

LoCITY

LoCITY Driving

Course Training Pack





Introduction

The LoCITY Driving Course Trainer Pack (CTP) is part of a series of tools, guidance and training produced by LoCITY, FORS Professional and Transport for London (TfL) to help the commercial fleet sector to:

- Reduce their impact on the environment and the road network
- Improve road safety and
- Increase their levels of regulatory compliance

This training pack will provide all the information required to prepare, deliver and administer LoCITY Driving courses.

What is LoCITY Driving?

LoCITY Driving is a seven-hour, DVSA approved course that focuses on minimising the environmental impact of heavy goods vehicles (HGVs) by reducing emissions through the use of fuel-efficient driving techniques, cleaner vehicles and alternative fuel technologies. The course equips drivers with knowledge of:

- Air quality and fuel efficiency
- How vehicle checks and maintenance can help reduce emissions
- Fuel-efficient driving techniques
- The benefits of journey planning
- How to use in-vehicle technology to improve driving performance
- Alternative fuels in commercial vehicle fleets

Who should attend LoCITY Driving?

LoCITY Driving is essential training for all HGV commercial drivers and will be applicable to all sectors. The training will raise awareness of the environmental impact of emissions, fuel efficiency, cleaner vehicles and alternative fuel technologies. Commercial drivers have a greater responsibility than other driving licence holders because they are employed to drive. They are required to drive professionally, responsibly and with consideration for the environment and other road users.

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Section 1:

LoCITY Driving Background and Framework

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About the LoCITY Driving CTP

Purpose of the LoCITY Driving CTP

This LoCITY Driving CTP provides all the information and guidance you need as a training provider to prepare, deliver and administer standardised and approved LoCITY Driving courses to commercial fleet drivers. Course content includes the operational requirements needed for commercial vehicle drivers to be environmentally aware when operating on UK roads. The course training pack will:

- Provide an industry leading high quality training resource to deliver consistent and standardised approved courses
- Specify the competency level, qualifications, skills and experience required by trainers
- Enable both commercial and in-house training providers to subscribe to LoCITY Driving and offer the course as part of their standard training syllabus

Who is the CTP for?

This training pack is designed for the delivery of LoCITY Driving courses. If you are a trainer or training organisation with the relevant industry knowledge, skills and experience to deliver the course material, then this CTP is intended for you.

How should the CTP be used?

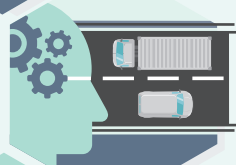
The LoCITY Driving CTP provides you with all the materials you need, including background information, lesson plans, presentation material, trainer notes and course administration documentation. These resources have been developed

by industry experts and will enable you to deliver an effective and consistent high standard of training provision. LoCITY Driving has been designed to be interactive and engaging for drivers, with video content, discussion and practical exercises, and the CTP contains advice about how to facilitate these sessions.

Use the five LoCITY Driving themes to help drivers remember the basic techniques of fuel-efficient driving. The five simple themes that are echoed throughout the CTP are:



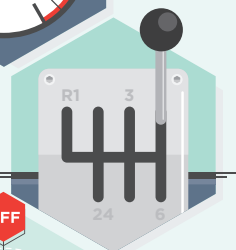
Get set: Check your vehicle and prepare for your journey



Think ahead: Observe, anticipate and apply fuel-efficient techniques



Smooth ride: The more you brake, the more you need to accelerate



Get in gear: Use your gears wisely to maintain an efficient engine speed



Power off: Idling gets you nowhere, so switch off when stationary

Structure of the CTP

The LoCITY Driving CTP is structured in three parts:



Section 1

LoCITY Driving
background and framework



Section 2

Trainer notes
and lesson plan



Section 3

Training administration

Glossary of Terms

Consistent terminology is important in driver training and development and a comprehensive glossary of terms associated with HGV operations and environmental impact is provided below. Some of the terms are used within this CTP, while others may be referred to throughout the LoCITY Driving course.

Air pollution – A mixture of gases and particles that have been emitted into the atmosphere by man-made processes and that have negative impacts on human health and the natural environment

CO₂ – Carbon dioxide: Principal greenhouse gas related to climate change

CNG – Compressed natural gas: Methane derived from fossil fuel sources, stored at high pressure and used to power spark ignition and compression ignition engines

DfT – Department for Transport: Central government department responsible for transport in England and Wales

Driver CPC – Driver Certificate of Professional Competence: A qualification for professional bus, coach and lorry drivers

DVLA – Driver and Vehicle Licensing Agency: Agency of the DfT responsible for keeping a database of drivers and vehicles in Great Britain

DVSA – Driver and Vehicle Standards Agency: Agency of the DfT responsible for testing and enforcing driver and vehicle standards in Great Britain

Emission – Direct release of a pollutant into the atmosphere

Euro Standards – Standards for emission regulations adopted as part of the EU framework for the type approval of cars, vans, trucks, buses and coaches. The current standards are Euro 6 for light duty vehicles (cars and vans) and Euro VI for heavy goods vehicles

EV – Electric vehicle: Vehicle that uses electric motor for propulsion. Includes both pure-electric vehicles that run solely from batteries and plug-in hybrid electrics that have an attached petrol or diesel engine

FORS – Fleet Operator Recognition Scheme: A fleet accreditation scheme that promotes best practice among freight and fleet operators

Greenhouse Gas – Gases that absorb heat, contributing to climate change. The most significant is CO₂

HGV – Heavy Goods Vehicle: Large commercial vehicle with a gross combination weight of over 3,500 kilograms

LEZ – Low Emission Zone: for example, the charging zone across Greater London for vehicles that do not meet emissions standards for Particulate Matter

LoCITY – Programme to lower emissions from commercial vehicles

LPG – Liquid Petroleum Gas: Also referred to as propane or butane, flammable mixtures of hydrocarbon gases used as fuel

NO_x – Nitrogen oxides: A generic term for nitrogen dioxide (NO₂) and nitrogen monoxide (NO), both of which can form NO_x in the atmosphere. Euro standards set limits for vehicles emissions of NO_x

NO₂ – Nitrogen dioxide: A gas formed by combustion, identified as an air pollutant harmful to human health. The European limit values measure concentrations of NO₂ in the air

OLEV – Office for Low Emission Vehicles: Cross governmental office set up to support the development of the low emission vehicle sector

Particulate Filter – An exhaust filter that traps Particulate Matter

PM – Particulate Matter: A mixture of various solid and liquid particles of various chemical compositions suspended in the air

PM₁₀ – Particulate Matter <10 microns in diameter: Particulate Matter that is harmful to human health and subject to EU limit values

PM_{2.5} – Particulate Matter <2.5 microns in diameter: The smallest and most harmful form of Particulate Matter. Also subject to EU limit values

TfL – Transport for London: An executive body of the Greater London Authority (GLA) responsible for the public transport system in London

TLRN – Transport for London Road Network: A network of 580km of roads within Greater London for which TfL has highway authority powers

Van – Light commercial vehicle with a gross weight up to 3,500 kilograms

VED – Vehicle Excise Duty: Annual charge levied for vehicles to use the public highway

ULEZ – Ultra Low Emission Zone: A package of measures in central London, including a new standard for TfL buses, taxis, private hire vehicles and a proposed charging zone for all other types of vehicles within central London for vehicles that do not meet set emission standards.

Background to LoCITY Driving

Background

Air pollution presents a major threat to public health, with transport accounting for 63 per cent of nitrogen dioxide and 52 per cent of Particulate Matter, the two principle pollutants of concern in London. Commercial vehicles represent around one third of road transport NO_x and PM emissions in the capital.

The European Union (EU) has set legal limits for concentrations of these pollutants and they apply to the UK as a whole. London is one of several UK cities that are currently in breach of legal limits for NO₂.

In 2016, air pollution was found to cause the equivalent of 40,000 premature deaths per year across the country. In London, over 440 schools were in areas that exceeded safe air quality levels. It is vital that action is taken to reduce vehicle emissions and improve air quality.

TfL is leading the way in reducing the environmental impact of commercial vehicles operating in London. It has worked with operators to develop the industry led LoCITY programme.

Aims of LoCITY

LoCITY has been established to help reduce commercial vehicle emissions, one of the causes of poor air quality. It offers a unique opportunity for vehicle manufacturers, fuel infrastructure providers, procurers and commercial fleet operators to collaborate to ensure we have the right technology, the right vehicles and the right fuels to reduce the impact of commercial vehicles on the environment.

LoCITY is working to stimulate the supply and uptake of low emission commercial vehicles and improve the infrastructure needed to operate these vehicles. This will make it easier for operators to invest in new technology. LoCITY also supports the introduction of new programmes and initiatives that aim to lower emissions and improve air quality.

LoCITY Driving

LoCITY Driving has been developed as part of the LoCITY programme and is designed to raise environmental awareness among drivers and demonstrate the benefits of fuel-efficient driving techniques. It provides a default driver training solution for fleet operators to improve fuel efficiency, reduce vehicle emissions and improve air quality.

Other initiatives to reduce emissions

LoCITY supports a number of other initiatives that aim to reduce commercial vehicle emissions and improve air quality. These include:

Clean Air Zones (CAZs)

A CAZ is designed to improve air quality by restricting the number of high-polluting vehicles, or encouraging the uptake of lower emission vehicles, on certain roads in areas with the poorest air quality. By 2020 there will be CAZs in five English cities: Birmingham, Derby, Leeds, Nottingham and Southampton.

Low Emission Zones (LEZs)

London's LEZs, a type of CAZ, was introduced in 2008 to discourage the most polluting heavy diesel vehicles from operating in the Capital. The zone mandates that vehicle engines meet specific European standards, covers most of Greater London, and operates 24 hours a day on every day of the year.

Ultra Low Emission Zone (ULEZ)

By 2020, the world's first Ultra Low Emission Zone will be introduced in London. All cars, motorcycles, vans, minibuses, buses, coaches and HGVs will need to meet exhaust emission standards (ULEZ standards) or pay a daily charge when travelling in central London. TfL is currently consulting on proposals to bring the ULEZ implementation date forward to 2019.

Fleet Operator Recognition Scheme (FORS)

FORS is a voluntary national accreditation scheme developed by TfL and managed by the FORS Community Partnership. It is designed to help improve operators' performance in key areas such as fuel efficiency, vehicle emissions, safety and efficient operations.



LoCITY Driving Course Programme

Course title: LoCITY Driving **Course number:** CRS/0000 **Delegate ratio:** 1:20

Course objectives

The objectives of the LoCITY Driving course are to understand:

1. Strategies to reduce fuel use, emissions and improve air quality
2. How good journey planning, vehicle checks and maintenance can reduce emissions
3. How to apply fuel-efficient driving techniques designed to improve efficiency
4. The value of vehicle design and technology
5. How in-vehicle technology improves driving performance
6. Alternative cleaner fuels that are available for commercial vehicles

Details

Session	Timings	Content delivery
1	15	Introduction and module objectives
2	15	Icebreaker – personal objectives
3	60	Fuel efficiency and air quality
Break 15 minutes		
5	45	Journey planning and vehicle checks
6	60	Fuel-efficient driving techniques
Lunch 30 minutes		
7	60	Journey planning exercise
8	45	Value of vehicle design and technology
Break 15 minutes		
9	45	Monitoring and managing driving performance
10	30	Alternative fuels in commercial vehicles
11	30	Confirmatory Q&A, summary and evaluation

Extra information

Method: Presentation, group activities, practical exercises, discussions, explanation, Q&A sessions, summary and lessons learned

Resources: Projector/screen, toolbox talks, case studies, video media, flipchart or whiteboard, marker pens

Location: Classroom

European Directive 2003/59 EC syllabus reference: 1.1, 1.2, 1.3, 3.6

LoCITY Driving Training Objectives

Training objective	Learning outcomes
Understand strategies to reduce fuel use, emissions and improve air quality	<ul style="list-style-type: none">• Explain the scale of the air quality and climate change issues that are challenging cities• Describe measures taken by cities to improve air quality, including LEZ's and London's ULEZ• List the road transport programmes aiming to reduce emissions from buses, taxis and private hire vehicles• Explain the contribution that commercial vehicles make to poor air quality, in relation to other vehicle types• List the principal emissions from the tailpipe and other sources (eg brakes, tyres and ancillary equipment)• Describe the links between fuel consumption, driver behaviour and financial, environmental and social costs• Explain the business viability, job security, cost of living, and personal benefits of fuel-efficient driving
Understand how good journey planning, vehicle checks and maintenance can reduce emissions	<ul style="list-style-type: none">• Explain how proactive vehicle maintenance, fuel consumption and emissions are linked• Describe the role daily and weekly vehicle checks play in reducing fuel consumption and emissions• Explain the extent to which wheel alignment and tyre pressure impact fuel consumption• Define good practice loading and describe the impact of unnecessary load and equipment• Outline the fuel efficiency and journey time implications of congestion, roadworks and local restrictions• Apply Drivers' Hours and Working Time rules effectively to improve fuel efficiency and journey time• List and describe the information, tools and systems that can be used for effective journey planning• Plan a multi-stop route in the most fuel-efficient way

Training Objective	Learning outcomes
<p>Apply fuel-efficient driving techniques designed to improve efficiency</p>	<ul style="list-style-type: none"> • List the typical organisational policy requirements on pre-journey checks, efficient driving and anti-idling • Explain fuel-efficient driving techniques such as anticipation and appropriate use of gears • Describe the impact of unnecessary engine idling and state when to switch off an engine and the benefits of doing so • Identify the primary dashboard warning lights associated with an increase in unnecessary emissions (eg DPF or tyre pressure systems) and take appropriate action
<p>Understand the value of vehicle design and technology</p>	<ul style="list-style-type: none"> • Explain the role of Euro Standards in reducing emissions from commercial vehicles • List the types of in-vehicle technology products that are designed to optimise fuel efficiency • State the benefits of in-vehicle technology for drivers, operators and the wider environment • Explain how to make the best use of in-vehicle technology to improve driving skills • List other vehicle design features and retrofit technology that optimise fuel efficiency
<p>Understand how in-vehicle technology improves driving performance</p>	<ul style="list-style-type: none"> • List the methods a fleet operator would typically use to monitor, measure and analyse driver performance • Outline how to best use in-vehicle technology and other methods to provide accurate data and feedback on driving performance • Identify typical incentives that fleet operators use to encourage and reward efficient driving performance • List the ways an organisation can give you feedback on driving and help improve performance
<p>Know the alternative cleaner fuels that are available for commercial vehicle fleets</p>	<ul style="list-style-type: none"> • List the main fuel and technologies that are expected to displace use of petrol and diesel engines • Outline the definition and overview for each alternative fuels and their benefits for drivers, operators and society • Explain the benefits and limitations of alternative fuels with regard to performance, cost and fuel availability • Describe the barriers to move from conventional vehicles to more sustainable cleaner fuelled vehicles

LoCITY Driving Trainer Competence

Introduction

Specific skills and knowledge are required to professionally deliver the LoCITY Driving course, and all trainings must meet the following competencies.

Competency	Evidence
Have attended the LoCITY DCPC course	Course certificate
Hold a full Category C or D licence	Hold a valid driving licence
Have no more than three driving licence penalty points	DVLA licence checking service
Complete 35 hours of periodic training	Hold a valid Driver Qualification Card
Have at least two years' experience in freight road transport operations	Your CV/references from industry professionals
Have at least two years' experience of providing driver training (classroom based or in-cab), including some element of fuel-efficient driving behaviour	Your CV/references from industry professionals
Have knowledge of LoCITY and FORS	Member of an industry body/subscription to industry publications/receive LoCITY and FORS newsletters
Have undertaken an approved Train the Trainer course	Certificate of an approved course/inclusion on a recognised training register

In addition to the above table, the following competency would also be desirable:

Have completed an industry recognised environmental training course (for example: Safe And Fuel Efficient Driving (SAFED), Energy Saving Trust's FuelGood driver training, or FORS Practitioner – reducing fuel use and minimising environmental impacts).

Frequently asked questions (FAQs)

These FAQs are intended to help you answer some of the questions that could be asked during the LoCITY Driving course. If you have any additional questions, please email freight@tfl.gov.uk.

Why is LoCITY Driving important?

The training is important as it offers real scope for drivers and fleet operators to reduce both fuel usage and the associated emissions that commercial vehicles generate.

Why should we send drivers on this course?

LoCITY Driving is a bespoke course that is designed to raise driver awareness of the environmental issues of operating commercial vehicles and inform them of the actions they can take to reduce environmental impact and improve fuel efficiency.

Is this course DVSA approved?

LoCITY Driving is an approved Driver Certificate of Professional Competence (CPC) course and counts towards periodic training. When drivers successfully complete the LoCITY Driving course and pay the upload fee, seven hours of periodic training will be uploaded to their Driver CPC training record.

Will this course benefit my company?

The course is designed to enhance overall professional knowledge with regard to compliance. This in turn will improve overall company compliance and assist with preventing the vehicle operator from being prosecuted.

What is LoCITY?

LoCITY is an industry led programme that works with freight and fleet operators, vehicle manufacturers, infrastructure providers and other key stakeholders to increase the availability and uptake of ultra low emission commercial vehicles and associated infrastructure. TfL initiated LoCITY because of the need to improve air quality.

What is an ultra low emission commercial vehicle?

LoCITY's definition of an ultra low emission commercial vehicle is a vehicle that emits extremely low levels of CO₂ compared to conventional vehicles fuelled by petrol/diesel, with typically much lower (or virtually nil) emissions of air pollutants and lower noise levels.

How are ultra low emission commercial vehicles measured?

The mechanism for measuring both air quality and CO₂ emission reductions is the LowCVP's new HGV and van emissions testing certification programme. TfL is developing a common approach for estimating in-service vehicle whole life costs, tailpipe and well to wheel emissions for alternative fuels and retrofit equipment. This will help the industry to better understand the difference between CO₂ emissions from fossil fuels and those from biogenic sources.

What else is being done to improve air quality?

Greener buses and age limits on taxis have resulted in newer vehicles that emit fewer pollutant emissions. Air quality policies have led to the introduction of low emission neighbourhoods and projects to retime and consolidate deliveries.



Useful Statistics and Sources

Statistic	Ref in CTP	Source	Source page
Transport accounts for 63 per cent of NO ₂ and 52 per cent of PM in London.	p8	GLA – Transport Emissions Road Map (September 2014) content.tfl.gov.uk/transport-emissions-roadmap.pdf	p6
Air pollution causes the equivalent of an estimated 40,000 premature deaths per year in the UK.	p8	Royal College of Physicians – Every breath we take: the lifelong impact of air pollution (February 2016) www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution	p3
CO ₂ is responsible for 60 per cent of the enhanced greenhouse effect	p29	European Commission’s ‘You Control Climate Change’ campaign website www.ec.europa.eu/clima/sites/campaign/pdf/gases_en.pdf	p1
Rising global sea level of 1.8mm per year over the last 50 years	p29	Joint Nature Conservation Committee www.jncc.defra.gov.uk/page-4371-theme=textonly	Webpage
Between 1990 and 2010, emissions rose by 36 per cent	p33	Transport Environment – Lorry CO ₂ – why Europe needs standards www.transportenvironment.org/sites/te/files/publications/2015_06_Lorry_co2_briefing_update_US_PHASE_III.pdf	p3
An average of 150 million lorry miles are driven unnecessarily each year	p39	Institute of Mechanical Engineers – UK needs new freight strategy to ease congestion and improve air quality (2016) www.imeche.org/news/news-article/new-report-uk-needs-new-freight-strategy-to-ease-congestion-and-improve-air-quality	Webpage

Statistic	Ref in CTP	Source	Source page
Just half a degree's misalignment on one axle could reduce tyre life by half and reduce fuel efficiency by 3-5 per cent	p49	DfT Best Practice – Keeping Profit on Track with Wheel Alignment (2009)	p3
A preventative wheel alignment program can contribute to fuel savings of 3-18 per cent and improvements in tyre life of 5-20 per cent	p50	DfT Best Practice – Preventative Maintenance for Efficient Road Freight Operations (2009)	p9
Aerodynamic trailers have high potential to reduce fuel consumption and emissions by 10 per cent	p50	DfT Best Practice – Preventative Maintenance for Efficient Road Freight Operations (2009)	p9
Aerodynamic trailers have high potential to reduce fuel consumption and emissions by 10 per cent	p76	Ricardo for DfT – Review of Low Carbon Technologies for HGVs (2009) www.lowcvp.org.uk/assets/workingdocuments/CVWG-P-10-03%20Review%20of%20low%20carbon%20technologies%20for%20HGVs.pdf	p40
Low rolling resistance tyres can make a significant contribution to fuel consumption and up to 5 per cent CO ₂ emissions reduction	p76	Ricardo for DfT – Review of Low Carbon Technologies for HGVs (2009) www.lowcvp.org.uk/assets/workingdocuments/CVWG-P-10-03%20Review%20of%20low%20carbon%20technologies%20for%20HGVs.pdf	p44
Spray-reduction mud flaps reduce spray by 40 per cent	p77	Ricardo for DfT – Review of Low Carbon Technologies for HGVs (2009) www.lowcvp.org.uk/assets/workingdocuments/CVWG-P-10-03%20Review%20of%20low%20carbon%20technologies%20for%20HGVs.pdf	p42

References and Further Reading

Air Quality Consultants (2016): Emissions of nitrogen dioxides from modern diesel vehicles

DfT (2015): Provision of HGV emissions testing

DfT (2015): Improving air quality in the UK – Tackling nitrogen dioxide in our towns and cities

DfT (2014): Low Emission HGV Task Force – Recommendations on the use of methane and biomethane in HGVs

DfT (2012): Opportunities to overcome the barriers to uptake of low emission technologies for each commercial vehicle duty cycle

DG Climate Action (2015): Light weighting as a means of improving heavy duty vehicles' energy efficiency and overall CO₂ emissions

Energy Saving Trust (2012): Advising eco-driving techniques for your fleet

London Assembly (2016): Driving away from diesel – Reducing air pollution from diesel vehicles

Royal College of Physicians (2016): Every breath we take – The lifelong impact of air pollution

TfL (2016): The road to reducing commercial vehicle emissions – Exploring the technical barriers to uptake of alternatively fuelled commercial vehicles

TfL (2015): In-service emissions performance of Euro 6/VI vehicles

TfL (2015): An Ultra Low Emission Vehicle Delivery Plan for London – Cleaner vehicles for a cleaner city

TfL (2014): Transport Emissions Roadmap - Cleaner transport for a cleaner London

TfL (2014): Ultra Low Emission Zone consultation – Supplementary information

TfL (2016): Motivations, barriers and opportunities for LoCITY to influence operator uptake of Ultra Low Emission Vehicles (ULEVs)

Section 2:

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Welcome



Introduction and course objectives

During this short session, you will introduce yourself, ask the delegates to introduce themselves, and explore the training objectives of the LoCITY Driving course.



Session objectives

Your main aim of this session is to instil confidence through your background, knowledge, skills and experience and to gauge the collective level of knowledge and experience among the delegates.



