N17/N18 Gort - Tuam PPP Scheme

Construction update and engineering challenges

TII Annual Conference 28-29 September 2016

Presented by Obey Mhondera & Stuart Nicol

Comhairle Chontae na Gaillimhe
Galway County Council

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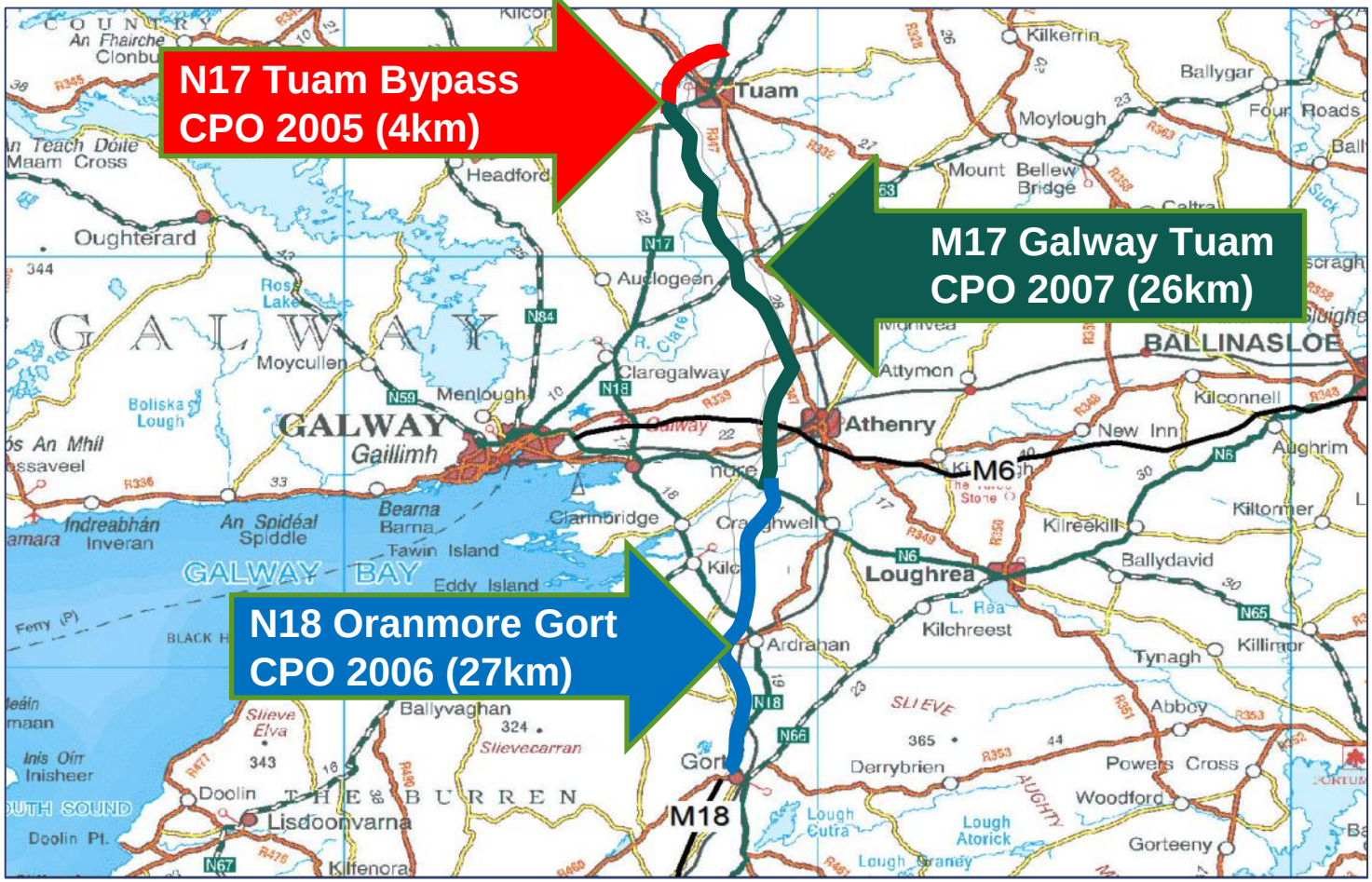
M17/M18 Gort to Tuam – Scheme Combined

Total Length 57km



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Procurement & Construction Programme

- Start of Tender - June 2009
- Financial Close & DirectRoute Tuam Ltd appointed - April 2014
- Mobilisation, Advance Work & Detailed Design - April-Dec 2014
- Construction Start - January 2015
- Open to traffic - Q3 2017
- Construction Completion - Q1 2018

PPP Model

- 25 year concession period (2018-2043)
- Private sector designs, builds, finances and operates (incl. maintenance) the Project Road
- Private sector funds construction
- PPP Co. receives availability payments over 25 years
- Road returns to public sector with prescribed residual life

PPP Co. Refinancing

- DirectRoute entered into a voluntary refinancing of the scheme which was concluded in early 2016.

