
Demand Responsive Transport Connecting People to Opportunities

Survey and Interview Data Overview

The Centre for Transport & Society
University of the West of England, Bristol

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1 Project summary

‘The Role of Demand Responsive Transport in Connecting People to Opportunities in Less Densely Populated Areas’ project (or ‘DRT-CPO’ for short) was funded by UK Research and Innovation (UKRI) via its Creating Opportunities Evaluation Development Fund which supported projects generating causal evidence on what works to spread opportunities and reduce spatial disparities in outcomes for people and places across the UK. The project was conducted between May 2024 and April 2025 by the University of the West of England (UWE Bristol) and the University of Leeds.

Demand Responsive Transport (or DRT) is a flexible public transportation service that adjusts routes and schedules based on passenger demand, rather than following fixed routes and timetables. The latest generation of DRT uses sophisticated algorithms to coordinate the scheduling of passengers, dispatch and routing of vehicles with passengers using an app to book and pay for journeys. DRT has been viewed as having the potential to better meet the needs of local communities than fixed timetable bus services where demand is dispersed. There has been a large growth in DRT services since 2020 when the Department for Transport (DfT) made funding available, first with the Rural Mobility Fund and then with the Bus Service Improvement Fund. Over 50 different schemes were noted in England, Scotland and Wales by the middle of 2024 (Stonham, 2023). In some cases, they are being introduced in areas without existing bus services and in other cases as a replacement of LA supported services.

DRT services are primarily aimed at improving social inclusion and access to services. However, concerns have been raised they are costly to run with revenues from customers only contributing a small share of running costs (Stonham, 2023). In transport planning practice, the user benefits of schemes are usually considered in terms of how much time and cost they save travellers, rather than what social and economic activities are made possible. As noted in Chatterjee et al. (2019), “there have been relatively few attempts at systematic evaluation of the benefits of initiatives aimed at improving accessibility for target groups/areas”. This gap in knowledge is particularly urgent to address given the investment in DRT services taking place currently.

The overall aim of the project was to assess DRT’s impact in unlocking educational, employment, social and other opportunities for residents in rural areas. It had three objectives:

1. To apply an innovative, participatory methodological framework to measure the impact of public transport on life-defining economic, social and health outcomes.
2. To estimate the social value of DRT schemes and bus services more generally in areas of rural deprivation and their contribution to reducing place-based inequalities.
3. To inform policy in relation to the future of DRT and broader public transport services.

The project was intended to help DfT, local authorities, service providers and other interested parties to understand the potential contribution of DRT, and public transport more generally, to their objectives and enable them to make better informed funding decisions. It was also intended to make a major methodological contribution to valuing the social impacts of public transport.

In partnership with the county councils of Essex, Gloucestershire and Nottinghamshire, the project looked at the impact of DRT services in three rural case study areas. Impact evaluation was conducted using a quasi-experimental approach with surveys of residents in deprived sub-areas of DRT service areas and comparator areas. It considered the impact of DRT not only on those people using the service but also on the local communities in general. For users it looked at how DRT can unlock educational, employment, social and other opportunities and for non-users it looked at the value they place on having a public transport

service that is available to others in the community, distinct from the value they place on personal use.

This document summarises the data collection methodology and data collected. An ethics application for the collection of the data was submitted to the College Research Ethics Committee (College of Arts, Technology and Environment at UWE Bristol) and given approval on 2nd December 2024.

2 Data collection needs

The data collection was designed to meet the evaluation needs of the project. The evaluation plan involved using a combination of quasi-experimental and theory-based evaluation methods to identify DRT impacts and explain them.

The project sought outcome data for residents living both in DRT service areas and comparator areas and aimed to establish whether there was a ‘treatment’ effect of DRT discernible for the different outcomes measured. The DRT services had been introduced in 2022, two years before the project started, and it was only possible to obtain ‘post-intervention’ data.

The project also sought detailed information on DRT use from DRT users in each of the three study areas. This was intended to enable a theory-based evaluation approach to be used to test the intervention logic. The logic map (Figure 1) below shows the theoretical expectation for how DRT can achieve beneficial outcomes for rural residents and impacts for the economy and society.

