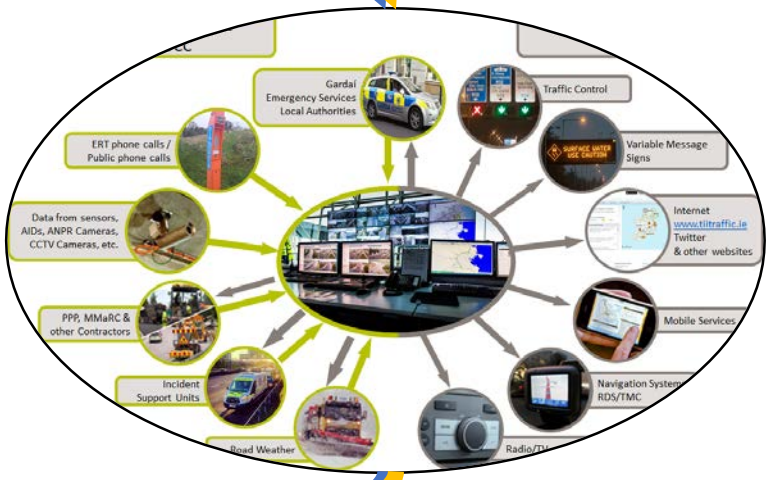

enhancing Motorway Operation Services (eMOS)

Lewis Feely | TII Annual Conference | 27.09.2018

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Introduction

What is enhancing Motorway Operation Services (eMOS)?

eMOS describes a framework for the delivery of various works and services by Transport Infrastructure Ireland to secure and continuously enhance the operation of a safe, efficient and sustainable motorway network.

Reflective of the changing responsibilities of road authorities

From:

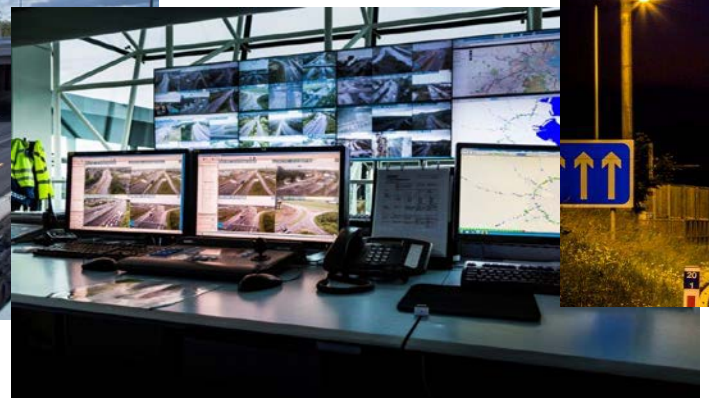
traditional motorway construction & maintenance

Towards:

- Traffic management
- Traveller information

To:

- Availability
- Safety
- Optimise traffic flow



Today – Ongoing TII network enhancements

- Review of congestion points & implementation of interventions to improve traffic flow & safety

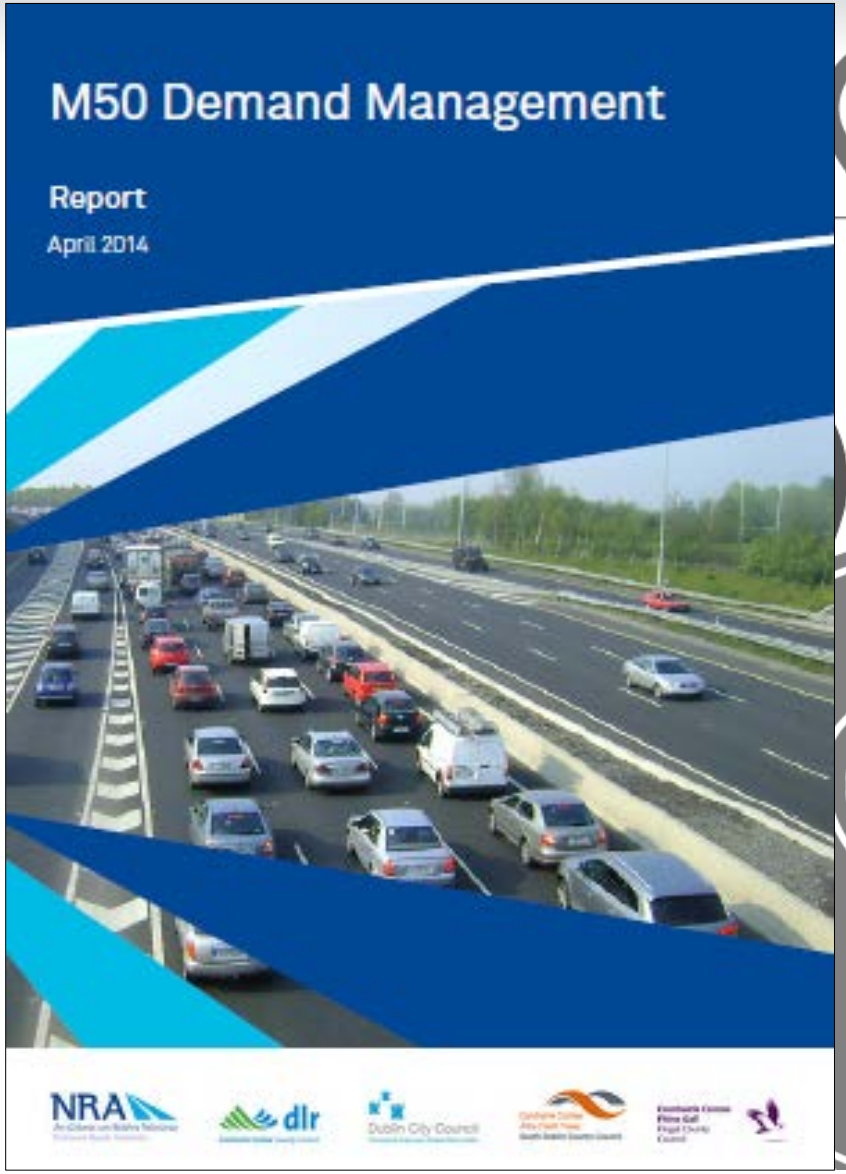
- Upgrade of existing ITS installations on the M50
  - Upgrade of Fibre Joints
  - Construction of ITS equipment sites
  - Construction of localised duct runs
  - Parking and Access facilities

- Evolving of the VMS Strategy in line with increased road user awareness

- Deployment of additional CCTV cameras to Increase Operator CCTV Coverage

- Deployment of Variable Message Signs on M7/M18

Project Background



2005

2005 Planning Granted – M50 Motorway Upgrade Scheme

2014

M50 DEMAND MANAGEMENT REPORT (April 2014)

- Fiscal Measures (Various Tolling Scenarios)
- ITS & Traffic Control
- Information (Internet & Roadside)
- Control (Motorways Operations & Control Centre)

Introduction

enhancing Motorway Operation Services (eMOS)

MTFO
M50 Traffic Flow Optimisation

Implementation of an operational Mandatory Variable Speed Limits on the M50

NIMS
Network Intelligence & Management System

Active Traffic Management System (ATMS) replacement

Operational support of a new Operations Centre

MOCC
Motorway Operations Control Centre

Construction and fit out of MOCC and associated space

TII Statement of Strategy – 2018 to 2022

Strategic Objectives

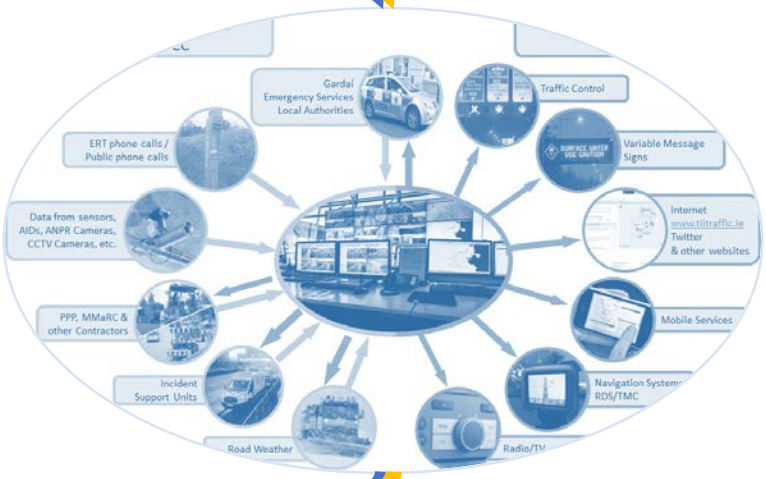
Strategic Responses

- Establish flow optimisation measures **[MTFO]**

- Upgrade and enhance the resilience of the Motorway Operations and Control Centre **[MOCC]**
- Establish demand management measures on the M50 **[MTFO & NIMS]**
- Expand and enhance ITS provision and operation **[MTFO]**

