

# England's Economic Heartland: Development of Alternative Futures

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**steer**

# Context

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- This slide pack reports on the approach to creating, and the purpose of, the alternative future scenarios for England's Economic Heartlands.
- Two workshops have been facilitated by Steer, WSP and England's Economic Heartland, and attended by key stakeholders to support the development of the alternative futures.

# How will the scenarios be used for the connectivity study?

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- The four alternative futures will support a high level qualitative assessment of the infrastructure scenarios that have been developed as part of the connectivity studies. The alternative futures will not be modelled.
- While alternative futures are not modelled, optimised infrastructure scenarios are being modelled. This approach continues to be in line with TAG, however, we have not explicitly modelled higher or lower demand scenarios (e.g. as a result of a higher or lower levels of housing or employment), rather housing, employment, and demand are outputs of the model.
- The futures will then form one part of the multi-criteria assessment framework process, for the assessment of the long list of infrastructure options, and support with the short listing to arrive at the preferred package of options. Infrastructure options that perform well, not only in relation to the connectivity study and transport strategy objectives, but also against all futures, implies a more resilient strategy.
- The formation of these alternative futures are distinct from the Transport Strategy and Local Economic Strategies future – the exercise was not designed to scope/re-scope this preferred future.
- The emerging Transport Strategy and local economic strategies future is the benchmark against which infrastructure scenarios will be tested.

# Stage 1: Driver Mapping

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- The first stage in the development of the alternative futures is Driver Mapping. This process is drawn from ‘The Futures Toolkit’ by the Government Office for Science and aligns with the Department for Transport’s Transport Analysis Guidance (TAG) – ‘Uncertainty Toolkit’.
- Driver Mapping is used to identify the various political, economic, societal, technological, legislative and environmental drivers shaping the future environment. It is intended to:
  - Identify drivers shaping the future;
  - Identify which drivers are most important for the future; and
  - Identify which drivers are most uncertain in the future.

