JUST
TRANSITION
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SCOTLAND

Paper - Transport Scotland
For information

1.   Purpose

1.1   This paper provides Commissioners with background briefing on low carbon transport in Scotland. Transport Scotland officials have drafted this paper, at the request of the secretariat.

2.   Background

2.1   The paper provides an overview of low carbon transport initiatives in Scotland, and the potential for future mobility trends to realise economic benefits and promote socioeconomic inclusion.

1. Context

1.1   In the last five years, reductions in emissions from the power sector have enabled Scotland to reduce its overall emissions. However, this has led to the share of Scotland's emissions from transport increasing substantially. Transport is now Scotland's largest sectoral emitter, responsible for 37% of Scotland's total greenhouse gases in 2016.

### Historical emissions from transport and its share of total emissions in Scotland[1]
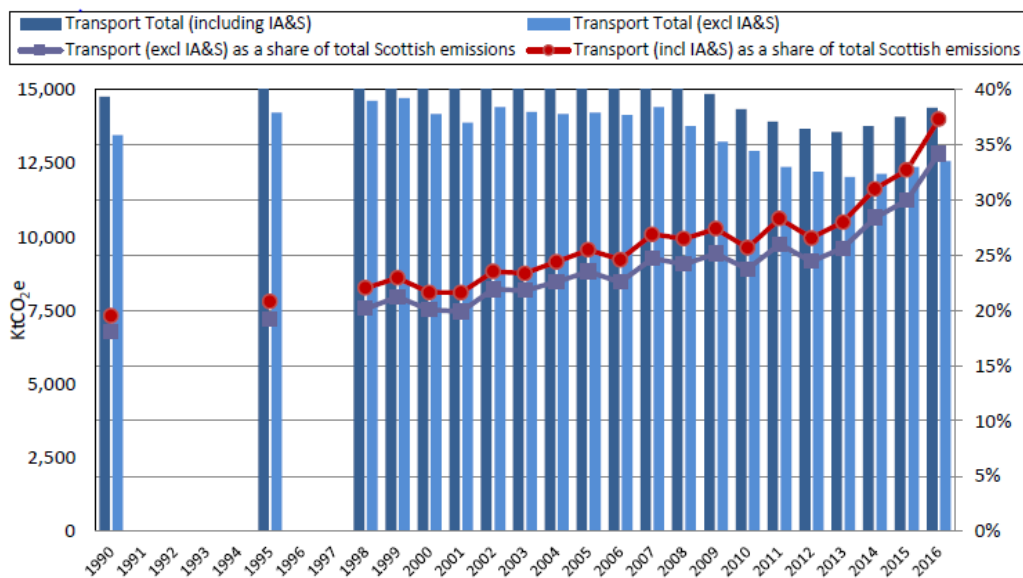
Source: National Atmospheric Emissions Inventory

1.2   The largest contributor to transport emissions is the road sector, accounting for 68%. The factors affecting transport emissions are numerous and complex. The 2008 recession was a contributing factor to the fall in emissions, alongside fuel efficiency improvements and fluctuations in the price of oil. In general emissions from transport have decreased since the 2007 peak but the last couple of years have seen an increase due to increasing miles driven which is counterbalancing the more efficient technology.

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[1] IA&S – International Aviation and Shipping

