ClairCity: Citizen-led air pollution reduction in cities

D4.4 Pilot Cities DELPHI Evaluation

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Authors	Jo Barnes (UWE) Corra Boushel (UWE)
Contact	Jo.barnes@uwe.ac.uk Corra.boushel@uwe.ac.uk
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Description	This report presents a summary of the results and an evaluation of the data quality from Work Package 4: Citizens and Stakeholder Engagement Task 4.1 Citizen Delphi Engagement for each of the six city/regions (Amsterdam, Aveiro region (CIRA), Bristol, Liguria, Ljubljana and Sosnowiec) as deliverable D4.4. Its aim is to provide the key findings relating to citizens' desires, ambitions and concerns to inform the development of the Policy Packages and enable botttom-up policy-making.

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Quality Assurance	Irati Artola (Trinomics)
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Executive Summary

This report presents the analysis of Task 4.1 Citizen Delphi Engagement and an evaluation of the data quality in fulfilment of Deliverable *D4.4 Pilot Cities DELPHI Evaluation*. The report describes the role of the Delphi process within the context of the other ClairCity activities and work packages and within the wider research arena. The Delphi methodology is explained and justified based on citizens as experts in their own lives. By better understanding what citizens want from their city/region and how they live their lives, as well as the policy measures that they support and how more difficult measures could be facilitated, we can gain context for the recommendation of policy measures to be taken forward. By putting citizens at the heart of air quality policy and challenging traditional top-down policy-making, the final Policy Packages will reflect the ambitions and desires of the citizens and will ultimately be more effective in implementation.

This report presents the analysis of responses from each Round of the Delphi process for each of the six city/regions (Amsterdam, Aveiro region (CIRA), Bristol, Liguria, Ljubljana and Sosnowiec).

For Round 1 the analysis of responses relating to transport and home heating, now and in the future are presented. Further analysis exploring the reasons why citizens feel unable to change their behaviour focuses on those individuals who would like to move from the most polluting activities, i.e. car only transport and solid fuel only for home heating, to less polluting activities, i.e. travel without a car, or with a car and other modes, and alternatives to solid fuel use for home heating.

Round 2 presents the responses to the policy measures, which were derived from Round 1 questions relating to what citizens liked and disliked about their city/region and what they wanted their future city/region to be like in 2050. Round 2 respondents were asked to reflect on how each policy measures would affect their lives and whether it would be good or bad for the city region.

Round 3 presents the outcomes of the workshops in which citizens were asked to explore how the most difficult measures could be facilitated.

The final section summarises the report.

This report presents a summary of the results and an ‘evaluation’ of the data quality, rather than an evaluation of the Delhi process. The process evaluation will covered by ClairCity Deliverable *D2.8 Communication Evaluation Report* and the interpretation of the results will be presented in ClairCity Deliverable *D4.7 Role of Delphi*.

1 Introduction

1.1 Objective of this report

This report presents a summary of the results and an evaluation of the data quality from Work Package 4: Citizens and Stakeholder Engagement Task 4.1 Citizen Delphi Engagement for each of the six city/regions (Amsterdam, Aveiro region (CIRA), Bristol, Liguria, Ljubljana and Sosnowiec) as deliverable D4.4. Its aim is to provide the key findings relating to citizens' desires, ambitions and concerns to inform the development of the Policy Packages and enable botttom-up policy-making.

1.2 Role of Delphi within ClairCity

Task 4.1 Citizen Delphi Engagement belongs to Work Package 4: Citizens and Stakeholder Engagement. The primary goal is to engage citizens and key stakeholders across all of our European partner cities and regions to give them the platform to generate their vision for a low carbon, clean air, healthy future.

The results from the Delphi process feed into the ClairCity Skylines Game (Task 4.2) and, together with outputs from the Skylines Game and the Mutual Learning Workshop (Task 4.4.1) will contribute to the Stakeholder Engagement Workshops to determine 'scenarios' of a low carbon, clean air, healthy pathways in the short-medium and long term to 2050. The quantification of these scenarios will then feed into a Policy Workshop that will seek to derive consensus on a final scenario through discussion with policy makers in each city/region, and ultimately to the development of the Policy Packages for each pilot city/region.

This Citizen Delphi task, is integral to ClairCity in putting citizens at the heart of air quality policy and enabling bottom-up policy-making.

1.3 Research context

> *"Delphi may be characterized as a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem"*[1].

Delphi has "established itself as one of the standard techniques to accumulate, to pool, and to appraise expert opinions"[2]. It is a technique for exploring issues using expert judgement, in areas where there are no scientific 'rules'. In its 'true' form, the technique is a decision making tool, focussed on forming a consensus on an issue that is relatively unknown in scientific terms, and has been particularly used in forecasting technological developments and other futures studies. It is an iterative, remote, consultative process, using a group of 'experts', where subsequent rounds of consultation are conducted in light of the group's

[1] Linstone, H.A. and and Turoff, M., eds. (2002) *The Delphi Method: Techniques and Applications* [online]. Newark: New Jersey Institute of Technology.
[2] Steinert, M. (2009) A dissensus based online Delphi approach: An explorative research tool. *Technological Forecasting and Social Change* [online]. 76 (3), pp.291-300.

answers to the first in order to achieve convergence on a consensus.[3] Effectively, Citizen Delphi treats citizens as the 'experts' in their own lives in order to better inform policy making from the bottom up.

The activities conducted under Citizen Delphi fit into wider research fields of travel choice surveying and social research into housing options. Surveys can identify latent demand or support the assessment of public acceptability for new schemes. Data collected from the public can identify issues across or between populations, offering stronger support for policy proposals than modelling or technical evidence alone may provide to policymakers or service providers.

In the multi-disciplinary fields of transport and domestic energy choice, understanding and predicting citizen behaviour has been an ongoing topic of interest. The impact of spatial planning on behaviours, [4] cultural norms and identity,[5] or how material infrastructure interacts with behaviours have all been included in the field.[6] Exploring not only the actions (self-reported or observed) of individuals is useful, but intervening directly to pose questions about the rationales behind a person's behaviour adds valuable data to the research, as "the same behaviour can take place for different reasons and that the same attitudes can lead to different behaviours." [7]

1.4 Methodology selection

To better understand citizens' behaviour and choices, within our project remit of apportioning air pollution emissions and concentrations, carbon footprints and health outcomes by city citizens' behaviour and day-to-day experiences, we used open and closed question survey methods and face-to-face workshops as part of a Delphi process.

The Delphi process is a mixed method approach, usually using multiple rounds of opinion elicitation to generate and identify consensus over complex topics.[8] Most frequently used to draw together the opinions of expert groups, within ClairCity it has been adapted to involve citizens[9] as experts in their own lives. Their knowledge and experience of travelling in their areas, heating their homes and the opportunities and problems of their cities or regions was drawn together by successive rounds of data collection. We looked to identify areas of consensus and dissensus primarily on transport and home heating policies. Our participants, while they may not have had specialist knowledge of air quality or carbon emissions

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[3] Wilenius, M. and Tirkkonen, J. (1997) Climate in the making: Using Delphi for Finnish climate policy. *Futures* [online]. 29 (9), pp.845-862.
[4] Schwanen, T. & Mokhtarian, P., What affects commute mode choice: neighborhood physical structure or preferences toward neighborhoods? *Journal of Transport Geography,* **13**(1), pp. 83-99, 2005.
[5] Anable, J., 'Complacent Car Addicts' or 'Aspiring Environmentalists'? Identifying travel behaviour segments using attitude theory. *Transport Policy,* **12**(1), pp.65-78, 2005.
[6] Cass, N., & Faulconbridge J., Commuting practices: New insights into modal shift from theories of social practice, *Transport Policy,* **45,** pp.1-14, 2016.
[7] Anable, J., 'Complacent Car Addicts' or 'Aspiring Environmentalists'? Identifying travel behaviour segments using attitude theory. *Transport Policy,* **12**(1), pp.65-78, 2005.
[8] Dalkey, N., & Helmer, D., Delphi technique: characteristics and sequence model to the use of experts *Management Science,* **9**(3), pp. 458-467, 1963.
[9] Bloor, M., Sampson, H., Baker, S. & Dahlgren K., Useful but no oracle: reflections on the use of a Delphi group in a multi-methods policy research study, *Qualitative Research,* **15**(1), pp. 57-70, 2015.

modelling, could provide expertise and experience over a spectrum of relevant behaviours and practices and the rationales behind them.[10]

The data was collected via:

- Round 1 survey: a mix of open and closed questions presented online and face-to-face by interviewers and in self-complete forms
- Round 2 survey: a mix of open and closed questions presented online
- Round 3 workshop: a face-to-face event facilitated by ClairCity staff, with groups of between 5 – 35 citizens at a time. (Reported in ClairCity Deliverables *D4.2* and *D4.3*.)

The approach taken is detailed in ClairCity Deliverable *D4.1 Delphi Guidelines and Pilot*. These Guidelines and specific training sessions provided by University of the West of England, Bristol (UWE) enabled the pilot city/region partners to conduct the 'on the ground' citizen engagement activities including the Round 3 workshops. This meant that all engagement activities could be undertaken in the native language.

Within our survey design, we included basic demographic questions to analyse the representivity of our sample and identify group differences where appropriate. In Round 1, we also explored choice modelling through a "stated preference" question on how people currently travel and heat their homes and a "revealed preference" question asking people hypothetically how they would like to travel or heat their homes.[11] In Round 2, alongside asking for stated preferences on their own experience, we asked respondents to extrapolate for the city, to explore situations where respondents may feel that the impact on the wider society differs from the impact on themselves.

The online version of the survey used Online Surveys[12] or Qualtrics[13] depending on language availability within the software. Both systems comply with research ethics on data security and confidentiality. The links to the surveys were shared by local project partners via social media platforms including Facebook, Twitter and Instagram, and sent by local partners on local newsletters, news websites and online networks.

Beyond digital methods, local partners attended events and meetings that were targeted to broaden the sampled population. Digital engagement usually recruits a more educated public, and is less likely to capture the views of ethnic or national minorities, disabled people, older people, people living in poorer communities or those marginalised in other ways.[14] As a consequence, partner organisations in each case study region defined groups that were likely to be under-represented in their sample, and used their resources and networks to ensure more effort was put into recruiting these groups. For example, this involved doing

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[10] Devenish, G., Pollard, C., Kerr, D., The Delphi Process for Public Health Policy Development: Five Things You Need to Know, Curtin University, Australia, 2012

[11] Wardman, M., A Comparison of Revealed Preference and Stated Preference Models of Travel Behaviour, *Journal of Transport Economics and Policy,* **22,** pp.71-91, 1988.

[12] Online Surveys [formerly Bristol Online Surveys], https://www.onlinesurveys.ac.uk/ Accessed on 22 May 2018.

[13] Qualtrics https://www.qualtrics.com/uk/research-core/survey-software/ Accessed on 22 May 2018.

[14] McKenzie, K., 2007. digital divides: the implications for social inclusion. *Learning Disability Practice (through 2013),* **10**(6), pp. 16-21.

street surveys in a neighbourhood with a higher non-Dutch population in Amsterdam, attending community festivals in poorer neighbourhoods in Bristol, and using connections through the network of local authorities across the Aveiro region to spread the survey to a non-urban public.

Our respondents sample is not representative of the city populations, as this would have been outside of the scope of this project. However, through Round 1 and 2 we have a relatively large sample size, we conducted purposive sampling to target specific populations that would have been less well represented without positive recruitment, and we have monitored the demographic data of our sample to identify where data may be skewed and to identify patterns from different demographic groups in our survey data.

At some face-to-face survey recruitment opportunities, the surveys were conducted as mini-interviews, with a ClairCity team member asking the questions to individuals and noting the responses. In other situations, paper copies of the surveys were given out for people to self-complete e.g. at community meetings where participants were happy to write their own answers and had the materials – tables, pens etc – to do so.

Data collected face-to-face was uploaded into spreadsheets by the local project team, and sent – with confidential data removed – to the Delphi lead via email. All of the data was then collated in Excel spreadsheets and all responses were translated into English using Google Translate with a native speaker checking and correcting the translations. For closed and short open questions, filters were used to generate code groups.[15] Further qualitative analysis of longer text answers was conducted to generate "inductive" codes – grouping answers together that referred to common issues or reasons.[16]

In line with the ClairCity Deliverable *D1.9 Data Management Plan*, strict data management procedures were employed to protect respondents. Respondents' names were not collected and survey respondents were identified by reference number so responses could not be traced to any individual. Paper and electronic survey responses were held securely, either in the secured research office or on password protected servers with access limited to specific research personnel. No data security breaches were identified.

1.5 Demographic summary

The ClairCity Delphi was conducted across all of our six cities and regions. A total of 3,297 respondents completed the Round 1 survey across all of the cities, with 1,441 responding in Round 2 (Table 1-1). This represents between 0.28% – 0.04% of the populations in each area in the Round 1 sample, which although low in population terms actually represent a significant number of total respondents.

[15] Keeney, S., Hasson, F., & McKenna, K., The Delphi Technique in Nursing and Health Research, Wiley-Blackwell, Oxford, UK, 2011.
[16] Marks, D. F., & Yardley, L., Content and Thematic Analysis, In: *Research Methods for Clinical and Health Psychology*, Sage, London, 2004.

Table 1-1: Number of Round 1 and 2 respondents and populations for each city/region

City/region	Number of Round 1 respondents	Number of Round 2 respondents	City/region population
Amsterdam	638	271	834,713 (City survey 2016)
Aveiro region (CIRA)	1031	285	370,394 (Census 2011)
Bristol	500	230	428,100 (Census 2011)
Liguria	646	462	1,570,694 (Census 2011)
Ljubljana	199	73	280,310 (City survey 2017)
Sosnowiec	283	120	204,013 (City survey 2017)
TOTAL	**3297**	**1441**	**3,688,224**

We did not collect demographic data on respondents who attended Round 3 workshops. As their answers came out through interactions between groups, it was less feasible to track an individual's perspective in the final data set. Due to the limitations of workshop approaches – they will tend to disproportionately represent the wealthier, more highly educated participants unless they are conducted specifically with a different target group – we expect our sample to hold this bias. However, as a consequence we are also using data from Rounds 1 and 2 for analysis where we can track some of this bias and understand a variety of perspectives as they pertain to air quality and carbon emissions in everyday transport and heating behaviours.

1.6 Overview of the report

This report presents the analysis of responses from each Round of the Delphi process by city/region alphabetically.

For Round 1 we have presented the analysis of responses relating to transport and home heating, now and in the future. Further analysis exploring the reasons why citizens feel unable to change their behaviour focuses on those individuals who would like to move from the most polluting activities, i.e. car only transport and solid fuel only for home heating, to less polluting activities, i.e. travel without a car, or with a car and other modes, and alternatives to solid fuel use for home heating.

Round 2 presents the responses to the policy measures, which were derived from Round 1 questions relating to what citizens liked and disliked about their city/region and what they wanted their future city/region to be like in 2050. Round 2 respondents were asked to reflect on how each policy measures would affect their lives and whether it would be good or bad for the city region.

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2 Round 1

The Round 1 survey (Appendix A) comprised three parts, as well as demographic questions:

- Questions about your city – now and in the future
- Questions about your travel in the city – now and in the future
- Questions about your home heating – now and in the future

As part of the Delphi process the results from the 'Questions about your city' were used to identify policy measures that citizens would like to see implemented to improve their cities/regions, i.e. common themes were framed as policy measures and taken into Round 2. 'Questions about your travel in the city' and 'Questions about your home heating' were used to identify how citizens wanted to travel (for commuting, shopping and leisure) and heat their homes. It was also used to start to explore what are the barriers and challenges that citizens feel prevent them changing to less polluting modes of transport or heating systems (if that is what they want), or, conversely, why they do not want to change. Better understanding the citizens' views and circumstances will help to inform policy development and ensure that measures implemented will be more effective through increased public acceptability.

2.1 Explanation of our analytical choices

As a survey of open questions, Round 1 required detailed coding and analysis to extract meaning. The analysis for the travel and home heating questions are summarised by city alphabetically. For travel questions, only responses for commuting and shopping were analysed as responses for leisure were sparse and too variable to be of value. In this report, we are detailing the "commuting" responses as the most prevalent activity driving transport choices and hence where the most gains may be made in terms of informing policy decisions.

2.1.1 *Transport*

It is important to understand whether those who want to use cars in the future are people who are already using cars and do not see that any other option would suit them, or whether they are currently using other modes but think they will need to use a car in the future. To identify successful policy measures that can support behaviour change, it is important to understand the motivations of those whose behaviour has negative environmental impacts, and understand whether and why they may want to continue in the future.

2.1.2 *Heating*

We explored the reasons why those who were currently using solid fuel heating systems wanted to change or felt they could not (or were not interested) in changing to a less polluting source. This used data only from respondents that had answered both their present and future heating choices. We examined where respondents were moving away from the "polluting" source (solid fuel use, which could include wood, coal or other) to any other heat source. Our interest is in understanding the reasons they give for choosing or feeling forced to continue with a "polluting" behaviour, as a way to identify more successful policy levers.

2.2 Amsterdam

2.2.1 *Demographic data*

In total, 638 people responded to our survey in Amsterdam, out of a city population of 834,713[17]. The Amsterdam respondents were 55% male, which is slightly higher than the city gender ratio. Our respondents were disproportionately older compared to the city population, with 89% of respondents aged 37 or older in our Round 1 sample, compared to only 52% of the city population. Our sample was more educated (i.e. had higher level of qualifications) than average, with limited representation of those who had a low level of education compared to the categories used to collect city-wide data. In our sample, 67% of the respondents had a "high" level of education with only 5% having "no/low" level of eduation, compared to the city population where 47% have a "high" level, and 22% have a low level of education. In The Netherlands, categories are more relevant regarding the national identity rather than ethnicity of respondents. The "non-Dutch" population of Amsterdam is around 14% according to city statistics. In Round 1, 13% of our sample were non-Dutch nationals with 5% of the total coming from Western countries (Europe, North America, Japan etc) and 8% coming from other non-Western countries.

While our respondents are not demographically representative of the city as a whole, we are using their data to understand the better specific behaviours so we can still report valid findings from the categories that we identify.

2.2.2 *Transport*

In Amsterdam, 397 respondents gave an answer for how they currently travelled to work or study. Given the older age of respondents, many did not answer this question as they were retired or otherwise unemployed. Respondents could give more than one answer, to cover those who might use multiple modes during the same journey, or different modes on different days (Table 2-1). Of the responses received, 71% were currently using non-car means to commute for work or study, mainly by bicycle and public transport (Figure 2-1).

2.2.2.1 *How are people travelling for commuting in the present?*

Table 2-1: Breakdown of current modal choice of commuters in Amsterdam

Car[1]	Clean car[2]	Public transport[3]	Walking	Cycling[4]	Work from home	Other	NA
113 (28%)	2 (0.5%)	146 (37%)	30 (7.5%)	248 (62%)	14 (3.5%)	0 (0%)	240

[1] Includes car, car share, car pool, lift, taxi, motorbikes, Vespa; [2] includes electric or hybrid car; [3] (OV) includes bus, metro, train, tram, rapid transit, ferries; [4] includes (e-)Bike.

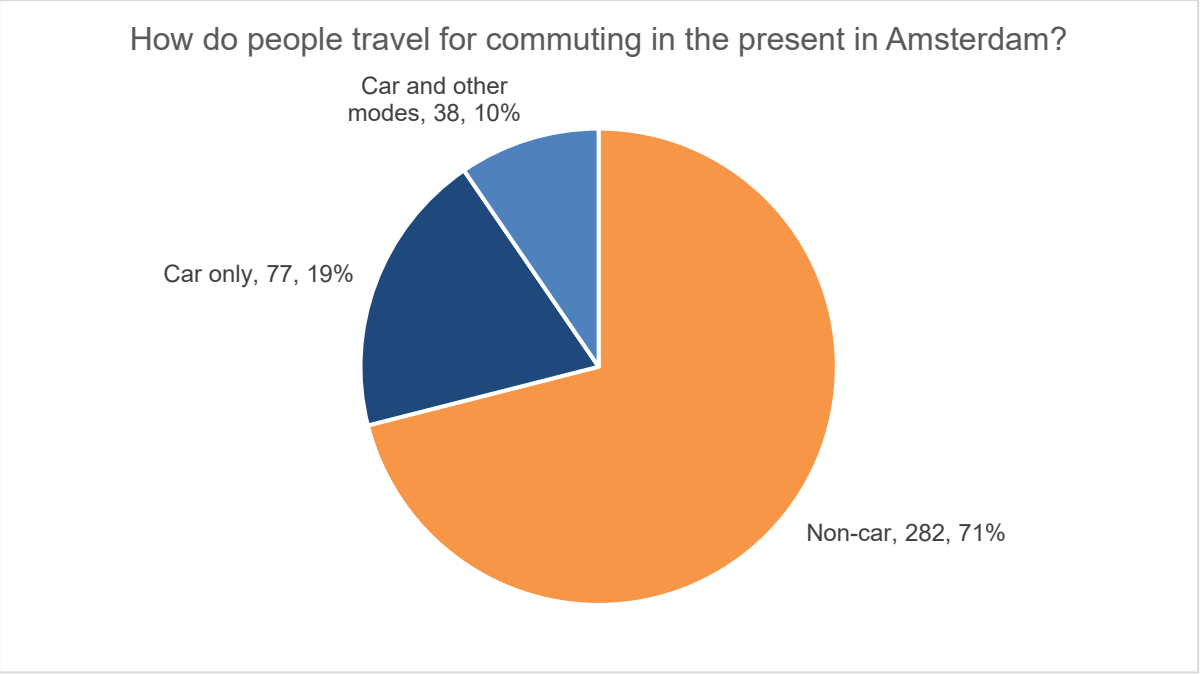
17 UrbiStat. Municipality of Amsterdam Statistics 2016, Avalable from https://ugeo.urbistat.com/AdminStat/en/nl/demografia/eta/amsterdam/23055764/4 Accessed on 3 October 2018.

Total number of commuters = 397

N.B. There is overlap between modes (i.e. respondent use more than one mode to travel) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question and hence will add to more than 100%.

We identified those who had included a car in their answer (but may have also indicated other modes as well) as compared to those who never use a car.

Figure 2-1: Proportions of current car use of commuters in Amsterdam



N.B. Data labels show category name, value and percentage separated by commas.

When we compared the answers for how people currently travelled with how they wanted to travel in the future, a smaller proportion of respondents wanted to travel by car (Table 2-2). In the present, 71% of respondents did not use a car (including a “clean car”, which we categorised as any mention of electric or hybrid cars) for their commute, in the future 77% of respondents did not chose a car as a means to travel for commuting (Figure 2-2).

2.2.2.2 *How do people want to travel for commuting in the future?*

Table 2-2: Breakdown of future modal choice of commuters in Amsterdam

Car[1]	Clean car[2]	Future public transport[3]	Future walking	Future cycling[4]	Future work from home	Future futuristic[5]	Future clean/ green other[6]	Future other	NA
70 (20%)	9 (3%)	115 (34%)	28 (8%)	226 (66%)	10 (3%)	2 (0.6%)	1 (0.3%)	0 (0%)	295

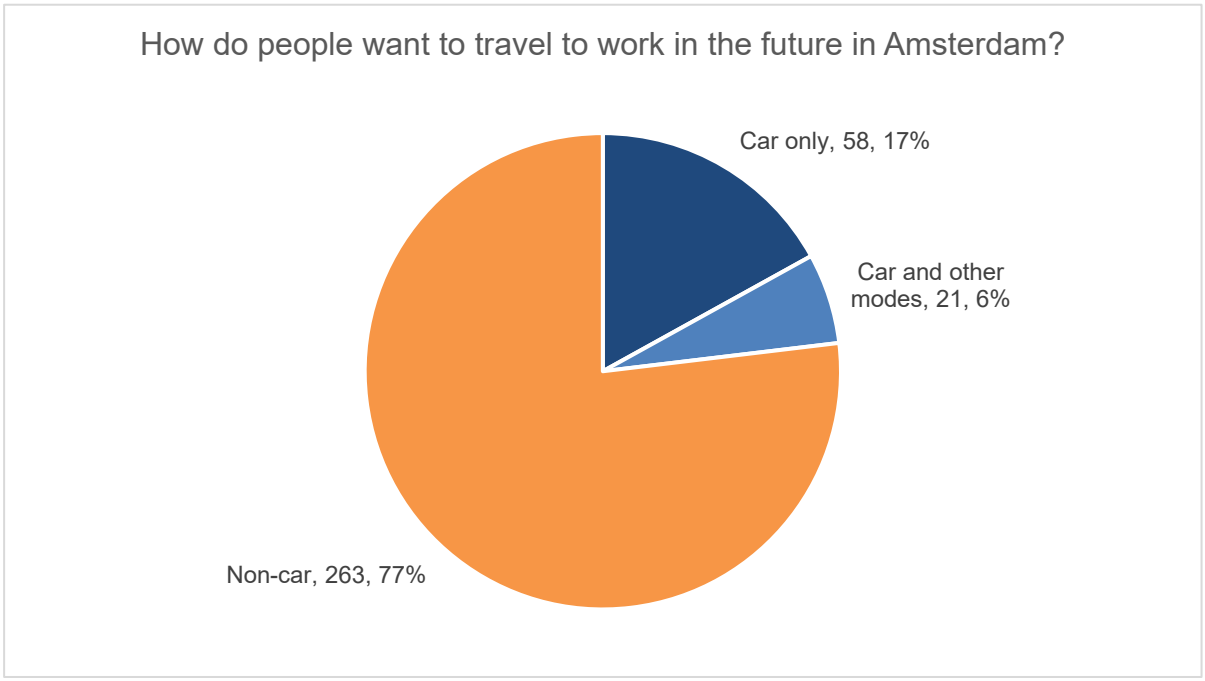
[1] Includes car, car share, car pool, lift, taxi, motorbikes, Vespa; [2] includes electric or hybrid car; [3] includes bus, metro, train, tram, rapid transit, ferries, monorail, tube; [4] includes (e-)Bike; [5] includes autonomous car; [6] low emission vehicle (unspecified)

Total number of future commuters = 342

N.B. There is overlap between modes (i.e. respondent use more than one mode to travel) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question and hence will add to more than 100%.

Of those who responded that they use a car, a minority also selected other modes, but 17% of the total sample selected “car only” (Figure 2-2).

Figure 2-2: Proportions of future car use of commuters in Amsterdam



N.B. Data labels show category name, value and percentage separated by commas.

2.2.2.3 *Do commuters want to change?*

In our survey, we asked all of the respondents why they wanted to change or why they did not want to change their mode of transport in the future. This data is useful for exploring the reasons that users of different modes have for selecting their choices and understanding the perceived barriers or rationales to their decisions. 331 respondents answered both the present and future transport options for commuting, allowing us to investigate their responses.

In the matrix below (Table 2-3) we have divided the commuting respondents into four groups:

- Entrenched: those who only use a car in the present and would like to continue to only use a car in the future.
- Looking for positive change: those who only use a car in the present but would like to use additional means as well as a car in the future.
- Getting worse: those who use alternative means as well as cars in the present but would like to only use a car in the future.
- Staying positive: those who use alternative means as well as cars in the present and would like to continue to use additional means as well as a car in the future.

Table 2-3: Matrix of modal change desires of commuters in Amsterdam

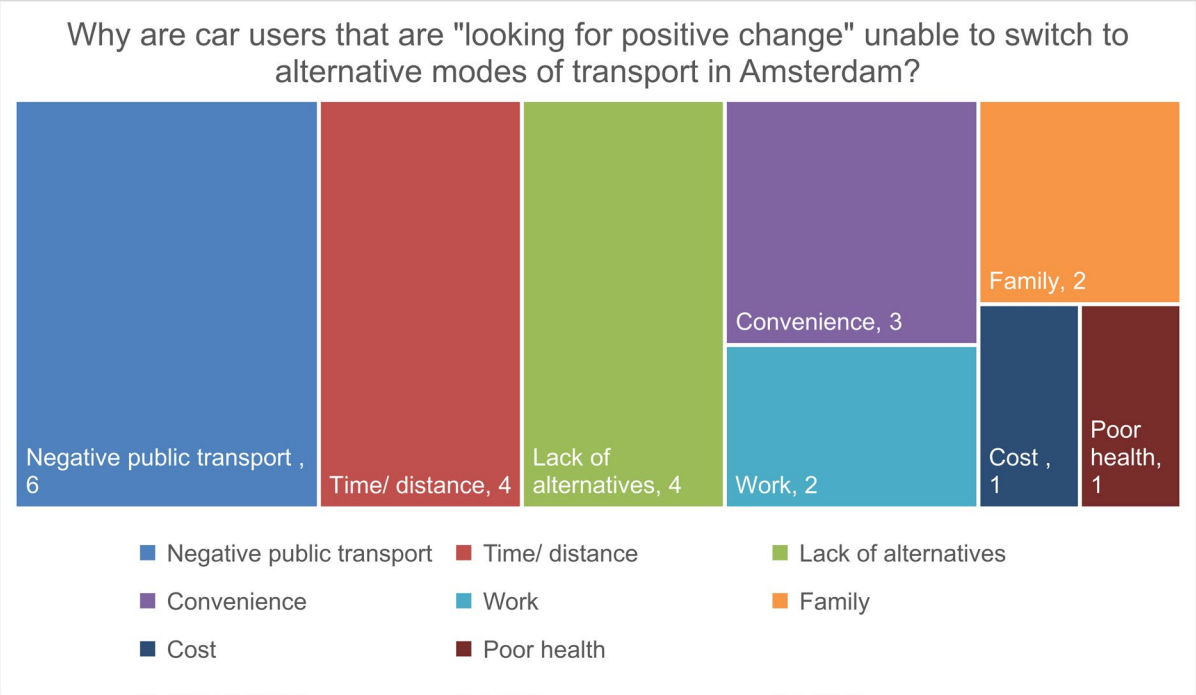
	High polluting choice in future (car only)	**Low polluting choice in future ('car and other' or non-car) e.g. car and walk; walk and bus**
High polluting choice in present (car only)	40 Entrenched	16 Looking for positive change
Low polluting choice in present ('car and other' or non-car) e.g. car and walk; walk and bus	14 Getting worse	261 Staying positive

N.B. Car includes a "clean car", which we categorised as any mention of electric or hybrid cars.

Current car users who would like to switch to using alternative means, at least some of the time (our 'Looking for positive change' group), have the potential to be an easy gain for policy-makers seeking to encourage citizens to move to less polluting modes. Consequently, this is the group of people we are most interested in understanding. There are 16 respondents (5% of the 331 'commuter' respondents) who only travel by car in the present, who would like to switch to using alternative means, at least some of the time (Table 2-3).

We have analysed the reasons given by this "looking for positive change" group below (Figure 2-3). Many people gave more than one reason in their answer, so the total of each category combined is greater than the number of responses.

Figure 2-3: Reasons why commuters in Amsterdam who want to change from car-only in the present to car and other modes in the future feel unable to change



The most frequent responses related to negative comments about public transport (6 responses) with two respondents saying that public transport took longer, and two mentioning that they had children and this was one of the reasons that made public transport less convenient. For example *"got a daughter, the public transport connections in the South-West of the cities are not good"*.

