A TO B 1102

Sustainable Transport and the North East Cambridge Corridor: Results of a Travel Survey

Report Prepared by the A to B1102 Group

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Sustainable Transport and the North East Cambridge Corridor: Results of a Travel Survey: Executive Summary

- *The villages and parishes along the B1102 corridor, from Quy to Fordham (and including the Wilbrahams, Wicken and Soham) have a combined population in excess of 27,000, equivalent to a fifth of the population of Cambridge. Continued growth and congestion in Cambridge, complex layers of responsibility for transport in the region and uncertain public transport provision create problems for those travelling from and within the area.*

- *The AtoB1102 travel group organised a survey in late 2023 to provide evidence of travel behaviour and issues faced by residents in the area to inform our advocacy of improvements to transport infrastructure and environment in and around the B1102.*

- *Some 900 people completed the survey. The respondents were broadly representative of the local area, both in terms of location and demographics. There was good representation of those in full time education, working age population and the retired amongst respondents.*

- *We collected information on over 2,000 journeys made by survey respondents. These journeys were dominated by car travel – 75% of all journeys and 70% of trips weighted by frequency. Bus travel was the next most frequent mode, but at only 17% of trips. No other travel mode exceeded 10%, the next most frequent being cycling.*

- *Cambridge was clearly the main destination, constituting some 50% of all trips. The next highest category of journeys was inter-village travel within the B1102 villages, with Newmarket another cluster. This held for all the parishes, with Cambridge ranking first even for Fordham. There was little evidence of frequent travel to Ely.*

- *Within Cambridge, journey destinations varied widely. Only a third of journeys were to the city centre, with other significant clusters at Addenbrookes/Bio-medical campus; the various sixth form colleges; the science park, Cherry Hinton/ARM, and the stations, particularly Cambridge North. The great majority of these destinations are not directly served by public transport.*

- *Within the B1102 corridor, Burwell and Bottisham were key destinations, given their size and the presence of amenities and services; proximity determined which of those villages were favoured (and for those in Little and Great Wilbraham, Fulbourn was another important destination.*

- *Journeys to Cambridge were dominated by car travel despite congestion and parking issues. A higher proportion of journeys to the city centre were by bus (at around 36%), reflecting both the location of the Drummer Street bus station and the usage of the bus by 16-18 year olds en route to their educational establishments.*

- *The Survey identified significant issues for those 16-18 year olds in continuing education. The main sixth form establishments (Hills Road, Long Road, the Oakes and CRC) have no direct service and are some distance from Drummer Street. Students thus faced lengthy and costly journeys, with issues of reliability and the lack of an evening service. Free form comments emphasised the difficulties and anguish many students felt.*

- *The survey asked what barriers prevented people making more use of bus services. In rank order, respondents identified over-lengthy travel time, that buses did not run when they were needed, that the service was too infrequent, and there were no services to desired destinations. The 16-18 year olds added cost and reliability to these barriers.*

- *The survey's implications are that people would make more use of bus services if there was a denser, reliable network that enabled them to reach target destinations in reasonable time. The main improvements suggested were to extend operation into the evenings (and, to a lesser extent on Sundays), to provide interchanges for travel to other destinations and to provide teal time travel information to aid travel. Were that to exist, there would be more willingness to move away from car travel.*

- *Some 5% of reported journeys were by bicycle despite the uneven quality of cycle infrastructure. Of these some 50% were for work or schooling and half were into Cambridge (but again with very varied final destinations, with relatively few in the city centre). Journeys into Cambridge were, as expected, more frequent from the villages to the South West of the study area (Quy is around 8km from the city centre, parts of Burwell in excess of 20km).*

- *When asked what would encourage people to cycle more, the predominant response emphasised safety and the need for dedicated, separated cycle paths that went directly to destinations / between villages. For those contemplating use of cycles for split-mode travel, supportive infrastructure, including safe bike storage, was a high priority.*

- *The survey suggests a number of key policy implications:*

  - *If there is to be a move to more sustainable travel modes, there must be an effective network of public transport, allowing travel to a range of destinations, that is reliable, frequent and operating when needed.*
  - *Such a network needs interchange points, travel hubs with real time information, parking and secure bike storage, safe waiting areas and, perhaps, other services.*
  - *There is an important need to address the requirements of 16-18 years olds in continuing education, many of whom have unacceptable journeys into Cambridge.*
  - *A switch to more active travel modes whether for commuting, education or other purposes, needs substantial improvements to infrastructure, most importantly through provision and maintenance of safe, direct cycle paths.*
  - *The limits on the use of active travel given the distances involved, infrastructure and other constraints need to be acknowledged. Nonetheless there is scope for increasing cycling's modal share particularly for inter-village trips.*
  - *Access to rail stations, in particular to Cambridge North, is important. It is unreasonable to expect travellers with onward journeys to make lengthy multi-mode journeys to access the station(s). This needs to be considered as development and population growth continues.*
  - *There is a clear need for integration across all the players with responsibility for, and influence on, transport development in the greater Cambridge region. Without policy integration, the needs of local residents, including those in the study area, will not be met.*

Sustainable Transport and the North East Cambridge Corridor: Results of a Travel Survey

1. Introduction

Transport policy needs to balance the economic and social needs of households with environmental and health considerations (not least given commitments linked to the implications of climate change). Balancing economic and environmental priorities can lead to conflict. One potential area of conflict is between the needs of cities and those of their hinterlands, linked together for labour markets, access to services and amenities. Problems of congestion and environmental impacts are greater within the city: but attempts to restrict access and transport can have adverse effects for those living in the areas around the city and attempting to travel to it and across the wider region (not least given that public transport networks tend to be radial and converging on the city centre itself).

The Cambridge region is one such area: the city of Cambridge and the surrounding areas have experienced substantial growth over the last decades: congestion issues in the city are substantial (not least given its historic structure and buildings) and the need to move to more environmentally sustainable forms of travel seems clear. However, the city is intimately linked to the communities in the hinterland, who need to be able to access the city for work, education, services and leisure. This generates a potential conflict of interests: attempts to limit private car usage into and within the city have potentially negative impact on the surrounding communities in the absence of coordinated plans for alternative forms of transport. Such conflicts can be exacerbated by fragmentation of responsibility and control: the Cambridge region consists of a number of distinct councils; the Greater Cambridge Partnership (GCP), a city deal which includes some, but not all of those councils; the Cambridge and Peterborough Combined Authority (CPCA) which has responsibility for the bus network but not other transport planning functions (and has an elected mayor), the County Council and various national bodies such as Highways England, National Rail and Network Rail. Coordination across so many actors is difficult and the needs of parts of the region may be overlooked or neglected.

The B1102 area covered by this study runs North East from junction 35 of the A14, on the edge of the city of Cambridge to the village of Fordham, which sits between Ely and Newmarket. We include the nearby parishes of Little Wilbraham, Six Mile Bottom and Great Wilbraham, which make use of amenities and services in that corridor. The study area had a population of around 16,000 at the 2021 Census: adding in the parishes of Wicken and Soham brings the population using the B1102 corridor to some 27,000, equivalent to a fifth of the population of Cambridge. Much of the area is in East Cambridgeshire (which is not part of the Greater Cambridge Partnership), although the parishes at the Southwest end are in South Cambridgeshire. Given the importance of Cambridge to the area for economic activity, education, services and amenities, decisions about transport and access are of key importance to households in the study area. In turn, the area is important in sustaining the labour market, schooling and consumer activity in the city. The needs of the area, thus, need to be considered carefully in transport decisions taken, including those aimed at encouraging more environmentally stable travel modes and a transition towards a net zero economy.

