
# Rural Mobility Fund Evaluation: Interim Report

On behalf of the Department for Transport

transport for quality of life

UNIVERSITY OF WESTMINSTER

sustrans

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## Disclaimer



## Acknowledgements

We want to explicitly thank the local authorities, operators and app providers involved in this research and data collection for their participation. They have devoted a considerable amount of time and effort into obtaining and collating the data and all involved in the monitoring and evaluation are grateful for their efforts.

We also want to acknowledge that this report presents a variety of information and data, with local authority statistics differing from one another, as would be expected. Whilst some data may show 'stronger' results than other data, the purpose of the RMF pilot project and the monitoring and evaluation is to learn about what best works, in which circumstances and why. Therefore, all data is valuable and contributes to supporting learning around how to increase the viability of DRT and assess whether it can provide an effective solution to rural transport provision in some areas. Without local authorities trialling different processes and set ups for their DRT schemes, giving the variation in the data, little useful information would be gained.

## Image credit

Cover photo: Vinita Nawathe

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# GLOSSARY OF TERMS

| Term | Meaning |
|---|---|
| **Award/RMF award** | A successful bid to the RMF which received funding. |
| **Corner to corner (C-to-C)** | A service picking up and dropping passengers off at designated stops (a combination of pre-existing physical bus stops and new virtual stops). |
| **Demand Responsive Transport (DRT)** | Flexible service that provides shared transport to users who specify their desired location and time of pick-up and drop-off.[1] |
| **D-DRT** | Demand Responsive Transport utilising digital technology. |
| **England national concessionary travel scheme (ENCTS)** | A mandatory bus concession for older and disabled people.[2] |
| **Feeder service** | Service to connect to high frequency bus or rail corridors, or even remove need to interchange, reducing journey length and time, depending on the service.[3] |
| **Free-floating service** | With respect to bus-based DRT, a service that can pick up and drop off passengers throughout an operating zone. |
| **Hub and spoke system** | A transport system in which passengers travel from smaller stops/stations to one large central stop/station to make longer trips.[4] |

[1] www.gov.uk/government/publications/demand-responsive-transport-local-authority-toolkit/demand-responsive-transport-local-authority-toolkit

[2] www.gov.uk/government/publications/guidance-for-travel-concession-authorities-on-the-england-national-concessionary-travel-scheme/guidance-for-travel-concession-authorities-on-the-england-national-concessionary-travel-scheme

[3] www.gov.uk/government/publications/demand-responsive-transport-local-authority-toolkit/demand-responsive-transport-local-authority-toolkit

[4] https://dictionary.cambridge.org/dictionary/english/hub-and-spoke-system

| Term | Meaning |
|---|---|
| **National Public Transport Access Node (NAPTAN)** | National dataset of all public transport 'stops' in England, Scotland and Wales.[5] |
| **Pilot/RMF pilot** | A single RMF award. |
| **Pilot area** | Geographical DRT operating zone covering single pilot award. |
| **Pilots launched** | LA pilot areas where at least one scheme has launched. |
| **Revenue hours** | The hours when the vehicles of a DRT scheme are in revenue service (i.e. the time when a vehicle is available to the general public and there is an expectation of carrying passengers).[6] |
| **Roundtable** | Involving several people who talk about something as equals.[7] |
| **Scheme** | A single DRT zone of operation. |
| **Scheme area** | Geographical area of the DRT operating zone. |
| **Schemes launched** | Geographical DRT operating zones where the scheme has launched. |
| **Second-generation DRT** | Used to describe a more recent product or model that uses improved technology, making it better than when it was first available.[8] |
| **Service** | Bus service which is part of a DRT scheme or separate to it. |
| **Unfulfilled journey bookings** | Booking requests that were submitted but not fulfilled due to supply factors (e.g. unavailability of vehicle) or demand factors (e.g. passenger cancelling booking). |

[5] www.gov.uk/government/publications/national-public-transport-access-node-schema/html-version-of-schema

[6] Pettersson, F., 2019. An international review of experiences from on-demand public transport services. The Swedish Knowledge Centre for Public Transport.

[7] dictionary.cambridge.org/dictionary/english/roundtable

[8] dictionary.cambridge.org/dictionary/english/second-generation

| Term | Meaning |
| --- | --- |
| **Vehicle utilisation rate** | Average daily distance travelled per vehicle with passengers. |
| **Virtual bus stop** | Pick up or drop off in an area that doesn't have a physical bus stop.[9] |

[9] www.n-somerset.gov.uk/my-services/parking-travel-roads/transport-travel/bus-travel/westlink

# EXECUTIVE SUMMARY

## Overview

The Rural Mobility Fund (RMF) is a £20 million fund to trial Demand Responsive Transport (DRT) solutions in rural and suburban areas of England. 15 local authorities (LAs) outside London were awarded funding to run DRT pilot schemes between April 2021 and March 2025. The University of the West of England has been commissioned by the Department for Transport (DfT) to undertake a programme-level evaluation study of the RMF.

DRT is defined as a flexible service that provides shared transport to users who specify their desired location and time of pick-up and drop-off. In the case of the RMF, it specifically refers to flexible bus services operating in areas of low passenger demand where a regular bus service is not considered to be financially viable. The current funding provided through the RMF is facilitating trials of second-generation DRT, underpinned by the availability of sophisticated algorithms that coordinate the scheduling of passengers, dispatch and routeing of vehicles and ensure the continuous optimisation and efficiency of the service. Passengers can book a journey, pay for it and track a vehicle within a mobile app.

DRT has long been seen to offer the potential to provide public transport services in areas with low or dispersed populations. This promise has often floundered in the past in respect of commercial or financial sustainability, and a need for significant levels of financial support. The RMF offers the opportunity to investigate the performance of DRT schemes in a variety of settings in England.

The primary objectives of the fund are:

- To improve understanding of whether DRT can fill a gap in current service provision, or work with existing services to create an improved public transport package that better meets the needs of residents in rural and suburban areas.
- To better understand the specific barriers unique to DRT and any potential solutions that may establish it as a viable and sustainable alternative.

The evaluation study is addressing these objectives through: (i) conducting a programme-level process evaluation of the RMF to understand the experiences of designing and implementing the DRT pilot schemes and what lessons can be learned; and (ii) collecting monitoring data from LAs for each pilot scheme, analysing the data and summarising programme-level results. This interim report presents initial findings from the evaluation study based on data collected in the first 18 months of the funded period up to September 2022.

## The DRT pilot schemes

Fourteen out of a total number of 22 DRT schemes had started serving the public in 12 LAs by October 2022. Six DRT schemes are set to start in the remaining three LAs in 2023 and another two schemes will be introduced in LAs already running schemes. Six of the 14 operational schemes are serving predominantly rural areas,

six are serving areas with mixed urban and rural character and two are serving suburban areas. The residential populations served vary from about 12,000 to 176,000 people.

All the DRT services are designed as flexible bus services that provide shared transport to users who specify their desired location and time of pick-up and drop-off. In some cases, the services are restricted to operate entirely within a single operating zone, while in others they are permitted to leave the operating zone and act as feeders to locations/zones outside the boundary of the operating zone. All the DRT services provide a 'corner to corner' service picking up and dropping passengers off at designated stops (a combination of pre-existing physical bus stops and new virtual stops).

The number of vehicles per scheme varies between one and six and the DRT schemes are using minibuses with between 12 and 16 seats. Most schemes have been running six days a week (Monday to Saturday) for at least 12 hours per day. In most cases, the new DRT schemes have been introduced with no changes to existing bus services, but in some cases LAs have taken the opportunity to reorganise LA supported public transport services. Journey bookings can be made via mobile apps, websites and phone. Fare structures vary between flat rate, mileage-based and zone-based. The DRT schemes have the ambition to attract a wide range of users including concessionary pass holders, fare paying adults (including young adults), commuters and school children.

Interviews and roundtables with LAs to explore their experience in designing and mobilising the DRT schemes has shed light on the challenges faced by LAs in setting up a new form of public transport and why the introduction of DRT schemes was delayed in some cases. They also provide valuable lessons for other LAs who are considering DRT.

The interviews and roundtables identified that LA officers were required to review and prepare plans to improve their wider bus networks in 2021-2022 which reduced time available to focus on the DRT schemes. The service design and implementation process for DRT schemes involved several challenges that had not been experienced before. These included forecasting demand, identifying virtual bus stops and procuring a technology platform and payment processor. Having overcome these challenges, LAs are in a good position to consider future DRT schemes and to consider other enhancements to public transport provision in their areas.

LAs have grasped the opportunity to reach out to a broad cross-section of their public in marketing the DRT schemes and the data analytics available from the DRT technology platforms are already proving invaluable for reviewing the effectiveness of the DRT schemes.

## DRT operational performance

Operational performance of the DRT schemes has been analysed based on monitoring data supplied by the LAs. Data was available for nine out of 12 LAs whose schemes had started by October 2022.

DRT schemes have been fully operating to their advertised schedules at 25-30 days per month. Distance travelled without passengers is of a similar magnitude to

distance travelled with passengers. Higher empty running ratios have been recorded for schemes areas with low population densities. Vehicle utilisation rates (measured in terms of average daily distance travelled per vehicle with passengers) have generally been in the range of 33 – 86 miles with lower rates for one scheme that only just started operating and another scheme that has reconfigured its service to make it more appealing.

Average journey distances have been longest for the schemes serving rural areas with the lowest population densities (for example, 10.7 miles in Norfolk), and shortest for pilots serving areas with the highest population densities (for example, 2.4 in Warwickshire).

The lead times for journey bookings have varied considerably with bookings made two weeks in advance on average in North Lincolnshire and 1-4 days in advance in other scheme areas. Unfulfilled journey bookings (i.e. booking requests that were submitted but journeys were not ultimately made) are in the range of 13.0% to 18.9% across five schemes which supplied this data. App-based bookings are generally more popular than phone or website bookings, but phone bookings have been equally popular to app bookings in North Lincolnshire and remain an essential feature in all the DRT schemes.

## DRT usage

DRT usage appears to be on an upward trend for all the schemes. Average usage levels of 282 - 1725 passengers per month (or 11 – 676 passengers per day in operation) have been recorded for schemes that started before October 2022. Schemes which serve areas with relatively large populations, and have more vehicles available, have achieved the highest passenger numbers (North Lincolnshire, Nottinghamshire, Warwickshire and Hertfordshire).

The results for number of passengers per revenue hour show a range from 0.14 to 1.77. This is a similar range of values to those reported in a study  of second-generation DRT schemes published in 2019 (covering schemes in eight countries), but lower than values reported for traditional DRT schemes in various contexts in the United States .

The extent to which DRT schemes are being used by passengers travelling on concessionary fares varies between 12% and 55%. Where information is available, there are notable numbers of children/young people using the schemes. The average revenue per passenger (across paying and non-paying passengers) differs considerably between pilots with a range of £1.22 - £2.92 for well-established schemes. Fare structure and the proportion of concessionary permit holders are two influential factors that determine revenue per passenger.

The passenger use profile by day of week and time of day varies between schemes. Saturdays are more popular than weekdays in some cases, whilst in other cases more use is seen on weekdays. Journeys are made less often in the morning peak period than middle of day and afternoon peak period.

Rail and bus stations and market towns within the operating zones, or at the edge of operating zones, are attracting a large number of journeys. Healthcare centres, employment and retail parks and schools and colleges also feature as popular

destinations. This suggests that the DRT schemes are helping to enable connections to local transport, economic, retail, education and healthcare facilities.

## Concluding remarks

It has not been possible to assess whether overall bus use in the scheme areas (including use of the DRT schemes) has seen a more positive trend than other areas, but we expect that this will be possible when a longer time-series of monitoring data and equivalent data from wider services and areas has been collected. It is hoped that many of the LAs will carry out surveys of DRT users. Limited survey results were available at the time this report was written, but results from surveys will help to build an understanding of the socio-demographic characteristics of users, the nature of journeys made and whether there were alternative transport options.

This report represents a new knowledge base to assist LAs and other agencies in considering the role of DRT schemes in different contexts. It has documented how 14 DRT schemes have been set up across rural and suburban areas of 12 LAs and summarised their operational performance and usage at an early stage in their operation. It has shown that DRT services can be implemented to serve less populated areas, as well as detailing examples of good practice and lessons learnt when doing so, but a fuller assessment would be needed to ascertain whether they achieve wider objectives.

# 1. INTRODUCTION

This report presents interim findings from an evaluation of the Rural Mobility Fund (RMF), a £20 million fund to trial Demand Responsive Transport (DRT) solutions in rural and suburban areas of England. It presents findings from the evaluation study at a point in time when most of the DRT pilot schemes have started operating and serving the public. It includes lessons learnt from the design and mobilisation stages of the DRT schemes, as well as initial outcomes on DRT performance and usage.

## 1.1. Demand Responsive Transport

DRT is defined by DfT in its 'Demand responsive transport: local authority toolkit' as:

> *"a flexible service that provides shared transport to users who specify their desired location and time of pick-up and drop-off"*

In the case of the RMF, it specifically refers to flexible bus services operating in areas where demand is more dispersed and the distances involved make it more challenging to maintain or provide services meeting residents' needs, and in mixed use or residential areas at the outer fringe of urban areas where links to existing transport hubs are often less developed.

The local authority toolkit states that DRT services are primarily aimed to improve social inclusion and access to services, but they can also contribute to reducing carbon emissions by replacing car journeys and facilitating multi-modal travel, for example by linking users to a train station or fixed route bus service. For providers, they might also be more economical compared to a fixed route bus service by only running when there is demand and on an optimised route. From the perspective of users, DRT can enable travel at a convenient time and provide an almost door-to-door service.

DRT has long been seen to offer the potential to provide public transport services in areas with low or dispersed populations. This promise has often floundered in the past in respect of commercial or financial sustainability, and a need for significant levels of financial support . A review of DRT schemes in England and Wales in 2009 based on a survey of LA officers found schemes were predominantly aimed at "increasing accessibility to locations that were currently inaccessible". LA officers reported their schemes to be largely successful at achieving their objectives. Where lack of success was reported, common reasons were "generating sufficient demand and surmounting psychological barriers of prospective users". It found "the majority of the schemes were operating at a subsidy level exceeding £2.00 per passenger trip, with slightly over half having a subsidy exceeding £5.00 per passenger trip". The review noted a subsidy level of £2.00 - £5.00 was considered acceptable based on the cost of operating conventional bus services. LA officers were confident their schemes could achieve financial sustainability in the medium to long run.

## 1.2. RMF pilot programme

In 2020, the Department for Transport (DfT) invited English Local Authorities (LAs) outside London to bid for funding to trial on-demand bus services in rural or suburban areas. 17 successful applications ('awards') from 15 LAs were announced in March 2021 with funding provided from April 2021 to March 2025. In May 2021, DfT commissioned the University of the West of England (UWE Bristol) to undertake a programme-level evaluation study of the RMF.

The current funding provided through the RMF is facilitating trials of second-generation DRT, underpinned by the availability of sophisticated algorithms that coordinate the scheduling of passengers, dispatch and routeing of vehicles and ensure the continuous optimisation and efficiency of the service. Passengers can book a journey, pay for it and track a vehicle within a mobile app . Second-generation DRT is sometimes referred to as Digital Demand Responsive Transport (D-DRT).

A recent study[10] of D-DRT schemes, which use the latest technology, looked at 35 schemes in nine countries and found they were operating in a mixture of contexts (often low density, low-demand peripheral urban or semi-rural areas) but it was not clear that productivity, measured as passengers/revenue hour, was greater than for traditional DRT. The RMF offers the opportunity to investigate the performance of DRT schemes in a variety of settings in England.

The primary objectives of the fund are:

- To improve understanding of whether DRT can fill a gap in current service provision, or work with existing services to create an improved public transport package that better meets the needs of residents in rural and suburban areas.
- To better understand the specific barriers unique to DRT and any potential solutions that may establish it as a viable and sustainable alternative.

These objectives will be partly assessed in terms of the extent to which the DRT services help contribute to the following policy goals:

- Improve access to employment, education, healthcare and other services.
- Enable greater social inclusion and reduce isolation.
- Provide a public transport offer that attracts a diverse customer base.
- Support the government's commitments to tackling air pollution and reducing carbon emissions by reducing reliance on private vehicles.

A logic map has been developed to provide a systematic and visual representation of how the RMF programme is expected to achieve its objectives. This is included in Appendix A. It shows how enhanced and more efficient provision of local public transport, via the addition of DRT services, is intended to improve perceptions of

[10] Pettersson, F., 2019. An international review of experiences from on-demand public transport services. The Swedish Knowledge Centre for Public Transport.

## 1.3. Research areas and questions

The evaluation study is addressing the two primary objectives of the RMF programme through two research areas:

1. Collecting monitoring data from LAs for each pilot scheme, analysing the data and summarising programme-level results.
2. Conducting a programme-level process evaluation of the RMF to understand the experiences of designing and implementing the DRT pilot schemes and what lessons can be learned.

A set of 19 research questions have been defined based on the overall objectives of the RMF and the programme-level logic map. They are organised into three separate groups of questions concerned with:

a. Overall lessons from the pilots,

b. Population impacts

c. Delivery and implementation lessons.

These questions will be addressed as far as possible through the two research areas above. The process evaluation is aimed in particular at answering the delivery and implementation questions. The monitoring data analysis is aimed at contributing towards answering the population impacts questions. Further impact and value for money (VfM) evaluation may follow later and enable a broader analysis of the impacts of the RMF schemes in a subset of pilot areas.

### Overall lessons

| | |
|---|---|
| RQ1 | What is the potential for DRT to fill gaps in current public transport provision in rural and suburban areas? |
| RQ2 | Is DRT best implemented as a standalone service, or can it work with existing services to create an improved public transport package that better meets the need of residents in rural and suburban areas? |
| RQ3 | Are there specific barriers to viable and sustainable DRT implementation in rural and suburban areas? |
| RQ4 | Are there particular aspects of the pilots that help facilitate DRT as a viable and sustainable alternative in rural and suburban areas? |

### Population impacts

| | |
|---|---|
| RQ5 | Can DRT improve access to employment, education, healthcare and other services in rural and suburban areas? Does it facilitate new / additional access to such services (i.e., new employment taken, greater take up of further education and training, fewer missed appointments for healthcare)? |
| RQ6 | Could DRT play a role in supporting economic activity in rural towns and neighbouring urban areas? Does this apply to both daytime (i.e., retail, services) and night-time economic activities (i.e., leisure, culture)? |
| RQ7 | Do DRT services facilitate (greater) social inclusion and help to reduce isolation in rural and suburban communities? |

| | |
|---|---|
| RQ8 | Does a DRT service enabled by new digital technologies provide a public transport offer that attracts a diverse (and potentially new) customer base, reaching new target groups / markets? |
| RQ9 | Are existing user groups still supported in a digitally enabled DRT service, in particular older people and those who are disabled, who may not use (or be unable to use) digital technologies? |
| RQ10 | What are the impacts of DRT in rural and suburban areas in respect of air pollution and carbon emissions? |
| RQ11 | Do the new DRT services encourage modal shift from the private car and reduce dependence on it? Might DRT have an influence on driving licence holding longer term? |

## Delivery and implementation lessons

| | |
|---|---|
| RQ12 | Have the pilots been delivered as intended? |
| RQ13 | What worked well, less well, for whom and why? |
| RQ14 | What could have been improved in the delivery and implementation of the DRT schemes? |
| RQ15 | How effective have communications and promotional activities been in generating patronage, and in increasing the understanding of the opportunities provided by DRT? |
| RQ16 | How did context and local authority's capabilities and capacity influence delivery? |
| RQ17 | What are the implications of the RMF pilots for future DRT solutions delivered by LAs? |
| RQ18 | What are the implications for DfT of the RMF pilots for future DRT policy making, regulatory structures and funding? |
| RQ19 | How does the learning from the RMF programme-level evaluation build on existing understanding of the role of DRT in public transport? |

## 1.4. Scope and structure of report

This interim report presents initial findings from the evaluation study based on data collected in the first 18 months of the funded period up to September 2022.

**Table 1** lists the RMF-funded DRT schemes with their start dates.

**Table 1: RMF-funded DRT schemes with start dates**

| | RMF award | DRT scheme | Local authority | Region | Start date |
|---|---|---|---|---|---|
| 1. | Buckinghamshire - Aylesbury | Buckinghamshire - Aylesbury | Buckinghamshire CC | South East | Not launched yet (planned Autumn 2023) |
| 2. | Buckinghamshire - High Wycombe | Buckinghamshire - High Wycombe | Buckinghamshire CC | South East | September 2022 |
| 3. | Cheshire East | Cheshire East - South West of Nantwich | Cheshire CC | North West | October 2021 |
| 4. | Cheshire West and Chester | Cheshire West and Chester - South of Frodsham and Helsby | Cheshire CC | North West | Not launched yet (planned July 2023) |
| 5. | Cumbria | Cumbria - Penrith | Westmorland and Furness Council | North West | Not launched yet (planned Autumn 2023) |
| | | Cumbria – Egremont-St Bees | Cumberland Council[10] | North West | Not launched yet (planned Autumn 2023) |
| | | Cumbria - Ulverston | Westmorland and Furness Council | North West | Not launched yet (planned Autumn 2023) |
| | | Cumbria - Wigton | Cumberland Council[11] | North West | Not launched yet (planned Autumn 2023) |

[10] This DRT scheme will operate within the Cumberland Council authority area but will be managed by Westmorland and Furness Council.

[11] This DRT scheme will operate within the Cumberland Council authority area but will be managed by Westmorland and Furness Council

| | RMF award | DRT scheme | Local authority | Region | Start date |
|---|---|---|---|---|---|
| 6. | Essex - Central Essex | Essex - Central Essex and South Braintree (schemes now merged) | Essex CC | South East | Two separate awards: March 2022 (both launched) Sept 2022 (schemes merged and extended to Great Dunmow) |
| 7. | Essex - South Braintree | | | | |
| 8. | Gloucestershire | Gloucestershire - South Forest of Dean | Gloucestershire CC | South West | October 2022 |
| | | Gloucestershire – North East Cotswolds | Gloucestershire CC | South West | October 2022 |
| 9. | Hertfordshire | Hertfordshire - North and East Herts | Hertfordshire CC | South East | September 2021 |
| 10. | Leicestershire | Leicestershire – South West Leicestershire | Leicestershire CC | East Midlands | July 2022 (with formal launch September 2022) |
| 11. | Norfolk | Norfolk – Swaffham | Norfolk CC | East of England | March 2022 |
| 12. | North Lincolnshire | North Lincolnshire | North Lincolnshire CC | Yorkshire and the Humber | September 2020 |
| 13. | Nottinghamshire | Nottinghamshire - North and South Ollerton | Nottinghamshire CC | East Midlands | August 2022 |
| | | Nottinghamshire - Mansfield | Nottinghamshire CC | East Midlands | August 2022 |
| | | Nottinghamshire – West Rushcliffe | Nottinghamshire CC | East Midlands | May 2023 |
| 14. | Staffordshire | Staffordshire - Moorlands | Staffordshire CC | West Midlands | October 2021. March 2022 (extended operating |

| RMF award | DRT scheme | Local authority | Region | Start date |
|---|---|---|---|---|
| | | | | zone to south west) |
| 15. Surrey | Surrey – Mole Valley | Surrey CC | South East | May 2021 (pre-pilot in small area)<br>June 2022 (expanded to cover northern part of full operating zone) May 2023 (full operation) |
| 16. Warwickshire | Warwickshire - Hatton and West Warwick | Warwickshire CC | West Midlands | May 2022 |
| 17. Wiltshire | Wiltshire - Pewsey Vale and Marlborough | Wiltshire CC | South West | Not launched yet (planned July 2023) |

**Table 1** shows 14 separate DRT schemes had started in 12 LAs by October 2022. This represents 13 of the 17 RMF awards. Two of the schemes (Gloucestershire - South Forest of Dean and Gloucestershire – North East Cotswolds) started in October 2022 one month after the end of the latest monitoring data collection period, hence no data was available for this report. Four schemes started within four months of the end of the latest monitoring data collection period - results are included in this report for these services where possible (Leicestershire – South West Leicestershire, Nottinghamshire - North and South Ollerton, Nottinghamshire – Mansfield, Warwickshire - Hatton and West Warwick). A further scheme (part of the Nottinghamshire pilot award) started in May 2023 and schemes in Buckinghamshire (Aylesbury scheme), Cheshire West and Chester, Cumbria (now Cumberland and Westmorland and Furness) and Wiltshire are due to start in 2023.

