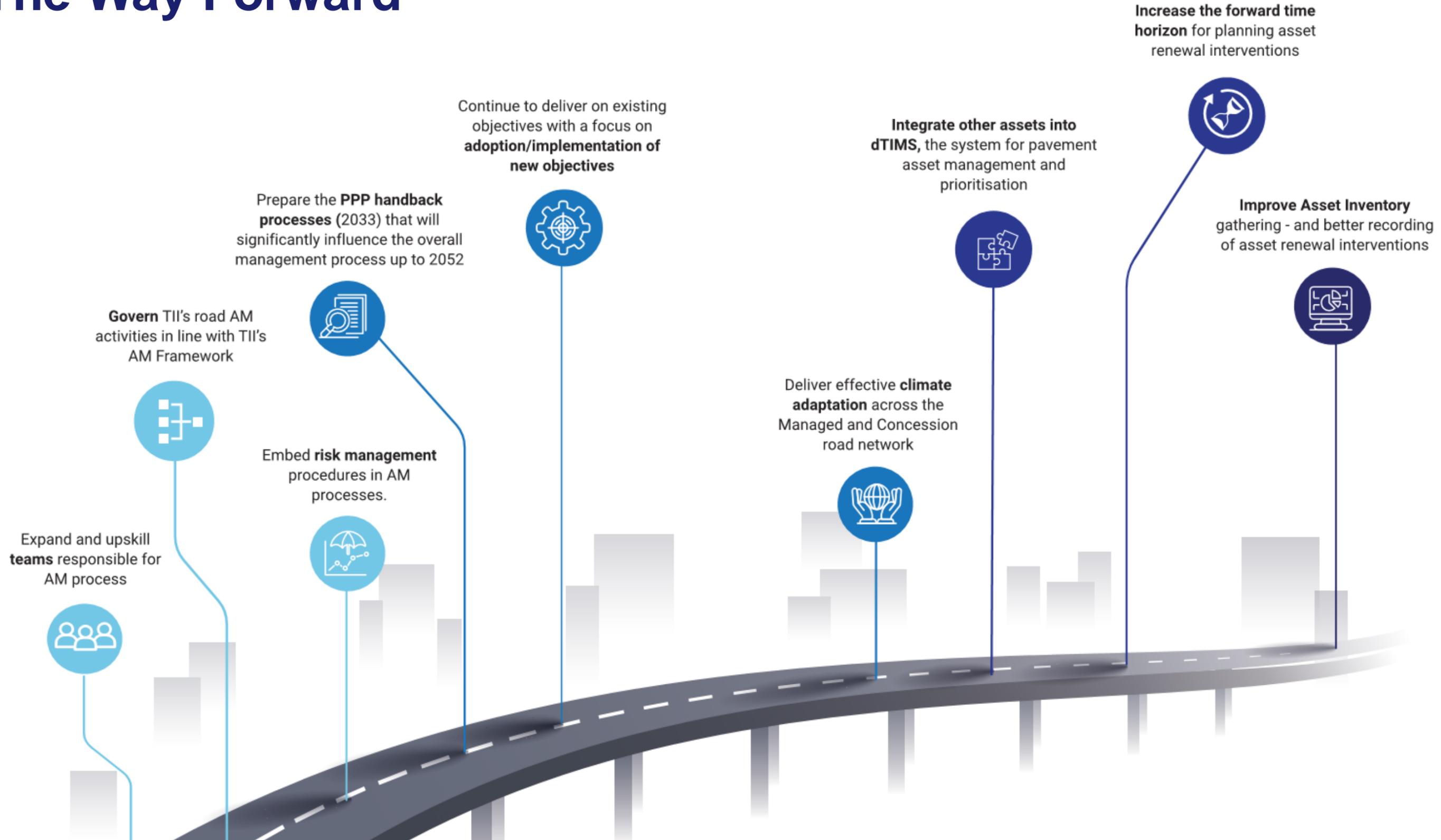
Preparation for PPP Handback

First Scheme Handback – 2033 Pre-planning period of 7 to 8 years

Document	Author
Preparing for PPP Contract Expiry – An overview of practical experiences and lessons learned so far.”	EPEC -The European PPP Expertise Centre 2021
“Preparing for PFI Contract Expiry”	Infrastructure and Projects Authority (IPA) UK- 2022
“Managing the Risks of PFI Contract Expiry”	Infrastructure and Projects Authority (IPA) UK- 2021
“Case Studies of Handback Experience with Public-Private Partnerships”	United States Department of Transport-2017
Managing PFI assets and services as contracts end	National Audit Office (NAO) UK -2020



