

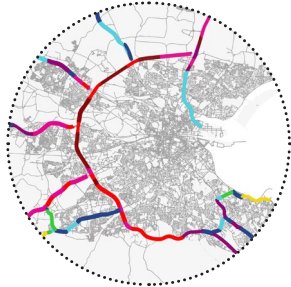
TRANSPORT INFRASTRUCTURE IRELAND

NATIONAL ROADS NETWORK INDICATORS 2017

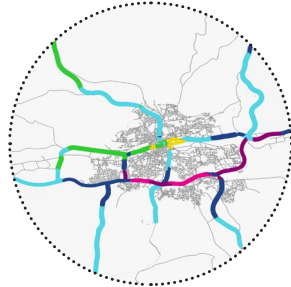
A: KEY TREND SUMMARY

TRAVEL HOTSPOTS:

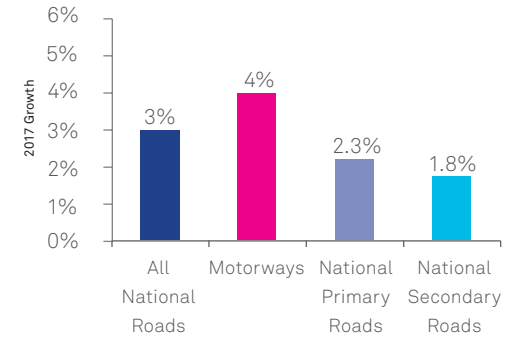
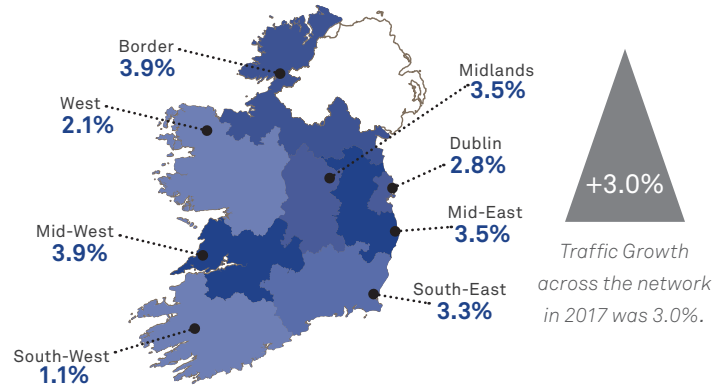
M50 Dublin area:
145,000 vehicles per day
Hotspot: ■



N40 Cork area:
85,000 vehicles per day
Hotspot: ■



TRAFFIC GROWTH:



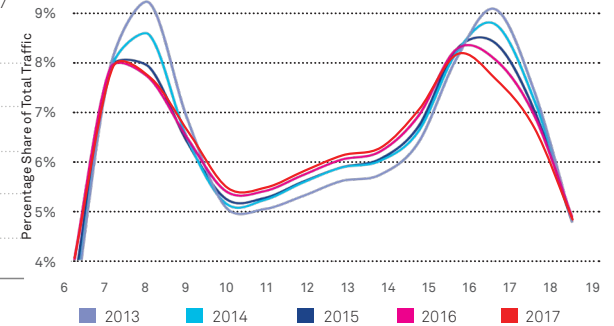
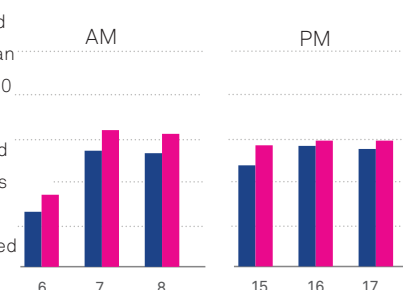
M50 KEY NETWORK STATISTICS:



CHANGES IN PEAK HOUR SPREAD M50:

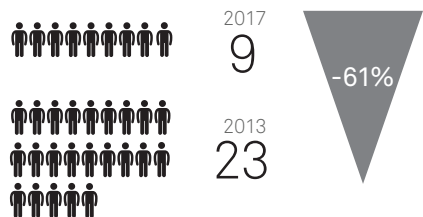
The peak hours remain the same as 2016: 6.30 - 9.30 and 15.30 - 18.30, but there was an increase in trips between 6.00 and 7.00 of 0.4% from 2016. This was a result of continued growth on the National Roads network and traffic demand reaching previously unreachable levels especially on the M50.

TOTAL TRAFFIC M50 TMUs

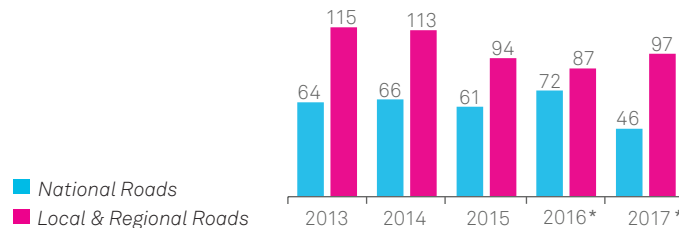


FATAL COLLISIONS ON THE NATIONAL ROADS NETWORK:

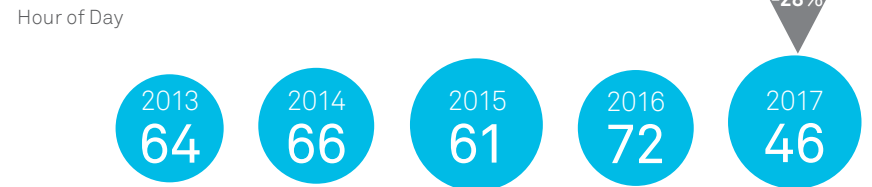
Pedestrians:



Fatal collisions by road type:



Total fatal collisions on the National Roads (2013-2017):



*Fatal collisions 2015 - 2017: AGS data (not verified by RSA)

B: NEWS + UPDATES

Establishment of TII
In August 2015, the National Roads Authority (NRA) and the Railway Procurement Agency (RPA) were merged to become Transport Infrastructure Ireland (TII).

To find out more about TII visit www.tii.ie

National Transport Model (NTpM)

Following a major update in 2013, the NTpM is updated annually using data from the Traffic Monitoring Unit network. Documentation regarding the National Transport Model can be located on the TII website at www.tii.ie/tii-library/strategic-planning/

Traffic Monitoring Units

TII now has over 370 Traffic Monitoring Units around the country which are used to monitor traffic patterns and to plan future interventions.

See website: www.nratrafficdata.ie

Motorway Service Helpline

A Motorway Service Helpline has been set-up to assist roads users in difficulty on a Motorway. All calls are directed through the Motorway Traffic Control Centre (MTCC) and the number is:



0818-715-100 or;
operator@nraits.ie

Further information and live traffic updates are available on www.tiittraffic.ie

CONTENTS

INTRODUCTION	P5
1. ROAD NETWORK	P6
2. ECONOMIC	P22
3. ROAD CONDITION	P24
4. SAFETY	P28
5. ACCESSIBILITY + ENVIRONMENT	P30

INTRODUCTION

Transport Infrastructure Ireland's mission is to deliver transport infrastructure and services that contribute to the quality of life of the people of Ireland and support the country's economic growth

For this purpose, TII has overall responsibility not only for the planning and supervision of the construction and maintenance works on these roads, but also for ensuring the efficient use and safe operation of the National Roads network.

Efficient use of the National Roads network provides benefits to road passenger and road freight users in the form of shorter journey times, reduced congestion and

reductions in the cost of operating vehicles. Society as a whole benefits from increased economic productivity, reduced energy consumption and a better environment.

If the National Roads network is operated to a high standard, then road users will enjoy safe journeys with predictable journey times.

Transport Infrastructure Ireland considers it important to monitor the performance and usage of the National Roads network and to share this information with the public.

This publication sets out some key indicators of performance and usage of the National Roads network.

ONE: ROAD NETWORK



A: LENGTH OF NATIONAL ROADS NETWORK


Length of National Roads network by road type 2017

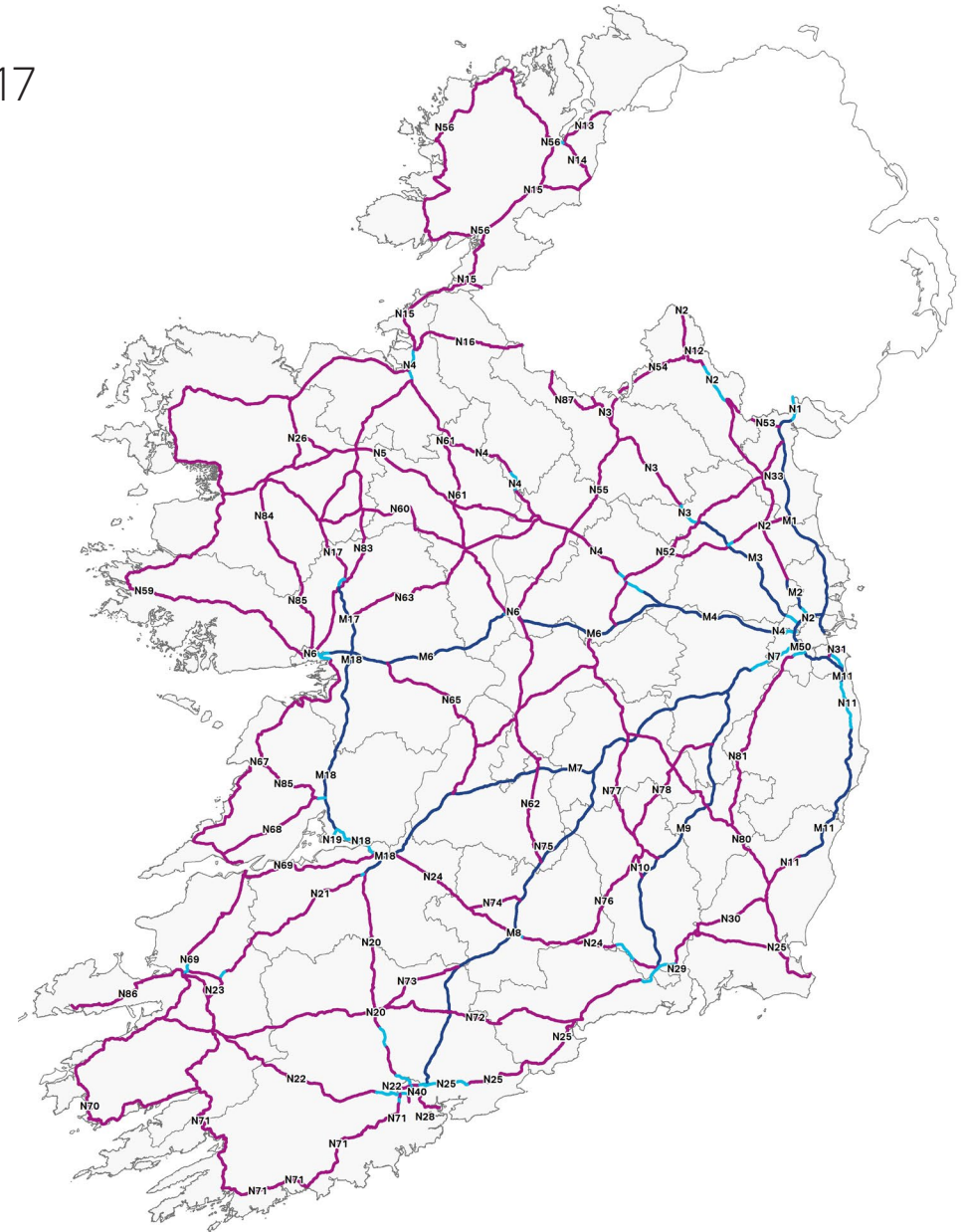
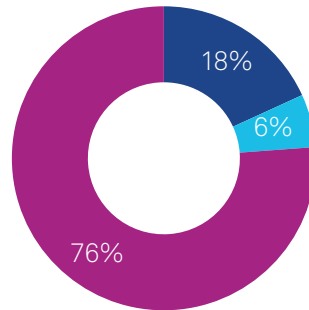
There are in excess of 5,300 kilometres of National Roads network in Ireland.

The National Roads network is comprised of 969 km of motorway, 301km of dual carriageway and 4,062km of single carriageway.

The actual length of the National Roads network fluctuates year on year due to road reclassification, realignments to existing National Roads, completion of new roads and analysis/updating of data in the TII Roads Database.

Road type:

Motorway		969km
Dual carriageway		301km
Single carriageway		4,062km



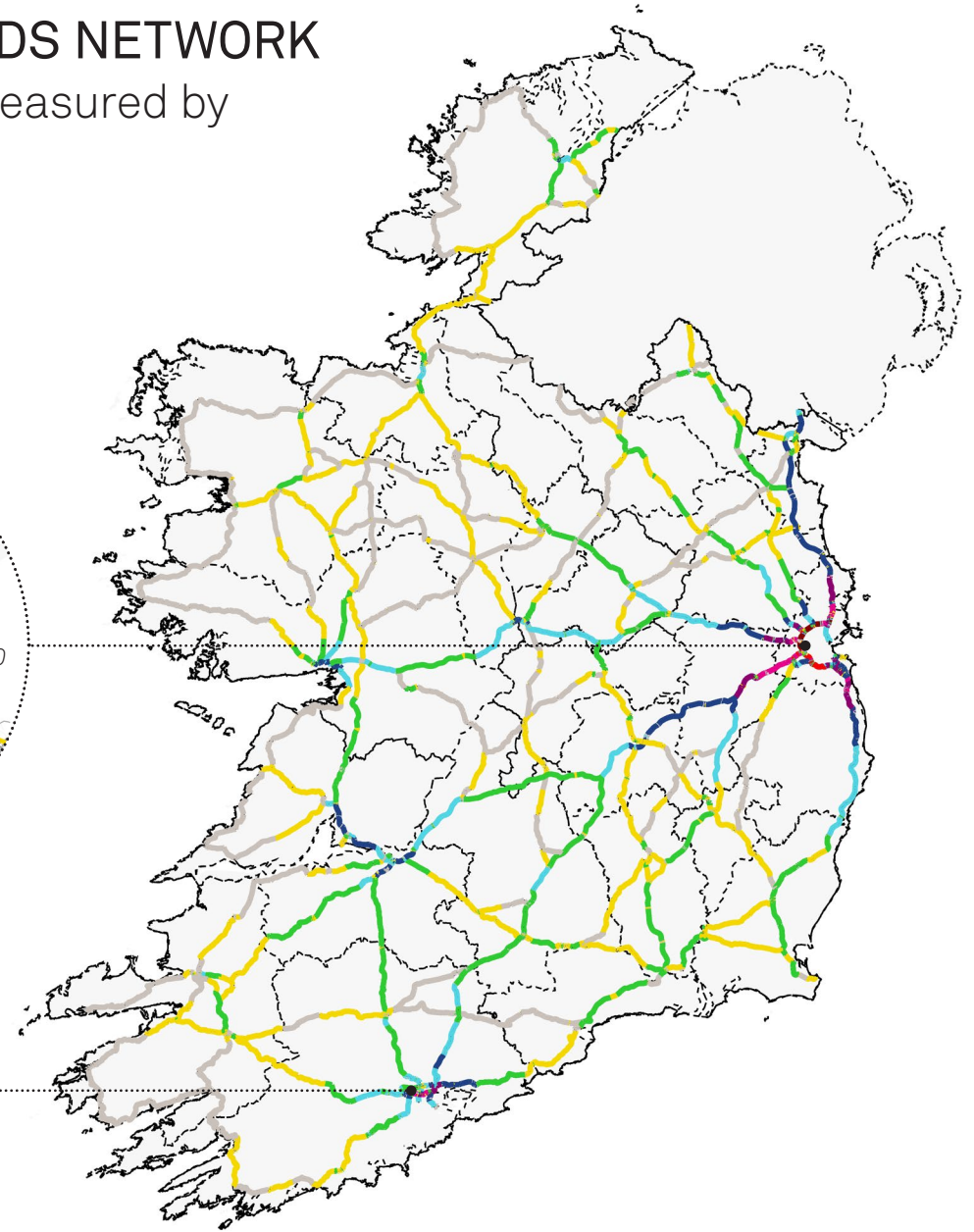
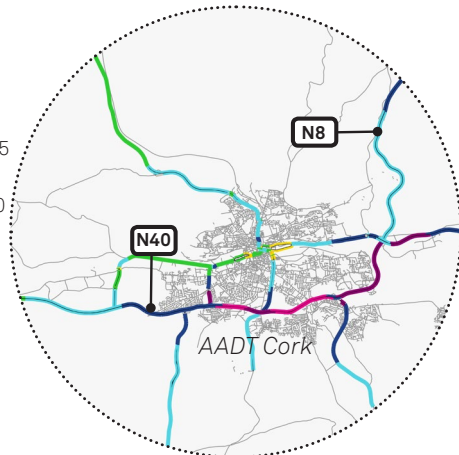
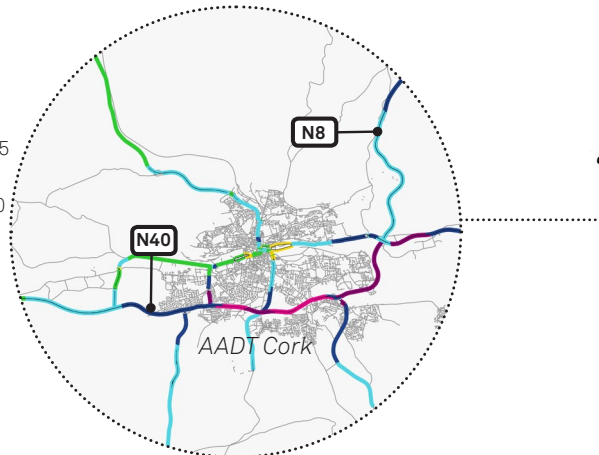
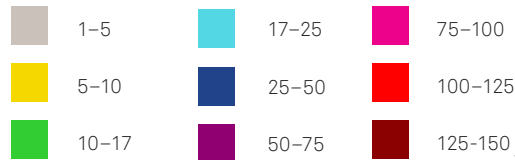
B1: LEVEL OF USAGE OF THE NATIONAL ROADS NETWORK