The findings presented in this report include outcomes on DRT operations and usage which provide early insights to help answer some of the population impacts questions above. They also include lessons learnt from the design and mobilisation stages of the DRT schemes which contribute to answering the delivery and implementation questions.

After this introduction, Section 2 explains the methodology for collecting and analysing data. Section 3 describes the DRT schemes. Section 4 presents information on the operational performance of schemes that started before September 2022 and Section 5 reports on usage of the schemes. Section 6 reports

on the experiences of LAs in designing and mobilising their schemes and the lessons that emerge from these. Section 7 has conclusions on what has been learnt from the RMF after 18 months.

# 2. METHODOLOGY

The RMF evaluation study involves the following two research areas:

1. Scheme-level monitoring: collection of monitoring data from LAs to analyse performance and usage of DRT pilot schemes and impacts on other bus services in scheme areas.
2. Process evaluation: interviews and roundtables with LAs to explore their experience in designing and mobilising the DRT pilot schemes.

## 2.1. Scheme-level monitoring

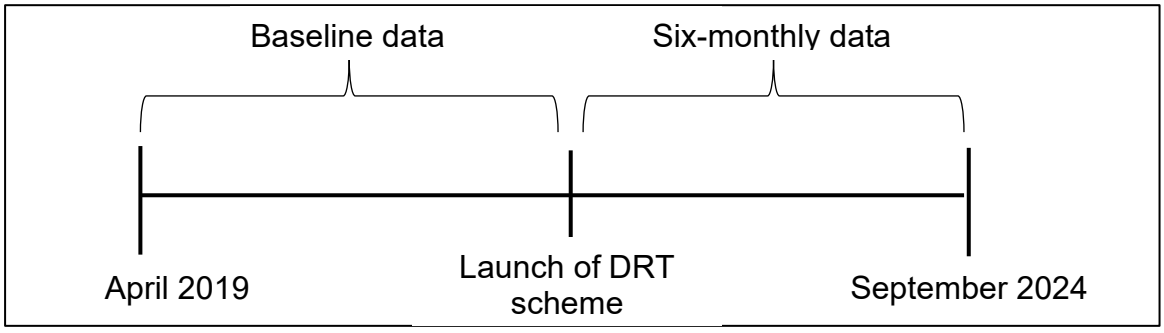
Scheme-level monitoring data is required from LAs for each of their DRT schemes to analyse outcomes of the pilots and of the programme as a whole.

It was expected that much of the data required for the national programme-level evaluation would already be being collected by LAs, for example through the technology platforms being deployed as part of the DRT schemes. However, to ensure consistency in data across the schemes, standardised data collection templates were prepared and provided to LAs, along with a data collection guidance document outlining the data required and the reason for requesting it.

Monitoring data has been collected before the schemes start operation in the form of baseline data and continued after this in the form of six-monthly data. Both the baseline and six-monthly data collections have been carried out at fixed, six-month intervals during the lifetime of the project funding via Excel spreadsheets provided to LAs.

The data collection schedule is shown schematically in **Figure 1**.

**Figure 1: Data collection schedule**




### Baseline data

An initial request was made in December 2021 for baseline data for the period before the launch of the DRT schemes covering the following information:

DRT plans:

- Planned operational and ticketing characteristics of DRT scheme
- Planned integration between DRT scheme and other public transport services
- Planned marketing and promotional activities
- Any expected barriers to deployment of the DRT scheme

Traditional bus services serving the DRT scheme area:

- Fares and ticketing data from April 2019 to September 2021
- Usage data from April 2019 to September 2021
- Financial data from April 2019 to September 2021

Comparison bus services operating outside the DRT scheme area:

- Fares and ticketing data from April 2019 to September 2021
- Usage data from April 2019 to September 2021
- Financial data from April 2019 to September 2021

Data was requested dating back to April 2019 for traditional bus services serving the DRT scheme area and selected bus services operating outside the DRT scheme area. This request was made due to bus services being affected by the Covid-19 pandemic from March 2020 and the wish to obtain data reflecting a one-year period unaffected by social distancing rules and guidelines.

Since September 2021, the data collection process has been carried out every six months and has focused on obtaining data on DRT scheme performance.

## Six-monthly data

In April 2022, a request was made for the following data for the period October 2021 to March 2022:

DRT scheme performance:

- Operational data (number of vehicles, operating hours, number of miles running without passengers etc.)
- Usage data (passengers by month including passengers on concessionary fares, unfulfilled bookings, average journey length, key destinations etc.)
- Passenger demographics (age and gender of users)
- Financial data (revenue, public subsidy)
- Marketing and promotional activities
- Any changes to DRT scheme

Traditional bus services serving the DRT scheme area

- Fares and ticketing data
- Usage data
- Financial data
- Any changes to bus services

Comparison bus services operating outside the DRT scheme area

- Fares and ticketing data
- Usage data
- Financial data
- Any changes to bus services

The DRT pilot schemes commenced operation at different points in time. Those DRT schemes that started before October 2021 were asked to provide DRT data from the month when the service started. The DRT schemes that started after March 2022 could not provide DRT data at this data collection point but could provide data on traditional bus services serving the DRT scheme area and selected bus services operating outside the DRT scheme area.

A further six-monthly data collection request was made in October 2022 for the period April 2022 to September 2022 and future requests will be made on a six-monthly basis up to September 2024.

## Traditional bus services serving the DRT scheme area

Fares, ticketing, usage and financial data is being sought for non-DRT bus services which serve scheme areas (for instance, travel through the scheme area, along the edge of the area or go to its boundary). This is being sought from April 2019 up to the end of the RMF funding period to allow investigation of how the introduction of the DRT scheme affects overall public transport use in the scheme areas. In some cases, there will be changes to existing bus services as a result of the introduction of the DRT scheme (planned or unplanned) and information on this has been requested in the six-monthly spreadsheet.

## Comparison bus services operating outside the scheme area

Fares, ticketing, usage and financial data is also being sought for a selection of bus services operating in different geographical parts of the LAs from the DRT pilot scheme. These should ideally be bus services unaffected by the introduction of the DRT scheme. This data will enable a comparison to be made between the trend in bus use over time in the DRT scheme area and the trend in the wider local authority area (the ‘counterfactual’). This will allow an assessment of whether the DRT schemes are making a difference to bus use in the areas they are serving. This data is also being sought from April 2019 up to the end of the RMF funding period.

## Other data

All of the LAs awarded funding had anticipated carrying out surveys of DRT users and/or residents of DRT scheme areas during the RMF funding period. The evaluation team has provided guidance on how to conduct surveys and suggestions for questions that could be included in user and resident surveys. Limited survey results were available at the time this report was being written but results from future surveys will be considered alongside monitoring data in future reporting. Survey results will allow an understanding to be gained on user characteristics, experiences and benefits across the DRT schemes.

The evaluation team has also requested LAs submit results of any other data collection carried out locally (for example, interviews or focus groups) to the national evaluation project when it is available.

## Availability of data

Baseline data has been received from 14 out of the 15 LAs who received funding for DRT schemes, while six-monthly data has been received from nine out of 12 LAs whose pilot schemes had started by the end of September 2022. Two of the three LAs (Buckinghamshire, Gloucestershire) not providing six-monthly data had pilot schemes starting in September or October 2022, so had little or no data to report. One LA (Surrey) had not provided baseline or six-monthly data at the time this report was written.

LAs were required to collate data from a number of different sources to provide full responses in the baseline and six-monthly spreadsheets. It has not been possible for some LAs to provide all the requested data because some data was not available to them. For instance, the DRT pilot scheme in North Lincolnshire serves the whole LA area and data could not be provided on comparison bus services.

Data that has proven challenging to provide is identified below in **Table 2**. Some LAs faced particular difficulties in providing data for traditional bus services serving the scheme area and comparison bus services operating outside the scheme area. The difficulties included selecting suitable comparison bus services that operate outside of the pilot area, lack of stability in bus services and gaining access to commercially sensitive data on passenger numbers and revenues. The evaluation team has worked closely with LAs to resolve these difficulties and a large volume of data has been received. The evaluation team need to carefully examine the data received and identify how it can be best used to generate valid time-series estimates of bus use within and outside scheme areas.

**Table 2: Data gaps**

| Data area | Data item | Difficulty experienced |
|---|---|---|
| **Traditional bus services serving the scheme area** | Data related to bus services in scheme area | There have been changes to bus services serving scheme area since April 2019 |
| | Fares and ticketing data | Too many different fares and ticket types to report |
| | Usage and financial data | No access to data for commercially run bus services |
| **Comparison bus services operating outside the scheme area** | Data related to bus services outside scheme area | Unclear how to select suitable bus services operating outside scheme area |
| | Fares and ticketing data | Too many different fares and ticket types to report |
| | Usage and financial data | No access to data for commercially run bus services |
| **DRT scheme performance** | Usage data for key destinations | LAs were asked to make a subjective judgement of key destinations which was open to interpretation and DRT stops do not always align clearly with specific places (village/town centre) |
| | Passenger demographics | Unavailable from most technology platforms |
| | Fares and ticketing data | Passengers travelling on concessionary fares |
| | Financial data | Public subsidy received from DfT and other sources unable to be identified for six-month period requested |

The data gaps outlined in **Table 2** have some implications for the evaluation process:

- **Changes to bus services serving scheme area:** Changes to bus services serving scheme areas will mean they are not suitable to be used to generate trend data for overall bus use in scheme areas.
- **Selection of comparison bus services:** The difficulties faced by LAs in selecting comparison services operating outside scheme areas means that careful assessment is needed by the evaluation team of the selected bus services to ensure they serve the intended purpose.
- **Fares and ticketing data for bus services:** Lack of fares and ticketing data for other bus services will mean it is not possible to consider the relative cost of using the DRT scheme compared to other bus services.
- **Usage and financial data:** Lack of usage and financial data about bus services serving scheme areas and operating outside scheme areas will compromise the ability to (i) assess how the DRT scheme is interacting with other bus services in the scheme areas and (ii) compare the trend in bus use over time in the DRT scheme area and the trend in the wider local authority area (the 'counterfactual').

- **DRT usage data for key destinations:** Lack of data on the most commonly requested destinations, or uncertainty over how this data was derived, will limit the ability to assess the contribution of DRT schemes to improved access to employment, education, healthcare and other services.
- **DRT passenger demographics:** Lack of data on passenger demographics will mean the contribution of DRT schemes to the mobility of different population groups will be unknown. This is a key gap that will need to be addressed in another way (for example via user surveys) if data is not available from technology platforms.
- **DRT fares and ticketing data:** Lack of fares and ticketing data will limit the ability to identify how popular DRT schemes are with different concessionary fare users.
- **DRT financial data:** Lack of information on public subsidy received from DfT (aside from RMF funding) and other sources during the scheme period of operation will prevent assessment of the economic viability of the DRT schemes and the level of support that might be needed after the end of the RMF pilot project**.**

This report focuses on reporting initial results on DRT scheme performance for those schemes that had started before October 2022. There is more data for some aspects of service performance than for others and this is noted in Sections 5 and 6.

## 2.2. Process evaluation

The process evaluation involves:

- In-depth interviews with officers and other relevant individuals involved in the operation of schemes in four LA pilot areas.
- Group roundtables with officers from a number of other LAs in receipt of RMF awards.

These activities are taking place at two time points (covering ‘design and mobilisation’ and ‘implementation and reflection’). The same four LAs will be interviewed at two points in their lifecycle to get a full appreciation of their experience. In contrast, the selection of LAs for the roundtables will be independently considered at the two time points to maximise the learning that can be achieved on those occasions.

The interviews and group roundtables are designed to contribute different but complementary insights. The interviews involve talking directly to one or more individuals, whilst the roundtables are deliberately group events with the expectation of a more discursive context.

The four LAs participating in the interviews (Cumbria, Essex, North Lincolnshire and Nottinghamshire) were selected to include schemes: (i) attracting new users to public transport and facilitating better access to a range of trip attractors; (ii) providing a more joined up transport network by integrating with other public transport modes; and (iii) varying in scale.

The selection of five LAs (Gloucestershire, Hertfordshire, Norfolk, Staffordshire and Warwickshire) for the first set of group roundtables was focussed on involving those LAs whose DRT schemes had started operating at the time (or were imminently about to launch) and could therefore share experiences of their mobilisation and launch.

The first set of interviews and roundtables took place between February 2022 and September 2022. The LAs interviewed were invited to bring key team members who had been involved from the early stages of the schemes to take part in semi-structured interviews. The majority of the LAs put forward two or more LA lead officers responsible for the pilots, one put forward an embedded consultant and another one additionally put forward their operator and app developer delivery partners. All interview participants had worked within, or closely with, the scheme from early in the process. Each interview involved two or three participants.

Two online roundtable discussions took place in June 2022. Gloucestershire, Hertfordshire, and Staffordshire took part in one discussion, while Norfolk and Warwickshire took part in the other. Each LA was represented by one to three LA officers.

As various factors determined how quickly schemes launched, the schemes were at different stages of development and mobilisation, ranging from having been operating for 18 months to having started running a few weeks before or not yet running services.

The participants in the interviews and roundtables were asked to share their perspectives and experiences regarding:

1. The nature of their schemes, including how the scope and delivery mechanisms were chosen.
2. Challenges and successes in their design and mobilisation activities including:
    - Targeting areas and users
    - Introducing new technology
    - Working with partners and stakeholders

The results from the interviews and group roundtables are reported in Section 6.

# 3. THE DRT PILOT SCHEMES

## 3.1. Overview

This section contains descriptions of the DRT pilot schemes in the 15 different LAs awarded funding through the RMF. Short summaries are provided of the pilots before comparing the DRT pilots in terms of operating zones and service design, integration with other public transport, booking and ticketing, and marketing and publicity activities.

- 14 DRT schemes had started in 12 LAs by October 2022. DRT schemes are set to start in another three LAs in 2023 and another two schemes will be introduced in LAs already running schemes.
- Six of the 14 operational schemes are serving predominantly rural areas, six are serving areas with mixed urban and rural character and two are serving suburban areas. The residential populations served vary from about 12,000 to 176,000 people.
- All the DRT pilot schemes are designed as flexible bus services that provide shared transport to users who specify their desired location and time of pick-up and drop-off. In some cases, the schemes are restricted to operate entirely within a single operating zone, while in others they are permitted to leave the operating zone and act as feeders to locations/zones outside the boundary of the operating zone. All the DRT schemes provide a 'corner to corner' service picking up and dropping passengers off at designated stops (a combination of pre-existing physical bus stops and new virtual stops).
- The number of vehicles per scheme varies between one and six and the DRT schemes are using minibuses with between 12 and 16 seats. Most schemes have been running six days a week (Monday to Saturday).
- In most cases, the new DRT schemes have been introduced with no changes to existing bus services, but in some cases LAs have taken the opportunity to withdraw LA supported public transport services.
- Journey bookings can be made via mobile apps, websites and phone. Fare structures vary between flat rate, mileage-based and zone-based.
- The DRT schemes have the ambition to attract a wide range of users, including concessionary pass holders, fare paying adults (including young adults), commuters and school children.

## 3.2. Scheme descriptions

Brief summaries of all DRT pilot schemes, for each LA awarded RMF funding, are provided in this section.

### Buckinghamshire

Two awards were given to Buckinghamshire covering two different DRT schemes.

The PickMeUp scheme started operating in September 2022 in an operating zone covering High Wycombe town and adjacent villages (Booker, Downley and Wooburn Green). The pre-existing bus services based on a hub and spoke system made cross town journeys challenging. The pilot serves the Cressex Industrial Park and Buckinghamshire New University, as well as High Wycombe railway, coach and bus stations. It is operated by Carousel Buses, part of the Go-Ahead Group. The service runs Monday to Friday 6am to 7pm with five 16-seater vehicles and uses Via technology. From January 2023, PickMeUp took part in the national £2 Bus Fare Cap Scheme[12], which caps single bus fares at a maximum of £2 between January to October 2023 and will be replaced by a £2.50 fare cap between November 2023 and November 2024.

The Aylesbury scheme will provide better connections between Aylesbury and the surrounding rural area (Weedon, Hartwell, Aston Clinton, Weston Turville and Halton) than available from the current hub and spoke bus network. It will serve Stoke Mandeville Hospital, an important local employer and key regional hospital, as well as three railway stations and Aylesbury bus station. The start of the scheme has been delayed owing to a need to retender following the withdrawal of the intended operator. Service levels and hours of operation are likely to be similar to the High Wycombe scheme, at least initially.

### Cheshire East

The go-too scheme started operating in October 2021 in an operating zone covering the rural area south-west of Nantwich which contains small villages with limited local amenities. The bus network had declined over a number of years with 85% of the area's residents further than 800m from a stop served by a fixed route bus service. The pilot is additional to the existing traditional FlexiLink demand responsive service in Cheshire East that is targeted at older people and disabled customers and has limited operating hours. go-too is operated by Ansa Transport, owned by Cheshire East Council, and permits journeys within the operating zone and to and from the town of Nantwich (but not within Nantwich). The scheme runs Monday to Saturday 7am to 9pm with three 16-seater, biodiesel-fuelled vehicles and uses Via technology.

### Cheshire West and Chester

The scheme will serve the rural area to the south of Frodsham and Helsby which is sparsely populated making it difficult to serve by traditional fixed bus routes. It will

[12] https://www.gov.uk/guidance/2-bus-fare-cap

extend to the south to Delamere Forest, a recreation destination which is not connected to the rail network. It will provide connections to a number of bus and rail stations and improve access to major employers such as the Stanlow Refinery and Thornton Science Park. The planned scheme will include morning peak time scheduled services down a corridor to provide a guaranteed arrival time for bus and rail at Frodsham or Helsby and the equivalent in reverse for the evening peak. At other times there will be a free-floating service. Some timeslots will be made available to authorised group travel organisers. A seven-day-a-week service is planned based on one full-time vehicle plus two peak-time vehicles. Stagecoach has been awarded the contract to operate the scheme with its own vehicles. Padam will be the software provider.

## Cumbria

DRT schemes will be introduced in four hub towns (Penrith, Egremont-St Bees, Ulverston and Wigton) where they will connect surrounding areas to the towns, including rail and bus stations. The services will help improve access to health facilities for older residents and to education for younger residents. It is planned to operate seven-day-a-week services with eight vehicles (four people carriers and four minibuses), although supply chain issues mean these may be pre-owned rather than new. An operator has not been appointed yet. Cumbria has recently split into two new unitary authorities – Cumberland Council and Westmorland and Furness Council. The schemes in the Egremont-St Bees and Wigton areas fall within the former and the Penrith and Ulverston schemes fall within the latter.

## Essex

Two awards were given to Essex covering two different DRT schemes. These have been combined into one scheme. The DigiGo scheme started operating in March 2022 in two separate operating zones: one covering a rural area northwest of Chelmsford (the Central Essex scheme) and the other covering a suburban area of South Braintree. In response to passenger feedback, it was decided to merge the two schemes in September 2022 and expand the operating zone to include Great Dunmow. Essex has experience of DRT from operating six other more traditional DRT schemes in other rural areas of the county. DigiGo connects people from the rural hinterland to interchange points at the edge of the operating zone where they can access other bus or rail services, as well as to hospitals and other major destinations. DigiGo is operated by Essex County Council in partnership with Moovit technology. The service runs seven days a week 7am to 10pm with six fully electric 12-seater vehicles which use ‘Gridserve’ charging facilities to recharge (see **Figure 2**). From January 2023, DigiGo took part in the £2 Bus Fare Cap Scheme.

**Figure 2: Electric DigiGo minibus**


## Gloucestershire

The Robin DRT system started operating in October 2022 in two operating zones, a southern area of the Forest of Dean and a north-eastern area of the Cotswolds. It is designed to serve all members of the community and connect rural residents to locations where they can take fixed-route bus services for onward travel. It aims to explore whether DRT can complement the conventional public transport network and offer a model for flexible provision across the rest of the county. The Forest of Dean scheme is being operated by Lydney Dial-a-Ride (a member of Forest of Dean Community Transport) and the North Cotswolds scheme by Pulham Coaches. The schemes run Monday to Saturday 7am to 7pm with two minibuses running in the Forest of Dean and one minibus (with one reserve) in North Cotswolds. The vehicles are 16-seaters and the scheme uses Padam technology.

## Hertfordshire

The HertsLynx scheme started operating in September 2021 to serve a rural area in North and East Hertfordshire around Buntingford which had limited provision of fixed route bus services. The DRT scheme is designed to improve connections between rural areas and town centres, as well as expand access to employment, education, healthcare and shopping. The scheme operates in a free-floating operating zone centred around Buntingford and surrounding rural villages, whilst also offering a feeder service to fixed destinations within six key hub towns (Stevenage, Royston, Letchworth, Hitchin, Baldock and Bishop's Stortford) where onward connections are possible by bus and rail. The scheme is being operated by Uno Buses, a bus operator owned by the University of Hertfordshire. The scheme runs seven days a

week 7am to 7pm (10am to 4pm on Sunday) with four 16-seat vehicles (increasing to five in Summer 2023) and uses Padam technology. From April 2023 an evening service will be offered from 8pm to 11:30pm every Friday and Saturday. From January 2023, HertsLynx took part in the £2 Bus Fare Cap Scheme.

## Leicestershire

The FoxConnect scheme started operating in July 2022 with a formal launch in September 2022 to serve a rural area between Leicester and Hinckley which had very limited or non-existent bus connections to employment sites and lengthy journey times to shopping areas. The scheme operates in a free-floating operating zone and provides a feeder service to a number of external destinations, including employment sites and transport interchanges for onward connections. The scheme is being operated by Woods Coaches, part of the National Express Group. The service runs six days a week (Monday to Saturday) 6am to 7:30pm with three vehicles and uses Liftango technology. From January 2023, FoxConnect took part in the £2 Bus Fare Cap Scheme.

## Norfolk

The Flexibus+ scheme started operating in March 2022 serving 24 dispersed villages to the south of the market town of Swaffham in West Norfolk and Breckland. It builds on three existing DRT schemes in Norfolk. The addition of the mobile app was implemented to assist with dynamic routing and to see if it attracted younger passengers who see advance booking via telephone as a barrier. The scheme enables access to employment, education and other essential services in Swaffham and allows onward connections to Kings Lynn and Norwich. It operates as a free-floating service except for a short period during the morning and afternoon in term-time to provide a scheduled school service. The scheme is being operated by Vectare who provide specialist public transport services. The scheme runs six days a week 7am to 7pm with one 16-seater vehicle and uses Via technology.

**Figure 3: Flexibus+ minibus in Norfolk**


## North Lincolnshire

The JustGo North Lincs scheme started operating in September 2020 across North Lincolnshire, connecting rural communities to Scunthorpe and other hubs. It superseded the Call Connect DRT scheme by introducing digital booking and scheduling technology. Bookings can be made for any journey within North Lincolnshire, except those within Scunthorpe or served by fixed-route bus services. Initially there was a single operating zone for the whole of North Lincolnshire but it was divided into two zones in July 2022 to help improve journey times, availability and reliability. The scheme is being operated by East Yorkshire, part of the Go-Ahead Group. The service runs six days a week 7am to 7pm (8am to 6pm on Saturdays) with six 15-seater vehicles. It uses Liftango technology.