The Way Forward



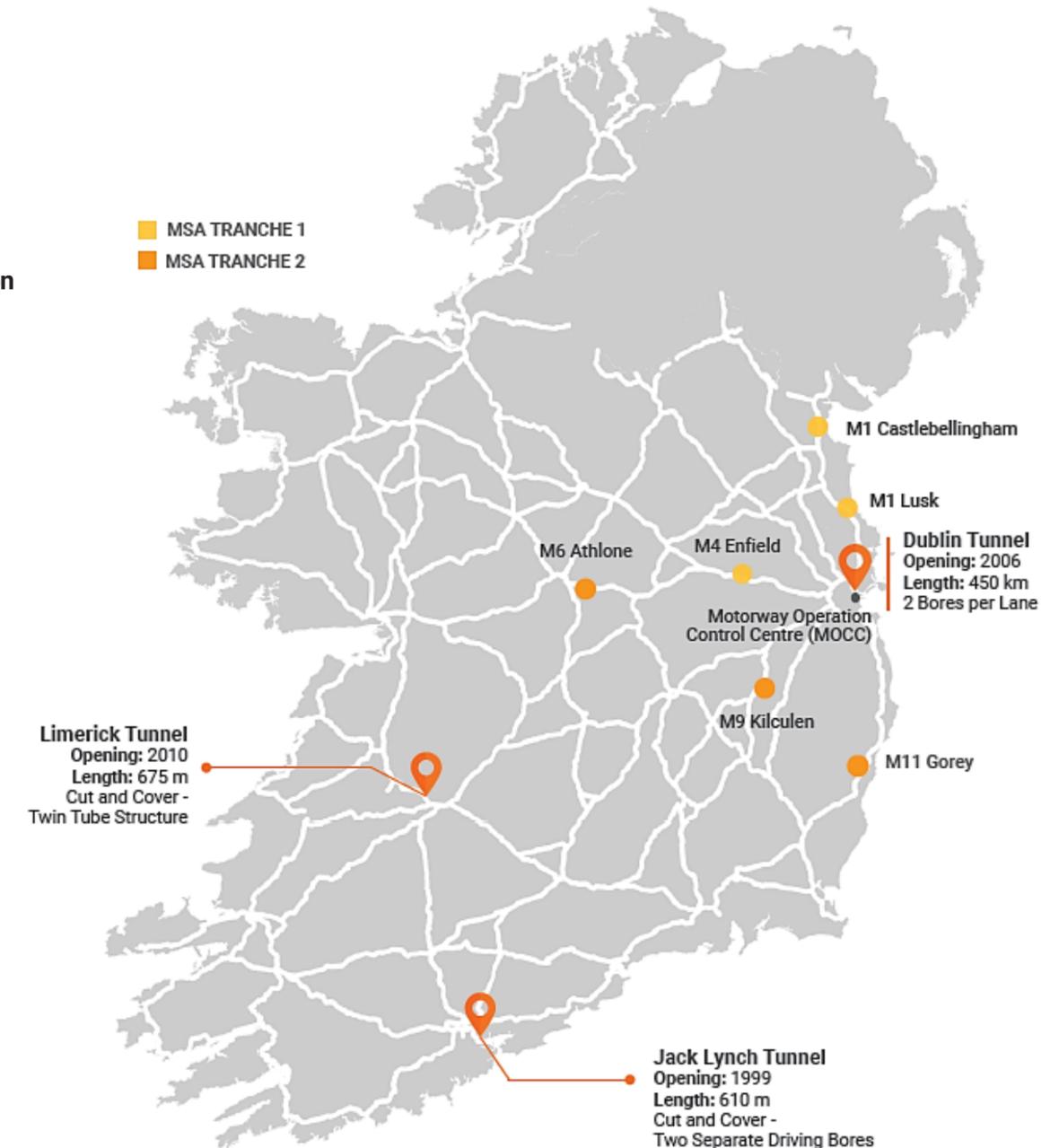
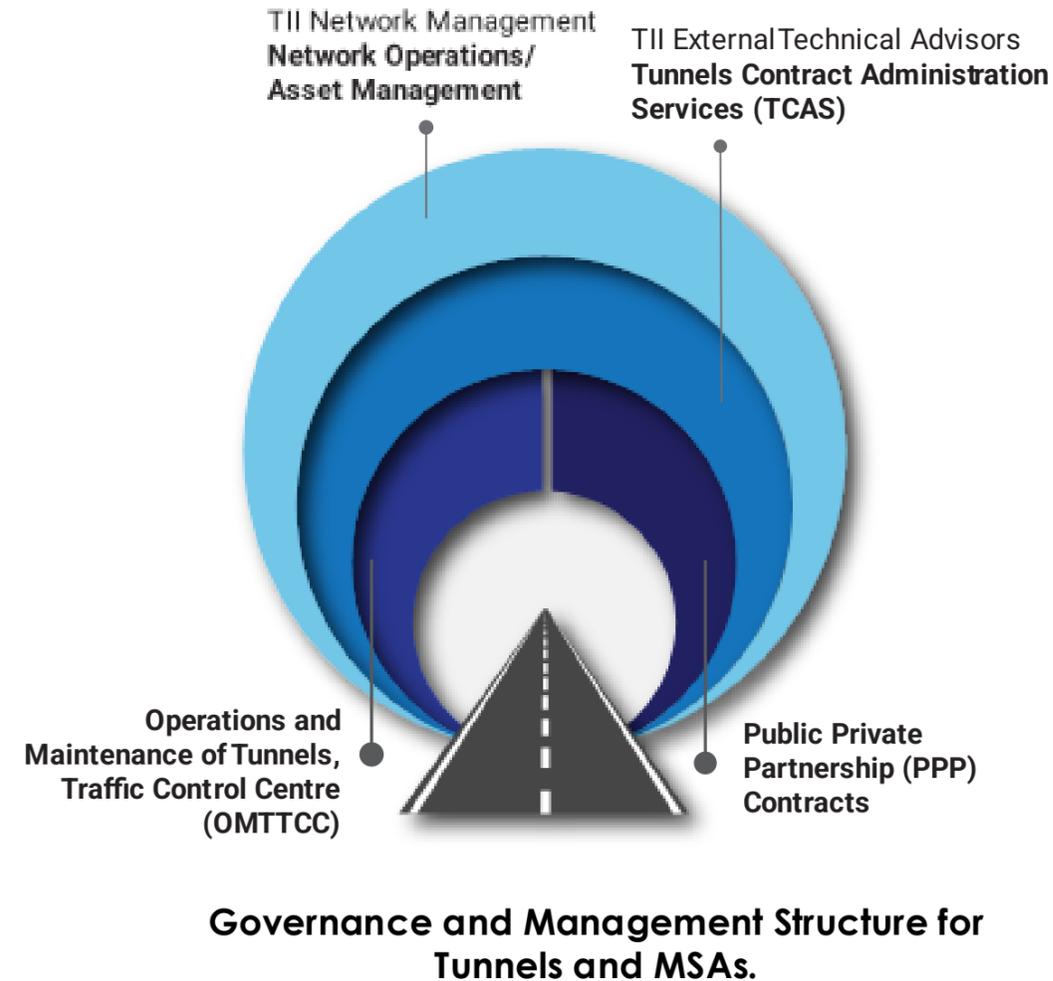
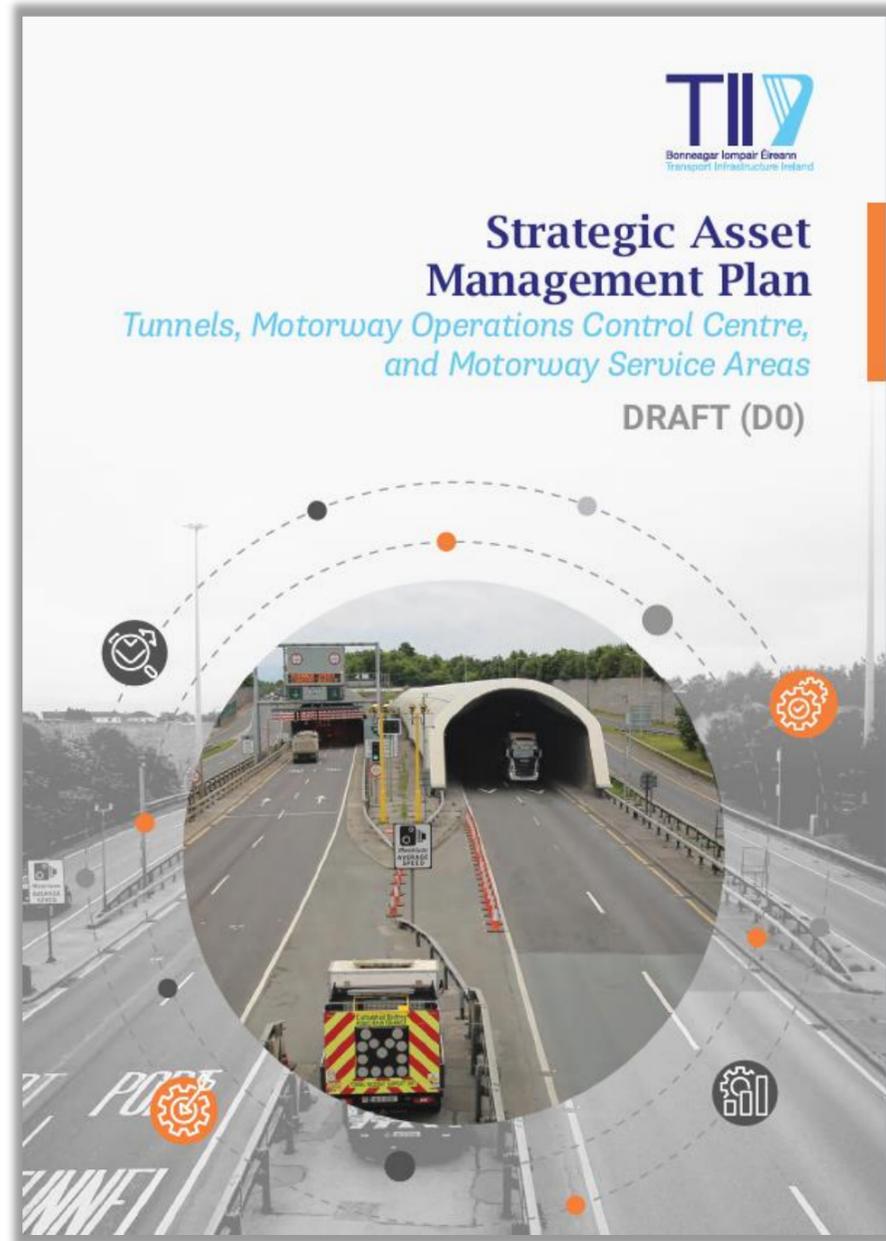


