TRA

TRANSPORT RESEARCH ARENA BUDAPEST

18-21/05/26

Asset Management Strategy and Strategic Asset Management Plan for Motorways in Ireland

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Agenda

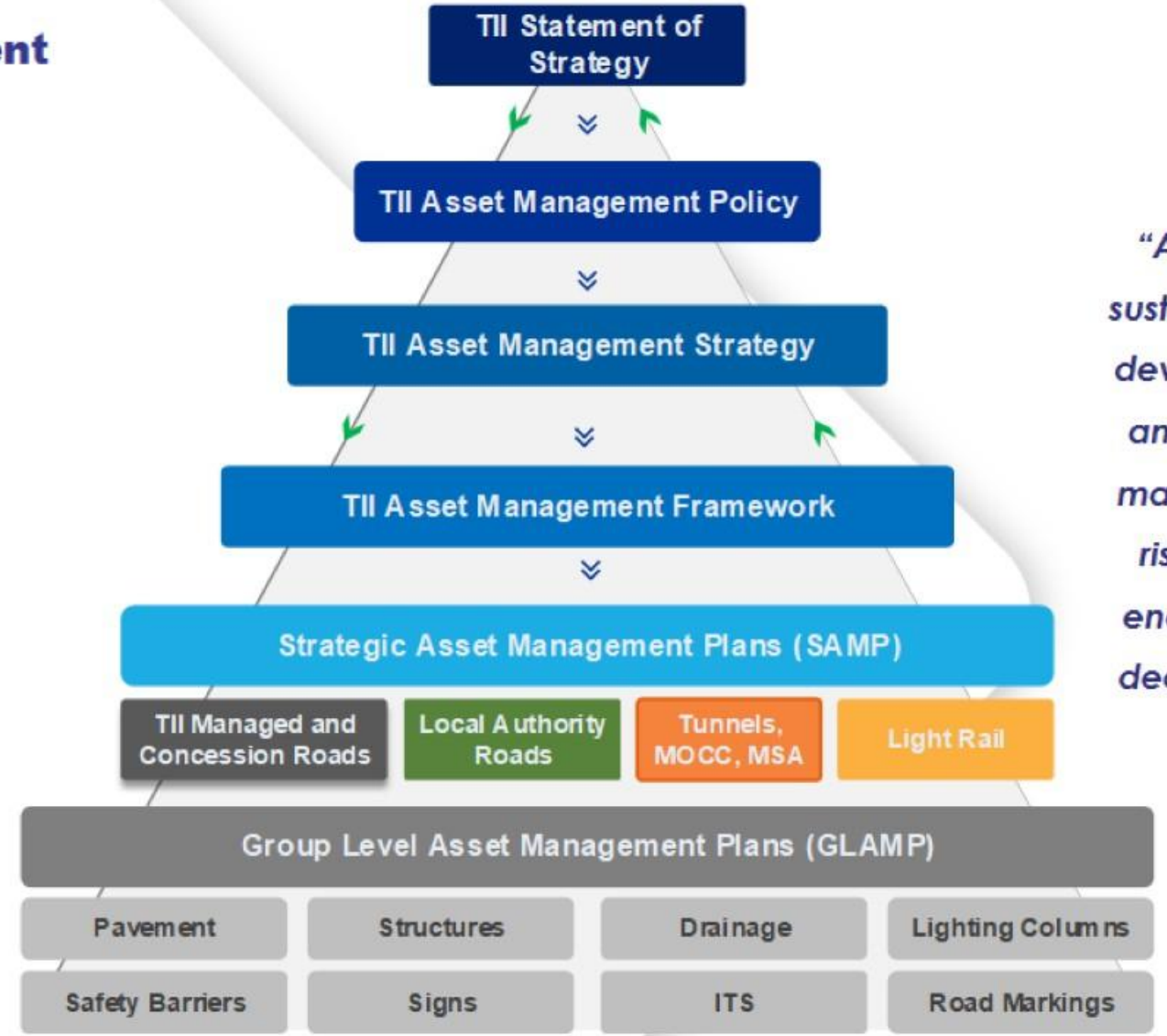
- Introduction
  - Integrated Asset Management Framework
  - Asset Management Objectives
  - Challenges
- Strategic Asset Management Plan for Motorways in Ireland
  - Overview, Governance and Delivery Model
  - Data and Systems
  - Methodology
- Key Performance Indicators (KPIs)
  - AM Objectives and KPIs
- Continuing Improvement
- Key Takeaways and Way Forward

