

Greener vehicles and infrastructure: Today, tomorrow and beyond

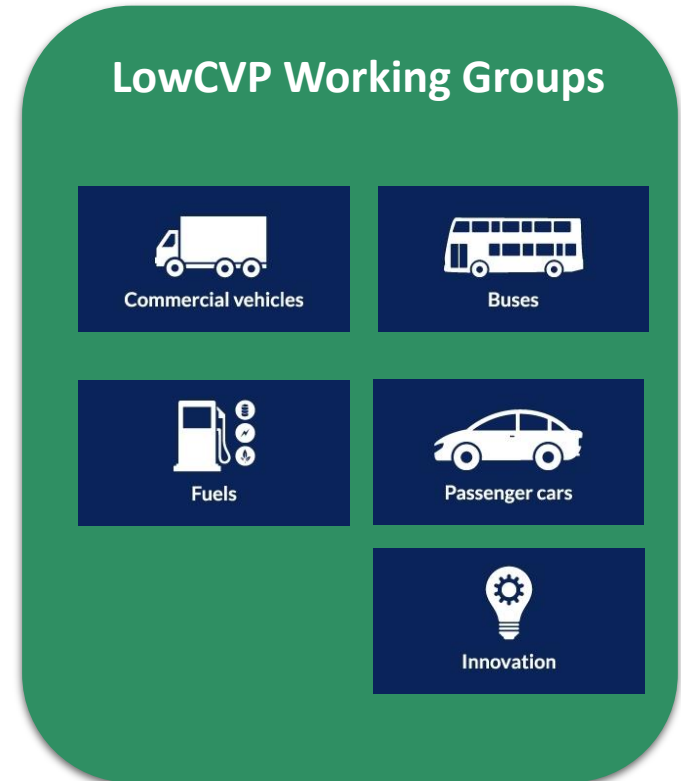
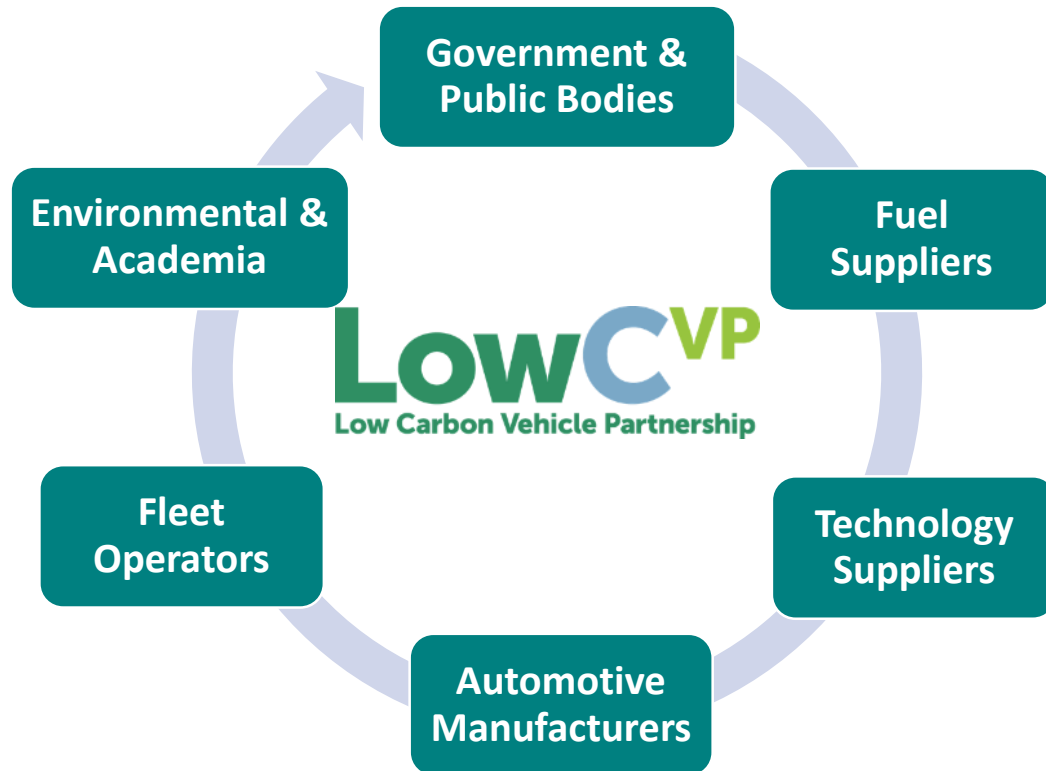