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Breakdown of transport GHG emissions by mode (2016)
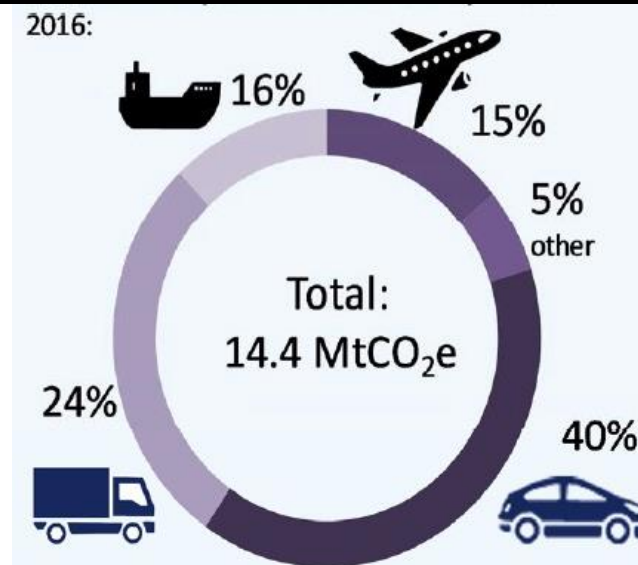
1.3   The Climate Change Plan[2] (CCP), published February 2018, envisages significant decarbonisation of transport, with emissions reducing by 37% over the lifetime of the Plan (2018-2032). However, transport will need to increase its decarbonisation ambitions further to meet the new, more ambitious net zero by 2045 target that will be established through the Climate Change (Scotland) Bill which is currently progressing through Parliament.
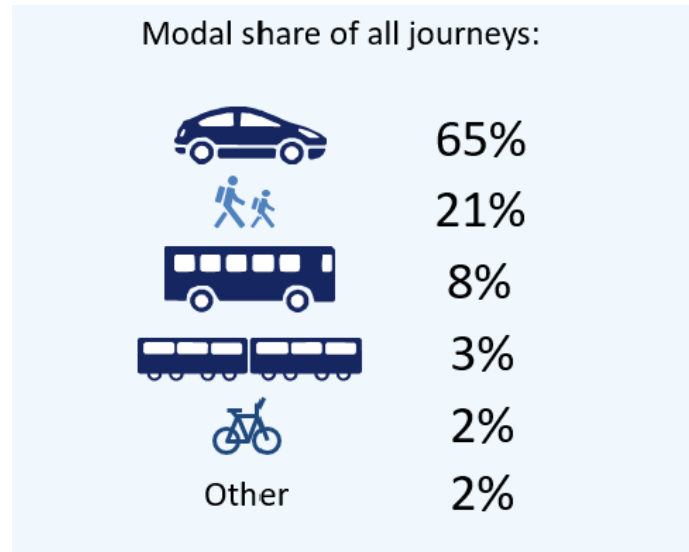
1.4   Our ambition is to reduce emissions from transport in ways that promote sustainable environmental and socio-economic wellbeing. New infrastructure, improvements in technology and behaviour change will be the main drivers for success. The CCP sets out a wide-ranging sectoral vision for transport, which includes the following policies and proposals:

- phase out the need to purchase petrol or diesel powered cars or vans by 2032;
- introduce low emission zones in Scotland's major cities;
- electrify 35% of the Scottish rail network by 2032; and
- increase low emission ferries in the Scottish Government fleet by 30%.

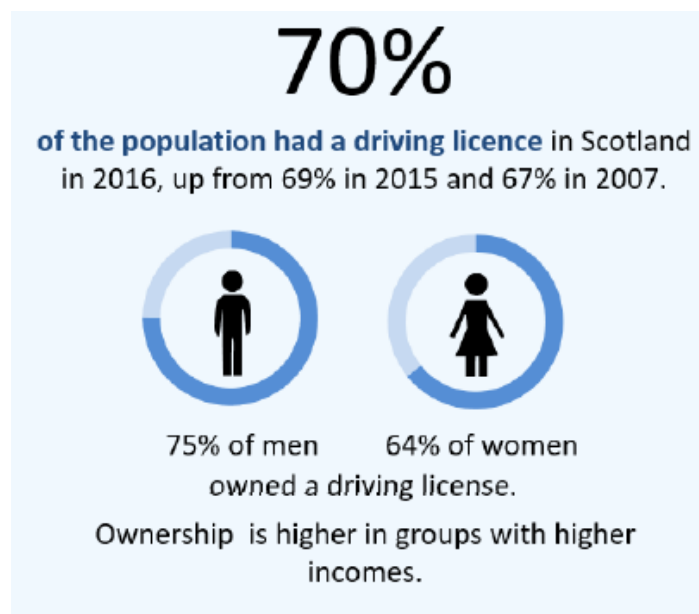## 2.   Differences in travel across social groups

2.1   In Scotland in 2017, driving remained the most popular mode of transport: 52% of journeys were made as a car or van driver. A further 13% were made as a car/van passenger. The second most used mode of transport was walking, at 21%. Around 8% of journeys were made by bus. Rail accounted for less than 3% of journeys and bicycle 1.5%.

