

Reducing Car-km and Carbon Emissions: Options for the Nestrans Region Executive Summary

Document no: 2
Version: 3

Nestrans

10 July 2023



Context and study process

The Scottish Government, in its Climate Change Plan, has committed to reduce carbon emissions (from all sectors) by 75% by 2030 (compared with 1990) and to reach net zero emissions by 2045. The target for the transport sector is to reduce emissions by 56% by 2030 in comparison with the 1990 baseline.

Work undertaken for Transport Scotland¹ showed that, even if sales of zero/low emission vehicles expand significantly, a substantial reduction in car kilometres is required if Scotland is to meet these targets and indicated that, to achieve this target, the number of car-km would need to reduce by 21% compared to a 2018 baseline, and emissions per km to fall by 57%.

As a result, the Government committed to reduce the number of car-km travelled on Scotland's roads by 20%, in comparison with a 2019 baseline, by 2030. Achievement of that target would create substantial carbon saving benefits, thereby contributing to one of the key aims of Nestrans Regional Transport Strategy (RTS), as well as the objectives of Aberdeen City Council, Aberdeenshire Council and other partners in the North East of Scotland.

There are many potential options for achieving change in car-km and emissions in the Nestrans region. In its "Route map to achieve a 20 per cent reduction in car kilometres by 2030"² consultation document, Transport Scotland proposed some interventions that would contribute to the achievement of that target. Each (and other options that are relevant to the North East region but are not considered in the Route Map) comes with different implications for inclusion and equality, and for the region's economy, in addition to its direct impacts on transport choices.

This report summarises the findings of a review which has considered the targets in the specific context of the baseline and trends of the North East of Scotland and has considered the quantitative and qualitative impacts of measures which might influence car use or emissions per km.

The review is intended to help Nestrans and its partners identify ways to achieve the target reductions in car-km and carbon emissions from car use in a way that accords with the needs and aspirations of the region and its people.

Alongside the quantified effects on car-km and emissions, this study also considers the ability to implement each potential intervention, and considers how each might affect different groups of people and/or journey types undertaken in the region. This reflects that the target allows for 80% of car-km to continue to be travelled, but is commensurate with the Government's aspirations for a Just Transition towards net zero, as well as regional partners' aspirations for a transport system that is inclusive and equitable, as well as environmentally sustainable.

The work has followed a logical, evidence-led approach, as summarised in the flowchart. It concludes with identification of the region's "offers" to help work towards the targets, and "asks" of national government and others where assistance is requested.



¹ <https://www.transport.gov.scot/media/50354/decarbonising-the-scottish-transport-sector-summary-report-september-2021.pdf>

² <https://www.transport.gov.scot/publication/a-route-map-to-achieve-a-20-per-cent-reduction-in-car-kilometres-by-2030/>