Andy Eastlake

Managing Director – LowCVP

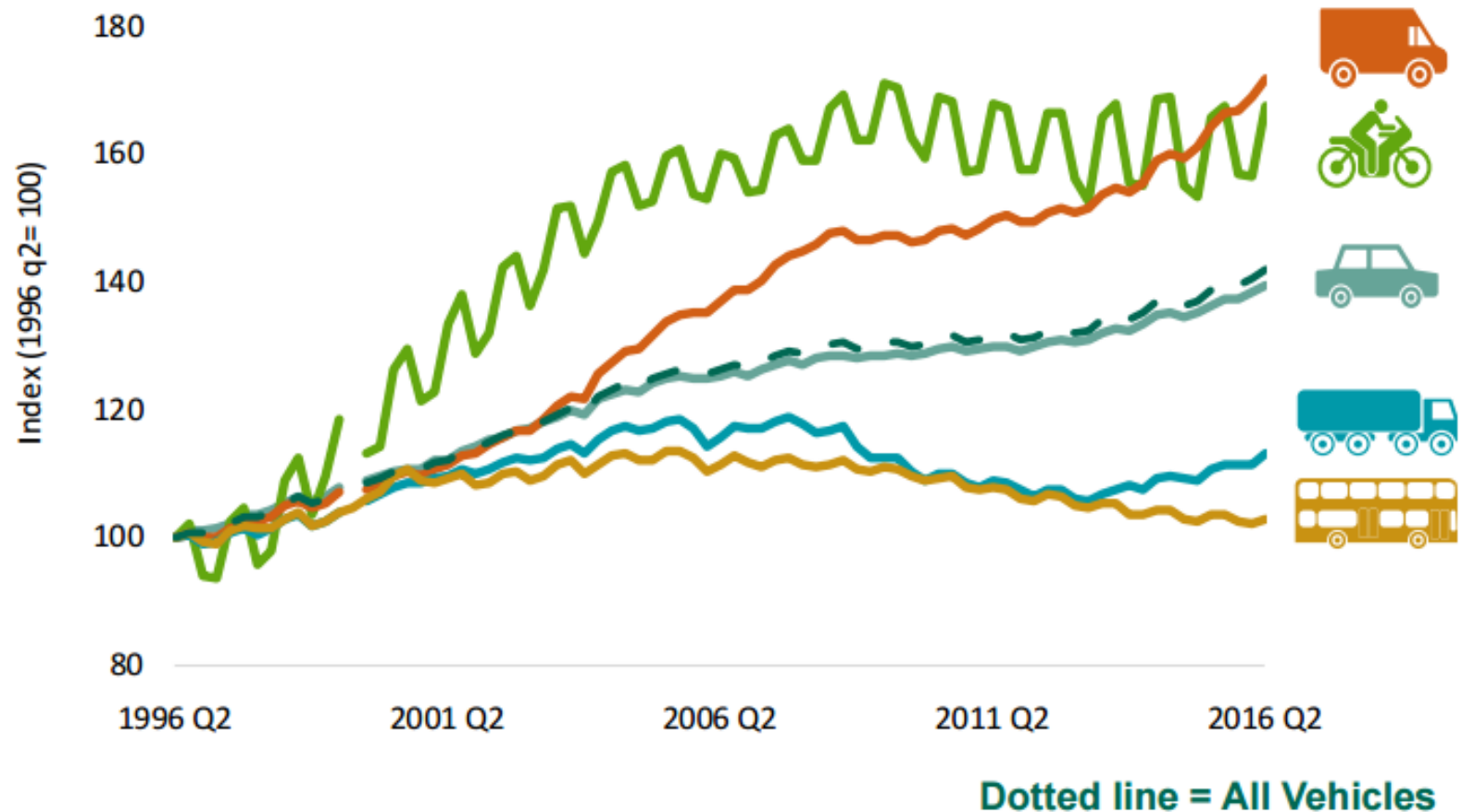
IRTE, 28 September 2016

LowCVP is a unique public-private membership organisation that exists to *'accelerate the shift to low carbon vehicles and fuels and stimulate UK business opportunities'*



Commercial goods vehicles: The next big (low) carbon opportunity?

Figure 5: Licensed vehicles by type, GB: Q2 1996 - Q2 2016



The perfect storm (of policy and products)



Department
for Environment
Food & Rural Affairs



Improving air quality in the UK
Tackling nitrogen dioxide in our towns and cities

