

Mobilising Mobility: Data-driven Urban Mobility Planning and Citizen Science

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POLIS Mobilising Mobility Series

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ClairCity Aims and Objectives

ClairCity (www.claircity.eu) is aimed at creating a major shift in public understanding towards the causes of poor air quality, inviting citizens to give their opinions on air pollution and carbon reduction to shape the cities of the future.

1. Putting citizens behaviour and practices at the heart of the debate.
2. Develop a suite of innovative toolkits for enhanced quantification, engagement and impact evaluation.
3. Integrate citizens behaviours in city policies now and in the future.
4. Raise awareness of environment changes and their solutions

By putting people at the heart of both the problem and the solutions, we will stimulate the public engagement necessary to tackle our challenging emissions problems through the development of a range of citizen-led future scenario and policy packages.

NOT EVERY CITY IS THE SAME...

OUR PARTNER CITIES AND REGIONS REPRESENT VARIETY.



People create pollution through technology

Traditional approaches to managing air pollution



ClairCity approach to managing air pollution



How citizens can influence policy

ClairCity Skylines Game

Using game technology to engage citizens and crowd-source public acceptability of interventions

ClairCity Citizen Delphi

Hearing the citizen voice and giving them a platform to connect their day to day practices with air pollution

ClairCity Source Apportionment

Apportionment of pollution by demographics and travel motives.



ClairCity Skylines Game Design Challenge



Game Core Mechanics



Visit areas, collect 'ideas' they like
Ideas *promoted* to policies every 5 years

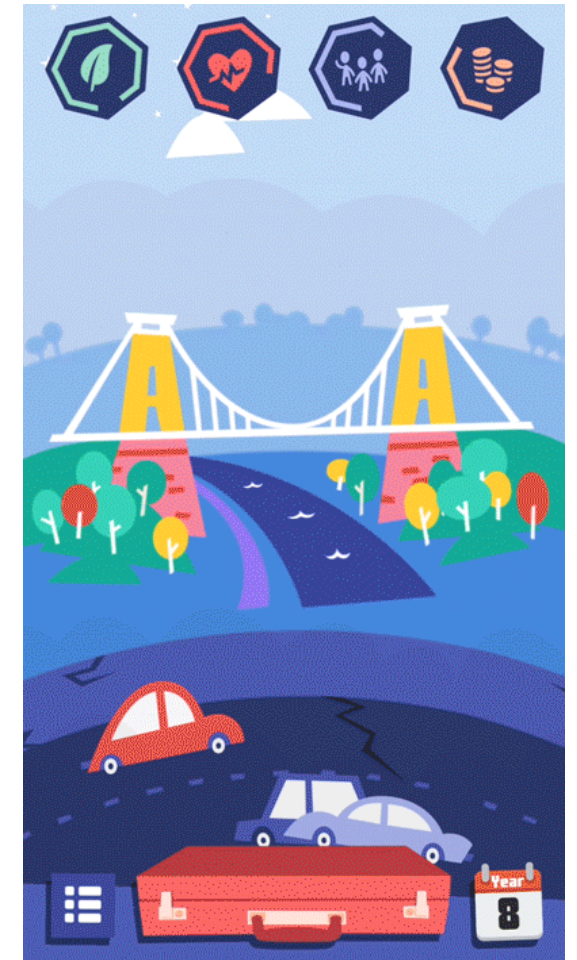
Gold/Silver/Bronze priority possible

Policy reports deliver results (after X years)

Newspapers give nudges pre **win/fail**

If **Fail**, play again.

If **Win**, play again for better medal or play another city



| Attribute | Area | Visual Effect |
|--------------|--------------|-------------------|
| Climate | Green Space | Smog |
| Economy | Bank | Dereliction |
| Health | Hospital | Citizen sickness |
| Satisfaction | Tourist area | Citizen Happiness |

ClairCity Policy Library (CPL)

- ClairCity Policy Library contains >500 policies or interventions (+ve and –ve)
- These are the **‘ideas’** that are presented to the players
- The ‘ideas’ were mined from a number of sources: JOAQUIN, FAIRMODE etc
- Each idea is also categorised into four **levels**:
 - L1: Source Sector
 - L2: Source Sub-sector
 - L3: Policy Type
 - L4: Responsible authority
- Each ‘idea’ is scored on a scale (+/- 10 point) for the short and long term impacts for four **attributes**:
 - Carbon Emissions
 - Air Quality / Health
 - Citizen satisfaction / happiness
 - City economy



EN

Welcome to ClairCity



How old are you?

13-15

16-24

25-34

35-49

50-64

65+

Are you:

Male

Female

Other

Prefer
Not To Say

Rate your knowledge of air pollution:



Nothing

Expert

Do you live, work, or study in:

Bristol

Amsterdam

Aveiro

Sosnowiec

Liguria

Ljubljana

Other

I agree that by playing this game my choices
will inform the ClairCity project about policy
making research into air pollution.

I Agree

Each player gets a unique id and game records:

- Simple demographic data
- # of times specific idea has been offered
- # of times specific idea has been chosen (or rejected)
- # of times specific idea has been stamped (or not)
- Length of play sessions
- Final year achieved
- Evaluation survey data

A simple ranking process to feed into the policy stream:

