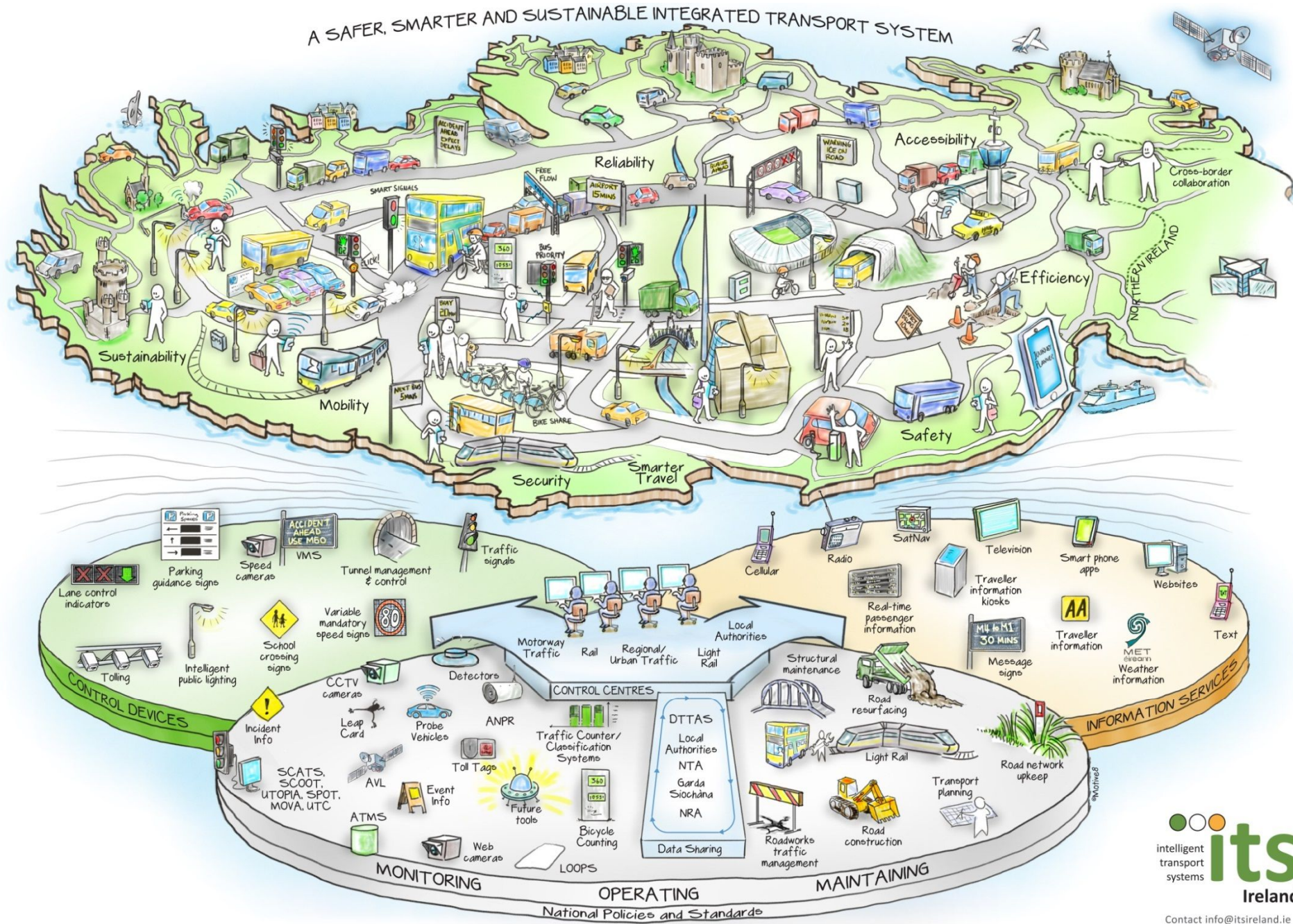# ITS Ireland – The Big Picture

ITS Ireland – Who We Are?

- ITS (Intelligent Transport Systems) is the application and integration of advanced sensor, computer, electronic and communication technologies to promote safer, more efficient and sustainable systems for the movement of people and goods.

- ITS Ireland was established in 2010 as a non-profit Organisation to promote greater awareness of Intelligent Transport Systems (ITS). ITS Ireland is a true public and private partnership, with members collectively working together in an advocacy role.

www.itsireland.ie

# ITS is about Delivering Outcomes, Not Implementing Technology

- Motorway Development
  - Pre 2000: Under-developed Network
  - Major Investment Programme Implemented
  - PPPs played a Key Role
  - PPP Model evolved between 2003 & 2010
  - Ten toll roads on the National network and one on the local network
- Ireland now has a Modern Motorway Network Connecting all Major Cities