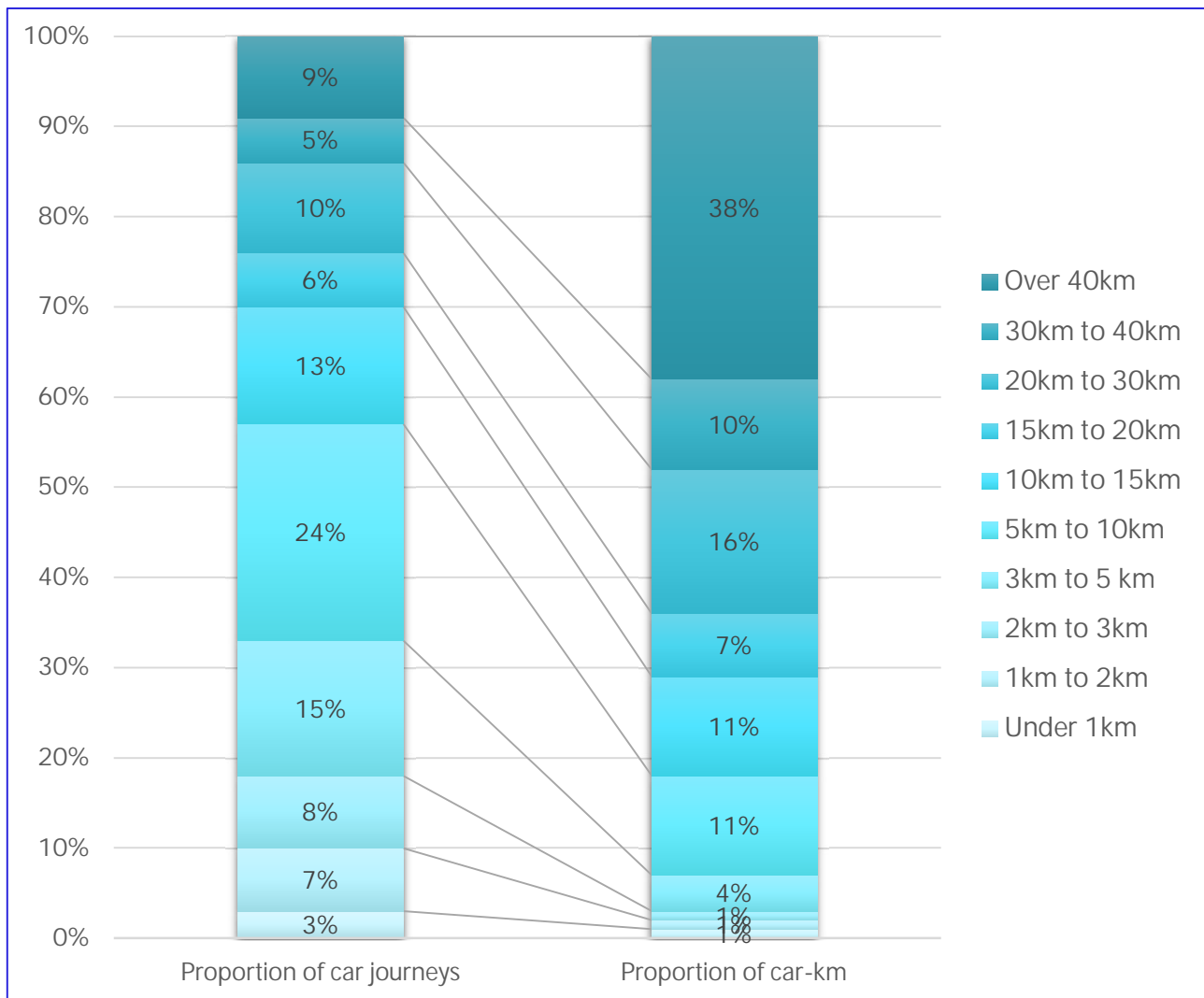
Baseline car use and carbon emissions in the Nestrans region

There are around 7,500 car-km driven in the region annually for each resident. Car-km in the region have grown over time and the last time that car-km were 20% less than those in 2019 was in the early 2000s.

Car-km per person in the region is around 13% greater than the Scottish average, and is 75% greater in Aberdeenshire than Aberdeen City.

Most car journeys are relatively short, but long journeys comprise a high proportion of car-km, as shown in Figure 1. For example, journeys of more than 20km comprise less than a quarter of all car journeys made in the region but nearly two-thirds of all the car-km.

Figure 1. Proportion of car journeys and car-km by journey length, Nestrans region³



Around 90% of car-km in the region arises from journeys made entirely within it; the other 10% from journeys to/from or across the region.

More than 80% of all km travelled in Scotland are by car, so even a relatively large proportional change in use of other modes might result in only a small impact on car use (Figure 2).

