Transport Infrastructure Ireland:

Now, what is our business, and challenges?

Michael Nolan

Chief Executive
Transport Infrastructure Ireland

18th May 2016
Transport Infrastructure Ireland (TII) was established through a merger of the National Roads Authority and the Railway Procurement Agency under the Roads Act 2015, with effect from 01/08/15.

TII's primary function is to provide an integrated approach to the future development and operation of the national roads network; and working closely with the National Transport Authority, the development of light rail infrastructure.
Transport Infrastructure Ireland

- Transport Infrastructure Ireland (TII) organisational structure consists of 6 business units
  - Capital Programme Management
    - Public Transport
    - Roads
  - Network Management
    - Network Operations
  - Commercial Operations
    - Light Rail Business
    - Tolling Business
  - Business Services
  - Professional Services
  - Corporate Services

- Current staff of circa 270
The Asset:
National roads
The Asset – Light Rail - Luas Network

Red & Green Lines
Tallaght to The Point
Saggart to Connolly
Brides Glen to St. Stephen’s Green
Updated January 2012

**Red Line**

<table>
<thead>
<tr>
<th>Route length</th>
<th>21km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stops</td>
<td>32</td>
</tr>
<tr>
<td>Commercial speed</td>
<td>22kph</td>
</tr>
<tr>
<td>Annual passengers</td>
<td>~19m</td>
</tr>
<tr>
<td>Park and Ride spaces</td>
<td>1,039</td>
</tr>
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</table>

**Green Line**

<table>
<thead>
<tr>
<th>Route length</th>
<th>17km</th>
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</thead>
<tbody>
<tr>
<td>Stops</td>
<td>22</td>
</tr>
<tr>
<td>Commercial speed</td>
<td>27kph</td>
</tr>
<tr>
<td>Annual passengers</td>
<td>~16m</td>
</tr>
<tr>
<td>Park and ride spaces</td>
<td>1,161</td>
</tr>
</tbody>
</table>
Benefits: Reductions in Collisions

Since 1999, the safety of the national road network has greatly improved.

Note: the number of collisions and causalities shown here has been sourced from all reported road traffic collisions to An Garda Síochána.
Benefits: Reduction in Journey Times

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>Routes</th>
<th>1999</th>
<th>2013</th>
<th>Saving (mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M50 – Border, on the M1</td>
<td>79</td>
<td>48</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>M50 – Galway, on the M4/M6</td>
<td>157</td>
<td>104</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>M50 – Limerick, on the M7</td>
<td>145</td>
<td>105</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>M50 – Cork, on the M7/M8</td>
<td>205</td>
<td>128</td>
<td>77</td>
<td></td>
</tr>
<tr>
<td>M50 – Waterford, on M7/M9</td>
<td>125</td>
<td>86</td>
<td>39</td>
<td></td>
</tr>
</tbody>
</table>

The investment in the Major inter-urban routes and other road improvements has resulted in significant travel time savings - delivered a more reliable transport infrastructure and service - contributed to Ireland’s economic growth by reducing the time and costs to businesses of accessing markets.
Impact of Road Investment on Employment Accessibility

Access to employment following completion major inter-urban routes 2011

2006 Road Network & Employment 2011 Road Network & Employment

Note: Accessibility score is set against highest zone for employment i.e. Rotunda Ward in south Dublin City Centre

- Low accessibility score
- High accessibility score
Luas Red and Green Line Benefits

• Reduced road traffic congestion
  • 27% modal shift from private car due to faster journey times, high reliability and frequency

• Economic benefits
  • User and non-user time savings
  • Reduction in accidents
  • Reduction in environmental emissions

• Financially sustainable
  • Revenues cover operating, maintenance and life cycle costs

• Urban regeneration
  • Facilitated significant redevelopment of areas within catchment
Roads Network Management
“The big shift”