- This refinancing is unique in Ireland. Refinancing normally occurs after construction when the Project is greatly de-risked from a lender's perspective.

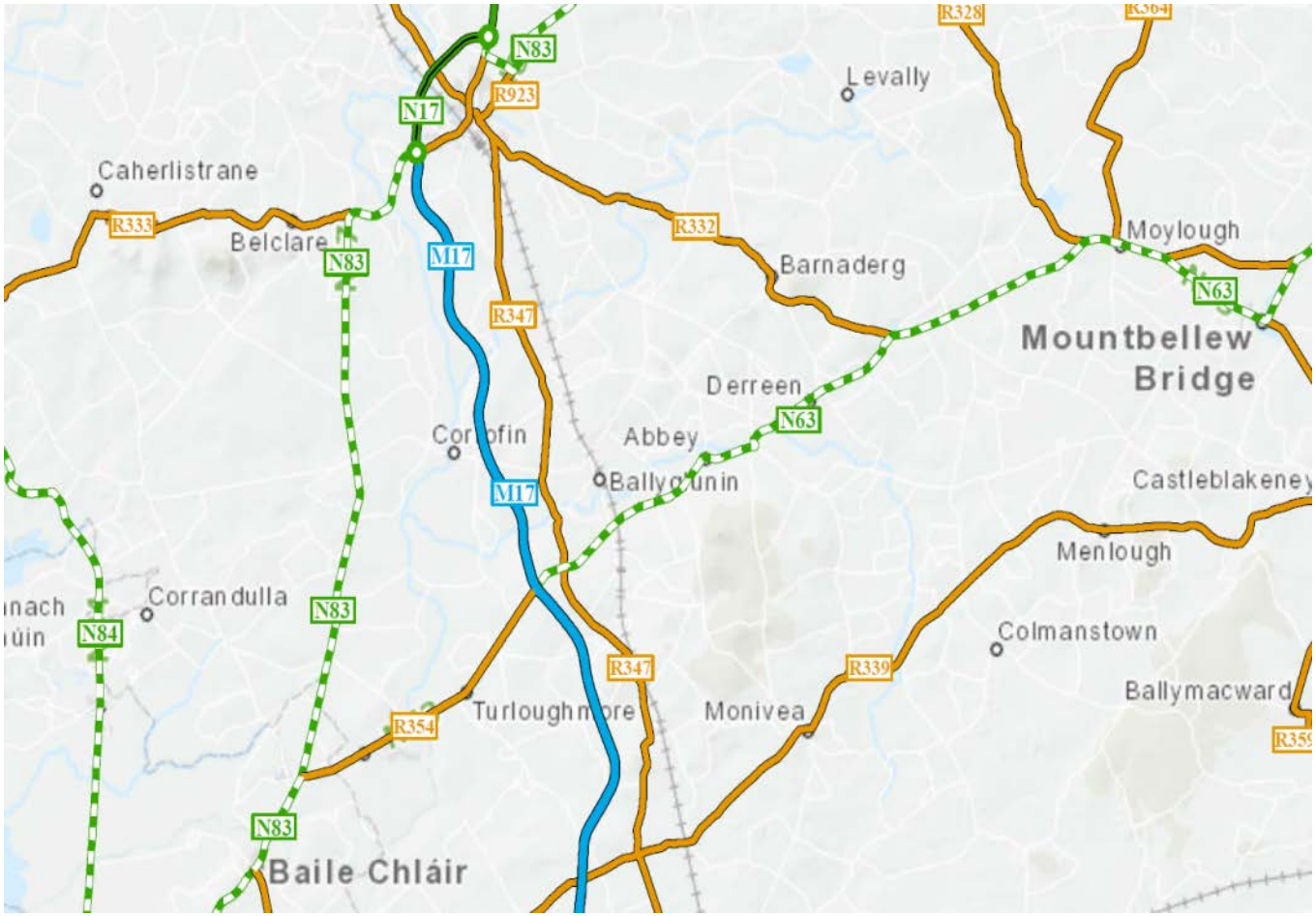
- The Project originally closed in April 2014 at a time of relatively high debt pricing, reflective of the markets at the time in addition to the 'Ireland Inc' concerns around its financial crisis.