Integrated Asset Management Framework

AM Framework Hierarchy and Objectives

Asset Management Guiding Principles

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"

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

TII Asset Management Objectives

Resilience

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

Safety

To ensure transport networks that are secure and safe for all

Climate Adaptation

Sustainability

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

Reliability

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

Environment

To provide efficient and effective transport systems with positive environmental benefits

Condition

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

Customer

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

Maximising Value

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

Challenges

Climate Risks

Asset Deterioration

Funding Pressures

Strategic Asset Management Plan (SAMP)-Motorways

Overview, Governance and Management Model

Overview

TII directly manage approximately 1,350 km of motorway and dual carriageway routes, providing vital inter-urban links between major cities, ports, and airports. TII oversees governance and operations, through two principal contract mechanisms:

- **Motorway Maintenance and Renewals Contracts (MMaRC)**
- **Public–Private Partnerships (PPP)**

Gross Replacement Cost – excess of € 20 billion- approximately 68% of the total national road network value.

TII's MMaRC Network

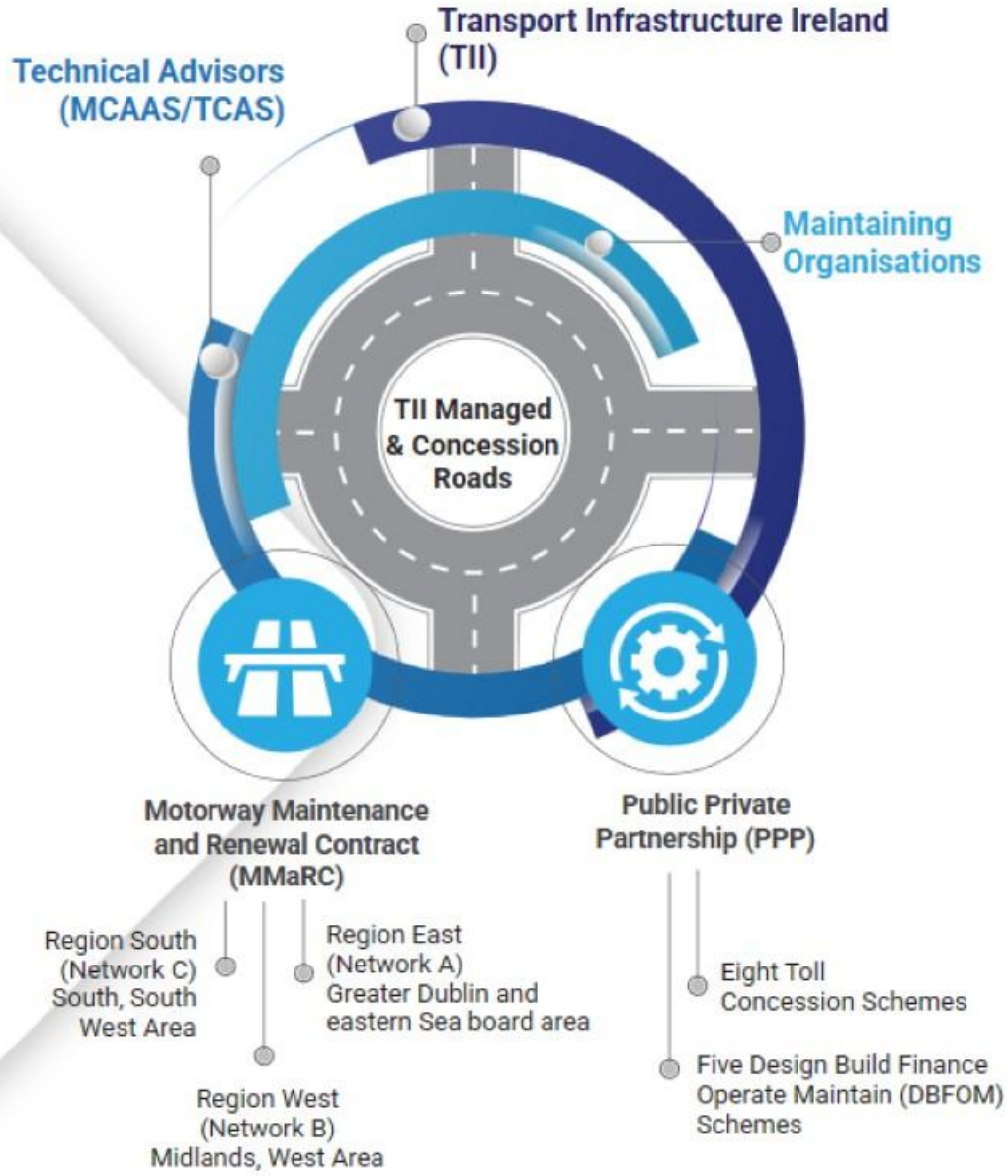
3 MMaRC Networks Contracts - 887 km
(incl. Tasked Maintenance Areas (TMAs))

