North-East Cambridge Development – Transport Position Statement and Approach

INTRODUCTION

The North-East Cambridge area (**NEC**), a location containing key employment clusters, alongside education facilities at Cambridge Regional College and transport assets such as Cambridge North station and the Cambridgeshire Guided Busway, (see Figure 1) has long been seen as a key opportunity site for regeneration and development. Following discussions with the developers and landowners, the County Council ("**the Council**") has developed and set out the transport approach for NEC, considering alternative levels of development and their impacts, and whether the proposed growth can be accommodated in transport terms. Other impacts of the development such as biodiversity, flooding, etc will need to be assessed and considered separately.

This position statement is the result of that work and sets out the Council's position on the development of various sites in the north-east of Cambridge collectively referred to here as NEC, or "**the Development**" from a transport perspective, and describes the Council's vision and requirements for mitigating the comprehensive redevelopment of the area. A short summary is provided in this position statement, which is supported by two technical appendices which describe and evidence the Council's detailed transport response to the emerging proposals.

BACKGROUND

This position statement updates and builds on the existing work which was approved in September 2021[1] and updated in February 2022[2]. The technical work that underpins both the original and revised position statements was developed as part of the Ely to Cambridge Study[3], and included detailed technical analysis undertaken that was specific to the NEC area. These earlier studies were overseen by a technical group that included officers from both the local and strategic highway authorities and included engagement with landowners and developers. This led to the conclusion that development in the area was acceptable in transport terms as long as it did not result in additional levels of car trips on the surrounding highway network and hence a severe cumulative impact.

The first appendix describes using a **trip budget** approach to respond to planning applications and in understanding the impact of proposals as they come forwards. The second appendix considers the mitigation required for the Development, and how this shall be apportioned. A trip budget is an innovative and proactive approach to bringing forwards and managing the impacts of development, which is being used successfully on other key strategic sites by the Council. Both appendices form part of a coherent approach to the Development by the Council as Highway Authority but can also be used as stand-alone technical documents.

[1] North East Cambridge Area – Transport Approach EGI 16 September 2021
[2] https://www.greatercambridgeplanning.org/media/2452/transport-position-statement-revised-february-2022.pdf
[3] [3] 2018-Ely-to-Cambridge-corridor-transport-study PSOBC.pdf

The trip budget and apportionment methodology used in this assessment considers the delivery of strategic transport interventions to support the comprehensive development of whole NEC area. Individual transport assessments will still be required for all planning applications and, should these flag the need for additional local interventions, then these will be secured by CCC and the Local Planning Authorities in the usual way.

The 2018 adopted Local Plan[4] allocates the area east of Milton Road for regeneration but notes that a future Area Action Plan (**AAP**) will determine the quantum and mix of uses, and that any interim proposals must not compromise the future comprehensive redevelopment of the area. The Cambridge Science Park west of Milton Road is allocated for densification of employment.

The Draft Proposed Submission North East Cambridge Area Action Plan[5] was agreed by Cambridge City and South Cambridgeshire District Councils (together the **LPAs**) in January 2022 for future public consultation in the eventuality that a future consent for the relocation of a waste water treatment plant is approved. The draft AAP allocates 8,350 additional homes and 15,000 additional jobs to the NEC area. The draft AAP is supported by transport evidence prepared by the County Council and has a vision for a different approach to development on the edge of Cambridge, with increased height and density of buildings and a mixture of employment and residential sites.

Previous public sector transport investment in and around the Development has been significant and provides links to the new community at Northstowe by public transport and active travel along the Busway, direct connections to the rail network via Cambridge North station, and strategic high quality active travel links along the Chisolm Trail. Capacity on the A14 has also been significantly improved by National Highways, and the major interchange of the A10 and the A14 has had improvements completed. Major works have been carried out on Milton Road, as part of a Greater Cambridge Partnership project to improve connectivity for public transport and active travel users. Notwithstanding this, the highway network surrounding the Development is effectively at capacity, with regular and sustained congestion, particularly during the morning and evening peak periods. This is still the case despite the impact of the Pandemic on traffic levels around the development where the levels of traffic are still approximately 10 percent less than in 2019[6].

