



Torbay Council

DEMAND RESPONSIVE TRANSPORT SERVICES

Feasibility Study





Torbay Council

DEMAND RESPONSIVE TRANSPORT SERVICES

Feasibility Study

TYPE OF DOCUMENT (VERSION) PUBLIC

PROJECT NO. 70078766

DATE: MAY 2021

WSP

1st Floor, Keble House
Southernhay Gardens, Southernhay East
Exeter, Devon
EX1 1NT

Phone: +44 1392 267 500

Fax: +44 1392 267 599

WSP.com



QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Draft for comment	Final for issue		
Date	22/12/2020	11/05/2021		
Prepared by	M Gallagher	M Gallagher		
Signature				
Checked by	H Shrimpton	H Shrimpton		
Signature				
Authorised by	M Holmes	H Shrimpton		
Signature				
Project number	70078766	70078766		
Report number	01	02		
File reference	70078766 Torbay DRT Feasibility Study formatted	70078766 Torbay DRT Feasibility Study May21		

CONTENTS

EXECUTIVE SUMMARY

1	INTRODUCTION	1
1.1	BACKGROUND	1
1.2	APPROACH METHODOLOGY	1
1.3	REPORT STRUCTURE	2
1.4	TERMINOLOGY	2
1.5	ACKNOWLEDGEMENTS	2
2	BASELINING	4
2.1	INTRODUCTION	4
2.2	POPULATION AND DEMOGRAPHICS	4
2.3	SOCIO-ECONOMICS	4
2.4	CURRENT BUS SERVICES	8
2.5	COMMUNITY TRANSPORT	13
2.6	TORBAY COUNCIL PUBLIC TRANSPORT SPENDING	13
2.7	ANALYSIS	14
2.8	SUMMARY	17
3	STAKEHOLDER ENGAGEMENT	19
3.1	INTRODUCTION	19
3.2	BUS OPERATOR ENGAGEMENT	19
3.3	NEIGHBOURING LOCAL AUTHORITIES	23
3.4	SUMMARY	25

4	POLICY & RESEARCH REVIEW	27
4.1	INTRODUCTION	27
4.2	LITERATURE REVIEW	27
4.3	CURRENT UK GOVERNMENT DRT POLICY	34
4.4	CURRENT UK GOVERNMENT DRT ACTIVITY	37
4.5	CURRENT LOCAL AUTHORITY DRT ACTIVITY	39
4.6	SUMMARY	39
5	CASE STUDIES	41
5.1	INTRODUCTION	41
5.2	UK EXAMPLES	41
5.3	INTERNATIONAL EXAMPLES	49
5.4	OTHER DRT INNOVATIONS	52
5.5	SUMMARY	53
6	ESTABLISHING A DRT	56
6.1	INTRODUCTION	56
6.2	DRT SETUP KEY CONSIDERATIONS	56
6.3	DRT BOOKING AND TECHNOLOGY CONSIDERATIONS	60
6.4	TORBAY SWOT ANALYSIS	63
6.5	TORBAY DRT FEASIBILITY FRAMEWORK	63
6.6	SUMMARY	63
7	CONCLUSION	66
7.1	STUDY SUMMARY	66
7.2	STUDY KEY FINDINGS	66
7.3	NEXT STEPS	67

TABLES

Table 2-1 - Distribution of commuting in Torbay by journey mode (count)	5
Table 2-2 - Torbay bus service routes and frequencies	9
Table 6-1 - Annual DRT technology costs illustration	62
Table 6-2 - Torbay DRT SWOT Analysis	63

FIGURES

Figure 2-1 - Distribution of commuting in Torbay by journey mode (percent)	5
Figure 2-2 - Distribution of commuting in England by journey mode (percent)	6
Figure 2-3 - Indices of Multiple Deprivation, Torbay	7
Figure 2-4 - Torbay bus network map	12
Figure 2-5 - Torquay bus services and deprivation rankings	14
Figure 2-6 - Paignton bus services and deprivation rankings	15
Figure 2-7 - Brixham bus services and deprivation rankings	16
Figure 4-1 - Future of Mobility Key Challenges	35
Figure 5-1 - CallConnect Lincolnshire DRT vehicle and publicity	41
Figure 5-2 - Tees Flex vehicle	43
Figure 5-3 - ArrivaClick vehicles, Liverpool	44
Figure 5-4 - ArrivaClick Leicester operating area	46
Figure 5-5 - Go2 DRT Vehicle	47
Figure 5-6 - Oxford PickMeUp vehicle	48
Figure 5-7 - My Way DRT vehicle	49
Figure 5-8 - Passenger using DRT service in Sant Cugat	50
Figure 5-9 - Super Shuttle vehicle at San Francisco Airport	51
Figure 5-10 - Stagecoach Connect NHS staff app	52
Figure 6-1 - Propensity to travel	57



APPENDICES

APPENDIX A

TORBAY DRT FEASIBILITY FRAMEWORK

APPENDIX B

LITERATURE REVIEW REFERENCES

EXECUTIVE SUMMARY

Torbay Council required consultancy advice to assess the feasibility of procuring Demand Responsive Transport (DRT) services as a potential replacement for existing tendered local bus services. The Council has recognised that in many instances, tendered bus services are running with very few or no passengers and there is a need to ensure value for money from the limited budget available. The impacts of the coronavirus (Covid-19) pandemic in 2020 has exacerbated the situation and has necessitated the Council stepping in to provide financial support for more bus services. The Council wish to reduce spending on subsidised transport but acknowledge that DRT is unlikely to be delivered commercially and will still require some subsidy. WSP was appointed in November 2020 to investigate the suitability and feasibility of DRT services in Torbay and to provide Torbay Council with a framework to use when considering future procurement and specification of supported public transport services.



The approach to the study was to undertake a strategic, high-level assessment of the recent and ongoing developments in DRT and use this against a developed baseline of Torbay public transport and socio-economic information to assess the suitability of DRT application in the area. The study has not sought to identify specific bus routes and services to replace with DRT, but will equip the Council with the guiding principles and considerations to inform future decisions on the potential use of DRT in Torbay.

Population and demographic information was collected and analysed, noting that Torbay has an aging population compared to the national average. Socio-economic data covering employment status, personal transport and travel to work was assessed, finding that the unemployment rate, percentage of retired persons in Torbay and those with access to a car are broadly similar to the England averages. Indices of multiple deprivation have been gathered and mapped, illustrating the range of deprivation and affluence in Torbay. Deprivation was found to be concentrated most in Torquay around the town centre and adjacent neighbourhoods, with a sizeable area of deprivation in Paignton. Brixham was found to be the least deprived of the three settlements. Current public transport supply has been mapped, assessed and overlaid with the deprivation indices, finding that while Torbay is generally well served by bus services with several frequent routes running between every 10 and every 30 minutes, these are concentrated along the main corridors, especially in Paignton, meaning adjoining areas have much reduced service levels of generally no more than hourly. Brixham as the smallest settlement was found to have the least amount of bus service coverage and the challenge of serving the town efficiently being at the end of the bay on a peninsula was noted.



Stakeholder engagement has been a key part of this study in order to gauge the understanding of and attitudes towards DRT among the main bus operators in Torbay. Engagement with neighbouring local authorities has also taken place to similarly understand views on DRT. The engagement identified a general support for DRT where it is led by the local authority and provided that it is accessible to all potential users through a choice in the methods of booking. The engagement also identified support for DRT providing 'feeder' services from lesser served areas into the main established bus routes and interchanges. The engagement confirmed that there are currently no plans by any of the bus operators in Torbay to introduce commercial DRT services, but that they would be open to running such services under a local authority-led initiative.

A literature review of research into DRT was undertaken via online searches. Policy around DRT in the UK has been reviewed and summarised with a focus on the England context. Linked to this, an overview of current DRT activity by Government and local authorities has been undertaken. The literature review identified consensus around the need to understand markets for DRT and the types of application and operating model that are suited to DRT. However the review also identified a lack of evidence of the true costs of providing DRT and where any savings are realised.

Examples of DRT schemes in operation in the UK and internationally have been examined as part of this study. These examples have been presented as a series of case studies to illustrate different applications of DRT, both successful and unsuccessful, in order to provide Torbay Council with an informed position on how DRT has been deployed elsewhere. The majority of the schemes assessed were found to be subsidised in some way, either through the local authority or with additional financial support from other contributors. The only non-subsidised service identified that has operated for a substantial length of time is an airport service charging premium fares.

Key considerations for establishing a DRT service in Torbay in the future have been summarised, covering suitable area types, operational considerations, user types and likely technology costs. The importance of identifying appropriate areas for deployment was highlighted, as well as the need to understand the market for which any DRT service being introduced is intended to serve. Potential funding sources have been summarised, noting that these are closely tied to the operating model chosen, such as employer contributions from a destination-specific operating type, or Section 106 agreement developer contributions for DRT services targeting growth areas. The potential for commercial funding streams from interchange-type DRT schemes as part of an integrated network was also noted as a particularly beneficial operating model. Indicative technology costs have been summarised, illustrating that a DRT deployment will typically start at £25,000-£30,000 setup costs, with economies of scale being realised in schemes covering multiple vehicles.

The study concludes that there is potential for DRT in Torbay in a limited number of areas and scenarios. The recommended next steps are for the Council to undertake an audit of all bus services in Torbay to identify any 'at risk' services; assess the potential of DRT using the DRT Feasibility Framework provided in this study; and establish a 'fallback position' of what the network could look like if services are withdrawn and not replaced. The consideration of non-transport interventions is also highlighted as a next step.

Contact name Hannah Shrimpton

Contact details 01392 267500 | hannah.shrimpton@wsp.com

1

INTRODUCTION



1 INTRODUCTION

1.1 BACKGROUND

- 1.1.1. Torbay Council required consultancy advice to assess the feasibility of procuring Demand Responsive Transport (DRT) services as a potential replacement for existing tendered local bus services.
- 1.1.2. Torbay Council is a unitary authority on the South Devon coast and is bordered by Devon County Council. Its principal urban area encompasses the towns of Torquay, Paignton and Brixham which merge to form a larger conurbation, surrounded by a rural area. The area forms a popular seaside resort destination and includes a significant proportion of elderly residents. The population swells during the summer months as a result of visitors and the effect of second homes, with owners vacationing to enjoy the warm weather. This combination of a seasonal population change and the high proportion of elderly residents creates challenges for the Council in terms of public transport provision.
- 1.1.3. The main bus operator in Torbay is Stagecoach which has a depot located in Torquay and provides the majority of services in the town, all on a commercial basis. Services are concentrated along the waterfront forming a corridor, which includes the successful and popular premium Stagecoach Gold service between Torquay and Plymouth. Away from the core commercial corridor, town services are limited and some are at risk of becoming commercially unviable, particularly with the impacts of Covid-19, which may force the Council to step in and tender for more services in the future. Temporary emergency funding currently being provided for a small number of services is due to expire in March 2021 and the Council is interested in exploring other delivery models, such as DRT, with the aim of minimising the cost to the Council. The services are socially important due to the proportion of elderly residents and the topography of Torbay creates challenges for the elderly and those with reduced mobility in accessing the commercial services on the waterfront, with much of the housing located up steep streets.
- 1.1.4. The Council have recognised that in many instances, tendered bus services are running with very few or no passengers and there is a need to ensure value for money from the limited budget available. The Council wish to reduce the spending on subsidised transport but acknowledge that DRT is unlikely to be delivered commercially and will still require some subsidy.
- 1.1.5. WSP was appointed in November 2020 to investigate the suitability and feasibility of DRT services in Torbay and to provide Torbay Council with a framework for the Council to use when considering future procurement and specification of supported public transport services.

1.2 APPROACH METHODOLOGY

- 1.2.1. The approach to the study was to undertake a strategic, high-level assessment of the recent and ongoing developments in DRT and use this against a developed baseline of Torbay public transport and socio-economic information to assess the suitability of DRT application in the area.
- 1.2.2. The study has not sought to identify specific bus routes and services to replace with DRT, but will equip the Council with the guiding principles and considerations to inform future decisions on the potential use of DRT in Torbay.

1.3 REPORT STRUCTURE

1.3.1. This report has been structured in accordance with the tasks and key outputs detailed in the original commission programme and is organised as follows:

- Chapter 1: Introduction
- Chapter 2: Baseline, setting out the current public transport provision and socio-economic picture in Torbay (pages 4-17)
- Chapter 3: Stakeholder Engagement, detailing the feedback receiving from the local bus operators and neighbouring local authorities (pages 19-25)
- Chapter 4: Policy & Research Review, giving an overview of existing research, policy and strategy around DRT and forthcoming policy developments in DRT (pages 27-34)
- Chapter 5: Case Studies, illustrating some applications of DRT in the UK and internationally (pages 41-53)
- Chapter 6: Feasibility Assessment, analysing the suitability of DRT in Torbay from the previous chapter's findings (pages 56-63)
- Chapter 7: Conclusion, bringing together the overall findings and outputs from the study (pages 66)
- Appendix A: DRT Feasibility Framework
- Appendix B: Literature review references

1.4 TERMINOLOGY

1.4.1. Throughout this report, the term Demand Responsive Transport (DRT) has been used. The Department for Transport defines this in the Future of Mobility Urban Strategy as:

“A flexible service that provides shared transport in response to requests from users specifying desired locations and times of pickup and delivery. Dial-a-ride services scheduled through next day or advance bookings are a traditional example.”

1.4.2. An evolution of this term often referred to in Government papers and other literature is Dynamic Demand Responsive Transport (DDRT) which is sometimes alternatively referred to as Digital Demand Responsive Transport. Reference to DRT in this report should be taken to mean all forms of demand responsive public transport services, both traditional and 'digital' without inferring any exclusion of particular booking methods.

1.5 ACKNOWLEDGEMENTS

1.5.1. WSP gratefully acknowledges the assistance of Marcus Enoch, Professor in Transport Strategy at Loughborough University, for his assistance with the literature review undertaken as part of this feasibility study.

1.5.2. WSP also acknowledges the assistance of Matt Cranwell, Managing Director at Stagecoach East Midlands who assisted with the case studies chapter of this report.

2

BASELINING



2 BASELINING

2.1 INTRODUCTION

- 2.1.1. Baselineing is an important part of any feasibility study in transport planning to understand the current context of the study area and inform the subsequent steps. As part of this feasibility study, a baselineing exercise of Torbay has been undertaken covering the current public transport supply, community transport services, public transport spending by Torbay Council, population and demographics, and socio-economic metrics. This information is presented in the following sections.
- 2.1.2. Analysis of the demographic and socio-economic information about Torbay's residents, including age, employment, travel to work data and levels of deprivation has been undertaken through comparison with the whole of England.
- 2.1.3. Commentary on the public transport supply and how this relates to the identified demographic and socio-economic data is also presented.

2.2 POPULATION AND DEMOGRAPHICS

- 2.2.1. There were 130,959 residents of Torbay on the Census day of 2011.
- 2.2.2. Just over half the population of Torbay (58%) are aged between 18-64. Most of the working aged population of Torbay falls between the ages of 30 to 59 (35% of the total population).
- 2.2.3. Just under a quarter (24%) of all of Torbay's residents are aged over 65. In comparison, the same statistic for the whole of England is one-third less (16%).
- 2.2.4. A relatively small proportion of Torbay's population are young adults, with just over 12% aged between 18 to 29. This number is slightly higher when studying the whole of England, at 16%. Approximately 14% of the population are of school-attendance age (5-17), compared to 15% for the whole of England.
- 2.2.5. The mean age of the residents of Torbay is 44.2 years. In comparison, the mean age of the population of England is marginally lower, at 39.3 years.

2.3 SOCIO-ECONOMICS

ECONOMIC ACTIVITY

- 2.3.1. Census 2011 data shows 65.7% of Torbay's population to be economically active, with just over 30% employed on a full-time basis and just over 15% employed on a part-time basis. 9% are self-employed, whilst the unemployment rate is at 4%, and 14% have retired.
- 2.3.2. On average, Torbay has lower employment figures compared to the country-wide statistics. 69.9% of England are economically active, with almost 40% employed on a full-time basis, 14% employed on a part-time basis and 10% self-employed. The unemployment rate and the percentage of retired in Torbay is identical to that of the whole of England (4% and 14% respectively).
- 2.3.3. The most common types of occupation held by Torbay residents are: Skilled trade, caring and leisure, and professional occupations.