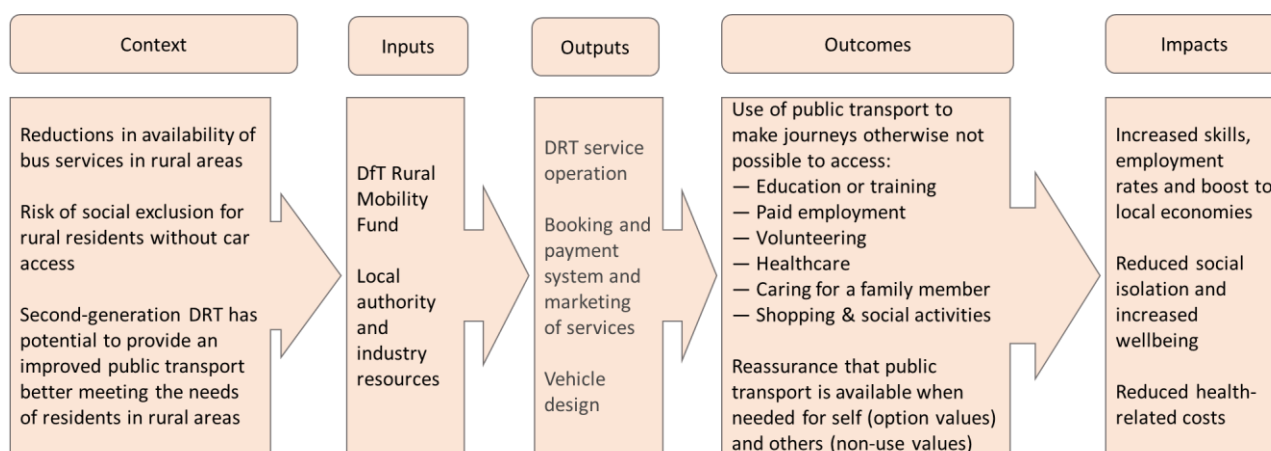


Figure 1: Logic map for impacts of DRT in areas of rural deprivation

The data collection involved a questionnaire survey of residents living in areas served by DRT, residents living in surrounding areas not served by DRT and people who had installed a DRT app. This was followed up by in-depth interviews of a subset of DRT users to understand in more depth how DRT assists with accessing opportunities.

3 Survey design and data collection

3.1 Sampling

Prior to data collection, for each of the three study areas we held participatory workshops with local stakeholders to explore social and economic challenges faced and the role of transport disadvantage. This informed the content of the questionnaire survey. Input was received on where to focus the research within the areas served by DRT and on how best to

collect data. This led to the decision to advertise the survey to residents using the Royal Mail Door to Door drop leaflet service which requires selection of postcode sectors.

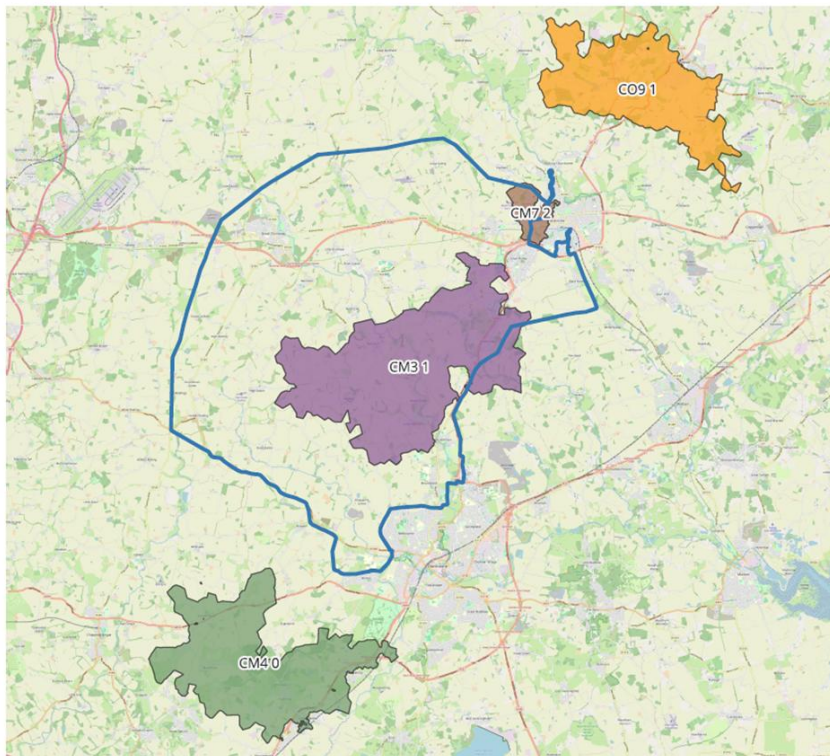
It was not feasible to survey the full populations of DRT areas and it was important to target areas of disadvantage. We selected specific geographical sub-areas in each DRT area and surrounding area based on an index of 'public transport need' (which we created based on demographic, economic and transport data¹) for Lower-layer Super Output Areas (LSOAs). We then selected postcode sectors which contained high ranked LSOAs in terms of public transport need and ensured there were good matches between the postcode sectors selected in DRT ('treatment') areas and surrounding ('comparator') areas.