PPP Co. Refinancing

- TII benefitted from the refinancing gain in accordance with the terms of the sharing mechanics agreed in the original PPP Agreement.

- The refinancing demonstrates that investors have an appetite for well structured project finance opportunities in Ireland.

DTTAS Road Reclassification



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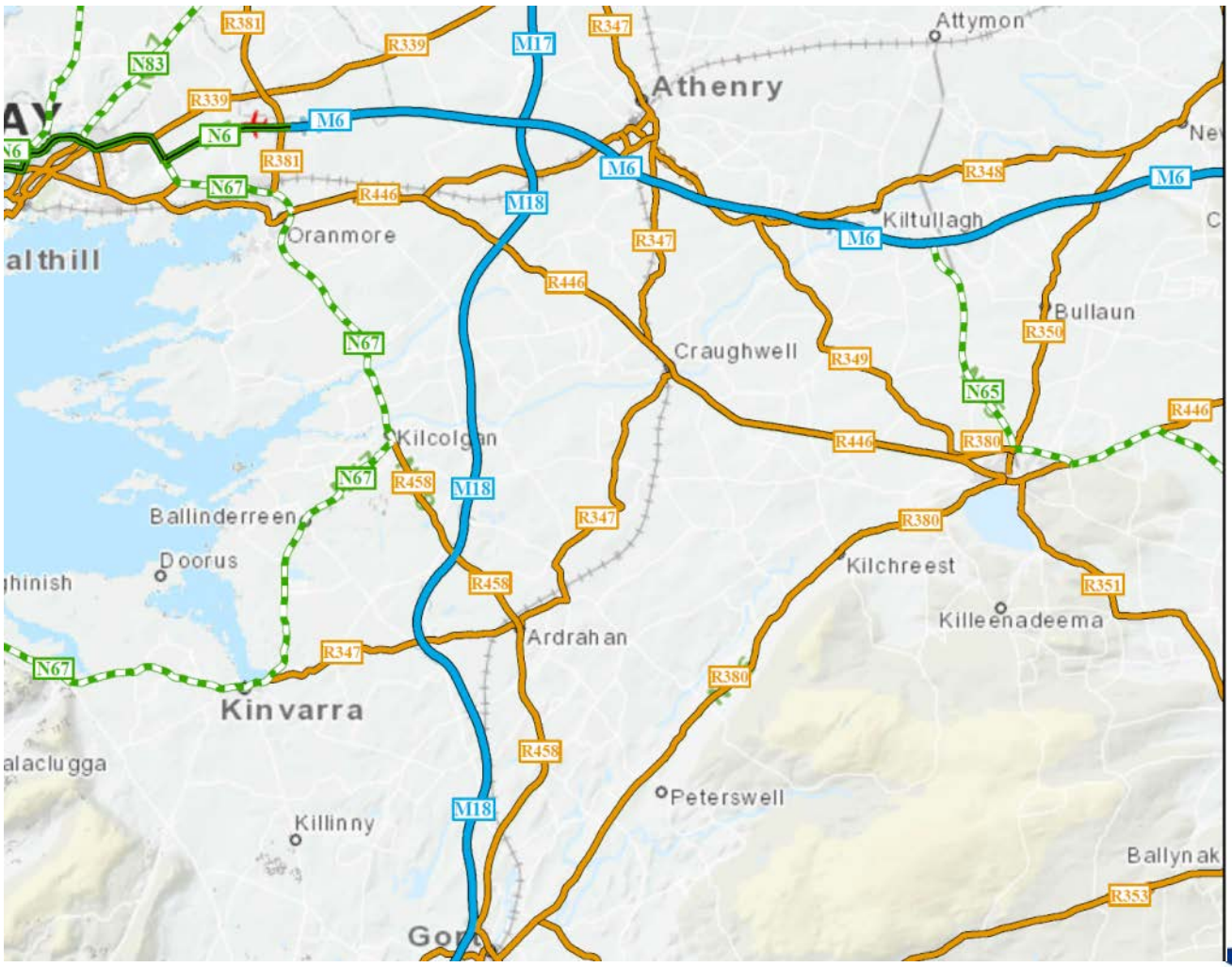
DTTAS Road Reclassification