Climate Change Act 2008

UK overview document

December 2015



22 SEPTEMBER 2016 #BUS AND COACH #FEATURES & INTERVIEWS #TRUCK #VAN

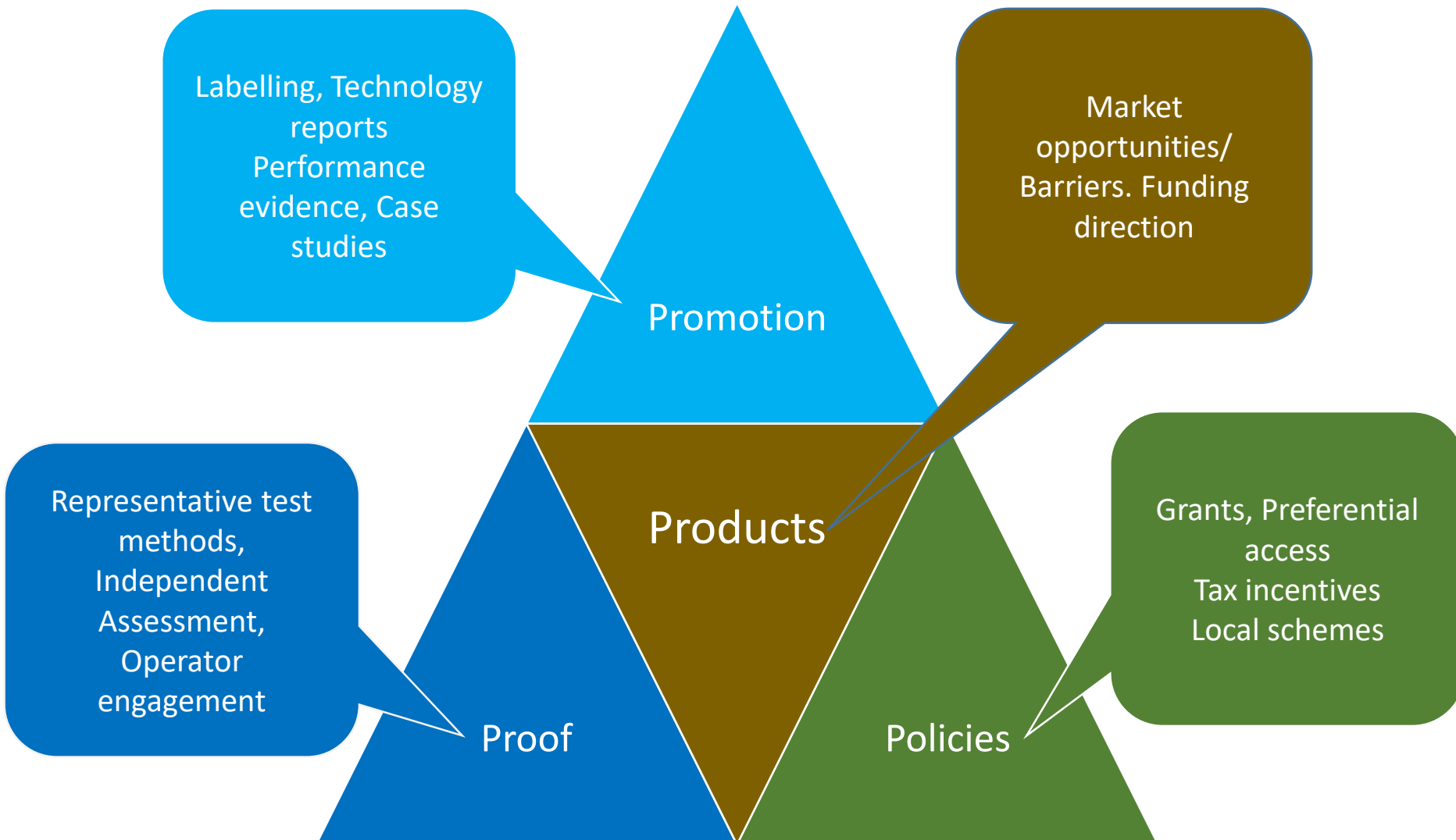
Feature: Truck concepts dominate IAA Hannover CV Show

Autonomy, alternative propulsion, sustainability and the road to an emissions-free future were the key themes ...

Electric Volkswagen Crafter 'with customers by 2017'