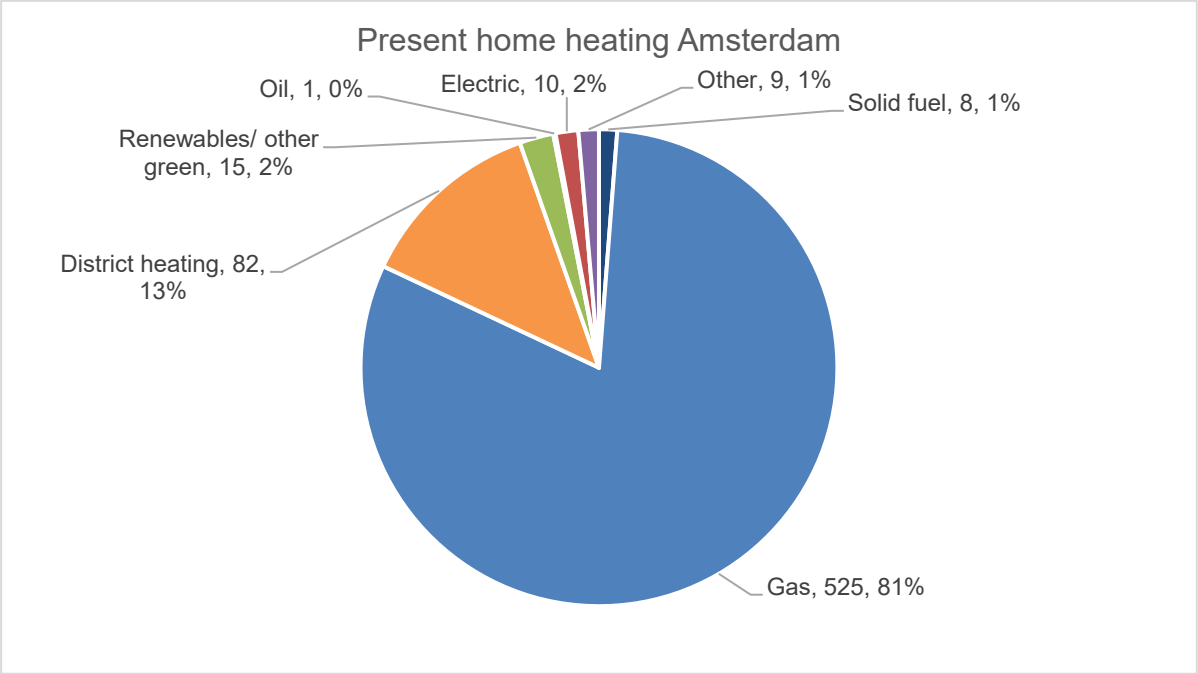
The categories of "Lack of alternatives" and "Time/distance" both collected four responses. For three respondents "Lack of alternatives" referred to a lack of provision of existing modes (bike, bus, generic public transport), whereas the other person wanted a technology that did not yet exist – *"transport on wind or solar energy."* In terms of "Time/distance," one commented that it was too far to walk, another that they travelled to another town for work and it was too far to use bike or public transport. The other two responses did not give more information, only saying "*cost, time"*.

2.2.3 *Heating*

2.2.3.1 *How are people heating their homes?*

The response rate for the current home heating question was 99%. Respondents were able to indicate more than one form of heating, so the total number of responses is higher than the total number of respondents. The vast majority of respondents currently use gas (525) to heat their homes, whilst very few use solid fuel (8) or renewables (15) (Figure 2-4).

Figure 2-4: Proportions of current home heating mode in Amsterdam

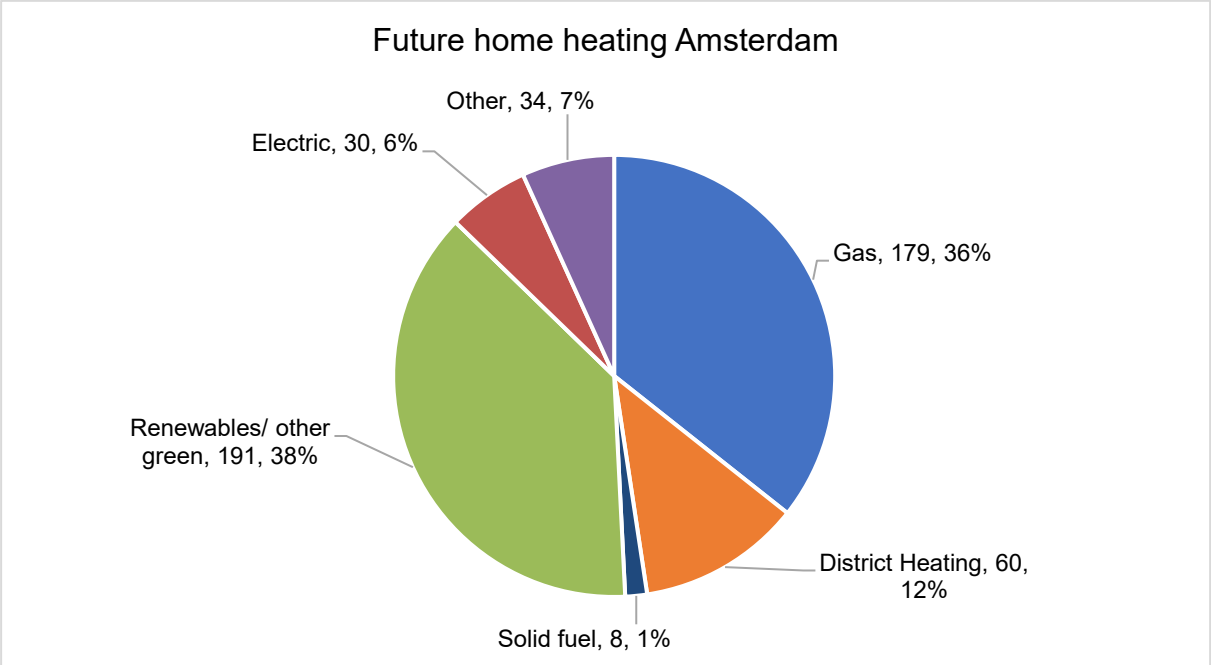


N.B. Data labels show category name, value and percentage separated by commas. There is overlap between modes (i.e. respondent use more than one form of heating) therefore number of analysed responses will not equal number of respondent.

2.2.3.2 *How do people want to heat their homes in the future?*

Based on a 74% response rate, there is a desire to increase use of renewables (191) and decrease use of gas (179). The number of respondents wanting to use solid fuel in the future remains the same (8) overall (Figure 2-5).

Figure 2-5: Proportions of future home heating mode in Amsterdam



N.B. Data labels show category name, value and percentage separated by commas. There is overlap between modes (i.e. respondent use more than one form of heating) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question.

An analysis of the eight current solid fuel burners indicates that the majority (63%) would like to continue to use solid fuel, although most would also like to use gas. The minority that want to stop using their solid fuel burner want to switch to using renewables. Of those that do not currently use solid fuel only three would like to take it up, the remaining majority preferring renewables and gas in almost equal measure, and district heating (Table 2-4).

This data indicates a strong latent demand for renewable energy in Amsterdam amongst our respondents, and no strong desire to increase the amount of solid fuel burning within the city. This is a positive response in terms of air quality, as an increase in solid fuel burning would be a worrying future trend for the city.

There was also no increase in the proportion of people who would rather have district heating.

2.2.3.3 *Do people want to change their home heating?*

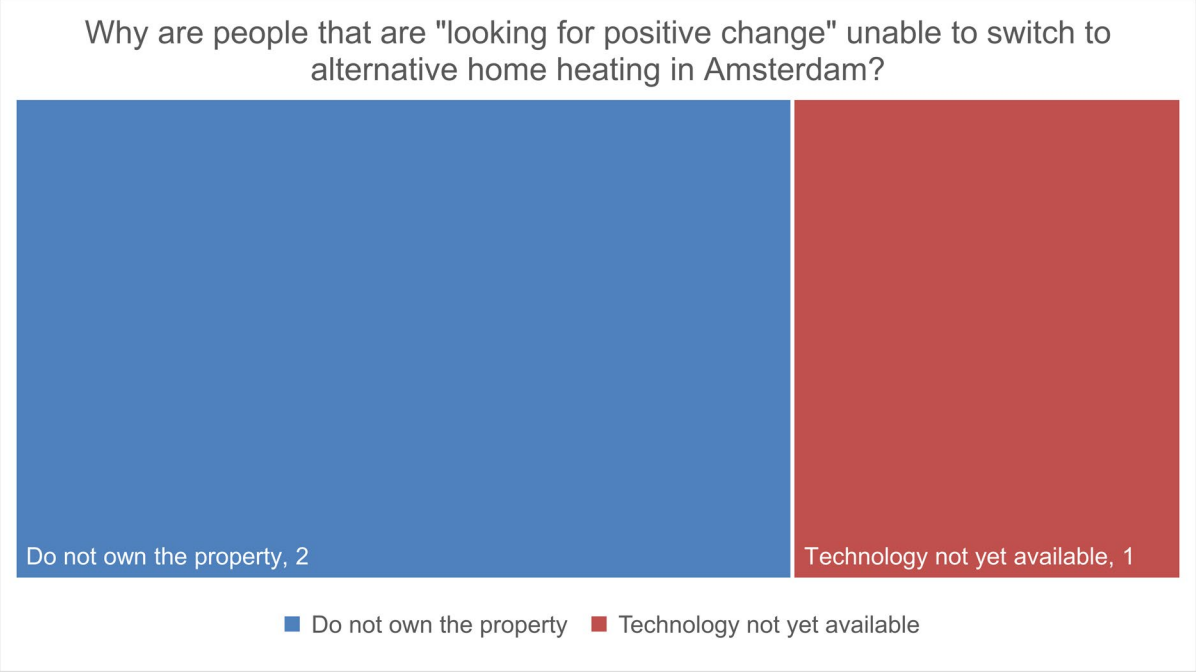
We explored the reasons why those who were currently using solid fuel heating systems wanted to change or felt they could not (or were not interested) in changing to a less polluting source. 466 respondents answered both their present and future heating choices. We examined where respondents were moving away from the “polluting” source (solid fuel use, which could include wood, coal or other) to any other heat source (Table 2-4).

Table 2-4: Matrix of modal change desires for home heating in Amsterdam

	Solid fuel in the future	Not solid fuel in the future
Solid fuel in the present	5 Entrenched	3 Looking for positive change
Not solid fuel in the present	3 Getting worse	455 Staying positive

Even though five “entrenched” respondents wanted to keep solid fuel use, four of them were interested in combining solid fuel and gas heating, with only one person wanting to rely solely on solid fuel in the future. Of those “looking for change”, that is, they currently had solid fuel heating but did not want to have it in the future, all three stated they wanted some form of renewables as their heating source, but the reasons they could not were either that they did not own their home (2) or that the renewables technology they wanted was not yet available to them (1) (Figure 2-6).

Figure 2-6: Reasons why citizens in Amsterdam who want to change from solid fuel-only in the present to non-solid fuel for home heating in the future feel unable to change



We identified a different group as “getting worse”. Three respondents out of 621 who were currently not using solid fuel for heating in the present said they would like to start using it in the future. Their reasons for not using it yet were that they were not the homeowner (1), the cost involved (1) or that even though they would like it, it was not a priority for them (1). Only one of them wanted to switch entirely to solid fuel heating, with the other two combining it with either renewables or electric heating. Although “getting worse”, “looking for positive change” and “entrenched” are extremely small sub-sets of our data, they raise the issue of home ownership and housing market differences that mean policy interventions need to

target different groups – landlords, housing associations, homeowners or others – to achieve their stated pollution reduction aims.

The majority of respondents – 455 out of 466 – did not currently use solid fuel use and were not interested in doing so in the future.

2.3 Aveiro region

2.3.1 *Demographic data*

Our survey was completed by 1031 people out of a regional population of 370,394[18]. 52% of our respondents were female, but only 4% of our respondents were over 65 years, compared to a regional proportion of 18%. However, our Round 1 proportion of 16-24 year olds was relatively accurate with 13% of our sample, compared to 10% of the overall population. Our respondents are disproportionately educated, with 4% receiving a basic or no education, compared to 72% of the general population of the region. 68% of our sample have a more than a degree or professional education, compared to only 15% of the general population. We have not collected ethnicity or nationality data from our Portuguese sample, as this is not typically reported as a demographic cleavage for Portuguese studies.

While our respondents are not demographically representative of the region as a whole, we are using their data to understand better the specific behaviours so we can still report valid findings from the categories that we identify.

2.3.2 *Transport*

In our Aveiro sample we had 959 responses to the commuting question (Table 2-5).

2.3.2.1 *How are people travelling for commuting in the present?*

Table 2-5: Breakdown of current modal choice of commuters in Aveiro

Car[1]	Clean car[2]	Public transport[3]	Walking	Cycling [4]	Work from home	Other	NA
707 (74%)	5 (0.5%)	71 (7%)	277 (29%)	71 (7%)	0 (0%)	2 (0.2%)	72

[1] Includes car, car share, car pool, lift, taxi, motorbikes, Vespa; [2] includes electric or hybrid car; [3] includes bus, metro, train, tram, rapid transit, ferries; [4] includes (e-)Bike.

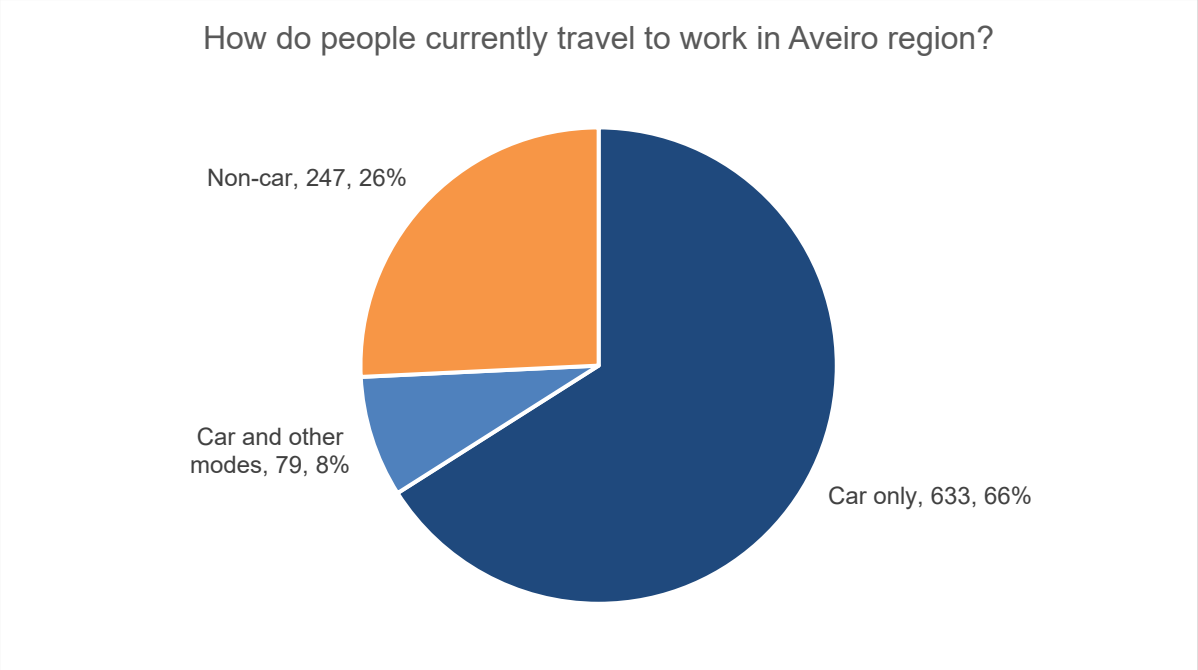
Total number of commuters = 959

N.B. There is overlap between modes (i.e. respondent use more than one mode to travel) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question and hence will add to more than 100%.

18 Portugal Census 2011

We identified those who had included a car in their answer as compared to those who never use a car. Almost three quarters of our respondents used cars for at least some of their commuting journeys, with two thirds of those who answered this question relying only on their car for their commute (Figure 2-7).

Figure 2-7: Proportions of current car use of commuters in Aveiro



N.B. Data labels show category name, value and percentage separated by commas.

2.3.2.2 *How do people want to travel for commuting in the future?*

Table 2-6: Breakdown of future modal choice of commuters in Aveiro

Car[1]	Clean car[2]	Future public transport[3]	Future walking	Future cycling[4]	Future work from home	Future futuristic[5]	Future clean/ green other[6]	Future other	NA
151 (16%)	87 (9%)	322 (35%)	231 (25%)	206 (22%)	1 (0.1%)	23 (2.5%)	33 (3.6%)	20 (2.2%)	111

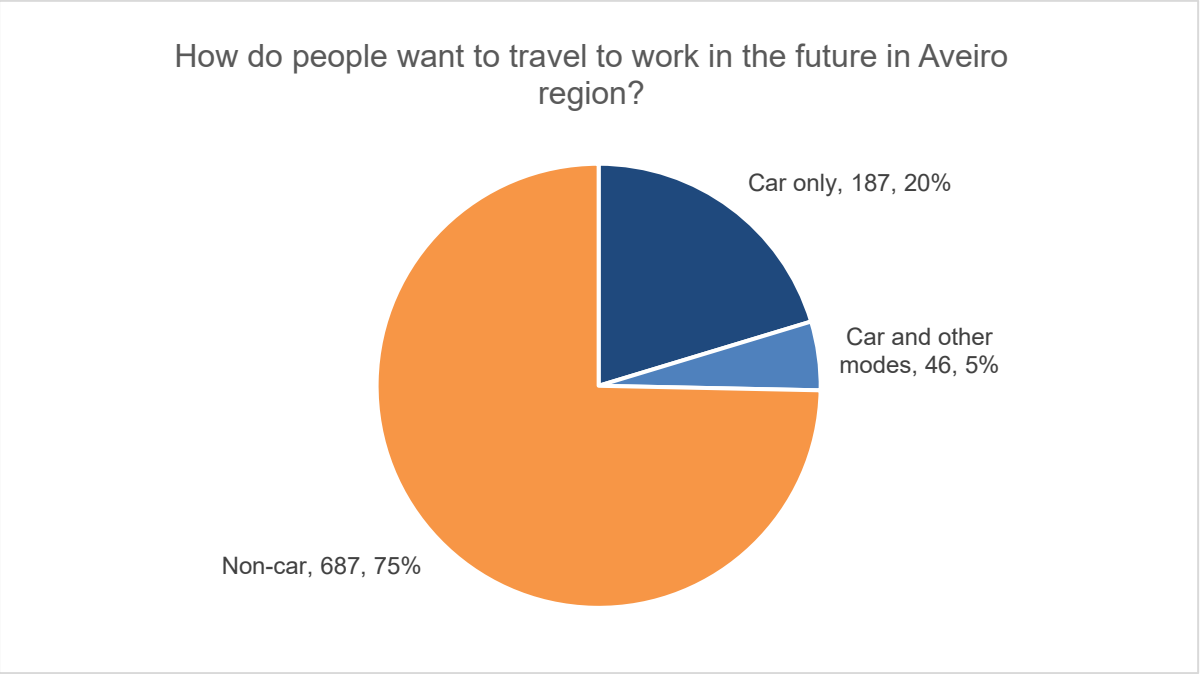
[1] Includes car, car share, car pool, lift, taxi, motorbikes, Vespa; [2] includes electric or hybrid car; [3] includes bus, metro, train, tram, rapid transit, ferries, monorail, tube; [4] includes (e-)Bike; [5] includes autonomous car; [6] low emission vehicle (unspecified)

Total number of future commuters = 920

N.B. There is overlap between modes (i.e. respondent use more than one mode to travel) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question and hence will add to more than 100%.

Despite the overwhelming reliance on cars in the present, 75% of respondents did not want to be using a car in their commute in the future, indicating a very large latent demand for alternatives in the Aveiro region (Figure 2-8).

Figure 2-8: Proportions of future car use of commuters in Aveiro



N.B. Data labels show category name, value and percentage separated by commas.

There is a strong switch towards both public transport and cycling, with a continued desire for walking. Amongst the car drivers, there were also a significant number of people seeking electric cars, hybrids or other "cleaner" cars even though they still think they will travel by car in the future (Table 2-6).

2.3.2.3 *Do commuters want to change?*

In our survey, we asked all of the respondents why they wanted to change or why they did not want to change their mode of transport in the future. This data is useful for exploring the reasons that users of different modes have for selecting their choices and understanding the perceived barriers or rationales to their decisions. 910 respondents answered both the present and future transport options for commuting, allowing us to investigate their responses.

In the matrix below (Table 2-7) we have divided our Aveiro commuting respondents into four groups:

- Entrenched: those who only use a car in the present and would like to continue to only use a car in the future.
- Looking for positive change: those who only use a car in the present but would like to use additional means as well as a car in the future.
- Getting worse: those who use alternative means as well as cars in the present but would like to only use a car in the future.
- Staying positive: those who use alternative means as well as cars in the present and would like to continue to use additional means as well as a car in the future.

Table 2-7: Matrix of modal change desires of commuters in Aveiro

	High polluting choice in future (car only)	Low polluting choice in future ('car and other' or non-car) e.g. car and walk; walk and bus
High polluting choice in present (car only)	164 Entrenched	437 Looking for positive change
Low polluting choice in present ('car and other' or non-car) e.g. car and walk; walk and bus	34 Getting worse	275 Staying positive

N.B. Car includes a "clean car", which we categorised as any mention of electric or hybrid cars.

Current car users who would like to switch to using alternative means, at least some of the time (our 'Looking for positive change' group), have the potential to be an easy gain for policy-makers seeking to encourage citizens to move to less polluting modes. Consequently, this is the group of people we are most interested in understanding. There are 437 respondents (48% of the 910 'commuter' respondents) who only travel by car in the present, who would like to switch to using alternative means, at least some of the time.

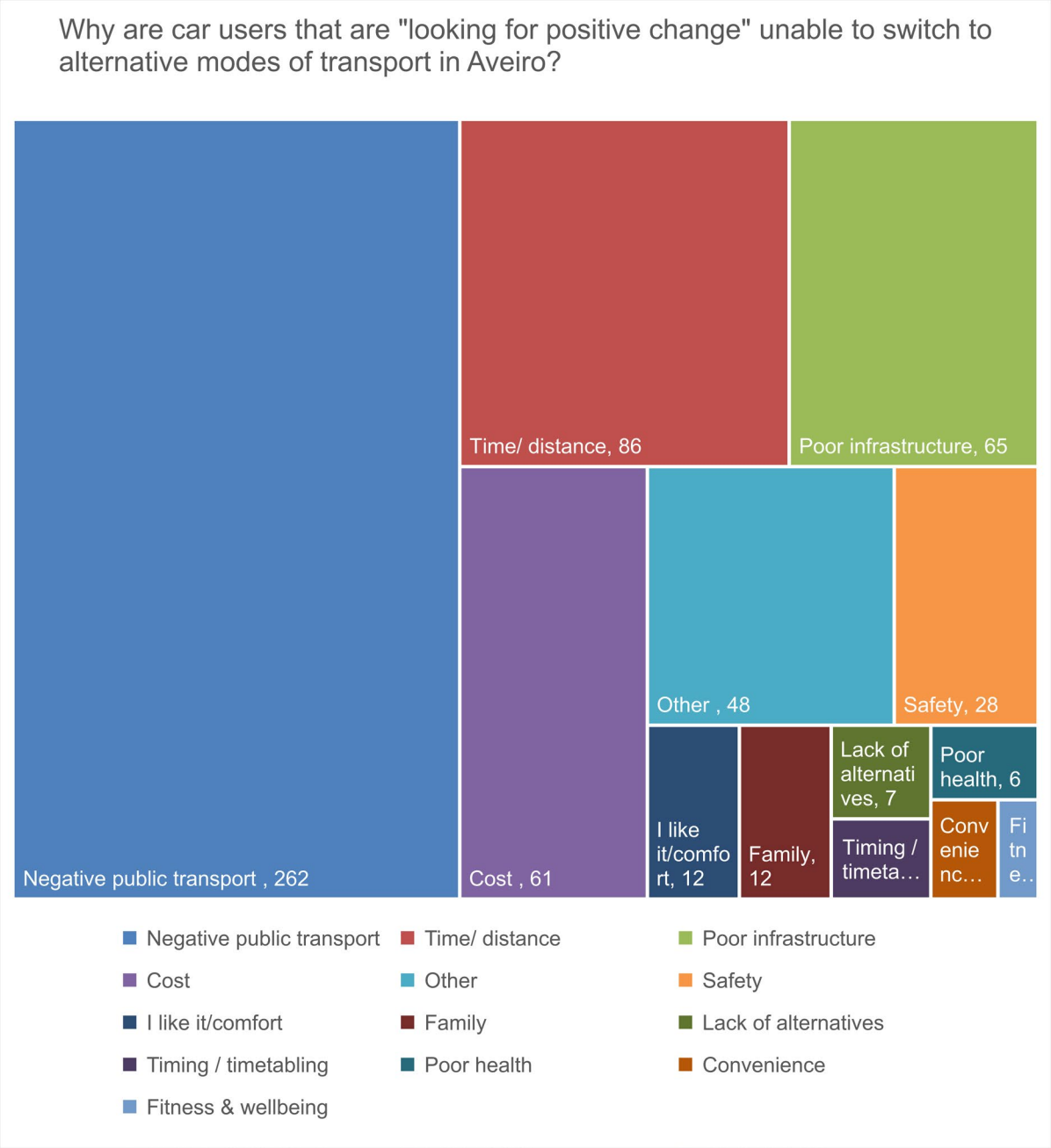
The most frequent responses in Aveiro were negative comments about public transport (262) (Figure 2-9). Key themes within the Negative public transport category included Cost (35) with comments such as *"The prices of public transport are very high. It's cheaper to get two people by car than pay a bus pass"*. Another frequent issue was Time/distance (39), e.g. *"the work is about 5 km from my house and there is no adequate public transportation"*, and Timetabling (71), e.g. *"Public transportation is lacking, there are no connections or schedules compatible with the ones I practice"*. The most frequent complaint about public transport however is a lack of availability (147), e.g. *"There is no public transport to the workplace".*

The second largest category of responses is Time / distance. Time and distance were combined in this category as this relates to duration of journeys, e.g. *"Due to distance and lack of time to complete all activities"*.

Poor infrastructure generally referred to lack of cycle and pedestrian accessibility.

'Other' responses included references to the need to carry items, lack of access to a bike/bike stolen, the absence of future technologies and a confusing public transport system.

Figure 2-9: Reasons why commuters in Aveiro who want to change from car-only in the present to car and other modes in the future feel unable to change

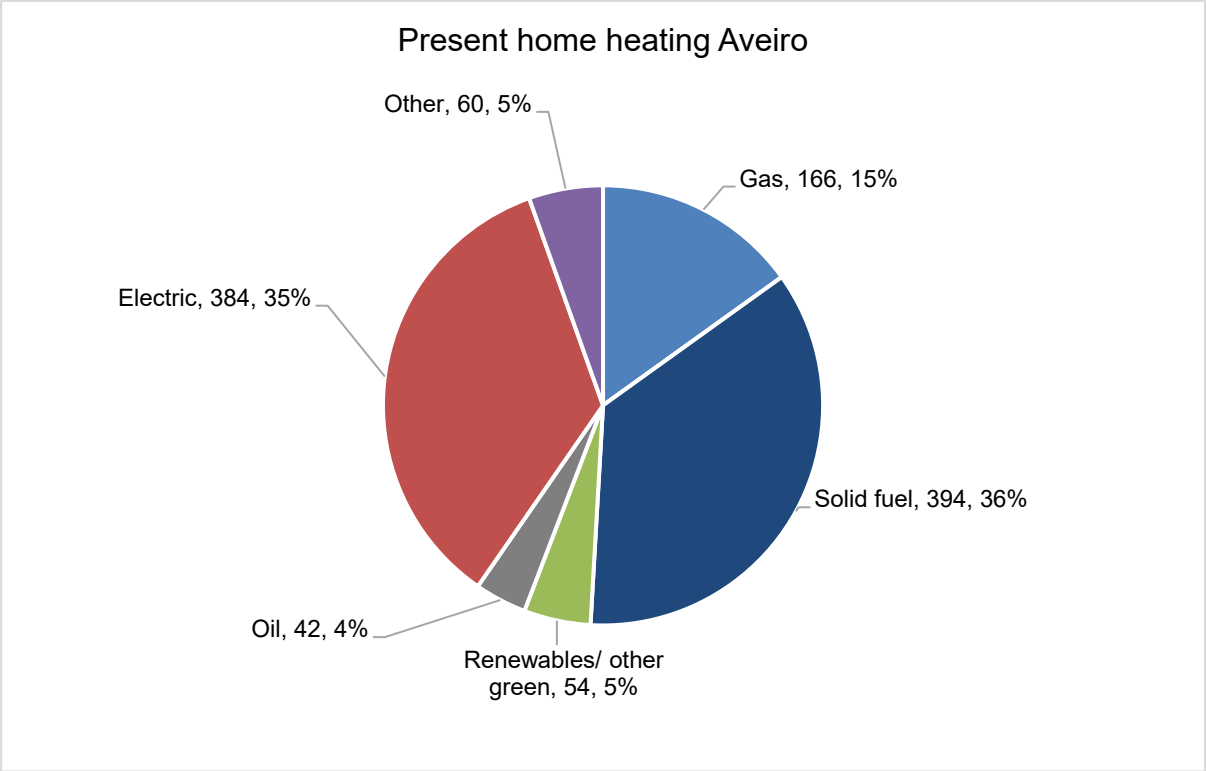


2.3.3 *Heating*

2.3.3.1 *How are people heating their homes?*

There were 883 responses to our question about current home heating. Respondents were able to indicate more than one form of heating, so the total number of responses is higher than the total number of respondents.

Figure 2-10: Proportions of current home heating mode in Aveiro



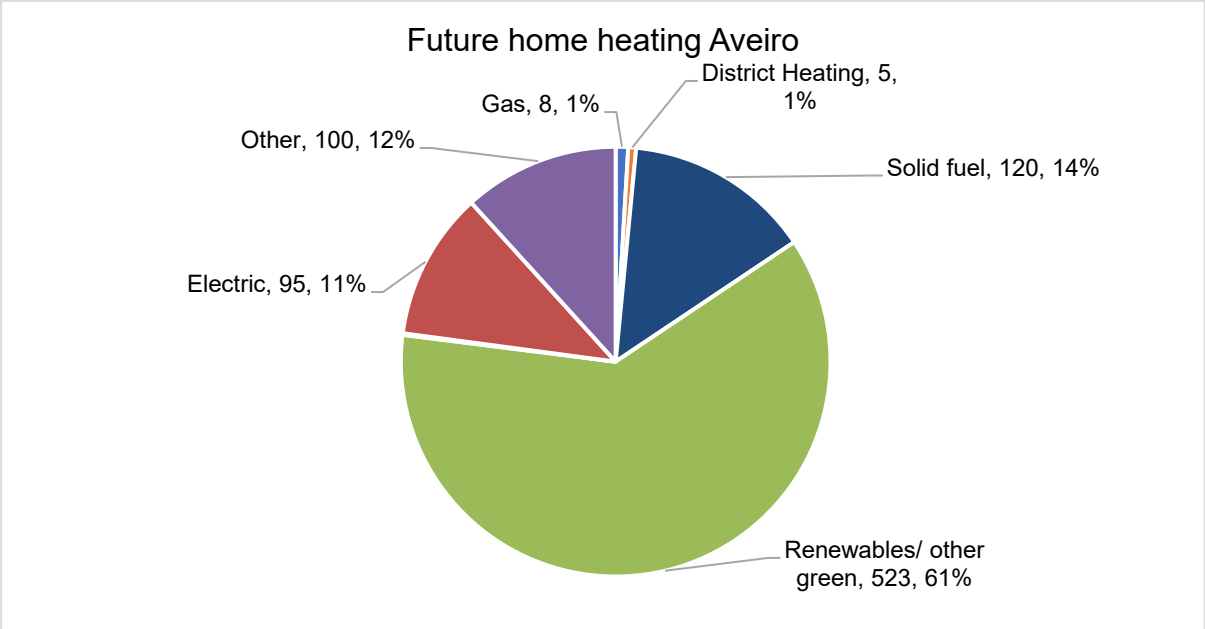
N.B. Data labels show category name, value and percentage separated by commas. There is overlap between modes (i.e. respondent use more than one form of heating) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question.

Heating choices in the Aveiro region are varied, with a third relying on electric heating (32%), some gas (14%) and a third also using some form of solid fuel e.g. wood burners, open fires (Figure 2-10).

2.3.3.2 *How do people want to heat their homes in the future?*

There was a large shift in the preferences people had for their future heating away from solid fuel and towards renewables, with 875 people answering the question (Figure 2-11).

Figure 2-11: Proportions of future home heating mode in Aveiro



N.B. Data labels show category name, value and percentage separated by commas. There is overlap between modes (i.e. respondent use more than one form of heating) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question.