³ Source: ASAM Transport Model

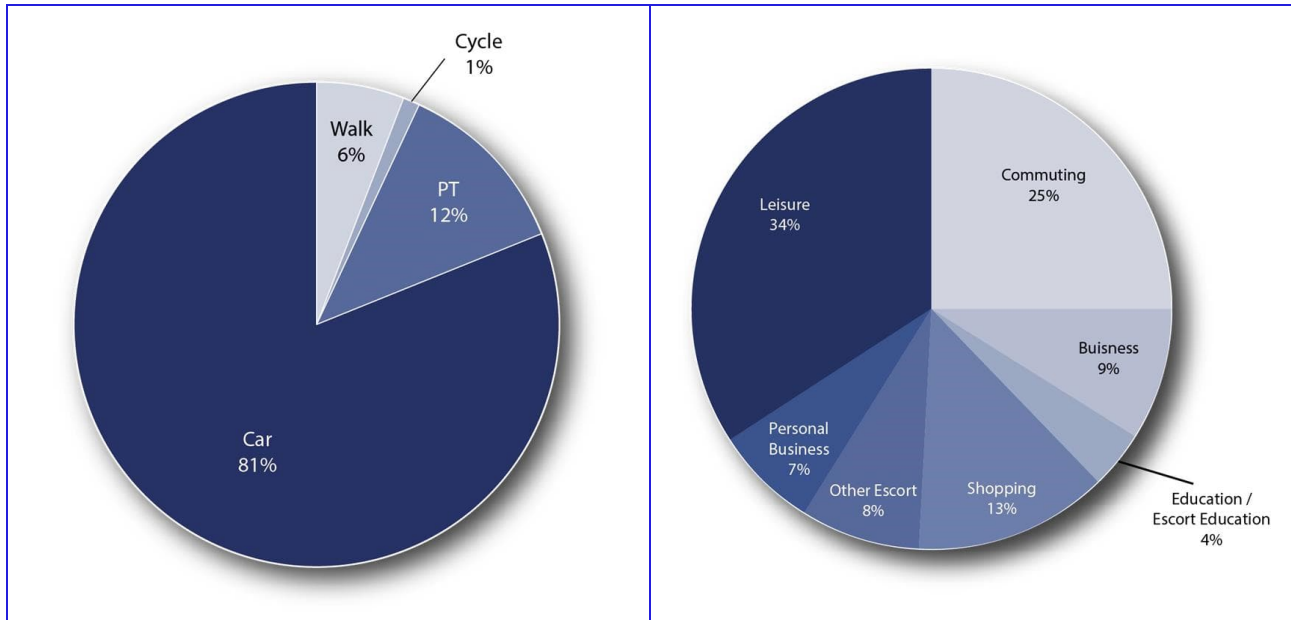
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Journeys for leisure result in a higher proportion of car-km than any other purpose (34% of the total); commute journeys comprise around 25% of all car-km (a variety of other purposes make up the remainder, Figure 3). Action to influence use of car for a variety of journey purposes is therefore likely to be needed if the 20% target is to be achieved.

Figure 2. Proportion of total km travelled by mode, Scotland⁴

Figure 3. Proportion of car-km by journey purpose, England⁵



More affluent people drive further: the most affluent travel over three times more car-km per person than the least affluent. As most electric and other low-emission cars are relatively new, it is also likely that the more affluent have better access to low carbon (at the point of use) vehicles.

Covid has had a major effect on travel patterns and on car use. Its long-term effects remain uncertain as work, leisure and other habits remain in a state of flux. Data presented above relates to pre-Covid travel. It is anticipated, however, that the pandemic could reduce car-km in the region in the range of zero to 10% (that is it may result in no long-term change, but could result in a reduction in car use of up to 10%).

Carbon emissions from transport per person in the region are slightly higher than the national average. National emissions from transport did not fall between 2015 and 2019, and were only 7% lower in 2019 than in 1990.

⁴ This data for Scotland, as reliable data for the Nestrans region is not available.

⁵ This data for England, as reliable data for the Nestrans region or for Scotland is not available.