Level of usage of the National Roads network as measured by Annual Average Daily Traffic (AADT)

The continued growth in the Irish economy is reflected by the growth in traffic on the National Roads network.

In Dublin, the M50 continues to experience growth in levels of usage as measured by Annual Average Daily Traffic (AADT) flows, with the section between Junction 5 (N2) and Junction 9 (N7) carrying in excess of 140,000 AADT. Increased economic activity outside of the Dublin region is also apparent with further AADT growth being experienced on the N40 (Cork South Ring Road) in 2017.

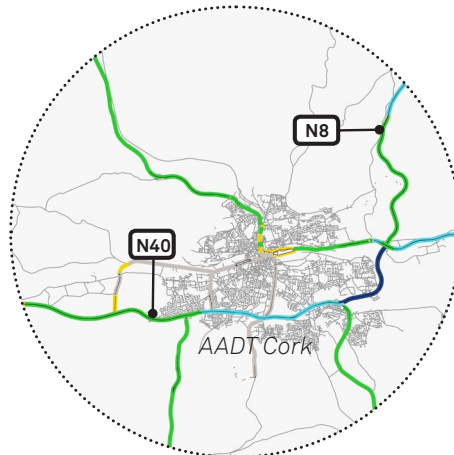
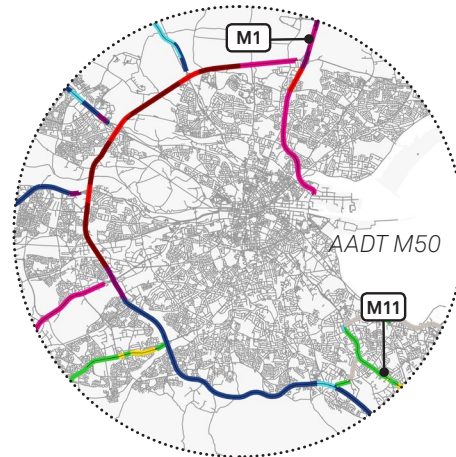
AADT (thousands per day)



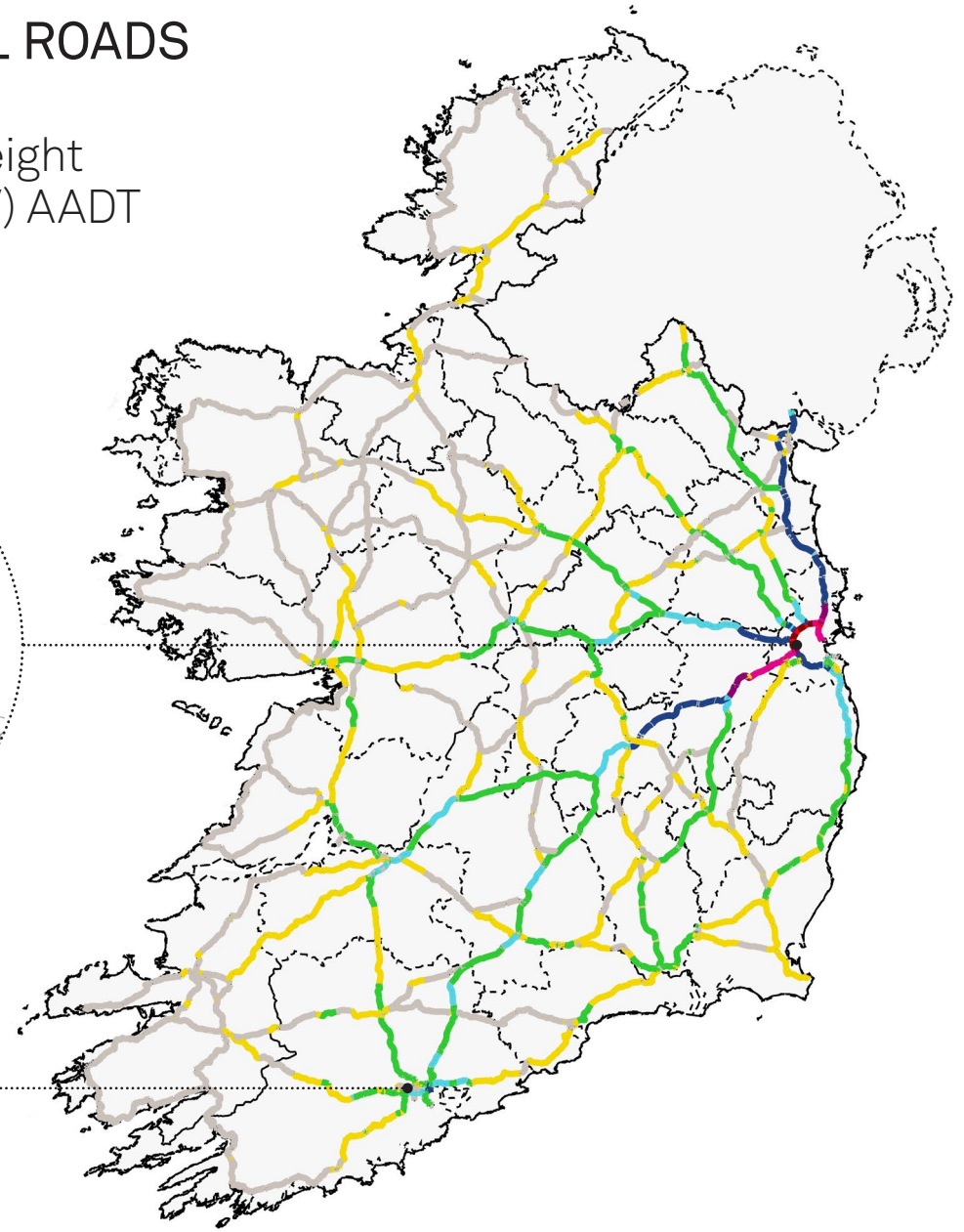
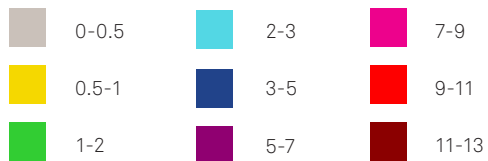
B2: FREIGHT MOVEMENTS ON THE NATIONAL ROADS NETWORK

Level of usage of the National Roads network by freight vehicles as measured by Heavy Goods Vehicle (HGV) AADT

The level of usage of the National Roads network by freight vehicles, as measured by Heavy Goods Vehicles (HGV) AADT, continues to experience growth particularly in economic centres near major ports.



HGV AADT (thousands per day)



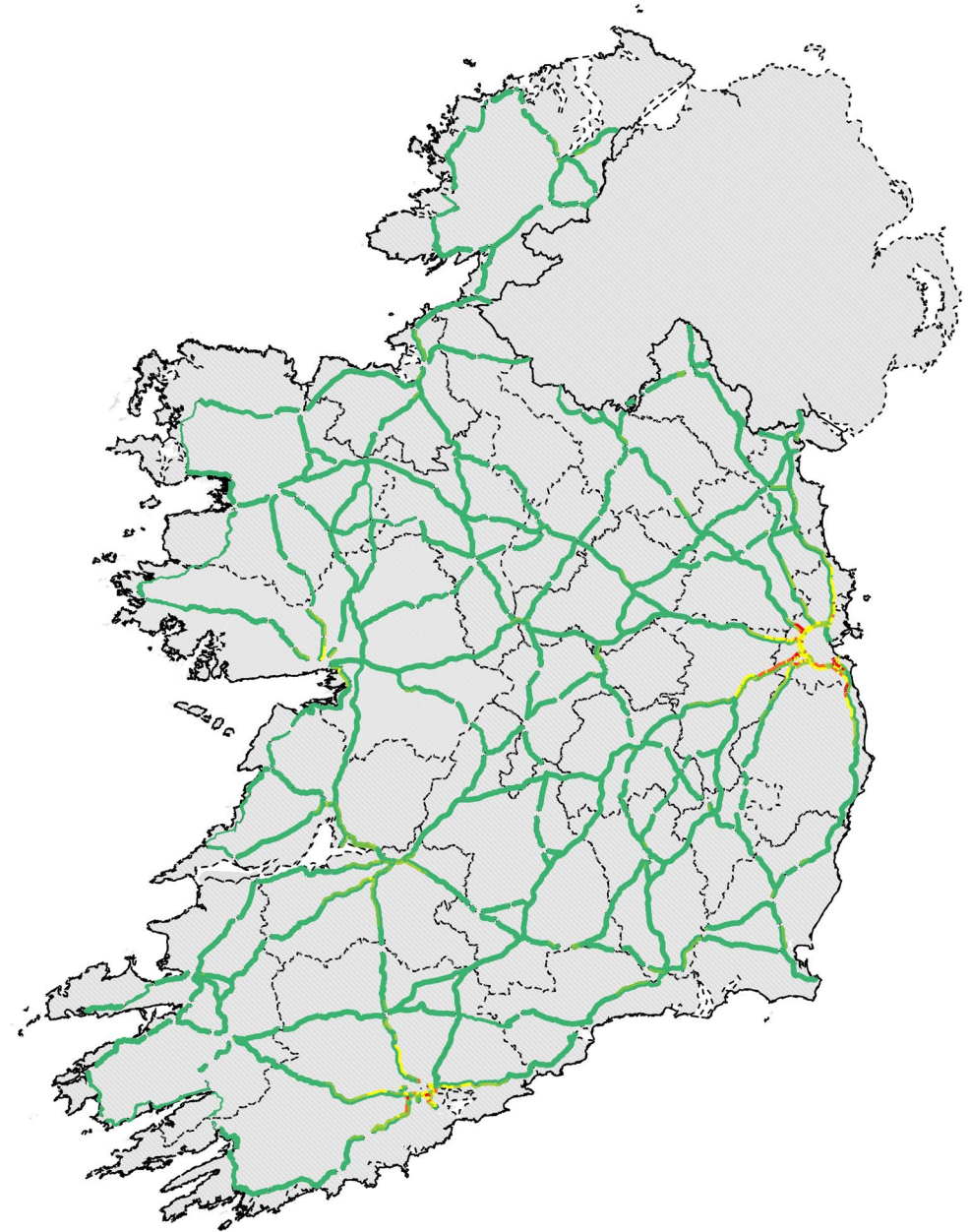
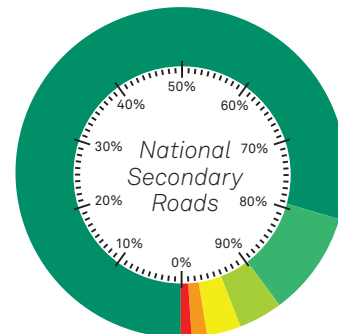
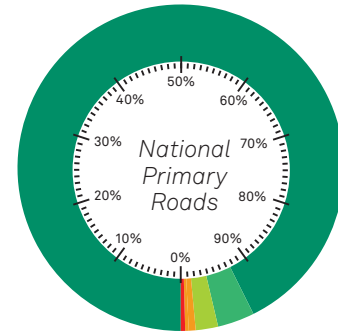
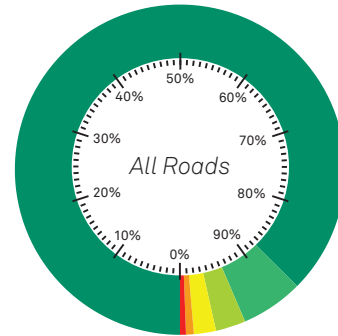
C1: LEVEL OF SERVICE: MORNING RUSH-HOUR, NATIONAL ROADS

Proportion of the National Roads network operating under each level of service condition

The level of service (LOS) provided by roads may be assessed using recognised international standards. LOS is a quality measure describing operational conditions within a traffic stream. Following the substantial investment in National Roads in recent times, most route sections are operating to the highest standard of service.