The selected treatment areas within each DRT service area and comparator areas outside each DRT service area are shown in Table 1 and Figures 2-4. There were 6,000 - 7,000 households in both the treatment areas and comparator areas for each DRT service.

Table 1: Selected treatment and comparator areas

Local authority	DRT service(s)	Number of vehicles	Treatment areas	Comparator areas
Essex	Central Essex & South Braintree (DigiGo)	6	Braintree, Great Leighs	Blackmore, Halstead
Gloucestershire	South Forest of Dean (Robin)	1.5	Cinderford, Coleford	Dymock, Newent, Staunton
Nottinghamshire	(1) North Ollerton and (2) South Ollerton (Nottsbus On Demand)	5	Treswell, Tuxford	Bilthorpe, Harworth

¹ Decile scores for percentage of residents aged below 20 or above 64 years old, percentage of households without a car, average travel time to nearest hospital by public transport and English indices of deprivation 2019 Index of Multiple Deprivation (IMD).



DRT-CPO
Resident's survey
mail-out postcode
sectors

Basemap: Open Street Map

Postcode Boundaries:
<https://longair.net>
 Contains OS data © Crown copyright
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 Contains Royal Mail data © Royal Mail
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 Source: Office for National Statistics
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Please note postcode sector
 boundaries are approximate.

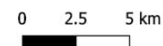
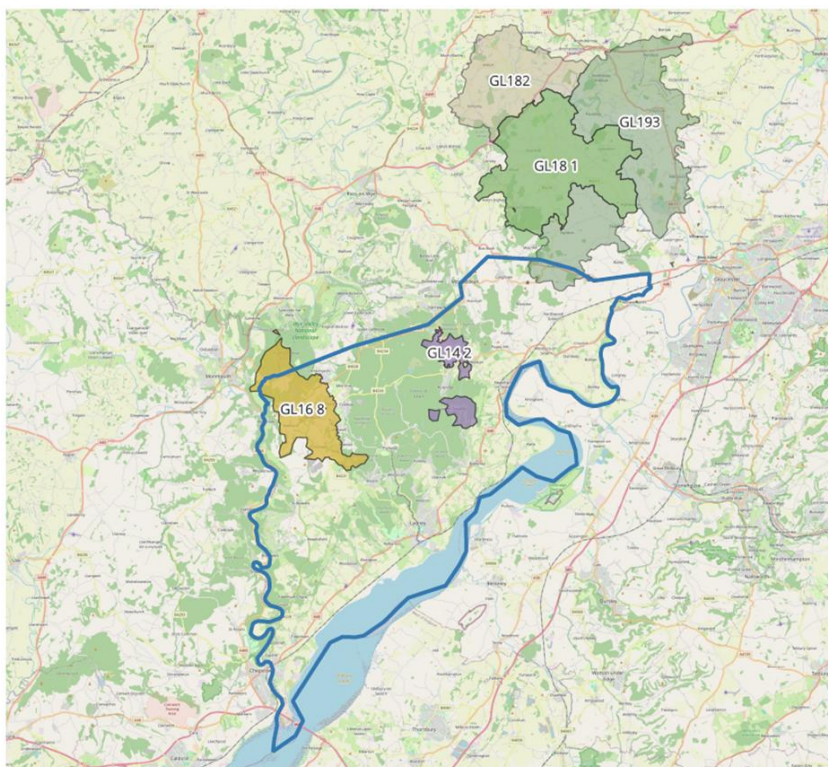


Figure 2: Selected postcode sectors in Central Essex & South Braintree DRT service area and surrounding area