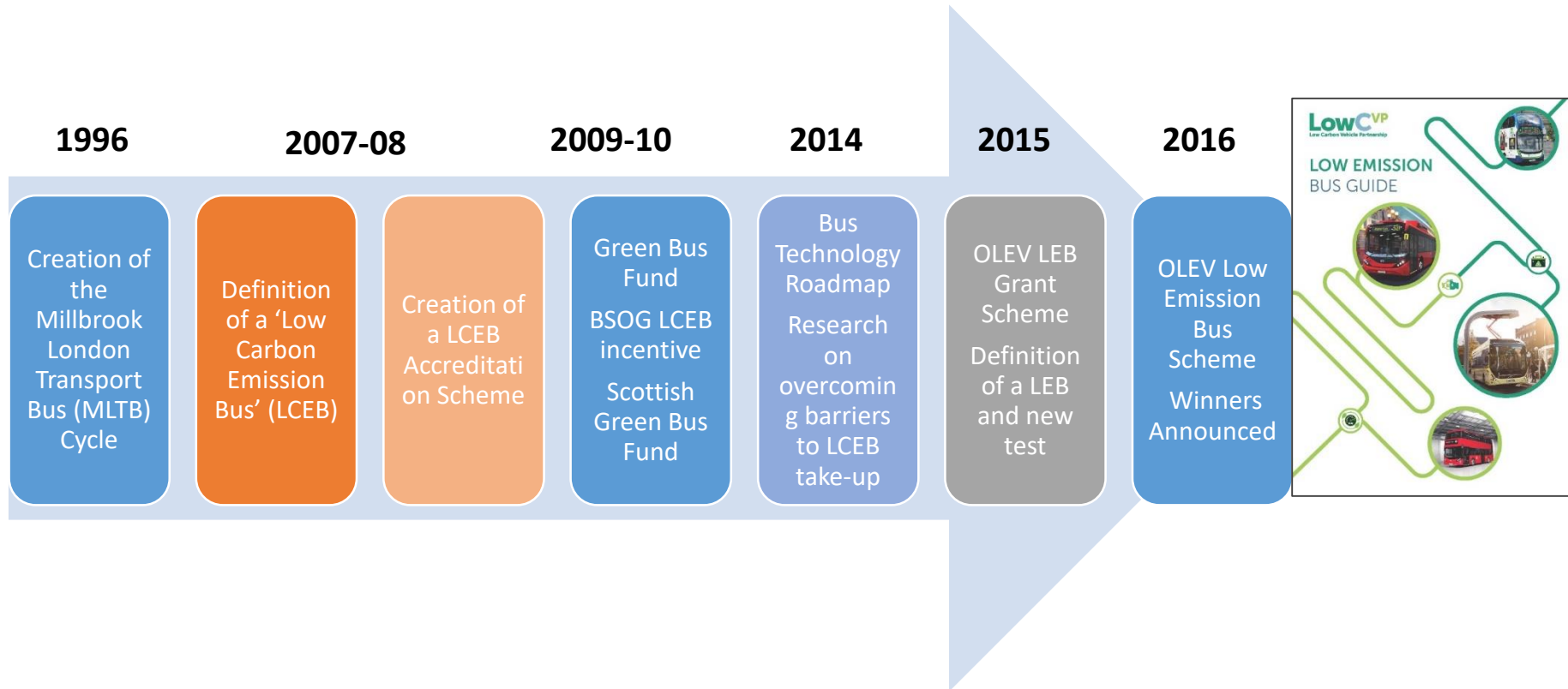
Hyundai Fuel Cell van revealed at IAA

The 4 'P's – LowCVP role



It takes time

Key milestones in the evolution of green bus policy in the UK



20 years of collaborative development of products, proof of performance, policy and promotion

The UK Bus market success

- 40% of new Buses sold in 2015 classed as “Low Carbon”
- All technology options represented - CNG, Hydrogen, Hybrid, Plug in, Full Electric, Mild hybrid, Biofuel
- Government support
 - Grant for Vehicles
 - Grant to support infrastructure
 - Operating incentives
- OEM support – Full range of products
- Robust assessment – full carbon impact, Air Quality, Cost
- Operator support and engagement, collaboration with OEM

Unprecedented support



Office for Low
Emission Vehicles



Department for
Business, Energy
& Industrial Strategy



Department
for Environment
Food & Rural Affairs

Competition brief: low emission vehicle systems IDP13

Updated 5 September 2016

Competition brief: low emission freight and logistics trial

Updated 12 August 2016

LoCITY

LoCITY is a structured collaborative programme that brings together the full range of stakeholders needed to stimulate the uptake of low emission commercial vehicles.

Competition brief: connected and autonomous vehicles 2

Updated 22 August 2016

Preparing for the policies

Freight carbon review

- Low Carbon Truck Trial report
- Gas truck testing – LowCVP
- Longer Semi Trailers
- General Circulation Directive
 - Weight derogation for Alternative fuels
 - Length Derogation for Aerodynamics
- Alternative fuel vans, weight discussion
- Plug in Van Grant review
- Renewable transport fuels obligation consultation
- Clean Air Zone proposals