- Put in place systems, structures and resources to respond to a changing environment and priorities **[NIMS & MOCC]**

eMOS – M50 Traffic Flow Optimisation [MTFO]



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Traffic Growth

Seek to reduce the adverse impact of future traffic growth on **the level of service**

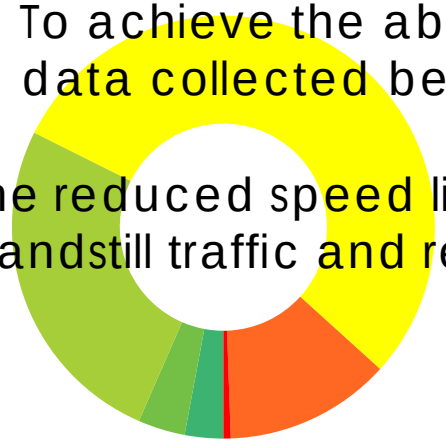
TII National Roads Network Indicators 2017

Figure 2.2 - Monthly Average Daily Traffic (MADT) on the M50 between the N3 and N4 junctions

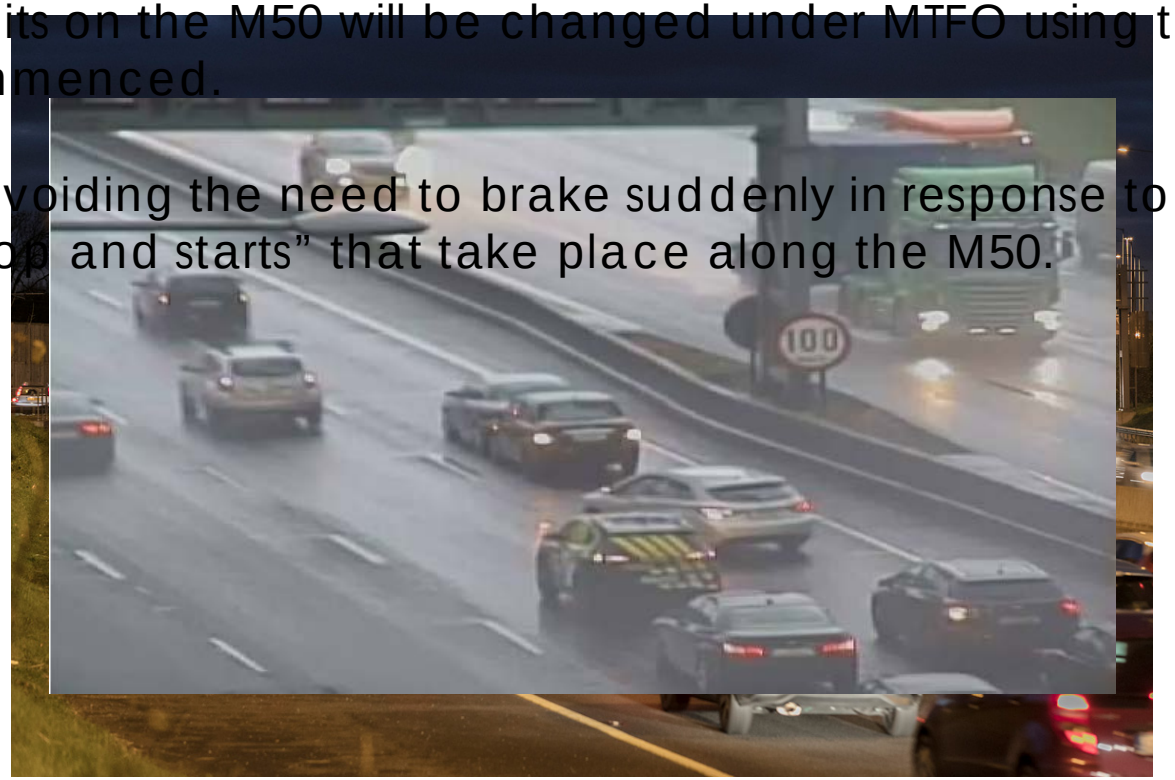
Congestion & Incidents

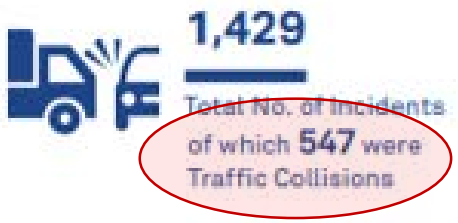
Seek to reduce the impact of congestion and **the level of disruption resulting from incidents on the M50** while enhancing journey time reliability.

- To achieve the above objective, Speed limits on the M50 will be changed under MTFO using the data collected before congestion has commenced.



The reduced speed limits will smoothen flow avoiding the need to brake suddenly in response to standstill traffic and reduce the number of "stop and starts" that take place along the M50.





Safety

Maintain the **excellent safety record** for road users and those who work on the motorway through Lane Control Signals being displayed to direct traffic safely around incidents and road works, protecting emergency responders and vulnerable road users from oncoming traffic.

M50
Northbound
Between J14
(Sandyford) and
J13 (Dundrum)

M50
Southbound
Between J13
(Dundrum)
and J14
(Sandyford)

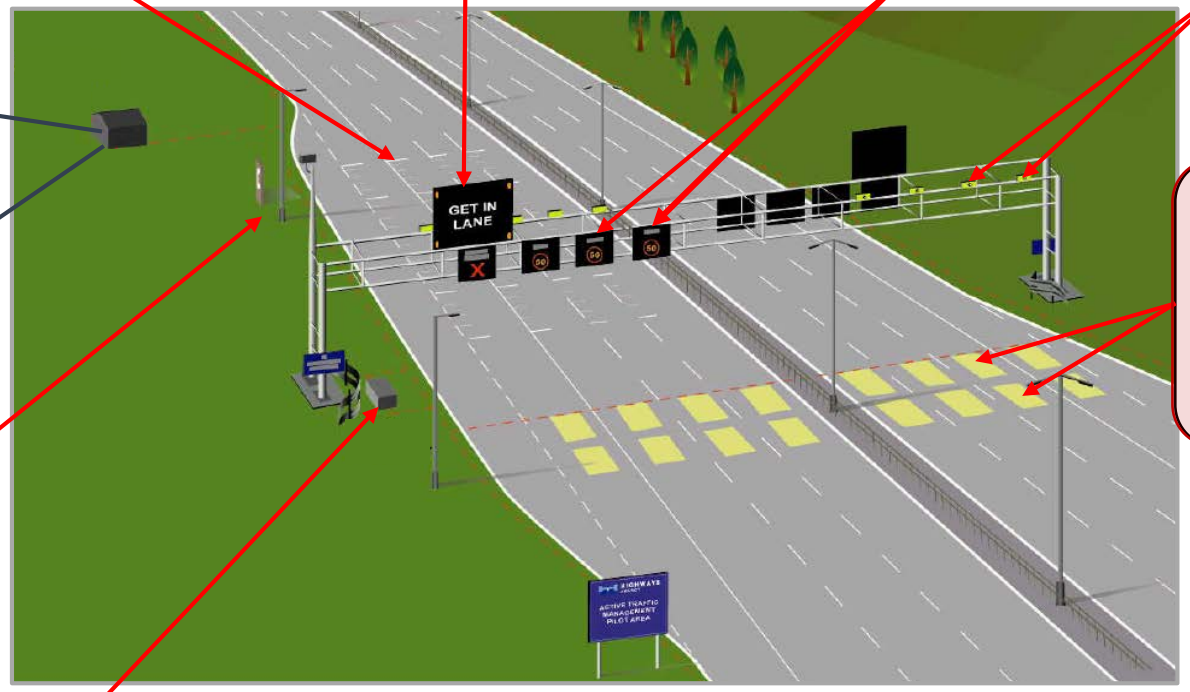
Incident Response

Implement an integrated and co-ordinated response to evolving traffic situations.

- Operator
- Fire Brigade
- Gardai
- Incident Support Unit
- Kelly's Removal Vehicle

M50 Northbound Between J14 (Sandyford) and J13 (Dundrum)

What will MTFO entail?