## Nottinghamshire

The Nottsbus On Demand DRT system has involved the phased introduction of three DRT schemes, starting in August 2022 with a scheme in North and South Ollerton (covering villages around Retford, Ollerton and Newark) and a scheme in Mansfield (covering the suburban fringe of the town). The North and South Ollerton scheme runs six days a week 7am to 7pm and the Mansfield scheme runs in the evenings from 7:30pm to midnight on Thursday-Saturday. Stagecoach operates the South Ollerton part of the North and South Ollerton scheme and the Mansfield scheme. Nottinghamshire County Council's fleet services operate the North Ollerton part of the North and South Ollerton scheme. These schemes use eight 16-seater vehicles (see **Figure 4**) and use Via technology. A scheme in rural western parts of Rushcliffe

District launched in May 2023 (West Rushcliffe) and is operated by Kinchbus and operates 7 days a week between 7am and midnight. Nottsbus On Demand seeks to improve connections to village and town centres, rail stations and employment and leisure destinations. It complements and integrates with the conventional public transport network through timetable coordination and through-ticketing.

**Figure 4: Nottsbus On Demand minibus in Nottinghamshire**


## Staffordshire

The Moorlands Connect pilot started in October 2021 serving the Moorlands District around the towns of Leek, Ashbourne and Buxton. The operating zone was expanded in March 2022 to the south west to cater for people wishing to travel from Oakamoor, Alton, Ipstones, Foxt and Whiston. The scheme superseded the existing, traditional style Moorlands Connect DRT scheme which was limited to weekdays at off-peak times. The scheme operates in a free-floating operating zone and provides a feeder service to Leek, Ashbourne and Buxton for onward conventional bus connections. The scheme is unavailable for a short period during the morning and afternoon in term time to provide a scheduled school service. 64% of the operating zone is located within the Peak District National Park and the target market includes visitors to the area as well as residents. The scheme is being operated by Ashbourne Community Transport. The service runs Monday to Friday 7am to 7pm, Saturday 8am to 6pm and on Sundays in summer months only, using three 16-seater vehicles and Via technology.

### Surrey

The Surrey Connect scheme serves rural communities around Dorking in the Mole Valley. A pre-pilot launched in North Leatherhead in May 2021 with the first formal phase of the RMF funded scheme starting in June 2022 when it was extended to cover the full Mole Valley area. The scheme operates in a free-floating operating zone and provides a feeder service to specific locations in Cobham, Dorking and Epsom which include hospitals and rail stations. The scheme is being operated by Mole Valley District Council. The scheme runs seven days a week for up to 16 hours a day. It uses four electric vehicles and Padam technology. The scheme was part of the £2 Bus Fare Cap Scheme from January to May 2023 when the scheme was extended to cover its full area.

### Warwickshire

The IndieGo PLUS scheme started in May 2022 to serve Hatton and west Warwick, a rural area west of Warwick and Kenilworth. It fully replaced a fixed route service. The area is reliant on the nearby towns of Warwick and Kenilworth for employment, education, local services and onward transport connections and the scheme provides access to both towns. The scheme operates in a free-floating operating zone and provides a feeder service to specific locations in Kenilworth, and Warwick, including Warwick Town and Parkway railway stations, Hatton railway station, Kenilworth railway station and Warwick bus station. The scheme is being operated by Stagecoach. The scheme runs Monday to Saturday for 13.5 hours a day. It uses three 16-seater vehicles and Liftango technology. From January 2023, IndieGo PLUS took part in the £2 Bus Fare Cap Scheme.

### Wiltshire

The scheme will expand existing DRT services in the Pewsey Vale and Marlborough area. A community engagement exercise in 2022 highlighted areas of concern including perceived poor connectivity with other forms of transport, services not running at times of need and services not running to needed destinations. Existing services will be revised and routes simplified and streamlined with the new DRT scheme focusing on serving deeper rural areas. It will comprise of two operating zones overlapping in the Pewsey Vale area. It is planned to operate Monday to Saturday with five vehicles. An operator is in the process of being appointed.

## 3.3. Operating zones and scheme design

### Operating zones

**Table 3** compares the characteristics of the operating zones (also known as travel zones) served by the DRT schemes which had started operating by October 2022. It shows six of the schemes are operating in largely rural areas (described as ‘Rural’). Six schemes are operating in areas with mixed urban and rural character (described as ‘Urban edge and rural’ and ‘Mixed urban and rural’) and two are operating in suburban areas not well served by other public transport (described as ‘Town with rural fringe’ and ‘Town’).

The residential populations served vary from about 12,000 to 176,000. The schemes are operating in areas with a range in population density from 34 persons per square kilometre in Staffordshire (*Moorlands Connect* scheme) to 3,410 persons per square kilometre in Buckinghamshire (High Wycombe *PickMeUp* scheme). The North Lincolnshire scheme covers the largest land area with this constituting the entire local authority area.

A number of the schemes permit 'feeder' travel to locations/zones outside the boundary of their operating zone under the condition that the other end of the journey must be within the operating zone. This is illustrated in **Figure 5.** below for the Cheshire East DRT scheme. Journeys are permitted within the operating zone (dark green area) and to and from the town of Nantwich (light green area) but not within Nantwich. This enables residents of the operating zone to gain access to shops, services and the railway station and bus and coach station in Nantwich.

**Figure 5: Example of the Cheshire East - South West of Nantwich operating zone**

**Table 3: Characteristics of DRT operating zones and scheme design**

| DRT scheme | Settlement structure | Pop-ulation | Area (sq. km) | Pop. density (pers./ sq. km) | Feeder locations served external to op. zone | Service model | No. of veh. | Size of veh. (seats) | Days of oper-ation per week | Hours of operation (Mon-Fri) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Buckinghamshire - High Wycombe** | Town with rural fringe | 133,000 | 39 | 3,410 | None | C-to-C | 5 | 16 | 5 | 6am-7pm |
| **Cheshire East - South West of Nantwich** | Rural | 17,000 | 368* | 46 | Nantwich | C-to-C | 2 | 16 | 6 | 7am-9pm |
| **Essex - Central Essex and South Braintree** | Urban edge and rural | 30,110 | 156 | 192 | Braintree | C-to-C | 6 | 12 | 7 | 7am-10pm |
| **Gloucestershire - South Forest of Dean** | Mixed urban and rural | 55,906 | 260 | 215 | Transport hubs at edge | C-to-C | 2 | 16 | 6 | 7am-7pm |
| **Gloucestershire – North East Cotswolds** | Rural | 24,181 | 360 | 67 | None | C-to-C | 2 | 16 | 6 | 7am-7pm |
| **Hertfordshire - North and East Herts** | Rural | 36,000 | 594* | 61 | Six towns | C-to-C | 3 | 16 | 7 | 7am -7pm |
| **Leicestershire – South West Leicestershire** | Urban edge and rural | 34,000 | 85 | 400 | Transport hubs at edge | C-to-C | 3 | 16 | 6 | 6am-7:30pm |
| **Norfolk – Swaffham** | Rural | 14,508 | 220 | 66 | None | C-to-C with scheduled school | 1 | 16 | 6 | 7am-7pm |

| DRT scheme | Settlement structure | Pop-ulation | Area (sq. km) | Pop. density (pers./ sq. km) | Feeder locations served external to op. zone | Service model | No. of veh. | Size of veh. (seats) | Days of oper-ation per week | Hours of operation (Mon-Fri) |
|---|---|---|---|---|---|---|---|---|---|---|
| **North Lincolnshire** | Mixed urban and rural | 176,000 | 876 | 201 | None | C-to-C | 6 | 15 | 6 | 7am-7pm |
| **Nottinghamshire - North and South Ollerton** | Rural | 12,287 | 298 | 41 | Transport hubs at edge | C-to-C | 5 | 16 | 6 | 7am-7pm |
| **Nottinghamshire – Mansfield** | Town | 17,005 | 6 | 2,834 | None | C-to-C | 3 | 16 | 3 | Thu-Sat 7:30pm-12am |
| **Staffordshire - Moorlands** | Rural | 11,887 | 348 | 34 | Leek, Ashbourne and Buxton | C-to-C with scheduled school | 3 | 16 | 7 | 7am-7pm |
| **Surrey – Mole Valley** | Mixed urban and rural | 80,000 | 258 | 310 | Cobham, Dorking and Epsom | C-to-C | 4 | 16 | 5 | 7am-7pm |
| **Warwickshire - Hatton and West Warwick** | Mixed urban and rural | 20,000 | 96* | 208 | Kenilworth and Warwick | C-to-C | 3 | 16 | 6 | 6am-7:30pm |

Notes: (i) Population and land area obtained from DRT business cases submitted to DfT, except where land area is estimated from maps (*). (ii) Settlement structure is an assessment by the evaluation team based on information included in DRT business cases to DfT. (iii) The number of vehicles is reported by LAs in the six-monthly spreadsheet and the size of vehicles in the baseline spreadsheet.

## Service models

All of the DRT pilot schemes are designed as flexible bus services that provide shared transport to users who specify their desired location and time of pick-up and drop-off. This is in contrast to fixed route public transport services that serve a fixed route to a fixed timetable. For two schemes, the DRT vehicles are used to operate scheduled school services for short periods of the day but otherwise provide a flexible service. One scheme that has not started yet (in Cheshire West and Cheshire) is planning to incorporate a morning and evening peak scheduled service along a specific route to provide access to rail and bus stations.

In some cases, the schemes are restricted to operate entirely within a single operating zone (in which they are 'free floating'), while in others they are permitted to leave the operating zone and act as feeders to locations/zones outside the boundary of the operating zone under the condition that one end of the journey must be within the operating zone. The Nottsbus On Demand system operates in two different zones in North Ollerton and South Ollerton but these have been treated as one scheme for the purposes of this report, as the zones are contiguous and combined data has been received for both zones.

All DRT pilot schemes have established pick-up/drop-off locations as a combination of:

- Physical stops registered as national public transport access nodes (NaPTAN)
- 'Virtual' stops identified specifically for the purpose of the DRT scheme and are often street corners or points of interest.

This arrangement is described as a 'corner to corner' (C-to-C) model in contrast to a 'door to door' model (D-to-D) which picks up and drops off users at a specific chosen address. The number of physical and virtual stops chosen will impact the overall density of stop coverage and how long people will need to walk to get to a stop. Some schemes offer a door-to-door service to vulnerable users such as those with mobility constraints.

LAs have been adjusting their schemes since their initial introduction as they learn from performance metrics and customer feedback. There have been changes to the size and shape of operating zones, to feeder locations and to the number and location of virtual stops.

## Number, size and type of vehicles

**Table 3** shows the number of operational vehicles varies between one and six with the number generally higher for operating zones with greater population size. The schemes are using mini-buses with between 12 and 16 seats with 16-seater buses being the most popular. The Essex and Surrey schemes are using fully electric vehicles.

## Days and hours of operation

Most DRT schemes have been running six days a week (Monday-Saturday) with schemes in Essex and Hertfordshire running seven days a week and the scheme in

Staffordshire running seven days a week in the Summer only. The Mansfield scheme is an evening service on Thursday to Saturday.

The hours of operation vary between the DRT schemes, although they follow roughly the same pattern starting between 6am and 7am and ending between 7pm and 9pm. The Essex scheme runs later to 10pm, while the Nottinghamshire Mansfield evening scheme runs from 7:30pm until midnight. The Nottinghamshire West Rushcliffe scheme, which started operating in May 2023, operates from 7am until midnight.

## 3.4. Integration with other public transport

DRT schemes have been designed to fill gaps in provision in LA areas and to complement existing public transport services (including commercial and local authority supported fixed route bus services, first-generation DRT schemes, community transport and rail and coach services).

In most cases, the new DRT schemes have been introduced with no changes to existing services, but in some cases LAs have taken the opportunity to withdraw LA supported public transport services. **Table 4** summarises changes to bus services taking place around the same time the DRT schemes were introduced. Supported bus services have been withdrawn in four cases (in Norfolk, Nottinghamshire (two schemes) and Warwickshire). Future evaluation will compare changes in overall bus use in operating zones where no changes have taken place to existing services and those where there has been service reorganisation.

In all cases, the operating zones and feeder locations have been designed to enable the DRT schemes to connect with the wider public transport network by serving major transport interchanges (bus, coach and rail stations, and Park and Ride sites). This is illustrated in **Figure 6** for the Leicestershire DRT scheme.

**Figure 6: South West Leicestershire DRT operating zone**

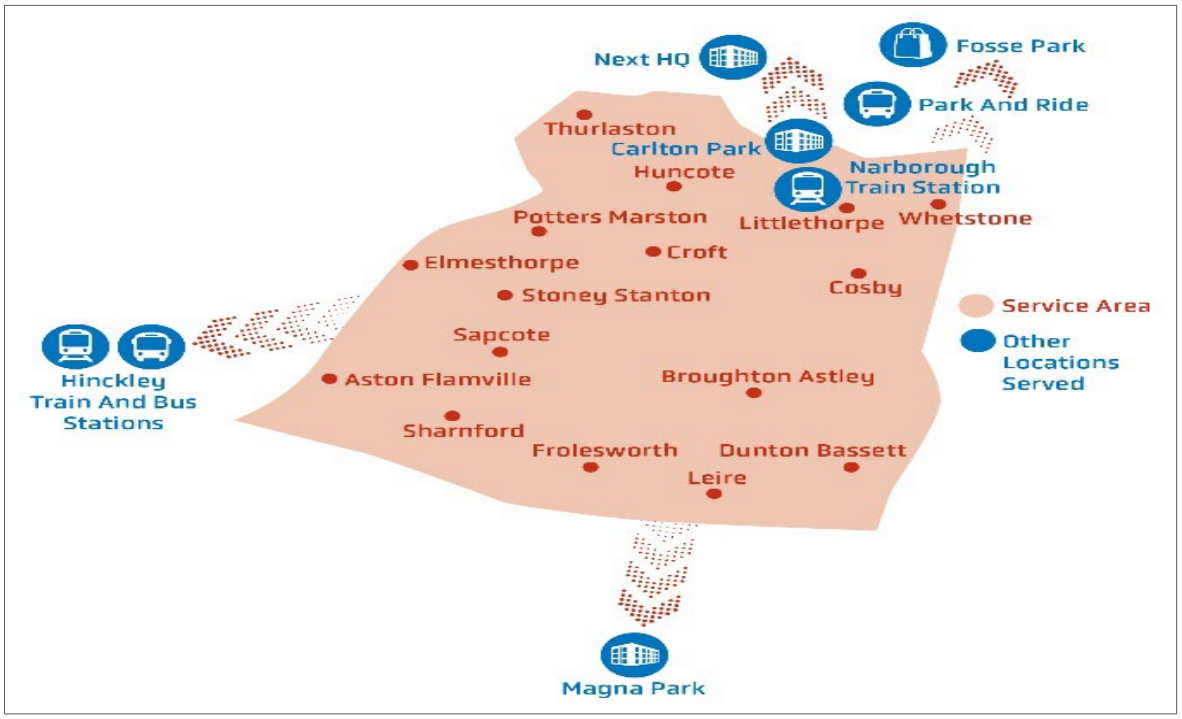


**Table 4: Integration with other public transport services**

| DRT scheme | Start date | Changes to other bus services | Integrated ticketing with other bus services |
|---|---|---|---|
| **Buckinghamshire - High Wycombe** | September 2022 | None | Yes, other tickets/cards accepted |
| **Cheshire East - South West of Nantwich** | October 2021 | Minor changes to timetables unrelated to DRT | No |
| **Essex - Central Essex and South Braintree** | March 2022<br>Sept 2022 (two schemes merged and extended to Great Dunmow) | Bus services withdrawn by commercial operator in spring 2022 unrelated to DRT | No |
| **Gloucestershire - South Forest of Dean** | October 2022 | Bus services withdrawn by commercial operator in November 2022 unrelated to DRT | No |
| **Gloucestershire – North East Cotswolds** | October 2022 | None mentioned (but service only started October 2022) | No |
| **Hertfordshire - North and East Herts** | September 2021 | None | No |
| **Leicestershire – South West Leicestershire** | July 2022 (with formal launch September 2022) | Minor changes to timetables unrelated to DRT | No |
| **Norfolk – Swaffham** | March 2022 | Two supported services withdrawn in April 2022 | Yes, countywide day ticket accepted (from August 2022) |
| **North Lincolnshire** | September 2020 | Service changes unrelated to DRT | No |
| **Nottinghamshire - North and South Ollerton** | August 2022 | Nine supported services withdrawn | Yes, through tickets accepted |
| **Nottinghamshire - Mansfield** | August 2022 | One supported service withdrawn | Yes, through tickets accepted |
| **Staffordshire - Moorlands** | October 2021<br>March 2022 (extended operating zone to south west) | None | No |
| **Surrey – Mole Valley** | May 2021 (pre-pilot in small area)<br>June 2022 (full operating zone) | Information not available | No |
| **Warwickshire - Hatton and West Warwick** | May 2022 | One supported service withdrawn | No |

Where there are commercial bus services serving operating zones, the DRT schemes have usually been designed not to compete with them. It is noted on the websites for some of the schemes (North Lincolnshire, Nottinghamshire, Staffordshire) that when customers make booking requests for journeys that could be undertaken using commercial bus services, they will be directed to use commercial services.

LAs have aspired to offer joint ticketing with other public transport services but this has not been possible for most of the DRT schemes at this time. In the Buckinghamshire High Wycombe scheme, area-wide bus tickets and cards are accepted but only by selecting the option to pay on the bus when using the PickMeUp mobile app. The Nottinghamshire DRT schemes accept through tickets purchased from other operators. The Norfolk Swaffham scheme started accepting use of a countywide day ticket from August 2022. It is not straightforward to offer joint ticketing due to the DRT schemes being run by different operators than other public transport services and using dedicated mobile apps separate from other booking systems. One exception is Essex where the DigiGo service is booked through the TravelEssex app.

The DRT schemes allow customers to book a journey for a particular departure time from their journey origin location or an arrival time at their journey destination location. This allows customers to arrange to make connections for onwards public transport journeys from transport interchanges, but these arrival times cannot be guaranteed by DRT operators.

## 3.5. Booking and ticketing

### Booking method

**Table 5** shows journey bookings can be made via mobile app and phone for all DRT schemes with website bookings possible for schemes in Gloucestershire and Hertfordshire. The app-based booking systems (and broader technology platforms) for the schemes that have launched so far are being provided by four different mobility technology providers. Details about the booking methods and any assistance offered to vulnerable users are available from scheme websites.

The lead time for rides refers to the time in advance that passengers are required to book their seat. There are maximum and minimum lead times. Maximum lead times range from 7 days to 30 days. For some schemes it is possible to make live on-demand bookings (Buckinghamshire – High Wycombe, North Lincolnshire and Staffordshire – Moorlands). There are minimum lead times of one hour for Gloucestershire and Warwickshire and bookings need to be made up to 5pm the day before for the Cheshire East scheme. Section 5.4 reports the average times in advance journeys have been booked in practice.

**Table 5: Booking methods and lead times for bookings**

| DRT scheme | Booking method | Maximum time in advance | Minimum time in advance |
|---|---|---|---|
| **Buckinghamshire - High Wycombe** | App and telephone | Two weeks | Live on-demand bookings |
| **Cheshire East - South West of Nantwich** | App and telephone | 14 days | 5pm the day before |
| **Essex - Central Essex and South Braintree** | App and telephone | Seven days | 15 minutes |
| **Gloucestershire - South Forest of Dean** | App, telephone and website | Two weeks | One hour |
| **Gloucestershire – North East Cotswolds** | App, telephone and website | Two weeks | One hour |
| **Hertfordshire - North and East Herts** | App, telephone and website | 30 days | Three minutes |
| **Leicestershire – South West Leicestershire** | App and telephone | 7 days | 45 minutes |
| **Norfolk – Swaffham** | App and telephone | Two weeks | Five minutes |
| **North Lincolnshire** | App and telephone | Four weeks | Live on-demand bookings |
| **Nottinghamshire - North and South Ollerton** | App and telephone | Not specified | One day |
| **Nottinghamshire - Mansfield** | App and telephone | Not specified | One day |
| **Staffordshire - Moorlands** | App and telephone | 28 days | Live on-demand bookings |
| **Surrey – Mole Valley** | App and telephone | Seven days | 30 minutes |
| **Warwickshire - Hatton and West Warwick** | App and telephone | Two weeks | 15 minutes |

## Ticketing

**Table 6** presents ticketing options and discounts for the DRT schemes. Most of the schemes have different ticket offers for adults, children and young people, and older people or disabled people with England national concessionary travel scheme (ENCTS) passes. Often the same ticketing structure applies to adults and children/young people but with lower fares for children/young people. Young people are variously identified as individuals under the age of 16, 18, 19 or 25 years.

There are flat rate fares for some schemes (such as the £3 fare for the Cheshire East scheme), mileage-based fares for other schemes (such as the Essex scheme) and zone-based fares in other cases (such as in Buckinghamshire). Some schemes offer return tickets and day tickets, as well as single tickets. Various fare offers have

been tried such as a free trip after a number of completed rides, weekly tickets, monthly tickets and discounts for group bookings.

Free travel (either after 9am on Mondays-Fridays or at any time) is available for ENCTS pass holders on most DRT schemes. The Cheshire East and Staffordshire schemes offer a discounted fare for ENCTS pass holders.

**Table 6** shows ticket prices prior to the introduction of the £2 Bus Fare Cap in January 2023. The fare cap scheme was originally scheduled to run for three months until the end of March 2023 but has since twice been extended and will now run until November 2024 (priced at £2.50 after October 2023). Five LAs have participated in the £2 Bus Fare Cap scheme.