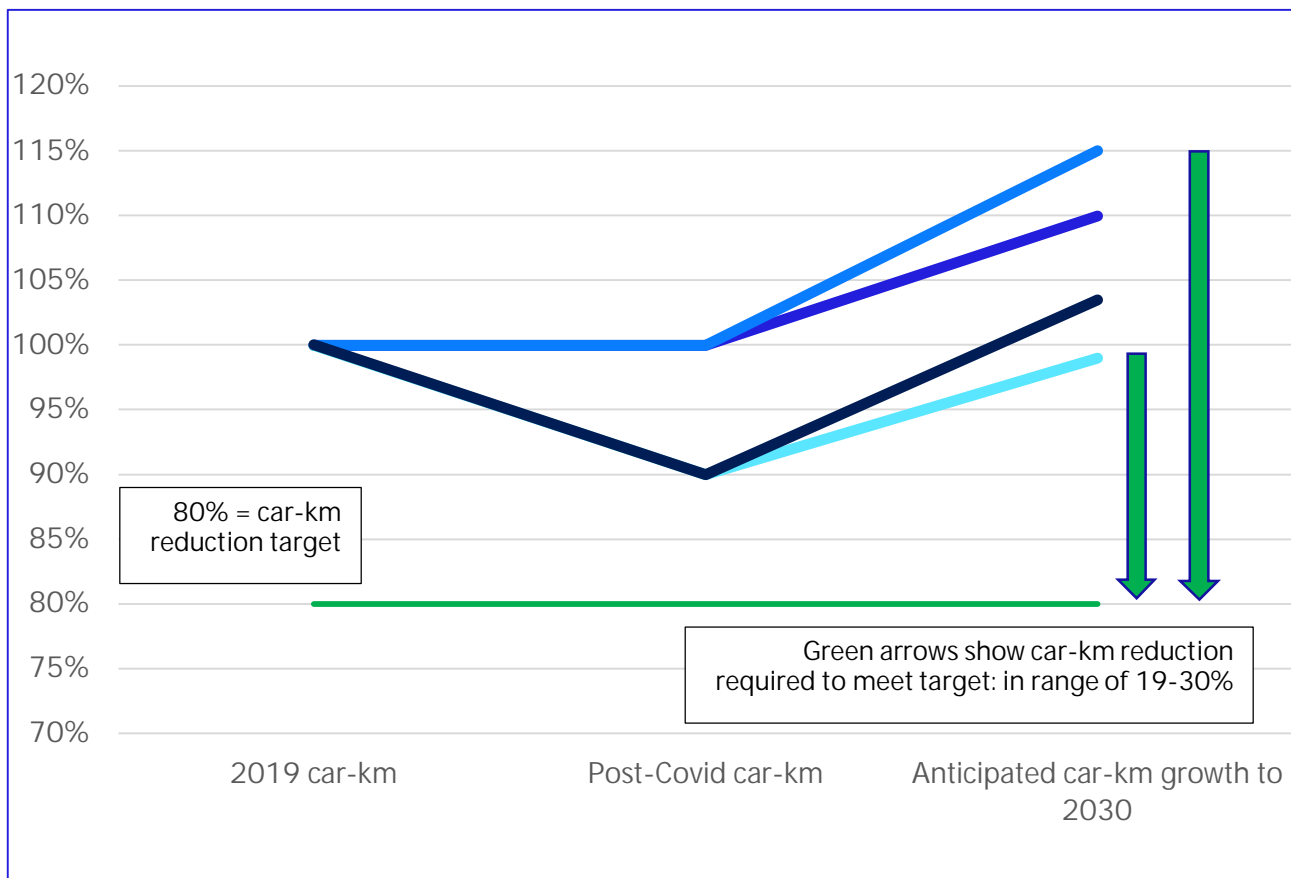
Forecasts of future change

Car use and emissions in the region are anticipated to change between the 2019 baseline and the 2030 target date.

