Scottish Government – Draft Climate Change Plan 2017 - 2032

1. INTRODUCTION

1.1 The Scottish Government passed the Climate Change (Scotland) Act in 2009, which in part requires the Scottish Government to publish regular plans for meeting future emission reduction targets. On the 19th January 2017, the draft Climate Change Plan (the draft third report on proposals and policies (RPP3) for meeting Scotland's annual greenhouse gas emissions targets) was laid in the Scottish Parliament to cover the period 2017 - 2032. The draft Plan is subject to a 60 day period of Parliamentary scrutiny.

1.2 This report summarises the main targets of the Climate Change Plan and the measures that Scottish Government will look to implement in regards to transport to meet the aims of the Plan.

1.3 SEStran also have a duty in regards to The Climate Change (Scotland) Act 2009. Further to the Act, in 2015 the Scottish Government introduced an Order requiring all 150 Public Bodies who appear on the Major Player list to report annually to Scottish Ministers on their compliance with the climate change duties. SEStran is included on this list and submitted their first annual report on 30th November 2016.

2. CONTENT OF PLAN

2.1 The plan sets out the Scottish Government path to decarbonisation up to 2032. This includes both the use of low carbon fuels and technologies as well as other emission reduction action, including land use and reducing demand from our energy system.

2.2 Before setting a batch of annual targets, Scottish Ministers must request advice from the Committee on Climate Change (CCC). The CCC is an independent body established by the UK Climate Change Act 2009 to provide climate change advice to the UK Government and devolved administrations. Following advice from the CCC in March 2016 and then again in July 2016, the Scottish Parliament passed legislation setting the third batch of annual targets in October 2016, for the years 2028 to 2032. The targets set an emission reduction pathway to 2032 and in doing so establish a 2032 target that represents a 66% reduction below 1990 levels.

2.3 The Scottish Government envisages a significant decarbonisation of transport by 2032, with emissions reducing by 32% compared to 2014. The main aims to achieve this include:

- Low emission cars and vans will be widespread and becoming the norm;
- Low emission HGVs will be more common;
- A third of the ferries owned by the Scottish Government will be low carbon;

- Aircraft fleets will be on the cusp of radical new designs;
- Freight infrastructure will feature more efficient HGVs operating from out-of-town consolidation centres; and
- Low emission vehicles will also play a role in energy storage within the wider energy system.

2.4 There is a recognition within the Plan that individuals and households account for over three-quarters of Scotland's consumption emissions. The Scottish Government have laid out, within the plan, 10 key behaviours to try and mitigate this impact. Three of these behaviours are directly linked to transport:

- Becoming less reliant on the car (walking, cycling, using public transport and/or car-sharing instead of driving)
- Driving more efficiently (using a low carbon vehicle (fuel efficient, hybrid, alternative fuel or electric), and/or following fuel-efficient driving principles)
- Using alternatives to flying where practical (e.g. train or teleconferencing for business)

2.5 The report is split in to separate sectors, with transport being included as one. There are several policy outcomes included within the transport sector:

- Average emissions per kilometre of new cars and vans registered in Scotland to reduce in line with current and future EU/UK vehicle emission standards
- Proportion of ultra-low emission new cars and vans registered in Scotland annually to reach or exceed 40% by 2032.
- Average emissions per tonne kilometre of road freight to fall by 28% by 2032.
- Proportion of the Scottish bus fleet which are low emission vehicles has increased to 50% by 2032.
- By 2032 low emission solutions have been widely adopted at Scottish ports and airports.
- Proportion of ferries in Scottish Government ownership which are low emission has increased to 30% by 2032.
- We will have electrified 35% of the Scottish Rail network by 2032.
- Proportion of total domestic passenger journeys travelled by active travel modes has increased by 2032, in line with our Active Travel Vision, including the Cycling Action Plan for Scotland Vision that 10% of everyday journeys will be by bike by 2020.

2.6 The Plan makes a further comment that an increased number of journeys to be made by active travel will further reduce congestion and pollution, in addition to the associated benefits that come through living an active lifestyle. Active travel and lift sharing offer a potential route to combat transport poverty by increasing the availability of low-cost, low carbon transport options and reducing the need to own a car. Car clubs will allow households to access efficient vehicles without the costs associated with car ownership. These policies and the actions taken to achieve them are laid out in full in appendix 1.

3. CALL FOR EVIDENCE / SESTRAN RESPONSE

3.1 Four parliamentary committees have launched a joint call for views on the Scottish Government's plan on how it will meet climate change targets from 2017 to 2032. The Rural Economy and Connectivity Committee has a focus on rural affairs, agriculture, forestry and transport and SEStran will therefore be submitting evidence to them. The joint call for views is asking for opinions on the following questions, as they relate to their specific remits:

- Progress to date in cutting emissions within the sector/sectors of interest and implementing the proposals and policies set out in the RPP2;
- The scale of reductions proposed within their sector/s and appropriateness and effectiveness of the proposals and policies within the draft RPP3 for meeting the annual emissions targets and contributing towards the 2020 and 2050 targets;
- The appropriateness of the timescales over which the proposals and policies within the draft RPP3 are expected to take effect;
- The extent to which the proposals and policies reflect considerations about behaviour change and opportunities to secure wide benefits (e.g. environmental, financial and health) from specific interventions in particular sectors.

3.2 The evidence is due for submission on the 10th February 2017 and therefore SEStran are unable to table a report for agreement by the Board and will therefore make a response on the views of the Partnership Director.

3.3 The ambition of the RPP3 is welcomed, as is the recognition of the role of Regional Transport Partnerships (RTPs) as there is clear potential in taking a new wider regional approach to tackling the challenges for the transport sector to deliver sustainable aggregated responses to certain transport-related climate change challenges.

3.4 An initial view of officers is that the draft RPP3 focuses predominantly on emissions reduction via supply side interventions. It would be welcomed going forward to also consider in greater detail a wider range of potential demand side interventions and the impact these could have on potential latent demand for transportation generated by the long-term achievement of inclusive growth in Scotland which may continue for the near future to generate unsustainable travel practices prior to the impact of supply side policies and proposals outlined in RPP3 being able to generate the emissions reductions planned for them.

3.5 We would welcome a greater discussion of workplace parking charges for all vehicles and it is welcome to see within the draft RPP3 a focussed policy on ULEVs. It is noted however that it would be useful to understand if councils will be able to charge, in order to cost recover, for LEZs given the potential magnitude of resources involved and as a further measure to alter behaviour alongside any access restrictions. It may also be appropriate to renew and revise strategic regional approaches to parking and demand restraint policies in order to strategically plan for the reduction of boundary

effects and therefore it would seem appropriate to reference RTPs as delivery partners.

3.6 Within the Plan many actions require preventative spend and it is good that the co-benefits section recognises this resourcing issue and observes it will bring benefits to healthcare budget. It also perhaps highlights the need to develop a strategic model of co-production of such transport policies and proposals to enable benefits to be realised.

3.7 The draft RPP3 makes welcome references to the need for further engagement with public sector run partnerships such as SEStran Freight quality partnerships. It would be welcome in the final document if greater reference could be made to Freight Quality Partnerships[1] run by RTPs and the potential for them to be involved in delivery of the outcomes required by various policies and proposals. Especially given the previous and future research ambitions of SEStran on green logistics and distribution centres[2].

3.8 We welcome the recognition of Intelligent Transport Systems (ITS) within the document and would be keen to see any ITS strategy also cover the wider aspects of ITS. We currently run a Real-Time Passenger Information system[3] to seek to enable passenger confidence in using public transport. If the future policies and proposals seek to encourage and enable a modal shift, it will be vital to cover maintenance and long term resilience of those systems as part of an ITS response to future travel demands. It will also be welcome if such a strategy could consider the costs of such maintenance and resilience of such systems.

3.9 On the proposals within the Transport Chapter, we would comment that RTPs could deliver greater efficiency and reach if we had greater access to funding such as Smarter Choices, Smarter Places alongside our constituent councils. In recent months, for example, we have just concluded a report entitled X-Route[4] with YoungScot investigating young people's attitudes to active travel and potential barriers to its update. Given the timescale of RPP3 many of the respondents to this report will be established commuters by the end of 2032 and many of the report recommendations highlight the need to engage and embed confidence to enable travel behaviour change for the long term. Certainly, an eye-catching result of the survey was that 75% of respondents hadn't heard of the term "active travel", which highlighted the need to manage our messages to young people better when seeking to initiate behaviour change.

3.10 The draft Climate Change Plan also makes welcome reference to the availability of trip-sharing. We would welcome the further promotion of trip sharing in the final RPP3. Given the predicted increase in population we will have to balance supply side measures with demand restraint to achieve emissions goals. SEStran has a successful and ever-growing Liftshare

[1] http://www.sestran.gov.uk/news/30/minister-launches-sestran-freight-quality-partnership/
[2] http://www.instituteforsustainability.co.uk/lopinod.html
[3] http://www.bustrackersestran.co.uk/
[4] http://www.youngscot.net/getting-active-with-xroute/

scheme[5] and it would be welcome if further proposals and policies could be considered in the final RPP3 alongside a recognition of the role of RTPs in promoting it. The increase in lift-sharing opportunities could have a related co-benefit in terms of potential inclusion and accessibility impacts across urban-rural geographies.

3.11 SEStran will make a further response to the draft RPP3 itself after consideration by the Partnership Board on 2nd March.

4. CONCLUSION/RECOMMENDATIONS

4.1 Chief Officers are asked to:

1. Comment upon the suggested proposals of the Draft Plan; and
2. Comment upon SEStran's suggested response

Emily Whitters
Business Support Officer
26th January 2017

George Eckton
Partnership Director

Appendix 1 – Scottish Government Draft Climate Change Plan, Transport Section

[5] https://liftshare.com/uk/community/sestran

9. Transport

The Transport sector covers all transport modes in Scotland, including public transport, freight, aviation, shipping, private motoring, active travel and the regulations, policies and infrastructure designed to support all of these.