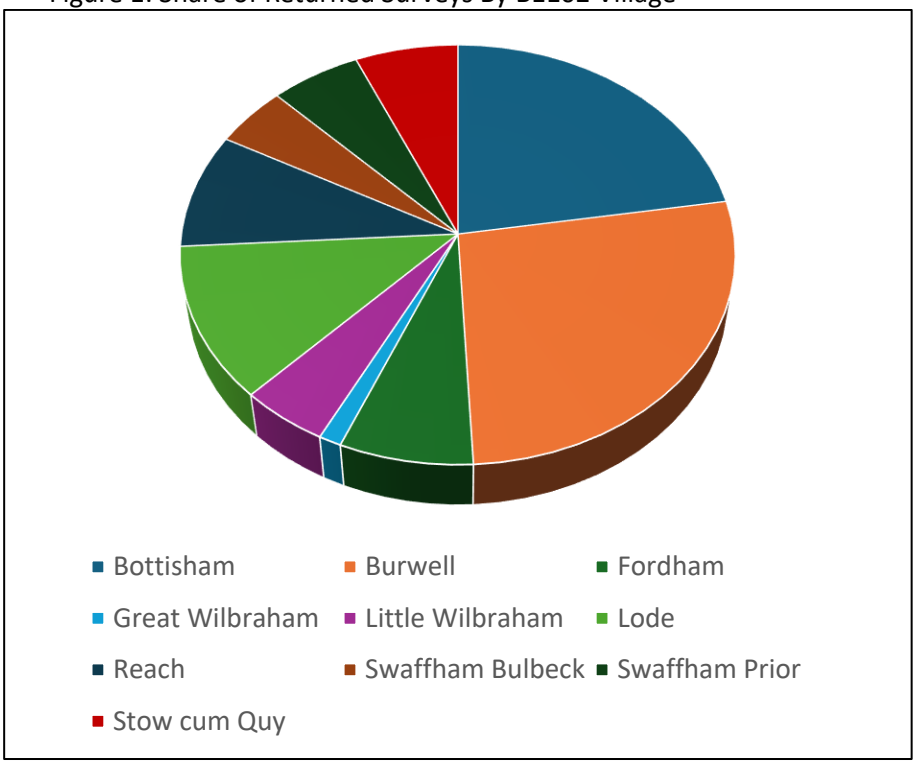
The vulnerability of the transport network was emphasised in 2022 when commercial operator Stagecoach announced it was discontinuing a number of services in rural Cambridgeshire including the 11 service running through the B1102 villages to Cambridge – a vital link for pupils, workers and those using Cambridge's services and amenities. A tendering process found a new operator to continue the service. The event, though, illustrates some of the issues linked to a policy shift from private to public transport modes.

The A to B1102 Local Transport Group is a voluntary, unaffiliated, group of residents based in the villages along the B1102 seeking to ensure improvements to transport for the households in the area[1]. The group organised a travel survey in late 2023, to help the group better understand the travel needs of people living along and around the B1102 route from Fordham to Stow-cum-Quy including Bottisham and Little and Great Wilbraham. It is hoped to use the data from the survey to inform improvements in public and private transport in the area and the development of more sustainable modes of transport. The survey asked people to identify their most frequent journeys, their mode of travel, to indicate journeys they felt unable to make, to indicate what improvements they felt could be made to public transport and to identify obstacles to changing from private car to more sustainable forms of travel. This report sets out some of the key findings of that survey.

2. The Survey

The survey was available both online and via paper forms and was publicised via the Group's website and Facebook page, via Parish websites and village Facebook pages and by direct distribution to key locations within the villages. In total, 891 surveys were returned, a large number for such informal voluntary surveys. Given the nature of the survey, it is not possible to give a definitive response rate nor to assess the extent to which it is a fully representative sample but, in the core villages along the B1102, the returned forms represent around one in nine of the households recorded in the 2021 Census. In terms of location, there is good coverage of all the villages bar, perhaps, Fordham, who were unrepresented on the Group until relatively late in the survey process. Some of the smaller parishes had higher response rates, which is beneficial in allowing us to examine results by village. Figure one shows the distribution of returns by core B1102 villages.

Figure 1: Share of Returned Surveys By B1102 Village



[1] See https://atob1102.org/ for more details of the organization.

Figures 2 and 3, below, show the age distribution and employment status of respondents. These show a broad range of ages and employment types. Over a quarter of the sample were aged over 65: a group often under-sampled in surveys primarily distributed digitally. The age distribution is broadly representative of the area's age profile as measured in the 2021 Census[2]. It is possible that the survey has under-sampled non-pensioners who are not economically active, although we would note that the claimant count for both East and South Cambridgeshire is below 2%[3]. We have also received a good proportion of responses from under-18s and those in full-time education, which is important given the specific travel needs of the post-16 school population in the area, who have to travel considerable distances to reach educational establishments.

Figure 2: Age Distribution of Respondents

Under 18	151	16.9%
18-24	34	3.8%
25-44	164	18.4%
45-64	291	32.7%
65+	235	26.4%
Prefer not to say / Blank	16	1.8%

Figure 3: Employment Status of Respondents

In full time education	168	18.9%
In employment - full time	292	32.8%
In employment - part time	133	14.9%
Seeking employment	2	0.2%
Carer - children or adults	17	1.9%
Retired	231	25.9%
Other (please specify)	28	3.1%
Prefer not to say / Blank	20	2.2%

In summary, the survey generated a large number of responses from a wide range of individuals, broadly in line with the demographic structure of the survey area. In what follows, section two presents analysis of the most common journeys made by respondents to the survey, detailing the reason for travel, the mode of transport, trip frequency and target destination. This enables us to provide a picture of the movement patterns in and from the B1102 corridor. Section three examines bus usage, barriers to travel by public transport and the improvements that those surveyed felt might encourage them to switch from car to bus or other more sustainable routes. The findings suggest that a service more responsive to the specific needs of the area could see a substantial switch to more sustainable forms of transport. Finally, we summarise and conclude.

3. Analysis of Journeys Made.

The survey gave respondents the opportunity to provide information on their most frequent journeys made. For up to four trips, they could provide information on the destination, the mode of transport, trip frequency, whether or not the trip was in peak hours and the reason for the journey. A high proportion of the sample submitted information although some entries were incomplete and the number of observations fell with the journey ranking (thus, there were over 700 entries for the most frequent journey but this fell to a little over 500 for the 4th most frequent).

[2] For example. for the core villages the Census records 36% of the population aged 15 or over in the 45-64 age bands and 30% as aged over 65, within the error margins of our sample (source: ONS / Cambridgeshire County Council).

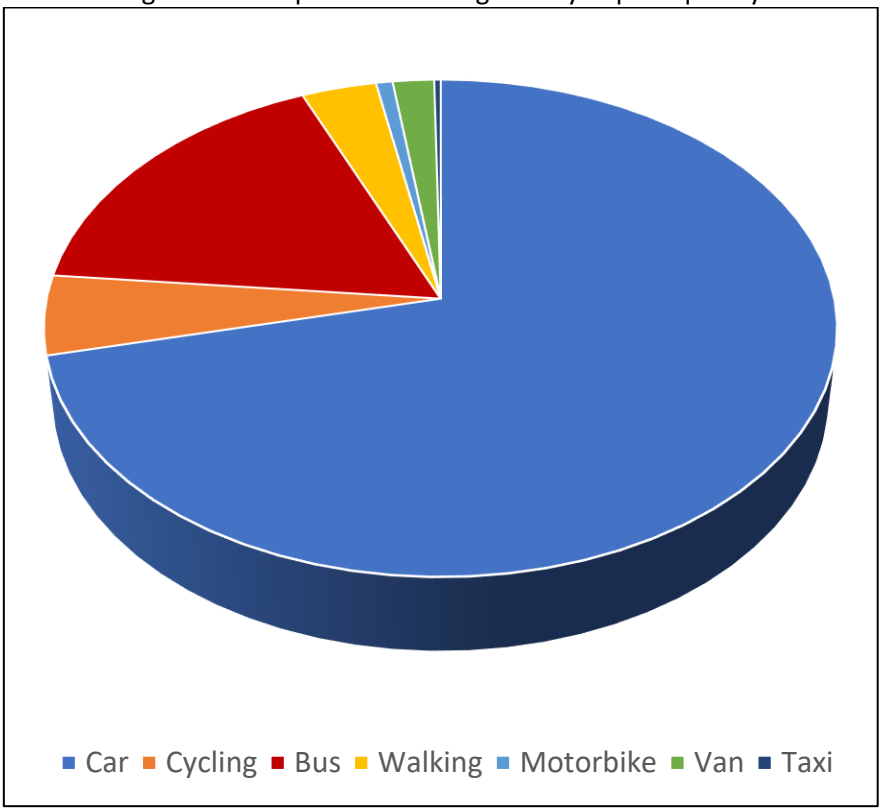
[3] Source: Office for National Statistics, local labour market reviews, online, accessed Feb 2023.

After data cleaning, in total, we were able to obtain near complete information for over 2,000 journey observations. Where there was sufficient information on starting point and destination, the entries were geocoded to allow spatial analysis. Frequency responses were coded to number of trips per week, with missing data set to the average frequency for that rank of journey adjusted upwards for work and education journeys.