Secondary Speed Markings

Variable Message Sign

Advanced Motorway Indicator (AMI)

Enforcement Cameras

To MOCC

To Enforcement Evidence Review Site

Automatic Incident Detection (AID) Loops

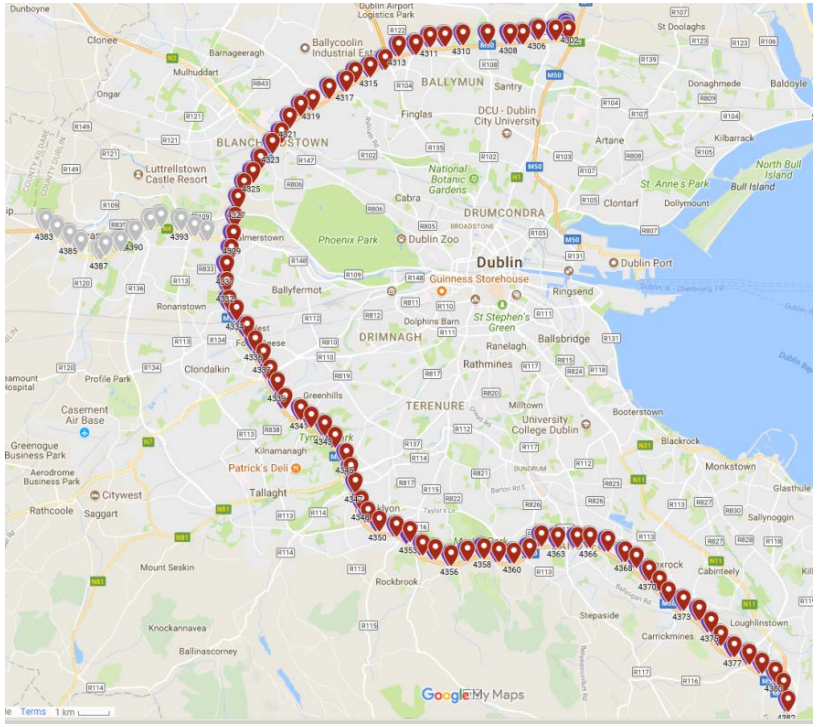
Emergency Roadside Telephone (ERT)

Roadside Cabinet

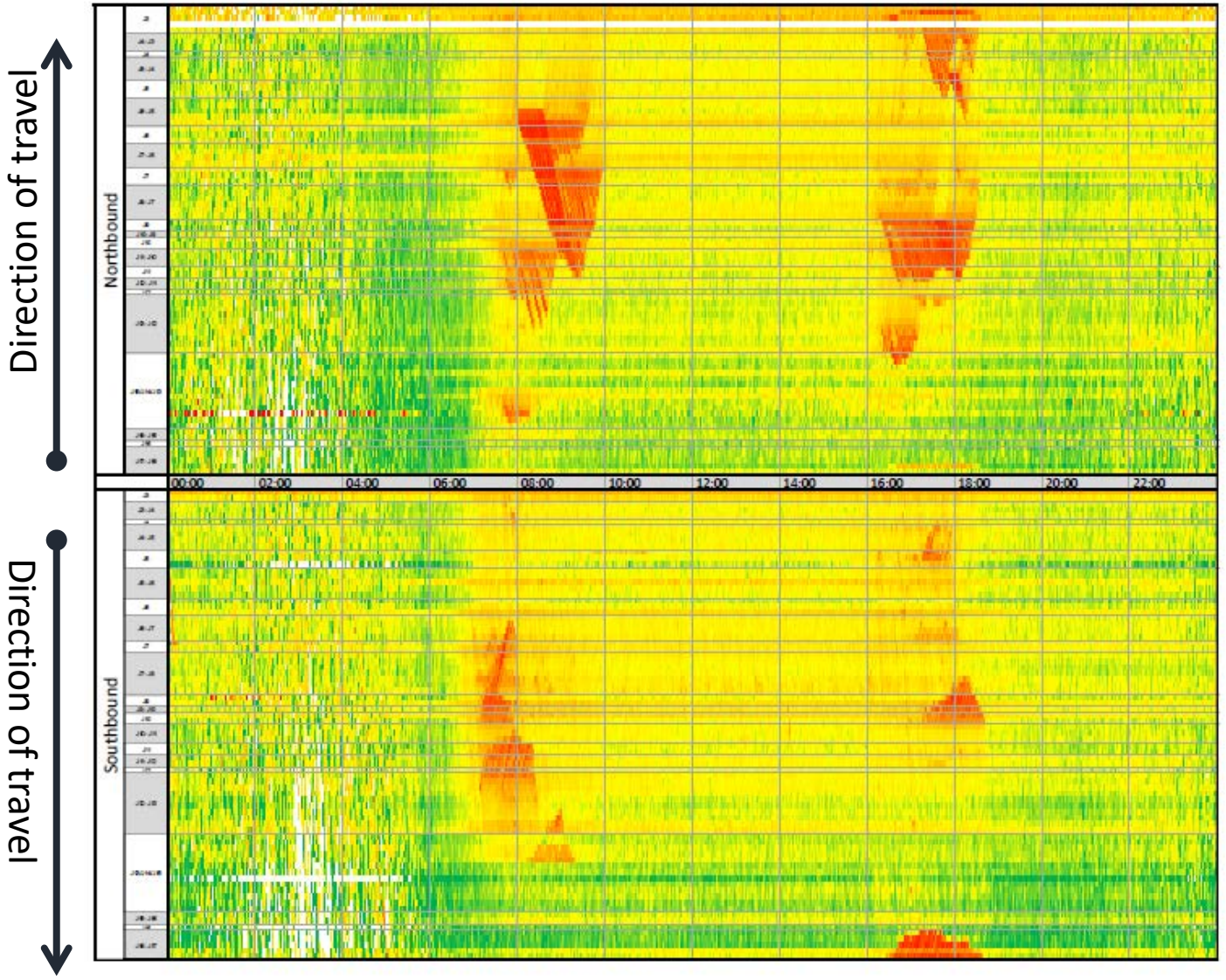
- ~ 390 AMI's will be deployed on the M50 directly over each lane
- The AMIs will display various signals in response to traffic conditions
- Supported by ~76 additional variable message signs that will display support messages
- AID Loops were already installed as part of the 2011 GDA Deployment to monitor traffic flows

eMOS – M50 Traffic Flow Optimisation (MTFO)

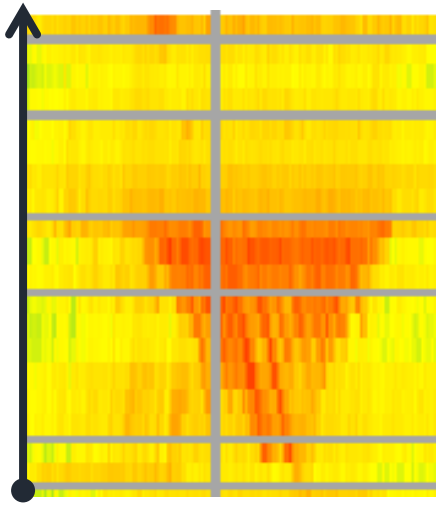
- "Double" inductance loops spaced 500 metres apart
  - M50 (J3 to J17)
  - N4 (J1 to J5)
- Every 20 seconds information per lane:
  - Number of vehicles
  - average speed
  - average length
  - average occupancy



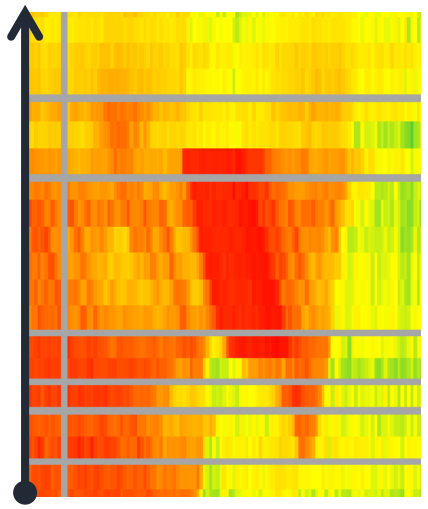
eMOS – M50 Traffic Flow Optimisation (MTFO)