9.1 Where we are now

Figure 8: Transport historical emissions

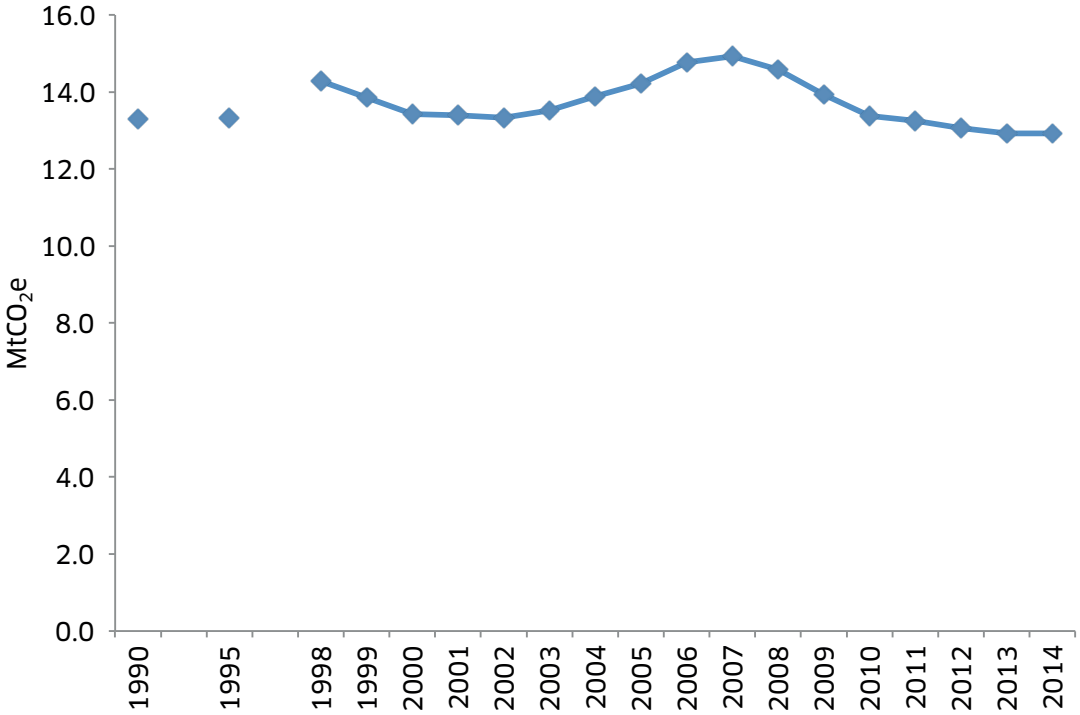
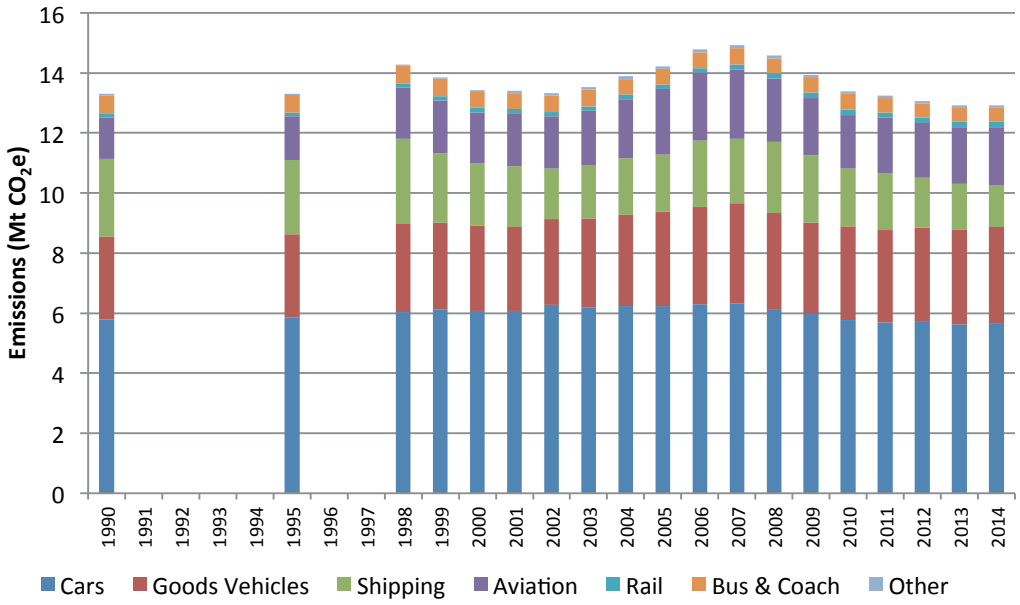


Figure 9: Scottish transport emissions by mode, 1990 – 2014



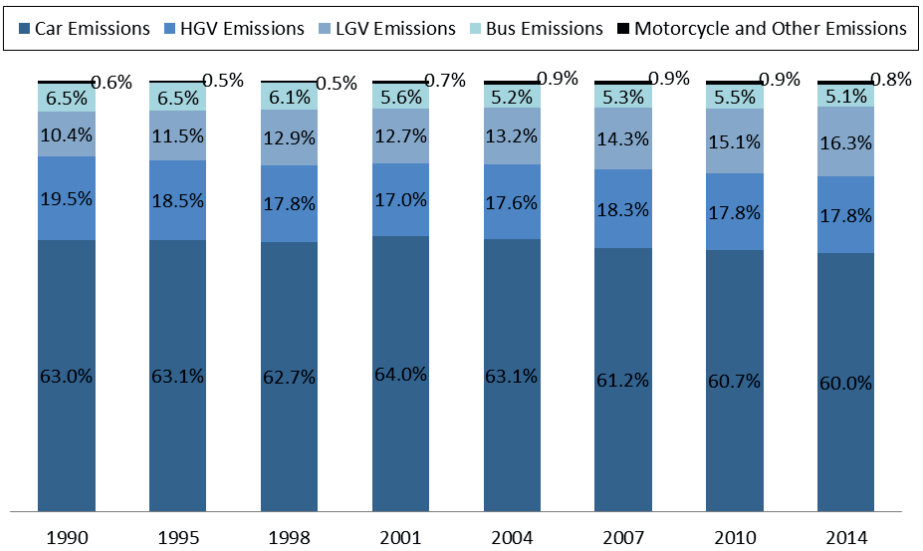
9.1.1 In 2014, transport emissions (including those from international aviation and shipping) amounted to 12.9 $MtCO_2e$, marginally below the 1990 baseline figure of 13.3 $MtCO_2e$. Currently, transport accounts for 28% of total Scottish emissions[48]. Within that long-term profile, we have seen significant reductions more recently: since transport emissions peaked at 14.9 $MtCO_2e$ in 2007, they have fallen year on year by a total of 2.0 $MtCO_2e$. This is a 13% reduction in seven years.

9.1.2 The composition of the numbers has changed significantly. For example, in 2014 demand for all road transport stood at 44.8 billion kilometres, as compared to 36.5 billion kilometres in 1995. This 22% increase in demand has been offset by significant improvements in vehicle efficiencies, combining to produce the broadly static but now reducing emissions figures.

Road transport emissions

9.1.3 The largest contributor to transport emissions is the road sector. In combination, cars, lorries, vans, buses and motor cycles accounted for 9.4 $MtCO_2e$ in 2014 (73% of total transport emissions). This compares with 9.2 $MtCO_2e$ in 1990.

Figure 10: Road transport emissions, 1990 – 2014



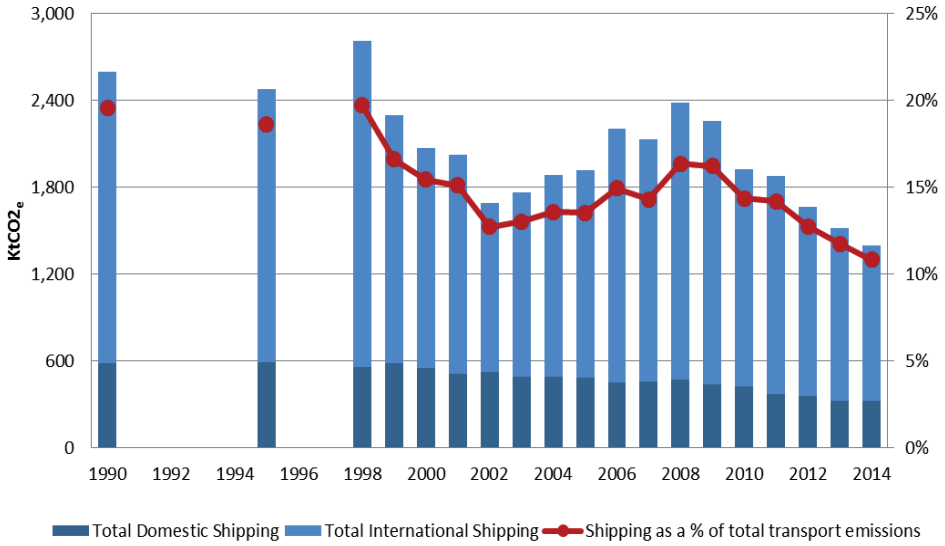
Maritime emissions

9.1.4 Emissions from maritime transport[49] in 2014 are estimated to be 1.4 $MtCO_2e$, or 11% of total transport emissions. This compares to 2.6 $MtCO_2e$ in 1990. Within that profile, emissions from international shipping have been volatile, while emissions from domestic shipping have decreased steadily since 1990.