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Project Resourcing & Health and Safety

- 2,450,000 hours worked on site.
- 3,717 Site inductions.
- 776 personnel working on behalf of the PPP Co.
- 416 items of major plant on site.
- Reportable Accident Frequency Ratio is 0.16.
- Lost Time Injury [all lost time] Frequency Rate is 0.49.
- 2 reportable dangerous occurrences & 4 reportable injuries.

Key Scope Elements & Progress

- Structures
  - 53 Bridges - 75% complete
  - 51 Other Structures - 45% complete
- Peat Removal (250,000 m^3) - 100% complete
- Rock Exc. & rocessing (2,000,000 m^3) - 98% complete
- Cut Volume (4,500,000 m^3) - 99% complete
- Fill Volume (3,000,000 m^3) - 95% complete
- Pavement (550,000 Tonnes) - 40% complete

Progress

Progress


Rock Processing
M18Ch.11+500
Southern Section
2016.06.27 08:09

Progress


Deck Pour OB161
M18 Ch.16+100
Southern Section
2016 06 07 09 44

Progress

Progress

Placing CBM
M17Ch.3+900
Central Section

Progress


Placing Binder Layer
M18Ch.12+400
Southern Section
2016.06.08 12:37

Progress

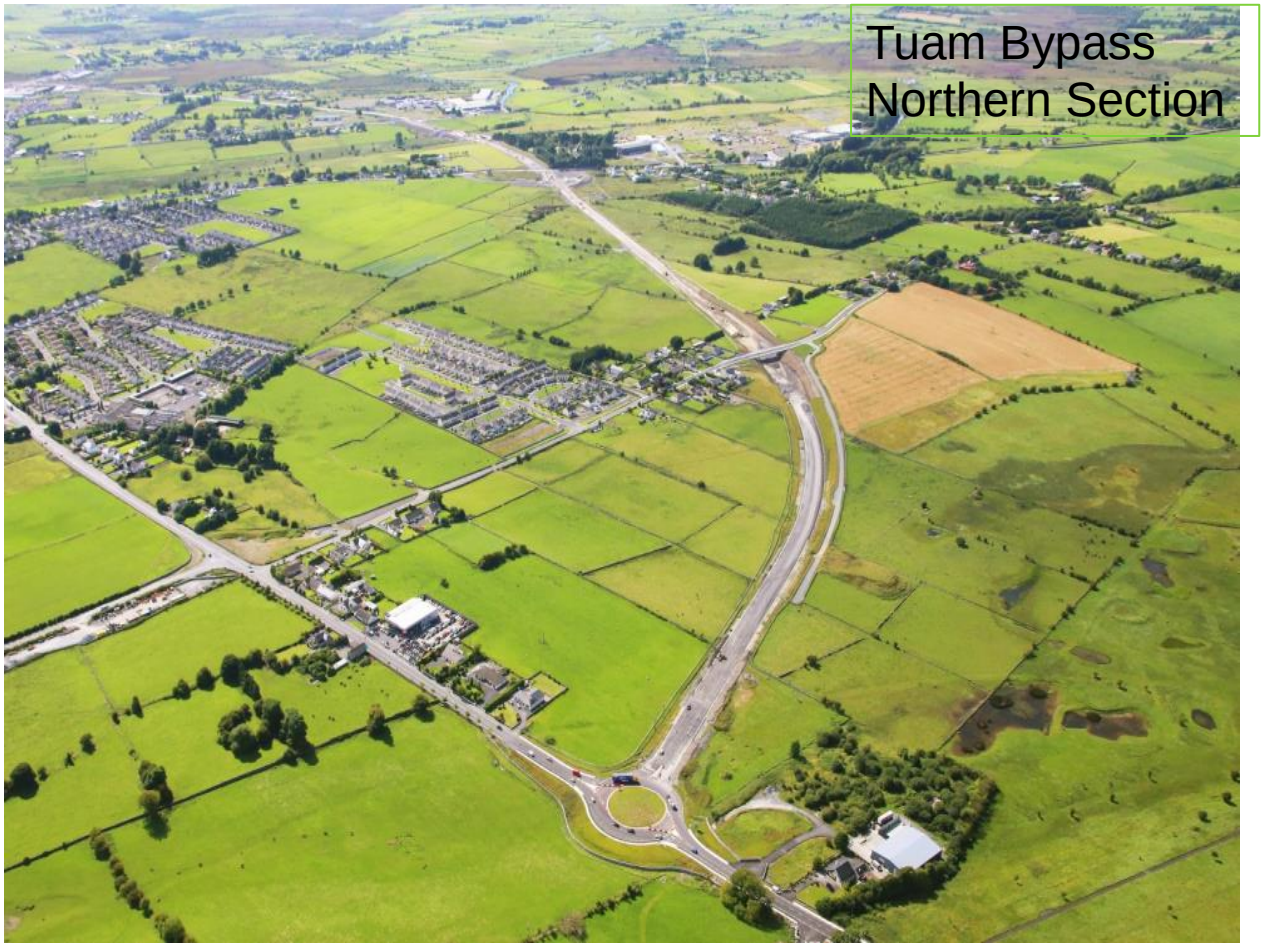

Safety Barrier Installation