Many of those classified as "Other" gave answers relating to wanting more insulation or underfloor heating, rather than a preference for the fuel type. Insulation could be perceived as a "passive house" approach and be counted within renewables, and some people specified this, for example "*Do not heat up! Build a house in which there is no need for heating or cooling. It's possible!"* However it was not clear that this was definitely the approach that all respondents who suggested insulation were meaning, or whether they had slightly misunderstood the question, so they have been left in the "Other" category.

2.3.3.3 *Do people want to change their home heating?*

We explored the reasons why those who were currently using solid fuel heating systems wanted to change or felt they could not (or were not interested) in changing to a less polluting source. 805 respondents answered both their present and future heating choices. We examined where respondents were moving away from the "polluting" source (solid fuel use, which could include wood, coal or other) to any other heat source (Table 2-8).

Of the "entrenched" respondents, 61 of them wanted to use only solid fuel in the future whereas others were looking to mix their heat sources. Overall for the "entrenched" respondents, cost was the most significant factor, with 28 (a third) of respondents mentioning the cost of changing being too high, or that solid fuel is the cheapest way to heat their homes. It was notable that 10 respondents (12% of this "entrenched" group) mentioned environmental reasons as reasons they did not want to change. For example, suggesting wood burning was "ecological" "less polluting" "[it] is sustainable since I only use firewood from sustainable forest management".

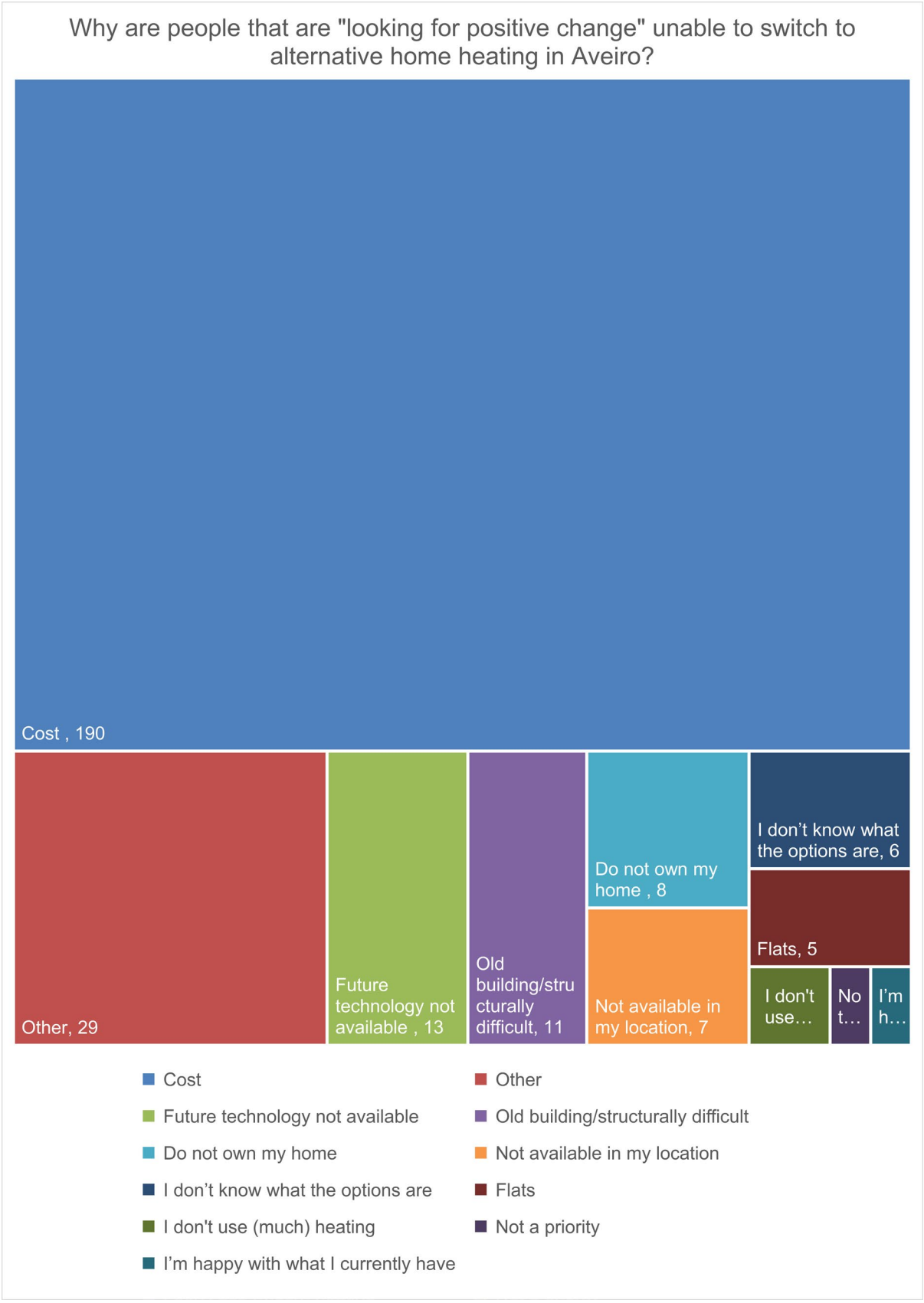
Table 2-8: Matrix of modal change desires for home heating in Aveiro

	Solid fuel in the future	Not solid fuel in the future
Solid fuel in the present	86 Entrenched	275 Looking for positive change
Not solid fuel in the present	28 Getting worse	416 Staying positive

From those “looking for positive change” (275), 70% wanted to switch to include renewables in their heat sources. For all of those who were wanting to move away from solid fuel use in the future, cost was by far the most significant factor. 69% of respondents mentioned cost as a reason why they could not currently change away from solid fuel (Table 2-8).

Those in the “Other” category were mainly generically negative comments but without enough information to categorise them elsewhere, for example “it is not possible,” “lack of conditions.”

Figure 2-12: Reasons why citizens in Aveiro who want to change from solid fuel-only in the present to non-solid fuel for home heating in the future feel unable to change



2.4 Bristol

2.4.1 *Demographic data*

Our Bristol Round 1 survey received 500 respondents, out of a city population of 428,100.[19] The respondents were 57% female, and our representation of age for the adult population was roughly approximate, with 29% over the age of 51 compared to 28% of the city population, and 11% of our respondents aged 16-24 compared to 15% of the city. The average education level of our respondents was less representative; our sample is highly educated compared to the city average – 58% of our dataset have a degree or higher, compared to 32% of the general population. Only 1% of our respondents have no qualifications, compared to 20% of the city population. 15% of the city population are BME (Black and Minority Ethnic), and 13% of our respondents in Round 1 also identified themselves as BME. Within these categories, we had slightly fewer "Black or Black British" (3% compared to 6% of the city) but more "Mixed (White & Black Caribbean, White & Black African, White & Asian, Other mixed)" (4% compared to 3% of the city).

While our respondents are not demographically representative of the region as a whole, we are using their data to understand better the specific behaviours so we can still report valid findings from the categories that we identify.

2.4.2 *Transport*

2.4.2.1 *How are people travelling for commuting in the present?*

Just under half of our respondents used the car at least occasionally for their commute in Bristol. Walking, cycling and public transport were fairly evenly spread with over a quarter of the sample each (Table 2-9).

Table 2-9: Breakdown of current modal choice of commuters in Bristol

Car[1]	Clean car[2]	Public transport[3]	Walking	Cycling [4]	Work from home	Other	NA
201 (46%)	1 (0.2%)	119 (27%)	133 (30%)	151 (34%)	6 (1.4%)	1 (0.2%)	59

[1] Includes car, car share, car pool, lift, taxi, motorbikes, Vespa; [2] includes electric or hybrid car; [3] includes bus, metro, train, tram, rapid transit, ferries; [4] includes (e-)Bike.

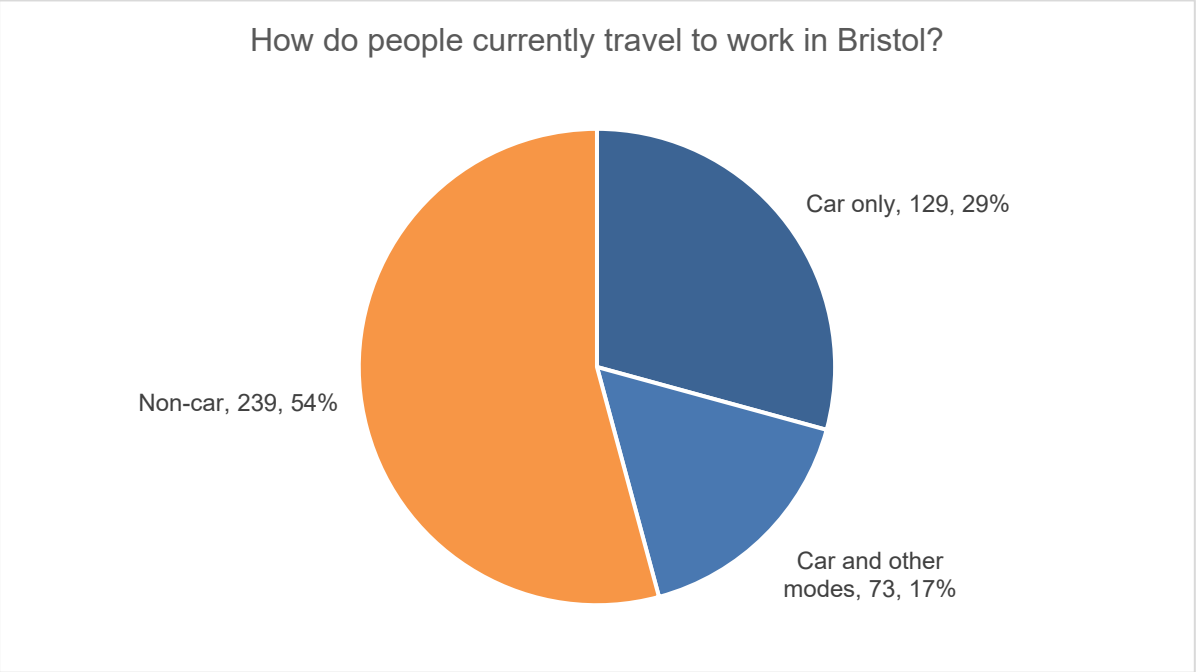
Total number of commuters = 441

N.B. There is overlap between modes (i.e. respondent use more than one mode to travel) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question and hence will add to more than 100%.

[19] Bristol Census 2011

Although only 54% did not use a car, it is notable that another 17% used modes as well as their cars; they were not solely dependent on the car for their commute (Figure 2-13).

Figure 2-13: Proportions of current car use of commuters in Bristol



N.B. Data labels show category name, value and percentage separated by commas.

2.4.2.2 *How do people want to travel for commuting in the future?*

Table 2-10: Breakdown of future modal choice of commuters in Bristol

Car[1]	Clean car[2]	Future public transport[3]	Future walking	Future cycling[4]	Future work from home	Future futuristic[5]	Future clean/ green other[6]	Future other	NA
85 (19%)	25 (5.7%)	185 (42%)	114 (26%)	182 (41%)	8 (1.8%)	13 (3%)	3 (0.7%)	4 (0.9%)	61

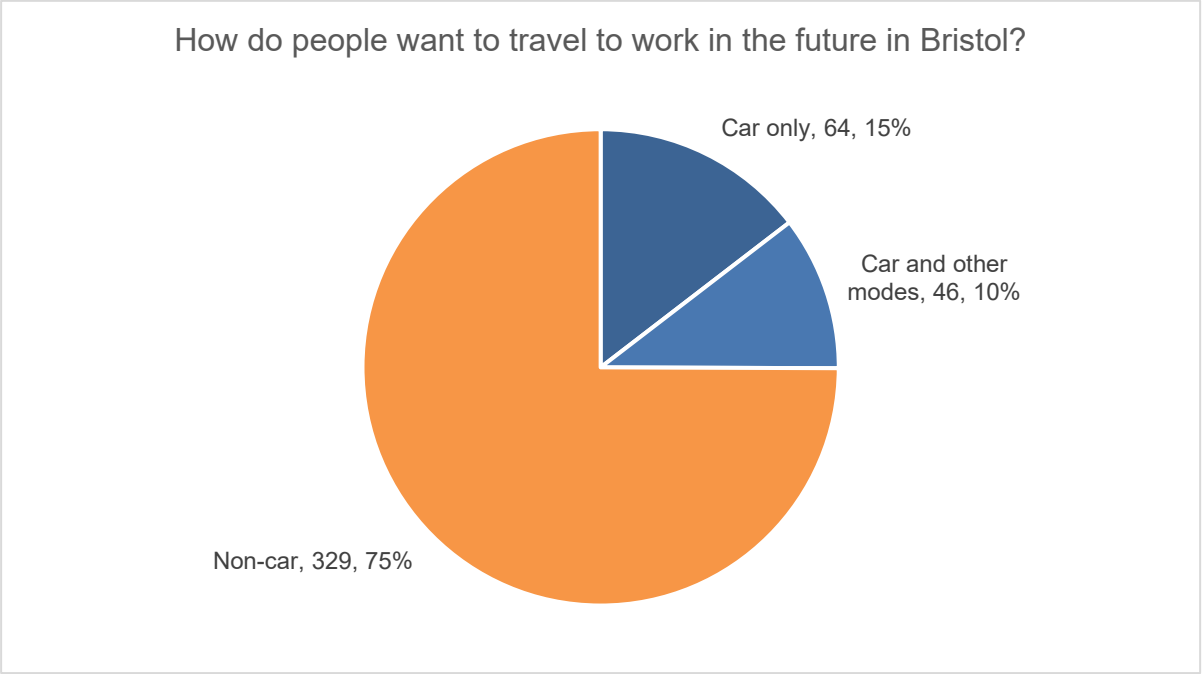
[1] Includes car, car share, car pool, lift, taxi, motorbikes, Vespa; [2] includes electric or hybrid car; [3] includes bus, metro, train, tram, rapid transit, ferries, monorail, tube; [4] includes (e-)Bike; [5] includes autonomous car; [6] low emission vehicle (unspecified)

Total number of future commuters = 439

N.B. There is overlap between modes (i.e. respondent use more than one mode to travel) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question and hence will add to more than 100%.

Three quarters of respondents would rather not be using a car in Bristol for their commute in the future (Figure 2-14), showing a strong number of those who currently commute by car would like to stop, with a significant increase in the proportion choosing public transport (Table 2-10).

Figure 2-14: Proportions of future car use of commuters in Bristol



N.B. Data labels show category name, value and percentage separated by commas.

2.4.2.3 *Do commuters want to change?*

In our survey, we asked all of the respondents why they wanted to change or why they did not want to change their mode of transport in the future. This data is useful for exploring the reasons that users of different modes have for selecting their choices and understanding the perceived barriers or rationales to their decisions. 421 respondents answered both the present and future transport options for commuting, allowing us to investigate their responses.

In the matrix below we have divided our commuting respondents into four groups:

- Entrenched: those who only use a car in the present and would like to continue to only use a car in the future.
- Looking for positive change: those who only use a car in the present but would like to use additional means as well as a car in the future.
- Getting worse: those who use alternative means as well as cars in the present but would like to only use a car in the future.
- Staying positive: those who use alternative means as well as cars in the present and would like to continue to use additional means as well as a car in the future.

Current car users who would like to switch to using alternative means, at least some of the time (our 'Looking for positive change' group), have the potential to be an easy gain for policy-makers seeking to encourage citizens to move to less polluting modes. Consequently, this is the group of people we are most interested in understanding. There are 84 respondents (19% of the 421 'commuter' respondents) who only travel by car in the present, who would like to switch to using alternative means, at least some of the time (Table 2-11).

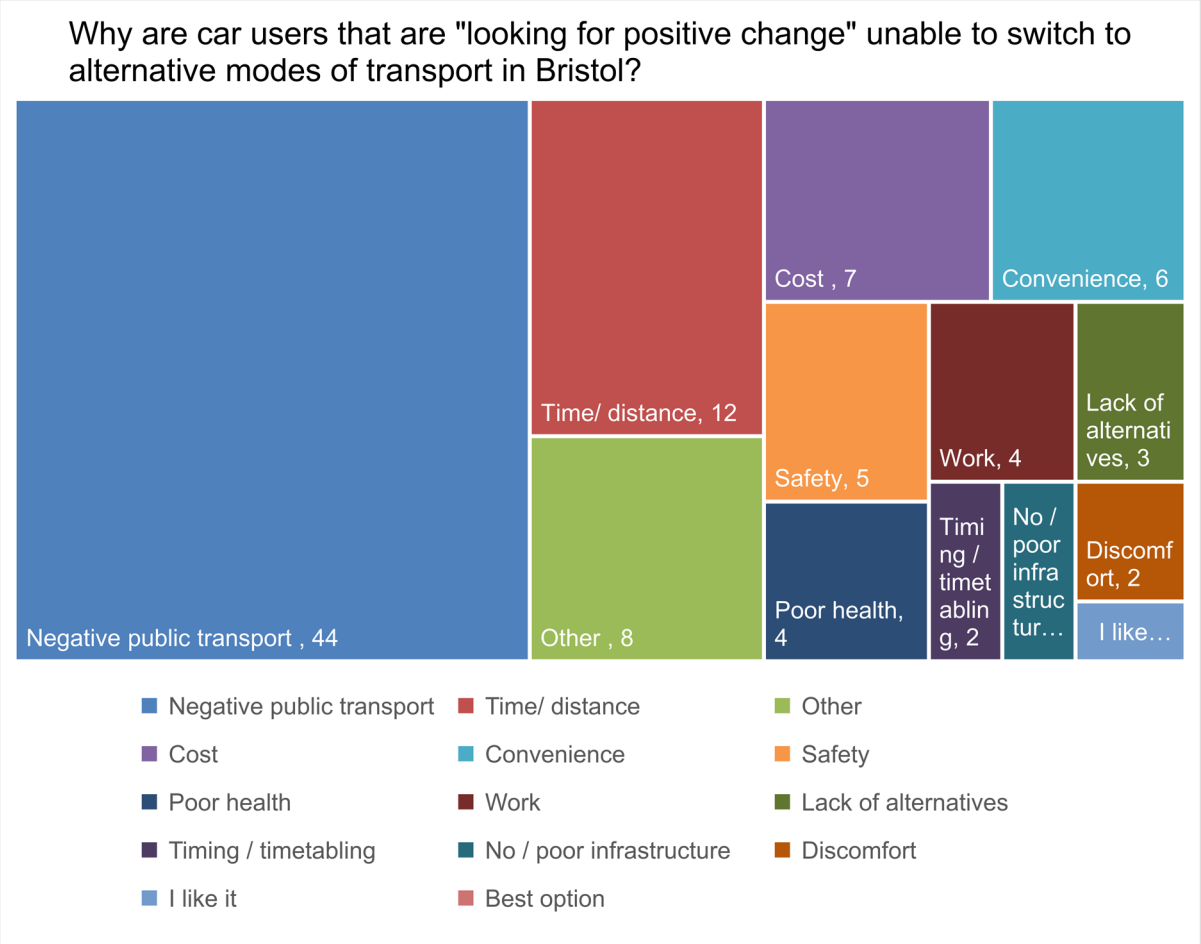
Table 2-11: Matrix of modal change desires of commuters in Bristol

	High polluting choice in future (car only)	Low polluting choice in future ('car and other' or non-car) e.g. car and walk; walk and bus
High polluting choice in present (car only)	35 Entrenched	84 Looking for positive change
Low polluting choice in present ('car and other' or non-car) e.g. car and walk; walk and bus	27 Getting worse	275 Staying positive

N.B. Car includes a "clean car", which we categorised as any mention of electric or hybrid cars.

We have analysed the reasons given by this "looking for positive change" group below (Figure 2-15). Many people gave more than one reason in their answer, so the total of each category combined is greater than the number of responses.

Figure 2-15: Reasons why commuters in Bristol who want to change from car-only in the present to car and other modes in the future feel unable to change



The most frequent responses related to negative comments about public transport (44 responses). Key themes within the Negative public transport category included Cost (11 responses) with comments such as *"Not enough public transports (train and bus) in terms of frequency and diversity. Current public transport are too expensive and I am living too far away from work to be able to cycle"*. Another frequent issue was Time/timetabling (15 responses), e.g. *"Bus times do not fit in around working hours. Bus also takes just as long as driving. So no real incentive"*. No/unreliable service was also a key public transport criticism (19 responses), e.g. "*Doesn't cover where I want to go, no direct service".*

The second largest category of responses is Time / distance. Time and distance were combined in this category as this relates to duration of journeys, e.g. *"Too far away, it's too much time out of my day already travelling, to cycle and have shower etc. Would be longer: I need a job that is closer"*.

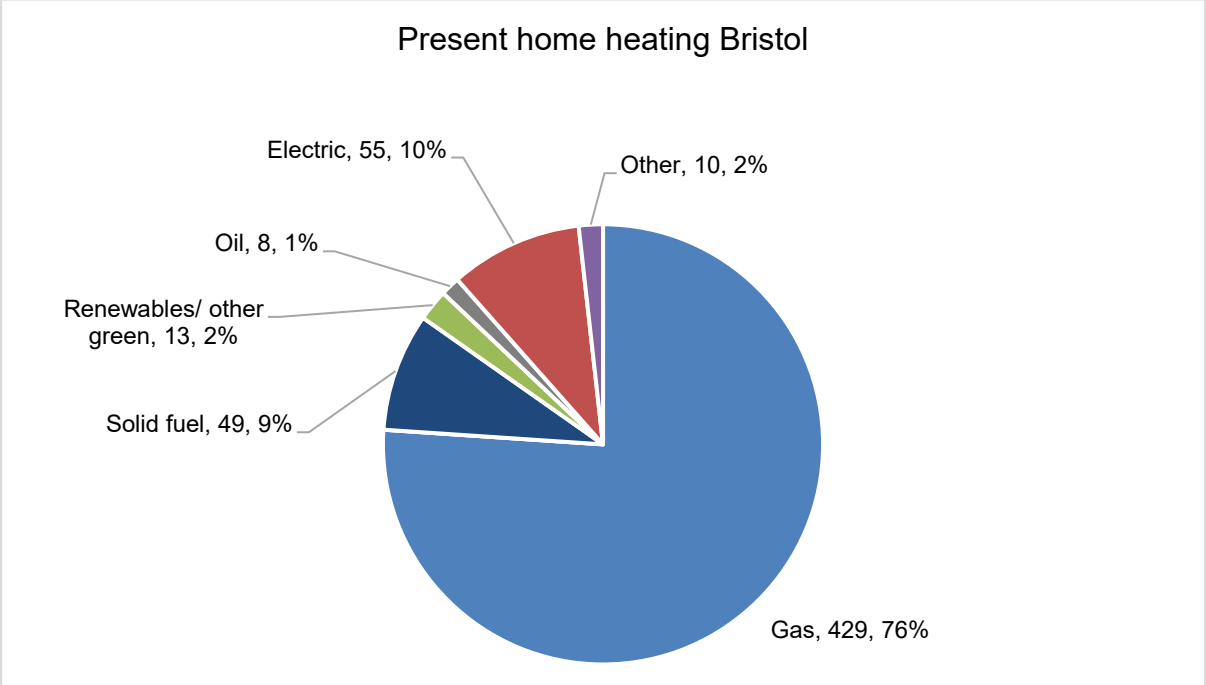
'Other' responses included references to topography (hilliness), lack of access to a bike/bike stolen, laziness and over-coming the mental barriers/breaking habits.

2.4.3 *Heating*

2.4.3.1 *How are people heating their homes?*

484 people responded to this question. Nearly three quarters of respondents use gas to heat their homes in Bristol, with a further 10% relying on electric heaters (Figure 2-16). Respondents were able to indicate more than one form of heating, so the total number of responses is higher than the total number of respondents.

Figure 2-16: Proportions of current home heating mode in Bristol

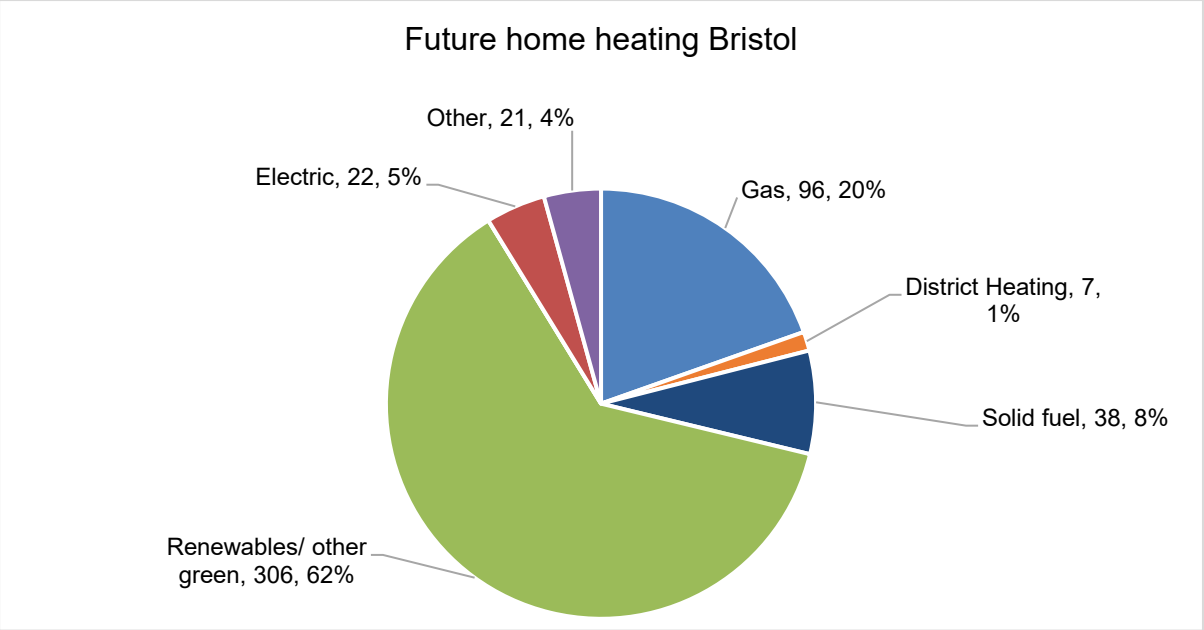


N.B. Data labels show category name, value and percentage separated by commas. There is overlap between modes (i.e. respondent use more than one form of heating) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question.

2.4.3.2 *How do people want to heat their homes in the future?*

There was a significant demand for renewable heating in the future, with some respondents specifying type of energy (e.g. solar, wind) others suggesting more generic responses e.g. “green” or “renewable” sources (Figure 2-17).

Figure 2-17: Proportions of future home heating mode in Bristol



N.B. Data labels show category name, value and percentage separated by commas. There is overlap between modes (i.e. respondent use more than one form of heating) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question.

2.4.3.3 *Do people want to change their home heating?*

We explored the reasons why those who were currently using solid fuel heating systems wanted to change or felt they could not (or were not interested) in changing to a less polluting source. 442 respondents answered both their present and future heating choices. We examined where respondents were moving away from the “polluting” source (solid fuel use, which could include wood, coal or other) to any other heat source (Table 2-12).

Table 2-12: Matrix of modal change desires for home heating in Bristol

	Solid fuel in the future	**Not solid fuel in the future**
Solid fuel in the present	17 Entrenched	28 Looking for positive change
Not solid fuel in the present	20 Getting worse	377 Staying positive

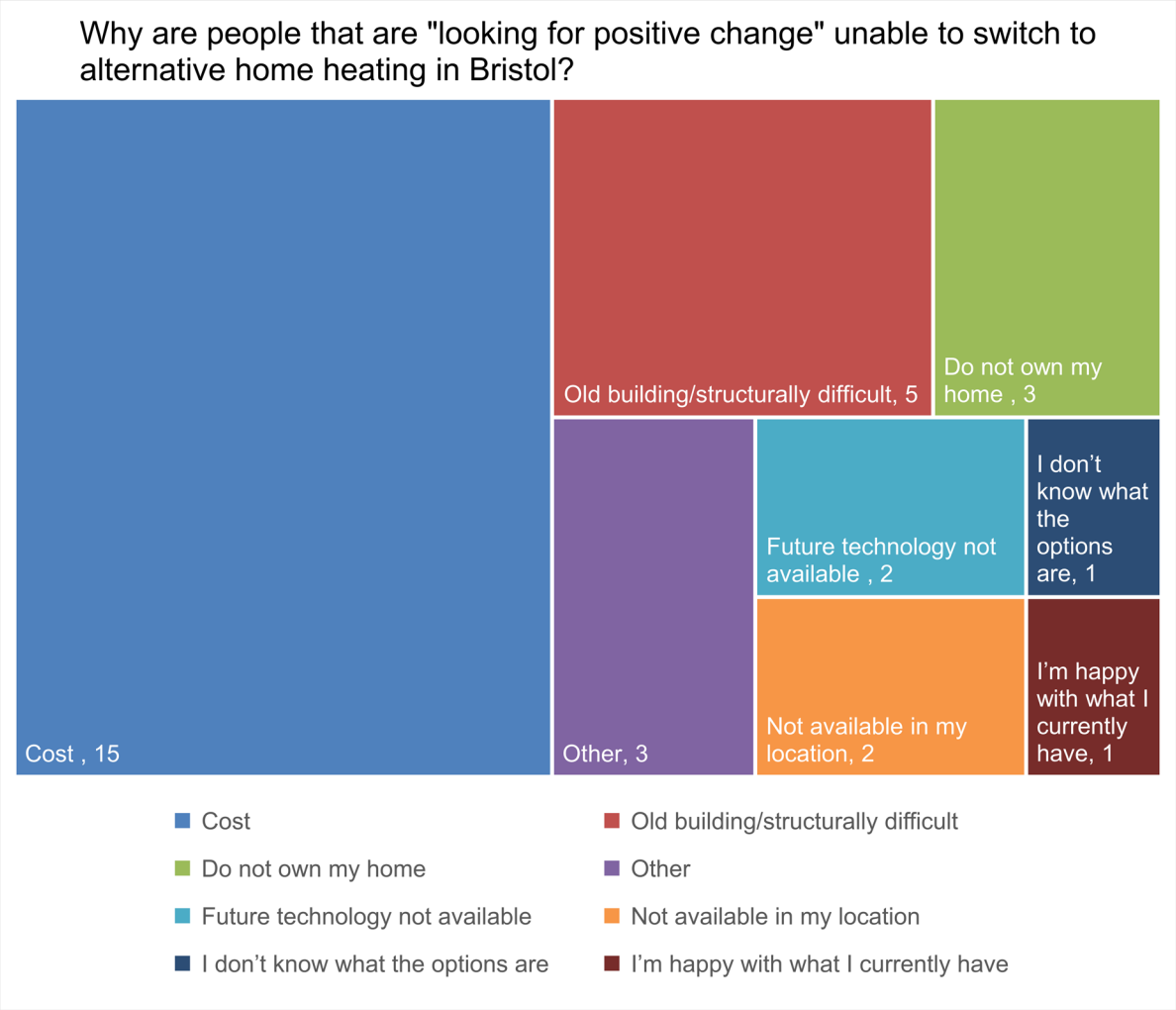
There were 17 respondents who wanted to continue using solid fuel in the future, labelled as “entrenched.” However, 15 of these wanted to combine solid fuel with other means, indicating less of a reliance on solid fuels. Nine respondents wanted to combine solid fuel

with renewables or other “green” energy sources, 7 with gas heating, and 1 with electric. Similarly, of those in the “getting worse” category, 65% (13 people) were looking for a mix of either gas or renewables with solid fuel in the future.

Exploring the “getting worse” data set, nearly half said that the reason they had not moved to solid fuel was due to cost, with not being a homeowner or the chimney/fireplace not being suitable also appearing for around 25%. None mentioned any concerns about the air quality impact of moving to solid fuel burning.