TRANSPORT AND TRAVEL TO WORK

- 2.3.4. Within Torbay, 45% of the population have access to one car/van in their household. A similar proportion of people has access to two cars/vans compared with those who do not have access to any form of private transport (22% vs 26%).
- 2.3.5. These statistics are similar to the figures of the wider country. 42% of the whole of England has access to one car/van in their household, whilst 25% have access to two cars/vans, and 26% do not have access to any form of private transport.
- 2.3.6. Table 2-1 shows the distribution of commuting trips in Torbay by journey mode:

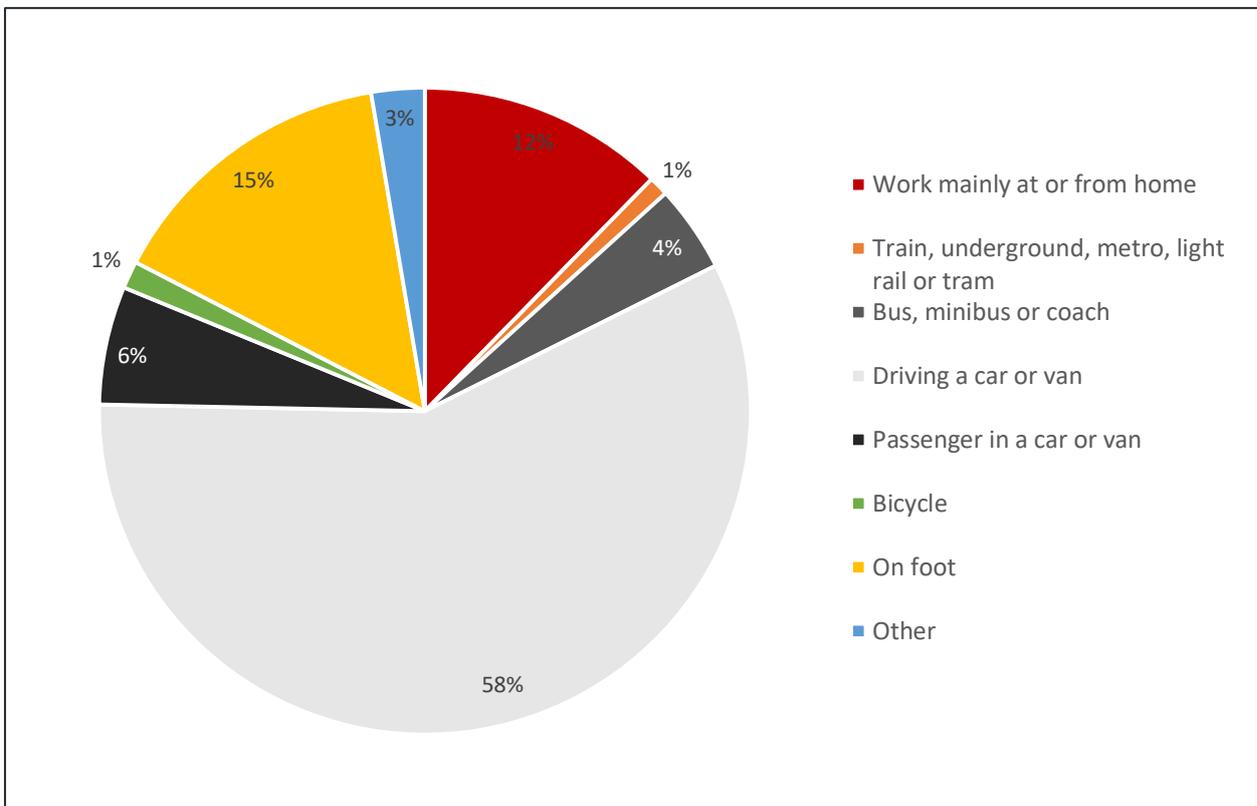
Table 2-1 - Distribution of commuting in Torbay by journey mode (count)

All	Work mainly at or from home	Train, underground, metro, light rail or tram	Bus, minibus or coach	Driving a car or van	Passenger in a car or van	Bicycle	On foot	Other
57,396	7,035	562	2,488	33,151	3,395	786	8,459	1,520

Census 2011 data

- 2.3.7. The same data is shown in Figure 2-1 as the percentage proportion split:

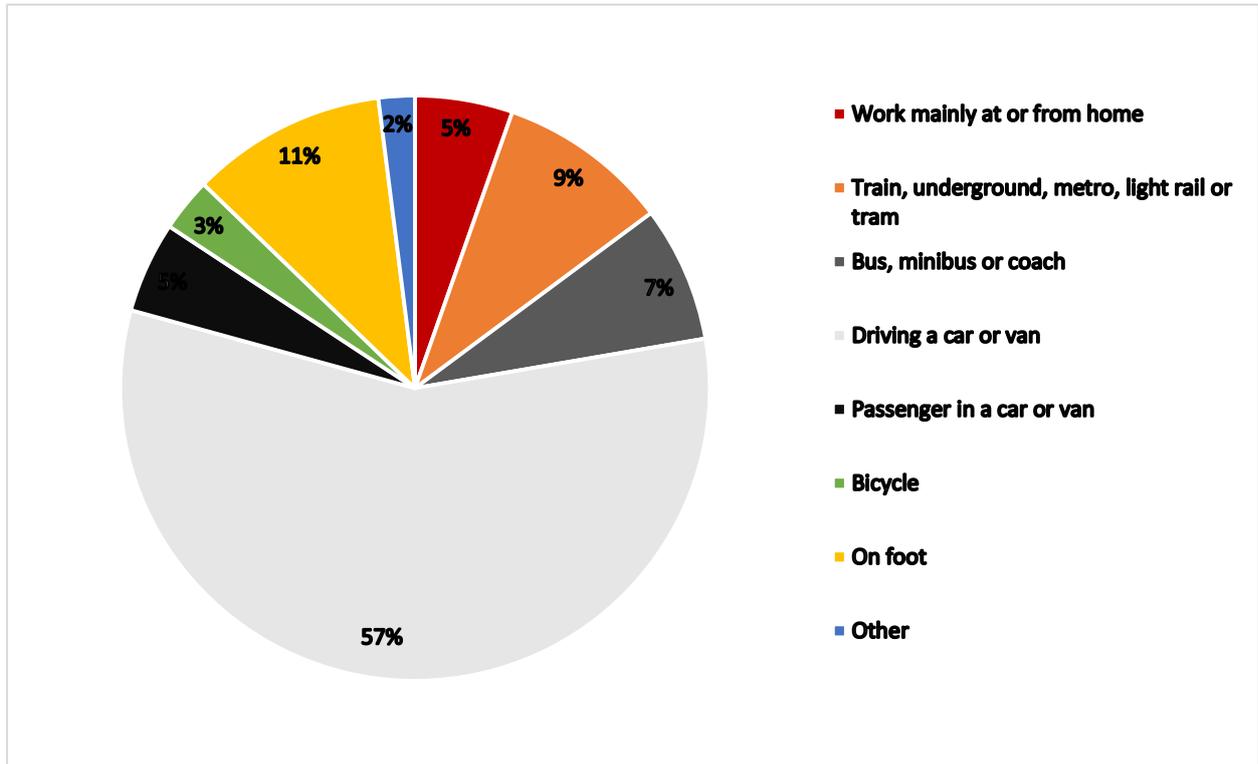
Figure 2-1 - Distribution of commuting in Torbay by journey mode (percent)



2.3.8. As can be seen in the pie chart in Figure 2-1, almost two-thirds (64%) of commuters in Torbay travel to work in a private car, either as a driver or a passenger. 16% of Torbay residents travel to work using active modes of travel (walk or cycle), whilst 12% predominantly work from home.

2.3.9. The equivalent information for England is given in Figure 2-2:

Figure 2-2 - Distribution of commuting in England by journey mode (percent)



2.3.10. From the above data, it is seen that the distribution of commuting in Torbay compared with the national average is similar. The proportion of economically active residents in Torbay commuting via private car/van, either as the driver or the passenger are almost identical compared with the national average, with 57% of England driving to work and 5% commuting as a passenger.

2.3.11. The largest discrepancy of travel modes between Torbay and the wider country is 'work mainly at or from home'. More than double the percentage of individuals predominantly work from home in Torbay compared to the national average. While already high, this may increase further in the future as a result of the coronavirus (Covid-19) pandemic and an expected permanent shift to higher levels of home-based working following a prolonged period of working from home for much of the workforce in 2020.

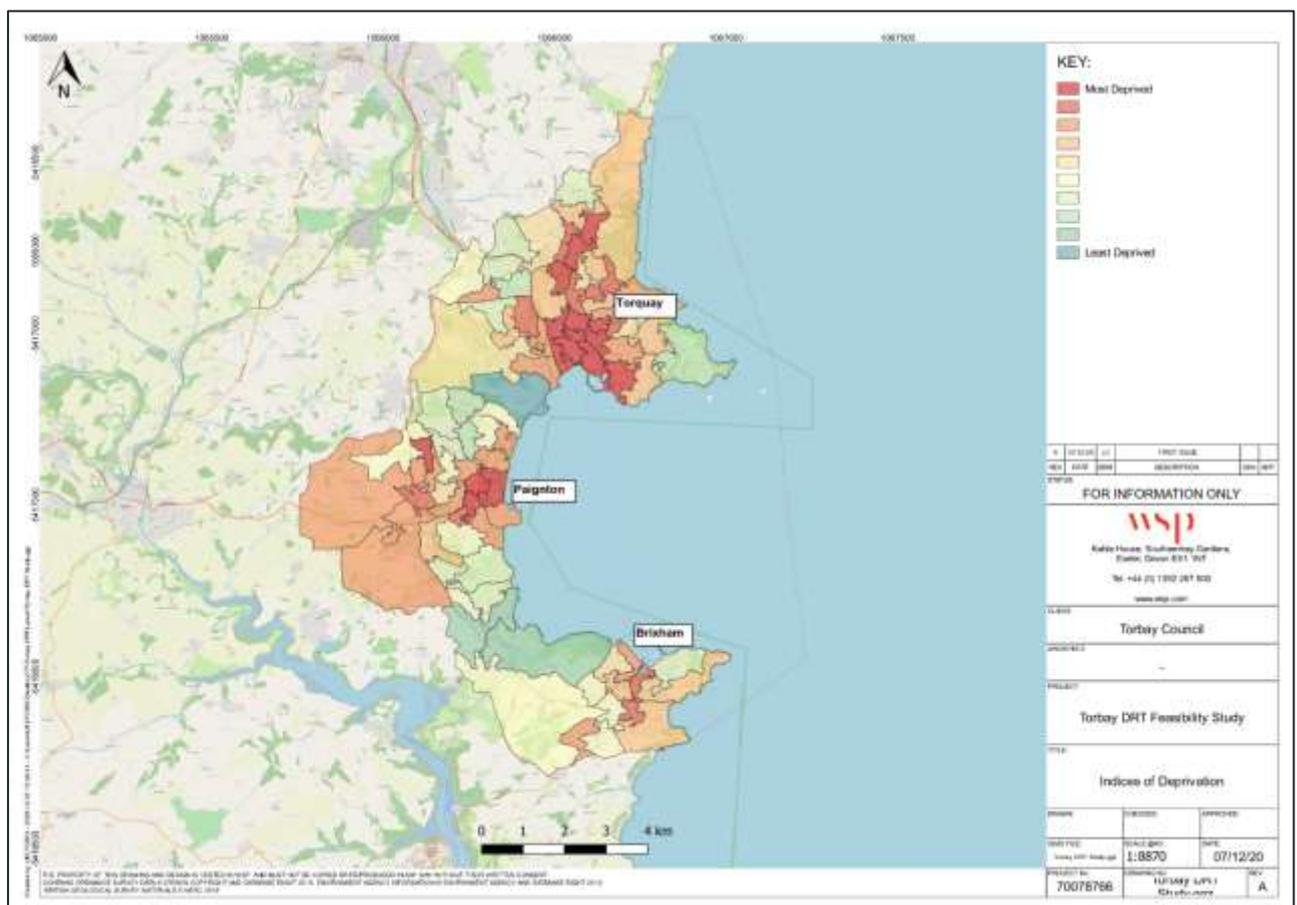
INDICES OF MULTIPLE DEPRIVATION

2.3.12. The Indices of Multiple Deprivation combines several socio-economic indicators to produce an overall deprivation score that measures relative deprivation in small areas (Lower-layer Super Output Areas) in England. The indices of Multiple Deprivation include the following seven factors:

- Income Deprivation
- Employment Deprivation
- Health Deprivation and Disability
- Education, Skills and Training Deprivation
- Barriers to Housing and Services
- Crime
- Living Environment Deprivation

2.3.13. The results are quantified based on the scores obtained and then ranked throughout the country. The lower the ranking, the greater the level of deprivation. Results are ranked into 10 categories from Most Deprived (1) to Least Deprived (10). This ranking is shown in Figure 2-3:

Figure 2-3 - Indices of Multiple Deprivation, Torbay



- 2.3.14. The IMD 2015 report commissioned by South Devon and Torbay Council highlights the relatively high levels of deprivation within Torbay:
- Torbay is amongst the top 15% most deprived district local authorities in England (46th out of 326);
 - Almost 1 in 3 (31.5% - 42,050) residents live in areas amongst the 20% most deprived in England;
 - Since 2010, there has been a 75% increase in Torbay residents living in areas amongst the 20% most deprived in England (16 LSOAs in 2010 to 28 LSOAs in 2015);
 - The most deprived small area in Torbay can be found in the ward of Roundham with Hyde. It is ranked 219 out of 32,844 LSOAs in England;
 - There are 6 LSOAs ranked in the top 1,000 most deprived in England (ranked out of 32,844) for the IMD; and
 - Out of the seven sub-domains of IMD, Torbay scored the poorest on income and employment related deprivation. Torbay ranks in the lowest possible categories (most deprived) for three of the seven IMD sub-domains.
- 2.3.15. An analysis of the deprivation data and bus services is presented in section 2.8.

2.4 CURRENT BUS SERVICES

- 2.4.1. Details of bus services in Torbay have been obtained in order to understand the current destinations served, frequencies and operating hours. The main bus operators in the area were identified prior to the project commencing and agreed with Torbay Council as in scope. These operators are:
- Stagecoach
 - Country Bus Devon
 - Torbay Minibuses
- 2.4.2. Timetables were obtained from the Traveline website and verified against the operator's own published timetables (where they existed). Routes were identified from the Stagecoach website network maps, and for the smaller operators the website www.bustimes.org was used to view a point-to-point representation of the routes. All services identified were cross-referenced with a list provided by Torbay Council.
- 2.4.3. A number of registered local services operating predominantly for school and college transport were identified from the service details obtained and the list provided by Torbay Council and were scoped out of this exercise. These services are infrequent, generally running only around school opening/closing times (0800-0900 & 1500-1600) and with only one or two journeys per direction, and were considered not relevant to the study. These services are:
- Stagecoach services 13C, 13D, 28, 30, 32C, X84, 110 & 122
- 2.4.4. Details of bus services are given in Table 2-2:

Table 2-2 - Torbay bus service routes and frequencies

Operator	Service	Route	Service Frequency						Comments
			MF Daytime	MF Evening	Sat Daytime	Sat Evening	Sun Daytime	Sun Evening	
Stagecoach	12	Brixham – Paington – Torquay - Newton Abbot	10min	10-20min	10min	10-20min	15min	30min	Services up until midnight
Stagecoach	13	Kingsteignton - Brixham	60min	No services	120min	No services	No services	No services	
Country Bus	15/16	Brixham Town Circular	30min	No services	30min	No services	No services	No services	Starts at 9:30; 120min interval at 11:30-13:30
Stagecoach	17/17A	Brixham, Bank Lane - Furzeham, Copythorne Road Inbound	60min	No services	60min	No services	120min	No services	17A Sunday only
Stagecoach	18	Higher Brixham - Kingswear	60min	1 service	60min	1 service	60min	No services	
Stagecoach	22	South Devon College - Dawlish Warren	20min	60min	20min	60min	30min	60min	Every second 30min interval on Sunday: operates from the 27th of September 2020 up to and including the Sunday before Easter
Stagecoach	23	Paington - South Devon College	30min	60min	30min	60min	60min	60min	
Torbay Minibuses	25	Morrisons - Paington Bus Station - Youngs Park - Paington Bus Station - Morrisons circular	50-60min	No services	50-60min	No services	No services	No services	6 services throughout the day; approx. Every 60min



Stagecoach	31	Barton Padacre Road - Torquay, Cary Parade	20min	30min	20-25min	30min	30min	30min	Services up until midnight
Stagecoach	35A / 35C	Torquay Strand - Torquay Strand circular	10min	10min	10min	15min	15min	15min	Services up until midnight
Torbay Minibuses	60	Occombe - Shorton - Paignton	60-90min	No services	5 services throughout the day				
Torbay Minibuses	62	Cockington - Torquay	50-100min	No services					
Torbay Minibuses	64	Torquay Middle Warberry Road - Town Centre - Torbay Hospital	60 min	No services	60min	No services	No services	No services	120min interval at 12:30-14:30
Stagecoach	88	Newton Abbot - South Devon College	No service	No services	College commuter				
Torbay Minibuses	108	Paignton - Foxhole - Paignton circular	60min	60min	60min	No services	No services	No services	
Torbay Minibuses	109	Paignton - Oldway - Blagdon - Paignton circular	60min	No services	60min	No services	No services	No services	120min interval at 11:30-13:30
Stagecoach	120	Kingswear - South Devon College - Paignton	60min	No services	60min	35-85min	No services	No services	
Country Bus	125	Marldon - Paignton Bus Station - Stoke Gabriel	60-70min	No services	60-70min	No services	No services	No services	
Country Bus	149	Torquay - Marldon - Totnes	145min	No services	2 services each way throughout the day				
Stagecoach	FOX	Fox - Paignton Bus Station - Foxhole circular	15min	30min	15min	30min	30min	30min	Services up until midnight
Stagecoach	GOLD	Torquay Strand - Totnes Royal Seven Stars	30min	50-90min	30min	50-90min	60min	1 service	Last service at 19:05
Torbay Minibuses	SB1	Sainsbury - Brixham - Sainsbury circular	2 services	No services	Mon, Wed, Fri ONLY; 120min interval				



Torbay Minibuses	SB2	Sainsbury - Goodrington - Roseland - Sainsbury circular	2 services	No services	Tue, Thu ONLY, 120min interval				
Torbay Minibuses	SB3	Sainsbury - Foxhole - Oldway - Sainsbury circular	2 services	No services	Tue, Thu ONLY; 120 min apart				
Torbay Minibuses	SB4	Sainsbury - Broadsands - Cherry Brook - Sainsbury	2 services	No services	Mon, Wed, Fri only				
Torbay Minibuses	SB5	Marks & Spencer - St Mary Church - Marks & Spencer	120min	No services	Daily				
Torbay Minibuses	SB6	Marks & Spencer - Chelston - Marks & Spencer	120min	No services	4 services throughout a weekday				
Torbay Minibuses	TC1	Tembani Court - Sainbury - Tembani Court circular	1 service	No services	Tue, Thu ONLY				

Traveline published timetables

- 2.4.9. A number of infrequent ‘shopper buses’ serve the Sainsbury’s superstore at Brixham Road, Paington, operated by Torbay Minibuses. These are services SB1, SB2, SB3 & SB4 and provide 3-4 journeys per day to facilitate shopping trips. Torbay Minibuses also operate a small number of services in Paington and Torquay including service 108/109 (Paington Circular) and service 62 (Cockington – Torquay).

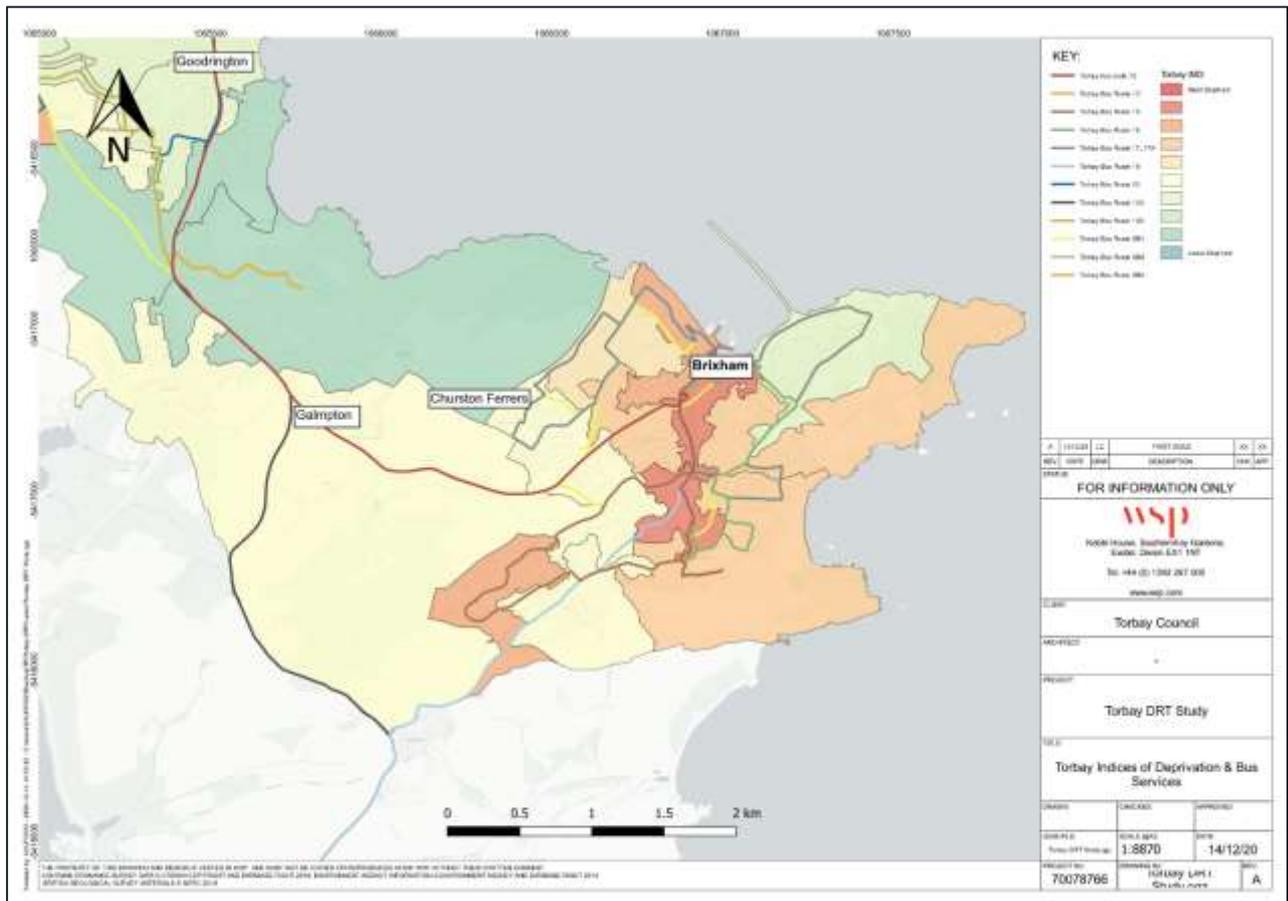
2.5 COMMUNITY TRANSPORT

- 2.5.1. There are two community transport services in Torbay:
- Fare Car Torbay
 - Torbay Community Development Trust bus service 61
- 2.5.2. Fare Car Torbay is a community transport service operating across Torbay and providing subsidised door-to-door travel (see section 2.6 below) for those unable to use conventional transport due to disability or reduced mobility. The service is provided by a taxi operator and runs to set times and days with booking by telephone required prior to travel. Passengers pay a fixed return fare of between £4.10-£4.70 depending on the zone they are travelling within, which is lower cost than a private hire.
- 2.5.3. Torbay Community Development Trust operate bus service 61 between the Livermead area of Torquay and the town centre, under a Section 22 Community Bus Permit. The service is operated on a not-for-profit basis and is funded through a combination of concessionary fare reimbursements and voluntary subscription fees paid for by regular users of the service. The service is open to the general public, running to a fixed route and timetable with volunteer drivers and charges fares for any users not holding a concessionary travel pass. Further information on how the service is operated is given in section 3.2 of Chapter 3.

