CAMBRIDGESHIRE AND PETERBOROUGH STRATEGIC BUS REVIEW: OPTIONS REPORT

SYSTRA

CAMBRIDGESHIRE & PETERBOROUGH
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1. INTRODUCTION

1.1 Study Purpose and Background

1.1.1 SYSTRA Ltd was commissioned by the Cambridgeshire and Peterborough Combined Authority (CPCA) in May 2018 to undertake a strategic review of bus service provision within the CPCA area. The study is intended to help explore opportunities for transformational change as well as for improving the service in short term (1-5 years), medium term (6-10 years), and long term (10+ years).

1.1.2 The timing of this report means that a number of key transport documents are in the process of being prepared, such as the Local Transport Plan for the CPCA, the GCP's Transport Strategy, and a number of detailed studies looking at delivering Cambridge's City Access package. As such, this Bus Review cannot, and does not, seek to present a single preferred solution for the network. It presents a range of options at a conceptual level which can help inform more detailed planning and design in the future through other studies. This is likely to include documents such as the future CPCA Bus Strategy, which will be developed as part of or in parallel with the Local Transport Plan.

1.1.3 For a number of the options presented, examples have been used to illustrate the types of incidences where these could be applied. These examples should not preclude the development of alternative approaches during more detailed planning of the network in other studies.

1.1.4 One of the key messages presented in this report is the need to consider different delivery models and funding – this is highlighted by the step change that would be required in the delivery of the

transport network if options such as those presented conceptually here were to be taken forward.

1.2 Part 1 of the Study

1.2.1 Previous work, documented in the study's Part 1 Report, looked in depth at the strengths, weaknesses, opportunities and challenges (SWOC) associated with bus-based public transport in Peterborough and Cambridgeshire.

1.2.2 This is summarised in the diagram on the next page. The work for Part 1 has formed the basis for a wide-ranging option generation exercise and sifting of potential options, until a coherent holistic set of potential interventions has emerged covering short, medium and long terms.

1.2.3 The Learning Points from the SWOC analysis formed the starting point for developing options to ensure that buses play a viable role in supporting economic development in the CPCA area and delivering the very challenging levels of mode shift required.

1.3 Structure of this Report

1.3.1 This report provides a summary of the option development stage of the study.

1.3.2 The remainder of this introduction summarises the SWOC analysis from the Part 1 report, describes the scale of the challenge, and considers some of the changes in society and technology that will impact on transport in the future.

1.3.3 Section 2 of the report presents a range of conceptual interventions which highlight they types of actions which could be explored further

to tackle the challenges faced in the cities of Peterborough and Cambridge.

1.3.4   Section 3 similarly presents conceptual interventions for further consideration in the context of rural and inter-urban bus services across the CPCA area.

1.3.5   Section 4 summarises potential delivery models for delivering these types of these transport interventions, including some of the examples presented in Sections 2 and 3. This includes discussion of funding and the consideration of financial sustainability.

1.3.6   Section 5 presents an indicative implementation and transition plan for how these types of transport could be implemented over time.

SYSTRA

STRENGTHS
- Good geographical network coverage, including strong rail network
- Frequent services on many corridors, especially in cities
- 90% of bus network provided commercially
- Ongoing investment in the network - new technology, including RTPI, busway
- Park & Ride concept supported in Cambridge
- External funding for bus services
- Local environmental awareness
- Local commitment to active travel, especially cycling
- Active community transport sector
- Existing integration of school and rural transport
- Willingness to trial new approaches (e.g. Zume)
- Bus users generally positive about bus service experience

WEAKNESSES
- Inconsistent service offer, in particular in rural areas - frequency, accessibility and journey time, times of day, information, etc.
- Inadequate coordination between services, especially Busway and P&R
- Unattractive journey times by bus, in particular in rural areas
- Crowding (on some peak services)
- Community transport provision inconsistent and restricted to users
- Some key travel desire lines not linked by direct bus - new developments not served
- Congestion and conflicting priorities for road space (cycling versus bus)
- Excessive supply of car parking
- Bus/rail integration poor
- Staff recruitment challenging
- Limited market research by commercial operators - limited appetite for innovation
- Limited competition amongst commercial operators
- Financial sustainability of existing commercial operations
- Inadequate public-sector funding
- Limited evening, Sunday services
- Complex public-sector delivery structure
- Inadequate multi-operator/multi-modal ticketing
- Costs of public transport to users too high

OPPORTUNITIES
- Air quality providing imperative to change
- City deal funding, work place charging levy
- Harnessing value from economic development
- Political appetite for change
- Younger people driving less
- Limited use of busway services by 16-24s
- Integration with other modes (e.g. cycling)
- Emerging new technologies (information, delivery models) - chance to revamp the image
- Eliminating inconsistencies of delivery
- Behavioural change - especially at new developments
- New delivery approaches (e.g. commercial DRT)
- Not all services busy - capacity to carry more
- Reconnecting rural areas to modern public transport
- Reallocation of road space
- Depot modernisation and location
- Greater partnership and collaboration (Transport for Cambridgeshire and Peterborough)

CHALLENGES
- Congestion
- PT keeping ahead of economic development
- Dispersal of growth
- Meeting ambitious mode shift targets
- Improving public perceptions of the bus
- Car and rail can be cheaper than bus, with parking charges providing the largest comparative cost disincentive for city centre access.
- Changing travel patterns, flexible working, online shopping, etc. - challenging by bus
- Long term political support over multiple electoral cycles
- Inadequate finance available - especially outside City Deal, also balance revenue/capital funding
- Labour shortages
- Operator uncertainty - legislation, regulations
- Pace (and cost) of technological change
- Engaging with MaaS providers
- Insufficient public-sector resources, especially staff
- Need to integrate short-term proposals with long-term aspirations (e.g. CAM)
- Relationships between stakeholders
- Providing infrastructure for electric vehicles

1.4 Scale of the Challenge

1.4.1 In the area around Cambridge, the Greater Cambridge Partnership (GCP) has established an objective that[1]:

> "City centre traffic in Cambridge should be reduced by 10% to 15% over 2011 levels."

1.4.2 Because city centre traffic has continued to grow since 2011, GCP estimates that a 24% mode shift to sustainable travel is now required to achieve this objective.

1.4.3 On top of this target based on existing economic activity, the Greater Cambridge area will continue to expand in terms of both residents and employment over the years to 2031, with GCP estimating that without a significantly adjusted mode share this would result in 26,000 additional cars on the road network by that year[2].

1.4.4 Cambridge is not the only area which is growing. Peterborough is one of the fastest growing cities in the UK (in fact ranked 4th fastest in 2017), and it faces greater levels of deprivation than Cambridge. We identified in our Part 1 report that an additional 20,000 homes are scheduled to be built in Peterborough by 2036. Although pressures of congestion are not as pronounced in Peterborough as Cambridge, continued growth both within the city and the surrounding area will increase pressures on Peterborough in a similar manner to those of Cambridge, and will demand similar radical mode shift targets. For example, data published in the Strategic Economic Plan[3] showed

travel demand growth expectations of 30% in Peterborough by 2031, and Peterborough's Environment Capital Action Plan notes that it's 2020 growth plans mean 9% more journeys need to be by sustainable modes, with 90% of all journeys zero emission by 2050.[4]

1.4.5 In addition, an ageing population is likely to increase the demand for public transport, with buses a vital part of the transport solution.

1.4.6 The scale of the challenge faced by public transport in contributing to these radical mode shift targets requires a focus on significant interventions to produce a step change in public transport delivery, far beyond that which can be achieved through simple enhancements to existing bus service provision.

1.4.7 This will need to be backed by step change in resourcing (predominantly staffing, but also specialist external support) and funding, in the form of both capital and revenue expenditure.

Future Mode Share

1.4.8 In our Part 1 report, we examined mode shares in each of the existing Cambridge and Peterborough Combined Authority (CPCA) districts. Figure 1 presents a summary of this data (more detail is available in the Part 1 report). The analysis highlighted that:

- Cycling is a very significant component of the mode share in Cambridge itself, for journey of up to 10km;
- Peterborough has the highest bus mode share, followed by Cambridge;

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[1] GCP, Transport Strategy - Future Public Transport Requirements, July 2018
[2] ibid
[3] GCGP (now Business Board), Strategic Economic Plan, 2013

[4] PCC, Environment Capital Action Plan, accessed at https://democracy.peterborough.gov.uk/documents/s25356/6.%20Appendix%20A%20-%20Environment%20Capital%20Action%20Plan.pdf, accessed on 28/11/2018

- Bus mode share elsewhere in Cambridgeshire is comparatively low; and
- In most districts, car mode share has been declining between 2001 and 2011 (latest data available) with some modest growth in bus mode share in some (but not all) districts.
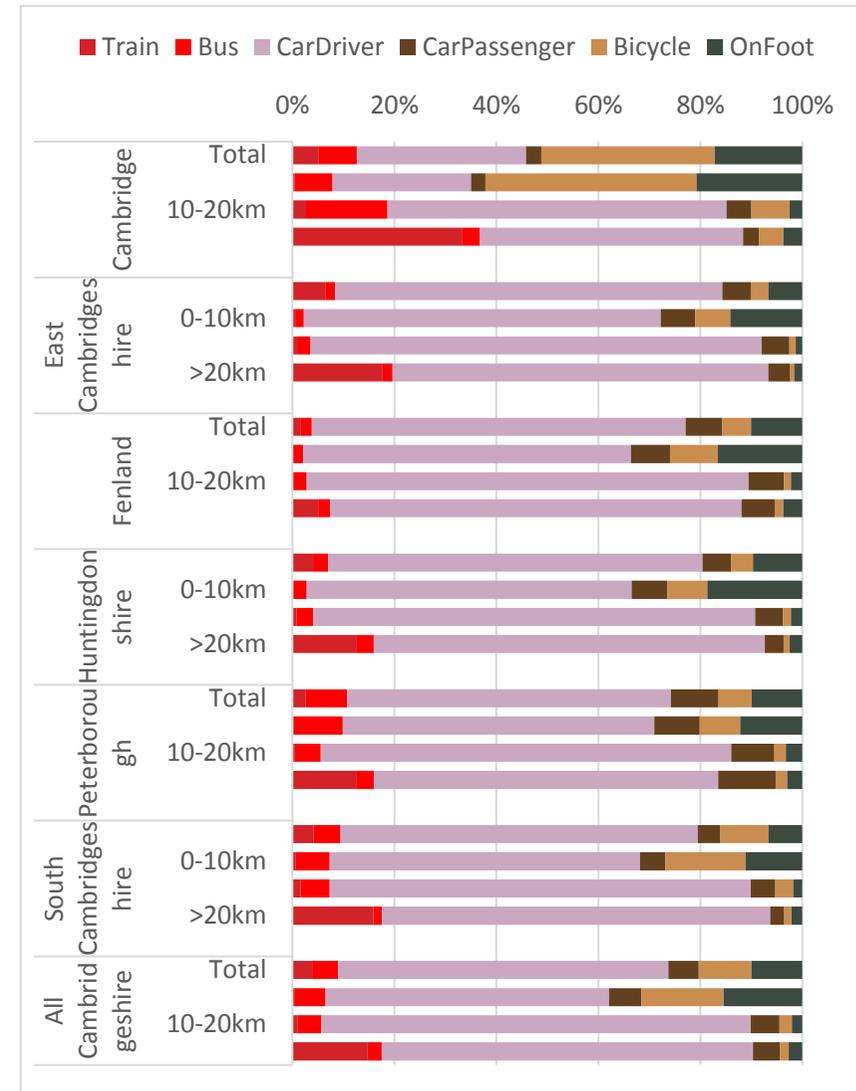

Figure 1.   Summary of Mode Shares, 2011

1.4.9 To explore the scale of the challenge, data for existing mode shares in 2011 was projected forward in time to 2031 as follows:

- Total volumes of travel were expanded by 30% in Cambridge and Peterborough, and by 15% in all other districts to simulate the impact of continued population growth and economic activity in the CPCA area;
- Distribution of travel between the different journey lengths are assumed to be in same proportion as 2011;
- Car-based journeys in Cambridge and Peterborough assumed to reduce by 12.5% (mid-point of GCP target range) compared to 2011, with existing journeys therefore redistributed to walking, cycling and public transport. Car-based travel in other districts assumed to be capped at 2011 levels;
- Redistributed journeys (in Cambridge and Peterborough) and all newly generated journeys since 2011 assumed to be split in proportion to existing sustainable travel mode shares as observed in 2011.

1.4.10 The results of this simulation are presented in Figure 2, in terms of both the absolute increase in bus passenger journeys required each working day to meet these aspirations, and the proportionate scale of change compared to current levels.

1.4.11 Note that given the current dominance of walking and cycling for travel in Cambridge, the method adopted projects forward a similar proportion of future travel for those modes – if this proved to be undeliverable (which might be the case if current unusually high levels cannot be maintained), then additional pressure will be placed on the local public transport network in Cambridge to absorb more passenger journeys than shown below, and future network capacity will need to reflect this. Alternatively, if other travel interventions

deliver greater support for walking and cycling, then it is possible that less public transport capacity will prove feasible.
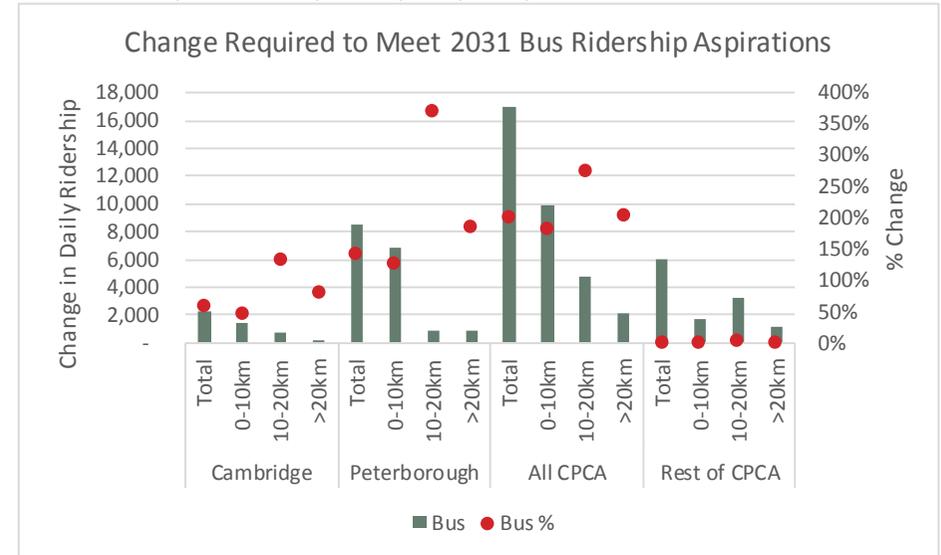
Figure 2.   Change in Bus Journeys Required to Meet Mode Share Aspirations

1.4.12 As shown:

- There is a very significant increase in bus passengers to be accommodated in Peterborough, mostly in the short-distance category (0-10 km), although the greatest proportionate increase is in the 10-20 km category;
- Increase in passengers to be carried in Cambridge is of a lower volume (because a high proportion are assumed to walk or cycle), but nevertheless this still represents a 63% increase over current bus use, with significant growth in travel of over 10km;
- Note that although this growth is categorised as being focused on Peterborough and Cambridge, the distances concerned have

profound implications not only for city-centric travel, but also for travel to/from the wider hinterland; and

- There is significant increase in travel volumes assumed in the wider CPCA area, albeit that these represent quite small proportions of existing travel.

1.4.13   These conclusions point to the need for radical interventions in Peterborough and Cambridge, as well as in the wider travel-to-work area, and therefore guide the proposals brought forward in the remainder of this report.

1.5   Changes in Technology, Society, and the Drivers for Change in Transport

1.5.1   This section aims to provide context for some of the options explored later in this report, and highlight how key drivers of change require us to think radically on the future of the transport sector.

1.5.2   This Strategic Bus Review must consider a full range of short-term (1-5 years), medium-term (6-10 years), and long-term (10+ years) transport options. It is therefore important to think about the technological and societal changes that have happened in recent years, and those that are likely to happen in the future across these time periods. These changes will profoundly affect the level of demand for travel as well as the physical means by which people travel, their travel needs, and their expectations for what represents an attractive transport offering.

1.5.3   Throughout history, technological changes have revolutionised the way we live and the way we travel. The internal combustion engine has had a dramatic influence on our natural landscape, the form and function of our public space, and is continuing to have a global impact on the environment as well as the health of the world's population.

Other technologies, such as the telephone and refrigeration, have changed both our need to travel as individuals and our means and requirements of transporting goods and services.

1.5.4   Fast-forwarding to the present, it is easy to forget that equally radical technological and societal changes have taken place in recent decades and are continuing to evolve, mature, and impact how we travel. Some of the biggest areas of change, both in transport and society more widely, are introduced below. Some of the largest opportunities and risks coming from this disturbance to traditional public transport delivery are then are explored in the next section.

Mobile Devices and the Internet

1.5.5   The rise of the internet, and in particular mobile devices such as smartphones and tablets, has changed the way we interact with the world around us, and expanded the suite of products and services available in the transport industry.

1.5.6   Mobile technology is becoming increasingly sophisticated, and smart devices provide an invaluable tool within the transport sector. In addition to the ability for voice and text communication across the globe from almost any location, features on smartphones now generally include locational positioning services, secure payment options, and user-friendly interfaces (e.g. via apps) that change the way we access information and act on that information while on the move. Examples of how these features can be used in the transport context are provided in Section 1.6 and many of the case studies throughout this report.

1.5.7   Figure 3 opposite shows smartphone penetration by Age Group. The rate of adoption observed is significant. It can be seen that the penetration (i.e. access to the device) of smartphones rose from 44% to 74% for all adults in a six-year period between 2011 and 2017, with

particular increases in the 55-64 age group (23% to 64%) and the 65-75 age group (8% to 36%). While those aged 16-54 are now likely to be at peak penetration in terms of access to these devices, the trend observed across older age groups suggests that access to smartphones will continue to rise until the vast majority of people have access to such a device. Increased availability of devices suitable for older people and for those with access issues is likely to facilitate this uptake.

1.5.8   While the increased uptake of smartphones does mean that the scale of services which can be offered through this medium will grow, public transport should continue to ensure that it is inclusive for all users. It is therefore important to design, prototype, and test new

services, with particular focus on the most vulnerable and isolated individuals in society in mind.

The Rise of Cashless Transactions

1.5.9   The way we can pay for goods and services has changed. Now well-established payment options, such as smartcards, EMV contactless credit and debit card payments, NFC based mobile phone payments, and the rise of integrated subscription based payment plans are filtering into public transport. While the consistency in payments options is fragmented both geographically and by mode and operator, progress has been made in a number of areas to make the best use of payment options to deliver attractive and integrated mobility services to users. Several case studies which demonstrate this are referenced later in this report.

1.5.10   Some of the potential wider benefits that can be offered from a range of smart ticketing and payment options, to both the user and operator/transport managers, include:

-    Increased patronage – a review of case studies from major urban areas across Europe, North America and Australia showed robust evidence that patronage can increase with integrated ticketing by between 6% and 20%, with some modes experiencing increases in the order of 40%;[6]

-    Improved satisfaction – e.g. from increased payment convenience and fare savings as well as reduced boarding and alighting times contributing to more reliable journeys;

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[5] Base data from: Ofgem, *Adults' Media Use and Attitudes Report*, 2018, available at, https://www.ofcom.org.uk/__data/assets/pdf_file/0011/113222/Adults-Media-Use-and-Attitudes-Report-2018.pdf, accessed on 15/10/2018

[6] PTEG, *The Benefits of Simplified and Integrated Ticketing in Public Transport*, October 2009, UK.

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- Prevention of fraud – through improved verification of payment/ticket validity, and management of concessionary/free travel eligibility;
- Better data on transport use – including a potential reduction of network survey costs;
- Improved throughput of passengers – e.g. via faster boarding times, integration between modes, automated retailing via ticket machines and online sales;
- Reduced operating costs – e.g. through more efficient boarding and alighting;
- E-purse/ account-based potential – allowing for payment of other services with the same account; the ability for family members/parents/guardians to pay for children; and
- Flexibility and choice between payment methods.

1.5.11   With many of these benefits being dependent, from the bus perspective, on the operational capability of the ticketing system, it is essential that there is a clear strategy to progress ticketing in line with the vision for the network.

