

Interactive Roadmapping Session Report

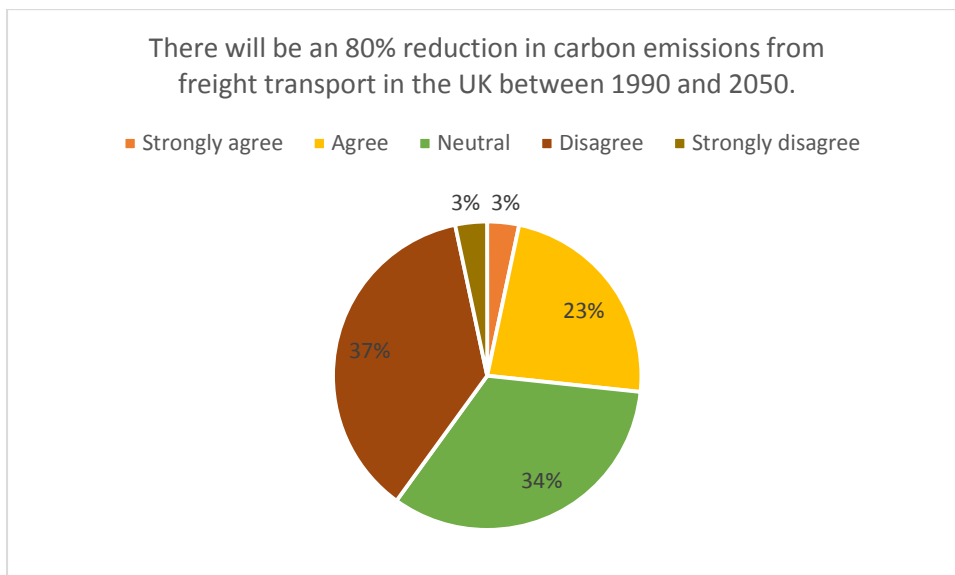
1. Introduction

The aim of this session was to gauge the validity of assumptions within the SRF 2050 roadmap model. This model includes estimated adoption trajectories for a range of technologies and logistics measures that are anticipated to reduce carbon emissions from road freight in the coming decades. Current assumptions are based on data from expert stakeholders, however there was need for a wider assessment of their validity. More general questions were also included at the beginning and end of the session, to inform further work on the roadmapping project. Interactive clickers were used to allow the audience to vote immediately in response to the questions presented. The results were displayed once voting on each had concluded. Each attendee could vote only once per multiple choice question. The number of respondents to each question varied between 24 and 31.

2. Results

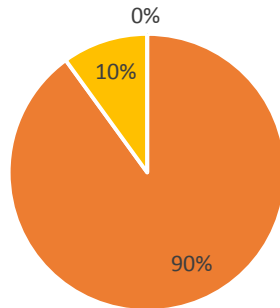
2.1. Introductory and closing questions

Pie charts are used to display the distribution of responses to each multiple choice question.



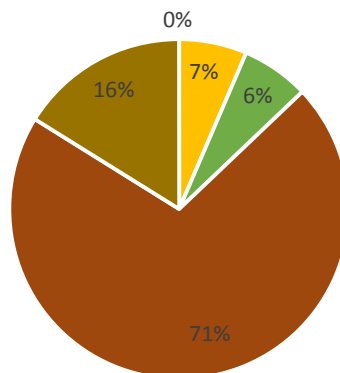
Do you think that additional policies, beyond those already in place, would be required to achieve an 80% reduction in carbon emissions from UK freight?

Yes Maybe No



Carbon free city logistics will be achieved by 2030

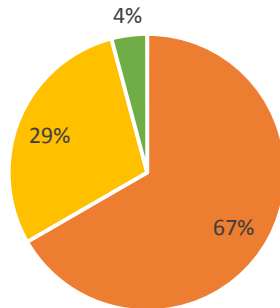
Strongly agree Agree Neutral Disagree Strongly disagree



The results from these first three questions suggest pessimism within the audience regarding the likelihood of meeting the 2050 Climate Change Act target within the freight transport sector. More than 70% of responses either disagreed or were neutral on the likelihood of this being achieved. Moreover, an overwhelming majority of 90% felt that additional policies would be required to meet the 2050 target. Carbon free city logistics were also seen as unlikely by 2030 amongst the majority of the audience, with an even greater proportion disagreeing that they would be achieved.

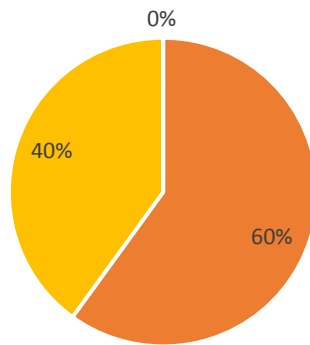
If you were confident that you weren't contravening anticompetitive legislation, would you make greater use of collaboration for backhaul and consolidation?

■ Yes ■ Maybe ■ No



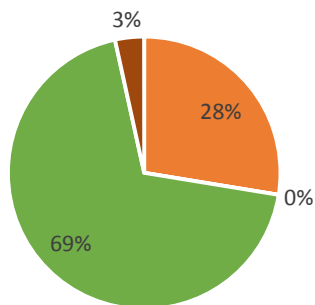
If you knew that your data was secure, would you be willing to share it to facilitate collaboration?