Key learning points

By the end of the session, delegates will know:

- The course housekeeping rules and any emergency drills
- The value of networking with their industry peer group
- The trainer's knowledge, skills and experience on the course topic
- A brief background of other delegates on the course and their responsibilities at work
- The objectives of the LoCITY Driving course and what they will learn from it



Timing



15 minutes



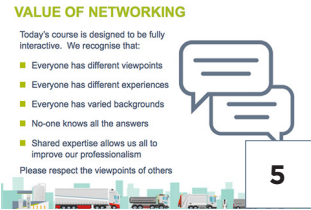


Further resources

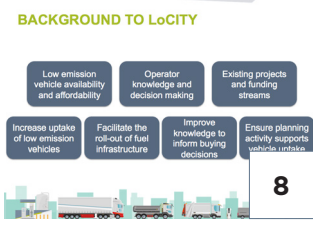

Refer to the following for more information relating to this session:

- LoCITY programme overview - LoCITY.org.uk
- LoCITY Driving programme
- LoCITY Driving training objectives

Key	Method	Resources
Welcome	<p>Show the course title slide and welcome the delegates. Explain that by the end of the session, delegates will know:</p> <ul style="list-style-type: none"> • The course housekeeping rules and any emergency drills • The value of networking with their industry peer group • The trainer's knowledge, skills and experience on the course topic • A brief background of other course delegates and their responsibilities at work • The objectives of the LoCITY Driving course and what they will learn from it 	 <p>The slide features the LoCITY Driving logo at the top left, a stylized cityscape with a yellow crane, and a large number '1' in a white box on the right.</p>
Housekeeping	<p>Get familiar with the site safety rules and administrative matters.</p> <p>Run through the general housekeeping points:</p> <ul style="list-style-type: none"> • If the fire alarm sounds, the fire exits are... • The toilets are located... • No smoking is allowed in the building. The designated smoking area is... • Please switch your mobile phones off or to silent • Refreshments will be provided throughout the day. You are welcome to drink to stay hydrated, but please refrain from eating until the breaks • The duration of the course is seven hours, plus a total of one hour in breaks <p>Ask that delegates keep a log of any noteworthy issues throughout the course. An evaluation form will be issued at the end of the day. We welcome feedback as it will help us to improve the course for the future.</p> <p>Request that delegates provide an email address to take part in further research and share experience and knowledge so the industry can get the best from the training in the future.</p>	 <p>The slide is titled 'HOUSEKEEPING' and contains several icons: a fire flame for 'Fire', male and female figures for 'Toilets', a cigarette with a slash for 'Smoking', a mobile phone for 'Mobiles', a coffee cup for 'Refreshments', a clock for 'Timings', and a speech bubble with a question mark for 'Feedback'. A large number '2' is in a white box on the right.</p>

Key	Method	Resources
<p>Fair Processing Notice</p>	<p>Inform delegates of the Fair Processing Notice and display this slide throughout the registration process. This is a Joint Approvals Unit for Periodic Training (JAUPT) requirement and reads as follows:</p> <p>Your personal data includes your contact details, your photographic image, driving licence and payment details, together with any other information we obtain directly from you or from third parties, or as a result of our relationship with you in our capacity as a Driver CPC (DCPC) Approved Training Centre and in providing goods and services to you.</p> <p>We will use your personal data for the purposes of uploading completed DCPC Periodic Training hours to the government's Recording and Evidencing (R&E) database, the provision of an attendance certificate, and for all other purposes connected with our role as an Approved Training Centre in providing goods and services to you. This information will be shared with JAUPT in order for it to monitor and manage approved centres and the training uploaded to the DVSA system. Where necessary, this data may be shared with member state authorities to confirm DCPC entitlement abroad.</p> <p>We are committed to ensuring that your personal data is secure. In order to prevent unauthorised access or disclosure, we have put in place suitable physical, electronic and managerial procedures to safeguard and secure the information we collect.</p>	 <p>FAIR PROCESSING NOTICE</p> <p>Your personal data includes your contact details, your photographic image, driver licence details and payment details, together with any other information we obtain directly from you or from third parties, or as a result of our relationship with you in our capacity as a Driver CPC (DCPC) Approved Training Centre and in providing goods and services to you.</p> <p>We will use your personal data for the purposes of uploading completed DCPC Periodic Training hours on to the Government's Recording and Evidencing (R&E) database, the provision of an attendance certificate, and for all other purposes connected with our role as an Approved Training Centre in providing goods and services to you. This information will be shared with JAUPT in order for them to monitor and manage approved centres and the training uploaded to the DVSA system, and where necessary, this data may be shared with member state authorities to confirm DCPC entitlement abroad.</p> <p>We are committed to ensuring that your personal data is secure. In order to prevent unauthorised access or disclosure, we have put in place suitable physical, electronic and managerial procedures to safeguard and secure the information we collect.</p> <p>3</p>
<p>Course programme</p>	<p>Talk through the LoCITY Driving course programme and timings.</p> <p>Explain that there will be a:</p> <ul style="list-style-type: none"> • A 15-minute morning break • A 30-minute lunch break • A 15-minute afternoon break 	 <p>COURSE PROGRAMME</p> <ul style="list-style-type: none"> ■ Lesson 1: Fuel efficiency and air quality ■ Lesson 2: Vehicle checks and journey planning ■ Lesson 3: Fuel efficient driving techniques ■ Lesson 4: Journey planning exercise ■ Lesson 5: Value of design and technology ■ Lesson 6: Monitoring and managing driving performance ■ Lesson 7: Alternative fuels in commercial vehicles <p>4</p>

Key	Method	Resources
<p>Value of networking</p>	<p>Explain the following points:</p> <p>The LoCITY Driving course has been developed for your career progression and to help share best practice across the industry.</p> <p>Today’s course is designed to be fully interactive and enable you to openly discuss challenging issues with your peers. We recognise that:</p> <ul style="list-style-type: none"> • Everyone has different viewpoints • Everyone has different experiences • Everyone has varied backgrounds • Shared expertise allows us all to improve our professionalism • No-one knows all the answers <p>Please respect the viewpoints of your peers. Any offensive, obstructive or rude behaviour may result in you being asked to leave early.</p>	
<p>Introductions</p>	<p>Introduce yourself by providing a brief outline of your experience in fleet management to give delegates confidence in your ability.</p> <p>Be modest and conscious of not sounding too arrogant or aloof. Collectively, there will be a great deal of knowledge, skills and experience in the room.</p> <p>Ask each delegate to introduce themselves, explain who they work for, and give a brief description of their current role.</p>	
<p>Background to LoCITY</p>	<p>Explain that:</p> <p>The LoCITY programme has been established to reduce commercial vehicle emissions. It offers a unique opportunity for vehicle manufacturers, fuel infrastructure providers, procurers and commercial fleet operators to collaborate to ensure we have the right technology, the right vehicles and the right fuels in the right places.</p>	

Key	Method	Resources
<p>Background to LoCITY</p>	<p>Explain that:</p> <p>The LoCITY programme is organised into three Workstreams:</p> <ul style="list-style-type: none"> • Workstream 1 – Help increase the availability and affordability of viable ultra low emission commercial vehicles • Workstream 2 – Establish alternative fuel and supply chain infrastructure to support the uptake of cleaner commercial vehicles • Workstream 3 – Improve understanding through jargon free communications. Highlight the bold steps organisations are already taking. Inform future fleet buying decisions <p>LoCITY Driving forms part of Workstream 3 of the LoCITY programme.</p>	 <p>BACKGROUND TO LoCITY</p> <ul style="list-style-type: none"> Low emission vehicle availability and affordability Operator knowledge and decision making Existing projects and funding streams Increase uptake of low emission vehicles Facilitate the roll-out of fuel infrastructure Improve knowledge to inform buying decisions Ensure planning activity supports vehicle uptake <p>8</p>
<p>Course objectives</p>	<p>Explain the LoCITY Driving course training objectives, which are to:</p> <ul style="list-style-type: none"> • Understand strategies to reduce emissions and improve air quality • Increase knowledge and awareness of fuel consumption and costs • Use vehicle checks and maintenance to reduce unnecessary emissions • Apply fuel-efficient driving techniques to improve efficiency • Benefits of journey planning for drivers, operators and the environment • Application of in-vehicle technology to monitor and improve driving performance • Monitoring and managing driving performance to improve fuel efficiency • Improve knowledge of alternative fuels and their use in commercial vehicle fleets <p>Acknowledge that many delegates may already have achieved, or be in the process of achieving, some of these objectives. Explain that the whole point of the LoCITY Driving course is to help and support them in making further improvements.</p>	 <p>COURSE OBJECTIVES</p> <ul style="list-style-type: none"> ■ Understand strategies to reduce emissions and improve air quality ■ Increase knowledge and awareness of fuel consumption and costs ■ Understand how vehicle checks and maintenance reduce emissions ■ Apply fuel efficient driving techniques designed to improve efficiency ■ Demonstrate the benefits of journey planning ■ Understand how in-vehicle technology improves driving performance ■ Improve your knowledge of alternative fuels in commercial vehicles <p>9</p>



Icebreaker



Personal objectives

During this short session, you will conduct an icebreaker activity to identify the key issues that delegates want to address and the personal objectives they want to achieve.



Session objectives

Your main aim of this session is to get the delegates to begin to think about the topic and draw out the specific objectives each delegate wishes to gain from the LoCITY Driving course. You should align these objectives to the content of the course programme and ensure expectations are managed if any personal objectives are out of the scope of the course training objectives.



Key learning points

By the end of the session, delegates will know:

- The value of undertaking group exercises with their industry peers
- Some of the strengths and limitations of other delegates
- Who they may want to network with during and after the workshop
- What their personal objectives are for attending the workshop
- What each of the other delegates wants to get out of the workshop
- The scope of the workshop content and whether it will fulfil their expectations



Timing


15 minutes





Further resources

Refer to the following for more information relating to this session:

- LoCITY Driving programme
- LoCITY Driving training objectives

Key	Method	Resources
Icebreaker introduction	<p>Show the lesson title slide. By the end of the session, delegates will know:</p> <ul style="list-style-type: none"> • The value of undertaking group exercises with their industry peers • Some of the strengths and limitations of other delegates • Who they may want to network with during and after the training • What their personal objectives are for attending the training • What each of the other delegates wants to get out of the training • The scope of the training content and whether it will fulfil their expectations <p>Remind yourself of the following:</p> <p>Icebreakers play an important role in helping people integrate and connect with one another in a group environment. Icebreakers can also enhance learning by helping to stimulate cooperation and participation. They provide a positive momentum for training courses by:</p> <ul style="list-style-type: none"> • Building a rapport and helping the delegates get to know one another • Encouraging cooperation and listening • Creating a good atmosphere for learning and participation <p>Whatever happens, be enthusiastic and do not cause embarrassment.</p>	 <p>The image shows a lesson title slide. At the top left is the 'LUCITY' logo. A green bar chart with a white line graph is positioned above a stylized city skyline. The word 'Icebreaker' is written in the upper right area. In the bottom right corner, there is a white box containing the number '10'.</p>

Key	Method	Resources
<p>Interesting fact</p>	<p>Introduce the icebreaker session.</p> <p>Ask the delegates to pair up with the person sitting next to them. Ask them to interview each other by asking the following questions:</p> <ul style="list-style-type: none"> • What is an interesting fact about you that not many people know? • What do you expect to gain from this course? <p>Ask the delegates to take turns in reporting their partners' answers to the wider group.</p>	
<p>Personal objectives</p>	<p>Make a note of what delegates want to gain and display this around the room on flipchart paper.</p> <p>Group the delegates' personal objectives into categories and align the categories to the workshop training objectives.</p> <p>If any personal objectives do not align to the workshop objectives, this should be made clear.</p> <p>Clearly explain why this information will not be covered.</p> <p>Signpost any relevant training course or e-learning module that does cover the personal objective.</p> <p>Encourage delegates to join in the discussions during the course, airing any issues and giving examples from their own experience.</p>	



Lesson 1

Fuel efficiency and air quality



Training objectives

Your main aim of this lesson is to discuss the importance of improving fuel efficiency and reducing emissions, and how national and local air quality strategies may affect HGVs.



Key learning points

By the end of the session, delegates will be able to:

- Explain the scale of the air quality and climate change issues that are challenging cities
- Describe measures taken by cities to improve air quality
- Explain the contribution that commercial vehicles make to poor air quality
- List the principal emissions from the tailpipe and other sources
- Describe the links between fuel consumption, driver behaviour and social costs



Timing





60 minutes






Further resources

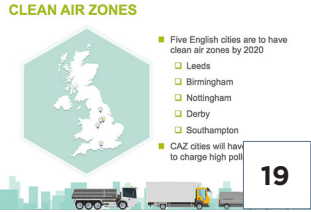
Refer to the following for more information relating to this session:

- Air Quality Consultants (2016): Emissions of Nitrogen Oxides from Modern Diesel Vehicles
- DfT (2015): Improving air quality in the UK – Tackling nitrogen dioxide in our towns and cities
- DfT (2015): Provision of HGV Emissions Testing
- DfT (2012): Opportunities to overcome the barriers to uptake of low emission technologies for each commercial vehicle duty cycle
- Royal College of Physicians (2016): Every breath we take – The lifelong impact of air pollution
- TfL (2014): Transport Emissions Roadmap – Cleaner transport for a cleaner London
- TfL (2016): The road to reducing commercial vehicle emissions – Exploring the technical barriers to uptake of alternatively fuelled commercial vehicles
- TfL (2016): Motivations, barriers and opportunities for LoCITY to influence operator uptake of Ultra Low Emission Vehicles (ULEVs)

Key	Method	Resources
Lesson introduction	<p>Show the lesson title slide.</p> <p>Explain that by the end of the session delegates will be able to:</p> <ul style="list-style-type: none"> • Explain the scale of the air quality and climate change issues that are challenging cities • Describe measures taken by cities to improve air quality including LEZs and London's ULEZ • Explain the contribution commercial vehicles make to poor air quality • List the principal emissions from the tailpipe and other sources (eg brakes, tyres and ancillary equipment) • Link between fuel consumption, driver behaviour and social costs 	 <p>Lesson 1 Fuel efficiency and air quality</p> <p>13</p> <p>LESSON 1 OBJECTIVES</p> <p>This lesson will cover the:</p> <ul style="list-style-type: none"> ■ Scale of air quality and climate change issues that challenge cities ■ Measures taken by cities to improve air quality ■ Contribution commercial vehicles make to poor air quality ■ Principal emissions from the tailpipe and other sources ■ Links between fuel consumption, driver behaviour and social costs  <p>14</p>
Air quality the challenge	<p>Explain that an estimated 40,000 UK premature deaths are attributed to air quality related illness. Almost 9,500 people die early in London each year due to poor air quality.</p> <p>Air quality in UK cities has improved significantly in recent years, but one air pollutant has a significant impact on public health. This pollutant is nitrogen dioxide (NO₂). Cities also face challenging targets to help mitigate the effects of climate change.</p> <p>To protect human health, the European Union has set legal limits for concentrations of pollutants in outdoor air. This includes nitrogen dioxide (NO₂) and also particulate matter (PM₁₀ and PM_{2.5}). These limits apply to cities and the UK as whole. We will cover what these emissions are later in the lesson.</p> <p>The reason we are here today is that UK cities are committed to tackling climate change, poor air quality and improving health. We all need to do our bit.</p>	 <p>AIR QUALITY - THE CHALLENGE</p> <ul style="list-style-type: none"> ■ 40,000 premature UK deaths are due to air quality related illness ■ 9,500 annual premature deaths in London due to poor air quality ■ Air quality has improved but nitrogen dioxide (NO₂) still impacts on health ■ The European Union has set legal limits for pollutants in outdoor air  <p>15</p>

Key	Method	Resources
<p>Climate change – the challenge</p>	<p>Explain that fuel-efficient driving techniques can lead to a reduction in petrol/diesel consumption and in turn lower levels of CO₂. Reduced emissions can help the UK to meet its greenhouse gas (GHG) targets.</p> <p>CO₂ (carbon dioxide) is probably the most important of the greenhouse gases as it is responsible for 60% of the enhanced greenhouse effect.</p> <p>Atmospheric CO₂ comes from sources such as natural decay, volcanic eruptions and animal respiration. It is removed naturally from the atmosphere through plants and is almost perfectly balanced with the amount put back into the atmosphere by respiration and decay. Carbon dioxide produced today stays in the atmosphere for approximately 100 years. Changes as a result of human activities have a large impact on this delicate balance.</p> <p>Burning fossil fuels in vehicle combustion engines releases the CO₂ stored millions of years ago.</p> <p>Increasing temperatures mean we are experiencing less predictable weather and seeing an increase in heatwaves and hot spells. This all contributes to:</p> <ul style="list-style-type: none"> • Greater risk of drought, extreme rain and wind, intense hurricanes • Increased rainfall • Rising global temperatures • Rising global sea level of 1.8mm per year over the last 50 years • Retreating mountain glaciers in non-polar regions 	<p>CLIMATE CHANGE – causes and effects</p> <ul style="list-style-type: none"> ■ CO₂ is responsible for 60% of the greenhouse effect ■ CO₂ stays in the atmosphere for around 100 years ■ Climate change means greater risk of drought, extreme rain, wind and intense hurricanes ■ Global temperatures are rising, 1998-2007 was the warmest on record ■ Global sea level is rising - 1.8mm per year over the last 50 years ■ Mountain glaciers in non-polar regions are retreating  <p>16</p>

Key	Method	Resources
<p>Video 1 – Part 1 Introduction to air quality</p>	<p>Introduce and show Video 1 – Part 1 (2m 51s) ‘Introduction to air quality’, which specifically focuses on the health impacts of emissions. The video specifically covers the following:</p> <ul style="list-style-type: none"> • Air quality and climate change issues caused by commercial vehicles • Any measures taken by UK cities to improve air quality • Hospital admissions per year due to air pollution • Financial and societal cost implications specifically related to health <p>The video should create a compelling sense of responsibility and action among drivers.</p> <p>Discuss the issues raised and the key learning points with delegates:</p> <ul style="list-style-type: none"> • Protect the environment • Improve health • Save money • Reduce stress 	<p>VIDEO 1</p> 
<p>City measures to improve air quality</p>	<p>Explain that there are a number of ways that cities are tackling poor air quality, including:</p> <ul style="list-style-type: none"> • CAZs • LEZs • ULEZs 	<p>CITY MEASURES TO IMPROVE AIR QUALITY</p> <ul style="list-style-type: none"> ■ There are a number of ways that cities are tackling poor air quality, these include: <ul style="list-style-type: none"> □ Clean Air Zones □ Low Emission Zones □ Ultra Low Emission Zones 

Key	Method	Resources
<p>Clean Air Zones</p>	<p>Explain that a Clean Air Zone (CAZ) restricts the number of high polluting vehicles, or encourages the uptake of alternatives, in areas with the poorest air quality. One type of CAZ is a Low Emission Zone (LEZ).</p> <p>There are over 200 LEZs in operation, or in advanced planning stages, across 11 countries in Europe.</p> <p>CAZs target areas with the poorest air quality. Five English cities are to have CAZs by 2020 under plans to reduce pollution. These are:</p> <ul style="list-style-type: none"> • Leeds • Birmingham • Nottingham • Derby • Southampton <p>The cities will have new powers to charge high polluting coaches, taxis, buses and trucks if they enter the zones. The operational requirements for each zone have not yet been confirmed.</p>	

London's Low Emission Zone

Explain that the London Low Emission Zone (LEZ) applies across the environmental zone covering Greater London and operates 24 hours a day, every day of the year. It discourages the most polluting heavy diesel vehicles from operating in the Capital.

The LEZ was introduced in 2008 and has been very successful so far. In January 2012, more vehicles were included and standards were tightened.

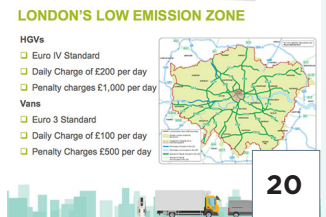
Vehicles need to meet the specified emission standard for Particulate Matter (PM) or pay a substantial daily charge to drive within the LEZ boundary.

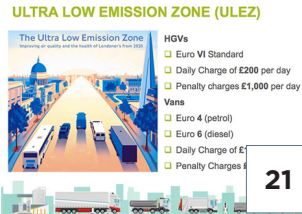
Lorries, buses and coaches must meet the Euro IV emission standard for PM. A Euro III rigid truck produces five times the PM of a Euro IV vehicle. We will discuss Euro standard engines later in the course.


Vehicles do not need to register with TfL before driving within the LEZ. The charges and penalties are:

- Lorries, buses and coaches
 - Daily Charge of £200 per day
 - Penalty Charges £1,000 per day (£500 if paid within 14 days)
- Larger vans and minibuses
 - Daily Charge of £100 per day
 - Penalty Charges £500 per day (£250 if paid within 14 days)

The LEZ is not aimed at generating revenue; its focus is on incentivising operators to use cleaner vehicles. TfL prefers vehicle operators to meet the standard rather than pay a daily charge or risk a fine.



Key	Method	Resources
<p>London's ULEZ</p>	<p>State that by 2020, all cars, motorcycles, vans, minibuses, buses, coaches and HGVs will need to meet exhaust emission standards (ULEZ standards) or pay a daily charge, when travelling in central London.</p> <p>The ULEZ standards are in addition to any Congestion Charge or Low Emission Zone (LEZ) charges that already apply.</p> <p>The area covered by the ULEZ is still to be confirmed. Cameras will read vehicle number plates as they are driven within the zone to check against the TfL database. It will operate 24 hours a day on every day of the year, including weekends and public holidays.</p> <p>If the vehicle does not meet the ULEZ emissions standards and the daily charge is not paid, a Penalty Charge Notice (PCN) will be issued, payable by the registered owner or operator.</p> <ul style="list-style-type: none"> • For motorcycles, cars, vans and minibuses, this will be: <ul style="list-style-type: none"> - A penalty charge of £130 - Reduced to £65 if paid within 14 days • For HGVs, coaches and buses this will be a: <ul style="list-style-type: none"> - A penalty charge of £1,000 - Reduced to £500 if paid within 14 days <p>This penalty is in addition to any CC or LEZ penalties received.</p> <p>TfL is currently consulting on proposals to bring the ULEZ implementation date forward to 2019, as well as on the introduction of a £10 daily emissions surcharge (commonly known as the 'T-Charge').</p>	 <p>ULTRA LOW EMISSION ZONE (ULEZ)</p> <p>The Ultra Low Emission Zone</p> <p>HGVs</p> <ul style="list-style-type: none"> □ Euro VI Standard □ Daily Charge of £200 per day □ Penalty charges £1,000 per day <p>Vans</p> <ul style="list-style-type: none"> □ Euro 4 (petrol) □ Euro 6 (diesel) □ Daily Charge of £ □ Penalty Charges f <p>21</p>

Key	Method	Resources
<p>Other programmes aiming to reduce emissions</p>	<p>Explain it is not just HGVs and vans that are being targeted to improve air quality. Other commercial vehicles are also expected to meet stringent standards.</p> <p>Funding is already in place in London to significantly reduce emissions from buses and taxis. Measures include:</p> <ul style="list-style-type: none"> • Retrofitting older buses by fitting selective catalytic reduction to exhausts that will reduce NOx by more than 80% • Trialling wireless inductive charging, hydrogen and biodiesel • Introducing hybrid and electric buses, including an electric double decker trial <p>From 2020, all double decker buses in central London will be hybrid and all single decker buses will be electric or hydrogen. Also:</p> <ul style="list-style-type: none"> • From 1 January 2018, all taxis licensed for the first time must be zero emission capable, and new diesel taxis will not be allowed in London • From 1 January 2023, all vehicles granted a private hire licence for the first time will be zero emission capable. There are a range of milestones leading up to this date to ensure this target is met regardless of vehicle age. 	<p>OTHER PROGRAMMES AIMING TO REDUCE EMISSIONS IN LONDON</p>  <p>22</p>

Key	Method	Resources
<p>HGVs and poor air quality</p>	<p>Explain that despite representing just 3% of vehicles on the road, HGVs are responsible for 25% of road transport emissions. That share is increasing; between 1990 and 2010, HGV emissions rose by 36%. Without action, it is estimated that HGV emissions could increase by a further 22% by 2030. Euro VI vehicles will lead to a reduction in air quality pollutants, but not GHG emissions.</p> <p>Collectively, diesel cars, goods vehicles and private coaches contribute about 30% of all NO_x emissions in London and about 26% of PM₁₀.</p> <p>It is therefore essential to reduce emissions from these sources. However, there are regulations in place for fuel efficiency and CO₂ emissions in cars and vans, but not for HGVs.</p> <p>Ask the delegates to share the average mpg of their cars. This should be anywhere between 30–50 mpg.</p> <p>Ask the delegates to share the average mpg of their trucks. This is typically around 8mpg for artics and 9mpg for rigids.</p> <p>Discuss the differences, and HGV drivers’ responsibilities due to their vehicles’ combination of low mpg and high mileages.</p>	<p>HGVs - POOR AIR QUALITY</p> <p>23</p>