ITS in Ireland – Electronic Toll Collection

- History
  - 2000 – Introduction of ETC on Westlink & Eastlink;
  - 2003–2010 - New motorway network with toll roads;
  - 2007 - Introduction of national ETC interoperability;
  - 2008 - Introduction of multi-lane free flow on M50;
  - 2008 - Introduction of National Tag Providers;
  - 2010 onwards - Preparation for EU Interoperability;
- Interoperable CEN DSRC across all Toll Plazas
- Irish Interoperability Model is being leveraged for EETS Implementation
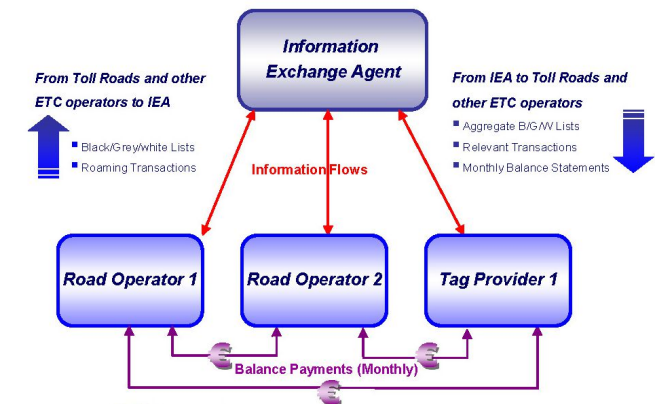
- Phased ITS Roll-Out
  - Emergency Roadside Telephones
  - VMS (traveller information)
  - Fibre Optic Network
  - Incident Detection
  - ANPR
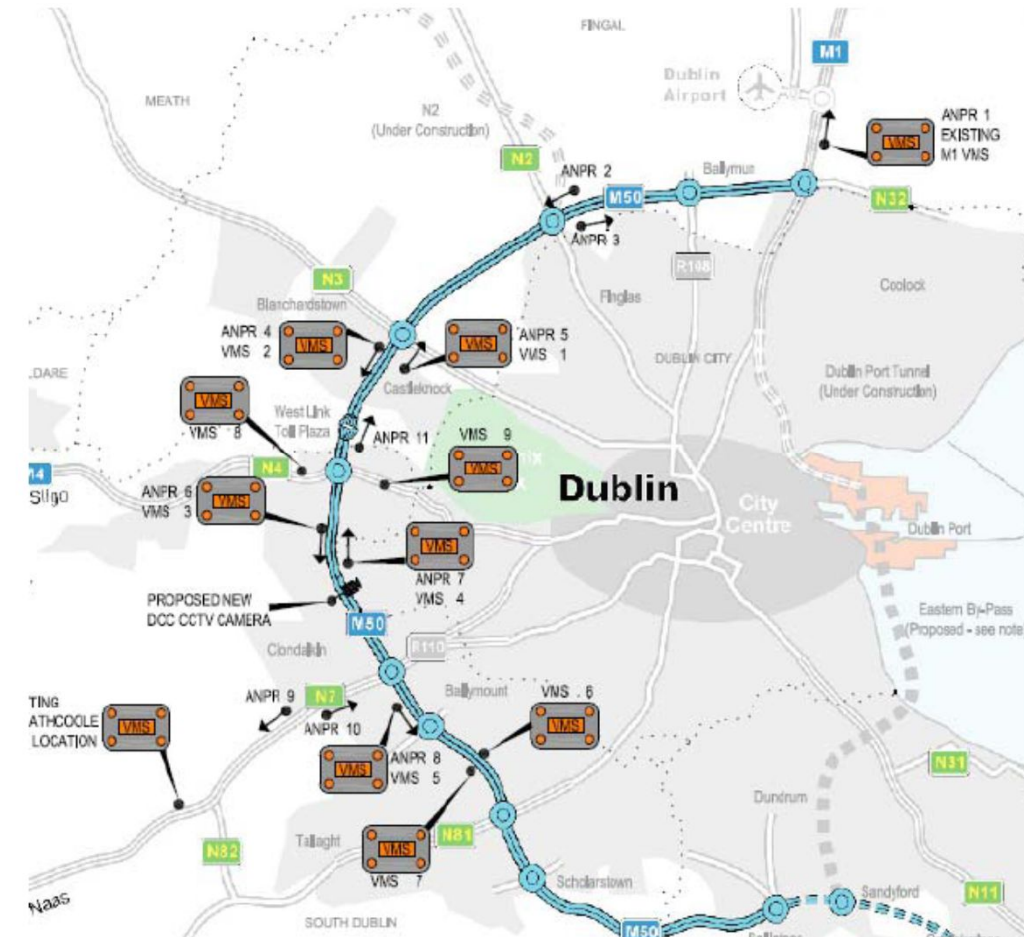
- M50: Upgrade to ORT in 2008
- Combined with major infrastructural improvements
  - Increased number of lanes
  - Re-engineering of on / off ramps
- Over 140,000 vehicles per day avail of this Service
- Tolling and ITS combined with Infrastructure Improvements

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- DPT: 5km Urban Twin-Bore Tunnel

- Incorporates Significant ITS
  - Control Centre, Incident detection, etc.

- Variable Price Tolling
  - HGVs – Free
  - Cars - €3 off-peak, €10 peak

- Diverts HGVs from City

ITS in Ireland – HGV City Cordon

- HGV Strategy introduced following completion of DPT and M50 projects

- HGV Management Strategy Commenced 2007
  - To encourage maximum use of the Port Tunnel by port-related traffic and to enhance the city centre environment.
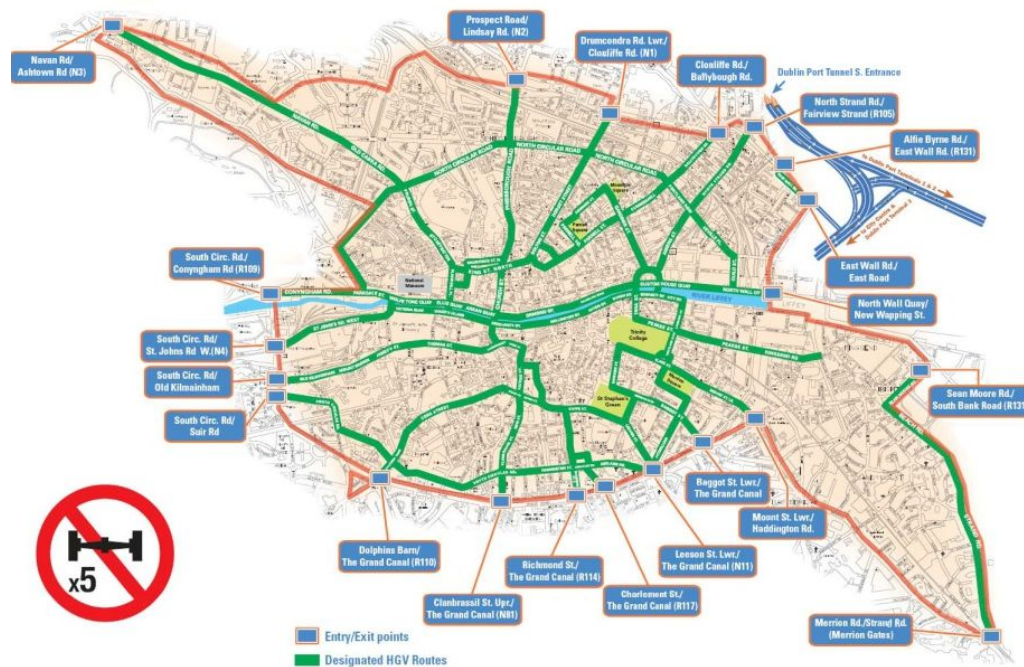
  - Ban on 5+ axle vehicles during the hours of 7am and 7pm.
  - Limited permit scheme for HGVs that need to load/unload within the city centre area.