■ Yes ■ Maybe ■ No



Which policy option would most effectively reduce carbon emissions from UK freight transport?

■ Legislative regulation ■ Advice
■ Financial incentives & taxation ■ Market forces will be sufficient

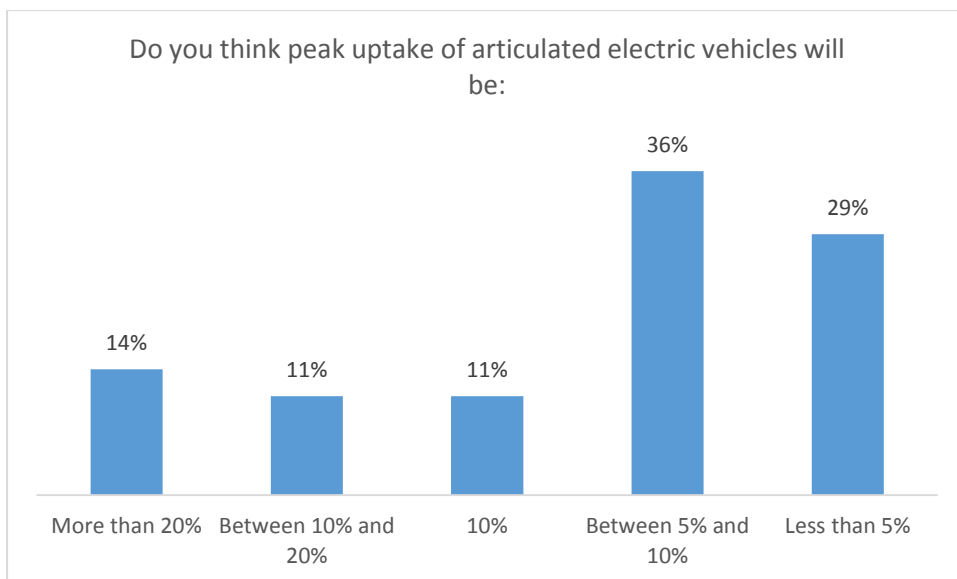
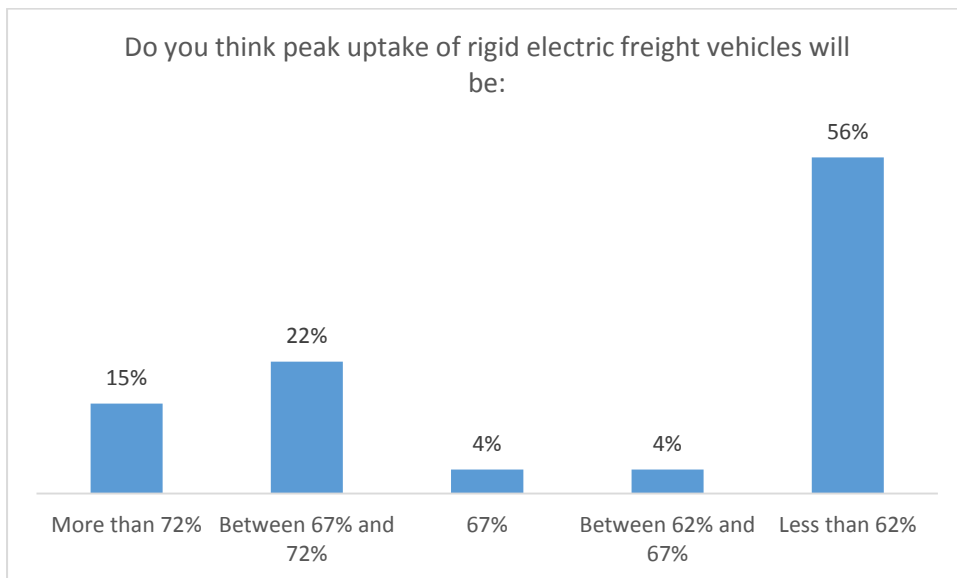


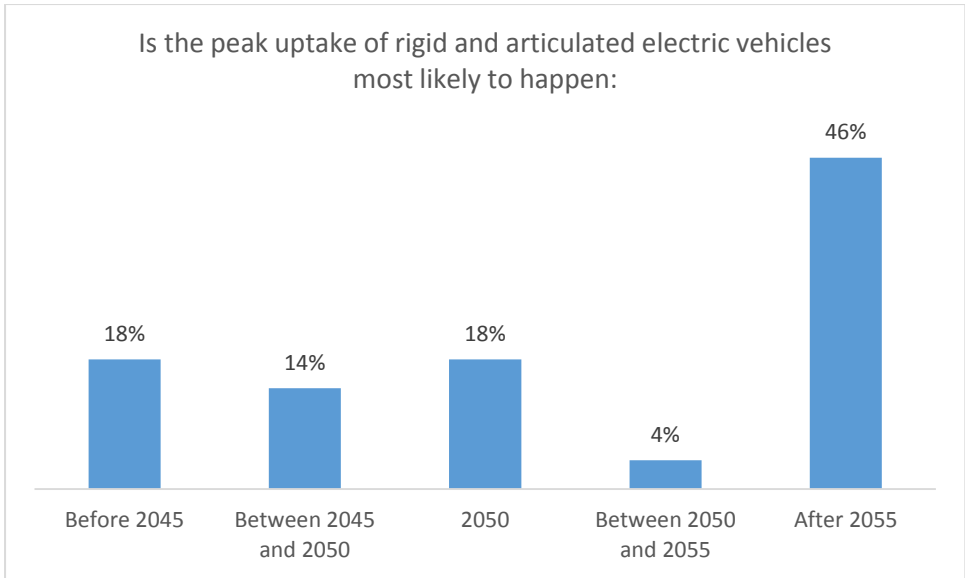
The concluding questions related to policy priorities. The former two each received a largely positive response as to whether uptake of logistics measures could be increased by the clarification of anticompetitive legislation and data security. It should be noted, however, that the audience of the session was largely from an academic rather than operator background. Thus the results cannot be taken as an indication of operator views per se. The final question saw financial incentives and taxation chosen as the most popular policy option to effectively reduce carbon emissions from freight by 69% of respondents.