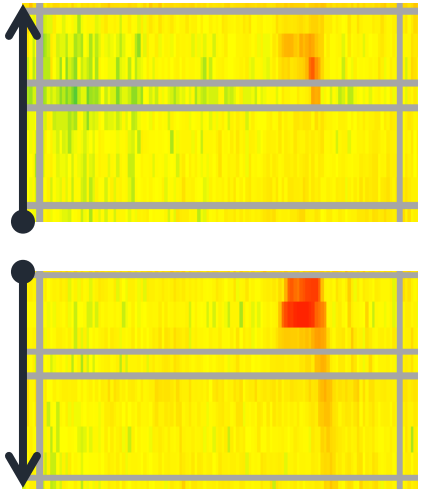
Excess demand



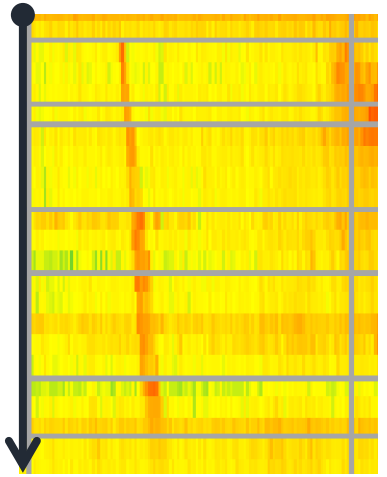
Incident



Cross Carriageway

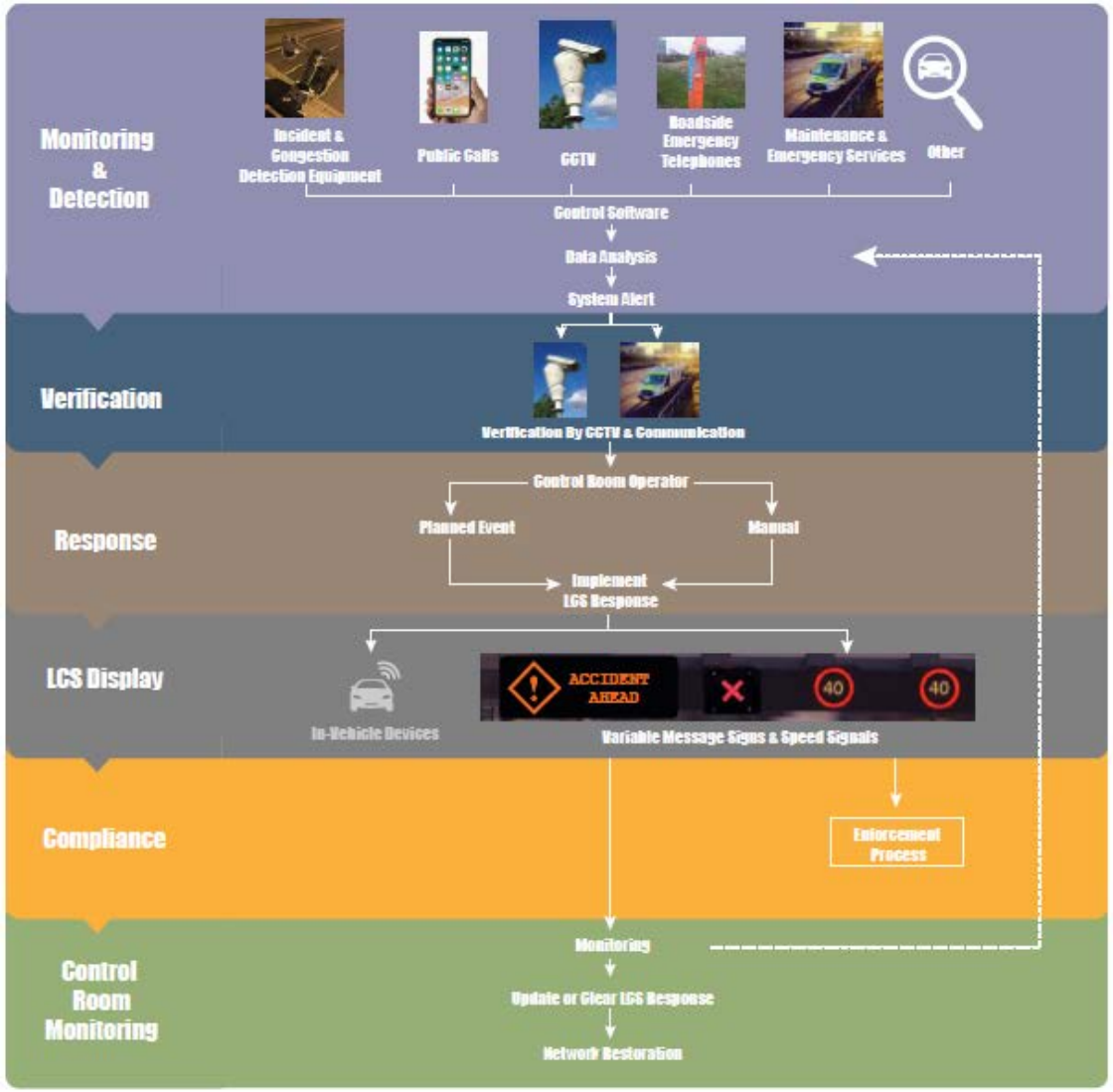


Slow moving vehicle



eMOS – M50 Traffic Flow Optimisation (MTFO)

So how will the system operate?



Today – Incident Management

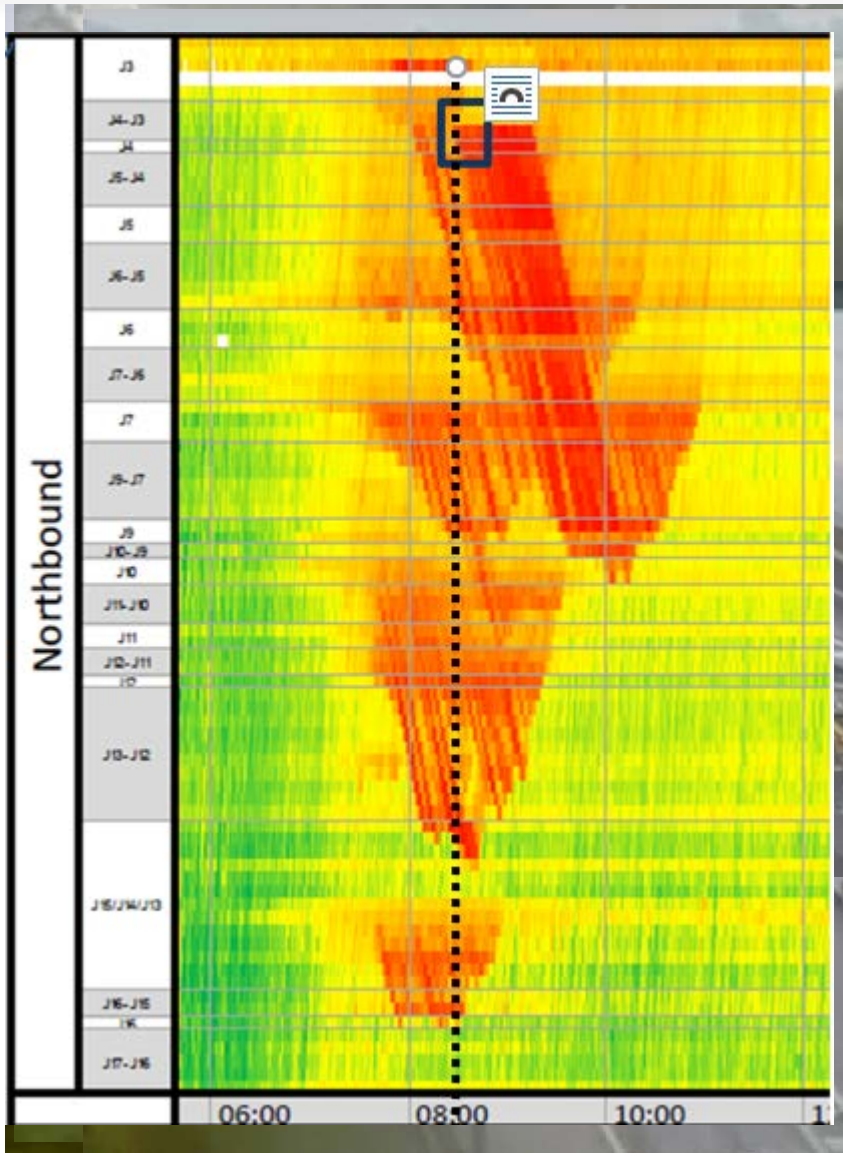
1.5 billion
Vehicle km travelled

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

16:00 -19:00
Peak Incident Time

29 minutes
Median Duration of Incidents

12 minutes
Average Response Time



eMOS – M50 Traffic Flow Optimisation (MTFO)