For further information see: Transport Research and Information Note: A Study of Lane Capacity, online at www.tii.ie/tii-library/strategic-planning

- A. Free flow
- B. Reasonably free flow
- C. Stable flow
- D. Approaching unstable flow
- E. Unstable flow
- F. Forced or breakdown flow



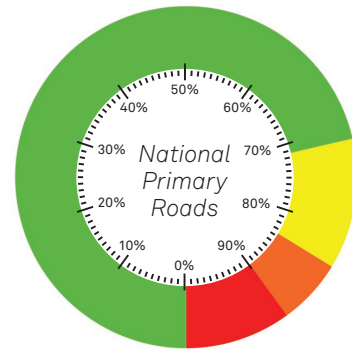
C2: VOLUME TO CAPACITY RATIO: NATIONAL PRIMARY ROADS

Proportion of the National Primary Roads network operating at each level of capacity

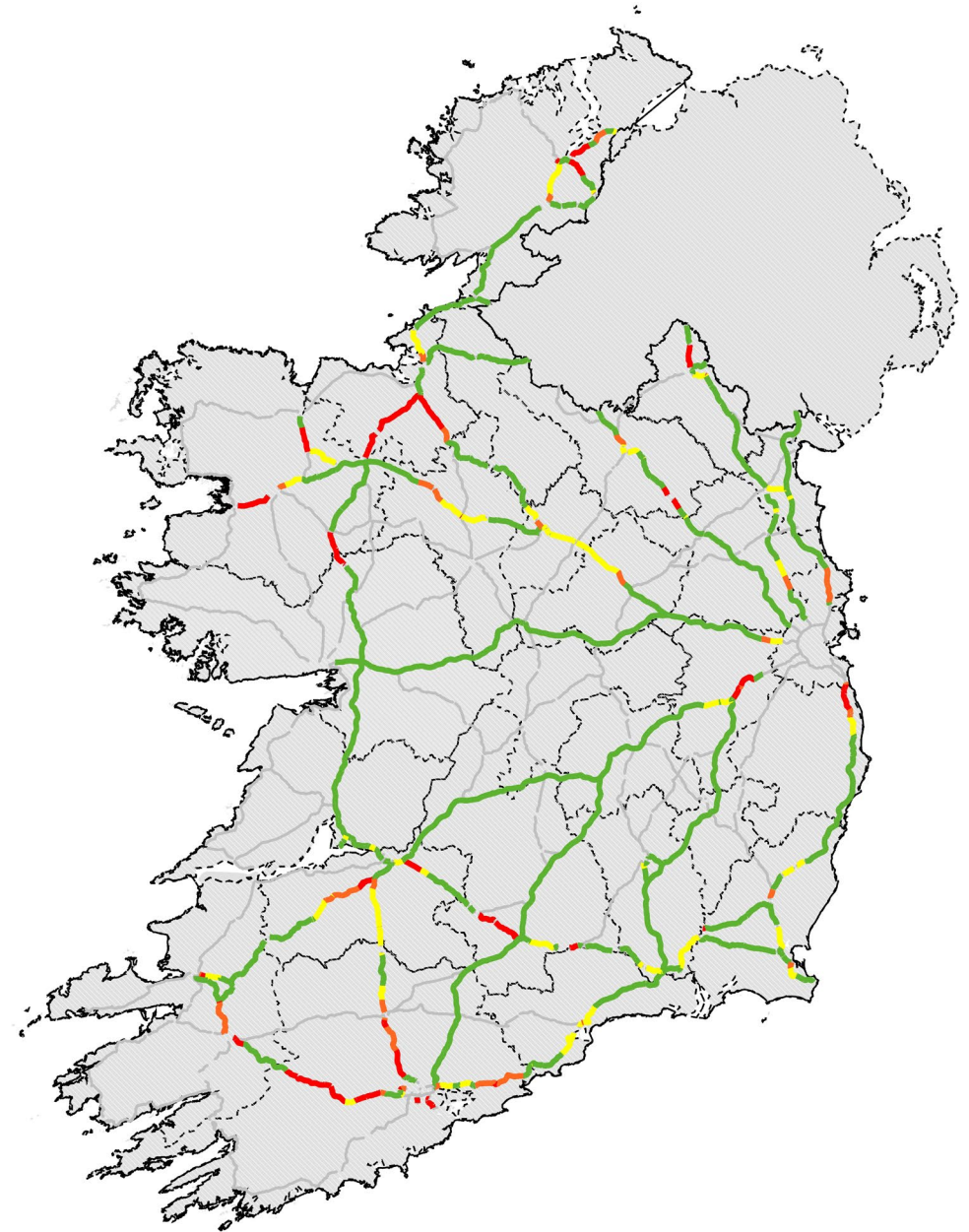
The Volume to Capacity (V/C) Ratio relates the AADT volume carried on a section of road to its daily operational capacity.*

The V/C Ratio for the National Primary Roads network indicates that over 70% of the network is operating at or below 80% of its daily capacity. This reflects the significant investment made in the National Primary Roads network in recent times.

*Capacity Based on TII TD 9 Road Link Design Table 6



- Operating Below 80% Capacity
- Operating between 80% - 100% Capacity
- Operating between 100% - 120% Capacity
- Operating above 120% Capacity



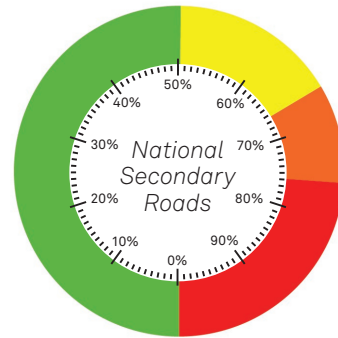
C3: VOLUME TO CAPACITY RATIO: NATIONAL SECONDARY ROADS

Proportion of the National Secondary Roads network operating at each level of capacity

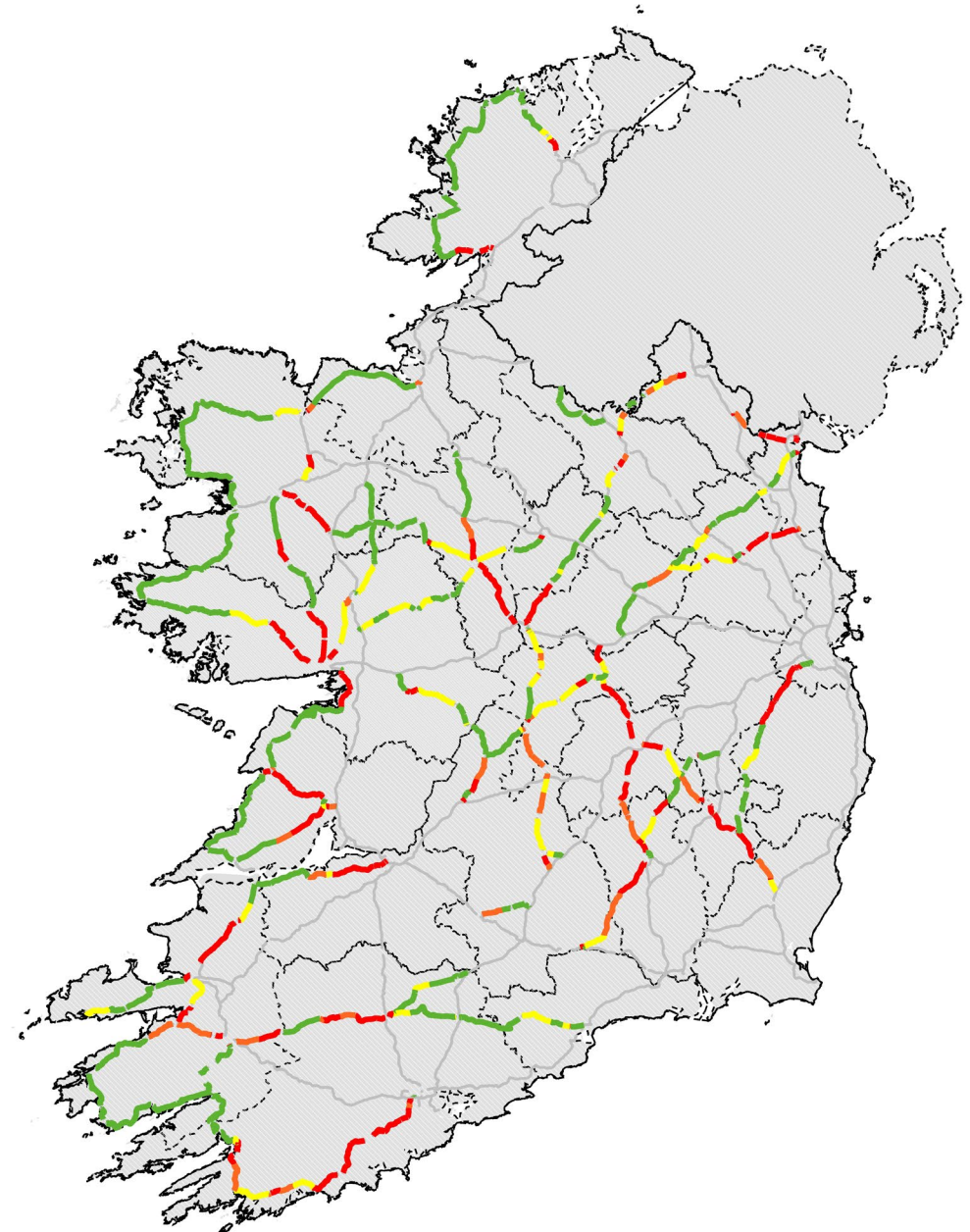
The Volume to Capacity (V/C) Ratio relates the AADT volume carried on a section of road to its daily operational capacity.*

The V/C Ratio for the National Secondary Roads network indicates that over 50% of the network is operating at or above 80% of its daily capacity.

*Capacity Based on TII TD 9 Road Link Design Table 6




- Operating Below 80% Capacity
- Operating between 80% - 100% Capacity
- Operating between 100% - 120% Capacity
- Operating above 120% Capacity



D1: M50 PERFORMANCE SUMMARY

2017 Key network statistics

The M50 is the most heavily trafficked road in the country with in excess of 140,000 vehicles using several sections on an average day.




15,417
Highest hourly flow recorded between the N4-N3 at 4pm on the 25th July



1.5 billion
Vehicle km travelled



170,711
Highest Daily Flow Recorded between the N3-N2



1,429
Total No. of Incidents of which **547** were Traffic Collisions



FRIDAY
Busiest Typical Day



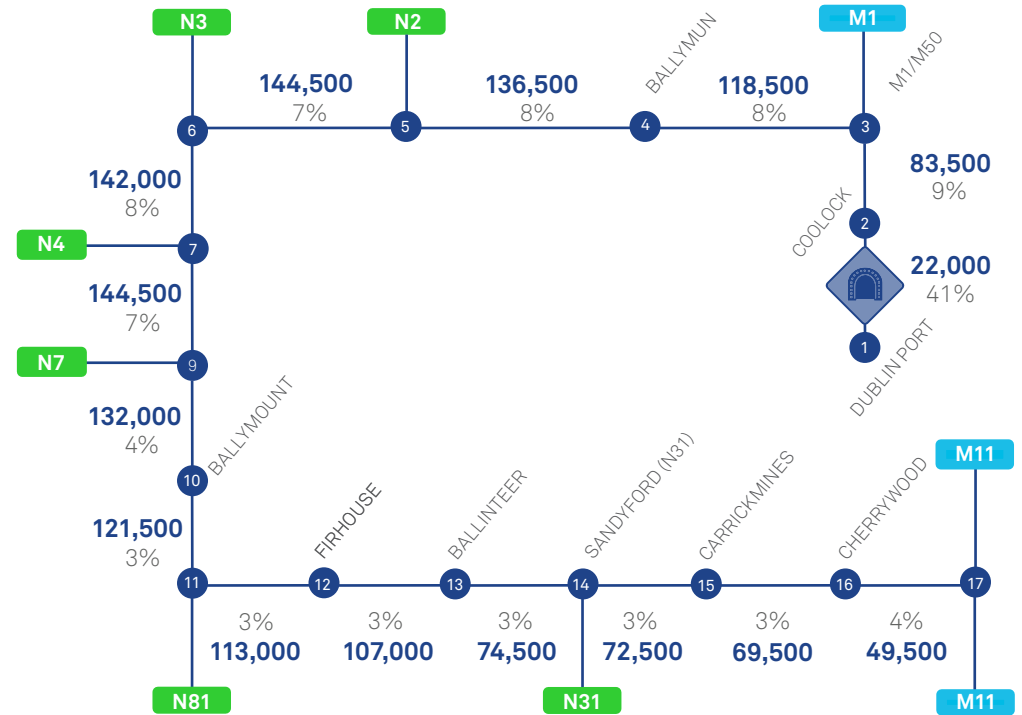
16:00 -19:00
Peak Incident Time



12 minutes
Average Response Time



29 minutes
Median Duration of Incidents



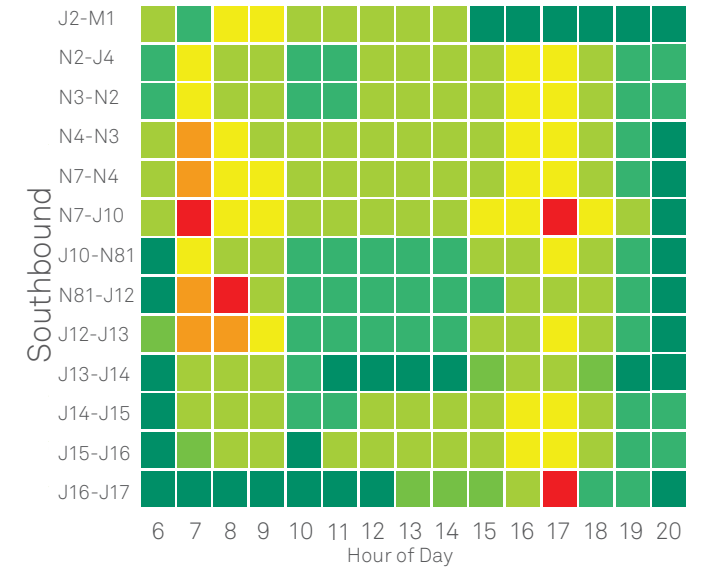
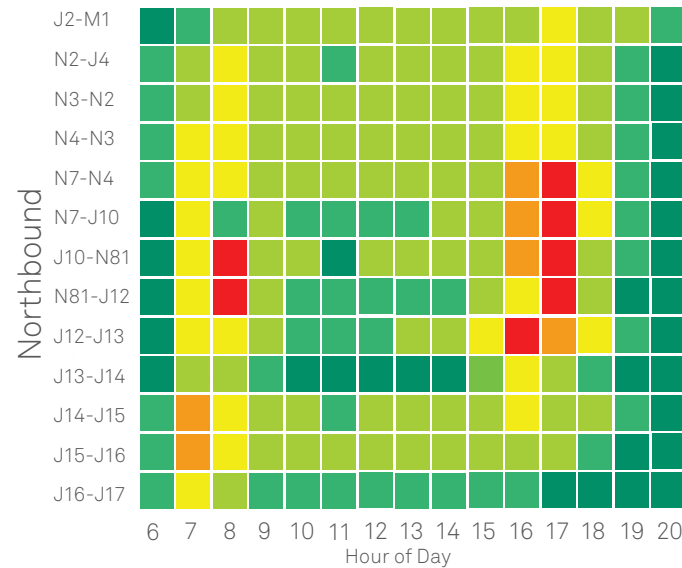
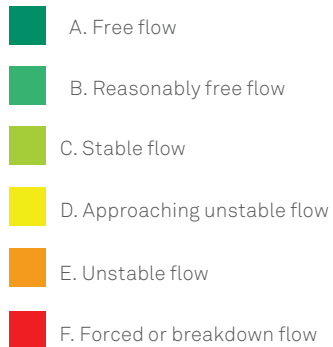
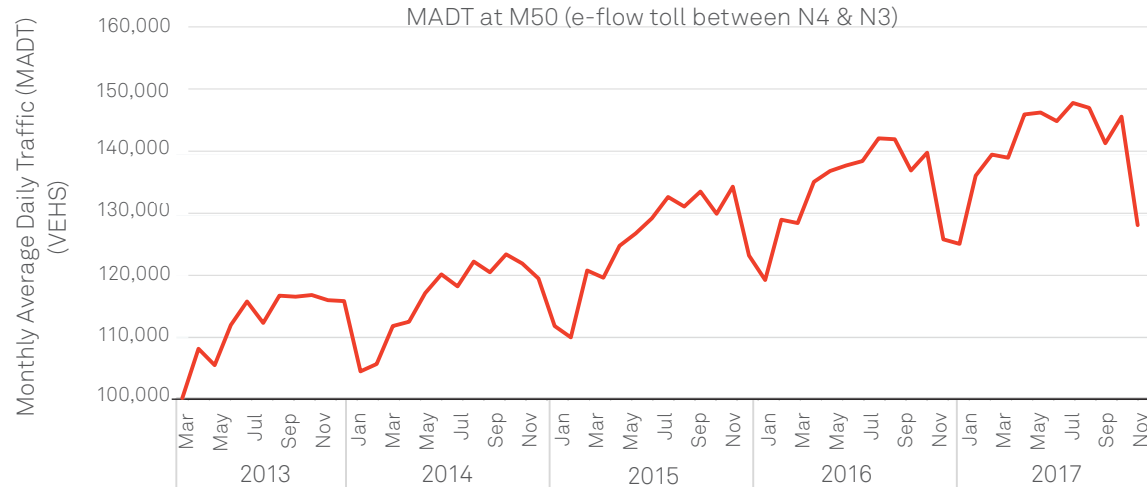
M50 Schematic Layout
2017 Annual Average Daily Traffic (%HGV) on M50

D2: M50 PERFORMANCE SUMMARY

Traffic growth and typical working day conditions represented by level of service

The level of service (LOS) provided by roads may be assessed using recognised international standards. LOS is a quality measure describing operational conditions within a traffic stream.