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03 | Next Steps in Asset Management

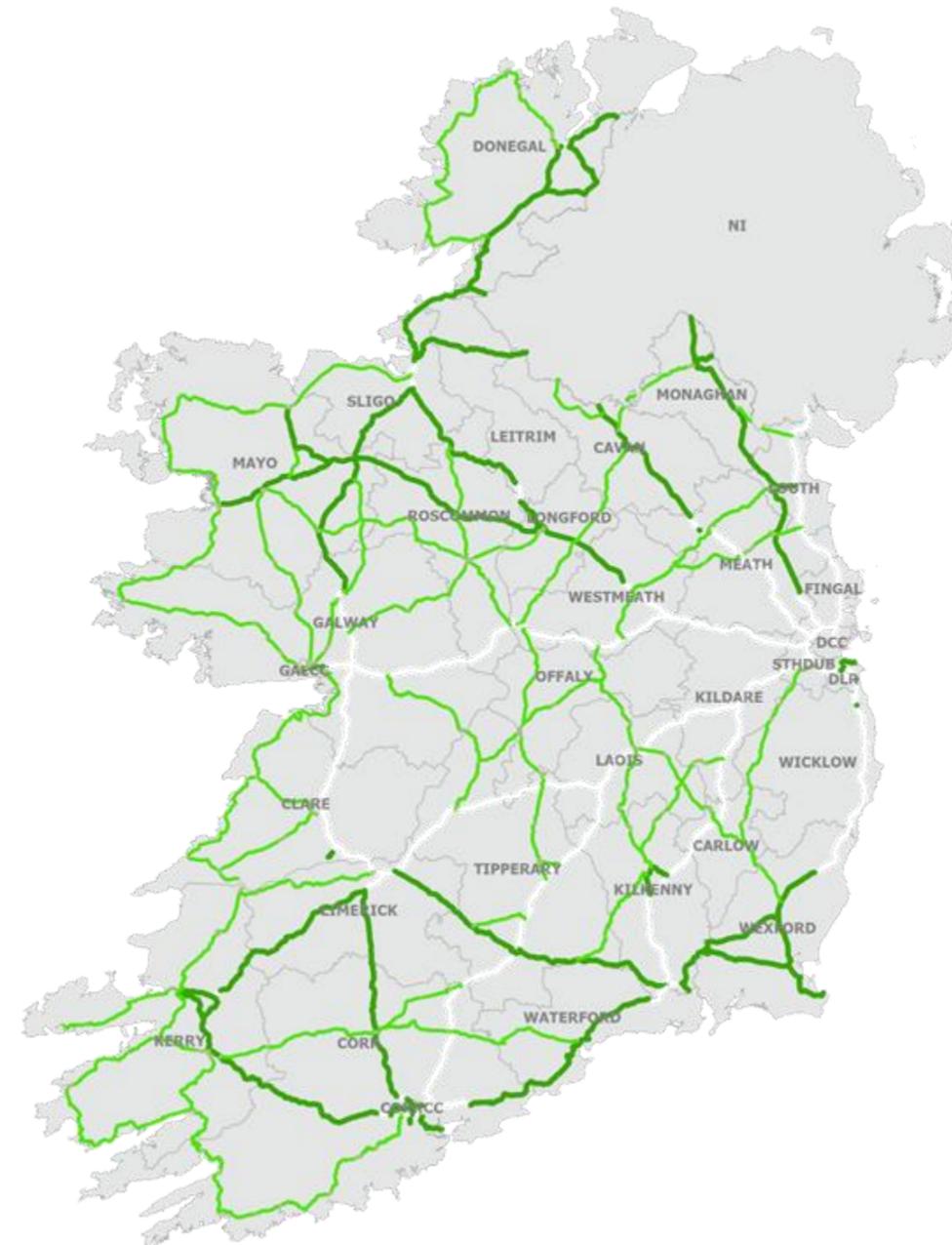
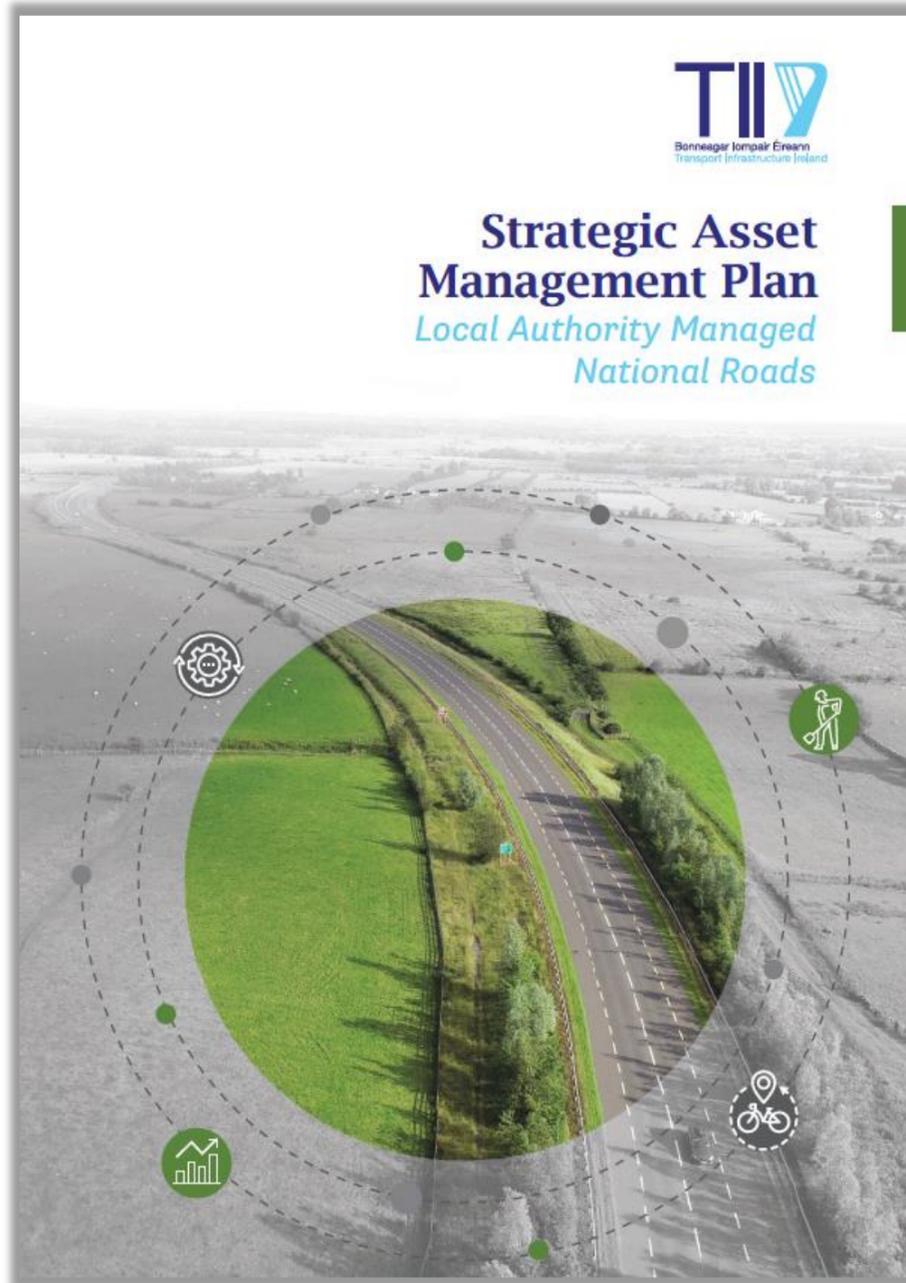