Work undertaken for this review has estimated that economic growth and other factors will increase car-km between 2019 and 2030 in the North East of Scotland in the range of 10-15%. When this growth is combined with the effects of Covid, car-km in the region in 2030 are anticipated to be in the range of 99-115% of those in 2019.

Meeting the target for car-km in 2030 therefore requires a reduction in the range of 19-30% from the level anticipated in 2030 (Figure 4).

Figure 4. Derivation of required reduction in 2030 car-km levels



Carbon emissions per car-km in the region are forecast to fall by around 30% in the same period, in comparison with the 57% fall that analysis for the Scottish Government suggested would be required.

Options to reduce car use and emissions

There are many options available which might reduce car use and emissions from transport; this review has identified 27 (as listed at the end of this summary). Some of the options work to improve the quality of alternatives to car, some to enable/encourage use of those alternatives, and others to discourage car use. Many of the options, but by no means all, are within the control of Nestrans and their regional partners.

Attitudes to traffic and carbon reduction

This work has investigated the views of residents of North East Scotland and key regional stakeholders about efforts to reduce car-km and carbon emissions through two related activities: focus groups with a cross section of members of the public, and discussions with members of the North East Transport Consultative Forum.

The work has shown that most members of the public support efforts to reduce carbon emissions and that measures to improve alternatives to car use are supported by many, but that a large proportion oppose measures which would restrict their ability to travel by car. It also identified that, if car restraint measures were to be introduced, there is a strong desire for improvements to alternatives (most notably to public transport) to be provided in advance. Given the rurality of much of the North East of Scotland, it would be essential for those improvements to be provided throughout the region, not only in urban areas and on main transport corridors, for them to be fully inclusive.

Key stakeholders understand the challenges, but many struggle to identify effective and fair mechanisms to make meaningful contributions to the targets in the light of public acceptability limitations, political realities and current fiscal constraints.

Impacts of measures on car-km and emissions

Quantitative assessments have been made of the potential for each of the 27 options to reduce car-km and emissions. Separate estimates have been provided for long-term effects and the potential impact by the 2030 target date; time available until 2030 is short in comparison with the typical timescales for implementation of many types of project, especially those that improve alternatives to car use, which limits their potential to contribute to the targets.

The analysis has shown that none of the options to improve alternatives to the car could, in isolation, get close to meeting the traffic reduction or carbon targets, and that many would have relatively modest impacts. For example, even comprehensive work to improve active travel facilities to high standard within and between all the region's communities, which could certainly not be completed by 2030 on current trajectories, is anticipated to reduce car-km by only around 3% (though remains valuable for health and social inclusion outcomes), and major improvements to public transport could reduce car-km by less than 5%.

There is no one measure that is within the direct control of Nestrans or its regional partners which could get close to meeting the anticipated 19-30% reduction in traffic that would be necessary for the car-km target to be met. The most effective single measure that can be directly managed regionally/locally is anticipated to be increased parking charges and controls which, if robustly and comprehensively introduced and enforced, may be able to reduce car-km by up to 5%.

Other measures which are outwith the control of Nestrans and regional partners which would increase the cost of car use or otherwise control the number of car-km could have significant effects, but substantial deterrents would be required for the targets to be met (for example, a road user charge of 16 pence per km may only reduce net car-km by around 10%).

Different measures will affect different types of people and different journey types in very different ways. As examples, fiscal measures which seek to restrain car use by increasing its cost are likely to have more effect on people on low incomes and that drive more (typically including those that live in rural areas), but relatively little impact on those that are more affluent. Meanwhile, measures to improve alternatives to car use will have the greatest impact on those able to use them most readily, typically including urban residents for whom active and public transport choices are more likely to be accessible. These distributional impacts pose significant challenges to efforts to reduce car-use and carbon emissions from transport in an equitable way. Packaging fiscal measures with comprehensive measures to improve alternative has the potential to mitigate some of these adverse impacts.