2.6 TORBAY COUNCIL PUBLIC TRANSPORT SPENDING

- 2.6.1. There are no tendered bus services operating in Torbay. The Council provides around £7,500 per annum support to Torbay Minibuses for service 25 under a de minimis agreement.
- 2.6.2. At the time of writing this report, the Council have been temporarily supporting a number of additional Torbay Minibuses routes under emergency measures due to the effects of the coronavirus pandemic. The Council have also been supporting Country Bus Devon service 15/16 again under the same emergency measures, with support for both operators lasting until 31 March 2021.
- 2.6.3. The Council subsidises the Fare Car service up to the value of £10,800 per annum, however in the 2019/2020 financial year the cost to the Council of this service was only £4,500. Usage is expected to remain low in 2021 due to the continued effects of the coronavirus pandemic.
- 2.6.4. According to data from the Department for Transport, expenditure on the English National Concessionary Travel Scheme by Torbay Council was just under £4 million in the 2018/2019 financial year.

Figure 2-7 - Brixham bus services and deprivation rankings



- 2.7.2. Deprivation ranking for the whole of Torbay (without bus services shown) is given in Figure 2-3 on page 7.
- 2.7.3. From the above figures, it is seen that deprivation in Torbay is concentrated in the centre of Torquay, with smaller pockets of deprivation in Paignton and Brixham. The most deprived areas of Torquay (covering the neighbourhoods of Torre, Plainmoor and the town centre) are generally well served by public transport, including the frequent services 12, 31 and 35A/35C.
- 2.7.4. Paignton ranks higher in deprivation overall than Torquay. Deprivation is concentrated in the town centre which, like Torquay, is the focal point for bus services in the area and as such the most deprived area of the town is reasonably well served by public transport, albeit with fewer destinations and less coverage than in the larger settlement. However, owing to the elongated characteristic of the town centre along the waterfront, it is notable that some residential streets are located a considerable walking distance from the main bus corridor along Torquay Road, uphill from the waterfront. The area of Foxhole also ranks high in deprivation, served by the Stagecoach 'FOX' bus service.

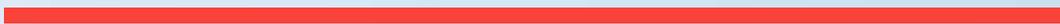
- 2.7.5. Brixham is the least deprived of the three settlements, with the highest deprivation concentrated in a relatively small area between the town centre and Brixham Hospital. As the smallest of the three settlements in Torbay, Brixham has the fewest number of bus services and the town's location on a peninsula at the southern end of the bay makes it more challenging to serve efficiently. Brixham also has particularly steep terrain which can be a challenge for the less mobile in getting to and from bus stops on the main roads.

2.8 SUMMARY

- 2.8.1. This chapter has established a baseline of the current public transport supply and socio-economic characteristics of Torbay used to inform subsequent stages of the feasibility study.
- 2.8.2. Population and demographic information was collected and analysed, noting that Torbay has an aging population compared to the national average. Socio-economic data covering employment status, personal transport and travel to work was assessed, finding that the unemployment rate, percentage of retired persons in Torbay and those with access to a car are broadly similar to the England averages.
- 2.8.3. Indices of multiple deprivation have been gathered and mapped, illustrating the range of deprivation and affluence in Torbay. Deprivation was found to be concentrated most in Torquay around the town centre and adjacent neighbourhoods, with a sizeable area of deprivation in Paignton. Brixham was found to be the least deprived of the three settlements.
- 2.8.4. The current public transport supply has been mapped, assessed and overlaid with the deprivation indices. The assessment found that while Torbay is generally well served by bus services with several frequent routes running between every 10 and every 30 minutes, these are concentrated along the main corridors, especially in Paignton, meaning adjoining areas have much reduced service levels of generally no more than hourly. Brixham as the smallest settlement was found to have the least amount of bus service coverage and the challenge of serving the town efficiently being at the end of the bay on a peninsula was noted.

3

STAKEHOLDER ENGAGEMENT



3 STAKEHOLDER ENGAGEMENT

3.1 INTRODUCTION

- 3.1.1. Stakeholder engagement has been a key part of this study in order to gauge the understanding of and attitudes towards Demand Responsive Transport (DRT) among the main bus operators in Torbay. Engagement with neighbouring local authorities has also taken place to similarly understand views on DRT.
- 3.1.2. Meetings were arranged via online video conference with all stakeholders asked to give their views on the suitability of DRT in general, the suitability of DRT in Torbay, and in the case of the bus operators they were also asked about any plans for commercial (i.e., without subsidy) DRT services in the future.

3.2 BUS OPERATOR ENGAGEMENT

- 3.2.1. The following bus operators were identified at the project inception stage and contacted:
- Stagecoach South West
 - Country Bus Devon
 - Torbay Buses
 - Torbay Community Development Trust
- 3.2.2. Existing bus services in Torbay are detailed in Chapter 2.

STAGECOACH

- 3.2.3. Stagecoach is the largest bus operator in Torbay operating a network of services within Torquay, Paignton and Brixham and with interurban services to Plymouth and Exeter. Services in Torbay are operated by the company's South West subsidiary which is a major provider of bus services in Devon, Somerset and into Cornwall. A meeting was held with Stagecoach senior management on 24 November 2020.
- 3.2.4. Stagecoach referenced the TeesFlex service which the company is operating in Tees Valley and which is financially supported by Tees Valley Combined Authority. The experience of this so far has been positive and Stagecoach stated that the TeesFlex model could be deployed by them in other locations.
- 3.2.5. In terms of the role of DRT in future, Stagecoach noted a reluctance among some local authorities to consider such an operating model, with reasons including concerns over digital exclusion for the elderly and the risk of losing passengers with such a major change to the operating model. Some local authorities have been reluctant to consider DRT due to concern about lack of understanding among potential users of how DRT works, the lack of a visible presence of a service (i.e., no fixed bus stops required) and elderly passengers being either less IT-savvy or physically unable to use technology such as smartphones due to disability.
- 3.2.6. Stagecoach expressed the view that DRT is unlikely to work on a purely commercial model given it is a hybrid of bus and taxi but typically has bus-equivalent fares. Stagecoach noted that as DRT gives the same flexibility of a taxi it could justify taxi-similar fares, but this would be unlikely to be politically acceptable.

- 3.2.7. As for the general suitability of DRT, Stagecoach noted that it needs to be bespoke and could be suitable for particular routes, such as specific destinations like business parks or feeders into rail services, but is not especially suitable for commuting where passengers want certainty over schedule and capacity (i.e., a bus rather than a minibus requiring a booking).
- 3.2.8. Stagecoach noted that for DRT to be cost-effective, it needs to aggregate journeys which can be more efficient than providing separate bus services, and this is most likely to be suitable in rural areas. The example of people travelling into a town on a market day was given.
- 3.2.9. Stagecoach pointed out that community transport services operating under a DRT model can act as important feeders into the main bus network. Reference was made to a scheme in Lincolnshire where DRT has enabled bus services to be speeded up by reducing variations and diversions off the main route (see Chapter 5 for more detail). Stagecoach noted that in this scenario, integrated ticketing is important for DRT if it is to feed into an established bus network. A possible solution is for the bus operator to provide the ticketing infrastructure and back-office, with the DRT operator handling the bookings and vehicle operation without having to be involved in ticketing transactions.
- 3.2.10. On the suitability of DRT in Torbay, Stagecoach noted they had previously suggested to Torbay Council that services 15/16 which provide the Brixham town circular could be a particularly suitable scenario for a DRT operation as there is an element of duplication with other services in the 1 Peak Vehicle Requirement (PVR) currently operated by Country Bus Devon. Stagecoach suggested that if service 15/16 was withdrawn, the residual parts could be covered with the 1 PVR currently on service 17/18, however there was reluctance by Torbay Council to do this previously due to the need for expenditure on back-office IT.
- 3.2.11. Elsewhere in Torbay, Stagecoach pointed to Cockington and Wellswood as potentially being suitable for DRT due to them lying out-with the core bus network.
- 3.2.12. Stagecoach is planning its 'Ground Zero' bus network in the South West for the start of the 2021/2022 financial year after the eventual end of the Coronavirus Bus Services Support Grant and is not looking at withdrawing services but may have to consider reducing frequencies on some routes. Some routes are expected to recover more quickly than others and thus may be able to have the current frequencies sustained in order to build back patronage.
- 3.2.13. Stagecoach South West does not currently have plans to introduce commercial DRT services but would not rule them out for the future, particularly if introduced in partnership with a local authority.

COUNTRY BUS DEVON

- 3.2.14. Country Bus Devon (CBD) is the largest independent operator in the county. The majority of the company's services run out of Newton Abbot, but also with services based in Exeter, Teignmouth, Totnes, Brixham and Paignton. A meeting was held with CBD senior management on 1 December 2020.
- 3.2.15. CBD noted that service 15/16 in Brixham was subsidised by Torbay Council until 2008/2009 and then became commercial. However in more recent times it has required financial support to continue operating which Torbay Council is providing until March 2021. If no more funding is made available after that point, the service will likely have to be withdrawn.

- 3.2.16. CBD observed that DRT may be appropriate for isolated villages where running a bus service would be financially unviable, but may be less appropriate in more urban settings with a regular passenger demand base. CBD noted that in summer months, Torbay residents wish to travel by bus every day but in winter, demand is much lower.
- 3.2.17. CBD confirmed that DRT is not something the company has considered but they would be interested in how it works. They would need clarification on implications around bus service registrations with the Traffic Commissioner if buses were then diverting off routes to serve an 'on demand' area or otherwise no longer following a fixed route.
- 3.2.18. CBD noted that Torbay has lost several bus services and operators over the years due to declines in patronage and reductions in funding and there are fewer and fewer commercially viable services. While there could be potential for DRT to work in very rural areas, CBD would need more information on how it could be used in Torbay but would be supportive of the Council if it was something they chose to pursue. CBD stated that bus operators would be led by local authorities in this regard and if DRT became essential to their continued business, it would clearly be something they would have to take up, but there are currently no plans by CBD to introduce DRT independently. CBD noted that Devon County Council has supported bus operators in the past with adapting new technology such as new ticket machines.
- 3.2.19. CBD summarised that the company would be very interested in DRT if this could be shown to work for passengers and if they as a bus operator were given more information on how it works.

TORBAY MINIBUSES

- 3.2.20. A meeting was held with Torbay Minibuses (TMB) senior management team on 8 December 2020.
- 3.2.21. Torbay Minibuses' business is primarily in school transport and private hires, which local bus services in Torbay are worked around. The company took on some of the local routes after another operator ceased trading. The company runs 16-seater minibuses plus two larger Optare Solos.
- 3.2.22. TMB have considered DRT in the past and would be interested in getting involved with a DRT scheme as it would suit their business model of operating smaller vehicles around existing contracts, which provides cost efficiencies in terms of having drivers and vehicles already utilised. However the company would not be able to carry the financial risk of investing in setting up a DRT and would need the Council to support it. The company would need to know that DRT would be financially viable as it is not something they have had much information on.
- 3.2.23. TMB noted that a drawback of DRT in Torbay could be the highly variable demand between summer and winter. Services can be very busy in summer due to extra visitors in the area, but over winter a lot of residents do not travel much and usage on some routes can be extremely low.
- 3.2.24. TMB also noted that Torbay has a high proportion of elderly residents which is a challenge for the financial sustainability of bus services where the vast majority of users are concessionary pass holders. TMB noted this can be in the region of 80-90% on some of their services. This also raised questions around accessibility of booking such services for those less confident with IT.
- 3.2.25. TMB suggested there was a lack of understanding among local authorities about the true costs involved in running bus services. Modern DDA-compliant Euro VI 16-seater minibuses such as a Mercedes Sprinter can be in the region of £90,000 to buy new and the company would need confidence in continued funding before making such commitments.

- 3.2.26. TMB noted that DRT feeder services into the core Stagecoach network would need integrated ticketing to be fully beneficial for all potential users. The lack of integrated ticketing in the area puts Torbay Minibuses at a disadvantage compared to the dominant operator and attempts to agree mutual cross-ticketing have been unsuccessful.
- 3.2.27. In summary, Torbay Minibuses considered that they would be in a good position to run DRT but that they would not be able to take on the significant financial risk in setting one up themselves, so any such initiative would need to be Council-led.

TORBAY COMMUNITY DEVELOPMENT TRUST

- 3.2.28. A meeting was held with Torbay Community Development Trust (“The Trust”) on 9 December 2020.
- 3.2.29. Torbay Community Development Trust is a charity whose overall aim is to create better communication across Torbay between different voluntary and community groups, actively encouraging local involvement and decision making in improving the region, as well as developing and supporting volunteering opportunities.
- 3.2.30. The Trust got involved in running buses because there was no other alternative after a commercial operator withdrew services and no replacements were forthcoming. The Trust’s role in providing the service 61 bus is therefore a means to an end to ensure that the full benefit of the Trust’s wider social inclusion programme and projects can be accessed by those who need them. The Trust’s purpose is to improve quality of life in Torbay and the running of bus services is non-core but complementary to their activities. The Trust received lottery funding to tackle social isolation and the bus service is therefore complementary in this regard, but the Trust do not consider themselves a bus operator.
- 3.2.31. The Trust has in the past tried running commercial bus services with paid drivers under a PSV licence, but the costs of this type of operation meant it could not make it stack up commercially. Since then, smaller (under 16 seats) buses with volunteer drivers have been used with the service running under a Community Bus Permit.
- 3.2.32. The Trust operates a ‘Friends of the Bus’ scheme where members subscribe and donate towards the cost of running the service. The Trust previously considered a dial-a-ride type service in Brixham with donations but engagement found that residents were unwilling to pay for this type of service when alternatives were considered to be available. It was noted in the discussion that Brixham Town Council had previously persuaded Stagecoach to reroute one of their services to an under-served area which alleviated the need to consider DRT. However with the future of the Country Bus Devon service 15/16 in Brixham now uncertain, the question of a DRT has arisen once again.
- 3.2.33. Residents may be more willing to pay for a service if the alternative was no service, the Trust noted, but that the willingness to make voluntary contributions can be undermined where particular services in certain areas are subsidised. The Trust observed that Torbay has very low bus subsidies and that the absence of subsidies can help the argument for voluntary contributions if all of Torbay is perceived as being treated equally in this respect.
- 3.2.34. The Trust noted that around 95% of users of service 61 are concessionary bus pass holders which presents a challenge in terms of financial viability. The service itself provides an important social inclusion role both for the users and volunteer drivers, without which both groups would face social isolation. The service also acts as a meeting place in itself by providing community cohesion.

- 3.2.35. The Trust observed that after the first national lockdown in March 2020 brought on by the coronavirus pandemic, some users who paid towards the running of the service indicated they would no longer be comfortable using the bus due to public health concerns. This could undermine efforts to secure voluntary contributions if some users are no longer confident going out and using the service.
- 3.2.36. The Trust also raised the issue of difficulty travelling for people with mobility issues: The Trust previously trialled a DRT service for persons with reduced mobility, but this was withdrawn due to challenges around timekeeping and the time taken to get users on and off the bus, as well as the extra training required for drivers transporting vulnerable passengers. There is a shortage of wheelchair accessible taxis in Torbay and there are few low-floor minibuses available on the market.
- 3.2.37. The Trust summarised that DRT could be a good solution in Torbay as there are still many places with gaps in service provision which a DRT could fill. The Trust highlighted Cricketfield Road as an example of a localised gap that needs a service but cannot viably be served by any bus service. The Trust recognised that a DRT service would involve some risk but could end the trend of reacting to bus service cuts and withdrawals which has been experienced in Torbay over recent years.

3.3 NEIGHBOURING LOCAL AUTHORITIES

- 3.3.1. Torbay Council identified the following neighbouring local authorities to be consulted as part of the stakeholder engagement:

- Brixham Town Council
- Devon County Council

BRIXHAM TOWN COUNCIL

- 3.3.2. A meeting was held with Brixham Town Council (BTC) on 4 December 2020.
- 3.3.3. BTC asked about the emerging digital aspect of DRT and what this means. It was emphasised that a service needs to be assessable both in terms of booking method and actually using the service itself. There was discussion around how bookings are taken for DRT and the need for this to be accessible.
- 3.3.4. The future of the 15/16 town bus service operated by Country Bus Devon was specifically raised in the meeting. BTC pointed out that the service is well used and has a core passenger base who use the service every day, but that due to them being concessionary pass holders the service is not financially viable.
- 3.3.5. During the meeting it was reiterated that the study was not focussed on identifying specific bus services to replace with DRT, but that the work will equip Torbay Council with ‘future ready’ information on which to make informed decisions around future transport provision.
- 3.3.6. BTC asked if the National Bus Strategy for England would support, encourage and enable DRT and if this was feeding into the study. WSP confirmed that the National Bus Strategy has not yet been published and its exact contents are still not known, but that the Future of Mobility Urban Strategy, published by the UK Government in 2019, states that DRT will have a significant role to play in the future of transport (see Chapter 4 for more details).
- 3.3.7. On the suitability of DRT, BTC suggested that feeder services could be a solution in Brixham, especially as the town is quite compact. A lot of elderly residents are loyal to the town centre and go there for local shopping, meeting friends and maintaining social connections.