Tunnels MSA MOCC SAMP



Motorway Operation Control Centre (MOCC), Motorway Service Areas (MSAs), and Tunnels.

Local Authority SAMP

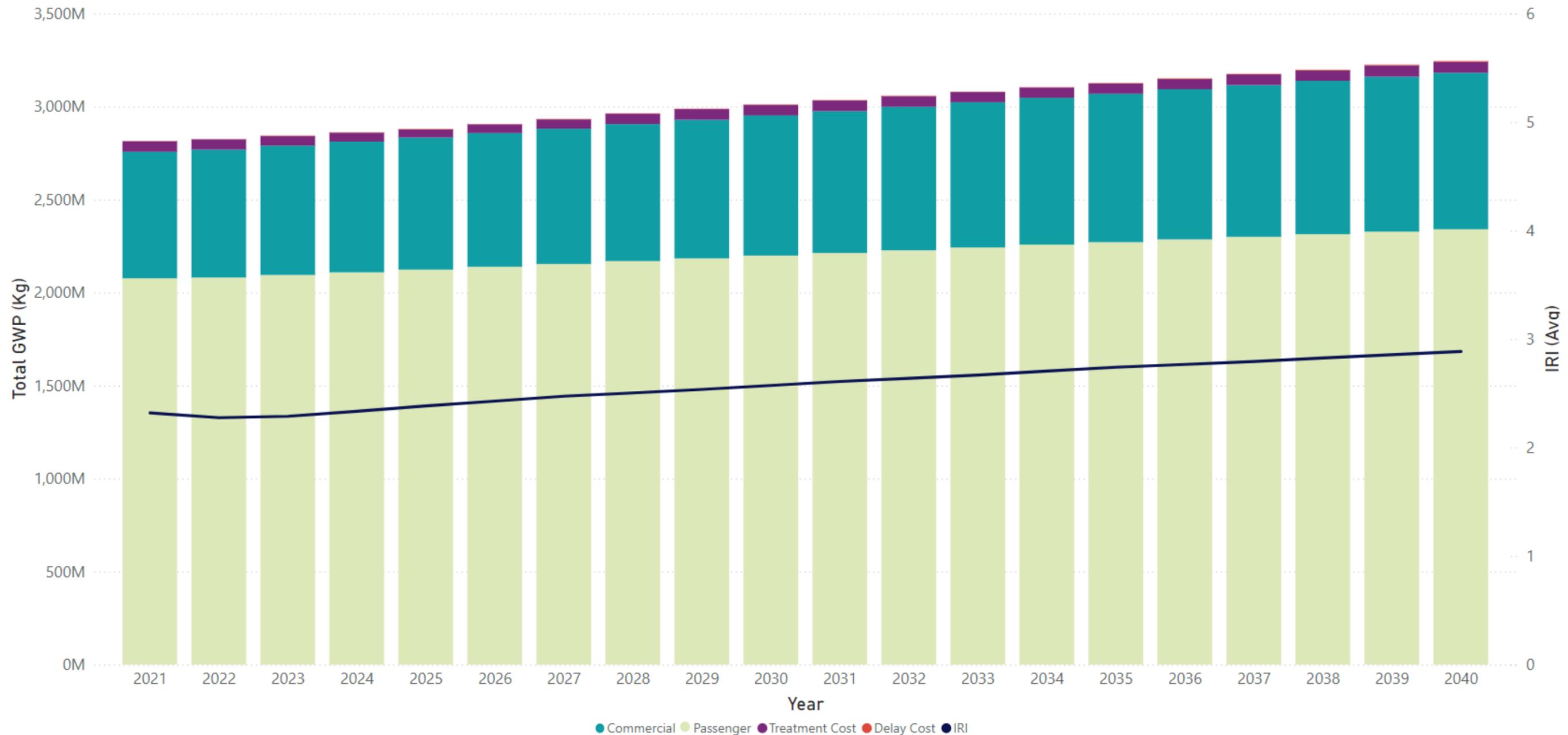


**LA-Managed National Roads: 3968 km
(c. 75% of network)**

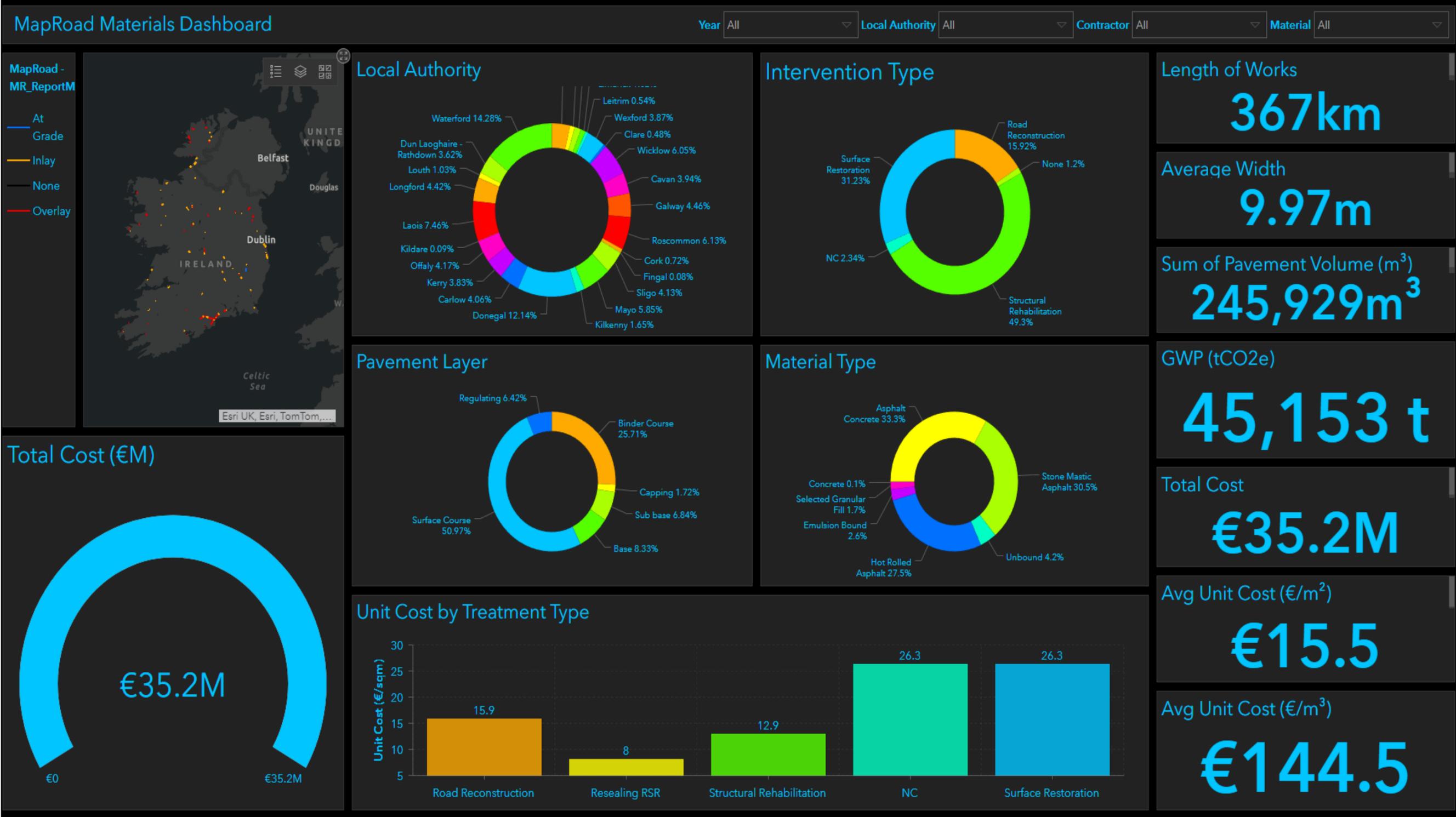
- **Part 1 (Overview)**
Governance structure, management and operations, and funding arrangements for the LA-managed national roads.
- **Part 2 (Assets and Resources)**
Scale and Diversity of Assets being Managed.
- **Part 3 (AM Performance)**
Alignment of LA operations and output with the eight AM objectives set by TII.
- **Part 4 (Continuing Improvement):**
Forward-looking, medium to long-term view of issues that need to be examined and addressed on the LA-Managed National Road Network (Lifecycle Planning, Optimisation, Investment Needs, Programme Development, Reporting).