Results from the questions on peak uptake and timing of measures now follow, grouped by measure and displayed in bar chart format. The central option in each chart is the percentage or year used in the 2050 model.

2.2. Electric vehicles

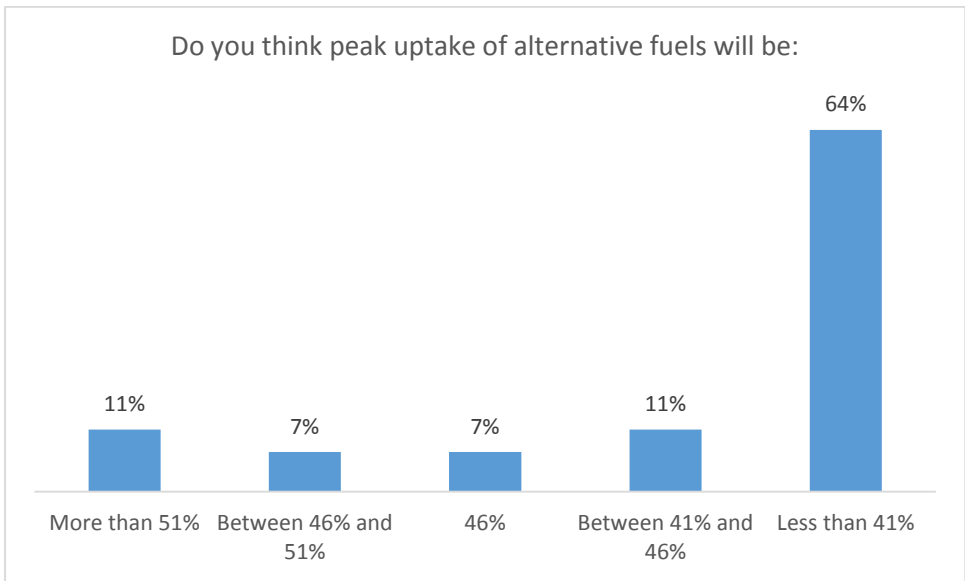
The majority of respondents believed that peak uptake of both rigid and articulated electric vehicles will be lower and slower than assumed in the roadmap model. A significant minority, however, took the opposite view, with relatively few selecting the current assumptions used.