48 Excluding adjustments for the EU Emissions Trading System

49 Includes national navigation and international shipping

Figure 11: Shipping emissions, 1990 – 2014

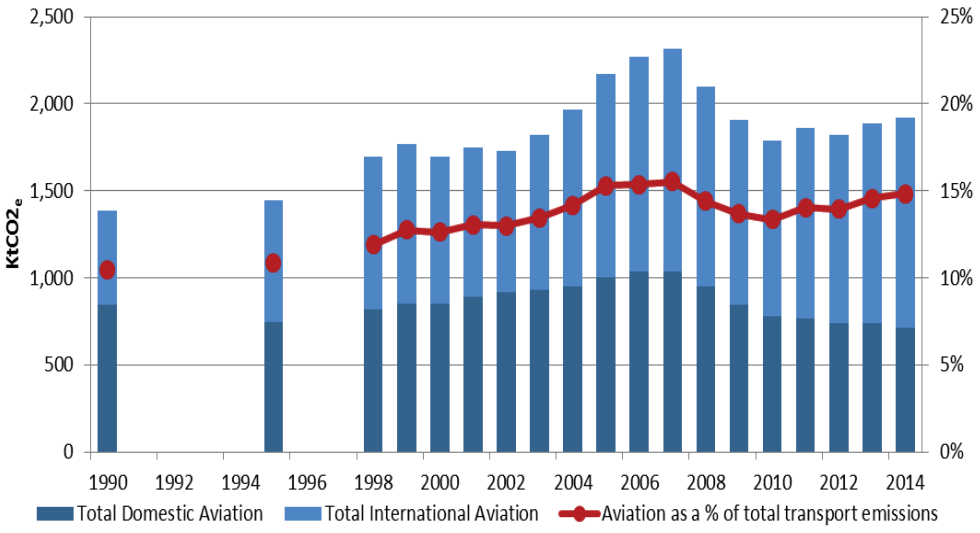


Aviation emissions

9.1.5 In 2014, aviation emissions stood at 1.9 $MtCO_2e$, or 15% of total transport emissions. This compares with 1.4 $MtCO_2e$ in 1990. Passenger numbers in that period increased from just over 10 million to 24 million. The growth in demand of 134% was thus associated with a significantly lower growth in emissions of 38%, reflecting effective efficiency improvements, including increased load factors.

9.1.6 In 2014, international aviation emissions account for 63% of total Scottish aviation emissions, almost the reverse of the proportion in 1990, when it was domestic aviation that accounted for 61% of aviation's emissions total.

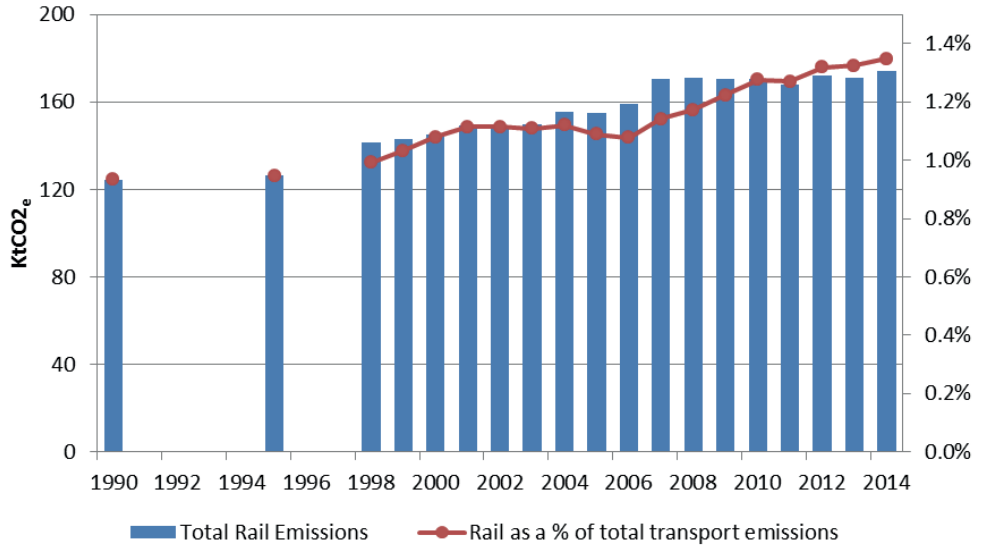
Figure 12: Aviation emissions, 1990 – 2014



Rail emissions

9.1.7 At 0.2 $MtCO_2e$ in 2014, rail accounts for only 1.3% of transport emissions. The 2014 figure is 44% above the equivalent 1990 figure of 0.1 $MtCO_2e$. and rail emissions have followed a generally rising trend over the period 1990 to 2014.

Figure 13: Rail emissions, 1990 – 2014



Active travel

9.1.8 In 2015, 1% of journeys had cycling as the main mode of transport and the average (mean) journey length was 4.7 km. For walking, the equivalent proportion cited in the Scottish Household Survey travel diary was 22%, with 14% of adults usually walking to work and 49% of children usually walking to school as their main mode of transport[50].

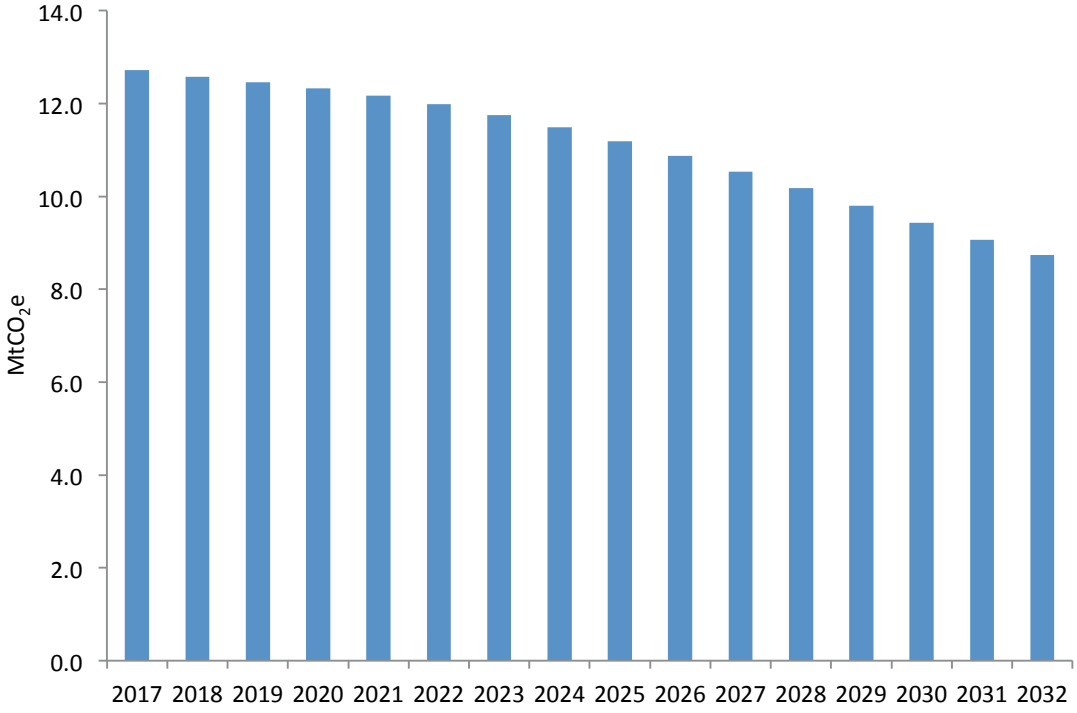
9.2 Our ambition

9.2.1 Our aim is to reduce emissions from transport in ways that promote sustainable environmental and socio-economic wellbeing. As historically, so in future we expect economic and population growth to increase the demand for the movement of goods, services and people. However, we also expect the pace of technological change to accelerate. Together with behaviour changes, that will allow for economic growth, while also reducing emissions significantly.

9.2.2 Future abatement will vary significantly across the individual transport modes. The availability of new technology; the cost of implementing technological, logistical and behaviour change; and the return on such investment will all have a bearing on which particular interventions we prioritise.

50 Transport and Travel in Scotland 2015

Figure 14: Transport carbon envelopes



The role of technology

9.2.3 We have commissioned and will be publishing research from Element Energy: Greenhouse Gas Emissions Reduction Potential in the Scottish Transport Sector from Recent Advances in Transport Fuels and Fuel Technologies.

9.2.4 On the basis of this and other work, we have identified key technological, economic and commercial trends which will form the baseline against which to measure future policy interventions, whether in relation to technology or behaviour change. We will continue to collect and interpret such baseline data. For example, air passenger numbers will be one data source that will allow us to evaluate the impact of changes to Air Passenger Duty (currently thought to be marginal in emissions terms and easily offset by other policy interventions).

9.2.5 A key observation is that, based on market-led technological change alone, we estimate an annual abatement of around 2.5 $MtCO_2e$ by 2035, even allowing for the effects of population and associated economic growth.

Cars

9.2.6 With the conventional car, we expect fuel efficiency improvements of 30% – 40% by 2035; and with hybrids and electric vehicles we expect battery costs to halve and their performance to double incrementally over the period to 2035, with a step-change in market penetration from 2020 onwards.

Road freight

9.2.7 With conventional HGVs, we expect fuel efficiencies around 25% by 2035, based on improved aerodynamics, transmissions and operations. Low carbon HGVs (such as diesel electric and gas powered LNG) will become more common from the mid-2020s.

Shipping

9.2.8 We might expect a 35% improvement in the efficiency of new, larger shipping by 2035, based on hybrid and gas-powered engines, battery-electric engines, and the potential use of assistive technology, such as sails, kite, rotors and aerofoil hulls. Gradual uptake and stock differences mean that this may equate to 10% at the fleet level.

Aviation

9.2.9 We might expect to see a 15% improvement in the efficiency of new aircraft by 2035, based on fleet modernisation, operational improvements, and improved aerodynamics and fabrication techniques (such as the use of composites). Step changes may occur in the 2030s and beyond, based on new engine technology (such as open rotors) and new aircraft designs (such as blended wing technology).

Policy implications

9.2.10 The detailed analysis underpinning these brief summaries suggests that technological change will be transformational, significantly reducing emissions, despite economic and population growth. Supporting such change remains a key priority.