Freight Carbon Review

Moving Britain Ahead 

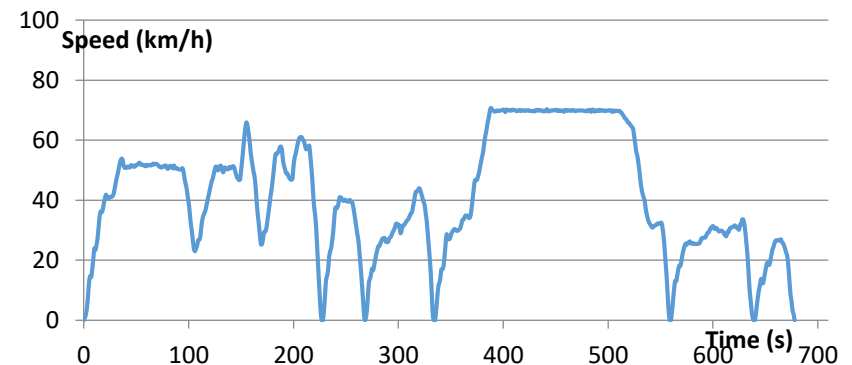
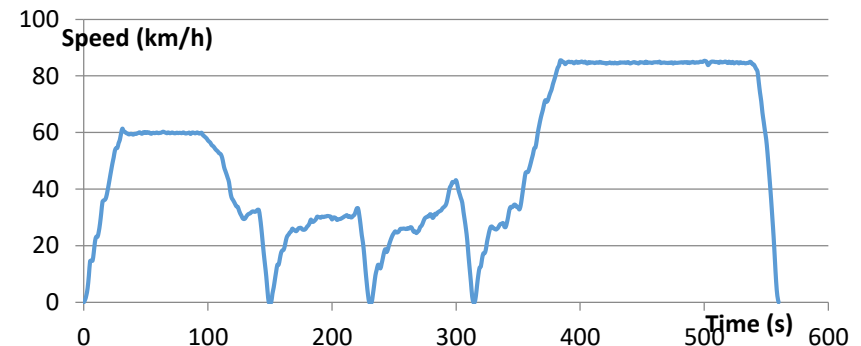
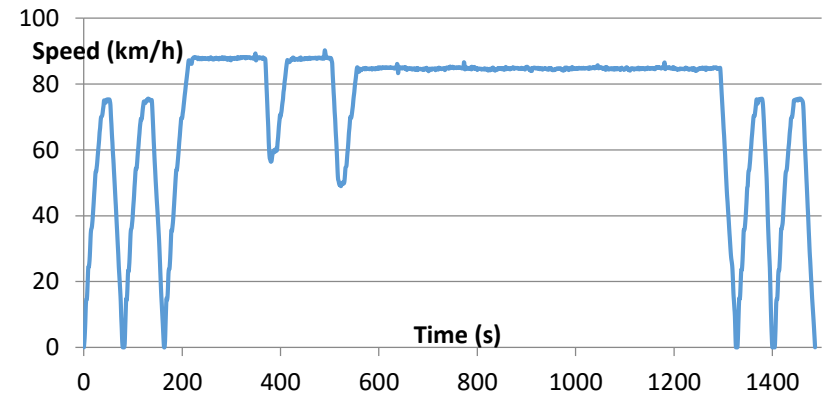
LowC^{VP}
Low Carbon Vehicle Partnership

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[illegible]

Proving the performance

- LowCVP commercial vehicle test
- 3 Phases, based on European work (VECTO) for HGV CO₂
- Long Haul – Avg 74 km/h
- Regional Delivery – 50 km/h
- Urban Delivery - 42 km/h
- Additional City Centre Phase LoCITY

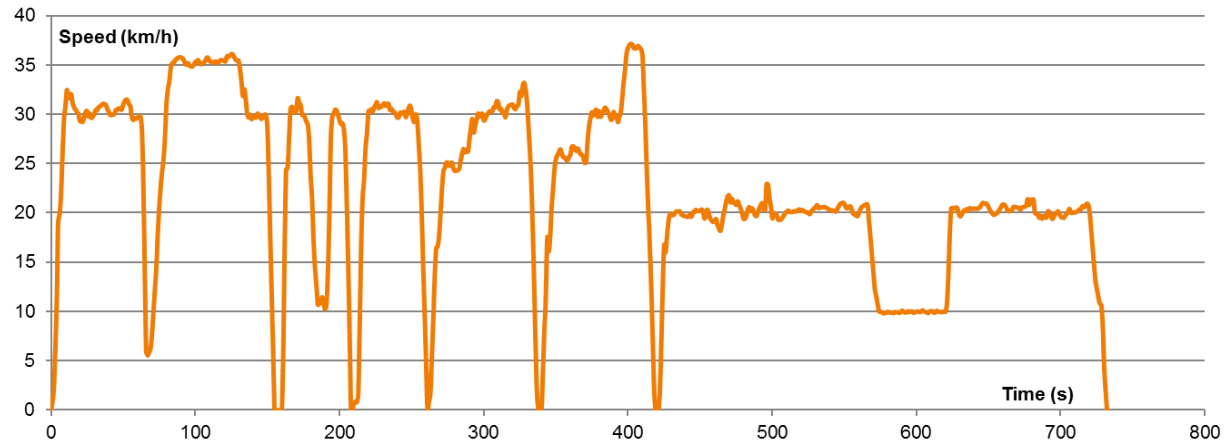


Real trucks, Real drivers, Real tests



TfL LoCITY city centre challenge

- City Centre Operation – low speed, start/stop (22km/h)
- Van focussed
- Correlated
- 60% load
- Range extenders