- Dramatic Results
  - HGV numbers on City streets down from 5,000 per day to under 500
  - Very large Reduction in accidents.
  - Large Increase in Cycling in City Centre
- Dublin has the safest roads of any capital city in Europe.
  - European Transport Safety Council report 2011 .
  - HGV City Cordon is a major contributing factor.
- Combining policy, planning, infrastructure delivery and ITS delivered Real Solutions for Real Needs

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ITS in Ireland is deployed in many different sizes, shapes and forms.

ITS in Ireland - Dublin Bikes

- City network of automated bike stations - 42 locations around the city

- Smart Card system handles deposits and payments

- Modest fee to encourage cyclists

- Monitored network to enable distribution teams to maintain and move bikes between locations depending on supply and demand

- New Schemes rolled out nationally in Cork Limerick & Galway

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ITS in Ireland – Traffic Signal Systems

- Various Means of Controlling Signals
- Network of Detectors
- Linked to Central System
- Maintenance

SCOOT ARCHITECTURE

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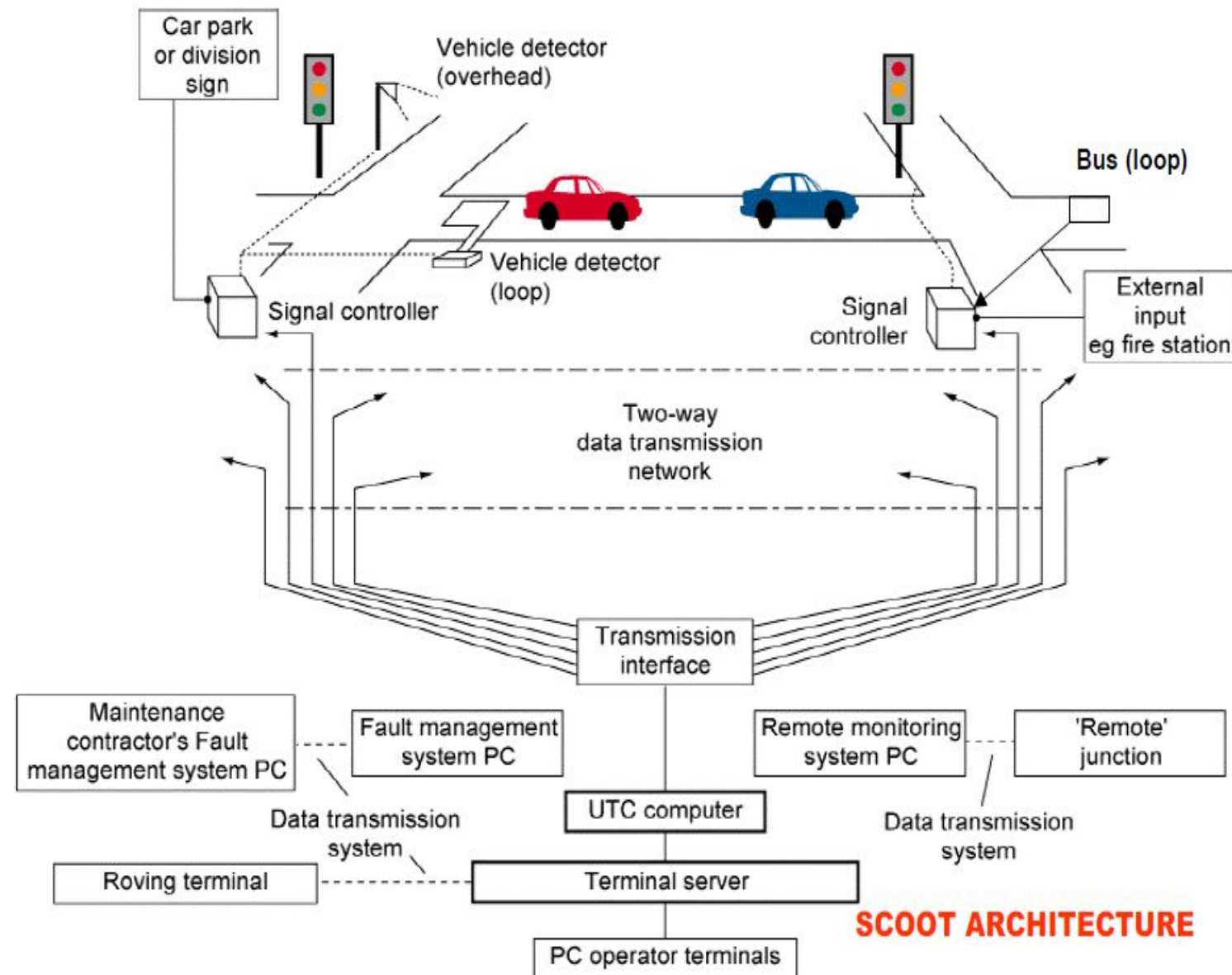
- Motorway TMC and Separate Urban TMCs Operations.
- Detect, Verify, Analyze and Take Appropriate Action.
- Information Management.
- Review and Enhance Strategies.