# Workshop 1: Driver Mapping

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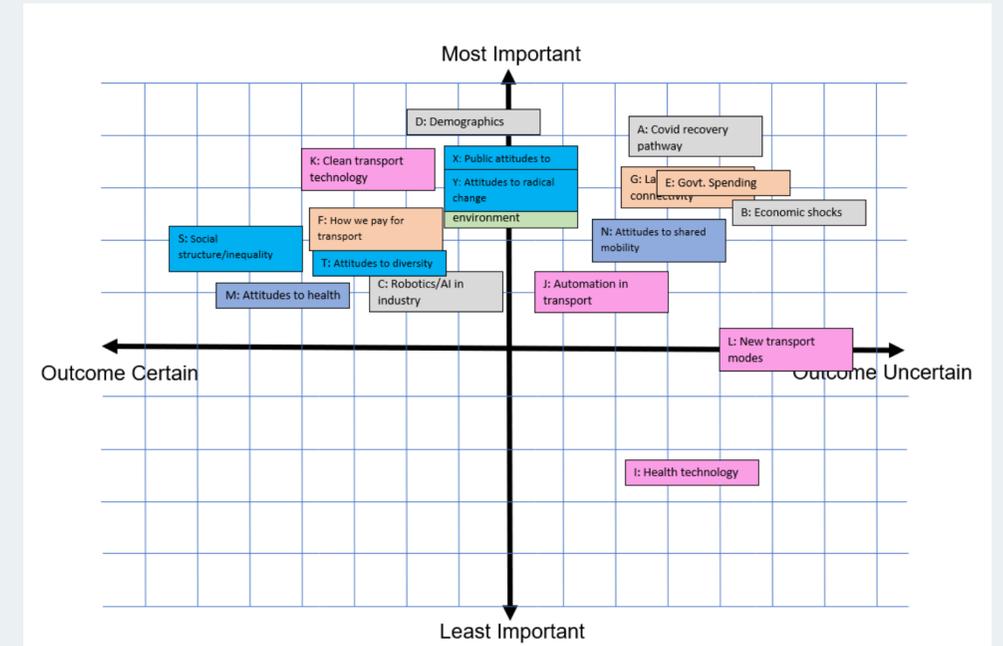
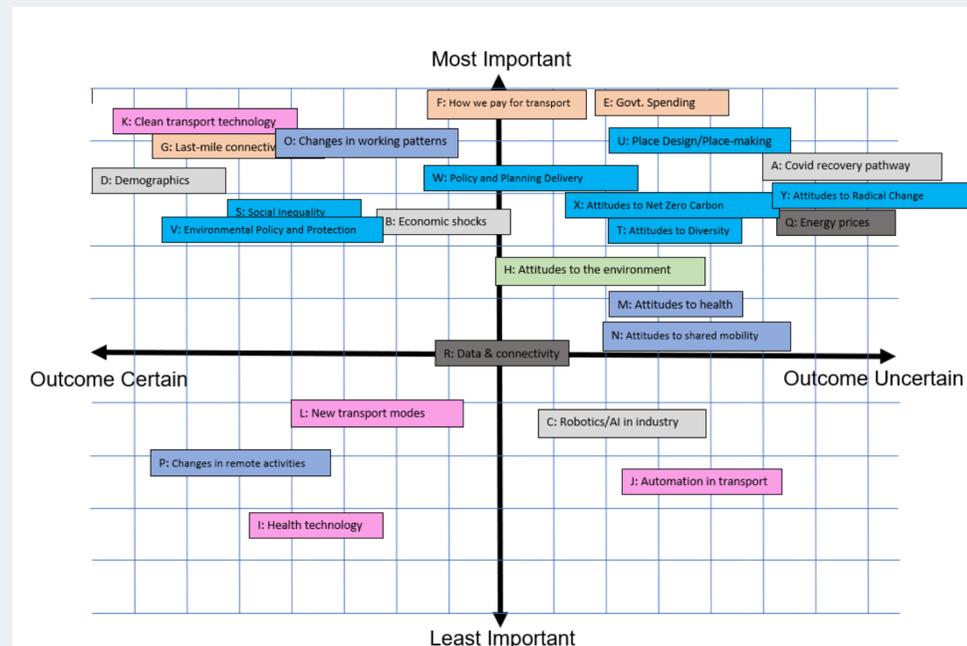
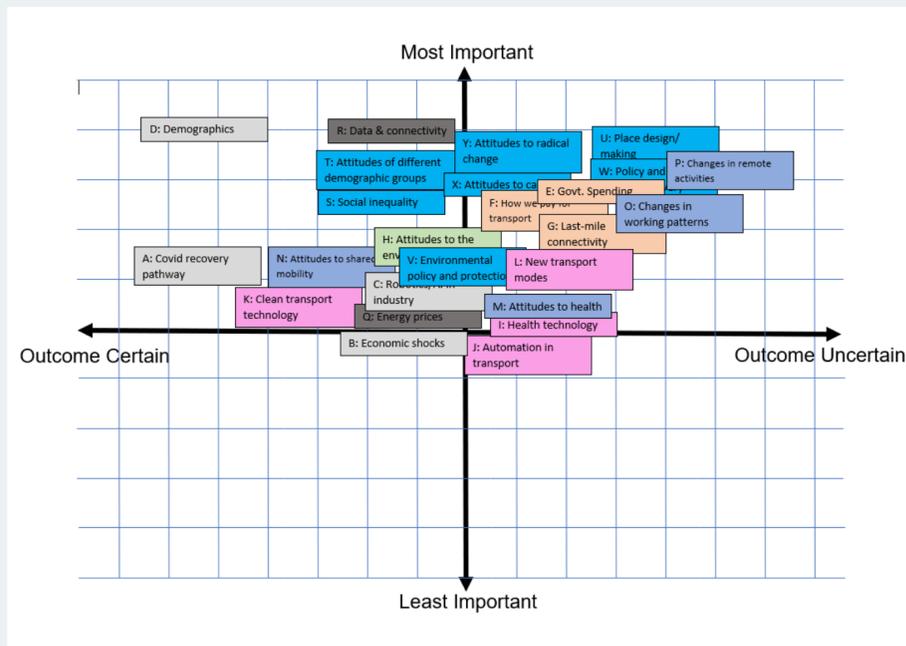
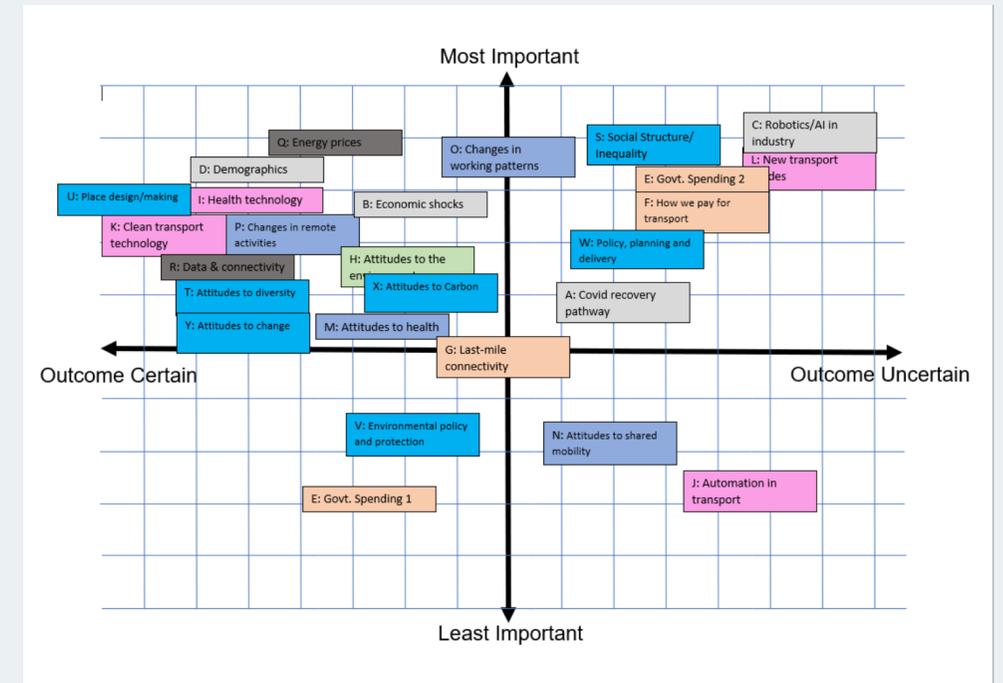
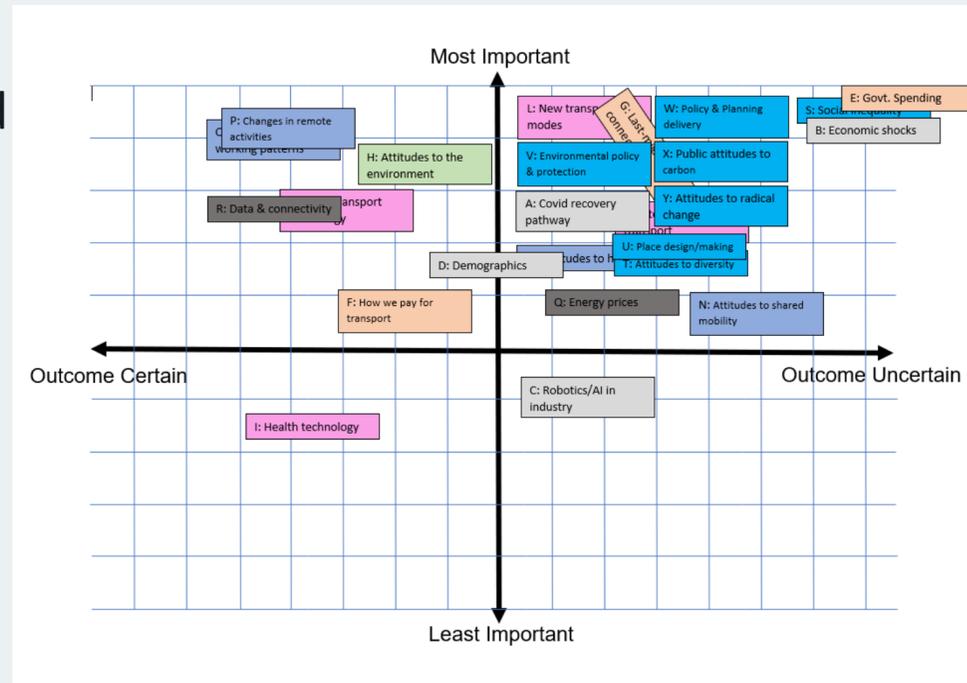
- An online stakeholder workshop was held on 22 June to explore what attendees believe would drive changes in transport demand between today and 2050.
- Stakeholders were divided into groups and invited to assess a number of 'external drivers' which describe broad areas outside of the control of EEH which could have an impact on future transport outcomes in the EEH area.
- There are a number of areas where EEH and its partners are defining policy and strategy which envisions specific future outcomes. The planned direction of travel for these outcomes are established, either through legally-binding requirements, regulatory frameworks or other policy arenas. Therefore, for the purpose of the EEH Alternatives Futures work, these will be assumed as established, and drivers related to these areas were not included in the driver mapping exercise.
  - Net zero carbon
  - Regional development (committed growth in Local Plans, following 'trends' of growth past plan period)
  - Regional economic development / industrial sectors (as set in the Arc Economic Prospectus)
- For the driver mapping exercise, stakeholders were encouraged to think about how the world could look in the long-term future – thinking beyond what is on the horizon now, and what could be of much more importance in the future.
- The drivers are listed on the following slide. All drivers except those in the 'Anything else' section were suggested by the project team, and stakeholders were invited to suggest additional external drivers that ought to be considered in the development of alternative futures.