Steps to success




















- Listen to the users – real operational issues and opportunities
- Learn from others – legislation, other sectors, International
- Make the test real
 - Representative - driving cycles
 - Realistic - load
 - Relevant - results
- Think about the costs – Testing, Certification, Application



LowCVP - Joining up the links

- Linking into Europe – T&E, ICCT, Smart Freight centre, VECTO
- International – Energo (US)
- UK stakeholders – RHA, FTA, SMMT, EST etc
- UK government – DEFRA, DfT, BEIS, HMT, OLEV
- Local/regional authorities – TfL LoCITY, Transport Scotland
- Suppliers, Tyres, Aftertreatment, Aero
- Funders – Innovate, APC

The road to robots?

	SAE level	Name	Steering, acceleration, deceleration	Monitoring Driving Environment	Fallback Performance of Dynamic Driving Task	System Capability (Driving Modes)
Human monitors environment	0	No automation The full-time performance by the <i>human driver</i> of all aspects of the <i>dynamic driving task</i> , even when enhanced by warning or intervention systems				n/a
	1	Driver assistance The <i>driving mode</i> -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 <i>human driver</i> perform all remaining aspects of the <i>dynamic driving task</i>	 			Some driving modes
	2	Partial automation The <i>driving mode</i> -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 <i>human driver</i> perform all remaining aspects of the <i>dynamic driving task</i>				Some driving modes
Car monitors environment	3	Conditional automation The <i>driving mode</i> -specific performance by an <i>automated driving system</i> of all aspects of the <i>dynamic driving task</i> with the expectation that the <i>human driver</i> will respond appropriately to a request to intervene				Some driving modes
	4	High automation The <i>driving mode</i> -specific performance by an <i>automated driving system</i> of all aspects of the <i>dynamic driving task</i> , even if a <i>human driver</i> does not respond appropriately to a request to intervene				Some driving modes
	5	Full automation The full-time performance by an <i>automated driving system</i> of all aspects of the <i>dynamic driving task</i> under all roadway and environmental conditions that can be managed by a <i>human driver</i>				All driving modes

AUTOMATED VEHICLES: AUTOMATICALLY LOW CARBON?

Institution of
MECHANICAL
ENGINEERS

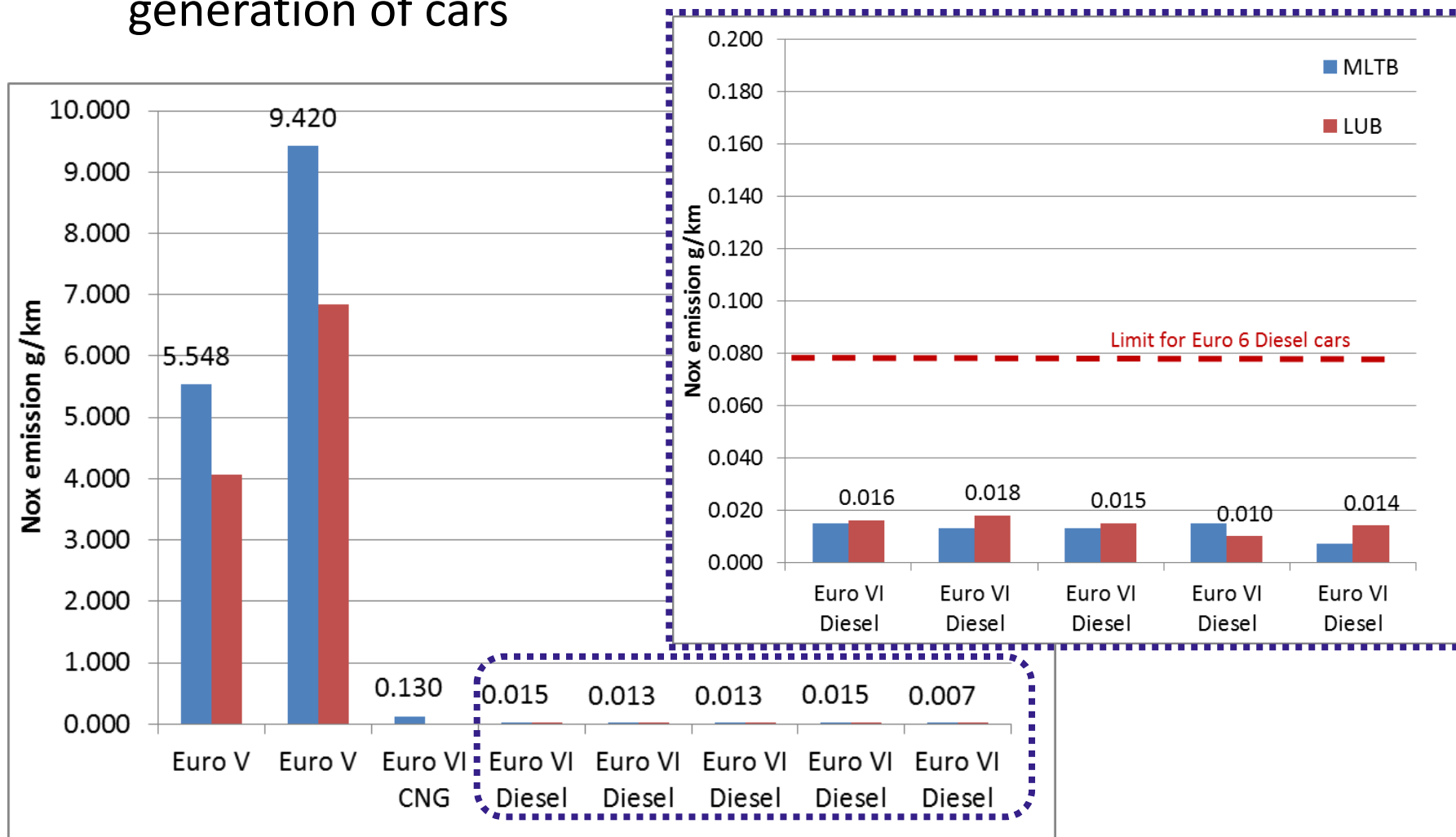
LowC^{VP}
Low Carbon Vehicle Partnership

