TII's Asset Management Approach for National Roads

Dr. Kieran Feighan





Asset Management Organisations





Road Network

€31.0bn



Road Network

£25.3bn



€12bn



€11bn

Snapshot of our Road Network Assets



The road network represents a very substantial level of investment by the people of Ireland



Carriageway & Earthworks

assets worth € 14.1 billion

5314 km roads 1200 km is high quality motorway and dual carraigeway



Drainage & Ducting assets worth

2.5 billion

600 km urban positive drainage 1200+ km designed drainage (filter, carrier, kerb and gulley)



Bridges, Walls and Structures

assets worth € 4.2 billion

3400 structures, 700 gantries



Land assets worth € 5.2 billion

14000 hectares



Tunnels & Major Structures

assets worth € 1.9 billion

3 x tunnels (1 x bored 2 x cut and cover)



Traffic Systems, Signs and Markings

assets worth € 0.4 billion

600 traffic signals 130,000 road signs



Street Lighting assets worth € 0.2 billion

42,000 streetlights



Footpaths and Cycleways

assets worth € 0.1+ billion

1000+km of footpaths, 200+ km cycleways



€31 billion

^{*}Other Ancillary Assets not shown such as buildings, depots, ITS, safety barriers, other street furniture, utilities and accommodation works total c . € 2.4bn

TII Asset Management – Integrated Approach





01. Corporate Policy

- Asset Management Approach aligned with Corporate Goals
- Asset Management Objectives Defined
- Cross Asset Management & Reporting – linked to live datasets



O3. Maintenance & Programming



- Data driven approach to maintenance & programming.
- Defining Key
 Performance Indicators
 (KPI) and targets aligned
 with AM Objectives



02. Data Storage & Referencing

- Data Structure
- Common Linear & Geospatial Referencing System
- Linking Dynamic Datasets

04. Funding Allocation

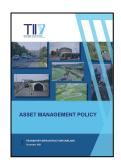


- Appropriate allocation of maintenance funding based on refined cost benefit models
- Demonstrate value for money

ISO 55000: Asset Management Hierarchy in TII



A Structured approach to protecting infrastructure investment



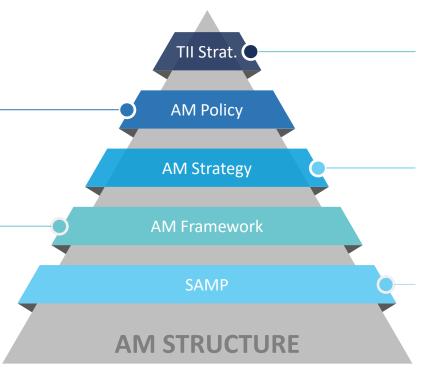
Asset Management Policy

Purpose, Vision, Guiding Principles



Asset Management Framework

Outlining TII Asset
Management Objectives,
Performance Measures,
Data Systems, Governance