**Table 6: Ticketing options and discounts**

| DRT scheme | Adults | Children/ young people | Older people/ disabled | Other | £2 Bus Fare Cap |
|---|---|---|---|---|---|
| **Buckinghamshire – High Wycombe** | £2.00 - £3.50 depending on distance | Not mentioned on website | Free for ENCTS pass holders | Accepts discount cards | Yes |
| **Cheshire East – South West of Nantwich** | £3 (age 16+) | £2 (under 16s) | £2 for ENCTS pass holder | 6th journey free | No |
| **Essex – Central Essex and South Braintree** | Distance-based (e.g. 0-2 miles £2.5, 2-4 miles £4) | Distance-based (e.g. 0-2 miles £1.87, 2-4 miles £3) (under 18s) | Free for ENCTS pass holders | | Yes |
| **Gloucestershire – South Forest of Dean** | 0-7 miles £2.50. 7+ miles £4.5 | 0-7 miles £1.50. 7+ miles £3 (under 16s) | Free for ENCTS pass holders | | No |
| **Gloucestershire – North East Cotswolds** | As above for South Forest of Dean | | | | |
| **Hertfordshire – North and East Herts** | Distance-based (e.g. 0-2 miles £3, 2-5 miles £4) | Distance-based (e.g. 0-2 miles £1.5, 2-5 miles £2) (under 25s) | Free for ENCTS pass holders | | Yes |
| **Leicestershire – South West Leicestershire** | £3.50 | Half adult single fares available to children (under 16s) | Free for ENCTS pass holders | | Yes |

| DRT scheme | Adults | Children/ young people | Older people/ disabled | Other | £2 Bus Fare Cap |
|---|---|---|---|---|---|
| **Norfolk – Swaffham** | Inner zone: £2 single, £3.50 day, ten trip £16<br>Outer zone: £3 single, £5 day, 10 trip £24 | Inner zone: £1.50 single, £2.60 day, 10 trip £12<br>Outer zone: £2.30 single, £4 day, 10 trip £18 | Free for ENCTS pass holders | | No |
| **North Lincolnshire** | Distance-based starting from £2.50 | Discounted child fares (under 16s) | Free for ENCTS pass holders | | No |
| **Nottinghamshire – North and South Ollerton** | £2.00 single £4.00 day | £1.30 single £2.60 day (under 19s) | Free for ENCTS pass holders | 10-trip and month tickets available | No |
| **Nottinghamshire – Mansfield** | As above for North and South Ollerton | | | | |
| **Staffordshire – Moorlands** | £3.50 single £5.50 return | £2 single £3.50 return (under 19s/ students) | £2 single £3.50 return (ENCTS pass holders) | Weekly, 28-day and group tickets available | No |
| **Surrey – Mole Valley** | 0-5 miles £2, 5+ miles £3 | 0-5 miles £1, 5+miles £1.5 (under 20s) | Free for ENCTS pass holders | | No |
| **Warwickshire – Hatton and West Warwick** | £4 single £6 return | £3 single £4.5 return (under 16s) | Free for ENCTS pass holders | Weekly ticket available | Yes |

## 3.6. Marketing and publicity activities

The approach to marketing and publicity taken by LAs is documented in detail in Appendix B and summarised in this section. LAs were asked what groups of people they are targeting for their DRT schemes. Most had a focus on residents of their operating zones, often with the ambition to attract a wide range of users including concessionary pass holders, adults (including young adults), commuters and school children. Some LAs reported targeting those lacking other options to access destinations, such as those without access to a car or who have difficulty using traditional bus services. Some LAs had a focus on major businesses and services in

their operating zones and targeting these. Staffordshire was unusual in emphasising visitors to the operating zone, an area popular with walkers and cyclists.

Some LAs took the opportunity in advance of launching their DRT schemes to hold consultation events with the public and businesses to help inform scheme design. These also served to raise awareness of the future scheme.

The following marketing activities were commonly mentioned by LAs:

1. Pre-launch:
    - Leaflet drops to households in operating zone
    - Posters and flyers at bus stops in operating zone (avoiding those serving commercial bus services)
    - Notices in traditional press and council newsletters
    - Targeted communications to businesses and community groups
    - Pop-up engagement stands at transport interchanges
    - Social media posts
2. At-launch
    - Public event launch at high-profile locations involving MPs and councillors
    - Roadshows at different places in the operating zone
    - Free and discounted ticket offers immediately after launch
3. Post-launch
    - In-app messaging with offers and information
    - Marketing campaigns to coincide with service changes
    - Free and discounted ticket offers at particular times (holiday periods, one-year anniversary)

The pre-launch marketing activities were also continued after the schemes commenced.

All LAs have set up dedicated websites for their DRT scheme(s) or have included the scheme(s) on an existing public transport website.

# 4. DRT OPERATIONAL PERFORMANCE

## 4.1. Overview

Section 4 presents results on the operational performance of the DRT schemes based on the monitoring data provided by the LAs in the six-monthly spreadsheets. At the time this report was written, data was available from nine out of 12 LAs whose schemes had started by October 2022. The period of data availability varied by LA depending on the launch date of the DRT schemes. Appendix C shows the months of data available for different LAs and for different performance indicators reported in Sections 4 and 5.

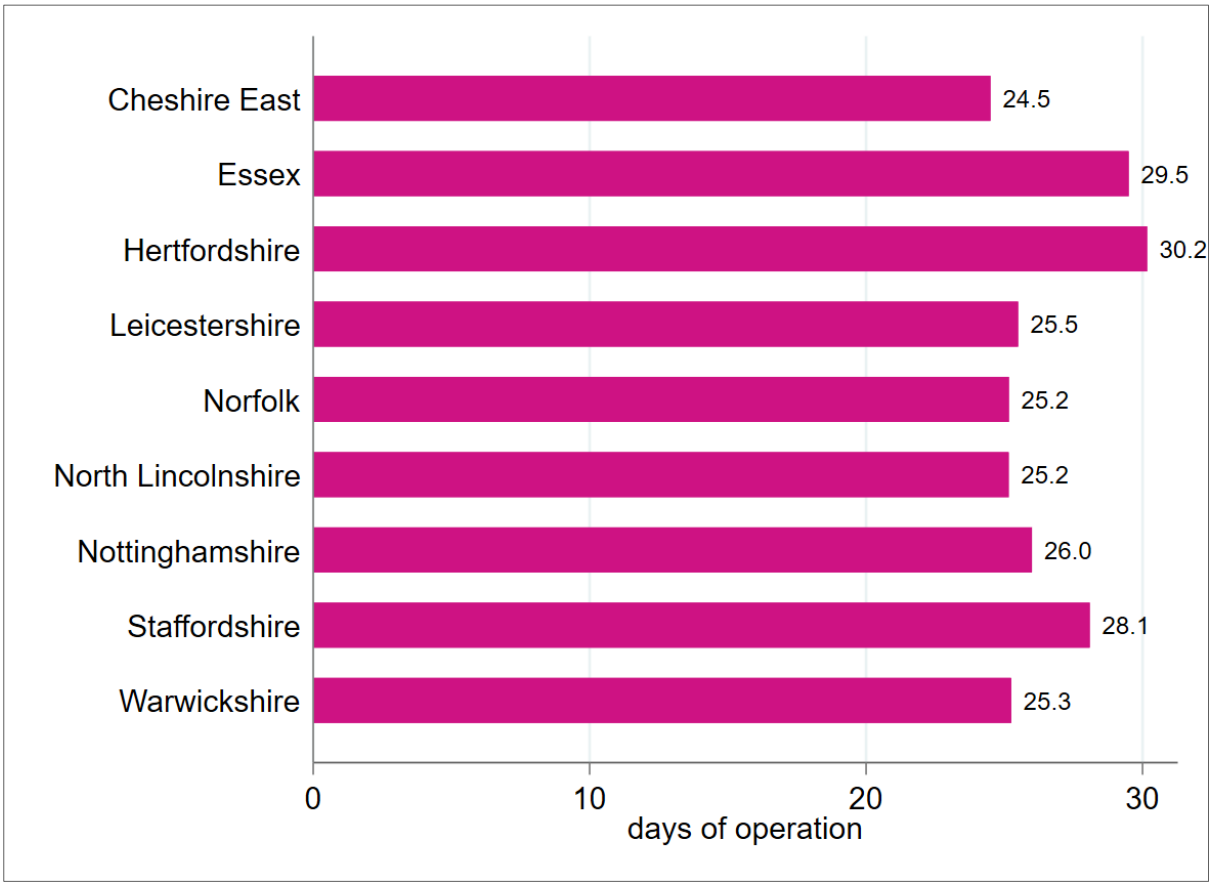
Key findings are:

- DRT schemes have been fully operating to their advertised schedules at 25-30 days per month.
- Distance travelled without passengers is of a similar magnitude to distance travelled with passengers. Higher empty running ratios have been recorded for scheme areas with low population densities.
- Average monthly service distance with passengers has varied from 1,073 to 10,754 miles with higher figures seen for schemes that have been established for longer and that are serving larger populations.
- Vehicle utilisation rates (measured in terms of average daily distance travelled per vehicle with passengers) have generally been in the range of 33 – 86 miles with lower rates for one scheme that had only just started operating and another scheme that has reconfigured its service to make it more appealing.
- Average journey distances have been longest for the schemes serving rural areas with the lowest population densities (for example, 10.7 miles in Norfolk), and shortest for pilots serving mixed rural and urban areas with the highest population densities (for example, 2.4 in Warwickshire).
- The lead times for journey bookings have varied considerably with bookings made two weeks in advance on average in North Lincolnshire and 1-4 days in advance in other scheme areas. Unfulfilled journey bookings are in the range of 13.0% to 18.9% across five schemes which supplied this data.
- App-based bookings are generally more popular than phone or website bookings, but phone bookings have been equally popular to app bookings in North Lincolnshire and remain an essential feature in all the DRT schemes for passengers not familiar or comfortable with using an app or website.

## 4.2. Number of days of operation

**Figure 7** shows the average number of days per month of DRT operation for the schemes since they started (excluding the first month if it was not a complete month). Most of the schemes have reported an average of 24-26 days of operation per month. The highest number of average days of operation is reported by the Hertfordshire, Essex and Staffordshire schemes (30.2, 29.5 and 28.1 days per month respectively) which run seven days a week. The average number of days of operation are in line with advertised schedules with minor differences attributable to bank holidays or vehicle unavailability for example.

**Figure 7: Average number of days of operation per month**

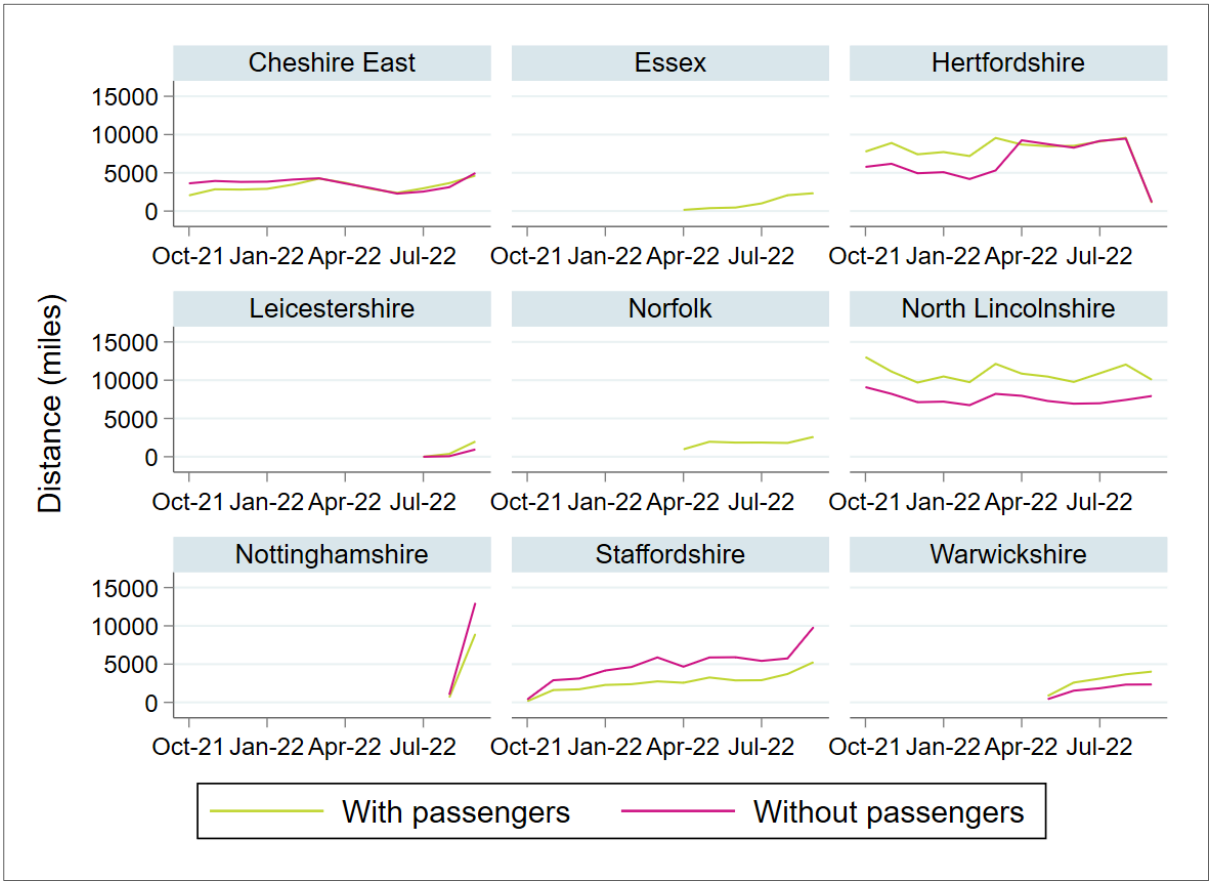



Note: Nottinghamshire figure refers to number of days of operation of DRT scheme in North Ollerton and South Ollerton in September 2022. The Mansfield evening scheme reported 13 days of operation in September 2022.

## 4.3. Service distance

**Figure 8** compares distance travelled per month for the different DRT schemes for the period October 2021 to September 2022. It shows distance travelled with passengers separate from distance travelled without passengers (except for Essex and Norfolk where only data for distance travelled with passengers has been supplied).

**Figure 8: Distance travelled per month**




Note: The sharp decrease in distance travelled in September 2022 in Hertfordshire is explained by one vehicle being out of service for two weeks.

**Table 7** reports total service distances for each DRT scheme with and without passengers since they started operating. **Table 8** reports average monthly service distance and **Table 9** reports average daily service distance per vehicle.

**Table 7** shows that North Lincolnshire has recorded the largest total service distance (247,345 miles travelled with passengers). It commenced operating in September 2020, almost a year before any other scheme started. It has also recorded the largest average monthly service distance with passengers of 10,754 miles (see **Table 8**). North Lincolnshire's DRT scheme serves the largest land area and population and has six vehicles.

**Table 7: Total distance travelled with and without passengers**

| DRT scheme | Number of vehicles | Total miles with passengers | Total miles without passengers | Total difference |
|---|---|---|---|---|
| Cheshire East | 2 | 38,614 | 43,167 | -4,552 |
| Essex | 6 | 6,439 | N/A | N/A |
| Hertfordshire | 3 | 94,022 | 77,560 | 16,462 |
| Leicestershire | 3 | 2,359 | 1,026 | 1,334 |
| Norfolk | 1 | 11,051 | N/A | N/A |
| North Lincs. | 6 | 247,345 | 169,084 | 78,261 |
| Nottinghamshire | 5 | 9,589 | 13,997 | -4,408 |
| Staffordshire | 3 | 31,456 | 58,510 | -27,054 |
| Warwickshire | 3 | 14,231 | 8,479 | 5,752 |
| Total | 32 | 455,106 | 371,823 | 83,283 |

Note: N/A = not available

**Table 8: Average monthly distance travelled with and without passengers**

| DRT scheme | Number of vehicles | Average monthly miles with passengers | Average monthly miles without passengers | Average monthly miles difference |
|---|---|---|---|---|
| Cheshire East | 2 | 3,218 | 3,597 | -379 |
| Essex | 6 | 1,073 | N/A | N/A |
| Hertfordshire | 3 | 7,835 | 6,463 | 1,372 |
| Leicestershire | 3 | 1,180 | 513 | 667 |
| Norfolk | 1 | 1,842 | N/A | N/A |
| North Lincs. | 6 | 10,754 | 7,351 | 3,403 |
| Nottinghamshire | 5 | 8,957 | 13,004 | -4,047 |
| Staffordshire | 3 | 2,846 | 5,285 | -2,439 |
| Warwickshire | 3 | 3,348 | 2,014 | 1,334 |
| Average across schemes | 4 | 5,448* | 5,461 | 314 |

Notes: (i) N/A = not available. (ii) *Essex and Norfolk excluded.

Nottinghamshire recorded 8,957 miles travelled with passengers in its first full month of operation in September 2022 (see **Table 8**). This is a combined total for both the North Ollerton and South Ollerton scheme and Mansfield scheme. Hertfordshire has recorded an average of 7,835 miles travelled with passengers per month since the North and East Herts DRT scheme commenced in September 2021. It serves the second largest land area and population. The other DRT schemes have recorded between 1,073 and 3,348 miles travelled with passengers a month.

**Table 9** compares vehicle utilisation rates (measured in terms of average daily distance travelled per vehicle with passengers) across the pilots by showing figures

for average daily distance travelled per vehicle. The Hertfordshire DRT scheme has recorded the highest utilisation rate of 86 miles per day per vehicle with passengers. Four other LAs have recorded 65 – 73 miles per day per vehicle with passengers (Cheshire East, Norfolk, North Lincolnshire and Nottinghamshire). Two LAs have recorded 33 – 44 miles per day per vehicle with passengers (Staffordshire, Warwickshire). Essex has recorded 6 miles per day per vehicle with passengers but the Essex pilot operating zone was expanded in September 2022 and the service distance figures reported do not yet reflect this. Leicestershire has recorded 16 miles per day per vehicle with passengers, but its scheme had only just started operating at the time it supplied data.

**Table 9** also shows the ratio of distance travelled without passengers to distance travelled with passengers (the 'empty running ratio') for those schemes reporting both of these. It shows a range in values from 0.44 to 1.86. The ratios are above one for Nottinghamshire (combined North and South Ollerton and Mansfield schemes), Staffordshire (Moorlands scheme) and Cheshire East (South West of Nantwich scheme). The operating zones for these schemes have low population densities which means it is likely vehicles will need to travel longer distances between journeys to pick up customers.

**Table 9: Average daily distance travelled per vehicle with and without passengers**

| DRT scheme | Ave. daily miles with pass. per vehicle (A) | Ave. daily miles without pass. per vehicle (B) | Average daily miles difference | Empty running ratio (B/A) |
|---|---|---|---|---|
| Cheshire East | 65 | 73 | -8 | 1.12 |
| Essex | 6 | N/A | N/A | N/A |
| Hertfordshire | 86 | 71 | 15 | 0.82 |
| Leicestershire | 16 | 7 | 9 | 0.44 |
| Norfolk | 73 | N/A | N/A | N/A |
| North Lincs. | 68 | 46 | 21 | 0.68 |
| Nottinghamshire | 69 | 100 | -31 | 1.45 |
| Staffordshire | 33 | 62 | -29 | 1.86 |
| Warwickshire | 44 | 27 | 18 | 0.60 |
| Average across schemes | 54* | 55* | -1 | 1.02 |

Notes: (i) N/A = not available. (ii) *Essex and Norfolk excluded. (iii) Average daily miles with passengers per vehicle (A) is the average of monthly calculations of: (Total miles with passengers/Days of operation)/Number of vehicles. Average daily miles without passengers per vehicle (B) is calculated similarly. Empty running ratio is calculated as B/A.

## 4.4. Journey length, time and speed

**Table 10** compares the average journey distance, time and speed across the operational pilot schemes. The longest journey distances are recorded in Norfolk. The shortest journey distances are recorded in Essex, Leicestershire and Warwickshire which are mixed rural and urban areas with the highest population densities. Journey times generally reflect journey distances, although journey speeds

are higher in Norfolk and hence journey times are not markedly higher than in the other pilot areas.

**Table 10: Average journey distance, time and speed**

| DRT scheme | Average journey distance (miles) | Average journey time (minutes) | Average miles per hour |
|---|---|---|---|
| Cheshire East | 6.8 | 17.3 | 23.6 |
| Essex | 3.0 | 8.7 | 20.7 |
| Hertfordshire | N/A | N/A | N/A |
| Leicestershi-re | 4.7 | 10.5 | 26.7 |
| Norfolk | 10.7 | 15.9 | 40.5 |
| North Lincolnshire | 6.5 | 14.9 | 26.2 |
| Nottinghams hire | 5.2 | 16.0 | 19.5 |
| Staffordshire | N/A | N/A | N/A |
| Warwickshire | 2.4 | 6.2 | 22.6 |

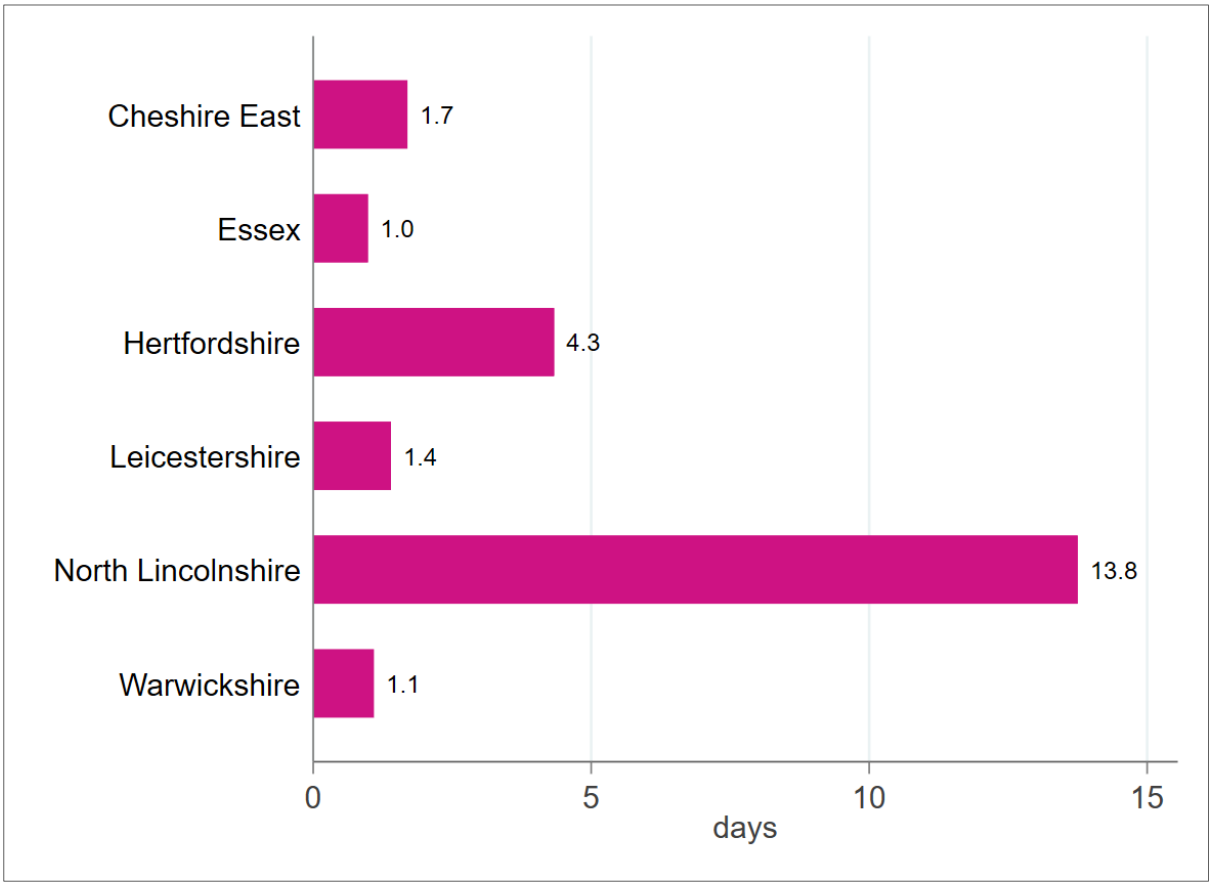
Notes: (i) N/A = not available. (ii) Average miles per hour is calculated as: Average journey distance/Average journey time.

## 4.5. Booking statistics

Section 3.5 introduced the minimum and maximum lead times for booking DRT journeys. **Figure 9** reports the average number of days that journeys have been booked in advance by users for six of the pilots where this information was available. Journeys have been booked far longer in advance in North Lincolnshire (13.8 days) than the other schemes with Hertfordshire reporting 4.3 days and the other four schemes reporting between 1.0 days and 1.7 days.

The North Lincolnshire JustGo scheme is a successor to the well-established Call Connect scheme, operating across North Lincolnshire and neighbouring LAs. JustGo has seen a high proportion of users make phone bookings (see Figure 11) and it is speculated that many users are continuing the past practice of making phone bookings well in advance of travel.