Proportion of road authority focus and investment

- Build the network
- Maintain the network
- Run the network


(QTRIP Statewide Industry Briefing 28 July 2015)
<table>
<thead>
<tr>
<th>MMaRC</th>
<th>Network Operator</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Globalvia Sacyr Jons [GSJ]</td>
<td>160 km</td>
</tr>
<tr>
<td>B</td>
<td>Colas Roadbridge JV [CRJV]</td>
<td>256 km</td>
</tr>
<tr>
<td>C</td>
<td>Egis Lagan Services [ELS]</td>
<td>328 km</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>744 km</strong></td>
</tr>
</tbody>
</table>
Strategic Maintenance Depots

- Balbriggan (A), Athlone (B), Ennis (B), Kinnegad (B), Nenagh (B), Cahir (C) and Kilkenny (C).

NRA Strategic Salt Barn – 15,000 tonnes

Operational Salt Barn with Lean-to structure

Fuel Tank Location

Brine Tank location

Depot Weighbridge

Depot Office & Car Park

Access Gates & Perimeter fencing

M18 Motorway Junction 13 Tulla Road

Ennis Depot
Do we need all that salt???
The M50

- 42km in length with 15 junctions
- Upgrade completed 2010
- TEN-T Core (M1-N7) & Comprehensive Network (N7-M11)
- Caters for in excess of 350,000 vehicle trips each weekday
- 145,000 AADT on busiest section (N4-N7)
- Average trip distance of 12km (equates to 1-2 junctions)
- Only 4% end to end trips (M1-M11)
- Facilitates local, inter-urban, business & freight trips
- Provides direct access to Dublin Port and Dublin Airport
- Key national freight corridor
Short Term Improvement Measures (2016)

- Roll out of improved merge layouts at N4, N7 and N81 junctions
- Completion of permanent signed diversion routes
- Implementing agreed measures from Interagency Working Group
- Co-operation with An Garda Síochána: Trialling of new electronic survey equipment to facilitate accelerated survey techniques in forensic crash investigations
Medium term measures (2-3 years)

- Variable Speed Limits
- Advance motorway indicators to display speed limits that can be changed to suit traffic conditions
- Generally mounted on overhead gantries
- Used in combination with variable message signage
- Can be implemented with system of enforcement cameras to ensure compliance
Medium term measures (2-3 years)

Variable Speed Limits - Benefits

- Reduce incident frequency & improve journey time reliability
- Facilitate improved incident management e.g. automated lane closures
- Improve level of service to reduce flow breakdown
- VSL will not manage demand and will not protect operation of M50 into the future
Long term measures (>3 years)

- TII Demand Management Study 2014
- Demand Management Measures
  - Multipoint tolling
## PPP Contracts Awarded

- **Programme 1 (Hard tolled)**

<table>
<thead>
<tr>
<th>SCHEME</th>
<th>CONTRACT AWARDED</th>
<th>OPERATIONS COMMENCED</th>
<th>CONTRACT EXPIRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kilcock/Kinnegad</td>
<td>March 2003</td>
<td>2005</td>
<td>2033</td>
</tr>
<tr>
<td>Dundalk Western Bypass</td>
<td>February 2004</td>
<td>2004</td>
<td>2034</td>
</tr>
<tr>
<td>Rathcormac/Fermoy</td>
<td>June 2004</td>
<td>2006</td>
<td>2034</td>
</tr>
<tr>
<td>Waterford City Bypass</td>
<td>April 2006</td>
<td>2010</td>
<td>2036</td>
</tr>
<tr>
<td>Limerick Tunnel</td>
<td>August 2006</td>
<td>2010</td>
<td>2041</td>
</tr>
<tr>
<td>Clonee/Kells</td>
<td>April 2007</td>
<td>2010</td>
<td>2052</td>
</tr>
<tr>
<td>Galway/Ballinasloe</td>
<td>April 2007</td>
<td>2010</td>
<td>2037</td>
</tr>
<tr>
<td>Portlaoise/Cullahill</td>
<td>June 2007</td>
<td>2010</td>
<td>2037</td>
</tr>
<tr>
<td>**M50 upgrade *</td>
<td><strong>September 2007</strong></td>
<td><strong>2007</strong></td>
<td><strong>2042</strong></td>
</tr>
<tr>
<td>Motorway Service Areas</td>
<td>October 2009</td>
<td>2010</td>
<td>2034</td>
</tr>
</tbody>
</table>
Southbound Weekday Hourly Traffic
(Santry to Port)