TII Strategy

Purpose, Vision, Values, Goals & Objectives



Asset Management Strategy

AM Concepts & Alignment with TII & Government Policies & Strategies



Strategic Asset Management Plans

Detailed plans to achieve AM Objectives & Outcomes for

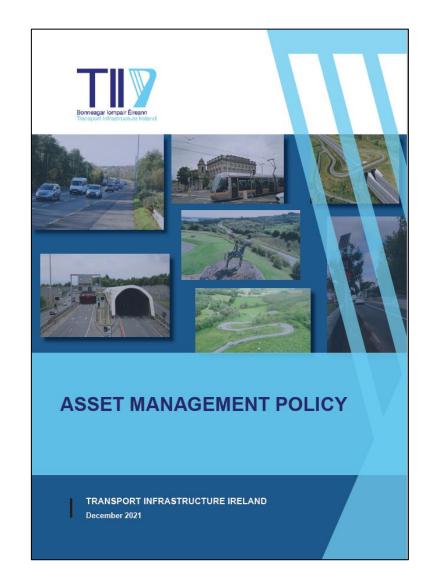


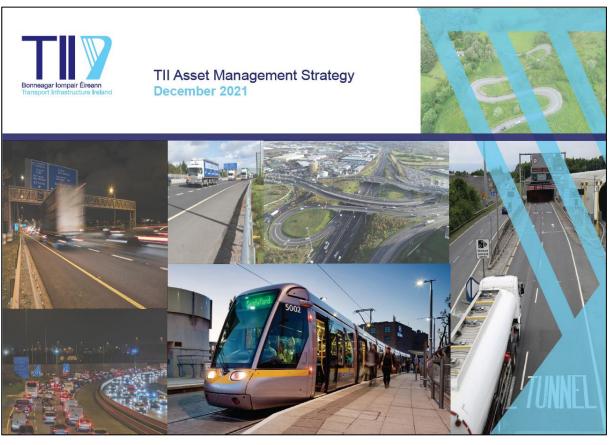


- Light Rail
- Local Authority Roads
- TII Managed & Concession Roads

Asset Management Policy & Strategy







Asset Management Policy



PURPOSE

ASSET MANAGEMENT

1 PURPOSE

We are committed to managing our assets 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.



VISION

ASSET MANAGEMENT

2 VISION

TII will use asset management principles to manage our transportation assets safely, sustainably, efficiently and effectively over their useful life in alignment with our strategic priorities.

In following these principles, we will demonstrate transparency and accountability, plan systematically, assess tradeoffs across organisational goals, satisfy applicable requirements, foster collaboration, and reflect community values.





GUIDING

3 PRINCIPLES

Our approach to asset management includes the following principles





POLICY-DRIVEN

Resource allocation is based on a welldefined set of organisational goals and objectives that inform all of our asset management decisions



RELIANT ON ANALYSIS OF OPTIONS AND TRADE-OFFS

Decisions on how to allocate resources within and across various asset types are based on an analysis of how different options best align with relevant policies, risk mitigation strategies, and performance objectives over the life of the assets.



PERFORMANCE-BASED

Asset management objectives are translated into system performance measures that are used for both operational and strategic management.



FOUNDED ON QUALITY INFORMATION

Informed decision making and management over the full lifetime of the assets is based on relevant, accurate and reliable data.



PROVIDING ACCOUNTABILITY AND FEEDBACK

Performance results are monitored and evaluated for both efficiency and effectiveness.



CONTINUAL IMPROVEMENT

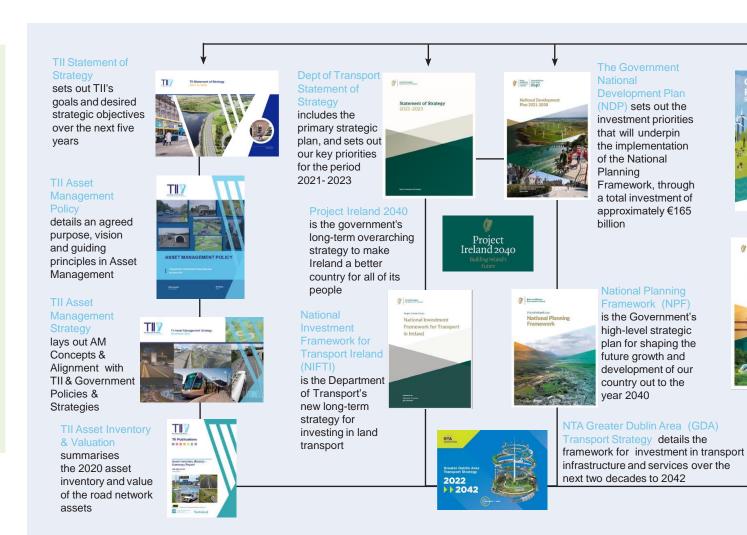
Performance feedback allows for continual assessment of results and improvement on past performance.

PRINCIPLES

TII Asset Management - External Alignment



The Asset Management (AM) Strategy describes how we manage our complex transport network in the public's interest. The AM Strategy is aligned with other TII, Department of Transport and Government initiatives



CLIMATE ACTION and set out in the Climate Act 2021.

Kisha na Mhoase Goessanse of Intiani

provides a detailed plan for taking decisive action to achieve a 51% reduction in overall greenhouse gas emissions by 2030 and setting us on a path to reach net-zero emissions by no later than 2050, as committed to in the Programme for Government

National Sustainable Mobility

sets out a strategic framework to 2030 for active travel (walking and cycling) and public transport journeys to help Ireland meet its climate obligations



aims to reduce the number of deaths and serious injuries on Irish roads by 50% over the next 10 years

TII Asset Management -

Line of Sight

Line of Sight translates our organisational objectives into asset management policy, strategy and framework, which cascade down into more detailed asset management plans and activities.