# 'External Drivers'

| Theme          | # | Driver                                     | Detail  |
|----------------|---|--|---|
| Economy        | A | <b>Covid-19 recovery pathway</b>           | Medical resolution pathway to current health crisis   |
|                | B | <b>Economic shocks</b>                     | Degree of economic stability nationally and regionally e.g Covid-19, Brexit, trade wars, globalisation/isolationism |
|                | C | <b>Robotics/AI in industry</b>             | Extent of automation effects on employment.   |
|                | D | <b>Demographics</b>                        | Changes in migration patterns and age profiles  |
| Policy         | E | <b>Government spending</b>                 | Extent of public expenditure on local/regional authorities and infrastructure                                       |
|                | F | <b>How we pay for transport</b>            | Forms of payment for consuming mobility including distance or tax-based.  |
|                | G | <b>Last-mile connectivity</b>              | Local transport plans/strategies and degree of connectivity beyond the private car                                  |
| Environment    | H | <b>Attitudes to the environment</b>        | Degree of support for protection of the natural environment   |
| Technology     | I | <b>Health technology</b>                   | Improvements in medicine and healthcare   |
|                | J | <b>Automation in transport</b>             | Change in share of manually controlled motor vehicles   |
|                | K | <b>Clean transport technology</b>          | Rate of diffusion of lower carbon transport technologies  |
|                | L | <b>New transport modes</b>                 | Changing modal mix of mobility with new modes entering the industry (e-scooters, hyperloop, ?)                      |
| Attitudes      | M | <b>Attitudes to health</b>                 | Importance of addressing public health individually and collectively  |
|                | N | <b>Attitudes to shared mobility</b>        | Willingness to share journeys and reduction in vehicle ownership  |
|                | O | <b>Changes in working patterns</b>         | Extent of flexible working and its effects on commuting.  |
|                | P | <b>Changes in remote activities</b>        | Degree that remote activities increase/decrease over face-to-face (business, leisure, retail, education)            |
| Energy         | Q | <b>Energy prices</b>                       | Oil, gas and electricity wholesale cost changes   |
|                | R | <b>Data and connectivity</b>               | Communications technology and influence of data/networks on service delivery  |
| Anything else? | S | <b>Social structure/inequality</b>         |   |
|                | T | <b>Attitudes to diversity</b>              |   |
|                | U | <b>Place design/placemaking</b>            |   |
|                | V | <b>Environmental policy and protection</b> |   |
|                | W | <b>Policy and planning delivery</b>        |   |
|                | X | <b>Attitudes to carbon</b>                 |   |
|                | Y | <b>Attitudes to radical change</b>         |   |