- 3.3.8. The 15/16 service is particularly important for avoiding social isolation. The town is hilly with much of the lower cost housing located further from the town centre which can be popular with retirees but means it is difficult for them to walk due to the topography.
- 3.3.9. BTC pointed out that residents need a reasonable amount of time in town, perhaps three hours, and that a DRT service should not limit this too rigidly. BTC noted that residents who use service 15/16 like it and appreciate that regular drivers are used on the service.
- 3.3.10. BTC pointed out that in summer, bus services can get overloaded with tourists. A DRT service requiring bookings could help in this regard but it could also be a barrier if smaller vehicles being used filled up more quickly.
- 3.3.11. BTC highlighted that their local surveys of residents had identified a willingness to pay a supplement on top of their free bus pass if the alternative was having no service at all.

DEVON COUNTY COUNCIL

- 3.3.12. A meeting was held with Devon County Council (DCC) officers on 8 December 2020.
- 3.3.13. DCC has extensive experience of supporting community transport in the county stretching back more than 25 years and DCC stated in the meetings that nearly all of them require ongoing annual subsidy. Costs are met by around 50% support from the Council, the rest coming from fundraising efforts as many of the schemes are operated by charitable organisations. These are generally to provide shopper services into the nearest town from isolated communities and only run generally weekly. DCC also supports car schemes to provide links to/from health centres. They are complementary to the core bus network, but not a replacement of conventional public transport.
- 3.3.14. DCC emphasised that in their experience, with a DRT service it is important to understand that the underlying costs do not change. Any service still needs a vehicle and a driver whether it is DRT or fixed route bus service. The only way to improve the cost base (by reducing the subsidy) is by increasing passenger loads or vehicle utilisation.
- 3.3.15. Devon was one of the Total Transport pilot areas which aimed to promote closer integration of different transport services for different public sector providers in rural areas, particularly NHS patient transport. The experience of this was that it provided cost savings to the public sector, mainly the NHS, through better use of vehicles by sharing resources.
- 3.3.16. DCC stated that if replacing bus services with DRT, service providers have to be honest with customers about what they will be getting: DRT is not as reliable as bus services because there is no fixed route and timetable. The ability to travel and the time it will take are not guaranteed, unlike with a bus service which operates at a fixed time. DCC's observation was that DRT can result in fewer passengers being served at a higher subsidy per journey than the bus services they replaced. DCC observed that there have been numerous DRT trials enabled in the past by government funding in the late 1990s & early 2000s, but none could become commercial and very few of them still exist.
- 3.3.17. DCC gave examples of the challenges around convincing people to accept DRT. Attempts to replace infrequent bus services with more frequent DRT options in Devon in the past were met with opposition in some places due to the need to book, which even for telephone bookings can be a barrier to some users.

- 3.3.18. Further illustrating the point around booking and use of technology, this year DCC had engaged with community transport operators to assist in providing contactless payment in light of Covid safety measures, but there was very little uptake due to the majority of the services' users still paying in cash rather than through digital means.
- 3.3.19. In terms of feeder services, DCC explained that Devon has some experience of these in the form of taxis and private hire cars providing links from a transport interchange, but these retained fixed departure times. DCC observed that as soon as there are more than a handful of passengers wanting to travel, it becomes more efficient to run a bus service from these points. DCC stated that there may be a tolerable margin of flexible operation on an otherwise fixed bus route but that this would not be a true DRT.
- 3.3.20. DCC summarised that all the experience shows that DRT cannot be operated commercially and it can actually be more expensive than fixed route bus services when dealing with moderate levels of demand. DCC stated that DRT is best used to deliver transport for very low areas of demand where a bus service would be prohibitively expensive, but that this still needs subsidy. There could be a niche for DRT in very specific circumstances only.
- 3.3.21. As for the future, Devon would be interested in trying DRT to improve, but not replace, existing public transport provision. They will be guided by the emerging DfT rural mobility strategy in this regard.
- 3.3.22. DCC has no plans to consider further DRT at this stage and therefore would not be supportive of DRT conversion/substitution on cross-boundary services operating in and out of Torbay.

3.4 SUMMARY

- 3.4.1. This chapter has detailed the stakeholder engagement undertaken with bus operators and neighbouring local authorities to inform the study on the understanding of and attitudes towards DRT. Stakeholders were asked for their views on the suitability of DRT generally, its potential application in Torbay and any plans to deploy DRT in the future.
- 3.4.2. The engagement identified a general support for DRT where it is led by the local authority and provided that it is accessible to all potential users through a choice in the methods of booking. The engagement also identified support for DRT providing 'feeder' services from lesser served areas into the main established bus routes and interchanges.
- 3.4.3. The engagement confirmed that there are currently no plans by any of the bus operators in Torbay to introduce commercial DRT services, but that they would be open to running such services under a local authority-led initiative.

4

POLICY & RESEARCH REVIEW



4 POLICY & RESEARCH REVIEW

4.1 INTRODUCTION

- 4.1.1. With the growth in interest over the past 20 years among local authorities, policymakers and transport planners in DRT, it is a transport mode that has been the subject of academic research in the UK and internationally by a number of different institutions. In order to understand what research already exists and the findings of such research, a literature review was undertaken via online searches. Reference was also made to previous WSP projects undertaken in the DRT sphere in the UK and internationally.
- 4.1.2. The growing interest in DRT has also been accompanied by corresponding developments of new policy and strategy by local authorities, transport agencies and governments. Policy around DRT in the UK has been received and summarised with a focus on the England context. Linked to this, an overview of current DRT activity by Government and local authorities has been undertaken.

4.2 LITERATURE REVIEW

OVERVIEW OF LITERATURE REVIEW METHODOLOGY

- 4.2.1. The purpose of the literature review is to report on peer reviewed and grey literature (information produced and provided outside of a formal publishing process) addressing Demand Responsive Transport services. This means that papers included needed to be focussed on research into DRT or case studies of specific DRT schemes that had operated and been assessed.
- 4.2.2. The search criteria are broken down as outlined below:
- Search approach: prioritising peer reviewed literature, but also grey literature;
 - Dates: January 2000 to present; and
 - Geography: global literature search for papers published in English
- 4.2.3. The search was conducted using the following key words and terms:
- Demand Responsive Transport;
 - Digital Demand Responsive Transport;
 - Dynamic Demand Responsive Transport;
 - DRT;
 - DDRT;
 - Dial-a-Ride;
 - Dial-a-Bus;
 - Community Transport;
 - Shared Ride Services;
 - Ride Sharing;
 - Shared Ride Bus; and
 - Paratransit
- 4.2.4. Online searches were conducted via Google Scholar and Refseek.

ASSESSMENT PROCESS

- 4.2.5. Twenty sources were found to be in scope in this literature review. Some single studies also summarised aspects of the literature in setting their own study in the wider context of the DRT literature. After searches had been undertaken to find studies and abstracts, these were checked to assess whether it was likely that they were in scope or out of scope. This involved reading the abstracts and then accessing the full study to read if the abstract suggested that it might be in scope.
- 4.2.6. A common procedure in identifying and examining a body of literature is to group studies under themes. For this literature review the themes identified were:
- Reviews & evaluations (11);
 - Qualitative research – users (2); and
 - Qualitative research – operators (7)
- 4.2.7. Fourteen studies were focussed on the UK, five on Europe and one from beyond Europe. All studies are listed with their full citation in Appendix B.

LITERATURE REVIEW FINDINGS

- 4.2.8. There is a substantial body of literature on DRT, albeit much of it written by the same small group of researchers. This may reflect the relatively niche aspect of this transport mode compared to more mainstream modes such as bus and rail.

Definitions and Purpose

- 4.2.9. DRT is defined as an intermediate form of public transport, lying somewhere between a bus and a taxi. It is a highly flexible form of transport than can be used in a variety of settings and applications (Mageean & Nelson, 2003). DRT is often designed to tackle social problems such as deprivation caused by poor accessibility, as well as being deployed for specific purposes, locations and target markets (Laws et al, 2009). DRT is typically undertaken by smaller vehicles (minibuses) but can equally be carried out by any passenger vehicle type, from private hire cars to full-size buses (Mageean & Nelson, 2003).
- 4.2.10. Reasons for establishing DRTs have included: increasing dissatisfaction with conventional public transport provision; the inflexible nature of conventional bus services which need passengers to fit around them; and interest in reducing social exclusion (Laws et al, 2009). A strength of DRT is its ability to operate in a variety of environments. More recently the main motivation for introducing DRT has shifted from social exclusion to geographic considerations, namely ensuring continued provision of transport in deep rural areas (Davison et al, 2013).

Passenger Types

- 4.2.11. Research undertaken for the then Scottish Executive (Halden, 2006), now the Scottish Government, identified four classes of passenger ‘value’ in DRT: premium value passengers, such as airport passenger transfers and employees of businesses; high social value passengers, such as jobseekers and those suffering social exclusion; high value-to-agency passengers, such as hospital transfers and assisted transport; and best value public transport, such as a replacement or bus services in rural areas. All four of these value classes have potential for DRT to grow and develop.

- 4.2.12. This 'value' categorisation expands on earlier research for the DfT (Enoch et al, 2004) which identified two main types of passenger as 'captive' or 'choice' users, the latter likely to be younger, working aged persons, often with access to a car, who place a greater emphasis on personal convenience and environmental considerations.

DRT Market Considerations

- 4.2.13. A systematic examination of a market is required before introducing DRT, meaning that DRT deployment has to be carefully planned, a sentiment expressed among several researchers. DRT must therefore have sufficient time invested at the planning stage, with the objectives and target users clearly understood.
- 4.2.14. DRT typically requires more up-front planning than conventional bus services, as well as the need for more enabling back-office infrastructure. All DRT services need to define clearly for whom and why the services are being funded and delivered (Halden, 2006). It is essential that they are not seen as standalone and must be planned as part of the wider transport network. Integration with both timetables and ticketing is likely to lead to a more successful service and lower levels of subsidy.
- 4.2.15. DRT is typically more straightforward to implement in regulated markets where there is already high integration between transport modes (Mageean & Nelson, 2003) and its application has progressed more rapidly on the continent than in the UK. There is little incentive for commercial operators to invest in DRT given the high up-front costs and the potential for other operators to benefit from the capital outlay.
- 4.2.16. DRT can impinge on taxi operators, especially at locations where there is already established competition between taxis and bus services, such as at rail stations and other transport hubs. The sharing of booking software or establishing compatible software systems can reduce this conflict and be of mutual benefit to both bus and taxi operators. Such sharing of back-office can help achieve cost savings and improve the commercial viability of DRT services.
- 4.2.17. Some researchers have expressed the view that DRT in the UK has been targeted at the wrong market, stemming from a legacy of 'dial-a-bus' and community transport use, with fares far below the justifiable level for what is a premium product providing a more personalised service than a bus. Researchers have suggested that DRT, in the right application, could be more successful in attracting 'cash rich, time poor' choice users. DRT needs to identify stronger markets of choice users rather than the captive user market typically targeted for such schemes, some research concludes. However, there are contrasting views on this, with passenger research in the UK finding that younger people tend to view DRT services as catering for the elderly and disabled and not geared to their needs (Transport Focus, 2016).

Operating Models

- 4.2.18. Research has identified three broad types of DRT: fully flexible (no defined route or stops); semi-flexible (mostly fixed route); and fixed & flexible (only flexing off a fixed route and timetable at certain times of day).

- 4.2.19. Earlier research for the Department for Transport (Enoch et al, 2004) identified four main operating models for DRT: Interchange DRT – feeding into existing public transport; Network DRT – Enhancing or part replacing existing public transport at times/areas of lower demand; Destination-specific DRT – specialist services for hospitals, airports, business parks, etc; and Substitute DRT – replacing conventional bus services altogether.
- 4.2.20. Recent research into DRT in Germany (Sorensen, 2020) found that a fully flexible scheme can actually reduce mobility for residents in the most isolated areas while catering for main travel corridors between generators of demand that could be fulfilled by conventional public transport. The researchers recommended that ‘feeder to trunk’ service models should be favoured in future DRT deployments in order to concentrate DRT resources on areas of low demand and improve (or at least maintain) mobility for all users. Separate research into DRT schemes in Hungary (Lakatos et al, 2020) found that significant economic benefits can be derived by ‘straightening’ of conventional bus routes by replacing variations to low demand areas with feeder DRT services, therefore giving journey time savings for passengers on the main bus route.

Operating Costs

- 4.2.21. There is a mix of findings in the literature around costs. It is pointed out that direct cost savings can be difficult to calculate due to the restructuring of public transport services that often accompanies the introduction of DRT (Mageean & Nelson, 2003). A benefit of DRT is the ability to provide a service to areas or times of low demand at lower cost than regular bus services, although subsidy is typically still required. While operating costs per hour and subsidy per passenger trip can be higher than conventional bus services, there are opportunities to offset costs through better utilisation of drivers and vehicles, for example by using the vehicles for different purposes at differing times of day. Some research into DRT has noted that staffing costs can be as much as 70% of the total cost and are higher than conventional bus operation if more drivers are required to drive several small vehicles (Brost et al, 2018).
- 4.2.22. In Europe, subsidy per passenger can be between 75% and 100% more than the equivalent subsidy on conventional bus services (Mageean & Nelson, 2003), a finding also supported by UK research which concluded that DRT is more expensive to provide than conventional bus services (Enoch, 2004). Cost savings are likely to be derived relatively rather than directly and across different sectors and agencies. The method of booking is a decisive factor in overall DRT scheme costs with research noting that no pre-booking is the lowest cost method of operating public transport (ie, as a conventional bus service) but is a necessity of DRT (Mageean & Nelson, 2003). Specifying booking further in advance can reduce costs by enabling more efficient scheduling, but this reduces the responsiveness to demand of the service. Research in the 2000s concluded at the time that the viability of DRT services as a self-financing enterprise had not been demonstrated and that the measure of success should be considered through other means, such as personal mobility and costs of transport to the individual.
- 4.2.23. It may be unrealistic to expect per-passenger subsidy to be the same as conventional bus and in many cases it will be more if passengers are paying bus equivalent fares. Gross cost contracts where the local authority carries the revenue risk and pays the operator a fixed fee for running the service, may be more likely to generate interest from prospective bidders compared to net cost contracts, as bus operators tend to see DRT as more financially risky.

- 4.2.24. Justifiable subsidy could be achieved by pooling resources to replace separate transport services with a DRT solution, eg, healthcare and education transport services could be combined with DRT from different budgets (Enoch, 2004).
- 4.2.25. DRT can offer reduced costs in deep rural areas that are not conducive to conventional bus service operation. There can also be cost savings because the service only operates when needed and can be used for other purposes eg school transport. It can prove more cost-effective by making better use of the asset compared to large buses. Schemes that offer season tickets and are able to capture regular travellers are likely to achieve lower subsidies per passenger trip compared to those without a season ticket option.
- 4.2.26. Generating sufficient demand and surmounting psychological barriers of prospective users are among the biggest challenges to making rural DRT a commercial success (Laws et al, 2009).

Usage and Demand

- 4.2.27. Changes in usage and utilisation following introduction of DRT varies according to the type of service operated and the population density of the area it serves. Evaluation of DRT schemes in Europe has found an increase in vehicle distance travelled of around 7% compared to the fixed routes they replaced, but with more varying changes in patronage. A useful metric is the change in passenger trips per revenue hour after introduction of a DRT, with some schemes in Europe recording increases of 4-5 passenger trips per revenue hour (Mageean & Nelson, 2003). However, passenger research undertaken into UK schemes (Transport Focus, 2016) found that significant reductions in passenger numbers can follow the replacement of conventional bus services with DRT, however any DRT service is still better if the alternative is no public transport provision at all.
- 4.2.28. Direct comparisons between schemes and locations are very difficult. Modelling of a DRT in England based on socio-economic data (Wang et al, 2013) found that demand for DRT is highest in areas with low car ownership, low population density, high proportions of white people and high levels of social deprivation. A 1% uplift in DRT trips can be expected for each 1% increment in deprivation index.
- 4.2.29. Researchers have also tried to quantify the relationship between seating capacity, number of vehicles and resulting demand. Research in the UK (Wang et al, 2013) found that every additional seat provided generates 165 trips per year, equating to a 0.79% increase in patronage for every 1% of capacity. The same research found that each additional DRT vehicle increases annual ridership by 2,363 trips, or a 1.01% increase in patronage for each 1% increase in vehicle numbers.
- 4.2.30. The main drivers of demand for DRT found in research in the UK (Wang et al, 2013) were leisure (33%), employment (29%) and shopping (16%) followed by a mix of other trip purposes. It was noted that this can vary considerably depending on the location of the scheme and any focus on the service, eg, linking to a hospital or business park. For each increase in 100 persons per square km, DRT trips decrease by 1%.

Success Factors

- 4.2.31. Successful schemes generally use some form of DRT technology and offer more than one method of booking, e.g., smartphone app and telephone. Successful schemes are likely to be established for a longer period of time (three years or more); operate longer hours and be in an area that is not entirely rural.

- 4.2.32. Less successful schemes are likely to only have one booking option; may not have been established for very long or not given sufficient time to grow prior to their withdrawal; they may operate restricted hours and are more likely to be in a wholly rural area (Laws et al, 2009). Where population density is very low, a mix of solutions may be required, for example incorporating elements of DRT into fixed routes. Semi-fixed routing is easier to schedule (Mageean & Nelson, 2003). Converting interest in having a DRT into actual usage can be a challenge.
- 4.2.33. DRT has rated strongly for shopping and healthcare trips, by both captive and choice users (higher by choice users). Certainty of arrival time is key a consideration, especially for choice users and door-to-door service is particularly appreciated by women. Times of operation are more important than door-to-door service for choice users. Price, comfort, convenience and image are important decision factors for choice users who may be willing to pay more than a conventional bus service for the more convenient journey experience (Enoch et al, 2004).
- 4.2.34. Passenger satisfaction tends to be higher with DRT compared to conventional services, a finding expressed by multiple researchers. Reasons for this include: receiving a more personalised service; coverage of the service meeting their needs better than bus services; feelings of enhanced personal security, especially among women; and higher satisfaction with the customer service provided by drivers operating DRT services. Causes of dissatisfaction are typically around perceived difficulty of booking plus the need to book compared to 'turn up and go'; anxiety over making return trips and the need to book these; response times after making a booking; and perceived or actual increase of time in transit compared to fixed route bus services (Mageean & Nelson, 2003). Passenger research in the UK (Transport Focus, 2016) has pointed out that the need to book can often be out of step with the need for 'spontaneous' travel, such as same-day GP appointments. Similar findings were made from research into barriers to using DRT in Finland, with DRT being viewed as less suitable for commuter trips and persons making multi-leg and multi-purpose trips, especially women with childcare responsibilities (Sihvola et al, 2012).
- 4.2.35. Research into the factors that cause DRT schemes to fail (Enoch et al, 2006) points to unrealistic expectations around costs, a temptation to provide very flexible services with a small fleet, a lack of understanding of the market being served, insufficient marketing of DRT services when they are established, competition from other modes, especially taxis, and a lack of awareness or understanding among potential users. Most importantly, it concluded that lack of joined-up partnership working is most often the cause of a failure of a DRT scheme. For public sector-led DRT schemes, a lack of support for DRT by a contracted operator can be a cause of failure.
- 4.2.36. Successful DRT schemes need to pool resources across different flexible transport services or charge fares which are more commensurate with the taxi-like individualised level of service they provide, some researchers have suggested (Davison et al, 2013). Research into DRT schemes in Germany (Schiefelbusch, 2016) noted that establishing such schemes is as much a communicative challenge as it is a planning one and requires local insight, engagement and a lot of patience.