€10

Cars and Light Goods
HGV's

WD South Untolled
WD South Tolled

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Northbound Weekday Hourly Traffic
(Port to Santry)

Cars and Light Goods

HGV's

WD North UnTolled  WD North Tolled

€10
Commercial Operations

- Tolling Business
- Light Rail
**Luas Business**

### Red Line
- **Route length**: 21km
- **Stops**: 32
- **Commercial speed**: 22kph
- **Annual passengers**: 19m
- **Park and Ride spaces**: 1,039

### Green Line
- **Route length**: 17km
- **Stops**: 22
- **Commercial speed**: 27kph
- **Annual passengers**: 16m
- **Park and Ride spaces**: 1,161

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**Legend**
- Luas Park + Ride
- Luas Cycle + Ride
- Luas Lost + Found
- Regional Bus Stop
- Train Station

*Luas bus services available close to most Luas stops*
Light Rail Business - Operating Performance

Luas Passenger Numbers

- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
Tolling Business
M50 Tolling

- Customer Base: 2 million unique customers
- Customer contact levels circa 5 million p.a.
- M50 Traffic volumes 2015: 127,000 AADT
- Toll Transactions 45 million per annum
- Traffic mix - Registered 84% : Unregistered 16%
- Compliance 96%
Tolling Business

• What is eFlow Barrier-Free Tolling

- ‘eFlow’ is the business name for the barrier-free tolling system on the M50 Motorway;
- eFlow replaced a congested conventional toll plaza in 2008;
- It was a vital part of the M50 corridor upgrade programme (42 km);
- Sanef Group developed and operate the tolling system;
- Currently being re-tendered, shortlisting announced earlier in the year
• About 40% of the national fleet is registered;
• About €230 million is collected annually in tolls – almost 60% of which is collected electronically (i.e. no cash);
• Irish tolling sector employs about 1,200 directly today – mix of technology, operational, financial and customer service roles.
Roads Capital Programme
## Active Construction: Roads PPPs*

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Contract Award</th>
<th>Operations Commence</th>
<th>Contract Expiry</th>
</tr>
</thead>
<tbody>
<tr>
<td>M17/M18 Gort to Tuam</td>
<td>April 2014</td>
<td>End 2017</td>
<td>25 Years post Operations Commencement</td>
</tr>
<tr>
<td>M11 Gorey- Enniscorthy</td>
<td>October 2015</td>
<td>Mid 2019</td>
<td>25 Years post Operations Commencement</td>
</tr>
</tbody>
</table>

*Availability payments based PPP Contracts*
M17/M18 Gort to Tuam PPP Scheme

Description of M17/M18 Gort to Tuam PPP Scheme

- Part of the Atlantic Corridor
- 57 kms long (53km motorway and 4km Tuam Bypass)
- Commences from the N18 Gort Crusheen scheme
- Connects to the M6 motorway west of Oranmore
- Provides a bypass of Tuam at the northern end as well as Ardrahan, Kilcolgan and Clarinbridge in the south
- Acts as a bypass of Claregalway
- Benefit to cost ratio of more than 2:1 for the low growth scenario
M11 Corridor – Gorey to Enniscorthy
M11 Gorey to Enniscorthy PPP: Scheme Details

- Construction of sections of M11, N30 and N80 link road
- 26km of mainline motorway (M11)
- 4km of dual carriageway (N80 link road)
- 8km of single carriageway (N30 Enniscorthy route)
- Provides a bypass of Enniscorthy, improving feeder routes and extending the Eastern M11 Motorway towards the Rosslare EuroPort
- Benefit to cost ratio of 2.0 in a low growth scenario
N25 New Ross PPP Scheme Details