3.1 Characterising Journeys

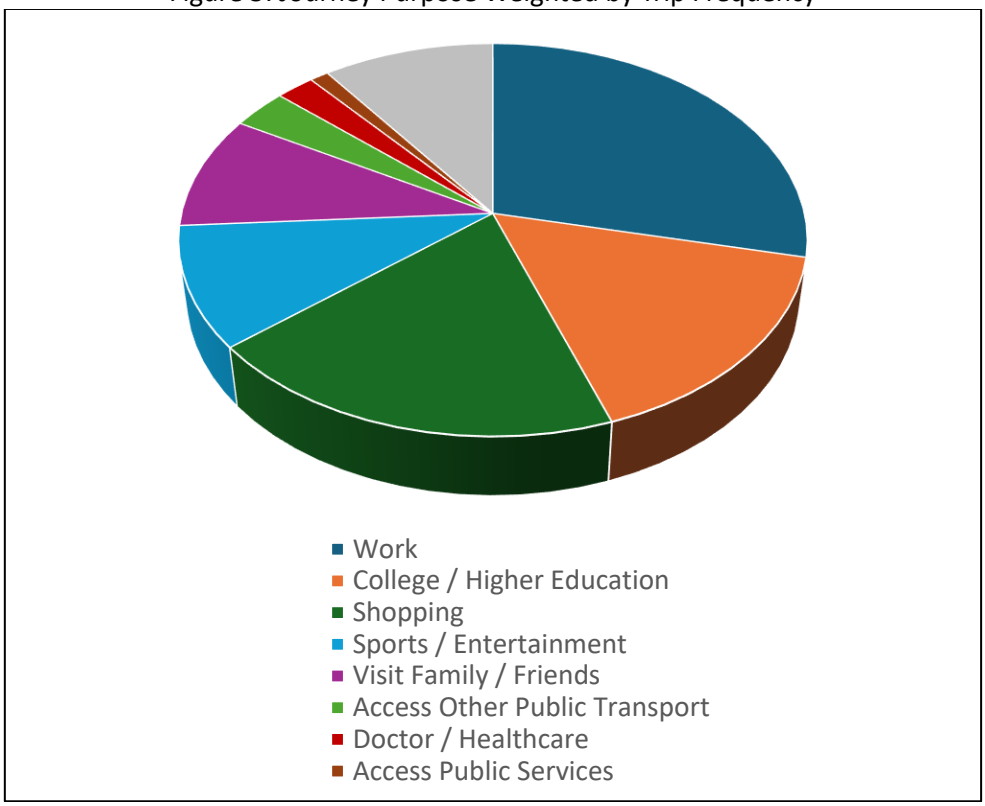
Before examining the spatial patterns revealed by the data, we begin by providing some descriptive statistics. The most striking feature from the data is the dominance of the motor car in trips from the area. On an unweighted basis, three quarters of all trips are by car, dominating all other transport modes (of the other categories, only bus travel, at 14%, reaching double figures. Weighted by journey frequency, the bus share increases to 17% but car travel still dominates at 71% (see Figure 4).

Figure 4: Transport Mode Weighted by Trip Frequency



While prior expectations were that travel to work or education would dominate journeys, the responses, weighted by frequency, totalled to less than half of all trips, with shopping ranking second behind work but ahead of education. In part, this might reflect the high proportion of over-65s in the sample (and in the study area); it might also result from the increase in hybrid working and working (and studying) from home that reduces the aggregate number of journeys to workplace, college or school. 10% of journeys are to visit family and friends and a further 10% for leisure (sport and entertainment) purposes.

Figure 5: Journey Purpose Weighted by Trip Frequency



We additionally asked those surveyed which train stations they used (or would use), with 62% of the sample answering. Respondents could select up to three stations. Cambridge dominates the responses. The most frequent station was Cambridge North (selected by 67% of respondents), followed by Cambridge Central (65%) and Ely (36%) with smaller proportions selecting Newmarket (21%), and fewer still selecting Soham, Dullingham or Waterbeach (where the response may have been boosted by a suggestion of a cycle route from Lode). We would note that the current bus services do not go directly to *any* of these stations and that there is no easy public transport route to Cambridge North, the most frequently used station. Free-format comments suggest that many of the users of Newmarket station are those in full-time education from the villages further up the B1102, using it as an alternative to the bus journey to school/college in Cambridge, seen as unreliable and too time consuming[4].

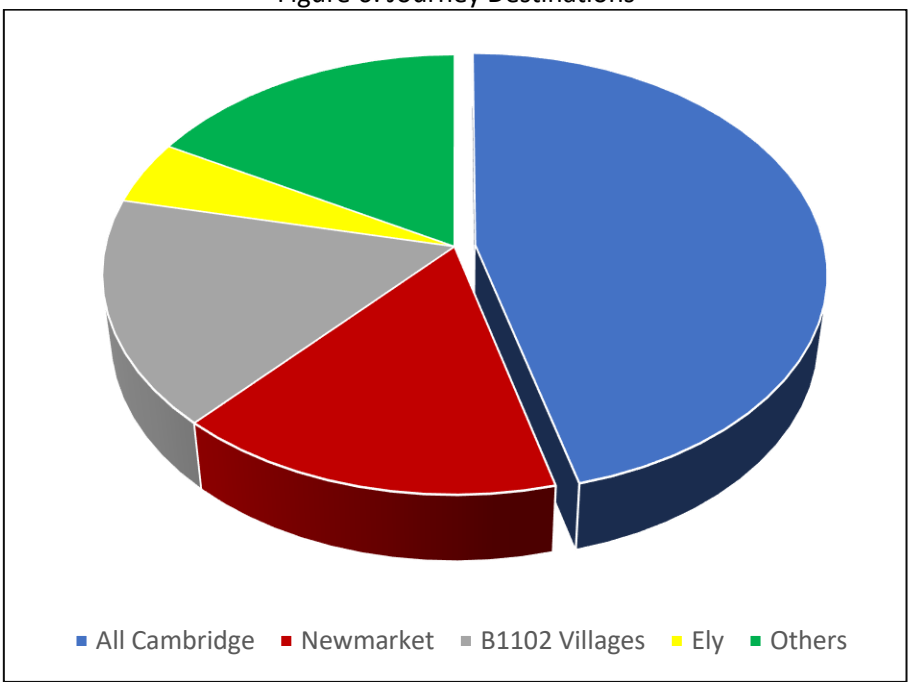
Choice of station clearly depends on location. Analysis the responses by parish, those to the North East were more likely to use Ely station (respondents from Fordham, Soham and the handful of Wicken response) – some of these respondents also mentioned Soham station (although Soham residents were as likely to mention Ely as their own station). Of other villages, only Burwell had more than 10% of respondents nominate Ely (but were more likely to use Cambridge North). For all the other villages the two Cambridge stations were dominant, with Cambridge North having a slightly higher response than the central Cambridge Station. We think it is important to stress this as there is no effective public transport route to Cambridge North from the B1102 corridor, such that restrictions to access or parking would significantly impact the residents of the survey area.

[4] Those same comments suggest that there is a very unfavourable view of the reliability of the rail service too.

3.2 Frequent Trips: Destinations

The majority of respondents to the survey answering the frequent journeys questions included a trip destination (either as a location or a postcode) and these have been geocoded. The analysis here is based on just over 2,000 trips[5]. As noted above, we are able to weight these by trip frequency[6]. In this report, we largely focus on journeys into Cambridge – defined as the wards in Cambridge city plus the contiguous areas to the North up to the A14 and to the East from Cherry Hinton. Journeys into the city account for 46% of all the trips reported. We note, though, that 16% of trips were to Newmarket and 17% of trips were to other villages along the B1102 corridor, with around 5% of trips going to Ely (recall that we do not have a large Fordham sample, however). Other smaller clusters include journeys to Fulbourn, Bury St Edmunds, Soham, Milton and Histon & Impington. Factoring in trip frequency, Cambridge's importance would be still greater.

Figure 6: Journey Destinations



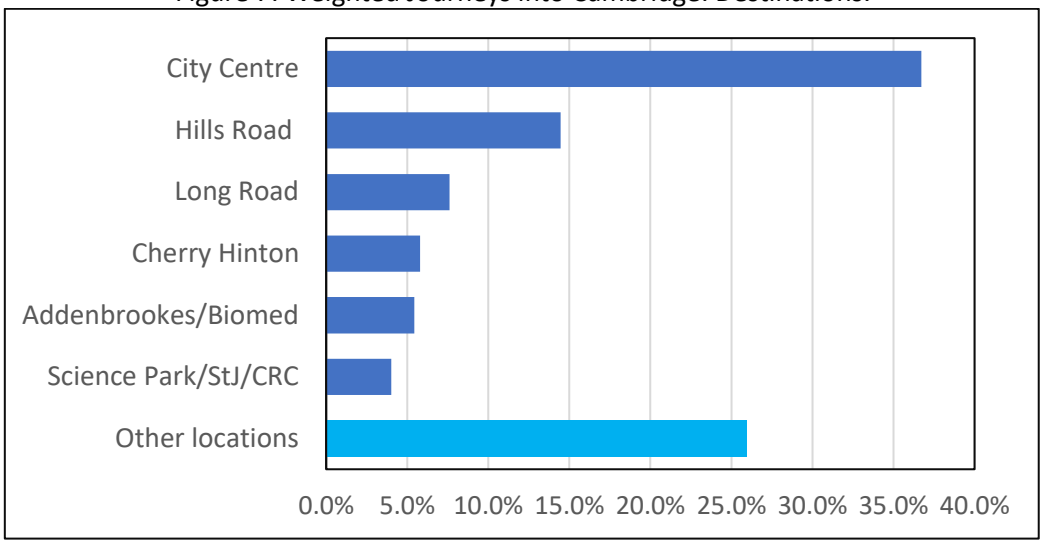
Focussing on the Cambridge journeys, we have examined clusters of destinations within the city. The first ranked destination is the city centre, broadly defined. However, this only accounts for 44% of trips and 37% of journeys weighted by frequency, emphasising the diversity of destinations that the survey respondents target. Other important clusters include Hills Road (14%) and Long Road (8%); Addenbrookes and the bio-medical campus (5%); Cherry Hinton including ARM and other business locations (6%), the Science Park, St John's and CRC (4%). Taken together, these clusters contain more destinations weighted by journey than journeys into the city centre.