1.5.12   A recent feasibility study regarding integrated ticketing for the Greater Cambridge area highlights some options.[7] These range from a 'do-nothing' approach, which it notes would achieve none of Greater Cambridge's vision towards intelligent mobility and introduces reputational risk from users, to a 'do-maximum' approach, using account-based systems and allowing contactless cards, phones, and wearables to be used to travel. This could make the area a

pioneer for next generation ticketing, but does present risks if not managed effectively. Ongoing work is also being undertaken the GCP.

1.5.13   Capitalising on progress, ensuring the ticketing approach is managed effectively to minimise risk, and helping ensure any benefits span the whole CPCA area, provide part of the rationale for the Advanced Ticketing Scheme presented later in this report (Section 4.5).

Availability and Analysis of Data

1.5.14   This rise of cashless payment mechanisms and the recording of these and other digital footprints, is offering the opportunity for greater collection, analysis, and the leveraging of useful data. Data about how we travel, such as boarding information, travel patterns (time, distance, origin and destination points etc.), travel speeds on the network, etc., all provide an important tool for those planning and managing transport. The rise of the 'internet of things', where more devices are connected to networks, also offers some interesting opportunities.

1.5.15   Some progress towards the innovative use of data sources in the area is seen through the Intelligent City Platform (iCP), developed by Smarter Cambridge and the University of Cambridge, and supported by the Connecting Cambridge partnership programme led by Cambridgeshire County Council.[8] This project, launched in 2017, collates and processes real-time data from an array of sensors around Cambridge that can be used across different applications. Data sources, e.g. traffic lights, bus movements, and car parks, together with new traffic monitoring cameras and air quality sensors, can be used to monitor a range of measures including air quality, traffic, and

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[7] Cambridgeshire County Council, Integrated Ticketing Feasibility Study, 2017

[8]   Connecting Cambridge, *Data – Intelligent City Platform (iCP)*, https://www.connectingcambridgeshire.co.uk/smart-places/smart-cambridge/data-intelligent-city-platform-icp/, accessed on 28/11/2018

cycle and pedestrian movements. One on-the-ground example is that is that of the digital wayfinding screens installed outside Cambridge Station, and planned for other locations.

1.5.16   As transport options progress in the CPCA area, it will be vital to consider how data can be used to maximise the value of the transport system for local authorities, operators and users.

Increasing Focus on the Importance of Climate Change

1.5.17   Recent years have seen an increase in societal pressure to act on the issue of global warming and climate change. Research, such as the Intergovernmental Panel on Climate Change's 'Global Warming of $1.5^{o}C$' report[9], demonstrates a fundamental need to improve global emissions of greenhouse gases for the purpose of limiting environmental impacts.

1.5.18   The UK's role in the legally binding global climate deal, the 2015 Paris Agreement, and the commitment made with the Climate Change Act to reduce emissions by 80% compared to 1990 levels by 2050, requires major changes to occur in the transport sector to reduce its share of total emissions.

Pressure to Reduce Air Pollution

1.5.19   Air pollution is a mixture of particles and gases that can have an adverse effect on human health. Although air pollution has improved over recent decades, there are still significant public health challenges mainly related to Particulate Matter ($PM_{2.5}$ and PM_{10}) and nitrogen dioxide (NO_2) in the ambient air.

1.5.20   While not a new phenomenon, recent studies have increased societal awareness and policy focus at the national and local level on reducing air pollution, in particular due to its association with a number of adverse health impacts. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions.[10]

1.5.21   Additional guidance on the health impacts of poor air quality and the cost/benefit values of different interventions have been published by the National Institute for Health and Care Excellence (NICE).[11]

1.5.22   There are legally binding health-based limits for concentrations of several pollutants in the outdoor air, notably NO_2. The UK Government have used a combination of national modelling and monitoring in accordance with legislation to determine the concentrations of these pollutants in order to assess compliance.

1.5.23   While relevant authorities in the CPCA area are both working towards these targets, the centre of Cambridge (approximately the area within the inner ring road) is designated as an Air Quality Management Area (AQMA) for NO_2, meaning that it breaches these

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[9] IPCC, *Global Warming of 1.5 ^{o}C*, 2018, available at http://www.ipcc.ch/report/sr15/, accessed on 25/10/2018

[10] The Committee on the Medical Effects of Air Pollutants, *The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom,* 2010, available

at https://www.gov.uk/government/publications/comeap-mortality-effects-of-long-term-exposure-to-particulate-air-pollution-in-the-uk, accessed on 25/10/2018

[11] NICE, *Air Pollution: outdoor air quality and health (NG70)*, June 2017

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objectives, primarily due to vehicular traffic.[12] Particulates are also of concern, although do not exceed thresholds in terms of the AQMA designation.

1.5.24 Peterborough City Council currently has one declared AQMA – this is in a rural area and is not transport related. However, expected growth from development means that this position may not persist and continuation of the status quo may not be a viable reality.

1.5.25 Public Transport will play a key role in helping tackle air pollution problems, both by reducing the need for unsustainable modes and by reducing emissions from public transport vehicles themselves by investing in cleaner technology. Cambridge City Council's Air Quality Action Plan 2018, for example, states that the second of its seven main areas of action is to "Reduce emissions from Buses and Coaches" [13]. While some fleet changes have been made as follow up to their 2008 plan, the changes have not been significant enough to produce the desired change in air quality. Air quality monitoring sites at the bus station show mixed changes across PM_{10} and $PM_{2.5}$.

1.5.26 Cambridge's Air Quality Action Plan also notes that other measures may be required: "The GCP ambition of 10 - 15% less traffic within Cambridge may require further restrictions on access to the city centre, which could include restrictions based on emissions to reduce air pollution.". It also suggests measures such as on street parking

controls (including Controlled Parking Zones), a workplace parking Levy, and wider traffic management. [13]

1.5.27 Peterborough Council's 2017 Air Quality Annual Status Report, notes that changes to bus services, along with residents moving to modes such as walking, cycling, and car sharing, will play a role in improving air quality in the area.[14]

Changes in the Vehicle Industry

1.5.28 Two of the main changes in the vehicle industry which are most relevant to the provision of public transport are the rise of Autonomous Vehicles (AV) and major developments of alternative fuel sources. Both sets of technologies will reach a critical point within the period that this Strategic Bus Review considers.

1.5.29 With regard to AVs, while this field is still in its infancy in terms of real-world fully operational systems, AV models are being prototyped and tested across the globe for different sizes of multiple occupancy vehicles – from small pods of around 6 or 7 people, such as the electric-powered Navya Autonomous Cab[15], to more traditional sized buses, such as the 12m Volvo 7900 electric autonomous bus, which is to be trialled in Singapore during 2019[16].

1.5.30 The advent of AVs brings significant opportunities (and challenges) to the delivery of both demand responsive style services, which

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[12] Cambridge City Council, *2018 Air Quality Annual Status Report*, available at, ttps://www.cambridge.gov.uk/media/6048/air-quality-annual-status-report-2018.pdf, 2018, accessed on 25/10/2018

[13] Cambridge City Council, *Air Quality Action Plan 2018 – 2023*, available at https://www.cambridge.gov.uk/media/3451/air-quality-action-plan-2018.pdf, 2018: p9, accessed on 25/10/2018

[14] Peterborough City Council, *Air Quality Annual Status Report*, available at https://www.peterborough.gov.uk/business/environmental-health/environmental-protection/#AirQuality, 2018, accessed on 25/10/2018

[15] http://navya.tech/en/autonom-en/autonom-cab/, accessed on 25/10/2018

[16]https://www.volvobuses.com/en-en/news/2018/jan/volvo-ntu-to-trial-autonomous-electric-buses-in-singapore.html, accessed on 25/10/2018

underpin concepts such as Mobility as Service, and more traditional fixed route bus services.

1.5.31 In relation to alternative fuels – when considering the move towards improving air quality and reducing emissions, the implementation of emissions standards in Europe for diesel powered buses has spurred on advancements in technology for not only diesel vehicles but other power sources.

1.5.32 European emissions standards are defined in a series of EU directives introducing increasing standards, with the latest introduced in 2013 as 'Euro VI'. As these standards have become progressively stringent and harder to meet, bus manufacturers have increasingly turning to alternative fuels and technologies to meet market needs. The most established of these include:

- Electric;
- Hybrid and Plug-in hybrid;
- Gas, including CNG and Biomethane; and
- Hydrogen fuel cells.

1.5.33 Funding is currently available in the UK via the Office for Low Emission Vehicles' Ultra Low Emission Bus Scheme to help facilitate the uptake of cleaner buses.[17]

1.5.34 Further consideration of vehicle technology is included in relation to the options in Section 2.7.

Changes in Lifestyles and the 'Mobility System'

1.5.35 A report produced under the Disruption Project, by a partnership of universities across the UK, suggest that society has already become much more multimodal, with two-thirds of people in the UK using multiple transport modes every week. It cites a study in Bristol, in which 52% of people who had used a bicycle as their primary mode for their commute during the survey week had also used another mode of transport in the same week for that same journey. For those who had used a car, 36% had also used another mode.[18]

1.5.36 The study also suggests that major transition points in life, such as when we move employment or housing, are also incredibly important in determining how we travel. It suggests that 50% of people change the main way they get to work every decade.

1.5.37 Heightened expectations for flexibility in how we travel, and the changes in lifestyle that underpin this, such as increased home working, mean that the concept that individuals have a standard way of travelling from A to B is quickly becoming obsolete.

1.5.38 To help deal with this, the mobility system needs to be considered not just as a transport network of roads and buses etc, but as a web of interactions between that transport network, social resources (e.g. social networks and relationships), the communication system (such as connectivity via mobile devices) and the activities that people undertake (e.g. working, eating, leisure etc.).

1.5.39 Approaching the planning of transport from this interconnected viewpoint offers the opportunity to deliver a more attractive system that really meets the needs of users.

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[17] UK Government, https://www.gov.uk/government/publications/low-emission-bus-scheme, accessed on 25/10/2018

[18] Flexmobility, *Unlocking Low Carbon Travel*, 2016, available at http://www.disruptionproject.net/category/outputs, accessed on 25/10/2018

1.6 Technology as a Disruptor and Enabler in the Transport Sector

1.6.1 With the array of changes outlined above, the traditional transport system, including bus, is being both disrupted and enabled by the arrival of new types of services and delivery models. The often-referenced Uber example, of the rapid market penetration of a new style of service, has forced many established transport providers (and planners alike) to fundamentally rethink what their potential users see as important, and how responsive they need to be to meeting those needs as part of their service offering.

1.6.2 A wave of concepts around user-focused transport have risen as part of this debate, with huge market potential emerging for real innovators to enter the transport sector. The Transport Systems Catapult (TSC), which seeks to enable innovation in the UK's transport sector, values the global intelligent mobility sector at £900 billion per annum by 2025.[19]

Mobility as a Service

1.6.3 One of the most popular of such concepts is that of Mobility as a Service (MaaS), which is generally promoted as putting the customer first and building mobility systems around their preferences or needs.

1.6.4 The TSC defined MaaS as: "Using a digital interface to source and manage the provision of a transport related service(s) which meets the mobility requirements of a customer"[20] in its report on opportunities for MaaS in the UK.

1.6.5 While the debate continues around this definition of MaaS, generally it is expected that we see a role for an organisation as a 'MaaS Provider' who's purpose is to develop a service offering for customers to access a range of transport assets and services. This would typically involve bringing together a range of transport providers, ideally across a wide range of modes and including public transport, and packaging this to allow flexibility and added value compared to simply owning a private vehicle. There is also a major role for data providers and integrators to facilitate the seamless flow of information between key actors across this value chain.

1.6.6 Features of the MaaS service offering include things such as:

- A personalised service relationship and account, usually accessed through a smartphone app in the first instance;
- Journey planning, based on personal preference for a range of requirements such as cost, mode, and time;
- An easy transaction for information, booking and payment, generally incorporating a choice of payment, such as pay-as-you go, or a monthly subscription; and
- Flexibility and the ability to react to changes on-the go, with the user kept informed and able to make decisions in real-time.

1.6.7 A MaaS case study from the UK is provided later in this report in Section 4 when introducing potential delivery models for the CPCA

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[19] TSC, *Imagine: Driving Intelligent Mobility, Review 2016-2017*, 2017: p4, available at https://ts.catapult.org.uk/2017/08/14/mobility-service-new-paradigm/, accessed on 25/10/2018

[20] TSC, Mobility as a Service: Exploring the Opportunity for Mobility as a Service in the UK, 2016, available at https://ts.catapult.org.uk, accessed on 25/10.2018

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area. Studies regarding developing the framework for MaaS also exist, such as the Swedish case study produced by Holmberg et al.[21]

1.6.8　MaaS is currently being explored as part of the Smart Cambridge workstream noted previously.[22] Work currently includes, working with local operators to explore data availability; auditing transport data availability; investing in the MotionMap real-time travel app; making data from the Intelligent City Platform (ICP) available for re-use (see Section 1.5.15); and researching integrated ticketing (see Section 1.5.12).

1.6.9　Again, exploring opportunities across the wider CPCA is a key point for this review.

Opportunities, Risks, and Engaging Positively with Technology

1.6.10　Technology providers (big and small) and other third parties, are well positioned to enter this emerging mobility market. They can make the most of any existing customer relationships, their experience in areas such as advanced data analytics, and their head-start in user focused design, to integrate services and provide an attractive offer to potential customers. They can do this without becoming a transport operator themselves, building upon the integration of existing and new transport systems.

1.6.11　The entrance of new players raises questions about the role of public authorities within the transport context of the future. With MaaS providers and other innovators potentially having a focus only on delivering an attractive offer for end users, difficult questions have to be considered regarding the behavioural elements of transport and

any potential ability to use a carrot and stick approach to achieving policy objectives.

1.6.12　There are very real potential benefits from concepts such as MaaS. A truly integrated and accessible one-stop-shop platform could offer a great opportunity through which to present potential users with a suite of attractive sustainable transport options and potentially promote positive transport choices. However, there is also the real potential that providers of concepts such as MaaS, who are likely to have a role in shaping peoples' travel behaviours, may be almost entirely policy agnostic or may even have a vested interest in promoting behaviours at odds with transport policy.

1.6.13　It is vital, therefore, that bodies like the CPCA and local and regional authorities, engage in some way with these emerging concepts of mobility, as well as other innovations in transport. By being involved early, there is the opportunity to take a seat at the table and help shape how these new mobility services and technologies evolve. Without this early involvement, an opportunity may be missed as potential guiding roles diminish.

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[21] Holmberg et al, *MaaS: Describing the Framework*, 2016

[22] Connecting Cambridge, *Smart Travel – Mobility as a Service (MaaS)*, https://www.connectingcambridgeshire.co.uk/smart-places/smart-cambridge/mobility-as-a-service/, accessed on 28/11/2018

2. INTERVENTIONS IN THE CITIES' NETWORKS

2.1 Introduction

2.1.1 Both Cambridge and Peterborough will face challenges in accommodating significant future growth in population and economic activity without a commensurate increase in car travel.

2.1.2 While not trying to dictate the detailed planning of future bus networks in either city, for the reasons outline in Section 1.1.2, this section presents a range of conceptual interventions which highlight they types of actions which could be explored further, to tackle the challenges they face in each city.

2.1.3 It is recognised that the majority of the options outlined below would require increased spend on public transport and that this would need to be delivered through additional sources of funding. However, to deliver the ambitious targets for mode share in the area, as well as wider Government objectives, such as reducing air pollution and emissions, easing social deprivation and health inequality, and delivering sustainable growth, options should not be discounted at this early stage because they represent a step-change in delivery and resources. Having noted this, it is also recognised that issues such as cost cannot simply be ignored, and therefore options for new delivery models and funding are provided later in this report, in Sections 4.5 and 4.6 respectively.

2.1.4 Longer-distance inter-urban travel to/from the cities, and rural transport services are covered in more detail is covered in the following section on rural and inter-urban transport; this section is focused on travel within the two cities themselves.

2.2 Enhancing the Existing Bus Networks

Establish Minimum Levels of Service

2.2.1 In Peterborough, analysis presented in the Part 1 SWOC report showed that there was a robust foundation on which to build future enhancements, namely:

- Strong ridership on city network;
- Reasonable geographical coverage; and
- Existing cross city links.

2.2.2 However, commercial pressures on the local bus operators coupled with the limited budget available to councils for subsidising bus services have resulted in a more limited provision of services in the evenings and on Sundays, as described in the Part 1 report. Improved services outside the main Monday-Saturday core times would be very valuable as they would support economic activity at all times, including that associated with industries with an extended shift pattern (e.g. many logistic operations have a daily two-shift system, or even 24/7 operations, and employment centres such as hospitals will have working hours patterns which differ significantly from the conventional Monday-Friday routines). A consistent offer for users also provides confidence in bus options and reduces uncertainty in the decision-making process where evening or weekend travel is involved. An example of daytime to evening/Sunday service is provided in Table 1.

> **The concept of 'minimum levels of service' can be used to provide a more equitable network across time periods by adopting rules of provision for evening and Sunday services which relate to the core daytime frequency. This could be explored for both cities.**

Table 1. Example of Relationship of Daytime to Evening/Sunday Bus Frequencies

MAIN DAYTIME FREQUENCY BASED ON MON-FRI 0900-1700 PROVISION	MINIMUM EVENING AND SUNDAY FREQUENCY PROVIDED MON-SAT AFTER 1900, AND SUNDAY 1200-1800
Every 10 minutes or more frequently	At least every 20 minutes
Every 12-15 minutes	At least every 30 minutes
Every 20-30 minutes	At least every 60 minutes
Less frequent than every 30 minutes	No service unless required by specific demand

Committed Equity of Access for Areas of Deprivation

2.2.3 To ensure that local residents have equitable access to the opportunities growth will generate, bus services to deprived areas should be priorities for support and enhancement, including evening and Sunday provision to support the maximum possible accessibility to employment opportunities.

2.2.4 Peterborough faces some specific challenges associated with deprivation, with a significant proportion of the urban area ranked within the 10% to 30% most deprived areas in England.

2.2.5 Figure 4 highlights the three worst areas of deprivation in Peterborough identified in the Part 1 report, and the Citi bus services across Peterborough. In addition to these Citi services, there are the 60, 61, 62, and 63 services:

- 60. Peterborough – Hampton – Orton;
- 61. Peterborough – Fengate – Newark Sainsburys;
- 62. Peterborough – Werrington – Glinton – Maxey; and
- 63. Peterborough – Newark Sainsburys – Keys's Park.

2.2.6 With the exception of the 61 (hourly), these do not offer consistent frequency across the day, with the 62 offering a service every 3 hours, 60 offering five services a day, and the 63 offering two/three services a day depending on direction of travel.

2.2.7 The existing Citi services 1 and 3 offer access to two of the three most deprived areas within the city. High frequencies (every 10 minutes) are offered on these routes during the day, however, evening and Sunday services delivered to the relative levels described above would represent an increase.

2.2.8 The 61 service provides access to the third area of deprivation, although the frequency is noted to be hourly, and does not include a weekend service. This falls short of many of the less deprived areas in the city.

2.2.9 In Cambridge, there are relatively few areas of deprivation, with only two areas ranked in the top 20% most deprived in the country, and six within the top 30% most deprived. The deprived areas are located in the east and north of the city and are currently relatively well served by bus services to the city centre in the peak, although this may not be the final travel destination of these bus-users.

A commitment could be made to serve areas of high deprivation with a defined 'attractive' level of service provision, reviewed regularly to ensure this is in line with the most attractive service levels provided in each city in terms of single service frequency.