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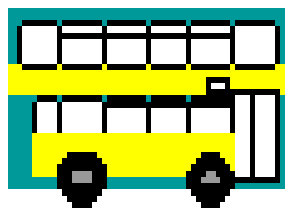systems
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ITS in Ireland – Parking Guidance Systems

- Reduces Congestion

- Reduces Travel Time

- Reduces Queuing

- Driver Information

- Efficient Use of Capacity

- Increases Revenue

- Higher Customer Satisfaction
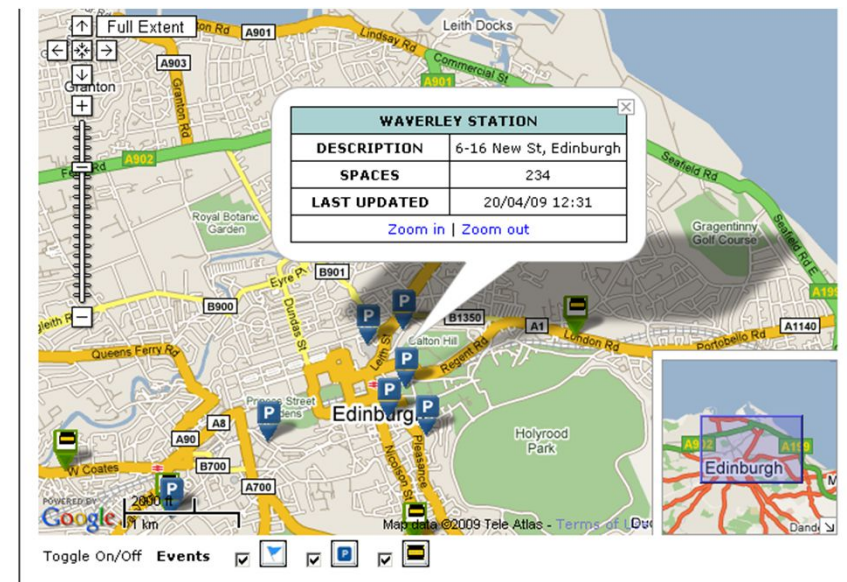
ITS in Ireland – Automatic Vehicle Location / Passenger Information Systems

- Manage Operations
- Maintain Schedules/Headways
- Key Bus Stops
- High profile
- Encourages Modal Shift
- Bus Priority

ITS in Ireland – Multi Modal Journey Planner

ITS in Ireland – Taxi Compliance Apps

- Suite of Taxi Regulation & Compliance Software
  - Taxi Industry Web Portal for Self Management of Taxi Drivers
  - Taxi Industry Apps (Android/iOS)
  - Consumer Taxi Verification App (Android/iOS)
  - Taxi Inspection Mobile App
- Taxi Passengers check their drivers credentials through this app, before and during travel
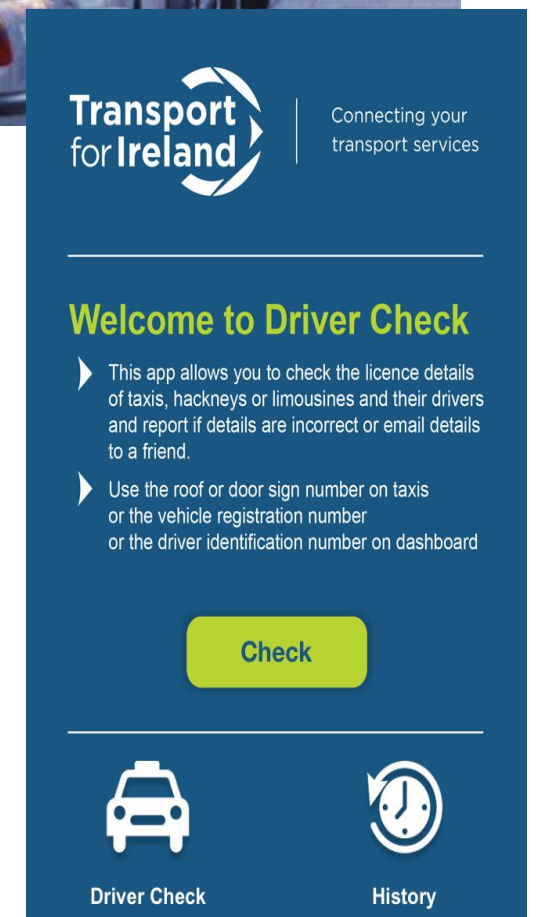
ITS in Ireland – Privatised Camera Safety Project

- Private Consortium ('GoSafe') contracted to provide and operate a network of mobile speed enforcement cameras nationwide

- First of it's kind in Europe

- Unique blend of ITS technology and complex back office operations.