Analysis of the unweighted trips indicate that, as expected, Addenbrookes becomes more significant (that is, many respondents visit the hospital and/or the bio-medical campus, but with a lower frequency). The importance of the Long Road and Hills Road clusters may well reflect journeys for post-16 education: we examine this further below. These named destinations only account for three-quarters of the frequency-weighted journeys and other smaller clusters are evident, including the two train stations, the University's Cambridge West site and (as a break of journey point) the Newmarket Road park & ride (we have no information on onward journeys from there, nor from the stations).

[5] After data cleaning, we have 2,093 trip records, 961 of which have destinations in Cambridge.

[6] As above, where there is missing data, we use the mean value for the trip ranking as a proxy, adjusting for commuting for work or education as appropriate.

Figure 7: Weighted Journeys into Cambridge: Destinations.



Examining weighted responses by parish (while noting concerns about the statistical robustness of the results given smaller and not necessarily fully representative samples at village level), it was striking that every single parish had Cambridge as the more frequent destination. Of the larger villages only Fordham showed a more even split between Cambridge, Newmarket and Ely (and was the only parish with more than 10% of trips going to Ely). Cambridge's dominance increases as one moves Southwest along the B1102. Newmarket was the next most frequent trip destination for most parishes. No parish had a higher proportion of trips going to Ely than to Newmarket (this holds for Soham, although the sample there is too small to be robust.

Although Cambridge dominates, there is evidence of considerable movement between the villages in the B1102 corridor, with Bottisham and Burwell destinations, presumably due to amenities and services (in particular schools, pharmacies and the GP practices). Bottisham was more important for those villages to the Southwest of the survey area, Burwell's use increasing as one moved out to the North East. Only Great and Little Wilbraham had Fulbourn as a common destination, again presumably reflecting amenities and services. This does emphasise the importance of transport links *within* the corridor. While Cambridge (and Newmarket to an extent) represents the most important target for households, the uneven distribution of amenities and services drives more local travel. Figure 8 shows the most important destinations for a selection of the parishes in the sample.

Figure 8: Trip Destination by Parish

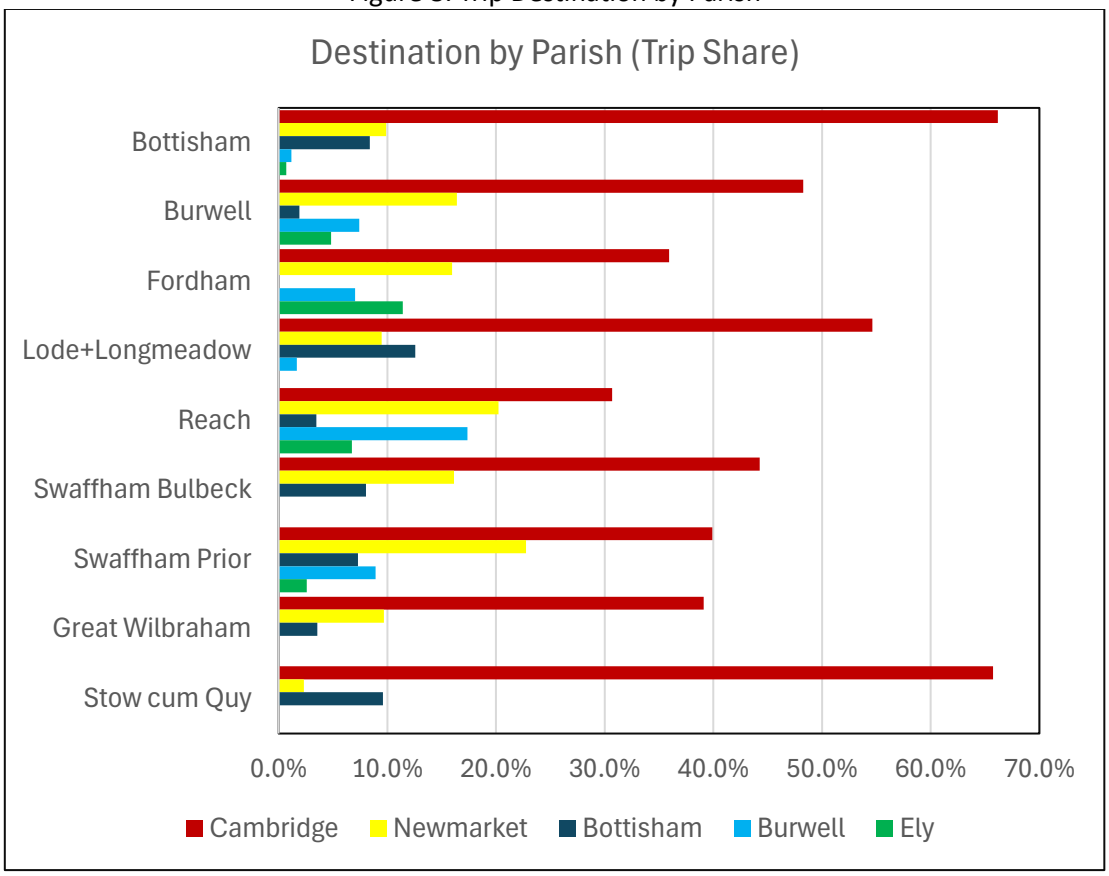


Figure 9 sets out the transport mode for the weighted journeys: Panel A shows the distribution for all Cambridge journeys and Panel B shows the distribution for journeys to Cambridge city centre. Once again, the dominance of car travel is clear, taking a 62% share of all Cambridge journeys and a 57% share of city centre journeys despite the known issues of congestion and cost. Bus travel becomes more significant for city centre journeys (36% compared to 27%) – this is to be expected given that Drummer Street is the route terminal and many of the other locations are not served directly, as discussed further below. Of those completing the data, 66% of journeys were reported to be in peak hours, reflecting journeys for work and education. The unweighted trip data shows a narrow majority (53%) of trips are off-peak, indicative that the survey respondents come into the city for other, less frequent, activities such as shopping, leisure and other service and amenity uses.

Results filtered by parish are largely consistent with the results from the full survey. For every parish, car is the most frequent mode, with most villages showing a car share of trips between 70%-80% with possible anomalies from Bottisham (61%, perhaps due to over-sampling of Bottisham Village College pupils, given higher bus usage) and Fordham (91% but from a small sample). For most parishes, bus travel is the second ranked trip mode, with cycling and walking making up most of the other trips. Stow-cum-Quy, Swaffham Bulbeck and Little Wilbraham had more than 10% of trips by bike. For those last two, low sample size requires caution. Quy is the parish closest to Cambridge (and to the Newmarket Park & Ride) which might explain the higher proportion. These figures, confirming the full survey result, illustrate the extent to which the survey respondents rely on private, motor transport to reach their destinations. To obtain a shift towards transport modes that have lower environmental impact thus represents a considerable task. Figure 10 shows transport modes for selected parishes.

Figure 9: Cambridge Journeys: Trip Mode.