Potential packages of options

As there is no one measure which could enable the target to be achieved, the review investigated possible packages of measures. There are many potential packages which could be considered for implementation; this review has considered five potentially plausible scenarios, reflecting differing levels of funding and support for implementation. The scenarios and quantified effects are shown in Table 1.

Table 1. Forecast scenario impacts

Scenario	Reducing car-km		Reducing carbon	
	Potential long-term effect	Potential effect by 2030	Potential long-term effect	Potential effect by 2030
1: business as usual activity by local authorities and regional partners but with further constraints as a result of reduced revenue and capital budgets	7%	<0.5%	7%	<0.5%
2: business as usual activity by local authorities and regional partners and have access to occasional additional external funding for alternatives to car	7%	<1%	7%	<1%
3: local authorities have increased willingness to act to restrain traffic and have access to occasional additional external funding for alternatives to car	12%	6%	12%	6%
4: local authorities have increased willingness to act to restrain traffic and have access to significant additional external funding for alternatives to car	27%	17%	27%	17%
5: local authorities have increased willingness to act to restrain traffic, have access to significant additional external funding for alternatives to car, and options requiring external leadership are also delivered ⁶	42%	23%	46%	27%

⁶ These measures potentially including road user charging and/or rationing of car use.

Conclusions

The analysis indicates that, even with significantly enhanced funding over the levels currently anticipated, and with strong support for implementation (including for measures to restrain traffic use), there is no plausible scenario whereby the 20% car-km reduction target can be met by measures within the control of Nestrans and its regional partners. As transport carbon emissions targets require even greater changes, these will also not be met only by local/regional action.

Action outwith the current control and funding ability of regional partners (for example in the form of road pricing) is therefore required if the car-km and carbon targets are to be achieved.

Business-as-usual activity may mean that car traffic in 2030 may be reduced by less than one percent in comparison with a do-nothing situation (hence car-km would be significantly higher in 2030 than in 2019).

In addition to these quantified impacts, the review has demonstrated that measures which are effective in constraining car use are likely to face significant public opposition. This opposition will arise in part because achieving the target without adverse distributional impacts will be challenging, with people that live in rural areas or have low incomes likely to be more significantly affected.

The extent of these adverse impacts could be reduced if significant improvements to alternatives to car use (including improved public transport and active travel facilities) which are relevant to all of the region's residents were provided in advance of traffic restraint measures being introduced. There may be potential for revenue raised from measures which discourage car use to be hypothecated in order to providing funding. However, the opportunities to make these improvements before the 2030 target date are limited because of the lengthy delivery times of many such projects.

Regional 'offers' and 'asks'

Following from the conclusions from the analysis set out above, discussions with officers from Nestrans, Aberdeen City Council and Aberdeenshire Council have helped define the regional "offers" and "asks" in relation to the regional contribution to the national car-km reduction target, and net zero transport ambition.

These are set out below as suggested "offers", which Nestrans and partners can lead, and "asks", of national and UK Government (and other stakeholders as appropriate).

The North East region offers:

- To work to implement those many measures that will help reduce car-km and emissions from transport in the region that are already defined in the RTS and other regional and local policies and plans, recognising both the impact on climate change objectives, but also wider transport policy goals;
- To make a commitment to continue to define potential measures which might reduce car-km travelled and transport emissions in the region, building on the work of the RTS and local strategies and plans, and to assess their potential contribution to traffic and carbon reduction, as well as their economic, societal and distributional impacts;
- To consider the introduction of locally led measures to discourage car use that are within the control of the region's Local Authorities or other partners (e.g. more stringent parking controls) in circumstances where they are proposed on a national level in order to maintain parity between regions;
- Within the ability of resource constraints, to provide regional/local capacity to work alongside national partners or those from other regions to help develop and implement measures that will reduce car use;
- Support national partners to communicate the extent of the climate emergency and the need for car-km and carbon emissions reductions in regional and local communications activities.