As growth takes place, areas of deprivation should be prioritised, where possible, to ensure that they have access to new

employment opportunities, and services (such as retail, health, and education) are maximised.
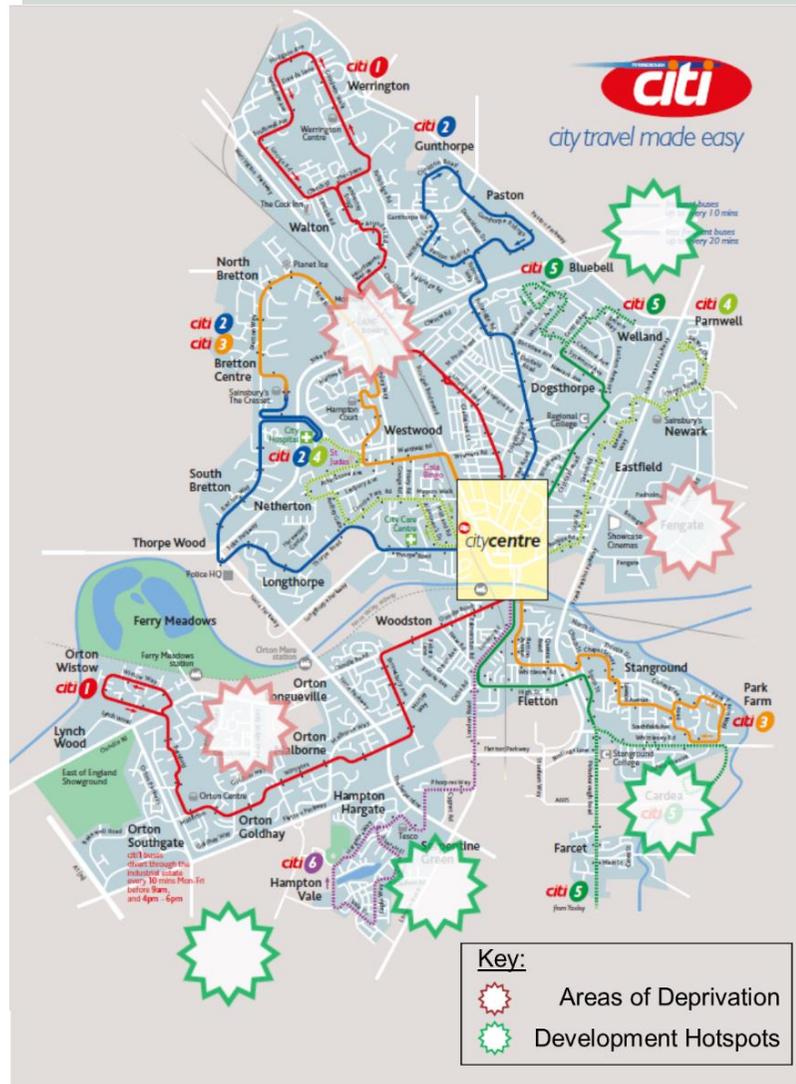
Enhanced Radial Bus Services in Peterborough

2.2.10 Providing improved bus services in isolation is unlikely to be successful – what will be critical is providing worthwhile links to existing and emerging centres of economic activity, some of which are also highlighted on Figure 4.

2.2.11 In Peterborough, continued growth of the outer suburbs will result in extended journey times from these suburbs to the city centre if existing bus services are simply extended further out and other measures are not put in place to speed up services.

2.2.12 In some cases, Section 106 Agreements may be leveraged to provide changes to the network, however, where this is not possible, additional funding sources would need to be considered. Constraints on local authority budgets make it unlikely that this funding would be available via this avenue in the short term at least, and so alternative sources would be needed.

Where growth is targeted at specific outer suburban locations, then bus services could be reconfigured to offer more direct linkages to the city centre.

By this reasoning, examples of such changes would be to provide enhanced or new peripheral links between:

- City Centre – Norwood & Paston
- City Centre – Hampton
- City Centre – Great Haddon

A funding arrangement which does not rely solely on s106 Agreements may be required to ensure this is feasible where required most.

Bus Service Pairs could be Cross-linked across Cambridge City Centre

2.2.13 In Cambridge, the network is slightly less optimised than Peterborough, partly because increasing traffic congestion has meant that many of the formerly cross-city services now operate separately either side of the city centre. Congestion can affect reliability and make cross-city service difficult to deliver. The offset nature of the railway station (south-east of the city centre) and concentrations of activity around Addenbrookes Hospital (also to the south-east of the city) mean reliable cross-city links would be particularly valuable in Cambridge.

2.2.14 Where possible, it would be beneficial for pairs of services to be linked across the city, removing interchange requirements, and potentially improving journey times for key movements. The Part 1 SWOC accessibility analysis showed that journey times from north to south are particularly impacted. With much of the residential development being in the north of the city, and employment in the south, this represents a real issue for daily commuter trips. Figure 5, shows the journey time by public transport for access to the Addenbrooke and Biomedical Campus in the morning peak, with journey times in the north typically up to 45 minutes, with almost 10 minutes of this being made up by interchange in the city centre.

2.2.15 Pairing of services can only occur in conjunction with either a reduction in congestion or adequate bus priority interventions which ensure punctual and reliable operation throughout the network. Suggestions for this are covered later in this chapter.

Consider the feasibility of providing targeted cross-city services for high demand movements, aligned to congestion reduction or bus priority interventions.

Biomedical Campus
Accessiblity Time
(mins)
- <= 15
- 15 to 30
- 30 to 45
- 45 to 60
- 60 to 90
- > 90 (or inaccessible)
- Biomedical Campus

Ely

St Ives

Soham

Cambourne
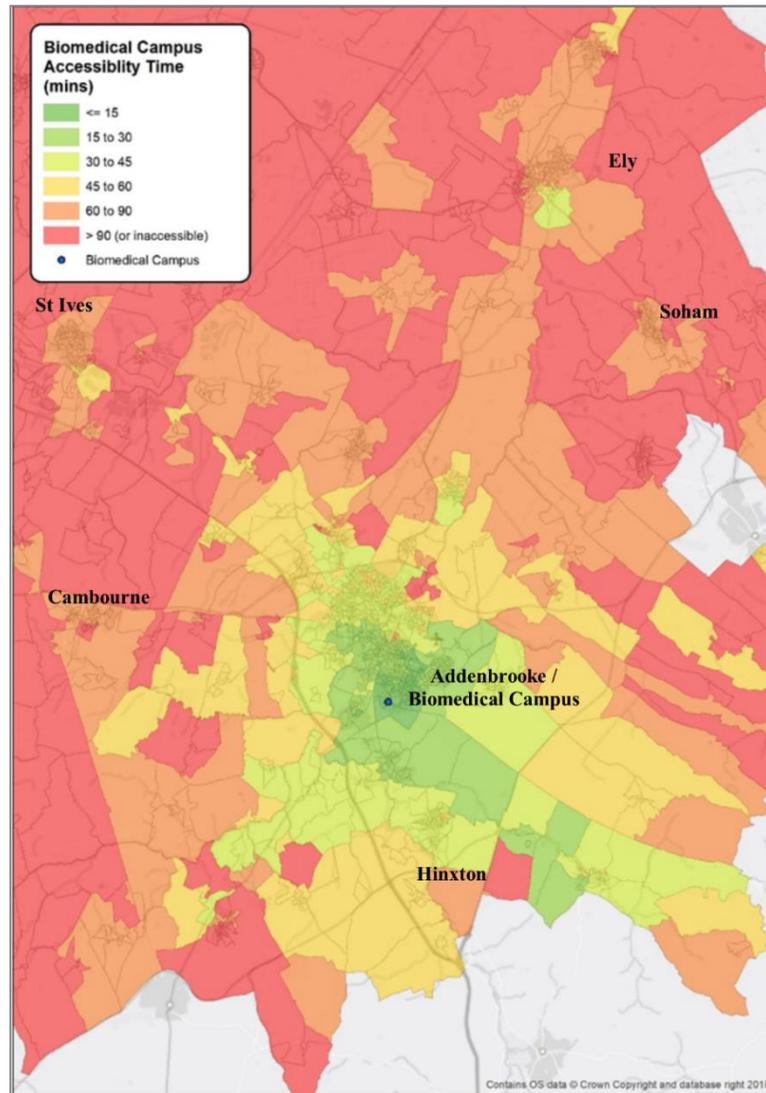
Addenbrooke / Biomedical Campus

Hinxton

Contains OS data © Crown Copyright and database right 2018

Evolve into a 'turn-up-and-go' Network

2.2.16   Some areas of both Peterborough and Cambridge are served by lower frequency services, and although there is a need to ensure value for money from all bus operations, we suggest considering an option to reviewing the potential to enhance frequencies to make services more attractive. Turn-up-and-go bus services need to operate at least every 12 minutes to be attractive, and many bus services in Peterborough and Cambridge fall below this standard.

2.2.17   Engagement with local authorities has highlighted that funding is currently an issue, with cuts to costs required in the short term; therefore, enhancements to services would potentially require new avenues of funding to be considered. However, as discussed later, accelerating bus services through targeted bus priority, and accepting adverse impacts on other road users along selected corridors, could support improved bus frequencies without excessive additional costs.

2.2.18   A turn-up-and-go frequency has also been suggested in the GCP's First and Last Mile Strategy[23] in relation to Park & Ride (P&R) travel hub sites only, but as a longer-term strategy could be something which is aimed for across the majority of the core network.

Consider targeting the creation of a turn-up-and-go service. This would largely require enhancing all major radial corridors from Peterborough and Cambridge city centres to at least a bus every 12 minutes (Mon-Sat daytime).

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[23] GCP, Greater Cambridge CaMKOx First/Last Mile Strategy, September 2017.

Merging Park & Ride Services with the Wider Cambridge Bus Network

2.2.19 Although we acknowledge that establishing a high-quality P&R network has been positive in attracting new users to buses in Cambridge, strategically we believe that the future lies with a more holistic approach. Firstly, additional capacity will be required in the bus system, as described in section 1.4, and the current overlapping of conventional and P&R bus services will prove wasteful of scarce resources (vehicles, drivers and road capacity). Secondly, improving quality on the conventional bus network will reduce the need to differentiate P&R services by way of enhanced features.

2.2.20 Such an approach would allow the delivery of bus-based P&R at additional sites (as referenced in Transport Strategy for Cambridge and South Cambridgeshire (TSCSC)[24] without the wasteful deployment of duplicate resources along existing bus routes, whilst simultaneously helping to support the improvement of local bus services for non-P&R journeys.

2.2.21 As an illustrative example, therefore, merging the Citi 4 service with the Madingley Road P&R service, allows enhancements for users of both services. At present Citi 4 offers only a daytime bus every 20 minutes, which is very unattractive for a city bus operation (well short of "turn-up-and-go") whereas the P&R service operates every 10 minutes – merging the two could well result in 8 buses per hour on the main corridor. Citi 4 also has an unattractive hourly evening and Sunday service, which could be replaced entirely by merging with the P&R service (every 20 minutes early evening; every 15 minutes on Sunday daytimes).

> **In Cambridge, part of the increased efficiency of resourcing could be achieved by completely merging the existing P&R services with the wider city bus network.**

Bus Services Adjusted to Complement CAM Proposals

2.2.22 The Cambridgeshire Autonomous Metro (CAM) proposals for Cambridge need to be integrated with the wider bus network, so that they complement each other. Figure 6 shows the CAM proposals superimposed on the existing Cambridge city bus network.

2.2.23 As the CAM proposals are still being developed, routing and service details are only indicative at present. Furthermore, as significant changes may be undertaken to the bus network in the period preceding the opening of the CAM, detailed planning of the bus network cannot be undertaken to specify exact service changes to maximise integration with the metro.

> **However, some general principles can be applied when considering future integration:**
>
> ⭕ The P&R strategy should complement the CAM, replacing services where overlapping, and expanding, relocating or providing additional sites where gaps in capacity, service level, or network coverage exist;
>
> ⭕ Maximise the potential of feeder services;
>
> ⭕ Provide first and last mile solutions across modes, including fixed route bus, demand responsive transport, and Mobility as

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[24] Ibid, page 12

a Service style transport provision (in addition to walk, cycle and car clubs for example);

- Integrate with the existing and proposed rail network; and

- Ensure communication, branding, and ticketing is integrated with other services where possible, presenting a unified transport network to the public.
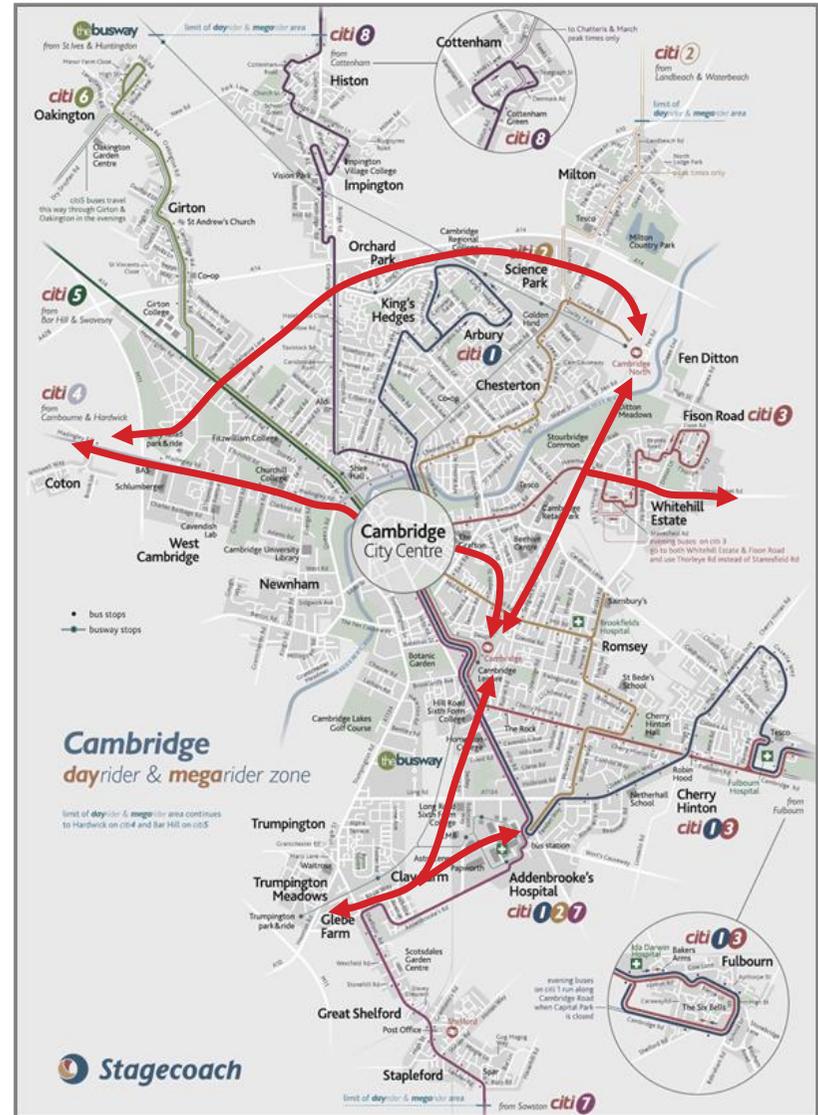

Figure 6.   CAM Proposals Superimposed on Cambridge City Bus Network

Enhanced Bus Service Provision for Key Employment Centres

2.2.24 Major developments, both existing and planned, must be adequately linked into the public transport network. The Greater Cambridge Partnership has identified Cambridge Science Park, Cambridge Biomedical Campus, West Cambridge, and a cluster around Cambridge Airport as key employment centres. They must be supported by adequate and attractive high-quality bus services.

While detailed planning would be required, and some work is already underway to progress access to these areas, some examples of the types of changes which could be made to the network include:

- Cambridge Science Park – provide enhanced links to Cambridge North station via busway; introduce peripheral bus service linking to West Cambridge (e.g. mirroring CAM proposals until CAM delivered).

- Cambridge East and Airport cluster - introduce peripheral link to Cambridge North station and Science Park if suitable route can be identified across River Cam.

- Cambridge Biomedical Campus – receives enhanced services as part of improvements for Addenbrookes Hospital area.

- West Cambridge – enhanced service provided from review of overlapping services; introduce peripheral bus service linking to West Cambridge (mirroring CAM proposals until CAM delivered).

2.2.25 Many hospital locations are not central, and poorly located for existing public transport, but nevertheless will require serving by a high quality public transport system. For example, despite the

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Good Practice – Features of a Good Bus Network

An attractive bus service MUST feature:

- The highest possible frequency of service;
- Fastest feasible journey time;
- Reliability and predictability – buses run at the advertised times and journey times are realistic;
- A simple network which is easy to understand and readily marketable; and
- straightforward opportunities for inter-connection between services where direct routes are not feasible.

An attractive service must AVOID:

- Overly complex routings;
- Low frequencies (particularly in urban areas); and
- The prioritisation of coverage (i.e. providing token services which run infrequently, but which appear to cover the map with bus routes) over attractiveness.

planned expansion of Addenbrookes Hospital it is not intended to provide additional car parking on site. Serving non-central locations (whether suburban or even outside the cities themselves) requires the provision of additional, circumferential bus services where few exist at present, based on the principles for high quality bus services set out below.

2.2.26 In both Peterborough and Cambridge, the characteristics of high quality bus services could be as follows, to maximise attractiveness to potential passengers:

- Highest possible viable frequency, with at least a turn-up-and-go frequency during the main periods of demand;
- Direct routings, balanced by ensuring that key demand generators and attractors are served en route;
- Suitable vehicle capacity for peak demand; and
- High quality in-vehicle features commensurate with the type of service offered.

2.2.27 The box opposite summarises good practice regarding network design for urban bus services, which should be adopted as the basis for rethinking the network as part of detailed Bus Strategy development.

2.3 Targeted Bus Priority

2.3.1 Delivering cost-effective enhancements to bus services, particularly in Cambridge, relies on improving reliability and accelerating bus speeds.

2.3.2 Whilst there are some priority interventions, many of them are compromised by sharing facilities with other modes, particularly cyclists, or by the continued presence of excessive private car traffic in the city centre (see Figure 7). In Cambridge, the reduction in cross-city bus links also results in additional terminating bus movements in the central area.

Figure 7.   Challenges facing Buses in Central Cambridge

Quality Bus Corridors – Cambridge

2.3.3 We recognise that the high mode share for cyclists in Cambridge is a positive feature of the city, but sharing infrastructure between cyclists and buses is often an imperfect solution for both modes. We therefore recommend that comprehensive and continuous bus priority measures (in the form of Quality Bus Corridors) are adopted on a small selection of radial corridors to support the bus service proposals set out above, giving priority to buses over all other users, and with alternative high-quality routes made available for cyclists along these corridors so that bus lanes are not shared.

2.3.4 A GCP study of Milton Road is looking to improve public transport and active travel provision, with options including public transport priority measures that include new sections of outbound bus lane and new floating bus stops, improved segregated cycle facilities, and removal of pavement parking. It is noted that stakeholder concerns have been raised over the proposal, however, concerning loss of green space and potential conflicts between cyclists and pedestrians. This general intent to explore greater separation of conflicting modes, however, does align with the sentiments suggested with the quality bus corridors concept.

Consider Potential Quality Bus Corridors, for example:

- Madingley Road from city centre to P&R site;
- Milton Road from city centre to junction with busway;
- Hills Road from city centre to Addenbrookes Hospital via Cambridge station;

➢ *Together these quality bus corridors on Milton Road and Hills Road would fill the central gap in the busway.*

2.3.5 When looking closer to the city centre, practical issues around the separation of modes is recognised as an issue under the current transport arrangements. Measures which have been used in the city centre, such as Advanced Stop Lines and Advanced Green Cycle Filters can help, but longer-term more radical options may be appropriate in the context, with such high mode shares for active travel and public transport targeted. Some concepts for the central area are presented in the remainder of this section.

Cambridge City Centre – Addressing Modal Conflict

2.3.6 Delivering radical mode shift, per the targets discussed in Section 1.4, will require radical measures, both in the form of carrots but also as sticks.

2.3.7 Therefore, further investigation of constraints on motorised access to the central city core in Cambridge may need to be carried out. It is recognised that previous proposals, such as Peak-Time Congestion Control Points (PCCPs), have been explored and that there are barriers that mean such measures have not been implemented. However, issues of congestion and conflict between modes in Cambridge city centre remain some of the biggest barriers to providing an optimal bus service in the city. As development growth and increased mode share (as per targets) inevitably brings the need for enhancements to services, many of which would seek to travel into or near the city centre, pressures on road space will continue to increase unless managed.

2.3.8 Studies are ongoing regarding central Cambridge, such as those related to the Spaces and Movement Supplementary Planning Document (SPD) being produced by the GCP and Cambridge City

Council. While this Bus Review does not seek to preclude the outcomes of these, we would suggest that the following sentiment, expressed in the recently adopted Local Plan when considering land for new public transport infrastructure, should also be considered for the city centre as well as the corridors noted above:

> "A successful and high quality public transport network needs to be efficient, reliable and attractive. Congestion is a problem in Cambridge, and it is vital for buses to be free from other traffic, where possible, in order for them to deliver on reliability and speed of journey."[25]

2.3.9 A step further than providing priority to buses through the centre could be considered. Although complete bans on entry for other motorised vehicles are unlikely to be feasible, as there will be a continued need for resident access and access for servicing, setting an aspirational vision for the central area of the city centre dominated by walking and cycling not road traffic and complemented by suitable public realm, would make the city centre a distinctive feature of Cambridge and support the radical mode share targets by discouraging use of motorised transport.