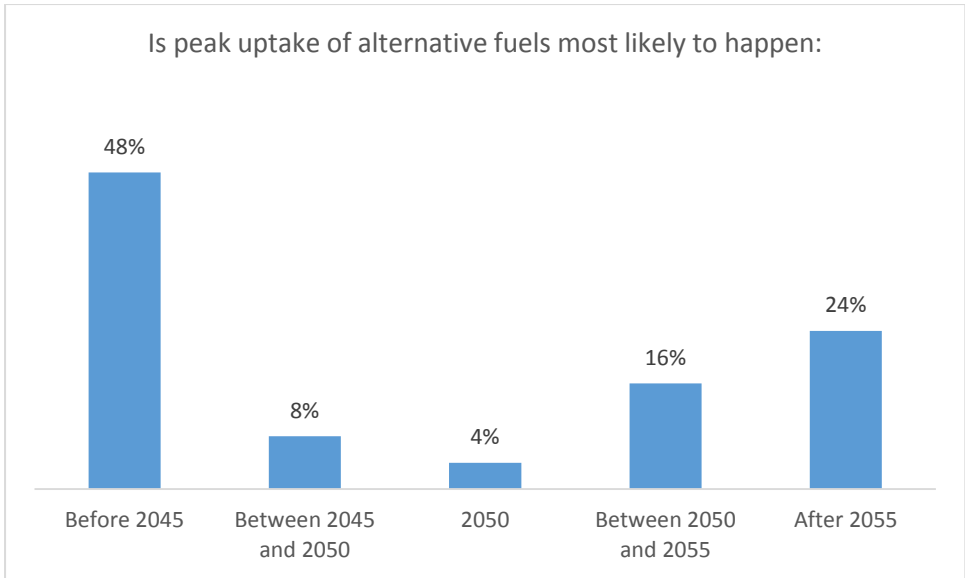




2.3. Alternative fuels

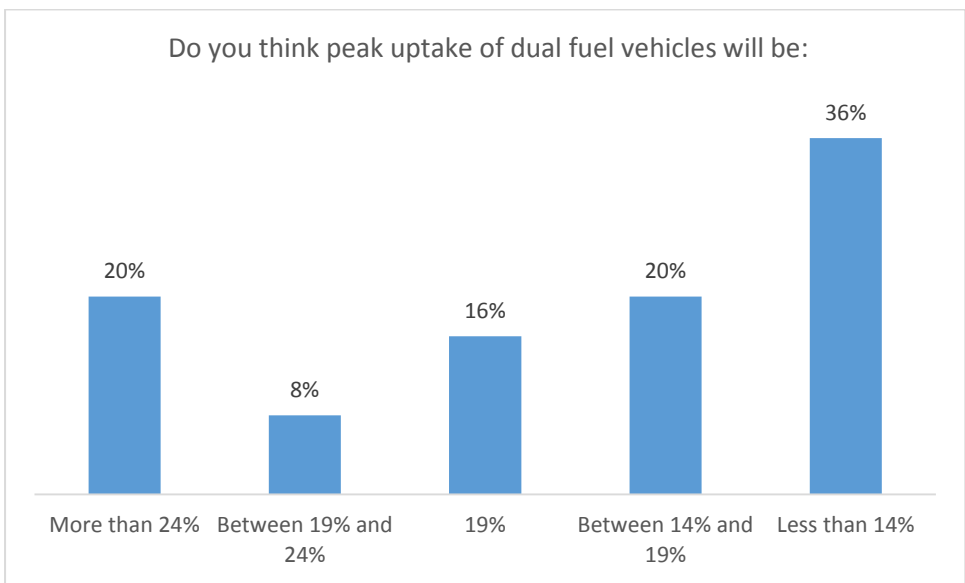
The alternative fuels referred to here are CNG and LNG. The majority of responses suggested a considerably lower and earlier peak in their use than the model shows, seemingly reflecting the belief that alternative fossil fuels are a bridging technology towards lower carbon options.

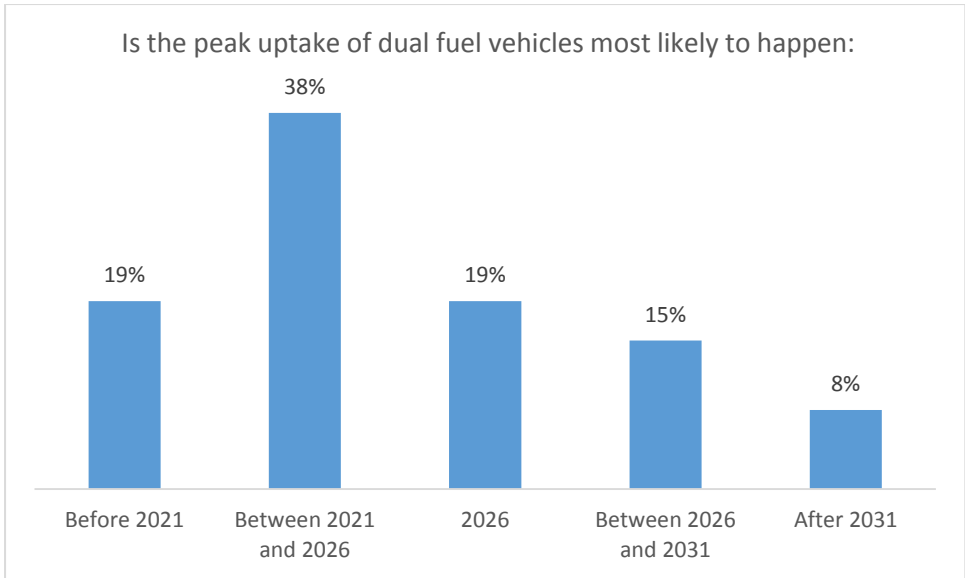




2.4. Dual fuel vehicles

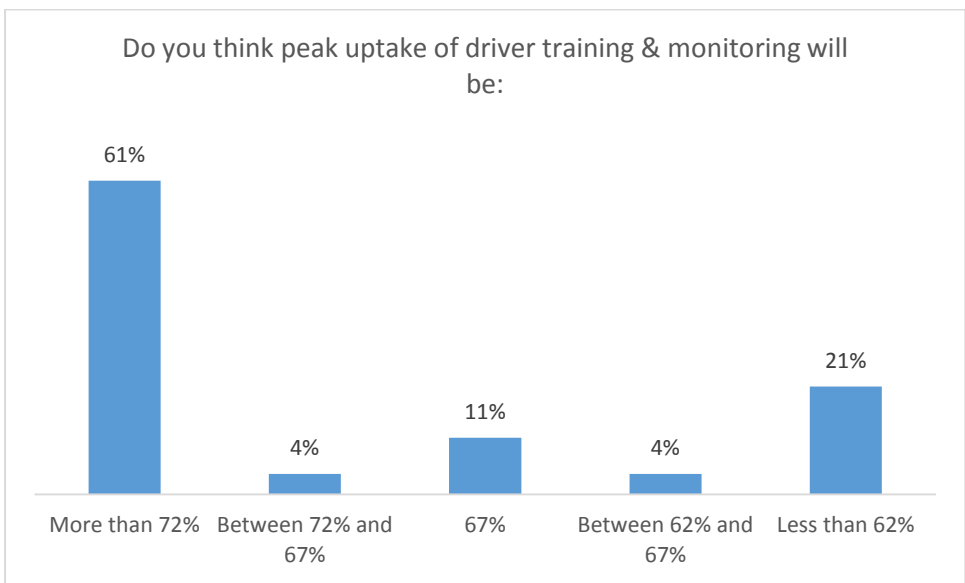
Respondents showed less of a firm consensus regarding dual fuel (CNG/LNG and diesel) vehicles. Narrow majorities favoured lower and earlier uptake: 56% thought that the peak uptake of dual fuel vehicles would be less than 19%, while 58% considered it most likely that the peak would occur before 2026.