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[2] https://www.gov.scot/publications/scottish-governments-climate-change-plan-third-report-proposals-policies-2018/

Modal share of all journeys:

🚗	65%
🚶	21%
🚌	8%
🚆	3%
🚲	2%
Other	2%

2.2   Around three quarters (73%) of adults travelled the previous day. Men were slightly more likely to have travelled than women; 75 per cent of men had travelled the previous day compared to 72 per cent of women. Older people were less likely to have travelled the previous day.

2.3   Women were more likely than men to walk or catch the bus to work. Men were more likely to cycle to work or travel by rail. People in lower income households were more likely to walk or take the bus; people in higher income households were more likely to drive. People in rural areas were also more likely to drive than those in urban areas. Younger people (aged 16 to 29) were most likely to take the bus.

70%

of the population had a driving licence in Scotland in 2016, up from 69% in 2015 and 67% in 2007.

75% of men   64% of women
owned a driving license.

Ownership is higher in groups with higher incomes.

3.   National Transport Strategy

3.1   Transport Scotland is currently undertaking a collaborative review of our National Transport Strategy (NTS2) to set out a compelling vision for the kind of transport system we want for Scotland over the next 20 years. We have set out an approach that is focused on collaborative working with our partners, developing a robust evidence base and engaging with stakeholders and citizens across Scotland to give them a greater say in the development of transport policy.

3.2   For a future NTS2 strategic framework, our current working assumption is a vision for a sustainable, inclusive and accessible transport system helping to deliver a healthier, more prosperous and fairer Scotland for communities, business and visitors. Transport is an enabler, and supports wider outcomes, which include four priority themes: Promotes Equality, Takes Climate Action, Helps our Economy Prosper and Improves our Health and Wellbeing

4.   The Sustainable Travel Hierarchy

4.1   The sustainable travel hierarchy[3], as referred to in our National Transport Strategy, promotes walking, cycling, public transport and bike, car or ride sharing in preference to single occupancy car use for moving people around and encourages efficient and sustainable freight. The hierarchy starts with investments being made in support for travel planning – then walking, cycling – then to public transport – to shared transport (e.g. car/bike share) - and then to greening of technology across all the modes.
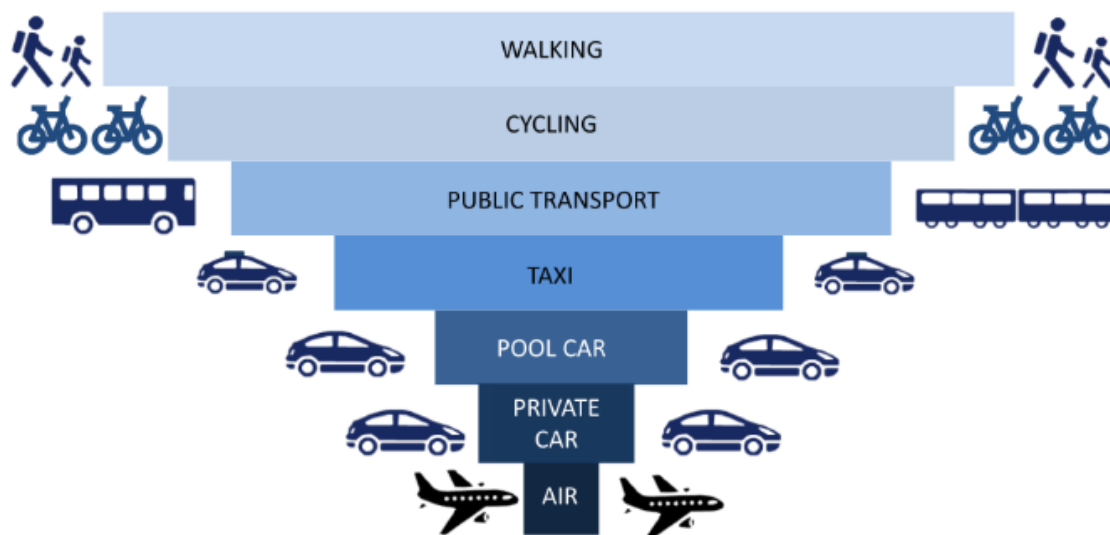
4.2   The Scottish Government are investing £7 million per annum in the *Smarter Choices Smarter Places* behaviour change programme to encourage more people to choose more sustainable transport. The Scottish Government is not anti-car, but rather we are encouraging the idea of shared transport and having access to cars rather than ownership, through the use of car clubs. Transport Scotland grant funds CoMoUK £359,870 to increase awareness of the role and