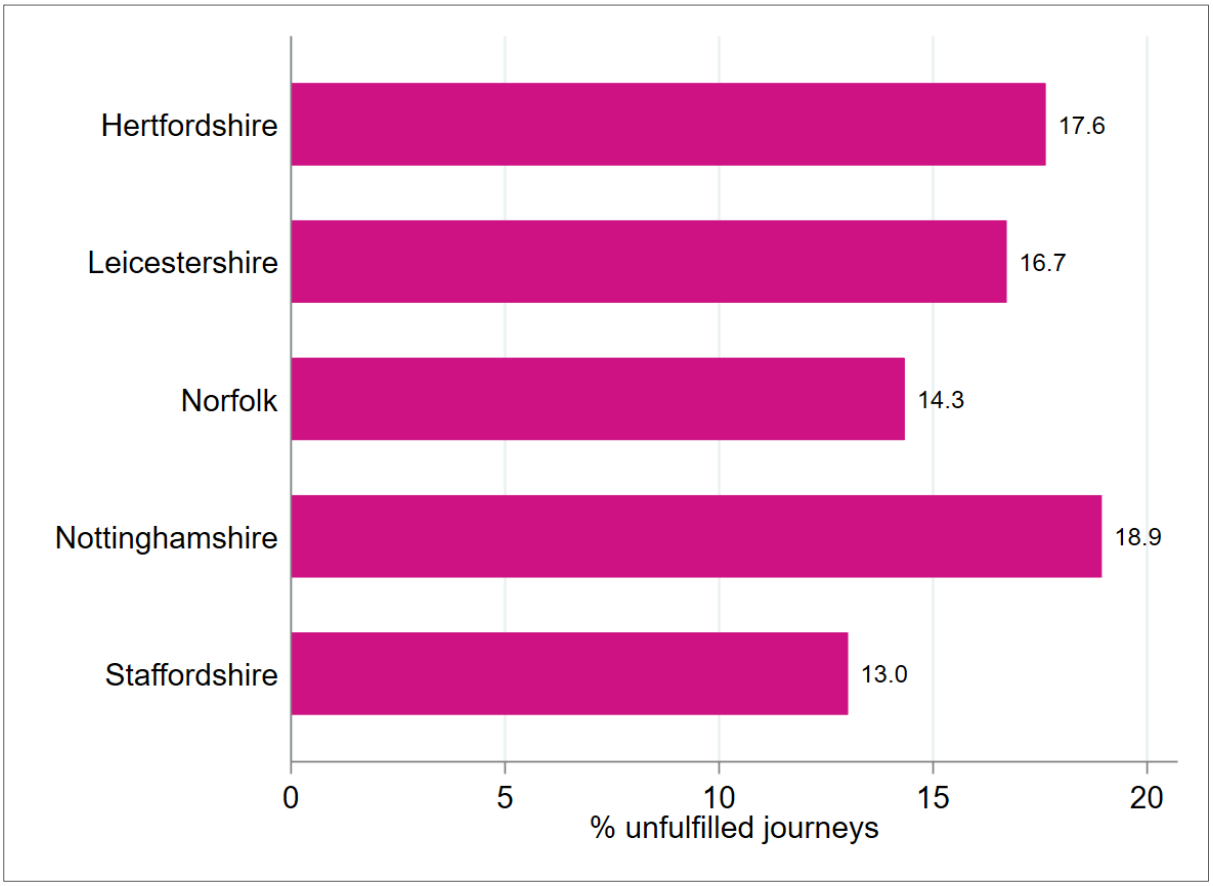
**Figure 9: Average days (mean) in advance that journeys booked**




Note: Cheshire East includes only the first six months of operation, i.e. October 2021 – March 2022.

**Figure 10** reports the percentage of unfulfilled journey bookings for five pilot services where this information is available, showing a range in values from 13.0% to 18.9%. Unfulfilled journeys are more likely when vehicles are heavily utilised, which is the case in Hertfordshire which has recorded the highest average distance travelled per day with passengers per vehicle of 86 miles (see **Table 9**). Nottinghamshire has noted the reported percentage of unfulfilled bookings (18.9%) reflects the recent launch of its DRT schemes with people testing and exploring the app or trying to select journeys outside of the operating zones.

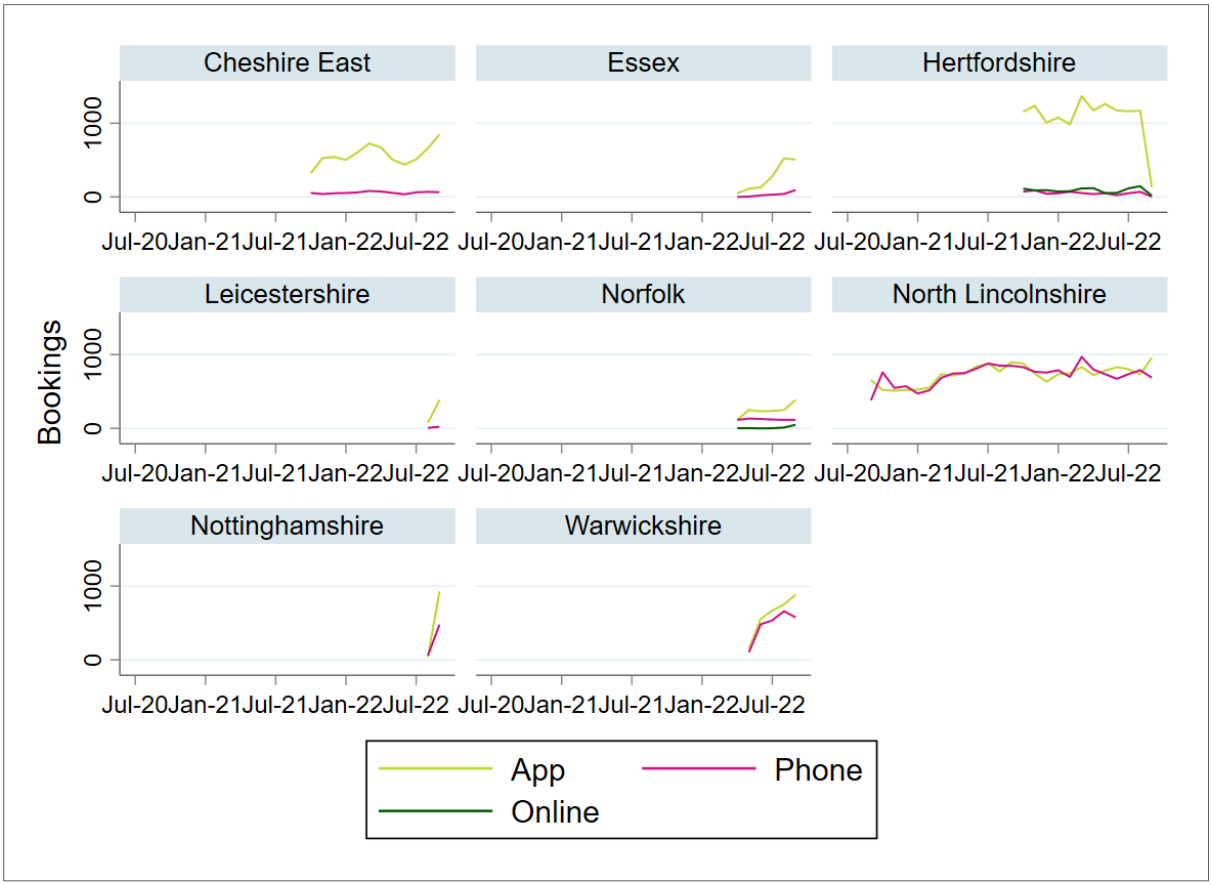
**Figure 10: Unfulfilled journey bookings**




Notes: (i) Percentage unfulfilled journeys is calculated as: (Total passengers whose bookings were unable to be fulfilled / (Total passengers + Total passengers whose bookings were unable to be fulfilled)) * 100. (ii) It is assumed unfulfilled journey bookings include bookings not fulfilled due to supply factors (e.g. unavailability of vehicle) or demand factors (e.g. passenger cancelling booking). This was confirmed by Hertfordshire. Norfolk, Nottinghamshire and Staffordshire have noted their figures only include bookings not fulfilled due to supply factors.

**Figure 11** shows that app-based bookings are generally more popular than phone or website bookings. North Lincolnshire is the only LA with an almost equal number of bookings by mobile app and phone. It is notable that 41% of North Lincolnshire's passengers are older people/disabled which may explain the popularity of phone bookings.

**Figure 11: Total bookings per booking method per month**




Note: The sharp decrease in distance travelled in September 2022 in Hertfordshire is explained by one vehicle being out of service for two weeks.

# 5. DRT USAGE

## 5.1. Overview

Section 5 presents results on the usage of the DRT schemes based on the data provided by the LAs in the six-monthly spreadsheets. This covers results on passenger numbers, passengers travelling on concessionary fares, revenues, passenger demographics and passengers by day of week and time of day. It also includes results on the most popular journey destinations. Key findings are:

- DRT usage appears to be on an upward trend for all the schemes, except for one of the earliest starting services (Hertfordshire) which achieved high passenger numbers in 2021 and has maintained these levels since.
- Actual usage levels of 282 - 1725 passengers per month (or 11 – 67 passengers per day of operation) have been recorded for schemes that started before October 2022. Schemes which serve areas with relatively large populations, and have more vehicles available, have achieved the highest passenger numbers (North Lincolnshire, Nottinghamshire, Warwickshire and Hertfordshire).
- The results for number of passengers per revenue hour show a range from 0.14 to 1.77. This is a similar range of values to those reported in a study13 of second-generation DRT schemes published in 2019.
- The extent to which DRT schemes are being used by passengers travelling on concessionary fares varies between 12% and 55%, implying they are attracting a high proportion of full fare-paying customers. Where information is available, there are notable numbers of children/young people using the schemes.
- The average revenue per passenger (across paying and non-paying passengers) differs considerably between schemes with a range of £1.22 - £2.92 for well-established schemes. Fare structure and the proportion of concessionary permit holders are two influential factors that determine revenue per passenger.
- The passenger use profile by day of week and time of day varies between schemes. Saturdays are more popular than weekdays in some cases, whilst in other cases more use is seen on weekdays. Journeys are made less often in the morning peak period than middle of day and afternoon peak period.
- Rail and bus stations and market towns within the operating zones, or at the edge of operating zones, are attracting a large number of journeys. Healthcare centres, employment and retail parks and schools and colleges also feature as popular destinations. This suggests the DRT schemes are

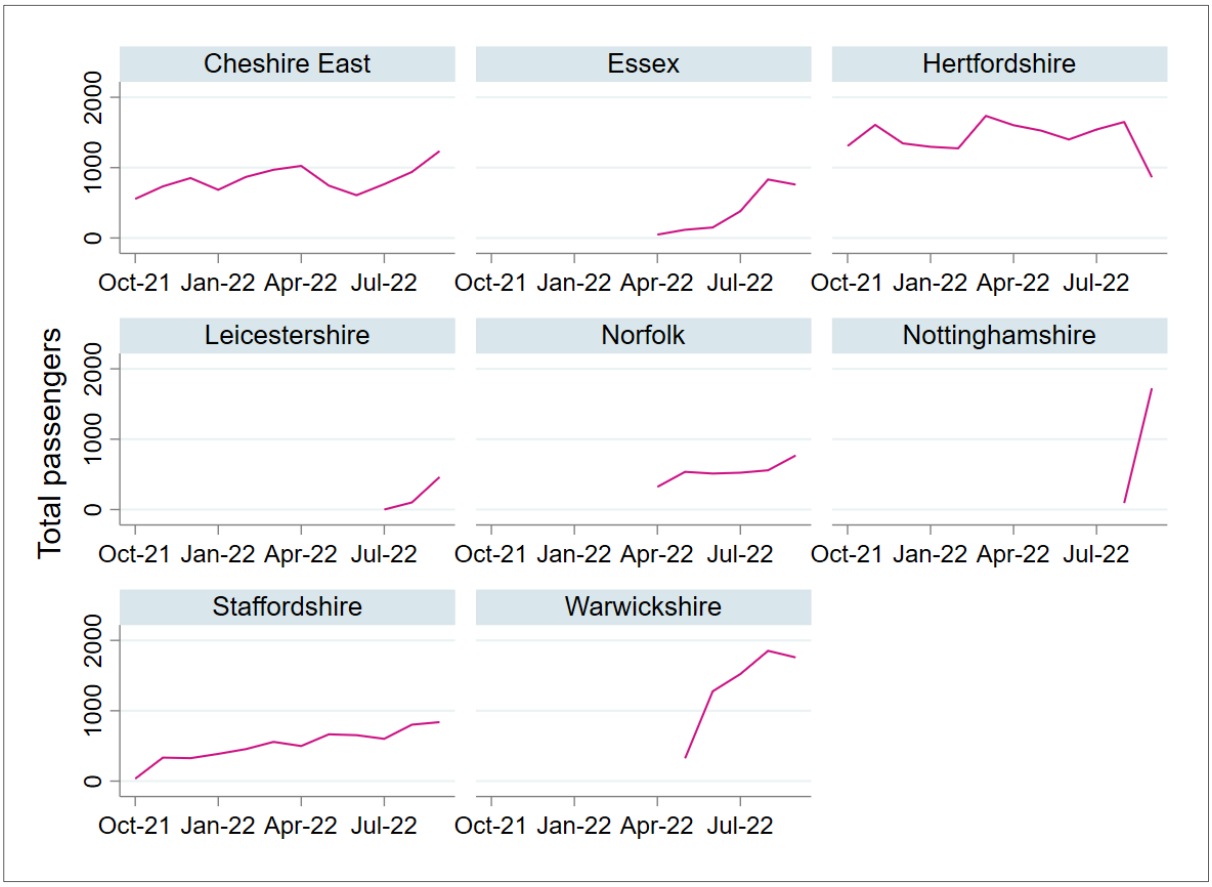
[13] Pettersson, F., 2019. An international review of experiences from on-demand public transport services. The Swedish Knowledge Centre for Public Transport.

helping to enable connections to local transport, economic, retail, education and healthcare facilities.

## 5.2. Total passenger numbers

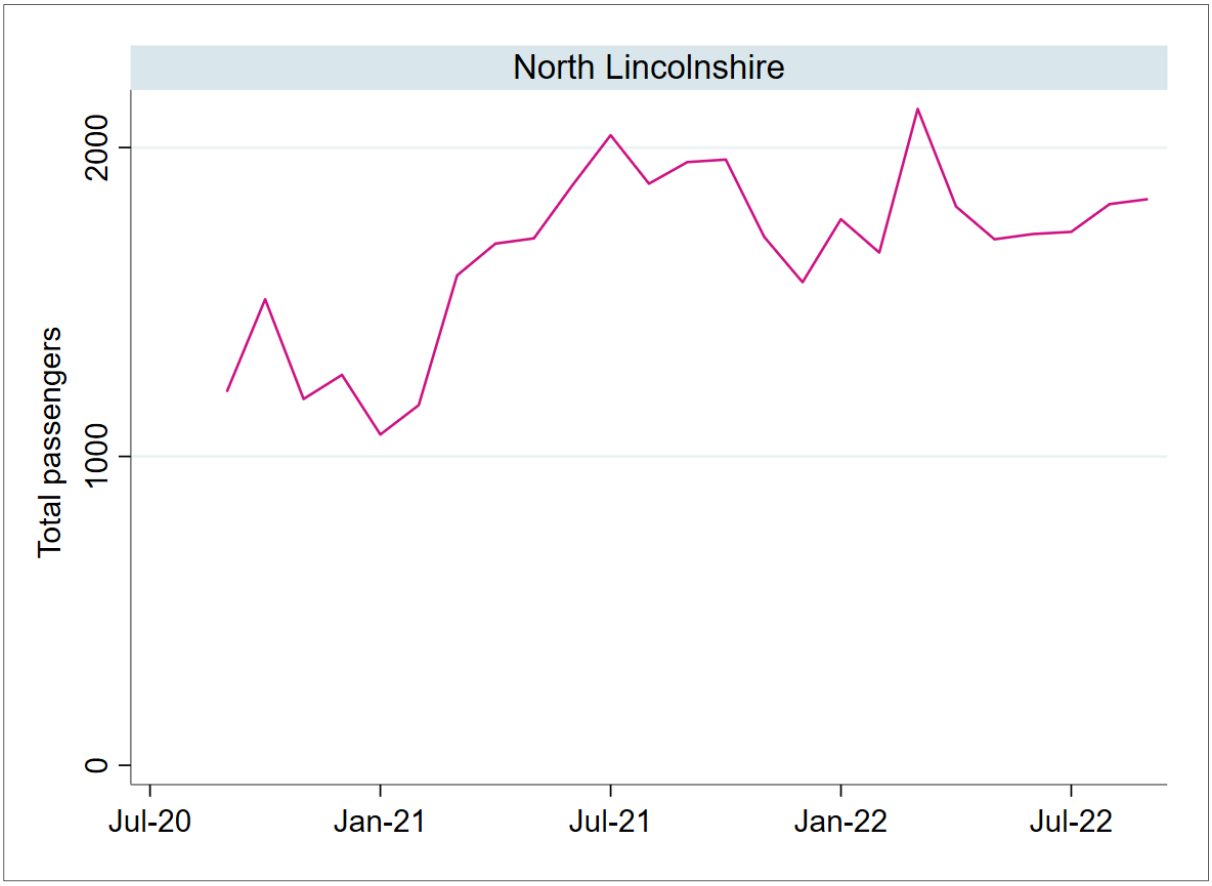
**Figure 12** compares passenger numbers per month between October 2021 and September 2022 for the DRT schemes that started before October 2022 and supplied data to the national evaluation. **Figure 13** shows separately the trend in passenger numbers for the North Lincolnshire DRT scheme for the full two years since it started operating in September 2020.

**Figure 12: Total passengers per month**




Note: Includes partial first months for Leicestershire, Nottinghamshire, Staffordshire and Warwickshire.

**Figure 13: Total passengers per month North Lincolnshire**




Patronage picked up relatively quickly for Cheshire East and Hertfordshire after they launched and has been maintained since. Both of these LAs offered promotional fares on launching their schemes (see Appendix B). Patronage has grown more slowly and steadily in the cases of Essex, Norfolk and Staffordshire. The sharp rise in demand in August-September 2022 in Essex occurred after it revamped its DRT scheme accompanied by a marketing drive (see Appendix B). The North Lincolnshire DRT scheme has been running for two years with gradual patronage growth in its first year of operation after which it has achieved 1,500 - 2,000 passengers per month. JustGo posters have been installed at all bus stops in North Lincolnshire not served by commercial bus services and may have contributed to these high and steady passenger numbers (see Appendix B). It is too early for the trends to be clear for Leicestershire, Nottinghamshire and Warwickshire.

**Table 11** reports a number of different indicators for passenger use of the DRT schemes. It reports average monthly and daily passenger numbers for each DRT scheme over the full period in which each scheme has been operating. It also reports a key indicator of the productivity of the DRT schemes – the average monthly number of passengers per revenue hour. Revenue hours have been calculated as the total number of vehicle hours (across all vehicles in fleet) that the schemes have operated each month. **Table 11** also contains contextual information about the scheme areas, number of vehicles used and scheme miles per month and day.

**Table 11** shows that average monthly passenger numbers range from 282 in Leicestershire to 1,725 in Nottinghamshire. The highest passenger numbers per day have been achieved in North Lincolnshire (67), Nottinghamshire (66), Warwickshire (63) and Hertfordshire (47), which serve areas with relatively large populations and have at least three vehicles available.

Passenger numbers per day of 34, 21 and 20 have been seen in Cheshire East, Norfolk and Staffordshire respectively, where the schemes serve areas with relatively low populations. Low passenger numbers per day in Essex (13) and Leicestershire (11) reflect their DRT schemes starting recently and an acknowledgement in Essex that the scheme area needed to be reconfigured after it was first introduced.

The results for passengers per revenue hour show a range from 0.14 to 1.77. Higher values are found for Cheshire East, Hertfordshire, Norfolk and Warwickshire which have achieved a relatively high number of passengers with three or fewer vehicles. A desk study[14] of second-generation DRT schemes published in 2019 reported values between 0.06 and 2.6 for eight different schemes in eight countries (covering schemes in Australia, Canada, Denmark, Finland, France, Netherlands, United Kingdom and United States) and benchmarked those figures against values reported for traditional DRT schemes in the United States of 1.28 to 4.7 passengers/revenue hour[15].

[14] Pettersson, F. (2019). An international review of experiences from on-demand public transport services. The Swedish Knowledge Centre for Public Transport.

[15] TCRP (2008). National Academies of Sciences, Engineering, and Medicine. Guidebook for Measuring, Assessing, and Improving Performance of Demand-Response Transportation. Washington, DC: The National Academies Press. https://doi.org/10.17226/23112

**Table 11: Average monthly and daily passenger numbers with contextual information**

| DRT scheme | Population | Pop. density (pers./ sq. km) | No. of vehicles | Average scheme miles with passengers per month | Average scheme miles with passengers per day | Average total passengers per month | Average total passengers per day | Passengers per revenue hours |
|---|---|---|---|---|---|---|---|---|
| Cheshire East - South West of Nantwich | 17,000 | 46 | 2 | 3,218 | 131 | 832 | 34 | 1.16 |
| Essex - Central Essex and South Braintree | 30,110 | 192 | 6 | 1,073 | 36 | 381 | 13 | 0.14 |
| Hertfordshire - North and East Herts | 36,000 | 61 | 3 | 7,835 | 259 | 1,429 | 47 | 1.31 |
| Leicestershire – South West Leicestershire | 34,000 | 400 | 3 | 1,180 | 47 | 282 | 11 | 0.28 |
| Norfolk – Swaffham | 14,508 | 66 | 1 | 1,842 | 73 | 537 | 21 | 1.77 |
| North Lincolnshire | 176,000 | 201 | 6 | 10,754 | 425 | 1,688 | 67 | 0.89 |
| Nottinghamshire - Ollerton/Mansfield | 12,287/ 17,005 | 41/ 2,834 | 5/ 3 | 8,957 | 345 | 1,725 | 66 | 1.11 |
| Staffordshire - Moorlands | 11,887 | 34 | 3 | 2,846 | 100 | 556 | 20 | 0.54 |
| Warwickshire - Hatton and West Warwick | 20,000 | 208 | 3 | 3,348 | 132 | 1,602 | 63 | 1.56 |

Note: Scheme miles and passenger numbers for Nottinghamshire are combined figures for North and South Ollerton and Mansfield schemes.

## 5.3. Concessionary fare users

**Table 12** presents information on the extent to which passengers are travelling on DRT schemes on concessionary fares for those LAs which supplied this information. It shows about half of passengers travelling on concessionary fares in North Lincolnshire and Staffordshire with between three to four times as many older/disabled people as children/younger people travelling on concessionary fares in these two schemes. In contrast, **Table 12** shows 12-20% of passengers travelling on concessionary fares in Essex, Hertfordshire and Nottinghamshire.

**Table 12: Passengers travelling on a concessionary fare**

| DRT scheme | Child /young person | Older person | Disabled | Other | Total pass | % older/ disabled | % conc-ession |
|---|---|---|---|---|---|---|---|
| Cheshire East | N/A | N/A | N/A | N/A | 9,981 | N/A | N/A |
| Essex | N/A | N/A | N/A | N/A | 2,287 | N/A | 19% |
| Hertfordshire | 831 | 1,311 | N/A | N/A | 17,149 | 8% | 12% |
| Leicestershire | 61 | 91 | 33 | N/A | 563 | 22% | 33% |
| Norfolk | N/A | N/A | N/A | N/A | 3,221 | N/A | 26% |
| North Lincolnshire | 5,678 | N/A | N/A | 16,978 | 41,537 | 41% | 55% |
| Nottinghamshire | 52 | 310 | N/A | N/A | 1,817 | 17% | 20% |
| Staffordshire | 522 | 1,795 | 111 | 490 | 6,152 | 31% | 47% |
| Warwickshire | N/A | N/A | N/A | N/A | 6,731 | N/A | N/A |

Notes: (i) 'pass' denotes passengers, 'concession' denotes concessionary fares. (ii) North Lincolnshire – other category is combined older people/disabled. (iii) Cheshire East and Staffordshire only offer half price fares for ENCTS holders. (iv) Hertfordshire – SaverCard users (aged 11-25) who get half price fares counted under Child/young person. (v) Norfolk % concession figure reflects the period March 2022 to February 2023.