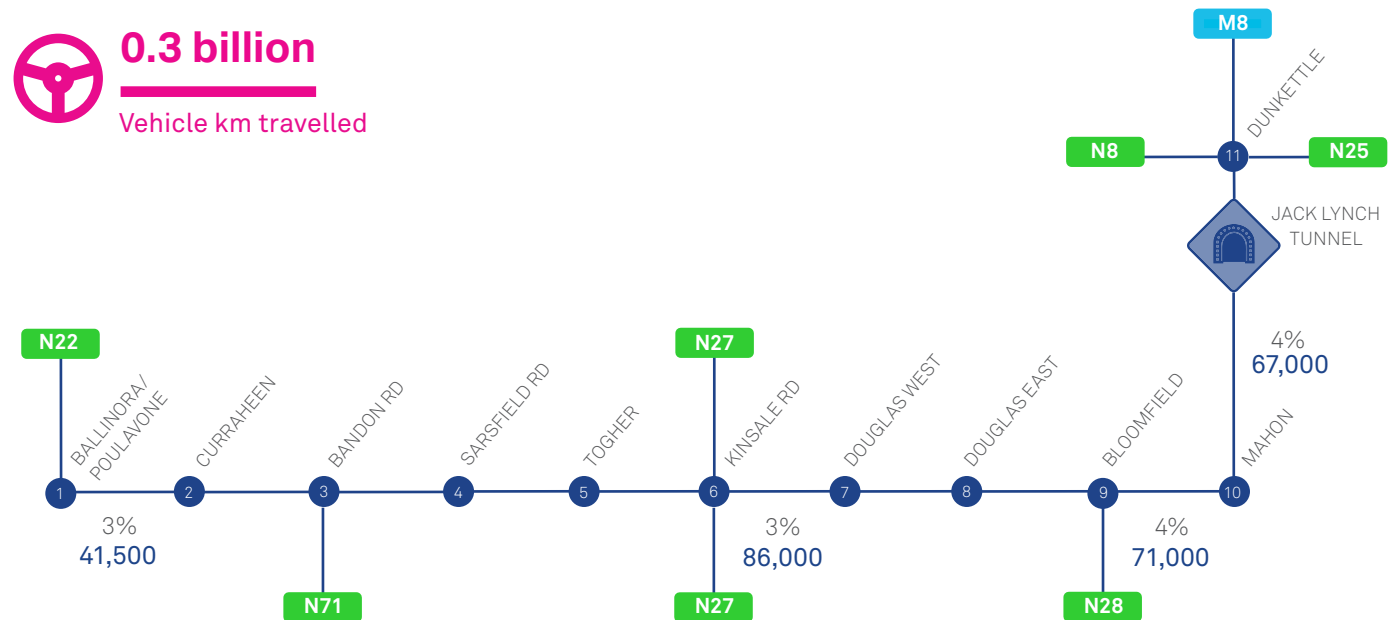
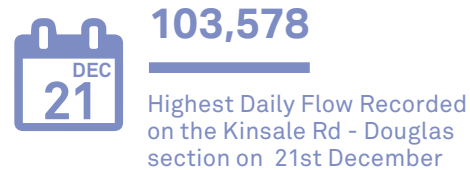
A typical working day in 2017 refers to all weekdays excluding school holidays and public holidays. Average hourly levels of service for the full year were analysed from TII Traffic Monitoring Units and by identifying the most frequent level of service condition. This gives an indication of what the busiest times of a typical day were and what sections of the M50 were most congested in 2017.



D3: N40 PERFORMANCE SUMMARY

2017 Key network statistics

Several sections of the N40 Cork Southern Ring Road carry in excess of 80,000 vehicles on an average day

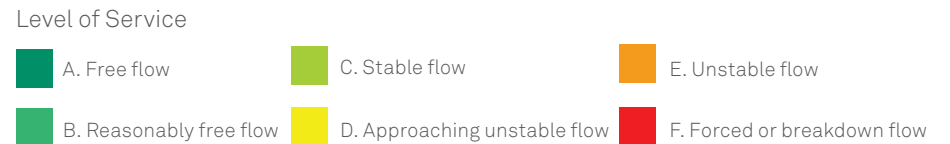
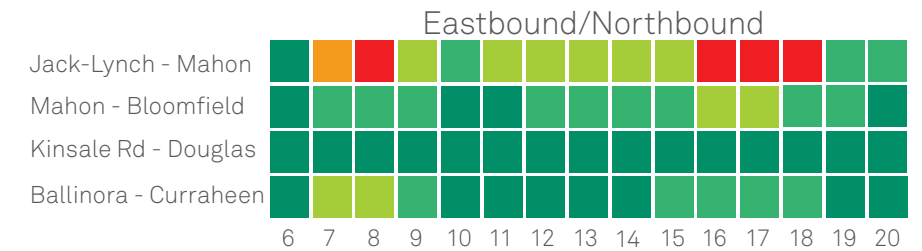
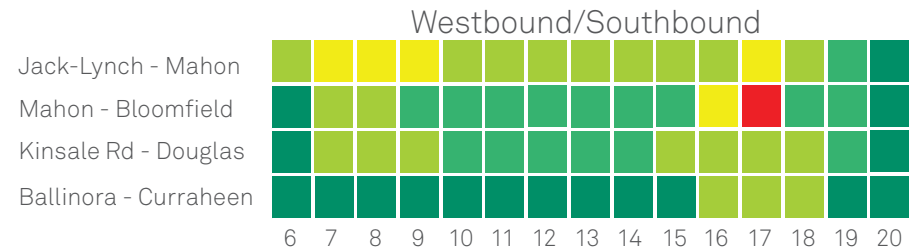
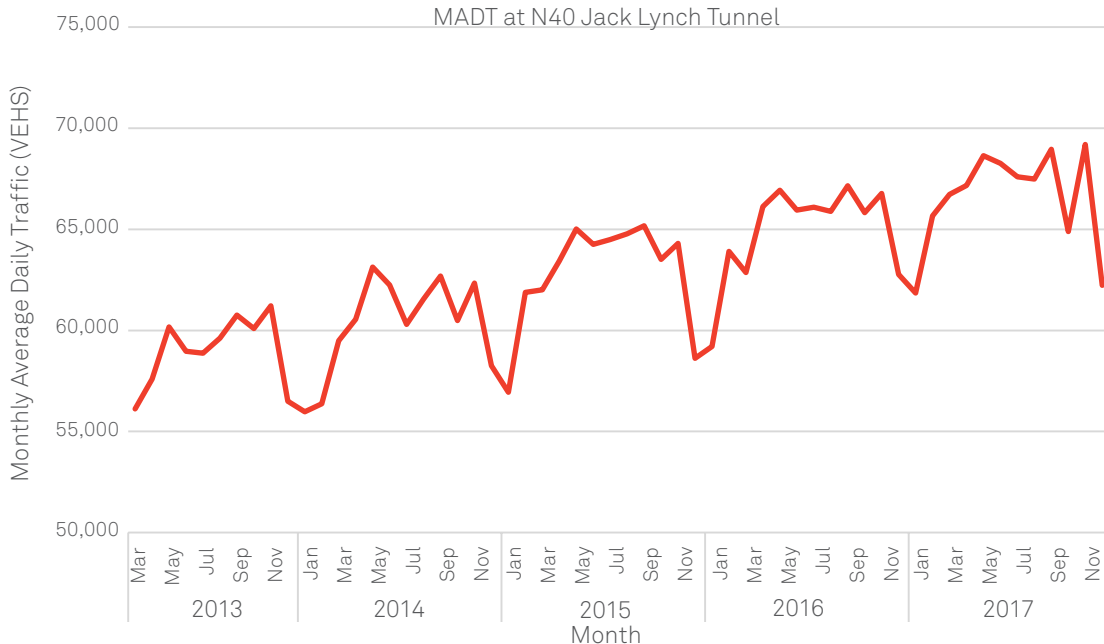


D4: N40 PERFORMANCE SUMMARY

Traffic growth and typical working day conditions represented by level of service

The level of service (LOS) provided by roads may be assessed using recognised international standards. LOS is a quality measure describing operational conditions within a traffic stream.

A typical working day in 2017 refers to all weekdays excluding school holidays and public holidays. Average hourly levels of service for the full year were analysed from TII Traffic Monitoring Units and the most frequent level of service condition. This gives an indication of what the busiest times of a typical day were and what sections of the N40 were most congested in 2017.



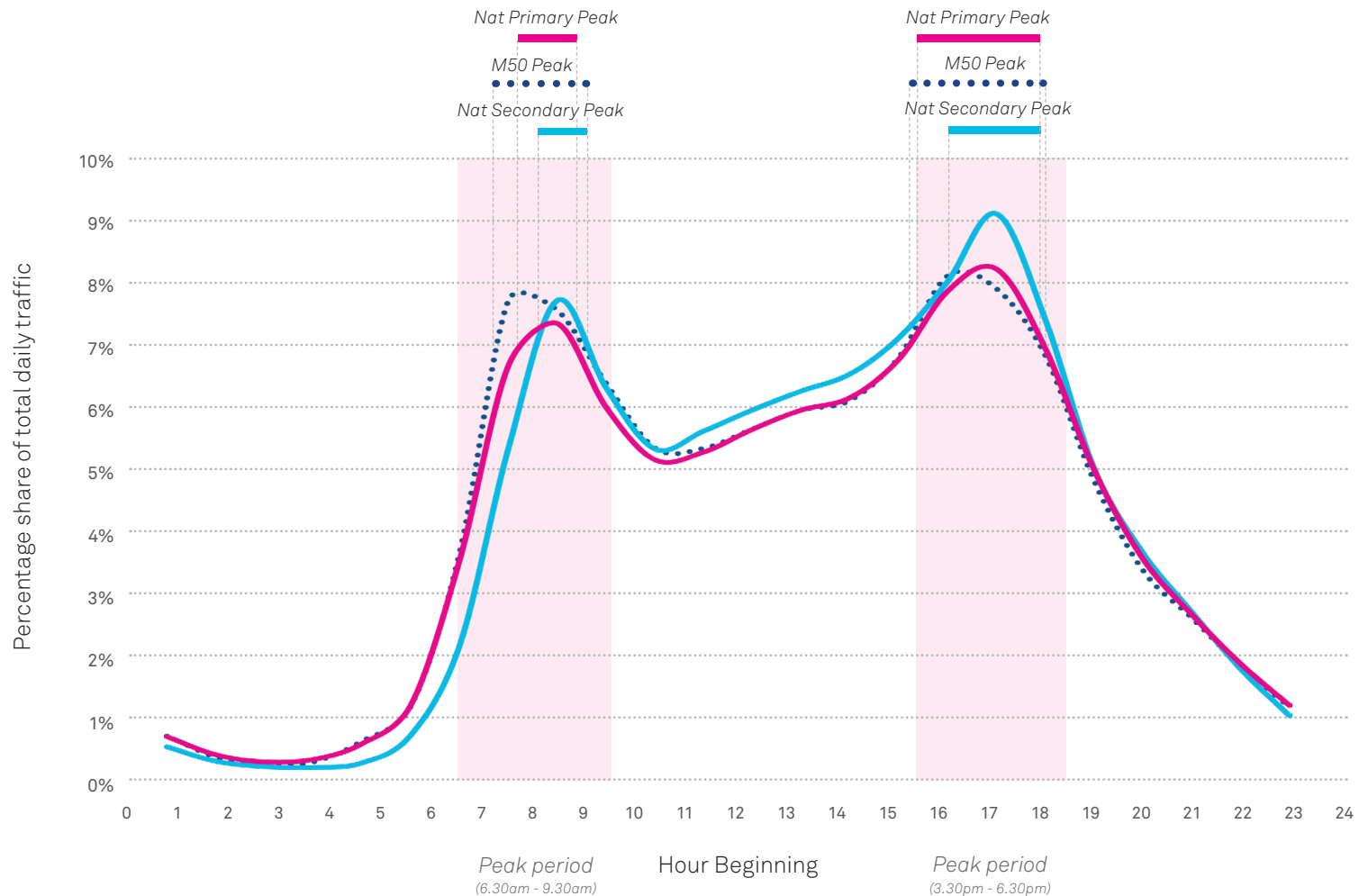
E: ROADS USAGE OVER THE DAY

Profile of the usage of the National Roads network by time of day

The peak periods on our National Roads are extending outwards due to increased demand and congestion.

In the morning, the peak period lasts between 6.30am and 9.30am whilst in the evening, the peak covers the period between 3:30pm and 6:30pm. Peak traffic hours have a level of traffic some 30% to 50% above off-peak levels. The M50 is the most used road in the country with daily weekday traffic of up to 145,000 along its busiest sections. The peaks on the M50 are more prolonged than other roads with significant traffic flows being maintained during off-peak periods. The trend of 'peak hour spreading' continued in 2017, with the peak period share of total daily M50 traffic reducing by 0.5% in the PM Peak period compared to the previous year.

- M50 Motorway
- National Primary
- National Secondary
- Peak period



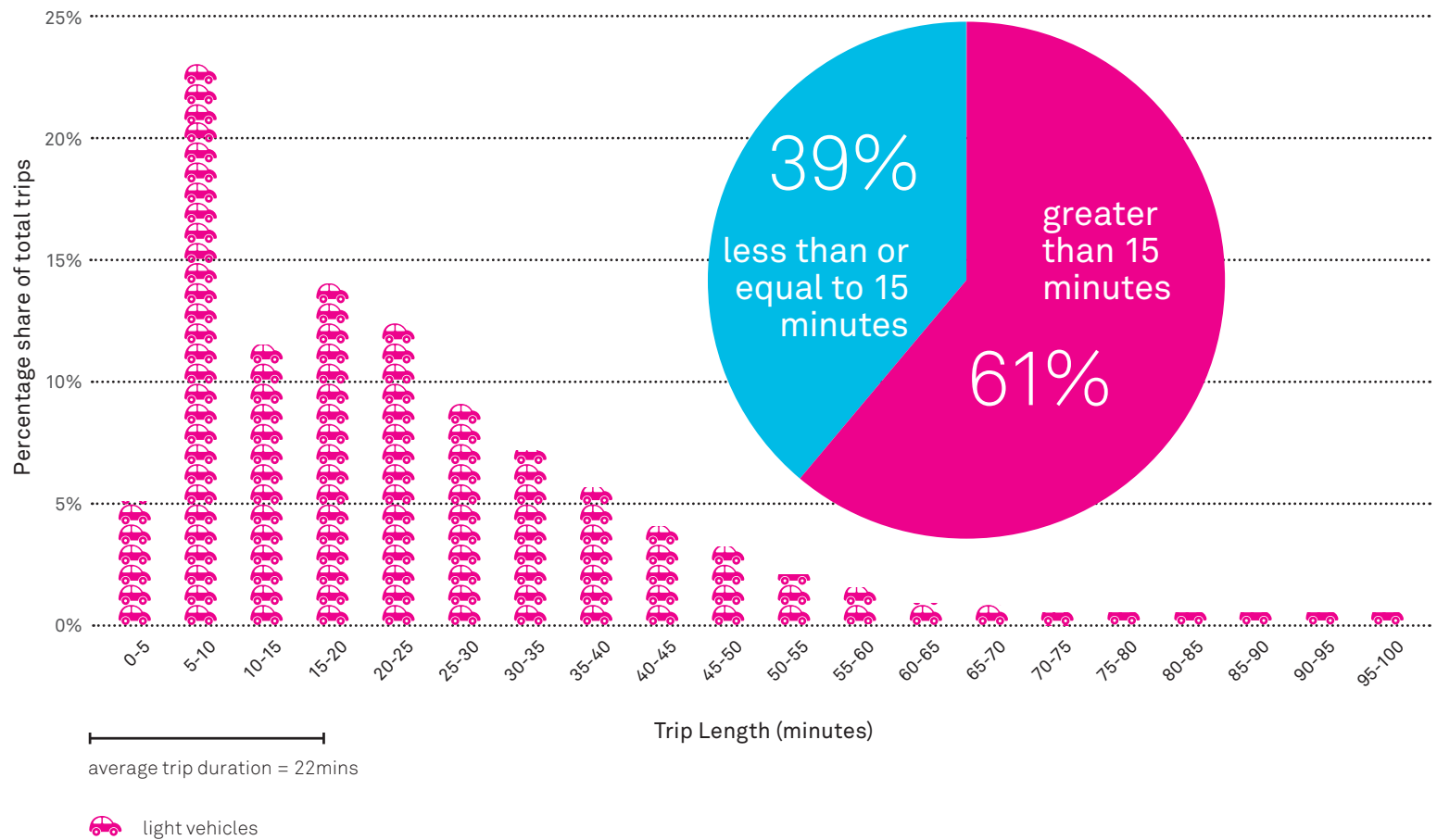
Source: TII National Transport Model, 2017

F: TRIP DURATION

NATIONAL ROADS AND REGIONAL ROADS - AM PEAK

Profile of the trips made on the National and Regional Roads network by their duration

Across the road network, a significant portion of trips that people make are of short duration. In total, 39% of trips are of 15 minutes duration or less.