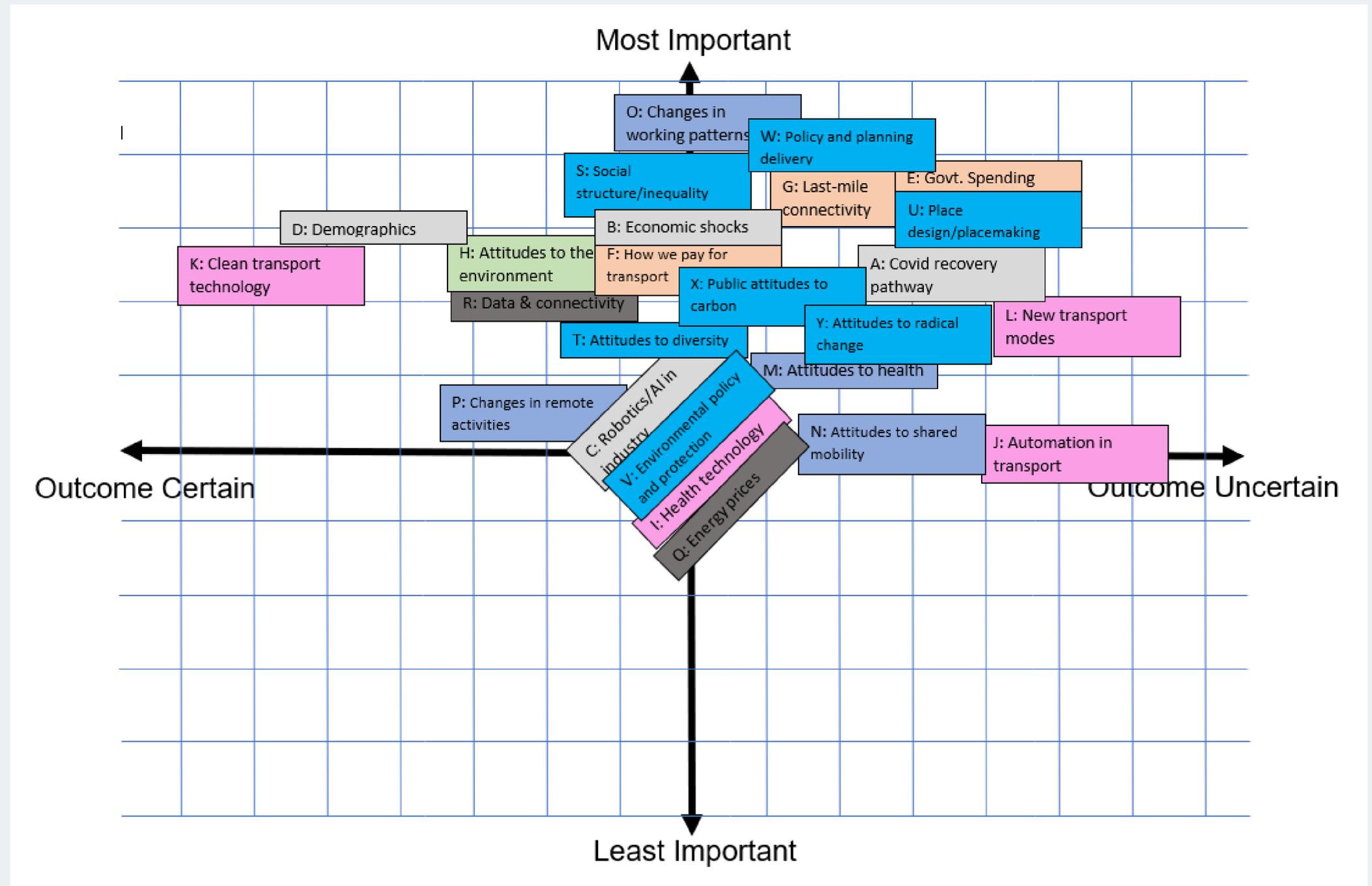
# Workshop 1: Driver Mapping Outputs

- In breakout rooms, and using the axis shown in the figures, stakeholders discussed and agreed where each driver should be placed, assessing each driver's importance and level of certainty in the future.
- The figures show the output from each breakout group. Not all groups completed this exercise, and so those drivers not mapped have been removed from the figures.



# Workshop 1: Driver Analysis

- Based on the Workshop 1 outputs presented on the previous slide, Steer collated all drivers on to one axis, taking an 'average' across the outputs from the five groups.
- These were then grouped into three categories, as presented on the following slides:
  - Higher importance / Uncertain
  - Higher importance / Certain
  - Lower importance



## Stage 2: Cluster Analysis

- The drivers that were grouped under each of the three categories, based on their location on the axis, is presented in the table below.
- The project team then considered which drivers naturally progress with one another, and focussed primarily on those assessed as *higher importance* and *uncertain* to develop suggested alternative futures.

| Higher Importance and Uncertain | Higher Importance and Certain   | Lower Importance                       |
|---------------------------------|---------------------------------|--|
| A: Covid recovery pathway       | D: Demographics                 | J: Automation in transport             |
| B: Economic shocks              | H: Attitudes to the environment | N: Attitudes to shared mobility        |
| E: Govt spending                | K: Clean transport technology   | C: Robotics/AI in industry             |
| F: How we pay for transport     | P: Changes in remote activities | I: Health technology                   |
| G: Last mile connectivity       | R: Data and connectivity        | Q: Energy prices                       |
| L: New transport modes          | T: Attitudes to diversity       | V: Environmental policy and protection |
| M: Attitudes to health          |                                 |  |
| O: Changes in working patterns  |                                 |  |
| S: Social structure/inequality  |                                 |  |
| U: Place design/placemaking     |                                 |  |
| W: Policy and planning delivery |                                 |  |
| X: Attitudes to carbon          |                                 |  |
| Y: Attitudes to radical change  |                                 |  |

## Stage 2: Cluster Analysis

- The table below presents the outputs of this consideration. It can be seen that some of those drivers assessed as certain and/or lower importance (drivers K, R, J and N) were included within one of the groupings. The project team considered that these drivers sit naturally with drivers F and L, and had the potential to form a plausible alternative future that ought to be considered by the stakeholders in the second workshop.