9.2.11 Our research indicates that road transport can contribute most additional abatement, essentially because its high share of emissions is matched by the relative availability of technological and behaviour change interventions.

A future scenario

9.2.12 By 2032 transport emissions should have reduced by 4.2 $MtCO_2e$ or more compared to today.

9.2.13 Low emission cars and vans will be widespread and becoming the norm; low emission HGVs will be more common; a third of the ferries owned by the Scottish Government will be low carbon; aircraft fleets will be on the cusp of radical new designs; and ground operations at airports and ports will already involve low carbon solutions.

9.2.14 As one of several key results, air quality will have noticeably improved; and we will be enjoying the social, health and economic benefits from these improved transport systems.

Infrastructure

9.2.15 By 2035, we expect fully functioning market solutions for low carbon transport. Freight infrastructure will feature more efficient HGVs operating from out-of-town consolidation centres. Plug-in vehicles will be commonplace, with improved battery technology providing longer ranges and infrastructure supporting both electric and hydrogen powered vehicles.

Traffic management

9.2.16 Journeys made on our road network will also be more efficient due to the deployment of Intelligent Transport Systems (designed to ease the flow of traffic) and widespread uptake of fuel efficient driver training.

9.2.17 Low Emission Zones will limit the access of vehicles that exceed emissions benchmarks, while permitting unrestricted access for clean buses, vans and cars, as well as smaller goods vehicles relaying goods from consolidation centres.

9.2.18 Other measures, such as parking policies, will also incentivise public transport and active travel, as well as reducing congestion and contributing to improved air quality.

Wider synergies

9.2.19 Low emission vehicles will also play a role in the wider energy system. Electric and hydrogen vehicles will have a role in energy storage. The adoption of smart technologies could allow battery electric vehicles to play a wider role in balancing the grid.

The ultimate goal

9.2.20 By 2050, Scotland will be free from harmful tailpipe emissions from land transport, with other transport modes decarbonising at a slower pace, resulting in a healthier, more active population.

9.3 Policy outcomes, policies, development milestones and proposals

Policy outcome 1: Average emissions per kilometre of new cars and vans registered in Scotland to reduce in line with current and future EU/UK vehicle emission standards.

There are four policies, two policy development milestones and one proposal that will contribute to the delivery of policy outcome 1.

Policies which contribute to the delivery of policy outcome 1

1) With the EU and UK, negotiate stretching emission standards for new cars (and vans) beyond 2020 (and 2021).
2) With the UK, negotiate vehicle excise duty differentials between ultra-low emission vehicles (ULEVs) and diesel/petrol vehicles to support and encourage the uptake of ULEVs.
3) With the UK, negotiate biofuels policies that will enable them to be used sustainably in the decarbonisation of the whole transport sector.
4) Support fuel-efficient driver training.

Policy development milestones which contribute to the delivery of policy outcome 1

1) With local authorities and others, evaluate the scope for incentivising more rapid uptake of electric and ultra-low emission cars and vans, as through public procurement policies and preferential local incentives (such as access management and parking policies).
2) With local authorities and others, evaluate the scope for urban-wide low emission zones with a specific focus on CO_2 emissions, as well as air pollution more generally.

Proposals which contribute to the delivery of policy outcome 1

1) Collaborate with a local authority to model reductions in congestion and improvements in use of public transport, in possible association with a low emission zone.

Relative significance of policies, policy development milestones and proposals to the delivery of policy outcome 1

9.3.1 Outcome 1 will account for a significant proportion of overall emissions reduction, as cars currently emit 44% of all transport emissions.

Policy outcome 2: Proportion of ultra-low emission new cars and vans registered in Scotland annually to reach or exceed 40% by 2032.

There are six policies, one policy development milestone, and four proposals that will contribute to the delivery of policy outcome 2.

Policies which contribute to the delivery of policy outcome 2

1) With the EU and UK, negotiate stretching emission standards for new cars (and vans) beyond 2020 (and 2021).
2) With the UK, negotiate vehicle excise duty differentials between ultra-low emission vehicles (ULEVs) and diesel/petrol vehicles to support and encourage the uptake of ULEVs.
3) Enhance the capacity of the electric vehicle charging network (ChargePlace Scotland):
   - provide funding until at least August 2019 in order to support the on-going expansion of the publicly available network of EV charge points;
   - provide funding to support the safe and convenient installation of domestic and workplace charge points.
4) Provide interest-free loans through the Energy Saving Trust to enable the purchase of EVs by both consumers and businesses until at least March 2020.

5) With local authorities, review licensing regulations and consider introducing incentives to promote the uptake of ULEVs in the taxi and private hire sector, with loan funding for vehicle purchase until at least March 2020.
6) Promote the benefits of EVs to individuals and fleet operators and increase awareness and confidence in the viability of EVs as an alternative to fossil-fuelled vehicles.

Policy development milestone which contributes to policy outcome 2

1) Work with the UK Government, local authorities and other public and third sector partners to identify annually a package of financial and convenience ULEV incentives, such as free parking, access to LEZs and interaction with proposed workplace parking levies.

Proposals which contribute to the delivery of policy outcome 2

1) Building Standards:
   - consider draft proposals in the Energy Performance of Buildings Directive, relating to the provision of EV charge points/wiring in new residential and commercial developments
   - investigate how such measures could potentially be trialled in Scotland and consider developing guidance on charge point provision to support planning authorities
2) Continue to investigate the role that other alternative fuels, such as hydrogen, gas and biofuel, can play in the transition to a decarbonised road transport sector. Consider the scope for market testing approaches to alternative fuels infrastructure and supply.
3) Work with Scottish Enterprise, the UK government and other bodies to investigate the potential to undertake trials of connected and autonomous vehicles in Scotland.
4) Work with Scotland Excel, COSLA and other partners to determine whether a new procurement policy could be introduced in Scotland, which introduces a presumption that all new vehicles purchased by public sector organisations in Scotland are ULEVs.

Relative significance of policies, policy development milestones and proposals to the delivery of policy outcome 2

9.3.2 Policy outcome 2 will account for a significant proportion of overall emissions reduction, as cars currently emit 44% of all transport emissions.

9.3.3 The policies and proposals under policy outcome 2 are focused on removing some of the key domestic barriers identified to a more rapid take-up of in particular battery electric vehicles. There is a strong read across to the measures in policy outcome 1.

Policy outcome 3: Average emissions per tonne kilometre of road freight to fall by 28% by 2032.

There are four policies, two policy development milestones, and two proposals which will contribute to the delivery of policy outcome 3.

Policies which contribute to the delivery of policy outcome 3

1) With the EU and UK, negotiate an emission standard for Heavy Goods Vehicles from 2025.
2) With the UK, negotiate biofuels policies that will enable them to be used sustainably in the decarbonisation of the whole transport sector.
3) Deliver our Rail Freight Strategy.
4) Continue to support local authorities in delivering the ECO-Stars programme, reducing fuel consumption for HGVs, buses, coaches and vans.

Policy development milestones which contribute to the delivery of policy outcome 3

1) Consult on Intelligent transport Systems (ITS) Strategy by the end of March 2017.
2) With local authorities and others, evaluate the scope for urban-wide low emission zones with a specific focus on CO_2 emissions, as well as air pollution more generally.

Proposals which contribute to the delivery of policy outcome 3

1) Collaborate with a local authority to put in place a pilot low emission zone by 2018, examining the feasibility of low emission zones (LEZs) mitigating CO_2 emissions via the National Low Emission Framework.
2) Work with the freight sector to examine the scope for new freight logistics and infrastructure (potentially including freight consolidation centres on the outskirts of cities and urban areas following the introduction of LEZs); and to support market testing of local initiatives.

Relative significance of policies, policy development milestones and proposals to the delivery of policy outcome 3

9.3.4 Policy outcome 3 will account for a moderate proportion of total emissions reduction. Road freight carried on HGVs accounts for 1.7 $MtCO_2e$, and implementation of all the policies and proposals could reduce emissions from HGVs by 28% by 2032.

Policy outcome 4: Proportion of the Scottish bus fleet which are low emission vehicles has increased to 50% by 2032.

There is one policy, one policy development milestone and two proposals which contribute to the delivery of policy outcome 4.

Policy which contributes to the delivery of policy outcome 4

1) Provide financial support for the purchase and operation of low carbon buses.

Policy development milestones which contribute to the delivery of policy outcome 4

1) In the context of the current review of the National Transport Strategy and Transport Bill, we will examine the scope for climate change policies, as in relation to bus, across the public sector in high-level transport legislation, strategies and policies.

Proposals which contribute to the delivery of policy outcome 4

1) With local authorities and others, evaluate the scope for urban-wide low emission zones with a specific focus on CO_2 emissions, as well as air pollution more generally.
2) With local authorities and others, model and pilot reductions in congestion and improvements in use of public transport, in possible association with a low emission zone.

Relative significance of policies, policy development milestones and proposals to the delivery of policy outcome 4

9.3.5 Policy outcome 4 will account for a small proportion of overall emissions reduction, as bus and coach emissions account for under 4% of total transport emissions.

9.3.6 Any behavioural switch from private to public transport is likely to be limited by capacity of the sector to absorb significant new traffic.

Policy outcome 5: By 2032 low emission solutions have been widely adopted at Scottish ports and airports.

There is one policy that will contribute to the delivery of policy outcome 5.

Policy which contributes to the delivery of policy outcome 5

1) Encourage and support Scottish port authorities and airports to adopt low emissions solutions. These could include: cold ironing (the use of shore power by ships whilst in harbour); and measures to reduce emissions associated with airport ground operations and while planes are on the ground (for example single engine taxiing, the use of ground power for planes at stand, and low emission ground vehicles).

Relative significance of policies, policy development milestones and proposals to the delivery of policy outcome 5

Policy outcome 5 will account for a small proportion of overall emissions reduction. The key drivers in emission reduction from aviation and shipping will come from international organisation agreements and from ongoing improvements in design and materials.