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[3] https://www.transport.gov.scot/media/10310/transport-scotland-national-transport-strategy-january-2016-final-online.pdf

benefits of shared transport. We also support the delivery of the Bike Share Forum for Scotland which has been set up to share knowledge, experience and support local authorities and community groups to develop bike share schemes.

5. Active Travel

5.1 From 2018/19, the Scottish Government doubled its record levels of funding for active travel to £80 million annually for the term of this Parliament. This year we will invest over £60 million in infrastructure projects to deliver more walking, cycling and place-making to encourage people to spend more time outdoors and enabling people to make active travel choices. Active Travel Delivery Partners, including Sustrans, Paths for All, Cycling Scotland and Cycling UK take account of the The Fairer Scotland Duty in assessing bids from communities, local authorities and other public sector organisations to ensure everyone has access to cycling and walking facilities, including subsidised bike hire in the Forth Valley area.

5.2 In 2018/19 we launched an innovative £1.8 million scheme for loans, grants and trials of electric bicycles. E-bikes can provide a more sustainable alternative to single-occupancy car journeys. For 2019/20, £1.14 million has been allocated to the Ebike Fund. The fund helps assist local authorities, public sector agencies, further and higher education institutions, active travel hubs and community groups to adopt e-bikes, e-cargo/adaptive bikes for more sustainable alternatives to car journeys.

6. Public Transport

6.1 This government is continuing to spend over £250 million a year to support our vital bus industry. This allows operators to keep fares at affordable levels, and provide free bus travel to older and disabled passengers. We also provide support to local authorities via the block grant so that they can support socially necessary bus services. Local authorities spent £52 million in 2016-17 in supporting bus services to meet local needs.

6.2 As part of our efforts to encourage more people out of their cars and onto public transport, we continue to work with our industry partners to boost rail and cycling integration by improving facilities for cyclists

7. Greener technology

7.1 The Scottish Government supports the development of alternative fuel technologies that can contribute towards its low carbon transport policy and its climate change targets. We have focused our climate change policy actions on encouraging increased uptake of new technologies, particularly for road transport as that is where research suggests the greatest impact can be made.

Ultra-Low Emissions Vehicles
7.2 The Scottish Government has committed to phasing out the need for petrol and diesel vans and cars by 2032, to support achieving the targets set out in the Climate Change Plan.

7.3   Scotland benefits from one of Europe's most comprehensive charging networks, and our continued investment ensures we improve and expand this network. There are currently almost 1000 ChargePlace Scotland public chargepoints, and an average distance of just over 2 miles between chargepoints - the equivalent figure for England and Wales is over 4 miles. The Scottish Government invested £15m in 2018/19 to add 1,500 new charge points in homes, businesses and on land owned by local authorities, including 150 new public charge points. We are committed to continuing to invest in growing and supporting the charging network in Scotland.

7.4   Scotland intends to be at the forefront of charging technology and investment and we will collaborate widely to support business opportunities, to realise wider economic benefits across Scotland. Transport Scotland is working with energy network businesses to identify how innovation and smarter management of our electricity networks can reduce the need for upgrades, and any associated costs and disruption.