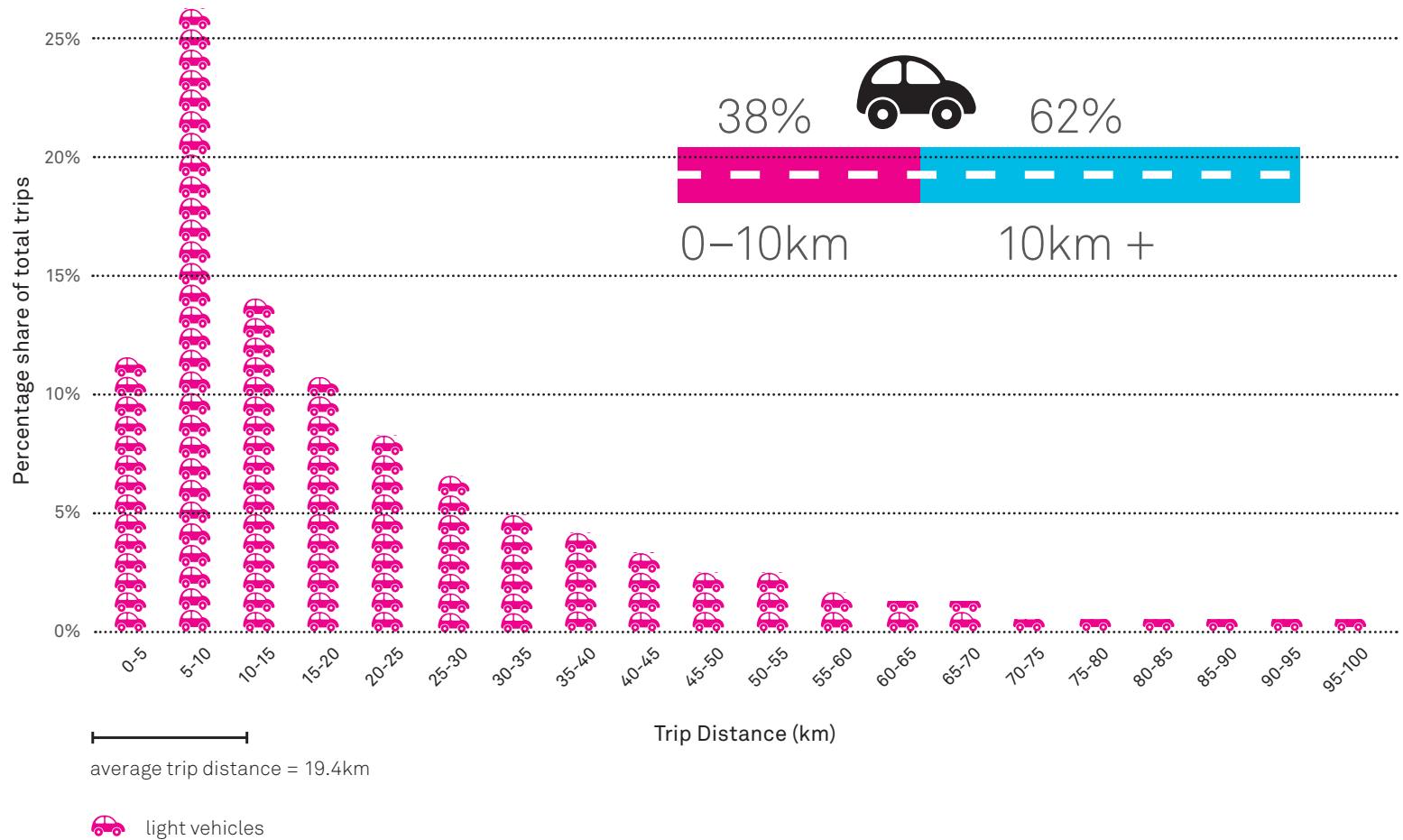
Source: TII National Transport Model, 2017

G: TRIP DISTANCE

NATIONAL AND REGIONAL ROADS - AM PEAK

Profile of the trips made on the National and Regional Roads network by their distance

Across the road network, a significant portion of trips that people make are short distance. In total, just over 50% of trips on the National and Regional road network are 15 kilometres or less.



Source: TII National Transport Model, 2017

H: ANNUAL TRAFFIC GROWTH RATES

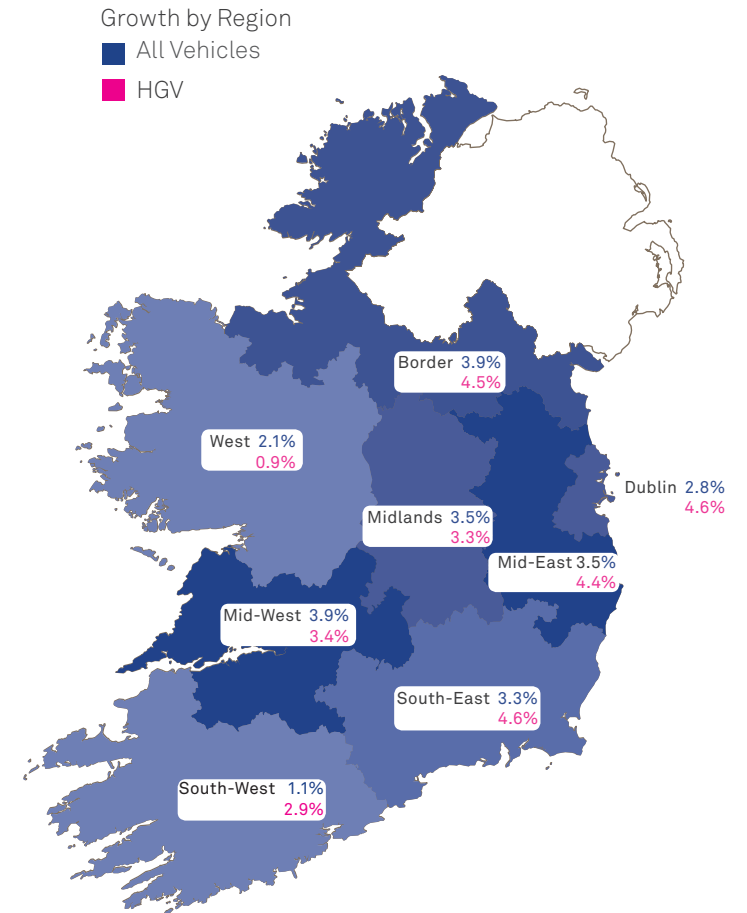
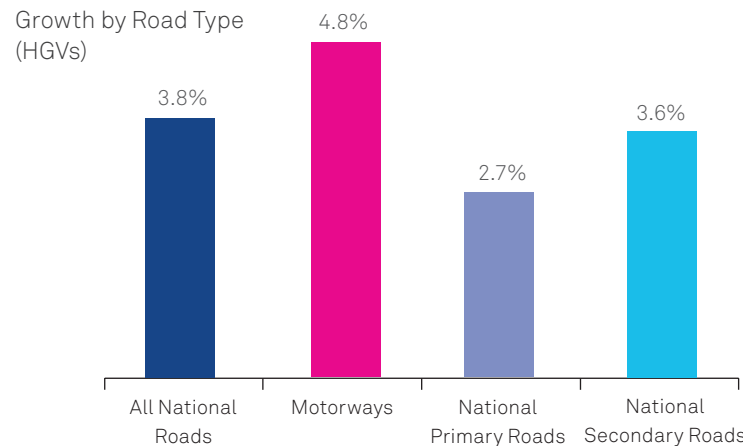
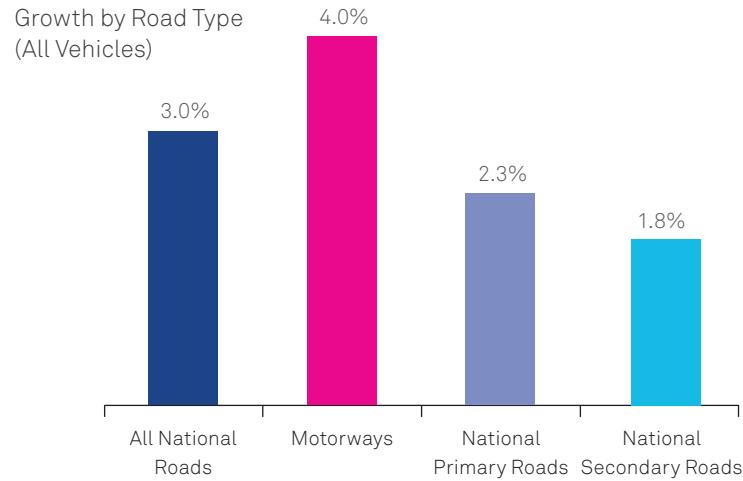
Annual Traffic Growth 2016-2017

Traffic growth was 3.0% across the network in 2017.

The highest regional growth recorded in 2017 was in the Mid-West and Border with 3.9% for the year. The Midlands and Mid-East also experienced significant growth at 3.5%. The South West and West had the lowest year on year growth at 1.1% and 2.1% respectively.

For HGVs Dublin and South-East recorded the highest regional growth at 4.6%. The West and South-West had the lowest year on year growth at 0.9% and 2.9% respectively.

The greatest year on year traffic growth by road type was recorded on motorways; where traffic has increased 4.0% for all vehicles and 4.8% for HGVs.



Source: TII Traffic Monitoring Units

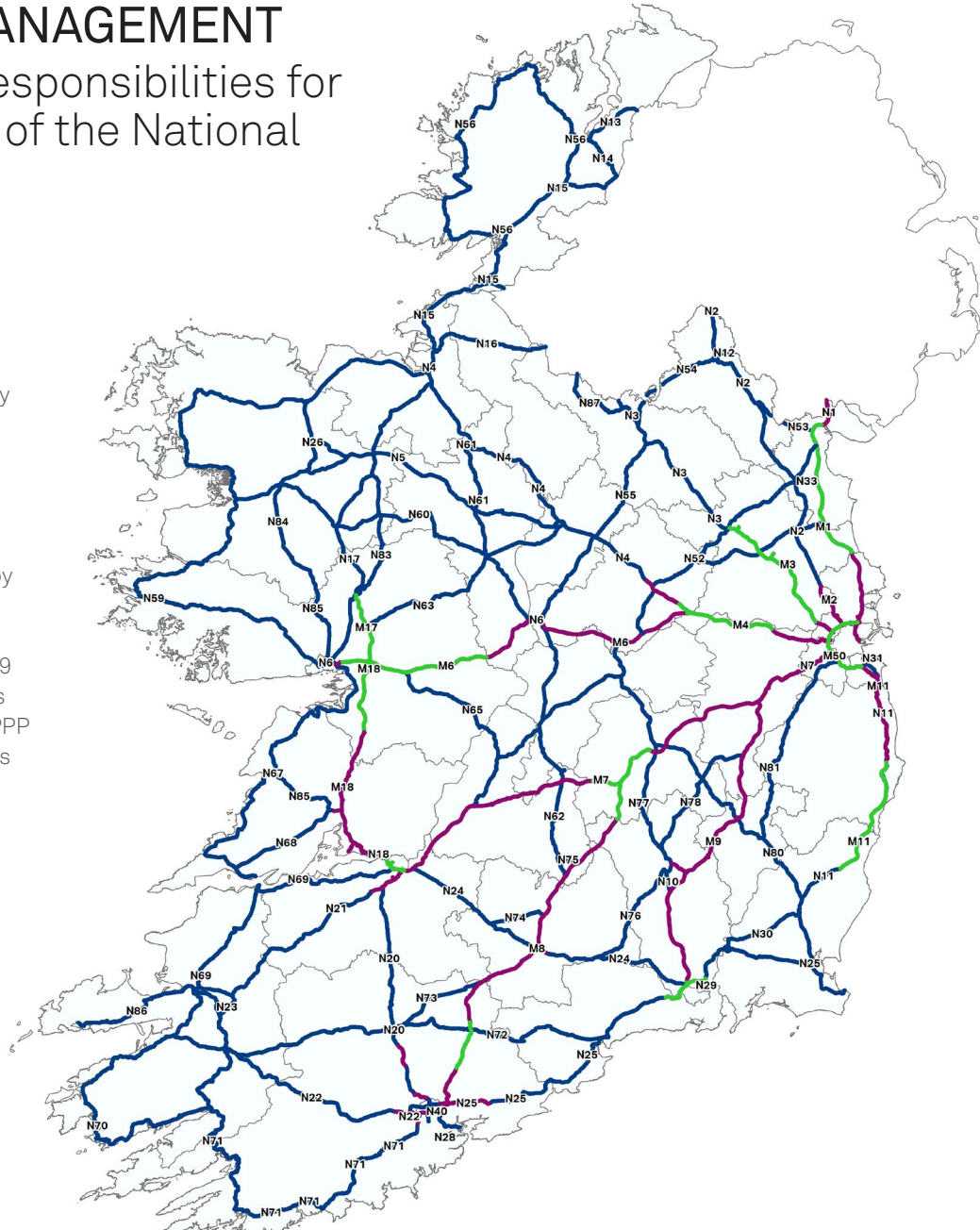
I: NETWORK MANAGEMENT

Overview of the responsibilities for the Management of the National Roads network








The management of the National Roads network is assigned to a number of bodies with the majority share of National Primary and National Secondary roads being managed by Local Authorities. Motorways are managed under the Motorway Maintenance and Renewal Contracts (MMaRCs) or by PPP Concession companies in the case of the tolled motorways. TII manages the maintenance of 2,709 bridges, which includes all bridges on National Roads other than on PPP roads. PPP Concession companies manage a total of 472 bridges.