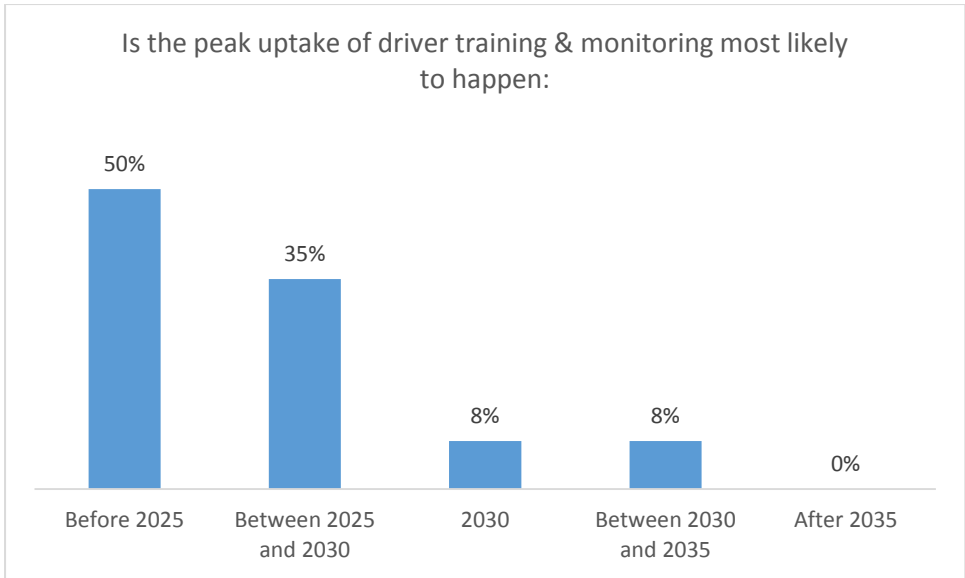




2.5. Driver training and monitoring

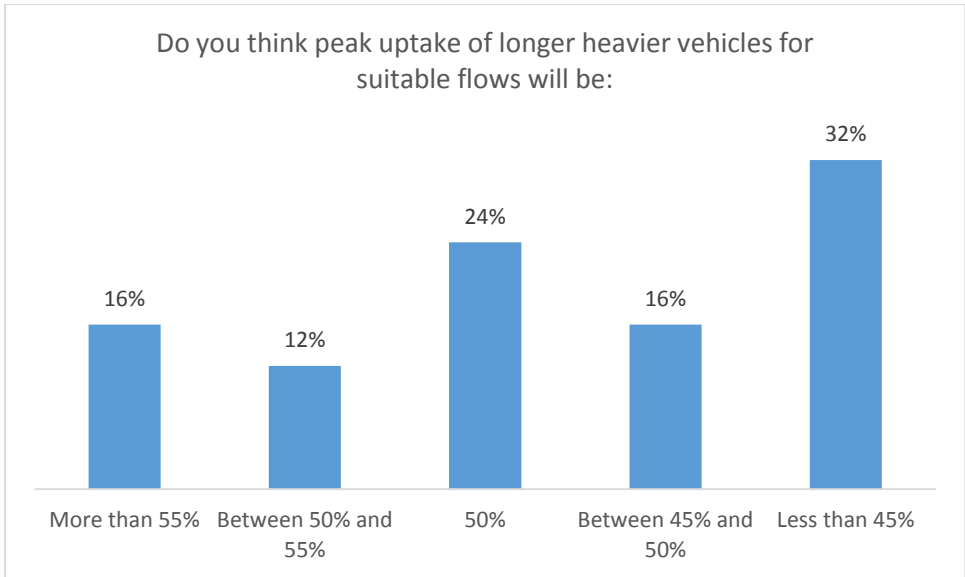
In contrast to the responses for previous technological measures, respondents voted for more optimistic assumptions than the roadmapping model regarding driver training and monitoring. 61% considered a peak uptake above 72% to be realistic, while 85% thought this peak would be achieved before 2030.