- Chosen / Offered (C/O)
- Stamped / Chosen (S/C)
- $C/O * S/C = \text{Rank \%}$



CLAIRCITY SKYLINES



Bristol
Start New Game



CLAIRCITY SKYLINES



Amsterdam
Start New Game



CLAIRCITY SKYLINES



Aveiro
Start New Game



CLAIRCITY SKYLINES



Sosnowiec
Start New Game



CLAIRCITY SKYLINES



Ljubljana
Start New Game



CLAIRCITY SKYLINES

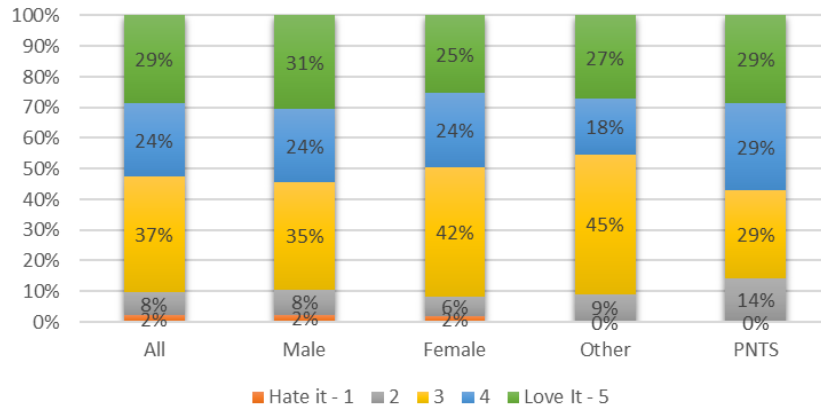


Liguria
Start New Game

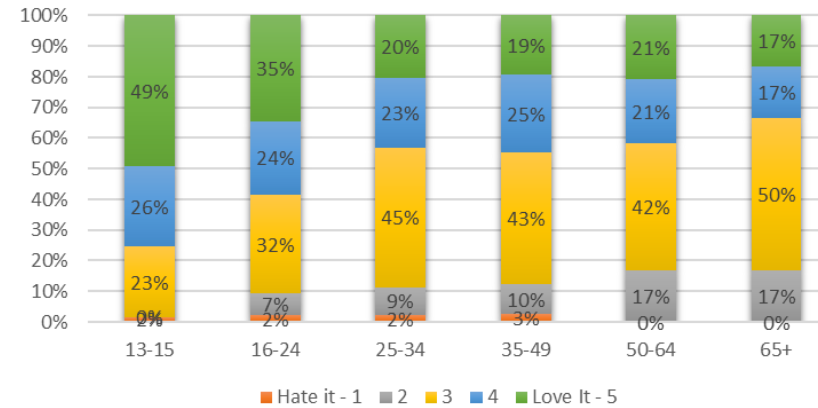


Who is playing?