DRT-CPO
Resident's survey
mail-out postcode
sectors

Basemap: Open Street Map

Postcode Boundaries:
<https://longair.net>
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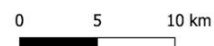


Figure 3: Selected postcode sectors in South Forest of Dean DRT service area and surrounding area

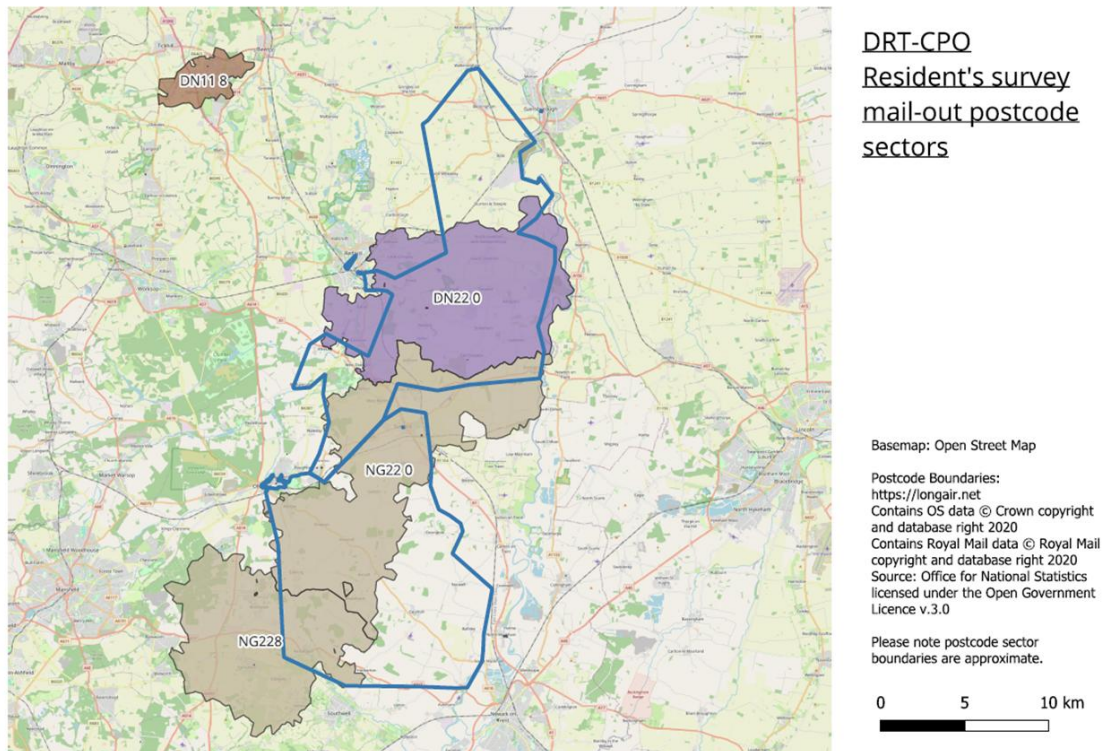


Figure 4: Selected postcode sectors in North Ollerton/South Ollerton DRT service area and surrounding area

3.2 Survey content

The same general design was used for the questionnaire for each of the three case studies with slight changes in wording reflecting the different names of the DRT services and counties. The questionnaire was designed for three target groups: residents living in DRT-served areas, residents living outside DRT-served areas, and DRT app users. Branching logic was used to direct the survey participant to appropriate parts of the questionnaire.

The questionnaire had eight sections, titled as shown below.

Table 2: Questionnaire sections

Section	Topic coverage
1	"How you get around for different travel needs"
2	"Availability and use of local public transport"
3	"The last time you used [DRT brand name]"
4	"Your use of [DRT brand name] in the last three months"
5	"Your preferences for [DRT brand name]" (for those living in a DRT service area or a DRT user) [or] "Your preferences for a future DRT service" (for those living outside a DRT service area)
6	"Your local area and wellbeing"
7	"Personal and household details"

Sections 3 and 4 were about DRT use and were only completed by survey participants who had used the DRT service in their area. Section 5 involved a stated preference (SP) exercise where respondents were presented with five scenarios and in each scenario asked to choose between different future hypothetical options for DRT in their area. In addition to personal and household details, the final section requested contact details for those respondents willing to participate in follow-up research (in particular an in-depth interview) or wishing to be entered into a prize draw.