Projected Outcomes

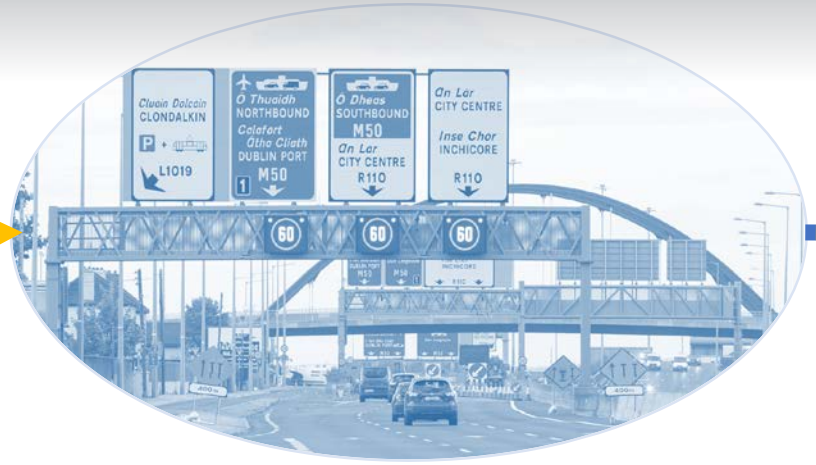
- Smoother traffic flow
  - Improved safety
  - Reduction in incidents
  - Reduced variability in journey time
- Better lane distribution
- Proactive management of incidents
- Higher profile for works Traffic Management

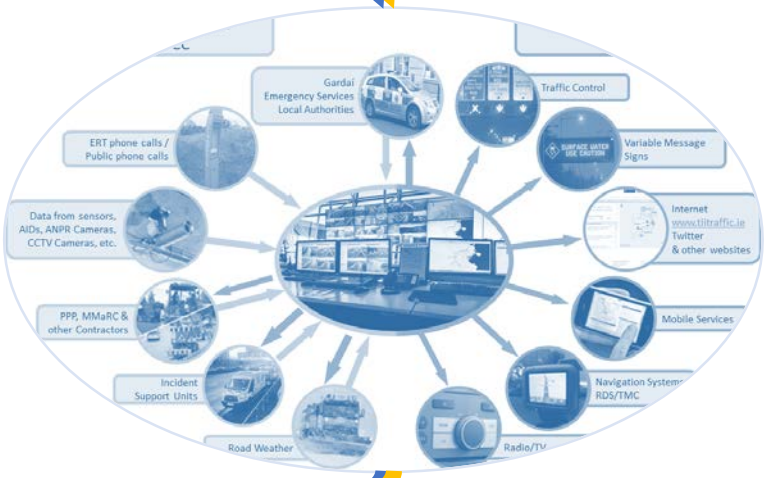
M50 Traffic Flow Optimisation (MTFO) - Compliance

How do we promote compliance?

- Inform road users of what to expect & likely impacts.
- Highlight to road users to the safety benefits
- Improve awareness of incidents, events and road works
- Demonstrate how Lane Control Signals will assist them & emergency responders when dealing with incidents
- Enforcement necessary but not necessarily welcomed

eMOS – Motorway Operations Control Centre (MOCC)





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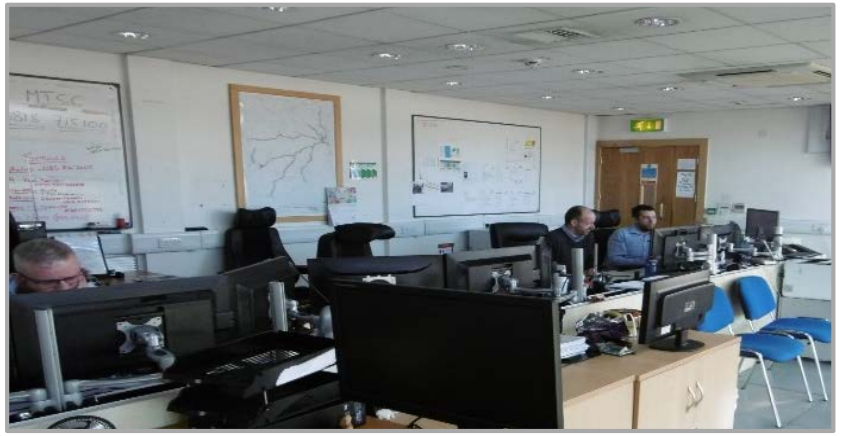
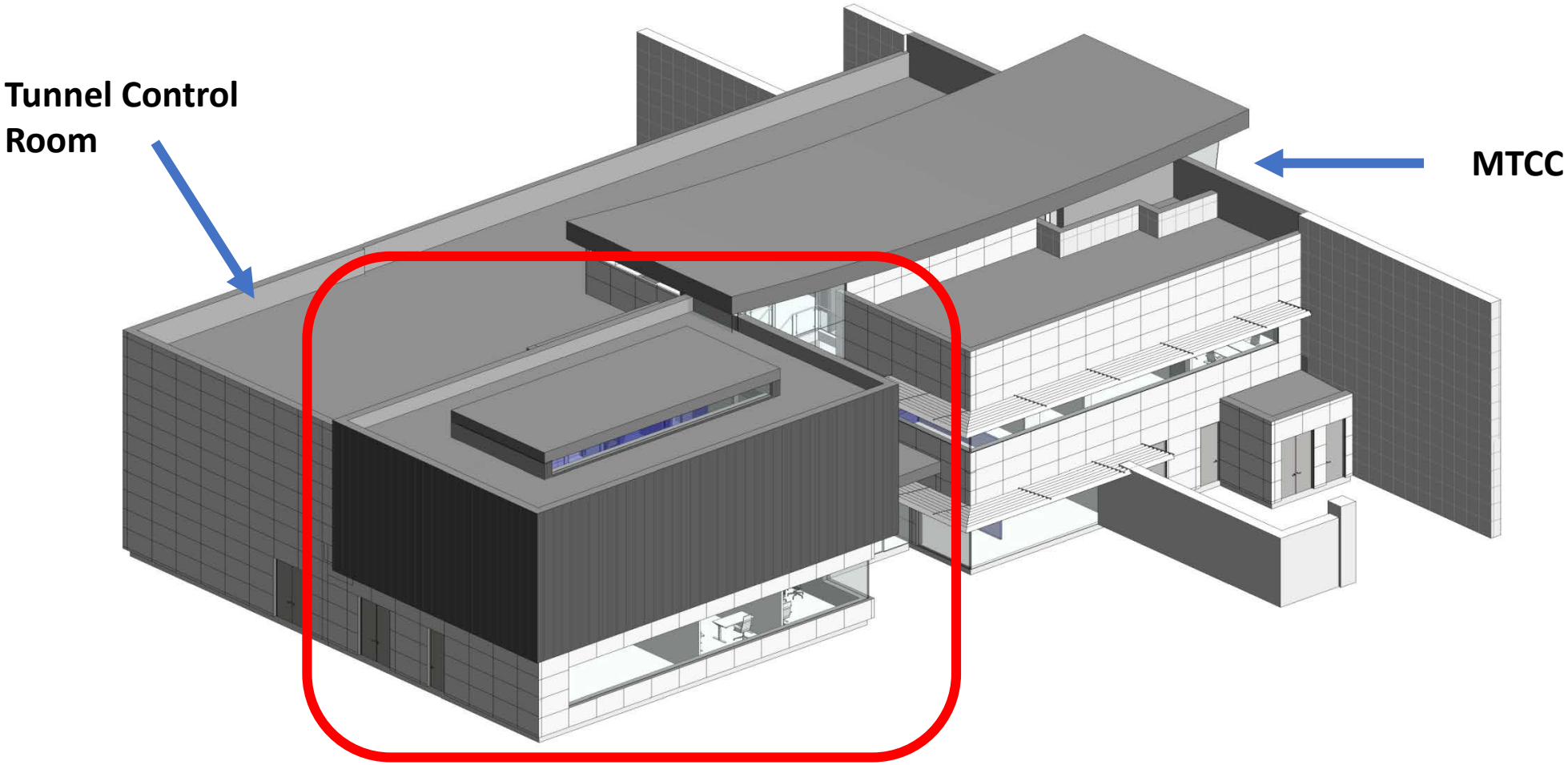
eMOS – Motorway Operations Control Centre (MOCC)