7.5   Transport Scotland initiatives are broadening access to Ultra Low Emission Vehicles and removing barriers to their use. We have increased our Low Carbon Transport Loan Fund from £8M to £20M enabling more businesses and consumers to make the switch to electric vehicles. Our Plugged In Households initiative will widen access to electric vehicles, including through housing associations and car clubs, so that communities across Scotland can share in the benefits of ultra-low emission vehicles. Our Switch on Towns and Cities initiative will deliver 20 electric towns by 2025 by supporting innovative actions within a town or city to incentivise the uptake of EVs. Our domestic charge point grant scheme is open to all electric vehicle users across Scotland, while our Switched on Fleets initiative supported orders for over 700 ULEVs in public sector last financial year.

7.6   The technical report from the Committee on Climate Change (CCC), published May 2019, suggests that by 2030 a new battery electric car will be cost saving compared to a petrol or diesel car over the lifetime of the vehicle, even when including the costs of developing a public recharging network and upgrading power networks to deal with the increased demand for electricity, and accounting for the need to replace exchequer revenue from fuel duty. Given expected reductions in the cost to purchase an electric vehicle and projected fuel costs, their analysis suggests that new electric cars are likely to become cost-effective during the 2020s from a societal perspective (i.e. including the cost of the vehicle and the cost of fuel (excluding taxes), discounted at the social discount rate of 3.5%).

Rail electrification
7.7   The addition of three newly electrified routes operating in Scotland means that by the end of 2019, 75% approximately of all ScotRail passenger journeys will be by low carbon electric trains. The proportion of passengers using electric trains (as opposed to diesel) will have increased by approximately 16% since 2016, at a time of significant absolute growth in passenger numbers. Between 2017 and 2018, ScotRail's diesel usage reduced by 9% with sizeable reductions in fuel costs being experienced as a result of the switch to electricity.

7.8   The electrified rail network brings many benefits (often in comparison to other modes of transport) including reduced emissions as electric trains regenerate when braking putting circa 20% electricity back into the supply, and are quieter in operation. Individual rail journeys have one of the lowest forms of carbon use, amplified when travelling by electric train, and bringing CO2

reductions of up to 21% when renewables or other low carbon sources provide that electricity – as is happening increasingly in Scotland.

Ferries

7.9 The Scottish Government supports a network of publicly-funded ferry services and, through its asset-owning company Caledonian Maritime Assets Ltd (CMAL), is committed to leading the way in innovative ferry design and building for the future.

7.10 Three diesel-electric hybrid ferries using a combination of battery and conventional diesel power have been procured and delivered within the last 7 years and are now all operating daily scheduled ferry services on the west coast of Scotland. The development of these low emission hybrid ferries in Scotland will see the introduction of more sustainable ferries which are reliable; fuel efficient and will have lower maintenance costs, benefiting the communities that rely on them and helping to contribute to the Scottish Government's targets on cutting climate change emissions.

7.11 Two major ferries designed to operate on LNG are currently under construction by Ferguson Marine Engineering Ltd (FMEL). These ferries will be 'dual-fuel' vessels so they can operate on liquefied natural gas (LNG) and marine diesel. LNG is significantly cleaner and has been adopted by ferry operators in Northern Europe in response to tighter emissions regulations. Benefits will be gained by a marked reduction in CO2 and sulphur and nitrous oxides emissions.

7.12 The Scottish Government has also supported the successive phases of the HySeas hydrogen ferry project which has the objective of developing a sea-going roll-on roll-off vehicle and passenger ferry powered by hydrogen from local renewable sources. The HySeas hydrogen ferry project is a natural extension of the above initiatives but is, at the same time, a significant increase in ambition – to produce a zero emission ferry based solely on local renewable energy sources. The HySeas project consortium includes FMEL, CMAL, Scottish Enterprise, St Andrews University and other partners. Following the success of HySeas I and II projects, the Scottish Government remains committed and welcomes the consortium's success in securing £9.3 million in EU Horizon 2020 funding to take forward the HySeas III £12.6 million initiative.

8. Smart Ticketing and MaaS

8.1 Mobility as a Service (MaaS) is about exploring use of innovative data driven solutions to create more, simple and flexible transport options for users. MaaS could help reduce emissions by promoting walking and cycling options and making public transport an easy alternative to using or even owning a car, complementing our wider smart ticketing work. We will look to harness innovation within our transport system through investing up to £2 million *per annum* to develop MaaS in Scotland.