Other considerations

- 4.2.37. Research has pointed out shortcomings in current bus service licensing and regulation where the rules have not kept pace with the development of DRT. A particular problem area is around timing points required in a local bus service registration, which DRT by its very nature does not abide to. However this has not stopped many DRT schemes from being approved and introduced.

LITERATURE REVIEW CONCLUSIONS

4.2.38. The following points represent the main conclusions of the literature review:

- DRT is well suited to fulfilling the transport needs of particular groups in society and in specific geographic circumstances, and this is where most research has focussed on to date. However its suitability for more general public transport services is less established and some research has identified an 'image problem' for DRT in this respect, particularly among younger passengers, as being associated with patient and additional support needs transport instead of a mainstream transport mode open to all. Psychological barriers to using a 'different' mode of transport has been highlighted as an additional challenge in growing use of DRT.
- There is broad agreement that understanding of the market is crucial in a DRT deployment and consequently that significant planning needs to be undertaken before a service is introduced. Objectives of a DRT scheme and who its intended users are must be clearly identified and this will in turn inform the operating model, fares and acceptable level of subsidy (if any).
- Operating models can vary both spatially and temporally. DRT services may blend aspects of conventional bus services such as partial fixed routes and timetables along with flexible times and locations of operation, or may be fully flexible. DRT services are often linked to specific generators of demand such as hospitals, airports, business parks or existing public transport hubs. Fully flexible models should be avoided in all but the most rural areas as more flexibility results in lower utilisation of vehicles and drivers.
- There is a lack of evidence around the true costs of providing DRT and mixed findings as to whether or not it is more or less costly than operating conventional fixed route bus services. Research is clear that subsidies/costs per passenger are significantly higher than conventional bus services but that this may not always be the best measure as overall operating costs can be lower. A sticking point is whether cost savings are direct or relative which may be easier to measure when DRT is delivered as part of a fully integrated or publicly-run transport system. Most of the literature reviewed focussed on publicly funded transport services and there is a lack of available data into the viability of commercially operated DRT services. This may be due to a combination of the rarity of such commercially operated services to date and a lack of publicly available data where this is held by private operators. Some researchers have advocated measuring cost and value more widely in terms of reduced journey times for passengers on mainstream bus services who have their journeys shortened where DRT replaces part of a route, or the value added to society of increased mobility for previously marginalised groups.
- Researchers have found a negative correlation between population density and DRT usage, noting that ridership declines as population density increases. This may reflect higher availability of bus services and other transport modes in areas with high population density. Research also found a link between deprivation and DRT use, noting that areas in high deprivation tend to experience better DRT ridership.
- Successful DRT schemes generally offer more than one method of booking, e.g., smartphone app and telephone; have been given sufficient time to grow and develop (three years or more); operate extended hours to cater for evening trips; and operate in an area that is not entirely rural.

4.3 CURRENT UK GOVERNMENT DRT POLICY

- 4.3.1. There has been a rapid pace of development in UK Government policy around public transport and mobility in recent years and this section gives an overview of some of the key policies and guidelines in place, with particular focus on bus services and DRT.
- 4.3.2. Torbay is classed as an urban area in the Rural-Urban Classification. The Rural Urban Classification is an official UK Government metric and defines areas as rural if they are outside settlements with more than 10,000 resident population. UK Government guidance is for Rural Urban Classification to be used when referring to rural or urban areas. Department for Transport (DfT) policy and strategy also refers to rural or urban in its guidelines around transport planning.
- 4.3.3. It is recognised in this study that while Torbay is urban, it is a relatively self-contained area within a highly rural surrounding. In conducting a review of UK Government DRT and mobility policy, the focus has therefore been on those applicable to urban areas, although cognisance of rural strategy has also been taken to a lesser extent in order to provide a suitable assessment for the characteristics of Torbay.

FUTURE OF MOBILITY URBAN STRATEGY

- 4.3.4. The UK Government's Future of Mobility Urban Strategy, published in March 2019, sets out the 'grand challenge' for mobility in urban settings and summarises the rapid changes underway in the transport and mobility sector. It makes clear that public transport must remain fundamental to an efficient transport system, with walking and cycling becoming the preferred option for short journeys. The demographic challenges of a growing and aging population but travelling less due to increased working from home and online service delivery are noted, with the trend of rural areas having a greater proportion of older residents than urban areas expected to continue. The trend of fewer young people holding a driving licence is also noted, which presents opportunities for urban areas but challenges for rural areas.
- 4.3.5. The Future of Mobility Urban Strategy notes the following key changes in transport:
 - Data and connectivity are transforming journeys
 - Transport is becoming increasingly automated
 - Transport is becoming cleaner (in reference to vehicle emissions)
 - New modes are emerging
 - Travel demand is rising overall, but falling at an individual level
 - The population is aging, and travel choices show clear generational differences
 - Consumer attitudes are changing
 - New digitally enabled business models are emerging
 - Shared mobility is becoming more prevalent
- 4.3.6. The strategy lays out nine guiding principles for the government's approach to the future of mobility:
 - 1 New modes of transport and new mobility services must be safe and secure by design
 - 2 The benefits of innovation in mobility must be available to all parts of the UK and all segments of society
 - 3 Walking, cycling and active travel must remain the best options for short urban journeys

- 4 Mass transit must remain fundamental to an efficient transport system
- 5 New mobility services must lead the transition to zero emissions
- 6 Mobility innovation must help to reduce congestion through more efficient use of limited road space, for example through sharing rides, increasing occupancy or consolidating freight
- 7 The marketplace for mobility must be open to stimulate innovation and give the best deal to consumers
- 8 New mobility services must be designed to operate as part of an integrated transport system combining public, private and multiple modes for transport users
- 9 Data from new mobility services must be shared where appropriate to improve choice and the operation of the transport system

Figure 4-1 - Future of Mobility Key Challenges

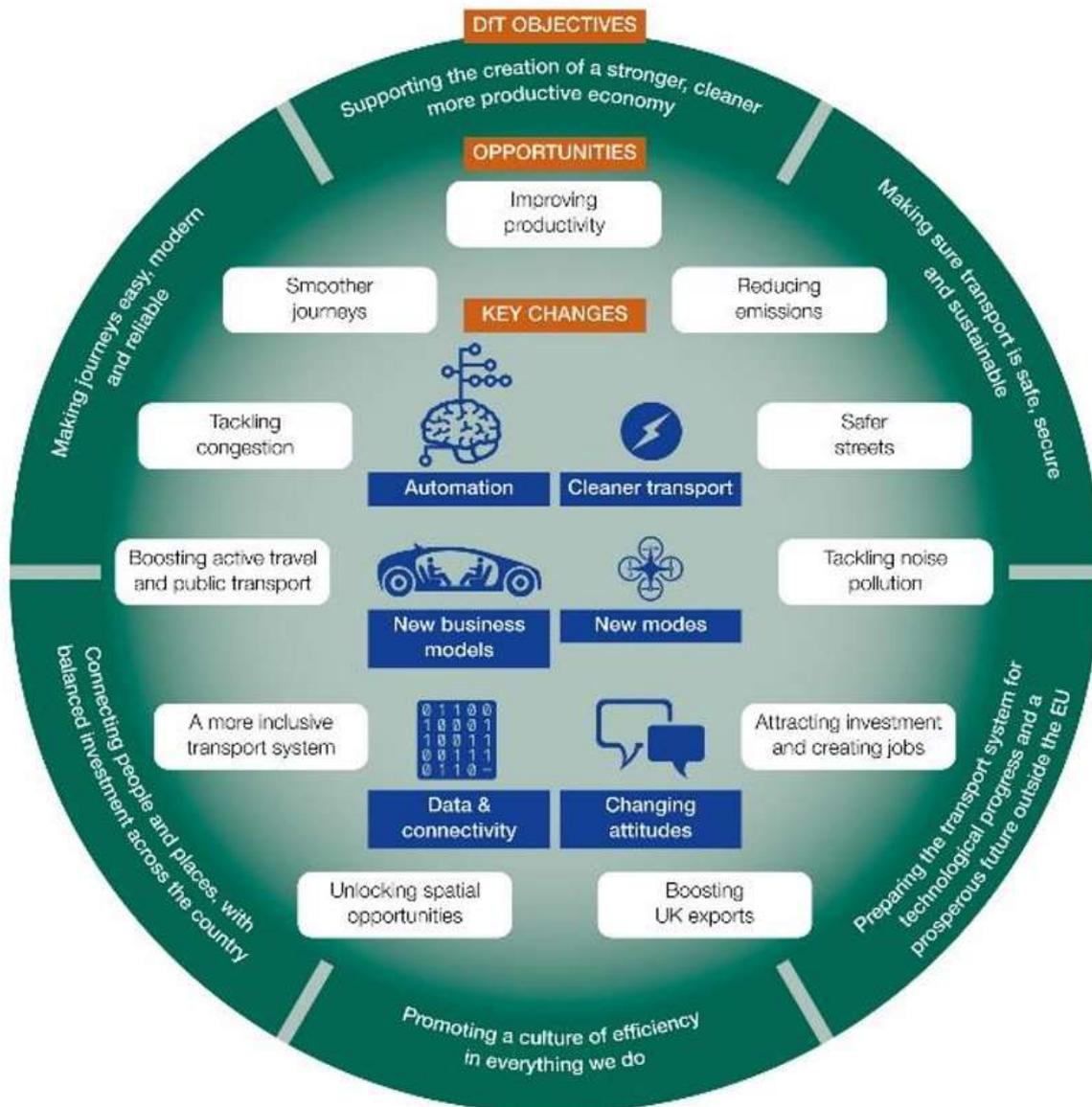


Image source: Future of Mobility Urban Strategy (2019)

- 4.3.7. Key risks in the future of mobility identified by the strategy are around safety of new transport modes, ensuring that bus services remain viable, inclusion for people who do not (or cannot because of disability) use the internet and smartphones, and ensuring security of personal data used in mobility services.
- 4.3.8. The Strategy defines DRT as “a flexible service that provides shared transport in response to requests from users specifying desired locations and times of pickup and delivery”. It notes that ‘dial-a-ride’ services scheduled through next day or advance bookings are a traditional example but that a new form of dynamic demand responsive transport or ‘DDRT’ is developing: This can take the form of services that adjust routes in real time to accommodate new pickup requests often made only minutes in advance via a smartphone app, with drivers and vehicles rerouted automatically without the need for manual rescheduling.
- 4.3.9. The Strategy commits Government to looking at the legislation covering flexible bus services in order to ensure that DRT services can operate at the maximum of their potential. The rigidity of existing regulations around bus services has been identified in previous academic research as a barrier to the development of DRT, as detailed in part 4.2.37.

FUTURE OF MOBILITY RURAL STRATEGY CONSULTATION

- 4.3.10. In November 2020, Government opened a call for evidence consultation on the development of a Future of Mobility Rural Strategy, building on the Future of Mobility Urban Strategy published in 2019. The consultation was open at the time of writing this report and was due to close in the middle of February 2021.
- 4.3.11. The consultation gives an overview of the emerging trends that Government has identified around rural mobility and the Strategy, once developed, will set out how Government will seize the opportunities and manage the risks around the future development of rural mobility. The consultation notes that technology will drive radical changes in transport over the next decade, with major changes for both users and operators. It notes that innovation in transport has particular potential in rural areas where lack of access to a car has often excluded people from fully participating in employment, education and leisure opportunities, however the challenge of ensuring that such innovations are inclusive for all is acknowledged.
- 4.3.12. The consultation notes the following challenges around rural mobility:
- Rural populations are older on average than urban areas (43 years old v 38 years old);
 - The population aged 65 and over is expected to grow by 50% between 2016 and 2039 and will be experienced most in rural areas, where virtually no growth in younger populations is expected;
 - In rural areas, cars are used more often and for longer trips than in urban areas;
 - There is less opportunity for active travel in rural areas due to a combination of the longer distances involved in making many typical trips and a lack of suitable infrastructure to facilitate active travel journeys; and
 - Geographical aspects such as terrain can limit the route and transport opportunities in rural areas
- 4.3.13. The consultation acknowledges the risk that innovations in transport are not inclusive and do not take account of the needs of people living in rural areas.
- 4.3.14. Infrequent public transport can make it difficult for elderly residents to travel even short distances to access basic services, it is noted, with impacts on health and wellbeing.

- 4.3.15. The consultation points out that travelling by public transport in rural areas is more likely to involve a change of mode than in urban areas due to less extensive and lower frequency services. Integration between different modes is therefore important, as well as having the infrastructure to support interchange, such as mobility hubs which co-locate several services together (transport and non-transport) to reduce the need to travel.
- 4.3.16. The consultation specifically highlights the emerging new applications for DRT through digital platforms and the potential to use 'feeder services' of shared taxis and DRT. The benefits of this type of service to employers and for serving suburban areas are noted as is the greater potential for shared journeys in rural areas. Good quality data and digital connectivity is needed to fully realise the benefits of DRT, the consultation notes.
- 4.3.17. The consultation refers to the Future of Urban Mobility Strategy guiding principles (given in part 4.3.6) and asks if these are appropriate for rural areas. The consultation acknowledges that some of them may require adjustment to take account of the different markets in rural areas.

DFT GUIDANCE ON PLANNING IMPROVEMENTS TO BUS SERVICES

- 4.3.18. Government guidance (Department for Transport, 2017) for local authorities on planning improvements to bus services covers providing inclusive services, improving environmental outcomes, maximising social value, improving the safety of bus services, tackling congestion and meeting the needs of rural communities. The guidance includes general suggestions and recommendations to make improvements in these aspects of bus service delivery.
- 4.3.19. The guidance makes several references to and suggestions for the application of DRT. It notes that DRT can be a way of increasing ridership by provide a more flexible and responsive public transport solution. Community transport operators are highlighted as being particularly suitable to run DRT services. The guidance suggests deploying publicly funded DRT services to transport passengers from isolated villages to bus stops and transport hubs where they can connect to commercial bus services and complete their journeys, which keeps costs down both for the DRT service and the commercial bus operator. Such a 'feeder to trunk' model has operated successfully in Lincolnshire for many years and is detailed under the case studies in Chapter 5.
- 4.3.20. Taking a 'Total Transport' approach in rural areas is recommended by the guidance to bring together various public sector transport services such as patient transport, social care services, education transport, community transport and subsidised bus services to pool resources and reduce duplication of resources. This follows a trial of the concept in different areas of England in 2015 which involved the creation of a 'one-stop shop' for transport services and information. Devon was one of the Total Transport pilot areas.

4.4 CURRENT UK GOVERNMENT DRT ACTIVITY

RURAL MOBILITY FUND

- 4.4.1. In February 2020, Government launched the Rural Mobility Fund with the objective of trialling DRT solutions in rural and suburban areas to either fill a gap in provision or complement existing timetabled bus services. The purpose of the trials would be to assess the potential of DRT, identify barriers to commercial entrants and assess potential solutions to sustainability of demand in rural and suburban areas. The pilots will allow DfT to collect evidence and disseminate lessons learnt to inform development of future local transport offers across the country.

- 4.4.2. Confirmation of the successful bidders was expected in summer 2020 but has been paused due to the effects of COVID-19, with an announcement now expected by the end of the year. Devon County Council was one of the local authorities which bid for the fund.

FUTURE OF TRANSPORT REGULATORY REVIEW

- 4.4.3. Government recently reported on the findings of its Future of Transport Regulatory Review, following a consultation which ran between March and July 2020. The review covered regulation of buses, taxis, private hire and micro-mobility services.
- 4.4.4. The review highlighted support for relaxing registration requirements around DRT and for changes to Bus Services Operator Grant. A dominant view indicated that the area of operation for a DRT should be a geographical area that is determined by demand. Several respondents believed the operational area should be associated with a local transport hub so the services can interconnect with other transport services, so not to overlap or present unfair competition with other transport modes, particularly taxis. This would complement existing transport services. Some respondents suggested that DRT services require to levy a surcharge for trips that could be undertaken on existing public transport.
- 4.4.5. A consistent theme was that DRT operators and local authorities need to work together to determine an operational area that benefits the local area and contributes positively to the area's transport network.
- 4.4.6. Following the review, Government has committed to engage with DRT service operators and collate findings from the Rural Mobility Fund schemes and services deployed in response to COVID-19, to inform the forthcoming National Bus Strategy.

NATIONAL BUS STRATEGY

- 4.4.7. In autumn 2019, Government announced its intention to develop the first ever National Bus Strategy for England as part of its Better Deal for Bus Users which has also seen initiatives such as the 'Super Bus' network in Cornwall, funding for electric buses and the Rural Mobility Fund referred to in part 4.4.1. The Strategy was due for release this year but has been delayed due to the impacts of COVID-19, with its publication now expected in Q1 2021.
- 4.4.8. While the contents of the National Bus Strategy is still not yet known, the DfT has indicated (Transport Network, 2020) that it is likely to focus on what support Government can give to lowering operating costs such as support for bus priority schemes and electric bus deployment, which is expected in turn to enable benefits in terms of fares and frequencies. It is not known at this point to what extent the Strategy will address opportunities around DRT.

4.5 CURRENT LOCAL AUTHORITY DRT ACTIVITY

- 4.5.1. Several English local authorities have trialled DRT in recent years and have schemes operational, including Kent County Council, Lincolnshire County Council, Tees Valley Combined Authority and Watford Borough Council, and some of these schemes are explored in more detail in Chapter 5.
- 4.5.2. Milton Keynes Council announced in September 2020 that it would replace all 26 of its subsidised bus routes with DRT from April 2021. DRT was already being considered for the area and the decision to introduce it from the next financial year has been accelerated by the impacts of the coronavirus pandemic. The DRT solution being introduced will be technology based using a smartphone app and dynamic real-time routing of vehicles to serve requested journeys. Milton Keynes Council currently spends £2.9 million annually on supported bus service subsidies.

4.6 SUMMARY

- 4.6.1. This chapter has provided an overview of the current research literature, policy and strategy around DRT in order to provide Torbay Council with an informed position around current and expected developments with this transport mode. Previous research into DRT has been reviewed, synthesised and analysed with the key points summarised to identify the common themes. The literature review identified consensus around the need to understand markets for DRT and the types of application and operating model that are suited to DRT. However the review also identified a lack of evidence of the true costs of providing DRT and where any savings are realised.
- 4.6.2. Government policy and strategy related to DRT has been reviewed in both the urban and rural contexts, noting the Government's desire to encourage greater uptake of and to ensure the right regulatory framework is in place to encourage their development.
- 4.6.3. Forthcoming developments in rural DRT trials from the Rural Mobility Fund and wider bus policy in the National Transport Strategy have been summarised, noting that the Rural Mobility Fund trials will provide learning insights for future DRT deployments as well as helping to identify more clearly the barriers to commercial operation.