Understanding the motivations for those who are “looking for positive change” is useful for identifying potential low-hanging fruit to move people away from solid fuel use. In our Bristol data set cost was the most significant factor with more than half of respondents mentioning it (Figure 2-18). Comments relating to problems in converting buildings were the next largest group, for example “old building” or “roof not facing the best way.” The physical infrastructure of a relatively old housing stock in Bristol is relevant as people are assuming their heating infrastructure would be part of the fabric of their house or building, like solar panels on their roof, rather than electric heating that could run from renewables located elsewhere.

Figure 2-18: Reasons why citizens in Bristol who want to change from solid fuel-only in the present to non-solid fuel for home heating in the future feel unable to change



2.5 Liguria

2.5.1 *Demographic data*

We received 646 responses to our Round 1 survey in Liguria, out of a regional population of 1,570,694. [20] The majority of our respondents were female, with only 59% identifying as female. Over 65s are under-represented in our responses, with a disproportionate number of younger respondents in our data set. Only 11% of our respondents are over 65, compared to a regional proportion of 27%. Our respondents are disproportionately educated, with 28% holding a degree equivalent or higher, compared to the regional average of 11%. 56% of the region has received either no education or only up to primary school, compared to less than 1% of our respondents. We have not reported nationality data for Ligurian respondents, as age and education statistics were determined to be sufficient to understand the representivity of our sample.

While our respondents are not demographically representative of the region as a whole, we are using their data to understand better the specific behaviours so we can still report valid findings from the categories that we identify.

2.5.2 *Transport*

2.5.2.1 *How are people travelling for commuting in the present?*

Half of our respondents used the car at least occasionally for their commute in Liguria. The predominant non-car mode was public transport, with more respondents using this mode than using cars. Just over a fifth of respondents cycled to work, but only 5% cycled and less than 1% worked from home (Table 2-13).

Table 2-13: Breakdown of current modal choice of commuters in Liguria

Car[1]	Clean car[2]	Public transport[3]	Walking	Cycling [4]	Work from home	Other	NA
244 (45%)	1 (0.2%)	273 (50%)	118 (22%)	28 (5%)	2 (0.4%)	2 (0.4%)	104

[1] Includes car, car share, car pool, lift, taxi, motorbikes, Vespa; [2] includes electric or hybrid car; [3] includes bus, metro, train, tram, rapid transit, ferries; [4] includes (e-)Bike.

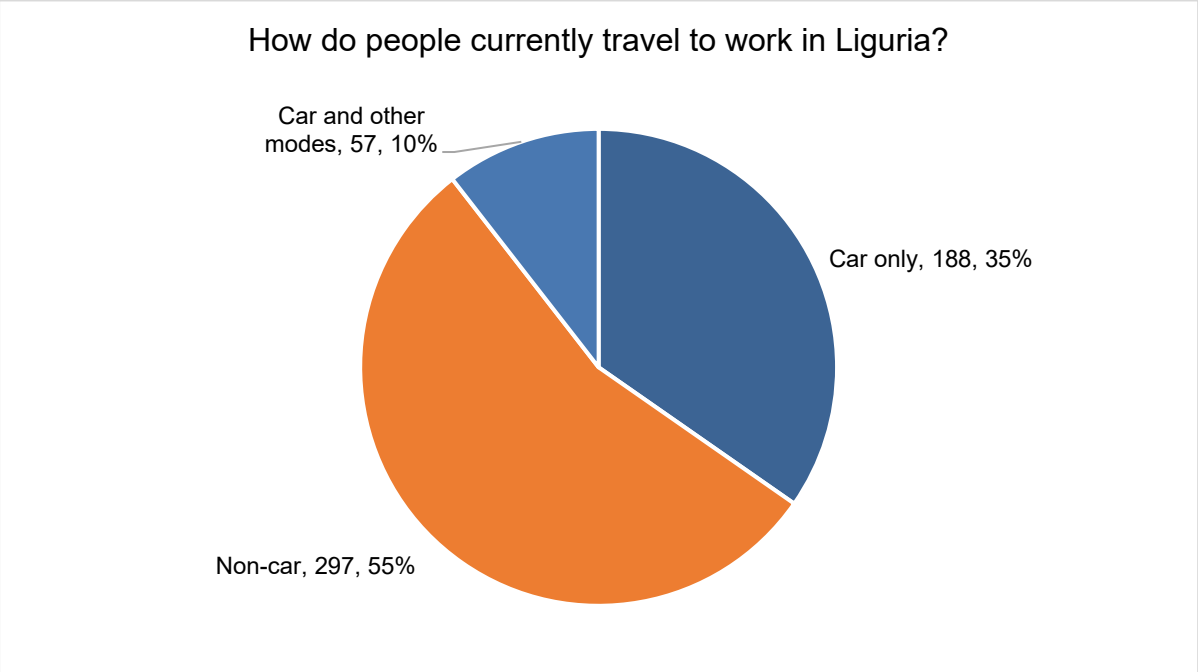
Total number of commuters = 542

N.B. There is overlap between modes (i.e. respondent use more than one mode to travel) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question and hence will add to more than 100%.

20 Italy Census 2011

Although only 55% did not use a car, it is notable that another 10% used modes as well as their cars; they were not solely dependent on the car for their commute (Figure 2-19).

Figure 2-19: Proportions of current car use of commuters in Liguria



N.B. Data labels show category name, value and percentage separated by commas.

2.5.2.2 *How do people want to travel for commuting in the future?*

Table 2-14: Breakdown of future modal choice of commuters in Liguria

Car[1]	Clean car[2]	Future public transport[3]	Future walking	Future cycling[4]	Future work from home	Future futuristic[5]	Future clean/ green other[6]	Future other	NA
69 (12%)	55* (10%)	333 (60%)	87 (16%)	118 (21%)	0 (0%)	6 (1%)	15 (2.7%)	6 (1%)	87

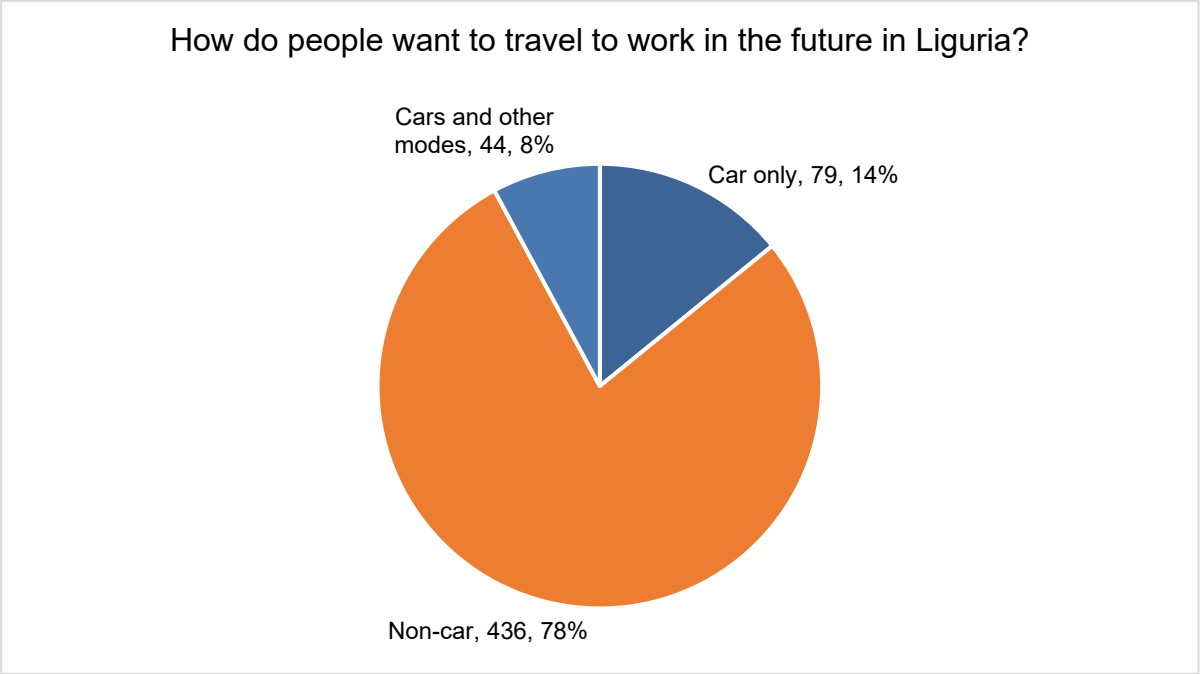
[1] Includes car, car share, car pool, lift, taxi, motorbikes, Vespa; [2] includes electric or hybrid car; [3] includes bus, metro, train, tram, rapid transit, ferries, monorail, tube; [4] includes (e-)Bike; [5] includes autonomous car; [6] low emission vehicle (unspecified)

*One respondent answered both car and EV.

Total number of future commuters = 559

N.B. There is overlap between modes (i.e. respondent use more than one mode to travel) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question and hence will add to more than 100%.

Figure 2-20: Proportions of future car use of commuters in Liguria



N.B. Data labels show category name, value and percentage separated by commas.

More than three quarters of respondents would rather not be using a car in Liguria for their commute in the future (Figure 2-20), showing a strong number of those who currently commute by car would like to stop, with a significant in crease in the proportion wishing to cycle (Table 2-14).

2.5.2.3 *Do commuters want to change?*

In our survey, we asked all of the respondents why they wanted to change or why they did not want to change their mode of transport in the future. This data is useful for exploring the reasons that users of different modes have for selecting their choices and understanding the perceived barriers or rationales to their decisions. 514 respondents answered both the present and future transport options for commuting, allowing us to monitor their thoughts of changing in the future.

In the matrix below (Table 2-15) we have divided our commuting respondents into four groups:

- Entrenched: those who only use a car in the present and would like to continue to only use a car in the future.
- Looking for positive change: those who only use a car in the present but would like to use additional means as well as a car in the future.
- Getting worse: those who use alternative means as well as cars in the present but would like to only use a car in the future.
- Staying positive: those who use alternative means as well as cars in the present and would like to continue to use additional means as well as a car in the future.

Table 2-15: Matrix of modal change desires of commuters in Liguria

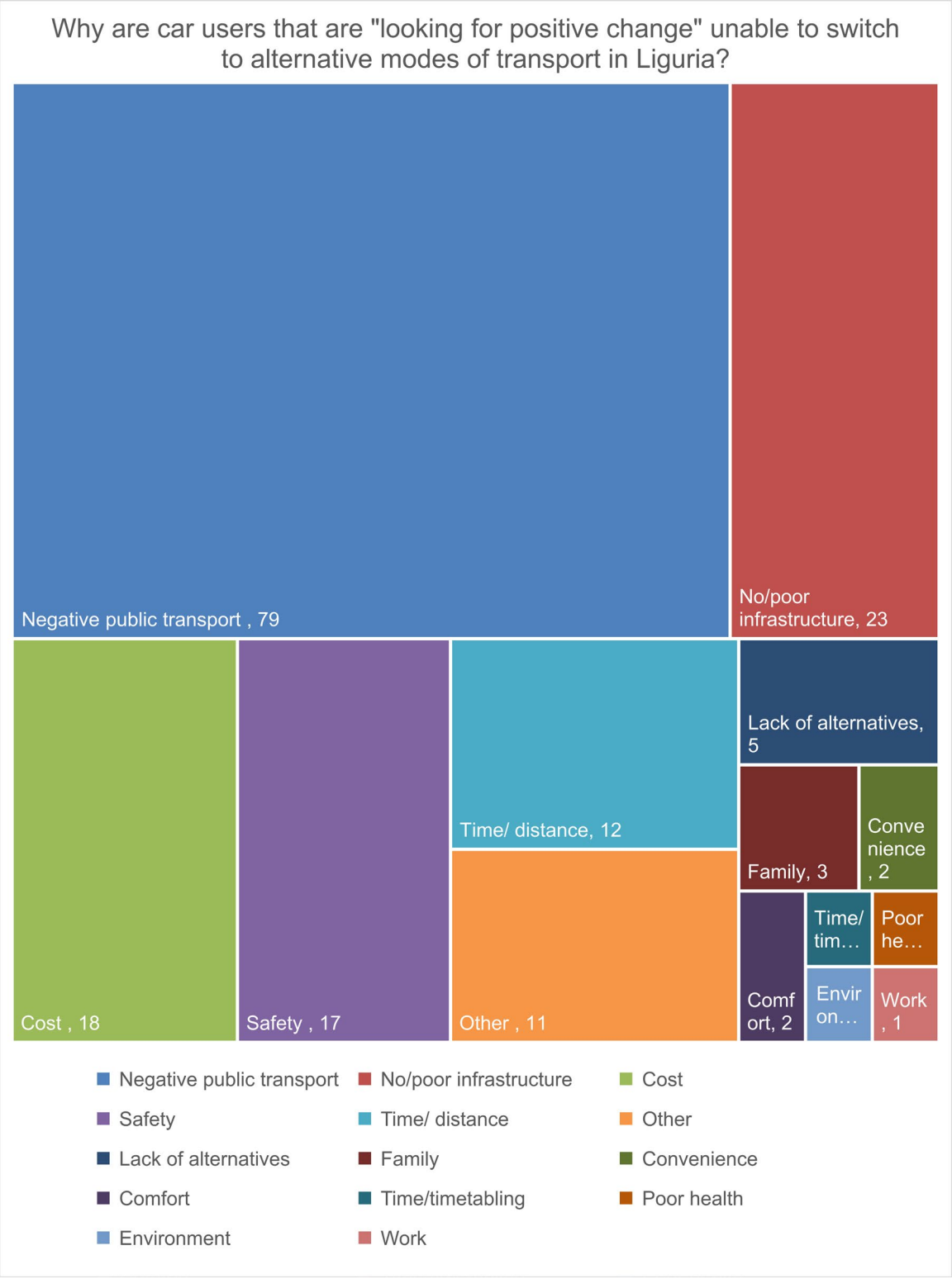
	High polluting choice in future (car only)	Low polluting choice in future ('car and other' or non-car) e.g. car and walk; walk and bus
High polluting choice in present (car only)	41 Entrenched	134 Looking for positive change
Low polluting choice in present ('car and other' or non-car) e.g. car and walk; walk and bus	32 Getting worse	307 Staying positive

N.B. Car includes a "clean car", which we categorised as any mention of electric or hybrid cars.

Current car users who would like to switch to using alternative means, at least some of the time (our 'Looking for positive change' group), have the potential to be an easy gain for policy-makers seeking to encourage citizens to move to less polluting modes. Consequently, this is the group of people we are most interested in understanding. There are 134 respondents (26% of the 514 'commuter' respondents) who only travel by car in the present, who would like to switch to using alternative means, at least some of the time.

We have analysed the reasons given by this "looking for positive change" group below (Figure 2-21). Many people gave more than one reason in their answer, so the total of each category combined is greater than the number of responses.

Figure 2-21: Reasons why commuters in Liguria who want to change from car-only in the present to car and other modes in the future feel unable to change



The most frequent responses related to negative comments about public transport (79 responses). This category had a range of comments, but the most common issue (34 comments) was the time it takes to travel and timetabling, for example *"The metropolitan network of our city is ridiculous and to make the same journey home / work using public*

transport would take much longer." 19 respondents criticised the reliability or the availability of public transport, for example "*The subway does not reach my home and my destinations*" and "*high prices in public transport that are often late in dirty and badly served."* As in this last comment, 11 of this group mentioned cost as a problem.

On infrastructure, 9 comments related to not enough cycle paths, two to pedestrian pathways and 7 to a lack of electric charging stations. Safety was raised as an issue for potential cyclists and pedestrians. *"Bicycle: currently too dangerous"* and *"There are no safe pedestrian paths"*.

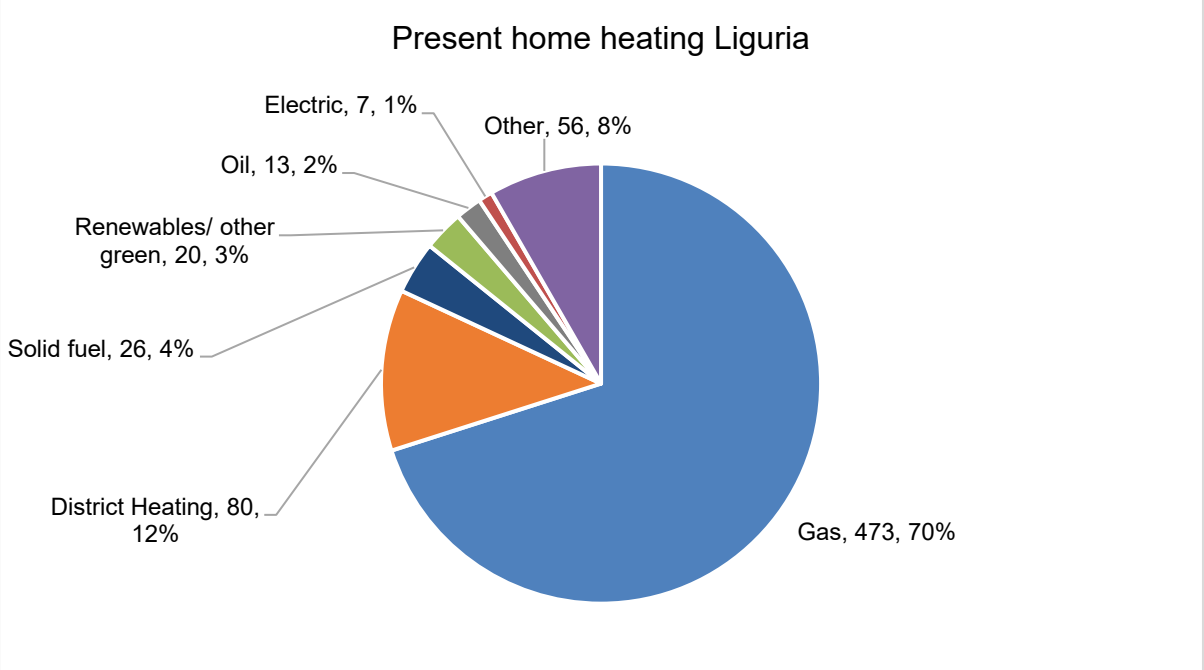
The "Other" comments referred to a mix of suggestions, mostly suggesting that government should do more *"I think at the moment are public institutions that have made little improvements to make sure that citizens change"* or mentioning a lack of incentives for change.

2.5.3 *Heating*

2.5.3.1 *How are people heating their homes?*

A total of 620 respondents answered this question in Liguria. 70% of respondents used gas in their homes, with 12% on district heating (Figure 2-22). While "district heating" is not a specific fuel type, it is a relevant category here as the loci of decisions and control over heating choice are not at the household level, but at a broader community level.

Figure 2-22: Proportions of current home heating mode in Liguria

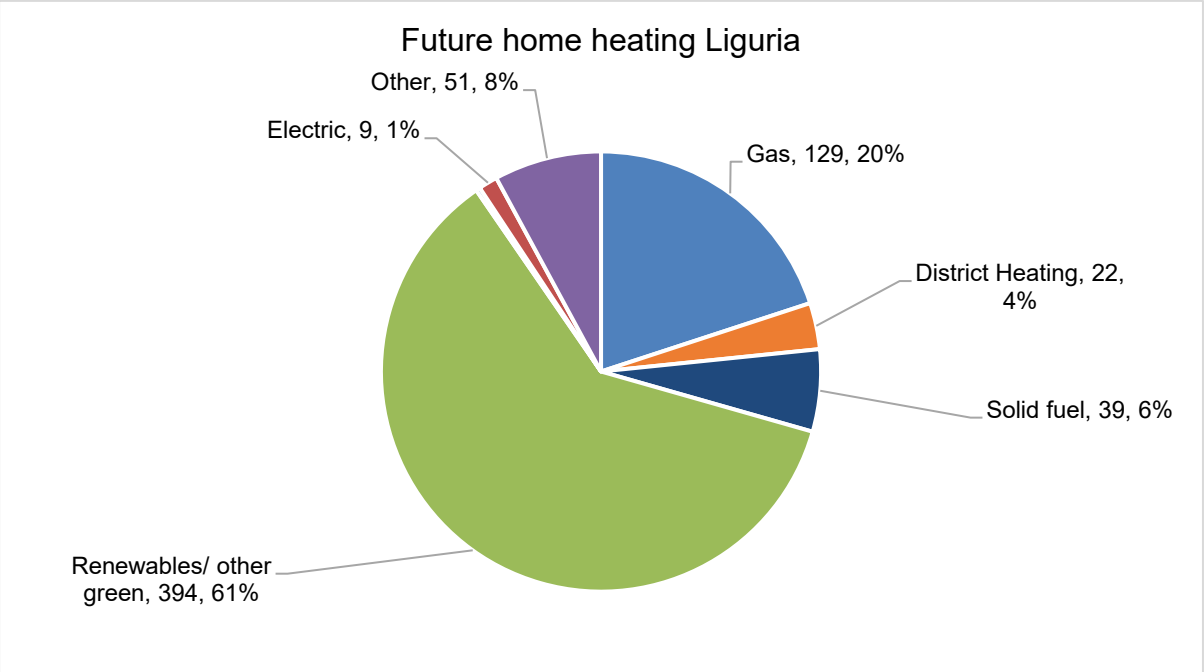


N.B. Data labels show category name, value and percentage separated by commas. There is overlap between modes (i.e. respondent use more than one form of heating) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question.

2.5.3.2 *How do people want to heat their homes in the future?*

There was a clear desired shift away from gas towards renewables, with district heating also reducing its share (Figure 2-23). Those in the "other" category gave a relevant answer to the question, but not a specific heating type. For example "whatever is financially cheapest" or futuristic responses like "fusion" and "in the future there would be new options".

Figure 2-23: Proportions of future home heating mode in Liguria



N.B. Data labels show category name, value and percentage separated by commas. There is overlap between modes (i.e. respondent use more than one form of heating) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question.

2.5.3.3 *Do people want to change their home heating?*

We explored the reasons why those who were currently using solid fuel heating systems wanted to change or felt they could not (or were not interested) in changing to a less polluting source. 619 respondents answered both their present and future heating choices (Table 2-16). We examined where respondents were moving away from the "polluting" source (solid fuel use, which could include wood, coal or other) to any other heat source.

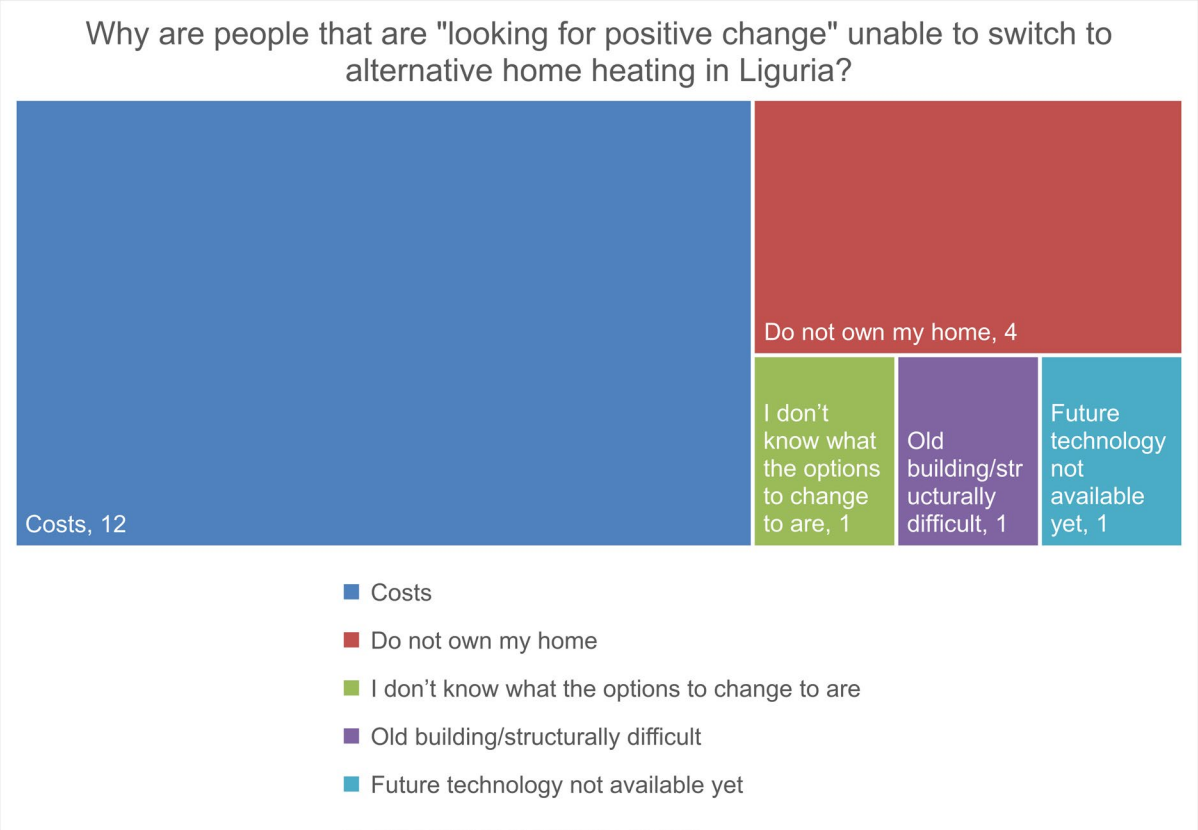
Table 2-16: Matrix of modal change desires for home heating in Liguria

	Solid fuel in the future	**Not solid fuel in the future**
Solid fuel in the present	9 Entrenched	17 Looking for positive change
Not solid fuel in the present	30 Getting worse	563 Staying positive

Our “entrenched” group was small in this data set, with 3 out of the 9 in this group also wanting to use other sources (2 renewables/gas, 1 electric) as well as solid fuel. The 9 respondents had a mix of reasons for not wanting to change, with 3 mentioning cost, others saying they were happy as they are or not interested in changing.

All of those “looking for positive change” wanted to switch to renewables or other green sources. Their reasons for not being able to change were largely financial, with 70% of this group mentioning cost as a problem (Figure 2-24).

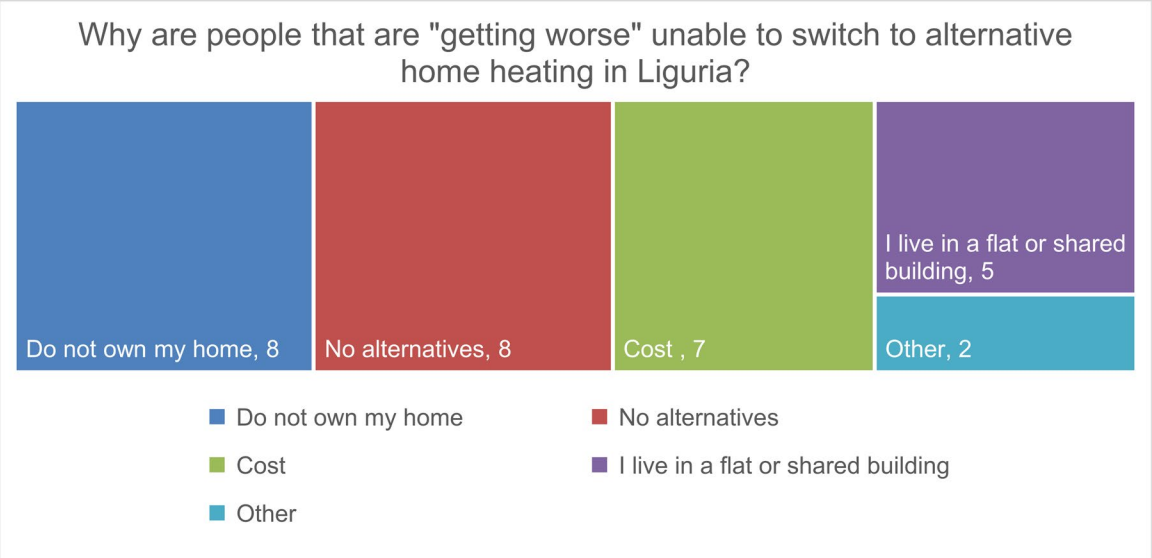
Figure 2-24: Reasons why citizens in Liguria who want to change from solid fuel-only in the present to non-solid fuel for home heating in the future feel unable to change



The “getting worse” group in Liguria was larger than those who were “looking for positive change”, with 30 people wanting to start using solid fuel heat sources. They were mostly using gas in the present, with 10% using district heating. Of the 30 people in the “getting worse” group, over 70% wanted to use only solid fuel in the future, with 20% looking to mix solid fuel and renewable sources and 1 person to combine solid fuel and gas. Their reasons for not using solid fuel already were mixed.

It was unclear from these reasons why people were motivated to want solid fuel instead of gas or district heating, as some of their responses were not highly informative (for example, 8 people simply said “no alternative”) (Figure 2-25).

Figure 2-25: Reasons why citizens in Liguria want to change from non-solid fuel in the present to solid fuel-only for home heating in the future



2.6 Ljubljana

2.6.1 *Demographic data*

In Ljubljana, we received 199 responses out of a city population of 280,210[21]. 58% of our respondents were female. In Ljubljana, we have an under-representation of the oldest and youngest categories, with more than two thirds of respondents aged 25-50 compared to 38% in this category in the city as a whole. Our respondents are highly educated, with 65% holding a university education compared to only 24% of the city population. A third of Ljubljana residents have vocational education qualifications, but only 1% of our survey respondents have this. In Slovenia the national or cultural identities of citizens is a politically charged topic due to the histories of Former Yugoslavian populations. As a consequence for ethical reasons we have not used nationality or ethnicity as a demographic identifier for population sampling in Ljubljana.

While our respondents are not demographically representative of the region as a whole, we are using their data to understand better the specific behaviours so we can still report valid findings from the categories that we identify.

2.6.2 *Transport*

2.6.2.1 *How are people travelling for commuting in the present?*

Only 35% of our respondents used the car at least occasionally for their commute in Liguria. The predominant non-car mode was cycling (55%), with more respondents using this mode

21 City survey 2017, data shared by Ljubljana City Council with the project.

than using cars. Just over a quarter of respondents used public transport to get to work, but only 14% walked and only 1% worked from home (Table 2-17).

Table 2-17: Breakdown of current modal choice of commuters in Ljubljana

Car[1]	Clean car[2]	Public transport[3]	Walking	Cycling [4]	Work from home	Other	NA
65 (35%)	1 (0.5%)	52 (28%)	26 (14%)	102 (55%)	2 (1%)	1 (0.5%)	11

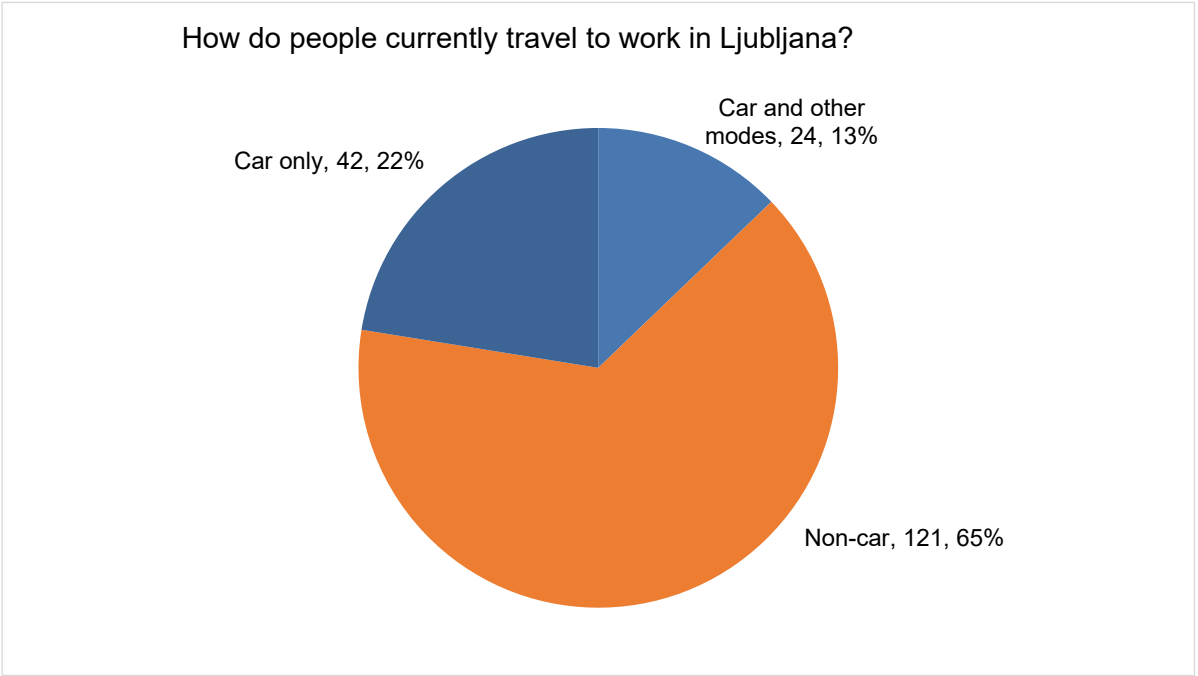
[1] Includes car, car share, car pool, lift, taxi, motorbikes, Vespa; [2] includes electric or hybrid car; [3] includes bus, metro, train, tram, rapid transit, ferries; [4] includes (e-)Bike.