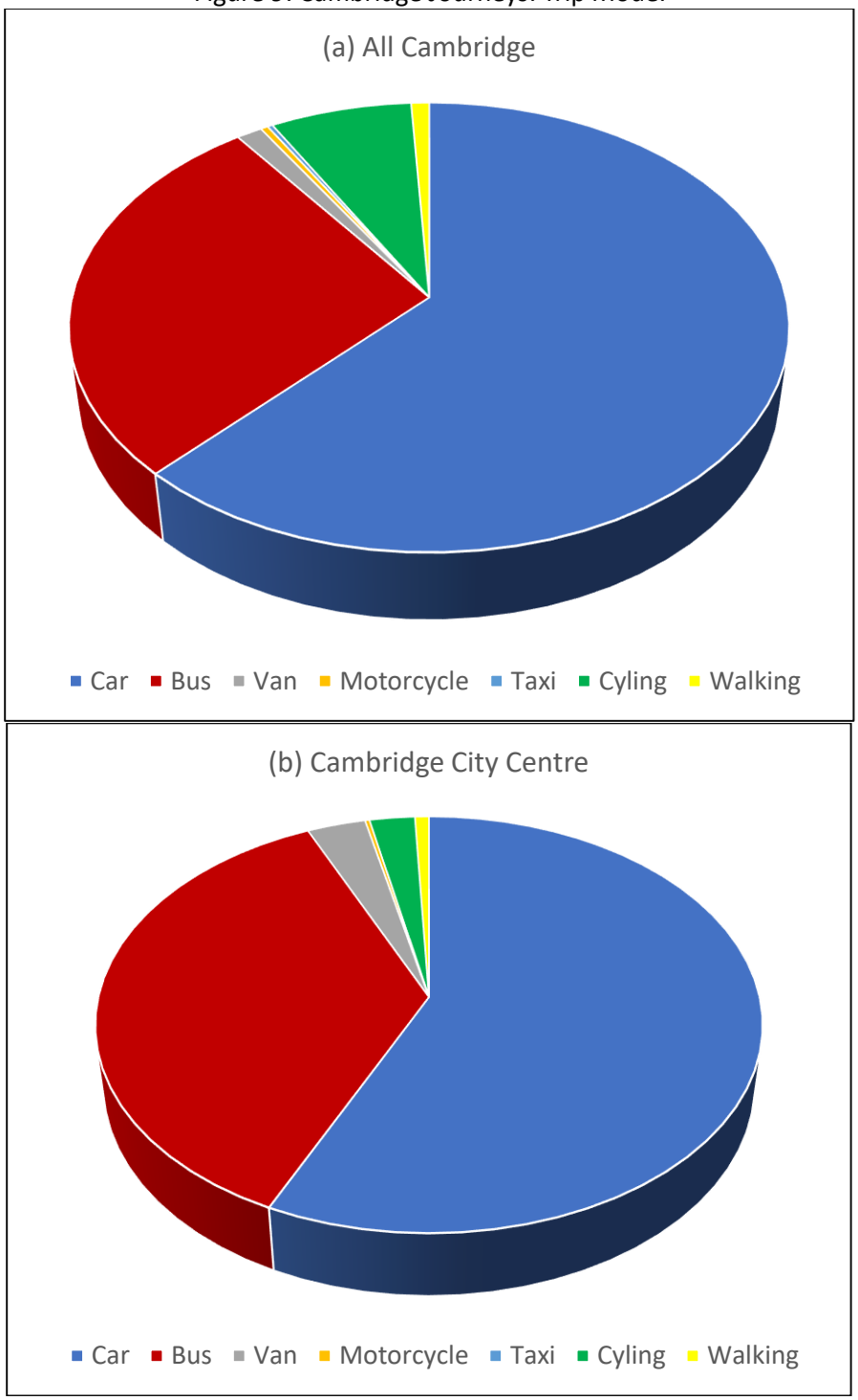
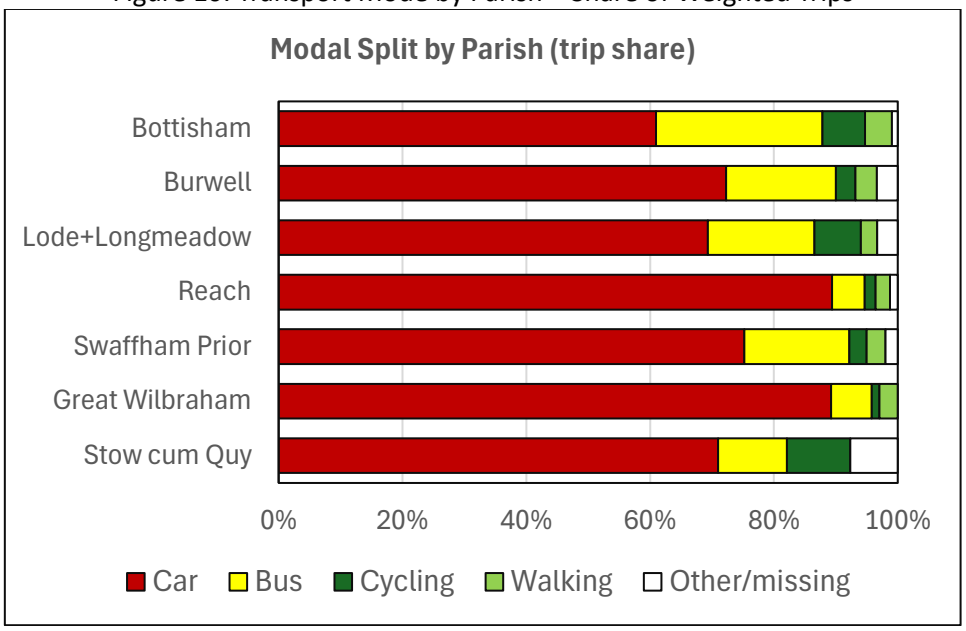


Figure 10: Transport Mode by Parish – Share of Weighted Trips



3.3 Those in Full-Time Education

Given the Hills Road and Long Road clusters and the presence of the sixth form colleges there, we separately analysed travel mode for those locations for respondents in full time education (around 100 trips). Hills Road sixth form college is over 2km from the Drummer Street bus station, albeit with a bus service between the two (often subject to congestion at the Lensfield junction and by the station), while Long Road and the Oakes are further still and there is no direct bus service from the B1102 villages. Nonetheless, 60% of journeys are taken by bus, despite the time involved. 27% travel by car including 35% of the journeys to Long Road. Given the distances, relatively few cycle (or walk), around 13% of those going to Hills Road, although given relatively small sample sizes this should be treated with some caution. It was also evident from comments that another route taken by some was into Newmarket (generally by car), then a train journey into Cambridge. The journey time and the lack of connection was a recurrent feature in the free-form responses to the survey. To give a flavour of these concerns we report a selection of (the printable) responses:

- *Buses do not run in Lode until 10am, meaning I have to walk to the Main Rd in order to get to college in the morning and walk home in the dark due to the irregular buses when I cannot be picked up;*
- *There are buses but they do not run at the times or frequency for me to use them so I have to rely on lifts;*
- *I would like to get the bus to and from sixth form college but can't rely on the 7:30am bus getting into town on time for a 9am start so a parent has to take me by car. Coming home it takes 2 hours because the buses are only hourly - if I finish at 16:00 the first bus I can get is 17:15 and I get home at 18:00;*
- *The bus I currently use doesn't stop at my destination, so I either have a 30 minute walk or have to pay an extra £2 for a return ticket for a crowded bus that would take about 20 minutes at peak time (from my bus stop to my college). At the end of my day, neither walking or getting the bus from my college to my bus stop will get my there in time for the hourly bus home so I normally have to wait at least 45 minutes until the next bus. Although the bus journey takes about 20 minutes (+ an extra 20/30 minutes getting another bus/walking), 3/5 days a week I don't get back until 2 hours after I finish college.*

- *To get to Long Road takes getting on for two hours some days and can cost up to £8 return, it is cheaper to get a lift in if possible;*
- *I have to get the 6:40 bus every morning as 7:20 the bus is constantly unreliable and can often not get me to Cambridge in time for classes at 9 causing me to be late regularly. Also there are large gaps in times and the buses sometimes don't run late enough into the evenings causing me to have to get picked up by car;*
- *Services to Cambridge aren't frequent enough. They are unreliable which means I can take over 2hrs to get to college. The services are also not integrated with Cambridge city transport so would need two different bus passes which makes it very*
- *I DO use the bus, but if I am to get to my college for a 9am start, I must catch the 6:40am bus. I'm tired before I get there. Then, it takes me two buses and almost two hours to get home again. It's not a good way to study.*

These responses are broadly representative of the comments made by respondents in full-time education, and it is clear that many of them are forced to spend hours travelling (and are also restricted in terms of extra-curricular activity if reliant on public transport). Grouping the responses by theme, 27% complained about the very long journey times, 23% appealed for a direct service to Hills Road or Long Road to reduce journey time and cost, a tenth noted that they were forced to rely on lifts and 8% complained about the costs of multi-stage trips. Other frequent themes were the infrequency and unreliability of public transport options.

The survey additionally asked respondents what other regular (local) journeys they would take but were unable to do so due to lack of transport. Resource constrained, we have only carried out basic analysis of the responses. The sample provides usable information on 316 possible trips. Strikingly, the vast majority of those desired journeys are by bus (84% of trips, 87% of trips weighted by frequency). Around half the desired journeys are into Cambridge and these journeys are absolutely also dominated by bus travel (90% by trip, 93% weighted by frequency). Aside from more direct journeys to target destinations (including those already highlighted for education purposes), the free-form text comments indicate that a strong component of this was the need for public transport later into the evening and at weekends. The desired Cambridge locations are diverse, with around a third into the centre, with other clusters at Hills Road/Long Road, the Bio-Medical Cluster and the two Cambridge stations[7].