M17Ch.14+750
Northern Section
2016.05.20 11:28

Progress


Median Barrier Installation
M17Ch.15+800
Northern Section
2016 07 04 11:05

Progress

Progress



Progress

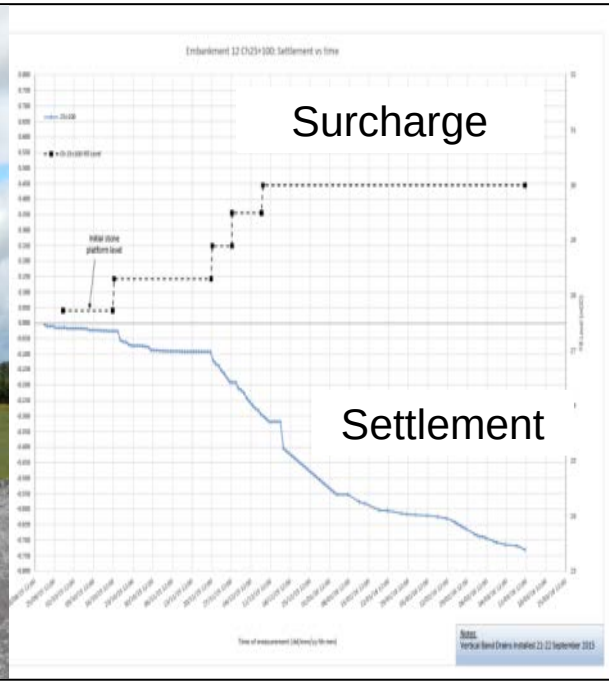
Engineering Challenges – Project Scale

M6-M17-M18
Junction at
Rathmorrissy

Engineering Challenges – Soft Ground

Vertical Drainage

Surcharged Embankment



Settlement Graph

Engineering Challenges – Karst

M18Ch23+000
Southern Section
4th May 2016

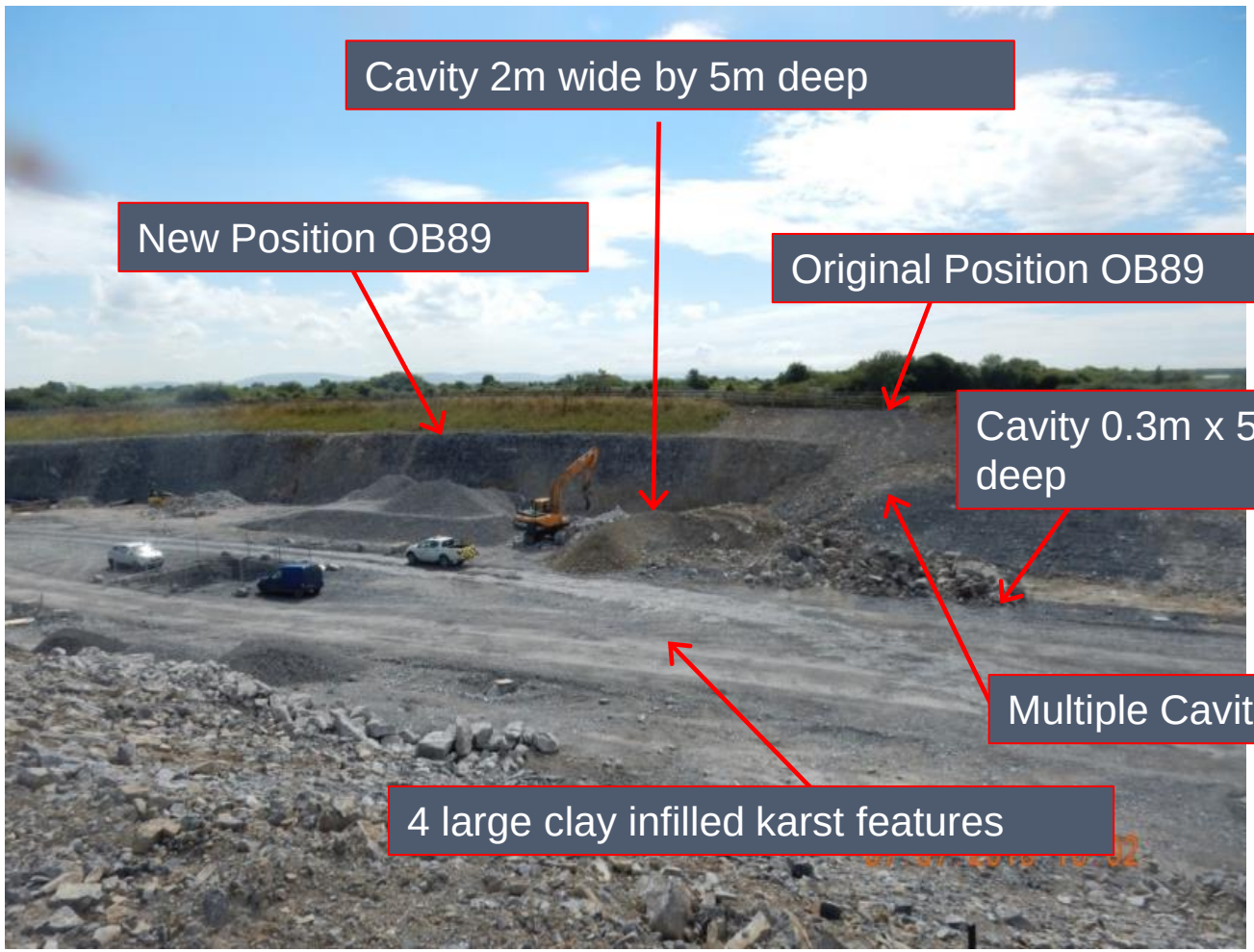
M17Ch12+500
Central Section
10th August 2015