## 5.4. Revenues

**Table 13** presents DRT scheme revenues reported by the LAs, as well as figures for total passengers and calculated revenues per passenger (across paying and non-paying passengers). It shows revenues are linked to total passenger numbers but the average revenue per passenger differs considerably between the schemes with Leicestershire having the highest average revenue per passenger (£3.05) and Nottinghamshire the lowest (£0.96). These two DRT schemes have only just started operating and it is too early to reach any conclusions on them.

Excluding Leicestershire and Nottinghamshire, average revenue per passenger has been in the range £1.77 - £2.32 with the exceptions of Norfolk at £1.22 and Hertfordshire at £2.92. Norfolk has fares of £2 for travel in an inner zone and £3 for travel in an outer zone and has attracted 74% full fare paying passengers. Hertfordshire has attracted a high percentage of full fare paying passengers (88%)

and its fares of £3 for journeys of 0-2 miles and £4 for journeys of 2-5 miles will also contribute to the relatively high revenue per passenger.

**Table 13: Revenues received**

| DRT scheme | Period | Revenue (£) | Total passengers | Average revenue (£) per passenger |
|---|---|---|---|---|
| **Cheshire East** | October 2021-March 2022 | 10170 | 4665 | 2.18 |
| **Cheshire East** | April 2022-September 2022 | 12315 | 5316 | 2.32 |
| **Essex** | April 2022-September 2022 | N/A | 2287 | N/A |
| **Hertfordshire** | October 2021-March 2022 | 19803 | 8566 | 2.31 |
| **Hertfordshire** | April 2022-September 2022 | 25037 | 8583 | 2.92 |
| **Leicestershire** | August 2022-September 2022 | 17188* | 563 | 3.05 |
| **Norfolk** | April 2022-September 2022 | 3922 | 3221 | 1.22 |
| **North Lincolnshire** | September 2020-March 2021 | 16346 | 8991 | 1.82 |
| **North Lincolnshire** | April 2021-September 2021 | 19698 | 11148 | 1.77 |
| **North Lincolnshire** | October 2021-March 2022 | 19721 | 10789 | 1.83 |
| **North Lincolnshire** | April 2022-September 2022 | 21735 | 10609 | 2.05 |
| **Nottinghamshire** | August 2022 - September 2022 | 1743 | 1817 | 0.96 |
| **Staffordshire** | October 2021 - March 2022 | N/A | 2094 | N/A |
| **Staffordshire** | April 2022 - September 2022 | N/A | 4058 | N/A |
| **Warwickshire** | May 2022 - September 2022 | 12367 | 6731 | 1.84 |

Note: *Revenue between 27th July - 30th September.

## 5.5. Passenger demographics

The only LA with data about the gender and age of passengers was Leicestershire and that was only for August and September 2022 after the scheme started operating in July 2022. During these two months their figures showed 60% of passengers (338 out of 563) were female, 25% male and 15% other/not reported. 32% of passengers (178 out of 563) were aged under 30 years old, 25% 30-49 years old, 15% 50-59 years old, 16% 60 years or more and 13% did not disclose their age. The South West Leicestershire DRT scheme appears to be attracting users with a broad age range. In the future, it is hoped more LAs will be able to provide data on passenger demographics as they have requested their app providers collect this information.

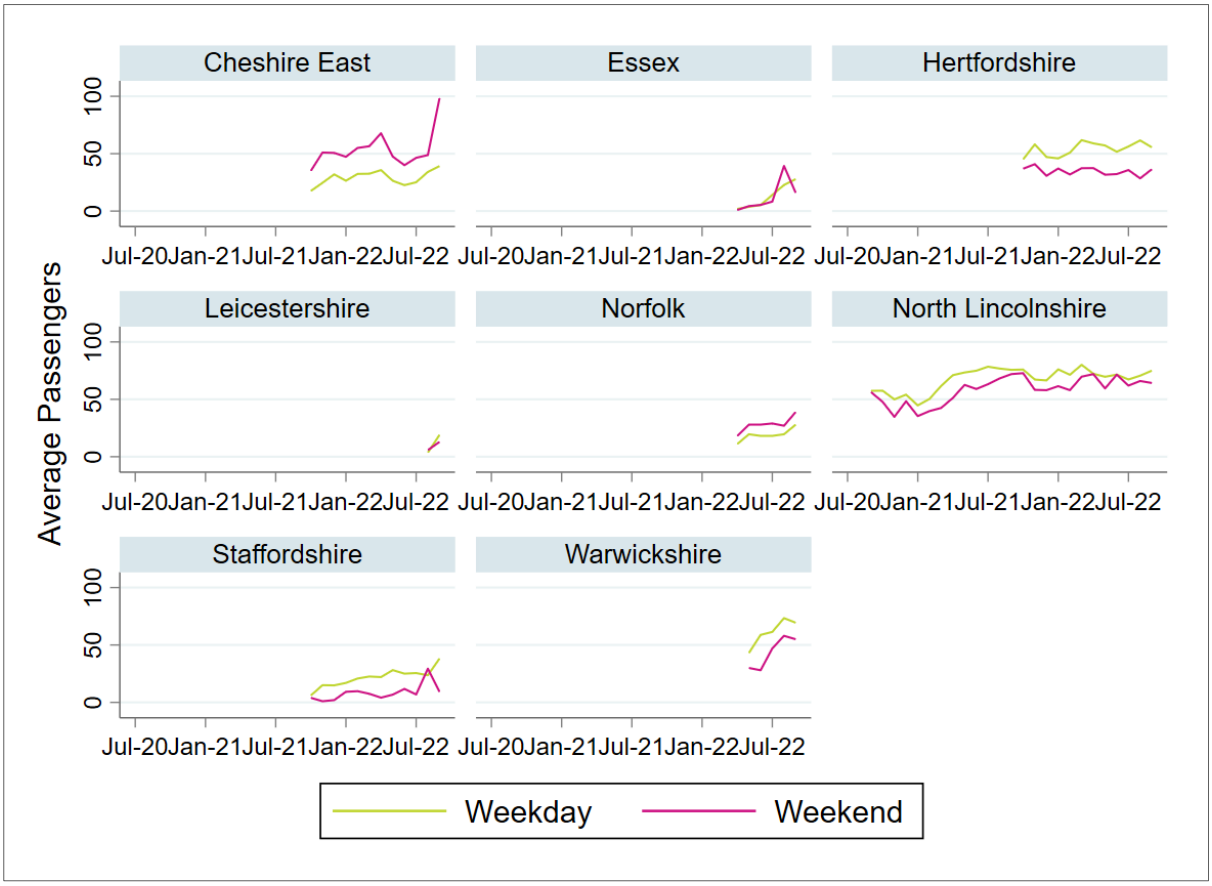
## 5.6. Passengers by day of week and hour of day

**Figure 14** compares average passenger numbers per day on a weekday and at the weekend[16]. Cheshire East and Norfolk reported a higher average number of passengers at the weekend compared to weekdays. The other schemes reported similar or lower numbers at the weekend.

**Figures 15-19** show passenger numbers by time of day for five DRT schemes. Fewer passengers have been recorded during the 6am-10am morning period than the 10am-2pm and 2pm-6pm periods, except for North Lincolnshire where a similar quantity of passengers have been recorded.

[16] Passengers per day at the weekend accounts for Saturday only for those schemes running Saturdays only and both Saturday and Sunday for those schemes running on both days. See Table 3 for days of operation.

**Figure 14: Average passenger numbers by day of week**




Note: Nottinghamshire is not shown above as only one month of data is available.

**Figure 15: Average passenger numbers by hour of day for Hertfordshire**

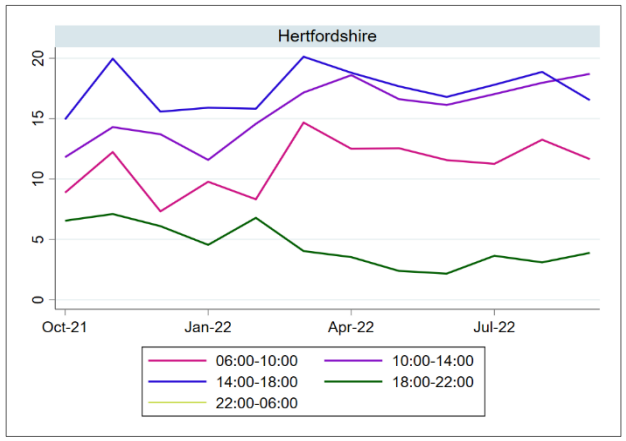



**Figure 16: Average passenger numbers by hour of day for Leicestershire**

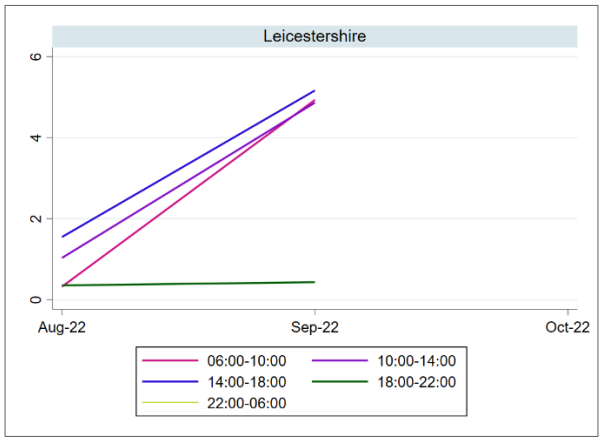



**Figure 17: Average passenger numbers by hour of day for Norfolk**

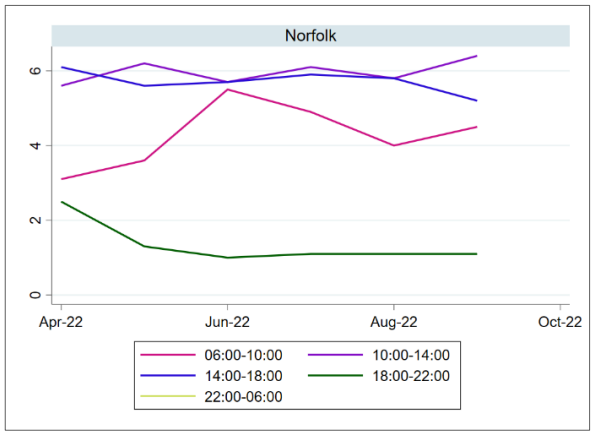



**Figure 18: Average passenger numbers by hour of day for North Lincolnshire**

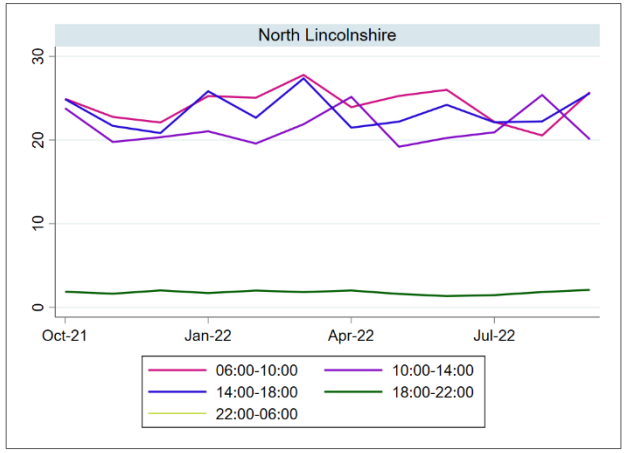
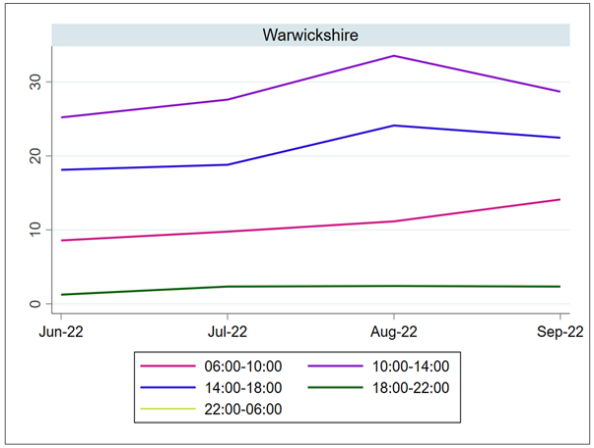



**Figure 19: Average passenger numbers by hour of day for Warwickshire**



## 5.7. Key destinations

LAs were invited to identify three or more key destinations and three or more origins served by their DRT scheme and to supply figures on the number of journeys made to/from them per month. The precise basis for selecting destinations and origins is not specified but the information provides useful insights on popular places people are getting to with the DRT schemes.

**Table 14** reveals the most popular journey destinations as reported by LAs for the six-month period April 2022 to September 2022. It reports the average number of journeys per month made to these destinations. Journey origins have not been considered as they were often the same places identified as destinations but this was not always the case, hence it would not always be possible to identify the correct number of total journeys associated with each place.

**Table 14** highlights that rail and bus stations and market towns within the operating zones, or at the edge of operating zones, are attracting a large number of journeys. Healthcare centres, employment and retail parks and schools and colleges also feature as popular destinations. This suggests that the DRT schemes are helping to enable connections to local transport, economic, retail, education and healthcare facilities.

Braintree town centre is the most popular location for users of the Central Essex and South Braintree scheme (in Essex). DigiGo has been carefully designed to feed passengers to the wider public transport network rather than competing with it. Railway stations at the boundary of the North and East Herts pilot operating zone (in Hertfordshire) have been the most popular destinations. Fosse Park retail park and Enderby Park & Ride are the most popular destinations in the first full month of the South West Leicestershire DRT scheme.

Swaffham town centre has been the most popular destination in Norfolk for users of the Swaffham scheme (in Norfolk). Swaffham town centre represents the most significant settlement in the operating zone. Retford and Newark bus stations have been the most popular destination for users of the North and South Ollerton scheme (in Nottinghamshire) in the first full month of operation.

Leek bus station has been the most popular destination for users of the Moorlands scheme (in Staffordshire). Warwick bus station and Kenilworth town centre have been popular destinations for users of the Hatton and West Warwick scheme (in Warwickshire).

**Table 14: Popular destinations**

| DRT scheme | Key destination | Average journeys per month |
|---|---|---|
| **Essex** | Braintree Town Centre (Bus Interchange, Train Station, Community Hospital etc) | 54 |
| **Essex** | GRIDSERVE/The Plaza/CareCo | 24 |
| **Essex** | Broomfield Hospital | 22 |
| **Hertfordshire** | Stevenage railway station | 130 |
| **Hertfordshire** | Royston railway station | 91 |
| **Hertfordshire** | Royston bus station | 74 |
| **Leicestershire** | Fosse Park (Retail Park) | 35 |
| **Leicestershire** | Enderby Park & Ride | 29 |
| **Leicestershire** | Hinckley Bus Station | 20 |
| **Norfolk** | Swaffham - Kings Arms (town centre) | 166 |
| **Norfolk** | North Pickenham - Bus Shelter | 43 |
| **Norfolk** | Gooderstone - Walnut Place (village centre) | 36 |
| **Nottinghamshire** | Retford Bus Station (Bay H) | 173 |
| **Nottinghamshire** | Newark Bus Station (Bay E) | 79 |
| **Staffordshire** | Leek Bus Station | 137 |
| **Staffordshire** | Ashbourne Bus Station | 37 |
| **Staffordshire** | Valley Primary School | 29 |
| **Warwickshire** | Warwick Bus Station | 191 |
| **Warwickshire** | Kenilworth (Abbey End both stops) | 107 |
| **Warwickshire** | Warwick Parkway Station | 34 |

# 6. PROCESS EVALUATION

## 6.1. Overview

The process evaluation involved interviews and roundtables with LAs to explore their experience in designing and mobilising the DRT schemes. They shed light on the challenges faced by LAs in setting up a new form of public transport and why the introduction of DRT schemes was delayed in some cases. They also provide valuable lessons for other LAs who are considering DRT. Key challenges and opportunities are summarised below with full results from the interviews and group roundtables reported after this.

### Contextual factors

The timing of the DRT schemes was seen as a challenge to LA officers as they were launching these in a period when there was pressure on bus services in the aftermath of the Covid-19 pandemic and there were large demands on their time due to the requirement to produce plans for future bus provision.

1. Post-pandemic reduction in public transport use – the widely seen reduction in bus use by traditional user groups since the Covid-19 pandemic has been a challenge for the LAs as they plan and introduce new services. However, it also presents an opportunity to restore confidence among traditional user groups and to attract new user groups.
2. National Bus Strategy - demands on LA public transport officers have been high during the bidding, mobilisation and launch periods, particularly with work required at a local level to produce Bus Service Improvement Plans (BSIPs). This has also provided an opportunity, however, to consider the role of DRT in longer-term bus network planning.

### Design factors

The interviews and roundtables highlighted a number of practical and regulatory challenges that needed to be overcome in the DRT scheme design process.

3. Demand forecasting - all the LAs were focused on introducing a new type of service in areas with limited public transport. There was no existing data on demand for these areas, therefore design of the DRT schemes (for example, determining the hours of operation and the number of vehicles) was based partly on desk-based research using geo-demographic data and partly on expert opinion of where and when people were likely to want to travel.
4. Competition law - Under the Transport Act 1985, LAs are effectively restricted to only subsidising a bus service to fill a gap in provision. Such services must not distort the local commercial bus market. This constrained where DRT schemes could operate and their fare structures. LAs reported working with commercial bus operators to agree issues such as through-ticketing and how DRT would feed into commercial fixed route areas.
5. Virtual stops – DRT has the potential to offer a larger number of possible journey start and end points compared to traditional bus services. However,

challenges in determining virtual stop locations include considering vehicle access to roads and safety/accessibility issues for passengers, and so a pragmatic approach was often adopted to build the DRT network around existing formal bus stops, supplemented with virtual stops.

## Operational factors

All the DRT schemes had the following operational elements to consider in the design and set-up stage:

- Fleet – procurement, operations, and maintenance
- Drivers – recruitment, training, and working patterns
- Booking platform
    1. App – procurement, development, and operation
    2. Call centre – procurement and management

There were variations between schemes regarding which of these elements were kept in house or tendered out and how.

6. Contracting out versus in-house – some LAs have contracted out all the operational elements of their DRT scheme (fleet, drivers, booking system), others are managing them in-house and some are taking a mixed approach. Contracting out was seen to reduce demands on internal resources and reduce exposure to risk. However, some LAs were keen to have access to information to learn and capture lessons they could use in planning future public transport provision.
7. Fleet decisions – a tension was highlighted in fleet deployment between the commercial objective of income generation and social objective of providing equity of access. There can be a choice between keeping vehicles close to where there is likely to be more demand and revenue and having vehicles available to get to less populated, less frequently demanded stops in a reasonable time for the service to be used. Interviewees felt that for DRT to function well there needs to be capacity available in reserve but this can be perceived to be an inefficient use of vehicles.
8. Booking system – an app-based booking system has been central to all the DRT schemes and offers many benefits, such as access to data analytics, but call-centres were seen to be particularly important early in the life of the schemes where they can provide reassurance to users unfamiliar with such a booking system.
9. Driver training – DRT drivers have to work in a different way to drivers of other bus services, but some LAs noted that their hours of service and vehicle types were attractive to applicants during recruitment. This is despite bus driver recruitment being a national challenge at the time. Bespoke driver training was needed for the DRT schemes given the many new features involved such as driver hand-held technology for receiving and acknowledging bookings.

## Technology factors

A number of LAs have been delayed in starting their pilot. Some of the reasons for the delays were external to the projects themselves but others centred around the introduction of new technology.

10. Mobile app technology – all the DRT schemes introduced app-based booking platforms. While one LA developed an in-house travel planning app with a DRT option, the majority chose to work with mobility technology providers with DRT experience. However, these companies had varying levels of knowledge of the UK bus market and some were more accustomed to taxi-type operations or US municipal single operator markets.

11. Programming DRT schemes into apps – the time required to programme service information (e.g. virtual stop locations) into apps had not been foreseen and needs to be taken into account in planning future DRT schemes.

12. Payment processing systems – many of the LAs experienced delays and frustration contracting with a US-based in-app payment processor, as the US company was unfamiliar with UK public sector institutional requirements relating to role designations and financial accountability.

## Targeting and marketing factors

All the pilots were conscious of wanting the DRT schemes to appeal to a broad ridership. They wanted to get away from any pre-conception of community services intended only for older people and to promote a service for everyone.

13. Targeting non-traditional users – various efforts have been taken to reach out to a wider user market compared to traditional bus services. LAs have worked with their communications teams using a wide variety of publicity media and techniques, including posters, YouTube videos, and roadshows. Promotions such as “first ride free” have been used to incentivise the public to try the service. Word of mouth and trying the service were seen to be key to establishing habitual users.

14. Reassuring existing users - where DRT was replacing or modifying existing bus services, it was essential to reassure existing customers that the new service would fulfil previous needs while offering advantages.

## Lessons learnt post launch

Once the DRT schemes had launched, data from the technology platform started flowing and has helped in reviewing their design and making service modifications. It has also helped them reflect on the overall role of DRT schemes.

15. Data analytics and service modifications – the data analytics available from the booking systems has been found to be invaluable for continuous improvement of the DRT schemes and for understanding who is using the service and where and when they want to travel. Real-time feedback, particularly in the early stages of the schemes, enabled some adjustments to be made quickly. Patterns of demand can already be seen early in the pilot schemes and this can inform future service development.

16. Attracting young users - LAs that had launched their schemes said they had observed a greater usage by young people than they had predicted, particularly around school timings and educational destinations. Some LAs suggest this indicates a potential pent-up demand by pupils not eligible for free school transport.

17. Role of DRT - LAs and partners involved in the process evaluation felt that there are inherent tensions operationally between maximising revenue, maximising passenger numbers and maximising access to services. However, many of the LAs see DRT in the context of wider policy objectives for public transport, such as reducing car usage and providing equitable access to employment, education, health or leisure facilities for dispersed populations. They note that DRT can be an effective delivery mechanism, but one that would probably need ongoing revenue support.

## 6.2. Challenges and opportunities at the outset of the process

The timing of the DRT schemes was seen as a challenge as they were launching new services in a period when there was pressure on bus services in the aftermath of the Covid-19 pandemic. Public transport ridership was reduced during the pandemic. While numbers rose once restrictions were eased, a number of participants remarked that patronage data showed concessionary fare passengers (particularly those with older person's bus passes) had not returned to pre-pandemic levels on bus services in their area. Reduced passenger numbers have a direct impact on the viability of commercial services and while bus services have been supported by government through the Covid-19 Bus Service Support Grant (CBSSG) and Bus Recovery Grant (BRG), there were planned withdrawals of commercial services in some areas from April 2022. Budget constraints within LAs also affected some supported services.

While this context was viewed as a challenge, it was also seen as an opportunity to encourage core concessionary passengers to return to public transport. A number of the LAs interviewed also saw the opportunity DRT brought to make public transport attractive and accessible to an entirely new set of passengers.