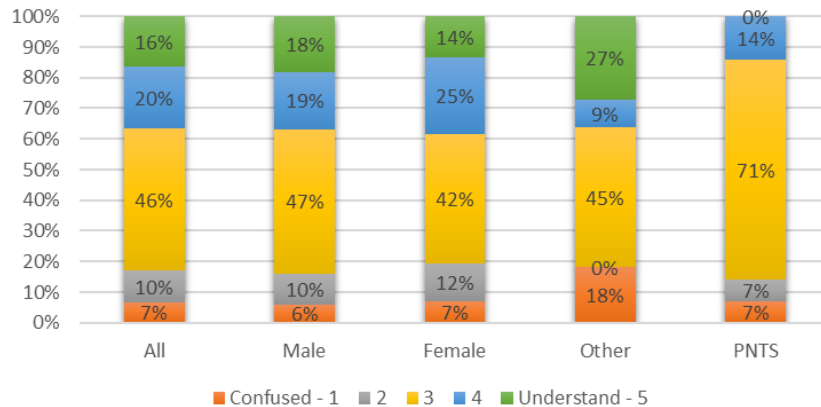
Player Enjoyment - Gender



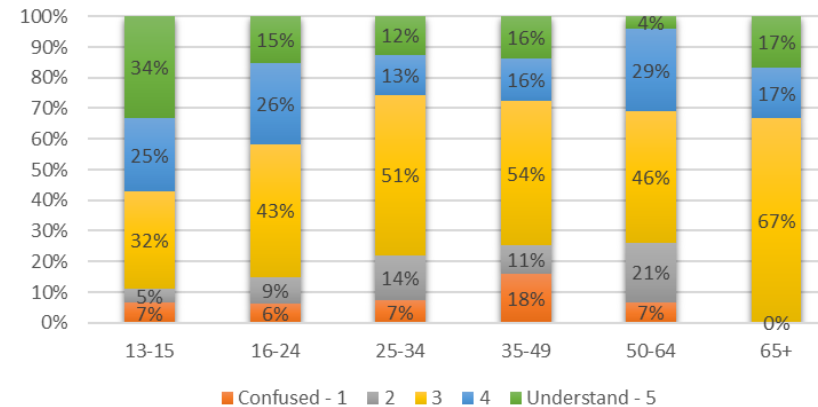
Player Enjoyment - Age



Player Understanding - Gender



Player Understanding - Age



4200 unique players

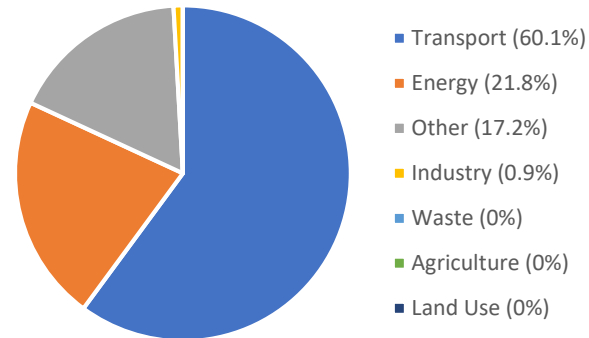
11,000 unique game plays

63:37 male:female ratio

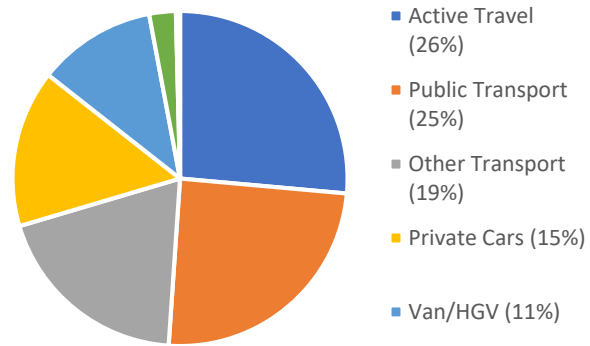
>80,000 policies chosen

Policies of Preference

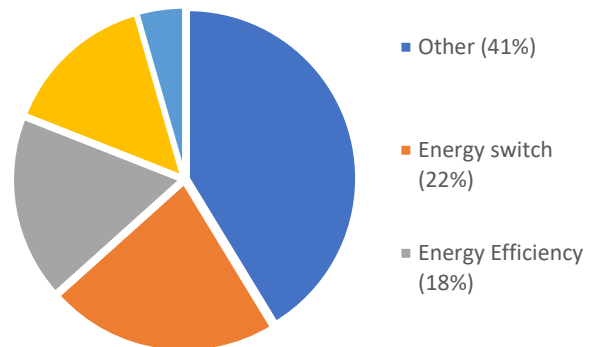
Category 1 Implemented Policies



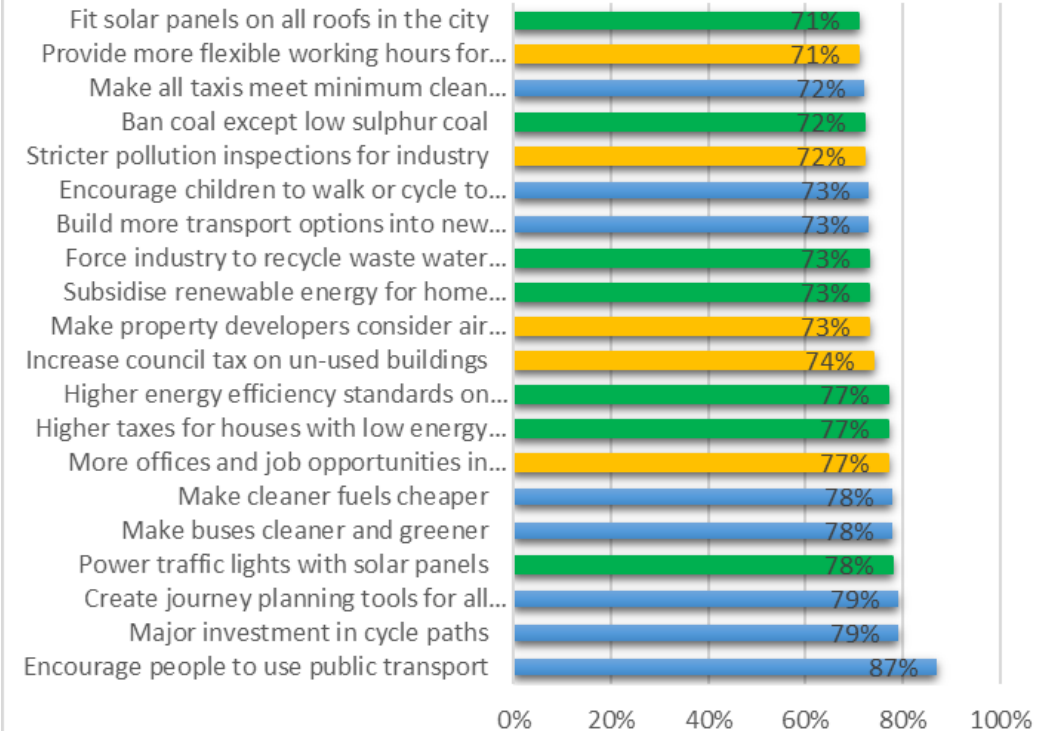
Category 2 - Transport



Category 2 - Energy / Other

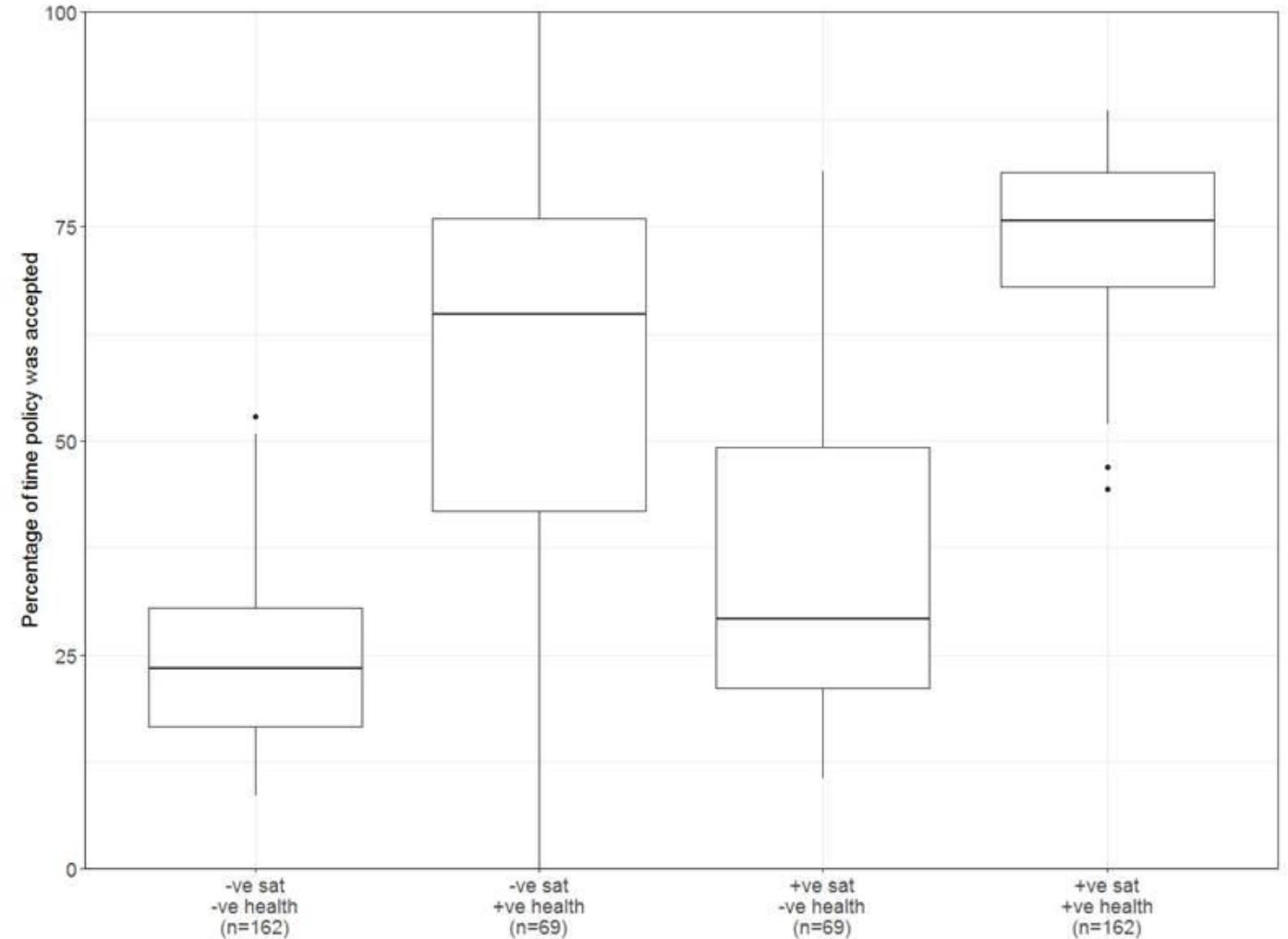


Bristol Top 20



Which policies (and why)?