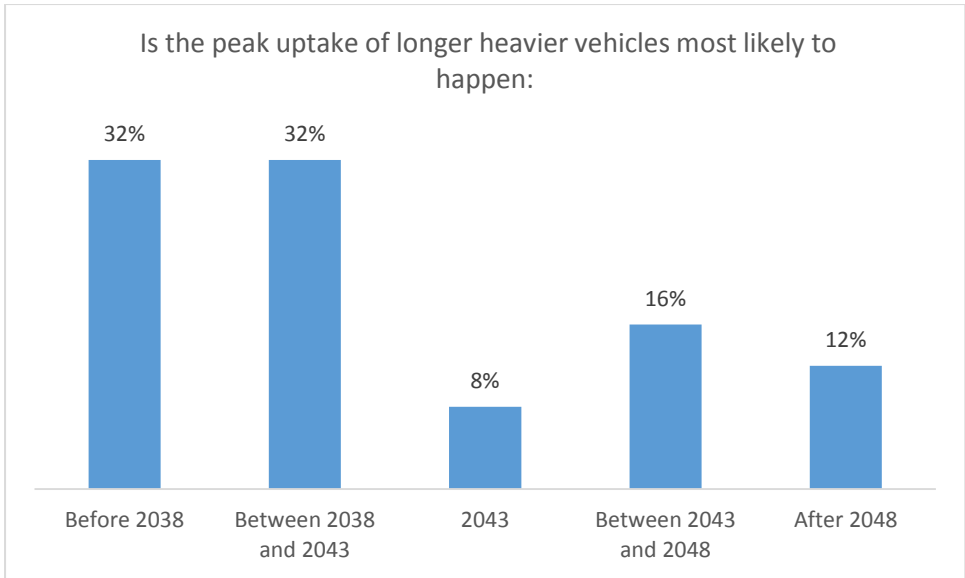




2.6. Longer heavier vehicles

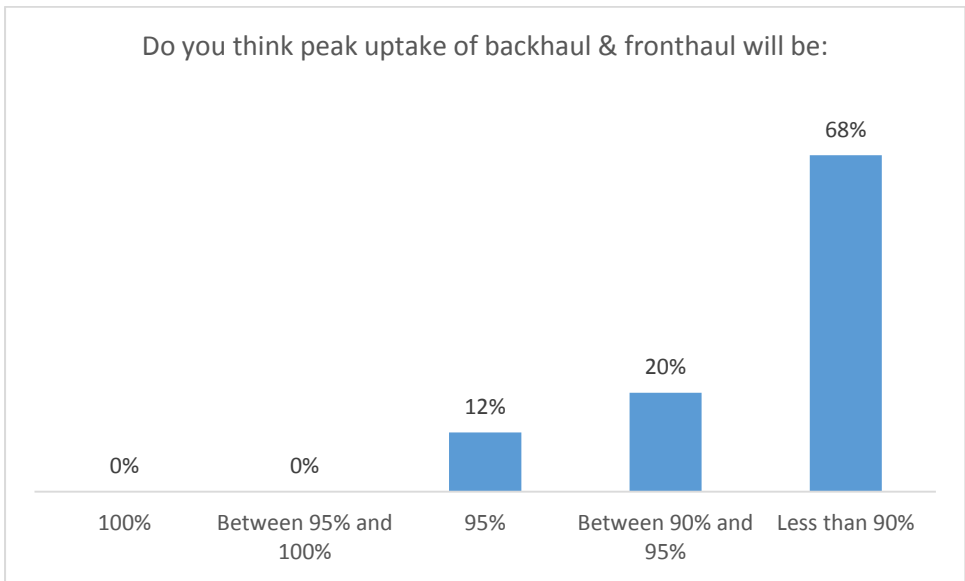
A lack of consensus was found on the expected peak uptake level of longer heavier vehicles (LHVs). While 32% of respondents thought that less than 45% of suitable flows would adopt this technology, 38% considered more than 50% more realistic. A further 24% favoured the level taken from the roadmapping model: 50%. Views on the timing of the peak were less evenly split, with 64% selecting a year before 2043.