Policy outcome 6: Proportion of ferries in Scottish Government ownership which are low emission has increased to 30% by 2032.

There is one policy development milestone that will contribute to the delivery of outcome 6.

Policy development milestone which contributes to the delivery of policy outcome 6

1) Examine the scope for procuring hybrid and low carbon powertrains in the public sector marine fleet as part of our vessel replacement programme.

Relative significance of policies, policy development milestones and proposals to the delivery of policy outcome 6

9.3.7 Policy outcome 6 will account for a small proportion of overall emissions reduction, as domestic maritime activity only accounts for 0.3 $MtCO_2e$ or 2.5% of transports total emissions.

Policy outcome 7: We will have electrified 35% of the Scottish rail network by 2032.

There are two policy development milestones that will contribute to the delivery of outcome 7.

Policy development milestones which contribute to the delivery of policy outcome 7

1) Electrification of the rail network in the High Level Output Statement for Control Period 6 (2019-2024).
2) Relative significance of policies, policy development milestones and proposals to the delivery of outcome 7.

Policy outcome 7 will account for a small proportion of overall emissions reduction, as rail makes up less than 1.5% of total transport emissions.

Policy outcome 8: Proportion of total domestic passenger journeys travelled by active travel modes has increased by 2032, in line with our Active Travel Vision, including the Cycling Action Plan for Scotland Vision that 10% of everyday journeys will be by bike by 2020.

There are two policies which will contribute to the delivery of outcome 8.

Policies which contribute to the delivery of policy outcome 8

1) Active travel: maintain funding for infrastructure and behaviour change programmes until at least 2021.
2) Support the Smarter Choices Smarter Places (SCSP) programme to encourage travel behaviour change.

Relative significance of policies, policy development milestones and proposals to the delivery of policy outcome 8

9.3.8 Policy outcome 8 will account for a small proportion of overall emissions reduction, as most journeys under a mile are already undertaken by walking.

9.4 Wider impacts

9.4.1 The following co-benefits and adverse side effects have been identified for policies in the transport sector:

Co-benefits to be realised

9.4.2 Many of the policies and proposals will bring additional co-benefits to communities, businesses and the third sector.

9.4.3 Individuals and businesses will benefit from increased electric vehicle uptake through improved air quality. Low emission zones, consolidation centres on the periphery of urban areas and support for the purchase of low emission buses will ensure the most polluting vehicles do not enter our towns and cities. Adverse health effects from exposure to pollutants are estimated to cause up to 50,000 deaths per year in the U.K. and reduce the average life expectancy by 7-8 months. Significantly reducing vehicle emissions in our towns and cities will improve health, reduce pollution related illnesses and consequently bring savings to healthcare.

9.4.4 Businesses and individuals will benefit from more reliable, faster deliveries in areas covered by consolidation centres. This is because the smaller vans travelling out of consolidation centres can travel directly to their locations, where as an HGV would travel round its delivery stops sequentially. A fleet of electric light goods vehicles will allow freight to be transported to its destination. Freight operators will be able to make more efficient use of their vehicles as they will not be delayed in congestion when delivering to inner city areas.

9.4.5 Further benefits will result from reduced noise pollution, which has a negative impact on health and wellbeing. The combined value of air quality improvements as a result of reduced emissions may be in excess of £500 million per year.

9.4.6 Taking cost projections for petrol and diesel cars into account, and the expected impact of future technological change, electric vehicles should become significantly cheaper to purchase and operate. This offers individuals and businesses the opportunity to make savings through reduced fuel and vehicle operating costs. Fuel efficient driving and travel planning offer further cost savings, as well as potentially reducing the risk of traffic accidents.

9.4.7 In the future, electric vehicles may be able to provide services to the power grid, smoothing out demand by drawing and returning power as needed by acting as a means of energy storage.

9.4.8 An increased number of journeys made by active travel will further reduce congestion and pollution, in addition to the associated benefits that come through living an active lifestyle. Active travel and lift sharing offer a potential route to combat transport poverty by increasing the availability of low-cost, low carbon transport options and reducing the need to own a car. Car clubs will allow households to access efficient vehicles without the costs associated with car ownership.

Adverse side effects to be managed

9.4.9 A significant proportion of the up-front funding required to implement many of these policies is likely to fall on the public sector. With electric vehicles, the Scottish Government has funded the roll out of the ChargePlace Scotland network of charge points and funds their operation. It is expected that there will be a need for the public sector to continue to incentivise electric vehicle uptake until they are competitive with conventional vehicles. As the price of electric vehicles fall, individuals and businesses will be encouraged to invest in low carbon alternatives.

9.4.10 The introduction of freight consolidation centres may present some disruption for logistics organisations, resulting from the need to relocate premises. Low emission zones may also present challenges to fleet operators as it will impact on fleet renewal decisions.

9.4.11 Other measures, such as the implementation of low emission solutions at ports and airports and the roll out of low emission solutions in the bus and maritime sectors will likely require initial public sector support.

9.4.12 These additional public sector costs should be balanced against the potential health, social and economic benefits arising.

9.4.13 The Scottish Government will ensure that potential adverse impacts are appropriately managed.

9.5 Summary of policies, development milestones and proposals

Policy outcome 1: Average emissions per kilometre of new cars and vans registered in Scotland to reduce in line with current and future EU/UK vehicle emission standards

Table 9-1: Policies that contribute to the delivery of policy outcome 1

Policy	EU, UK or Scottish policy	Public sector partners	Delivery route
With the EU and UK, negotiate stretching emission standards for new cars (and vans) beyond 2020 (and 2021)	EU and UK	N/A	Vehicle emission standards are currently set at a European level. Vehicle efficiencies have improved considerably over recent years, driven in large part by the existing EU vehicle emission standards. The current standards specify that average emission of new cars in 2021 must be 95 gCO_2/km and for new vans, 147 gCO_2/km by 2020. We will work with the EU and the UK Government to press for strong future emissions standards beyond those currently in place.
With the UK, negotiate vehicle excise duty differentials between ultra-low emission vehicles (ULEVs) and diesel/petrol vehicles to support and encourage the uptake of ULEVs	UK	N/A	VED differentials are in place for lower emission vehicles compared to higher emitting petrol and diesel vehicles. Zero emission vehicles are exempt, with a graded scale of differential for vehicles up to 100 gCO_2/km. Changes coming into force on 1 April 2017 may impact on adoption of low carbon vehicles as only zero emission vehicles will have reduced VED after year one on a vehicles life. It will be important to maintain this VED differential into the 2020s, as although the total cost of ownership premium between an ULEV and a petrol or diesel vehicle is likely to decrease in this period, some level of premium will still remain. VED is set by the UK Government, and we will continue to work with them and press the need for a VED differential for ULEVs through the 2020s.
With the UK, negotiate to introduce biofuels policies that will enable them to be used sustainably in the decarbonisation of the whole transport sector.	UK	N/A	The EU biofuels target is currently implemented in the UK through the Renewable Transport Fuel Obligation (RTFO) but is currently scheduled to end in 2020. We will press the UK Government to extend the RTFO (or equivalent) to ensure that biofuels (primarily as drop-in fuels) will make up a growing proportion of transport fuel and enable them to be used most effectively as a finite resource in the decarbonisation of transport.
Support fuel efficient driver training	Scottish	Local authorities	We will continue to fund Fuel Efficient driver training, improving fuel efficiency and encouraging safer driving. Almost 6,000 drivers completed training in 2014-16.

Table 9-2: Policy development milestones that contribute to the delivery of polcy outcome 1

Policy development milestone	Delivery route
With local authorities and others, evaluate the scope for incentivising more rapid uptake of electric and ultra-low emission cars and vans as through public procurement policies and preferential local incentives (such as access management and parking policies)	Procurement policies can be used to increase penetration of ULEVs through direct procurement by the public sector or by setting contract conditions for companies operating services for local authorities. Since 2014, Transport Scotland's Switched On Fleets initiative has provided £3.5 million to enable Scottish local authorities and their community planning partners to introduce an estimated 350 new electric cars and vans in the Scottish public sector fleet. There is potential to build on this strong foundation by strengthening public procurement policies in Scotland to positively favour ULEVs. We will therefore work with Scotland Excel, COSLA and others to determine whether a new procurement policy could be introduced in Scotland which introduces a presumption that all new vehicles purchased by public sector organisations in Scotland are ULEVs, unless there are very clear operational or technical reasons for not doing so. We will also encourage the public sector in advance of this work to set contract conditions for their suppliers, specifying the requirement for ULEV use. We will publish our findings by the end of 2017.
With local authorities and others, evaluate the scope for urban-wide low emission zones with a specific focus on CO_2 emissions, as well as air pollution more generally	We will build on the work being undertaken for the National Low Emission Framework (NLEF) to establish read across to low emission zones focusing on CO_2 emissions.

Table 9-3: proposals which contribute to the delivery of policy outcome 1

Proposal	Delivery route
Collaborate with a local authority to model reductions in congestion and improvements in use of public transport in possible association with a low emission zone	National Transport Strategy engagement begins in 2017.