Total number of commuters = 187

N.B. There is overlap between modes (i.e. respondent use more than one mode to travel) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question and hence will add to more than 100%.

Currently 65% of respondents do not use a car, and only 22% only use a car with 13% using other modes as well (Figure 2-26).

Figure 2-26: Proportions of current car use of commuters in Ljubljana



N.B. Data labels show category name, value and percentage separated by commas.

2.6.2.2 *How do people want to travel for commuting in the future?*

Table 2-18: Breakdown of future modal choice of commuters in Ljubljana

Car[1]	Clean car[2]	Future public transport[3]	Future walking	Future cycling[4]	Future work from home	Future futuristic[5]	Future clean/ green other[6]	Future other	NA
12 (7%)	5 (3%)	94 (53%)	37 (21%)	93 (53%)	0 (0%)	4 (2%)	3 (2%)	4 (2%)	22

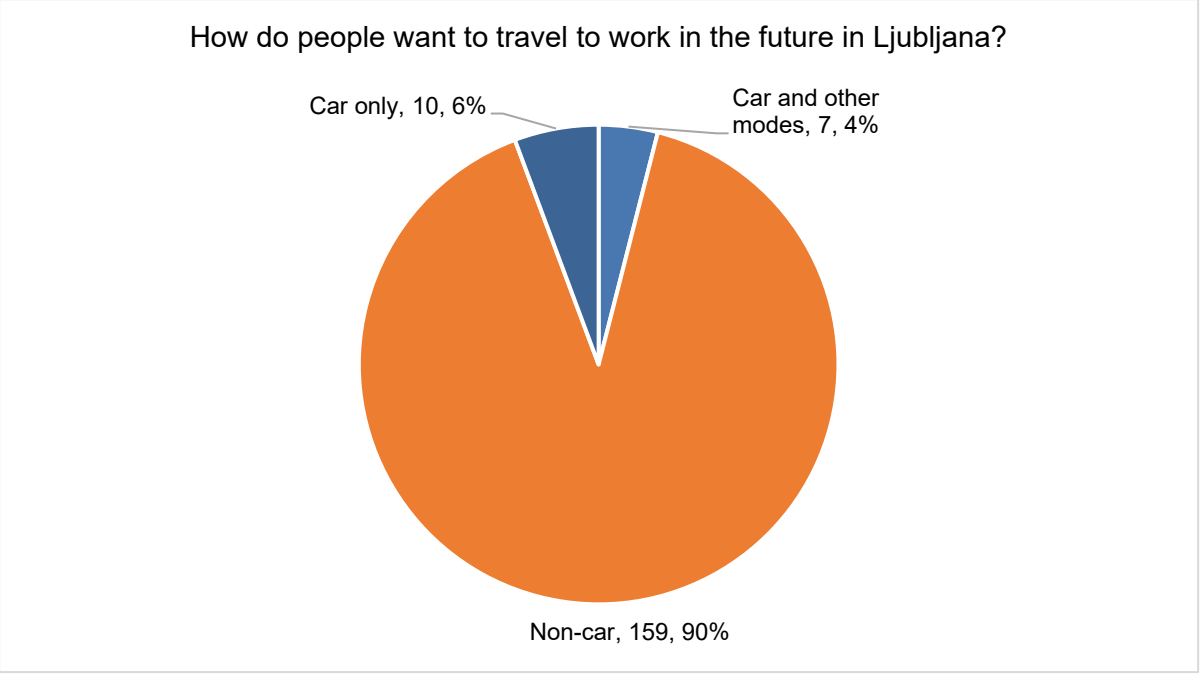
[1] Includes car, car share, car pool, lift, taxi, motorbikes, Vespa; [2] includes electric or hybrid car; [3] includes bus, metro, train, tram, rapid transit, ferries, monorail, tube; [4] includes (e-)Bike; [5] includes autonomous car; [6] low emission vehicle (unspecified)

Total number of future commuters = 176

N.B. There is overlap between modes (i.e. respondent use more than one mode to travel) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question and hence will add to more than 100%.

90% of respondents would rather not be using a car in Liguria for their commute in the future (Figure 2-27), showing a very strong number of those who currently commute by car would like to stop, with a large increase in the proportions wishing to use public transport or cycle (Table 2-18).

Figure 2-27: Proportions of future car use of commuters in Ljubljana



N.B. Data labels show category name, value and percentage separated by commas.

2.6.2.3 *Do commuters want to change?*

In our survey, we asked all of the respondents why they wanted to change or why they did not want to change their mode of transport in the future. This data is useful for exploring the reasons that users of different modes have for selecting their choices and understanding the perceived barriers or rationales to their decisions. 174 respondents answered both the present and future transport options for commuting, allowing us to monitor their thoughts of changing in the future.

In the matrix below (Table 2-19) we have divided our commuting respondents into four groups:

- Entrenched: those who only use a car in the present and would like to continue to only use a car in the future.
- Looking for positive change: those who only use a car in the present but would like to use additional means as well as a car in the future.
- Getting worse: those who use alternative means as well as cars in the present but would like to only use a car in the future.
- Staying positive: those who use alternative means as well as cars in the present and would like to continue to use additional means as well as a car in the future.

Current car users who would like to switch to using alternative means, at least some of the time (our 'Looking for positive change' group), have the potential to be an easy gain for policy-makers seeking to encourage citizens to move to less polluting modes. Consequently, this is the group of people we are most interested in understanding. There are 31 respondents (18% of the 174 'commuter' respondents) who only travel by car in the present, who would like to switch to using alternative means, at least some of the time.

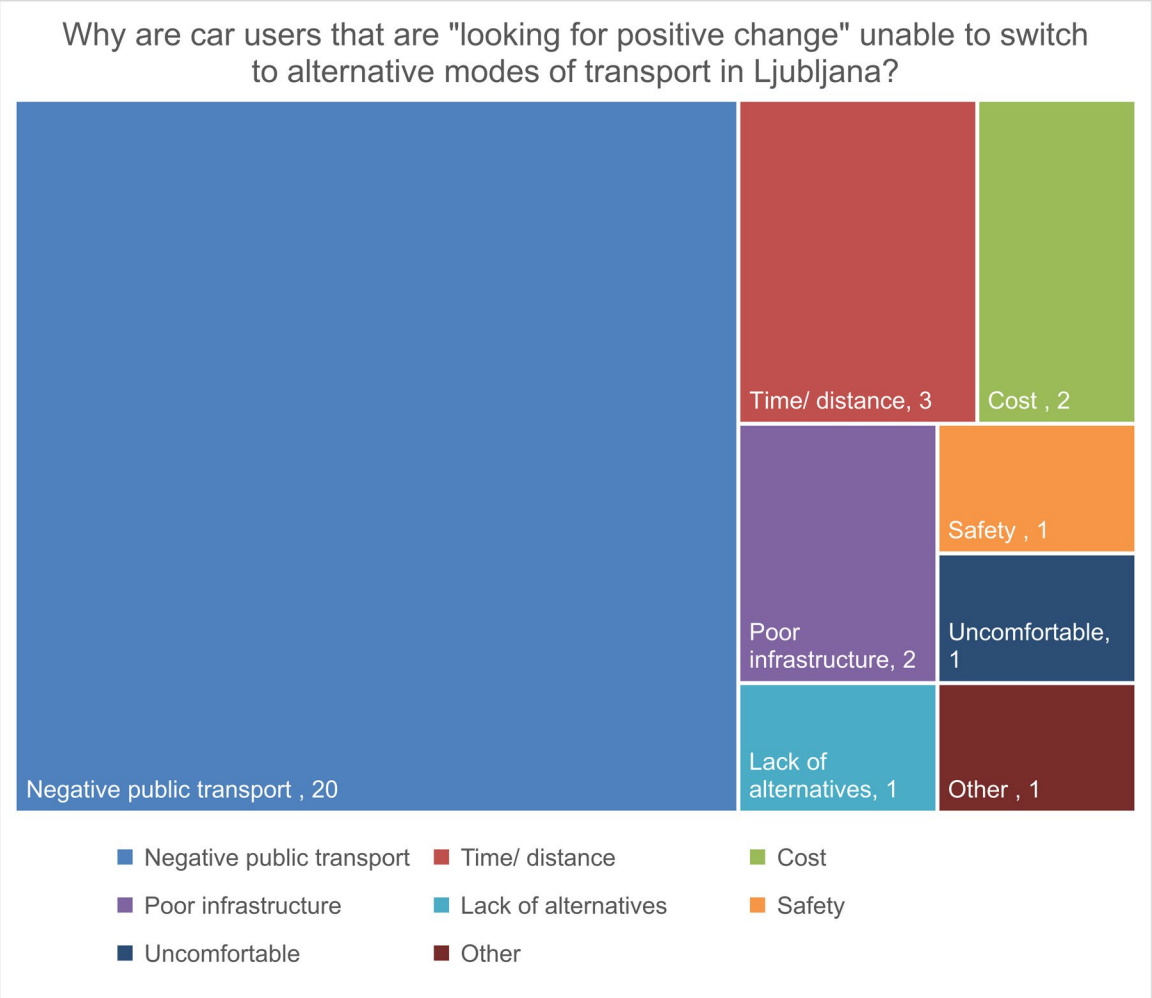
Table 2-19: Matrix of modal change desires of commuters in Ljubljana

	High polluting choice in future (car only)	**Low polluting choice in future ('car and other' or non-car) e.g. car and walk; walk and bus**
High polluting choice in present (car only)	8 Entrenched	31 Looking for positive change
Low polluting choice in present ('car and other' or non-car) e.g. car and walk; walk and bus	2 Getting worse	133 Staying positive

N.B. Car includes a "clean car", which we categorised as any mention of electric or hybrid cars.

We have analysed the reasons given by this "looking for positive change" group below (Figure 2-28). Many people gave more than one reason in their answer, so the total of each category combined is greater than the number of responses. Four respondents gave no reasons for their choice.

Figure 2-28: Reasons why commuters in Ljubljana who want to change from car-only in the present to car and other modes in the future feel unable to change



The most frequent responses related to negative comments about public transport (20 responses). None of the complaints about public transport from this group mentioned the cost. The majority, 15 respondents, referred to the slowness and the amount of time they wasted if they took it: "*too long a trip, poorer comfort, poor connectivity"* and "*Public transport is currently 3 to 6 times slower, which is absurd."* There were also 7 references to a lack of service or unreliability, for example *"bad and irregular connections, uncertainty in the schedule"*.

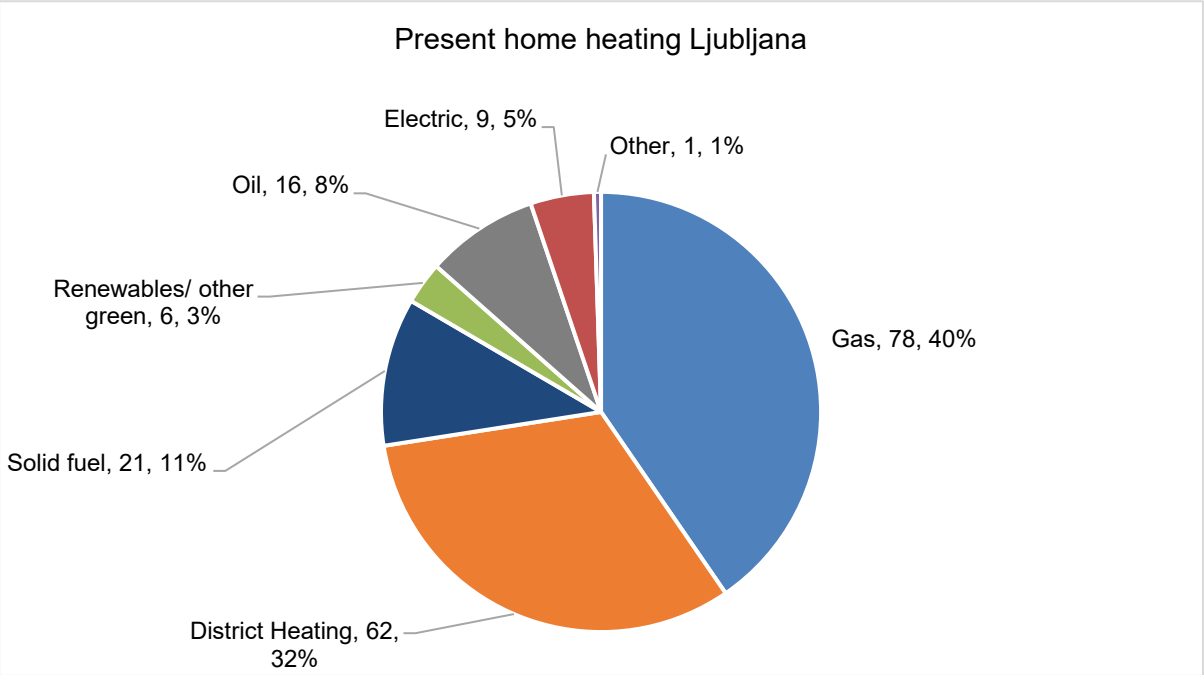
Both of the comments about poor infrastructure referred to a lack of cycle paths: *"Unregulated bicycle infrastructure"* and *"risk of life on non-cycling routes; pavement instead of cycling routes…"* were their complaints. In terms of "Time/distance," comments were short but stated issues like *"too much, too far"* [to cycle] and *"waste of time"* [walking rather than driving].

2.6.3 *Heating*

2.6.3.1 *How are people heating their homes?*

In Ljubljana, 184 people responded to this question. District heating and gas are common in the city, with only 11% of respondents using solid fuel (Figure 2-29). While “district heating” is not a specific fuel type, it is a relevant category here as the loci of decisions and control over heating choice are not at the household level, but at a broader community level.

Figure 2-29: Proportions of current home heating mode in Ljubljana

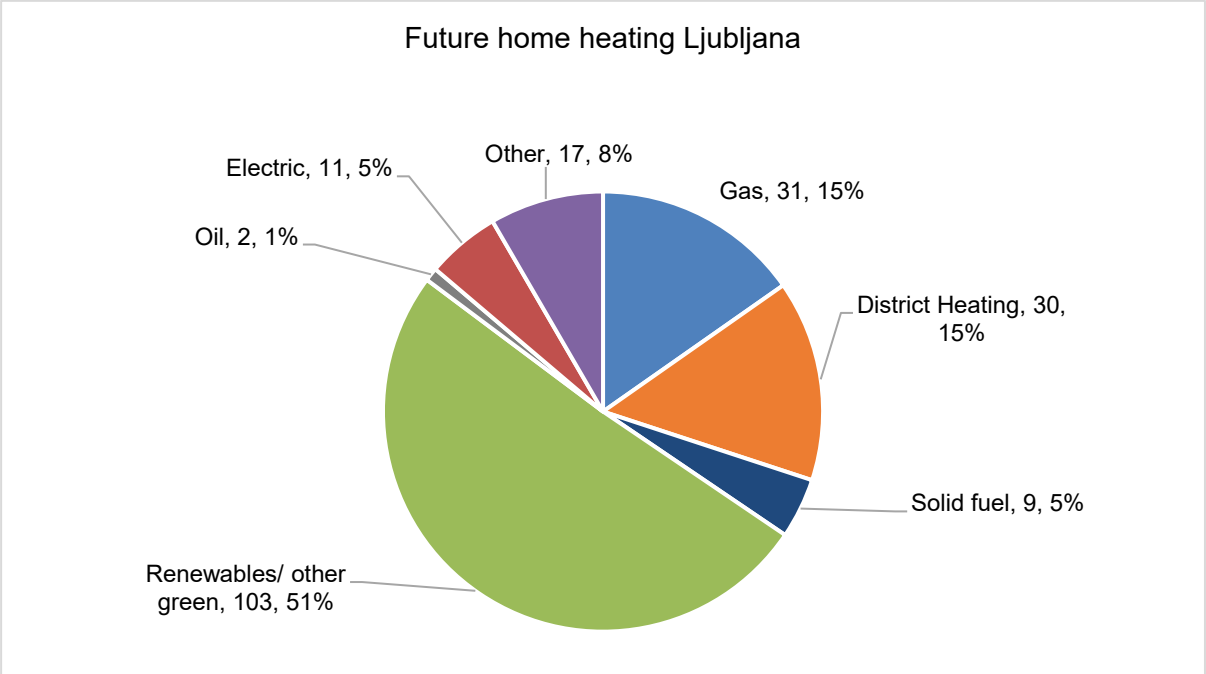


N.B. Data labels show category name, value and percentage separated by commas. There is overlap between modes (i.e. respondent use more than one form of heating) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question.

2.6.3.2 *How do people want to heat their homes in the future?*

A total of 179 people responded to the question about how they would like to heat their homes in the future. There was a significant swing towards renewables from both gas and district heating (Figure 2-30).

Figure 2-30: Proportions of future home heating mode in Ljubljana



N.B. Data labels show category name, value and percentage separated by commas. There is overlap between modes (i.e. respondent use more than one form of heating) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question.

For those who currently used district heating but wanted to use something else in the future (41 people), 70% wanted to switch to renewables. Within some of these answers, it was possible that they were happy to remain on district heating but with a renewable energy source, but this was not clear in their responses so they were coded as wanting to change.

2.6.3.3 *Do people want to change their home heating?*

We explored the reasons why those who were currently using solid fuel heating systems wanted to change or felt they could not (or were not interested) in changing to a less polluting source. 176 respondents answered both their present and future heating choices (Table 2-20). We examined where respondents were moving away from the “polluting” source (solid fuel use, which could include wood, coal or other) to any other heat source.

Table 2-20: Matrix of modal change desires for home heating in Ljubljana

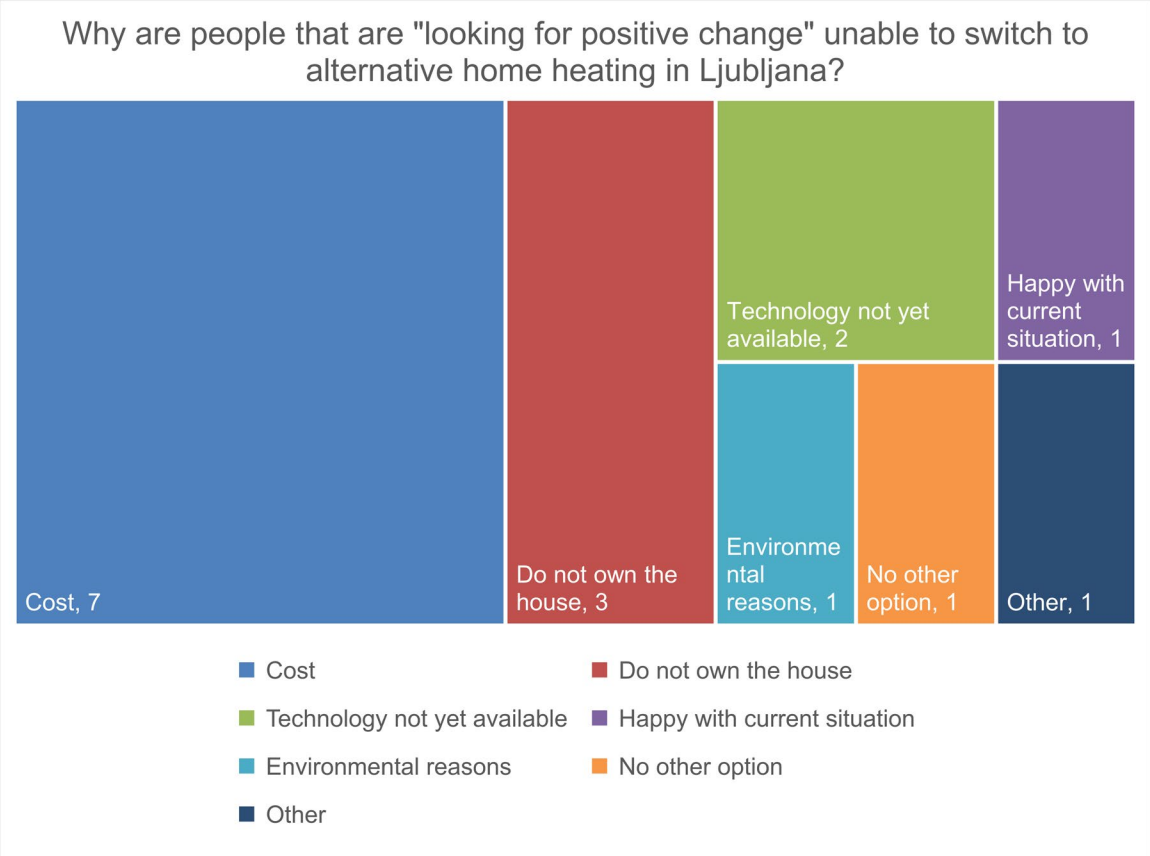
	Solid fuel in the future	Not solid fuel in the future
Solid fuel in the present	5 Entrenched	16 Looking for positive change
Not solid fuel in the present	4 Getting worse	149 Staying positive

Overall, the direction of desired change in Ljubljana is away from polluting heating sources. The five respondents who wanted to stay using solid fuels included three who gave no

reason for their choice. The other two mentioned cost, with one also stating that they felt it was more environmental: *"Solar cells and all modern technology do not pay for their lifetime, it's expensive to maintain, coming from different parts of the world ... it's more environmentally friendly to use biomass from the nearby forest than having the most advanced technology"*.

For those who were "looking for positive change", cost was the most significant reason that they had not already switched away from solid fuel (Figure 2-31). The "environmental" response related to using wood cleared under forest management practices. The person indicating that they were "happy with current situation" response located their fuel choice in a wider political landscape, stating *"Wood is the only source of heat which is independent of global trends and national ideas."* The "Other" coding related to a respondent currently on biomass and gas, who wanted heat pump and solar. They explained *"Just a few years ago we switched to gas heating"*.

Figure 2-31: Reasons why citizens in Ljubljana who want to change from solid fuel-only in the present to non-solid fuel for home heating in the future feel unable to change



The four respondents in the "getting worse" category, three were currently using gas and one was on district heating. All wanted to switch to solid fuel combined with other sources, for example "electricity and biomass" or "pellets, solar cells, heat pumps." One gave no reasons for the choice, two respondents lived in flats, and so could not switch. The final respondent in this group said that although they wanted to switch from gas to wood and heat pump, there was *"no financial and physical opportunity"*.

2.7 Sosnowiec

2.7.1 *Demographic data*

We had 283 responses to our Round 1 survey in Sosnowiec, out of a city population of 204,013.[22] 59% of our respondents in Round 1 were female. Sosnowiec respondents were disproportionately young, with a high response rate in the 16-24 year old category. Those over 65+ were underrepresented, with only 10% of responses from this category compared to 19% of the city. Our respondents were highly educated compared to the city average, with 53% holding a degree or equivalent, compared to 25% of the city overall. In this region of Poland, with an highly ethnically homogenous population, representation of ethnic minorities has not been a significant issue and therefore has not been relevant to record for our study.

While our respondents are not demographically representative of the region as a whole, we are using their data to understand better the specific behaviours so we can still report valid findings from the categories that we identify.

2.7.2 *Transport*

2.7.2.1 *How are people travelling for commuting in the present?*

Half of our respondents used the car at least occasionally for their commute in Liguria. The predominant non-car mode was public transport (32%), followed by walking (20%). Only 3% cycled and no respondents worked from home (Table 2-21).

Table 2-21: Breakdown of current modal choice of commuters in Sosnowiec

Car[1]	Clean car[2]	Public transport[3]	Walking	Cycling [4]	Work from home	Other	NA
130 (50%)	0 (0%)	82 (32%)	51 (20%)	9 (3%)	0 (0%)	2 (0.8%)	25

[1] Includes car, car share, car pool, lift, taxi, motorbikes, Vespa; [2] includes electric or hybrid car; [3] includes bus, metro, train, tram, rapid transit, ferries; [4] includes (e-)Bike.

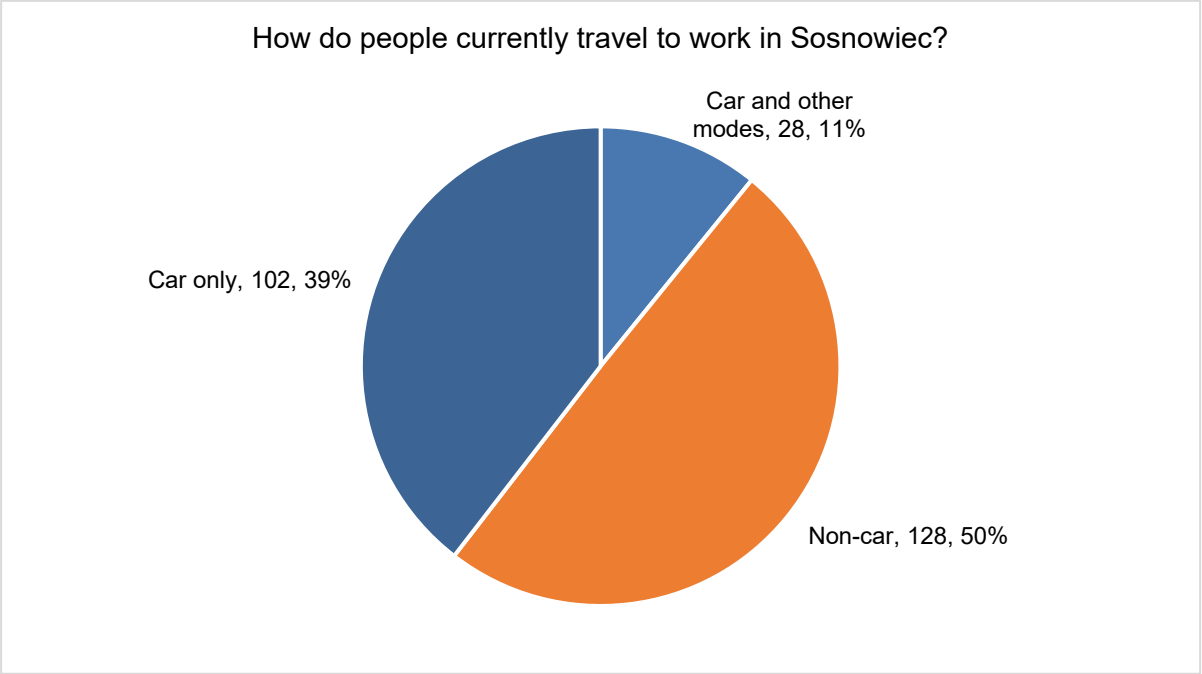
Total number of commuters = 258

N.B. There is overlap between modes (i.e. respondent use more than one mode to travel) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question and hence will add to more than 100%.

Currently 50% of respondents do not use a car, however nearly 40% only use a car with 11% using other modes as well (Figure 2-32).

22 UrbiStat Sosnowiec http://ugeo.urbistat.com/AdminStat/en/pl/demografia/eta/sosnowiec/2475/3

Figure 2-32: Proportions of current car use of commuters in Sosnowiec



N.B. Data labels show category name, value and percentage separated by commas.

2.7.2.2 *How do people want to travel for commuting in the future?*

Table 2-22: Breakdown of future modal choice of commuters in Sosnowiec

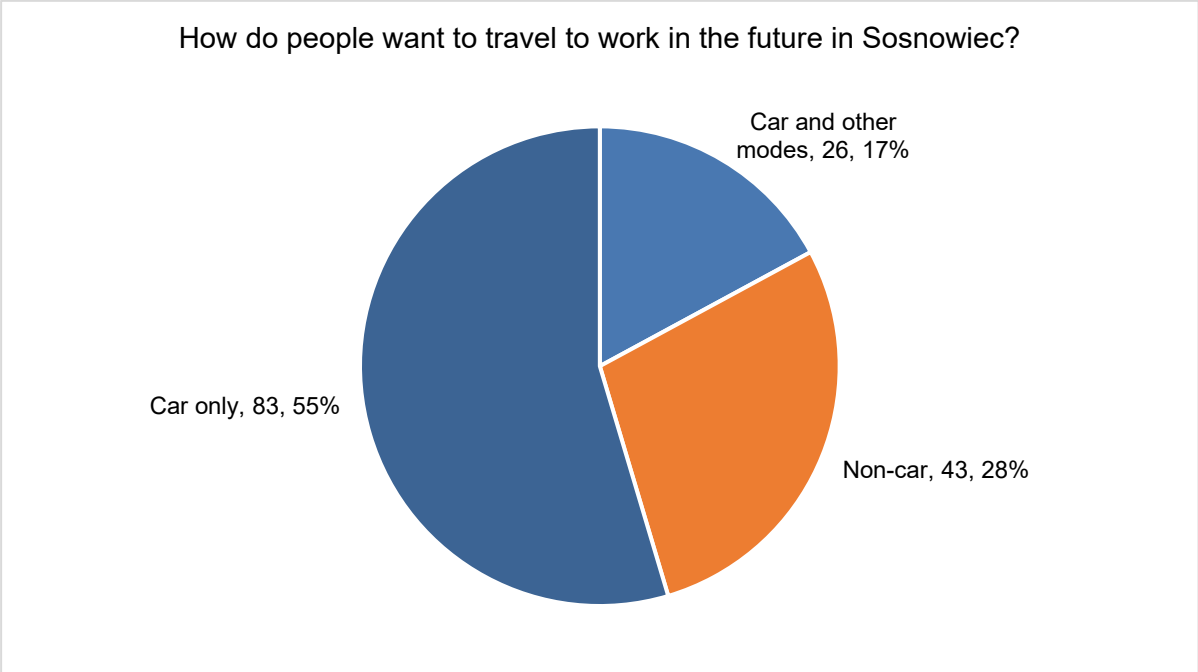
Car[1]	Clean car[2]	Future public	Future walking	Future cycling[4]	Future work from home	Future futuristic[5]	Future clean/ green other[6]	Future other	NA
86 (36%)	23 (10%)	92 (38%)	29 (12%)	32 (13%)	1 (0.4%)	9 (4%)	1 (0.4%)	12 (5%)	43

[1] Includes car, car share, car pool, lift, taxi, motorbikes, Vespa; [2] includes electric or hybrid car; [3] includes bus, metro, train, tram, rapid transit, ferries, monorail, tube; [4] includes (e-)Bike; [5] includes autonomous car; [6] low emission vehicle (unspecified)

Total number of future commuters = 240

N.B. There is overlap between modes (i.e. respondent use more than one mode to travel) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question and hence will add to more than 100%.

Figure 2-33: Proportions of future car use of commuters in Sosnowiec



N.B. Data labels show category name, value and percentage separated by commas.

Interestingly 55% of respondents in Sosnowiec would prefer to use a car only for their commute in the future; this is more than who currently use a car. The proportion of respondents wanting to use a car as well as other modes also increased to 17%, whilst the respondents that want to stop using a car altogether account for only 28% (Figure 2-33). The proportion wishing to use public transport remained high (38%), and future cycling increased, but those wanting to walk to work in the future fell from 20% to 12% (Table 2-22)

2.7.2.3 *Do commuters want to change?*

In our survey, we asked all of the respondents why they wanted to change or why they did not want to change their mode of transport in the future. This data is useful for exploring the reasons that users of different modes have for selecting their choices and understanding the perceived barriers or rationales to their decisions. 237 respondents answered both the present and future transport options for commuting, allowing us to monitor their thoughts of changing in the future.