TII's PPP scheme Network

13 PPP Contracts - 461 km

Governance and Management Model

- The governance structure for TII's managed and concession road network is a three-tier hierarchy comprising TII, its appointed technical advisors, and the maintaining organisations (MMaRC contractors and PPP concessionaires).
- TII provides strategic direction in line with its Asset Management Policy and Framework, technical advisors deliver oversight and monitoring, and maintaining organisations manage day-to-day operations, maintenance, and renewals.
- TII's Network Management Division coordinates planning and delivery, supported by specialist engineering teams, overseeing both regional operations and functional asset management.



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, **1539** 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

TII Data and Systems

Asset & Fault Management System (AFMS)

Traffic Signs, Lines and ITS

SCADA - IBM Maximo Tunnels Management

GIS - Collector Apps

Local Authority Lighting and VRS, Routine Maintenance/DMS

dTIMS Pavement Asset Management System

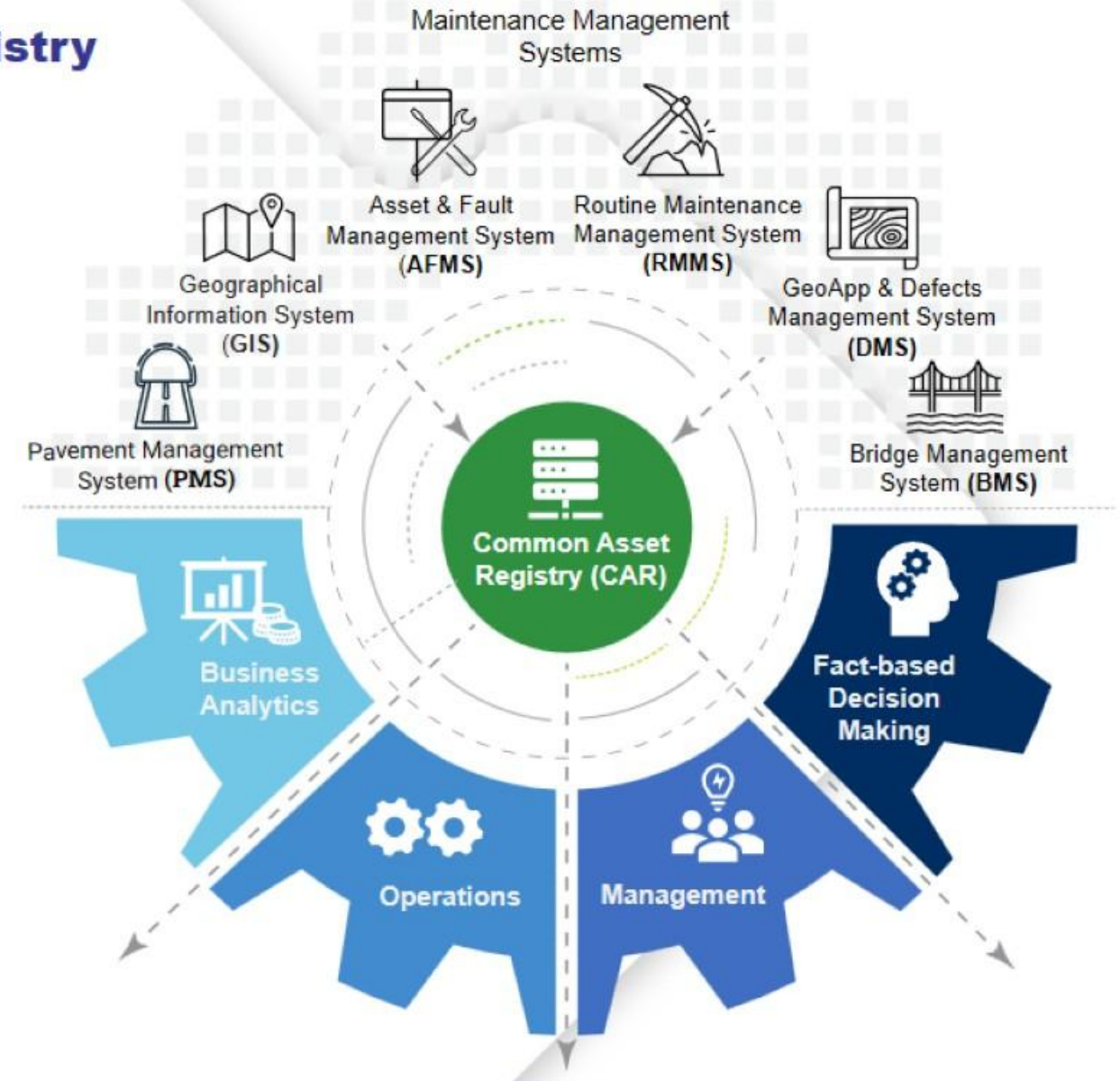
EIRSPAN/dTIMS Bridge Management System

Bridges, Retaining Walls, Gantries, High Masts

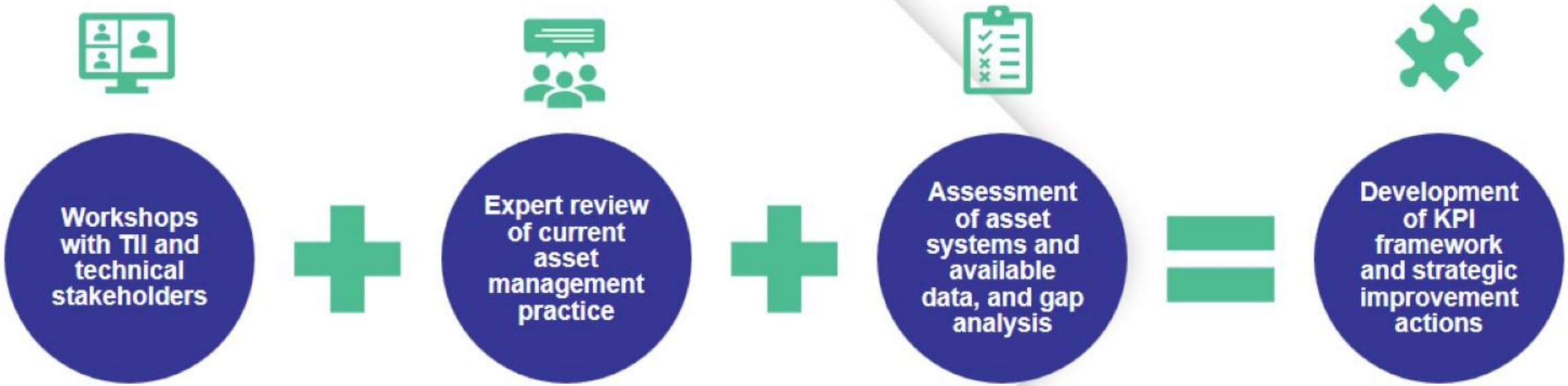
Routine Maintenance Management System (RMMS)