| Higher Importance and Uncertain | Higher Importance and Certain   | Lower Importance                       |
|---------------------------------|---------------------------------|--|
| A: Covid recovery pathway       | D: Demographics                 | J: Automation in transport             |
| B: Economic shocks              | H: Attitudes to the environment | N: Attitudes to shared mobility        |
| E: Govt spending                | K: Clean transport technology   | C: Robotics/AI in industry             |
| F: How we pay for transport*    | P: Changes in remote activities | I: Health technology                   |
| G: Last mile connectivity       | R: Data and connectivity        | Q: Energy prices                       |
| L: New transport modes          | T: Attitudes to diversity       | V: Environmental policy and protection |
| M: Attitudes to health          |                                 |  |
| O: Changes in working patterns  |                                 |  |
| S: Social structure/inequality  |                                 |  |
| U: Place design/placemaking     |                                 |  |
| W: Policy and planning delivery |                                 |  |
| X: Attitudes to carbon          |                                 |  |
| Y: Attitudes to radical change  |                                 |  |

\* Sits in two alternative futures

# Stage 2: Cluster Analysis – Alternative Futures

- The output of the cluster analysis was four plausible alternative futures, plus an additional set of drivers that will be important and certain across all futures. These are presented below.
- The formation of these alternative futures are distinct from the Transport Strategy and Local Economic Strategies future – the exercise was not designed to scope/re-scope this preferred future.

## Slow Recovery

A: Covid recovery pathway  
 B: Economic shocks  
 O: Changes in working patterns

## High Policy Impact

E: Govt spending  
 W: Policy and planning delivery  
 L: New transport modes  
 U: Place design/placemaking  
 S: Social structure/inequality  
 F: How we pay for transport\*  
 G: Last mile connectivity

## Radical Social Change

X: Attitudes to carbon  
 Y: Attitudes to radical change  
 M: Attitudes to health

## High Tech

F: How we pay for transport\*  
 J: Automation in transport  
 N: Attitudes to shared mobility  
 K: Clean transport technology  
 R: Data and connectivity

## All Alternative Futures

D: Demographics  
 H: Attitudes to the environment  
 K: Clean transport technology  
 P: Changes in remote activities  
 R: Data and connectivity  
 T: Attitudes to diversity

\* Sits in two alternative futures

# Stage 3: Impact of each alternative future on transport

- Each alternative future was then considered against the six criteria presented in the table below. The project team considered how demand and mode share proportions for transport modes may vary from the business as usual case under each of the futures.
- The results of this analysis for the five alternative futures is presented here, and the key is provided below. This was presented to the stakeholders during Workshop 2.

| Alternative Future      | Transport demand | Proportion using public transport | Proportion using active modes | Proportion using private motor vehicles | Proportion using new mobilities | Digital replacement of real-world activity |
|-------------------------|------------------|-----------------------------------|-------------------------------|---|---------------------------------|--|
| 0 BAU                   | ●                | ●                                 | ●                             | ●                                       | ●                               | ●  |
| 1 Transport Strategy    | -                | +++                               | +++                           | --                                      | +++                             | ++   |
| 2 Slow Recovery         | --               | --                                | -                             | --                                      | -                               | -  |
| 3 High Policy Impact    | + / ●            | ++                                | + / +++                       | - / ●                                   | ++                              | +  |
| 4 Radical Social Change | -                | + / ●                             | +++                           | ---                                     | +                               | ++   |
| 5 High Tech             | + / +++          | -                                 | -                             | ++                                      | +++                             | +++  |

● in line with BAU

- lower than BAU

+ higher than BAU

# Stage 3: Impact of each alternative future on transport

- During the stakeholder workshop there was a discussion on suggested alternative futures. It was decided that the *High Policy Impact* future could be merged with the *Radical Social Change* future as one is unlikely to be a scenario without the other (i.e. there is a need for a shift in public thinking, as well as spend, regulation and policy direction). The results of the assessment when the two are merged is presented below.

| Alternative Future   | Transport demand | Proportion using public transport | Proportion using active modes | Proportion using private motor vehicles | Proportion using new mobilities | Digital replacement of real-world activity |
|----------------------|------------------|-----------------------------------|-------------------------------|---|---------------------------------|--|
| 0 BAU                | ●                | ●                                 | ●                             | ●                                       | ●                               | ●  |
| 1 Transport Strategy | -                | +++                               | +++                           | --                                      | +++                             | ++   |
| 2 Slow Recovery      | --               | --                                | -                             | --                                      | -                               | -  |
| 3 Radical Change     | -                | ++                                | +++                           | ---                                     | ++                              | ++   |
| 4 High Tech          | + / +++          | -                                 | -                             | ++                                      | +++                             | +++  |