| | Policy | Female | Male |
|----|--|--------|------|
| 1 | Don't introduce new taxes for energy efficiency of houses | 16 | 37 |
| 2 | Increase the number of road lanes for cars | 15 | 35 |
| 3 | Make property developers consider air pollution & climate change | 88 | 68 |
| 4 | Free internet for all homes as standard | 47 | 66 |
| 5 | Promote car sharing clubs for personal & business use | 93 | 75 |
| 6 | Reduce taxes on petrol and diesel fuel | 13 | 30 |
| 7 | Allow delivery drivers to use any route through the city | 21 | 38 |
| 8 | Don't force bus companies to use clean engines | 19 | 35 |
| 9 | Allow public sector to use any kind of fuel | 26 | 41 |
| 10 | Switch all diesel cars and vans to use biofuel | 92 | 77 |
| 11 | Remove hedges and widen roads | 14 | 28 |
| 12 | Keep the 40 hour working week | 55 | 69 |
| 13 | Regulate construction & farm machinery pollution more heavily | 84 | 70 |
| 14 | Promote use of air conditioning | 39 | 53 |
| 15 | Make ship fuels cleaner | 69 | 56 |
| 16 | Remove all 20 mph speed limits in the city | 36 | 50 |
| 17 | Sell high polluting fuels | 2 | 15 |
| 18 | Encourage use of geothermal for home heating and cooling | 90 | 76 |
| 19 | Don't force councils to use hybrid vehicles | 19 | 32 |
| 20 | Make all buses meet minimum clean engine standards | 75 | 62 |

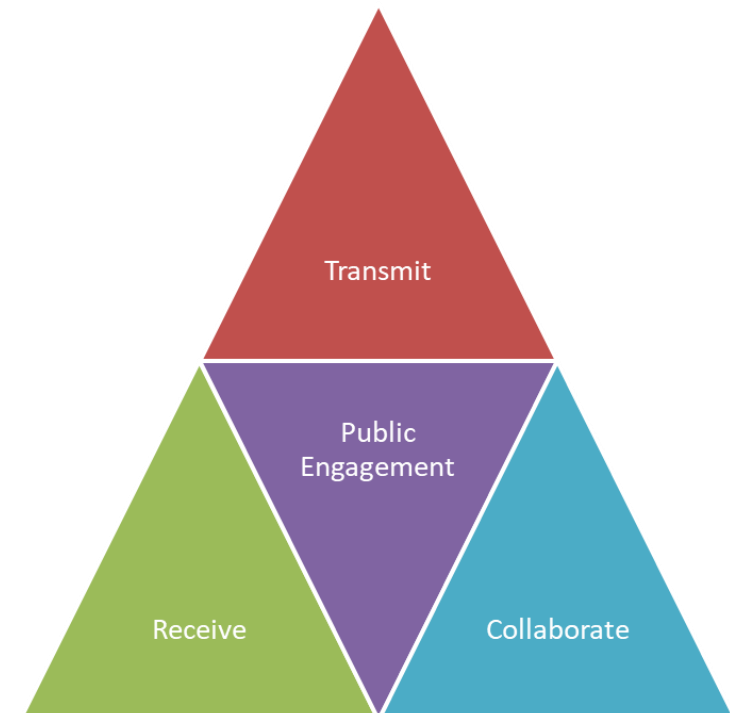


ClairCity Citizen Delphi



Common practice to '*provide information*' (Transmit) and '*consult public and stakeholders*' (Receive) but do we listen?

The public landscape is changing and we need to think of new mechanisms which allow us to work together (Collaborate)



Transport: influence of social practice

Flexibility

Insufficient public transport

“Unfortunately I use my car. The train is way too expensive and crowded. It would take twice as long compared to driving. I have nowhere to lock up my bike at work and I don't think my boss would like me sweating at my desk. Road feel unsafe at peak times, cycle routes are just on the edge of road, often randomly stopping just before difficult areas.”

Lack of facilities

Safety fears

Perception

Changing the conversation

"I simply don't see accessibility and cost of public transport ever being better"

"Unfortunately I use my car"