Capacity within LAs was a concern for some. It was noted by several interview and roundtable participants that bidding for funding, writing the business case, and setting up the scheme were undertaken alongside the "day job". Some participants noted that the National Bus Strategy ("Bus Back Better"[17]) requirement for local transport authorities to develop Bus Service Improvement Plans (BSIPs) and Enhanced Partnerships (EPs) had occurred alongside the development of their DRT schemes, limiting time to devote to the DRT schemes. However, the overlap meant that growth of some of the DRT schemes was written into some BSIPs and draft EPs – providing an opportunity for future development of the schemes if funding became available.

[17] https://www.gov.uk/government/publications/bus-back-better

Some of the interviewees remarked that it was helpful to have certainty regarding funding for the "experimental" DRT schemes funded by the RMF while funding decisions for some other funding streams were being made. Three of the LAs were amongst the 31 local transport authority areas allocated funding for their BSIPs in April 2022.

A few of the interview and roundtable participants referred to the challenge of developing a business case in an uncertain environment with a lack of historic data on the type of scheme they were proposing. Acknowledging they were designing pilots, some had wondered whether DfT could have helped with providing feedback and guidance along the way. One roundtable participant explained:

> *"...anything during the bid that could have helped us understand what we were going in for would have been helpful... so the more that DfT can meet local authorities halfway with education, information, - what they expect, et cetera., even if it's all an experiment and it's all postulated, at least feeling that we have that human team. I'm not saying I'm going to get assigned person every time I'm writing a bid, but, just a little bit less of 'please upload your response and you might hear from us'."*

## 6.3. Challenges and opportunities in designing the schemes

Interview and roundtable participants were asked to describe their schemes and how they had chosen to design them. Through descriptive and narrative accounts of where they chose to run the schemes and how they chose to deliver them, interview and roundtable participants highlighted the practical and regulatory considerations needed to navigate the DRT design process.

### Service areas and routes

Introducing a grant-funded DRT scheme provided the opportunity to do something new within the constraints that apply to publicly funded bus services. Under the Transport Act 1985, LAs are effectively restricted to only subsidising a bus service to fill a gap in provision. Such services must not distort the local commercial bus market. Traditionally LA supported services have involved fixed-route services – for example, services running along a published route and stopping at specific bus stops to a timetable, or dial-a-ride services, often delivered as community transport, which provide bookable, door-to-door shared-ride services for those with mobility impairments.

Many of the interview and roundtable participants expressed objectives for DRT that included making public transport available to *places* or to *people* that had limited or no public transport availability, along with ambitions such as connecting rural areas to urban hubs, reducing car use, or connecting dispersed residents to education, employment, health and leisure opportunities.

All of the DRT schemes were designed to serve rural and/or suburban areas to enable journeys that were not supported by commercial services. While some schemes targeted areas where there had been no public transport before, others

chose areas where there was a LA supported fixed route or dial-a-ride service which would be added to or replaced by the DRT scheme.

Approaches included designing DRT schemes to meet or feed into existing fixed routes, to link rural areas with key population centres (for employment, education, or leisure) or to call at destinations such as hospitals, transport hubs or tourist attractions.

> *"The spec was very much about taking forward the traditional dial-a-ride model to something that was a bit more modern... It's very much about filling the gaps that can't necessarily be served by a regular scheduled timetable service."* *[Case study interviewee]*

All the LAs had to consider where passengers would be picked up and dropped off, and how this would relate to the booking platform since pick-up points had to be input into the apps. The use of "virtual" and formal bus stops in combination was a widespread feature – where a "virtual" bus stop is a fixed pick-up/drop-off down location identifiable by the service provider when booking a service, and a formal bus stop is used by fixed route services and is identifiable by markings on the road and a sign. However, the LAs had to design approaches that would be practical for their areas. For example, one interview participant explained their initial aim of a corner-to-corner service, where pick-up and drop-off locations are at street intersections, with a maximum 100 metre walk to/from a pick-up or drop-off point. In practice, they recognised that some country roads are miles long and they had to think of the safety and practicality for passengers of walking 100 metres to a virtual stop, and the reality of where people would want to get on/off a DRT service in sparsely populated areas with a 60 miles per hour 'A' road. This LA therefore did not opt for evenly spaced virtual stops as a hard rule but located them close to where people lived.

Other considerations for the placement of virtual stops were the size of the vehicle and potential access, routing, and stopping issues. One interview participant considered that the work needed to research each potential stop for a corner-to-corner service, either on the ground or via Google maps, would be too great for a large geographical area. Instead, the LA chose to use existing formal bus stops with key stops at destinations and to add to these with virtual stops. As with many elements of the DRT schemes, this LA was open to learning as the scheme develops, and working with communities so that a regularly used virtual stop could potentially become a formal bus stop in due course, for example with level access.

All LAs were bound by the geography of their DRT scheme, which has to be registered with the Traffic Commissioner, and were constrained by where commercial services operated. For example, within the current rules for LA supported services, an on-demand service could bring people into an area or route served by a commercial service but could not operate in a way that was seen as competition to it. Typically, this means DRT schemes are unable to offer bookable journeys on a commercial operator's route, or to undermine an operator with a competing fare system. One interview participant explained:

> *"The challenge is coming up with something that promotes the service and makes it competitive with alternative options for people, [while] working with the operators so that we could reassure them that what we're doing with this service is feeding into their main services. We're not trying to take people away from them."*

Another interview participant explained that their aim was to provide public transport as an alternative to the private car in areas which had previously not had a service at all. They noted that constraints on where the DRT scheme could run, particularly at its boundaries, led to the only complaint they received in the first few weeks of operation being about the areas the scheme did not cover.

LA interview participants spoke about working with operators to reconcile the limits of the DRT operating parameters by developing through ticketing offers. It was noted that the backdrop of a post-pandemic reduction in bus travel demand and partnership working in the development of BSIPs and EPs has helped conversations to take place about multi-operator tickets. According to an interview participant:

> *".. we had to go through the ping pong. 'How?" How would it be administered?' 'How would it be paid?' ...But we got through that because we've got some good local bus companies that realise at the moment they need to be thinking differently about how they generate passengers and if they can facilitate a through ticket, it's better than not having somebody on their bus at all. So it's helped us remove [something] that has been a barrier in the past."*

## Delivery options

All the LAs had the following operational elements to consider in the design and set-up stage of their DRT schemes:

- Fleet – procurement, operations, and maintenance
- Drivers – recruitment, training, and working patterns
- Booking platform
    1. App – procurement, development, and operation
    2. Call centre – procurement and management

There were variations between LAs regarding which of these elements were kept in house or tendered out and how. For example, one LA undertook a procurement exercise for all aspects of their scheme in one lot. The bus operator that won the contract owns the buses, employs the drivers, and has a contractual relationship with the app technology provider. As an operator they deal directly with the customers through the call centre and access the analytics from the app.

In contrast, another LA decided to keep all aspects of the scheme in-house with the explanation that they wanted to learn first-hand about the pros and cons of running it. This included procuring the fleet, registering the services with the Traffic Commissioners, recruiting and training the drivers, specifying and procuring the app, managing the booking and payment systems and monitoring and using the data analytics. Most other LAs employed a mixed approach, keeping some elements in-

house and contracting others out, with local circumstances and decision-making determining the specific mix.

Potential benefits and drawbacks of contracting out or keeping elements of the scheme in-house were discussed with interview and roundtable participants. All of the participants spoke about learning as the scheme was developed and making changes as new information came forward. An argument for keeping all elements of the scheme in-house was to learn and capture all the lessons learnt from the scheme first hand to better inform future schemes. In contrast, contracting out one or more of the elements could be seen as alleviating resource demands for the LA and reducing LA exposure to risks relating to fleet procurement, deployment and maintenance, driver recruitment and employment or management of the app developer contract. It is too soon to evaluate the actual, rather than potential, benefits of these approaches but this can be explored at a later date given the four LAs taking part in in-depth interviews include DRT schemes with a mix of entirely in-house, entirely contracted out and a mixture of in-house and contracted out elements.

## Number of vehicles

Professional judgement had to be used in determining the size and nature of the fleet to be deployed at the start of the DRT schemes. Interview and roundtable participants reported choosing the size of DRT scheme fleets according to the size of the area, the hours of operation of the proposed service and an estimation of demand. However, as the schemes were either entirely new, or had new approaches in terms of times of operation, marketing or means of booking, a number of participants suggested that existing data and research was not a reliable indicator of the demand they would actually have.

One of the LAs was implementing two different approaches – one involving a commercial operator running one DRT scheme with two vehicles in the core hours of 7am - 7pm and then using the same vehicles on another evening-based scheme and the other involving running a scheme in-house using two of their own vehicles. While their modelling suggested four vehicles would be enough for the three DRT schemes, the LA decided to dedicate a fifth “floating“ vehicle from its own fleet in order to address peaks in demand and, particularly in the initial weeks of the schemes, to fulfil as many journeys as possible so as to learn and adapt to where vehicles should be placed at the beginning and end of the day to maximise efficiency.

In contrast, one of the roundtable participants explained that their bid had been for a single vehicle for their scheme. While the LA had other on-demand services bookable by phone or online, they had decided to pilot a scheme bookable by an app to connect rural areas to a particular town with a view to making education and employment from these areas accessible by public transport. The scheme was also registered as a school service. The LA made the scheme available to villages which had not had public transport before, and so there was no data from which to gauge demand accurately before launch. Having a specific time to arrive at a destination with a single vehicle constrained the demand responsiveness of the scheme as it precluded any additional intra-zonal journeys that would delay arrival at the final destination. Hence, a semi-fixed schedule and stops had to be put in for the school route. The LA felt that another vehicle would have given more flexibility in the

scheme design and adaptability as demand grew across a service area of 80 square miles in a short timescale.

> *"If those booking trends continue, a second vehicle would have been really, really helpful to allow us that flexibility it engenders, and to give quicker journey times because of the distances we've got involved between villages."*

The examples suggest that where there is little reliable data to predict demand when introducing a new DRT scheme, there is benefit in building in the capacity to respond flexibly to live demand data, particularly in the early stages of a scheme and as use patterns emerge.

## Type of vehicle

One LA had procured an all-electric fleet of six buses. However, the majority of DRT vehicles (across the interview and roundtable participants) were diesel Euro 6 mini-buses or people carriers. There was some indication that timing had some influence on fleet decisions. One participant spoke about looking into the business case for electric vehicles, but the price of energy changed rapidly and by the time the decision point came the projected price per mile for electric vehicles made them no longer seem as cost effective.

## Total Transport

Some LAs had considered "total transport" approaches - integrating transport services that have been commissioned by different local or central government departments to more efficiently allocate resources. Common examples are social care or education transport services that do not require full time vehicle operation. In particular, a number of LAs had considered integrating school services into DRT schemes, but many had chosen not to take the idea forward. There were examples of existing "dial-a-ride" services which made use of school transport between school pick-up and drop-off times, but as one LA explained:

> *"Basically, there isn't any point in starting our DRT service at 10 o'clock in the morning to cater for the total transport principles, because we would lose out. So we chose not to".*

They went on to explain that using part of the fleet's capacity to cater for school transport might be a better utilisation of the vehicles' capacity. However, that approach would not necessarily be the best utilisation of vehicles to achieve the wider objectives of their DRT scheme to expand accessibility and develop a new market, as the vehicles would be unavailable as DRT for those parts of the day.

Most LAs chose to start the operation of their DRT services at a time that would allow passengers to get to and from places of work, education, healthcare or leisure, running from early morning to early evening. As a new scheme, most of the LAs acknowledged the aim to attract new users to public transport and so aimed to maximise the utility of the scheme.

### Booking platform

All the interview and roundtable participants had chosen to have a booking service delivered via a mobile app with a call centre alternative. Most of the participants chose not to introduce a web-based booking service for their DRT schemes – even where they had an existing bookable service with such a feature. It was explained that mobile technology was important for being able to book on the move, while booking from home was possible via the app or the telephone – thereby making a web-based option unnecessary. However, whereas LAs were used to taking web and phone-based payments, setting up mobile application payment processing added a layer of complexity and therefore delay to some schemes. One of the roundtable participants noted the following about their scheme that provided all three options and had launched ten months previously:

> *"One of the key things that we wanted to make sure is that the service was accessible to people who weren't wanting to use technology. So we've got the call centre so that people can phone up to make bookings. But we have 85% of all of our bookings made via the app, 10% via the booking website and only 5% are made through the call centre."*

App technology involves both a user interface and a driver interface. It provides valuable information for users, drivers and operators and provides an array of analytical data. For all the interview and roundtable participants it was the method they would prefer customers use to make bookings. However, all the DRT schemes also had a call centre "for back up". In some cases, the call centre hours were extended to match the DRT service hours, in other cases, the call centre was available for fewer hours than the service – including in some cases not being available at weekends, even though the service was available. Call centres were considered important for those who did not have internet enabled mobile phones, but also to resolve issues quickly, to manually allocate services if necessary and to give customers reassurance and support in using the app. This was felt to be particularly important in the start-up phase of a new scheme. One interviewee noted that they could look through customer data and see that people who had booked their first few trips by phone had moved over to the app.

## 6.4. Challenges and opportunities with the mobilisation process

A number of LAs were delayed in starting their DRT schemes. Some of the reasons for the delays were external to the projects themselves. For example, one LA delayed its scheme as the LA was undergoing a major restructure. Other delays were caused by unforeseen issues in the process of design and mobilisation. One roundtable participant remarked:

> *"…we didn't have enough resources, but we just didn't know that it was going to be as work heavy as it was."*

### Challenges with technology

Challenges in the mobilisation phase centred around the introduction of new technology. A number of interview and roundtable participants noted that lessons

from the experiences they had in introducing new mobile app technology could benefit others. Typically, LAs did not have in-house experience in procuring and managing mobile device-based apps, nor in processing app-based payments. At the same time, technology providers had little experience working with English LAs.

The challenges of procuring, specifying, or developing an app for local circumstances were commonly mentioned. While one LA developed their own app which they described as a travel planning app with a DRT option, many had assumed that there was an 'off the shelf' product in the form of an app for DRT and found that this was not the case. Suppliers had different approaches, but none of these had been developed specifically for DRT operations in the UK. For example, one tech solution had been originally developed for an on-demand taxi-type service seeking to maximise revenue; another had been developed for a bus system such as in the USA, where one operator ran all the routes. None had been developed to meet the requirements of the RMF DRT schemes, which was to support vehicles which could pick up multiple passengers from different pick-up points (as efficiently as possible), to be available to be pre-booked or on-demand within a reasonable time window in low population areas, but that could not directly compete with or undermine commercial bus services. One LA interview participant explained:

> *"We actually ended up with a provider of the app who didn't understand local bus services, which we felt was strange because they have got lots of experience, but actually they're very good with the Uber type delivery where it's single journeys. Quite early on we were getting very exasperated by the fact [they] didn't seem to understand what a return ticket was."*

Interview and roundtable participants spoke of the learning curve they underwent working with app developers based outside of the UK and working in different time zones or, in the case of one app developer, where working days fell on different days of the week. A number of interviewees mentioned being surprised by the lead time needed for any changes.

A number of Interview and roundtable participants remarked on the unforeseen time it took to determine and programme into the app the location of virtual stops. One roundtable participant explained:

> *"They have to plot all the stops, how the stops are done and how the routing is planned to make the app work. And it was all very new [to us]. So you think, 'OK, I didn't realise that, I can understand that takes a long time.' But it wasn't necessarily something we were considering when we put the bid out."*

Once its location had been defined, each virtual stop had to be input into the app platform with a precise descriptor for booking and pricing purposes. More than one LA referred to the challenge of relying on National Public Transport Access Nodes (NaPTAN) descriptors as the apps use General Transit Feed Specification (GTFS) data, requiring more accurate stop descriptors, as outlined by one interview participant:

> *"… the system uses GTFS data and all of the stop information they brought in was just the bus stop common name from NaPTAN, and so I had to painstakingly go through 537 bus stops and give them a meaningful name because I didn't want somebody saying, 'you are being picked up on Main*

*Street' or 'we're on Main Street'. So now they are picked up at 'the bus stop next to the old telephone box' or 'the bus stop opposite the Red Lion pub', or 'the bus shelter outside the allotments'. … having three days to rename 537 bus stops - these are all things that we didn't know were going to happen."*

Conversely, app developers sometimes expected the LAs to move at a faster pace than LA internal approval processes might allow, for example expecting information to be provided or authorisations to happen within 24 hours.

A number of interview and roundtable participants cited the further challenge of setting up a payment processing system for taking payment through their app. While many LAs were able to take payment over the phone or via the web, most were not set up for app-based payments. In most cases this involved setting up a contract with one of the small number of global payment processing companies that deal with in-app payments.

A specific non-UK based payment processing company was identified by a few interview and roundtable participants for not being used to dealing with UK public sector organisations. Frustrations emerged regarding governance arrangements for receiving in-app payments - specifically around whose signature would be acceptable for the account. A few interview participants described the payment processing company asking for a company Managing Director rather than accepting a Section 151 Officer or a Local Authority Chief Executive, for example. In contrast, in one of the LAs where a commercial operator was contracted to deal with in-app payments, they were already set up to do so having taken in-app payments for some time, and so this was not an issue. The implication is that setting up a new in-app payment system at the outset of a scheme would have been easier for a commercial operator than it was for the LAs.

The experiences with both the payment processing and local development of the app highlighted to interview participants that their internal technical support teams had insufficient expertise and experience in dealing with mobile technology and the use of apps for council purposes. This extended in one case to the processes for internally registering staff hardware such as the mobile technology the drivers need to receive and confirm information about bookings. That particular LA's internal system required access to a PC platform to register a device, which most drivers did not have at work.

## Other mobilisation challenges and successes

One LA operating their own DRT scheme highlighted the process for registering their services with the Traffic Commissioner as slow and causing months of delay. They felt the forms were not fit for purpose for their proposed services which were not a fixed route bus service, a taxi service, or a traditional community bus service and that the time between application and response was too long. They noted that up to 42 days is required for approval of services by Traffic Commissioners. There is a form for a flexibly routed service, but the interview participant felt that the registration constrained the area of operation and that flexibility is needed. For example, they had found in the first few weeks of operation that passengers often wanted to travel just beyond the registered boundary. However, re-registration required another application.

Other LAs did not report the same experiences as a cause of delay, but where commercial operators were involved in the pilot, it was the operator who registered the service and had not mentioned difficulties.

Driver recruitment and training were mentioned by a few interview and roundtable participants as areas of focus in the mobilisation phase. Where a service was being replaced, in some cases the drivers moved across to the new service. However, in some cases drivers had to be recruited against a backdrop of driver shortages, which had the potential to be challenging. However, one LA highlighted the success of their driver recruitment in that they had 120 applicants for 25 posts. They noted that they were able to secure candidates who were very experienced drivers with detailed local knowledge and who were good with customers. Another interview participant noted that the hours of operation had been attractive for their drivers, which meant expanding to encompass an evening DRT service needed sensitive consideration of work patterns.

All LAs pointed to the need to train the drivers in a different way of working – encompassing the use of new technology, non-traditional routes and stops, and the patience to "educate" passengers in the use of the service. The apps are two-way communication tools for determining routes, confirming bookings and scheduling breaks. The app technology also gives a personal element to the service as the booking gives the driver the passenger's details and so the first driver/passenger interaction on each journey can start with the driver addressing the passenger by name.

## 6.5. Targeting and marketing

All the LAs were conscious of wanting the DRT schemes to appeal to a broad ridership. They wanted to get away from any pre-conception of community services used by older people and to promote a service for everyone. There was a consciousness of wanting to boost bus patronage generally but also to show how DRT was different – for example by including new services to new stops and more flexibility in times. One interview participant explained:

> *"a lot of people think this service isn't for me, it's for old people. So I think we've been conscious to try and actively not have any promotion that has a picture of an old person."*

While some LAs particularly wanted to target and grow a younger ridership, noting that "*we are all the older people of tomorrow",* there was a general acknowledgement that post-pandemic the older concessionary fare ridership had not returned to pre-pandemic levels and so there was a need to promote the DRT schemes to older people to build their usage up too. Although some felt that it was a myth that older people do not use technology, there was an acknowledgement that having the ability to book by phone was important for this demographic as was the opportunity to access in-person, face-to-face explanations of changes to existing ways of doing things.

Participants spoke about the importance of branding and a distinctive, smart-looking livery (design and colour scheme) on their fleet of vehicles. Approaches differed in wanting the livery to match or stand out from other services, balancing wider

corporate identity with having a distinctive service. Some mentioned the importance of a quality experience and having Wi-Fi or charging points on the DRT vehicles to attract younger people and those who had not habitually taken buses before. All LAs mentioned having wheelchair-accessible vehicles.

Many of the DRT schemes are being set up in areas where Uber and similar app-based taxi services had little or no presence, therefore education in on-demand apps has been a big feature in the scheme launches. A number of the interview and roundtable participants noted that promotion of the schemes should be continued to reach as many people as possible during the RMF funding period, not just a campaign at the launch.

Most LAs worked with their communications teams to promote the schemes and noted the importance of getting those colleagues involved at an early stage to understand the aims of the scheme and how it works. Publicity material included press releases, posters, maps, leaflets and videos explaining how to use the DRT services. Dissemination was via local news outlets across print, radio and tv and local council websites – which in some cases linked to YouTube videos. Posters were additionally put at bus stops and on buses.

A few interview participants spoke about engaging community groups, transport campaign organisations and businesses to spread the message about using the bus in general and DRT in particular. Local community groups and some key destinations also took publicity materials and were involved in roadshows where DRT service providers took personnel to engage with potential users in person. Some roadshows enabled would-be passengers to try out the vehicle. One interview participant noted that pre-launch roadshows had been a two-way information sharing process which had informed some aspects of how they provided their service. For example, a prospective customer had asked about accessibility for their guide dog and on entering the roadshow vehicle with the dog it became apparent that the dog should use the accessible space for better comfort for all users. This guided the DRT scheme to recommend people with guide dogs to request the accessible space when making a booking.

Those that had launched their schemes spoke about the value in getting people onto the vehicles themselves. In general, those that had launched noted that the best advert was from people who had used the service. “Getting people on the bus” was repeatedly reported as leading to repeat uses and word-of-mouth growth in use. As an example of the approaches used to encourage that first journey, one LA explained how at launch the call centre had an important role to answer queries about how to use the service and to give reassurance in the form of a real person, for example to confirm that an app-booked service was on its way. Demonstrating how to use the app and the importance of having patience when doing so was referred to a number of times. The role of drivers in this was highlighted, as well as staff at bus ticket outlets.

A number of the participants cited promotions such as “first ride free”, tie-ins with destinations such as “free swim” if you take the service to the pool, and reduced fares for young people or groups. One roundtable participant explained how their app had a “wallet” feature that the passenger could charge up with credit, and so to incentivise the app usage, for £20 in the wallet, the passenger could have £22 worth

of travel. The success of promotions will be explored later in the RMF evaluation when more monitoring data is available.

Flat fares and through fares with local operators were also commonly cited as means of encouraging DRT take-up. However, these were not without challenges, for example agreeing what age and discount applied to young people's fares across an area was mentioned by one LA. The commercial operators in the area had set youth fares to apply to under 19 year olds. However, the LA had wanted to make youth fares available to all under 22 year olds, noting the area had university students who could access discounted fares and this left employed young people in that age bracket without a discount. In the end the LA agreed to set the DRT youth fare in line with the local commercial bus operators to enable through ticketing and to avoid confusion when changing from one service to another.

In places where DRT was replacing a service that was being withdrawn, whether a fixed route or a more traditional dial-a-ride service, participants had similar experiences in having to reassure and explain to existing customers that they were not "losing" a service but that the DRT would offer a better flexible service to meet their needs. Emphasis in these cases was on how the service was different and could take customers directly to their destination (such as a hospital or garden centre) without the need to change and did not rely on a timetable, providing the opportunity to travel at different times in the day and more often. Drivers on existing services and call centres were considered key to reassuring passengers about changes to come.