Principal emissions

Explain that we have already established that tailpipe emissions are a serious threat to health. As a quick explanation, the main pollutants of concern in our cities are:

- NO₂ – Nitrogen dioxide. A gas formed by combustion, identified as an air pollutant harmful to human health. The European limit values measure concentrations of NO₂ in the air
- NO_x – Nitrogen oxides. A generic term for nitrogen dioxide (NO₂) and nitrogen monoxide (NO). Euro standards set NO_x limits for vehicle emissions
- PM – Particulate Matter. A mixture of various solid and liquid particles of chemical compositions suspended in the air
 - PM₁₀. Particulate Matter 2.5–10 microns in diameter that is harmful to health and subject to EU limit values
 - PM_{2.5}. Particulate Matter <2.5 microns in diameter. The smallest and most harmful form of Particulate Matter and also subject to EU limit values

Other emissions include:



- Greenhouse gas. Gases that absorb heat, contributing to climate change. The most significant is CO₂
- CO₂. Carbon dioxide. Principal greenhouse gas related to climate change


PRINCIPAL EMISSIONS

- NO₂ – Nitrogen Dioxide
Gas formed by combustion. An air pollutant harmful to human health
- NO_x – Nitrogen Oxides
A generic term for Nitrogen Dioxide (NO₂) and Nitrogen Monoxide (NO)
- PM – Particulate Matter
A mixture of various solid and liquid particles suspended in air – such as dust, pollen, soot, smoke and droplets



24

Key	Method	Resources
<p>Video 1 – Part 2 Introduction to air quality</p>	<p>Introduce and show Video 1 – Part 2 (1m 32s), which specifically focuses on costs. The video covers the following:</p> <ul style="list-style-type: none"> • Fuel is the biggest single cost of running a commercial vehicle – equivalent to running 100 cars • Why operators are investing in driver development and alternative fuels • The role of fuel-efficient driving to help reduce fuel consumption and costs • The role of the industry to help combat health issues raised in Video – Part 1 <p>Discuss the benefits highlighted by operators and the key learning points with delegates.</p> <ul style="list-style-type: none"> • Gas is 30-40% cheaper than diesel • £30,000 saving per annum • Incidents reduced by 66% • Insurance reduced by 25% • Fuel usage reduced by 27.5% 	<p>VIDEO 1 PART 2</p>  <p>25</p>
<p>LoCITY Driving themes</p>	<p>Explain that the LoCITY Driving course, and its supporting fleet manager toolkit, tracks a series of five themes. There are many interpretations of good fuel efficiency and driving techniques, and the LoCITY themes have been developed to help embed the principles. The five simple messages echoed throughout this initiative are:</p> <ul style="list-style-type: none"> • Get set: Check your vehicle and prepare for your journey • Think ahead: Observe, anticipate and apply fuel-efficient driving techniques • Smooth ride: The more you brake, the more you need to accelerate • Get in gear: Use your gears wisely to maintain an efficient engine speed • Power off: Idling gets you nowhere, so switch off when stationary <p>Explain that the themes will be followed throughout the course to help communicate some of the key learning points.</p>	<p>LoCITY THEMES</p> <ul style="list-style-type: none"> ■ Get Set – Check your vehicle and prepare for your journey ■ Think Ahead – Observe, anticipate and apply fuel efficient driving techniques ■ Smooth Ride – The more you brake the more you need to accelerate ■ Get in Gear – Use your gears wisely to maintain an efficient engine speed ■ Power Off – Idling gets you nowhere so switch off when stationary  <p>26</p>

Key	Method	Resources
Lesson summary	<p>Summarise the key points of the lesson. Pay particular attention to any issues that have been raised throughout.</p> <p>Ask delegates if they have any questions.</p> <p>Ask some questions of your own. Remember to pose, pause and pounce.</p> <ul style="list-style-type: none"> • How many premature deaths are attributed to poor air quality in the UK? (40,000) • What Euro Standard engine will London's Ultra Low Emission Zone require when it comes into force? (Euro VI) • What are the principle emissions that affect air quality? (NO₂, NO_x, PM) 	<p>LESSON 1 SUMMARY</p> <p>Fuel efficient driving techniques can help reduce the emissions from your vehicle that are harmful to public health. Applying the LoCITY Themes is a simple way to check you are driving in the most efficient way.</p>  <p>27</p>

Lesson 2

Get set – Journey planning and vehicle checks



Training objectives

Your main aim of this lesson is to discuss the importance of journey planning and walk around checks to ensure that the route and vehicle are as efficient as possible.



Key learning points

By the end of the session, delegates will be able to:

- Describe the importance of route plans to improve fuel efficiency and journey time
- List and describe the information, tools and systems that can be used for effective journey planning
- Describe the role of daily and weekly vehicle checks in reducing fuel consumption and emissions
- Define good practice loading and describe the impact of unnecessary load and equipment
- Explain the extent to which wheel alignment and tyre pressure impacts fuel consumption
- Explain how proactive vehicle maintenance, fuel consumption and emissions are linked



Timing



- Efficient journey planning – 15 minutes
- Vehicle walk around checks – 45 minutes

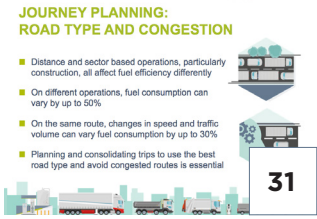




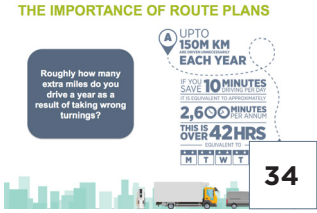

Further resources

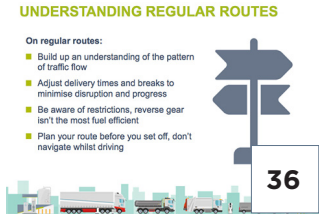


Refer to the following for more information relating to this session:

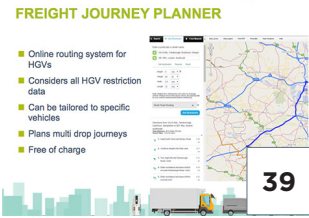

- DfT Statistics (2015): Average heavy goods vehicle fuel consumption: Great Britain, 1999–2014
- DfT: Planning and Managing Effective Customer Deliveries
- DVSA (2014): Guide to maintaining roadworthiness
- Freight Journey Planner
- Mercedes Benz (2009): Getting more out of your truck
- DfT: Freight Best Practice Preventative Maintenance for Efficient Road Freight Operations

Key	Method	Resources
<p>Lesson introduction</p>	<p>Show the lesson title slide.</p> <p>Explain that by the end of the session delegates will be able to:</p> <ul style="list-style-type: none"> Describe the importance of route plans to improve fuel efficiency and journey time List and describe the information, tools and systems that can be used for effective journey planning Describe the role of daily and weekly vehicle checks in reducing fuel consumption and emissions Define good practice loading and describe the impact of unnecessary load and equipment Explain the extent to which wheel alignment and tyre pressure impacts fuel consumption Explain how proactive vehicle maintenance, fuel consumption and emissions are linked 	 <p>Lesson 2 Get Set: Vehicle checks and journey planning</p> <p>28</p> <p>LESSON 2 OBJECTIVES</p> <p>This lesson will cover the:</p> <ul style="list-style-type: none"> Importance of routing to improve fuel efficiency and journey time Information and tools that can be used for effective journey planning Links between vehicle maintenance, fuel use and emissions Role of walk around checks in reducing fuel consumption and emissions Extent to which wheel alignment and tyres impact on fuel consumption Impact of unnecessary load and equipment <p>29</p>
<p>Theme 1: Get set – Journey planning</p>	<p>Introduce the first theme:</p> <ul style="list-style-type: none"> Get set: Checking your vehicle and preparing for your journey can make a significant difference to fuel efficiency <p>Explain that in the first part of this lesson we will cover effective journey planning</p>	 <p>THEME 1: GET SET</p> <p>Checking your vehicle and preparing for your journey can make a significant difference to fuel efficiency</p> <p>GET SET</p> <p>30</p>

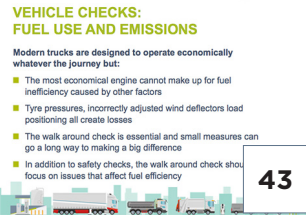
Key	Method	Resources
<p>Road types and congestion</p>	<p>Explain that a routing plan offers an effective way to make trips more fuel efficient. It also increases time efficiency. Planning and consolidating trips to avoid congested routes is essential, but it is accepted that this can be tricky in dense urban streets.</p> <p>Different operation types, such as long-distance haulage, urban distribution or construction site operations, can mean that fuel consumption can vary by up to 50% with the same engine output.</p> <p>Even when it comes to the same operation type, differences in average speed and traffic volume can produce differences in fuel consumption of up to 30%.</p> <p>If a vehicle spends most of its journey on the motorway, then it will definitely consume less fuel than an identical vehicle completing an equally long journey on urban roads, even though both have the same load.</p> <p>At peak travel times, stay on major routes until you are as close as possible to your destination. Use of inappropriate roads for the vehicle is a problem that affects congestion and environmental impact. Local authorities address this through vehicle restrictions and local planning conditions.</p>	 <p>JOURNEY PLANNING: ROAD TYPE AND CONGESTION</p> <ul style="list-style-type: none"> Distance and sector based operations, particularly construction, all affect fuel efficiency differently On different operations, fuel consumption can vary by up to 50% On the same route, changes in speed and traffic volume can vary fuel consumption by up to 30% <p>Planning and consolidating trips to use the best road type and avoid congested routes is essential</p> <p>31</p>
<p>Journey planning considerations</p>	<p>Discussion – when planning journeys, drivers should try to avoid:</p> <ul style="list-style-type: none"> Inappropriate roads for the vehicle Vehicle restrictions and local planning conditions Traditional peak traffic hours, typically 07:30 to 09:30 and 16:00 to 18:30 Schools at pick up and drop off times Bus lanes and other local traffic management schemes <p>Arterial routes offer the most efficient journeys</p>	 <p>JOURNEY PLANNING CONSIDERATIONS</p> <p>When planning journeys what should you try to avoid?</p> <ul style="list-style-type: none"> Inappropriate roads for the vehicle Vehicle restrictions and local planning conditions Traditional peak traffic hours, typically 07:30 to 09:30 and 16:00 to 18:30 Schools at pick up and drop off times <p>32</p>  <p>DISCUSSION - FEEDBACK</p> <p>Journey planning considerations:</p> <ul style="list-style-type: none"> Inappropriate roads for the vehicle Vehicle restrictions and local planning conditions Arterial routes offer the most efficient journeys Traditional peak traffic hours, typically 07:30 to 09:30 and 16:00 to 18:30 Schools at pick up and drop off times Bus lanes and other local management schemes <p>33</p>


Key	Method	Resources
<p>The importance of route plans</p>	<p>State that taking a few minutes to plan a route could save hours on the road, fuel and money.</p> <p>Ask the delegates:</p> <ul style="list-style-type: none"> • Have any of you ever taken a wrong turning? • Roughly how many extra miles do you travel a year from taking wrong turnings? <p>Facilitate a discussion:</p> <ul style="list-style-type: none"> • An average of 150 million lorry miles are driven unnecessarily each year. Saving 10 minutes of every working day would be equivalent to approximately 2,600 minutes or over 42 hours a year. 	 <p>THE IMPORTANCE OF ROUTE PLANS</p> <p>UPTO 150M KM EACH YEAR</p> <p>Roughly how many extra miles do you drive a year as a result of taking wrong turnings?</p> <p>IF YOU SAVE 10 MINUTES OF EVERY WORKING DAY, YOU COULD SAVE APPROXIMATELY 2,600 MINUTES PER YEAR. THIS IS OVER 42 HRS PER YEAR FOR EACH DRIVER.</p> <p>34</p>
<p>Route plans and access routes</p>	<p>Explain that route plans are imposed on certain operations and can form a key part of a construction logistic plan or delivery and servicing plan. Drivers should be aware of and comply with:</p> <ul style="list-style-type: none"> • Strategic access routes; The main arterial routes that take you from the depot to the locality of your delivery or collection • Local access routes; the specific local routes that we are legally obliged to comply with. As you will impact on local roads for the last stages of a journey, local access routes are specified as compulsory <p>You must provide a fully justified explanation if you have not followed an approved route. You may also be required to officially sign to acknowledge the route change.</p> <p>The time of day dictates how long vehicles may spend getting to their destination.</p>	 <p>ROUTE PLANS AND ACCESS ROUTES</p> <ul style="list-style-type: none"> ■ Route plans can be mandatory for certain operations ■ Drivers should be aware of and comply with: <ul style="list-style-type: none"> □ Strategic access routes □ Local access routes ■ Any deviations from an approved route must be supported with a statement <p>35</p>

Key	Method	Resources
<p>Understanding regular routes</p>	<p>Explain that when using regular routes, drivers should try to build up an understanding of the pattern of traffic flow and adjust delivery times, route plans and breaks to minimise disruption and progress.</p> <p>When a town or city centre is known to have particular weight or height restrictions, make sure you are fully aware of these.</p> <p>If the transport operation is more 'reactive' and you are required to leave a pre-planned route to cover other collections and deliveries, try to take the time to get the route clear in your mind.</p> <p>Don't try to navigate new routes while driving.</p> <p>Try to avoid lost mileage, where junctions can be missed or you have to return to a previous point in the journey.</p>	 <p>36</p>
<p>Journey planning tools and systems</p>	<p>Discussion - State that there are many route planning tools available.</p> <p>Ask the delegates which types of route planning tools they are familiar with</p> <p>Facilitate a feedback discussion on the tools available. These include:</p> <ul style="list-style-type: none"> • Personal knowledge • Maps • Route cards • Scheduling software • Journey planners • Sat navs • Traffic alerts (radio) • Variable messaging signs • Authorities such as TfL, Traffic England, etc <p>Discuss the pros and cons of each of the tools</p> <p>Explain that the use of data and technology is the best way of providing a realistic estimate or comparison of fuel consumption.</p> <p>However, this may not be readily available, and a professional driver must be able to plan an efficient route.</p>	 <p>37</p>  <p>38</p>

Key	Method	Resources
<p>Freight journey planners</p>	<p>Explain there are a range of freight journey planners available that cover the whole of the UK. Some of these products are available through the FORS Associate part of FORS online. Features of freight journey planners are:</p> <ul style="list-style-type: none"> • Online routing system for HGVs • Can be tailored to specific vehicle types • Plan routes considering height, width and weight restrictions • Multiple destinations can be planned • Free to use 	 <p>FREIGHT JOURNEY PLANNER</p> <ul style="list-style-type: none"> ■ Online routing system for HGVs ■ Considers all HGV restriction data ■ Can be tailored to specific vehicles ■ Plans multi drop journeys ■ Free of charge <p>39</p>
<p>Theme 1: Get Set. Checking your vehicle</p>	<p>Revisit the first theme:</p> <ul style="list-style-type: none"> • Get set: Checking your vehicle and preparing for your journey can make a significant difference to fuel efficiency <p>Explain that in the next part of this lesson, we will cover checking your vehicle.</p>	 <p>THEME 1: GET SET</p> <p>Checking your vehicle and preparing for your journey can make a significant difference to fuel efficiency</p> <p>GET SET</p> <p>40</p>

Key	Method	Resources
<p>Daily walk around checks exercise</p>	<p>Introduce the daily walk around checks exercise.</p> <p>Ask the delegates what specific daily vehicle checks should be made that contribute to fuel efficiency and environmental impact.</p> <p>Facilitate this discussion to draw out as many specific daily vehicle checks as possible.</p> <p>Uncover the following list and compare it to the list generated from the exercise.</p> <ul style="list-style-type: none"> • Bodywork – protruding panels, torn or insecure curtains any loose bodywork • Fuel tank – fuel leaks from and around the tank, security of fuel cap • AdBlue • Aerodynamics – correctly set for the vehicle and trailer • Start up – any unusual mechanical noise, excessive smoke • Moving off – dragging brakes, steering pulling, obvious tracking issues • Wheels and tyres – to be discussed in detail later in the lesson • Load security and positioning – also to be discussed in detail later in the lesson <p>Trainer note: AdBlue is one of the most efficient ways of keeping the NOx levels in fuel emissions to a minimum. AdBlue is injected into the flow of exhaust gases. When it combines with exhaust emissions, it breaks down NOx and produces nitrogen and oxygen, which are harmless gases that occur naturally in the environment. If the AdBlue diesel exhaust fluid (DEF) tank level is low, the vehicle will slow to a crawl to minimise its emissions.</p>	<p>The resources section contains two slides. Slide 41, titled 'VEHICLE CHECK EXERCISE', features a quote: 'Drivers accept that it is their responsibility to ensure a vehicle fit for purpose by conducting a 'walk around' check' and asks 'What specific checks do you make that contribute to improved fuel efficiency?'. Slide 42, titled 'EXERCISE - FEEDBACK', lists 'Walk around check for fuel efficiency:' with a checklist: Bodywork, Fuel tank, AdBlue, Aerodynamics, Excessive smoke, Brakes binding, Wheels and tyres, and Load.</p>

Key	Method	Resources
<p>Vehicle checks, fuel consumption and emissions</p>	<p>Explain that modern trucks are designed to operate economically due to progressive vehicle technology and emissions regulations. This is the case whether they operate for long distance haulage, urban distribution or on construction sites.</p> <p>Fuel consumption and emissions are influenced by a range of other factors, which even the most economical engine cannot reduce. Factors such as tyre pressures, incorrectly adjusted wind deflectors and load positioning all create losses that can be overcome.</p> <p>Fuel is scarce and very expensive. That is why it is so important to take full advantage of the opportunities to reduce fuel consumption that vehicle technology can offer.</p> <p>As a driver, you must undertake a daily walk around check before a vehicle is used and before the vehicle's first drive of the day. Small measures can go a long way to making a big difference and, in turn, reducing fuel consumption.</p> <p>This course does not cover the full safety and legal requirements of a daily walk around check, but we do focus on some of the specific points to check that can affect the fuel-efficient running of the vehicle and its impact on the environment.</p>	 <p>VEHICLE CHECKS: FUEL USE AND EMISSIONS</p> <p>Modern trucks are designed to operate economically whatever the journey but:</p> <ul style="list-style-type: none"> ■ The most economical engine cannot make up for fuel inefficiency caused by other factors ■ Tyre pressures, incorrectly adjusted wind deflectors and load positioning all create losses ■ The walk around check is essential and small measures can go a long way to making a big difference ■ In addition to safety checks, the walk around check should focus on issues that affect fuel efficiency <p>43</p>

Key	Method	Resources
<p>Proactive vehicle maintenance, fuel consumption and emissions</p>	<p>Explain that proactive maintenance is a preventative maintenance strategy for taking control of the reliability and efficiency of commercial vehicles. Basically, it means not waiting for a fault to occur before you do something about it.</p> <p>Preventative maintenance not only helps to ensure the reliability, safety and roadworthiness of a vehicle, but can also ensure optimum fuel efficiency and prevent the exhaust from emitting more pollutants than it is meant to.</p> <p>Taking care of a vehicle helps it to run more efficiently and use less fuel than a neglected vehicle. It can reduce wear and tear on vehicle components, increase tyre life and ensure the vehicle is mechanically sound. Typical preventative maintenance measures include:</p> <ul style="list-style-type: none"> • Implementing a wheel alignment programme. Wheels that are fighting each other waste fuel • Tyre rotation programmes • Using good quality oils. Correct lubricant choice can generate a 3-5% improvement in fuel performance • Regular air filter cleaning. A dirty filter clogs an engine's air supply, causing a higher fuel-to-air ratio 	<p>PROACTIVE VEHICLE MAINTENANCE</p> <ul style="list-style-type: none"> ■ Proactive means not waiting for a fault to occur before you do something about it ■ It helps ensure the reliability, safety, roadworthiness and fuel efficiency of a vehicle. ■ It reduces wear and tear on vehicle components, increase tyre life and ensure the vehicle is mechanically sound <p>Typical measures include:</p> <ul style="list-style-type: none"> □ Wheel alignment programme □ Tyre rotation programme □ Using good quality oils □ Regular air filter cleaning  <div style="border: 1px solid black; padding: 2px; display: inline-block;">44</div>

Tailpipe smoke emissions

Explain that the direct relationship between vehicle maintenance and tailpipe emissions is the smoke that is released from the exhaust. Exhaust smoke does not have to be visibly obvious to be more polluting than it should be.

State that the noticeable smokes are black, white and blue. Open the discussion and ask what the delegates think each smoke is caused by.

Uncover the actual cause of each smoke as follows:

- Black smoke – means there is too much fuel and not enough air. This means either too much fuel is being added to the mix or there is not enough oxygen being supplied to burn the fuel. The black smoke is full of particulates that are basically large diesel particles that would normally be burned as fuel. The most common causes are faulty injectors, injector pumps or air filters that either need to be replaced or cleaned
- White smoke – means that the fuel is not burning properly. The common causes are low engine compression, faulty fuel pumps or something as simple as water in the fuel
- Blue smoke – means burning engine oil and that oil is getting into the wrong places. This could be as simple as having too much oil in the engine, but the common mechanical causes are faulty injector pumps or lift pumps, worn cylinders, piston rings or valves

If your vehicle shows signs of visible exhaust smoke, refer this to your workshop. A diesel smoke meter should be used to ensure that the level of smoke emission is within the legal requirements.