M17Ch18+100
Northern Section
11th February 2016

Engineering Challenges – Karst

OB89
Roevehagh

M18Ch8+900
Southern
Section



Engineering Challenges – Project Scale

Engineering Challenges – Drainage

Attenuation Pond
M17Ch.14+600
Northern Section

Engineering Challenges – Flooding

M18Ch.22+500 to Ch23+000
Southern Section
10th February 2016

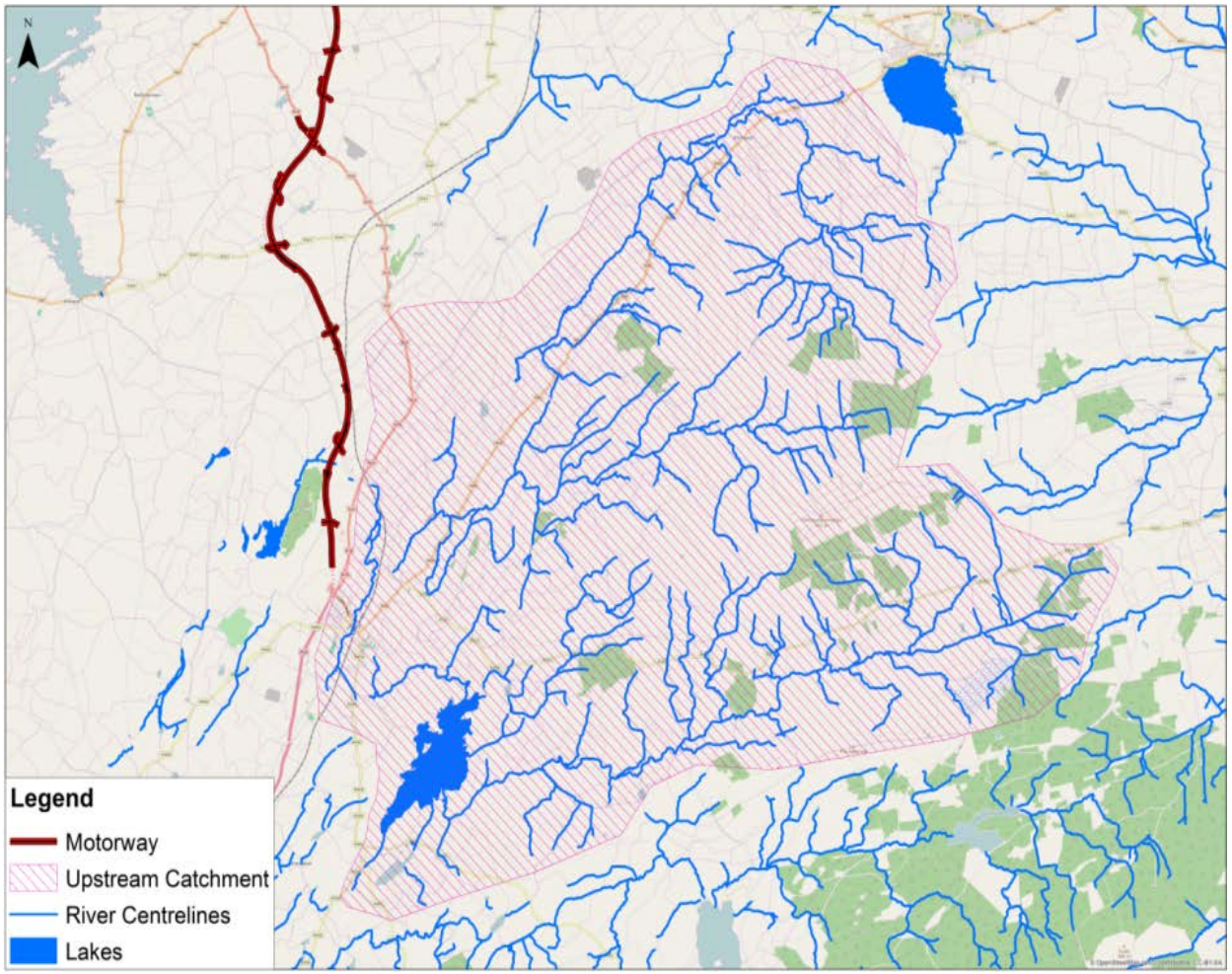
Engineering Challenges – Project Scale

M17Ch.20+200 to Ch21+700
Southern Section
27th December 2015

Engineering Challenges – Flooding

- November 2009 Event
  - 25 days of rain
  - 450mm of accumulated depth of rain
  - In excess of a 1 in 1000 year event
- December 2015/January 2016 Event
  - 40 days of rain
  - 500mm of accumulated depth of rain
  - In excess of a 1 in 1000 year event

Engineering Challenges – Flooding



Slieve Aughty
Catchment Area
South Galway

Engineering Challenges – Flooding

Dunkellin River Bridge UB100 : Southern Section

11th December 2015

24th August 2016

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Engineering Challenges – Flooding

Abbert River Bridge UB146

11th December 2015

24th August 2016

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Engineering Challenges – Flooding

Grange River Bridge UB194

11th December 2015

5th August 2016

Engineering Challenges – Flooding

Ballymaquiff M18Ch.20+700 to 21+000

11th December 2015

24th August 2016

Engineering Challenges – Flooding

- The Construction Requirements include;
  - 9km of free draining embankments 0.5m above flood levels.
  - Minimum vertical alignment requirements.
  - Flood Alleviation Culverts.
  - Ponds bunded to protect from flood waters.
  - Bridge set-backs for flood clearance.

Concluding Remarks

- Tremendous progress being achieved on the N17N18 PPP Scheme
- Do extraordinary flooding events point to climate change?
- What is TII's Response to Climate Change?
  - ✓ TII Strategy for Adapting Climate Change on Ireland's Light Rail and National Road Network(Jan 2016)
  - ✓ Incorporating climate change effects in Standards
  - ✓ Flood Mapping Tool
  - ✓ CEDR Research Programme (s)