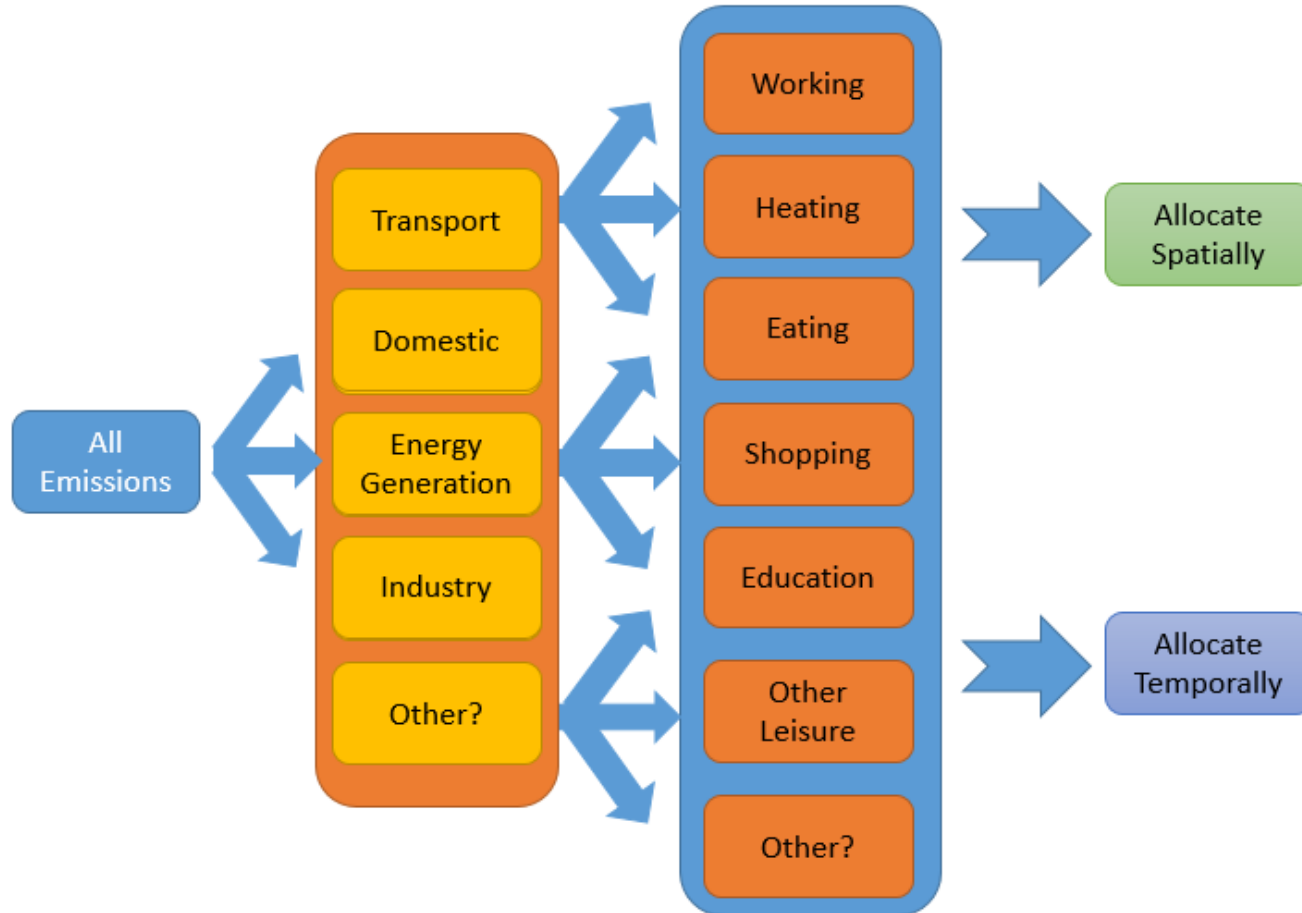
"Heavy loads, steep hills, small children, tired – I just want to get home!"

"What do I know about Euro Standards?! I just use my car to drive to the shops"

"I need flexibility to go where I want, when I want"



Putting 'people' into the data

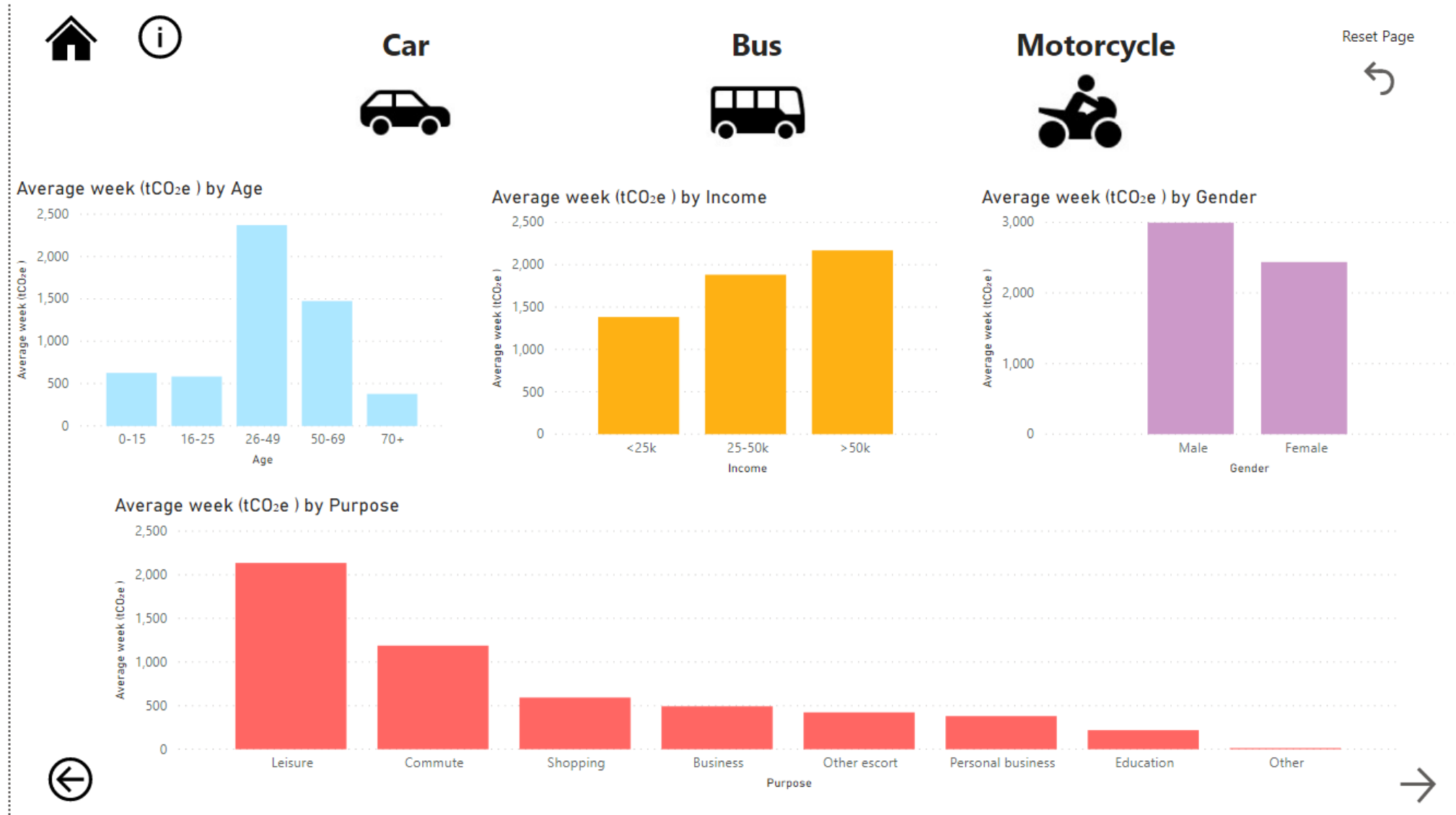


No two individuals are the same!