Routes managed by:

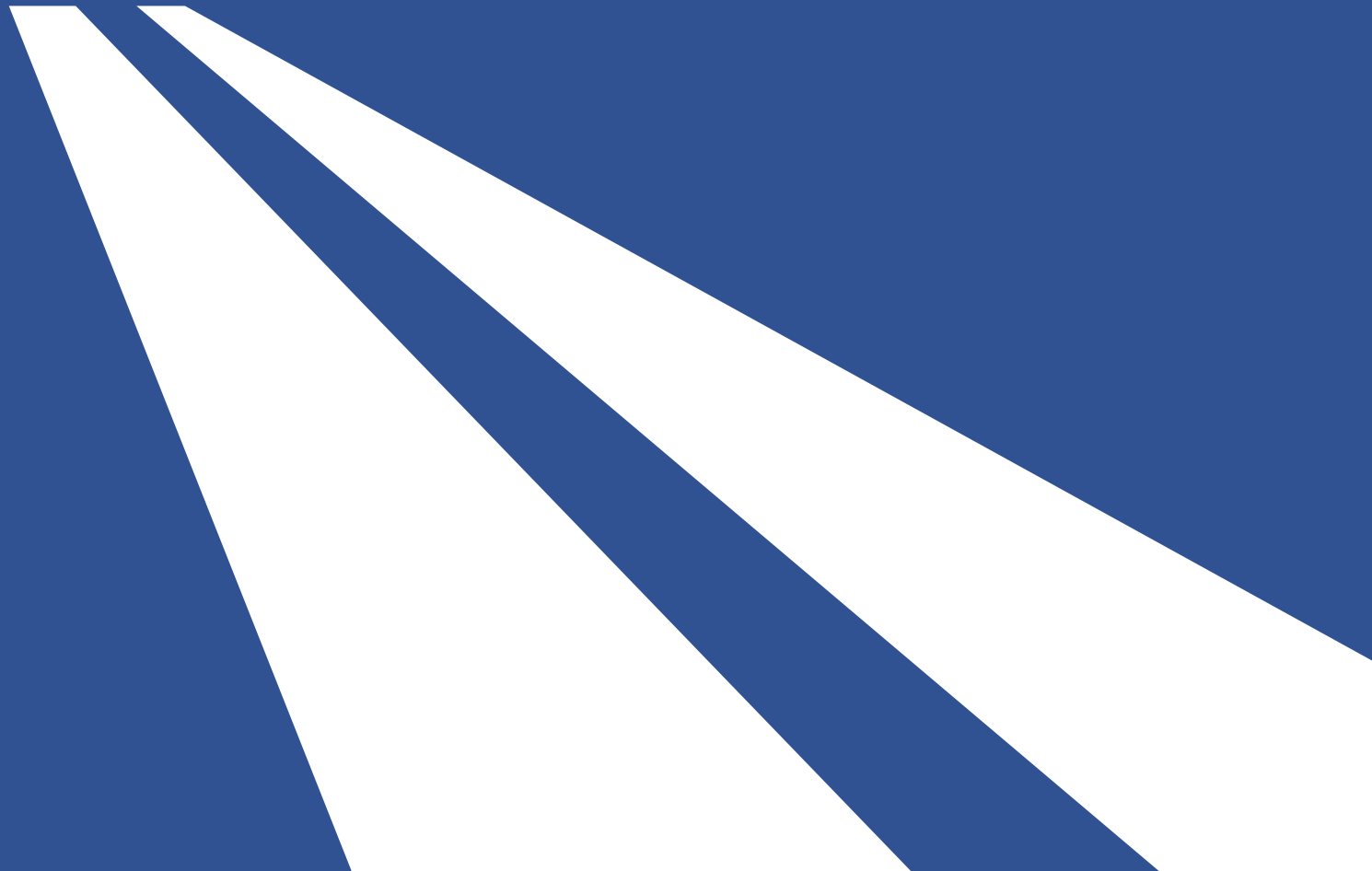
- MMaRC
- PPP
- Local Authority



Key facts:

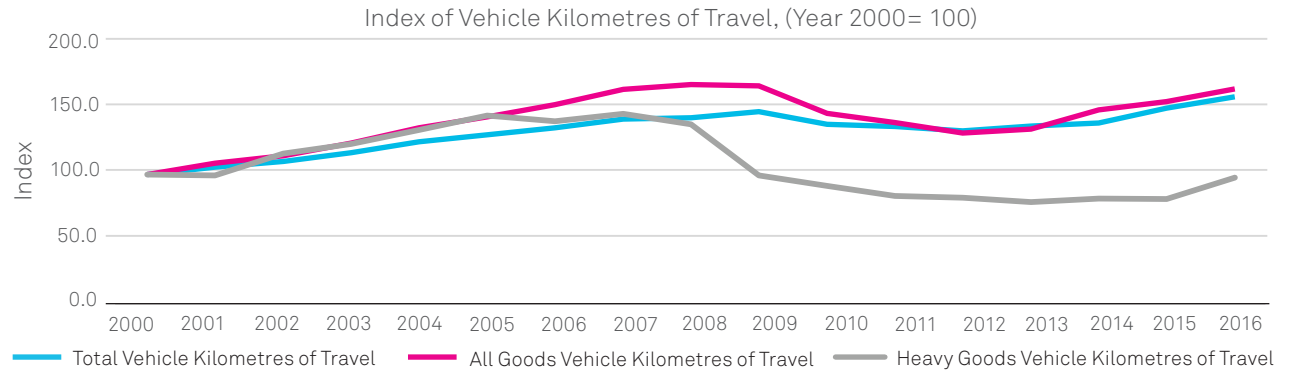
 327 demountable snow ploughs Our winter service fleet consists of:	 10,649 all emergency calls received by Motorway Traffic Control Centre including SOS phones	 56 nights in 2017 where the temperature reached below zero
 360 salt spreaders	 1,478 SOS phones in the country	 101 weather stations in operation on the National Roads Network
 31,835 tonnes of salt were used on National Roads Network in 2017		

TWO: ECONOMIC



A: ECONOMICS TRENDS AND TRANSPORT

Overall transport demand comprises both personal travel and carriage of goods. With regard to personal travel, a broad distinction may be made between commuting and non-commuting. Trends in overall employment in the economy drive commuting traffic whilst personal incomes are the major determinant of non-commuting traffic. With regard to the carriage of goods, economic output is the major determinant.



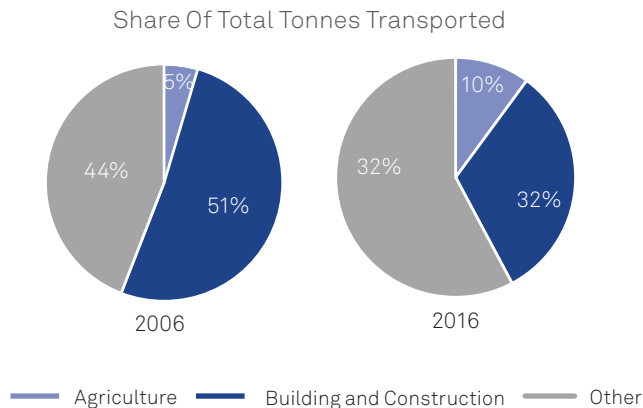
The Rise and Fall

In the period up to the peak of the economic boom in 2008, vehicle kilometres of travel on all roads grew at an annual average rate of 4.6% per annum. In aggregate, vehicle kilometres of travel increased by 43% between 2000 and 2008. In the same period, goods vehicle kilometres of travel grew at an annual average rate 6.7% per annum, with an aggregate growth of 69% between 2000 and 2008.

In the period 2000-2008, employment grew by 27% and Gross National Product (a measure of incomes) by 33%. The exceptional growth in goods vehicle kilometres in the period reflected a 40% increase in GDP combined with strong growth in the transport-intensive building and construction sector. When the economic and financial crisis occurred, vehicle kilometres of travel in total declined by 10% and goods traffic by 22%.

Recent Trends

Economic growth began to recover in a sustained way in 2012 and employment levels a year later. By 2015, total vehicle kilometres of travel had recovered its pre-crisis levels, while heavy goods traffic has yet to do so. The latter is due to the slow recovery of the building and construction sector. During the economic boom, building and construction-related heavy goods vehicle traffic accounted for over half of all tonnes carried by heavy goods vehicles (51.3%), declining to 32.1% in 2016.

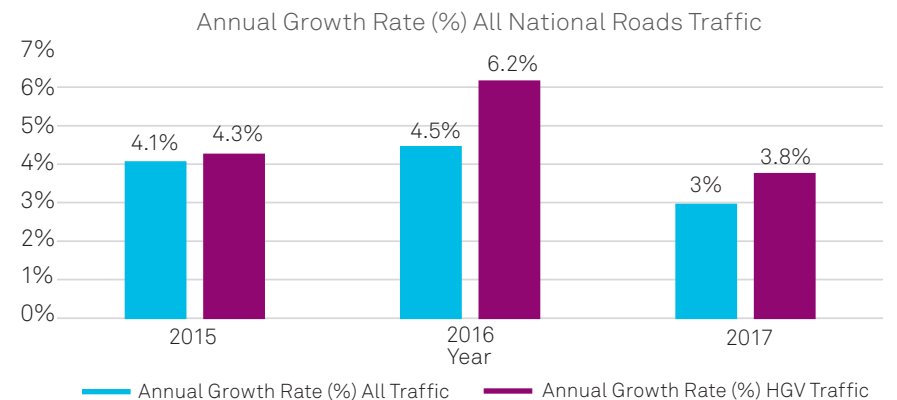


2017 & Beyond

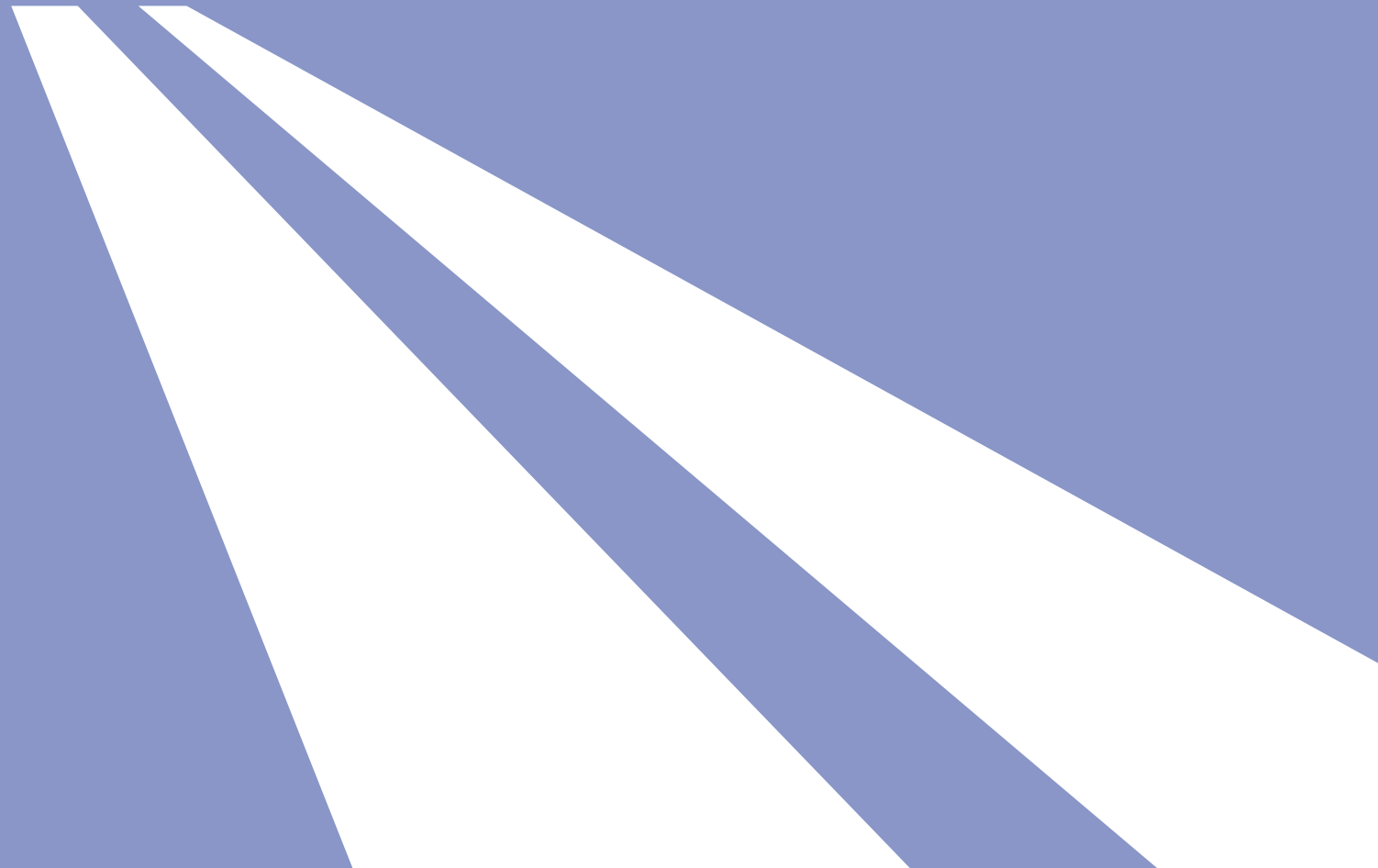
Traffic volumes on National Roads are exhibiting a recovery similar to that on all roads. All traffic on National Roads has averaged 3.9% per annum over the last three years, with HGV growth at 4.8% per annum.

In 2017, the rates of growth in both GNP and GDP exceeded 7%, while employment levels grew by 2.4%.

The unemployment rate of just over 6% in early 2018 indicates that there is still room for further growth in employment levels. Given these economic trends, the prospects are for continued significant growth in National Roads traffic overall and HGV traffic in particular, as building and construction sector continues to pick up.



THREE: ROAD CONDITION



A: PAVEMENT MAINTENANCE

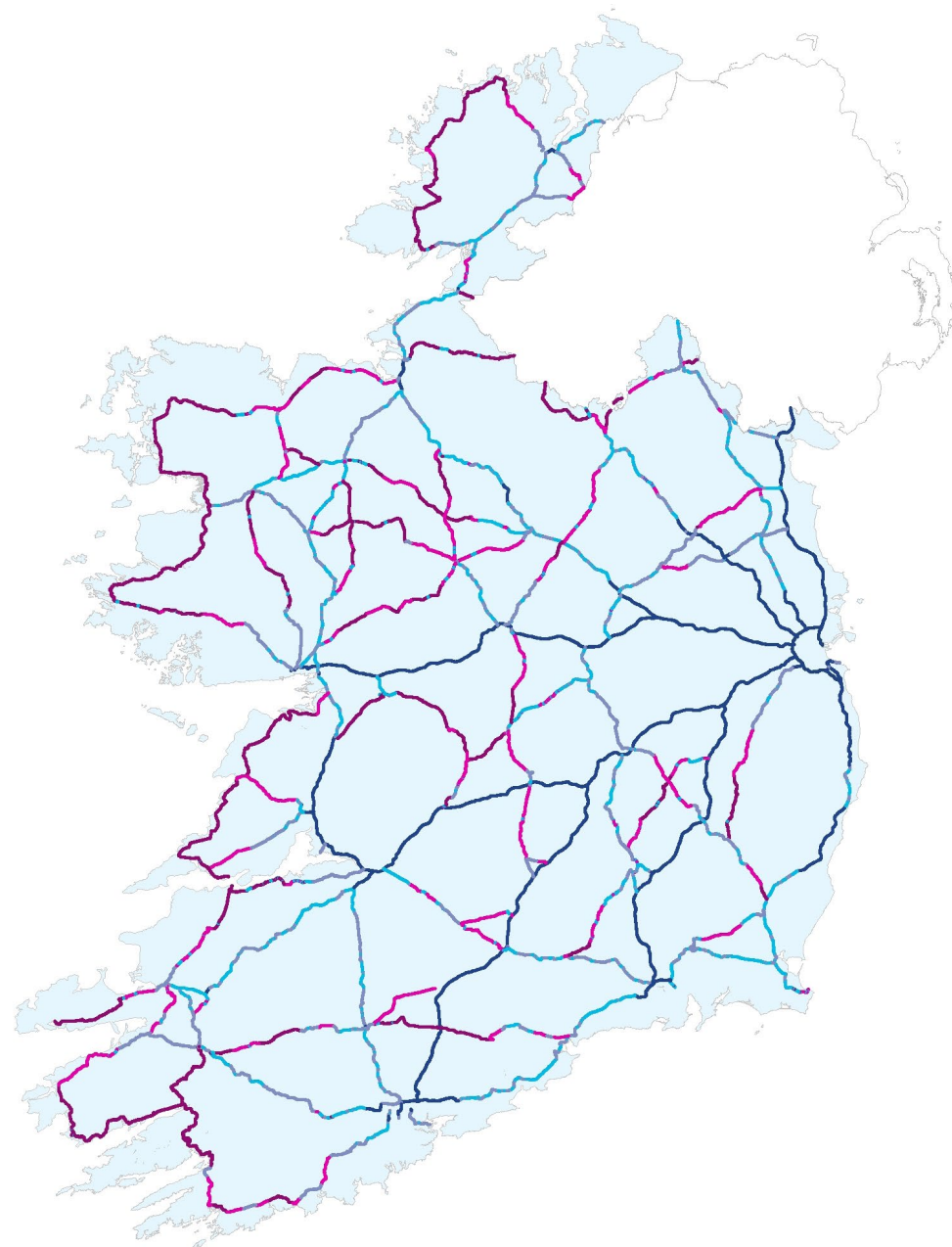
Overview of the status of the road pavement across the National Roads network by subnetwork type

The National Roads network consists of over 5,400 kilometres of road pavements. The pavements are predominately made of layers of flexible materials designed to support traffic volumes/loads over their design lifespan of between 0 and 40 years. Owing to the diversity that exists

across network pavements a series of 5 Subnetwork types has been defined, to assist in the ongoing management of the network. These Subnetworks are defined in terms of their characteristics, e.g type of pavement construction, pavement age, and traffic volumes carried.