- 16 km long
- 900 m long bridge over River Barrow making it the longest bridge in the Country
- Provides a bypass of New Ross town while developing the N25 which links Cork to Wexford
- Benefit to cost ratio ranging from 2:1 low growth scenario
As part of the Government’s Road Safety Strategy 2013 to 2020, TII was given responsibility for delivering Action 53 –

Which is to carry out 150 minor realignment schemes on the national road network between 2013-2020

- Twenty schemes were completed in 2013.
- Two were completed in 2014.
- Six were completed in 2015.
- Nine will be completed in 2016 and six in 2017.

That will result in the completion of 43 schemes in total by the end of 2017. With the funding profile currently available to TII it will not be possible to start construction on any more projects. There are currently an additional 30 schemes being brought through the planning and design process and could be brought to construction if funding was available.
Pavement Works

2016 Pavement Programme

Number of Schemes to commence in 2016: 123
Number of Schemes Yet to Progress: 95
Number of Schemes Currently At Tender: 9
Number of Schemes Tender Awarded: 13
Number of Schemes Construction Complete: 6

April 2016
Head lines: Building on Recovery (2016-2022)

- Approximately €730 million earmarked for new national roads projects
- Majority of funding to be made available in last three years of the plan
- New roads PPPs are not contemplated during the life of the Plan
- 2019 will see a ramp up of schemes, most likely procured as DB schemes.
Building on Recovery:

Advanced Schemes (i.e. approved by An Board Pleanala, lands acquired, some advance activities ongoing)

- N4 Collooney Castlebaldwin
- N5 Westport to Turlough
- M7 Naas Newbridge upgrades
- N8/N25/N40 Dunkettle Junction
- N22 Ballyvourney to Macroom
- N56 Dungloe to Glenties
- N56 Mountcharles to Inver
- N59 Moycullen Bypass
N4 Collooney to Castlebaldwin Road Project

• ABP Approved in July 2014, advance works currently underway
• Total length 15km - 14km of Type 2 dual c/way plus 1 km of single c/way
• Scheme Cost Estimate: €120m
• Part of TEN-T Comprehensive Network
N5 Westport to Turlough

- ABP Approved, advance works currently underway
- 20km of Type 2 dual c/way plus 2.5km of single c/way
- Scheme Cost Estimate: €180m
- TEN-T Comprehensive Network
M7 Naas to Newbridge Upgrade Scheme

- ABP Approved.
- 13km widening to 3 lane Motorway
- Scheme Cost Estimate: €60M
- TEN-T Core Network
- Upgrade and carriage widening from Junction 9 Naas Nth (Maudlins) to M7/M9 intersection Junction 11
N8/N25/N40 Dunkettle Interchange Upgrade Scheme

- ABP Approved, Land Acquisition ongoing
- Upgrade of existing interchange to free flow
- Scheme Cost Estimate: €100m
- Located on the TEN-T Core Road Network.
N22 Ballyvourney Macroom

- ABP confirmed, land being purchased
- 21km of Type 2 dual c/way
- Scheme Cost Estimate €180m
- TEN-T Comprehensive Network

Ballyvourney bypass and Ballymackeera bypass

Ballyvourney

Ballymackeera

Macroom bypass

Macroom
Building on Recovery:

‘Pipeline ’ National Road Schemes

- N2 Slane Bypass
- N6 Galway City Transport Project
- N72 Mallow Relief Road
- N21/N69 Adare to Foynes
- N28 Cork to Ringaskiddy
N6 Galway City Transport Project

• EIS/CPO in preparation
• 11km of Type 1 dual c/way plus 5.5km of single c/way
• Scheme Cost Estimate €630m
• TEN-T Comprehensive Network
• Preferred route selected, design ongoing
• 17km of Type 2 dual c/way plus 16km of single c/way
• Scheme Cost Estimate €320m
• TEN-T Core Network
M28 Cork Ringaskiddy