- Existing motorway operations run from the Toll Plaza Control Room (3 workstations)
- Insufficient space restricting services [servers / people]
- Increased operational capabilities now & into the future will require increased personnel
- Increased complexity of the operational service being provided will require facilitation of Operator training
- Expansion of existing Building required
- Opportunity to streamline operations – Single Control Room



eMOS – Motorway Operations Control Centre (MOCC)



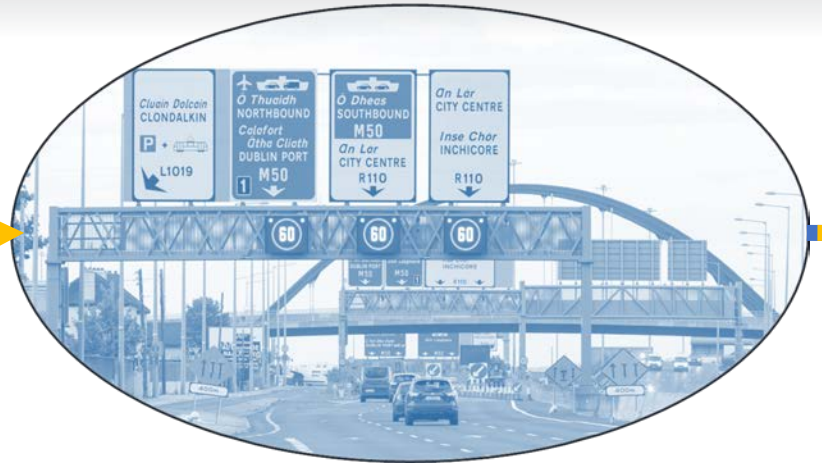
eMOS – Motorway Operations Control Centre (MOCC)

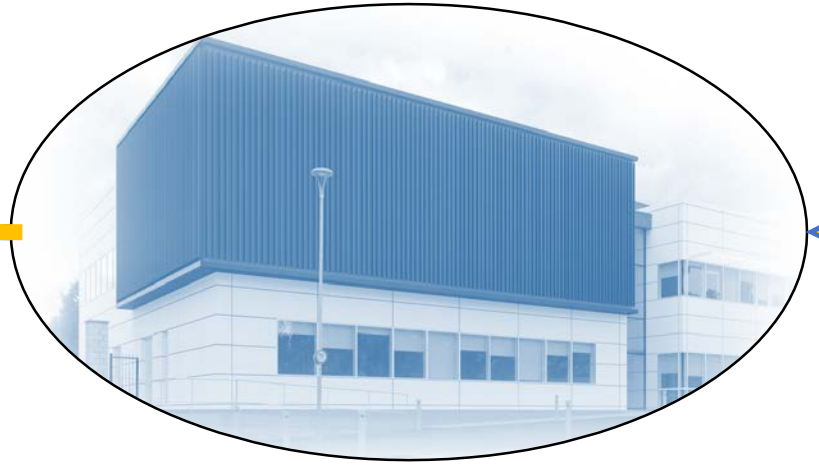
eMOS – Motorway Operations Control Centre (MOCC)

Opportunities

- Meteorologist (Winter Season)
- enhanced IICG co-ordination
    - An Garda Síochána
    - Contractors Liaison Officers [MMaRCs / PPPs] during significant / prolonged events
- Online Media Specialist – Twitter, Facebook, Website, DCR
- Future expansion of services in response to technological changes

eMOS – Network Intelligence & Management System (NIMS)





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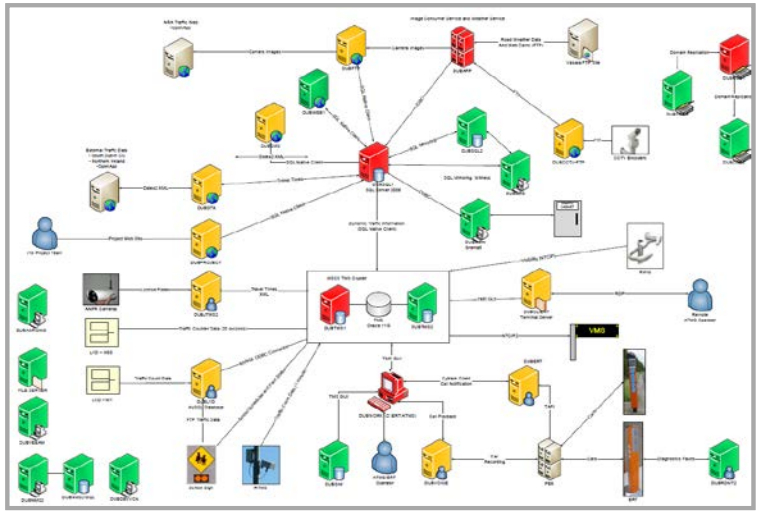
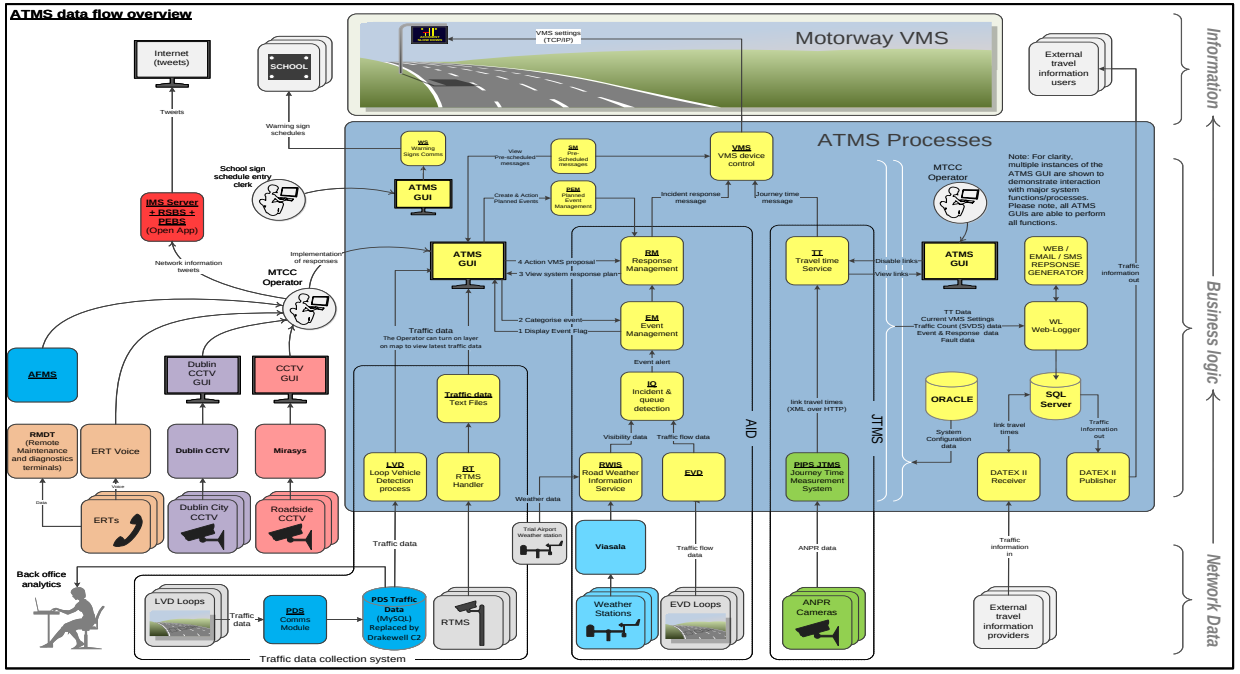
eMOS – Network Intelligence & Management System (NIMS)

Current ATMS

- Developed for Urban Traffic Management
- Purchased circa 2002
- Exceeded its lifespan & scalability
- It has expanded over its lifetime in response to changing technologies & supported by additional systems operating independently of ATMS
- It is now running in conjunction with multiple systems that increase Operator workload and increase Support & Maintenance Costs