Their behaviours are different:
spatially, temporally and
demographically.

The factors that influence their
behaviour vary: socially, income,
flexibility, responsibility

Source Apportionment: Mode



Source Apportionment: Motive

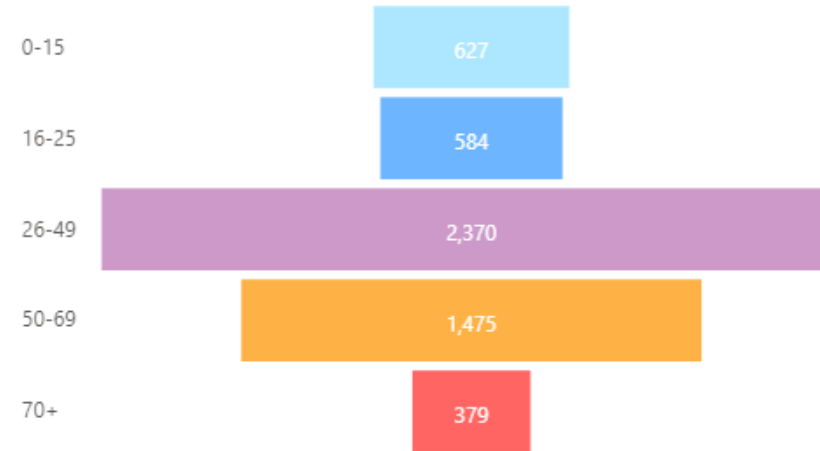


Filter menu:

Purpose: All

- ☐ Business
- ☐ Commute
- ☐ Education
- ☐ Leisure
- ☐ Other
- ☐ Other escort
- ☐ Personal business
- ☐ Shopping

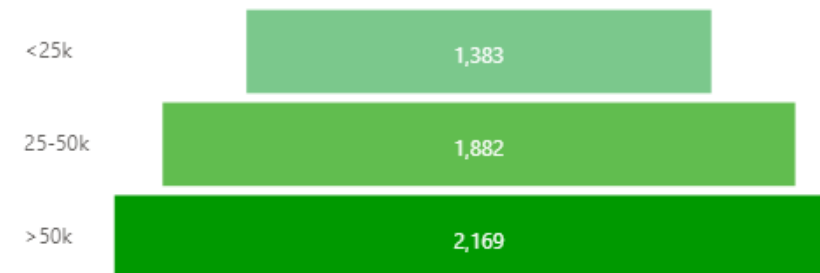
Average week (tCO₂e) by Age



Reset Page



Average week (tCO₂e) by Income



Source Apportionment: Gender



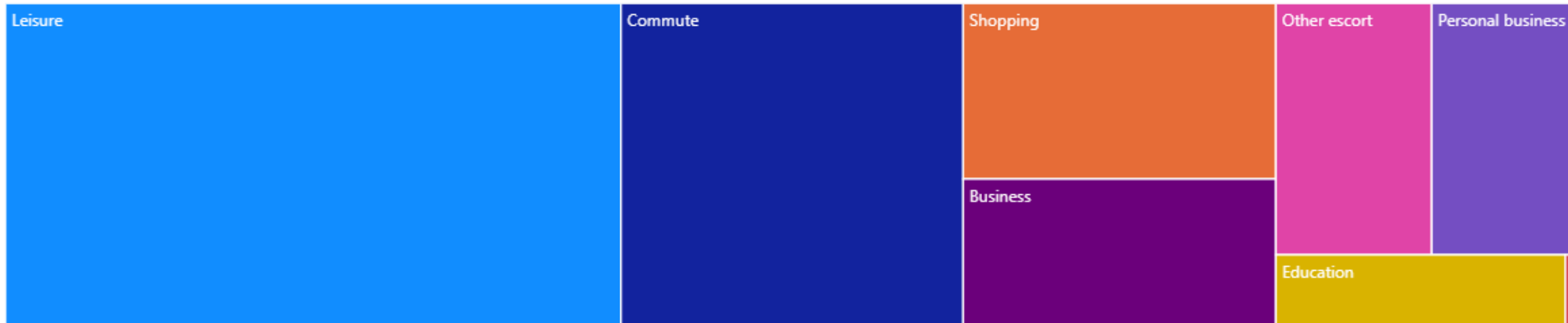
Male

Female

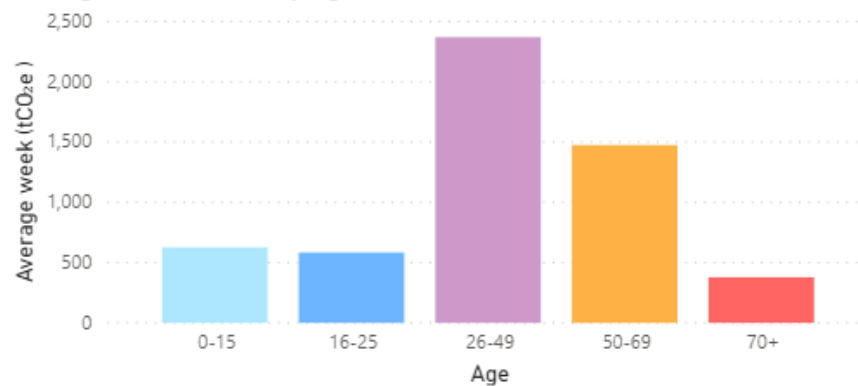
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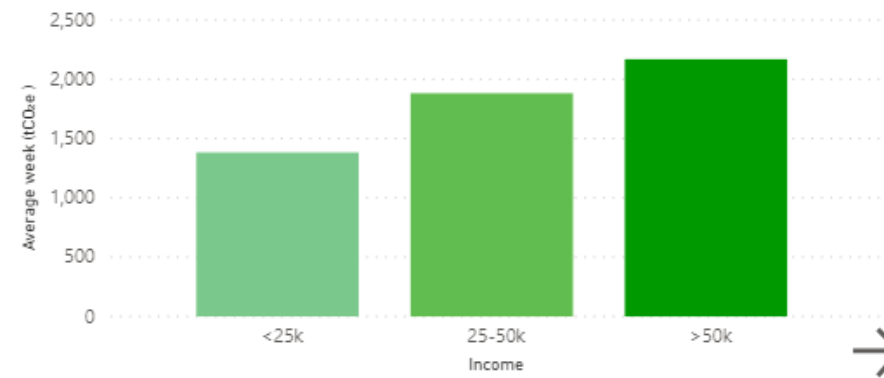
Average week (tCO₂e) by Purpose