- EIS/CPO in preparation
- 11km of Motorway plus 2km of single c/way
- Scheme Cost Estimate €200m
- TEN-T Core Network
Other National Projects Active in Planning & Design

- N4 (M50 to Jn8 Kilcock Ten-T) Feasibility Study
- N2 Ardee Bypass (An Bord Pleanala Approved)
- N5 Ballaghaderreen Bypass to Scramogue (Route Selected)
- N3 Corridor Upgrade (Feasibility Study)
- N7 (M50 to Naas North Jn 9 Ten-T Upgrade) Feasibility Study
- N11 (M50 to Glen of the Downs) Feasibility Study
- N59 Westport to Mulranny (An Bord Pleanala Approved)
- N13/14/15 Donegal Ten-T (Feasibility Study concluded)
- N14/N15 to A5 Link (subject to progression of A5 in Northern Ireland)
- N59 Clifden to Oughterard (with An Bord Pleanala)
- N69 Listowel Bypass (Design advanced)
- N86 Dingle to Tralee (An Bord Pleanala Approved)
Light Rail Capital Programme
Luas Cross City
Luas Cross City

• **Scope**
  - 5.6km extension of Luas Green Line through city centre to Broombridge

• **Need**
  - Economic NPV of €296m (2002 prices); BCR of 2.28:1
  - Extends Green Line into city centre and north city
  - Creates Luas network
  - DIT Grangegorman
  - Modal shift: 1 million fewer car trips annually

• **Progress**
  - On target for end 2017 and within budget
  - Enabling works complete
  - Main infrastructure approximately 40% complete
  - Systems installation commencing July
  - Rolling stock ordered

• **Key issues**
  - Traffic management
  - Red Line Tie-in
  - Communications
  - Stakeholder management
Luas Cross City Construction
Building on Recovery:
‘Pipeline’ Public Transport Projects.

- New Metro North
- Green Line Capacity Enhancement (GLCE) –
  - Platform extensions
  - Sandyford Depot Extension
  - Traction system upgrades
  - Additional trams and additional extensions
  - Carrickmines Park & Ride
- Life Cycle Assets Renewal
new Metro North

• Scope
  • 16km light rail line from city centre to Swords via Airport
  • Modified version of original Metro North, with lower initial capacity, fewer and smaller stations, less tunnelling

• Need
  • Economic NPV of €576m; BCR of 1.56:1 (NTA)
  • Links network: interchange with DART, rail, Luas and bus
  • Modal shift from congested N1 route: original Metro North was forecast to remove 11m car trips from roads each year
  • Swords to city in 30 minutes (average peak period car journey time from Swords to city in 2009 was 73 minutes)
  • 32 million passengers journeys per annum
  • Essential to growth of Dublin Airport: roads do not have capacity
  • Can increase capacity to meet long term demand

• Progress
  • Route alignment studies underway
  • Tunnel and station strategy study

• Issues
  • Route selection and station location
Green Line Capacity Enhancement

- **Scope**
  - Extending length of trams on Green Line from 42m to 54m
  - Associated depot extension, platform extensions and power upgrades

- **Need**
  - Green Line demand exceeds capacity for most of morning peak hour
  - Demand to increase significantly in coming years due to Luas Cross City services commencing and build out of Cherrywood area

- **Progress**
  - Planning permission granted for depot extension
  - Design and tender documents for platform extensions being developed
  - Negotiations with tram supplier on extensions
Dublin Light Rail Network 2035

Luas Red Line
Luas Green Line
Luas Finglas
Luas Cross City
Luas Lucan
Luas Poolbeg
new Metro North
Luas Bray

2035 Metropolitan Light Rail Network
(Source: NTA Transport Strategy 2016 – 2035)
2035 Light Rail Network

- **Metro South**
  - Provides necessary capacity to meet long term demand forecasts
  - Extends new Metro North southwards to an operating link with the Green Line
  - Enables through running from Bray to Airport and Swords

- **Luas Finglas**
  - Extension of Luas Cross City from Broombridge to the north of Finglas
  - Provides a high capacity service from large suburb into the city centre
  - Facilitates provision of a strategic park and ride at N2/M50 interchange

- **Luas Bray**
  - Extension of Luas Green Line from Bride’s Glen to Bray
  - Links Bray with employment areas of Sandyford, Dundrum and Cherrywood, and to the city centre.