MMaRC Assets
Signs, VRS, Lighting, Drainage

Common Asset Registry (CAR)



Methodology



Key Performance Indicators (KPIs)

Themes and KPIs aligned with AM Objectives

AM Objectives and KPIs Themes

AM Objective and KPIs

AM Objective	Potential Metrics	Implementation
Safety	• Contractor Lost Time Accident Frequency Rate, • % of safety inspections and patrols carried out, • Average defect repair time, • Skid Resistance measurement.	Present
	• Sign Retroreflectivity	Future
Reliability	• Static Lane Closures exceeding permitted times • Incident response times • % incidents responded to within target time	Present
	• Average additional delay due to roadworks • Observed and speed limit travel time difference • Freight travel time reliability • % time that network is available for uncongested use	Future
Condition	• Asset Condition - % in acceptable condition • Pavement Surface Health • Pavement Structural Health • Bridge Condition Rating • Street lighting operational • % of time that roadside technology assets are available and functioning	Present
	• VRS condition rating and defect reporting • Lighting condition rating and defect reporting	Future

AM Objective and KPIs

AM Objective	Potential Metrics	Implementation
Maximising Value	• Asset Sustainability Index - Maintenance • Asset Sustainability Index - Renewals	Present
	• Change in Asset Value	Future
Customer	• Accuracy of ITS Signage messaging • % of relevant staff that have completed disability awareness training	Present
	• Perceived quality of road maintenance • % of drivers satisfied with their journey • % nighttime works to minimise disruption to users on high volume routes	Future
Environment	• Targeted reduction to grass cutting regime • Compliance with maintenance of environmental noise barriers • Compliance with litter collection activities	Present
	• Strategic road network links > legal NOx limits • Implement biodiversity accounting metric • Number or area of invasive alien plant species treatments required • Number of households within mitigated • Noise Important Areas complying with noise requirements	Future

Carbon Reduction, Climate Adaptation and Asset Management

AM Objective	Potential Metrics	Implementation
Sustainability	• Scope 1 and Scope 2 CO_2 emissions rel. to baseline • % Maintenance fleet converted to EV • Reduction in total energy consumed • % of lighting that is LED • % of water from collected rainfall • CO_2 emissions associated with the maintenance fleet	Present
	• kWh energy generated through own renewable sources	Future
Resilience	• Number of reported flooding incidents • % winter service treatments within required timescale • % carriageway length not susceptible to carriageway surface water problems	Present
	• Lane Closure duration due to flooding • Time to restore minimum required performance level after disruption • % of investment addressing identified vulnerabilities	Future

- 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

Continuing Improvement

Continuing Improvement Priorities

Adopt extended forward planning horizons
Implement 25+ year lifecycle planning for Ireland's motorway network as assets enter major renewal phases over the next 10–20 years, using lifecycle optimisation

Develop asset-group specific forward strategies
Implement targeted asset-group strategies to strengthen long-term resilience and functionality by extending pavement life, applying lifecycle-based interventions

Integrate Climate and Sustainability Objectives
Align SAMP implementation with TII's Climate Action Plan and Roadmap by reducing emissions and energy use across motorway network, while prioritising circular economy measures

Establish an integrated asset data environment
Address data fragmentation by strengthening asset inventory, condition, and performance data through IT systems to enable evidence-based decisions, risk management, and performance monitoring.

Embed tiered risk management
Strengthen the framework to identify, assess, and mitigate network risks using risk registers, geospatial analysis, and scenario modelling, prioritising interventions by likelihood, consequence, and whole-life cost