- in line with BAU
- lower than BAU
- +
- higher than BAU

# Workshop 2: Activity

- During Workshop 2 stakeholders were split into four breakout rooms, and each group was allocated one alternative future scenario to consider.
- Groups were asked to consider how each of the drivers grouped under the Higher Importance / Uncertain and Higher Importance / Certain categories perform under the allocated scenario. The facilitator for each group noted down the discussion points and provided a summary of discussion to the wider group.
- The outputs were collated by the project team to develop narratives for each alternative future (including the likely travel demand and behavioural patterns). These are summarised on the following slides.

## Higher Importance / Uncertain

| Driver                          | Impact on driver |
|---------------------------------|------------------|
| A: Covid recovery pathway       |                  |
| B: Economic shocks              |                  |
| E: Govt spending                |                  |
| F: How we pay for transport*    |                  |
| G: Last mile connectivity       |                  |
| J: Automation in Transport      |                  |
| L: New transport modes          |                  |
| M: Attitudes to health          |                  |
| O: Changes in working patterns  |                  |
| S: Social structure/inequality  |                  |
| U: Place design/placemaking     |                  |
| W: Policy and planning delivery |                  |
| X: Attitudes to carbon          |                  |
| Y: Attitudes to radical change  |                  |

## Higher Importance / Certain

| Driver                          | Impact on driver |
|---------------------------------|------------------|
| D: Demographics                 |                  |
| H: Attitudes to the environment |                  |
| K: Clean transport technology   |                  |
| P: Changes in remote activities |                  |
| R: Data and connectivity        |                  |
| T: Attitudes to diversity       |                  |

# Alternative Future: Radical Change

High government spend is coupled with a radical change in policy, directed to support a shift in public attitudes towards health and carbon and accelerate progress towards achieving net zero carbon ambitions ahead of the EEH 2040 ambition (against the backdrop of the 2050 national government target). A resilient economy has supported a fast Covid19 recovery and government spending priorities include Transport Strategy objectives, with improvements for last mile connectivity and new modes, including shared / micro mobilities and digital demand responsive transport. Automated vehicles are less of a priority, with policy and regulations behind compared to a high-tech world. Users pay for their travel fully accounting for all externalities, including carbon emissions and road space usage, and payment is fully integrated across modes. Place-making is at the heart of local policy and planning decisions, with reclamation of road space, pedestrianization and environmental, social and health outcomes prioritized over purely economic ones.

| Driver                                 | Summary   |
|--|---|
| <b>E: Govt spending</b>                | Achievement of Transport Strategy objectives is enabled by prioritisation or increase in spending.  |
| <b>F: How we pay for transport*</b>    | Integrated payment systems across modes for users. Cost set to encourage usage of modes with better environmental, social and health outcomes – at a minimum fully accounting for any carbon / negative externalities of each mode. |
| <b>G: Last mile connectivity</b>       | Increased use of sustainable options, enabled through increased funding – on demand, integrated and seamless options.   |
| <b>L: New transport modes</b>          | Increased use of shared and micro mobilities, and digital demand responsive transport.  |
| <b>M: Attitudes to health</b>          | Increased awareness leading to behavioural change and more successful outcomes.   |
| <b>U: Place design/ placemaking</b>    | Revitalisation of town centres and improved connectivity to new developments. Integrated planning – “15 minute neighbourhoods”.   |
| <b>W: Policy and planning delivery</b> | Strong policy environment with funding to match.  |
| <b>X: Attitudes to carbon</b>          | Support for acceleration of net zero carbon ambition.   |
| <b>Y: Attitudes to radical change</b>  | Support radical change and spending directed appropriately to support this.   |