POSITION STATEMENT

The Council's key principles for the Development are:

- In principle support for the comprehensive development of North-East Cambridge
- Recognition of the significant amount of transport infrastructure already provided
- Recognition of the role of the Greater Cambridge Partnership programme to provide additional capacity for public transport and active travel journeys to the area
- Despite the previous and planned investment, the highway network is at or nearing a finite capacity throughout the day but especially in the AM and PM peak periods
- That allocation of employment and residential land within the development is a key element of defining and managing trips generated by the development
- Planned growth can be mitigated and managed but requires limited additional trips onto the highway network

[4] Cambridge City Local Plan 2018.pdf
[5] North East Cambridge Area Action Plan v4 2021.pdf
[6] quarterly-transport-data-updates/

- Significant further transport mitigation is required, and an overarching and coherent approach to the long-term design and delivery of the Development is needed
- Minimal impact on the highway network is required and this will be managed by a trip budget approach, with grade separation of key barriers and routes for pedestrians and cyclists as well as improved connectivity for public transport
- Continued collaboration and joint working between the Council and the LPAs is essential to enable the comprehensive redevelopment of NEC.

The mitigation identified in the Appendices is essential to enable the sites to be accommodated in transport terms, without significantly increasing the number of cars on the already congested network. The Development will need to provide the following:

- A comprehensive commitment to the trip budget approach, and the consideration of the NEC area as a whole in the form of a transport strategy for the whole NEC area to show that the development can be delivered within the trip budget.
- Grade separated crossings of the congested Milton Road to connect the site for pedestrians, cyclists and public transport.
- Significant contributions to the GCP transport programme in recognition of the additional capacity which is being provided.
- Mitigation as described in the Appendices, which may be updated from time to time.
- Future planning and safeguarding of land for potential strategic improvements must be made to enable a future solution to the Fen Road level crossing and access to the east of the railway; and to facilitate links to a future additional river crossing for sustainable transport, should these interventions be brought forwards to support growth at NEC and elsewhere in the sub-region.

Levels of development above those assessed in the Appendices are not sustainable in transport terms and will not be supported unless further, additional and transformative, mitigation can be identified and delivered entirely by the Development. Developers will be required to demonstrate that this additional mitigation is adequate to support their proposals.

Some individual sites within NEC have already been approved and, at the time of writing, further applications are being prepared and considered. These applications will be considered in the context of the principles and evidence set out here as they come forwards, and the onus will be on the landowners and developers to work together and demonstrate how their proposals will deliver the mitigations and contributions required.

The approach set out in this note has been prepared to be compliant with the current National Planning Policy Framework (NPPF) of December 2023[7]. The NPPF notes (at paragraph 115) that development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe. The Council's approach addresses the cumulative impacts of development across the NEC and is well evidenced through the technical work summarised in the Appendices.

At the time of writing revisions to the NPPF are being considered including promotion of a vision-led approach to development-related transport planning. This position statement is based on vision-led principles and is therefore considered to also be in line with the emerging NPPF.