TAILPIPE SMOKE



- **Black Smoke:**
 - Faulty injectors, a faulty injector pump or an air filter that needs replacing or cleaning
- **White Smoke:**
 - Low engine compression, faulty fuel pump or water in the fuel
- **Blue Smoke:**
 - A faulty injector pump or lift pump, worn cylinders, piston rings or valves





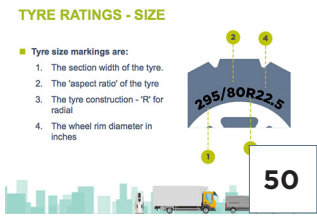
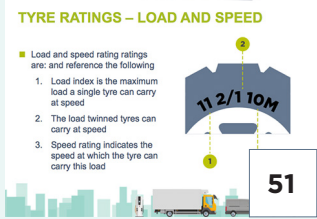
What should you do if you see tail



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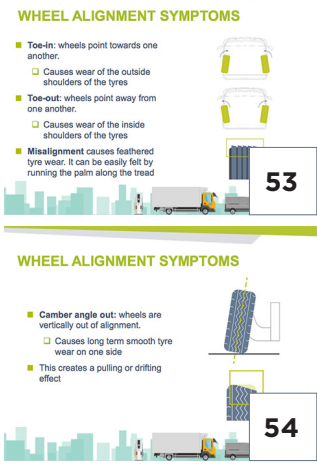


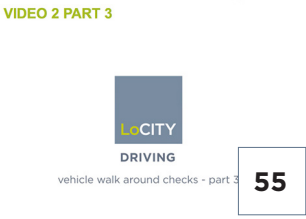
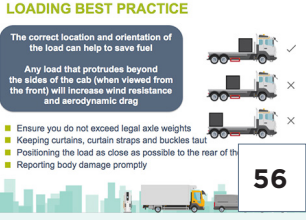
Key	Method	Resources
<p>Video 2 – Part 1 Daily checks</p>	<p>Introduce and show Video 2 – Part 1 (3m 10s), which specifically focuses on a walk through of a company doing its daily vehicle checks and the environmental impacts of poor maintenance. The video includes:</p> <ul style="list-style-type: none"> • An explanation of how proactive vehicle maintenance, fuel consumption and emissions are linked • The role of driver walk around checks in reducing fuel consumptions and emissions • Specific vehicle checks to be considered with regards to emissions and vehicle aerodynamics <p>Facilitate a discussion on the Tarmac vehicle in the video.</p> <p>Ask the delegates if there was anything that could have been done to the vehicle to improve efficiency.</p> <p>Uncover the Tarmac vehicle image that shows a large amount of lighting equipment on the top of the vehicle. Explain that this is not aerodynamic and contributes to fuel inefficiency.</p>	<p>VIDEO 2 PART 1</p>  <p>46</p>
<p>Tyres and fuel consumption</p>	<p>Explain that commercial vehicles lead a particularly tough life, so it is vital that tyres are regularly checked for any signs of damage, premature or uneven wear, correct inflation and missing valve caps.</p> <p>At a constant 56mph, about a third of the vehicle's power is used to overcome the rolling resistance of the tyres. This is primarily affected by tyre selection, tyre pressure and wheel alignment.</p> <p>Every tyre is designed for a specific operation and plays its part in fuel consumption, safety and mileage efficiency for that particular operation.</p> <p>In addition to the fuel saving benefits associated with correct tyre pressure, there is also a safety aspect that needs to be considered.</p> <p>Under inflated tyres can lead to increased stopping distances and can reduce the stability of a vehicle, both of which can have a dramatic effect on the driver and other road users.</p> <p>Tyres optimised for low rolling resistance do not help reduce fuel consumption in urban distribution and should therefore only be used for long distance haulage.</p>	<p>TYRES AND FUEL CONSUMPTION</p> <ul style="list-style-type: none"> ■ At 56mph, a third of the vehicle's power is used to overcome rolling resistance ■ This is affected by tyre selection, tyre pressure and wheel alignment ■ It is vital that tyres are regularly checked for any signs of: <ul style="list-style-type: none"> □ Damage □ Premature or uneven wear □ Correct inflation  <p>47</p>


Key	Method	Resources
Tyre pressures	<p>Explain that one tyre manufacturer has put together a scenario that helps to highlight fuel efficiency and tyre pressures:</p> <ul style="list-style-type: none"> In a fleet of vehicles, approximately 20% will have tyres that are 10% under-inflated This leads to a loss of 1% mpg per vehicle <p>Encourage the delegates to do the maths.</p> <ul style="list-style-type: none"> Average 8/9 mpg for artics/rigids Average mileage of 60,000 Fuel at £5 per gallon What is the additional cost per vehicle? <p>Formula $60,000 / 8 \text{ or } 9 \text{ mpg} \times 5$</p> <p>Answer £333.33 - £375.00 per vehicle</p> <ul style="list-style-type: none"> Summarise that low tyre pressures create a larger than normal contact patch on the road surface. This in turn generates a higher rolling resistance and higher fuel consumption 	<p>TYRE PRESSURE DISCUSSION</p> <p>■ Scenario: In a fleet of vehicles, approximately 20% will have tyres that are 10% under-inflated. This leads to a loss of 1% mpg per vehicle:</p> <ul style="list-style-type: none"> □ With an average 8/9 mpg for artics/rigids □ With an average mileage of 60,000 per year □ And fuel at £5 per gallon □ What is the additional cost per vehicle? <p>£333.33 - £375.00</p> 
Video 2 – Part 1 Tyres	<p>Introduce and show Video 2 – Part 2 (1m 14s), which specifically focuses on a company doing its vehicle checks and the environmental impacts of poor maintenance. The video includes:</p> <ul style="list-style-type: none"> Impact of tyre condition and pressures on fuel efficiency Detailed checks on tyres to be considered Damage, incorrect tyre pressures, missing valve caps 	<p>VIDEO 2 PART 2</p> 

Key	Method	Resources
<p>Tyre ratings - Size</p>	<p>Explain that commercial tyres are optimised for specific types of operation. Selecting the right tyre should be a primary consideration.</p> <p>Facilitate a discussion on tyre size ratings. Ask the delegates what the tyre load and speed markings mean.</p> <p>Uncover the tyre size markings and explain the following information:</p> <ol style="list-style-type: none"> 1. The section width of the tyre (either in inches or millimetres) 2. There is often an optional reference to the aspect ratio of the tyre. This is a ratio of the tyre's height to its width 3. The types of tyre construction - 'R' for radial 4. The wheel rim diameter in inches <p>Example 295/80R22.5:</p> <ul style="list-style-type: none"> • 295-295mm section width • 80 - low profile tyre - section height 80% of its section width • R - radial construction • 22.5 - rim diameter 22.5 inches 	 <p>TYRE RATINGS - SIZE</p> <p>■ Tyre size markings are:</p> <ol style="list-style-type: none"> 1. The section width of the tyre. 2. The 'aspect ratio' of the tyre 3. The tyre construction - 'R' for radial 4. The wheel rim diameter in inches
<p>Tyre ratings - Load and speed</p>	<p>Facilitate a discussion about tyre load and speed ratings. Ask the delegates what the tyre load and speed markings mean.</p> <p>Uncover the load index and the speed rating symbol and explain the following information:</p> <ol style="list-style-type: none"> 1. The load index is a numerical code that shows the maximum load a single tyre can carry at the speed shown by its speed rating symbol 2. There is often an optional reference that shows the load a twinned pair of tyres can carry at the speed shown by its speed rating symbol 3. The speed rating symbol indicates the speed at which the tyre can carry a load shown by the load index <p>Example 112/110M:</p> <ul style="list-style-type: none"> • 112 - Load index for single tyres 1,120 kg • 110 - Load index for twinned tyres 1,060kg • M - Speed rating (130kmh/81mph) max speed at load as in load index 	 <p>TYRE RATINGS - LOAD AND SPEED</p> <p>■ Load and speed rating ratings are: and reference the following</p> <ol style="list-style-type: none"> 1. Load index is the maximum load a single tyre can carry at speed 2. The load twinned tyres can carry at speed 3. Speed rating indicates the speed at which the tyre can carry this load

Key	Method	Resources
<p>Wheels and fuel consumption</p>	<p>Explain that if the wheels on your vehicle are misaligned by only a small amount it can have a significant impact on the vehicle's handling characteristics, tyre life and fuel economy.</p> <p>Just half a degree's misalignment on one axle could reduce tyre life by half and reduce fuel efficiency by 3-5%.</p> <p>Many operators wait until they see major tyre wear before getting the wheel alignment checked. However, by this point the damage is done and the vehicle may not have been running efficiently for some time. It is not just the cost of replacing the tyres. It is not just the cost of replacing the tyres; for every £1 wasted on tyre wear, around £4 would have been wasted on fuel.</p> <p>A preventative wheel alignment program can contribute to fuel savings of 3-18% and improvements in tyre life of 5-20%. This is where wheel alignment checks are conducted as part of periodic safety inspections and every time a steering or suspension component is replaced.</p>	<p>WHEELS AND FUEL CONSUMPTION</p> <ul style="list-style-type: none"> ■ Just half a degree misalignment on one axle could reduce: <ul style="list-style-type: none"> □ Tyre life by half □ Fuel efficiency by 3 - 5% ■ Many operators wait until they see major tyre wear before getting wheel alignment checked   <p>52</p>

Key	Method	Resources
<p>Wheel alignment symptoms</p>	<p>Explain that the driver is usually the first person to spot a potential wheel alignment problem. This can be either through visible damage to tyres and mudflaps or through adverse driving characteristics.</p> <p>Steer-axle wheels should be parallel to the direction of travel. If not, they are either:</p> <ul style="list-style-type: none"> • Toe-in. This is where the wheels point towards one another at the front edge. Too much toe-in leads to rapid wear of the outside shoulders of the tyres • Toe-out. This is where the wheels point slightly away from one another at the front edge. Too much toe-out leads to rapid wear of the inside shoulders of the tyres <p>Or:</p> <ul style="list-style-type: none"> • Camber angle out. This is where the wheels are vertically out of alignment, causing long-term smooth tyre wear on one side that creates a pulling or drifting effect <p>Ask the delegates if they have ever driven a vehicle that ‘pulls’.</p> <p>Discuss the symptoms and the actions taken.</p> <p>Explain that misaligned wheel alignment will require constant adjustments from the driver and a ‘fight’ to keep a vehicle straight on the road, as it can often seem like an extra load is being pulled.</p> <p>Explain that tyres not only suffer uneven wear pattern, but there can be an unnecessary build-up of heat leading to premature tyre failure.</p> <p>State that if anyone experiences any of these symptoms, they should document it on the defect sheet and report it immediately.</p>	 <p>WHEEL ALIGNMENT SYMPTOMS</p> <ul style="list-style-type: none"> ■ Toe-in: wheels point towards one another. <ul style="list-style-type: none"> □ Causes wear of the outside shoulders of the tyres ■ Toe-out: wheels point away from one another. <ul style="list-style-type: none"> □ Causes wear of the inside shoulders of the tyres ■ Misalignment causes feathered tyre wear. It can be easily felt by running the palm along the tread <p>53</p> <hr/> <p>WHEEL ALIGNMENT SYMPTOMS</p> <ul style="list-style-type: none"> ■ Camber angle out: wheels are vertically out of alignment. <ul style="list-style-type: none"> □ Causes long term smooth tyre wear on one side ■ This creates a pulling or drifting effect <p>54</p>

Key	Method	Resources
<p>Video 2 – Part 2 Wheels – Going Straight</p>	<p>Introduce and show Video 2 – Part 3 (1m 7s), which specifically focuses on a company doing its daily vehicle checks and the environmental impacts of poor maintenance. The video includes:</p> <ul style="list-style-type: none"> • The impact of wheel alignment and tracking on fuel efficiency • Moving off – dragging brakes, steering pulling, obvious tracking issues • The detailed checks on wheel alignment to be considered 	<p>VIDEO 2 PART 3</p> 
<p>Loading and unnecessary loads</p>	<p>To appreciate the effects of air resistance, aerodynamics and fuel consumption, ask the delegates to imagine putting their hand out of the window of a truck at 50mph.</p> <p>Explain that correct location and orientation of the load can help to save fuel. Any load that is arranged so that it protrudes beyond the sides of the cab (when viewed from the front) will increase the area that is subject to wind resistance and increase aerodynamic drag. Other loading points to note include:</p> <ul style="list-style-type: none"> • Positioning the load as close as possible to the rear of the cab. This is the optimum point to minimise the engine power and torque needed to move the vehicle. If the load is irregular in shape, position the larger end nearest to the cab • Not exceeding legal axle weights. Not only is this illegal, it also increases the workload on the vehicle’s engine • Keeping curtains, curtain straps and buckles taut to minimise any flapping in the wind, and use a cover or sheet on tipper bodies and skip loader bins • Reporting body damage promptly, particularly holes and tears in curtains and load sheets 	<p>LOADING BEST PRACTICE</p> 

Key	Method	Resources
Lesson summary	<p>Summarise the key points of the lesson. Pay particular attention to any issues that have been raised throughout.</p> <p>Ask delegates if they have any questions.</p> <p>Ask some questions of your own. Remember to pose, pause and pounce.</p> <ul style="list-style-type: none"> • What are strategic access routes? (The main arterial routes that take you from the depot to the locality of your delivery or collection) • What does blue smoke from the exhaust mean? (Burning engine oil) • How much fuel efficiency can half a degree misalignment affect? (3-5%) 	 <p>LESSON 2 SUMMARY</p> <p>Taking the time to maintain your vehicle and plan your route can help reduce wasted fuel and mileage. This will reduce the impact you have on the environment, improve air quality and the efficiency of your vehicle.</p> <p>57</p>



Lesson 3

Fuel-efficient driving techniques



Training objectives

Your main aim of this lesson is to discuss the techniques that a driver should adopt to minimise fuel consumption and vehicle emissions.



Key learning points

By the end of the session, delegates will be able to:

- List the typical organisational policy requirements for pre-journey checks, efficient driving and anti-idling
- Explain fuel-efficient driving techniques such as anticipation and appropriate use of gears
- Describe the impact of unnecessary engine idling, and state when to switch off an engine and the benefits of doing so
- Identify the primary dashboard warning lights associated with an increase in unnecessary emissions (eg DPF or tyre pressure systems) and take appropriate action



Timing


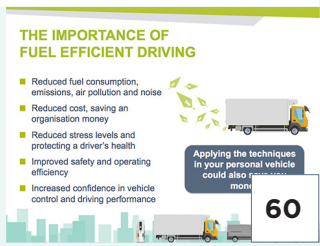
60 minutes



Further resources

Refer to the following for more information relating to this session:

- LoCITY Video 3

Key	Method	Resources
Lesson introduction	<p>Show the lesson title slide.</p> <p>Explain that by the end of the session delegates will be able to:</p> <ul style="list-style-type: none"> List the typical organisational policy requirements for pre-journey checks, efficient driving and anti-idling Explain fuel-efficient driving techniques such as anticipation and appropriate use of gears Describe the impact of unnecessary engine idling, and state when to switch off an engine and the benefits of doing so Identify the primary dashboard warning lights associated with an increase in unnecessary emissions (eg DPF or tyre pressure systems) and take appropriate action 	 <p>Lesson 3 Fuel Efficient Driving Techniques</p> <p>58</p> <p>LESSON 3 OBJECTIVES</p> <p>This lesson will cover the:</p> <ul style="list-style-type: none"> Organisational policy requirements for pre-journey checks, efficient driving and anti-idling Fuel efficient driving techniques Impact of unnecessary engine idling Primary dashboard warning lights associated with emissions <p>59</p>
The importance of fuel-efficient driving	<p>Explain that fuel-efficient driving is the application of professional and efficient driving techniques that get the most out of your vehicle and reduce running costs like fuel, maintenance and tyres.</p> <p>Fuel-efficient driving is not slow driving – a good, fuel-efficient driver will get from A to B in pretty much the same time as a bad, inefficient one, but will use less fuel and feel less stressed.</p> <p>This in turn improves performance and minimises your impact on the environment. It can also save money and improve health.</p> <p>We have already covered social responsibility and the part it plays in our organisational culture. Drivers adopting fuel-efficient driving techniques is key to this. The broad benefits include:</p> <ul style="list-style-type: none"> Reduced fuel consumption, air pollution, CO₂ emissions and noise levels Reduced costs, saving an organisation money Reduced stress levels and protection of a driver's health Improved safety and operating efficiency Increased confidence in vehicle control and driving performance <p>Applying the techniques in your personal vehicle could save you money</p>	 <p>THE IMPORTANCE OF FUEL EFFICIENT DRIVING</p> <ul style="list-style-type: none"> Reduced fuel consumption, emissions, air pollution and noise Reduced cost, saving an organisation money Reduced stress levels and protecting a driver's health Improved safety and operating efficiency Increased confidence in vehicle control and driving performance <p>Applying the techniques in your personal vehicle could also save you money</p> <p>60</p>

Driving styles

Ask the delegates whether they agree that most people are aware that the way a vehicle is driven will affect the fuel used and emissions produced. Then split the delegates into four groups, provide flipcharts and pens, and ask:

- What would you consider to be examples of inefficient driving?
- What would you consider to be examples of efficient driving?
- What are the environmental benefits of efficient driving?
- What are the implications to health of inefficient driving?

Allow 10 minutes for the groups to produce their answers. Ask each group to feed back their comments to the wider group.

Reveal the list of answers and discuss how many of them were identified by the groups. Highlight any answers that were not covered by the groups and explain them in more detail.

DRIVING STYLES EXERCISE

- What would you consider to be examples of inefficient driving?
- What would you consider to be examples of efficient driving?
- What are the environmental benefits of efficient driving?
- What are the implications to health of inefficient driving?



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EXERCISE - FEEDBACK

- | | | |
|--|---|---|
| Inefficient driving <ul style="list-style-type: none"> ■ Hard braking/acceleration ■ Speeding ■ Tailgating ■ Not reading the road, traffic flows ■ Lack of concentration, awareness of other road users ■ Not using correct gears for speed ■ Lack of anticipation | Efficient driving <ul style="list-style-type: none"> ■ Blocked gear changes ■ Maintain momentum ■ Reading the road in advance ■ Driving to the conditions, weather, time, etc. ■ Anti-idling ■ Good route planning, good local knowledge | Benefits <ul style="list-style-type: none"> ■ Better use of fuel ■ Less congestion ■ Reduced noise pollution ■ Less stress on vehicle ■ Less stress on driver ■ Fatigue ■ Stress levels ■ Health impact ■ Air quality reduced |
|--|---|---|

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How you drive

Explain that how a vehicle is driven influences the impact it has on its surroundings, especially harsh acceleration and inappropriate gear selection.

Inefficient driving wastes fuel, which costs money and incurs environmental consequences.

The way you drive can:

- Affect how much is spent refuelling and maintaining your own vehicle
- Affect the corporate image of your company and its profit margin
- Have an impact on the company's carbon footprint
- Affect the safety of you, your passenger and other road users
- Impact on your job security

Good (fuel-efficient) driving has many advantages over and above direct savings in fuel costs and emissions – it is less stressful, safer, healthier, improves public image, lowers the likelihood of breakdowns, leads to fewer damaged loads, etc.

Business viability, job security and the personal benefits of fuel-efficient driving are also direct benefits.



HOW YOUR DRIVING COULD IMPROVE AIR QUALITY



In addition to contributing to poor air quality, the way you drive can:

- Reduce how much is spent refuelling and maintaining the vehicle
- Improve the corporate image of your company and its profit margin
- Reduce your company's carbon footprint
- Improve the safety of you, your passengers and other road users
- Improve on your job security



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Key	Method	Resources
Organisational policy requirements	<p>Ask the delegates:</p> <ul style="list-style-type: none"> • Who has a driver handbook? • Does it include fuel-efficient driving? • If so, what does it say? • When did you last read it? <p>Explain that a robust environmental fleet management policy is vital to ensure that there are clear procedures on what to do to minimise environmental impact and fuel use. It will help ensure that:</p> <ul style="list-style-type: none"> • Vehicles are serviced to maintain optimum performance standards • Drivers are encouraged to adopt and observe fuel-efficient driving techniques • Journeys are planned to minimise distance driven and fuel used • Engine idling is minimised to reduce unnecessary waste • Fleet data is collected and analysed to identify inefficiencies and trends <p>Explain that organisational policies seek to implement measures that:</p> <ul style="list-style-type: none"> • Demonstrate organisational commitment and goals to achieve environmental good practice • Improve awareness of environmental impact and the need to reduce tailpipe emissions • Develop sympathetic attitudes and behaviours that lead to a reduction in fuel use <p>State that LoCITY has used its themes to help communicate organisational policy</p>	<p>ORGANISATIONAL POLICY</p> <ul style="list-style-type: none"> ■ Who has a driver handbook? ■ Does it include fuel efficient driving / idling techniques? ■ If so, what does it say? ■ When did you last read it?  <p>64</p> <hr/> <p>ENVIRONMENTAL FLEET MANAGEMENT POLICY</p> <p>Demonstrate organisational commitment to:</p> <ul style="list-style-type: none"> ■ Improve awareness of environmental impact ■ Maintain vehicles to best performance standards ■ Encourage drivers to adopt and use fuel efficient techniques ■ Ensure journeys minimise distance driven and fuel used ■ Reduce engine idling to cut emissions and fuel consumption ■ Collect and analyse fleet data to identify inefficiencies  <p>65</p>

Key	Method	Resources
<p>Theme 2: Think ahead</p>	<p>Revisit LoCITY theme 2:</p> <ul style="list-style-type: none"> • Think ahead: Observe, anticipate and apply fuel-efficient driving techniques <p>Explain that fuel-efficient driving techniques are generally common sense. Observe, anticipate and think ahead to apply fuel-efficient driving techniques.</p> <p>It means observing, anticipating and thinking ahead to ensure a driver does not need to do anything unnecessary or too sudden. A good driver will:</p> <ul style="list-style-type: none"> • Observe and plan ahead. Keep their vehicle moving and use momentum to save fuel, particularly when ascending and descending • Stay alert. Concentrate and keep their mind on what they are doing-driving • Anticipate everything. Predict the actions of other road users and situations to avoid unnecessary braking and acceleration • Give themselves time to think. Keeping a safe distance, they will not tailgate and will maintain a distance so that they can regulate their speed without using the brakes 	<p>THINK AHEAD</p> <ul style="list-style-type: none"> ■ Observe and plan ahead ■ Stay alert ■ Anticipate everything ■ Positive attitude ■ Give yourself time to think   <p>66</p>

Theme 3:
Smooth ride

Revisit LoCITY theme 3:

- **Smooth ride:** Observe, anticipate and apply fuel-efficient driving techniques

Explain that the more you use the footbrake, the more you will need to use the accelerator.