4. Bus Usage, Bus Improvements and Switching to More Sustainable Travel Modes

The survey asked respondents a number of questions about public transport and for those using cars (as noted above, over 70% of trips identified in the survey were by private car), what might encourage them to switch to more environmentally friendly formats. The responses identify both barriers to bus travel and possible improvements that might alter respondents' mode choice. The question format consisted of a series of structured responses (derived from pilot work on the survey and prior research) and the ability to add free form comments.

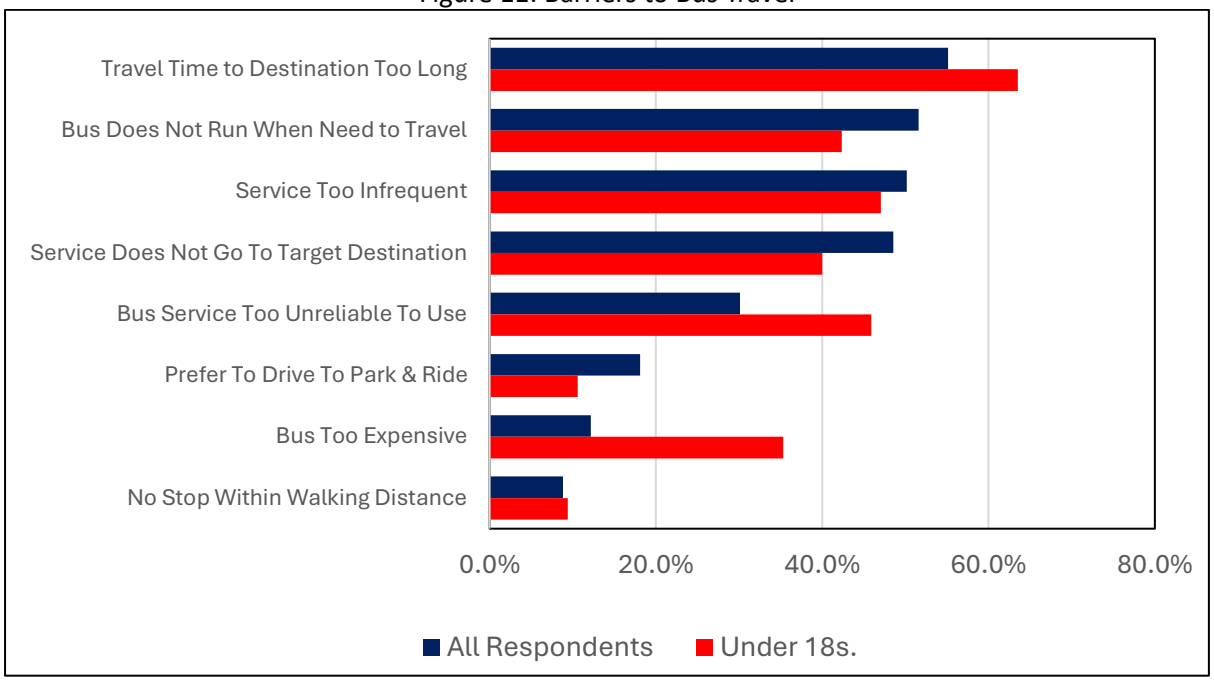
4.1 Barriers to Bus Usage

First, we asked respondents what were the most significant barriers that prevent them from using the bus for all or some of their journeys. Around 70% of respondents completed this question (the response rate was broadly constant across age categories, but lower for the under-18s, who presumably are more dependent on available public transport. The responses emphasise that the most important barriers related to service quality.

[7] This also suggests that with the opening of Cambridge South, that there is substantial potential for a southern route serving Addenbrookes, Long Road and the new station.

The most frequently cited barriers were that the current bus service did not allow the respondent to get to their destination within a reasonable time frame (cited by 55% of respondents); that the service does not run when the respondent wished to travel (52%); that the service was not sufficiently frequent[8] (50%); and that the current bus service did not allow the respondent to get to their desired destination. These were the major barriers for all age groups. Journey time was a major issue for the under-eighteens with 63% of those responding citing it as a barrier. They also noted concerns about service reliability and cost with over a third of under-18s stating that travel by bus was too expensive (this did not seem to be a concern for other age groups). Taken together, these responses suggest that those surveyed felt that the existing bus service did not meet their needs in terms of travel time, frequency or destination.

Figure 11: Barriers to Bus Travel



The free form text comments confirm and amplify these results. Many speak to the absence of a service to the destination required and/or at the time needed. Some of the representative comments include:

- *There are no bus services to any train stations which is madness.*
- *I would like not to have to go into Cambridge then out again when there is a more direct route to Addenbrooke's.*
- *I would love to be able to go to work with public transportation, but it's impossible to get to the Science Park from Burwell.*
- *I currently have to get the bus at 7 which then gets stuck in traffic for sometimes up to 30 mins, I then have to walk for 35 mins to school, I am often late and the journey should not take this long.*
- *I volunteer in Cambridge on weekday evenings (7:30-10pm) but the buses do not run after 6pm so I cannot go into town or get home on the bus.*
- *It would be great if the buses ran in the evening and on Sunday so I could get to work and meet friends without needing my parents to take and collect me by car.*

[8] The responses were linked to confidence in using the service: with one bus an hour, a cancellation or long delayed running can make the bus infeasible for most users.

- *I would prefer to commute to work by bus, however the infrequency makes this difficult. I often have to work later than normal 9 - 5 office hours (finishing after 8pm or later)*
- *If there were a regular reliable bus service, including into the evenings, we would use it. We could also reduce to one car from two, in a two-person household.*
- *Without a bus from Lode to Bottisham I cannot get to the shop or the doctors. It is a long walk.*

All these responses eloquently suggest that individuals would be prepared to switch to public from private transport, reducing the dominance of the car as transit mode if the service provided reached target destinations sufficiently quickly and at the times needed. The current, very restricted service, with a single central destination and limited operating hours does not meet the needs of the B1102 communities and hampers the switch to more sustainable forms of transport.

4.2 Bus Improvements

Next, respondents were asked which improvements might encourage them to use the bus more frequently. As with the travel barriers question, the survey provided a list of potential improvements and the opportunity to provide free-form text. The improvements drew from the work of the A to B1102 Group, discussions with parishes, from local authority travel consultations and from other schemes. Around two thirds of our sample completed this question, just over 600 responses.

For the whole sample, the most frequently cited improvement was for services to be extended into the evening (58% of respondents, rising to 65% in the 25-64 year old age band). Other frequently cited improvements included provision of real time departure information at bus stops (47%); an interchange to enable travel to other Cambridge locations[9] (46%); a Sunday service (42%) and a fast service along the B1102 from Fordham into Cambridge (40%). As with the bus barriers question, the under-18s had somewhat different priorities with 57% supporting the fast bus concept but only a third selecting extension of services into the evening. Responses across other age categories were broadly consistent although only a quarter of the over-65s selected the fast bus choice but 36% supporting a local minibus service linking villages and going to shops and surgeries. Fewer younger adults chose this option.

The free-form text comments amplify the structured data on constraints and improvements. Our analysis suggests that by far the most commonly cited issue was the availability of buses – that they did not run in the evenings or on Sundays and that they were too infrequent: nearly a third of the comments made reflected this issue. The second ranked issue was journey time: a sense that the time taken to reach target destinations was too long to make a bus journey feasible or was having negative impacts on the traveller. A number of the comments related to the absence of (reasonable) public transport links to mainline stations and the lack of connections between communities in the B1102 corridor: a particular issue being the ability to access medical facilities, shops and other amenities located in the larger communities from the smaller villages. More generally, the comments suggested that concerns about safety were limiting the use of more sustainable transport forms, notably cycling: a number of respondents talked about safety issues travelling from village to village.

Finally, we asked those who currently used a private car or van for the majority of their frequent journeys what would encourage or cause them to change their mode of transport. Again, around two thirds of our sample completed this question. By far the most frequently selected response was “more frequent bus service” (selected by 66% of respondents), followed by provision of a bus route that replicated the car journey (54%) – the answer included the phrase “as fast as possible (albeit with stops)”. No other choice was selected by a majority of those responding, the next highest being “better

[9] The question gave South to the bio-medical campus, North to the Science Park as examples.

connections/interchange" picked by 38% of the sample. There was some support for a better and safer footpath/cycle path, although not amongst the younger age categories[10]. The responses here suggest that, in the absence of a proven, frequent and reliable service, it will be hard to persuade travellers in the B1102 corridor to use public transport, although these responses are clearly influenced by the existing service provision and its perceived inadequacies.