- Website advertises camera sites on interactive map

- Objective is to discourage speeding

- Launched in Nov' 2010

- Results demonstrate increased road safety

ITS in Ireland – eCar Programme

- National Roll out of Charging Infrastructure

- 3,500 Charge Points by end 2011

- 1500 On Street Charge Points

- At least one charging point for every town with 1500+ population

- 30 Fast Chargers

- Every 60km on all major inter urban routes

- 2000 Domestic Chargers

🔴 **On Street Charge Points**

🟣 **Fast chargers**

Dublin 500

Galway 45

Limerick 45

Waterford 45

Cork 135
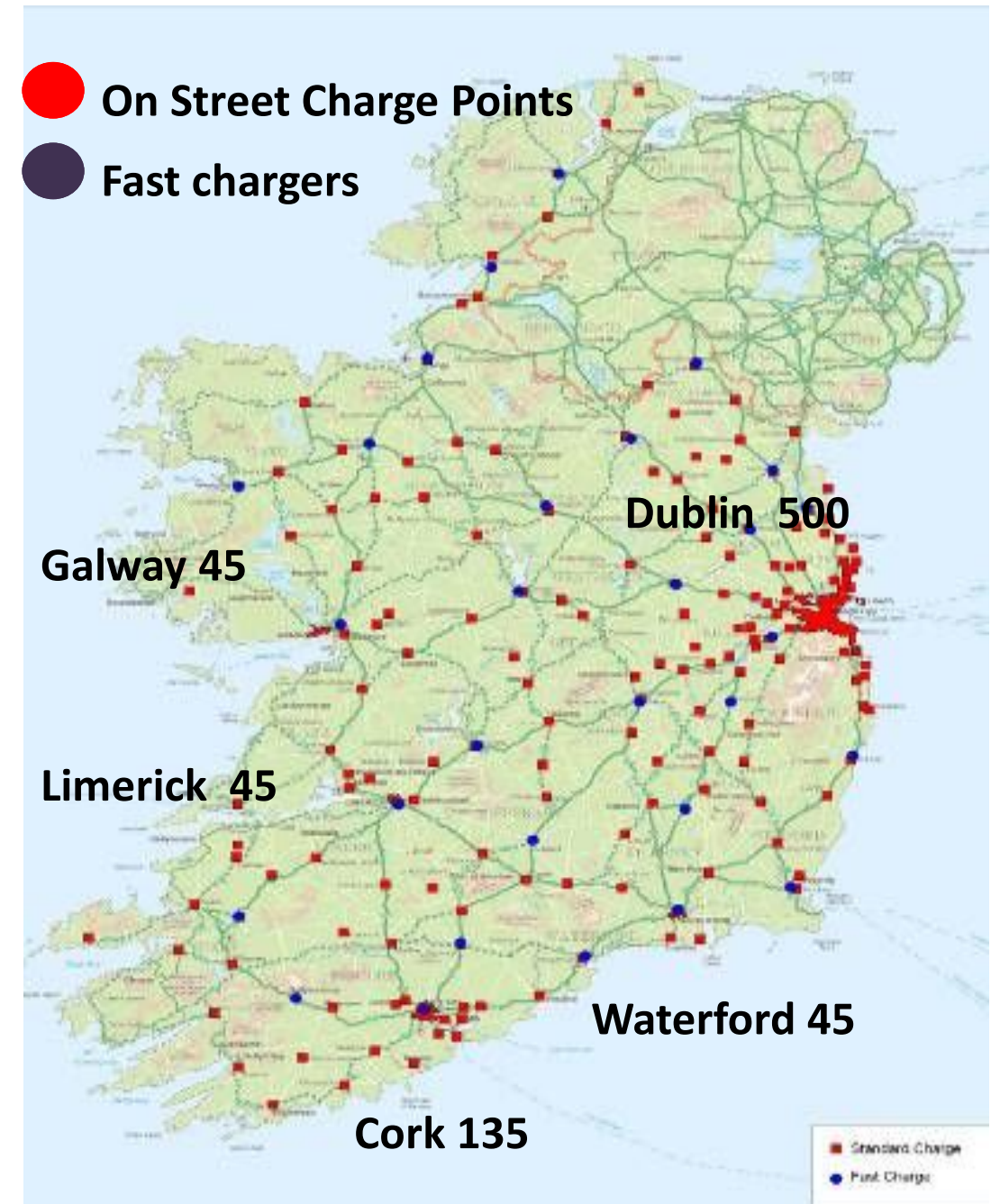
A Lot Done, A Lot More To Do!

ITS in Ireland could also Leverage from International Experience.

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ITS in Ireland – More Could Be Done

- Wrong Way Driver Alert Systems rolled out in Florida, Arizona etc.

- Thermal Imaging and / or Radar Sensors

- Linked to VMS and TMCs

- Proven to Save Lives

- Integrated ITS with comms, infrastructure and operations.

PROTOTYPE DEPLOYMENT
WRONG-WAY DRIVER ENTERS THE RAMP

Thermal camera detects wrong-way vehicle entering off ramp (activates illuminated wrong-way sign)

Another thermal camera mounted on pole on center median wall detects wrong-way vehicle entering freeway

Wrong-way driver triggers wrong-way detection

WRONG WAY

ADOT and DPS notified of the location

ALERT WRONG-WAY DRIVER AHEAD

MESSAGE ACTIVATION
Drivers on the freeway are alerted

Ramp meters show *constant* red signal

Next detection here (to track vehicle)

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ITS in Ireland – More Could Be Done

- Intelligent Street Lighting
- Intelligent Road Studs (lane management)
- Virtual loading bays to manage parking
- Adaptive traffic management (roadworks, schools etc.)
- The list goes on…..