- **Luas Lucan**
  - Serves Lucan, Liffey Valley and Ballyfermot
  - High existing demand - in excess of 20 million trips per annum

- **Luas Poolbeg**
  - Extension of Luas Red Line from Point across Liffey to Poolbeg
  - Serves future development area of Poolbeg, in addition to Ringsend and Irishtown

(NTA Transport Strategy for the Greater Dublin Area 2016 – 2035)
Challenges?
Reduced Funding

Peak spend

2016 Funding
Building on Recovery: Indicated Funding

• Our funding for roads capital programme is now much reduced, running at about 80% off the previous peak spend for roads,

• This level of funding presents many challenges, in the context of managing a public roads asset valued > €30bn, and a public transport asset valued > €1bn.

• This years capital funding is €280m, with an additional €25m allocated to support the Stimulus PPP programme.

• This Capex is slightly down on 2015, and reduces somewhat over the coming two years, and then rising back to and stabilising at €300m each year for the balance of the Capital Plan.
With this level of roads funding, our challenges are as follows:

• managing our modernised networks safety and as efficiently as we can, while working within present funding constraints

• ensuring the public’s investment is protected through adequate rehabilitation and maintenance.

• improving, and making safer, some three thousand kilometres of legacy unimproved road.

• Dealing with congestion

• Coping with, and Preparing for Growth
Population Growth

CSO Population Projections (2016-2046)
Motorway & National Primary Network (2030 AADT Flows / NRA TD9 LoS Capacity)

Motorway / National Primary Schemes with Approvals (included in Capital Plan):
1. N7 Naas Newbridge
2. M8/N40/N25 Dunkettle
3. N4 Collooney to Castlebaldwin
4. N22 Ballyvourney to Macroom
5. N5 Westport to Turlough

Schemes in Planning (included in Capital Plan):
6. N20 Mallow Relief Road
7. N2 Slane Bypass
8. N6 Galway City Transport Project
9. N21/N69 Adare to Foynes
10. N28 Cork to Ringaskiddy

Potential Schemes Identified with NTA Transport Strategy for the Greater Dublin Area:
11. N7 Naas to M50
12. M1 South of Drogheda capacity improvements
13. M50 Widening (between Jctn 14 and 17)
14. N4 Leixlip to M50
15. M11/N11 Ashford to M50 capacity enhancement
16. N2 Capacity enhancements (including Slane BP)

The following are not shown on the map:
17. N3 Widening between Clonee and M50 (Not Shown)
18. Road link between Dublin Port Tunnel and South Port area
19. Enhance orbital movement outside of M50 between N3 and N7
20. M50 Demand Management measures
Motorway / National Primary Schemes with Approvals (included in Capital Plan):
1. N59 Moycullen Bypass
2. N56 Mountcharles to Inver
3. N56 Dungloe to Glenties
Pavement Renewals

- National Roads Network – estimated value €32.5bn
- €12.5bn is subject to deterioration
- Pavements represent 70% of the depreciating assets
- Our analysis has shown that a consistent level of renewals investment of the order of €140m annually is required to maintain pavement condition at current levels
- This year, we are investing only €50m on pavement renewals.
Kilometers Improved per Year 2002-2020

- Long Term Required
- Annual Average Pavement Renewals Length

Kilometers Completed

Year:
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
- 2018
- 2019
- 2020

Structural Renewal
Minor Realignments
Major Projects
Land Transport Revenue vs Expenditure 1997 - 2012
