Managing the Regional and Local Road Network Pavements

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Background
### Roads in Ireland

<table>
<thead>
<tr>
<th>Road Class</th>
<th>% Length</th>
<th>Length (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>5.42%</td>
<td>5,412,847</td>
</tr>
<tr>
<td>NP</td>
<td>2.72%</td>
<td>2,717,234</td>
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<tr>
<td>NS</td>
<td>2.70%</td>
<td>2,695,613</td>
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<tr>
<td>R</td>
<td>13.15%</td>
<td>13,124,058</td>
</tr>
<tr>
<td>R</td>
<td>13.15%</td>
<td>13,124,058</td>
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<tr>
<td>L</td>
<td>81.43%</td>
<td>81,292,961</td>
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<tr>
<td>LT</td>
<td>24.18%</td>
<td>24,138,459</td>
</tr>
<tr>
<td>LP</td>
<td>23.83%</td>
<td>23,788,815</td>
</tr>
<tr>
<td>LS</td>
<td>33.42%</td>
<td>33,365,687</td>
</tr>
</tbody>
</table>

**Grand Total** 100.00% 99,829,867

2.5 time EU average .... A lot of road!
Regional and Local Roads

- Historical Funding Trends
Regional and Local Roads

• Historical Trends
## Regional and Local Roads Investment Programme

<table>
<thead>
<tr>
<th>Programme</th>
<th>2016 Amount € m</th>
<th>2017 Amount € m</th>
<th>2018 Amount € m</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restoration Maintenance</td>
<td>41</td>
<td>41</td>
<td>47</td>
<td>Surface dressing programme (+15%)</td>
</tr>
<tr>
<td>Restoration Improvement</td>
<td>148</td>
<td>165</td>
<td>195</td>
<td>Road pavement strengthening (+18%)</td>
</tr>
<tr>
<td>Discretionary Grant</td>
<td>64</td>
<td>70</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td>Bridge Rehabilitation</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>Bridge strengthening (+11%)</td>
</tr>
<tr>
<td>Drainage</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td>New</td>
</tr>
<tr>
<td>CIS</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td>New</td>
</tr>
<tr>
<td>Specific / Strategic</td>
<td>10</td>
<td>27</td>
<td>50</td>
<td>Large / Major projects (+85%)</td>
</tr>
<tr>
<td>Safety</td>
<td>8</td>
<td>7</td>
<td>8</td>
<td>Safety works &amp; 30 km/h zones (+14%)</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>19</td>
<td>5</td>
<td>16</td>
<td>Includes salt purchase</td>
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<tr>
<td>Total</td>
<td>298</td>
<td>324</td>
<td>417</td>
<td></td>
</tr>
</tbody>
</table>
Regional and Local Roads

Maintenance & Rehabilitation Needs

• Surface Dressing
  • Minimum length of required per year is 4,700 km i.e. 5% of network.
  • Achieve just over half of target in 2013

• Strengthening
  • Minimum length of required per year is 4,700 km i.e. 5% of network.
  • Achieve significantly less than strengthening target in 2013

• Steady State Expenditure (2014 - SFILT)
  • RI - €369m
  • RM - €87m
  • Routine - €124m
  • Total - €580m
  • Is this enough?
Regional and Local Roads

Maintenance & Rehabilitation Needs

• Backlog ?

• Other Assets
  • Bridges (30,000) ?
  • Public Lighting ?
  • Traffic Equipment ?
  • Drainage ?

• SFILT being updated with PLUTO project
Road Management
Success Factors (World Bank)

• Like any system the success of an RMS system depends three fundamental components:

  **PROCESSES – PEOPLE - TECHNOLOGY - FUNDING**

• There must also be a commitment to **adequate funding**. If any of these are lacking, the system will not be successful.

The best technology in the world will ultimately fail:

- If implemented in an environment where there are no people to run it,
- where the business processes are not in place to utilize it.

For an RMS to be successful, the importance of each component must be clear.
Success Factors (World Bank)

**PROCESSES – PEOPLE - TECHNOLOGY - FUNDING**

• For Ireland this means: -
• Processes – Guidelines / Circulars mandating and setting out requirements for use
• People – Setting up the RMO as support office / centre of excellence
• Technology – MapRoad
• Funding – RLR Investment Programme

• Will ultimately fail: -
  - If implemented in an environment where there are no people to run it,
  - where the business processes are not in place to utilize it (very nice system in the corner!).

• For an RMS to be successful, the importance of each component must be clear.
Pavement Management

The process of planning the maintenance and repair of a network of roadways in order to **optimise conditions** over the entire network.

- Incorporates **life cycle costs** into a more systematic approach

- A **Pavement Management System (PMS)** is a software planning tool used to:
  - aid pavement management decisions.
  - model future pavement deterioration due to traffic and weather, and recommend maintenance and repairs to the road's pavement based on the type and age of the pavement and various measures of existing pavement quality.

- Research has shown that it is **far less expensive** to keep a road in good condition than it is to repair it once it has deteriorated. This is why pavement management systems place the priority on **preventive maintenance** of roads in good condition, rather than reconstructing roads in poor condition.
Pavement Management Process

A pavement management approach is a process that consists of a number of typical tasks / steps to include:

- Asset Inventory / Definition
- Identifying pavement conditions, identifying good, fair and poor pavements.
- Prioritisation - Assign importance ratings for road segments, based on traffic volumes, road functional class, and community demand.
- Condition Prediction & Analysis
- Work Planning & Scheduling
  - maintenance of good roads to keep them in good condition.
  - repairs of poor and fair pavements as remaining available funding allows.
Pavement Management - Objectives

So far .... developed and implemented a system to record:

- **Works on the Road Network** such as:
  - Road Openings (Licensing System)
  - Pavement Surface Maintenance / Improvement Works

- **Condition of the Network** for a range of parameters (visual and mechanical)

- **Inventory and known value** of Road Network (surface, geometry, etc.)