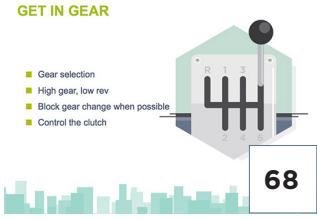
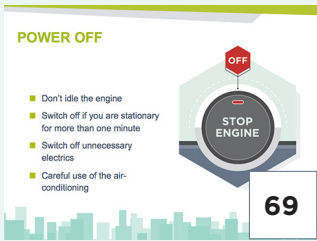
- Accelerate slowly. Maintain as constant a speed as possible and increase speed gradually
- Avoid excessive speed. Driving at high speed greatly increases fuel consumption
- Drive in the green band. Monitor the rev counter and stay in the green band
- Smooth braking will save fuel and reduce stress – on both you and the vehicle
- The footbrake is the most inefficient and wasteful vehicle component. It removes valuable energy and momentum. It takes a lot of power and energy to get your vehicle moving, so do not waste that energy by using the brakes unnecessarily
- Harsh braking increases the number of gear changes and wastes fuel
- Use the engine. When slowing down or driving downhill, take your foot off the accelerator while in gear to initiate engine braking
- Use the exhaust brake. In diesel vehicles, the exhaust brake helps decrease speed more smoothly, increases the lifespan of brake linings and saves fuel

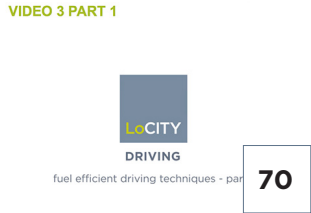

SMOOTH RIDE

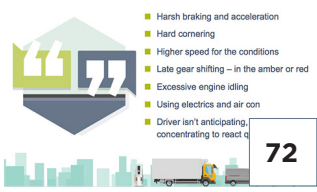
- Accelerate slowly
- Avoid excessive speed
- Drive in the green band
- Smooth braking
- Use the engine
- Avoid harsh braking
- Use the engine and exhaust brakes



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Key	Method	Resources
<p>Theme 4: Get in gear</p>	<p>Revisit LoCITY theme 4:</p> <ul style="list-style-type: none"> • Get in gear: Use your gears wisely to maintain an efficient engine speed <p>Acknowledge that many modern vehicles now have automatic gearboxes. Despite this...</p> <p>Explain briefly how manual gears should be used wisely:</p> <ul style="list-style-type: none"> • Gear selection. Keep the engine speed in the green band – change up to keep in the bottom end • High gear, low rev. The highest gear optimises fuel consumption • Block gear change. Keep gear changes to a minimum. Do you need to use all the gears all the time? • Clutch control. Double declutching is not necessary on modern vehicles and can increase wear and tear 	 <p>GET IN GEAR</p> <ul style="list-style-type: none"> ■ Gear selection ■ High gear, low rev ■ Block gear change when possible ■ Control the clutch <p>68</p>
<p>Theme 5: Power off</p>	<p>Revisit LoCITY theme 5:</p> <ul style="list-style-type: none"> • Power off: Idling gets you nowhere, so switch off when stationary <p>Describe the following:</p> <ul style="list-style-type: none"> • Do not idle the engine – If you expect to be stationary for more than a minute, switch off your engine when you come to a stop. Only restart when you are ready to drive away • Switch off unnecessary electrics – electrical loads reduce fuel efficiency, turn off heated windscreens, demisters and headlights when not needed • Careful use of the air-conditioning – open the window in urban driving environments (low speeds) and use the air-conditioning while driving on A-roads or a motorway (higher speeds). Opening the window at high speeds is even less fuel-efficient than using air conditioning 	 <p>POWER OFF</p> <ul style="list-style-type: none"> ■ Don't idle the engine ■ Switch off if you are stationary for more than one minute ■ Switch off unnecessary electrics ■ Careful use of the air-conditioning <p>69</p>

Key	Method	Resources
<p>Video 3 – Part 1 Fuel-efficient driving techniques</p>	<p>Introduce and show Video 3 – Part 1 (54 seconds), which specifically focuses on a case study of a company that has introduced fuel-efficient driver training. The video includes:</p> <ul style="list-style-type: none"> • Organisational policy requirements • Benefits and changes before and after efficient driving techniques were introduced 	<p>VIDEO 3 PART 1</p> 
<p>Video 3 – Part 2 Fuel-efficient driving techniques</p>	<p>Introduce and show Video 3 – Part 2 (2m 58s), which specifically focuses on a case study of a company that has introduced fuel-efficient driver training. The video includes:</p> <ul style="list-style-type: none"> • Discussion and demonstration of fuel efficient driving techniques • Demonstration drive under normal driving conditions • Emphasise obvious and inefficient driving techniques <p>This video should stimulate discussion on recognising inefficient driving techniques.</p>	<p>VIDEO 3 PART 2</p> 

Key	Method	Resources
Video 3 – Discussion	<p>Discuss the driving that was demonstrated in the video.</p> <p>Ask the delegates what kinds of driving behaviour they have seen in the past that would not demonstrate fuel-efficient driving. Points to discuss include:</p> <ul style="list-style-type: none"> • Unnecessary braking and harsh acceleration • Hard cornering • Speeds within the speed limit but high for the conditions • Late gear shifting – in the amber or red • Excessive engine idling • Using electrics and air-conditioning unnecessarily • Driver is not anticipating or observing effectively to react quickly enough <p>Ask delegates what they identified as good fuel-efficient driving and what specific techniques were identified.</p> <p>The techniques address the issues raised at Video 3 – Part 2, but also underpin and follow the LoCITY Driving themes:</p> <ul style="list-style-type: none"> • Get set: Check your vehicle and prepare for your journey • Think ahead: Observe, anticipate and apply fuel-efficient driving techniques • Smooth ride: The more you brake, the more you need to accelerate • Get in gear: Use your gears wisely to maintain an efficient engine speed • Power off: Idling gets you nowhere, so switch off when stationary 	<p>VIDEO DISCUSSION</p> <ul style="list-style-type: none"> ■ Harsh braking and acceleration ■ Hard cornering ■ Higher speed for the conditions ■ Late gear shifting – in the amber or red ■ Excessive engine idling ■ Using electrics and air con ■ Driver isn't anticipating, concentrating to react q  <p>72</p>

Dashboard warnings

Ask the delegates if they know what the different dashboard warning lights mean.

Explain that the dashboard warning lights let you know when there is a problem with your vehicle.

Knowing what these lights mean and what to do when they are lit will help you protect the engine and other equipment from damage. If any of them start to flash, or if you hear a warning beep, do not ignore it.

Explain that red lights require you to stop in a safe place to rectify the fault, while amber lights warn of a fault that will need attention at the earliest safe opportunity.

The primary dashboard warning lights associated with an increase in unnecessary emissions are:

- Tyre pressure. If there is a fault with the tyre pressures, then you may have picked up a slow puncture. If you keep driving with low tyre pressure then you will use more fuel. Action: You should schedule a stop at the next safe available opportunity and adjust your tyre pressures. You should then monitor for a slow puncture
- Engine emission filter. When you see this warning light, the vehicle's Diesel Particulate Filter (DPF) needs attention and/or servicing. The vehicle may be releasing higher levels of pollutants than it should. You should schedule a stop at the next safe available opportunity and perform a parked regeneration (hold the ON/PARKED REGEN switch in the 'ON' position for two seconds to initiate the regeneration cycle) as soon as possible. This means running the engine at high revs for about 15 minutes
- AdBlue Diesel Exhaust Fluid (DEF). If you see this warning light then the AdBlue DEF level is either low or cannot be read. If the AdBlue DEF tank level is low, the vehicle will slow to a crawl to minimise its emissions. If you are running low on AdBlue you should stop safely and fill up the AdBlue tank
- Idle shutdown. Each time you put on the parking brake when the engine is running, a timer begins. When it reaches the end of its countdown, the engine will turn off to save fuel. A warning sound is heard or the warning light flashes just before this shut down happens

DASHBOARD WARNING LIGHTS INTRODUCTION



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TYRE PRESSURE WARNING LIGHT

- If there's a fault with the tyre pressures, then the vehicle may have picked up a slow puncture
- Driving with low tyre pressure uses more fuel and using extra fuel results in higher emissions



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ENGINE EMISSION FILTER WARNING LIGHT

- When you see this warning light, the vehicle's DPF needs attention
- The vehicle may be releasing higher levels of pollutants than it should
- Don't ignore it. Park up and perform a parked regeneration
- This means running the engine at high revs for a period of time



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ADBLUE LEVEL WARNING LIGHT

- If you see this warning light then the AdBlue DEF level is either low or cannot be read
- The vehicle will slow to a crawl to minimise its emissions
- Stop safely and fill up the AdBlue tank




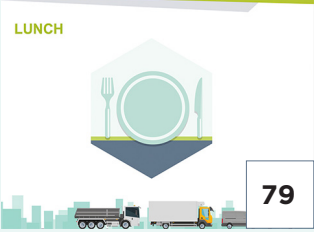
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IDLE SHUTDOWN WARNING LIGHT

- When you put the parking brake on while the engine is running, a timer begins
- When it reaches the end of its countdown, the engine will turn off
- A warning sound is heard or the warning light flashes just before a shutdown occurs



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Key	Method	Resources
Lesson summary	<p>Summarise the key points of the lesson. Pay particular attention to any issues that have been raised throughout.</p> <p>Ask delegates if they have any questions.</p> <p>Ask some questions of your own. Remember to pose, pause and pounce.</p> <ul style="list-style-type: none"> • How does a company communicate its environmental policy to drivers? (Driver handbook) • If you expect to be stationary for more than a minute, what should you do? (Switch off your engine) • What action would you take if your AdBlue light displayed while driving? (Stop safely and fill the AdBlue tank) 	 <p>LESSON 3 SUMMARY</p> <p>Fuel-efficient driving techniques, such as anticipation, gentle acceleration, using appropriate gears and avoiding engine idling, help to reduce fuel consumption, vehicle emissions and risk to health.</p> <p>78</p>
Lunch		 <p>LUNCH</p> <p>79</p>



HYDROGEN REFUELLING STATION

CONTACT TELEPHONE NUMBERS

For assistance with refueling or to
report an issue with the station
please call:

01253 502770

For local security emergencies
please call:

02089 436756



Lesson 4

Journey planning exercise



Training objectives

Your main aim of this lesson is to discuss and practice efficient journey planning techniques and to highlight the external factors that can affect journey time reliability.



Key learning points

By the end of the session, delegates will know:

- How to plan a multi-stop city route in the most fuel-efficient way



Timing


60 minutes



Further resources

Refer to the following for more information relating to this session:

- Journey planning exercise scenario
- Journey planning exercise distance table
- LoCITY journey planning maps

Key	Method	Resources
Lesson introduction	<p>Show the lesson title slide. Explain that by the end of the session, delegates will be able to:</p> <ul style="list-style-type: none"> Plan a multi-stop city route in the most fuel-efficient way <p>Explain that you cannot always rely on technology and data being available. This session is a practical route planning exercise.</p>	
Plan a multi-stop city route in the most fuel-efficient way	<p>Follow the journey planning exercise – trainer guidance below.</p> <p>Read out the scenario.</p> <p>Read out the task.</p> <p>Read out the brief.</p> <p>On completion, read out the debrief but do not reveal the answers until all the groups have reported back their answers.</p>	<p>ROUTE PLANNING EXERCISE – SCENARIO</p> <p>Scenario</p> <p>You are a multi-drop delivery driver working for FE Logistics. FE Logistics provides pallet distribution and operates a fleet of twelve 18-tonne rigid curtain sided trucks from the Green Drive Depot. Your shift pattern is 0800hrs – 1800hrs.</p> <p>You arrive for work and a key driver hasn't turned up for their shift. Your manager states there is a priority delivery on the LoCITY schedule and you are to cover this. The LoCITY schedule is completely new to you.</p> <p>ROUTE PLANNING EXERCISE – TASK</p> <p>Task</p> <p>Your vehicle is a rigid 18-tonne with a height of 3.6m and you have been tasked to deliver to five customer locations. This includes a priority delivery to Peak Practice.</p> <p>You are to deliver to all five customer locations using the most efficient route. You can deliver to the customer locations in any order but the Peak Practice delivery must be completed before 0800hrs. You have been provided with a map with all customer locations plotted. You are to return to the Green Drive Depot on completion.</p> <p>All deliveries are to be made kerbside and Dean Fittings is location with turning facilities. The approximate time for each is 15 minutes.</p> <p>ROUTE PLANNING EXERCISE – BRIEF</p> <p>You have 30 minutes to produce a route plan.</p> <ul style="list-style-type: none"> What order would you deliver to each customer to achieve the most efficient route? What is the approximate distance of your chosen route? What factors did you consider in choosing your route? How many different journey combinations are there? <p>ROUTE PLANNING EXERCISE – DEBRIEF</p> <ul style="list-style-type: none"> What order would you deliver to each customer to achieve the most efficient route? • C – A – E – D – B What is the approximate distance of your chosen route? • 51 miles What factors did you consider in choosing your route? • Railway, bridge, river, school, high street at peak How many different journey combinations are there? • 24
Lesson summary	<p>Summarise the key points of the lesson. Pay particular attention to any issues that have been raised throughout.</p> <p>Ask delegates if they have any questions.</p>	<p>LESSON 4 SUMMARY</p> <p>If you take the time to plan your route you can save yourself wasted miles, avoid congested roads and lower your stress levels.</p> 

Journey planning exercise – Trainer guidance

1. Objective

The objective of this exercise is for delegates to plan a multi-stop route in an urban setting in the most fuel-efficient way. Delegates will also gain an appreciation of the factors to be considered in producing the most efficiently sequenced route for their vehicle to minimise:

- Journey time
- Distance travelled
- Fuel use and emissions

While operating safely and within the law, delegates will take into account the considerations of:

- The road network available
- Its associated vehicle restrictions (such as low bridges/weight restrictions)
- Variable factors (such as congestion hotspots and roadworks)

2. Preparation

This task is for groups of 3–4 delegates. Each group will require:

- Journey planning exercise instructions at **Appendix A**
- LoCITY map at **Appendix B**

Each group will require an area to work to discuss their solution independently of others.

3. Setting up

Explain that the next stage is a group exercise. Split the delegates into smaller groups and provide each group with the scenario resources (task instructions and map).

Step	Note
1. Introduce the group exercise	With the slide 'route planning exercise scenario' displayed on screen
2. Outline the scenario	Talk through the 'route planning exercise scenario' slide
3. Outline the task	Talk through the 'route planning exercise task' slide. Inform delegates that there are further details relating to the scenario that need to be observed
4. Detail the exercise brief	Talk through the 'route planning exercise brief' slide. Leave this slide on screen during the exercise
5. Distribute scenario exercise and map	Inform delegates that: <ul style="list-style-type: none">• They need to read the scenario and examine the map. There are further scenario details that should be observed• They have 30 minutes to determine their solution (provide start and finish time)

Inform delegates that once 30 minutes has elapsed the class will reconvene and be asked to provide feedback on the following brief:

- What order would you deliver to each customer to achieve the most efficient route?
- What is the approximate distance of your chosen route to the nearest five miles?
- What factors did you consider in choosing your route?
- How many different journey combinations do they think there are?

The brief is shown on the slide 'route planning exercise - brief' and is to be left on screen.

4. Running the exercise

Ask the groups to start working on their solution to the brief. During the group exercise, observe the groups and, if necessary, facilitate discussions around the four questions:

Consideration	Note
What is critical about the routing order?	To obey the scenario requirements, the first delivery location must be Location C in order to fit with the delivery time constraint of before 08.00.
Which road classes are you considering using?	The major road network should be used until nearing the delivery locations.
How are you dealing with vehicle restrictions?	There are some restrictions on the network that the vehicle can pass.
What other factors are being considered?	There are schools that should be avoided if possible. Congestion was identified near the hospital.

Distance and time origin-destination matrices for routing combinations are contained in **Appendix C**. These are provided for reference and not for distribution to the delegates. **NOTE** – Calculation of a route distance using the matrix is likely to underestimate the total journey distance. This is due to distances being point to point and therefore not taking into consideration the direction of approach and departure required (due to no turning facilities) for calculation of a real route in line with the scenario requirements.

5. Reporting back

When the 30 minutes has elapsed, ask the groups to select a speaker who will provide feedback on their solution.

Step	Note
Get each group to present their chosen route	Go around the groups and ask for their routing sequence of letters. Record each of the groups' answers and then reveal the preferred solution on the slide. See how many got the right sequence and make sure all had C as the first stop. The most efficient route is C A E D B.
Explain that this could vary even with the same routing, and that variation is likely as this was estimated	Explain that this could vary even with the same routing and it was estimated so variation is likely. The most efficient route is 51 miles.
Ask for feedback on the factors that were considered in choosing the route	Make sure that key factors are all covered: <ul style="list-style-type: none">• Road type• Congestion• Roadworks or closures• Height or weight restrictions• Client requirements (08.00 delivery)
Ask how many routing options there are on the basis that C needs to be the first delivery	The answer is 24. This is four factorial ($4 \times 3 \times 2 \times 1 = 24$). Explain that this means there are lots of options, and therefore large differences in total mileage if the driver does not choose the best sequence.

6. Provide preferred solution

For the closing stage of this activity show the preferred solution map (Appendix D). Explain that this is not the only option but obeys all of the restrictions and uses a suitable route for the vehicle type.

7. Potential questions from delegates

Question	Answer
Will the vehicle require refuelling on the route?	No, the vehicle has sufficient fuel for the delivery route.
Do we need to factor in driver breaks?	No, this exercise is looking at route considerations. Assume that driver breaks would be available at one of the customer locations when required.
Does the priority delivery need to start before 08.00 or be completed by 08.00?	The priority delivery at Location C needs to be completed and the vehicle to have departed the delivery location before 08.00.
How to decide between a shorter route and a longer route on a road of higher category?	Encourage the delegates to use the routes that they believe are most suitable.

8. Appendices

- A. Journey planning exercise instructions
- B. LoCITY map - Delegate
- C. LoCITY map - Solution
- D. Distance and time matrices

Appendix A: Journey planning exercise – Delegate instructions

Scenario

You are a multi-drop delivery driver working for FE Logistics. FE Logistics provides pallet distribution and operates a fleet of 12 18-tonne rigid curtain-sided trucks from the Green Drive depot. Your shift pattern is 06:00-16:00.

You arrive for work and a key driver has not turned up for their shift. Your manager states there is a priority delivery on the LoCITY schedule and you are to cover this. The LoCITY schedule is completely new to you.

Task

Your vehicle is a rigid 18-tonne with a height of 3.6m and you have been tasked to deliver to five customer locations. This includes a priority delivery to Peak Practice. The five customer locations are:

A. Robin Castings B. Clough Catering C. Peak Practice
D. Dean Fittings E. Ram Interiors

You are to deliver to all five customer locations using the most efficient route. You can deliver to the customer locations in any order, but the Peak Practice delivery must be completed before 08.00. You have been provided with a map with all customer locations plotted. You are to return to the Green Drive depot on completion.

All deliveries are to be made kerbside and Dean Fittings is the only location with turning facilities. The approximate time for each delivery is 15 minutes.

Brief

Your vehicle has been loaded and you have completed your walk around checks. The time is now 06.30 and you are due to depart at 07.00.

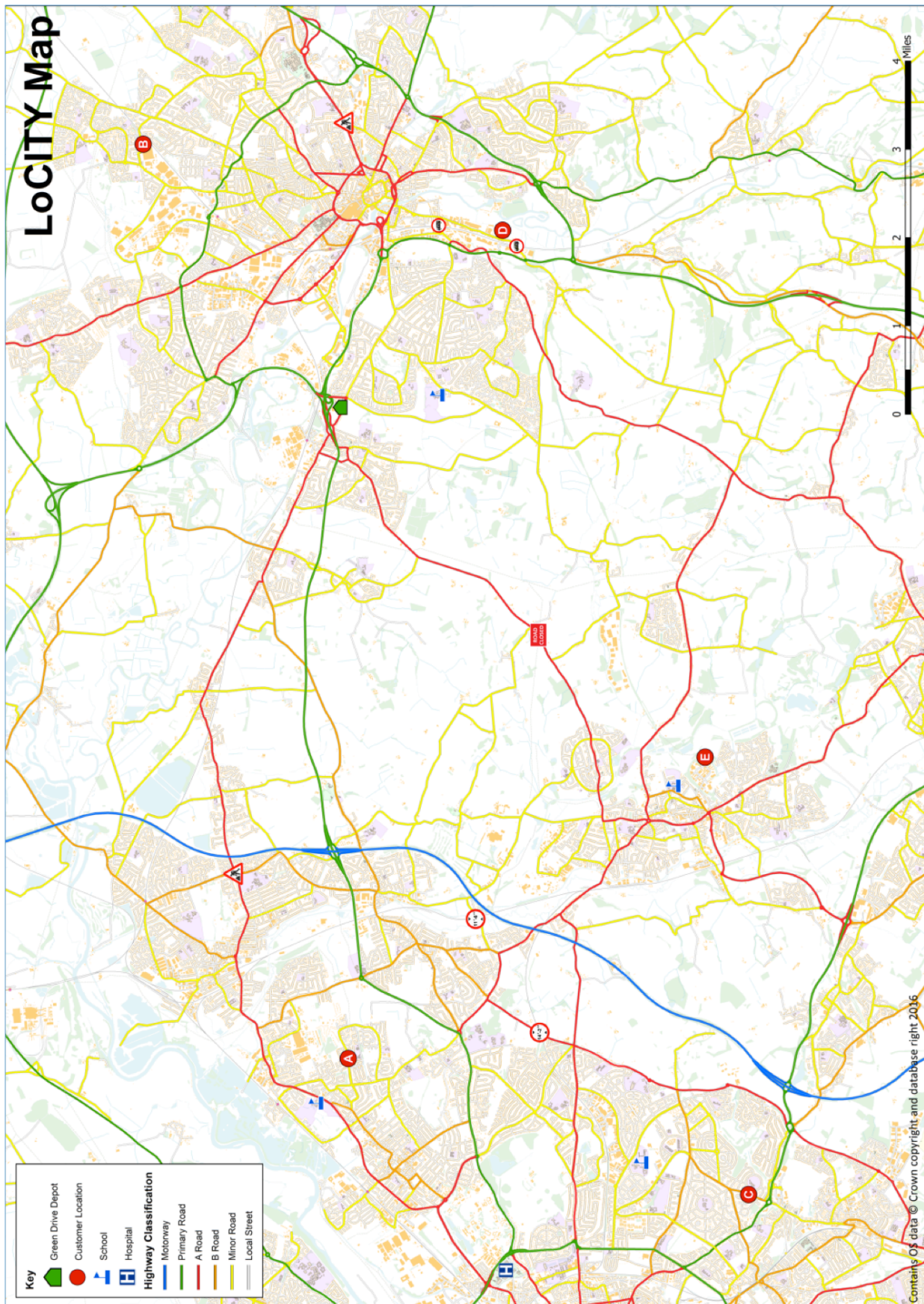
You have 30 minutes to produce a route plan.

- What order would you deliver to each customer to achieve the most efficient route?
- What is the approximate distance of your chosen route?
- What factors did you consider in choosing your route?
- How many different journey combinations are there?

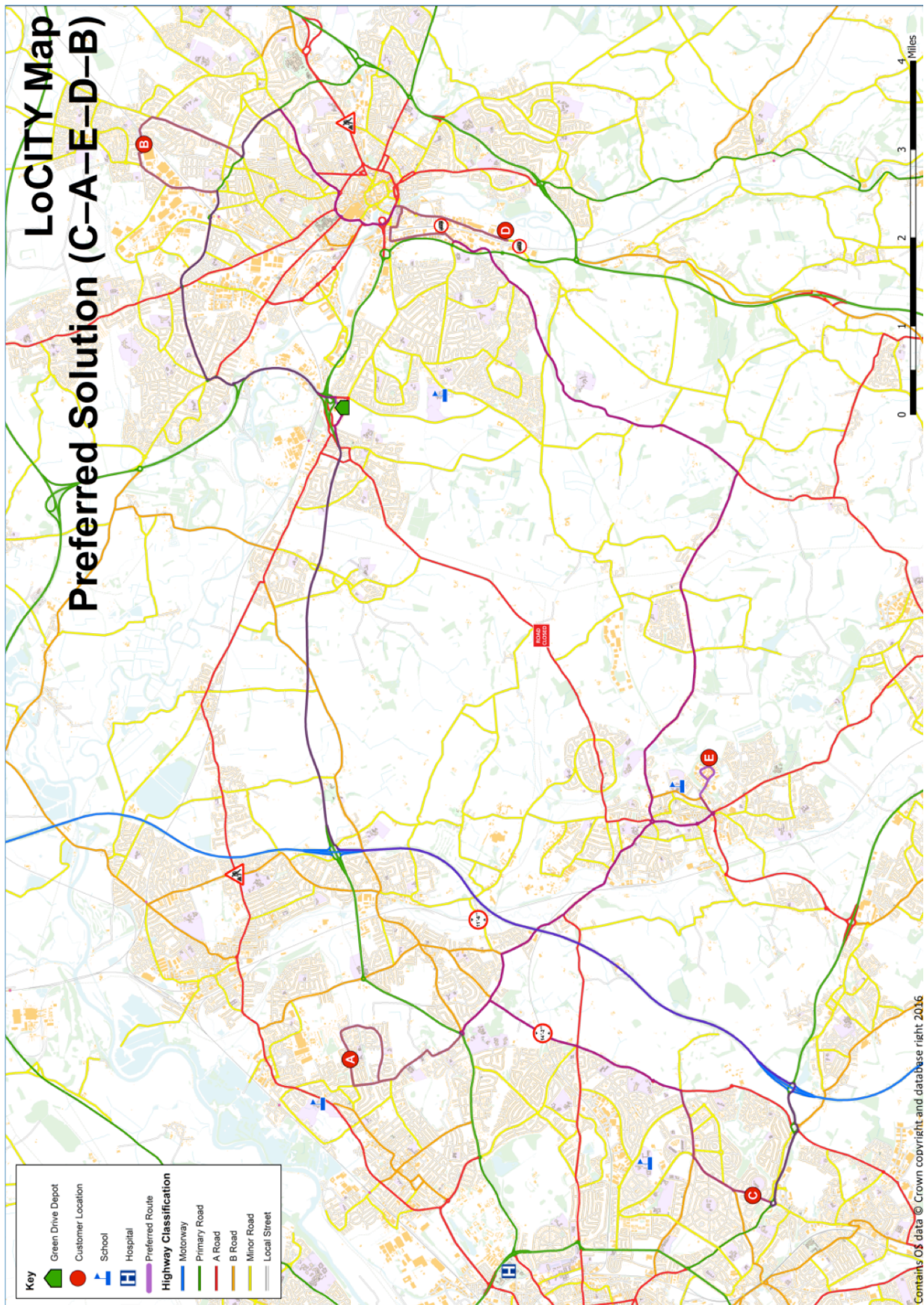
Road conditions

- Today is a weekday in school term time
- The weather is dry but misty and the forecast indicates rain later in the morning
- There is heavy congestion around the hospital following a serious traffic collision

Appendix B



Appendix C



Appendix D: Distance and time matrices

Distance origin destination matrix

Miles	Depot	A	B	C	D	E
Depot	-	9.7	5.9	12.9	4.6	9
A	9.7	-	15.3	6.3	13.5	6.6
B	5.7	15	-	18.3	5.1	14.2
C	13	6.3	18.5	-	16.8	6.6
D	4.2	13.5	5.9	16.7	-	12.1
E	9	6.5	15.3	6.8	12.2	-

Time origin-destination matrix

Minutes	Depot	A	B	C	D	E
Depot	-	20	20	23	13	25
A	20	-	38	23	28	25
B	18	38	-	44	20	44
C	23	23	44	-	30	20
D	10	28	20	30	-	33
E	23	25	44	20	33	-



Lesson 5

Value of vehicle design and technology



Training objectives

Your main aim of this lesson is to discuss the in-vehicle technologies and retrofit features that improve driving skills, help optimise fuel usage and reduce vehicle emissions.