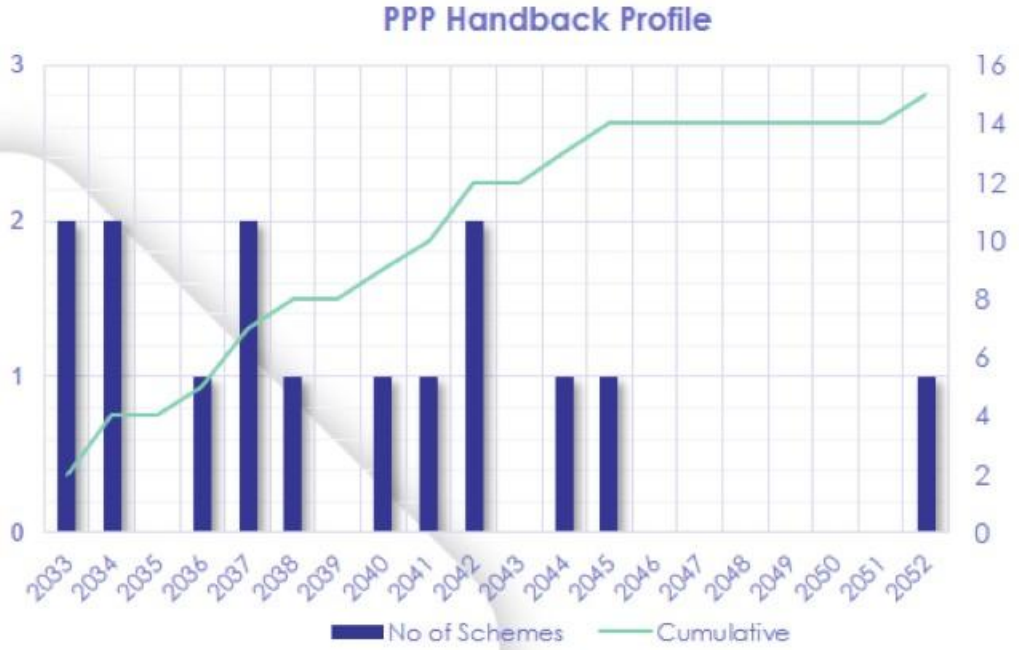
Embed lifecycle optimisation across asset classes
Apply lifecycle planning across the network using inventory and condition data from systems to model deterioration, prioritise cost-effective interventions, and guide long-term investment

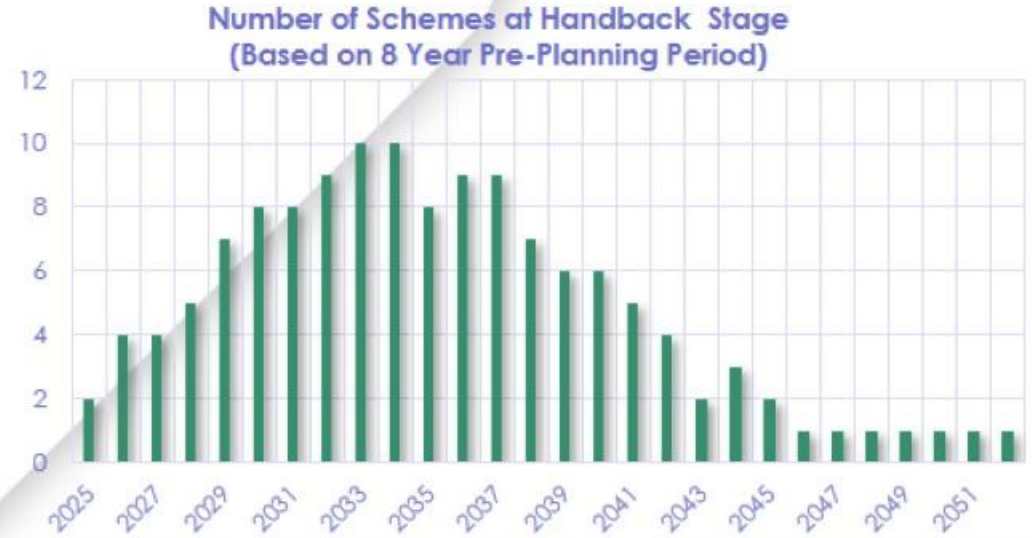
Implement PPP Handback Preparation and Planning
Prepare for the staged handback of Ireland's 15 PPP road concessions (2033–2052) by establishing common condition benchmarks, strengthening data quality, and ensuring renewal and maintenance align with contractual obligations