5

CASE STUDIES



5 CASE STUDIES

5.1 INTRODUCTION

- 5.1.1. This chapter details examples of Demand Responsive Transport (DRT) schemes in operation in the UK and internationally which have been examined as part of this study. These examples are presented as a series of short case studies to illustrate different applications of DRT, both successful and unsuccessful, in order to provide Torbay Council with an informed position on how DRT has been deployed elsewhere.
- 5.1.2. The case studies have built on the themes and operating models identified from the literature review in Chapter 4 and the key points demonstrated by the case studies have been highlighted.

5.2 UK EXAMPLES

CALLCONNECT, LINCOLNSHIRE

STATUS: OPERATIONAL SINCE 2001

'Interchange DRT' operating model funded by local authority

- 5.2.1. Lincolnshire is home to one of the largest and longest-running DRT schemes in the UK. Known as 'CallConnect', the scheme was launched in 2001 and provides demand responsive bus service to hamlets, villages and market towns across the county, enabling residents to connect with other public transport options. As part of this case study the main bus operator in the county, Stagecoach, was engaged with and were able to offer insight into how the scheme works through a meeting held online with Stagecoach East Midlands senior management team on 4 December 2020.

Figure 5-1 - CallConnect Lincolnshire DRT vehicle and publicity



- 5.2.2. Lincolnshire is the fourth-most sparsely populated county in England with an average of 10 persons per square kilometre. The county has only one medium sized city (Lincoln) and six smaller market towns. Three-quarters of residents have access to a car and the area has an aging population. Like many rural counties this makes Lincolnshire a challenging area to serve by public transport.
- 5.2.3. The DRT scheme was introduced as part of a 'Total Transport' approach integrating several public sector transport providers into one planning unit, covering public & community transport; home to school transport, children & adults social care and council fleet operations. In 2019 there were 31 CallConnect vehicles in operation with the scheme transporting around 25,000 passengers per month and handling over 12,000 booking telephone calls.
- 5.2.4. As part of the introduction of CallConnect, the core commercial bus services were streamlined to reduce the number of diversions off the main trunk routes into areas of low demand, with these replaced by feeder DRT services. Bus services were branded 'InterConnect' giving consistency of branding between the fixed and flexible public transport services. As interurban bus services in the county compete primarily with the private car, the introduction of CallConnect enabled the bus timetables to be speeded up to give the quickest end-to-end journey time.
- 5.2.5. CallConnect services are tendered by Lincolnshire County Council who also handle the booking and ticketing. Stagecoach operates some of the CallConnect services but must tender for them through a competitive tendering process. Fare revenue is a very low proportion of overall revenue, most of which comes in the form of concessionary reimbursement. The CallConnect services have therefore required ongoing subsidy throughout their 20 years of operation.
- 5.2.6. Due to the interchange aspects, infrastructure was enhanced to provide a high quality interchange point when passengers transfer between bus and DRT. This is particularly important for the elderly who may be apprehensive about having to make a connection. The booking requires a sufficient 'comfort time' to facilitate interchange and avoid connections being missed. Bookings are handled by telephone, email or text message and processed manually. This human element means there is a 'gatekeeper' who can direct passengers to use the fixed route bus services if they provide a more suitable travel mode than a DRT. This does however mean that the booking element can be a labour-intensive part of the operation. Having services feeding into interchange also keeps the DRT resource available for those who need rather than paralleling existing bus routes. The demographic is also generally the elderly who are less likely to use smartphones and apps for booking their journeys.
- 5.2.7. Stagecoach indicated in their feedback that part of the success of DRT in Lincolnshire has been because it complements rather than parallels the established bus network and the boundary between bus and DRT is very clear. CallConnect will only take people end-to-end if they have a disability or other mitigating circumstances that means they cannot complete the journey on fixed route bus services.
- 5.2.8. Feedback from the scheme has indicated that there can be a barrier to use from no longer having a timetable which passengers can refer to. A timetable gives passengers comfort and confidence that a service exists and that they can use it whenever they need to, unlike a DRT which requires booking and which may not always be able to fulfil their journey (although Stagecoach indicated that this occurrence is rare in Lincolnshire).

- 5.2.9. It has been found that registration of users is important, both from a customer insight point of view and also for dealing with any no-shows. Experience from the Lincolnshire scheme is that nearly 10% of bookings are not picked up which in turn reduces the efficiency of the service and potentially deprives others of being able to make a journey.
- 5.2.10. The ‘image’ of the service is also a challenge, with some people perceiving it as assisted transport, when it is meant to be as close to a bus service as possible. This in turn can put-off other passengers if it is seen as something only for the disabled and those with reduced mobility, especially younger passengers.
- 5.2.11. While the CallConnect scheme has been successful in Lincolnshire in enabling core bus services to be simplified and streamlined with benefits to those passengers, the passenger numbers and demographics are such that it is not a commercial proposition and requires ongoing subsidy.

TEES FLEX, TEES VALLEY

STATUS: OPERATIONAL SINCE FEBRUARY 2020

Fully flexible ‘Network DRT’ operating model funded by combined authority

- 5.2.12. Tees Flex is an on-demand service provided by Stagecoach North East in Tees Valley as the result of a partnership with the Tees Valley Combined Authority. ViaVan provides the technology to power the Tees Flex service. The technology works by directing passengers to a nearby ‘virtual bus stop’ for pick-up, allowing for quick and efficient shared trips without lengthy detours, fixed routes or schedules and providing a balance between passenger convenience and operational efficiency.

Figure 5-2 - Tees Flex vehicle



- 5.2.13. Launched in February 2020, the service aims to help residents in more isolated communities across the region access essential services along with training and employment opportunities that are being created across Tees Valley. Nine new, high-quality Mercedes Sprinter buses operated by Stagecoach are used for the pilot, which has been funded by the Combined Authority.
- 5.2.14. Serving three geographically defined zones in Darlington/Stockton, Hartlepool/Redcar and Cleveland, passengers are able to pre-book the bus via a smartphone app, a website or over the telephone. They can request pick-up and drop-off points within the serviced area, and to destinations including rail stations along with hospitals outside of the area. The pilot, which will run for three years, has the potential to be extended across the region if successful.

ARRIVAClick, LIVERPOOL AND SITTINGBOURNE

STATUS: WITHDRAWN (LIVERPOOL 2020, SITTINGBOURNE 2019)

Fully flexible 'Network DRT' operating model, commercially operated without subsidy

Figure 5-3 - ArrivaClick vehicles, Liverpool



- 5.2.15. Arriva launched its first ArrivaClick service in Sittingbourne in March 2017, followed by Liverpool in 2018. ArrivaClick combines the cost effectiveness of bus travel with the convenience of personalised transport. There were no fixed routes, with journeys determined by where passengers wanted to go within a defined operating zone. Passengers 'ordered' and tracked a vehicle from the app, which provided them with a guaranteed fare and allowed them to choose their pick-up point and reserve a seat. Computer algorithms matched passengers travelling in the same direction, dynamically routing vehicles in real time to find the optimal route for their trip.
- 5.2.16. During the pilot in Sittingbourne, over half the customers surveyed switched from using private cars to ArrivaClick, with 61% of users using the service a few times a week or more. 43% adopted the service for their daily commute and 9 out of 10 said they would recommend it to a friend. The Liverpool scheme found that 52% of customers previously used private cars and taxis.

- 5.2.17. Like the Tees Flex scheme, ArrivaClick Liverpool and Sittingbourne were powered by ViaVan which provided the booking and routing technology solution.
- 5.2.18. The Sittingbourne scheme ended in November 2019 with Arriva stating that the company wished to focus more on existing operations in the area and pursue new opportunities for ArrivaClick elsewhere.
- 5.2.19. The Liverpool scheme ended in July 2020, with Arriva citing the tough commercial environment for public transport as a result of the coronavirus pandemic. Arriva stated in their announcement of ArrivaClick's withdrawal in Liverpool that their experience in Leicestershire has shown that DRT services perform most strongly when partnered with other streams of support.

ARRIVACLICK, LEICESTERSHIRE

STATUS: OPERATIONAL SINCE APRIL 2019

Fully flexible 'Network DRT' operating model funded by developer contributions

- 5.2.20. In April 2019, Arriva launched a DRT service in Leicester under its ArrivaClick brand, the third such scheme launched following similar service introductions in Liverpool and Sittingbourne, Kent.
- 5.2.21. ArrivaClick is a bookable, 'street to street' DRT service. The scheme covers an area of 29 square kilometres using a fleet of five 15-seater minibuses and serves a population of 70,000 with the aim of providing easier access to work, study and leisure. Like the Tees Flex scheme, ArrivaClick is powered by ViaVan which provides the booking and routing technology solution.
- 5.2.22. Through the ArrivaClick Rider App, passengers can book an on-demand trip to or from anywhere in the service area, which includes several rail and bus stations; the New Walk Business District; St. George's South cultural quarter, home to the City's Creative Business Depot; the University of Leicester and De Montfort University; King Power and Welford Road Stadiums, homes to Leicester FC and Tigers RC respectively; Leicester Royal Infirmary; and Highcross and Haymarket shopping centres. Passengers do not wait at a bus stop but are instead directed by their app to a nearby street where they will be picked up at an agreed time and dropped off as close to their final destination as possible. Bookings can be made as quickly as five minutes in advance.
- 5.2.23. The service is being funded through a Section 106 agreement with the developers behind a £1billion, 4,250 home expansion west of Leicester at New Lubbethorpe, the first time a Section 106 agreement has been used to fund a digitised DRT service. Destinations served include Leicester city centre, the city's university campuses as well as railway and bus stations and the city's main hospital. It is the first such example of a digital DRT being funded through a Section 106 agreement.

Figure 5-4 - ArrivaClick Leicester operating area



GO2, SEVENOAKS

STATUS: OPERATIONAL SINCE MAY 2020

Fully flexible 'Substitute DRT' operating model, part funded by local authority

Figure 5-5 - Go2 DRT Vehicle



- 5.2.24. As a result of a decline in demand and growing uncertainty from COVID-19, bus company Go Coach has replaced seven fixed bus routes in Sevenoaks with DRT services powered by ViaVan. This change has been enabled by financial support from Kent County Council.
- 5.2.25. Branded Go2, the service is bookable using a mobile app developed and powered by ViaVan, operating like a shared taxi, meaning that journeys will be made only when and where they are required. The service runs between 0600hrs and 1800hrs, Monday to Saturday, picking passengers up within 30 minutes using 8-seater Ford Transit Tourneo private hire vehicles. Users will be able to track vehicle movements for pick-up times and changes to arrival estimates via the Go2 app. Previous fares and concessionary travel schemes will continue to apply.

PICK ME UP, OXFORD

STATUS: WITHDRAWN JUNE 2020

Fully flexible 'Network DRT' operating model, part-funded by private sector contributions

- 5.2.26. In June 2018, Oxford Bus Company, part of the Go-Ahead Group, introduced the largest commercially operated DRT service in the UK, branded PickMeUp. The service was launched with the aim of improving connectivity in the eastern arc of the city, an area characterised by large car-oriented housing estates with a series of ring roads, and the service aimed to complement existing bus services. To this end, a surcharge was levied on journeys that could be completed using the conventional network in order to keep the DRT service available for those making journeys not served by the city's fixed bus routes. Bookings were required to make a journey and were made via a smartphone app,
- 5.2.27. In its two years of operation, the service did prove popular and was unable to meet all demand at certain times. More than 38,000 people downloaded the PickMeUp app and more than 300,000 journeys were made on the service.

Figure 5-6 - Oxford PickMeUp vehicle



- 5.2.28. Despite impressive passenger numbers, the service was unable to meet required commercial milestones and was withdrawn in June 2020. The operator cited a number of reasons for this, including congestion slowing down vehicles at times of greatest demand and the lack of local authority financial support for the service. The operator had sought a three-way funding partnership with businesses and the public sector, and while private sector funding was provided by Oxford Science Park, the required public sector funding to enable the continuation of the service was not.
- 5.2.29. Go-Ahead have stated that lessons learned from the Oxford scheme are being taken forward for DRT deployments elsewhere and that greater public sector support is required for future DRT schemes to be successful. In urban areas this could include bus priority and congestion management measures, the company has noted.

5.3 INTERNATIONAL EXAMPLES

MY WAY, TIMARU, NEW ZEALAND

STATUS: OPERATIONAL SINCE MARCH 2020

Fully flexible 'Substitute DRT' operating model funded by local authority

- 5.3.1. The city of Timaru in New Zealand introduced a trial of DRT to replace conventional fixed route bus services in March 2020. Lasting for 12 months initially, the scheme called My Way uses 12-seater minibuses which are booked in advance either via a smartphone, online, or over a landline. Bookings can also be made in person at designated public buildings such as council offices and libraries. The service picks up passengers from pre-booked points including bus stops, although passengers without a booking are not permitted to travel.

Figure 5-7 - My Way DRT vehicle



- 5.3.2. The service covers all of Timaru's urban area, replacing three bus routes and covering a wider area than previously available. It runs every day, compared to the previous Monday to Saturday operation of the bus services and the trial is being funded by the local council.
- 5.3.3. Early indications are that the service is proving popular, with patronage in the first three months of operation from March to June 2020 around 40% higher than the fixed route bus services they replaced. Patronage has risen from 262 trips per day on the bus services at the same time last year, to a weekday average of 365 during June on the new DRT services.
- 5.3.4. The service was introduced following significant public consultation which identified an acceptance that reform of public transport services was needed given low usage of the fixed route bus services. The council visited community centres, senior citizen and disability advocacy groups and held focus groups, pop up consultation booths, an online survey and conducted a pilot with more than 150 users to ensure the service would meet the needs of the community. This extensive community engagement ensured there was support for the bus services being replaced.

SANT CUGAT MUNICIPALITY, SPAIN

STATUS: OPERATIONAL SINCE MARCH 2020

'Interchange DRT' operating model funded by local authority

- 5.3.5. Sant Cugat, with a population of around 100,000 residents lies on the outskirts of Barcelona and features a number of isolated, low-density neighbourhoods located on hilly terrain which makes access by conventional fixed route public transport difficult and inefficient.

Figure 5-8 - Passenger using DRT service in Sant Cugat



- 5.3.6. In 2017, the city launched its first DRT service in partnership with technology provider Shotl. The first service was established to link connect commuters in the Can Barata area with the rail station. The second service started in March 2019, in the mountainous neighborhood of Les Planes. Both operations are still running today and their ridership continues to increase. Demand for the Can Barata service has seen a five-fold increase when compared with the traditional service that was previously in place. Service was expanded to a fourth neighbourhood, Can Trabal, covering an area of 1.6 square kilometres km².
- 5.3.7. The services are operated by 16-seater Mercedes Sprinter minibuses. Users book via a smartphone app or by telephone to a call centre.

SUPER SHUTTLE, UNITED STATES

STATUS: OPERATIONAL FOR 10 YEARS+

'Destination-specific DRT' operating model, commercially operated without subsidy

- 5.3.8. Super Shuttle is an American transport operator specialising in airport transfers in the United States, as well as having operations internationally. The company runs a fleet of minibuses servicing many of the nation's largest airports including in New York, Los Angeles, San Francisco, Chicago and Houston. Vehicles and drivers are provided by contractors working under the Super Shuttle brand.

Figure 5-9 - Super Shuttle vehicle at San Francisco Airport



- 5.3.9. SuperShuttle uses a smartphone app and booking solution to automatically group passengers who are heading to the same airport. Passengers are assigned a pickup time that is typically between two and three hours before the flight departure time. On the day of travel, passengers are assigned a scheduled pick up time within a 15-minute window. Passengers can book a minimum of two hours in advance but are recommended to book with 24 hours' notice.
- 5.3.10. Reflecting the premium segment of the airport market, fares are higher than equivalent public transport fares and vary according to the time of day and notice period given for the booking. Early morning journeys and those booked at short notice attract higher fares.

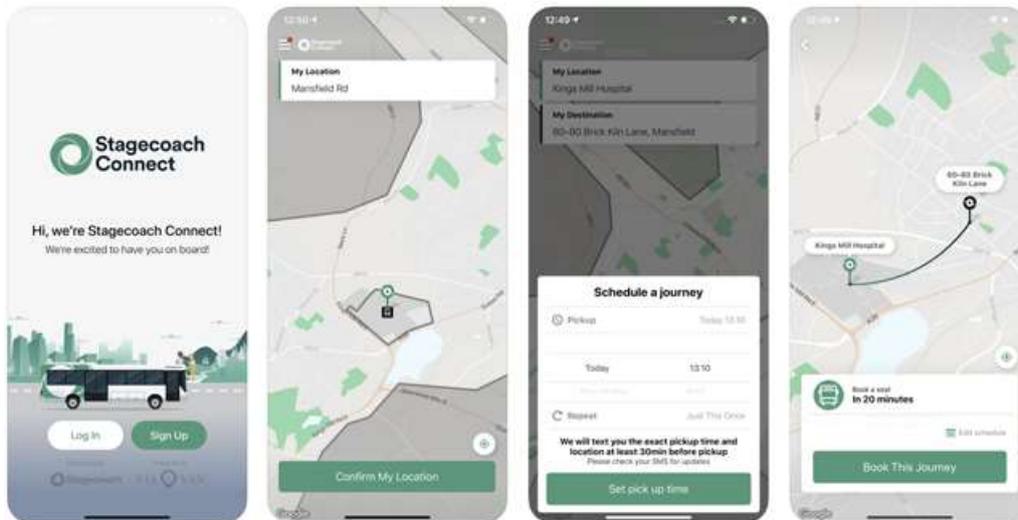
5.4 OTHER DRT INNOVATIONS

STAGECOACH CONNECT

STATUS: OPERATIONAL SINCE MAY 2020

‘Destination-specific DRT’, high value users

Figure 5-10 - Stagecoach Connect NHS staff app



- 5.4.1. In May 2020, Stagecoach launched Stagecoach Connect, the UK's first dedicated app-based demand responsive bus service for NHS workers. The service was developed and launched to support the NHS in ensuring safe transport for its staff while tackling the coronavirus pandemic. The app was developed from concept to delivery with technology partner ViaVan to help NHS employees access hospitals and other key workplaces.
- 5.4.2. Through the mobile app, healthcare workers are able to track the location of their bus, change or cancel a booking, and pre-book up to one week in advance to match upcoming shift schedules. They select a desired pick-up and drop-off location and are matched with a seat in standard sized buses (single deck or double deck). The technology directs healthcare workers to a nearby “virtual bus stop” for pickup, allowing for quick and efficient shared trips without lengthy detours, fixed routes or schedules. Staff simply use their NHS ID badge when they board. The solution ensures that transport is delivered more efficiently by only running buses when they are needed, instead of the NHS having to contract buses to run to set times and days regardless of demand.
- 5.4.3. Stagecoach launched its first pilot of the new service in partnership with Nottinghamshire County Council and Sherwood Forest Hospitals NHS Trust. The service has been running at King’s Mill Hospital in Sutton-in-Ashfield since May 2020. Stagecoach is also involved in discussions with other NHS Trusts about the roll out of a similar service and it has since launched Stagecoach Connect for NHS staff who work at Diana, Princess of Wales Hospital in Grimsby.
- 5.4.4. The new DRT services are in addition to the emergency scheduled bus network provided by Stagecoach and other bus operators.