- **Speed Limits**
Technology / IT (LGMA)

- **MapRoad**
- Integrated, Geographical Information System (GIS) enabled, Roads Management System.
- MapRoad has five main elements:
  1. Desktop System (original system)
  2. Web Based Interface (since 2010)
  3. Licensing system
  4. Project /Financial Module,
  5. Mobile Apps
  - WEB based and open source
  - software solutions where possible.
Pavement Surface Condition Index (PSCI)

- Condition Rating Index (2012 & 2013) – 3 Manuals
- Project Level & Network Level implementation (RW 21/2014)

Condition <=> Rating <=> Treatment <=> Money
Pavement Surface Condition Index (PSCI)

- Condition Rating Index (2012 & 2013) – 3 Manuals
- Project Level & Network Level implementation (RW 3/2018 previously RW 21/2014)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>R</td>
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<td>0%</td>
<td>0%</td>
<td>5%</td>
<td>6%</td>
<td>14%</td>
<td>22%</td>
<td>20%</td>
<td>22%</td>
<td>8%</td>
<td>2%</td>
</tr>
<tr>
<td>LP</td>
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<td>0%</td>
<td>1%</td>
<td>11%</td>
<td>8%</td>
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<td>24%</td>
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<td>13%</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>LS</td>
<td>1%</td>
<td>1%</td>
<td>3%</td>
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<td>11%</td>
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<td>14%</td>
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</tr>
<tr>
<td>Total</td>
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<td>11%</td>
<td>9%</td>
<td>17%</td>
<td>20%</td>
<td>12%</td>
<td>12%</td>
<td>4%</td>
<td>11%</td>
</tr>
</tbody>
</table>

**National PSCI Statistics**

![National PSCI Statistics Chart](www.instituteofasphalt.org)
Key Users / Benefits

• Pavement Surface Condition Index (PSCI)
• Extensively used for Managing Works / Funding (LA / RMO / DTTAS / DPER)
• but also by: -
  • C&AG / Oireachtas PAC
  • National Oversight (NOAC / DTTAS)

• Timber Transport
• Milk Collection
• Construction Impacts
• Road Openings
• Ubiquitous
• However this raises issues on data quality / training
Pavement Management Survey Regime

Pavement Management Survey Regime - Review

• A lot of the building blocks are in place

• Essential to have an effective survey regime for an effective PMS (bread & butter)

• In place since 2014 as Circular RW 21 and followed on from earlier back to 2010
Pavement Management Survey Regime

Pavement Management Survey Regime - Review

• How does PMS and Survey Regime Stand up / compare to others?
• What are other Pavement Management Systems doing?
• Is what we have effective?
• Are we achieving the objectives we should be?
• Where should we be going next?
Pavement Management Survey Regime

New issued February 2018 (Circular RW 03)

Objectives

- Close out outstanding tasks (History of Works / Inventory)
- Improve efficiency of survey regime (mechanical / Visual)
- Improve context/background
- Improve alignment with current/emerging/future requirements
- Address Quality Control
- Address Training
- Define role of RMO more clearly for surveys and quality control
Road Licensing System

MapRoad Licensing system usage

- Guidelines applicable to all road authorities and to all road openings.
- 409 Organisations, 1650 individual Users (1000 Applicant Users/ 650 Authority Users)
- Very large task, still not complete
- Currently Road Openings but will expand to others
Road Management Developments
Road Management Development

• Main Areas
  • Funding / Grants
  • Road (Asset) Management
  • Road Licensing
Road Management Development

• Pavement Management Next Steps ......

• User Improvements

• National Level
  • Monitor and Track Performance (Indicators / KPI’s etc.)
  • Greater linkages to funding

• Network Level
  • Pavement Management Strategies
  • Planning Pilots

• Needs to be Part of the Day Job (not something Nice)
Road Management Development

• Pavement Management Next Steps ….

• Project Level
  • Decision processes for maintenance / improvement works
  • Better decision making using data such as with ‘strip maps’
  • Works recording
Road Management Development

• Pavement Management Next Steps
  • Project Level
  • Works recording

• Needs to be Part of the Day Job (not something Nice)
Road Management Development

• Range of other areas in Asset Management: -

  • Bridges
  • Footways
  • Collisions / Accidents
  • Public Lighting
  • Traffic Data
  • Speed Limits
Road Management Development

• Range of other areas for road licensing: -
  
  • Road Openings (Current)
  
  • Section 254 permits
    • Tables & Chairs
    • Hoardings / Scaffolding
  
  • Abnormal Loads
  
  • Events
Guidance and Standards (DTTAS)

• Department Guidelines
  • Guidelines for Road Drainage
  • Guidelines on the Depth of Overlay to be used on Rural Non National Roads (Orange Book) (2014)
  • Pavement Surface Condition Index (PSCI) (3 volumes) (2012 & 2013)
  • Guidelines for Scheduling of Roads in Ireland (2012 & 2013)
  • Circular on Pavement Management Surveys (2014 & 2018)

• On DTTAS & RMO Websites
Road Management Development

- Institutional Structures
  - Road Management Office
    - Pavement Management
    - Road Licensing
    - Public Lighting
  - DTTAS Support Office

- System is an Asset

- Data is an Asset

- Other Gains
  - C-ITS
  - CAV
Thank You

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