Table 9-4: Policy outcome 1 over time

Policy outcome 1	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Total change in average gCO_2e/km (cars)	111	107	103	99	95	-	-	-	-	-	-	-	-	-	-	-
Total change in average gCO_2e/km (vans)	175	165	156	147	-	-	-	-	-	-	-	-	-	-	-	-

Policy outcome 2: Proportion of ultra-low emission new cars registered in Scotland annually to reach 40% by 2032

Table 9-5: Policies that contribute to the delivery of policy outcome 2

Policy	EU, UK or Scottish policy	Public sector partners	Delivery route
With the EU and UK, negotiate stretching emission standards for new cars (and vans) beyond 2020 (and 2021)	EU and UK	N/A	Vehicle emission standards are currently set at a European level. Vehicle efficiencies have improved considerably over recent years, driven in large part by the existing EU vehicle emission standards. The current standards specify that average emission of new cars in 2021 must be 95 gCO_2/km and 147 gCO_2/km by 2020 for new vans. We will work with the EU and the UK Government to press for strong future emissions standards beyond those currently in place.
With the UK, negotiate vehicle excise duty differentials between ultra-low emission vehicles (ULEVs) and diesel/petrol vehicles to support and encourage the uptake of ULEVs	UK	N/A	VED differentials are in place for lower emission vehicles compared to higher emitting petrol and diesel vehicles. Zero emission vehicles are exempt, with a graded scale of differential for vehicles up to 100 gCO_2/km. It will be important to maintain this VED differential into the 2020s, as although the total cost of ownership premium between an ULEV and a petrol or diesel vehicle is likely to decrease in this period, some level of premium will still remain. VED is set by the UK Government, and we will continue to work with them and press the need for a VED differential for ULEVs through the 2020s.
Enhance the capacity of the electric vehicle charging network (ChargePlace Scotland): • provide funding until at least August 2019 in order to support the on-going expansion of the publicly available network of EV charge points • provide funding to support the safe and convenient installation of domestic and workplace charge points	Scotland	All property owning public sector partners	Given the importance of an extensive and reliable EV charging network across Scotland to enabling the widespread adoption of EVs, TS will continue to provide funding to support the on-going expansion of the publicly available ChargePlace Scotland network. We will also continue to support the installation of domestic and workplace charge points and we will work with partners to identify solutions for households without off-street charging. The composition of this funding package will be reviewed annually to ensure funding is deployed in such a way as to maximise support for EV uptake. A review will be undertaken before August 2019, prior to the end of the current agreement with our network operator, Charge Your Car.

Policy	EU, UK or Scottish policy	Public sector partners	Delivery route
Provide interest-free loans through the Energy Saving Trust to enable the purchase of EVs by both consumers and businesses until at least March 2020	Scottish	N/A	In addition to the UK Government's plug-in car and van grant, TS are providing over £7 million of funding to EST in 2016/17 for a Low Carbon Transport Loan Scheme for both consumers and businesses. Individuals can apply for a loan of up to £35,000 to cover the cost of purchasing an ULEV, while businesses can apply for a loan of up to £100,000 which can be used towards a wide range of measures to reduce the business' transport carbon footprint (including the purchase of ULEVs, up to £35,000 per vehicle). Current Loan provision will continue until at least March 2020 and will be reviewed on a yearly basis to ensure it is proportionate to the level of demand.
With local authorities, review licensing regulations and consider introducing other incentives to promote the uptake of ULEVs in the taxi and private hire sector with loan funding for vehicle purchase until at least March 2020	Scottish	Local Authorities	There are more than 20,000 taxis and private hire cars in Scotland, offering potential for increased adoption of EVs. We will continue to fund the Energy Savings Trust's Low Carbon Transport Loan which offers an interest-free loan of up to £100,000 to businesses, including licensed taxi and private hire operators, to encourage them to switch to EVs. In addition, 'Hackney cab' operators can apply for a loan to replace cabs that are at least eight years old with a lower emission alternative. We will also consider expanding the loan scheme to include ultra-low emission 'Hackney cabs', when they are available to buy (expected 2017). At present, fewer than half of Scotland's local authorities allow EVs to be licensed as taxis and private hire vehicles. We will therefore work with EST to encourage authorities to review their interpretation of licensing regulations, learning from areas such as Dundee and Edinburgh, where EVs are already being used as taxis or private hire vehicles.
Promote the benefits of EVs to individuals and fleet operators and increase awareness and confidence in the viability of EVs as an alternative to fossil-fuelled vehicles	Scottish	Community Planning Partnerships	A combination of Greener Scotland marketing campaigns, major annual events such as Greenfleet Scotland/Evolution and a series of EV road shows by EST have enabled engagement with a significant number of individuals and businesses. This engagement has focused on promoting EV benefits, dispelling myths and providing test drives for a wide range of vehicles. This activity will continue, the exact nature and composition of the communication and marketing initiatives being determined on an annual basis to ensure maximum levels of engagement from available budget.

Table 9-6: Policy development milestones that contribute to the delivery of policy outcome 2

Policy development milestone	Delivery route
Work with the UK government, local authorities and other public and third sector partners to identify annually a package of financial and convenience ULEV incentives, such as free parking, access to LEZs and interaction with proposed workplace parking levies.	It is forecast that the cost of electric vehicles will fall and annual sales increase. This means that, over time, Government will review the incentive packages available to ensure these reflect market conditions. Instead, ongoing financial or time benefits that provide an incentive in the order of £1,000 over the vehicle lifetime are likely to play an increasing role. These could include discounted use of ferries (as previously trialled on all routes to Mull and Bute), free parking (already in place in Dundee), access to LEZs, interaction with proposed workplace parking levies and reduced licence fees for electric taxis. Furthermore, indirect or perceived financial incentives (such as permitted bus lane running and prioritised parking spaces for EVs) may also have a role to play in encouraging EV uptake. Such measures would be implemented at a local authority (LA) level, and financing options will be discussed as this develops. The Scottish Government role would be to address any legislative barriers; provide guidance and potentially financial support. Transport Scotland recently published a National Framework of Local Incentives for Electric Vehicles, providing guidance and technical assistance and an overview on the barriers and challenges associated with introducing such measures. As a next step, TS will work with partners and, by the end of 2017, publish initial plans for the introduction of a package of EV incentives in Scotland.

Table 9-7: Proposals which contribute to the delivery of policy outcome 2

Proposal	Delivery route
Planning/Building Standards Consider draft proposals in the Energy Performance of Buildings Directive, relating to the provision of EV charge points/wiring in new residential and commercial developments Investigate how such measures could potentially be trialled in Scotland and consider developing guidance on charge point provision to support planning authorities	The review of the Energy Performance of Buildings Directive (EPBD), contains proposals regarding the provision of pre-cabling and charging points in new residential and non-residential developments respectively (and those undergoing major renovations). SG has already strengthened the guidance in both Third National Planning Framework and the Scottish Planning Policy 2014, recognising the importance of considering plug-in vehicle charging infrastructure in new developments. Furthermore, as of August 2016, eleven (34%) out of 32 Local Development Plans (LDPs) include the consideration for provision of charge points in new developments. Building on this work, SG will consider the draft proposals in the EPBD, and investigate undertaking a trial with a developer in Scotland. The outputs of any trial would help shape potential national rollout of such provisions. In addition, when development plans are reviewed and updated, changes at the national level will filter down. Whilst it is important to maintain the flexibility that local authorities have to do what is best for local development in their own areas, Transport Scotland will consider developing guidance on charge points to support planning authorities.
Continue to investigate the role that other alternative fuels, such as hydrogen, gas and biofuel, can play in the transition to a decarbonised road transport sector Consider the scope for market testing approaches to alternative fuels infrastructure and supply	Building on our investment in both the Aberdeen H2 bus project and the Levenmouth community energy project, we will continue to work with key partners to investigate the use of hydrogen as a transport fuel, as well as exploring wider environmental and economic opportunities of using hydrogen for energy applications – especially in promoting renewables, energy balancing and storage. We will also continue to engage with our partners, including fuel supply companies, local authorities and developers on the role lower carbon intensive fuels such as liquid petroleum gas, compressed natural gas and biofuels can play in the transition towards a near zero emission road transport sector by 2050.
Work with Scottish Enterprise, the UK Government and other bodies to investigate the potential to undertake trials of connected and autonomous vehicles in Scotland	Over the next few years advances in connected and automated vehicle technologies will likely have a an impact on our transport system, with the potential to deliver major benefits; fewer crashes on our roads; freedom to travel for those who currently find that difficult; more efficient transport networks that are safer, smoother, and swifter; and, new jobs in the technology and automotive sectors. We want to make sure that Scotland is prepared for this potential transformation. We will work with partners and investigate the possibility of Scotland hosting large scale autonomous and connected vehicle trials.

Proposal	Delivery route
Work with Scotland Excel, COSLA and other partners to determine whether a new procurement policy could be introduced in Scotland, which encourages new vehicles purchased by public sector organisations in Scotland are ULEVs	Procurement policies can be used to increase penetration of ULEVs through direct procurement by the public sector or by setting contract conditions for companies operating services for local authorities. Since 2014, TS's Switched On Fleets initiative has provided £3.5 million to enable Scottish local authorities and their community planning partners to introduce an estimated 350 new electric cars and vans in the Scottish public sector fleet. There is potential to build on this strong foundation by strengthening public procurement policies in Scotland to positively favour ULEVs. We will therefore work with Scotland Excel, COSLA and others to determine whether a new procurement policy could be introduced in Scotland which introduces a presumption that all new vehicles purchased by public sector organisations in Scotland are ULEVs, unless there are very clear operational or technical reasons for not doing so. We will also encourage the public sector in advance of this work to set contract conditions for their suppliers, specifying the requirement for ULEV use. We will publish our findings by the end of 2017.