Preparation for PPP Handback

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

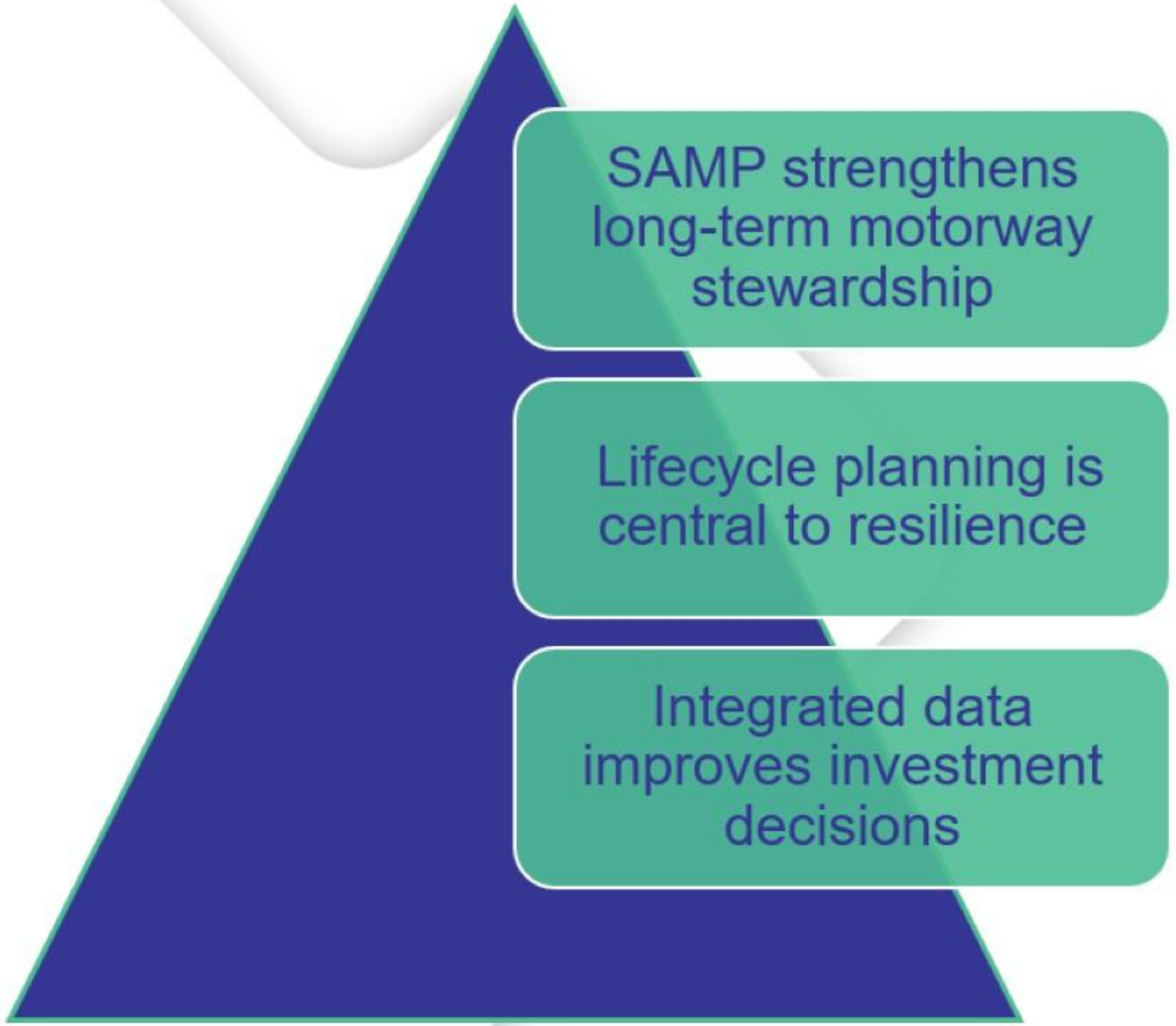
Document	Author
Preparing for PPP Contract Expiry – An overview of practical experiences and lessons learned so far."	EPEC -The European PPP Expertise Centre 2021
"Preparing for PFI Contract Expiry"	Infrastructure and Projects Authority (IPA) UK- 2022
"Managing the Risks of PFI Contract Expiry"	Infrastructure 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