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Increased Digitalisation of the Transport Network is happening in the here and now.
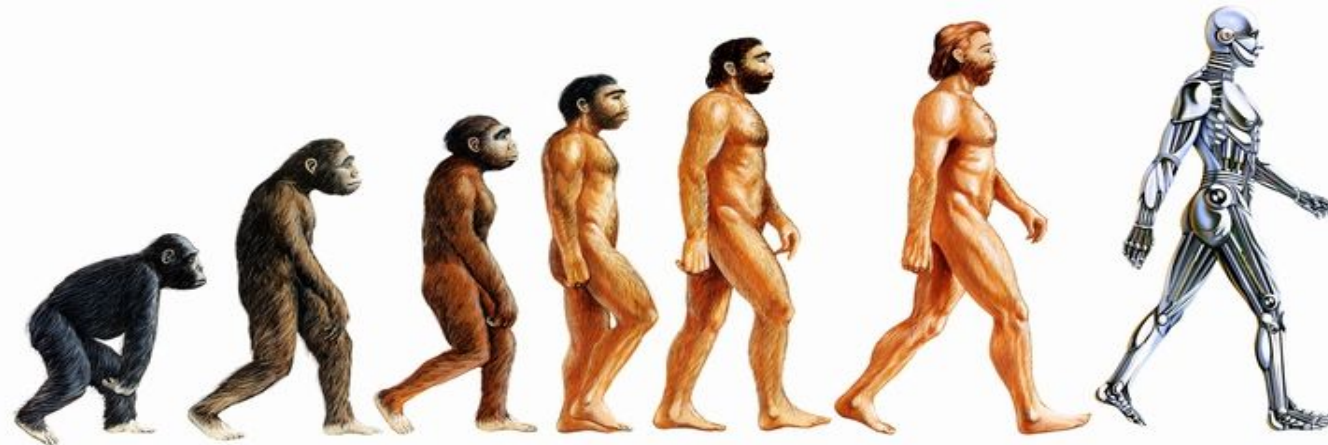
What Does That Mean For You?

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- We are now in the Digital Age
- Connectivity leading to convergence of everything!!!
- Steady pace of evolution is rapidly accelerating
- Huge socio-economic benefits but major challenges in transition
- Evolution, not revolution
- Need to accelerate Discovery
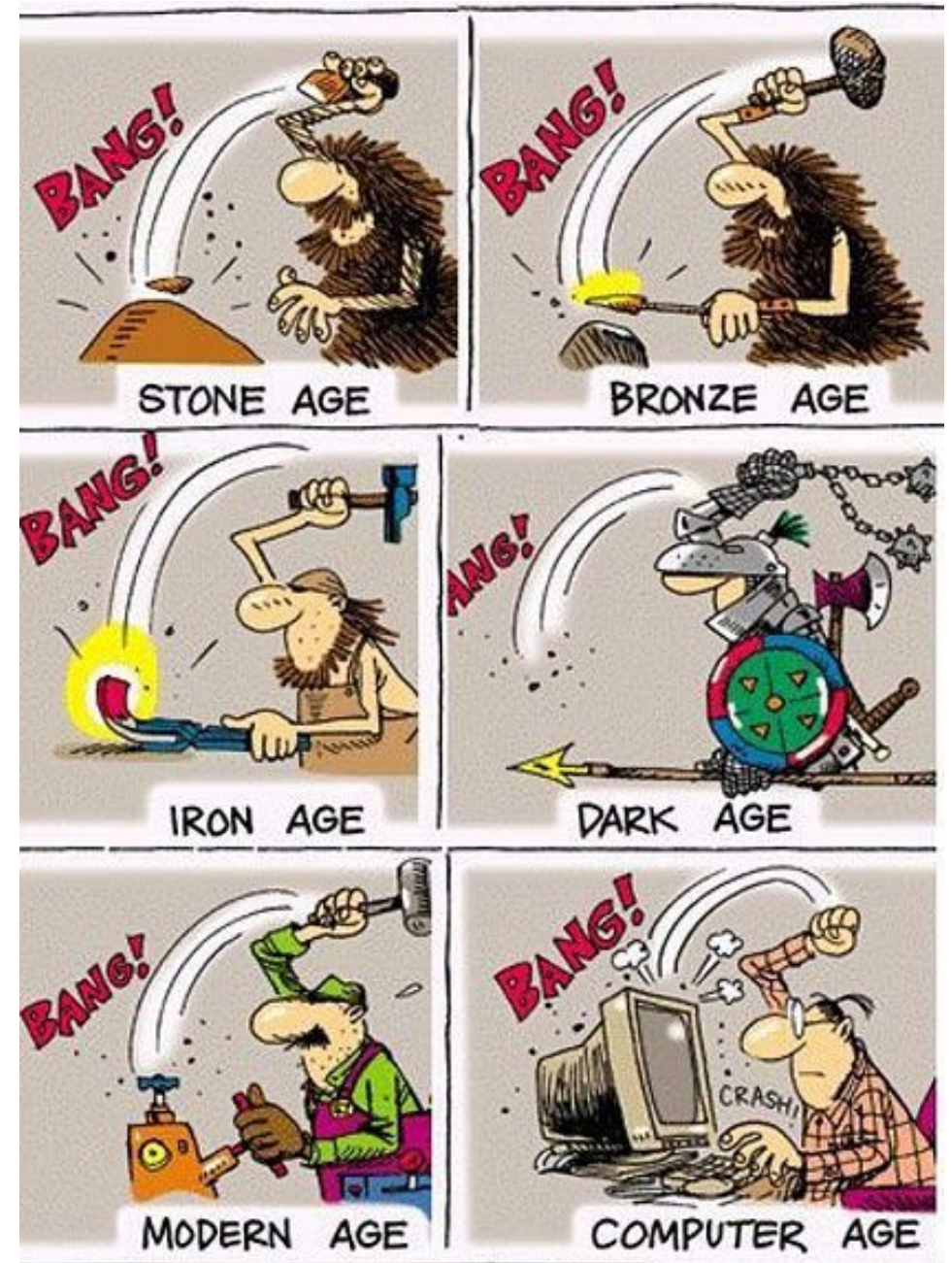
ITS in Ireland - IBM Smart Cities Initiative