4.3 Walking and Cycling

As the earlier analysis of trip modes demonstrated, a smaller proportion of journeys recorded were by bicycle or walking. As a result, the number of observations is relatively low and the results presented here must be treated with some caution. Of the trips recorded, cycling accounted for around 5% of journeys and walking less than 3%. Since the survey requested most frequent journeys, these figures may well underplay use of active travel modes, particularly for inter-village travel. That 5% cycling figure is higher than the 2% of trips recorded in the National Travel Survey, but well below the share in countries such as the Netherlands with a higher quality and denser cycling infrastructure in place.

As might be expected, the age profile of those cycling is younger than that of the sample as a whole, with 54% being aged under 44 (compared to 39% overall) and only 16% aged 65 or over (as against 26% of all respondents). Again, age is no barrier to cycling (particularly with the increasing availability of electric bikes) although Cycle UK figures do suggest that access to a bike falls sharply from 49% for those aged 50-59 to 28% for the over 60s. It may be that access is greater in a comparatively wealthier area like the B1102 corridor, but this does imply that improving cycle infrastructure needs to be accompanied by encouragement to use more active travel modes. The age profile of those walking was closer to the overall sample distribution, with nearly a third of walking trips being by those in the 65 or over category.

Just under half of all cycling trips were for work or college / higher education – the trip purpose distribution was very similar to the overall distribution in the sample, with a further 14% of trips being for shopping. While one might have expected cycling trips to be more local, over half had Cambridge postcodes as the final destination. As with the overall sample, the end destinations *within* Cambridge were widely dispersed (since many of the bus trips ended at Drummer Street, cycle journeys, presumably to final destinations, were *more* diverse). Walking trips were less likely to be for work or education (although some 10% were to access other public transport). Shopping, sports and entertainment were more frequent reasons for journeys than in the overall sample.

The small sample size makes any detailed analysis by parish problematic. For work journeys, as one might expect, those parishes nearer to Cambridge are over-represented in cycling journeys into the city (20% are from Quy, 30% from Bottisham) although there were some very long journeys recorded, in excess of 16km from Burwell, for example. A similar, if less distinct pattern is observed for trips for college or higher education although Quy does not show the same over-representation, perhaps due to the shorter duration of the bus journey. For non-work or education journeys, there is some evidence of a pattern of cycle journeys from the smaller villages to the larger for shopping and access to services including healthcare; and for intra-village walking trips for leisure and visits to family and friends.

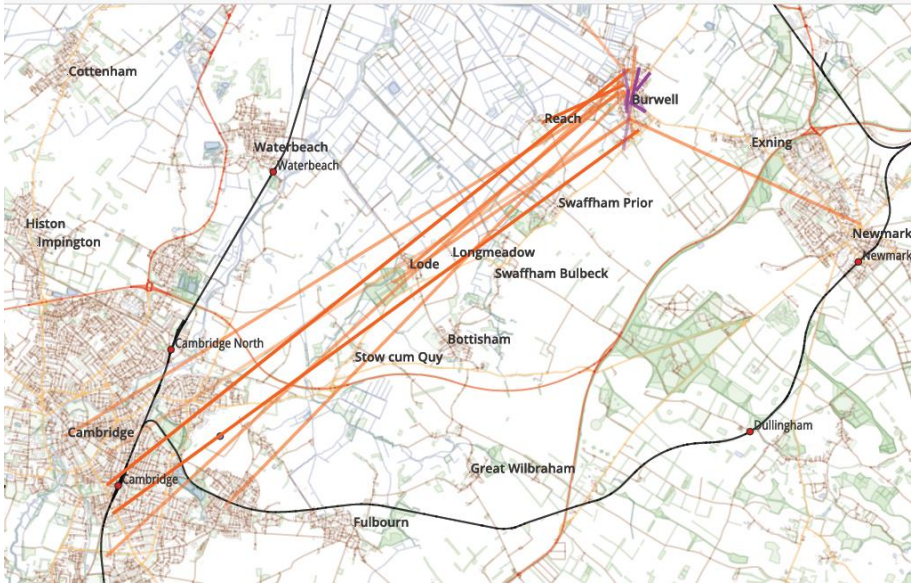
Figure 11 shows heat maps of active travel from Burwell and Bottisham. The maps show the extent to which Cambridge dominates cycle trips recorded (but also the varied final destinations. The dominance of Cambridge as destination is, perhaps, surprising, given the distance (some 18km to the city centre) although there are fewer trips than sampled for Bottisham.

[10] There is some sense from the responses and free format text that improved safety might increase cycling *within* the B1102 corridor, but not see an increase in cycle commuting. Even from Quy, the city centre is some 8km away, closer to 20km from the centre of Burwell.

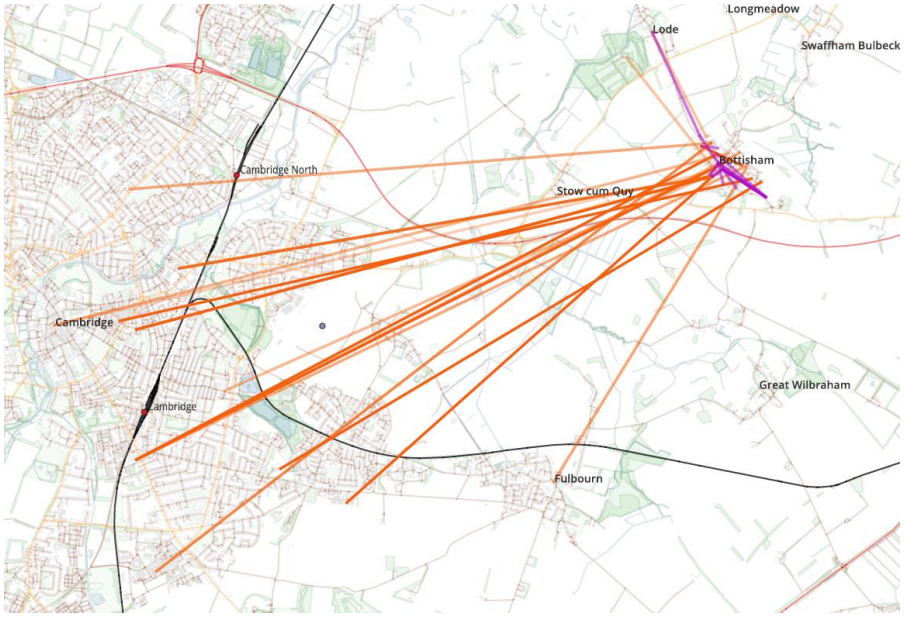
The orientation of journeys is striking, with little to the North and East of each village. It should be noted that the survey requested information on the most frequent journeys made, so the maps will understate more occasional trips made by bike or on foot. For other villages, where analysis is possible, similar patterns emerge, with two exceptions: Lode & Longmeadow and Reach show more local walking and cycling patterns – to Bottisham for the former and to Burwell for the latter presumably to access amenities and services in the larger neighbouring villages. As might be expected, Stow cum Quy has clearer commuting patterns by bike to Cambridge locations.

Figure 12: Active Travel Heatmaps, Burwell and Bottisham

Panel A: Burwell



Panel B: Bottisham



The maps show trips from the two villages: brown for cycling, purple for walking, with the line density indicating trip frequency (darker more frequent). Lines do not represent routes.

Perhaps surprisingly, the sample provided little evidence of cycle journeys to Newmarket or to Ely from the B1102 villages. Distance may, in part explain the latter; however, the freeform comments provide some evidence that the lack of safe, direct cycle routes to those centres constrain use of more sustainable transport modes other than bus travel. A number of themes emerge from the comments. The first is safety: numerous comments suggested that potential cyclists feel unsafe at present and that they would cycle more if they felt secure: for many (but not all) this implied cycle paths separated from car traffic. Linked to this were comments about the need for *direct* routes between villages and towns – safer routes that involved substantial detours or long journeys seemed to deter usage.