- **Part 5 (The Way Forward):**
Future directions for asset management, including resources, improving governance, and integrating new asset management objectives.

Carbon Assessment – Pavements – dTIMS EMS

GWP and IRI for Selected Budget Scenarios



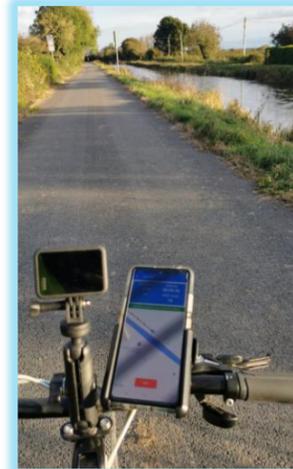
Carbon Assessment – Pavements – Maproad



Active Travel Asset Management – R&D / Innovations

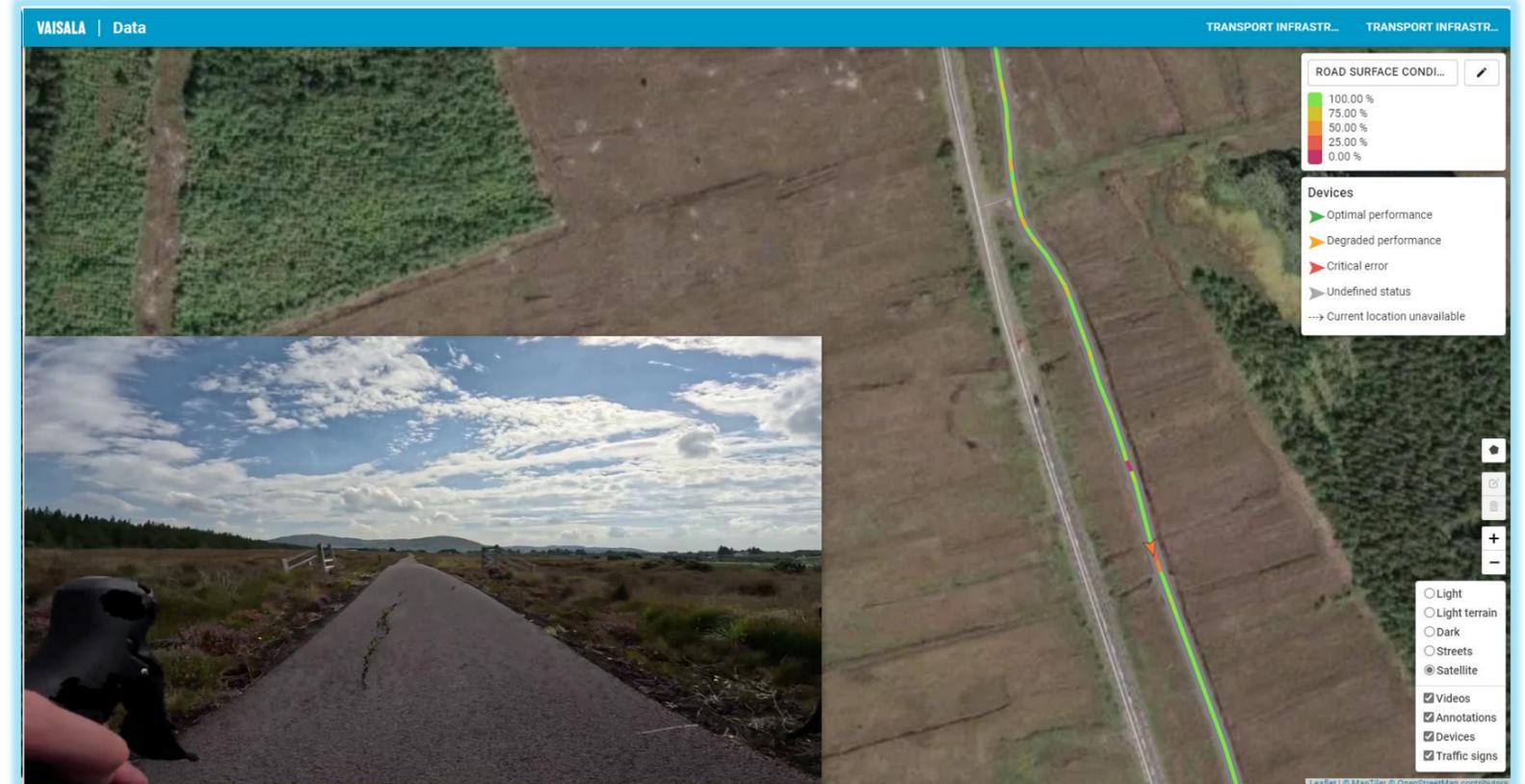
- **Current**

- ESRI AGOL Field Maps Collector App
- GoPro Georeferenced Video– UbiPIX
- Vaisala Road AI App
- MapRoad – Inventory and Data Capture



- **Future**

- University of Galway ATI Machine Learning - Research
- VivaCity AI Sensor
- Trial Xenobike – LiDAR.