2.3.10 Such an arrangement, with coverage shown for illustrative purposes only, as a Green Travel Area in Figure 8, would also underscore the existing, unusually high mode share for walking and cycling in Cambridge and ensure that this continues into the future. This would help minimise the pressure on local public transport and the need for high levels of public funding for bus service enhancements.

2.3.11 Although traditionally bus priority has been associated with hard measures (such as bus gates, restricted right turns, bus lanes, etc),

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[25] Cambridge City Council, Cambridge Local Plan, September 2018

technological advances mean that much more nuanced approaches are now emerging, allowing systems to react to emerging traffic conditions and only provide priority to buses when it is required and will make a difference (see case study on smart traffic management and Figure 9 below).

2.3.12 Figure 8 also highlights a more radical, and again illustrative, option of a bus loop around which buses could circulate (facilitating easy interchange at a series of high quality public transport hubs), and its integration with the proposed Quality Bus Corridors and busway. This bus loop concept builds on the successful launch and development of busway service U by Whippet, which largely skirts the central area.

2.3.13 It is recognised that concepts such as these do present both practical challenges, such as competition for kerb space if smaller, zero-emission vehicles were used to access the central area, and political challenges related to restricting car access, for example. However, these examples are used to stress that fundamental changes to how people, goods and vehicles, access the city centre may be required in the long term to provide a transport system which meets the ambitious targets that have been set.

2.3.14 While this report has concentrated on the benefits for bus operation, there are also benefits to greenhouse gas emissions, air quality and health from helping create a low-traffic city centre, and uncongested and efficient operation of vehicles through the network.

Figure 8. **Illustrative Concept of a Green Travel Area for Cambridge and Bus Loop**

CASE STUDY - Smart Traffic Management

Instead of changing the road layout, an alternative approach is that taken in Amsterdam with use of Smart Traffic Management. In this scheme, traffic signals are made more adaptable to allow priority to be given buses, or other vehicle types. This scheme provides a softer approach to bus priority management which is less aesthetically disruptive.

Smart Traffic Management schemes can also provide drivers and passengers with real-time journey information about upcoming delays and, for cars, alternative routes. These can be combined with in-vehicle navigation equipment to encourage cars onto different routes which are not used by buses.

This approach is being investigated and deployed in Sydney, with full delivery of the system in 2020. The scheme has also been installed in Los Angeles, which had the effect of increasing average bus speeds by c. 25% on the routes affected.[3]

Applicability to CPCA

This approach could be applied to locations within the CPCA with significant congestion, however consideration should be given to what is most appropriate in each setting. Whilst bus lanes have been well-used in the UK, there is scope for more use of Smart Traffic Management which presents an alternative approach to the problem.

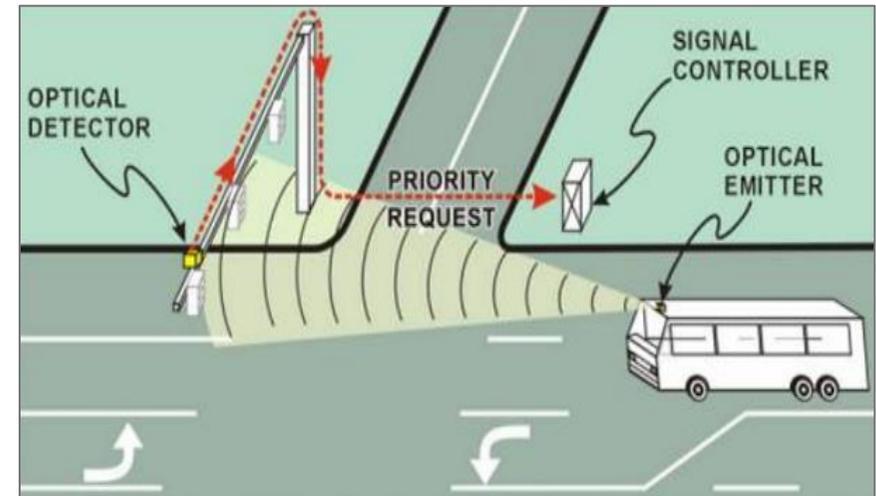**Figure 9.**   **A Typical Arrangement for Bus Priority Signals[27]**

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[26] Active Transport Alliance, *http://activetrans.org/blog/los-angeles-signals-way-better-bus-service,* accessed on 24/10/2018

[27] Graphic credit: *Global Traffic Technologies*

2.4 Flexible Responses to Passenger Requirements

Embedding Quality Services Early

2.4.1 Successful implementations of new bus services need to be demand-led (i.e. responses to clear travel needs), but must be delivered as early as possible in the life of major new developments. Travel habits quickly become embedded, and if there is an inadequate bus service then that travel habit may well revolve around the private car. Therefore, it is critical that bus services for new developments continue to be provided at the start of activity at the location, and that of sufficient frequency and adequate routing to make them attractive to current *and future* users.

2.4.2 Offering token services (e.g. a few journeys each day, or even an hourly service) is unlikely to be sufficient to offer an attractive alternative to the car, and the new service should be embedded within the wider public transport network as quickly as possible. This may well involve striking suitable deals with developers to provide early funding for attractive bus services, based on the specifications set out above – and accepting that this may require compromises on total value of developer contributions to ensure funding is released as early as possible. Services also need to be tailored to the nature of the development – for example, new industrial locations with shift-working arrangements will need bus services which adequately cater for those shift times.

Flexible Services and First/Last Mile Solutions

2.4.3 Modern working practices, with a significant increase in flexible hours, part-time working, and working from home, now result in even more pressures on public transport to be adequately flexible to match users' travel expectations and the alternative flexibility offered by the car.

2.4.4 Figure 10 summarises this approach of flexible, demand-responsive local transport providing a link from major peripheral developments to nearby bus stops and rail stations from where a frequent and attractive public transport service is offered.

Last mile, tailored transport
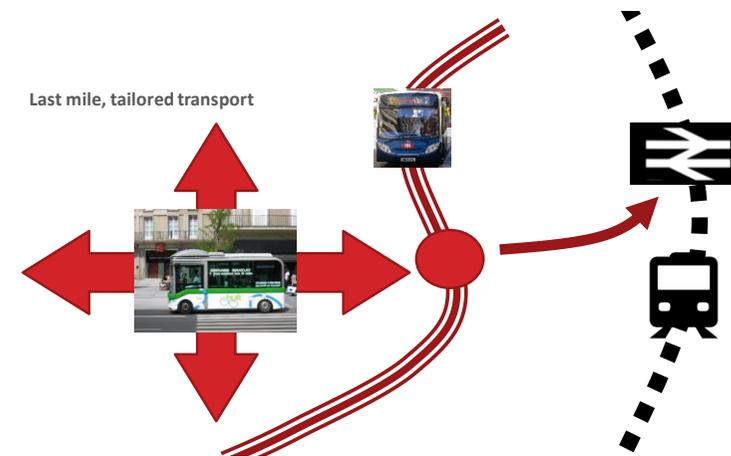
Figure 10.   Flexible, demand-responsive transport at peripheral locations

2.4.5 First mile/Last mile solutions can play a significant role in this attractive flexibility, with commercially-funded demand-responsive solutions now being piloted in a number of parts of the UK as below.

2.4.6 A recent development in the provision of bus transit is the advent of urban demand responsive transit (DRT), an 'Uber for buses'. In this style of operation, passengers can request a bus pick-up using an app at a location convenient to them, rather than relying on conventional bus routes and stops. It is often advertised as an intermediate service between taxis and buses: cheaper than a taxi, but more flexible than a bus. This solution would address concerns over infrequent or irregular bus service patterns and can help plug the gap in areas not best suited to conventional fixed route services.

CASE STUDY - PickMeUp – DRT in Oxford

Oxford Bus Company (run by Go-Ahead) launched their DRT service – PickMeUp – in June 2018. The service operates across the central city and surrounding area (shown in the map, right), covering 12.2 square miles. Passengers experience average response times of 10 minutes, lowered by the existence of 2,000 'virtual bus stops' – agreed pick-up points which are generally more convenient to passengers than existing bus stops.

Fares during the introductory period are set at £2.50 for all journey lengths, with a surcharge applied if the route taken could be completed on an existing bus route. Passengers on conventional buses currently pay between £1.10 and £2.20 for their journey, depending on journey length. The service is operated by minibuses.

Applicability to CPCA

Oxford's service has seen around 750 early adopters becoming regular users of the system, and the company is managing to run a system over much of the city area at an early stage. The immediate applicability of this system to CPCA would be in Cambridge and Peterborough, with areas well suited to this, outlined below. Furthermore, if DRT services in these areas proved successful, this form of bus transit could be expanded, and may be able to provide solutions in the urban fringes of these cities and beyond.

These services would provide a unique way to cater to a wide range of journey purposes which vary in time of travel, e.g. education, health visits, friends and relatives.

The types of location which may be suitable for urban DRT in Peterborough and Cambridge include, but are not limited to:

- ○ Norwood and Paston (Peterborough)
- ○ Stanground (Peterborough)
- ○ Hampton and Great Haddon (Peterborough)
- ○ Cambridge Science Park and Regional College
- ○ Cambridge East and Airport cluster
- ○ Cambridge Biomedical Campus and Addenbrookes Hospital
- ○ Cambridge West development area

2.4.7　Delivering a holistic and flexible transport experience should include consideration of how taxis interact with the wider public transport offer in the cities. As we discuss later, offering transport users a flexible experience requires a new approach to payment for regular transport requirements, and there would be considerable merit in developing a partnership with local taxi owners as they offer a ready-made opportunity to provide flexible local transport solutions.

2.5　Vehicle Quality

2.5.1　Vehicle standards across both city fleets should be best in class if they are to offer an attractive alternative to the private car and support the radical mode shift targets.

2.5.2　Best standard of interior finish, high quality seats, and selected features such as WiFi, and charging points should be standard features.

2.5.3　Vehicle age is less of a consideration provided the fleets are well maintained and regularly cleaned – this is generally the case already in both cities. However, wider policies regarding emissions in the cities may well mean a progressive introduction of low emission vehicles replacing the existing diesel fleets – either hybrids or even electric buses.

2.5.4　There are no intrinsic transport-related reasons to accelerate the introduction of low emission buses - the cost of low emission vehicles should therefore be justified against non-transport objectives such as health, and funded accordingly.

2.5.5　Accessibility for all persons wishing to travel is increasingly seen as a right, and both vehicles and associated stop infrastructure should be specified to provide step-free access to all bus services in both cities, with a rolling programme of conversion where necessary – always ensuring that there is a match of buses to suitable infrastructure.

2.6　Multi-Modal Integration

2.6.1　Bus/rail integration is a key consideration at Peterborough, Cambridge, Cambridge North and the proposed Cambridge South stations.

2.6.2　Inter-modal integration depends on two key components:

- ○ Physical integration; and
- ○ Journey coordination.

2.6.3　Physical integration at all three existing stations in Peterborough and Cambridge is reasonable. However, the number of buses passing close to Peterborough station is very limited, and we would recommend enhancements to the physical linkages between the bus

and rail stations at this location, including improved walking routes and clear signage. The distance to walk is quite acceptable if adequate signage is provided.

2.6.4 Cambridge station has high quality physical integration between bus and rail, and is served by a generally adequate network of buses, including busway services (illustrated in Figure 11).

Figure 11. Busway services at Cambridge Station

2.6.5 Facilities at Cambridge North are adequate, but the station is very poorly served by local bus services, including those along the busway. Commercial bus operators are not prepared to take a long-term view

regarding service development, therefore sustaining an attractive service level may well require funding by the public sector. The potential for growth is underpinned by planned local development which Cambridge North station is well-placed to serve.

Taking these points into account we would suggest exploring:

- Routing additional busway journeys via Cambridge North station; and

- Providing local feeder bus services to Cambridge Science Park, as well as proposed new developments at the Cambridge Airport cluster.

2.6.6 Journey coordination needs to be carefully considered, and action taken in a number of areas. One of the main features of both city bus networks is their role as a feeder to/from the main rail stations, so the timetables offered need to viewed in that context as well as the context of local journey opportunities wholly within the city. For example, to support long-distance commuting patterns, the spread over the day of the high-frequency, turn-up-and-go bus network needs to match peaks in demand for commuters travelling to/from London, meaning that frequent services may be required much earlier and later in the day than if the aim was to service only local commuting.

Timetables should therefore be carefully examined to ensure they are fit for all potential purposes. At locations and times of day when trains and buses are less frequent, careful consideration needs to be given to matching timetables so that adequate timetabled connections are provided where these would be of value. An example of this is the timing of trains and buses at

Cambridge North station, where busway and train times are not coordinated.

2.6.7   The proposed station at Cambridge South should conform to best practices as regards physical integration (Cambridge North would be a good template for this) and in addition should be supported by a network of buses offering a suitable feeder function as soon as the station opens.

2.6.8   The introduction of CAM as a new, additional public transport mode will also need careful integration with existing bus services – with best practice at each interchange and a redesigned local bus network which avoids abstraction from CAM and provides it with the complementary feeder functions which will maximise its contribution to the radical mode shift targets.

2.7   New Vehicle Technologies

2.7.1   It is difficult to project precisely how emerging vehicle technologies will influence bus service operation over the medium to long term. However, it seems highly likely that technologies associated with autonomous (driverless) vehicles will develop rapidly over coming years, and this underpins the CAM concept.

2.7.2   Staff shortages, particularly in Cambridge, are known to have limited the appetite of local bus operators to expand their services, and Autonomous Vehicles (AV) provide an obvious potential solution to that challenge. It is understood that Smart Cambridge, led by Cambridgeshire County Council, and the GCP have secured a grant from the Centre of Connected and Autonomous Vehicles (CCAV) to build and trial 1-15 seater self-driving shuttles to operate on the southern section of the existing guiding busway, initially out of hours.

Take a Lead in AV Operation

To release resources for additional local bus services described throughout this report, we recommend continued support for AV technology operation existing busway operations, releasing drivers over significant proportions of the network, and exploiting existing crew facilities at locations such as St Ives and the Stagecoach bus depot adjacent to the busway in Cambridge.

2.7.3   As outlined in Section 1.5, there are significant pressures on the transport sector from issues of global warming and air pollution. Alternative, cleaner, fuel options are available within the bus market, and many cities are taking action to encourage the implementation of cleaner fleet across their network, for example via bringing in Clean Air Zones. Feasibility of such an introduction is being explored by Cambridge City Council, and the implications for this on the bus fleet should be a priority for consideration.

2.7.4   As noted previously, options other than diesel include: electric buses; hybrid and plug-in hybrid buses; gas, including CNG and biomethane; and hydrogen fuel cells.

Facilitate Cleaner Fleets

The CPCA may wish to engage with operators to consider the most effective route for pulling forward cleaner fuel options across the area. This not just an issue for Cambridge; while Peterborough does not currently have an active AQMA area in its city centre, efforts will be required to ensure that air quality is not adversely affected by growth. Likewise, global emissions of greenhouse gases are still a problem even when released outside of urban areas.

CASE STUDY – Electric and Hybrid Buses in Edinburgh

Lothian Buses, the main bus operator in Edinburgh, has introduced both full electric and standard hybrid buses to a number of routes. 11 electric buses operate on one route, which carries around 1.8m passengers a year, and a further 65 hybrids run on six routes through the city.

Each of these routes pass through AQMAs, and the buses were introduced to help reduce the negative impact of the bus fleet on air quality.

The fully electric Wright StreetAir low-floor buses were introduced in 2017 and can operate for up to 210kms on a single 75kW charge of 3 to 4 hours duration. Each vehicle can carry around 70 passengers and is equipped with wi-fi and USB charging points. Single and double deck versions of the StreetAir are available at a range of sizes. Due to the success of the existing fleet, Lothian Buses intends to upgrade all single-deck buses to electric or hybrids by 2020.

Applicability to CPCA

Clean bus fleets would help reduce air pollution in urban areas and contribute to overall greenhouse gas emission reductions.

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3. RURAL AND INTER-URBAN BUS SERVICES

3.1 Introduction

3.1.1 Sections 3.1 to 3.4 outline some of the key trends and debates around rural and inter-urban bus services, before outlining a number of options which may represent a way forward for the CPCA area in Section 3.5.

Rural Bus Patronage is in Decline

3.1.2 Rural bus services have been in decline for many years. Although usage received a boost from the introduction of free concessionary travel for older and disabled people, the overall trend is downward. Whilst reductions in support have accentuated the demise of bus services, it is likely that this would have come about anyway at some point in the future as usage dwindled further. Many people have abandoned buses, as services are unattractive due to circuitous routes and infrequent timetables coupled with the lack of early morning and evening provision.

There is Pressure on Rural Service Financing

3.1.3 Rural and urban bus services are often viewed differently. This is because urban and inter-urban networks are largely run commercially by operators, who have generally lost interest in rural areas where services are not viable. Rural services, however, are generally supported by local authorities, which arrange these services quite separately from the commercial network.

3.1.4 The significant pressures on public spending in recent years have led to reductions in local authority financial support for bus services. Along with maintaining evening and Sunday buses, most support in the past focused on the provision of rural bus services. Consequently, as cuts in support have been implemented, it is rural areas that have felt the loss of services more keenly. In these areas, it is people with no access to a car that are most affected.

Rural Services have Unique Problems

3.1.5 The car is dominant in rural areas and seen as the only option, even for households that can't really afford a car, or certainly a second car. Therefore, buses are used by a small proportion of rural dwellers – often those who have no other option (older and younger people) and those, who because they have free travel, choose to use it. However, bus users value their services very much.

3.1.6 The problems of rural bus services have been recognised for many years. The sparse population and limited demand make it difficult to provide and sustain, particularly using conventional fixed route bus services. However, this has been the model that has worked as a reasonable compromise, with the ability to be propped up through financial support and co-ordination with school transport requirements.

3.1.7 The above scenario is true also across rural parts of the CPCA area. For example, there are several services that were withdrawn by operators earlier this year for which short-term support is being provided until March 2019, pending the outcome of this Bus Strategy review.

There are Contrasts with Inter-Urban Services

3.1.8 On the positive side, the last 20 years have seen the development of inter-urban bus services. Whilst primarily linking two or more towns or cities, any villages that happen to lie on their routes also benefit,

providing a good level of service for those rural communities compared with other villages away from the route.

3.1.9 Most such services have been developed by operators on a commercial basis, and in many cases do not form part of any planned sub-regional network.

3.1.10 Usage on inter-urban services has been boosted by free concession holders, although in a few cases such services have been excluded from free travel schemes by local authorities on the basis that they are premium services.

3.1.11 As much of the demand is end to end, services have generally become more direct and operate as limited stop, sometimes removing diversions through villages.

3.1.12 Mirroring the national position, the CPCA area has benefitted from inter-urban bus developments, including Stagecoach's X5 Cambridge – Bedford – Milton Keynes – Oxford and First's X1 'Excel' Peterborough – Norwich services.

3.2 Rural Bus Services

Strategy and Vision has been Lacking

3.2.1 Over the last 30 years there has been no national, regional or local strategic leadership or vision for the bus generally, and particularly for rural public transport. Whilst the problems of rural public transport have long been recognised, no lasting solutions have been forthcoming. Instead, a host of short term fixes have been tried, which in many cases have had little lasting impact. Equally, technological innovation has tended to be in urban areas, where there are commercial prospects to achieve a return, for example in the introduction of app-based on-demand transport provision, such as Uber, Bristol Slide and Arriva Click.

3.2.2 There have been a few notable exceptions where opportunities have been taken to develop longer term solutions. For example, Lincolnshire used the additional funds it received through Rural Bus Subsidy Grant (1999) and Rural Bus Challenge (1999-2004) to realise a vision for a co-ordinated network of regular 'InterConnect' services, alongside a network of 'Call Connect' demand responsive feeder services. A consistent, long term approach was taken, such that the network remains in place today.

There is a Role for Demand Responsive Transport

3.2.3 The potential for demand responsive transport (DRT) to play an important role in rural public transport has been recognised for some time. A 'think piece' for the Commission for Rural Communities in 2009[28] suggested that there was considerable scope for DRT: "Whilst the experiences of DRT over the last 10 years have seen successes and failures, they have all helped to provide valuable insights into the circumstances and conditions where DRT can be successful. There is much evidence to support the view that there is a role for DRT; the challenge is knowing where, when and how to deploy it as an appropriate solution."