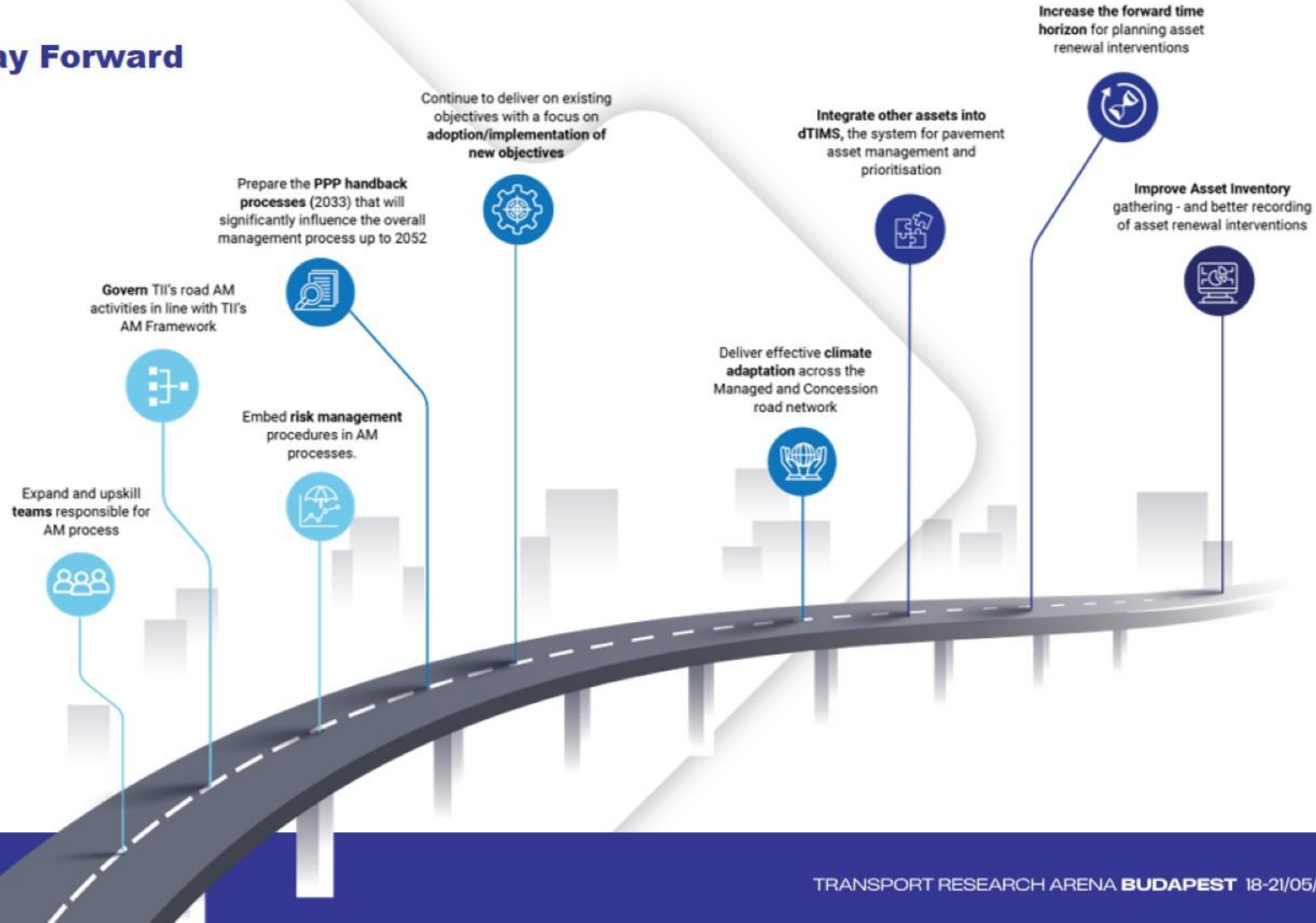


Key Takeaways and Way Forward

Key Takeaways



The Way Forward



Thank you.

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