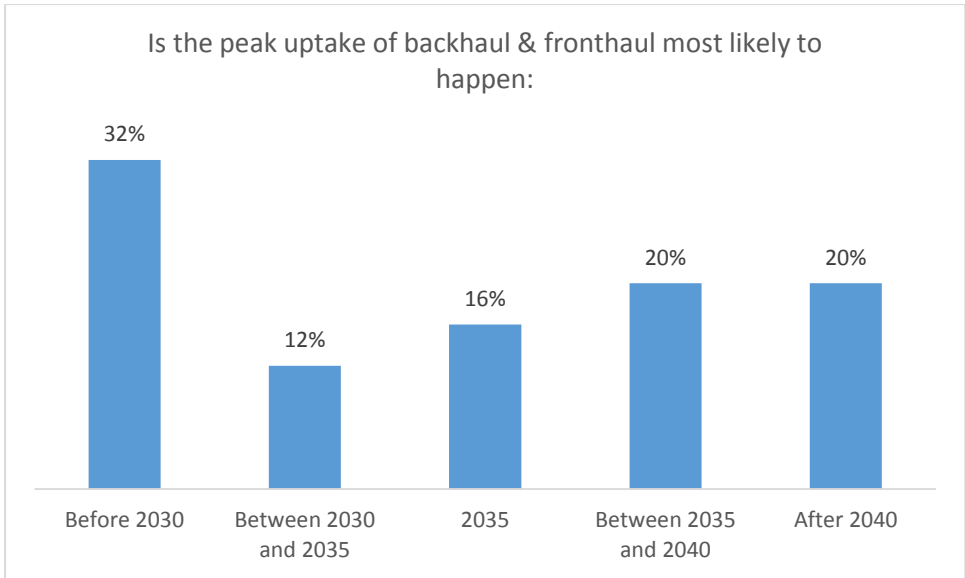




2.7. Backhaul and fronthaul

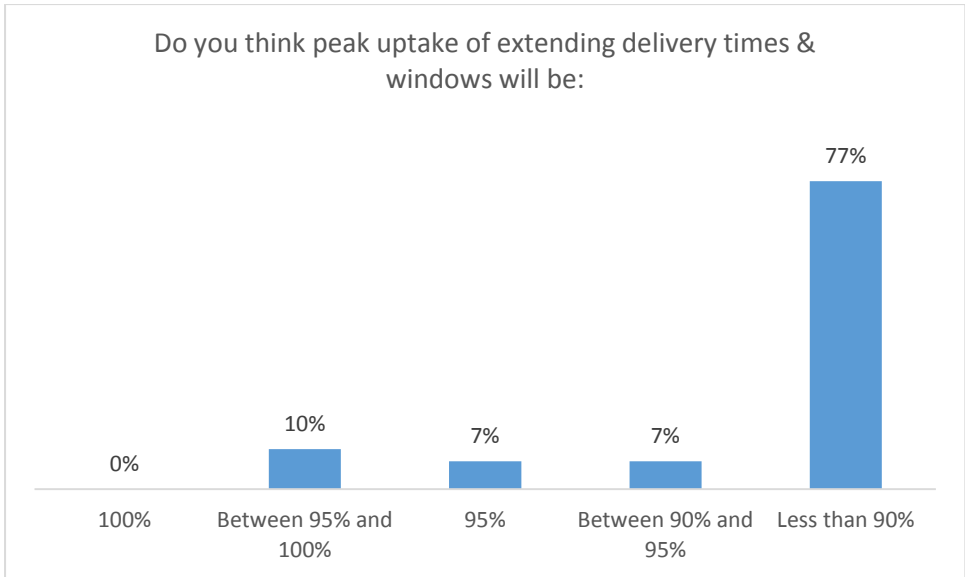
Responses to the questions on backhaul and fronthaul showed broad agreement on the likely peak uptake, as 68% voted for less than 90%, but disagreement on the date of this peak. 44% thought it would occur before 2035 and 40% after.

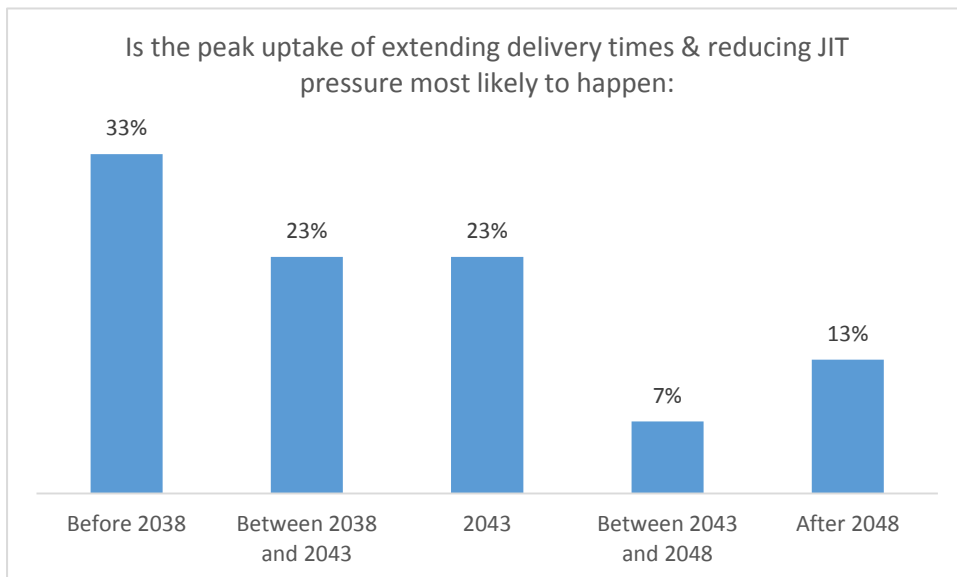
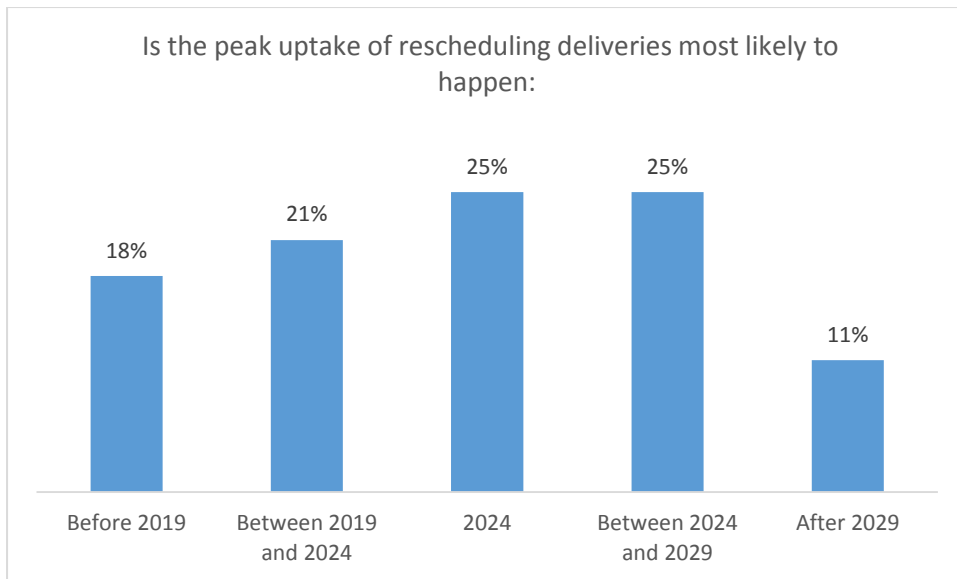