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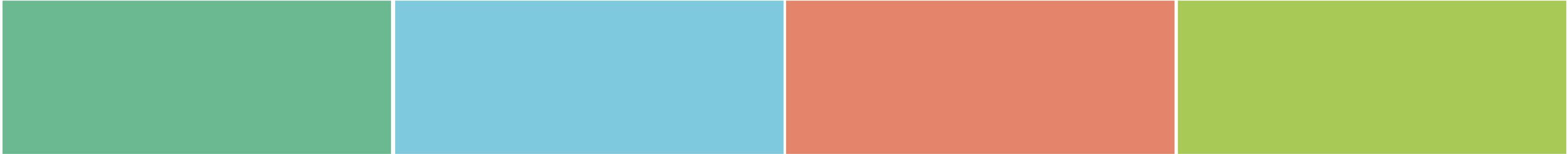


Thank you for your attention



Collaboration between ESB and Road Authorities

Cormac Collins, Networks Projects Delivery Manager, ESB Networks



Agenda

- **Introduction**
- **ESB Networks**
- **Grid Change Drivers**
- **Constructing Grid Infrastructure**
- **Collaboration**

ESB Networks – Facts and Figures 2024

3,900
Employees
Nationwide

>1,100
Irish
Suppliers

€1.2bn
Contribution
to Irish
Economy

€1bn
Annual
Investment

€4bn
in Contractor
Frameworks


c.800
HV Stations


c.157,000 km
Overhead Lines


c.26,000 km
Underground Cables


c.23,000
MV Ground Mounted Subs


c.245,000
MV Pole Mounted Subs

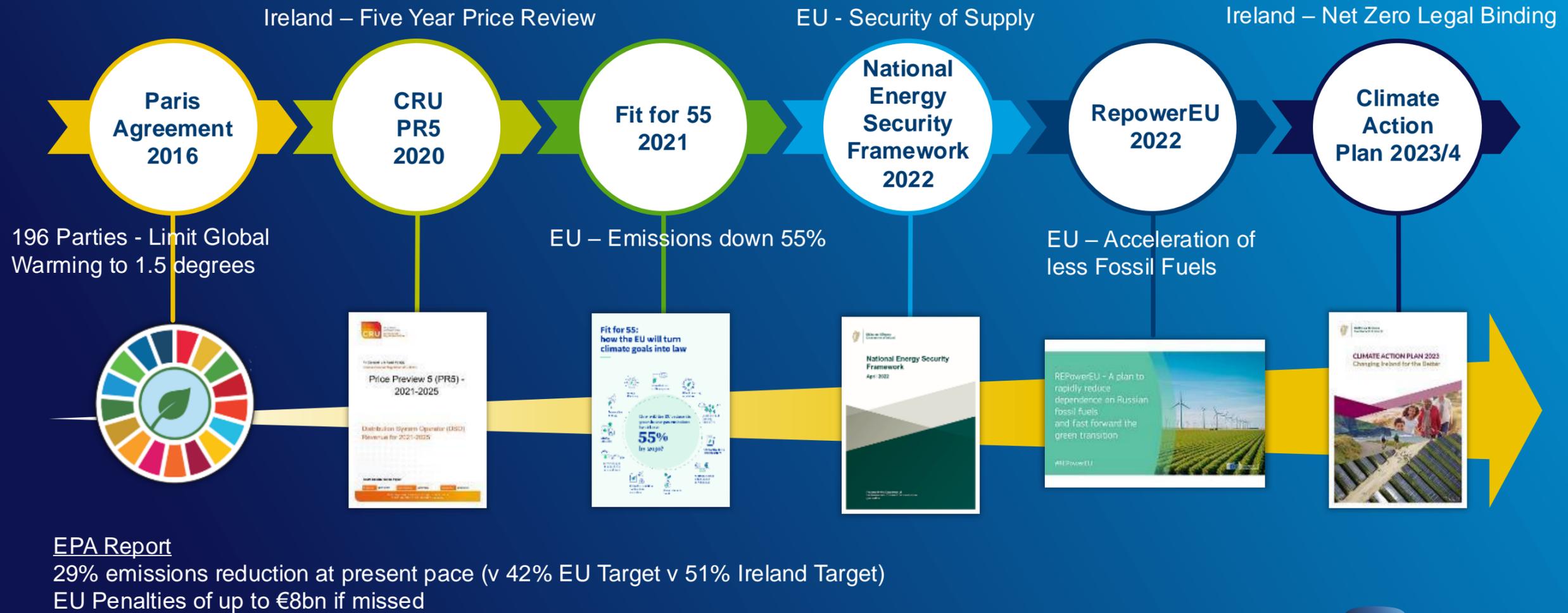

c.175,000
Mini Pillars


c.10,000
Protection Relays

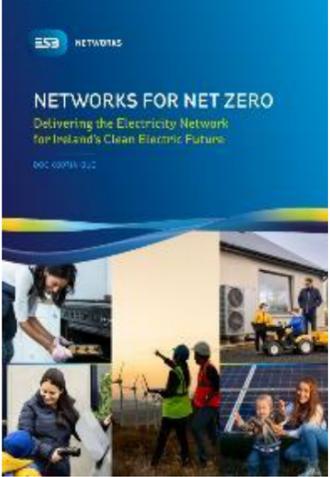
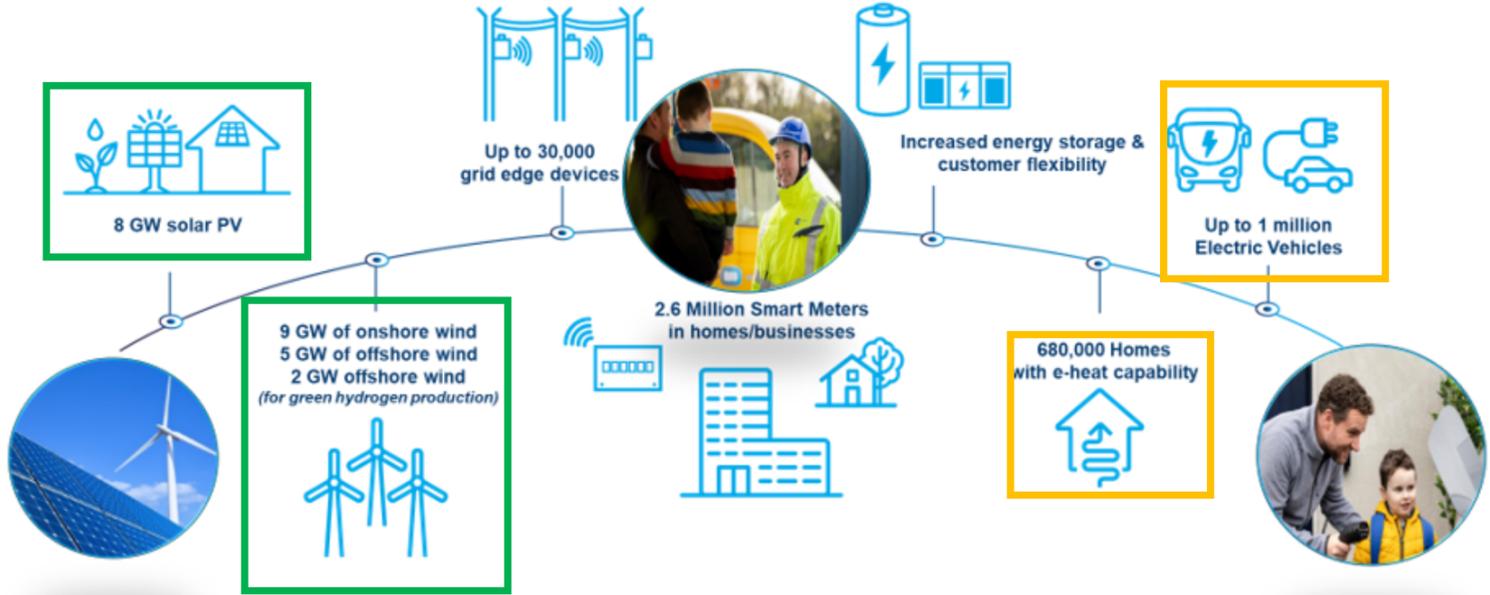