5.5 SUMMARY

- 5.5.1. This chapter has detailed different applications of DRT in the UK and internationally through a series of case studies. A range of operating models have been examined, linked to the types identified through the literature review in Chapter 4, including network DRT, interchange DRT and destination-specific DRT. Successful schemes, as well as some that did not prove sustainable, have been assessed in order to illustrate some of the experiences of running DRT services.
- 5.5.2. All but one of the schemes assessed (Stagecoach Connect) use small vehicles or ‘minibuses’ typically in the 12-15 seat capacity range and vehicles smaller than this were identified in at least one of the case studies (Go2, Sevenoaks). Most of the schemes assessed offered a smartphone app booking option in addition to telephone booking.
- 5.5.3. The majority of the schemes assessed through the case studies are subsidised in some way, either through the local authority or with additional financial support from other contributors. The only commercial (non-subsidised) service identified that has operated for a substantial length of time is an airport service charging premium fares.
- 5.5.4. Some of the key findings of the case studies were:
- An interchange DRT model, with services feeding into the main bus network, can be successful in speeding up journeys for the majority of passengers while enabling areas of lower demand to be served more efficiently. Complementary infrastructure upgrades to establish comfortable interchange points, with suitable transfer time provide between bus and DRT, will add to the customer experience and encourage usage (Lincolnshire).
 - The purpose and role of DRT needs to be clearly defined and should complement rather than parallel or duplicate existing bus services. An element of control over bookings to discourage inappropriate use of a DRT service will ensure that capacity is reserved for those who most need it where requested journeys could be provided more efficiently by the mainstream bus network (Lincolnshire, Oxford).
 - There can be high psychological barriers to using DRT, including the lack of a timetable to illustrate expected journey times; the need to book travel in advance, particularly the return leg where required times may be less certain for the user; and perceptions of DRT being for elderly and disabled persons only which can deter young passengers from using a DRT service. Consultation and engagement with actual and potential public transport users prior to introducing a DRT can help reduce or remove some of the barriers and ensure greater public support for such services being introduced (Lincolnshire, Timaru).
 - There are several recent examples of commercially operated DRT services having been introduced and trialled in the UK, but to date none of them have achieved commercially sustainable operation beyond the typical two-year trial periods (Liverpool, Sittingbourne, Oxford).

5.5.5. The key lessons learned from the case studies were:

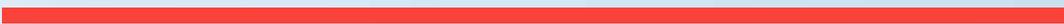
- Without a technology solution, handling bookings manually can be a labour-intensive part of a DRT operation, particularly if operating an interchange DRT model where there is a need to ensure sufficient transfer time and redirect inappropriate journey requests onto the conventional public transport network (Lincolnshire).
- Even where DRT services attract high passenger numbers and achieve modal shift away from cars, they are unlikely to be financially viable on a wholly commercial basis due to a combination of lower load factors on smaller vehicles, the demographic of many DRT service users (i.e. concessionary pass holders) and the additional costs of DRT associated with managing bookings (Liverpool, Sittingbourne, Oxford). Congestion in urban areas slowing down vehicles at times of high demand can also reduce the financial viability of DRT services (Oxford).
- Requiring passengers to register in advance prior to making bookings will improve the efficiency of the booking process and help reduce the instances of 'no shows' by passengers booking and then failing to turn up for the journey.

5.5.6. The following success factors have been identified from the case studies:

- Operating an interchange DRT approach, with clear boundaries between the DRT and fixed route public transport services to ensure a holistic, efficient and joined-up public transport network (Lincolnshire, Barcelona).
- Undertaking prior public consultation and engagement in order to explain the need for a DRT service, how it will operate, address any user concerns and gain public buy-in to the service specification process (Timaru).
- Partnering with other public or private sector organisations to provide funding will increase the financial sustainability of a DRT service. The case studies included examples of funding from private sector employers (Oxford), developer contributions (Leicester) and the NHS (Stagecoach Connect), as well as conventional local authority subsidy (Lincolnshire, Tees Valley, Sevenoaks).

6

ESTABLISHING A DRT



6 ESTABLISHING A DRT

6.1 INTRODUCTION

- 6.1.1. This chapter builds on the findings of the earlier tasks detailed in previous chapters and sets out some of the key considerations for establishing a Demand Responsive Transport (DRT) service in Torbay in the future. The key factors and considerations have been informed by the policy & research review (chapter 4) and case studies (chapter 5), as well as WSP's wider industry knowledge and work in the DRT and public transport field.
- 6.1.2. Having identified the DRT setup key considerations, a SWOT Analysis (Strengths, Weaknesses, Opportunities, Threats) has been undertaken using the baseline information gathered (chapter 2) and the stakeholder engagement (chapter 3) in order to form an assessment of the suitability of DRT in the Torbay context. DRT service providers have been engaged with using our established industry contacts to obtain illustrations of headline costs of DRT operation.
- 6.1.3. The DRT setup key considerations and Torbay-specific SWOT analysis have together informed a DRT feasibility framework that can be used to inform future decision making on the potential procurement and specification of DRT in Torbay.

6.2 DRT SETUP KEY CONSIDERATIONS

- 6.2.1. The following section sets out the key considerations for establishing a DRT service. The key considerations identified come under the following four headings:



Drivers of demand



Area typologies



Operating models



Resource considerations



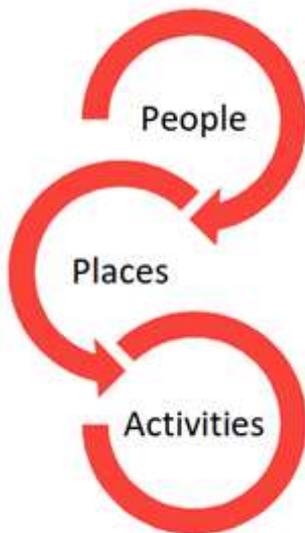
User personas

DRIVERS OF DEMAND



- 6.2.2. Prior to setting up a DRT service or making any transport service intervention, it is important to establish the drivers of demand for travel in order to understand if a transport-based intervention is the most appropriate solution. Increasingly, transport practitioners are adopting a mobility-focussed approach which considers the relationships between people, places and activities, as shown in Figure 6-1:

Figure 6-1 - Propensity to travel



- 6.2.3. Understanding this propensity to travel among Torbay’s residents is crucial for targeting resources where they are most likely to be effective and may highlight opportunities for innovative and alternative interventions. It is important to recognise that the activity itself is not usually dependant on the location (place) in which it is undertaken and the need to travel is therefore often a consequence of the way that activity is accessed or delivered.
- 6.2.4. The rapid changes in activities and service delivery brought about by the coronavirus (Covid-19) pandemic in 2020 has forced many people and organisations to re-evaluate their practices, with the potential that alternative means of service access and delivery (such as online instead of in person) have now become much more palatable to more people and organisations. There has also been a significant shift in how people purchase and access goods, including ‘day to day’ purchases such as groceries, with an acceleration of more remote and digital transactions.

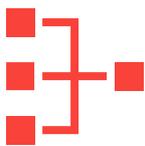
- 6.2.5. Establishing the key activities, the places where they are undertaken and who is undertaking them will help inform the need for any transport-based intervention and highlight if alternative solutions are available. A practical example of this could be providing public transport for people to travel to a hospital for appointments when these appointments could be provided online or within a local community setting. Such place-based interventions will likely require partnership working with other organisations such as the NHS.
- 6.2.6. Only after the drivers of transport demand have been assessed and alternative interventions considered should the potential setting up of a DRT be progressed.

AREA TYPOLOGIES



- 6.2.7. The type of area should be the first consideration in the deployment of DRT since certain types of area have been shown to be more effective than others in achieving a successful scheme. The literature review (chapter 4) identified that geographical aspects have become the main motivation for introducing DRT in recent years. The area typologies most suitable for DRT are:
 - Rural and suburban fringe
 - Areas comprising of communities experiencing socio-economic deprivation
 - Areas underserved by conventional fixed route public transport
 - Employment areas such as industrial estates and business parks
 - Low density growth areas such as new-build housing estates
- 6.2.8. The presence of one or more of these area characteristics is likely to result in a more successful and effective scheme compared to a DRT deployment in areas without any of these characteristics.

OPERATING MODELS



- 6.2.9. The type of DRT operation is influenced by the transport need being addressed but is also a key decision of the service provider or funder, as the operating model chosen has a significant impact on running costs. Operating models used for DRT are:
 - **Interchange:** feeding into established fixed route public transport corridors and/or transport hubs from a defined and limited geographical area
 - **Network:** Enhancing or part replacing existing public transport at times or in areas of low demand
 - **Substitute:** Completely replacing fixed route public transport in a given area
 - **Destination-specific:** Focussed on a specific generator of demand such as an employment zone

6.2.10. The amount of flexibility provided by a DRT service is also an important decision that impacts on operational efficiency. Flexibility can take the form of:

- **Fully flexible:** providing journeys anywhere within a service operating area
- **Semi-flexible:** observing a combination of DRT and fixed route, often associated with interchange and destination-specific services
- **Fixed and flexible:** operating mostly fixed route and flexing only at specific points or specific times of day

6.2.11. Interchange DRT has been identified through the earlier literature review and case studies as being particularly effective and an operating model favoured by practitioners. Fully flexible services reduce operational efficiency and should be avoided.

RESOURCE CONSIDERATIONS



6.2.12. Resources required to fund and operate a DRT are influenced by the operating model chosen and the area type within which the service is being deployed. These also impact on the potential sources of funding. These could include:

- **Existing subsidies and ticket revenue:** DRT schemes using an interchange operating model with integrated ticketing are more likely to have a commercial revenue stream from existing ticket sales and from transfer of passengers to/from commercial bus services.
- **Kick-Start:** Supporting local authority subsidy with the aim of establishing a commercial service.
- **Agency contributions:** Suitable for destination-specific operations with the potential for private sector or other public sector agencies to contribute to the service running costs, such as employers, businesses, NHS, etc.
- **Developer contributions:** Suitable for DRT deployment in new housing and employment developments with Section 106 or other contributions.

6.2.13. The type of booking option chosen and how any manual bookings are handled is also an important resource consideration. Manual bookings should, where possible, be facilitated through existing services, such as a local authority call centre, bus operator customer services helpline, or public library.

6.2.14. Interchange DRT may require upgrades to infrastructure to establish interchange points and provide a comfortable and safe waiting environment. This does not necessarily involve significant expense and could be as simple as providing a waiting shelter and timetable panel at a bus stop.

USER PERSONAS



- 6.2.15. The type of passenger expected to use the DRT should be clearly understood. Previous research detailed in the literature review in chapter 4 has identified that a lack of understanding of the market has often been a reason why DRT services have failed. User types for DRT fall into two main categories:
- **Captive users:** typically older, less affluent, often digitally excluded and favour 'ease of use'
 - **Choice users:** typically younger, economically active, IT literate, environmentally conscious, time-poor and favour personal convenience
- 6.2.16. It is recognised that in the Torbay context, the vast majority of users fall into the 'captive user' persona. DRT services are typically seen as catering for the captive user type even though DRT may be more suitable for the demands and needs of choice users.
- 6.2.17. If the DRT service is expected to cater mainly for captive users, its suitability compared to conventional fixed route public transport should be carefully considered, as should the ability of the users to make bookings electronically if a digital solution is being employed.

6.3 DRT BOOKING AND TECHNOLOGY CONSIDERATIONS

- 6.3.1. DRT has existed for decades and as such there is a wide choice of booking and technology options. This ranges from low-tech operation with all bookings and vehicle routings organised manually, to semi-automated operations using a mix of manual bookings and computer-aided vehicle routing, to the latest Dynamic DRT (DDRT) operations using sophisticated technology to automatically handle bookings and dynamically assign vehicles in real-time.

MANUAL

- 6.3.2. As highlighted in part 6.2.13, the resourcing of handling bookings is an important consideration in setting up a DRT, particularly if this to be undertaken manually. With adequate resource, sizeable DRT schemes covering dozens of vehicles can operate in this way with no specialist IT required.
- 6.3.3. Entirely manual processing usually requires a longer notice period for bookings to be made, ranging from a few hours to 24 hours' notice, which reduces the 'demand responsive' element of the service.

COMPUTER-AIDED DRT

- 6.3.4. There are several software packages designed for local authorities and transport agencies which can be used to organise and schedule DRT operations. These software packages are often used for multiple transport purposes, such as school transport planning, special educational needs transport and adult social care transport services. Providers of such software applications used in the UK include Mobisoft, QRoutes, Route-r, Trapeze and Vectare.

6.3.5. Computer-aided DRT can be useful in schemes with a sizeable element of fixed operation such as interchange or destination-specific operating models (described in part 6.2.9) and those with elements of fixed route (described in part 6.2.10), but may be less effective on fully flexible schemes.

DYNAMIC DRT

6.3.6. Dynamic DRT represents the most modern and innovative form of DRT technology and booking management. Technology solutions to power this type of DRT typically have three core features which come packaged as one service:

- **A user-facing app** which enables trip booking and planning (in some cases just for the digital DRT service, in others multi-modal), digital payment and real time tracking of vehicles. In addition to these core features, other services can be included such as seat reservations and incentivisation/nudging tools.
- **A driver-facing app** providing details of pick-ups and drop-offs which dynamically updates in real time based on demand information from the back office system, and reporting location to the back office. Such apps can also include navigation and other features.
- **A digital back office** which powers the service, automatically managing in real time: bookings; payments; booking and vehicle matching; vehicle scheduling and dispatching; vehicle and user monitoring; and journey planning. This is accessible to the service operator, often through a web-based dashboard. Depending on capabilities, operators (and authorities) can utilise the data generated to better understand demand and plan future services.

6.3.7. There are four broad models for utilising digital solutions in a dynamic DRT service:

- Licensing a digital solution from a private sector provider, with the user-facing app branded under the provider's brand.
- Licensing a 'white label' digital solution from a private sector provider, with the user-facing app branded under another brand as chosen by the transport authority (e.g. a newly created brand, or integrated into an existing brand).
- The transport authority develops a digital solution themselves (either in-house or through a procurement exercise) which they then own.
- The transport authority works with DRT service providers to 'digitise' their services, making them discoverable within existing journey planning apps.

6.3.8. The operating model can impact on the chosen technology solution to power a dynamic DRT service.

6.3.9. Private sector suppliers of dynamic DRT solutions include:

- **Ioki:** Owned by German public transport operator Deutsche Bahn, Ioki is a provider of intelligent on-demand mobility solutions with extensive deployment of their products in Germany, Austria and Switzerland. The company is providing the technology for a DRT service recently launched in Watford and operated by Arriva, also part of the Deutsche Bahn group.
- **Moovit:** A mobility as a service provider and journey planning application used globally, with a DRT technology solution that includes the back office system and driver and user apps. Offers both a Moovit branded and white label service. Its digital DRT solution is relatively new to the UK market. Moovit was recently purchased by Intel.

- **Shotl:** A Spanish transport technology provider working with transport authorities to test and deploy DRT services within their networks. The company has deployed its technology solutions in several countries including Germany, Spain, France, Finland, Switzerland, Italy, Portugal and the United States and offers its products in the UK. The company can provide a DRT platform, passenger-facing application and supervisors' dashboard for minibus services in urban and rural areas. The Shotl app enables local authorities and transport operators to digitalise Dial-a-Ride, home-to-school, non-emergency hospital transport and similar operations.
- **Viavan:** An on-demand shared transport services company. Whilst ViaVan operates DRT services themselves in the US, within the UK they licence their digital DRT technology solution to third parties. ViaVan's DRT technology is being utilised in a number of UK DRT services with major operators such as Stagecoach and Arriva as detailed in chapter 5.

6.3.10. There are many other suppliers with a range of solutions, including large and small software providers. This is still an emerging market and so suppliers are often willing to negotiate on cost to secure a market position.

DRT TECHNOLOGY COSTS

6.3.11. Through market engagement with suppliers, costs for DRT technology and apps have been identified and are given here for information. It should be noted that these costs are indicative and actual costs can vary depending on the scale of the deployment and any bulk discount provided by the supplier if covering a number of vehicles.

Table 6-1 - Annual DRT technology costs illustration

Feature	Cost	Unit
DRT service using provider app per vehicle deployed	£7,500	Per vehicle
Real time vehicle tracking per annum per vehicle deployed	£1,250	Per vehicle
Account based registration service	£8,300	Per platform
Future booking functionality	£8,300	Per platform

6.3.12. As identified in earlier chapters, it is seen that DRT with a technology solution involves additional costs on back-office infrastructure which can be a substantial proportion of the running costs if only shared across a small number of vehicles.

6.3.13. DRT deployments covering numerous vehicles will achieve economies of scale on back-office platform costs. From the above illustration, it is seen that a DRT covering one vehicle would be expected to cost £25,350 per annum (ie, £25,350 per vehicle) for a digital/dynamic booking technology solution, but with a five vehicle deployment the expected cost per vehicle would reduce to £12,070 and a 10 vehicle deployment would be expected to cost £10,410 per vehicle.

6.3.14. Development and setup costs for a 'white label' app (ie, branded for the transport authority) typically start at around £80,000.

6.4 TORBAY SWOT ANALYSIS

6.4.1. An analysis of the strengths, weaknesses, opportunities and threats for public transport and DRT in Torbay is given in Table 6-2:

Table 6-2 - Torbay DRT SWOT Analysis

<p>STRENGTHS</p> <p>Commercial network with several frequent services</p> <p>Established community bus service with volunteer drivers</p> <p>Voluntary financial contributions from residents towards running costs of community bus service</p>	<p>WEAKNESSES</p> <p>Services concentrated along specific corridors</p> <p>Infrequent services off main corridors</p> <p>Lack of integrated ticketing</p> <p>Limited information available on routes taken by less frequent bus services run by smaller operators</p> <p>Small supported bus services budget</p>
<p>OPPORTUNITIES</p> <p>Local bus operators supportive of trialling DRT</p> <p>Mixed of large, medium and small bus operators with differing business models able to provide a range of services on a commercial basis</p> <p>Operators in the area have small vehicles in their fleets that would be suitable for DRT</p> <p>Frequent bus service corridors could facilitate interchange to/from DRT</p> <p>Torbay is a relatively compact urban area</p> <p>Improve access, coverage, efficiency and quality of user experience for those who struggle accessing fixed bus routes due to Torbay's hilly terrain</p> <p>Improve personal safety through door-to-door or street-to-street service</p> <p>Improve value for money for Torbay Council through a more dynamic, personalised service</p>	<p>THREATS</p> <p>Future budget/funding availability may be reduced or withdrawn</p> <p>Uncertainty over passenger numbers after COVID</p> <p>Fewer commercially viable bus services will increase competition for limited Council resources to subsidise / contract public transport services</p> <p>Bus/coach hire companies may cease trading and reduce the number of tenderers available</p> <p>Increased digital/online transactions will further reduce the demand for public transport</p> <p>High start-up costs compared to fixed route bus services for IT/back office infrastructure may be a barrier to establishing DRT in Torbay</p> <p>Overcoming psychological barriers to use: fear of the new / unknown; concern over dependability</p>

6.5 TORBAY DRT FEASIBILITY FRAMEWORK

6.5.1. Drawing on the previous research, the key considerations identified in section 6.2 and the SWOT analysis above, a DRT Feasibility Framework has been produced that can be used to inform future decision making on the potential procurement and specification of DRT in Torbay. This is included as Appendix A.