- IBM's first Smarter Cities Technology Centre (Mar 2010)
- Build highly-skilled cross-disciplinary team
- Collaborate with an ecosystem of partners to test technologies in the real world (Cloud, Stream and High Performance computing, advanced analytics and visualisation etc.)
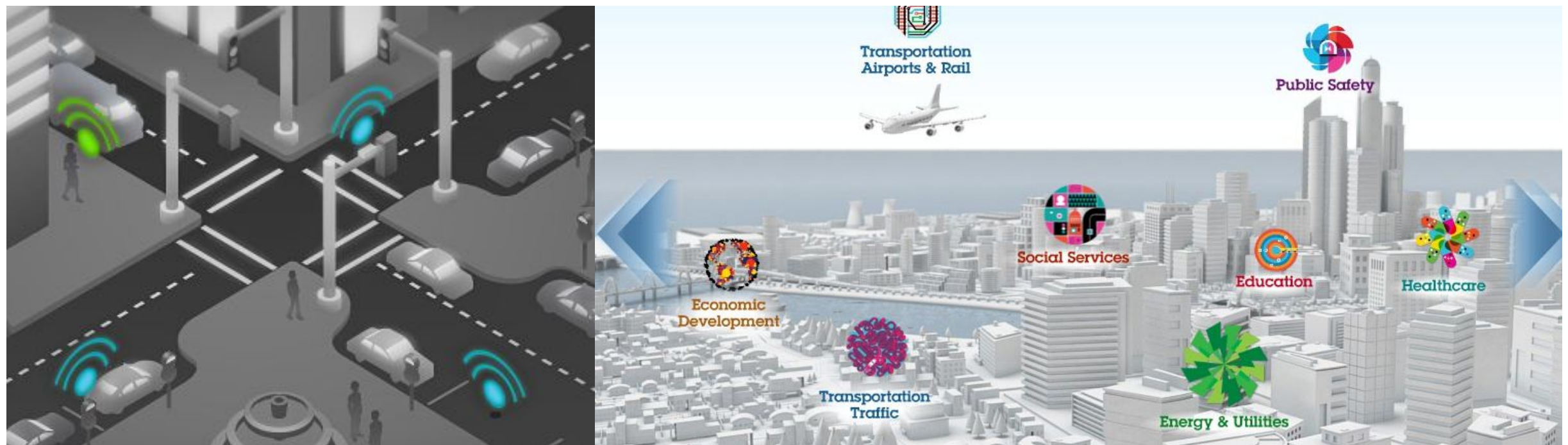
- Irish CAV Forum established as a central platform to bring together stakeholders from across industry, academia & research, transport authorities and support agencies to help build a CAV value proposition for Ireland.

- CAV covers all transport modes and will ultimately change how we view mobility.
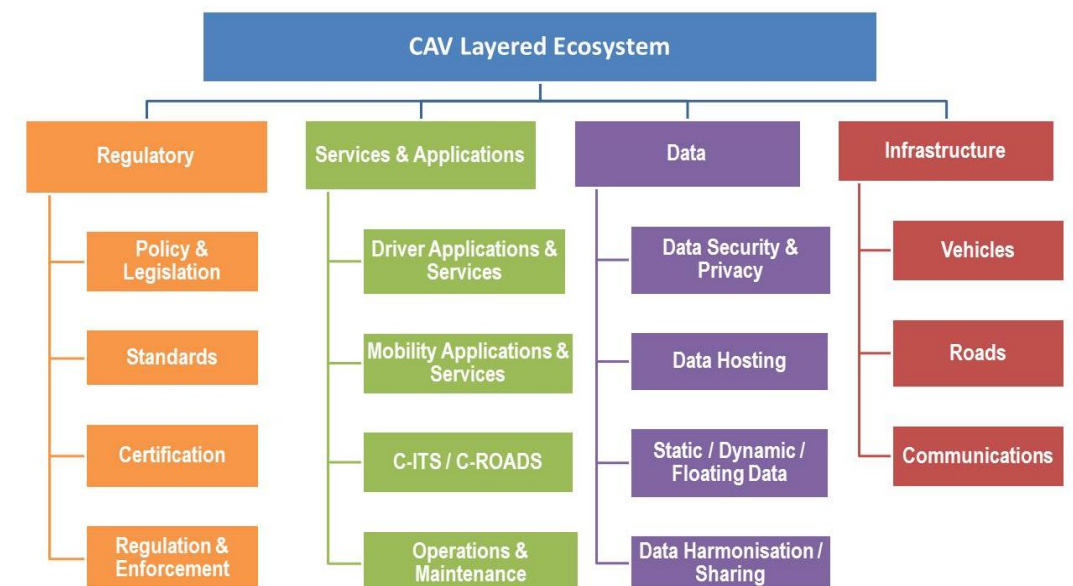
- CAV is happening in the here and now.

- Increased connectivity is a major disruptor

- Technology is not the challenge

- Immediate challenge is to determine how to manage mobility in a blended automation environment

SAE level	Name	Narrative Definition	Execution of Steering and Acceleration/ Deceleration	Monitoring of Driving Environment	Fallback Performance of Dynamic Driving Task	System Capability (Driving Modes)
Human driver monitors the driving environment						
0	No Automation	the full-time performance by the *human driver* of all aspects of the *dynamic driving task*, even when enhanced by warning or intervention systems	Human driver	Human driver	Human driver	n/a
1	Driver Assistance	the *driving mode*-specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the *human driver* perform all remaining aspects of the *dynamic driving task*	Human driver and system	Human driver	Human driver	Some driving modes
2	Partial Automation	the *driving mode*-specific execution by one or more driver assistance systems of both steering and acceleration/ deceleration using information about the driving environment and with the expectation that the *human driver* perform all remaining aspects of the *dynamic driving task*	System	Human driver	Human driver	Some driving modes
Automated driving system ("system") monitors the driving environment						
3	Conditional Automation	the *driving mode*-specific performance by an *automated driving system* of all aspects of the dynamic driving task with the expectation that the *human driver* will respond appropriately to a *request to intervene*	System	System	Human driver	Some driving modes
4	High Automation	the *driving mode*-specific performance by an automated driving system of all aspects of the *dynamic driving task*, even if a *human driver* does not respond appropriately to a *request to intervene*	System	System	System	Some driving modes
5	Full Automation	the full-time performance by an *automated driving system* of all aspects of the *dynamic driving task* under all roadway and environmental conditions that can be managed by a *human driver*	System	System	System	All driving modes