Table 9-8: Policy outcome 2 over time

Policy outcome 2	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Total share of sales that are classified as low emissions	2.5%	3.0%	3.5%	4.1%	4.9%	5.9%	7.2%	8.8%	11%	13%	15%	18%	22%	27%	32%	40%

Policy outcome 3 Average emissions per tonne kilometre of road freight to fall by 28%* by 2032

Table 9-9: Policies that contribute to the delivery of policy outcome 3

Policy	EU, UK or Scottish policy	Public sector partners	Delivery route
Lobby the EU and UK Governments to introduce an emission standard for new Heavy Goods Vehicles in line with proposals arising from the EU European Strategy for Low-Emission Mobility	EU and UK	N/A	We will work with the UK Government and our EU partners to encourage the introduction of a new binding carbon emission standard for new HGVs registered and operating in Scotland (and the rest of the UK/EU). Currently new HGVs must meet Euro VI standard – but this is focused on pollutants and does not include a CO_2 standard. The introduction of a fuel efficiency standard for newly registered HGVs (as has existed in the US for some time) will encourage HGV manufacturers to bring forward new models which are more efficient and produce lower levels of carbon emissions. As these new vehicles penetrate the HGV fleet operating in Scotland and replace higher emission vehicles more road freight miles will be driven in the most up to date, fuel efficient vehicles – thereby leading to a reduction in CO_2 emissions from the freight sector. The EU European Strategy for Low-Emission Mobility proposes a post 2020 strategy for lorries, buses and coaches. Given the 10 year average life of an HGV, the Commission argues that steps to address emissions must be in place by 2020. A first step will be the proposed legislation on monitoring/reporting of Heavy-Duty Vehicle fuel consumption and CO_2 emissions, with further proposals due in 2017. We will support efforts at this level to address emissions.
With the UK, negotiate biofuels policies that will enable them to be used sustainably in the decarbonisation of the whole transport sector	Scotland	N/A	See above.
Deliver our Rail Freight Strategy	Scotland	Network Rail, Scotrail, Local authorities, Office of Rail Regulation	"Delivering the Goods" Scotland's Rail Freight Strategy was published in March 2016 and set out 22 actions that Transport Scotland and/or other industry partners will take forward with a range of organisations to develop a sustainable rail freight industry, with identifiable growth potential over time. Currently, per tonne of freight, rail freight produces 76% less CO_2 than road freight so there is potential to reduce emissions by switching more freight from road to rail. A report setting out progress against the Strategy's six critical success factors will be published by June 2018 including the success factor of: longer, faster, greener freight trains. In the shorter-term a number of actions in the strategy relate to the Scottish Government's planning for the next rail control period and the ORR's periodic review both of which relate to the period 2019-2024.

Policy	EU, UK or Scottish policy	Public sector partners	Delivery route
Continue to support local authorities in delivering the ECO-Stars programme, reducing fuel consumption for HGVs, buses, coaches and vans	UK	Local authorities	ECO Stars is a UK wide fleet recognition scheme covering HGVs, buses, coaches, vans and taxis. The ultimate aim is to reduce fuel consumption and thereby lower emissions of both CO_2 and air pollutants. The scheme provides recognition for best operational practices and guidance for making improvements. Currently the Scottish Government provides funding support for 11 local authorities to operate ECO Stars schemes for HGVs, buses, coaches and vans, and three authorities for taxis. As of May 2016, these schemes collectively covered 148 unique members and 13,070 vehicles, representing approximately 11% of Scotland's HGV fleet and 23% of the public transport fleet.

Table 9-10: Policy development milestones that contribute to the delivery of policy outcome 3

Policy development milestone	Delivery route
Consult on Intelligent transport Systems (ITS) Strategy by the end of March 2017	The ITS strategy will set out our high level priorities for ITS development and asset management over the next 10 years and will be supported in due course by a series of action plans and delivery programmes. The strategy and its associated plans and programmes will address the changing roles that ITS systems and services will play in providing our road users with accurate and relevant traffic and travel information, incident response and transport resilience. The Strategy will take into account recent, current and near-future developments in information technologies, including an assessment of where customers want and expect to go for their traffic and travel information, and the role of Transport Scotland in the provision of these services. The Strategy will also consider existing ITS assets, in particular in respect of the maintenance, renewal and replacement of existing infrastructure.
With local authorities and others, evaluate the scope for urban-wide low emission zones with a specific focus on CO_2 emissions, as well as air pollution more generally	We will build on the work being undertaken for the National Low Emission Framework (NLEF) to establish read across to low emission zones focusing on CO_2 emissions.

Table 9-11: Proposals which contribute to the delivery of policy outcome 3

Proposal	Delivery route
Collaborate with a local authority to put in place a pilot low emission zone by 2018 examining the feasibility of low emission zones (LEZs) mitigating CO_2 emissions via the National Low Emission Framework.	The Cleaner Air for Scotland strategy calls for a reduction in greenhouse gas emissions whilst delivering co-benefits for air quality, The National Low Emission Framework (NLEF) is a transport-based air quality appraisal which will inform discussions with individual local authorities on the most appropriate locations for any Low Emission Zones (LEZ). NLEF decision making will rely on National Modelling Framework (NMF) outputs, which can examine carbon emission trends in tandem with air pollution. In preparing the first LEZ to be put in place by 2018, we will work with local authorities to explore and assess the potential for co-benefits. This first LEZ will provide a legacy upon which other Scottish LEZ's could be introduced, perhaps in conjunction with other award schemes such as the Freight Facilities Grants.
Work with the freight sector to examine the scope for new freight logistics and infrastructure (potentially including freight consolidation centres on the outskirts of cities and urban areas following the introduction of LEZs); and to support market testing of local initiatives.	Through the Scottish Freight and Logistics Advisory Group (ScotFLAG), we are working with our partners across the public and private sectors to identify and facilitate any opportunities to increase the efficiency and sustainability of freight movements in cities – including exploring opportunities for load consolidation. A Scottish Freight and Logistics Advisory Group (ScotFLAG) Urban Freight sub-group has been set up with a remit to identify opportunities, share best practice, , and co-ordinate activity aimed at increasing the sustainability, safety and efficiency of freight movements in Scotland's urban areas' . This sub-group is Chaired by the Freight Transport Association.

Table 9-12: Policy outcome 3 over time

Policy outcome 3	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Total emissions (gCO_2e) per tonne kilometre of road freight Index 2017 =100[51]	100	98	96	94	92	91	89	87	85	83	81	79	78	76	74	72

51 This is our initial indicator based on readily available and published data. We will work with the industry and other interested parties to assess and if necessary develop a more appropriate indicator with which to measure the emissions efficiency of the HGV sector.

Policy outcome 4: Proportion of the Scottish bus fleet which are low emission vehicles has increased to 50% by 2032

Table 9-13: Policy development milestones that contribute to the delivery of policy outcome 4

Policy development milestone	Delivery route
Provide financial support for the purchase and operation of low carbon buses	Transport Scotland has developed targeted interventions to encourage operators to purchase and operate low emission buses in the Scottish fleet. These help the government to meet its aims for improved air quality and reductions in emissions of greenhouse gases. A review of the SGBF is currently underway and we are considering changing the basis for assessing applications, widening the criteria to include aspects such as technological ambition, amount of carbon saved/passenger/vehicle, value for money and previous organisational experience. Infrastructure is unlikely to be included as other funding processes (such as the Bus Investment Fund) could be used to help with these costs if funding is available. The SGBF will likely remain an annual fund. The intervention to help with the costs of low emission bus operation forms part of the Bus Service Operators Grant. The green incentive is worth 100% uplift in 2016/17 (28.8p/km compared with a basic rate of 14.4p/km) though this level of incentive is not sustainable and will be reviewed in 2017. The green incentive was worth £762,00 in 2013/14 but has now grown to £3,498,000 in 2015/16 and is forecast for £5,606,000 in 2016/17. It has proved successful in encouraging operators to invest in low emission buses, purchasing them outwith the SGBF as they become more commercially viable to operate. We are working with Confederation of Passenger Transport (CPT) and the Low Carbon Vehicle Partnership to more closely target the available funding to maximise the outputs. We are designing a more sophisticated and future-proofed green incentive scheme which will be banded to weight subsidy towards the most carbon efficient buses and to ensure better value for money across the BSOG incentive. That scheme will also be time limited, unlike the current one, to better reflect bus payback periods. Both of these schemes are flexible and scalable which enables them to respond to progress against targets.
In the context of the current review of the National Transport Strategy and Transport Bill, we will examine the scope for embedding climate change policies, as in relation to bus, across the public sector in high-level transport legislation, strategies and policies	National Transport Strategy engagement begins in 2017.

Table 9-14: Proposals which contribute to the delivery of policy outcome 4

Proposal	Delivery route
With local authorities and others, evaluate the scope for urban-wide low emission zones with a specific focus on CO_2 emissions as well as air pollution more generally.	We will build on the work being undertaken for the National Low Emission Framework (NLEF) to establish read across to low emission zones focusing on CO_2 emissions.
With local authorities and others, model and pilot reductions in congestion and improvements in use of public transport, in possible association with a low emission zone.	National Transport Strategy engagement begins in 2017.

Table 9-15: Policy outcome 4 over time

Policy outcome 4	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Proportion of bus fleet made up of low emission vehicles	10%	13%	15%	18%	20%	23%	25%	27%	30%	33%	36%	39%	42%	45%	48%	50%

Policy outcome 5: By 2032 low emission solutions have been widely adopted at Scottish ports and airports

Table 9-16: Policies that contribute to the delivery of policy outcome 5

Policy	EU, UK or Scottish policy	Public sector partners	Delivery route
Encourage and support Scottish port authorities and airports to adopt low emission solutions. These could include cold ironing (the use of shore power by ships whilst in harbour); and measures to reduce emissions associated with airport ground operations and whilst planes are on the ground (for example – where appropriate – single engine taxiing, the use of ground power for planes at stand, and low emission ground vehicles)	Scotland	HIAL, Prestwick Airport, Local authorities, Ferry operators, Shipping companies, Ports, Maritime Industry bodies	We will work with port authorities, the shipping industry and airports to encourage and support them to introduce low emission solutions on a voluntary basis. For example, we will work with port authorities to identify the potential costs and benefits of cold ironing (the use of shore power by ships whilst in harbour) and other low emission measures to ship owners and operators. Similarly, we will work with airport owners [and operators?] to identify measures that can be taken to reduce emissions associated with ground operations and whilst planes are on the ground (for example (where appropriate) single engine taxiing, the use of ground power for planes at stand, and low emission ground vehicles). We will work with ports and airports, ship owners/operators and airlines to overcome barriers to the voluntary adoption of these measures and ensure they are taken into account when considering their future investment plans.