Physical Server Map



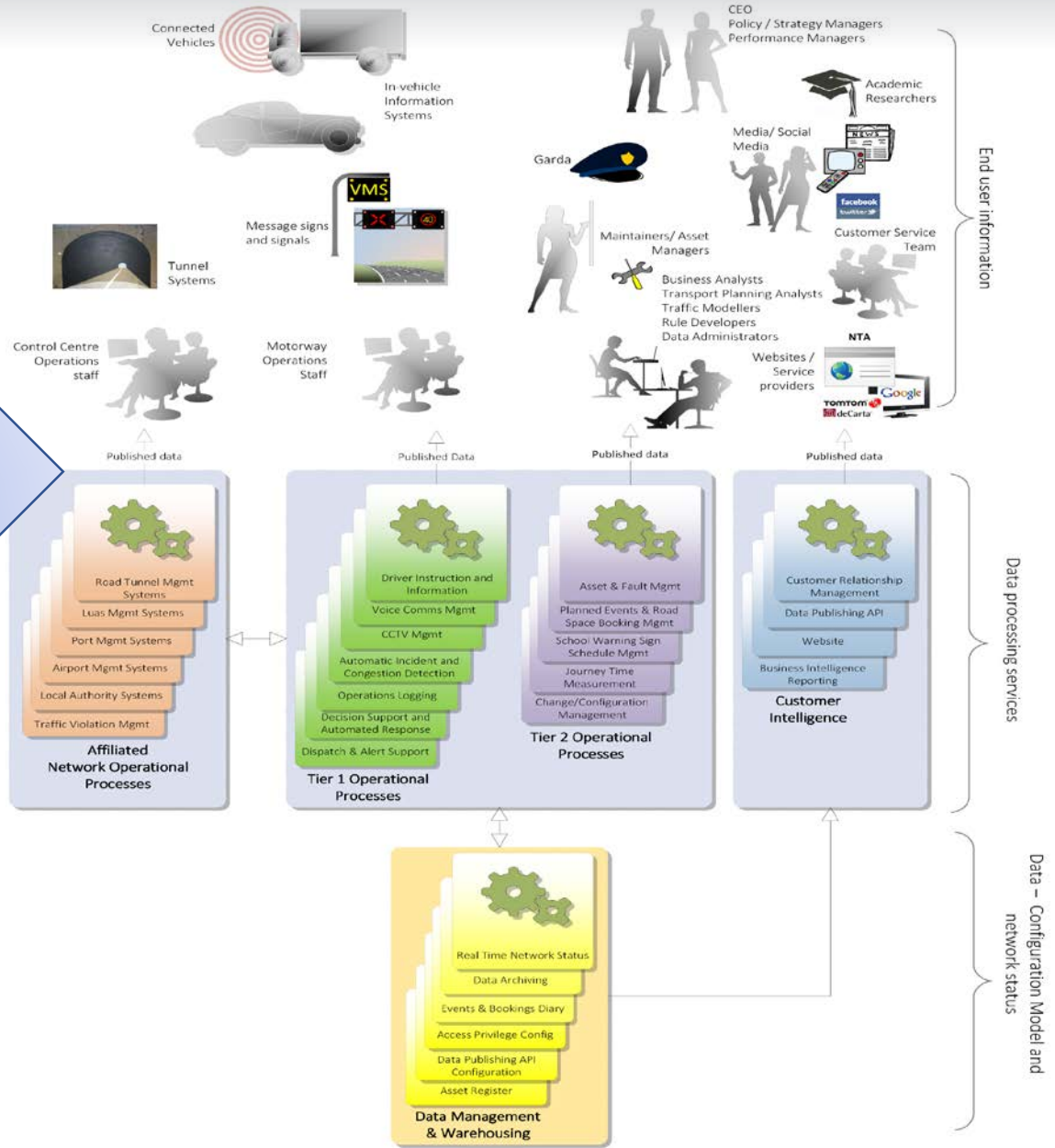
Data Flows

eMOS – Network Intelligence & Management System (NIMS)

Future ATMS

- Handles TII Operations
- Integrate & Maximise Existing Systems
- Scalability – Geographical
- Future Proofing
- Innovative
- Plug & play

NIMS



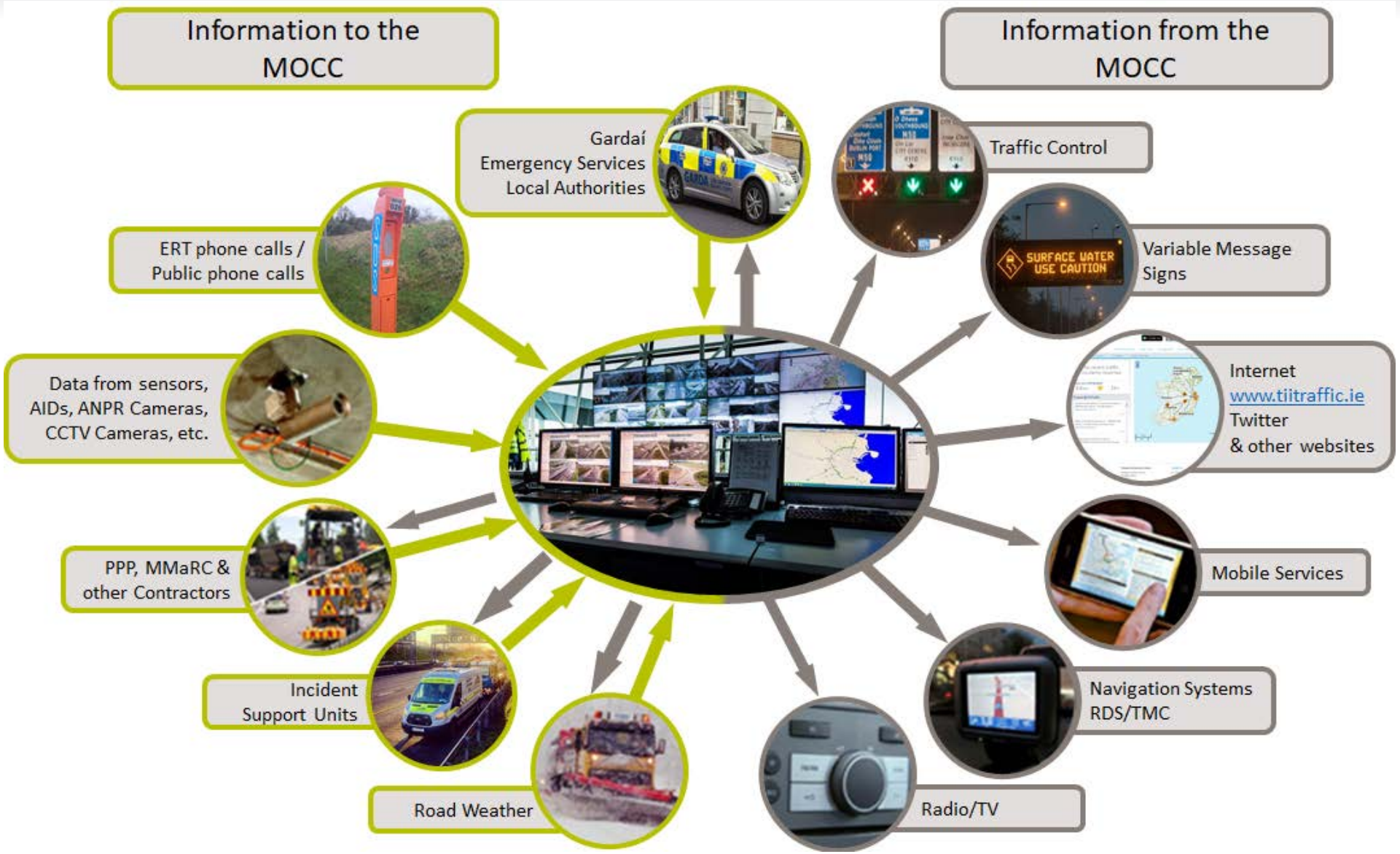
End User Information
Road User Dissemination
Maintainers / Asset Managers
An Garda Siochana
TII Analysts
Strategic / Performance Managers
Media / Social Media

Data - Processing
3rd Party Network Ops Systems
Network Ops Systems
Corporate Ops Systems
Customer Ops Systems

Data - Configuration Model
Real Time Network Status
Event Diary / Schedule Mgmt
Data Validation
Data Mgmt Filters