3.3 Survey distribution

Survey flyers were distributed to 41,000 addresses in total across the three case study areas (using the Royal Mail Door to Door drop leaflet service) and in-app messages were sent to users of the DRT services (Central Essex & South Braintree, South Forest of Dean, North Ollerton/South Ollerton). The Qualtrics online survey tool was used to collect questionnaire survey data. The survey flyers and text messages contained QR codes/web links to enable residents to access and complete the questionnaire.

Responses were received between December 2024 and March 2025. By monitoring the geographical distribution of responses received, we identified low response numbers from some target locations in each case study area and made in-person field visits to achieve additional responses. This involved knocking on doors and visiting community venues. We used the same Qualtrics online survey tool but on a tablet where the researcher could assist the survey participant complete the questionnaire.

3.4 Survey data processing

After the survey closed, responses were merged into one data set from separate data sets for each case study. The merged data set consisted of 1,607 responses.

A data cleaning process was carried out which led to 237 responses being removed due to the following reasons:

- Test responses submitted prior to survey launch (n=17)
- Responses which did not complete section 1 (n=207)
- Duplicate responses (n=13)

Partial responses were retained as long as section 1 was completed. The final data set consists of 1,370 responses with 908 fully complete responses and 462 partial responses (most of which completed sections 1-2 and sections 3-4 if applicable).

Survey participants were asked to provide their full postcode with 922 responses including this. This was to help us identify the geographical sub-area where they lived and to analyse how survey responses vary according to local socio-economic conditions. From the postcodes, Lower-layer Super Output Areas (LSOAs) have been obtained via a look-up table between postcodes and 2021 LSOAs. Each LSOA comprises between 400 and 1,200 households and has a population between 1,000 and 3,000 persons, in contrast to each full postcode which has an average of 15 delivery points (addresses). This has minimised the risk of identification of individuals.

Spatial variables have been added to the data set by linking to external data sets based on LSOAs. These include the following:

- English indices of deprivation 2019 Index of Multiple Deprivation (IMD) score/decile
- Percentage of residents aged below 20 or above 64 years old from Census 2021
- Percentage of households without a car from Census 2021
- Average travel time to nearest hospital by public transport in minutes based from Department for Transport Journey Time Statistics 2019

Some of the information provided by survey participants has been recoded with recoded variables present in the data set as well as original variables. A small number of derived variables have also been added based on information provided by survey participants.

Personal data has been removed from the data file which includes any information which could enable individuals to be identified (postcode, contact details, names). Open question responses have been checked and any detailed information which could enable individuals to be identified has been generalised (e.g. removed street names, removed mention of health condition).

A summary of survey responses in the final data set is presented in Table 3.

Table 3: Summary of survey responses

Survey target group Local authority	Residents of DRT service area	Residents outside DRT service area	DRT app	Total
Essex	158	51	404	613
Gloucestershire	174	138	51	363
Nottinghamshire	145	108	141	394
Total	477	297	596	1370

Please refer to the survey questionnaire (with separate versions for each county), variable information file and other survey materials for further information about the survey data.

4 Interview design and data collection

The interviews were designed to understand in more depth than possible from the questionnaire survey how DRT is perceived by users, how DRT has enabled users to make journeys otherwise not possible and the wider impact on their lives of being able to access opportunities. There was an initial target sample size of 10 interviews for each case study.

Please refer to the interview guide, case list and other interview materials for further details about the interview data.

4.1 Sampling

The interview participants were recruited from survey respondents who agreed to take part in further research and provided their contact details. A total of 338 survey respondents expressed willingness to take part in further research. A purposive sampling approach was adopted. Initial recruitment focused on those who did not own a car and had an annual household income below £40,000 and had used DRT and said that their journey would not have been possible without DRT. To increase the sample size, the car ownership and income criteria were relaxed and we deliberately targeted participants from demographics (gender, age, ethnicity, disability or long-term health issues) under-represented in the initial sample.

Shortlisted interview participants were contacted through their preferred contact method and asked if they wished to be interviewed. Out of 60 contacted individuals, 26 were

interviewed and the process was halted once data saturation was reached - when similar experiences were heard across participants and when a mix of individuals with differing demographic and socio-economic backgrounds, as well as mental and physical abilities, was obtained.