In the matrix below (Table 2-23) we have divided our commuting respondents into four groups:

- Entrenched: those who only use a car in the present and would like to continue to only use a car in the future.
- Looking for positive change: those who only use a car in the present but would like to use additional means as well as a car in the future.
- Getting worse: those who use alternative means as well as cars in the present but would like to only use a car in the future.
- Staying positive: those who use alternative means as well as cars in the present and would like to continue to use additional means as well as a car in the future.

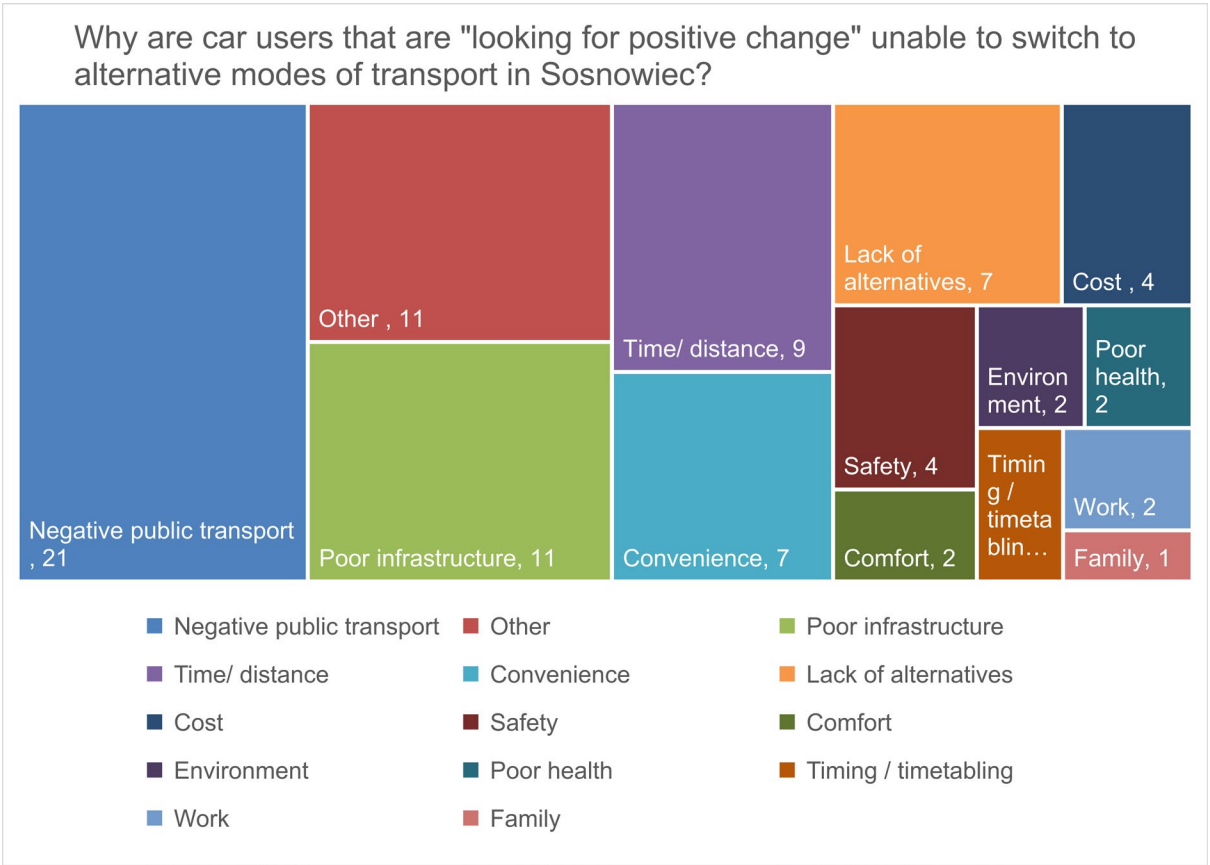
Table 2-23: Matrix of modal change desires of commuters in Sosnowiec

	High polluting choice in future (car only)	Low polluting choice in future ('car and other' or non-car) e.g. car and walk; walk and bus
High polluting choice in present (car only)	32 Entrenched	57 Looking for positive change
Low polluting choice in present ('car and other' or non-car) e.g. car and walk; walk and bus	51 Getting worse	97 Staying positive

N.B. Car includes a "clean car", which we categorised as any mention of electric or hybrid cars.

Current car users who would like to switch to using alternative means, at least some of the time (our 'Looking for positive change' group), have the potential to be an easy gain for policy-makers seeking to encourage citizens to move to less polluting modes. Consequently, this is the group of people we are most interested in understanding. There are 57 respondents (24% of the 237 'commuter' respondents) who only travel by car in the present, who would like to switch to using alternative means, at least some of the time.

Figure 2-34: Reasons why commuters in Sosnowiec who want to change from car-only in the present to car and other modes in the future feel unable to change



The most frequent responses in Sosnowiec were negative comments about public transport (21 responses) (Figure 2-34). Key themes within the Negative public transport category included Time/distance (6 responses), e.g. *"because traveling by public transport often takes twice as long as, for example, by car or even on foot."*, and Timetabling (5 responses), e.g. *"Because there is one bus line running to the workplace, which runs in the morning - every 50 minutes"*. A lack of infrastructure was also a concern, e.g. *"There are no parking lots at railway and bus stations and there is no convenient public transport connection to these points"*, Cost (2 responses), Family (1 response) and Comfort (1 response referring to a lack of air conditioning on buses).

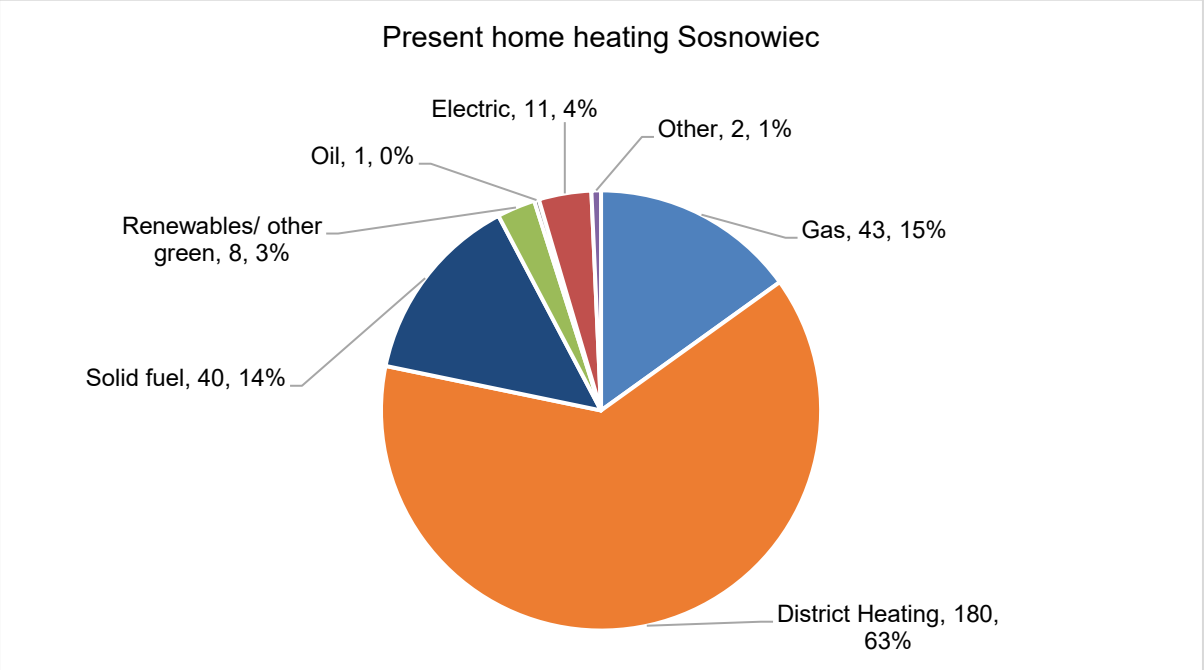
The second largest category of responses is Poor infrastructure generally referred to lack of cycle paths. Time / distance was also a common response. Time and distance were combined in this category as this relates to duration of journeys. 'Other' responses mostly included references to the absence of future technologies.

2.7.3 *Heating*

2.7.3.1 *How are people heating their homes?*

In Sosnowiec, 271 people responded to this question. The majority (63%) are on district heating networks, with gas and solid fuel use at around 15% each (Figure 2-35). In solid fuel use, there was a mix of those using coal and wood, with more using some form of coal.

Figure 2-35: Proportions of current home heating mode in Sosnowiec

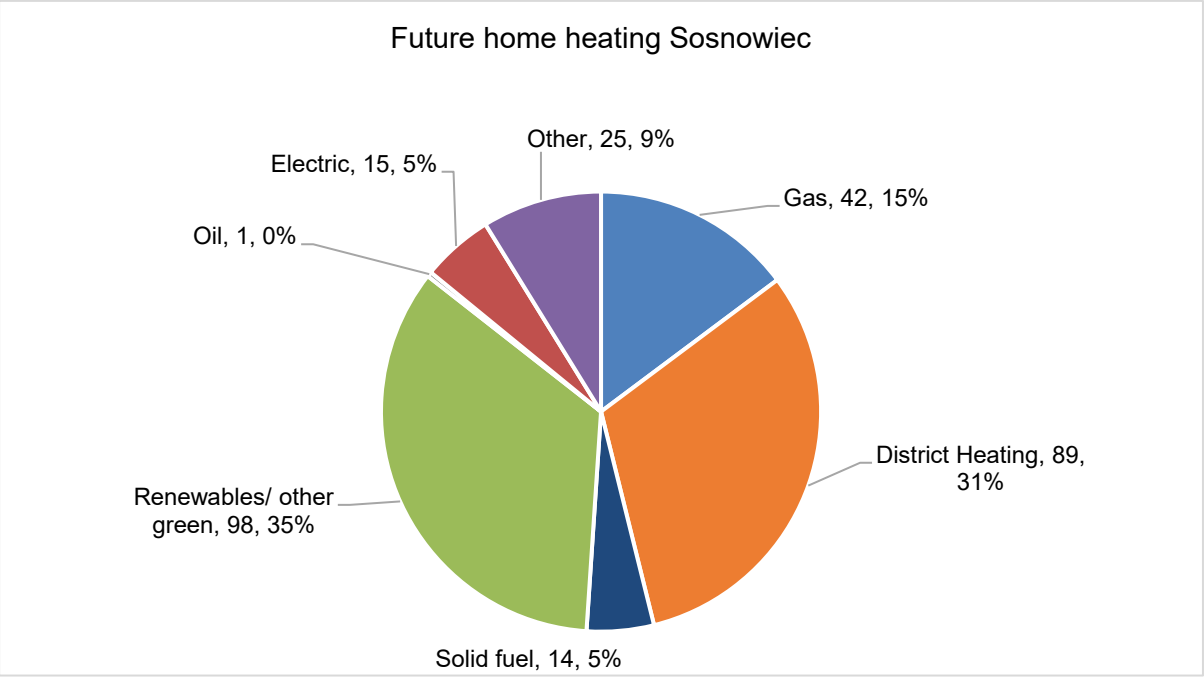


N.B. Data labels show category name, value and percentage separated by commas. There is overlap between modes (i.e. respondent use more than one form of heating) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question.

2.7.3.2 *How do people want to heat their homes in the future?*

A total of 255 people responded to the question about how they would like to heat their homes in the future. There was a strong swing towards renewable energy, away from district heating and solid fuel (Figure 2-36). Most of the comments recorded as “other” related to people giving a non-specific fuel source, but asking for something cheaper.

Figure 2-36: Proportions of future home heating mode in Sosnowiec



N.B. Data labels show category name, value and percentage separated by commas. There is overlap between modes (i.e. respondent use more than one form of heating) therefore number of analysed responses will not equal number of respondents. Percentages are given as a proportion of the total number of respondents for this question.

2.7.3.3 *Do people want to change their home heating?*

We explored the reasons why those who were currently using solid fuel heating systems wanted to change or felt they could not (or were not interested) in changing to a less polluting source. 251 respondents answered both their present and future heating choices (Table 2-24). We examined where respondents were moving away from the “polluting” source (solid fuel use, which could include wood, coal or other) to any other heat source.

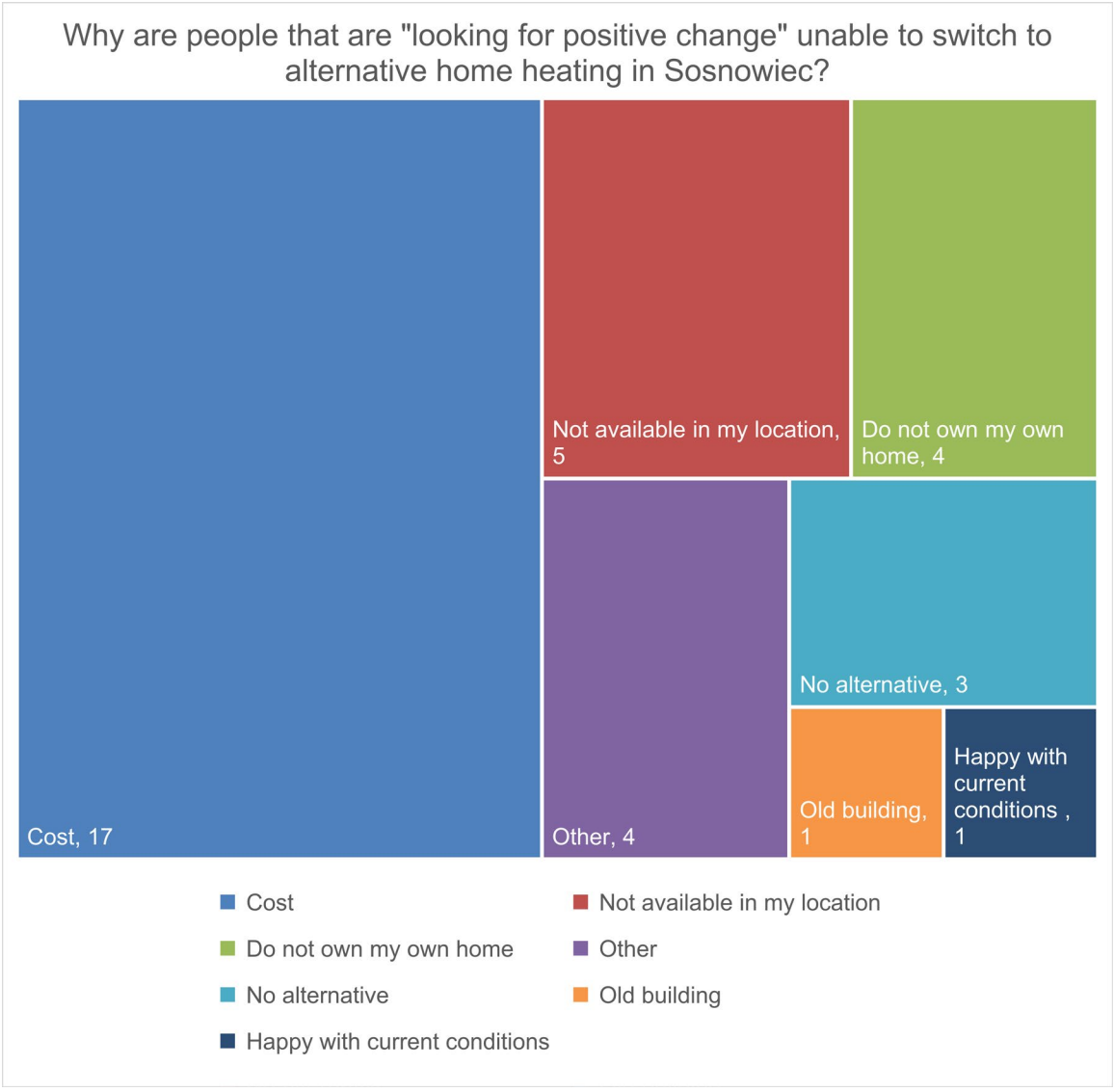
Table 2-24: Matrix of modal change desires for home heating in Sosnowiec

	Solid fuel in the future	**Not solid fuel in the future**
Solid fuel in the present	9 Entrenched	31 Looking for positive change
Not solid fuel in the present	5 Getting worse	206 Staying positive

The majority of respondents want to stay away from solid fuel. 9 respondents who currently used solid fuel wanted to continue using it in the future. One was not the homeowner and felt they could not change, and another said they had no alternative but gave no further information. Two others listed cost as their reason. One third of the group said they were happy with their current situations, saying either it was “comfortable,” or that “natural energy used in a smart way is the best solution, it also give a lot of heat.” One person also said they felt their existing choice (”ecopea” coal, lignite or bituminous coal in small, 5 to 25 mm granules) was “eco-friendly.”

Of those “looking for positive change,” a third wanted to switch to renewables, a third preferred gas, with others suggesting district heating, electricity or “the cheapest option.” 55% of all of those looking to change gave cost as a reason why they had not already changed. Those who gave their reasons as “not available in my location” were looking for either gas or district heating alternatives (Figure 2-37).

Figure 2-37: Reasons why citizens in Sosnowiec who want to change from solid fuel-only in the present to non-solid fuel for home heating in the future feel unable to change



3 Round 2

The Round 2 survey (Appendix B) built on the responses from Round 1 and comprised two parts, as well as demographic questions:

- Questions about your travel – now and in the future OR Questions about your home heating – now and in the future
- Questions about your future city/region

Citizens were either asked 'Questions about your travel' or 'Questions about your home heating' depending on the dominant pollutant source/concern in that city/region as identified in the Deliverable *D6.1 / 6.2 Policy Baseline Reports*. The questions under these themes from Round 1 were explored further in Round 2, with the closed questions in Round 2 being drawn from the responses to the open questions in Round 1. In some cities/regions the online survey was complemented with face-to-face interviews.

The 'Questions about your future city/region' presented citizens with a set of policy measures derived from the responses to open questions in Round 1 about how they would like to see their city/region improve to 2050. Citizens were asked whether those policy measures would improve or worsen their lives personally and whether, regardless, they would be good or bad for their city/regions. In this way, the Delphi process sought to derive consensus from the population on policy measures that then fed into Round 3, the Game (Task 4.2) and the Stakeholder Dialogue Workshop.

Our response rate was lower on Round 2 across all of our cities and regions as it was an online survey largely promoted through those who had already responded in Round 1 and left their contact details, and through social media platforms (Table 3-1).

This data helps our policy development in allowing us to identify policies with more widespread public support, more controversial policies (where there is a clear split for and against) and identify policies where people feel a difference between the impact on themselves and the impact on the city overall.

Table 3-1: Number of Round 2 respondents and populations for each city/region

City/region	Number of Round 2 respondents	City/region population
Amsterdam	271	834,713 (City survey 2016)
Aveiro region (CIRA)	285	370,394 (Census 2011)
Bristol	230	428,100 (Census 2011)
Liguria	462	1,570,694 (Census 2011)
Ljubljana	73	280,310 (City survey 2017)
Sosnowiec	120	204,013 (City survey 2017)
TOTAL	**1441**	**3,688,224**

3.1 Amsterdam

3.1.1 *Demographic data*

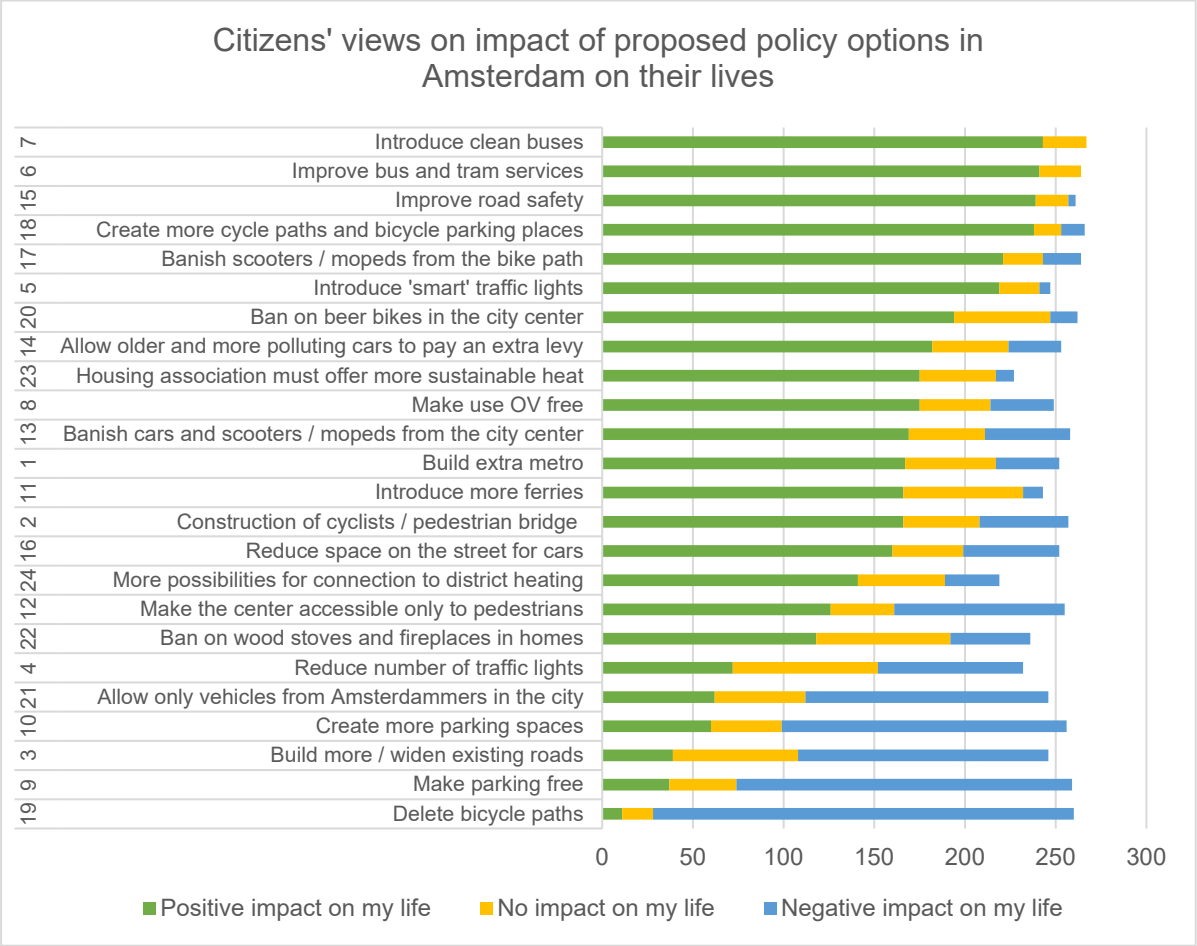
In Round 2, we had a predominantly male sample in Amsterdam with 57% of respondents identifying as male. As with Round 1, the respondents were disproportionately older with 76% of them over the age of 54, compared to only 23% of the city in this category. 73% of respondents had a high level of education, compared with 47% of the city as a whole. 91% of the respondents were Dutch nationals, compared to 86% of the Amsterdam population.

While our respondents are not demographically representative of the region as a whole, we are using their data to understand the better specific behaviours so we can still report valid findings from the categories that we identify.

3.1.2 *Survey results*

The key findings from Round 2 relate to the policy options and the impact that respondents perceived that these would have on their lives and on their city/region. The policy options presented in the Round 2 survey were derived from the citizens' responses to Round 1.

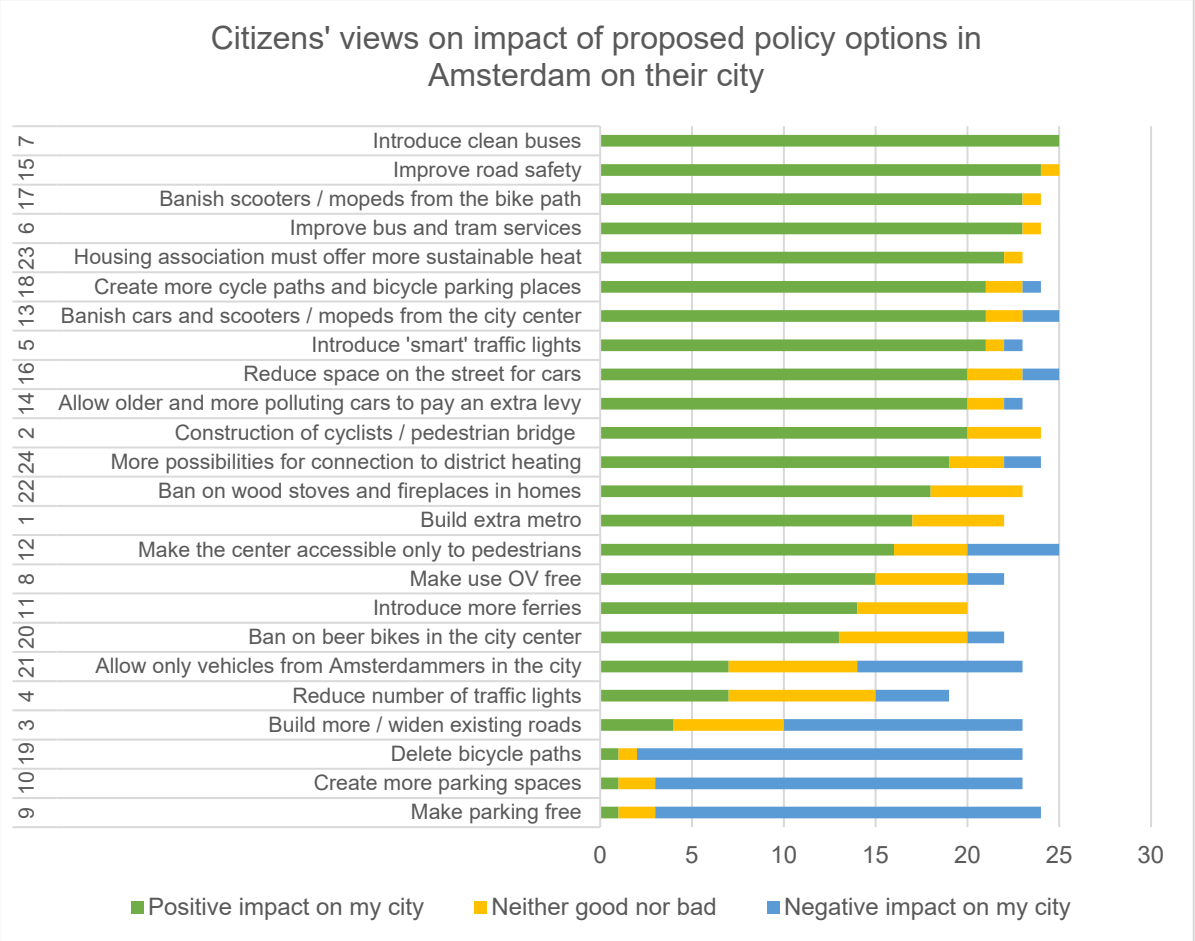
Figure 3-1: Citizens' views on the impact that proposed policy options in Amsterdam would have on their lives



In Amsterdam, the most popular measures with respect to individuals' own lives related to improving public transport, although, perhaps unsurprisingly, creating more cycle lanes and cycle parking was also very popular. Road safety was a key concern for individuals, which may be related to the strength of opinion behind banning mopeds from cycle paths and getting rid of beer bikes[23]. There was some support for levies for older/more polluting cars and banning cars and mopeds from the city centre, but more resistance to completely pedestrianizing the city centre, at least from a private perspective. The least popular measures related to car-centric polices, such as building more, or widening existing, roads, creating free car parking and getting rid of cycle lanes (Figure 3-1).

Concerning home heating, there was strong support for housing associations to provide sustainable heating options and more opportunities for connecting to district heating, although banning wood stoves and fireplaces was slightly more contentious.

Figure 3-2: Citizens' views on the impact that proposed policy options in Amsterdam would have on their city



[23] https://en.wikipedia.org/wiki/Party_bike

Only about 10% of respondents to the question about how the policy options presented may impact their lives responded to the question about how they may affect their city. With that in mind, the respondents' concerns were similar although introducing clean buses was unanimously seen to be beneficial for Amsterdam. Road safety was still a priority, although banning beer bikes was seemingly less important for the city. Conversely, banning cars, scooters and mopeds and reduced street space for cars was seen as of relatively more benefit for the city than for individuals. No respondents considered that the building of an extra metro in the city would be negative. Removing cycle paths and creating (free) parking, however, were very strongly opposed. As with individuals, sustainable heating options were considered positive for the city, and no respondents thought that banning domestic solid fuel burning would be negative (Figure 3-2).

3.2 Aveiro region

3.2.1 *Demographic data*

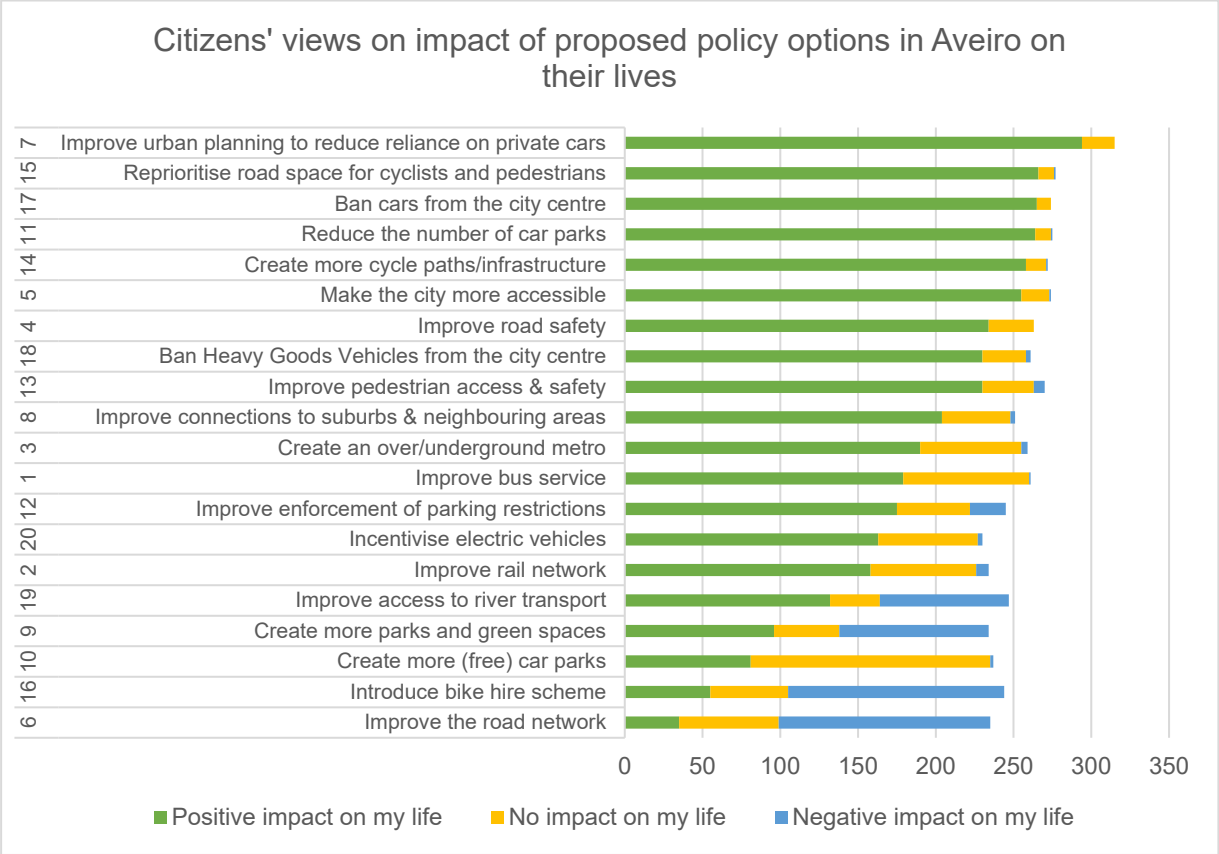
We had a higher rate of women answering our Round 2 survey, with 60% female respondents. The level of education was high compared to the region, with 77% of respondents holding the equivalent of a degree or higher compared to only 15% of the region. The dataset underrepresented older people, with only 3% over 65, compared to 18% of the city.