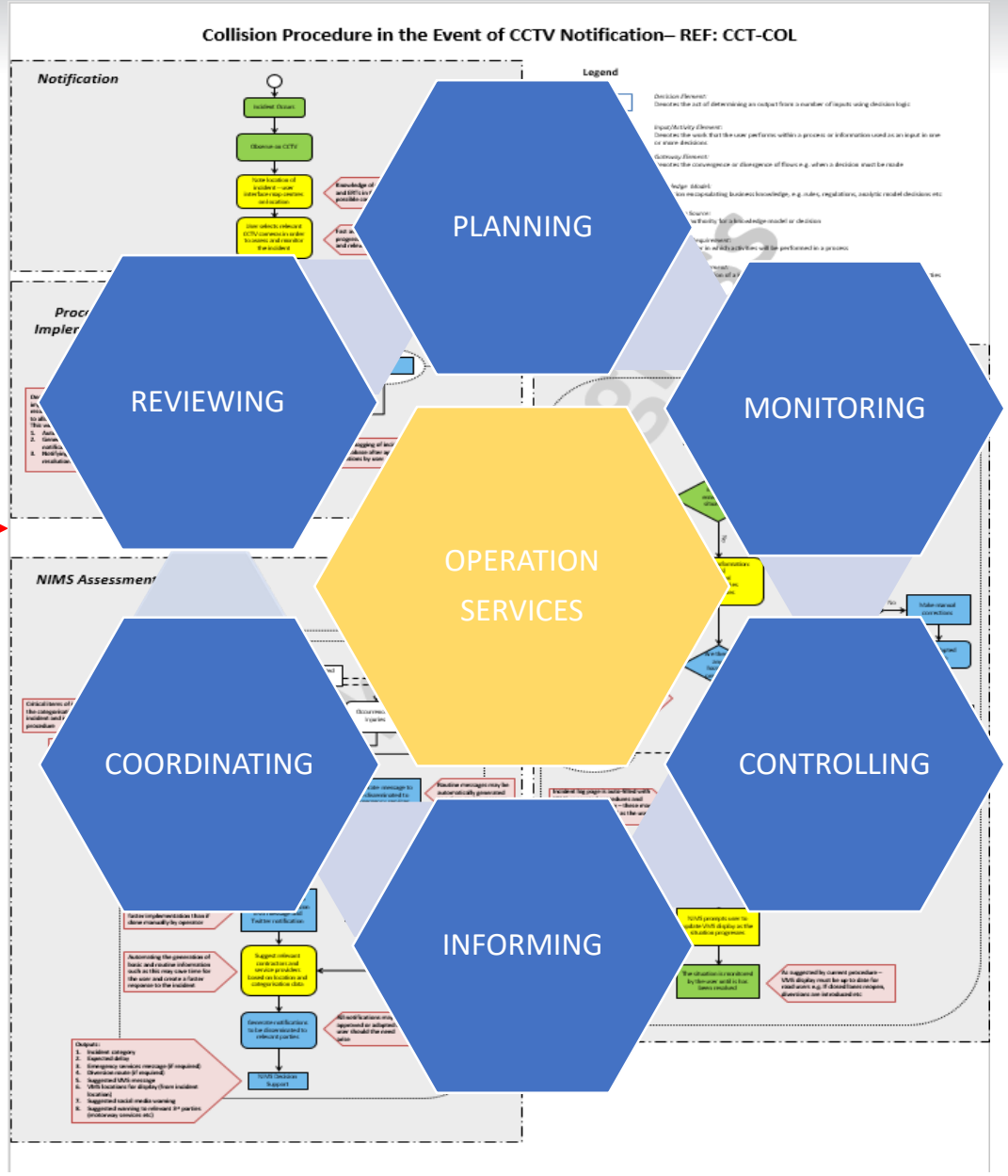
Decides what should be done with collected data

eMOS – Network Intelligence & Management System (NIMS)



Impact on Operator

- New surroundings – MOCC & Tunnel
- New equipment to operate on the roadside
- Increased geographical reach
- New functionality
- New graphical user interface
- Increased information dissemination
- Increased engagement & co-ordination with Operational Partners
- Increased operational expectations



eMOS – Beyond Tomorrow?

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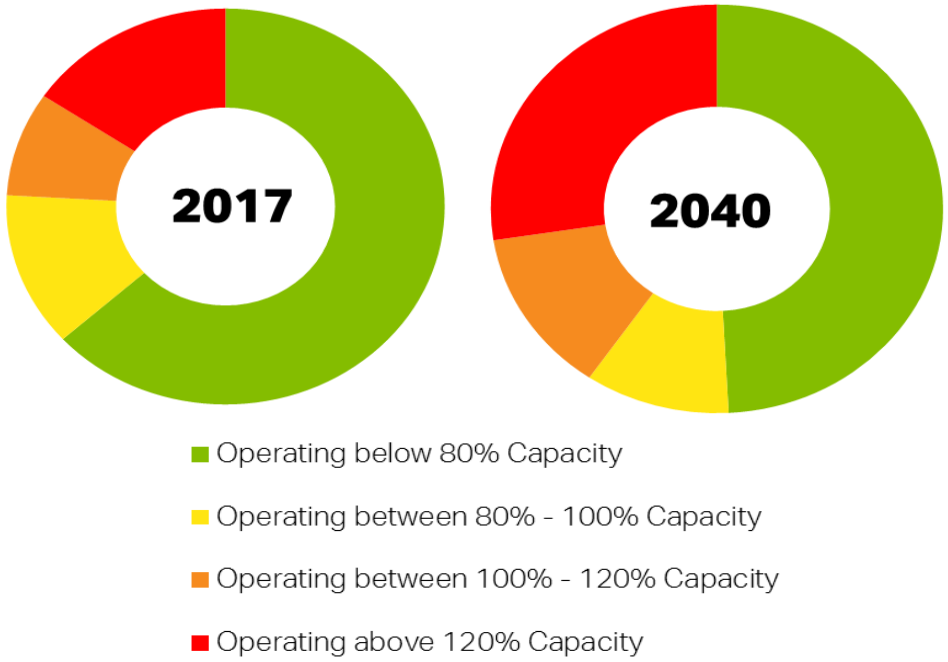
eMOS – Motorway Network up to 2040



Need will exist for Road Authorities to continue to enhance Motorway Operation Services beyond 2025 to:

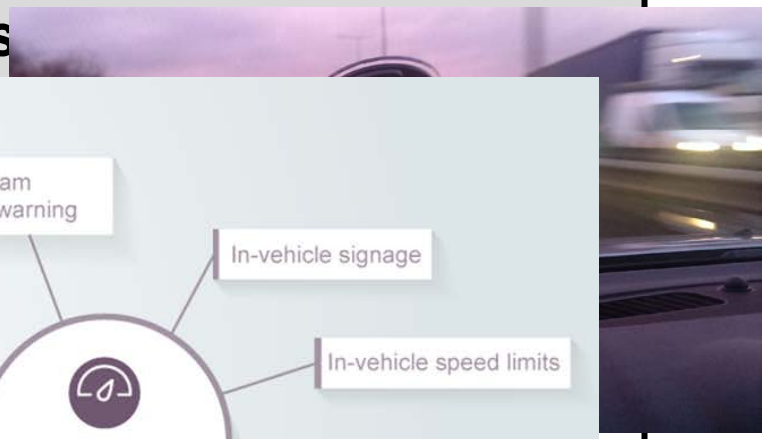
- Maximising value and use of the existing network
- Implement interventions that may be considered to alleviate some issues and improve people's travel as the network develops to 2040.
- Adapt to and realise the benefits of emerging technologies.

The new and emerging technologies:

- How vehicles are controlled – the emergence of Connected and Autonomous Vehicles (CAVs)
- How road transport is purchased – better communications, principally smart phones make new ways of providing and using road transport possible.

eMOS – C-ITS Pilot Study

C-ITS Services



Year	Key Activities
2018	Design Concept
	Stakeholder Engagement
2019	Fund, Procurement Planning and Industry engagement
	C-ITS Development & Prototyping
2020-2023	Road Trials
	Evaluation & Progress Outcomes

eMOS – C-ITS Pilot Study

The Pilot Study will help to inform TII with respect to the role out of new technologies around C-ITS

- What technologies & standards to adopt? - "Chasing a moving target" – given rapid development and evolution of technology & policy

- How will this impact the traditional traffic control role? Physical infrastructure?

- Where? Is this just a motorway issue – what about the rest of the network?
- When? Timescale - 2030 penetration levels of 15% to 35% "are possible" suggest a mixed car fleet – CEDR DRAGON Report

Need for authorities to strike the correct balance between renewing and refreshing "Traditional ITS" and directing investment towards the benefits of providing for innovative "New ITS".

eMOS – Back to Tomorrow

eMOS will continue to deliver various works and services by Transport Infrastructure Ireland to secure and continuously enhance the operation of a safe, efficient and sustainable motorway network through the following:

- Delivery of the MTFO, NIMS & MOCC projects;
- Completion of focused interventions at congestion points;
- Implementation of additional safety measures;
- Continuous review & improvement of operations to reflect the changing technologies and environment that TII operate in.

Thank You