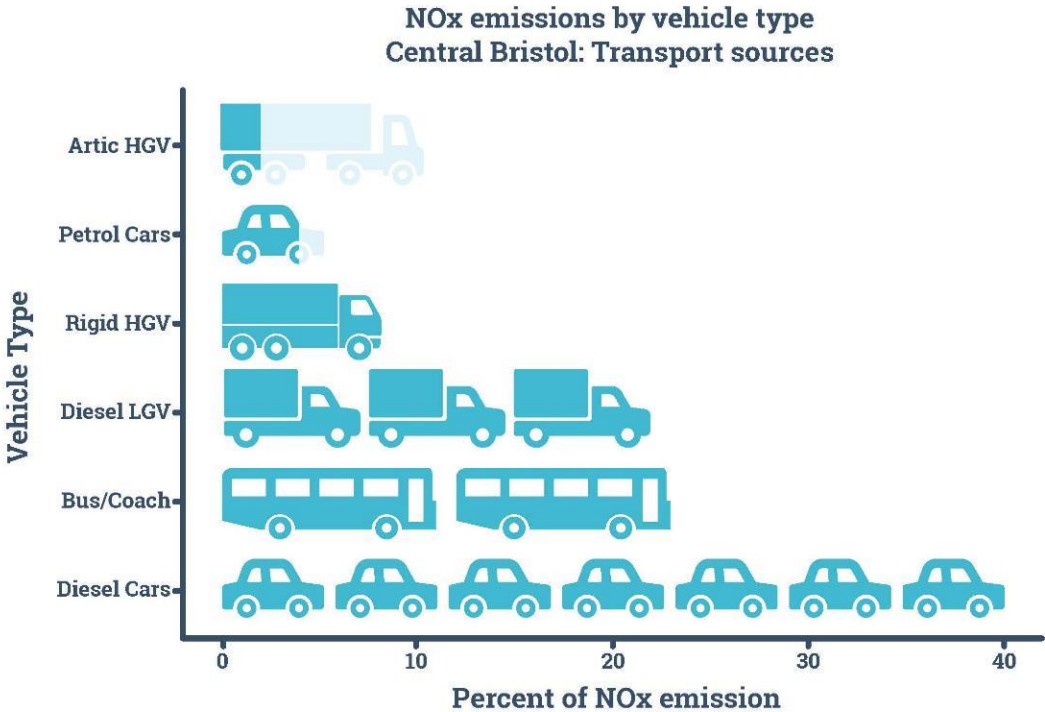
Average week (tCO₂e) by Age



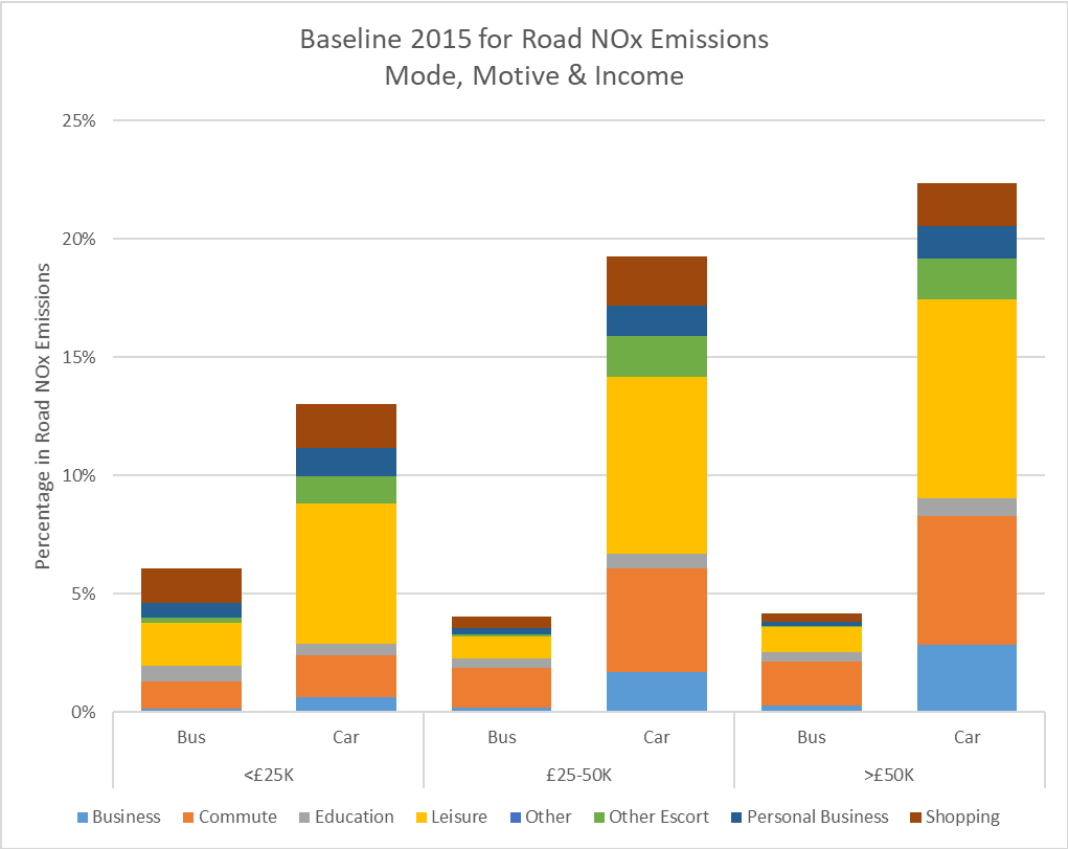
Average week (tCO₂e) by Income



Source Apportionment: Combinations

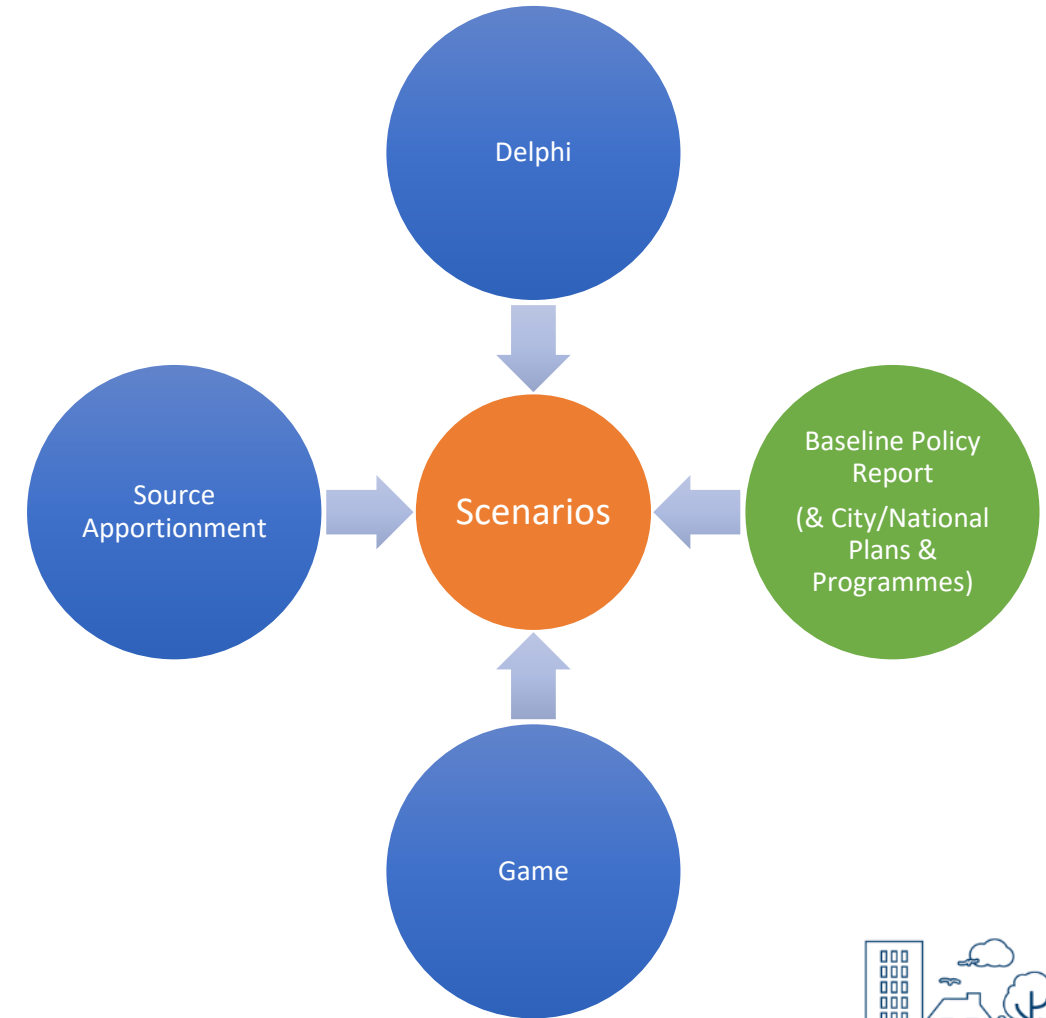


Data from Bristol City Council Cabinet Agenda, 15 Aug 2017, page 105.
Available from <https://democracy.bristol.gov.uk/documents/g2557/Public%20reports%20pack%2015th-Aug-2017%2016.00%20Cabinet.pdf?T=10>

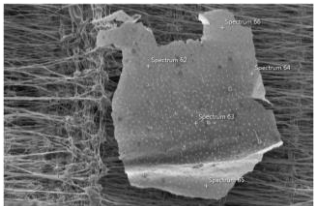
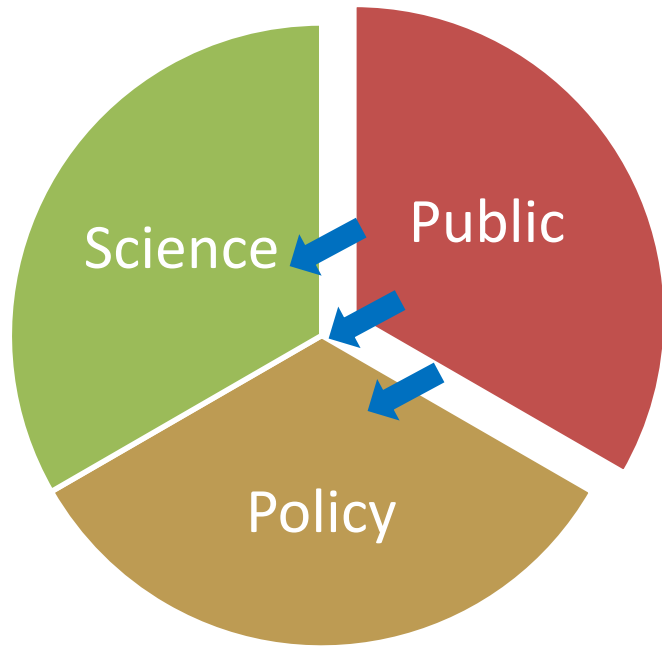


Using the citizen data to drive change

- Game / Delphi / SA results act as the foundation for citizen inclusive future scenario and policy recommendations.
- Also provides the platforms to raise awareness and create understanding.
- Results inform our understanding of social behaviour, public perceptions, supposed constraints and opportunities.
- Results underpin the ClairCity Scenarios and final ClairCity Policy Packages.



Citizen advocates for change



- **Need ‘enabling’ policies that breakdown social practice barriers so that greener choices become the social norm for everyone!**
- Must understand how social practices influence the generation of pollution and stop blaming the individual for their lack of willingness to change.
- How to engage the public
 - Know your audience
 - Connect to their lived experience / expertise
 - Find common ground to discuss the challenges and solutions
 - Need mechanisms that allow for continuation of engagement
 - Need multiple engagement pathways: the way we engage young people will be very different from older people
- The bottom-up approach raised ambition levels in the cities: policy-makers feel empowered to be more ambitious.
- Some ground-truthing is required: targets need to be challenging but also realistic



Thank You

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