While our respondents are not demographically representative of the region as a whole, we are using their data to understand the better specific behaviours so we can still report valid findings from the categories that we identify.

3.2.2 *Survey results*

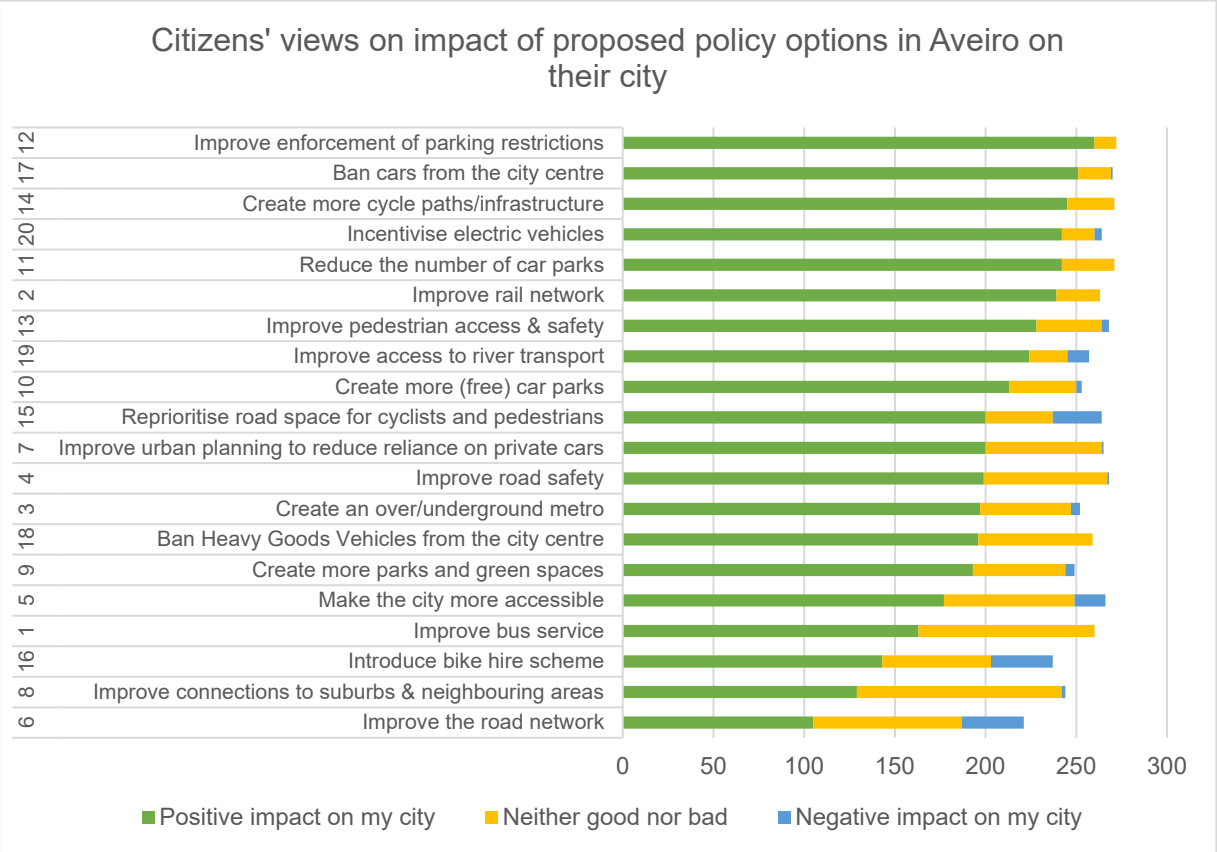
The key findings from Round 2 relate to the policy options and the impact that respondents perceived that these would have on their lives and on their city/region. The policy options presented in the Round 2 survey were derived from the citizens' responses to Round 1.

Figure 3-3: Citizens' views on the impact that proposed policy options in Aveiro would have on their lives



In the Aveiro region, the most popular policy measures for individuals were about reducing the reliance on cars, e.g. improving urban planning, reprioritisation of road space, banning cars from the city centre and reducing the number of car parks. Creating options for cyclists and pedestrians and improving road safety were also popular, as was banning Heavy Goods Vehicles from the centre. There was support for a new Metro and for improving the bus service, rail network and access to river transport, although many respondents did not feel these would necessarily affect them directly. Interestingly creating parks and green spaces was seen to be contentious with equal numbers of respondents considering them to have a positive and a negative impact on their lives. Introducing a bike hire scheme and improving the road network were the least popular options (Figure 3-3).

Figure 3-4: Citizens' views on the impact that proposed policy options in Aveiro would have on their city



There were a similar number of respondents to the 'own life' as the 'city impact' questions in the Aveiro region. Banning cars from the city centre was still popular, as was reducing the number of car parks, however improving enforcement of parking restrictions was considered the most positive measure for the city/region, and incentivising electric vehicles was seen to be good for the region. Encouraging alternative modes, e.g. by creating cycle paths and infrastructure, and improving pedestrian access were popular for the area, as was improving the rail network and access to river transport. Creating more parks and green spaces was a lot less contentious when respondents were considering the city/region as opposed to their own lives. Overall, there were very few negative responses for the impact of the measures presented on Aveiro, although reprioritising road space, introducing a bike hire scheme and improving the road network had some detractors. Interestingly, improving the bus service was not particularly high-ranking for individuals or the city/region (Figure 3-4).

3.3 Bristol

3.3.1 *Demographic data*

In terms of gender, Bristol was reasonably balanced with 52% female respondents. Only 2% of our respondents were in the 16-24 age category, with over-representation of the 25-49 age group. Less than 0.5% of our respondents were registered as having "no qualifications" compared to 20% of the city. In Round 2, our ethnicity representation was poorer, with 93%

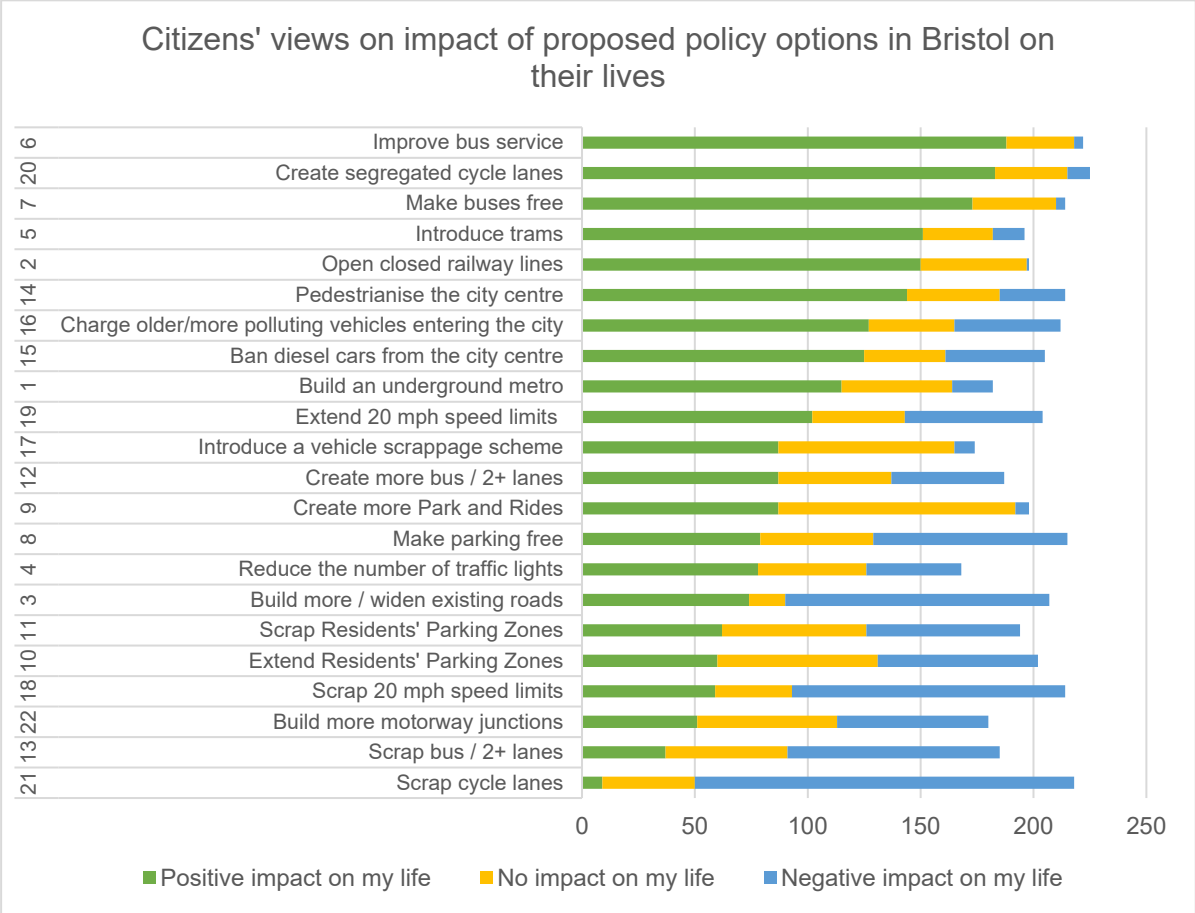
of respondents identifying as “White (British, Irish, Any other white background)” compared to 85% of the city.

While our respondents are not demographically representative of the region as a whole, we are using their data to understand the better specific behaviours so we can still report valid findings from the categories that we identify.

3.3.2 *Survey results*

The key findings from Round 2 relate to the policy options and the impact that respondents perceived that these would have on their lives and on their city/region. The policy options presented in the Round 2 survey were derived from the citizens’ responses to Round 1.

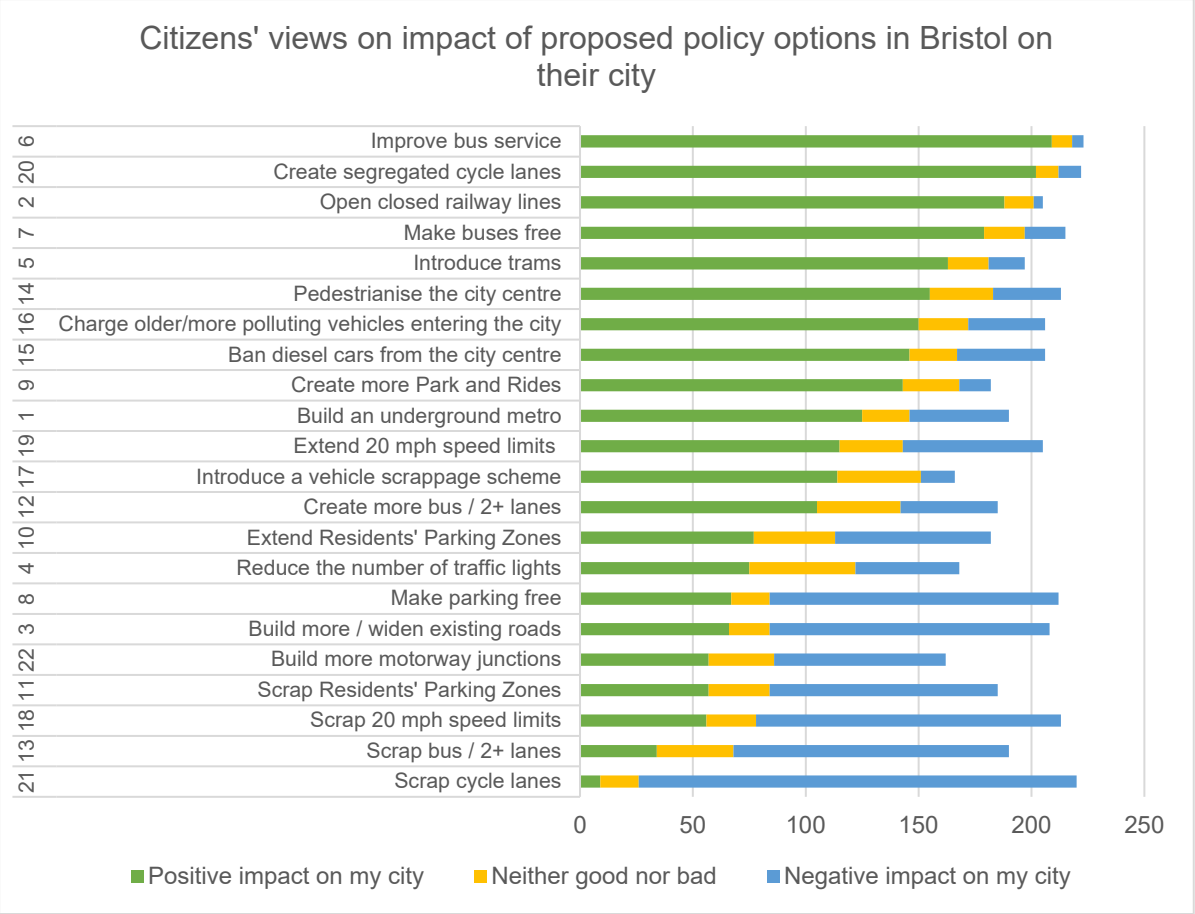
Figure 3-5: Citizens' views on the impact that proposed policy options in Bristol would have on their lives



The most popular responses (for both respondents’ lives and for Bristol) were improving the bus service and creating segregated cycle lanes. For many respondents making the buses free would be beneficial. Introducing trams and opening closed railway lines were also popular options. There was a good deal of support from respondents for pedestrianizing the city centre, charging older and more polluting vehicles and banning diesel cars. Scrappage schemes were seen to be popular, but many respondents recognised that this measure would not affect them personally. There was a lot more support for extending 20 mph zones than there was for their removal, however Residents’ Parking Zones were a lot more

contentious. Scrapping bus and multi-occupancy lanes and cycle lanes were very unpopular (Figure 3-5).

Figure 3-6: Citizens' views on the impact that proposed policy options in Bristol would have on their city



There were a similar number of respondents to questions about the impact of these measures on the city/region as on their lives and, in general, the responses were similar, with strong support for improving public transport and cycle and pedestrian infrastructure, and the removal of older/more polluting vehicles and diesel cars. Residents' Parking Zones were less contentious from a city perspective, with the majority of respondents being in favour of extending rather than scrapping them (Figure 3-6).

3.4 Liguria

3.4.1 *Demographic data*

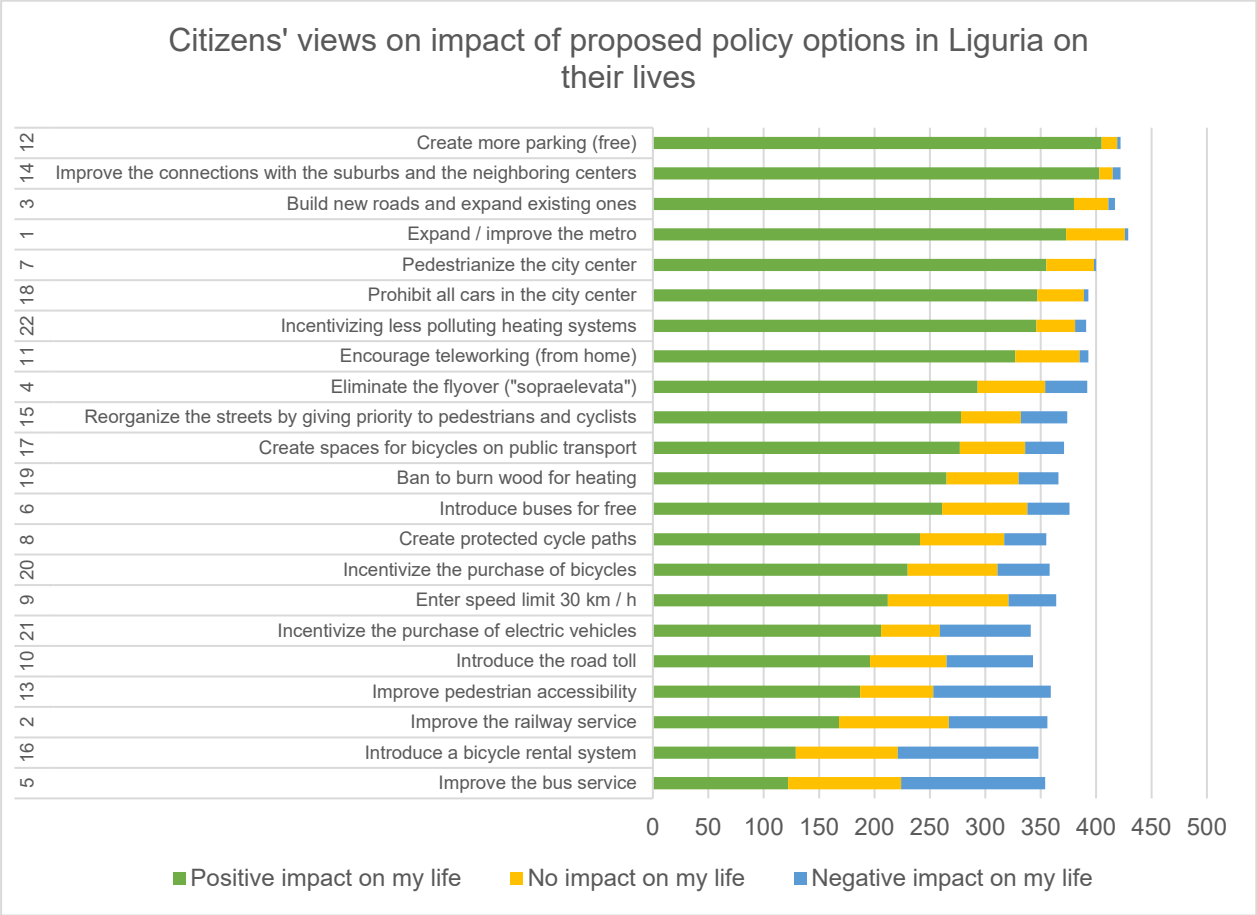
More of our respondents were female, at 59% of the sample. 42% of our respondents were aged 35-49, compared to only 23% of the region. Older people were underrepresented at only 11% over 50, compared to 48% of the population as a whole. The respondents were also highly educated, with 59% holding a professional or degree equivalent title, compared to 38% of the city.

While our respondents are not demographically representative of the region as a whole, we are using their data to understand the better specific behaviours so we can still report valid findings from the categories that we identify.

3.4.2 *Survey results*

The key findings from Round 2 relate to the policy options and the impact that respondents perceived that these would have on their lives and on their city/region. The policy options presented in the Round 2 survey were derived from the citizens' responses to Round 1.

Figure 3-7: Citizens' views on the impact that proposed policy options in Liguria would have on their lives

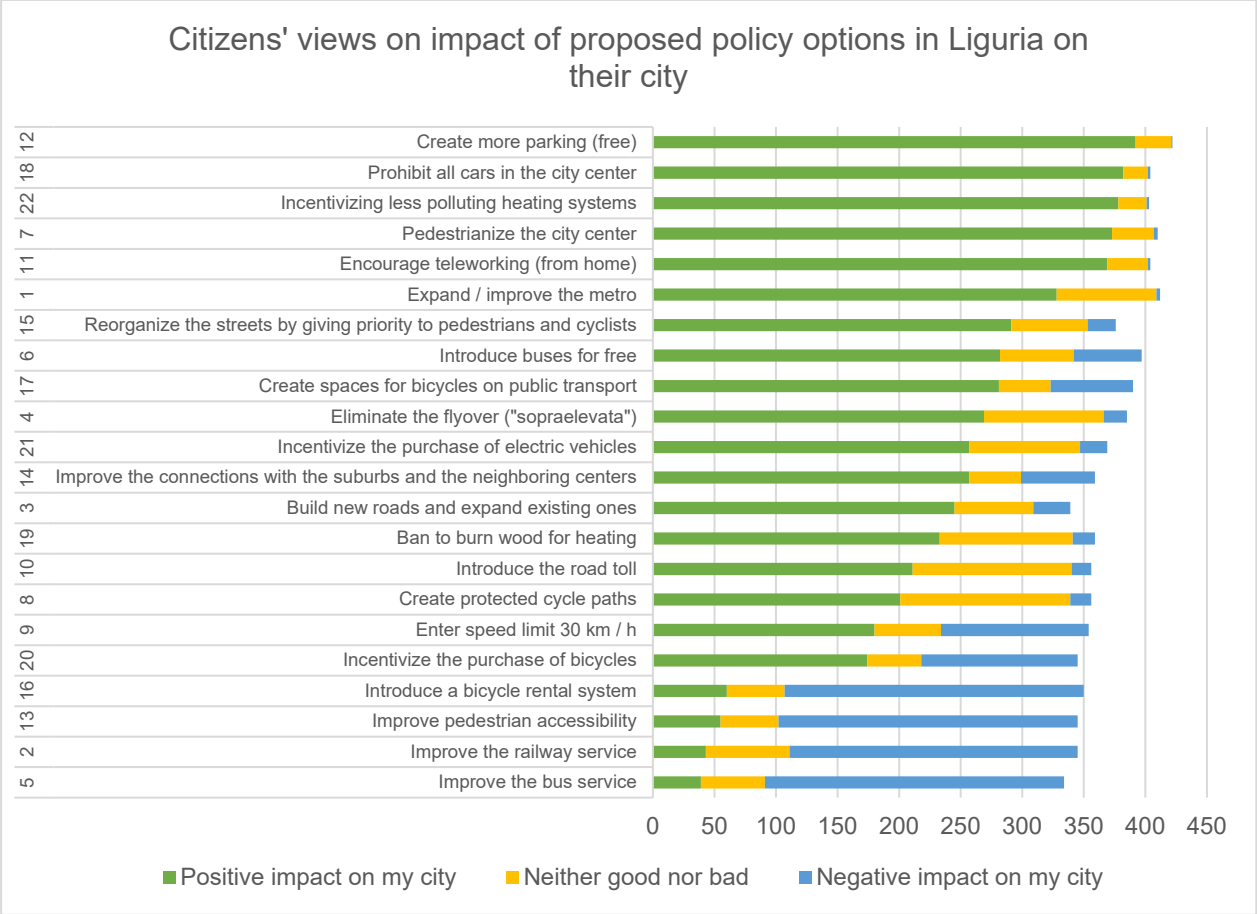


In Liguria, the most popular measures for individuals related to facilitating car use, e.g. more (free) parking, improved connections between the suburbs and the neighbouring centres, building new roads and expanding existing ones. However, there also appears to be some support for alternative modes (e.g. expand/improve the metro), and getting rid of cars (e.g. pedestrianize the city centre, prohibit all cars, reprioritising pedestrians and cyclists).

Improving the rail and bus services and public accessibility are relatively unpopular measures. There is mixed support for cycle-friendly measures (e.g. creating space for bikes on public transport, creating protected cycle paths, incentives to purchase bikes) although a bike rental scheme was not popular. On a personal level, there is general acceptance of some potentially disruptive infrastructural changes (e.g. building new roads, expanding the

metro, pedestrianizing the city centre, getting rid of the flyover, and reprioritisation of road space). With regards to home heating, incentives for less polluting systems was most popular, and banning wood burning was generally seen to be acceptable (Figure 3-7).

Figure 3-8: Citizens' views on the impact that proposed policy options in Liguria would have on their city



There were a similar number of respondents to the 'own life' as the 'city impact' questions in Liguria. Whilst creating more (free) parking was still a top priority, respondents appeared to recognise that banning cars and pedestrianizing the city centre would be beneficial for Liguria, although ironically improving pedestrian accessibility was seen as a negative impact. Improving connections with the suburbs and neighbouring centres and building new roads were ranked less highly for the city than for the individuals. Encouraging teleworking, thereby reducing the need to commute, was popular for individuals and for the city/region. Incentivising less polluting heating systems was a high priority for the city/region, but banning wood burning was not necessarily seen as beneficial (Figure 3-8).

3.5 Ljubljana

3.5.1 *Demographic data*

The majority of respondents were female, making up 68% of the Round 2 respondents. The 37-50 age category were a disproportionate set in our data, at 51% compared to only 24% of the total population. This was at the cost of older people, with only 3% of our Round 2

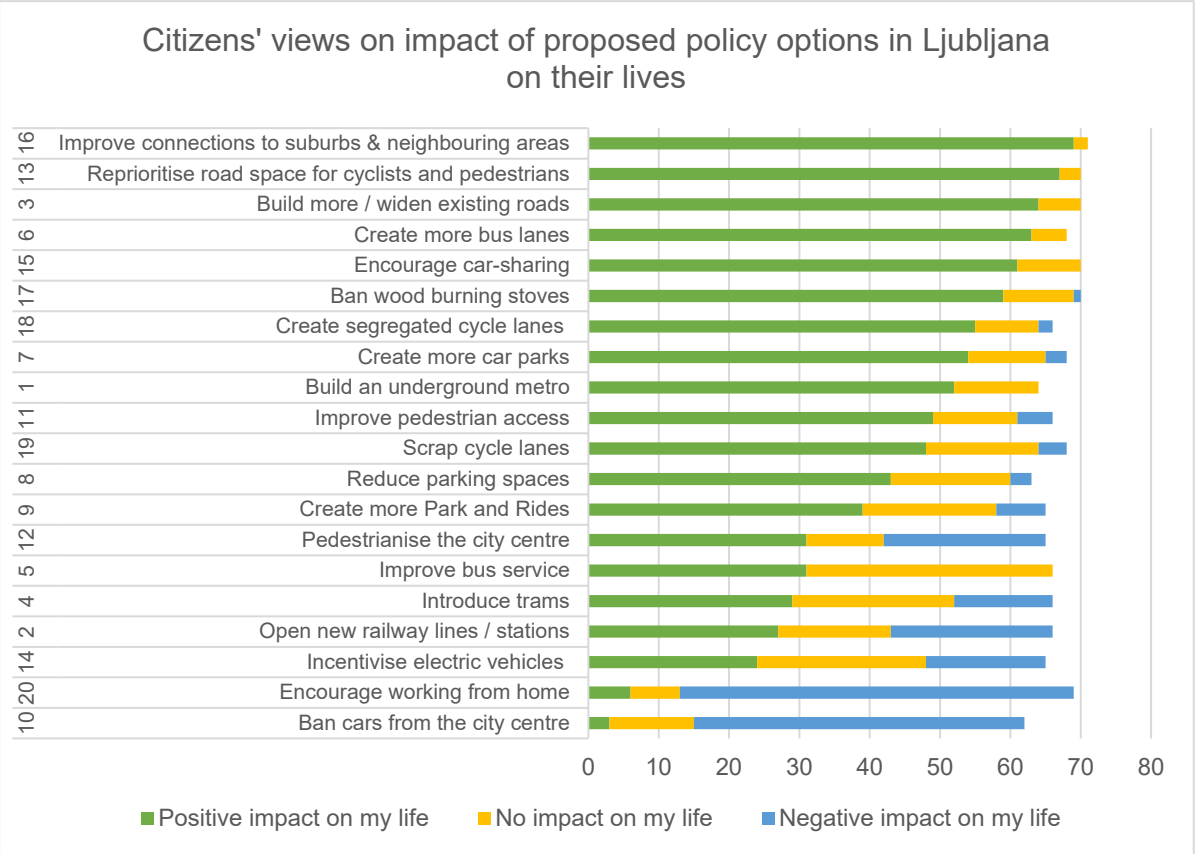
sample over 65, compared to 15% of the city. The data also represents the highly educated more than the average citizens, with 85% holding some form of higher education certificate, compared to only 31% of the general population.

While our respondents are not demographically representative of the region as a whole, we are using their data to understand the better specific behaviours so we can still report valid findings from the categories that we identify.

3.5.2 *Survey results*

The key findings from Round 2 relate to the policy options and the impact that respondents perceived that these would have on their lives and on their city/region. The policy options presented in the Round 2 survey were derived from the citizens' responses to Round 1.

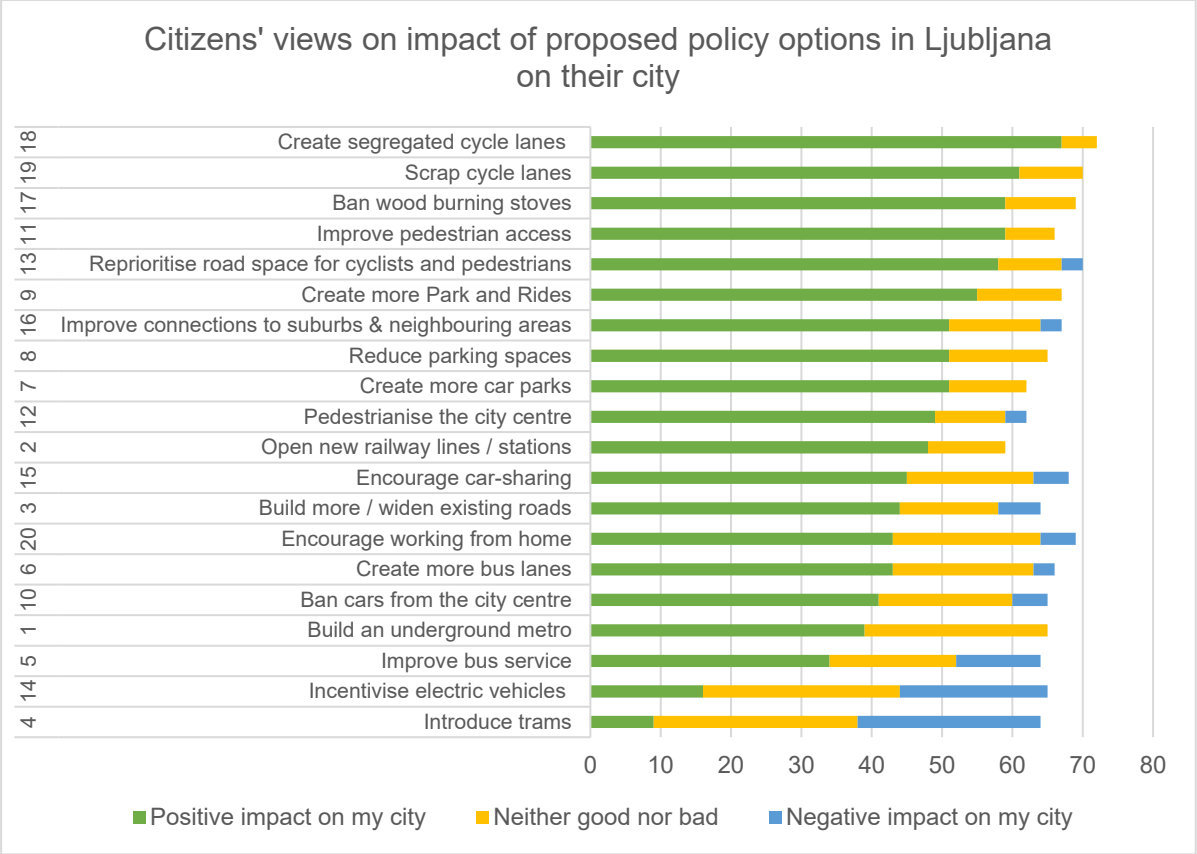
Figure 3-9: Citizens' views on the impact that proposed policy options in Ljubljana would have on their lives



In Ljubljana, among individuals there is strong support for improving connections to suburbs and neighbouring areas and building more, or widening existing, roads. There is also an interest in encouraging car share and for reprioritising road space for cyclists and pedestrians, and creating more bus lanes and segregated cycle lanes. Interestingly others would prefer to scrap the existing cycle lanes. More people would prefer to increase the car parking in the area than want to reduce it, although both options received very few detractors. There is quite a lot of support (and no detractors) for a new underground metro, although less support for improving the bus service, introducing trams or opening new railway lines or stations. There was support for improving pedestrian access but less for

pedestrianisation of the city centre. Encouraging working from home and banning cars from the city centre were the most unpopular options for individuals. Banning wood burning stoves was generally acceptable (Figure 3-9).