3.2.4 The paper noted that DRT offers various opportunities because of its flexibility and ability to integrate with other services, offer

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[28] JMP Consultants Ltd (2009): The potential for demand responsive transport to play an increasing role in revitalising rural public transport, for the Commission for Rural Communities

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personalised services and be cost effective. It also noted there were several barriers that had been around for a while and still needed to be addressed. Whilst some of those still exist today, such as the

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CASE STUDY – Lincolnshire DRT

In Lincolnshire, a long term and consistent approach has been taken to the development of Call Connect, which complements the mainline InterConnect services.

Services have been integrated with special educational needs, adult social care and community transport, and economies of scale achieved through the expansion of Call Connect (including to neighbouring areas) and back office functions being used to manage DRT services for other authorities in addition to Lincolnshire.

Applicability to CPCA

Some Call Connect services operate in the CPCA area, however, integration such as in Lincolnshire may offer added opportunities for these and future services.

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complicated regulations and licensing arrangements, others have been addressed through the improvements in technology, which have allowed on-demand transport services to develop and bookings via apps.

Pressure is Placed on Community Transport to Fill the Gap

3.2.5   In most rural areas, since the recession in 2009, bus services have been under continued pressure and been in a spiral of decline. There

have been significant funding reductions, coupled with public consultations that fuel concerns and uncertainty around whether services will continue. Resulting from these have been service reductions and modifications. Whilst more emphasis has been placed on community transport to fill the gaps, the sector has insufficient capacity. Equally, the ability for community transport to operate in certain ways has been under challenge from the commercial sector, causing a distraction from service development and provision. This situation remains unresolved, as decisions by the Department for Transport (DfT) are awaited.

There are Learnings from Total Transport

3.2.6   In recent years, the Government has tried to assist with short-term mitigation measures. The DfT provided two rounds of funding for the voluntary sector to bid for new minibuses. Also, between 2015 and 2017, the DfT funded some 'Total Transport' pilot schemes, which aimed to help local authorities develop integrated solutions to rural transport provision.

3.2.7   Cambridgeshire benefited from Total Transport funding, which was used for two different purposes:

- A review of school transport provision in the Soham area, to achieve a more efficient and cost-effective network.
- Development of the East Cambridgeshire Connect service, a demand responsive minibus service designed to meet general needs, replacing some one day per week services, alongside the specific needs of social care users and those who had previously used a dedicated dial-a-ride service.

3.2.8   The East Cambridgeshire Connect service has opened up new travel opportunities and enabled some previously specifically-commissioned services to become mainstream. The service has

added value in encouraging new journeys and new users. The variety of destinations is an indication of demands that weren't met by previous services. Equally, the fact that concession holders also pay a fare indicates that the service is valued.

3.2.9 This Total Transport project, along with others across England, has demonstrated that new approaches to rural transport are possible. Key learning points are:

- Local knowledge is necessary in developing new services, together with new thinking and innovative ideas.
- No one size fits all; different approaches are needed for different areas.
- Constructive local dialogue is needed with service users and other interested parties.
- Rural bus services cannot be commercially-viable and will continue to be dependent on subsidy.
- Integrated approaches ensure efficient use of resources.
- Revised legal frameworks may be needed to facilitate new types of services using smaller vehicles following legal challenges to community transport providers' use of use of section 19 and section 22 permits for commercial road transport operations.

Lack of a Coherent Network Presents Multiple Challenges

3.2.10 Overall, there is a lack of any sense of a 'network' in rural areas, with different operators responsible for different services, with limited co-ordination and lack of integrated ticketing. Bus stop infrastructure is often minimal, with limited information provision in many locations. Rural areas have been neglected in recent years, as attention has focused on public transport in urban areas. This has been intensified by the creation of Combined Authorities and the emphasis on economic growth and regional and inter-regional connectivity. Quality Bus Partnerships generally cover urban bus networks and it is

these areas that benefit most from investment by operators in vehicles and local authorities in infrastructure improvements.

3.2.11 Dealing with rural bus service decline has been viewed as two difficult to grasp. Therefore, the past approach has been to come up with initiatives aimed at patching things up, rather than taking a step back and considering what a totally new model might look like.

3.2.12 Government and local authorities have tended not to consider rural transport strategically, but instead consider support for small scale local initiatives, individual bus services or community transport projects in isolation and often based on specific proposals and bids for funding.

3.2.13 Over the years, there have been many initiatives aimed at addressing the transport problems of rural areas. There has been funding for new services and for different organisations to develop solutions. However, these have often been small-scale and piecemeal, with short-term funding and with little likelihood of becoming sustainable.

3.3 Inter-urban Services

3.3.1 As previously noted, the X5 and Excel services provide inter-urban links across the CPCA area. Equally, the Busway between St Ives and Cambridge might be viewed as a special type of inter-urban service. Over time, both the X5 and Excel have sought to become more direct, benefitting passengers travelling between urban areas, but reducing levels of service for intermediate villages.

3.3.2 Inter-urban bus services need to be part of the overall picture of public transport provision. Their more direct routes and limited stops mean that they are better able to compete with the car on journey time. They may offer high standards of quality and comfort, such that

they are viewed differently to ordinary bus services. Passengers can make good use of the time whilst travelling. Given these positive attributes, there is potential for such services to provide part of the framework on which to build rural bus networks.

3.3.3   This concept of direct and limited stop, generally with a reduced journey time, is likely part of the success of rail services, which have seen a marked increase in patronage in the area. As shown in Table 2 station entries and exits have increased greatly at rural stations (other than at Shippea Hill) between 2006/7 and 2016/17.

3.3.4   This growth in the rail industry shows what can be achieved through quick and direct access (admittedly with other factors contributing), and that many people in rural areas are willing to connect to a transport hub (in this case a station) in order to access attractive transport services. The inter-urban bus network can learn from this, and compliment this, but must seek to avoid direct route competition where there this can't be sustained.

Table 2.   Rail Station Entries and Exits[29]

STATION NAME	2006/07 ENTRIES & EXITS	2016/17 ENTRIES & EXITS	% CHANGE
Ashwell & Morden	108,013	150,384	39%
Cambridge	6,522,309	11,424,902	75%
Dullingham	19,676	40,376	105%
Ely	1,420,734	2,209,350	56%
Foxton	64,685	92,908	44%
Huntingdon	1,448,338	1,840,936	27%
Kennett	16,056	37,150	131%
Littleport	146,218	242,814	66%
Manea	1,603	13,452	739%
March	296,607	395,950	33%
Meldreth	195,567	269,934	38%
Peterborough	3,960,429	4,774,744	21%
Shelford	111,852	182,138	63%
Shepreth	76,382	110,756	45%
Shippea Hill	606	156	-74%
St Neots	888,971	1,351,480	52%
Waterbeach	227,281	440,142	94%
Whittlesea	22,148	30,474	38%
Whittlesford Parkway	294,534	509,744	73%

[29] Office of Rail and Road, *Estimates of Station Usage*, available at http://orr.gov.uk/statistics/published-stats/station-usage-estimates, accessed on 30/11/18.

CASE STUDIES – Inter-urban Services

A recent report by Greengauge21 sought to raise the profile of inter-urban bus services. It considered several case studies, including some where networks had been developed.

TrawsCymru Network

TrawsCymru is a strategically-designed network across Wales, promoted by Welsh Government, which aims to fill gaps in the public transport network and provide connections with other bus and rail services. It has developed gradually, either creating new services or building on existing services, bringing them up to a common standard and with enhanced levels of provision. TrawsCymru branding has been applied across all services. Services are long distance, but offer local travel opportunities along the route. In some cases, services have been made more direct and have been withdrawn from village diversions. To compensate, other local services, such as the Bwcabus DRT service in south west Wales, have been introduced to serve rural communities. Bwcabus aims to meet local travel needs and connect with TrawsCymru services for travel further afield, helping to build usage of the inter-urban network.

Lincolnshire Interconnect

In Lincolnshire, Rural Bus Subsidy Grant and Rural Bus Challenge funding provided the ability to develop the InterConnect network. In 1999, service 6 between Lincoln and Skegness formed the backbone of the network, eliminating some of the village diversions. Demand responsive Call Connect services were introduced to cover the villages and to provide interchange with service 6 at Horncastle and Spilsby. Other InterConnect and Call Connect services were gradually added to the network, with common branding and service standards.

A survey in 2008 showed that usage had been encouraged by improved regular services, both by existing and new users. Services that had become half-hourly showed substantial modal shift, with 48% of journeys previously made by another mode (of which over two thirds had been by car). The network provides good connectivity across a very rural area and has demonstrated that with appropriate frequency enhancements can be a viable alternative to car.

Applicability in the CPCA

These case studies highlight the importance of: complementing and integrating with rail services, while not trying to compete directly; connections with appropriately scaled local routes, including DRT, at key locations; the need for consistent branding and service standards; the need for an attractive frequency on core routes.

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[30] Greengauge21, *Interurban Bus – time to raise the profile,* 2018

3.4 Potential Role of Inter-urban and Rural Bus Services

3.4.1 At an officer workshop in September 2018, views on the future role of inter-urban and rural bus services were discussed. There was general agreement that both types of service were required. Particular points raised included:

- Should inter-urban services run in parallel to rail services? The TrawsCymru case study presented above, suggests a complementary role rather than an overlapping or competitive role.
- Inter-urban bus services may help improve connectivity with areas beyond the CPCA boundary.
- Many of the success factors for inter-urban buses replicate the reasons behind the significant recent success of regional rail services, and it is proposed that consistent levels of minimum service should apply to inter-urban bus services, with reasonable frequencies throughout the day and week, in line with those offered by rail.
- There is a balance to be achieved between directness of inter-urban services and levels of service provided for rural communities. Feeder services will be able to link into inter-urban services at hubs or interchanges.
- Roads used by inter-urban bus services can suffer from congestion, creating reliability problems.
- Development of rail and CAM services could render some inter-urban bus services redundant.
- Routing of services needs to consider peripheral employment areas as well as links to town and city centres. However, it is impractical to provide services from everywhere to everywhere. There may be a role for orbital services which connect with arterial services.

- It will be important from an equity point of view to ensure that services continue to be provided in rural areas. A fundamental principle is that all rural areas should be covered in some form.
- The different geographies within the CPCA area need to be recognised in developing bus services. The north has a series of market towns, creating different focal points for travel. The south has no market towns; people either seek to access Cambridge or places beyond the boundary of the CPCA area.

3.5 Way forward for Inter-urban and Rural Bus Services

Support to Commit to Long-term Network Planning

As a starting point, it will be important for the continued need for rural public transport to be recognised by elected members, decision makers and other stakeholders.

3.5.1 This leadership needs to be backed by a strong vision, based on a strategic, comprehensive approach with long-term and consistent support. The importance of on-going subsidy needs to be acknowledged, as does the need for modernisation and change in approaches to delivery.

A Suitable Support and Development Framework is Needed

There needs to be a comprehensive approach to rural transport; it needs to be bold but practical and affordable, offering stability and opportunities to achieve economies of scale.

3.5.2 The following key principles are considered important to underpin and provide a suitable framework for the support and development of rural public transport:

- Recognise that there will be a continuing need for rural public transport and that it will require financial support. Therefore, policies should recognise this, backed by on-going funding to fund services. Capital funding, in addition to revenue funding, will help ensure infrastructure is provided to support service enhancement.
- Take a holistic view of urban and rural public transport networks, recognising the linkage between the two. Exert some form of considered, central planning over rural networks to ensure they develop in an integrated and efficient way. A sense of 'network' needs to be achieved, whilst still leaving room for tailoring solutions to local needs.
- It will be important to involve rural communities throughout, both to articulate needs and to assist in the formulation and implementation of solutions.
- Collaboration by all interested parties (policy makers, commissioners and providers) is vital to achieve integration, economies of scale and effective use of resources. This will form the basis of an integrated (e.g. Total Transport) approach. Using the powers of the Bus Services Act 2017 may help (see later discussion on delivery models).
- A range of different operators and types of service (mixed economy of provision) will be necessary to find the most effective solutions for different areas. These may include private bus, taxi and private hire vehicle, community transport, public sector in-house vehicles, car clubs and car share schemes, all promoted across a single integrated service, perhaps provided via a MaaS platform.
- Taxi licensing reform may assist in service developments, and community transport operators may benefit from some consolidation of certain functions.

- Inter-urban bus services will form the framework for local networks, with more sparsely populated areas served by demand responsive services, feeding into the main network. There will be a presumption against low frequency fixed route rural bus services, which should be replaced by more flexible demand responsive arrangements feeding into a network of rural hubs. Hubs would be linked to each other and major urban centres by high quality inter-urban bus services running at least every 30 minutes.
- Operators need to be incentivised to develop and improve services, rather than merely operate services in a passive way as specified by commissioners. Again, partnership approaches should help, together with the use of more flexible procurement methods that look to achieve desired outcomes (as opposed to focusing on inputs and outputs).
- The value placed on services by users should be recognised, with fares set to reflect this and in a way that will help sustain services in the future.
- From a health and social care perspective, the organisation of non-emergency patient transport needs to be reviewed and reformed in order that it can be planned and provided in an integrated way with other types of transport.
- Use technology to support information provision, ticketing and on-demand service provision.

Getting this Right Matters for the Most Vulnerable in our Community

3.5.3 There will be an on-going need for some form of rural public transport provision. Rural areas will tend to have older populations and there will be other groups that have limited or no access to private transport. There will also be those requiring specialist transport. Currently, even in areas with little or no conventional bus services,

there are needs being met by various other types of transport, including non-emergency patient transport, volunteer car schemes and transport for school pupils and social care users.

3.5.4 Rural areas can't be ignored, as it is the most vulnerable individuals in those communities that will suffer and there will be risks of having to deal with other problems, such as the impacts of social isolation on people's health and well-being. There will continue to be travel needs to be met, particularly amongst older and younger people without access to a car.

In meeting rural transport needs, it will be important to take a holistic view, rather than the fragmented approach. A consistent and long-term response is needed, taking account of current needs, but also with a view to the future, to avoid catering only for a declining market.

Recognise the Benefits to Mobilise Action

3.5.5 As a precursor to change, it will be important for good rural transport to be seen as a necessity by decision makers and politicians at all levels, such that its wider social, economic and environmental benefits are recognised. This will provide the necessary support for regulatory and organisational change, as well as securing on-going funding.

A starting point for policy could be that all rural areas should have a public transport service that provides access to employment, education, shopping and recreation, operating at least 6 days per week at reasonable frequency.

A Coordinated Approach could be Provided by the CPCA

3.5.6 An effective network is unlikely to emerge if left to multiple agencies with different funding streams.

A centrally planned approach, led by the Combined Authority and taking forward concepts along the lines of those presented at the end of this section, is required to achieve a coordinated network.

3.5.7 It may be beneficial to explore the organisation of non-emergency patient transport to be considered as part of this, enabling that to be integrated too and adding to the demand for a flexible responsive transport service, but acknowledging that the early focus should be on modernising the delivery of rural public transport for general users, without the distraction associated with specialist transport provision.

Inter-urban bus services, together with any local rail services, could form the framework for the rest of the network.

3.5.8 If these bus services were supported, then they could become part of a franchised network planned and controlled by the Combined Authority. If the services were operated commercially, they could remain in the control of the operator, if it agreed to meet various conditions, including co-operation with feeder services, integrated ticketing and assurances on maintenance of services in the long term.

Delivering Rural Transport

3.5.9 The network could be developed in partnership with operators and include a mix of fixed route and flexible services.

The following principles are recommended:

- Fixed routes should only be provided where there is a recognised bulk demand, otherwise comprehensive DRT would be specified.

- Whatever delivery model is adopted, most rural services will require subsidy. Packages of service contracts could be put out to tender. Contractors could include commercial bus companies, taxi operators, on-demand providers, community transport or local authority in-house (where allowed by legislation).

- Common branding and promotion of services and integrated ticketing will likely be key.

- Vehicles may be multi-purpose and be used to convey all types of passengers.

3.5.10 Lessons from Peterborough City Council's work with Lincolnshire County Council on the existing Call Connect services may offer some valuable insights on partnership working in this way.

Maximise the Role of Hubs via Integration

The idea would be to plan the network in the most efficient way, with local fixed or flexible transport feeding into the main fixed public transport services at hubs, with all services running to clock-face timetables.

3.5.11 All specialist transport would be integrated and all demands and referrals for transport made through a single point that would plan and schedule flexible services. Integrated ticketing would apply across all services, with smartcard or other payment technology, and

CASE STUDY – Rural Car Clubs

Car clubs offer a potential solution for rural travel in areas where bus operations are difficult to run for financial or operational reasons. This would provide a solution to residents who cannot afford to finance car ownership, but are still able to drive.

In one business model, the car club owner covers all costs of the vehicles including tax, maintenance, fuel and cleaning. Members may pay an annual fee as well as rates based on miles driven and hours or days of usage. This is the approach taken by ZipCar and CoMoUK. Alternatively, members of the car club can already own cars and are paid by others for usage of the car when they do not require it, e.g. easyCar.

Of these two approaches, the latter is more suited to the rural setting as residents could use neighbours' cars when they were not required. Although conventionally used to reduce congestion on the road network, car clubs also present an alternative to bus transport in rural areas.

The easyCar scheme is already available nationally, however the concept could be applied on a smaller scale within CPCA if sufficient publicity was used to increase participation. Users can book cars via the company's app which also shows the locations of available vehicles nearby. Car owners who participate are paid annually based on their car's usage.

Applicability to CPCA

With dedicated publicity across the authority, participation in such a scheme could be brought to the levels required to provide a reliable service to rural residents. These schemes offer another alternative to private car use rural areas, and could be planned as a network to integrate with bus hubs on the inter-urban network. Additional benefit could be gained from prioritising low emission vehicles for operation.

real-time tracking of all vehicles. Free concessionary travel could remain on all conventional bus services, as this would help to encourage usage and modal transfer from car. It is suggested that all flexible services would involve a charge for everyone, although this would be discounted for concession holders and could be free for users for whom another agency is responsible (such as those eligible for non-emergency patient transport).

Bold Medium and Long-Term Changes are Required

Whilst the starting point might be based around current services, the aim could be to ensure that consistent and comprehensive provision was in place.

3.5.12 This wouldn't necessarily be based around existing community transport operating areas or conditions. Furthermore, booking arrangements and scheduling would be centralised. As such, there may be some consolidation of community transport organisations, again to achieve economies of scale. All types of provision would become integrated, including car clubs, volunteer car services and car sharing schemes. For instance, a car club vehicle might be used by someone without their own car, to provide transport as part of a volunteer car scheme. Equally, the car club vehicle might provide a local vehicle to provide a school transport service, rather than contracting with a taxi company that may have significant dead mileage.

Involve Communities

3.5.13 It will be important to involve local communities, recognising that they have local knowledge and insight, will highlight needs and demands and can contribute to solutions.

New initiatives would be encouraged and supported, such as the crowd-sourcing of services to test out new potential routes. Also, initiatives to use available capacity, such as the ability to sign-up to receive messages about available travel opportunities at relatively short notice.

3.5.14 There are various ways to mobilise community action. One method, which is used extensively on the UK's rail network, with around 60 in place across the country, is that of Community Partnerships. Community partnerships act as a means of connecting local communities to the railway and train operators that serve them. They act alongside local, regional and national partners to improve social inclusion, community well-being, as well as promoting sustainable and healthy travel. There have been efforts to introduce community partnerships focusing on bus usage, e.g. in Leicestershire, however the success of rail partnerships is yet to be realised for community bus partnerships. A case study example is provided alongside.

Establishing Community Bus Partnership along similar principles to rail partnerships could be explored.

3.5.15 We believe that empowering local rural communities to engage with their transport provision is fundamental to making them a success. Where additional operators are required, such as community transport providers or locally-based taxis, the CPCA could help support the establishment of suitable Social Enterprises in rural areas, ensuring that funding for rural transport is focused on employers based in those areas wherever possible.

3.5.16 This would involve appointing a network of rural transport Hub Co-ordinators with a central coordinator, with the intention that as much

of the planning and delivery can be delivered through the local Hub Co-ordinators ensuring a suitably tailored service for local users and communities.