# Alternative Future: High-tech

*Public and government attitudes to technology and technological change are very positive. An acceptance of a hybrid model of working, locking in the benefits of home working, leads to a lower overall and peak travel demand. With less need to travel, private car ownership reduces, and individuals seek alternative shared, on-demand and convenient options. Public and private sectors work collaboratively to respond to changing travel trends with new, innovative and inclusive transport options emerging, such as CAVs. The necessary policy, regulation support, and investment to encourage and advance the pace of the shift to clean transport technology, automated vehicles and shared mobility leads to increased demand and capacity for both private and shared road transport options. Meanwhile, traditional public transport modes such as bus and rail decline. Strong national policy and supporting regulation leads to differentiated per-km charges for road space usage.*

| Driver                                 | Summary  |
|--|--|
| <b>F: How we pay for transport*</b>    | Integrated payment systems across modes for users. Cost dependent on carbon / negative externalities of a given mode.                          |
| <b>J: Automation in transport</b>      | Advanced policy and regulatory environment supports automation for users and freight.  |
| <b>N: Attitudes to shared mobility</b> | Mobility as a Service is widely adopted, with individuals seeking on-demand shared mobility over private vehicle ownership.                    |
| <b>K: Clean transport technology</b>   | Policy and regulatory environment is supportive of clean transport modes.  |
| <b>R: Data and connectivity</b>        | Methods to overcome potential barrier to sharing data to encourage uptake. Advancement in MaaS provides opportunities to collect and use data. |

# Alternative Future: Slow recovery

*With a slower return to the pre-Covid19 business-as-usual and an economy vulnerable to external and internal economic shocks, there will be a prolonged period of working from home / hybrid working and subsequently, a continuation of fewer journeys for all trip types, across all modes. This will be particularly true for peak travel demand and for private vehicle trips due to wage stagnation/unemployment. Affordability will impact on social structure, with transport choice being removed for some individuals due to the cost being disproportionate to income. For journeys that are required (e.g. to access employment), there will be increased reliance on public transport and active modes. The impacts of Covid19 on retail trips will continue, with a reliance on home delivery services. There will be less focus on new transport modes, automation of transport and last mile connectivity under this scenario due to the lack of funding to create policy, invest, and incentivise change (though there may be some potential for increased use of new low cost modes such as e-scooters).*

| Driver                                | Summary  |
|---------------------------------------|--|
| <b>A: Covid recovery pathway</b>      | Slow recovery due to new variants emerging, resistant to the vaccine, and vulnerability of the economy more generally to external and internal economic shocks. Home working is the norm, causing lower travel demand, particularly in the peak. Increased reliance on home delivery services. |
| <b>B: Economic shocks</b>             | Vulnerable economy with expected national and global economic downturn. Rising unemployment, stagnant wages and increased cost of travel works to lower travel demand, particularly private vehicle trips, and public transport. Increased reliance of low cost modes for necessary trips.     |
| <b>C: Changes in working patterns</b> | Home working continues for several sectors and there is an increased degree of flexibility for working hours.  |

# Alternative Future: Business as usual

| Driver                                 | Summary  |
|--|--|
| <b>A: Covid recovery pathway</b>       | Following period of low public transport demand, peak demand returns in short-medium term post Covid19.  |
| <b>B: Economic shocks</b>              | Following period of reduced overseas travel, in the short-term medium term travel demand returns to pre-Covid19 level.   |
| <b>E: Govt spending</b>                | Unfocussed government spending and lack of clear and consistent policy on sustainable transport across geographies. Funding available is focused on larger authorities.                              |
| <b>F: How we pay for transport</b>     | Increased public transport fares and fuel prices reduce transport affordability.   |
| <b>G: Last mile connectivity</b>       | A continued gradual shift towards sustainable modes, no acceleration in pace, with individuals still reliant on private car.   |
| <b>J: Automation in transport</b>      | Slow shift, no acceleration in pace. Pace more advanced for freight purposes.  |
| <b>L: New transport modes</b>          | Public resistance to new modes causes a slow shift to new modes. No acceleration in pace. Pace more advanced for freight with continued uptake of cargo bikes, and smaller, more efficient vehicles. |
| <b>M: Attitudes to health</b>          | Aspects of health, primarily air quality, increasingly a driver in policy and public attitudes.  |
| <b>N: Attitudes to shared mobility</b> | Younger generations more open to shared mobility. Demand responsive transport is being trialled.   |
| <b>O: Changes in working patterns</b>  | Hybrid model is developed for some sectors where appropriate. Flexible working patterns are more widely accepted. Number of business trips reduced compared to pre Covid19 world.                    |
| <b>S: Social structure/inequality</b>  | Transport poverty increased due to increased fares and fuel prices. A level of digital inequality.   |
| <b>U: Place design/placemaking</b>     | Some shift towards improved place design, e.g. healthy streets, with increased less focus on motor vehicles and more focus for other road users.   |
| <b>W: Policy and planning delivery</b> | Shift towards green policy, but with continued disconnect between high level political drivers and local change.   |
| <b>X: Attitudes to carbon</b>          | Some positive shift, but not sufficient to achieve net zero ambitions within strategy timescales.  |

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