TII Asset Management -



Internal Alignment



Protecting and Renewing Our Assets



As Asset Management is continually evolving, TII will...

Set strategic objectives and use performance measures to set targets and monitor progress.



- Safety
- Mobility
- Customer service
- Asset sustainability

Make improvements to address changes to the data, processes, and systems that may be needed to advance asset management.



Use fiscally-sound trade-off decisions that:

- Achieve strategic objectives
- Foster collaboration
- Promote systematic and sustainable approaches
- Satisfy applicable requirements
- Reflect community values.



Implement life-cycle strategies that consider needs over the whole life of an asset.



Consider risks and uncertainties that can impact the level of service that is provided.

TII Asset Management Objectives





Asset Management –

Answering Key Questions



What

Asset

Management

- What is the asset?
- > What detail do we have on the asset?
 - > Subcomponents
- What condition is it in
 - Condition surveys

When

- > When is it maintained and why
 - Condition information
 - › Deterioration Modelling
 - Intervention Programme

Where

- Where is it located?
- > How is it referenced?
- > Geolocated?
 - Coordinate referencing system

How

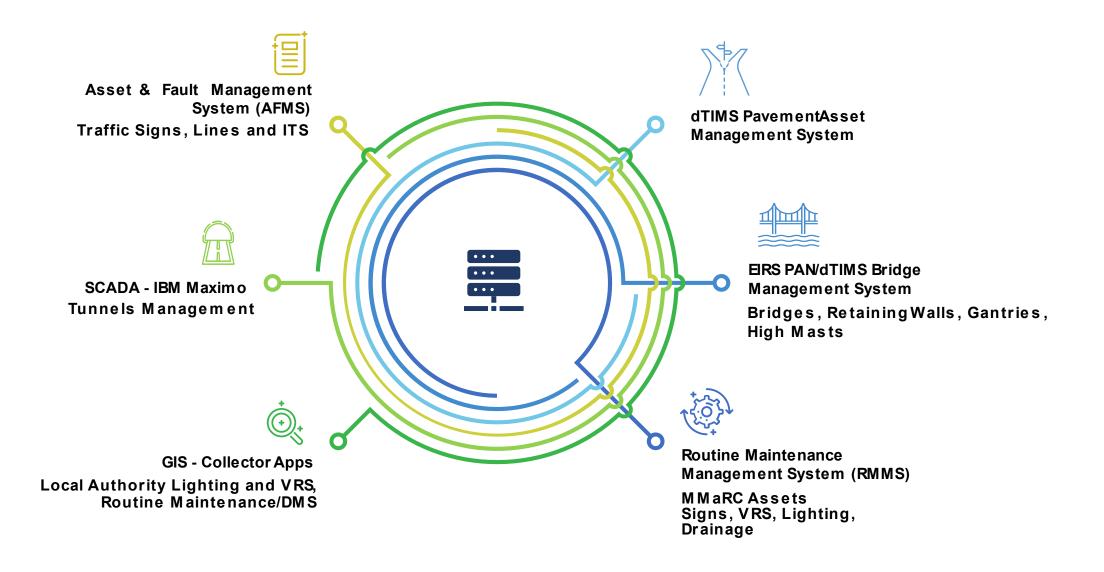
- > How is the asset information stored
 - > Database, SQL, Excel, ArcGIS
- > How much is the Asset worth
 - > GRC/DRC
- > How is it operated & maintained
 - > Maintenance Programs



- > Who is in charge of maintaining the asset?
 - > TII, Contractor, PPP, Local Authority

TII Data and Systems





Common Asset Registry (CAR)







Best practice suggests that a consistent referencing system yields the best results in Asset Management

All asset registers should at least have data referenced to National Grid Co-ordinates using the Irish Transverse Mercator geographical coordinate system

Many other asset groups use geospatial co-ordinates to locate and report

TII asset managers and data processes rely on more than one system of network referencing