A third theme was quality and maintenance of cycle routes with a sense that cycle paths were inadequate and neglected, often rendering them unusable. Finally, it was suggested that people might cycle to transport interchanges (such as the park and ride or to bus interchanges in the B1102 corridor if there was secure and flexible bike storage). Comments and views expressed included:

- *More practical, safer cycling routes in all directions from Burwell that were lit and direct.*
- *Safe off-road cycle routes would make it possible for me to dust off my bike – but please do not destroy plant-and-wildlife-important areas to create cycle routes.*
- *I would like to try cycling into Cambridge but I am not confident and it doesn't feel safe.*
- *Cycle paths with lights would be amazing.*
- *Would like safe cycle routes from The Wilbrahams …*
- *Would bike more often if the path had better lighting.*
- *Cycling to Newmarket is too dangerous*
- *Main issue is with the lack of safe cycle route provision. There is some already in place which is poorly maintained, overgrown in places, too narrow and immediately adjacent to fast carriageway- this is unsafe for children.*
- *I do sometimes cycle to Ely, a good A142 cycle path would help (Soham and riverside is a lot further and slower).*
- *Would like to cycle safely as a family in the general vicinity. This is hampered by the poor standard of the cycle/footpaths provided and the lack of them in most areas.*
- *The cycleway … needs improvements - it is dangerously narrow, especially when two cycles are passing one another.*
- *The bike path… is not maintained sufficiently. It is so overgrown in some areas you cannot safely cycle or get two bikes past. This should be a priority to improve and maintain so that cycling is a safe viable option.*
- *Cycle routes have to be maintained. A 40 cm encroachment of weeds or hedging onto a 120 cm cycle path is a 33% loss of space, but many are in that condition.*
- *… secure bike storage at Burwell would allow surrounding villagers to access improvements this group makes and increase users.*
- *I would cycle from the P&R but it feels difficult to sort out secure parking for my bike.*
- *I need flexibility. It's hard to see a good alternative to the car. A bike might be possible for part of some journeys, but I would need a secure interchange and safe storage.*

These suggest that people *would* cycle more if there were safe and feasible options. Distance constrains use of a bike as the primary method of commuting for many residents. Cycling for part of the journey requires clear and reliable interchanges with secure bike storage within the B1102 corridor: while cycling *from* the park and ride into Cambridge would reduce car traffic into the city, it would do nothing to alleviate the congestion at the Southwest end of the B1102 and at and around the Quy interchange. An increase in active travel is also dependent on the provision *and maintenance* of safe and direct routes. Whilst, given the demographics and geography of the area, active travel is unlikely ever to be the main mode of transport for the majority of residents, addressing current barriers to cycling use could facilitate an increase, in particular for inter-village trips

Summary and Conclusions

The A To B1102 travel survey generated nearly 900 usable responses, with very good coverage of the communities along the B1102 corridor, the sample being broadly representative both of the spatial distribution and the demographic profile of the area. The data allows us to provide a clear view of the pattern of travel within and from the B1102 villages and the constraints and problems faced by residents in the area. The analysis presented here demonstrates the constraints hampering use of public transport and the potential for a switch towards more sustainable transport forms if the service provision were more sensitive to the needs of the local population.

Based on analysis of more than 2,000 frequent trips made by the respondents, it is evident that car travel dominates all other transport modes: weighted by travel frequency, some 70% of journeys are by car. Travel is for a wide range of purposes with, as expected, work, education and shopping being the most frequent reasons. 50% of journeys are into the city of Cambridge, with other less dominant clusters including Ely and Newmarket (with trips predominantly there largely originating in the area beyond Burwell. There is also evidence of significant inter-village travel to access local services and amenities (in particular doctors' surgeries) in the larger communities, and particularly around Burwell and Bottisham.

For travel into Cambridge, only 44% of trips and 37% of journeys weighted by frequency are into the city centre (at the time of the survey, the only destination served by buses). The results show a wide range of destinations, with important clusters found in Hills Road and Long Road, Addenbrookes and the bio-medical campus and the Science Park/Cambridge North. None of these are directly served by a bus route: public transport journeys would involve multiple stages. This provides a substantial explanation for the dominance of car-based journeys, as emphasised in many of the comments made.

Travel to work or education dominates journeys made. We identify a specific issue for students aged 16-18 in the area, many of whom travel into Cambridge to access the sixth form colleges at Long Road, Hills Road, CRC and the Oakes. None of these have a direct bus service, entailing lengthy and costly multi-stage public transport journeys (or travel by car); further, the early final bus times back from Cambridge curtail extra-curricular activity and socialising. The dissatisfaction of these students was very evident from the comments provided in the survey.

We asked about obstacles to travel by bus. Once again, the answers are consistent with the journey information: the services were seen as taking too long, not going to desired locations, and not running where needed (with cost an additional factor for those in full-time education). There was also a sense that the service frequency and reliability was a constraint (an hourly service creates significant issues if a bus is cancelled). Our question on transport improvements and switching to more sustainable travel modes mirrored this, focussing on routing, speed of journey and extended operating hours.

We also have analysis of desired journeys – the great majority of which were into Cambridge: direct to colleges for those in education but also into the city to access amenities and services but at times when the bus service currently does not operate. In particular the lack of adequate evening and weekend services featured prominently.

While much of this report focusses on journeys to and from Cambridge (since these form the largest proportion of trips taken), the survey shows that there are a considerable number of journeys *between* the villages and communities in the B1102 corridor: for schooling below sixth form level, for access to local shops and services (particularly medical services) and for social reasons. As with travel into the city, the car dominates. A move to other, perhaps more sustainable, forms of transport is made difficult by the lower population densities and more substantial distances involved by comparison to the urban setting. There are obstacles, individual and logistic, to a move towards more active travel formats.

This analysis suggests that while car travel dominates travel in the B1102 corridor, there is considerable potential for greater use of more sustainable transport forms – but only if the public transport services provided were more sensitive and responsive to the needs of the B1102 communities in terms of the range of target destinations, travel time, operating hours and frequency/reliability. Although some comments indicated a determination to continue to rely on the car, a considerable proportion of those responding indicated that they would switch if the public transport service provided supported that.

There is scope to increase significantly active travel for inter-village trips and into Cambridge, especially from the nearer villages. Cycling achieves a much higher modal share in the Netherlands in communities a similar distance from a large centre, because of the provision of high-quality cycleways and low-traffic routes. Nonetheless, distances involved and other constraints limit the extent to which active travel can substitute for car or bus journeys, given the dominance of commuting and of Cambridge as the primary destination.

The survey provides some indication that residents *would* cycle more if safer (but direct) routes were provided and maintained – for many (but not all[11]) respondents this meant physical separation from motor traffic on dedicated cycle paths. For there to be more use of active travel modes for commuting (including split-mode journeys cycling to or from travel interchange points), adequate infrastructure (including safe cycle storage) was needed.

There are substantial policy implications from the survey findings. These include:

- *If residents in the area are to switch from a predominant private car mode of transport, then there has to be a public transport network that provides a reliable service to the varied destinations of journeys. The service at the time of the survey was unsatisfactory in that it was solely focussed on central Cambridge, was slow and did not provide options outside a narrow daytime band. This is not sufficient to drive a switch to more sustainable travel modes.*

- *Transport policy must recognise that Cambridge does not have a single central core location for travel into the city. There are significant clusters of destinations in South Cambridge (e.g. the bio-medical campus), to the North (the science park, Cambridge North station) and to the West as well as central locations. These are not adequately served by public transport, emphasising the need for transport around as well as into Cambridge and for improved inter-connection points with proper waiting facilities and real time information on services.*

- *There needs to be urgent consideration given to the needs of 16-18 year olds in education, many attending sixth form establishments in Cambridge and facing costly, lengthy and unreliable multi-stage bus journeys with inflexible timings or relying on parental car journeys. More direct routes to educational destinations and multi-trip fare structures are needed.*

- *Given the need for faster public sector routes into Cambridge, perhaps with more limited stops and given the relatively low density and wide spread of population in the study area, consideration should be given to the establishment of local travel hubs at key interchange points. These could provide secure waiting areas with information on arrivals and departures, safe cycle storage, parking and other facilities, encouraging users to switch to more sustainable travel methods.*

[11] Given that most cycle paths are shared use and designed for maximum cycle speeds of 20kph, this limits their value for faster cyclists (of all ages) but this can result in aggression from motorists who demand those cyclists use the bike paths. More cyclists on the road would normalise the activity and increase awareness.

- *For both principal journeys and less frequent trips, a switch to more active travel modes (mainly cycling), there is an urgent need for safe and direct cycle routes. These are not substitutes: a lengthy, indirect route, however safe, will not encourage more cycling. Provision must be accompanied by adequate maintenance: existing cycle routes are often barely usable.*

- *Distance constrains widespread use of exclusively active travel modes for commuting. However, people might travel to (or from) travel interchanges. This emphasises the need for appropriate infrastructure including secure bike storage at such points.*

- *Given the demographics of the area, the varied destinations of journeys and the thin nature of public transport natures, there is unlikely to be a rapid switch away from the private car as the main means of transport. This needs to be accommodated. As an example, there needs to be adequate car parking provision and transport infrastructure at Cambridge North station, if this is to be the main rail interchange for the area.*

- *Transition to new modes of transport will take time and travellers will need to gain confidence in the feasibility and reliability of alternative journey types. Given the continuing development and growth of Cambridge and the wider region, it is vital that transport infrastructure accommodating the needs of Cambridge and its hinterland is central to land-use planning decisions.*

- *There needs to be clearer coordination between all the authorities and players involved in transport policy in the Cambridge region to ensure integration of transport initiatives and proper consideration of the needs of the residents in the wider Cambridge travel area.*

The A to B1102 group will use the results of the survey to provide evidence-based arguments to improve transport for the communities around the B1102 corridor and as input to transport planning initiatives in the Cambridge region.