The North East region asks:

- For robust and on-going nationally led political support to be available to help communicate the necessity of reducing car-km travelled and carbon emissions in the region, and to advocate the introduction of appropriate measures within the North East;
- For an enhanced national delivery plan to be provided to accompany Transport Scotland's Route Map, which clearly sets out the national pathway to achievement of the 20% car-km and transport carbon targets, in order to help shape our regional pathway;
- For more complete local, regional and national monitoring of car-km, as well as the economic, health and social effects of traffic reduction; if the target is to be understood, having the data to understand travel habits is a key issue, noting that the trunk roads are the easiest data that can be collected (because of the presence of extant counters) but make up less than 4% of the road network in the North East.
- For information on the national position regarding options for road pricing schemes and/or other priced demand management measures, and how they could be implemented given the historic reluctance to adopt such measures at local authority level and a desire to maintain parity between regions;
- For clarity on whether additional funding will be made available to regional/local partners to increase the attractiveness and/or capacity of alternatives to car use in the North East to help address the difficulties that the region faces given its geographic make-up and challenges around public transport and current lack of active travel provision;
- For support developing "with policy" strategic modelling forecasts that instead of being calibrated to the nationwide 20% car-km reduction target, reflect the evidence presented in this report that smaller reductions are more likely in the North East in the absence of schemes such as road-pricing;
- For support to continue to develop modelling tools that are better adapted to help assess the full range of measures that might be used to influence car use and enable forecasting of their impacts, including of distributional economic and social effects.

List of potential measures to influence car-km or emissions that have been assessed

The measures that could potentially reduce car-km or emissions fall into four broad categories, according to whether they seek to:

- Improve the quality or availability of alternatives to car (options labelled Q below);
- Enable or encourage alternatives to car (options E);
- Discourage or prevent car use, and are within the control of Local Authorities in the Nestrans region (options D-LA);
- Discourage or prevent car use, but would require external intervention to implement because of reserved powers or the need for new primary legislation (options D-ext).

The measures are:

- Improve the quality or availability of alternatives to car:
 - Q1: Improve active travel facilities;
 - Q2: Improve bus/demand responsive transport (DRT) services;
 - Q3: Implement Aberdeen Rapid Transit (ART);
 - Q4: Improve rail services;
 - Q5: Implement North East Rail services between Aberdeen and Peterhead/Fraserburgh;
 - Q6: Park & ride/choose improvements;
 - Q7: 20-minute neighbourhoods;
 - Q8: 20mph zones and road safety improvements;
 - Q9: Travel planning;
 - Q10: Promotion of zero/ultra-low emission vehicles (ZEVs/ULEVs);
 - Q11: Expand car clubs and car share;
 - Q12: Expand Mobility as a Service (MaaS);
 - Q13: Mobility hubs and interchange improvements;
 - Q14: Broadband improvements;
 - Q15: Increased use of home deliveries/lockers;

- Enable or encourage alternatives to car:
 - E1: Car-use minimising development plans;
 - E2: Incentivising reduced car use;
 - E3: Sustainable travel marketing;

- Discourage or prevent car use, and are within the control of Local Authorities in the Nestrans region (options D-LA):
 - D-LA1: Low Emission Zones;
 - D-LA2: Increased parking charges and controls;
 - D-LA3: Road pricing: cordon-based;
 - D-LA4: Vehicle bans: temporal;
 - D-LA5: Workplace parking levy;

- Discourage or prevent car use, but would require external intervention to implement because of reserved powers or the need for new primary legislation (options D-ext):
 - D-ext1: Increased fuel duty;
 - D-ext2: Rationing car use;
 - D-ext3: Road pricing: distance-based;
 - D-ext4: Increased Vehicle Excise Duty.

Nestrans, Aberdeen City Council, Aberdeenshire Council and other regional partners are already working to implement many of the measures listed (that are within their control or influence), but in every case there is more that could potentially be done.