SYSTRA

CASE STUDY – Meldreth, Shepreth and Foxton Community Rail Partnership

**Meldreth, Shepreth and Foxton
Community Rail Partnership**

This community rail partnership, based in South Cambridgeshire, was launched in 2013 by local council members, the train operating company, and Network Rail. The group was established to:

- develop community engagement;
- work with other local interest groups;
- promote rail as sustainable transport;
- work with local schools to offer work experience and increase awareness of the railway; and
- to support the development of travel plans by local authorities.

As well as holding regular meetings, the partnership publishes news on its website, informing users of local developments in rail. In addition, they also provide links to live train times for the stations within their area. Part of the purpose of such schemes is to give local communities a sense of participation and ownership of their facilities.

Applicability to CPCA

Community Partnerships are a good way to get local communities involved in their local transport network and increase the likelihood of people in the region with using the services available. Such groups would also act as useful modes of sharing news and updates about bus services, and give residents a channel for voicing their views.

This model could be adapted to become an important part of the bus network in the CPCA area. The Association of Community Rail Partnerships (ACoRP) provide useful resources and case studies on their website about the successful running of community partnerships.

Network Concept

> **A stronger network concept for rural and inter-urban services should be considered, providing feeder hubs and services to connect low access areas to core transport links.**

3.5.17 While a detailed strategy would provide further service detail, guiding principles could be as follows:

- Develop a series of attractive core inter-urban routes with a minimum level of service guaranteed (e.g. 30 minute or better frequency) provided by bus or rail between cities and large towns;
- Provide a further tier of service for links between large market towns and some smaller towns, offering a sustainable but consistent minimum frequency (e.g. 60 minutes on Monday to Saturday);
- Align these with the rail network and CAM plans. As noted previously, rail services are performing strongly in the area and bus routes should not seek to compete with these where no benefit is added. Enhancements to service capacity are being introduced to existing services in coming years, and East West Rail is planned for a 2025 opening. Development of a detailed study for a March to Wisbech rail link also recently achieved support from the CPCA mayor. Where future rail plans such as these, and other mass transport options such the CAM network around Cambridge, are known, inter-urban bus services may still be used to build up public transport patronage in the lead up to these services coming online;
- Use the core networks developed above (rail, core bus, and secondary bus) to form the backbone of a network of connecting hubs at villages and service centres along routes. These hubs

would be served by appropriately scaled, and consistently branded and integrated, rural feeder services and DRT services; and

- Hubs could also integrate with cycle facilities such as secure parking and a network of quality cycle routes.

3.5.18 To illustrate the concept, if such an arrangement was provided on the Cambridge – St Neots corridor, Camborne could act as a rural transport hub with feeder services connecting in to an inter-urban bus service between Cambridge and St Neots running at least every 30 minutes, as well as Citi services.
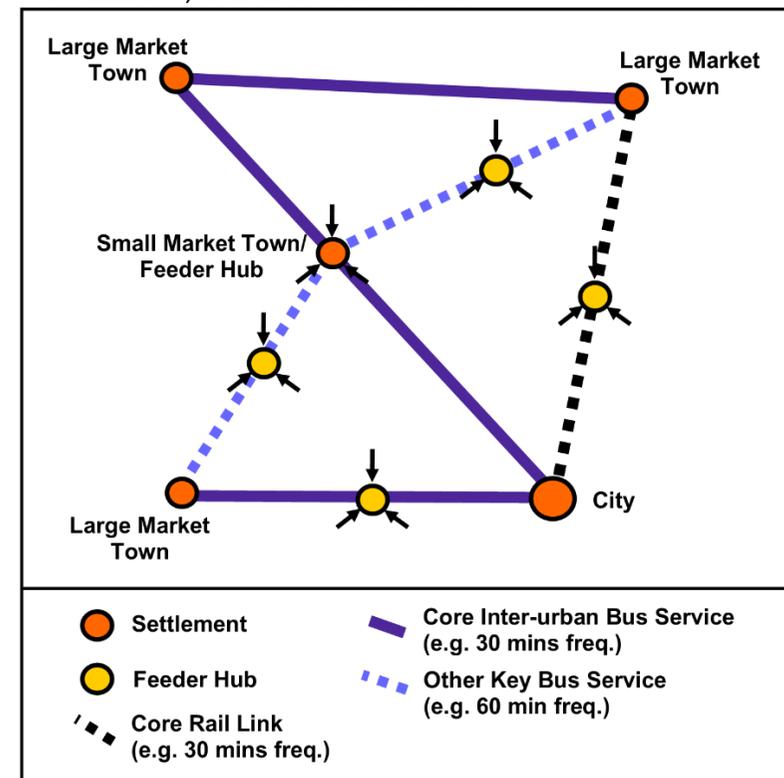
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4. DELIVERING MODERN PUBLIC TRANSPORT

4.1 Holistic Delivery of Public Transport

4.1.1 Delivery of these radical mode shift targets requires a step change in the weight placed to delivering transport solutions in the CPCA area – as already emphasised, the targets mean that simply continuing business as usual will not achieve success, and the delivery of significant changes to delivery will need a new approach to funding and resourcing.

4.1.2 There are many fundamental components of delivering a more holistic approach to delivering public transport, summarised in Figure 13.

4.1.3 The vision is to deliver high quality public transport as if it was a key 21st Century utility, in similar way to modern telecommunications (e.g. high-speed broadband). Transport has always been largely a means to an end (few people travel solely for the enjoyment of the journey), and re-envisaging it as a 21st Century utility affords it the weight given to other utilities – it isn't a "nice to have", it is critical to success of the CPCA area, as embodied in the CPCA's radical mode shift targets.

4.1.4 There are several components to successful delivery of transport as a utility.

4.1.5 Firstly, the services themselves need to be fit for purposes. Most aspects of this have been touched on in the previous section of this chapter: providing high quality, high frequency city bus services, using best in class vehicles, and supported by world-leading

infrastructure, alongside seamless integration with other sustainable modes (walking, cycling, rail and CAM).

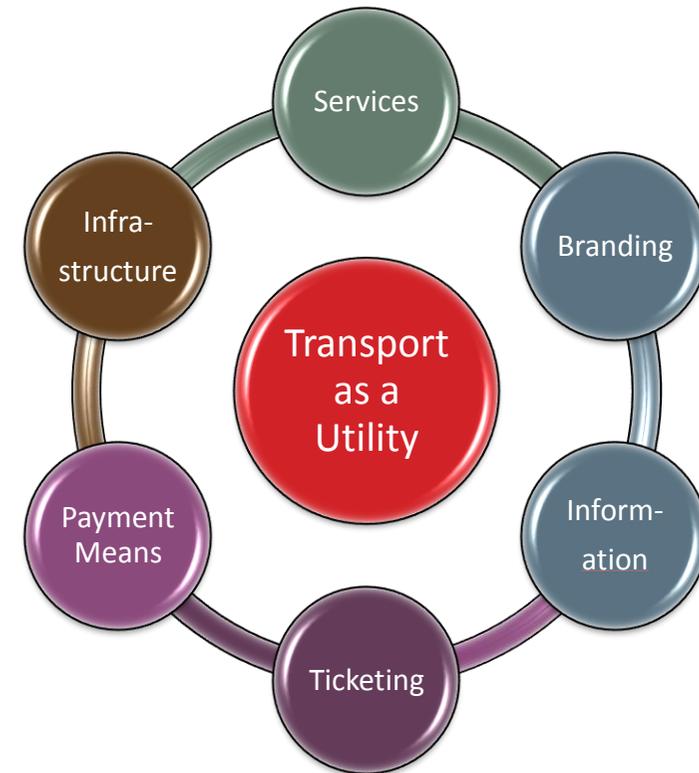

Figure 13. Holistic Delivery of Public Transport in CPCA area

4.1.6 The vision is for public transport to be an unobtrusive part of everyday living for residents and workers in the CPCA area, a utility they use without stopping to think about it, and within which usage patterns can be flexed at will to meet changing daily needs. The

model we have in mind is that of mobile phone usage, which is now simply taken for granted as part of most people's lives.

4.1.7   In the same way that mobile phone users have no need to understand the technology and back-office systems which support their use of the phone wherever they may be in the world, then the objective should be to ensure that public transport users have the same ease and flexibility of use.

4.1.8   Transport provision will still involve multiple providers: bus operators, community transport, the CPCA itself, other public-sector authorities, train operating companies, cycle hire providers, community car clubs, and the CAM franchisee for example. Providing a seamless marketing front and effective communication with these multiple service providers will be critical in positioning public transport as a 21st Century utility. Branding must be unified and information coordinated so that a coherent message is always provided. This links to the need to consider all aspects of the 'Mobility System', as described in Section 1.5.38, including social resources, communication, and the activities that people undertake.

it is suggested that communication, branding, and ease of user access are reviewed in line with network options to ensure an effective approach is taken.

4.1.9   Fundamental to this repositioning of public transport as a utility will be payment means and ticketing. Replicating the flexibility and seamless nature of mobile phone pricing suggests a move towards multimodal payment contracts encompassing all relevant transport modes in the CPCA area, following mobile phone practices – see adjacent panel.

4.1.10   In principle, as with a mobile phone, subscribers choose between a

Transport Delivery for the 21st Century

Pay monthly

- O Choose services you need
- O Multimodal
- O Include green modes
- O Top ups and extensions

Pay as you go

- O Electronic purse
- O Combo
- O Geo-fencing
- O Concessionary Travel

Devices

- O Cards
- O Phones
- O Residual cash payments
- O Wearables

fixed monthly contract payment and/or the opportunity to pay as they go for selected services (a combination of the two being feasible).

4.1.11   With this model, payment for the regular contract would be for a stipulated set of services (e.g. all bus services in Peterborough, or all

transport services provided through a selected rural hub, etc), with touch on/touch off or geo-fencing to check validity. Certain contracts would then authorise the payment means provider to take payments for services not covered by the contract (e.g. out-of-area travel, or use of other modes).

4.1.12 Back office systems then deal with revenue allocation between participating transport providers.

4.1.13 In this model, ticketing becomes a secondary consideration for residual non-contracted travel – through a range of agreed and simplified ticket products (e.g. single fares for one-off journeys, daily passes for selected areas, etc). Users would be incentivised through pricing initiatives to use the contract travel facilities.

4.1.14 Taxis offer a flexible response to both rural and urban transport requirements, and we would recommend that they are incorporated into its holistic delivery – with one potential "transport contract" including the potential to use taxis as part of the transport solution.

4.1.15 Infrastructure is also a key part of the transport service offer, and needs to be delivered holistically alongside all other elements – for example, as already cited ensuring that physical accessibility measures are coordinated with provision of suitable vehicles.

4.1.16 Many of these aspects are covered by the Mobility as a Service concept, as introduced in Section 1.5 and the case study below.

4.1.17 These variations require changes to the delivery model, as at present many of the components are either not in place or are not delivered holistically.

New mobility concepts, such as MaaS, should be explored to consider their potential to provide holistic delivery of the mobility system.

CASE STUDY – MaaS, WHIM in the West Midlands

After successfully establishing their business in Finland, WHIM have started operations in the West Midlands as the first provider of MaaS in the UK. Users can subscribe to the service at different levels:

- Pay as you Go – no monthly subscription fee; aimed at less frequent travel users who pay for each service as they use it. Similar to conventional travel, but with all transport modes presented together on one platform.
- Whim Everyday - £99/month; allows for occasional use of hire cars and taxis on top of regular use public transport.
- Whim Unlimited - £349/month; users on this plan have unlimited access to public transport, taxis or cars.

The scheme will also be expanded when shared bicycle systems are put in place in the West Midlands.

Applicability to CPCA

Such a scheme in CPCA would simplify the way passengers pay for their travelling needs. It would additionally help the public to see CPCA's bus network as one part of a wider transport network that can serve their travelling requirements in different ways. Both objectives would help to improve the perception and usage of the bus network in the region.

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4.2 Fares Initiatives

4.2.1 Ensuring that public transport is affordable will help to maximise its usage. At present, there is a limited range of tickets available, including day, weekly and monthly unlimited travel on selected operators and in selected areas – with some constraints on what can be delivered in terms of multi-operator ticketing as a result of competition legislation that restricts cooperation between operators regarding pricing.

4.2.2 Targeted initiatives that could be considered include:

- Discounts for young people;
- Targeted initiatives at new developments; and
- Initiatives to reduce the cost of concessionary travel funding.

4.2.3 Given the high proportion of local population who are students, particularly around Cambridge, discounts based solely on age or status (i.e. for students) need to be carefully controlled as they could rapidly lead to a significant erosion of the revenue base. Discounts are available on Stagecoach services for under 18s and those in full time education. However, it may be beneficial for discounts to be applied either to all fare-payers (e.g. by moving to a city-wide flat single fare for each city), and/or with discounts targeted at carefully selected groups such as young apprentices and jobseekers. This would require consideration of a new approach to working with commercial operators, or the adoption of a franchising approach.

4.2.4 In addition, to encourage the development of positive travel behaviours at new developments, it may be beneficial for residents and bona fide employees at new developments are offered discounts on existing ticket products for a finite time designed to give them an incentive to sample the available bus service. While this may be

undertaken for some developments already, a consistent and accessible framework for managing this across the whole CPCA may be beneficial in order to make this a go-to arrangement.

4.2.5 Some transport authorities have considered requesting a voluntary contribution towards free concessionary travel under the English National Concessionary Travel Scheme (ENCTS), for example a voluntary donation of £1 per journey undertaken by a concessionary travelcard holder. Our research into travel behaviours by travelcard holders, described in the Part 1 report, suggested that demand for travel by this group was relatively inelastic, and that a modest charge would have limited adverse impact on ridership (i.e. would be likely to generate a positive revenue effect).

4.2.6 However, the Government has strongly discouraged transport authorities from pursuing this option, and has strengthened legislative support for free travel. Moving to a modest compulsory charge would require a change to primary legislation, which is unlikely to be supported by Government. While not explicitly against legislation, for a voluntary contribution it is by no means clear that the courts would support a situation where a transport authority was seeking voluntary donations if there was any hint of coercion. An example of an authority seeking voluntary payments on a local service otherwise threatened with cancellation if revenue did not increase was ruled non-compliant with the ethos of the legislation, and the Government recently issued guidance against that type of action.

4.2.7 The situation regarding concessionary travel on community transport services is different, and many such providers charge fares even to ENCTS cardholders. Our proposals to expand rural demand responsive transport, if delivered via community transport providers,

would allow fares to be charged for all passengers, perhaps with ENCTS cardholders offered a discount.

> **We would therefore recommend the following fares initiatives for consideration:**
>
> - Simplified, flat fare system for Peterborough and Cambridge;
> - Discounted fares for young apprentices;
> - Discounted fares for active jobseekers;
> - Retention of current free travel arrangements for ENCTS cardholders;
> - Discounted fares for over 60s on community transport services; and
> - Promotional packages for new residents and employees of new developments – suggested 50% discount for one year.

4.2.8 Fares initiatives can be made easier to implement by some of the changes resulting from the Bus Services Act 2017, described later (section 4.5).

4.3 Political Support

4.3.1 Delivering radical reform to how transport is delivered, such that it becomes a core utility underpinning economic success in the CPCA area and delivering the radical mode shift targets described previously, will require strong and consistent political support.

4.3.2 This support will be required to secure sufficient budget allocations, maintained over a prolonged period of time, and to give coherent and consistent support, across multiple electoral cycles.

4.3.3 Significant changes to the delivery models for public transport are proposed, and are likely to be resisted by some stakeholders. Political support will be critical to seeing through the proposed series of reforms.

4.3.4 Some interventions are longer-term (see Section 5 for implementation proposals). Support across multiple political terms will be critical to ensure projects are seen through to completion, and that there is no cherry-picking of easy/non-controversial schemes from the integrated, holistic programme (as loss of certain elements may well undermine delivery of the whole programme).

4.4 Delivery Agencies

4.4.1 There will be a wide variety of stakeholders involved in repositioning transport as a 21st Century utility. Delivering a radical mode shift compared to current travel patterns will not be achieved easily, and will certainly require a very clear focus on adhering to the vision, and delivering the components which will make up the coherent, holistic programme.

4.4.2 Drawing together professional officers from the current transport authorities, delivery of the necessary back office systems, and ensuring community support as the programme advances will require radical changes to how transport is currently delivered, in the form of a modern transport delivery agency.

4.4.3 We refer to this as Transport for Cambridge and Peterborough, and a schematic illustration of the high-level relationships is shown in Figure 14.

4.4.4 Such an arrangement would be critical in delivering a robust future working relationship with transport providers, as discussed in section

4.2, which could encompass negotiations to investigate enhanced partnership working with local bus operators, or (if desired) bus franchising with its associated competitive procurement of network operators.

4.4.5   Interventions to enhance bus service delivery are not confined to operational or marketing interventions associated with public transport, but will also require adjustments to highway capacity, delivery of bus priority measures, etc. TfCP will therefore either need to incorporate appropriate powers over local highways, which may be difficult to achieve under existing legislation, or alternatively it will need a very robust and seamless working relationship with relevant local transport authorities to deliver the necessary infrastructure underpinning successful bus operations.

4.4.6   TfCP will also need to work in a holistic manner with other key delivery agencies associated with transport, most notably the Greater Cambridge Partnership (to ensure a coherent and integrated economic and transport strategy), and also with land-use planning authorities (to ensure delivery of coherent transport and land-use plans).

4.4.7   As TfCP will not have direct control over local rail services, a robust working relationship with the rail franchisee and Network Rail will also be critical.

> **It is anticipated that TfCP would adopt a Board and Executive structure, broadly:**
>
> ○ **Board** – local political representatives, including the Mayor, perhaps alongside senior stakeholder directors (e.g. from the

> rail franchisee, Network Rail, etc) plus Non-Executive Directors (e.g. representing local passengers); and
>
> ○ **Executive** – TfCP senior officers, charged with the responsibility of delivering the Board's strategic vision.

4.4.8   We acknowledge that delivering the radical proposals which are critical to successful achievement of the mode share targets will require an investment of staff and other resources, whilst maintaining business-as-usual for existing transport delivery, with a transitionary period whilst existing and "shadow" delivery models are both in place, requiring temporary additional staff resources.

4.4.9   At the conclusion of the transitionary period, TfCP will have assumed responsibility for delivering the public transport network in Cambridgeshire and Peterborough which is required to support the economic and social vision for the Combined Authority area, ensuring that it remains fit for purpose and responsive to the needs of its users.

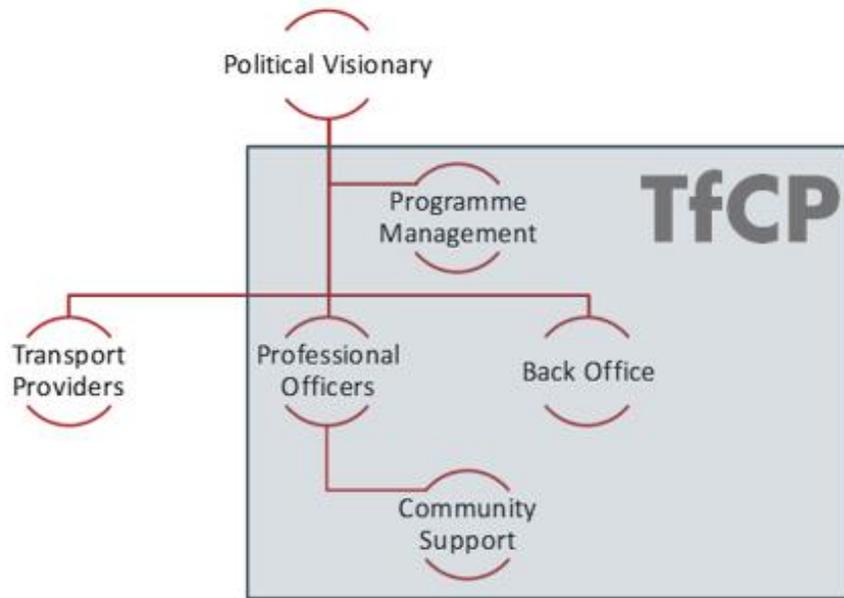4.4.10   As we set out in Section 5, we anticipate a phased implementation of the TfCP model over the medium term.