4.2 Interview content

The interviews covered the following topic areas:

Table 4: Interview topic areas

Part	Topic area
1	"When and why started using DRT in the context of life situation"
2	"How DRT has helped get to destinations/opportunities"
3	"Living well and the role of DRT"
4	"Feelings about using DRT"
5	"What they think about the value of DRT to the wider community"

4.3 Interview process

Interviews were conducted between February 2025 and April 2025. All except for one interview were conducted via Microsoft Teams in the form of a video call or a telephone call. One interview was conducted in person. All interviews were audio recorded (based on consent of the participant).

4.4 Interview transcripts and anonymisation

The personal information held in the interview transcripts is categorised as 'sensitive data' as defined by the Data Protection Act, since most of the respondents referred to their physical or mental health, some in more detail than others and how the issues they are experiencing affect their employment, their social relations and the ways in which DRT acts as an enabler in these circumstances.

All transcripts have been fully anonymised so the information contained cannot be traced back to them. Written transcripts were commissioned from a trusted third-party company which involved removing the names of participants, family members, colleagues, acquaintances and interviewers, as well as some place names and personal information such as age and home town. Upon receiving the anonymised transcripts, the research team reviewed all texts to quality check the anonymisation process and add additional anonymisation. Overall, the process for the main identifiers can be summarised as follows:

Names (of participants, family members, friends, colleagues, acquaintances)

Names that could identify individuals were removed and replaced with a descriptor.

- For family members, this was possible through using [husband], [wife], [son], [daughter], etc...

Place names: residences, local streets, local shops/amenities, schools/colleges/universities, local landmarks, estates, workplaces)

- Anonymity was applied to residential areas at the neighbourhood and village levels due to the small number of residents in such areas, which may create risks for identification. The names of these places and features within them (such as streets, roads, estates, etc.) were replaced with suitable descriptors.

- The names of large places were almost always left in (for example, London, Gloucester, and Nottingham) with the exception being when these were sufficiently unique to potentially identify someone (as an example, one participant moved to Gloucestershire from a county in England and the latter detail was removed as it could have potentially made them identifiable to someone with local knowledge of this community. The county was generalised to a [county in southern England]).
- Workplaces and employer names were replaced with [workplace/employer] as standard, sometimes with additional detail when this was informative (for example: [local hospital])
- Local schools and colleges that participants or other named individuals attended were replaced with descriptive terms. University names were mostly substituted because they could serve as identifiers in rural contexts (for example, a graduate of a particular university might be recognised in a rural setting).

Personal information: age, nationality, home village/town/city, previous addresses

Personal information related to participants and other people mentioned was routinely replaced with an appropriate descriptor.

- In the case of age, an individual's age was replaced with an age range; the type of age range varied by context (for example, for children it was often more useful to put [primary school age], or [mid-teens]. For adults it was more useful to use a numerical format (e.g. [35-45]).
- Home villages/towns/cities and previous addresses were mostly replaced. Some were kept, for example, if a person was originally from Bristol and now lives in a town in Gloucestershire, this information was retained due to the close proximity of the two places. If a participant discussed transport they used in the past and casually mentions place names rather than specific previous addresses, those place names were also kept (for example, "I'd just end up walking from say Sea Mills up into Clifton").
- If the participant specifically mentioned a country outside England, the nationality was changed even if the interviewee was from the UK. However, in order to give some context, countries were replaced with descriptions like [a country in sub-Saharan Africa] or [a country in Western Europe].

A 'case list' is included with the interview transcripts. Each interviewee is uniquely identified by county and serial number in the transcripts and case list. The case list also includes categorical information for each interview participant on household structure, gender, age, ethnicity, education, employment status, income, health conditions, caring responsibilities as reported in the questionnaire survey. Index of Multiple Deprivation (IMD) decile is also included based on data linking from the postcode provided in the survey. This information is not detailed enough to identify individuals, but it provides demographic and socio-economic context information on the interview participants.

5 References

Chatterjee, K., Clark, B., Nguyen, A., Wishart, R., Gallop, K., Smith, N., & Tipping, S. (2019). Access to Transport and Life Opportunities. Project Report for Department for Transport.

Stonham, P. (2023). Failing DRT schemes will have cost £100m, analysis reveals. In *Local Transport Today* 868 (10 May 2023), pp.2-3.