UNIVERSITY OF LEEDS
Institute for Transport Studies



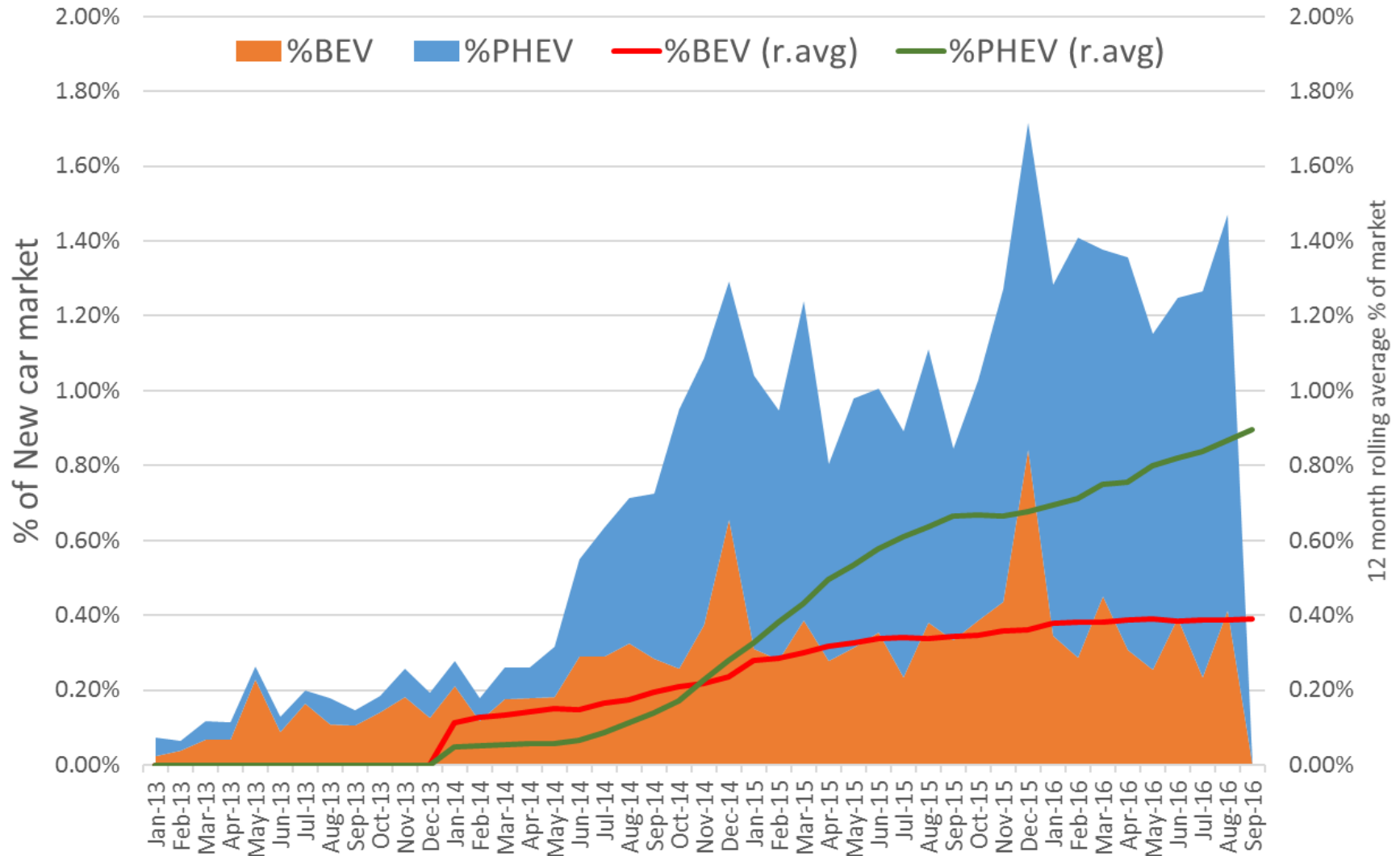
Myth – “All diesels are dirty”