Key learning points




By the end of the session, delegates will be able to:



- List the types of in-vehicle technology products that are designed to optimise fuel efficiency
- State the benefits of in-vehicle technology for drivers, operators and the wider environment
- Explain how to make the best use of in-vehicle technology to improve driving skills
- List other vehicle design features and retrofit technology that optimise fuel efficiency



Timing

- 45 minutes

Key	Method	Resources
Lesson introduction	<p>Show the lesson title slide.</p> <p>Explain that by the end of the session delegates will be able to:</p> <ul style="list-style-type: none"> List the types of in-vehicle technology products that are designed to optimise fuel efficiency State the benefits of in-vehicle technology for drivers, operators and the wider environment Explain how to make the best use of in-vehicle technology to improve driving skills List other vehicle design features and retrofit technology that optimise fuel efficiency 	 <p>Lesson 5 Value of vehicle design and technology 86</p> <p>LESSON 5 OBJECTIVES</p> <p>This lesson will cover the:</p> <ul style="list-style-type: none"> Types of in-vehicle technology to help improve fuel efficiency Benefits of in-vehicle technology Best use of in-vehicle technology to improve driving skills Other vehicle design features and retrofit technology that improve fuel efficiency  <p>87</p>
Euro Standard engines	<p>Ask delegates what Euro Standard engine they drive at work. What do the standards mean?</p> <p>Explain that European emission standards define the acceptable limits for exhaust emissions of new vehicles.</p> <ul style="list-style-type: none"> These are rated as Euro Standards, from I–VI Euro I was introduced in 1992 and Euro VI was introduced on 1 January 2014 Euro VI is the most stringent so far Note that standards for HGV heavy duty diesel engines are referred to in Roman numerals, while standards for cars and vans take modern European numerals (1, 2, 3, 4, etc.) 	 <p>EURO STANDARDS</p> <p>g/kWh (CO₂ emissions)</p> <p>12 10 8 6 4 2 0.0</p> <p>0 2 4 6 8 10 12 14 16</p> <p>88</p>

Key	Method	Resources
<p>In-vehicle technology</p>	<p>Explain that there are various ‘in-vehicle’ technologies on the market that help drivers improve fuel efficiency.</p> <p>Group exercise: What specific in-vehicle technologies have you experienced or used?</p> <p>Facilitate feedback from the groups and list the findings on the flipchart.</p> <p>Discuss the findings. Technologies are often referred to as telematics.</p> <p>Explain that telematics is a broad term, and there are lots of different systems available that have different capabilities.</p> <p>Telematics is a digital method of monitoring a vehicle’s activities. By combining a GPS system with on-board diagnostics, it is possible to record – and map – exactly where a vehicle is, how it is being driven and how fast it is travelling.</p> <p>Some systems can then cross reference this information with how the actual vehicle is mechanically performing.</p> <p>Describe the different types of in-vehicle technology:</p> <ul style="list-style-type: none"> • Active information systems immediately alert the driver if performance is outside an acceptable range, such as harsh acceleration, braking or steering. Active information systems provide continuous automated feedback through an in-cab display. They coach a driver throughout their journey, giving objective, real-time feedback whenever an unsafe or inefficient driving event occurs. Feedback can be audible or visual and helps drivers quickly self-correct without getting distracted. Alerting drivers of inefficient driving behaviour through real-time information such as harsh braking, acceleration and steering enables the driver to take instant action and can generate significant fuel savings 	<p>IN-VEHICLE TECHNOLOGY EXERCISE</p>  <p>There are various ‘in-vehicle’ technologies on the market that help drivers improve fuel efficiency. What specific technologies have you experienced?</p> <p>89</p> <p>EXERCISE - FEEDBACK</p>  <p>Fuel efficiency technology and features:</p> <ul style="list-style-type: none"> □ Active information systems alert the driver of harsh acceleration, braking or steering □ Passive monitoring systems where performance information is stored and later retrieved for review □ A vehicle’s tachograph is a passive monitoring system □ Camera monitoring systems perform both an active and passive □ Other active features are cruise control and ABS <p>90</p>

Key	Method	Resources
In-vehicle technology (continued)	<ul style="list-style-type: none"> • A vehicle's tachograph is also a passive monitoring system that provides valuable information to fleet managers on vehicle speed and distance, together with the driver's shift activity • Camera monitoring systems perform both an active and passive role. Although not usually fitted for fuel efficiency purposes, they do provide the driver with continuous visual information and continually record events that can be used for review, feedback and training • There are also other active features that help ensure the vehicle does not exceed a prescribed performance range. Typically, these include the vehicle's speed limiter, cruise control and active braking systems 	

Benefits of in-vehicle technology



Explain that one of the biggest challenges in utilising in-vehicle technology effectively is what is it capable of. In-vehicle technology is a bit like a smartphone; it has lots of different functionalities, but we only use a fraction of them.


In-vehicle technology can ensure operators know where vehicles are being driven and how they are being used.



Achieving lower fuel use and reducing emissions are just two of the benefits of lower mileage and improved driving standards.

Other benefits include automatic mileage updates to enable proactive servicing and timely vehicle replacement. Tracking systems are able to identify a vehicle's location, so the right vehicle and driver can be sent to the closest job. Typical journey patterns can be monitored and reviewed to establish the most efficient route.



Key	Method	Resources
<p>Video 4 – Part 1 In-vehicle technology</p>	<p>Introduce and show Video 4 – Part 1 (2m 25s), which specifically focuses on the in-vehicle technologies and devices available, and features a case study of companies that have used them. The video includes:</p> <ul style="list-style-type: none"> • A summary of what technology products are available on the market that are specifically related to driving standards: <ul style="list-style-type: none"> – Telematics, tracking and speed limiters – Passive driver monitoring – information stored and/or passed to managers for later review/feedback – Active driver feedback – alerts the driver if their behaviour is outside the acceptable range, eg harsh acceleration, braking or steering • Details of systems that helps help drivers to develop their skills can be used to recognise/ reward those skills • Comments from the companies that have used and benefitted from them 	<p>VIDEO 4 PART 1</p> 
<p>Using technology to improve driving</p>	<p>Explain that modern systems have easy to read charts to help fleet managers get quick visibility of broad trends across the whole fleet, as well as the details of individual vehicles, drivers and trips.</p> <p>Some drivers are not fully aware of bad habits they have developed over the years. In-vehicle technology can provide real-time feedback, analysing and translating driving performance into a simple score for each driver and an entire fleet.</p> <p>Generally, the lower the score, the better and more efficient the driver.</p> <p>Scores can be compared in league tables that can help inspire better, more efficient driving.</p> <p>Managers can track scores by fleet, team, driver and vehicle.</p>	<p>USING TECHNOLOGY TO IMPROVE DRIVING</p> <ul style="list-style-type: none"> ■ Provide easy to read charts ■ Trends individual vehicles, drivers and trips can be identified ■ Provide real-time feedback on performance ■ The lower the score, the better and more efficient the driver ■ Scores can be compared in league tables ■ Scores by fleet, team, driver and vehicle can be tracked 

Key	Method	Resources
<p>Vehicle design and retrofit technology</p>	<p>Describe other vehicle design features and retrofit technology that optimise fuel efficiency</p> <ul style="list-style-type: none"> • Aerodynamic trailers have high potential to reduce fuel consumption and emissions by 10%. These features are currently limited to articulated trailers but the greatest benefit will be from fleets with higher average speeds and mileages • Aerodynamic fairings can be fitted to the vehicle to reduce wind resistance and drag. These include cab deflectors, trailer side skirts, cab collars and, since recently, boat tails • Low rolling resistance tyres can make a significant contribution to fuel consumption and up to a 5% CO₂ emission reduction. Rolling resistance is wasted energy, and tyre choice is key to minimise this waste • Spray reduction mud flaps reduce spray by 40% and also have aerodynamic benefits. They are designed to separate water from air and can help reduce fuel consumption and emissions by around 3.5%. This can be affected by weather conditions, however • Fuel economy lubricants are based on a special formula that helps to save more fuel than conventional oils. These apply generally to engine oil, but can also relate to transmission oils for gearboxes and axles. You can significantly reduce fuel consumption by improving the performance of the engine and other vehicle components • Lightweighting is a manufacturing concept to make vehicles less heavy. Reducing vehicle weight achieves better fuel efficiency and vehicle handling. Vehicle manufacturers are now making parts from lighter metals, carbon fibre, plastics and aluminium foam as ways to reduce the overall weight of the vehicle • Journey planning and routing applications help remove unnecessary mileage and maximise the miles that vehicles do every day. They can fulfil customer deliveries in the most cost-effective and fuel-efficient way. 	<p>VEHICLE DESIGN AND RETROFIT TECHNOLOGY</p> <ul style="list-style-type: none"> ■ Aerodynamic trailers ■ Aerodynamic fairings ■ Low rolling resistance tyres ■ Spray suppression mud flaps ■ Fuel economy lubricants ■ Lightweighting ■ Journey planning and routing applications  <p>94</p>

Key	Method	Resources
<p>Video 4 – Part 2</p> <p>Other technology</p>	<p>Introduce and show Video 4 – Part 2 (1m 37s), which specifically focuses on the in-vehicle technologies and devices available, and features a case study of companies that have used them. The video includes:</p> <ul style="list-style-type: none"> • A summary of other technology products and devices available on the market that contribute to improving fuel efficiency: <ul style="list-style-type: none"> – Camera monitoring systems that digitally record the actions of the driver and other road users – Journey planning and routing tools, sat navs and live traffic information that can help minimise congestion – Other devices: Low rolling resistance tyres, aerodynamic aids, advanced lubricants, light-weighting • Comments from the companies that have used and benefitted from them 	<p>VIDEO 4 PART 2</p>  <p>95</p>
<p>Lesson summary</p>	<p>Summarise the key points of the lesson. Pay particular attention to any issues that have been raised throughout.</p> <p>Ask delegates if they have any questions.</p> <p>Ask some questions of your own. Remember to pose, pause and pounce.</p> <ul style="list-style-type: none"> • When was Euro VI standard engine introduced? (1 January 2014) • What is an active information telematics system? (Provides continuous feedback to the driver through an in-cab display) • What fuel efficiency retrofit vehicle features are available? <ul style="list-style-type: none"> – Aerodynamic trailers – Aerodynamic fairings – Low rolling resistance tyres – Spray reduction mud flaps – Fuel economy lubricants 	<p>LESSON 5 SUMMARY</p> <p>In-vehicle technology can provide data that can help you to improve the efficiency of your driving and your vehicle. Vehicle design and retrofit technology can also reduce fuel consumption and lower emissions.</p>  <p>96</p>



Lesson 6

Monitoring, measuring and managing driving performance



Training objectives

Your main aim of this lesson is to appreciate how, and the reasons why, your driving performance is monitored, measured and managed.



Key learning points

By the end of the session, delegates will be able to:

- List the methods a fleet operator typically uses to monitor, measure and analyse driver performance
- Outline how to best use in-vehicle technology and other methods to provide accurate data and feedback on driving performance
- Identify typical incentives that fleet operators can use to encourage and reward efficient driving performance
- List the ways an organisation can give feedback and help improve driving performance



Timing



- 45 minutes



Further resources

Refer to the following for more information relating to this session:

- ACAS - How to manage performance
- ACAS - Managing performance for small firms
- Fleet Data Insight - Driver performance

Key	Method	Resources
Lesson introduction	<p>Show the lesson title slide. Explain that by the end of the session, delegates will be able to:</p> <ul style="list-style-type: none"> List the methods a fleet operator typically uses to monitor, measure and analyse driver performance Outline how to best use in-vehicle technology and other methods to provide accurate data and feedback on driving performance Identify typical incentives that fleet operators can use to encourage and reward efficient driving performance List the ways an organisation can give feedback and help improve driving performance 	
Managing performance	<p>Explain that efficiency on the road is not just about vehicle performance, but also about driver performance. This is why methods are in place to monitor, measure and manage this. If it is not being measured, it cannot be managed.</p> <p>Group exercise: Managing performance. What are the different ways drivers are managed in an operation?</p> <ul style="list-style-type: none"> Which examples make a positive contribution to fuel efficiency? Which examples can make a negative contribution to fuel efficiency? <p>Facilitate feedback from the groups and list the findings on the flipchart.</p> <p>Discuss the findings. Compare them with the fundamentals of job descriptions and objectives.</p> <ul style="list-style-type: none"> Ask who has a job description. <p>Explain that the job description outlines the competencies for the role of the driver and therefore the baseline for performance measuring.</p> <ul style="list-style-type: none"> Ask who has personal objectives. 	

Key	Method	Resources
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Managing performance (continued)

Explain that personal objectives provide the benchmark that determines good or poor performance. Objectives should be based on behaviour as well as output; not only is what you do important, but how you do it. What is a typical personal objective for a driver that is linked to fuel efficiency?

- **Ask** whose operation has clearly defined organisational goals. Do drivers know where they fit into achieving them?

Competencies and objectives help encourage behaviours that lead to high performance.

- **Ask** whose operation has a performance appraisal process.

The performance appraisal is the most visible tool of performance management; it relies on meetings between the manager and the driver to define and review performance objectives and review progress in achieving these objectives.

Performance management data

Explain that the widespread uptake of telematics has provided operators with greater detail of the performance of a vehicle and a driver on every single journey.

Most telematics systems use a scoring method and award grades to reflect driver behaviour in key areas such as braking, harsh acceleration, anticipating the road ahead, gear changing, and can also identify use of cruise control and excessive idling.

Technology measures can also range from measuring the temperature of sensitive or dangerous goods all the way to detecting whether a driver is under the influence of drugs or alcohol.

If a business collects data, it also has an obligation to use it.

So, with such a transparency of driver data, how does a manager use it?

PERFORMANCE MANAGEMENT DATA

- Telematics provide good vehicle and driver performance data
- Most telematics systems use a scoring method and award grades to reflect driver behaviour in key areas such as:
 - Braking
 - Harsh acceleration
 - Gear changing
 - Use of cruise control
 - Excessive idling
- If a business collects data, it also has an obligation to use it.

101

Miles per gallon

Facilitate a short discussion about mpg and the typical mpg of an artic and a rigid.

Ask the delegates to share the average mpg of the vehicle they drive regularly.

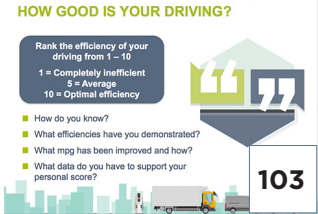
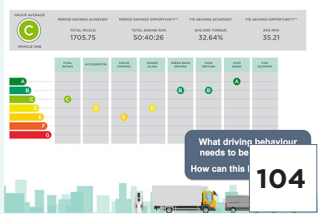
MILES PER GALLON


What does a 5% fuel efficiency gain look like?



9 mpg

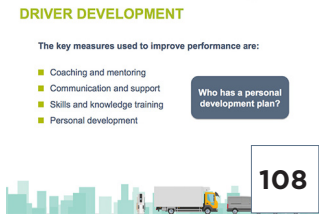

8 mpg

102

Key	Method	Resources
<p>How good is your driving?</p>	<p>Ask the delegates to rank the efficiency of their driving from 1-10 (with one being completely inefficient, 10 being the optimal efficiency, and five being average).</p> <p>Facilitate a discussion about the self-assessed scores. Ask questions such as:</p> <ul style="list-style-type: none"> • How do you know? • What efficiencies have been realised? • What mpg has been improved and how? • What data do you have to support your personal score? <p>The exercise should outline that many drivers believe that they are at the top of their game. Some can take offence to feedback, regarding it as criticism.</p> <p>State that at the end of this course, you will be asking for feedback. Feedback is an essential mechanism to performance improvement. Explain that as long as the feedback is constructive, no offence will be taken, no comments will be taken personally, and feedback will help you improve.</p>	
<p>Telematics reporting</p>	<p>Facilitate discussion on the types of telematics technology used in the delegate operations.</p> <ul style="list-style-type: none"> • What systems are used? • How is the information used? • Do they see the data? <p>Ask who has seen their detailed driver report before.</p> <p>Prompt drivers to return to their companies and ask to see their own reports.</p>	

Key	Method	Resources
<p>Incentives and reward methods</p>	<p>Open the lesson with a discussion.</p> <p>Ask the delegates whose operation rewards good performance. Is performance management transparent and fair?</p> <ul style="list-style-type: none"> • What reward methods are used? • What reward methods should be used? • What rewards should be used? <p>Rewards should always be linked to performance measures.</p> <p>Communicating the results through competitive league tables</p> <ul style="list-style-type: none"> • We all like a game. A game that appeals to drivers making performance management – specifically aspiring for high performance – more relevant, enjoyable and engaging to drivers • League tables that compare the performance of drivers and teams against peers can spark healthy competition <p>Ask the delegates if internal recognition is enough on its own to motivate or change and improve behaviour.</p> <p>Explain that typical performance reward methods include:</p> <ul style="list-style-type: none"> • Financial rewards, such as driver bonus schemes. These are a good way of changing behaviour, but the desired behaviours must be encouraged • Many financial rewards can encourage the wrong behaviour, however <p>Ask the delegates what type of financial reward can encourage the wrong behaviour. (Pay per load).</p> <p>Other reward schemes include:</p> <ul style="list-style-type: none"> • Prizes and gifts. A points scheme can be introduced, with collected points traded for gift vouchers. Points could be awarded for hitting specific performance targets • Career rewards. Rewards linked to drivers' professional development could include promotion, vocational qualifications, training, development, or new responsibilities 	<p>INCENTIVES AND REWARDS</p> <ul style="list-style-type: none"> ■ League tables ■ Financial rewards ■ Prizes and gifts ■ Career rewards <p>Is internal recognition enough on its own to motivate or to change and improve behaviour?</p> <p>What type of reward can encourage the right behaviour?</p>  <p>105</p>

Key	Method	Resources
<p>Incentivising good performance</p>	<p>Explain that a performance management system helps an operator regularly review performance and identify poor performance early.</p> <p>The first principle of a performance management system using vehicle efficiency data should be to communicate positive results and good performance. We have already covered incentives in the previous section.</p> <p>Ask delegates:</p> <ul style="list-style-type: none"> • What reward methods are used? • What reward methods should be used in your operation? <p>Explain that rewards should always be linked to performance measures.</p>	
<p>Poor performance</p>	<p>Explain that managing poor performance is much more sensitive to deal with, and that most problems to do with performance are due to management.</p> <p>A good manager will be able to recognise factors that could lead to poor performance in the operation and appreciate that many of these are outside the individual driver's control.</p> <p>Facilitate a group discussion on poor performance.</p> <ul style="list-style-type: none"> • What factors lead to poor performance but are outside the driver's control? • What factors lead to poor performance and are within the driver's control? <p>Poor performance could be caused by:</p> <ul style="list-style-type: none"> • Inadequate training • Inadequate resources • Poor communication within the organisation • Poor change management practices • Poor leadership and direction from management • Heavy workloads • Personal issues • Stress 	

Key	Method	Resources
<p>Driver development</p>	<p>Explain that supporting and addressing issues positively is good practice driver development, as is only using disciplinary measures when absolutely necessary. It is important to discuss the causes of poor performance so that practical solutions can be agreed.</p> <p>The most fundamental ways in which an organisation can give you feedback on driving and help improve performance are:</p> <ul style="list-style-type: none"> • Coaching and mentoring • Communication and support • Skills and knowledge training • Personal development <p>Driver development is an important contributor to improved operational performance, which is why you are here today.</p> <p>Ask delegates if they have personal development plans, or even a structured approach to their five years' Driver CPC.</p>	 <p>DRIVER DEVELOPMENT</p> <p>The key measures used to improve performance are:</p> <ul style="list-style-type: none"> ■ Coaching and mentoring ■ Communication and support ■ Skills and knowledge training ■ Personal development <p>Who has a personal development plan?</p> <p>108</p>
<p>Lesson summary</p>	<p>Summarise the key points of the lesson. Pay particular attention to any issues that have been raised throughout.</p> <p>Ask delegates if they have any questions.</p> <p>Ask some questions of your own. Remember to pose, pause and pounce.</p> <ul style="list-style-type: none"> • What is the best way of capturing driver performance data? (Telematics) • What incentives and reward methods are used to improve performance? (League tables, financial, prizes) • What factors lead to poor performance? (Refer to slide 102) 	 <p>LESSON 6 SUMMARY</p> <p>In-vehicle technology can be used by managers to identify areas for improvement in the performance of their drivers. Thinking about the factors that are in your control could improve the safety and fuel efficiency of your driving.</p> <p>109</p>

ON BRIDGE



IVECO

DN52 GVA

LVH-103

RX07 NSU

LBI2 OZC

Setting a New Standard

Lesson 7

Alternative fuels in commercial vehicles



Training objectives

Your main aim of this lesson is to introduce delegates to the range of alternative, cleaner fuels that are set to replace diesel and petrol engines in the future.