Resistance to change was cited by some interview participants in areas where a "fixed-route, fixed-timetable DRT" service had been operating - these services were more akin to request stop services, where passengers knew what time a service would run and could book to be picked up at an intermediary stop.

> *"For a lot of people it's something different, people are creatures of habits and we tend to find that with users of the flexible services. They like to have a set routine. They know that on a Thursday at midday they can go out and do the shopping and the bus will be there. And for them to then lose that fixed element, it hasn't gone down well… but then those who used to do that and have used the app and have seen, 'well, I can go whenever I want, that actually works out better..', once they've used the service, they know what it's like. It's not big and scary. The drivers are friendly. They'll speak to you. They know your name when you get on the vehicle. And it's much more personal service. So I think that's something I learned was key to all this - the personal element ... that there had to be a very personal service… and it's about how when people actually use our services … the strap I came up with is book, travel, relax."* *[Case study pilot interviewee]*

A number of interview and roundtable participants additionally highlighted the importance of getting local councillors to be accepting of the scheme from an early date. Councillors were considered to be important advocates – particularly where they could see benefits of access for a wider pool of residents. One interview participant, for example, highlighted the potential for DRT to bring in working age people from rural areas to employment areas, pointing to a high number of jobs which were going to be available at a distribution centre or at the decommissioning

of a local power plant, which are the sort of benefits that, if realised, would attract political support.

## 6.6. Data and early feedback

A number of interview and roundtable participants mentioned that at the design phase, while they had carried out modelling and estimated demand, there was little or no data to inform the scheme design as the schemes were being introduced in areas with low or no public transport usage and because the service was of a new type. However, once schemes had launched, data from the DRT apps started flowing immediately and built up quickly over time.

The real-time data analytics coming from the apps was cited by all who had launched as being invaluable for continuous improvement of the DRT scheme and for understanding who was using the service and where and when they might want to travel. It was noted that traditionally bus operators knew little about their passengers other than number of journeys made and fare types. Apps provide a lot of real-time information that can be acted on quickly.

Useful insights included popular booking periods. For example, one DRT scheme allowed bookings up to 28 days prior to usage and could see a U-shaped curve with a peak of bookings 28 days in advance and another peak the day before with fewer bookings in between. However, as the scheme went on, there was another pattern of some of those early bookings being cancelled, which if at short notice was difficult to adjust for. This evidence led the scheme eventually to change the ‘cancel by’ window to earlier which helped them to better re-plan routes.

LAs had ensured that there were methods of booking to use the DRT services other than the app, with an assumption that at the start of a new service, the ability to talk to a person in a call centre was reassuring to new users. One interview participant tracked the booking habits of early passengers and noted, in support of the role of the call centre in embedding the service, an example of a passenger that had phone booked their first few journeys but had then switched to being a regular app user.

Schemes that had been running for a few months noted the take up by young people. One scheme with advance booking noted repeat bookings with notable peaks at school start and end times during term-time, suggesting a demand by those not eligible for free school transport who might otherwise be dropped off by car. App data also suggested that DRT services were being used to go to schools during the exam period. This was seen to have policy implications for how DRT might help alleviate congestion at peaks and might have an impact on access to further/higher education, training and employment as a cohort gets older with the service. The data resulted in suggestions for targeting DRT information towards younger people. For example, one interview participant suggested a campaign to promote using the service to meet up with friends independently without the need for the “mum and dad taxi”, noting that there had been a focus on the notion of buses taking groups of friends to school but no focus on providing transport for group travel for other purposes.

One roundtable participant noted with pleasant surprise that 25% of their ridership were university students during their first ten months of operation. This was

evidenced by the use of a 50% discount card that could be used across the area including on DRT. The data showed that the most popular destination was a railway station and the next two most popular were places of education. In contrast, the proportion of free (older persons) concessionary fares was lower than previous services at 10%.

While all LAs had done some research about potential demand for the services, the reality of the pandemic and changing travel patterns made this tentative rather than a blueprint. A key benefit of the app analytics is the hard evidence that it produces regarding patterns of demand and the ability to respond to changing circumstances.

Analytics allowed LAs and operators to see where demand is coming from and where and when people want to travel with start-to-end destinations clearer than on fixed routes. Interview and roundtable participants highlighted the ways information helped guide vehicle deployment. Whilst a commercial operation might want to gravitate vehicles towards areas of higher demand, use of data could allow a more efficient deployment of 'run empty' vehicles to be worked out to give equitable access to more sparsely populated areas. Where, and how long, drivers have breaks are also possible to schedule and see to inform booking management and staff and vehicle deployment.

A number of the LAs had underestimated how many miles per day their vehicles would complete and the time the vehicles would run empty. One interview participant remarked:

> *"…the big cost of running buses is paying the drivers and you know that's typically 60% of the customer operation. What we underestimated by probably about 50% was the amount of mileage that the vehicles were going to be doing. You know, these vehicles are doing about 200 miles a day. We thought it would be about 100 miles a day."*

Apps which were integrated with journey planner functions could note popular journey searches which could inform targeted promotions or potential future services. For one LA the information regarding which virtual stops were most used could inform the establishment of "real" bus stops or fixed routes in the future.

All the participants in the research were enthusiastic about the potential for DRT to make flexible public transport available to a wider range of residents to access employment, education, leisure, and health services and the data from some of the more established schemes were starting to show this happening. However, there was an acknowledgment that it was not a low cost way of meeting this objective at present. As an interview participant explained, there is an inherent tension between maximising revenue and maximising access to services. In order to provide an on-demand service, particularly in sparsely populated areas, there has to be extra capacity in the system. For example, a vehicle might have to travel a considerable distance empty to pick up a more remote passenger, whereas there are more fare payers concentrated in populous areas leading to more fares in densely populated areas which would be more attractive for a non-regulated, revenue maximising operation. While there is evidence emerging from the pilots that the use of data could help with the efficiency of service planning, the inherent tension remains a challenge. One interview participant suggested:

> *"… the DfT needs to say to people that it's not about cost effectiveness versus a local bus service. It's about availability of a service that a resident will actually use instead of their car. We need to look at it from the customer, from the resident, from the citizens' perspective, not from a big bus company's… [cost effectiveness is] not the way to build demand and unlock that suppressed demand".*

Welcoming the RMF funding which has enabled new things to be tried in different places, the interview participant went on to suggest that the DRT schemes should be expanded to form larger networks. They noted that running relatively small, one-vehicle schemes typical of previous DRT pilots will not make enough of a cultural change to demonstrate the potential impact of DRT.

# 7. CONCLUSIONS

DRT has been seen by the transport industry for many years as a potential solution to enhance transport accessibility in areas with low or dispersed populations, but it has not generally been found to be financially sustainable. The RMF is a £20 million fund to trial DRT solutions in rural and suburban areas of England. Second-generation DRT, underpinned by the availability of sophisticated scheduling algorithms and app-based booking and payment systems, offers the prospect of more efficient and attractive DRT schemes than previously seen.

This interim report of the RMF programme-level evaluation has presented initial findings based on data collected in the first 18 months of the funding period up to September 2022. These provide delivery and implementation lessons that will be valuable for LAs and other agencies considering investment in DRT schemes. They also provide indications of population impacts for the areas where the schemes have been deployed.

There have been delays to the introduction of the DRT schemes, but 14 schemes had started operation in 12 LAs by October 2022. **Most have been delivered as proposed in their funding applications, although some have phased the introduction of their schemes more than originally planned and some are only due to launch in 2023.** All the DRT schemes are designed as flexible bus services that provide shared transport to users who specify their desired location and time of pick-up and drop-off.

LA officers have faced competing demands to review their bus networks which reduced time available to focus on the DRT schemes. The service design and implementation process for DRT schemes involved several challenges they had not experienced before. These included forecasting demand, identifying virtual bus stops and procuring a technology platform and payment processor.

Having overcome these challenges, LAs are in a better position to make evidence based decisions regarding DRT schemes and other enhancements to public transport provision in their areas. The data analytics available from the DRT technology platforms will provide a valuable information source for reviewing the effectiveness of the DRT schemes and considering public transport more generally in the scheme areas.

Average monthly service distance with passengers has varied from 1,073 to 10,754 miles with higher figures seen for schemes that have been established for longer and that are serving larger populations. **Vehicle utilisation rates have generally been in the range of 33 – 86 miles per vehicle per day.** Distance travelled without passengers is of a similar magnitude to distance travelled with passengers. Higher empty running ratios have been recorded for scheme areas with low population densities. App-based bookings are generally more popular than phone or website bookings, but phone bookings remain an essential feature of the schemes.

**DRT usage appears to be on an upward trend for most of the pilots.** Average usage levels range from 11 to 67 passengers per day of operation. Pilots which serve areas with relatively large populations, and have more vehicles available, have achieved the highest passenger numbers. The results for number of passengers per revenue hour show a range from 0.14 to 1.77. This is a similar range of values to

those reported in a study of second-generation DRT schemes published in 2019 (covering schemes in eight countries), but lower than values reported for traditional DRT schemes in various contexts in the United States.

The extent to which DRT schemes are being used by passengers travelling on concessionary fares varies between 12% and 55%, implying they are attracting a high proportion of full fare-paying customers as well as concessionary pass holders. **Breakdowns of concessionary fare passengers, where they are available, show there are notable numbers of older people and children/young people using the schemes which suggests the DRT pilots are serving a broad cross-section of the local communities.**

**Revenue also varies across schemes.** The average revenue per passenger (across paying and non-paying passengers) differs considerably between schemes with a range of £1.22 - £2.92 for well-established schemes. Fare structure and the proportion of concessionary permit holders are two influential factors that determine revenue per passenger.

Rail and bus stations and market towns within the operating zones, or at the edge of operating zones, are attracting a large number of journeys. **This suggests that the DRT schemes are helping to enable connections to local transport, economic, retail, education and healthcare facilities.**

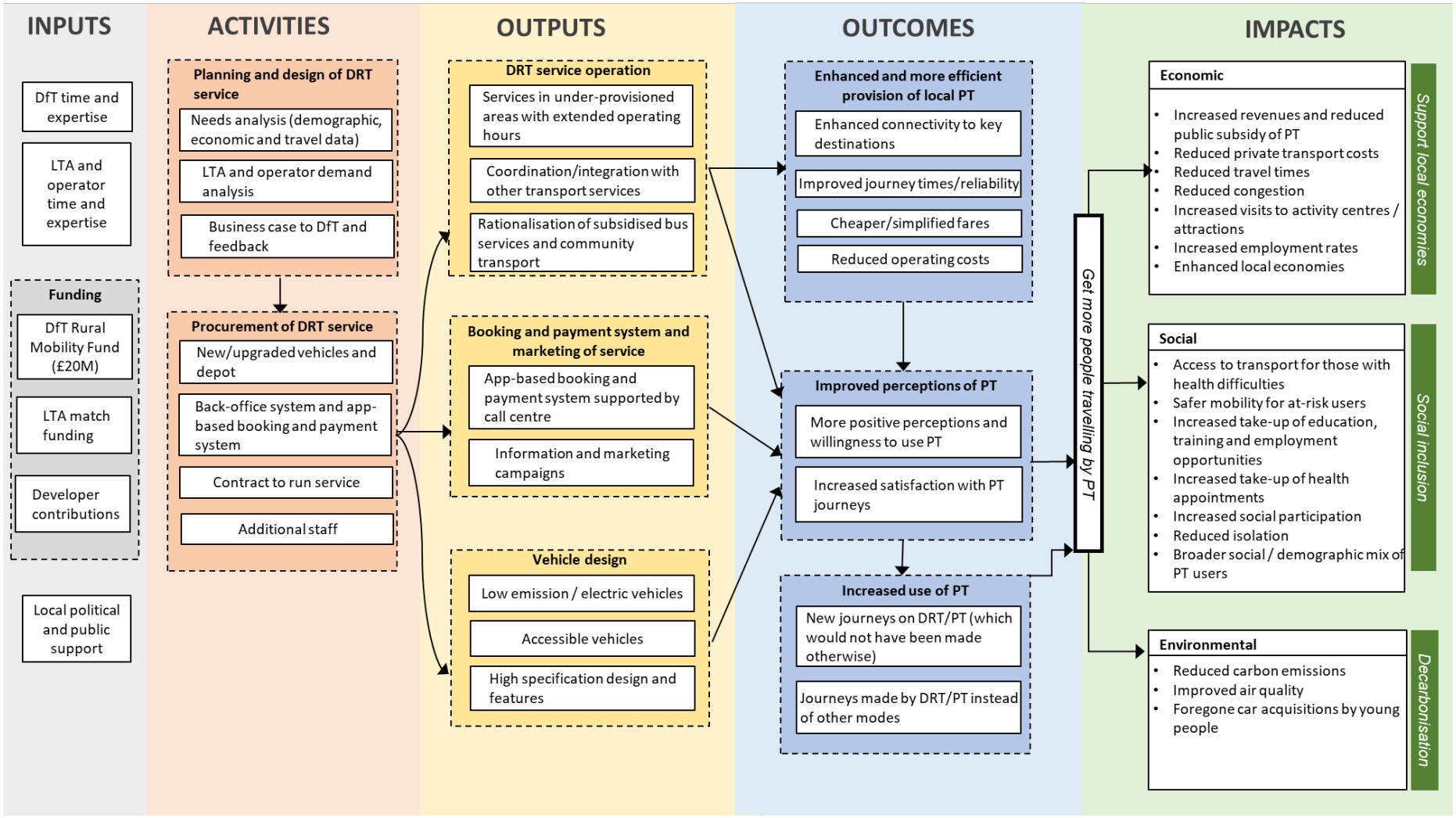
There are several limitations of the reported analysis. It has not been possible to assess whether overall bus use in the scheme areas (including use of the DRT schemes) has seen a more positive trend than other areas, but this will be possible when a longer time-series of monitoring data has been collected.

Data has not been available from the DRT apps on the socio-demographic characteristics of users. It is hoped that many of the LAs will carry out surveys of DRT users. Limited survey results were available at the time this report was being written but results from surveys will allow an understanding to be gained on the socio-demographic characteristics of users, the nature of journeys made and whether there were alternative transport options. This data, along with the monitoring data, will help to enable any future assessment of modal shift, air quality and carbon impacts and social inclusion benefits.

Further impact and value for money (VfM) evaluation may follow later and enable a broader analysis of impacts for a subset of pilot schemes. This would require additional outcome and impact data such as that from surveys mentioned above. It would also require more detailed information on the costs of running the DRT schemes and the public subsidies involved.

This report represents a new knowledge base to assist LAs and other agencies in considering the role of DRT schemes in different contexts. It has documented how 14 DRT schemes have been set up across rural and suburban areas of 12 LAs and compared their operational performance and usage at an early stage in their operation. It has shown that DRT services can be implemented to serve less populated areas and may help to improve access to opportunities, but a fuller assessment would be needed to ascertain whether they achieve wider objectives.

# APPENDIX A: RURAL MOBILITY FUND LOGIC MAP



# APPENDIX B: MARKETING ACTIONS AND TARGETED GROUPS

| Local Authority (DRT scheme) | Marketing actions | Targeted groups | Post-launch update |
|---|---|---|---|
| **Buckinghamshire (Aylesbury)** | Door-dropped leaflet and local radio advert campaign. | To be confirmed. | Not launched. |
| **Buckinghamshire (High Wycombe)** | Door-dropped leaflets, local radio advert campaign, leaflets included in university fresher packs, posters and digital displays in bus stations and a launch event in High Street. | Students, older persons with mobility difficulties and schools for after school clubs. | Information not available. |
| **Cheshire East** | Two free trips to each new rider during the first month of operation.<br>Ongoing promotions: (a) a free sixth journey when five journeys have already been made and (b) a spring promotion encourages new passengers, those who have downloaded the app but have not used or not used since with two free journeys in March. | Anyone in the area wishing to access services and social opportunities e.g. people not owning a car and have difficulty accessing traditional public transport. | No new marketing. |

| Local Authority (DRT scheme) | Marketing actions | Targeted groups | Post-launch update |
|---|---|---|---|
| **Cheshire West and Chester** | Leaflet drops, dedicated web pages, pop-up engagement stands at the two main stations, publicity at interchange points, a public launch (with PR build up) and continued engagement with the stakeholders listed above.<br><br>Awareness through public consultation on scheme design and engagement with large employers, medical facilities, parish councils and community bodies within the area. | Not identified yet. | Not launched. |
| **Cumbria** | Not identified yet. | Not identified yet. | Not launched. |
| **Essex** | A marketing plan, put in place before launch, engaged with local parishes to raise awareness and assist with dissemination of marketing materials (digital and print). There was also a launch event (involving local stakeholders, Local MP and councillors etc.). Roadshows events were carried out in local area, as was engagement with business. | All passenger groups including older people, concessionary pass holders, adults, commuters, young adults, school children. | Social media posts at launch, Launch event at Gridserve Electric Forecourt, marketing waves coinciding with scheme changes, roadshows at various locations. |

| Local Authority (DRT scheme) | Marketing actions | Targeted groups | Post-launch update |
|---|---|---|---|
| **Gloucestershire** | Online media (Twitter etc.), leaflets/posters, press events and in-app communications. | All ages are targeted. | Information not available. |
| **Hertfordshire** | Webpage, local authorities' communications, social media, posted leaflets, ad vans, virtual outreach, targeted emails, magazine articles, discounted or promotional fares and parish newsletters. | All demographics have been targeted. | Comprehensive marketing campaigns Christmas and Summer incentive campaign (including one-year anniversary one free trip per person). |
| **Leicestershire** | Online presence, digital marketing (including social, search and targeted online advertising), social media (including organic and paid-for campaigns), print and outdoor advertising (where cost effective), local media relations, design and print marketing materials for use in pre-launch promotions, regional TV, engagement with district councils, parishes, and community groups. Bus stop advertising also considered. | Residents, businesses, members, local Media (including, where relevant, community newsletters), district/parish councils, advocates (including support provided for older people); bus user groups; managers; customer service centre and wider staff groups. | Flyer/posters circulated, newsletter article, roadshows at various locations. |
| **Norfolk** | One or more of: targeted outreach, out of home publicity, user engagement, and traditional PR/marketing material. | Under 21s (education), under 21s (social); over 65s (digitally included), over 65s (digitally excluded); adult villagers (business), adult villagers (not business). | Further door-to-door delivery in some parishes has been undertaken. |

| Local Authority (DRT scheme) | Marketing actions | Targeted groups | Post-launch update |
|---|---|---|---|
| **North Lincolnshire** | Launch events in the Summer of 2020, ongoing social media campaign and direct emails. | Workers, education, and older people. | JustGo posters at bus stops where no commercial bus services. |
| **Nottinghamshire** | Development of a marketing and information strategy with the Local Authority's comms team, and commission of paper based and social media content to promote pilots. | Local communities in Bassetlaw, Newark and Sherwood, Rushcliffe and Mansfield; commuters; concessionary fare users; students; leisure/social bus users; users with health problems; families; local business employees; hospitals, businesses, community leaders; other key public facing organisations; those with no access to public transport, especially young people. | Social media posts, TV and Radio News segments, Youtube Video, advertising at bus stops, leaflet drops at points of interest i.e. libraries, doctors, pubs and tourist locations. |
| **Staffordshire** | Leaflets, posters and local press releases. | Visitors to the area, walkers, cyclists, and local groups. | Leaflets and posters distributed to local businesses, libraries, tourist info, etc. |

| Local Authority (DRT scheme) | Marketing actions | Targeted groups | Post-launch update |
|---|---|---|---|
| **Warwickshire** | Leaflet drops in the scheme area, targeted social media marketing, leaflets handed out to passengers of replaced fixed route service, three launch events carried out in areas of densest population, and a main launch event outside a Shire Hall with press, senior officers and local dignitaries. | Existing fixed route passengers, businesses and health and retail areas of the 'Destination' DRT areas. | Pre-launch leaflet drops to all households, social media campaign, notices at bus stops where service withdrawn, launch event at Shire Hall, discounted rides in Summer and half-terms. |
| **Wiltshire** | Includes social media, dedicated web pages on ‘Connecting Wiltshire’ website, posters, printed material, livery on vehicles, signposting at rail stations, parish councils and area boards, roadshows and fare promotions. | Not identified yet. | Not launched. |

# APPENDIX C: MONTHS OF DATA AVAILABILITY

**Table C1: Number of months of full data availability**

| DRT scheme | Number of months | Period covered |
|---|---|---|
| Cheshire East | 12 | 10/21 – 9/22 |
| Essex | 6 | 4/22 – 9/22 |
| Hertfordshire | 12 | 10/21 – 9/22 |
| Leicestershire | 2 | 8/22 – 9/22 |
| Norfolk | 6 | 4/22 – 9/22 |
| North Lincs. | 23 | 11/20 – 9/22 |
| Nottinghamshire | 1 | 9/22 only |
| Staffordshire | 11 | 11/21 – 9/22 |
| Warwickshire | 4 | 6/22 – 9/22 |
| Total | 77 | - |

**Table C2: Months of data used in tables**

| Table | Cheshire East | Essex | Hertford-shire | Leicester-shire | Norfolk | North Lincs. | Nottingham-shire | Staffordshire | Warwick-shire |
|---|---|---|---|---|---|---|---|---|---|
| Table 7 | 12 | 6 | 12 | 3 | 6 | 23 | 2 | 12 | 5 |
| Table 8 | 12 | 6 | 12 | 2 | 6 | 23 | 1 | 11 | 4 |
| Table 9 | 12 | 6 | 12 | 2 | 6 | 23 | 1 | 11 | 4 |
| Table 10 | 12 | 6 | 12 | 2 | 6 | 23 | 1 | N/A | 4 |
| Table 11 | 12 | 6 | 12 | 2 | 6 | 23 | 1 | 11 | 4 |
| Table 12 | N/A | 6 | 12 | 2 | 6 | 25 | 2 | 12 | N/A |
| Table 13 | 12 | N/A | 12 | 2 | 6 | 25 | 2 | N/A | 5 |
| Table 14 | N/A | 6 | 6 | 2 | 6 | N/A | 2 | 6 | 5 |

**Table C3: Months of data used in figures**

| Figure | Cheshire East | Essex | Hertford-shire | Leicester-shire | Norfolk | North Lincs. | Nottingham-shire | Staffordshire | Warwick-shire |
|---|---|---|---|---|---|---|---|---|---|
| Figure 7 | 12 | 6 | 12 | 2 | 6 | 25 | 1 | 11 | 4 |
| Figure 8 | 12 | 6 | 12 | 3 | 6 | 23 | 2 | 12 | 5 |
| Figure 9 | 6 | 6 | 12 | 2 | N/A | 23 | N/A | N/A | 4 |
| Figure 10 | N/A | 6 | 12 | 2 | 6 | N/A | 1 | 11 | N/A |
| Figure 11 | 12 | 6 | 12 | 2 | 6 | 25 | 2 | N/A | 5 |
| Figure 12 | 12 | 6 | 12 | 3 | 6 | N/A | 2 | 12 | 5 |
| Figure 13 | N/A | N/A | N/A | N/A | N/A | 25 | N/A | N/A | N/A |
| Figure 14 | 12 | 6 | 12 | 2 | 6 | 25 | N/A | 12 | 5 |
| Figure 15 | N/A | N/A | 12 | N/A | N/A | N/A | N/A | N/A | N/A |
| Figure 16 | N/A | N/A | N/A | 2 | N/A | N/A | N/A | N/A | N/A |
| Figure 17 | N/A | N/A | N/A | N/A | 6 | N/A | N/A | N/A | N/A |
| Figure 18 | N/A | N/A | N/A | N/A | N/A | 25 | N/A | N/A | N/A |
| Figure 19 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 5 |