Figure 3-10: Citizens' views on the impact that proposed policy options in Ljubljana would have on their city



There were a similar number of respondents to questions about the impact of these measures on the city/region as on their lives. For the city, there are conflicting views about cycle lanes, with the two most popular measures being to both create and scrap them, with slightly more support for the former. Improving pedestrian access was also highly supported, more so than fully pedestrianizing the city centre. Reprioritisation of road space for cyclists and pedestrians also remained popular. Improving connections to suburbs and neighbouring areas appears slightly less important for the city than for individuals, however increasing Park and Rides was more popular. The respondents were divided on car parking with slightly more support for reducing parking spaces. There was less support for building or widening roads for the city, but more support for banning cars in the city centre.

Incentivising electric vehicles was contentious for both individuals and the city. Encouraging car sharing was less popular for the city, but encouraging working from home was more popular than for individuals. Other than building a metro and introducing trams, there was generally more support for public transport improvement and provision for the city. There was similar support for banning wood burning stoves for the city as there was for individuals (Figure 3-10).

3.6 Sosnowiec

3.6.1 *Demographic data*

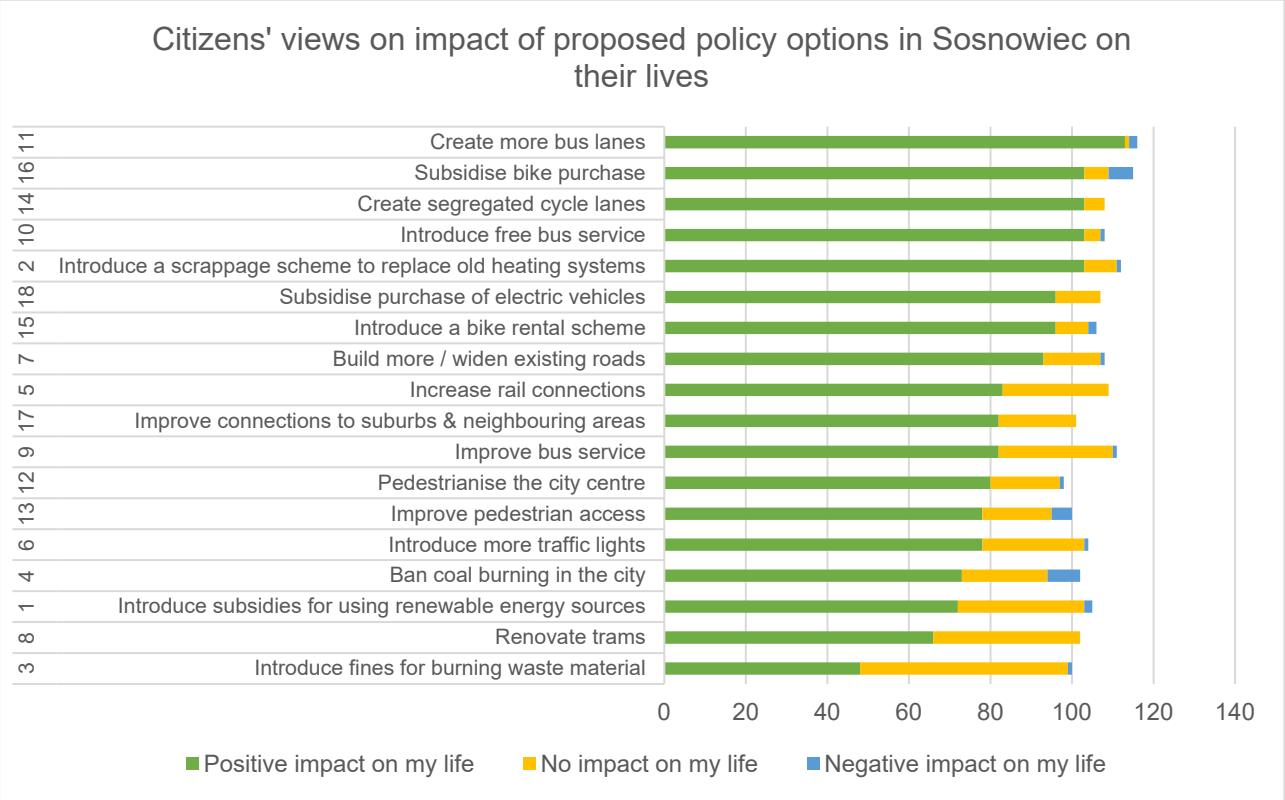
In Sosnowiec, 63% of our Round 2 respondents were women. Older people were underrepresented, with only 3% of the sample but 19% of the general population. Similarly, 82% of our sample had some form of degree or equivalent education, compared to only 25% of the Polish population as a whole.

While our respondents are not demographically representative of the region as a whole, we are using their data to understand the better specific behaviours so we can still report valid findings from the categories that we identify.

3.6.2 *Survey results*

The key findings from Round 2 relate to the policy options and the impact that respondents perceived that these would have on their lives and on their city/region. The policy options presented in the Round 2 survey were derived from the citizens' responses to Round 1.

Figure 3-11: Citizens' views on the impact that proposed policy options in Sosnowiec would have on their lives

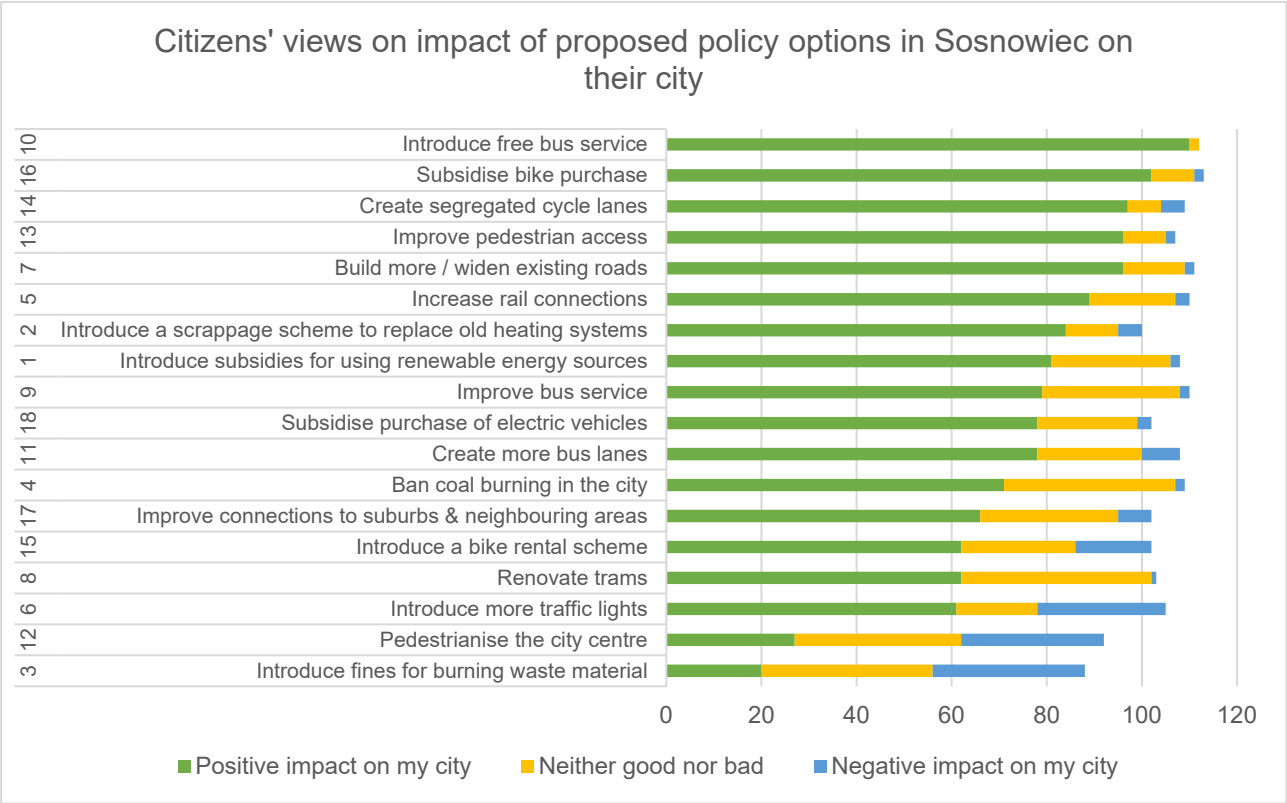


The most popular measures amongst respondents from Sosnowiec relate to improvement or provision of buses (e.g. create more bus lanes, introduce free bus service) and cycling (e.g. subsidise bike purchase, create segregated cycle lanes and introduce bike rental). There is support for continued car use, albeit potentially cleaner vehicles, with subsidising electric vehicles proving popular as well as building more, or widening existing, roads and improving

connections to suburbs and neighbouring areas. Improving the bus service and increasing rail connections were also relatively popular, although there was less support for renovating trams. Pedestrianizing the city and generally improving pedestrian access were supported, although relatively less popular.

With regards to home heating, introducing a scrappage scheme to replace old heating systems was the most popular measure for individuals. Banning coal, introducing subsidies for renewable energy sources and introducing fines for burning waste material were less popular (Figure 3-11).

Figure 3-12: Citizens' views on the impact that proposed policy options in Sosnowiec would have on their city



There were a similar number of respondents to the ‘own life’ as the ‘city impact’ questions in Sosnowiec and, in terms of transport measures, the responses were similar, except creating bus lanes was seen to be less beneficial for the city and pedestrianizing the city centre was a lot more contentious. For home heating, introducing fines for burning waste material was seen as the most negative for the city, however the other measures (e.g. banning coal, subsidies for renewables and a scrappage scheme to replace old heating systems) were generally well-supported (Figure 3-12).

4 Round 3

Round 3 comprised a workshop with small groups of citizens, with two components:

- Activity 1 – Health and air pollution awareness
- Activity 2 – Policy measures

The purpose of Activity 1 was to provide a stimulus for participants to attend the workshop and to set a baseline for their understanding of the policy measures presented in Activity 2. The policy measures presented in Activity 2 were derived from the consensus of policy measures from Round 2, supplemented with additional 'good practice' examples from other cities. In a series of sub-activities, participants were asked how and why the policy measures would affect their lives, and how implementation of those policies regarded by participants as 'difficult to implement' could be facilitated for them.

The results for all cities/regions from Round 3 are presented in *Deliverable D4.2 Delphi Workshops Complete – First City* and *Deliverable D4.3 Delphi Workshops Complete – Last City*. The sections relevant to facilitating "difficult" policies are summarised in brief by city below.

4.1 Amsterdam

4.1.1 *How could the most difficult policies be made easier for you?*

- Instead of metro there should be a more accessible public transport on the ground, with narrow grid
- Not allowing older cars should be accompanied by better public transport and electrical car-to-go
- Free public transport would remove hurdles to enter public transport
- Wood stoves. Not a ban but a policy that only certified wood stoves are allowed. And a subsidy scheme for those that need to replace.
- Electric cars – Stimulate other ways of transport (electric buses for instance) and promote active ways of commuting (walk, bike)

4.2 Aveiro region

4.2.1 *How could the most difficult policies be made easier for you?*

<u>Estarreja</u>

- Create car parks on the outskirts of the city, with connections to the centre by public transport
- Create more cycle paths in the city centre; create free bicycle parking (city hall)
- To provide the citizens with non-polluting vehicles, guaranteeing accessibility, but without polluting; (city hall and change of mentalities in the citizens)
- Many measures, to be accepted by society, imply a change of mentalities
- Prohibit the movement of vehicles in the city centre on specific days, such as on market days or holidays. / The circulation of vehicles in the centre of the city may be

limited but in places (downtown) that have diverse stores and services necessary for the daily life relatively next to each other. This ensures that everyone has access to the services and that there are conditions for the citizens to walk in the streets. (To be applied by Local Government - Municipalities) / This measure could be peaceful if there were good and adequate public transport that allowed access to the different places of the city. (To be applied by the State - Municipalities) / Define days to restrict the access of vehicles to the city centre, especially when holding weekly events that mobilize large numbers of people.

- To ban all car parks - alternatives:
- Vertical parking
- Automatic parking systems
- Easy access systems
- Car parking in the suburban areas followed by public transport (with high quality) to the city centre.
- Definition of cycle lanes (regulating and educating for the relationship between pedestrians and cycle users)
- Education and dissemination of the road traffic rules
- Separate roads for the heavy vehicles
- To create vertical parking spaces with automatic storage and that is economically accessible (national system)
- Create alternatives (buses, bicycles, pedestrian access, etc.) (city hall and citizens)
- Changes to the rules followed by information campaigns (central and local administration and schools); distinguish their routes in order to avoid conflicts (national road system)
- Create integrated system between peripheral car parks and public transport to the city centre (public transport system and city hall)

<u>Ílhavo</u>

- To provide information to citizens about the schedule and waiting time of the public transports.
- To increase the cycle lanes to reduce the dependence of the private car.
- To create lanes only for bus.
- To implement a metro/ tram – allows to safe money comparing with other mobility schemes.
- To develop the project, using the partnership between the University and other Intermunicipal communities, increasing the points of interest within the city centres.
- System of urban buses running on carousel (not in 30min-30min as it currently exists) to reach any part of the city - Local Government (CIRA + Municipalities). Create specific bus lanes.
- The metro should pass through the main points of interest in terms of commerce and services. Road traffic should be banned. - The City Hall, in partnership with the University, mainly with courses related to this area.
- Parks for bicycles in central spaces of the neighbourhoods and with video surveillance (to avoid thefts) - City Hall
- Creation of cycle paths that connect specific and important routes.

- The local government, CIRA and public transport enterprises should create a good bus network and provide free or low-cost parking alternatives.
- Improve the public transport network - to be done by city halls or CIRA; creation of car parks in the suburbs through joint effort of political forces and residents commission
- The creation of a subway has to be carried out by CIRA and combined with other measures (e.g. diminution or prohibition of vehicles in the city centre)
- Create a large parking lot and increase the public transport network to the centre - to be done by the mayor and transport companies; create a public transport network of small capacity (electric minibuses), with strategic circulation by the city and with great frequency - to be done by the city hall and public companies; creation of parking lots in the suburbs - to be done by central and local government
- Be free; no traffic
- Charges for citizens - to be done by central and local government
- Create car parks on the outskirts of the city and create alternatives for internal circulation (city hall + transport system)
- A bicycle sharing system would be more feasible (city hall)
- Create viable alternatives (city hall)
- Creation of municipal structures for the implementation of the surface subway; take advantage of the existing lines between the city of Aveiro and the commercial port and extend it to the beach - to be done by the mayor and CIRA;
- Create agreements with the main employers of the region (industrial zones, state services, universities, ...) to share the costs of installing the subway, privileging access to these areas;
- Redefine roads and establish complementarities with car and bicycle circulation
- Create green and recreational areas in the city; create furniture for picnics (wooden tables and benches); more usufruct of the city; creation of vertical gardens and social spaces; urban gardens; bring fruit trees and herbs to the centre of the city (edible forests); swings for adults
- Create free car parks on the suburbs of the city. Also creating a public transport network that connects the suburbs with the centre of the city
- Extend the pedestrian rides to allow a safer movement for people and bicycles
- Build a Portuguese factories for the production of battery that could work on various brands of electric bicycles
- Implement a public transport network capable of responding to the necessity of accessing the city centre
- Clearing the navigation channels that are clogged (dredging) - to be done by Portuguese Environment Agency; Create river transport network

4.3 Bristol

4.3.1 *How could the most difficult policies be made easier for you?*

In Activity 2, most participants appeared to be able to separate out personal impacts from societal impacts, although in some cases the impact was less directly about how it would influence their travel choice, and more about the aesthetic impact of introducing an underground metro system (for example). Some participants also found it hard to think about timescales up to 2050 initially, but quickly realised that some of the measures that might be

more challenging for the city to implement could be achieved over these timescales and so were able to then make an assessment of the personal impact. Participants found that, in general, policies restricting car travel would be easy to adapt to because of the good level of public transport and services (food, cultural etc.) in their neighbourhood. It was also thought that these measures would be positive, leading to cleaner air, less traffic, less focus on cars and more focus on active travel (walking and cycling), and better safety, although not all participants were able to see the direct relation to reducing emissions. There was discussion on some tables in Activity 2b about whether 'No impact' was more or less positive than 'Easy', however Activity 2c which enabled them to explain their choices helped to ameliorate this concern. Some participants felt that certain measures required more detail, e.g. removing city centre car parking. In addition to the proposed measures, some groups created their own as they considered them to be more effective, although many of these were beyond the scope of the local authority, e.g. increase price of fuel for cars.

4.4 Liguria

4.4.1 *How could the most difficult policies be made easier for you?*

Table 4-1: Policy measures identified as 'difficult' by Round 3 workshop participants in Liguria with recommendations for their facilitation

"Difficult" measures	**How they could be made easier**
Ban all cars from the city centre	time slots: introduce ban hours
Reprioritise road space for cyclists and pedestrians	create suitable cycle paths and scan unruly cyclists
Pedestrianize the city centre	install belt mats and escalators for those who have difficulty 'in walking for a long time
Introduce free buses	To introduce a fixed quote in the taxes
Get rid of the elevated highway	Create under-bridge tunnels
Build more/widen existing roads	Remove parked cars to create residential car park
Introduce motorway tolls	Quick entry control should be introduced, for example, tariffed on telepass
Ban diesel/petrol vehicles from the city centre	To compensate for the elimination of the private vehicle from the roads it would be essential to have frequent public transport and on all the time slots

4.5 Ljubljana

4.5.1 *How could the most difficult policies be made easier for you?*

The most discussion was devoted to the change of society – a big percentage of population now do not have permanent jobs, they work on temporary contracts or as precariat. That does affect their potential for obtaining loans and therefore also for investment in housing. In addition this sector of the population do not know over the longer period if they can spend larger amounts of money for such investments.

The city decision makers would need to organize and to better disseminate/present the available services in the city, improve the system for most vulnerable population, improve the daily migrations and transport of the commuters.

4.6 Sosnowiec

4.6.1 *How could the most difficult policies be made easier for you?*

Getting rid of all car parks in the city:

- The number of transfer centres in the city centre would have to be increased
- It would have to be possible to travel from the car park by another vehicle
- Free parking lots would have to be built outside the centre, from which the centre can be reached easily and cheaply
- In addition to the centre, multi-storey car parks would have to be built (at transfer centres) with simultaneous improvement of public transport
- free public transport
- construction of one big, two-story car park
- there are no paid parking lots in Sosnowiec
- launch of free public transport and transfer points
- parking lots for disabled people and suppliers
- Under condition of expanding the tram network
- If underground is built
- If underground car parks are built

Introducing a speed limit of 30 km/h throughout the city.

- Several bypasses and free public transport would have to be introduced
- Substitute communication, e.g. trams
- Free public transport
- travel time by public transport would have to be reduced;
- speed limited, but only in the city centre, not throughout the city;
- perfectly developed network of trams and electric buses from all districts to the city centre
- increase of the number of cyclists and pedestrians
- subway
- increase of the number of road lanes

- creating an alternative public transport
- introduction of command and prohibition signs
- The introduction of speed limits can make sense if drivers are made aware of their driving culture and learn their driving culture.

High parking fees throughout the city

- Underground parking spaces in off-centre areas, free public transport
- Wages increase
- Free public communication (public transport) for everyone
- a different, easier and faster way to get to school / work than by a car
- car parks on the outskirts
- launch of free public transport
- creating parking lots outside the city centre linked with the public transport network
- the longer you park, the higher the fee is

Ban on using coal as fuel

- high co-financing for other fuels;
- greater awareness of the harmful effects of coal burning;
- Installing a network heating system in residential buildings at the cost of the city.
- It would be acceptable if it would be possible to make large subsidies to change the method of heating and to halve the prices for energy / gas)

No entry by private car to the city centre (centre available only by public transport)

- free public transport, large parking lots outside the centre, more public transport in the centre
- making public transport more cost-effective
- relocate offices and institutions from the city centre

Launching additional rail connections with neighboring cities, increasing the number of tram and bus connections

- Possible to introduce, provided that the buses will be eco-friendly

5 Summary

This report has presented the analysis of Task 4.1 Citizen Delphi Engagement and an evaluation of the data quality in fulfilment of Deliverable D4.4 Pilot Cities DELPHI Evaluation. The report has described the role of the Delphi process within the context of the other ClairCity activities and work packages and within the wider research arena. The Delphi methodology is explained and justified based on citizens as experts in their own lives. By better understanding what citizens want from their city/region and how they live their lives, as well as the policy measures that they support and how more difficult measures could be facilitated, we can gain context for the recommendation of policy measures to be taken forward. By putting citizens at the heart of air quality policy and challenging traditional top-down policy-making, the final Policy Packages will reflect the ambitions and desires of the citizens and will ultimately be more effective in implementation.

An analysis of the demographics has demonstrated that the responses may not necessarily be representative of each city/region as a whole, but that there is significant value in using their data to understand better the specific behaviours relating to transport, heating and policy receptiveness, from the categories that we have identified. By presenting the analysis from each of the three Rounds we have also been able to demonstrate additional value from the process, which not only contributes to later Rounds (as in a traditional Delphi), but is able to provide insight and depth of understanding at each stage.

Appendix A – Round 1 survey (Bristol version)

ClairCity: Citizen-Led Air Pollution Reduction in Cities

ClairCity is a large Europe-wide project to involve citizens in how their cities will develop in the future. This survey is part of our activities to listen to local people. There is space at the end of this questionnaire for you to leave your details if you would like to participate in a second online survey, and if you like, we will invite you to a workshop over the next few months.

This survey is to find out what you think about your city and how you would like to see it improve in the future. We also ask about how you travel around the city, how you heat your home, if and how you would like to change these and the reasons why this may be challenging. This questionnaire will take about 5-10 minutes to complete.

Your answers will not be identifiable to you and will be grouped thematically with other respondents. ClairCity will treat your information in accordance with the terms and conditions of the 1995 EU Data Protection Directive. Overall outcomes from the research will be published in reports to the European Commission, on our website www.claircity.eu, and through wider media.

It is up to you to decide whether or not to take part. If you do decide to take part, please proceed and complete the questionnaire. This study was given ethics consent by the Research Ethics Committee of the Faculty of Environment and Technology, University of the West of England, UK researchethics@uwe.ac.uk.ClairCity Project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 689289.

<table>
<tr><th colspan="3">Questions about your city – now and in the future</th></tr>
<tr><td rowspan="2">1</td><td colspan="2">What do you like/dislike about your city/region now?</td></tr>
<tr><td>Likes:</td><td>Dislikes:</td></tr>
<tr><td rowspan="2">2</td><td colspan="2">How would you like to see your city/region improve over the next 35 years?</td></tr>
<tr><td colspan="2"></td></tr>
</table>

ClairCity Fact

Part of our research is about air pollution. Did you know that road traffic is the biggest source of air pollution in the Bristol area?

Please circle*:* Yes / No

Questions about your travel in the city – now and in the future

3	**How do you currently travel for:**	
	• Commuting to work/study?	
	• Shopping?	
	• Leisure?	
	• Other activity (please specify)?	
4	**How would you like to travel in the future (e.g. in 2050) for:**	
	• Commuting to work/study?	
	• Shopping?	
	• Leisure?	
	• Other activity (please specify)?	
5	**If you want to change, what are the reasons why you can't currently travel that way?**	
6	**If you don't want to change, can you say why not?**	

Questions about your home heating – now and in the future

7	**How do you normally heat your home? E.g. gas, electric…**
8	**How would you like to be able to heat your home in future (2050)?**
9	**If you want to change, what are the reasons why you can't currently heat your home that way?**
10	**If you don't want to change, please can you say why not?**

PLEASE TURN OVER.

Finally, we have a few questions about you. This helps us to make sure that our survey represents the citizens of this city/region.

Questions about you							
11	**Gender**						
	Male	Female	Other	Prefer not to say			
12	**Age**						
	16-24	25-36	37-50	51-65	65+	Prefer not to say	
13	**Ethnicity**						
	Asian or Asian British (Indian, Pakistani, Bangladeshi, Other Asian Background)						
	Black or Black British (Caribbean, African, Other Black Background)						
	Mixed (White & Black Caribbean, White & Black African, White & Asian, Other Mixed Background)						
	Chinese						
	White (British, Irish, Any Other White Background)						
	Prefer not to say						
	Other (please specify)						
14	**What is your highest qualification?**						
	Professional qualification (e.g. Chartered)						
	Higher degree (e.g. PhD, MSc)						
	Degree (e.g. BSc, BA)						
	Secondary school/Further education qualifications (e.g. GCSE, O level, A level)						
	Vocational qualification (e.g. City & Guilds, NVQ)						
	No qualifications						
	Prefer not to say						
15	**Home postcode:**						
If you would like to be involved in an online questionnaire and/or a workshop in the next few months please leave your details below:							
Email							
Phone							

Appendix B – Round 2 survey (Bristol version)

ClairCity: Citizen-Led Air Pollution Reduction in Cities

ClairCity is a large Europe-wide project to involve citizens in how their cities will develop in the future. This survey is part of our activities to listen to local people. There is space at the end of this questionnaire for you to leave your details if you would like to participate in a workshop in the next few weeks.

This survey is to find out about your life in Bristol and how you would like to see it improve. There are questions about your travel and your views on what should and shouldn't be done in Bristol in the future. This questionnaire will take about 10-15 minutes to complete.

This questionnaire follows on from on from a previous (Round 1) questionnaire, but it does not matter if you did not compete the earlier questionnaire.

Your answers will not be identifiable to you and will be grouped thematically with other respondents. ClairCity will treat your information in accordance with the terms and conditions of the 1995 EU Data Protection Directive. Overall outcomes from the research will be published in reports to the European Commission, on our website www.claircity.eu, and through wider media.

It is up to you to decide whether or not to take part. If you do decide to take part, please proceed and complete the questionnaire. This study was given ethics consent by the Research Ethics Committee of the Faculty of Environment and Technology, University of the West of England, UK researchethics@uwe.ac.uk.ClairCity Project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 689289.

Questions about your travel – now and in the future

1 How do you usually travel for these journeys. (Please tick all that apply.)

	Means of travel								
	Car	**Car share**	**Bus**	**Train**	**Bicycle**	**On foot**	**Work at home/ Home delivery**	**Not applicable**	**Other (please specify)**
Travel to work									
Travel to college/ university									
Taking children to school									
Grocery shopping									
Travel to leisure activities									

2 How often do you make these journeys?

	Journey frequency						
	Daily	**Several times a week**	**Weekly**	**Several times a month**	**Monthly**	**Less frequently**	**Not applicable**
Travel to work							
Travel to college/ university							
Taking children to school							
Grocery shopping							
Travel to leisure activities							

3 How long do these journeys take on average?

	Journey time					
	Less than 15 minutes	**15-30 minutes**	**31-60 minutes**	**61-90 minutes**	**Over 90 minutes**	**Not applicable**
Travel to work						
Travel to college/ university						
Taking children to school						
Grocery shopping						
Travel to leisure activities						

4 How much do you enjoy making these journeys?

	Do you like your journey?						
	Really hate it!	**Dislike**	**Neither like nor dislike**	**Like**	**Really love it!**	**Not applicable**	**Why?**
Travel to work							
Travel to college/ university							
Taking children to school							
Grocery shopping							
Travel to leisure activities							

5 Do you have a choice over your destination for grocery shopping and leisure activities?

	Do you have a choice of destination?			If yes, please state why you choose this destination.
	Yes	**No**	**Not applicable**	
Grocery shopping				
Leisure activities				

6 We want to understand what influences people's decisions about travel.

For each of your journeys, why do you travel in this way? (Please choose all that apply.)

	Reasons why you travel that way										
	Cost	**Comfort**	**Conven-ience**	**Distance**	**Timing**	**Fitness/ wellbeing**	**Poor health/ health concerns**	**Lack of altern-atives**	**Another part of my journey depends on it**	**Not applic-able**	**Other (please specify)**
Travel to work											
Travel to college/ university											
Taking children to school											
Grocery shopping											
Travel to leisure activities											

7	**Please tell us more about you would improve your journey.**	
		How would you improve your journey?
	Travel to work	
	Travel to college/ university	
	Taking children to school	
	Grocery shopping	
	Travel to leisure activities	

8 We want to know how people in Bristol would like to travel in the future.

If you could choose another way of doing these activities in the future, what would you choose? (Please choose all that apply, even if they are not currently available.)

	Means of travel													
	Car	**Electric car**	**Car share**	**Public transport**	**Bus**	**Train**	**Metro/ Under-ground**	**Tram**	**Bicycle**	**Electric bike**	**On foot**	**Work from home/ Home delivery**	**Not applic-able**	**Other (please specify)**
Travel to work														
Travel to college/ university														
Taking children to school														
Grocery shopping														
Travel to leisure activities														

Questions about your future city/region

Please think about what you would like your city/region to be like in the future (i.e. 2020-2050).

9 These are all ideas that Bristolians have suggested to improve Bristol.
If any of the following were introduced in Bristol in the future, how would they affect your life?

	Impact on your life				
	Improve my life	**No impact**	**Worsen my life**	**Don't know**	**Comments**
Build an underground metro					
Open closed railway lines					
Build more / widen existing roads					
Reduce the number of traffic lights					
Introduce trams					
Improve bus service					
Make buses free					
Make parking free					
Create more Park and Rides					
Extend Residents' Parking Zones					
Scrap Residents' Parking Zones					
Create more bus / 2+ lanes					
Scrap bus / 2+ lanes					
Pedestrianise the city centre					
Ban diesel cars from the city centre					
Charge older/more polluting vehicles entering the city					
Introduce a vehicle scrappage scheme					
Scrap 20 mph speed limits					
Extend 20 mph speed limits					
Create segregated cycle lanes					
Scrap cycle lanes					
Build more motorway junctions					

10 These are all ideas that Bristolians have suggested to improve Bristol.

If any of the following were introduced in Bristol in the future, do you think this would be good or bad for Bristol overall?

	Do you think this would be good or bad for Bristol overall?			
	Good	Neither good or bad	Bad	Don't know
Build an underground metro				
Open closed railway lines				
Build more / widen existing roads				
Reduce the number of traffic lights				
Introduce trams				
Improve bus service				
Make buses free				
Make parking free				
Create more Park and Rides				
Extend Residents' Parking Zones				
Scrap Residents' Parking Zones				
Create more bus / 2+ lanes				
Scrap bus / 2+ lanes				
Pedestrianise the city centre				
Ban diesel cars from the city centre				
Charge older/more polluting vehicles entering the city				
Introduce a vehicle scrappage scheme				
Scrap 20 mph speed limits				
Extend 20 mph speed limits				
Create segregated cycle lanes				
Scrap cycle lanes				
Build more motorway junctions				

11 **Is there anything else you would like to say about the future of your city?**

PLEASE TURN OVER.

Finally, we have a few questions about you. This helps us to make sure that our survey represents the citizens of this city/region.

Questions about you							
11	**Gender**						
	Male		Female		Other		Prefer not to say
12	**Age**						
	16-24	25-36	37-50	51-65	65+		Prefer not to say
13	**Ethnicity**						
		Asian or Asian British (Indian, Pakistani, Bangladeshi, Other Asian Background)					
		Black or Black British (Caribbean, African, Other Black Background)					
		Mixed (White & Black Caribbean, White & Black African, White & Asian, Other Mixed Background)					
		Chinese					
		White (British, Irish, Any Other White Background)					
		Prefer not to say					
		Other (please specify)					
14	**What is your highest qualification?**						
		Professional qualification (e.g. Chartered)					
		Higher degree (e.g. PhD, MSc)					
		Degree (e.g. BSc, BA)					
		Secondary school/Further education qualifications (e.g. GCSE, O level, A level)					
		Vocational qualification (e.g. City & Guilds, NVQ)					
		No qualifications					
		Prefer not to say					
15	**Home postcode:**						

Previous questionnaire		
16	**Did you complete the previous ClairCity Round 1 questionnaire?**	
		Yes, online
		Yes, I was interviewed at an event
		Yes, I completed a paper copy at an event
		No, not as far as I am aware
		Don't know

Many thanks for your participation. We will be running a 2-hour workshop in different neighbourhoods in Bristol. Please leave your email address or phone number if you would like more information**.**

Email	
Phone	