Network

Referencing

And GIS

Link and section
referencing based on
chainage are used for the
Pavement Asset
Management System
(PAMS) and the Light Rail
network

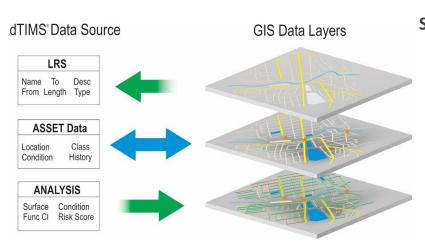
Geospatial co-ordinates are also used within the PAMS to facilitate mapping and reporting for GIS

Integration of ESRI Roads & Highways



Key Functions

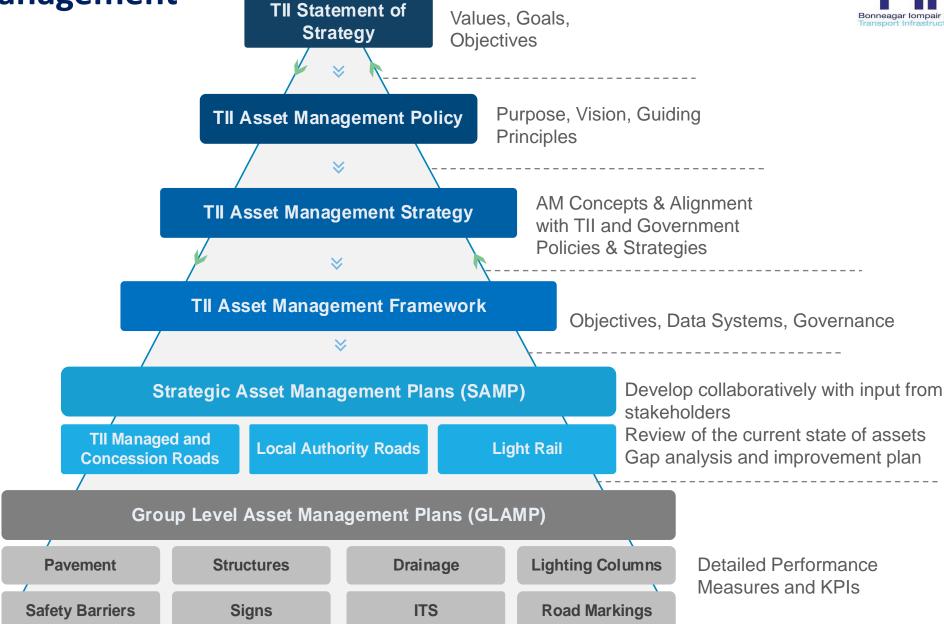
- Interoperability
- Authoritative LRS





TII's Asset Management Hierarchy





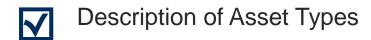
Proposed SAMP and GLAMP Content



Section I

Section II

For each asset group:



Inventory and Asset Value

Delivery Mechanism for Asset M&R

Annual Programme – Description, Volume of Assets Repaired, Scale (Cost of Programme)

Supporting Processes, Data Capture, Data Storage, Data Systems, Management Systems

For each asset group:

Development of KPIs to monitor progress against each of the eight AM objectives defined in the AM Framework. Some of these will be derived from data already captured through supporting processes, others may need new data to be captured, stored etc.

(There will be a separate requirement to modify and/or develop systems for this data capture, data transfer, data storage, data reporting to dashboards etc.)

Proposed SAMP Content





- Raising the planning horizon from 1-3 year cycle to encompass lifecycle planning
- Gaps between current and desired will be identified at each stage and set out as actions to be undertaken
- 5-10 year financial requirements based on lifecycle analysis
- Drainage is an area that may have a relatively large gap to fill

- Focus on cyclical trends with longer but finite term life cycles e.g. waterproofing in bridge deck systems, Large-scale Directional signs, ITS, cameras, key components in Dublin Tunnel etc.
- The evolution of SAMPs will proceed over time, with consistent improvement and building on successful initiatives

Incorporate consideration of energy, carbon, circular economy principles into multi-criteria lifecycle analysis

Management of PPP road network assets in transition to change of ownership will have its own challenges and solutions



Managing our transportation assets for the future