Subnetwork	Classification
0 Motorways + dual carriageways	High speed, high volumes pavement, made up of Motorway and Dual Carriageway sections of the network. Much of this subnetwork is less than 10 years old.
1 Engineered pavement	Significant geometric and pavement design has taken place in the construction and/or rehabilitation of the pavement sections. Typically carry reasonably large volumes of traffic, and are identified by presence of hard shoulders adjacent to the carriageway.
2 Legacy pavement – high traffic	Legacy subnetwork, typically constructed without formal geometric or pavement design. Typically carries traffic volumes less than 10,000 AADT.
3 Legacy pavement – low traffic)	Legacy subnetwork, typically constructed without formal geometric or pavement design. Typically carries traffic volumes less than 5000 AADT.
4 Legacy pavement – very low traffic	Legacy subnetwork, typically constructed without formal geometric or pavement design. Typically carries traffic volumes less than 2000 AADT.

Note: Classification excludes M17 / M18 motorway scheme which opened on 27 September 2017. In 2018, the pavement subnetwork types were updated to incorporate new schemes and to classify urban sections of the network. These updated classifications will be incorporated into the 2018 National Road Indicators report.



B: CURRENT STATUS OF THE ROADS PAVEMENT CONDITION

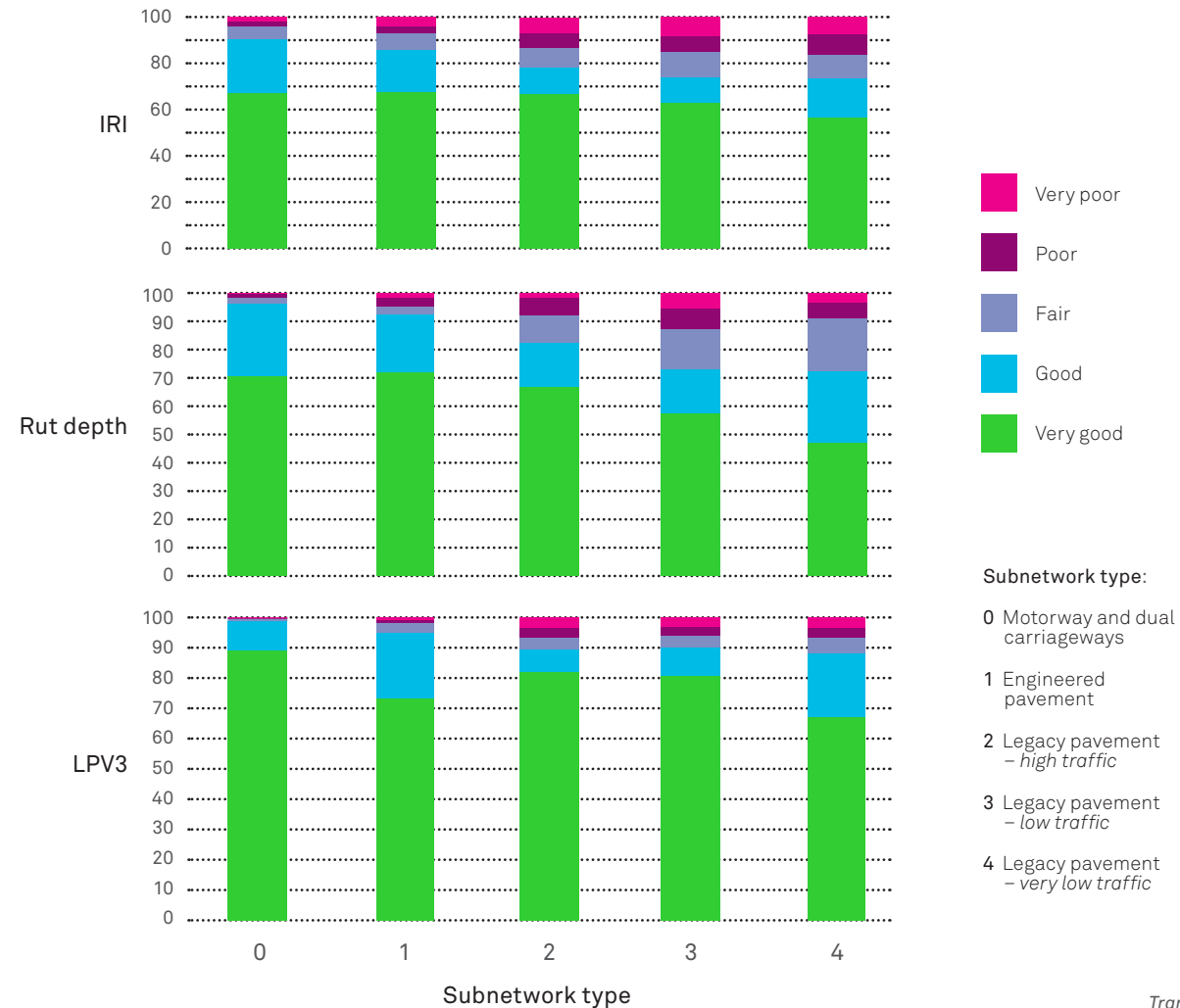
Overview of the condition of the road pavement across the National Roads network by some key indicators

TII collects data on the pavement condition across the entire pavement network annually, using high speed machine survey vehicles. This data is used to select sites for treatment under the Pavement and Minor Improvements programme. As part of the annual survey of road pavement condition, data on a number of key indicator parameters are collected, including:

- **IRI (International Roughness Index)** which measures the response of vehicle to the pavement surface conditions
- **Rut Depth** which measures the level of rutting/deformation on the pavement caused by heavy traffic
- **LPV3 (Longitudinal Profile Variance)** which measures the level of bumps, potholes, sags etc in the pavement

In 2017, it was identified in relation to roads belonging to motorway/dual carriageway that:

- 67% of the network had very good IRI;
- 70% of the network had very good Rut Depth
- 90% had very good LPV3 levels



Source: TII Pavement Condition Report

C: NATIONAL ROAD BRIDGE STRUCTURES

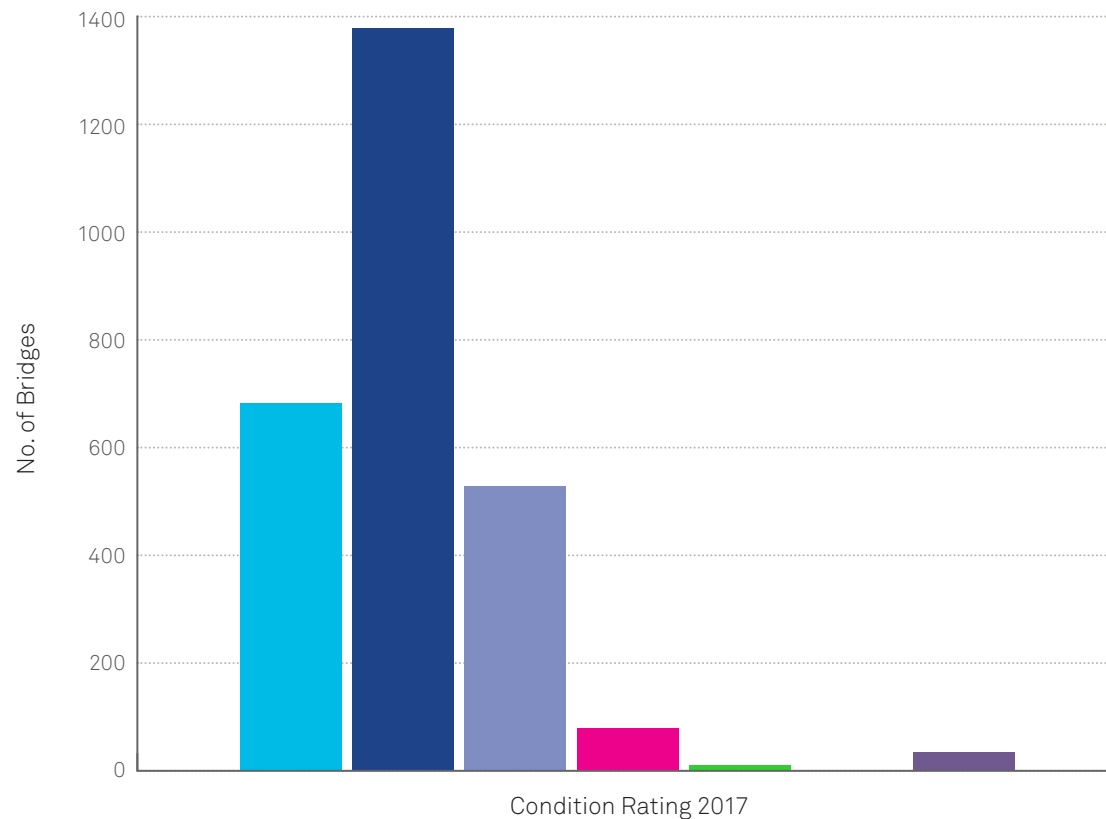
Overview of the quantum and condition of bridge structures on the National Roads network

Bridges are key elements of the National Roads system and maintenance and rehabilitation of bridges is a key part of the TII's asset management strategy.

The National Roads network includes approximately 2,700 bridge structures of which 472 are on roads provided by public private partnerships.

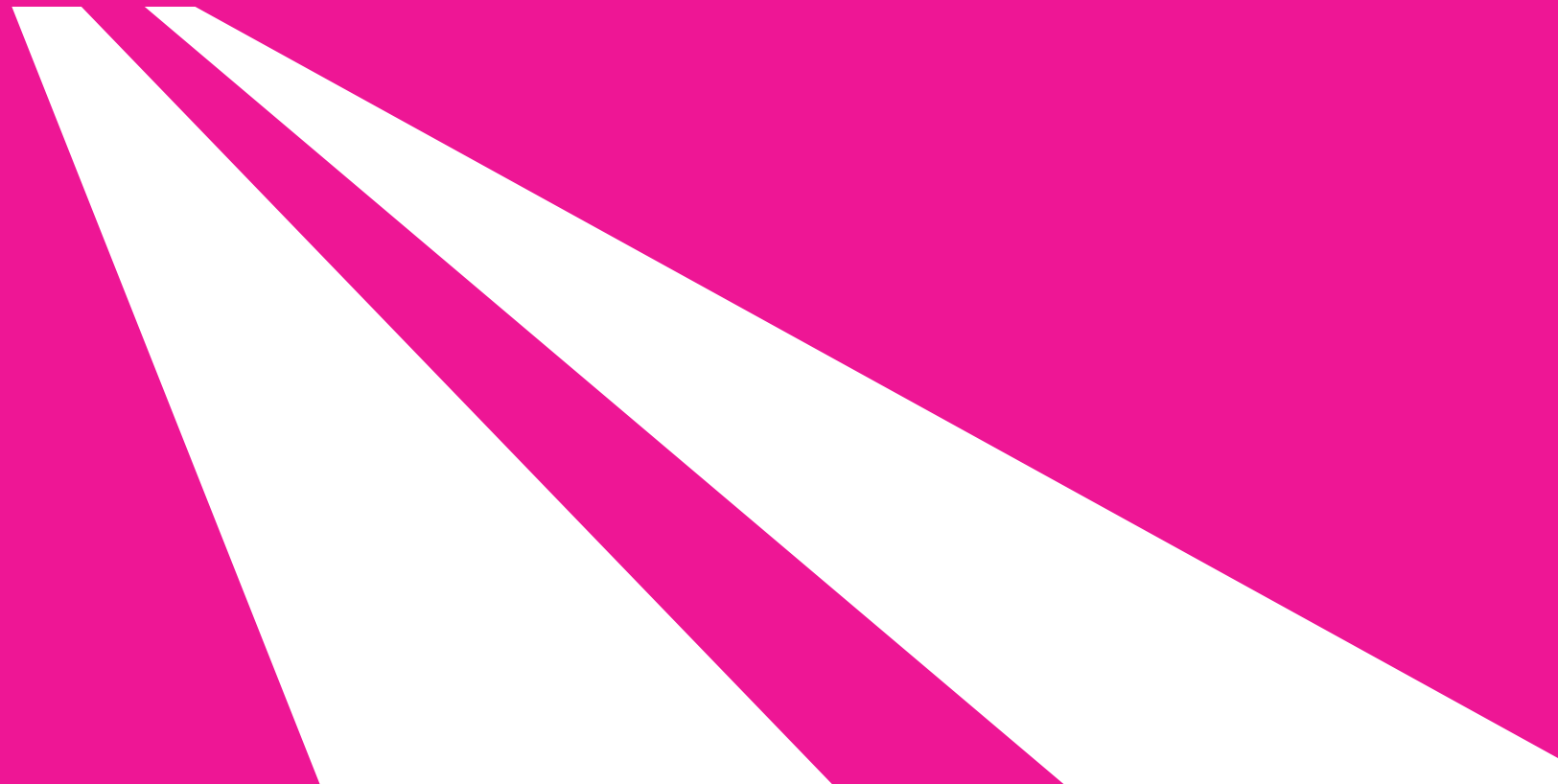
Bridges are inspected on a regular cycle. Bridge components which are allocated a condition rating of 0 or 1 do not require repair work, whereas those assigned a rating of 2 or higher are scheduled for future repair.

The amount of bridges falling into CR0 and CR1 categories has increased since 2016.



- CR 0: No or insignificant change.
- CR 1: Minor Damage but no need of repair.
- CR 2: Some Damage, repair needed when convenient.
- CR 3: Significant Damage, repair within next financial year.
- CR 4: Damage is critical, repair at once.
- CR 5: Ultimate Damage. The component has failed or is in danger of total failure.
- N/A: Data not available due to access restrictions.