2.8. Extending delivery times and windows

Respondents voted strongly for a lower peak uptake of extended delivery times and windows, with 84% favouring a level below 95%. In the model, different years were specified for peak uptake of rescheduling deliveries off-peak and extending delivery times/reducing JIT pressures. In the former case, 71% of respondents chose a peak between 2019 and 2029. In the latter, 56% chose a year before 2043.





Overall, the responses to the interactive segment of the session demonstrated that respondents, largely drawn from academia across a range of countries, disagreed with a number of the assumptions within the 2050 model. The results of the session will allow those assumptions to be sensitivity tested and adjusted as necessary. More investigation will be necessary where the most popular choice was unbounded, for example a peak uptake occurring 'before 2038' in the preceding graph. In such cases, it will be important to understand whether the peak is likely to have already occurred, in order to make a more focused estimate of its scale and timing. This will require confirmation of current uptake levels of certain measures.

3. Breakout Group Discussions

The interactive roadmapping session was followed by discussion across three breakout groups to develop specific themes within the topic of measures to significantly reduce carbon emissions in the freight sector. Attendees were invited to choose the group that they joined, each of which discussed

a different question raised by the interactive segment of the session. A synthesis of key points raised by each group discussion follows.

3.1. Group 1: What changes would you suggest to reduce barriers to backhaul and consolidation?

The group reached a consensus that to encourage the use of backhaul and consolidation there needed to be:

- Education in the form of workshops, conferences, and industry association meetings.
- Help from logistics service providers and/or trustees and industry associations.
- Pressure to collaborate from customers.
- An internal company collaboration champion.
- A dominant company to kick start the process.

3.2. Group 2: Are any high-impact carbon reduction measures missing from the list presented here?

The following additional measures and trends were mentioned by the group:

- New materials and light weighting.
- 3D printing.
- Design processes allowing logistics-friendly design.
- Rebound factors.
- The circular economy.
- Local manufacturing.
- Freight exchanges.
- Slow logistics, changed storage regimes involving inventory in motion.
- Route management, including green wave traffic control.
- Driver feedback taking into account topography.
- Drones on parcel delivery vehicles.
- The Internet of Things/Physical Internet.
- Platooning and autonomous vehicles.

3.3. Group 3: What policy-based incentives and penalties would increase peak uptake of the measures presented here?

The following policy opportunities and constraints were raised by the group:

- Need for stronger incentives and instruments. Policies must to be part of a long-term vision, despite political short-termism. Clear incentives must be aligned with long-term vision. Start strong then can roll back if necessary.
- Freight policy must be kept separate from industrial policy, as combining these objectives is problematic.
- Manufacturers need encouragement to develop more EV options.
- Tax instruments can reduce pollution to levels that polluters claimed were impossible to reach through regulation.

- Congestion charging: requires political consensus and courage. Peak/off-peak pricing could be used on roads.
- Pricing is critical, based on polluter pays principle. Current carbon cap and trade mechanism isn't working, as price is far too low.
- Autonomous vehicles (AVs) need to be shared in order to reduce vehicle mileage. Prices of access to shared AVs should be proportionate to vehicle size, to discourage ownership of cars suited to greatest rare use. Could be used for shared freight in urban areas.
- Need to offer alternatives in order to avoid negative consequences, and ideally policies that make alternatives more attractive (example of London).
- Timing is also important. Market instruments require time and thought to deal with the equity implications.
- Need criteria for incentives and enforcement & evaluation mechanisms to check that criteria are met.

4. Conclusions

The data gathered from this session provides both a constructive challenge to assumptions within the existing 2050 model and a framework for progressing the wider roadmap project. There is clear agreement that further policies are needed to achieve the 2050 carbon target for the freight sector. The session also produced suggestions of additional measures that the model could incorporate, once an assessment has been made of their likely level of impact on carbon emissions. Some may only have marginal effects and there is a need to focus on those with the strongest potential for emissions reduction. The next stages of the roadmapping project will consider: firstly, how adjusting the scale and timing of peaks in mitigation measure uptake impacts on the overall trajectory of carbon emissions, secondly, the impact of additional high-impact measures not currently included in the model, and thirdly, how policies can be designed to encourage faster and higher uptake of carbon mitigation measures.