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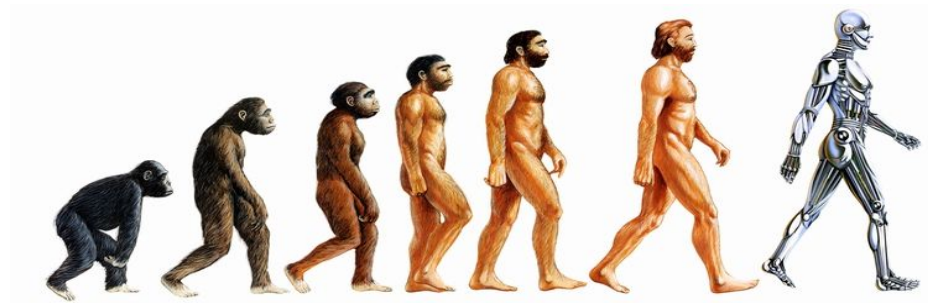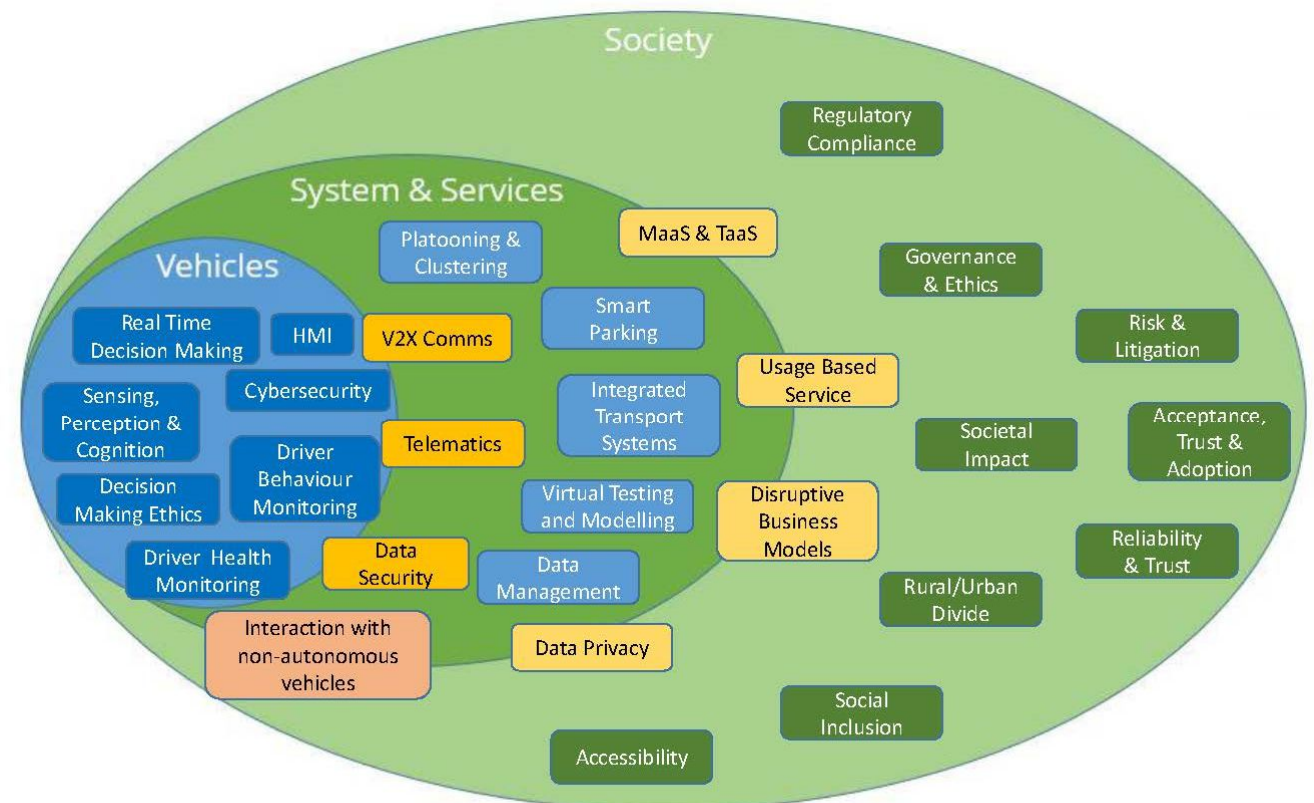

CAV Layered Ecosystem

Regulatory	Services & Applications	Data	Infrastructure
Policy & Legislation	Driver Applications & Services	Data Security & Privacy	Vehicles
Standards	Mobility Applications & Services	Data Hosting	Roads
Certification	C-ITS / C-ROADS	Static / Dynamic / Floating Data	Communications
Regulation & Enforcement	Operations & Maintenance	Data Harmonisation / Sharing	

- Roadside signage will ultimately be replaced by in-vehicle displays.

- Highways England Trial proved capability of communicating tactical traffic management information in this manner.

- But will it always be effective if driver inundated with other dashboard data?

- Some vehicles will still require roadside infrastructure so how do you manage asset life cycle?

- How do you enforce traffic regulations?

- CAV covers a broad spectrum

- Impacts on roles and responsibilities of all transport practitioners

- Digital Transport Network requires integration and cooperation between all transport disciplines

- ITS Evolution in Action

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