FOUR: SAFETY



A: FATAL COLLISIONS NATIONALLY

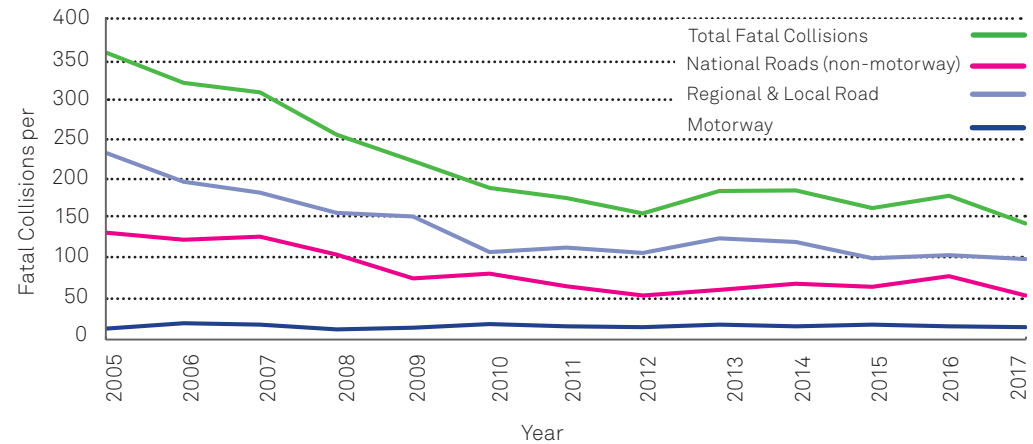
Trends in fatal collisions nationally by road type and collision type*

Total fatal collisions on National Roads:

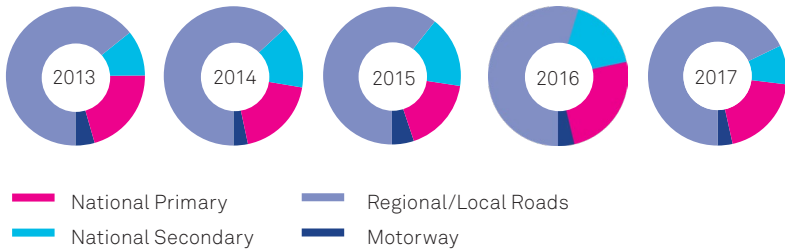
2013–2017



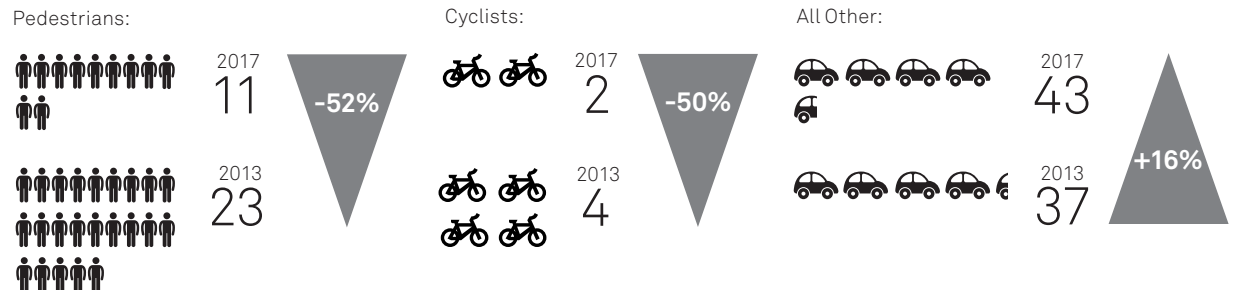
Long term trends in total fatal collisions



Distribution of fatal collisions by road type (National & non-national):



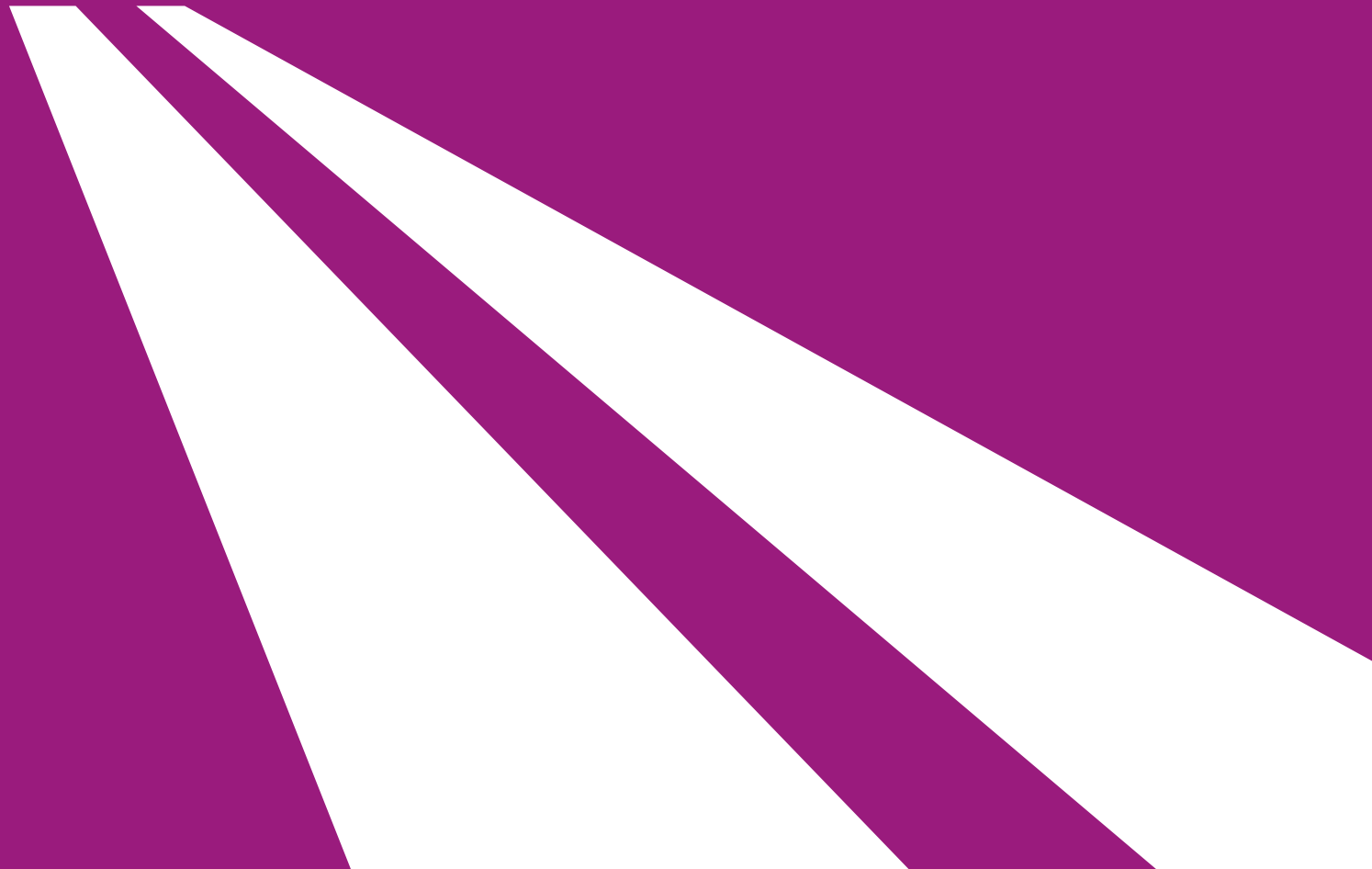
Recent trends in total fatalities* on National Roads:



Fatal collisions 2015-2017: AGS data (not verified by RSA)

* A fatal road collision may result in multiple deaths (fatalities). Therefore the number of fatalities in any given year will be larger than the number of reported fatal collisions.

FIVE: ACCESSIBILITY + ENVIRONMENT

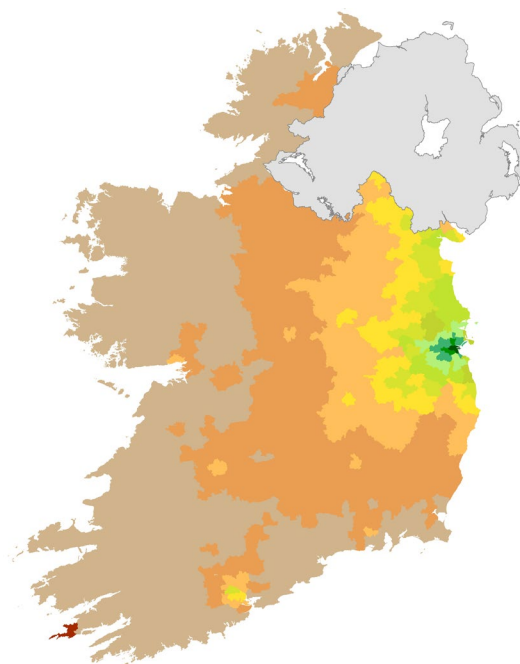


A1: IMPACT OF ROAD INVESTMENT ON EMPLOYMENT ACCESSIBILITY

Key milestones in the development of the National Roads network

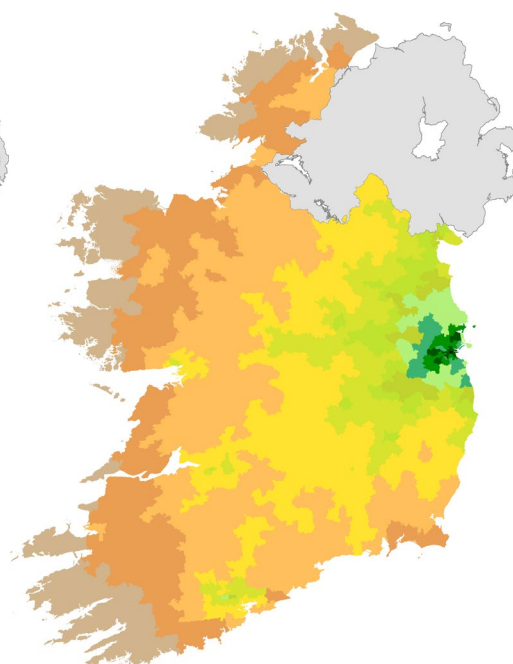
Building on the methodology put forward within the TII Transport Research and Information Note: *Impact of Improvements in the Road Network on the Accessibility & Economic Potential of Counties, Urban Areas, Gateways & Hubs*, 2012; TII has plotted accessibility to jobs for a number of key milestones in the development of the National Roads Network.

Employment Accessibility Score by NTM Zone



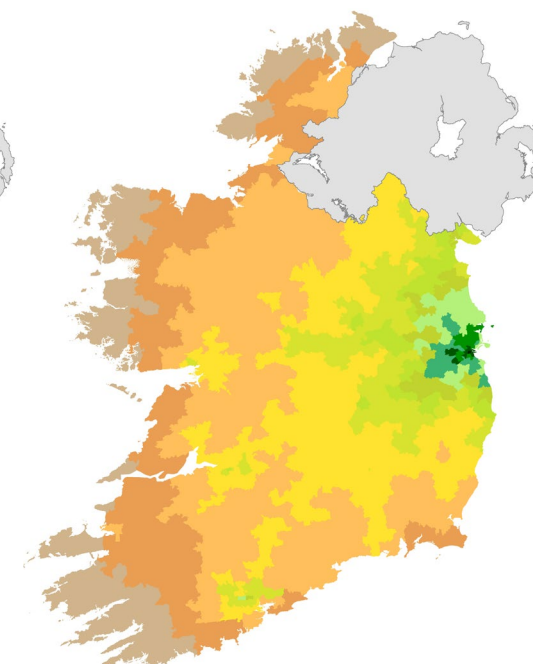
2006

In 2006, prior to the completion of the Major Inter Urban (MIU) corridors linking the capital to the other cities; accessibility to jobs within peripheral regions was weak.



2013

By 2013 the development of the MIUs delivered significant improvements in terms of accessibility to jobs in some of the more peripheral areas.



2017

Since 2013, there are only subtle changes in accessibility (e.g. along the M17/M18 corridor), related to the reduced capital spend on National Roads infrastructure during that time.

A2: IMPACT OF ROAD INVESTMENT ON EMPLOYMENT ACCESSIBILITY

2013 versus 2017

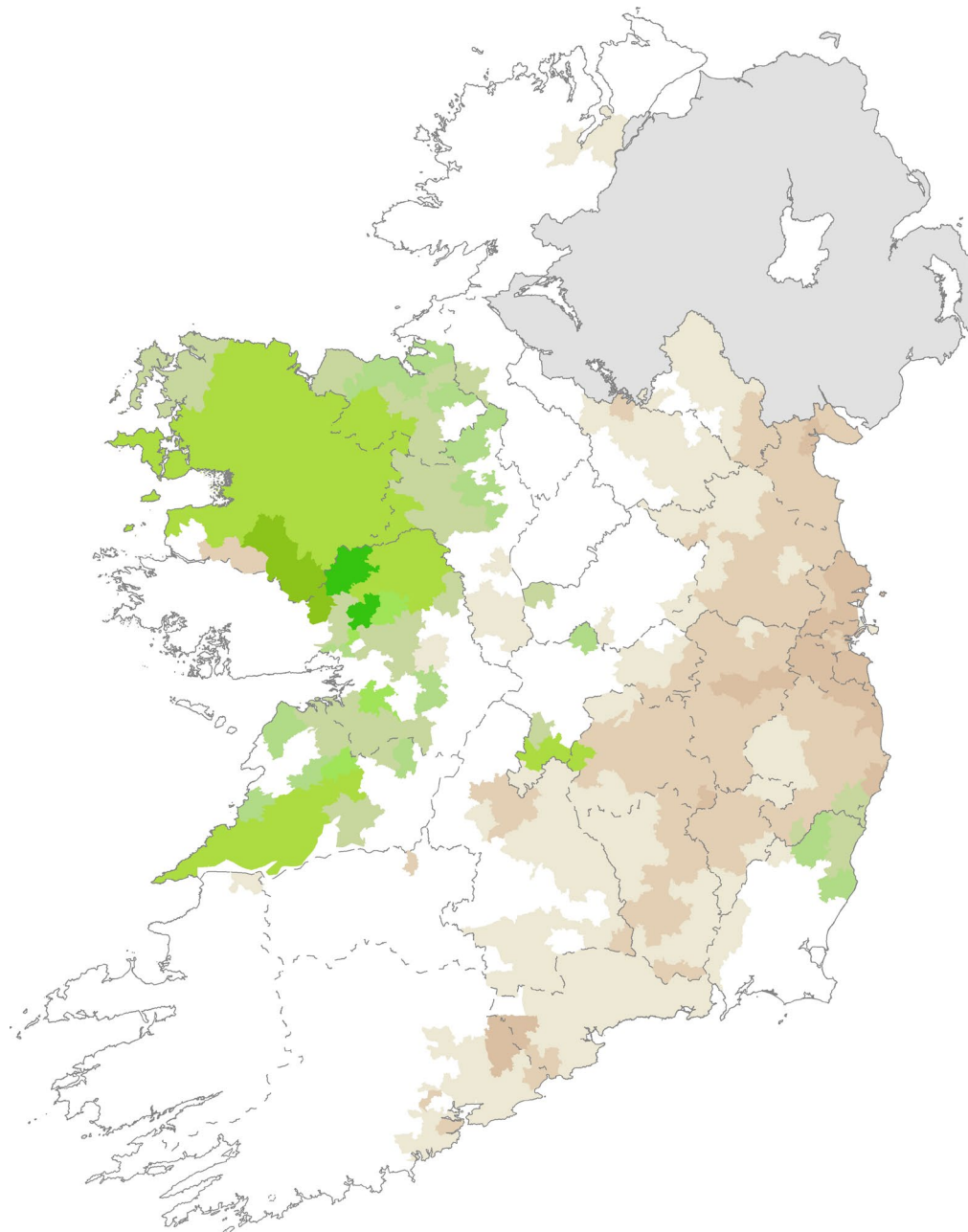
A significant proportion of the road capital spend from 2013 to 2017 was within the west of the country and this has resulted in improved employment accessibility for these areas.

The image compares accessibility to jobs between 2013 and 2017 (relative percentage change), and effectively presents two stories:


- 1) An improvement in accessibility to jobs in the West related to recent investments in a number of schemes;
- 2) Ongoing traffic growth in the east, particularly on the routes into Dublin has contributed to increased journey times and in turn slight reductions in accessibility to jobs in the Greater Dublin Area (excluding sections of the M11 corridor which were recently improved).

Despite the above, peripheral areas in North-West, West and South-west and South-East still tend to suffer from poor accessibility to jobs as shown on Page 31.

Difference in Accessibility:



*Assessment based on the change in accessibility to employment only as a result of the network investment. Employment levels have been held constant at 2011 levels as part of the assessment.



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