Key learning points

By the end of the session, delegates will be able to:

- List the main fuels and technologies that are expected to displace use of petrol and diesel engines
- Outline the definition and overview of each alternative fuel and their benefits to drivers, operators and society
- Explain the benefits and limitations of alternative fuels in terms of their performance, cost and fuel availability
- Describe the barriers to moving from conventional vehicles to more sustainable, cleaner fuelled vehicles



Timing


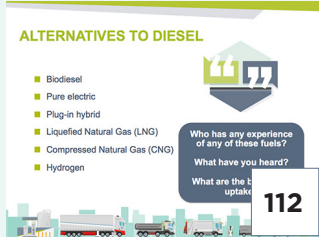
30 minutes

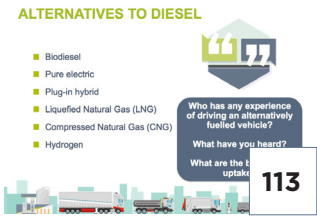


Further resources

Refer to the following for more information relating to this session:

- LoCITY Driving fact sheets on alternative fuels used in commercial vehicles

Key	Method	Resources
Lesson introduction	<p>Show the lesson title slide. Explain that by the end of the session, delegates will be able to:</p> <ul style="list-style-type: none"> List the main fuels and technologies that are expected to displace use of petrol and diesel engines Outline the definition and overview of each alternative fuel and their benefits to drivers, operators and society Explain the benefits and limitations of alternative fuels in terms of their performance, cost and fuel availability Describe the barriers to move from conventional vehicles to more sustainable cleaner fuelled vehicles 	 <p>Lesson 7 Alternative fuels and their use in commercial vehicle fleets</p> <p>110</p> <p>LESSON 7 OBJECTIVES</p> <p>This lesson will cover the:</p> <ul style="list-style-type: none"> Main fuels and technologies that will displace use of petrol and diesel engines Overview for each alternative fuels and their benefits for drivers, operators and society Benefits and limitations of cleaner fuels with regard to performance, cost and availability Barriers to move from conventional vehicles to cleaner fuelled vehicles <p>111</p>
Alternatives to diesel	<p>Explain that the current market is dominated by diesel engines – by diesel engines, meaning there is a clear role for biodiesel as a transitional fuel. In addition to biodiesel, other fuels and energy sources include:</p> <ul style="list-style-type: none"> Pure electric Plug-in hybrid Liquefied Natural Gas (LNG) Compressed Natural Gas (CNG) Hydrogen <p>Ask the delegates if they have any experience of any of these fuels, or if they have heard about the experiences of others.</p>	 <p>ALTERNATIVES TO DIESEL</p> <ul style="list-style-type: none"> Biodiesel Pure electric Plug-in hybrid Liquefied Natural Gas (LNG) Compressed Natural Gas (CNG) Hydrogen <p>Who has any experience of any of these fuels? What have you heard? What are the biggest uptake</p> <p>112</p>

Key	Method	Resources
<p>Alternatives to diesel feedback</p>	<p>Use information on each fuel below to help bust any myths that have been raised.</p> <p>Points raised may include:</p> <ul style="list-style-type: none"> • Operators may be reluctant to change • Uncertainty around reliability – however, many of the early teething problems have already been overcome, and confidence in the technologies can only grow • Initial costs – while new technologies are often more expensive than the old ones in the short term, they are cheaper in the long term • Ongoing costs – but these are usually already cheaper, eg electric • A shortage of refuelling points – but the infrastructure is expanding and will do so even more as the number of vehicles increases • Safety issues – but there is no evidence of any adverse safety impacts • Fear that the product will become obsolete – but such risks diminish as market share grows. Do you really believe that trucks will still be running on diesel engines in 2030? How about 2040? 2050? 	 <p>ALTERNATIVES TO DIESEL</p> <ul style="list-style-type: none"> ■ Biodiesel ■ Pure electric ■ Plug-in hybrid ■ Liquefied Natural Gas (LNG) ■ Compressed Natural Gas (CNG) ■ Hydrogen <p>Who has any experience of driving an alternatively fuelled vehicle? What are the latest uptake?</p> <p>113</p>

Biodiesel


Discuss the biodiesel fact sheet.



- **Overview** – Biodiesel is a sustainable and renewable source of energy. It is a clean burning renewable fuel made using natural vegetable oils and fats. LoCITY only supports biodiesel made from waste products, such as used cooking oil. Fuel suppliers are allowed to blend biodiesel into regular diesel of up to 7%. This is known as B7 and is compatible with any vehicle
- **Benefits** – Biodiesel vehicles normally emit less particulate matter with similar, or marginally increased, NO_x emissions. As biodiesel is a renewable fuel, life-cycle CO₂ reductions of around 28% are available when using B30 manufactured from used cooking oil
- **Drawbacks** – A vehicle's fuel delivery system has to be designed to work with biodiesel, and manufacturers will recommend more frequent maintenance. Stronger blends can be used without engine modification, but a manufacturer warranty may not cover stronger biodiesel blends. Contact your manufacturer first before trialling biodiesel. There are also no publicly available biodiesel refuelling stations
- **Performance** – Biodiesel can be used as a replacement for petroleum diesel fuel, or can be blended with petroleum diesel fuel in any proportion. Biodiesel is blended at different ratios. 100% biodiesel is referred to as B100, and 20% biodiesel/80% petro-diesel as B20, and so on. Biodiesel vehicles have a similar range as diesel and are ideal for operation in cities, suburbs and on motorways
- **Misconceptions** – Availability, costs and overall sustainability impacts depend on production routes. Biodiesel from waste streams tend to be very good (eg used cooking oil), but have limited supply. Some (but not all) crop-based biofuels can be very bad, particularly due to land use change impacts
- **Typical model**
 - Make: DAF
 - Model: CF
 - Load capacity: Same as diesel equivalent



BIODIESEL

- Overview
- Benefits
- Drawbacks
- Performance
- Misconceptions
- Typical model

**114**

Key	Method	Resources
Pure electric	<p>Discuss the pure electric fact sheet.</p> <ul style="list-style-type: none"> • Overview – Pure-electric vehicles are powered entirely by an electric motor. They are best suited for city or suburban driving, and drivers can take them home if they have charging facilities. They are classed as zero tailpipe emission vehicles • Benefits – Electric vehicles produce zero emissions at the tailpipe. They offer CO₂ savings of up to 35% when compared to diesel, even when taking electricity generation into account. Electric vehicles get a 100% discount on London’s Congestion Charge • Drawbacks – Pure-electric vehicles have a typical range of about 100 miles. The battery weight reduces payload slightly, depending on the size of the vehicle. Pure-electric vehicles are more expensive to buy, but running costs are much lower than petrol or diesel equivalents • Performance – Battery-electrics are best suited to city and suburban environments. They can be plugged into conventional chargers and take around eight hours to charge with a standard charger • Misconceptions – These include concerns about poor range and expense. However, when used for city or suburban driving with recharging facilities on hand, these vehicles are an economical solution due to their low running costs • Typical model <ul style="list-style-type: none"> – Make: Nissan – Model: e-NV200 – Load capacity: 770kg, 4.2m³ 	<p>PURE ELECTRIC</p> <ul style="list-style-type: none"> ■ Overview ■ Benefits ■ Drawbacks ■ Performance ■ Misconceptions ■ Typical model  <p>115</p>

Key	Method	Resources
Plug-in hybrid	<p>Discuss the plug-in hybrid fact sheet.</p> <ul style="list-style-type: none"> • Overview – The plug-in hybrid is a sensible option if you have to drive in the city and go out of town for longer distances. It has a normal engine and a battery-powered electric motor. It can run entirely off the battery, in electric mode, or in hybrid mode, where both electricity and conventional fuel are used. New models are appearing as battery technologies improve • Benefits – A plug-in hybrid can operate on petrol or diesel when the battery depletes, so there are no range limitations. It uses less fuel and is cheaper to run than a conventional vehicle. It is very good for air quality (zero emission) and has low noise when in electric mode • Drawbacks – Plug-in hybrids cost more than conventional models. Also, their large batteries make them heavier, which means payload is slightly reduced. Load space, however, is unaffected • Performance – Expect 30 miles in pure-electric mode. The standard size fuel tank will keep you on the road for as long as a normal vehicle. The hybrid is well suited for city, suburban and occasional motorway driving • Recharging – Takes five hours using a standard charger, which is ideal for filling up at the depot between shifts • Misconceptions – There have been concerns about the range, cost and availability of plug-in refuelling. However these issues are being addressed by improvements in technology and infrastructure • Typical model <ul style="list-style-type: none"> – Make: TEVVA – Model: EURO 6/IV – Gross vehicle weight: 7.5 tonne 	<p>PLUG IN HYBRID</p> <ul style="list-style-type: none"> ■ Overview ■ Benefits ■ Drawbacks ■ Performance ■ Misconceptions ■ Typical model   <p>116</p>

Key	Method	Resources
Liquefied Natural Gas (LNG)	<p>Discuss the LNG fact sheet.</p> <ul style="list-style-type: none"> • Overview – LNG vehicles have achieved steady growth in recent years and are already popular in Europe. At least three major truck manufacturers already offer, or plan to offer, gas-powered vehicles. Retrofit conversions are also possible • Benefits – The vehicles are quieter and emit fewer pollutants than diesels. They also offer reduced fuel costs • Drawbacks – The vehicles are less efficient than diesels. LNG is a fossil fuel, so its use affects climate change and offers limited environmental benefits. The availability of gas refuelling stations is limited, but improving. Retrofit conversions can suffer from ‘methane slip’, resulting in pollution from unburned methane; however, companies are working to fix this • Performance – LNG vehicles are well suited to long-distance driving, with a range of up to 500 miles, depending on the number of gas cylinders. They operate well in any driving environment, with a similar performance to diesels • Misconceptions – These include concerns about safety, but LNG tanks are very sturdy and will withstand an impact better than a conventional fuel tank • Typical model <ul style="list-style-type: none"> – Make: Iveco – Model: Stralis – Load capacity: Same as diesel equivalent 	<p>LIQUEFIED NATURAL GAS (LNG)</p> <ul style="list-style-type: none"> ■ Overview ■ Benefits ■ Drawbacks ■ Performance ■ Misconceptions ■ Typical model   <p>117</p>

Compressed Natural Gas (CNG)


Discuss the CNG fact sheet.



- **Overview** – CNG vehicles use the same gas used to power central heating boilers and cookers. CNG is stored on the vehicle in pressurised cylinders and used in a spark ignition engine. CNG is a fossil fuel. However, biomethane is available, which is a renewable and sustainable version. Biomethane is produced from organic waste and can be directly used in CNG vehicles
- **Benefits** – They are quieter, emit fewer pollutants than diesel, and load space is not affected. CNG vehicles are good for air quality; they are quiet and emit similar levels of CO₂ to diesel vehicles. If operated on biomethane, fuel life cycle CO₂ savings of over 60% are available
- **Drawbacks** – The vehicles are less efficient than diesels and CNG is a fossil fuel so its use affects climate change and offers limited environmental benefits if biomethane isn't used. Payload is often reduced by about 10% due to the weight of the gas tanks. The availability of gas refuelling stations is limited, but improving.
- **Performance** – CNG vehicles can undertake similar duties to regular diesel vehicles due to the long range available between refuelling. They are well suited to long distance driving, with a range of up to 300 miles, depending on the number of gas cylinders. They operate well in city, suburbs, motorway with a similar performance to diesels
- **Misconceptions** – These include concerns about safety, but CNG tanks are very sturdy and will withstand an impact better than a conventional fuel tank
- **Typical model**
 - Make: Volvo
 - Model: FE CNG
 - Load capacity: Same as diesel equivalent

COMPRESSED NATURAL GAS

- Overview
- Benefits
- Drawbacks
- Performance
- Misconceptions
- Typical model



Key	Method	Resources
Hydrogen	<p>Discuss the hydrogen fact sheet.</p> <ul style="list-style-type: none"> • Overview – Hydrogen vehicles emit nothing but water. Hydrogen is used to generate electricity through a fuel cell. There are a number of different models currently available in the UK. Fuel cells can be retrofitted to battery-electric vans • Benefits – Hydrogen vehicles do not reduce air quality because they only produce water when the fuel is used. They usually have a much longer range than pure-electric vehicles • Drawbacks – Fuel cell technology is expensive and there is a limited number of hydrogen refuelling stations in the UK • Performance – Hydrogen fuel cell vehicles are powered by generating electricity that drives a motor. Hydrogen vehicles have a typical range of 180-200 miles. They are best suited for city and suburban driving, and can also be used for limited motorway driving • Misconceptions – Explosion risk, range and lack of refuelling stations are common worries. However, if used and stored correctly, hydrogen poses no greater risk than conventional flammable fuels • Typical model <ul style="list-style-type: none"> - Make: Renault - Model: HyKangoo ZE Maxi - Load capacity: 550kg, 4.5m³ 	 <p>The thumbnail shows a fact sheet titled 'HYDROGEN'. It features a table of contents with five items: Overview, Benefits, Drawbacks, Performance, and Typical model. To the right of the table is a photograph of a yellow Renault HyKangoo ZE Maxi van. The number '119' is displayed in a white box in the bottom right corner of the thumbnail.</p>

Key	Method	Resources
<p>Video 5 Alternative fuels</p>	<p>Introduce and show Video 5 (2.18 mins), which specifically focuses on alternative fuels available on the market. The video includes:</p> <ul style="list-style-type: none"> • The main fuels and technologies and their benefits for drivers, as well as any limitations • Success stories from companies using alternative fuels • Discussion on the benefits and any difficulties encountered • A summary to end the alternative fuels lesson 	<p>VIDEO 5</p>  <p>120</p>
<p>Lesson summary</p>	<p>Summarise the key points of the lesson. Pay particular attention to any issues that have been raised throughout.</p> <p>Ask delegates if they have any questions.</p> <p>Ask some questions of your own. Remember to pose, pause and pounce.</p>	<p>LESSON 7 SUMMARY</p> <p>Alternatively fuelled HGVs are becoming increasingly common, and LoCITY is encouraging wider uptake of these vehicles. You may be driving one in the near future.</p>  <p>121</p>

Alternative Fuel Fact Sheet

Plug-in hybrid or range-extender

Overview

The plug-in hybrid is a sensible option if you have to drive in the city and go out of town for longer distances. It has a normal engine and a battery powered electric motor. It can run entirely off the battery, in electric mode, or in hybrid mode, where both electricity and conventional fuel are used. New models are appearing as battery technologies improve. Range-extendors are similar, but use a small diesel/petrol engine to re-charge the battery (not to drive the wheels) and thus increase daily range.

Benefits

A plug-in hybrid can operate on petrol or diesel when the battery depletes, so there are no range limitations. It uses less fuel and is cheaper to run than a conventional vehicle, it is very good for air quality (zero tailpipe emissions in electric mode) and has low noise when in electric mode. Electric motors offer high torque at low revs, making them ideal for stop-start conditions and a pleasure to drive.

Drawbacks

Plug-in hybrids cost more than conventional models. Also, their large batteries make them heavier which means payload is slightly reduced. Load space, however, is unaffected.

Performance

Expect between 30 and 100 miles in pure electric mode. The standard size fuel tank will keep you on the road for as long as a normal vehicle. The hybrid is well suited for city, suburban and occasional motorway driving.

Recharging takes several hours using a standard charger, depending on the battery size, ideal for filling up at the depot between shifts.

Misconceptions

There have been concerns about range, cost and availability of plug-in recharging, however these issues are being addressed by improvements in technology and infrastructure.

Typical model

- Make: TEVVA vehicle (range extender)
- Model: Retrofit to any existing 7.5t truck
- Gross vehicle weight: 7.5 tonne

Liquefied Natural Gas (LNG)

Overview

Liquefied Natural Gas (LNG) vehicles have achieved steady growth in recent years and are already popular in Europe. At least three major truck manufacturers already offer, or plan to offer, gas-powered vehicles. Retrofit conversions are also possible.

Benefits

The vehicles are quieter and can emit fewer pollutants than diesels, though the move to Euro VI has negated much of this advantage. They can also offer reduced fuel costs.

Drawbacks

The vehicles are less efficient than diesels and LNG is a fossil fuel so its use affects climate change and offers limited environmental benefits. The availability of gas refuelling stations is limited, but improving. Retrofit conversions can suffer from 'methane slip', resulting in pollution from unburnt methane, however companies are working to fix this.

Performance

LNG vehicles are well suited to long distance driving, with a range of up to 500 miles, depending on the number of gas cylinders. They operate well in any driving environment, with a similar performance to diesels.

Misconceptions

Misconceptions include concerns about safety, however LNG tanks are very sturdy and will withstand an impact better than a conventional fuel tank.

Typical model

- Make: Iveco
- Model: Stralis
- Load capacity:
Same as diesel equivalent

Pure electric

Overview

Pure electric vehicles are powered entirely by an electric motor. They are best suited for city or suburban driving, and drivers can take them home provided they have charging facilities, otherwise they can be charged at the depot. They are classed as zero tailpipe emission vehicles.

Benefits

Electric vehicles produce zero emissions at the tailpipe, meaning no local air pollutants such as NO_x and PMs. In addition, they are often quieter than other vehicles and offer CO₂ savings of up to 35% compared to diesel even when taking electricity generation into account. Electric vehicles get a 100% discount on London's Congestion Charge. Electric motors offer high torque at low revs, making them ideal for stop-start conditions and a pleasure to drive.

Drawbacks

Pure electric vehicles have a typical range of about 100 miles. The battery weight reduces payload slightly, depending on the size of the vehicle. Pure electric vehicles are more expensive to buy, but running costs are much lower than petrol or diesel equivalents.

Performance

Battery electrics are best suited to city and suburban environments. They can be plugged into conventional chargers and take around 8 hours to charge with a standard charger.

Misconceptions

These include concerns about poor range and expense. However, when used for city or suburban driving with recharging facilities on hand, these vehicles are an economical solution due to their low running costs.

Typical model

- Make: Nissan
- Model: e-NV200
- Load capacity: 770 kg, 4.2 m³

Hydrogen

Overview

Hydrogen vehicles emit nothing but water. Hydrogen is used to generate electricity through a fuel cell. There are a number of different models currently available in the UK. Fuel cells can be retrofitted to battery electric vans.

Benefits

Hydrogen vehicles do not reduce air quality because they produce only water when the fuel is used. They usually have a much longer range than pure electric vehicles.

Drawbacks

Fuel cell technology is expensive and there is a limited number of hydrogen refuelling stations in the UK. The production, storage and transportation of hydrogen is difficult, and can have substantial environmental impacts.

Performance

Hydrogen fuel cell vehicles are powered by generating electricity which drives a motor. Hydrogen vehicles have a typical range of 180–200 miles. They are best suited for city and suburban driving, and can also be used for limited motorway driving.

Misconceptions

Explosion risk, range and lack of refuelling stations are common worries, however, if used and stored correctly hydrogen poses no greater risk than conventional flammable fuels.

Typical model

- Make: Renault
- Model: HyKangoo ZE Maxi
- Load capacity: 550 kg, 4.5 m³

Biodiesel

Overview

Biodiesel is a sustainable and renewable source of energy. It is clean burning renewable fuel made using natural vegetable oils and fats. LoCITY only supports biodiesel made from waste products, such as used cooking oil. Fuel suppliers can blend biodiesel into regular diesel up to 7%, known as B7, and is compatible with any vehicle. Higher blends, e.g. B20 and B30 are commonly available and can be used in most engines requiring no modifications.

Benefits

Biodiesel vehicles normally emit less particulate matter with similar, or marginally increased, NO_x emissions but as biodiesel is a renewable fuel, fuel life-cycle CO₂ reductions of around 15% and 28% are available when using B20 and B30 respectively manufactured from used cooking oil. Switching to B20 and B30 compares favourably as a cost-effective CO₂ reduction measure with other fuels due to its compatibility with most engines.

Drawbacks

A vehicle's fuel delivery system has to be designed to work with biodiesel and manufacturers will recommend more frequent maintenance. Stronger blends can be used without engine modification but a manufacturer warranty may not cover stronger biodiesel blends.

Contact your manufacturer first before trialling biodiesel. There are no publicly available biodiesel refuelling stations.

Performance

Biodiesel can be used as a replacement for petroleum diesel fuel, or can be blended with petroleum diesel fuel in any proportion. Biodiesel is blended at different ratios. 100% biodiesel is referred to as B100 and 20% biodiesel, 80% petroleum diesel is B20 and so on. Biodiesel vehicles have a similar range as diesel and are ideal operation is city, suburbs and motorway.

Misconceptions

Biodiesel, like hydrogen and many other fuels, can come from a variety of sources, not all of them fully sustainable. Waste-derived biodiesel, such as that manufactured from used cooking oil, is fully sustainable, has a very low environmental impact and does not require additional food crops to be grown to produce it. It is considered an important transitional fuel to low pollution transport.

Typical model

- Make: DAF
- Model: CF
- Load capacity:
Same as diesel equivalent
- More information and in depth toolkit advice with link

Compressed Natural Gas (CNG)

Overview

Compressed Natural Gas (CNG) vehicles use the same gas used to power central heating boilers and cookers. CNG is stored on the vehicle in pressurised cylinders and used in a spark ignition engine. CNG is a fossil fuel. However, biomethane is available which is a renewable and sustainable version. Biomethane is produced from organic waste and can be directly used in CNG vehicles.

Benefits

They are quieter and emit fewer pollutants than diesels, particular older ones (Euro V and earlier) and load space is not affected. CNG vehicles are good for air quality; they are quiet and emit similar levels of CO₂ to diesel vehicles. If operated on biomethane, fuel life cycle CO₂ savings of over 60% are available.

Drawbacks

The vehicles are less efficient than diesels and CNG is a fossil fuel so its use affects climate change and offers limited environmental benefits if biomethane isn't used. Payload is often reduced by about 10% due to the weight of the gas tanks. The availability of gas refuelling stations is limited, but improving.

Performance

CNG vehicles can undertake similar duties to regular diesel vehicles due to the long range available between refuelling. They are well suited to long distance driving, with a range of up to 300 miles, depending on the number of gas cylinders. They operate well in city, suburbs, motorway with a similar performance to diesels.

Misconceptions

Misconceptions include concerns about safety, however CNG tanks are very sturdy and will withstand an impact better than a conventional fuel tank.

Typical model

- Make: Volvo
- Model: FE CNG
- Load capacity:
Same as diesel equivalent
Load capacity:
550 kg, 4.5 m³

Course summary, evaluation and feedback



Training objectives

Your main aim of this session is to ensure that the training objectives have been met and to gain insight from delegates on how the workshop has been received.



Key learning points

By the end of the session, delegates will:

- Know whether training objectives have been delivered effectively
- Confirm their learning throughout the course
- Address any final issues they may have
- Share any improvements they feel need to be made to the training content



Timing


- 30 minutes



Further resources

Refer to the following for more information relating to this session:

- Course quiz sheet
- Course evaluation form

Key	Method	Resources
Session introduction	Show the session title slide.	
Any final questions	<ul style="list-style-type: none"> • Ask the delegates if they have any final questions or have any issues that they feel have not been addressed during the course • Facilitate answers to questions, but make sure you manage expectations • Signpost any other FORS Professional courses or LoCITY information for further details 	
Confirmatory quiz	<p>Run the multiple-choice confirmatory quiz. It can either be run as an on-screen group activity or as an individual paper-based activity. The purpose of the multiple-choice quiz is to find out how much the delegates have learned during the lesson.</p> <p>Ask delegates to note their name and date at the top of the quiz sheet. Instruct them to read all questions and answer carefully by simply putting a line through the appropriate letter(s) (A, B, C, D).</p> <p>Go through the answers verbally when they have finished and ask delegates to mark their own papers.</p> <p>Ask delegates to enter their score and keep hold of their completed quiz papers for future reference.</p>	

Key	Method	Resources
<p>Have we achieved our objectives?</p>	<p>Recap the objectives of the course:</p> <ul style="list-style-type: none"> • Understand freight and TfL’s strategy to improve air quality • Increase knowledge and awareness of fuel consumption and costs • Understand how vehicle checks and maintenance reduce emissions • Recall fuel-efficient driving techniques designed to improve efficiency • Demonstrate the benefits of journey planning • Understand how in-vehicle technology improves driving performance • Improve your knowledge of alternative fuels in commercial vehicles <p>Refer back to the flipchart sheets with delegates’ expectations that were written at the beginning of the day. Go through them to check whether these expectations have been met.</p>	
<p>Evaluation form</p>	<p>State that feedback is important and gives the delegates an opportunity to share what they think was good or needs improvement.</p> <p>Do not skip or rush this part of the day.</p> <p>Introduce the evaluation form and make sure the delegates understand that:</p> <ul style="list-style-type: none"> • Feedback is important and is used to make relevant changes to the content • They may be part of wider research by giving an email address. Explain they will receive further research questions in three months and 12 months by email • Support is available to those who may need guidance on completing the form <p>Recover all feedback forms and close the course.</p>	
<p>Thank you</p>	<p>Thank the delegates for their attention, commitment and input throughout the day.</p> <p>State that you hope they enjoyed the training and have both been reminded of something and learned something new.</p> <p>Remind delegates that they can make sure the training has been recorded for Driver CPC by visiting the DVSA and FORS websites.</p> <p>Wish them a safe return to their day jobs.</p>	

LoCITY Driving - Quiz 1

Name

Date

Score

There are 12 questions in this quiz, each question has only one answer. Please circle the correct answer.