9.6.1 There are no appropriate quantifiable indicators here for measuring this activity as there will be ad-hoc specific actions by individual organisations, largely in the private sector.

Policy outcome 6: Proportion of ferries in Scottish Government ownership which are low emission has increased to 30% by 2032

Table 9-17: Policy development milestones that contribute to the delivery of policy outcome 6

Policy development milestone	Delivery route
Examine scope for procuring hybrid and low carbon powertrains in the public sector marine fleet as part of our vessel replacement programme	We are developing a programme of procurements to replace vessels in the CMAL ferry fleet with lower emission powertrains. For each project we will consider diesel-electric hybrid and liquid natural gas (LNG) fuelling options; in addition CMAL will continue to pursue technical designs which improve fuel efficiency and CFL will continue its operational work on reducing fuel consumption. We are supporting the Scottish-based Hyseas consortium with its initiative to trial a hydrogen-powered ro-ro vehicle ferry. We publish annual Vessel Replacement and Deployment Plans which will set out our evolving plans and projects in more detail.

Table 9-18: Policy outcome 6 over time

Policy outcome 6	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Proportion of bus fleet made up of low emission vehicles	3	3	4	4	5	5	5	6	6	7	7	7	8	8	9	9

Policy outcome 7: We will have electrified 35% of the Scottish rail network by 2032

Table 9-19: Policy development milestones that contribute to the delivery of policy outcome 7

Policy development milestone	Delivery route
Electrification of the rail network in the High Level Output Statement for Control Period 6 (2019-2024)	We will continue to roll out electrification across the rail network with plans announced as part of the High Level Output Statement for Control Period 6 (2019-2024). It is estimated that the use of electric trains across the rail network will result in an average reduction in emissions of 18% when compared with equivalent diesel trains. We will also investigate hybrid train and other emerging technologies to determine the suitability for application on Scotland's railways as a potential energy and cost-saving alternative to overhead wire electrification.

Table 9-20: Policy outcome 7 over time

Policy outcome 7	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Percentage of rail track electrified (kilometres)[52]	*26%*	*27%*	*27%*	*28%*	*29%*	*29%*	*30%*	*30%*	*31%*	*32%*	*32%*	*33%*	*33%*	*34%*	*34%*	*35%*

52 Commitments in kilometres electrified do not extend beyond the current control period. The Italicised figures are simply indicative at this point and future plans will be announced as part of the new control period.

Policy outcome 8: Proportion of total domestic passenger journeys travelled by active travel modes has increased by 2032, in line with our Active Travel Vision, including the Cycling Action Plan for Scotland Vision that 10% of everyday journeys will be by bike by 2020

Table 9-21: Policies that contribute to the delivery of outcome 8

Policy	EU, UK or Scottish policy	Public sector partners	Delivery route
Active travel: maintain funding for infrastructure and behaviour change programmes until at least 2021	Scottish	Local authorities are our main delivery partners and have a critical role to play. In addition, Regional Transport Partnerships, the NHS, Further and Higher Education Institutions, Scottish Canals and the Trunk Road Operating Companies will all have a role to play	Increasingly we will plan infrastructure improvement projects that re-prioritise road space in our largest settlements away from cars in favour of walking and cycling. This will make out urban areas more liveable, increasing safety and enabling people to choose walking and cycling for short trips, for example through the Community Links Plus design competition. We will maintain the annual budget for active travel at until at least 2021 and will look to increase it whenever possible. That budget will fund both improvements and extensions to the infrastructure for walking and cycling throughout the country (particularly in our towns and cities) and a range of behaviour change initiatives that encourage and support people to choose walking and cycling for everyday journeys. Integration between walking, cycling and public transport will also be improved (for example through more and better bike parking and the development of a network of active travel hubs at public transport interchanges). We will continue to work with a range of delivery partners (including Cycling Scotland, Paths for All, Sustrans, Living Streets, Cycling UK Scotland and local authorities) to deliver behaviour change programmes that support people to overcome information, awareness, skills, confidence and attitudinal barriers to walking and cycling for everyday journeys. The exact mix of funding for infrastructure and behaviour change initiatives and the programmes that it supports will be reviewed regularly in partnership (e.g. through the National Walking Strategy Delivery Group and the Cycling Action Plan for Scotland Delivery Forum) to ensure that our approach is most effective in bringing about change in people's travel habits to encourage more active travel.
Support the Smarter Choices Smarter Places (SCSP) programme to encourage travel behaviour change	Scottish	Local authorities, Regional Transport Partnerships, Paths for All, Third Sector Delivery Partners	SCSP partnership project with COSLA is designed to increase walking and cycling for short journeys, car sharing and public transport use for longer journeys. Local Authorities target specific populations for travel behaviour change interventions. The projects include travel planning (at work, school or home), public awareness events, signage and mapping, supporting car clubs and work with public transport operations.

9.6.2 There are no appropriate quantifiable indicators here for measuring this activity as there will be ad-hoc specific actions by individuals and organisations.

9.6 Progress since RPP2

Table 9-22: Progress on RPP2 policies

RPP2 Policies	Summary of progress
EU Cleaner Vehicle Directives	EU regulations specify average emissions of new cars in 2021 must be 95g CO_2/km. These regulations have been the primary driver of reduced emissions in cars. The annual rate of car emissions reduction increased from 1% per year in the year before implementation to 4% per year in years afterwards. Efficiency improvements in fossil-fuelled cars will likely be significant in reaching the 2021 emissions targets.

Table 9-23: Progress on RPP2 proposals

RPP2 Proposals	Summary of progress
EU Biofuels target as implemented through the UK Renewable Transport Fuel Obligation (RTFO)	The main mechanism for the promotion of biofuel use, the Renewable Transport Fuel Obligation (RTFO), set by UK Department for Transport, results in the use of available biofuel across the whole of the transport sector. The UK DfT is currently developing a successor mechanism to RTFO from 2017 and there are indications that this may focus the deployment of sustainable biofuel on sectors such as heavy freight or aviation, that are difficult to decarbonise through electrification. Scottish Ministers support this principle, which could mean that sustainable biofuel penetration into those sectors could reach higher percentages than the expected maximum average across the wider transport sector.
Continued roll-out of EV charge points through ChargePlace Scotland	We have continued to expand our network of EV chargepoints since this proposal. The ChargePlace network now comprises over 1,200 charging, including 150 'rapid' chargers, one of the most comprehensive networks of rapid charge points in Europe.
Switched-on Fleets	Switched-on Fleets offers evidence based analysis to identify opportunities for the deployment of EVs in each of Scotland's 32 CPPs. Transport Scotland has provided £2.5 million to enable local authorities to buy or lease plug-in vehicles. The first phase of Switched-on Fleets resulted in over 240 EVs being introduced across 50 public sector fleets. Another £1.2 million of funding will be provided in 2016-17.
Scottish Green Bus Fund (SGBF)	Since its launch in 2010, six rounds of the SGBF have provided nearly £15 million to support the introduction of 315 new low carbon vehicles into the Scottish bus fleet. The fund is complemented by the Bus Service Operators' Grant, which currently pays double the standard rate of grant for services operated by low carbon vehicles.
Ferries Plan	Three diesel-electric hybrid ferries using a combination of battery and conventional diesel power have been procured and delivered within the last six years and are now all operating daily scheduled ferry services on the west coast.
Use of Intelligent Transport Systems (ITS) and Average Speed Cameras on the Trunk Road Network	Transport Scotland have utilised ITS to inform transport network users of issues, alternative routes and methods of travel to minimise transport disruption. Variable message signs located at key points along the trunk road network and regularly spaced overhead lane signals advise drivers of incidents and delays. Traffic Scotland provide real time information in response to traffic problems through their website, mobile app and radio.

RPP2 Proposals	Summary of progress
Development of community based travel planning strategies	Personalised travel planning was provided to over 5,000 households, 49 employers and 2101 staff across 85 schools in 2015 through the Smarter Choices, Smarter Places programme. Further behaviour change measures, including personal travel planning, will be delivered under the additional £5 million of funding for the SCSP enhanced roll-out in 2016-17. In 2015-16 and 2016-17 the £10 million funding attracted over £13 million in match funding for the local projects. Over 340 projects have been supported locally. The programme of work started on 1 April 2016 and has attracted £6.8 million in local match funding.
Cycling and walking	The second Active Travel Summit took place on 2 November 2016 in Stirling and the third iteration of CAPs will be published by the end of 2016, reaffirming the Scottish Government's commitment to the 10% vision of everyday trips by bike by 2020. The Programme for Government (2016) further commits to maintaining record levels of funding to support active transport, such as cycling and walking for the remainder of the parliamentary term.
Car Clubs	There are car clubs in 25 locations in 16 Local Authority areas. There are approximately 10,000 members across Scotland, with access to 342 vehicles. 23% of the Scottish Car Club fleet is electric.
Support for Workplace Travel Planning and fuel efficient driving	A new Scotland wide travel planning site, 'TravelKnowHow Scotland', was launched in September 2016 with 100 organisations registered. In addition, over 20 Business Improvement Districts took part in European Mobility week events. The Energy Savings Trust has trained over 13,400 drivers in fuel efficient driving techniques, which deliver an average 15% improvement in efficiency.
Freight Efficiencies	Annually, MSRS enables around 2.5 million tonnes of freight to move by rail rather than road, removing 100,000 HGV road journeys and delivering more than £7 million in environmental benefits. In addition, FFG funded operations deliver around £3.5 million in environmental benefits. Through ScotFlag and its Urban Freight and Last Mile Connections sub groups, we continue to engage with the industry and key stakeholders to increase efficiencies in respect of urban deliveries and connectivity to intermodal hubs.
Additional Emissions Reduction Potential from transport in 2025	We will continue to explore and consider alternative policies and proposals to achiaeve additional emissions reduction potential in transport.