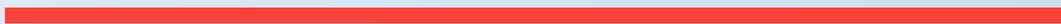
6.6 SUMMARY

6.6.1. This chapter has outlined the key considerations for setting up a DRT service, covering suitable area types, operational considerations, user types and likely technology costs. The importance of identifying appropriate areas for deployment has been highlighted, as well as the need to understand the market for which any DRT service being introduced is intended to serve.

- 6.6.2. Potential funding sources have been summarised, noting that these are closely tied to the operating model chosen, such as employer contributions from a destination-specific operating type, or Section 106 agreement developer contributions for DRT services targeting growth areas. The potential for commercial funding streams from interchange-type DRT schemes as part of an integrated network was also noted as a particularly beneficial operating model.
- 6.6.3. Indicative technology costs have been summarised, illustrating that a DRT deployment will typically start at £25,000-£30,000 setup costs, with economies of scale being realised in schemes covering multiple vehicles.
- 6.6.4. A SWOT Analysis has identified opportunities presented by the mix of bus operators and business models in Torbay along with the area's established community transport provision and its strong core commercial bus network. However the weaknesses of the public transport network being concentrated along the waterfront and specific corridors with infrequent services and gaps in coverage off the main corridors has also been highlighted, as has the small budget available for subsidised public transport services in Torbay.

7

CONCLUSION



7 CONCLUSION

7.1 STUDY SUMMARY

- 7.1.1. This study has assessed the feasibility of procuring Demand Responsive Transport (DRT) services as a potential replacement for existing tendered local bus services in Torbay. The study investigated the suitability and feasibility of DRT services and has provided DRT Feasibility Framework for Torbay Council to use when considering future procurement and specification of DRT services.
- 7.1.2. The study did not seek to identify specific bus routes and services to replace with DRT. It has been undertaken through a 'Future Ready' lens in order to equip the Council with the guiding principles and considerations to inform future decisions on the potential use of DRT in Torbay.
- 7.1.3. Stakeholder engagement, case studies and a review of existing DRT research have informed the findings and conclusions of the study. These overall findings are set out below.

7.2 STUDY KEY FINDINGS

- 7.2.1. There is potential to deploy DRT in Torbay in the future, building on the strengths of the existing public transport network and the opportunities presented by the characteristics of the area. These include: support among local bus operators for trialling DRT; the mix of large, medium and small bus operators with differing business models; the sizeable fleet of small vehicles ('minibuses') already operating in the area which would be more suitable for DRT than large buses; the presence of an established frequent bus service corridor along the bay presenting opportunities for interchange and feeder DRT services; and the fact that Torbay occupies a relatively compact and mostly urban area.
- 7.2.2. There are area types suitable for deploying DRT in Torbay in the future. These include the rural and suburban fringes of Torbay; areas of Torbay with high social deprivation; areas of Torbay underserved by conventional public transport; employment and industrial zones in Torbay; and low-density growth areas of Torbay. However, as these area types are generally quite small and have only a few specific examples of each in Torbay, the potential to deploy DRT at an operationally efficient scale is currently very limited.
- 7.2.3. The limited opportunities for DRT in terms of suitable area types in Torbay means that any DRT services would likely require only a small number of vehicles. When coupled with the higher start-up costs for DRT and the requirement to provide additional back-office resources to handle bookings (digitally or manually), the result would likely be running costs that were the same or higher as a conventional fixed route bus service, but serving potentially fewer passengers. In order to have the potential to achieve cost savings, DRT would need to be deployed at a sufficient scale (i.e. more than only one or two vehicles) to allow the back-office booking costs to be shared out across a larger pool of vehicles and users. Based on the current commercial bus service provision in Torbay, it is unlikely that a DRT deployment of scale could be justified in the near future when taking a commercial, or cost/benefit ratio approach. However, such a DRT operation could be justified if replacing a group of bus services over a given area.
- 7.2.4. There is a lack of evidence of the true costs of providing DRT services and any cost savings are likely to be realised indirectly rather than directly. There are very few examples of commercially successful DRT schemes delivered without ongoing public subsidy and any introduction of DRT in Torbay would need to be led and financially supported by Torbay Council.

- 7.2.5. It is also important to consider the wider strategic case for maintaining public transport accessibility, and the outcomes generated in terms of accessibility, inclusivity, access to employment, mental and physical health, and social isolation and loneliness. This approach would follow that latest DfT Green Book appraisal guidance that places a greater emphasis on the strategic case, moving away from cost/benefit ration driven decision making.

7.3 NEXT STEPS

- 7.3.1. It is recommended that Torbay Council undertakes the following actions:

- The Council should consider and establish the outcomes it wants to achieve for public transport in Torbay beyond 2020, taking cognisance of existing policy and strategy such as the Devon and Torbay Local Transport Plan (LTP) and other associated Council objectives around social inclusion, health and wellbeing. It is possible that some of the existing LTP objectives may no longer be relevant or achievable in light of the changes that the pandemic has brought to travel patterns and public transport usage.
- The key drivers of demand for travel in Torbay and the propensity to travel among Torbay residents should be established using the mobility-focussed approach of people, places and activities, highlighted in part 6.2.2 of this study. This should include public engagement and ‘what if’ consultation of residents across Torbay to understand their current and future transport needs, particularly in light of post-Covid changes in how people use and access services. Part 6.2.4 of this study highlighted how the pandemic has forced users and suppliers of services to rethink their approach and has reduced some of the previously perceived barriers to alternative means of interaction, such as online and telephone health appointments, online shopping and home delivery. Opportunities for alternative (non-transport) interventions, made in partnership with other organisations, should be identified and explored.
- The Council should consult with bus operators to identify any at risk services which may be reduced or withdrawn when the temporary emergency funding via the UK Government’s Coronavirus Bus Services Support Grant ceases. Operators should also be asked to identify any services that would similarly be at risk due to any reduction in concessionary fare reimbursement.
- Using the DRT Feasibility Framework produced as part of this study and given in Appendix A, the Council should evaluate the routes and areas currently served by public transport in Torbay and establish the potential for DRT in each area, taking cognisance of any at risk services and areas identified through the bus operator engagement.
- The Council should establish a ‘ground zero’ scenario for the public transport network in Torbay beyond 2020 if the at risk services identified by bus operators were all to be withdrawn and no replacement provision such as DRT put in place. This exercise would help highlight potential gaps in public transport provision (and therefore inclusion) and the resulting socio-economic impacts (e.g. on isolation, access to employment and health) and could help inform future decisions by the Council on funding.

Appendix A

TORBAY DRT FEASIBILITY FRAMEWORK





1 DRT FEASIBILITY FRAMEWORK

1.1 BACKGROUND

- 1.1.1. Torbay Council required consultancy advice to assess the feasibility of procuring Demand Responsive Transport (DRT) services as a potential replacement for existing tendered local bus services.
- 1.1.2. This Appendix accompanies the Demand Responsive Transport Services Feasibility Study main report (December 2020).

1.2 PURPOSE

- 1.2.1. To complement the main feasibility study, this DRT Feasibility Framework has been produced. Its purpose is to provide a quick and simple reference that can be used by Torbay Council to guide future decision making on the potential procurement and specification of DRT in Torbay.
- 1.2.2. The framework draws on the research undertaken and conclusions reached in the main report about the feasibility of DRT services in general as well as taking account of the specific characteristics and features identified in Torbay.

1.3 FRAMEWORK FOR DRT DEPLOYMENT IN TORBAY

	<p>UNDERSTAND DRIVERS OF DEMAND</p> <p>Prior to considering the introduction of a DRT service in Torbay, the drivers of demand should be established so to understand the reasons for travelling and if the need for transport could be reduced or eliminated through alternative means of service delivery. In assessing these drivers of demand, the Council should consider:</p> <ul style="list-style-type: none"> ■ People: who is travelling? ■ Places: where are they travelling to? ■ Activities: what is the reason for travelling there? <p>By understanding the people, places and activities and the relationships between them that drive demand for travel in Torbay, the Council may be able to identify opportunities for non-transport interventions that better meet the community's needs. This could include partnering with other public sector organisations to make place-based interventions, such as moving activities and services to alternative locations.</p> <p>Only after the drivers of demand have been assessed and alternative interventions considered should the potential setting up of a DRT in Torbay be taken forward</p>
	<p>IDENTIFY IF AN AREA IS SUITABLE FOR DRT</p> <p>When considering DRT as a solution to address a transport need in Torbay, the area type should be the first consideration before progressing any plans. The Council should only consider DRT if the area meets one of more of the following descriptions:</p> <p>The rural and suburban fringes of Torbay:</p> <ul style="list-style-type: none"> ■ Including Higher Brixham, Galmpton, Collaton St Mary, Blagdon, Cockington and Maidencombe. <p>Areas of Torbay with socio-economic deprivation:</p> <ul style="list-style-type: none"> ■ The Torre and Plainmoor areas of Torquay and Torquay town centre ■ The Foxhole area of Paignton and Paignton town centre ■ Brixham town centre and the area around Brixham Hospital <p>Areas of Torbay underserved by conventional fixed route public transport:</p> <ul style="list-style-type: none"> ■ Cockington, Maidencombe, Higher Brixham <p>Employment areas in Torbay such as industrial estates and business parks:</p> <ul style="list-style-type: none"> ■ Yalberton Industrial Estate ■ Westfield Business Park <p>Low density growth areas in Torbay such as new-build housing estates</p> <ul style="list-style-type: none"> ■ The area around Devonshire Retail Park ■ South Devon College and Long Road

	<p>While not exhaustive, the above list identifies some of the main areas in Torbay matching the area typologies best suited to DRT services. Areas not matching these typologies are less likely to support an efficient and effective DRT operation and will be better suited to more conventional public transport.</p>
	<p>ASSESS THE INTENDED MARKET AND USERS</p> <p>Sufficient time must be invested at the planning stage of any DRT deployment in Torbay in order to understand the intended users and what their needs are. Consideration should be given to:</p> <ul style="list-style-type: none"> ■ Is the service targeting captive users or choice users? Captive users are more likely to be elderly, less affluent, digitally excluded and favour ease of use of a public transport service. Choice users are more likely to be younger, economically active, IT literate, using public transport for commuting and value convenience. ■ The reasons for travelling: access to employment, leisure and shopping are the main drivers of demand for DRT services. ■ How users will respond to the need to book travel: elderly passengers may be less willing or unable to use digital booking services. However, elderly/retired users are also more likely to have flexibility in booking travel and varying travel times compared to those travelling for employment who need to travel at set times around working hours.
	<p>DESIGN THE OPERATING MODEL BASED ON THE AREA TYPOLOGY AND USERS</p> <p>The operating model chosen is determined both by the area type and the intended user market. In Torbay, this could take the form of:</p> <ul style="list-style-type: none"> ■ Interchange: feeding into established fixed route public transport corridors and/or transport hubs such as Brixham Town Square, Paignton bus and rail stations, Torquay Strand bus interchange and stops along the A3022 Torquay Road. ■ Network: Enhancing or part replacing existing public transport at times or in areas of low demand, especially suitable for off-peak, evening and weekend services. Potentially suitable areas in Torbay include Brixham, the Shorton and Foxhole areas of Paignton, and the rural fringes of Torquay. ■ Destination-specific: Focussed on a specific generator of demand. In Torbay this could include Torbay Hospital, South Devon College/University Centre South Devon, Westfield Business Park, Yalberton Industrial Estate and the town centres of Torquay, Paignton and Brixham. ■ Substitute: Completely replacing fixed route public transport in a given area. Given the extent of commercial services provided in Torbay at the time of writing, this operating model is not especially suitable but could be an option if Torbay Council was faced with several services being withdrawn or requiring financial support in the same area in future. <p>The degree of flexibility provided by the service should also be decided as part of the operating model, such as whether to provide 'door to door' or 'street to street' service, and if certain journey origins and destinations are to be excluded due to existing public transport provision. Fully flexible services should be avoided.</p>

	<p>DECIDE ON THE COMMERCIAL MODEL</p> <p>The Council should consider how a DRT will be funded and identify potential revenue opportunities linked to the operating model chosen. These could include:</p> <ul style="list-style-type: none"> ▪ Agency contributions: suitable for destination-specific operations with the potential for private sector or other public sector agencies to contribute to the service running costs, such as employers, businesses, NHS, etc. ▪ Developer contributions: Suitable for DRT deployment in new housing and employment developments with Section 106 or other contributions. ▪ Existing subsidies and ticket revenue: DRT schemes using an interchange operating model with integrated ticketing are more likely to have a commercial revenue stream from existing ticket sales and from transfer of passengers to/from commercial bus services. <p>The Council should consider the higher start-up costs associated with a technology solution for DRT (typically £30,000 minimum for the booking solution) and compare this to the cost of tendering conventional bus services. The likely need for ongoing subsidy of a DRT service should also be considered.</p> <p>Economies of scale on DRT technology costs can be achieved when establishing a scheme covering multiple vehicles (five or more). DRT schemes with only one or two vehicles will likely be more costly than an equivalent conventional fixed route bus service.</p>
	<p>AGREE ON SUBSIDY LEVEL AND ‘VALUE FOR MONEY’</p> <p>Subsidy levels per passenger trip on DRT services are typically higher than on equivalent bus services due to the lower load factors of DRT vehicles, but overall costs can be lower, particularly if replacing a group of bus services. As such, subsidy per passenger is likely to be a poor measure of value for money and should be avoided.</p> <p>Any cost savings for the transport authority associated with introducing a DRT can be difficult to quantify and are likely to be achieved relatively across the public sector rather than directly.</p> <p>Prior to introducing a DRT, the Council should agree an acceptable higher subsidy per passenger trip of between 1.5 and 2.0 times that of the equivalent bus service per passenger subsidy, justified on the basis that subsidy per passenger is not a good measure of the social value of DRT services in getting people to work, education, healthcare and leisure opportunities and in reducing social isolation and loneliness. Higher per-passenger subsidy can also be justified by the better value for money aspect of providing an enhanced and more personalised service, with typically higher user satisfaction of that from conventional bus services.</p> <p>Fares higher than the bus equivalent levels will reduce subsidies if there is a sizeable portion of fare-paying users and can be justified on the basis of providing a taxi-level type of service, although this may be more difficult politically to gain acceptance of.</p>



	<p>It is important to remember that the concessionary travel scheme is a subsidy of the passenger and not the transport service and the cost of providing a DRT service versus a conventional fixed route bus service should be assessed by Torbay Council on this basis. Tendering for DRT on a gross cost contract basis is likely to attract more bids from commercial operators and will make assessing the cost to the Council of a DRT against tendered bus services easier.</p> <p>It is unrealistic to expect DRT services charging bus-level fares and with high proportions of concessionary passengers to be commercially viable and such services will require ongoing subsidy throughout their operation.</p>
--	--

Appendix B

LITERATURE REVIEW REFERENCES



REFERENCES

- Blackburn, A (2020) *New ways to travel in Sevenoaks* unpublished presentation, GoCoach
- Brost, M, Klötzke, M, Kopp, G, Deißer, O, Fraedrich, E, Karnahl, K, Sippel, T, Müller, A and Beyer, S (2018) 'Development, Implementation (Pilot) and Evaluation of a Demand-Responsive Transport System' *World Electric Vehicle Journal* vol 9, no 4 doi:10.3390/wevj9010004
- Davison, L, Enoch, M, Ryley, T, Quddus, M, and Wang, C (2013) 'A survey of Demand Responsive Transport in Great Britain' *Transport Policy* vol 31 (2014) pp. 47-54
- Department for Transport (2017) *The Bus Services Act 2017: New powers and opportunities* Department for Transport, London
- Elliott, J (2020) *Mind over Mode Shift -MaaS and the future of public transport in Kent* unpublished presentation, Kent County Council
- Enoch, M, Potter, S, Parkhurst, G and Smith, M (2004) *Innovations in Demand Responsive Transport* Department for Transport/Greater Manchester Passenger Transport Executive
- Enoch, M; Potter, S; Parkhurst, G and Smith, M (2006). *Why do demand responsive transport systems fail?* In: Transportation Research Board 85th Annual Meeting, 22-26 Jan 2006, Washington DC
- Halden, D (2006) *Review of Demand Responsive Transport in Scotland* TAS Partnership/University of Aberdeen
- Hardy, P (2020) *DRT: learning from the past – looking to the future* unpublished presentation, ITP
- Lakatos, A, Tóth, J and Mándoki, P (2020) 'Demand Responsive Transport Service of 'Dead-End Villages' in Interurban Traffic' *Sustainability* vol 12, no 3820; doi:10.3390/su12093820
- Laws, R, Enoch, M, Ison, S and Potter, S (2009) 'Demand Responsive Transport: A Review of Schemes in England and Wales' *Journal of Public Transportation* vol 12, no 1
- Mageean, A and Nelson, J (2003) The evaluation of demand responsive transport services in Europe *Journal of Transport Geography* vol 11, pp. 255-270
- Pointon, R (2020) *Is Demand Responsive Transport (DRT) the answer for new housing schemes?* unpublished presentation, Go Travel Solutions
- Schiefelbusch, M *Operational Aspects* chapter 5 in *Paratransit : Shaping the Flexible Transport Future*, edited by Mulley, C and Nelson, J, Emerald Publishing Limited, 2016. ProQuest Ebook Central, <https://ebookcentral.proquest.com/lib/open/detail.action?docID=4717120> [accessed November 2020]
- Sihvola, T, Jokinen, JP, Sulonen 'User Needs for Urban Car Travel: can Demand-Responsive Transport Break Dependence on the Car?' (2012) *Journal of the Transportation Research Board* no 2277, Transportation Research Board of the National Academies, Washington, D.C. DOI: 10.3141/2277-09
- Sorensen, L, Bossert, A, Jokinen, JP and Schlüter, J (2020) 'How much flexibility does rural public transport need? – Implications from a fully flexible DRT system' *Transport Policy* vol. 100 pp 5-20
- Transport Focus (2016) *Demand responsive transport: users' views of pre-booked community buses and shared taxis* Transport Focus, London



Transport Network (2020) *DfT director concedes Bus Strategy must halt 'vicious decline'*
<http://www.transport-network.co.uk/DfT-director-concedes-Bus-Strategy-must-halt-vicious-decline/17004> [accessed November 2020]

Wang, C, Quddus, M, Enoch, M, Ryley, T and Davison, L Multilevel (2014) modelling of Demand Responsive Transport (DRT) trips in Greater Manchester based on area-wide socio-economic data
Transportation vol 41 pp 589-610 DOI 10.1007/s11116-013-9506-1



1st Floor, Keble House
Southernhay Gardens, Southernhay East
Exeter, Devon
EX1 1NT

wsp.com

PUBLIC