1	How many UK premature deaths are attributed to air quality related illness?
A	40,000
B	44,000
C	4,000
D	400,000

2	Which city is not a Clean Air Zone city
A	Leeds
B	Liverpool
C	Birmingham
D	Derby
E	Nottingham
F	Southampton

3	What is the latest Euro Standard for HGVs?
A	Euro V
B	Euro 6
C	Euro VI
D	Euro VII

4	How much can traffic congestion affect fuel consumption?
A	10%
B	20%
C	30%
D	40%

5	Why is AdBlue important?
A	It improves CO2 emissions
B	It reduces NOX emissions
C	It improves fuel efficiency
D	It reduces blue exhaust smoke

6	What might black smoke from a diesel engine indicate?
A	Too much fuel and not enough air
B	Water in the fuel
C	Burning engine oil

7	Which of the following is not a LoCITY Driving theme?
A	Get set
B	Think Ahead
C	Smooth Ride
D	Get in Gear
E	Power down

8	What percentage of fuel can be saved by using aerodynamic trailers?
A	5%
B	10%
C	15%
D	20%

9	What is the typical mpg for a rigid HGV?
A	5/6 mpg
B	8/9 mpg
C	11/12 mpg

10	How far can a pure electric vehicle typically travel on a single charge?
A	30 - 40 miles
B	40 - 50 miles
C	50 - 60 miles
D	60 or more miles

11	What is a plug-in hybrid?
A	A vehicle that draws electricity from the mains and another electric power source
B	A vehicle with a normal engine and spark plugs
C	A vehicle with a normal engine and a battery powered electric motor
D	A vehicle that uses both petrol and diesel fuel

12	Why are low tyre pressures inefficient?
A	Affect suspension and damage the road surface
B	Increase rolling resistance and fuel usage
C	Make steering and manoeuvring more difficult
D	Requires harsher braking and acceleration

LoCITY Driving - Quiz 1 Answers

Handout the quiz question sheet. Give the delegates 10 minutes to complete the quiz, explain that each question has only one answer and that the correct answers are to be indicated with a circle

After 10 minutes get delegates to exchange quiz papers with another delegate. Facilitate and discuss the correct answers.

1	How many UK premature deaths are attributed to air quality related illness?
A	40,000
B	44,000
C	4,000
D	400,000

2	Which city is not a Clean Air Zone city
A	Leeds
B	Liverpool
C	Birmingham
D	Derby
E	Nottingham
F	Southampton

3	What is the latest Euro Standard for HGVs?
A	Euro V
B	Euro 6
C	Euro VI
D	Euro VII

4	How much can traffic congestion affect fuel consumption?
A	10%
B	20%
C	30%
D	40%

5	Why is AdBlue important?
A	It improves CO2 emissions
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C	It improves fuel efficiency
D	It reduces blue exhaust smoke

6	What might black smoke from a diesel engine indicate?
A	Too much fuel and not enough air
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C	Burning engine oil

7	Which of the following is not a LoCITY Driving theme?
A	Get set
B	Think Ahead
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8	What percentage of fuel can be saved by using aerodynamic trailers?
A	5%
B	10%
C	15%
D	20%

9	What is the typical mpg for a rigid HGV?
A	5/6 mpg
B	8/9 mpg
C	11/12 mpg

10	How far can a pure electric vehicle typically travel on a single charge?
A	30 - 40 miles
B	40 - 50 miles
C	50 - 60 miles
D	60 or more miles

11	What is a plug-in hybrid?
A	A vehicle that draws electricity from the mains and another electric power source
B	A vehicle with a normal engine and spark plugs
C	A vehicle with a normal engine and a battery powered electric motor
D	A vehicle that uses both petrol and diesel fuel

12	Why are low tyre pressures inefficient?
A	Affect suspension and damage the road surface
B	Increase rolling resistance and fuel usage
C	Make steering and manoeuvring more difficult
D	Requires harsher braking and acceleration



Section 3:

Training Administration

- 131 Driver Certificate of Professional Competence (CPC)
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Driver Certificate of Professional Competence (CPC)

Driver CPC overview

The Driver CPC is a qualification for professional bus, coach and lorry drivers. It has been introduced across Europe with the aim of improving road safety, reducing environmental impact and helping to improve driving standards.

All drivers need to complete 35 hours of periodic training every five years on an ongoing basis to keep driving for a living. Drivers can check their Driver CPC periodic training record online to see how many hours they have done.

Training objectives in accordance with the Driver CPC syllabus

The LoCITY Driving course covers aspects of the following syllabus objectives for Driver CPC Periodic Training. The course does not cover each objective in full.



Syllabus reference	Descriptor
1.1 To know the characteristics of the transmission system in order to make the best possible use of it	Curves relating to torque; power; and specific consumption of an engine; area of optimum use of revolution counter; gearbox-ratio cover diagrams.
1.2 To know the technical characteristics and operation of the safety controls in order to control the vehicle, minimise wear and tear and prevent disfunctioning	Specific features of hydraulic vacuum servobrake circuit; limits to the use of brakes and retarder; combined use of brakes and retarder; making better use of speed and gear ratio; making use of vehicle inertia; using ways of slowing down and braking on downhill stretches; action in the event of failure.
1.3 Ability to optimise fuel consumption	Optimisation of fuel consumption by applying know-how with regards to points 1.1 and 1.2.
2.1 To know the social environment of road transport and the rules governing it	Maximum working periods specific to the transport industry; the principles, application and consequences of Regulations (EEC) No. 3820/85 and (EEC) No. 3821/85; penalties for failure to use, improper use of and tampering with the tachograph; knowledge of the social environment of road transport and the rights and duties of drivers with regards to initial qualification and periodic training.
3.6 Ability to adopt behaviour to help enhance the image of the company	Behaviour of the driver and company image; the importance for the company of the standard of service provided by the driver; the roles of the driver; people with whom the driver will be dealing; vehicle maintenance; work organisation; commercial and financial effects of a dispute.

Driver CPC approval

Before delivering the LoCITY Driving course, you will need to complete the 'Application for Driver CPC Course Approval' form included below.



Application for Driver CPC Course Approval

Section 1: Approved Centre Details

1.1 Name of approved centre:

1.2 Centre approval number (if known):

1.3 Proposed name of course:

1.4 Proposed approval start date:

Please note the proposed start date is an indication of when you would like the approval period to start; however this cannot be guaranteed and JAAPT cannot be held responsible, should the approval period start after the date requested. Should the application be processed prior to the proposed approval start date, the approval will commence as requested.

Please note that all approval documentation will be sent to the person responsible for Driver CPC at the approved centre.

1.5 Has this course been previously approved? Yes No

Please note that previous approval of this course does not guarantee that it will be granted approval again.

If **Yes** - what was the course number?

Please note that a course is approved for 12 months starting at the date shown on the course approval certificate. If you deliver the course before this date the training will not count towards Driver CPC. JAAPT will send a courtesy reminder email when the course is due to expire and a further notification once the course has expired. Once expired, the course cannot be delivered as periodic training.

Section 2: Course details

2.1 Sector(s) to which this course is to be delivered: LGV PCV

2.2 Training delivery location: Classroom On Road / In Vehicle Yard / Outside Area

2.3 Length of course (in hours):

2.4 What is the anticipated driver/trainer ratio for this course?

2.5 If this course is intended for delivery as part of another programme or qualification, please provide details:

2.6 Subject area of the course (tick all that apply):

The numbers below are syllabus reference numbers as stated within the European Directive 2003/59 EC.

- | | |
|--|--|
| <input type="checkbox"/> 1.1 Vehicle Systems (Transmission System) | <input type="checkbox"/> 3.1 Health, Safety and Emergencies |
| <input type="checkbox"/> 1.2 Vehicle Systems (Safety Controls) | <input type="checkbox"/> 3.2 Prevention of Criminality and Trafficking |
| <input type="checkbox"/> 1.3 Safe and Fuel Efficient Driving | <input type="checkbox"/> 3.3 Personal Health and Wellbeing |
| <input type="checkbox"/> 1.4 Loading/Unloading (LGV) | <input type="checkbox"/> 3.4 Physical/Mental Health and Wellbeing |
| <input type="checkbox"/> 1.5 Customer Service / Disability Awareness (PCV) | <input type="checkbox"/> 3.5 First Aid |
| <input type="checkbox"/> 1.6 Loading/Unloading (PCV) | <input type="checkbox"/> 3.6 Professional Driver and Company Issues |
| <input type="checkbox"/> 2.1 Legislation (including Drivers Hours, Rules and Regulations and the Working Time Directive) | <input type="checkbox"/> 3.7 Economic Environment for Carriage of Goods (LGV) |
| <input type="checkbox"/> 2.2 Regulations for Carriage of Goods (LGV) | <input type="checkbox"/> 3.8 Economic Environment for Carriage of Passengers (PCV) |
| <input type="checkbox"/> 2.3 Regulations for Carriage of Passengers (PCV) | <input type="checkbox"/> 3.9 Vulnerable Road Users (VRU) |

2.7 Course delivery

2.7.1 Please provide details of the training programme for this specific course in the form of a course layout. Please refer to the course summary example which can be found at: www.gov.uk/government/uploads/system/uploads/attachment_data/file/224196/driver-cpc-course-summary-example.pdf

2.7.2 Please provide the aims and objectives (ie learning outcomes) for this specific course:

Aims:

Objectives:

2.7.3 Please attach details and evidence of the qualifications and fields of activity of each of your trainers to be used to train/teach this specific course. Trainers must have sound, up-to-date knowledge of relevant regulations and training requirements as outlined in the Directive 2003/59 EC. If this course is a reapproval you only need to tell us about trainers you have hired in the last 12 months. Supporting guidance can be found at: www.gov.uk/provide-driver-cpc-periodic-training

All courses are subject to audit and the auditor will verify that the course is being delivered as specified on the approved course summary. Failure to deliver the course as approved may result in the revocation of the driver's training hours.

Section 3: Publication

3.1 Would you like this course to be publicised on GOV.UK website? Yes No

Section 4: Payment

4.1 Payment of the current fee is accepted via the methods below and should be made within 5 working days of application receipt by JAUPT.

Cheque (Cheques should be made payable to DVSA)

Credit / Debit card

BACS Please use the following bank details for BACS payment:

Bank Name: Nat West
Sort Code: 60-70-80
Account Number: 10004440

Please ensure your remittance advice is included.

Name:

Position:

Date:

4.2 Application checklist

Payment details

Course summary

Trainer evidence

If you are submitting a modular course you must include one course application for the 7 hour modular course (excluding the course summary) plus a course application for each 3.5 hour module (including the course summary and trainer information).

You must give up-to-date details of where and when you will be running approved periodic training courses and notify JAUPT of any changes including cancellations, dates, times and locations of the training courses as soon as they occur via www.jaupt.org.uk.

Failure to comply with the conditions of approval may result in the suspension or withdrawal of the centre approval.

You should submit this form to enquiries@jaupt.org.uk or alternatively post it to:

Joint Approvals Unit for Periodic Training
9 Warren Yard
Warren Park
Stratford Road
Milton Keynes
MK12 5NW

Any queries should be directed to enquiries@jaupt.org.uk or alternatively on **0844 800 4184**.

For further supportive information and to keep up to date with future updates, feel free to follow and visit the links below:



www.jaupt.org.uk



facebook.com/JAAPT



twitter.com/jaupt_drivercpc



Joining instructions – LoCITY Driving

Date:

Dear [name]

Thank you for choosing the LoCITY Driving training course – a place has been reserved for you. The following information will help you prepare for the day.

Timings

The course runs from 09:00–17:00 and includes seven hours of training, plus a total of one hour in breaks. Please arrive at least 15 minutes before the course start time for Driver CPC registration to ensure that your attendance is correctly recorded. Timings for the course are as follows:

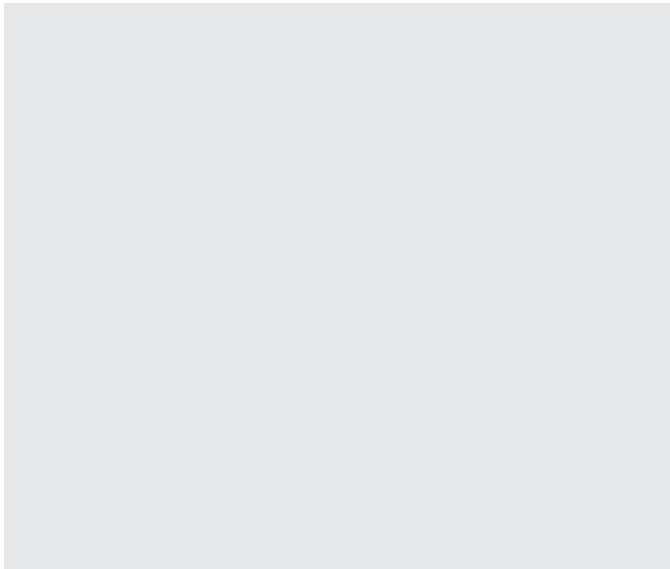
Session	Timing
Registration opens	08:30
Registration closes	08:55
Training session 1	09:00
Break	11:00
Training session 2	11:15
Lunch	12:45
Training session 3	13:15
Break	14:45
Training session 4	15:00
Course summary and evaluation	16:30
Close	17.00

You must attend the full seven hours' training. Late arrivals or early leavers may not be recorded to the DVSA recording and evidencing system.

Location

The course will be held in our training room at:

Please see map:



Lunch and refreshments

Lunch is not provided. Light refreshments are available on site, mostly from vending machines; having loose change will be an advantage.

Equipment

Make sure you bring writing material for personal note taking. All other training materials will be provided.

Identity checks

Delegates attending the course should be in the possession of valid identification. Please refer to the list on the below for official documents that are acceptable to prove identification:

- Photocard driving licence
- Digital tachograph card
- Driver qualification card (DQC)

Delegates who want the training recorded with the government's Recording and Evidencing (R&E) database will need to pay an £8.75 (cash) upload fee. Delegates MUST notify the trainer on arrival of their intentions to register for the Driver CPC hours.

NOTE: If the fee is not paid on the day, your learning hours may not be uploaded.

Contact details

Training centre:

Telephone:

Email:

Trainer:

Telephone:

Email:

We look forward to seeing you on the day.

Yours faithfully

Syllabus reference	Yes	No
Space to accommodate 20 delegates plus observers		
Adequate furniture (tables and chairs for delegates and observers)		
Size of room adequate for arranging working groups		
Adequate lighting		
Air-conditioning in good working condition		
Cross ventilation		
Windows with curtains/blinds in good working condition		
Appropriate electricity supply		
Located away from any distractions, such as traffic or noise		
Adequate arrangement for drinking water		
Appropriate toilet facilities		

Training materials	Yes	No
Projector and screen		
Laptop and remote speaker		
Extension lead		
Name tents		
Flipchart		
Whiteboard and pens		
Hard copy printouts of training slides		

Risk assessment

Health and safety in a training environment is about taking a sensible and proportionate approach to ensure the premises provide a healthy and safe place for all who use them. You should use the risk assessment in this CTP to make sure training facilities meet minimum health and safety standards.

However, the results and findings from completed risk assessments will provide a useful resource to the company management when reviewing their whole-company risk assessments.

The risk assessment is a means to raise awareness of areas of concern. Employers in the training sector, whether they are a commercial company, local authority, governing body, trust or proprietor, have wider responsibilities under health and safety law.

Training room checklist

Questions to ask		Yes	No	Action
Movement around the training room (slips and trips)	Is the flooring in a good condition?			
	Are there any changes in floor level or type of flooring that need to be reported?			
	Are gangways between desks clear?			
	Are trailing electrical leads/cables prevented where possible?			
	Is lighting bright enough to allow safe access and exit?			
	Is sufficient equipment in place to protect from glare and heat from sun, eg blinds?			
	Are procedures in place to deal with spillages, eg water?			
	For standalone training rooms:			
	• Are access stairs or ramps properly maintained?			
	• Are access stairs or ramps provided with handrails?			

Questions to ask		Yes	No	Action
Furniture and fixtures	Are permanent fixtures in good condition and securely fastened, eg cupboards, display boards, shelving?			
	Is furniture fit for purpose and suitable for adults?			
	Where window restrictors are fitted to upper-floor windows, are they in good working order?			
Electrical equipment and services	Are fixed electrical switches and plug sockets fit for purpose?			
	Are all plugs and cables fit for purpose?			
	Has portable electrical equipment, eg projectors, been visually checked and, where necessary, tested at suitable intervals to ensure that it is safe to use? (There may be a sticker to show this)			
Fire	If there are fire exits from the training room, are they: <ul style="list-style-type: none"> • Unobstructed? • Kept locked? • Able to be opened from the inside? 			
	Is firefighting equipment available in the training room?			
	Are fire evacuation procedures displayed clearly?			
	Are you aware of the evacuation drill, including arrangements for any vulnerable adults?			
Classroom ventilation and heating	Can a reasonable room temperature be maintained during use of the training room?			
	Does the room have natural ventilation?			

This list is not exhaustive and you should identify any other hazards associated with the daily use of the training room, including any further actions needed. If necessary, discuss this with your employer.

Further action needed

Hazards identified	Action taken	When?

Name:	Position:
Date:	Signature:

Training location:	
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Housekeeping and safety brief

The trainer must be familiar with the site safety rules and administrative matters.

The following important information must be shared with the delegates at the earliest opportunity and — in any case — before the training begins. Run through the general housekeeping points:

- If the fire alarm sounds, the fire exits are...
- The toilets are located...
- No smoking is allowed in the building. The designated smoking area is...
- Please switch your mobile phones off or to silent
- Refreshments are provided throughout the day. You are welcome to drink to stay hydrated, but please save eating for the breaks
- The duration of the course is seven hours long, plus a total of one hour in breaks

Ask that delegates keep a log of any noteworthy issues throughout the course. An evaluation form will be issued at the end of the day. Feedback is very important as it will help us improve the course for the future.

Request that delegates provide an email address to take part in further research and share experience and knowledge so the industry can get the best from the training in the future.

Delegate registration

Driver CPC course attendance and registration record

Training provider:		AC number:	
Venue (site, building, room):		Course name:	
Course dates:		CRS code:	
Start time:		Finish time:	
		Total breaks:	

Driver name	DVLA number	Licence categories	Licence type	Driver signature	Notes

Driver name	DVLA number	Licence categories	Licence type	Driver signature	Notes

Declaration: I have conducted the required licence and identity checks and delivered a seven-hour Driver CPC course to the above delegates.

Trainer name:

Trainer signature:

Driver licence/identity checks

Delegates must provide proof of identity before any training session starts. Trainers need to carry out these checks in order to verify the identity of each delegate.

The following documents are acceptable for identity checking:

- Photocard driving licence
- Digital tachograph card
- Driver qualification card (DQC)

If you have concerns over the eligibility of a driver's licence, you can contact the Driver and Vehicle Licensing Agency (DVLA) via its website (www.dvla.gov.uk), call its customer enquiries line on 0870 240 0009, or seek legal or professional advice. Photocard licences are issued every 10 years to ensure the photograph on the licence retains a true likeness of the holder.

Fair Processing Notice

Delegates must be informed of the Fair Processing Notice. This slide should be displayed throughout the registration process. This is a JAUPT requirement:

Your personal data includes your contact details, your photographic image, driving licence and payment details, together with any other information we obtain directly from you or from third parties, or as a result of our relationship with you in our capacity as a Driver CPC (DCPC) Approved Training Centre and in providing goods and services to you.

We will use your personal data for the purposes of uploading completed DCPC Periodic Training hours on to the government's Recording and Evidencing (R&E) database, the provision of an attendance certificate, and for all other purposes connected with our role as an Approved Training Centre in providing goods and services to you. This information will be shared with JAUPT in order for it to monitor and manage approved centres and the training uploaded to the DVSA system. Where necessary, this data may be shared with member state authorities to confirm DCPC entitlement abroad.

We are committed to ensuring that your personal data is secure. In order to prevent unauthorised access or disclosure, we have put in place suitable physical, electronic and managerial procedures to safeguard and secure the information we collect.

As of 14 January 2016, you can now upload UK and non-UK licence holders at the same time, pay any charges, and no longer have to email the 'Notification of EU Licence Holder Attending Driver CPC Periodic Training' template to DVSA in order to upload a non-UK licence holder's hours directly to the Recording and Evidencing system.

At registration, you should note the driver's full name, date of birth and the member state that issued the driving licence. This is to help establish the driver's identity. Non-UK licence holders are still required to complete and return a Driver Qualification Card (DQC) 1 Form to the DVSA in order

to verify their entitlement and trigger the issue of their DQC.

Non-UK licence holders will not have access to the online driver enquiry service. Should they wish to check how many periodic training hours have been uploaded, they will need to contact DVSA by emailing PCRE@dsa.gsi.gov.uk

When uploading non-UK drivers' periodic training hours, please ensure that you enter their EU driving licence number as shown on the driving licence. Do not upload against their GB counterpart number, as this will cause problems with the upload.

Course evaluation

State that feedback is important and gives the delegates an opportunity to share what they think was good or needs improvement.

Do not skip or rush this part of the day.

Introduce the evaluation form and make sure the delegates understand that:

- Feedback is important and is used to make relevant changes to the content
- They may be part of wider research by giving an email address. Explain they will receive further research questions in three months and 12 months by email
- Support is available to those who may need guidance on completing the form

Recover all feedback forms and close the course.

FORS Driver CPC evaluation and feedback form



Please complete in BLOCK CAPITALS

Name (optional)	Company name	Email	Date

Please rate each of the following:

Organisation	Strongly agree	Agree	Disagree	Strongly disagree	Not sure
Location was easy to get to					
Venue was fit for purpose					
Resources were of high quality					
Accessibility was easy					
Refreshments were adequate					

How was the trainer?

Trainer	Strongly agree	Agree	Disagree	Strongly disagree	Not sure
Professional					
Approachable					
Responsive					
Engaging					

What did you think of the course content?

Course content	Strongly agree	Agree	Disagree	Strongly disagree	Not sure
Confirmed current knowledge					
Content was clear and relevant					
Materials were good quality and useful					
The course objectives were achieved					

Learning outcomes	Strongly agree	Agree	Disagree	Strongly disagree	Not sure
The course increased my understanding of why it is important to reduce fuel use, emissions and improve air quality					
Following the course I will carry out journey planning and vehicle checks to reduce my vehicle's emissions					
Following the course I will apply fuel efficient driving techniques designed to improve efficiency					
My knowledge of the value of vehicle design and technology has increased					
My understanding of how in-vehicle technology improves driving performance has increased					
I am able to describe the alternative cleaner fuels that are available for commercial use					

The course overall:

Satisfaction	Strongly agree	Agree	Disagree	Strongly disagree	Not sure
The course was enjoyable, informative and professionally delivered					

Any other comments

Thank you for completing this form, your comments will help us in our ongoing commitment to improve our delivery of this programme.

Complaints procedure

If you are unhappy with our service, please let us know as soon as you can. We will do our best to put things right. We are fully committed to addressing all complaints fully, fairly and in a reasonable timeframe. We prefer to resolve complaints by telephone – but if you would prefer to receive a response in writing, then please ask.

There are two easy ways to get in touch. So we can get back to you sooner, let us know your preferred contact details when you contact us.

By phone:

08448 09 09 44

By email:

enquiries@fors-online.org.uk

Your email will be acknowledged within 48 hours of receipt and we aim to resolve all written complaints within 28 days of receipt.

If you are not satisfied:

If a complaint is not resolved to your satisfaction, you can ask to escalate the issue to a manager. In the event a manager has to call you back, you can help us by letting us know which daytime and evening contact numbers work best for you. If, after speaking to the manager, you feel we have still not dealt with your complaint appropriately, please ask for your complaint to be escalated to a senior manager.