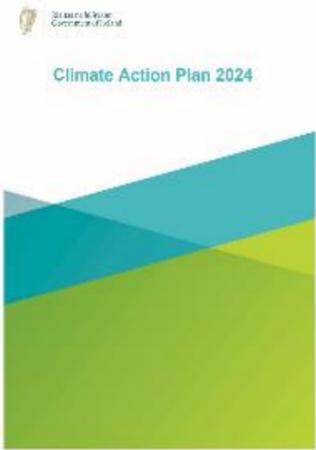

c.2.3 million
Poles


c.2.4 million
Customer Meters

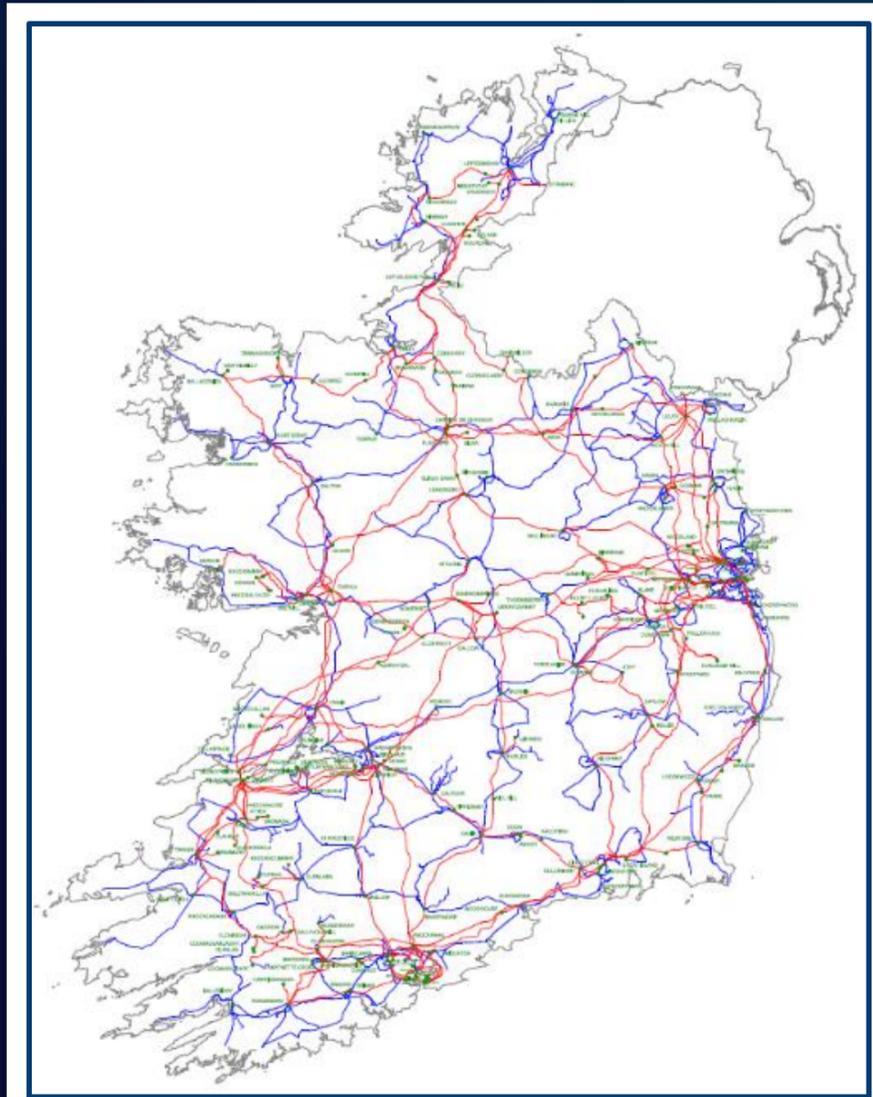
Policy and Regulatory Context



Electrical Energy Landscape



city System and End User



Driver	Indicator	MVA Demand (approx by 2030)
Housing	44,000 housing units per year	~ 792 - 1,452 MVA
Electrification of homes	Retrofitting 280,000 units	~ 280 - 840 MVA
Economy & Industrial Heat	Last 12 months	~ 100 MVA per year
Electrification of Public Transport	Bus Depots, DART+, Metrolink	~ 270 MVA
AFIR (Alternative Fuel Infrastructure Regulation)	Public Re-charging Infrastructure - 945,000 EVs	~ 1,000 MVA
	Ports & Airports	Under Evaluation

Legend:

- Transmission System (all voltage levels)
- High Voltage Distribution System (110 kV in Dublin and 38 kV nationally)
- Interface stations between transmission and distribution system