8.2 The smart programme supports the Scottish Government agenda for a more sustainable Scotland in that, through providing more convenient, smart, ticketing and payment options on public transport, plus enhancing the information available digitally for journey planning, we are aiming to encourage people out of cars and onto our sustainable public transport network, so reducing carbon emissions. Key projects currently being delivered include:

- Our £1.1m **Smart Pay Grant Fund**, opened in Nov 2018 is supporting operators with providing a modern bank payment method for bus travel, improving access to this public transport mode by negating the need for correct change or cash at all, providing a smart, contactless payment method and meeting society's expectations for contactless convenience. The fund has awarded over £600k to support operators so far, which is estimated to provide a contactless payment solution to potentially 4.5 million fare paying journeys right across Scotland. We are currently in round two for the fund, due to close June 2019, with potential for a third round following market evaluation.

- **Traveline Scotland** – aggregator project and public data projects. We are working in partnership with Traveline Scotland (TLS), CPT and representative transport operators on a technical and solution development study for the Traveline Scotland website and app to improve its current journey planning offering to include aggregated fares information, giving people more information around their travel options. The outcomes of this discovery project, completed in April 2019, will influence smart programme activity for TLS, and the support we provide in terms of developing projects for their website or app information or functionality improvements.

- **Smartcard interoperability**, technical project commenced early 2018 – We are working closely with ScotRail, various bus operators, and the Glasgow Subway, as well as smartcard issuers Local Authorities, Young Scot and NECPO on a project to further enhance smartcard acceptance across modes of transport, bringing flexibility and convenience for both commercial and concessionary smartcards. This will benefit passengers as they will only need one smartcard for smart travel on the majority of Scotland's public transport networks.

9. Connected and Autonomous Vehicles

9.1   The development and deployment of Connected and Autonomous vehicles and infrastructure has the potential to bring transformative change to peoples' lives. The Scottish Government is committed to developing a well-integrated, sustainable, accessible and environmentally friendly transport system and, with the adoption of CAV technologies expected to deliver both safety benefits and also economic growth attributable to productivity gains and the reduced cost of transport, the opportunity to use CAV technologies and contribute to their development is highly attractive.

9.2   In alignment with the UK Government, the Scottish Government is committed to maintaining the UK's position as a global leader in the safe and responsible testing of automated vehicles and in helping to deliver fully self-driving vehicles on our roads by 2021. In support of this, Transport Scotland are a partner in the Project 'CAVForth' pilot study which will see an autonomous bus service operate on the trunk road network from the Ferrytoll Park and Ride facility in Fife, across the Forth Road Bridge Public Transport Corridor, to Edinburgh Park as well as the return journey.

9.3   Transport Scotland has instituted an annual 'CAV Scotland' event to showcase both UK and world-wide practice, with the successful inaugural event taking place alongside Traffex RoadExpo in 2018. Transport Scotland are also developing a CAV Roadmap to explore the opportunities

associated with the adoption of CAV technologies and the operational challenges in deploying these, it is anticipated that this will be published in 2019.

9.4   A frequently cited benefit of CAV technologies is the potential for increased accessibility for those, such as the elderly or those with mobility issues, who are unable to use or access traditional vehicles or public transport. This could contribute towards better health, social and economic outcomes.

9.5   The potential benefit in social inclusion due to the adoption of CAV technologies is not limited to the elderly and those with mobility issues. The adoption of CAV technologies could also provide significant benefits in rural areas both through improved access to transport and, if CAV technologies are integrated into the freight and logistics network, they could be used to significantly reduce the costs of delivery. Furthermore, populations in rural areas could access services that are otherwise difficult or inconvenient to reach. Given that Scotland's elderly population is expected to continue to grow, with the proportion of people over the age of 75 years to increase by 27%, then these benefits will be magnified.

9.6   There could also be a reduced need for parking in city centres as CAVs could be able to drive themselves away from city centre areas after picking up or dropping off. This could free up land to be repurposed as green space and represents an opportunity to realise environmental and land value benefits and help re-imagine places and facilitate inclusive street design.