- Euro VI HDV engines (in buses and trucks) deliver NO_x levels in representative testing far below those required for the next generation of cars



Finding the right tool for the job

ULEV car market growth (SMMT)



The journey starts now

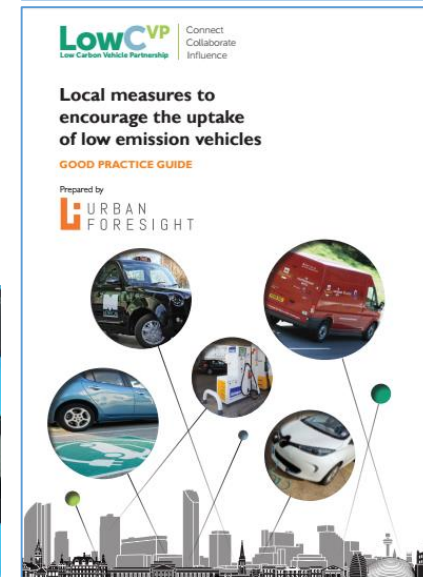
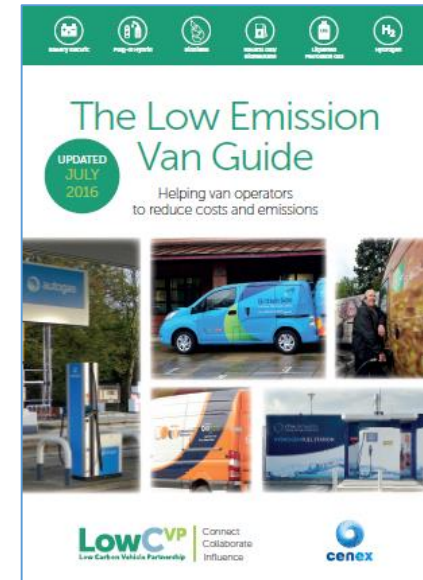
Taking low carbon technology off the shelf and putting it on the road using robust evidence.

- New OEM Euro VI trucks
- Low Rolling Resistance tyres
- Aerodynamic improvements and trailers
- Light weighting
- Alternative fuel implementation
- Embracing the future
 - Consider retrofit hybrid/dual fuel

Light Goods Vehicles (Vans)

Stimulating the market for low and ULEV vans

- Developing the test standards with LoCITY for representative van operation
- Creation of Low Emission Van Guide with CENEX (updated version published July 2016)
- Creating local policy guide for enhancing the user incentives and complementing the OLEV PiVG
- Disseminating the guides and providing an information resource to support the market



Goods Vehicles - ambition

Kick-starting market for low carbon commercials

- Providing the evidence and information help operators choose more efficient cleaner Trucks and vans and lower carbon fuels and defining a “Low Emission Truck”
 - Independent accreditation of low carbon and low emission technology
 - Developing the evidence base for gas powered HGVs – publishing summer
 - Supporting the development of low emission truck trials
 - Creating a framework for national accreditation of low emission commercial vehicles
 - Supporting Government policy for Incentives



Efficient vehicles, lower carbon, cleaner air

- **Creating the platform for robust support of low emission and fuel efficient technologies**

- ❑ **Connect:** With privileged access to information, you'll gain insight into low carbon vehicle policy development and into the policy process.
- ❑ **Collaborate:** You'll benefit from many opportunities to work – and network – with key UK and EU government, industry, NGO and other stakeholders
- ❑ **Influence:** You'll be able to initiate proposals and help to shape future low carbon vehicle policy, programmes and regulations



LowCVP is a partnership organisation with over 180 members with a stake in the low carbon road transport agenda.