Grid Construction

Killonan 220kV GIS



Kilnap 110kV GIS



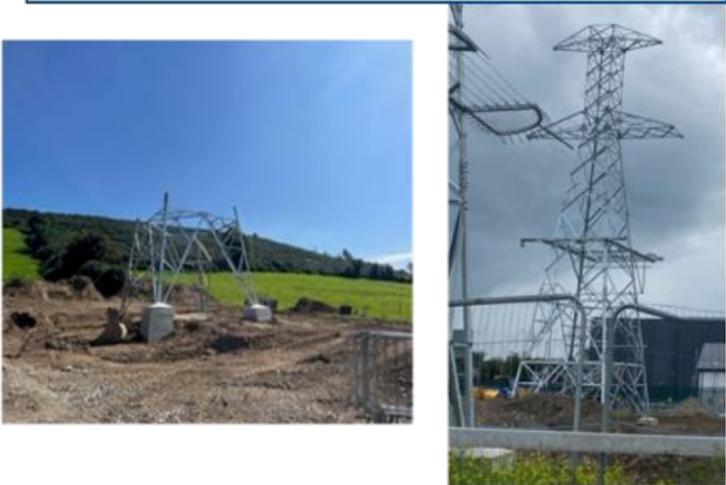
Finglas-Dardistown 110kV Cable



Woodford 38kV Uprate



Laois-Kilkenny OHL Reinforcement



Ballyvouskil StatCom



1950s



Modern Installation



Signage on Approach



TM in place, road opened up



Install Underway



Temporary Reinstatement

Collaboration



Dodder Greenway Phase 4 (during and after)



Templeogue Village Upgrade (during and after)



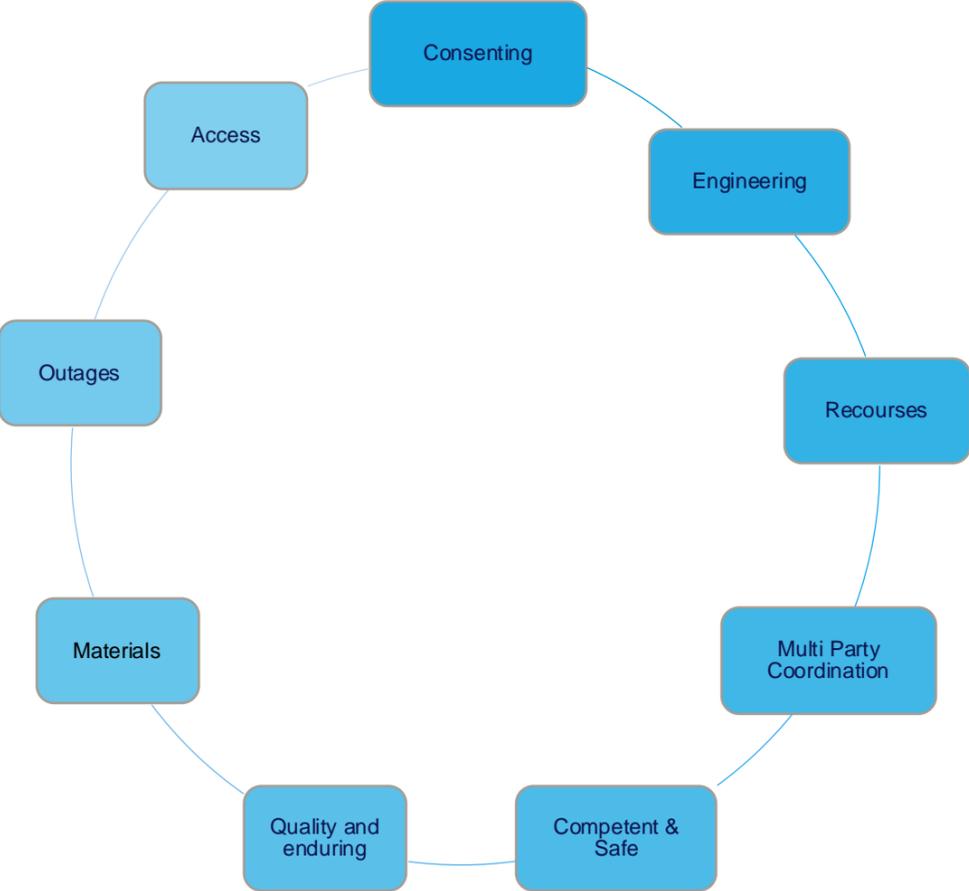
Sub Station



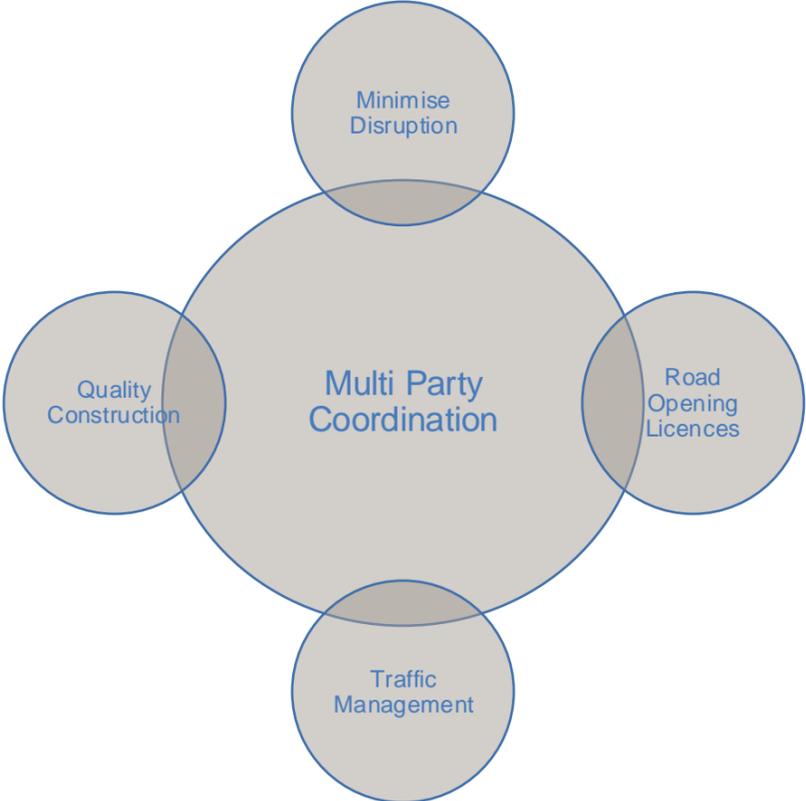
Substations



Project Enablers - Complexities



- HV Interphase Forum
- Dublin Infrastructure Forum





Thank You

Questions: Session 5 Panel

Session 5: Protection & Renewal

Chair: Stephen Smyth, Senior Manager, Pavement Asset Management Programmes, TII

Sustainable Pavement Design and Construction: A case study

Dimitris Michailidis, CEng, Kilsaran

Update on the new Road Safety Audit standard

Martin Deegan, CEng, TRAFFICO

An introduction to Ireland's Supply Chain Sustainability School

*Pamela Sheridan, Operations Manager,
Supply Chain Sustainability School*

Speed Limit Review (2023) and implementation

*John McCarthy, Senior Advisor, Roads,
Department of Transport*

Strategic Asset Management Plan (SAMP) for National Roads.

*Dr Kieran Feighan, PMS Ltd and Gerard
O'Dea, TII*

Collaboration between ESB and Road Authorities

*Cormac Collins, Delivery Manager, ESB
Networks*



End of Session 5

Tea & Coffee Break

Session 6 commences at 11.10am