Figure 14. **Stakeholder Relationships – Transport for Cambridge and Peterborough**

CASE STUDY - Central Management of Bus Services - TfL

Bus services in London are managed by London Bus Services Ltd, a branch of TfL. It plans bus routes and service frequency, as well as monitoring service quality. Private operators run the services under contract from London Buses. Since 2001, the contracts awarded have been 'Quality Incentive Contracts', which are gross payment contracts (i.e. TfL retains revenue) with additional incentives for operators. These incentives include bonus payments or penalties relating to the performance of the operator against benchmarked conditions. Quality of Performance is measured through an eleven-point list of quality areas including aspects such as Passenger & Staff Security, Customer Satisfaction, Driver and Vehicle Quality Monitoring. A summary of the key facts of the tendering process is set out below, as described by TfL in their tendering and contracting document:

- Routes are tendered individually, but can be let simultaneously to facilitate service changes.
- Contracts are normally 5 years, with scope for 2-year extensions depending on performance.
- Tendering is a continual process, with 15-20% of the network tendered each year.
- Contract payments are related to mileage operated and overall reliability of the service.

This tendering process gives TfL control over what the winning operator can do in its operation, giving a sense of overall control over the type of service provided across the region. Greater control over how buses are operated across the region results in a more consistent service offered to passengers, even when different routes are run by different operators. As a central body managing London's bus services, TfL can monitor all of the region's bus services and thus hold individual operators accountable for poorly performing services. This system therefore maintains the benefit of operators competing for routes, whilst retaining a region-wide level of regulation and control. Passenger satisfaction with bus services in London is high, with overall satisfaction at 85% for 2018/19 Q1.

Applicability to CPCA

Having a central authority to manage bus (and wider public transport) operations in the region would be of great benefit to CPCA. As explained above, this approach would help to provide passengers with a consistent level of service across the region. In addition, it would provide a useful first step in standardising the cost of bus travel in CPCA, potentially increasing frequency of use and satisfaction as a result.

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[31] TfL, http://content.tfl.gov.uk/uploads/forms/lbsl-tendering-and-contracting.pdf, accessed on 24/10/2018.

[32] TfL, *Network Performance Summary*, 2018/19 Q1: http://content.tfl.gov.uk/2018-19-q1-network-performance-summary.pdf , accessed on 24/10/2018.

4.5 Delivery Models

4.5.1 The current delivery models for public transport in the CPCA reflect historic arrangements, and differ by sector. Broadly speaking they have involved:

- Commercial (i.e. unsubsidised) delivery of public bus services by three local operators (Stagecoach, Delaines and until recently Whippet) – these services are provided under provisions of the 1985 Transport Act, giving operators freedom to operate any services they see fit provided no subsidy is required (so-called "bus deregulation");
- Supported public bus services subsidised by local transport authorities and operated by a selection of local operators, to meet perceived social needs resulting from gaps in the commercial bus network;
- Community transport initiatives in Cambridgeshire and Peterborough, some available to all users, but others restricted to certain user-categories. Typical types of delivery model include (further information in Part 1 report):

  - Rural bus services, some provided on a demand responsive basis;
  - Car schemes – volunteer drivers providing lifts to key locations;
  - Local authority transport services – predominantly for home-to-school transport (including support for additional support needs) and social care transport;
  - Community vehicle sharing schemes; and
  - Taxi cards.

> The concept of a holistic approach to transport as a utility supporting 21st century development aspirations, articulated in the radical mode shift targets for the CPCA area, will require integration of these delivery models.

4.5.2 Community transport initiatives have already been reviewed by the Department for Transport through their Total Transport pilot, and good practices emerging from those pilots (which included one in Cambridgeshire) have been included in Section 3.2.

4.5.3 Fundamental to repositioning transport as a utility for economic growth also requires tackling the structure of the conventional bus sector in the CPCA, and the associated restrictions imposed by competition legislation as a result of the deregulated bus market (e.g. restrictions on joint ticketing products and cooperation between operators).

4.5.4 Despite the presence of an open, deregulated bus market, there is very little actual competition between operators in the CPCA area – the only significant overlap in services was between Whippet and Stagecoach on sections of the busway, and even this has now ceased.

4.5.5 Recognising that the deregulated market may not always be the most effective delivery model to meet local authority aspirations, recent legislation (Bus Services Act 2017) provides for a range of interventions to modify the fully deregulated model introduced in 1986.

4.5.6 Compared to current arrangements, it is now also possible for local transport authorities to consider[33]:

- strengthened arrangements for partnership working between bus operators and local authorities, introducing new Advanced Quality and Enhanced Partnership schemes;
- bus franchising powers, similar to those available to Transport for London;
- modernised ticketing legislation to support more user-friendly ticketing schemes; and
- improvements to the information available to passengers through audio and visual on-board information and through the provision of open data on timetable, fares and bus service arrival times.

4.5.7 Agreement with Operators could be encompassed within an Enhanced Partnership under the Bus Services Act 2017. If the operator was unwilling to meet these requirements, the CPCA would be able to propose incorporating it within its own network (as part of the franchising element of the Act).

4.5.8 Table 3 summarises the potential for these powers to tackle the challenges faced in the CPCA, and sets out specific proposed applications in the area.

4.5.9 Under a partnership, CPCA/TfCP would have an expanded influence over local bus service delivery, but with very little leverage for TfCP to enforce its plans and operators still at liberty to take commercial decisions, albeit under Enhanced Partnership there is the potential for such decisions to be moderated in line with jointly-agreed plans

and schemes. There would still be only limited data-sharing between operators and TfCP, and constrained strategic decision-making.

4.5.10 Regardless of whether Franchising ultimately emerges as the preferred course for meeting the CPCA's transport aspirations, it is likely that a genuine attempt to established some form of improved partnership working should be a vital prerequisite – if successful, it accelerates delivery of many of the recommendations set out in this document, and if unsuccessful it will be a key point of evidence to support the case for Franchising.

4.5.11 Attempting a partnership-based approach need not delay or postpone franchising, many of the plans will be common to both delivery models and can be developed in parallel.

Our recommendation is that the preferred initial course of action for the CPCA should be to investigate an Enhanced Partnership with Stagecoach (as the only remaining significant commercial bus operator in the CPCA area), with the option of Franchising (perhaps only in selected areas) if it becomes obvious that partnership working with operators will not deliver the radical mode shift targets established for the area. Franchising may be of particular value in rural areas to facilitate a holistic, radical approach to rural transport delivery where most bus services are already contracted by the local transport authority anyway, but also to ensure integration of modes in the cities (eg in association with the CAM proposals).

4.5.12 All these interventions need to be coordinated with wider emerging policies and plans, including the Local Transport Plan (still in draft),

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[33] DfT, *The Bus Services Act 2017 New powers and opportunities,* October 2017

the CAM study (still underway), and wider inputs such as specific economic development plans.

Table 3. Application of 2017 Bus Services Act Powers to CPCA area

CATEGORY OF POWER	DESCRIPTION & DISCUSSION	PROPOSED APPLICATION
Advanced Quality Partnership Scheme (AQPS)	Allows operators and transport authorities to develop minimum quality standards that must be delivered, relating to (for example) vehicle standards, timetables, maximum fares. In return, the transport authority agrees to meet certain obligations (e.g. infrastructure provision). Access to the infrastructure provided by the transport authority is dependent on operators meeting the agreed standards. DfT envisage these being of greatest value where a high level of consensus already exists between transport authority and operators, in a limited geographical area.	Could be used to support the proposed Quality Bus Corridors in Cambridge, and the Green Travel Area proposal. **However, we anticipate that these powers would be too limited to support the radical mode shift targets envisaged in the CPCA area.**
Enhanced Partnership (EP)	Mutual agreement between operators and transport authorities on a vision for future public transport (an EP plan) and a suite of associated actions (EP schemes), potentially encompassing vehicle specifications, branding, payment/ticketing, real-time information, and timetables. Once agreed these standards become requirements of all bus services operating in the relevant area, whether new or existing. The local authority can, in certain circumstances, also become responsible for registering local bus services - taking on responsibilities from Traffic Commissioners - and enforcing those standards. Likely to be most useful where it is important that all bus operations meet the same standards, some operators	*If supported by a willing partner (ie Stagecoach, as they are the only remaining significant commercial bus operator in CPCA area)* – Could support many of the proposed interventions, with CPCA providing infrastructure, administrative back office support and targeted public funding in support of the EP plan. In return, operators would need to agree to meet minimum timetable and vehicle standards as described in this report, and participate in suitable holistic ticketing/payment arrangements, under a common TfCP branding. We would recommend that to maximise the effectiveness of the EP plan delivery, TfCP would assume responsibility for local bus service registration and enforcement. The EP plan could cover all the CPCA area.

CATEGORY OF POWER	DESCRIPTION & DISCUSSION	PROPOSED APPLICATION
	may resist a partnership and require to be compelled to participate[34], where registration and enforcement is seen as being valuable, and where a wide geographical scope is envisaged. Can be for a narrowly-defined area or a wider extent.	**An early action should be for the CPCA to engage with Stagecoach to quickly judge their appetite for a genuine partnership based on the principles of an Enhanced Partnership Plan.** **If it becomes clear that Enhanced Partnership will not deliver the CPCA/TfCP's vision, the alternative of a Franchise approach can be investigated in parallel.**
Franchising	In a franchising scheme, local authorities will determine the details of the services to be provided – where they run, when they run and the standards of the services. Typically bus operators provide their services under contract to the local authority who can let whatever sort of contract they feel is appropriate. No other services can operate in the franchised area without the agreement of the franchising authority. Franchising is only available to Mayoral Combined Authorities (or otherwise as agreed by the Secretary of State) – power is therefore automatically available to CPCA. Can be for a narrowly-defined area or a wider extent.	Franchising is a major intervention in the free market instituted under the 1985 Transport Act, and the CPCA would need to invest considerable time and budget in justifying this intervention. We therefore do not recommend it is treated as the first choice for delivering the recommendations of this report, as Enhanced Partnership has the potential to deliver many of the recommendations more quickly and at less cost to the CPCA. **Nevertheless, if it becomes clear that the EP plan will not deliver on the CPCA's vision and radical mode shift targets, either in part or the whole of its area, then franchising must be considered as a viable alternative.** It would give the CPCA complete control over how services are delivered in the area, ticketing/payment arrangements, branding, etc. The CPCA would need to be confident that it could adequately fund its aspirations, as well as the preparations necessary to make its case for franchising. Given our proposals for a holistic, multi-modal approach to future rural transport delivery (ie not restricted to existing conventional arrangements), it is likely that franchising may be most easily applied to these rural initiatives, and would probably be critical to the holistic approach identified as it gives greater control to the CPCA to

[34] Note that if a majority of operators oppose an EP plan, the transport authority cannot proceed

CATEGORY OF POWER	DESCRIPTION & DISCUSSION	PROPOSED APPLICATION
		integrate bus services with wider rural transport initiatives in areas where there are few (if any) commercial bus operators to partner with. **Therefore, as regards franchising:** **An EP plan should be investigated in the first instance. However, ensuring that an integrated holistic solution can be developed may require a delivery model that is not restricted by provisions of the 1985 Transport Act.** **As such, if the EP plan is unlikely to deliver the CPCA's aspirations, rapid progress with franchising would be essential to deliver the aspirations identified by this review, with preliminary work proceeding in parallel with partnership discussions.**
Advanced Ticketing Scheme	Allows the establishment of multi-operator and multi-modal ticketing schemes so that local authorities can specify, among other things, the technology to be accepted (e.g. contactless bank cards, mobile technology, smart cards). These powers do not, however, allow local authorities to set the price of multi-operator or multi-modal tickets which will need to be agreed with the relevant operators. This would generally involve a local ticketing company of which both the local authority and relevant operators are members. Table 4 sets out the various payment and ticketing arrangements available under the various powers established by the 2017 Act.	This would support the proposed modernisation of transport payment systems underpinning provision of transport as a utility. **It is recommended that a local ticketing company is established for the whole of the CPCA area of which both the CPCA and relevant operators are members, and which is delivered under the TfCP banner and branding.**

Table 4.   Available Ticketing Obligations on Operators through 2017 Bus Services Act

	TICKETING SCHEME	ADVANCED QUALITY PARTNERSHIP	ENHANCED PARTNERSHIP	FRANCHISING
Sell and accept a multi-operator or multi-modal ticket (including in a specific format, such as on a smart card	✓	✓	✓	✓
Market particular tickets in a certain way (including promoting multi-operator tickets not just their own tickets)	X	✓	✓	✓
Set all their tickets and fares on a standard set of 'zones' that apply to all operators	X	X	✓	✓
Follow common ticket rules for their own tickets (such as a standard length of 'period' tickets or age to qualify for a youth concession if offered)	X	X	✓	✓
Sell or accept any ticket on a particular technology (such as a smart card)	✓	✓	✓	✓
Charge a set price for a multi-operator ticket	X	X	✓	✓
Charge a set price for their own, single-operator tickets	X	X	X	✓

Conclusions on Partnership versus Franchising

4.5.13   Table 5 summarises the comparison between the various available delivery models and how they might support our recommendations from sections 2 and 3.

4.5.14   Both Enhanced Partnership and Franchising are completely untested in reality, so no one can be sure what will prove possible, and it is certainly likely to be challenging to get operators to offer everything that the CPCA might want include in its public transport plans. Franchising gives greater certainty about what is delivered, but at additional cost to the CPCA (some – or possibly all – of which might be recouped by the successful franchisees working for lower profit margins than the existing operators, but again there are no certainties).

4.5.15   It is highly unlikely that a franchising proposal could be sustained against a legal challenge if it hadn't been adequately tested against an Enhanced Partnership alternative, so there is every incentive to start discussion of an Enhanced Partnership plan and schemes as soon as possible. These discussions can then be pursued in parallel with preparations for Franchising, so that a suitable alternative is in place should EP discussions fail, and so that there is no delay with implementing Franchising should that prove the only viable option.

In conclusion:

The CPCA requires a delivery model which supports radical enhancements to public transport provision in Peterborough and Cambridgeshire, with buses playing a key role in that future transport provision, building on existing services particularly in the two cities. It is clear, however, that existing delivery models face challenges in supporting an integrated approach to the full range of strategic interventions which are likely to be required, and there is a need to explore how cross-subsidisation might help to enhance overall service levels throughout the area.

Whilst delivery of these future aspirations may be feasible through partnership, this requires positive engagement by the Operators as well as the transport authorities, and in the absence of a willingness to partner in a positive way, Mayoral Authorities such as the CPCA are uniquely placed to deliver the alternative – Franchising.

We therefore recommend that the CPCA develops a Business Case comparison of alternative delivery models, including both Enhanced Partnership and Franchising, in compliance with the requirements of the Bus Services Act 2017.

Table 5. Comparison of Delivery Models for Partnership, Franchising and Integrated Ticketing

THEME	NETWORK	DELIVERY OPTION	AQPS	ENHANCED PARTNERSHIP	FRANCHISING	INTEGRATED TICKETING
Timetables	City / Peterborough	1. Establish minimum levels of service for evenings and weekends	✓ (Note 1)	✓✓ (Note 2)	✓✓✓	N/A
	City / PCC + CCC	5. All major radial corridors enhanced timetable (12 minute)	✓ (Note 1)	✓✓ (Note 2)	✓✓✓	N/A
	City / PCC + CCC	7. Enhanced services to key employment centres	✓ (Note 1)	✓✓ (Note 2)	✓✓✓	N/A
Route	City / Peterborough	2. Enhanced connectivity to/from deprived areas	✓ (Note 1)	✓✓ (Note 2)	✓✓✓	N/A
	City / Peterborough	3. Enhanced radial services	✓ (Note 1)	✓✓ (Note 2)	✓✓✓	N/A
	City / Cambridge	4. Cross-city links	✓ (Note 1)	✓✓ (Note 2)	✓✓✓	N/A
	City / Cambridge	6. Adjust services to complement CAM	✓ (Note 1)	✓ (Note 2)	✓✓✓	N/A
	Inter-urban network	14. Maximise the role of Hubs via integration	✓ (Note 1)	✓ (Note 2)	✓✓✓	N/A
Efficiency of the network / MaaS + MaU	City / Cambridge	8. Quality bus corridors	✓ (Note 1)	✓✓ (Note 2)	✓✓✓	N/A
	City / Cambridge	9. Green travel area	✓ (Note 1)	✓✓ (Note 2)	✓✓✓	N/A
	City / PCC + CCC	10. Urban DRT	✓ (Note 1)	✓✓ (Note 2)	✓✓✓	N/A
	City / PCC + CCC	11. Set vehicles standards	✓ (Note 1)	✓✓ (Note 2)	✓✓✓	N/A
	City / PCC + CCC	12. Multimodal integration	✓ (Note 1)	✓ (Note 2)	✓✓✓	N/A
	Rural network	13. DRT for rural areas	Possible but limited commercial operation		✓✓✓	N/A
	Rural and Inter-urban	14. Integration and coordination of network to achieve efficiencies	✓ (Note 1)	✓✓ (Note 2)	✓✓✓	N/A
	All	19. Central management of network	✓ (Note 1)	✓ (Note 2)	✓✓✓	N/A
Fares	All	15. Simplified, flat fare system	x	x	✓✓✓	x
		16. Discounted fares for young apprentices, job seekers, +60's	✓ (Note 1)	✓✓ (Note 2)	✓✓✓	✓ (would require commercial viability)
		17. Package for residents and employees of new developments	✓ (Note 1)	✓ (Note 2)	✓✓✓	
		18. Retention of current free arrangements for ENCTS cardholders	Automatic right under existing legislation			
Key	x Not possible					
	✓ Possible, but challenging/unlikely					
	✓✓ More effective and less challenging					
	✓✓✓ Most likely to be effective, with certainty of delivery					
	(Note 1) = Legal requirement on CA to offer facilities and/or bus improvement measures in return for operator agreement					
	(Note 2) = Although not a legal requirement, operators will need a quid pro quo to agree to these measures					

4.6 Funding

4.6.1 Capital funding for enhanced public transport in parts of the CPCA area should be available through the City Deal funding, albeit that a significant proportion of that may be required for the CAM project.

4.6.2 However, providing enhanced and high-quality bus-based transport always relies very heavily on revenue funding. Many of the initiatives will require dedicated staff to drive them forward, and where additional and enhanced bus services are recommended it is likely that these will require targeted subsidies because it is assumed that if they were already commercially viable then the bus operators would be providing them.

> **Delivering enhanced bus services will require additional revenue funding support from the public sector, identification of additional revenue streams (e.g. workplace parking levy), a reduction in overall operating costs, or – most likely – a mixture of all three.**

4.6.3 We estimate that the net impact of enhanced city and inter-urban bus services could increase costs by 10-15% compared to present, offset by additional revenue earned by carrying more passengers. We currently project that **additional** funding equal to circa the existing subsidised budgets of Cambridgeshire and Peterborough councils would be required to meet the service enhancements and fares initiatives, and assuming no net increase in funding for rural services.

4.6.4 Other than conventional direct subsidies from local authority budgets, most funding or potential funding sources are linked to urban settings, such as parking revenues, local payroll tax, land value benefit, workplace parking levy or congestion charge. It would be useful to find a mechanism to spread the benefits of these, particularly as the cities benefit from rural dwellers contributing towards urban activities.

4.6.5 Revenue funding may be required to kick-start new services – in some cases, these may reach commercial viability, allowing subsidy to be withdrawn, but in other situations the subsidy may need to be continued.

4.6.6 Sources of funding are summarised in Figure 15:

- City Deal – for major capital projects, such as CAM but also bus priority;
- Innovative Sources – investigation of workplace parking levies, s106 payments, land value benefit sharing, congestion charging, etc, as well as redirecting transport-related spending from health, education, and social care budgets;
- Rebalancing capital and revenue spending – ring-fencing capital spending to provide incentives such as kickstart, or including subsidies for specific services within the development costs of development projects;
- Operator commitments – under Partnership, operators could be encouraged to self-fund initiatives rather than seek public subsidies; and
- Providing resources as well as funding – many interventions will require sharing of resources, including personnel.

4.6.7 Under a franchising approach, all transport funding could be pooled under TfCP for services in the area.

4.6.8   Table 6 sets out an indication of resourcing and funding requirements associated with repositioning public transport as a vital utility to support economic growth in the CPCA area.

Figure 15.   **Potential Sources of Funding for Bus Service Enhancements**

Table 6. Resource Implications of Enhancing Public Transport Delivery in CPCA area

PROGRAMME ITEM	TIMING (S/M/L)	INTERNAL RESOURCE (FTES)	EXTERNAL SUPPORT
Transport for Cambridgeshire & Peterborough – basic establishment			
Basic establishment of TfCP	M	1 FTE + staff from CCC and PCC	
Branding & Information Provision	M	-	Marketing Support & Materials
Investigate Alternative Delivery Models (Partnership, Franchising)	S	-	Expert Advice – initial investigations
Restructure to engage with emerging Mobility as a Service (MaaS) opportunities	S/M	1 FTE to focus on investigating MaaS concept and developing its application for CPCA area	Ad hoc expert advice
Delivering CAM	M/L	Consultancy support for business case, design, build etc. Shortlisted option from SDG appraisal report suggest £1.5 - £1.7bn CapEx and surplus operational profit.	Development of Strategic Outline Business Case.
Cambridge & Peterborough City Networks			
Engage with operators to improve services	S	Dedicate member of staff to focus on delivery (0.5 FTE) Would require additional budget to support any additional services	Ad hoc expert advice
Delivery of Urban demand responsive transport, in conjunction with local operators / key partners	M	Dedicate member of staff to focus on delivery (0.5 FTE)	Ad hoc expert advice
Develop integrated networks with other modes, particularly rail	M	Covered by resources shown above	
Expanded and targeted bus priority network	M	Covered by resources shown above	Will require external assistance to identify hotspots and prepare business case(s)
Inter-urban and Rural Networks			
Rural Hubs	M	Hub Co-ordinators (6 FTEs) Would require subsequent CapEx to support provision of hubs	Expert Advice – initial investigations
Improvements to Inter Urban services	S	Dedicate member of staff to focus on delivery (0.5 FTE) Would require additional budget to support additional services	Ad hoc expert advice
Restructuring of Rural Transport Delivery	S	Dedicate member of staff to focus on delivery (0.5 FTE)	Expert Advice to support identification of delivery models

4.7 Achieving Financial Sustainability

4.7.1 As we described in the Part 1 report, there are a range of different sources of funding for local bus services:

- Fares paid by the travelling public;
- Reimbursement paid to operators and transport authorities under BSOG;
- Subsidy paid by local transport authorities for selected non-commercial bus services; and
- Reimbursement paid to operators as compensation for free travel provided through the English National Concessionary Travel Scheme (ENCTS).

4.7.2 We would currently estimate that total revenue collected on bus services in the CPCA area is in the order of £75m per annum[35]. Where enhancements are made to local bus services, there will be a need to consider the impact on financial sustainability. BSOG reimbursement will increase if additional commercial bus services are operated, however it represents a relatively small proportion of overall funding, circa £5m per annum in recent years – even a 20% increase in total eligible mileage operated in the CPCA area would generate only £1m of additional BSOG funding from DfT, and then only for commercial (ie unsubsidised) bus services.

4.7.3 Currently just short of £10m per annum is used to fund the councils' ENCTS obligations. Whilst operating additional bus services would potentially generate a requirement to increase reimbursement to operators, further detailed investigation would be required to identify if this could be offset (at least in part) by:

- Increased generation factor[36] if services became more attractive; and
- Reductions to the fares basket calculation (if discounted fares are commonplace, then arguably this should be reflected by reducing the average fare calculation used to compute reimbursement to operators).

4.7.4 Any increase in ENCTS obligations would, of course, require to be met from local authority funds, and therefore the potential impact of enhanced public transport services on ENCTS obligations must be taken into account, particularly if provided through an Enhanced Partnership. We have already discussed the potential to raise additional funds by seeking donations from ENCTS travelcard users to help partially offset their travel costs, but have recommended against this based on Government guidance. Providing additional rural services via community transport operators could result in discounted fares for certain categories, replacing free travel for ENCTS cardholders.

4.7.5 Total transport pilots have identified that enhancements to rural transport might be deliverable within existing budgets, if these were pooled and deployed more effectively. Our proposals recommend extending that principle to take a totally holistic approach to rural transport delivery, merging all delivery models into a single approach tailored to the requirements of the CPCA's rural districts, and focusing travel around a network of hubs linked by enhanced inter-urban services. **The target here would be no additional funding.**

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[35] Based on analysis in Part 1 report (section 6.4) which identified circa £65m per annum on the three main commercial bus operators

[36] The calculation that ensures that operators are only recompensed for travel that takes place because of the free nature of the fare

4.7.6　Operating enhanced bus services which are not directly commercially viable (ie where the additional revenue collected falls short of the additional operating costs) would require funding from the CPCA – at present, the two councils spend just over £3m per annum on supporting local bus services. Enhancing services as envisaged to meet the radical mode shift targets is likely to require a significant increase in financial support.

4.7.7　Currently the three principal commercial bus operators in the CPCA area earn circa £10m per annum in operating profit. This suggests that the commercial operators are earning circa 13%-15% operating margin in the CPCA area. From this profit, they need to reinvest for the future, as well as using the profit for shareholder returns such as dividends, and meeting taxation liabilities.

4.7.8　By comparison, East London Bus & Coach Co Ltd (a Stagecoach subsidiary providing contracted bus services for Transport for London) reported an operating margin of circa 3% in the most recently reported financial year. It must be noted, however, that bus companies in London tend to lease rather than own buses, resulting in higher apparent operating costs to offset the risks associated with short contract terms, and in turn depressing the apparent operating margin earned.

4.7.9　Nevertheless, if say one-third of the profits earned in the CPCA area were available to reinvest into the network, this could represent an additional £3.5m funding per annum, more than doubling the amount spent on subsidised local bus services by the two councils at present, and closely matching the projected net annual cost of the interventions described in sections 2 - 4.

4.7.10　There are two means by which this funding can be released into the local bus network:

○ Agreeing a set of interventions jointly with local operators through an Enhanced Partnership plan and its associated schemes – with operators agreeing to part-finance initiatives in partnership with the CPCA; or
○ Establishing one or more franchising areas covering the CPCA, whereby competitive tendering for contracts could release some of the existing profit based on the London example quoted above.

4.7.11　It should be noted, however, that both approaches imply increased costs compared to present, particularly the franchising approach which not only would require ongoing procurement and contract management resources, but also implies a significant commitment of one-off fees to prove the case for franchising (see below).

Costs of Franchising

4.7.12　Figure 16 illustrates the process for introducing franchising using powers under the Bus Services Act 2017[37].

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[37] The Bus Services Act 2017: Franchising Scheme Guidance (DfT, October 2017)

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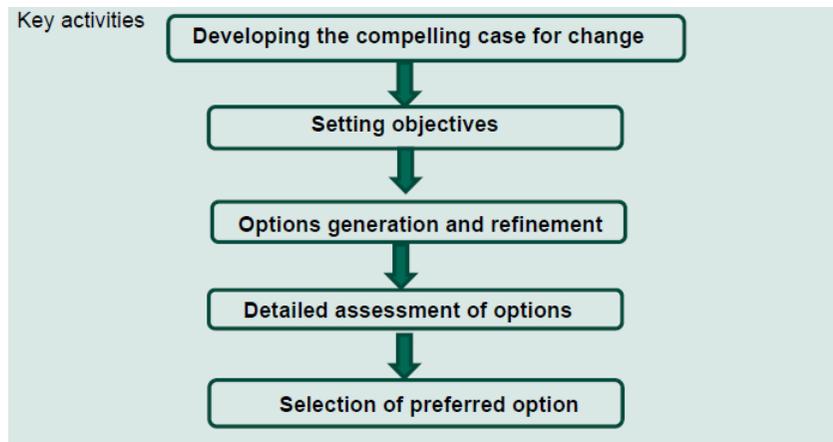| Cambridgeshire and Peterborough Strategic Bus Review: Options Report	107607	
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Figure 16. **Process for Franchising**

4.7.13 Proving the case that franchising is the preferred delivery model requires preparation of an assessment equivalent to that of an Outline Business Case, comparing the franchising option against alternatives which are likely to include both "do nothing" and utilising an Enhanced Partnership (EP) approach – as such, it is likely that the costs of attempting an EP will have to be met *additionally* to those associated with preparing a franchising proposal. The assessment requires to be assured by a qualified auditor, followed by a public consultation. Once the Mayor is content that franchising offers the most appropriate way of delivering their public transport requirements (having taken account of consultation feedback), they make and publicise the finalised franchising scheme, and transition from the deregulated bus market begins.

4.7.14 Approximate timescales for franchising are as follows:

- O Establish brief (6 months)
- O Procurement of Business case (3 Months)
- O Business Case (12 months)
- O Consultation (3 months, in parallel with Business case)
- O Independent Audit (3 months)
- O Decision by Mayor

4.7.15 If this route was explored an approved business case should be deliverable by Q1 2021. It is estimated that to run the franchising scheme in the CPCA, 10 officers (all levels) will be needed.

4.7.16 The process of investigating, developing and transitioning to a franchised delivery model may incur significant one-off costs with no guarantee of success – TfGM are reported to have spent £11.5m to date on developing the UK's most progressed franchising proposals, with the prospect of continued spend downstream[38]. Even assuming that spending in the CPCA area would be somewhat lower, a total spend of circa £3m on the franchising investigation and assessment might be postulated (based on 20% of the eventual cost to TfGM), covering both internal and external resource costs.

4.7.17 In addition, there would be ongoing costs associated with resources to support franchising, such as a procurement and contract management team, plus the staff required to support the passenger-facing elements of providing a local bus service network – promotional activity, information provision, data collection and analysis, liaison with local stakeholders, public engagement, market research, etc.

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[38] See http://www.passengertransport.co.uk/2018/03/tfgm-spends-11-5m-on-franchising-probe/ (downloaded 23/10/2018)

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4.7.18 Some bus operators are opposed to franchising, most notably Stagecoach who orchestrated a robust campaign against a previous version of franchising proposed by Nexus (Tyne & Wear PTE)[39]. It should be anticipated that they would strenuously push back against franchising proposals in the CPCA area, and they are – of course – the overwhelming dominant operator.

4.7.19 Other operators may support franchising, and there is certainly evidence that operators active in the London area would be prepared to tender for contracts, ensuring that there was sufficient competition to drive down contract prices.

4.7.20 Examination of competitive tendering compared to directly awarded contracts for bus services has concluded[40]:

- Substantial cost savings are achievable in the first move to competitively tender services. While these can be eroded with subsequent competitions, unit costs remain below pre-tendering levels. In some cases, stricter service specification in subsequent competitions have eroded the initial savings;
- The underlying level of efficiency prior to a move to competitive tendering is a determinant of the scale of savings achieved; and
- In general service quality has improved through competition but not in all cases.

4.7.21 Unfortunately, there is no comparable data for savings delivered by transitioning from a deregulated market such as that in Great Britain (outside London) to a franchised model.

Conclusions on Sustainable Financing – Short/Medium Term

4.7.22 Additional revenue funding is critical to meet the radical mode shift targets established for the CPCA area.

4.7.23 It is possible that improvements to services could be secured through robust dialogue with local operators, and tied up through an Enhanced Partnership – which would, in any case, need to be considered as an alternative to franchising. Franchising might eventually allow for a doubling in funding for local bus services in the CPCA area, albeit that initial upfront preparation costs may be equivalent to the first year of this funding, and supporting franchising would require dedication of additional internal contract management and procurement resources.

4.7.24 As an alternative, as discussed under delivery models, franchising could be focused on the rural areas (where services are already largely subsidised) to deliver the holistic approach described, with franchising as a backstop for enhanced city and inter-urban bus services. Targeting holistic rural transport provision within existing revenue budgets would mean that funds released either through partnership or franchising could be focused on enhanced local bus services within Cambridge and Peterborough, and on inter-urban links within the CPCA area.

4.7.25 Capital funding can then be targeted at facilitating schemes, such as rural bus hubs, expanded bus priority, and investment in the back-office systems which would support the positioning of public transport as a utility supporting economic growth in the CPCA area.

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[39] See https://www.stagecoach.com/media/news-releases/2013/2013-11-15.aspx (downloaded 23/10/2018)

[40] Proposal to Directly Award a Public Bus Service Contract to Bus Éireann in 2019 (National transport Authority, October 2018)

Conclusions on Sustainable Financing – Long Term

4.7.26 As set out already, transition to a suitable 21st Century model for public transport is likely to shift the landscape of financing, because there will be far more pooling and sharing of revenue if a holistic and seamless service is offered to the public.

4.7.27 In a franchised model, this would be immaterial as TfCP would be taking all revenue risks and simply paying contractors supplying services through appropriate Service Level Agreements. Otherwise there would need to be a methodology of identifying equitable shares of revenue, and subsidising service provision which would not otherwise be viable from revenue shares alone. The complexities of doing so with any degree of transparency and certainty are likely to result in a trend towards a franchise model led by TfCP.

5. IMPLEMENTATION AND TRANSITION PLAN

5.1.1 Table 7 summarises the proposed interventions and their rationale and how they could be delivered.

5.1.2 Figure 17 shows an outline implementation plan for the recommendations set out in this report.

5.1.3 Initially we had anticipated discrete sets of interventions, divided into short, medium, and long-terms, albeit with some commonality and cohesion across the timescales.

5.1.4 However, for the following reasons, we consider that a more holistic approach is critical:

- The scale of change from the current "business as usual" is very significant given the radical nature of the aspiration for modal shift to public transport – in turn meaning that radical change is required to support all interventions, starting as early as possible; and
- The likelihood of forthcoming major changes to how transport is delivered (Mobility as a Service, emerging new technologies, and repositioning future public transport as a fundamental modern utility like telecoms and internet access) means that adopting a short/medium/long term perspective is inappropriate.

5.1.5 We have therefore developed a broadly 10-year plan for implementation and transition.

5.1.6 Achieving the radical aspiration for mode shift is likely to require delivery of **all** the recommendations, which have been designed in a holistic manner rather than as a menu from which only a selection is taken forward. The implementation plan recognises these holistic inter-dependencies, whilst at the same time identifying some groupings of recommended interventions, identified by colour coding.

Groups of Interventions

- New delivery models – GREY
- Enhancements to bus services in Peterborough and Cambridge, Busway services, and Inter-Urban bus services – BLUE
- Enhancements to Rural public transport provision – YELLOW
- Delivery of CAM project - RED
- Enhancements across all areas – BLUE and YELLOW striped

Table 7. Strategic Interventions and Associated Delivery Models

THEME	NETWORK	DELIVERY OPTION	SHORT/ MEDIUM/ LONG TERM	RATIONALE	DELIVERY MODEL
Timetables	City / Peterborough	1. Establish minimum levels of service for evenings and weekends	Short	Increase the attractiveness of buses to potential users and reflect changes to travel patterns in modern society.	Partnership with operators, or Franchising as alternative.
	City / PCC + CCC	5. All major radial corridors enhanced timetable (12 m)	Short -> Medium	Increase the attractiveness of buses to potential users.	Partnership with operators, or Franchising as alternative.
	City / PCC + CCC	7. Enhanced services to key employment centres	Short -> Medium	Need to ensure bus-based alternatives to private car.	CPCA-funded initiative, Partnership with operators, or Franchising as alternative.
Route	City / Peterborough	2. Enhanced connectivity to/from deprived areas	Short	Need to ensure economic impacts of development benefit all members of society.	Partnership with operators, or Franchising as alternative.
	City / Peterborough	3. Enhanced radial services	Short -> Medium	Increase the attractiveness of buses to potential users.	Partnership with operators, or Franchising as alternative.
	City / Cambridge	4. Cross-city links	Medium	Increase the attractiveness of buses to potential users. Note: Not possible until congestion has been reduced in city centre or priority provided.	Partnership with operators, or Franchising as alternative.
	City / Cambridge	6. Adjust services to complement CAM	Medium -> Long	Bus services must complement CAM.	Partnership with operators, or Franchising as alternative.
	Interurban network	14. Maximise the role of Hubs via integration	Short -> Medium	Hubs will provide high quality interchange locations, and allow improvements to rural transport provision.	CPCA and District initiative, supported by Partnership with inter-urban operators (Franchising as alternative).
Efficiency of the network / MaaS + MaU	City / Cambridge	8. Quality bus corridors	Medium	Improve the experience of passengers travelling along key transport corridors, and support cost effective enhancements to bus services.	Infrastructure delivered by highway authorities; services by Partnership with operators (Franchising as alternative).
	City / Cambridge	9. Green travel area	Medium -> Long	Support the high mode share for walking and cycling in Cambridge. Improve air quality.	Infrastructure delivered by highway authorities; services by Partnership with operators (Franchising as alternative).
	City / PCC + CCC	10. Urban DRT	Short -> Medium	Enhance flexibility and attractiveness of urban travel, to ensure it meets the aspirations of new users.	CPCA-funded initiative, Partnership with operators, or Franchising as alternative.
	City / PCC + CCC	11. Set vehicles standards	Short	Ensure in-vehicle experience meets aspirations of new users.	Partnership with operators, or Franchising as alternative.
	City / PCC + CCC	12. Multimodal integration	Medium -> Long	Ensure that every component of the sustainable transport network plays a complementary role in holistic strategy.	Partnership with operators, or Franchising as alternative.
	Rural network	13. DRT for rural areas	Short -> Medium	Enhanced, cost-effective service provision for rural areas.	Likely to be CPCA initiative.
	Rural and Inter-urban	14. Integration and coordination of network to achieve efficiencies	Medium	Ensure that every component of the sustainable transport network plays a complementary role in a holistic strategy.	Partnership with operators, or Franchising as alternative.
	All	19. Central management of network	Medium -> Long	Coordination of all transport modes to ensure they are complementary to each other and with wider aspirations (e.g. economic development)	Likely to only be feasible under Franchising.
Fares	All	15. Simplified, flat fare system	Medium -> Long	Makes transport system easier to user, and therefore more attractive.	Partnership or Advanced Ticketing Scheme, but may require Franchising.
		16. Discounted fares for young apprentices, job seekers, +60's	Short	Makes transport system cheaper to use, and therefore more attractive for selected user groups.	Partnership with operators, or Franchising as alternative.
		17. Package for residents and employees of new developments	Short	Attracts residents/employees to use public transport before car-based travel habits become engrained.	S106 funding, CPCA initiative or Partnership with operators.
		18. Retention of current free arrangements for ENCTS cardholders	Throughout	This is an automatic right under existing legislation.	Delivered and funded by relevant transport authority.

Activity	SHORT TERM					MEDIUM TERM					LONG TERM	
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030+
Procurement and completion of a business case to assess different delivery model options, including engagement with operators around likely Enhanced Partnership and Franchising options	▓	▓	▓									
Basic establishment of TfCP, including preparation to deliver outcomes of the business case – scope of responsibilities, what will be delivered in-house, what will be contracted out, governance arrangements, etc.		▓	▓									
Consultation on business case, completion of an independent audit			▓									
Decision on the delivery model by the mayor, and implementation of switch to new delivery model			▓									
Expanded role for TfCP across the delivery of projects that follow					▓	▓	▓	▓	▓	▓	▓	▓
Engage with operators to improve city bus services – define gaps, identify how to fill those gaps	▓	▓	▓	▓								
Exercise targeting immediate improvements to busway services	▓	▓	▓									
Identify opportunities for modern, urban demand responsive services	▓	▓	▓									
Improvements to Inter Urban bus services – start to create the network of hubs into which the modernised rural transport will link, and the services which will link those hubs (some exist already)	▓	▓	▓	▓								
Restructuring of Rural Transport Delivery – begin to identify holistic future model, combining best aspects of existing provision and targeting consistency of rural service across the area	▓	▓	▓									
Expanded and targeted bus priority network, particularly in Cambridge but also as required in Peterborough (and elsewhere)				▓	▓	▓						
Delivering CAM – preliminary work to deliver proposals	▓	▓	▓	▓	▓							
Expansion of Urban demand responsive transport, in conjunction with local operators				▓	▓	▓						
Progressive roll-out of holistic and consistent rural transport services						▓	▓	▓	▓			
Rural Hubs – completion of a series of rural hubs, providing comprehensive facilities for their local areas, and linked into the upgraded inter-urban bus network						▓	▓	▓	▓			
Delivery of CAM and revision of bus services to complement CAM operations								▓	▓	▓	▓	▓
Restructure internally to engage with emerging Mobility as a Service (MaaS) opportunities – process continues into medium term	▓	▓	▓	▓	▓							
Branding & Information Provision – establish unique and identifiable branding and promotion for all public transport in CPCA area			▓	▓								
Develop integrated networks with other modes, particularly rail					▓	▓	▓	▓	▓			
Begin switch to a modern, MaaS-based public transport service, with harmonised payment systems, information provision, etc							▓	▓	▓			
Completion of switch to modern, MaaS-based public transport service								▓	▓			

Figure 17. **Indicative Implementation Plan**

SYSTRA provides advice on transport, to central, regional and local government, agencies, developers, operators and financiers.

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