[7] NPPF_December_2023.pdf

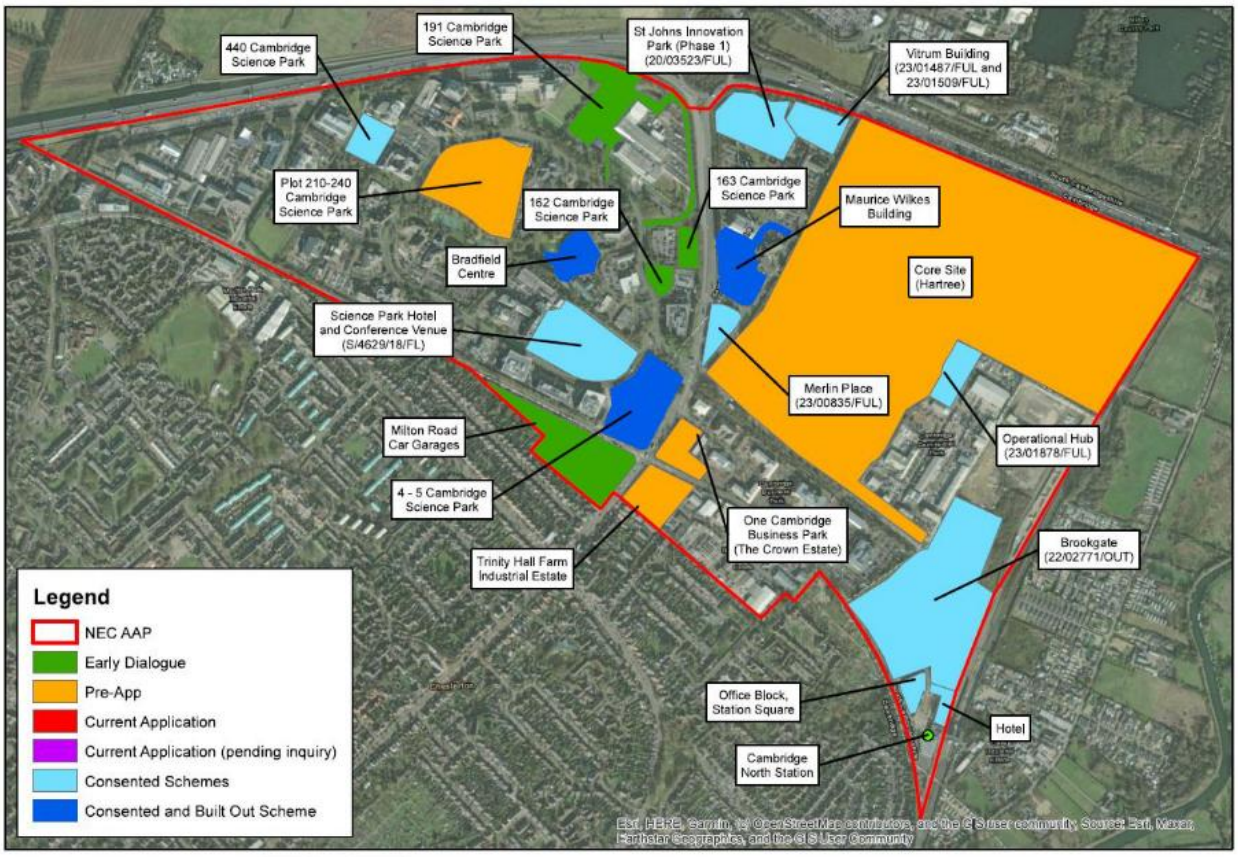
Appendix 1 – Trip Budget Approach

Introduction

This note considers the emerging development quanta being promoted by the landowners within the NEC area. It assesses whether these development quanta are likely to be achievable in transport terms with the known list of mitigation schemes in the Greater Cambridge area or whether additional mitigation will be required to enable the proposed levels of development to come forward, all while ensuring the level of vehicle trips remains within the trip budget for the area.

The North East Cambridge development area is shown in Figure 1 below

Figure 1: North East Cambridge Development Area



Background

The NEC area includes land to the east of Milton Road, which is currently occupied by the wastewater treatment works, St John's Business Park, Merlin Place, Cowley Road and Nuffield Road, plus Cambridge Science Park and Cambridge Regional College located to the West of Milton Road. This area is covered by a draft Area Action Plan[8] which is supported by a Transport Evidence Report[9].

The North East Cambridge Area Action Plan Transport Evidence Report (September 2019) (NECTER) built on the Ely to Cambridge Preliminary Strategic Outline Business Case

[8] NECAAPNorthEastCambridgeAreaActionPlanReg192020v42021.pdf
[9] nec-aap-transport-evidence-base.pdf (greatercambridgeplanning.org)

(PSOBC)[10] (particularly the Strand 3 report[11]) which used the Council's Cambridge Sub Regional Model (CSRM) to assess the capacity of the highway network surrounding the NEC area. The NECTER used available traffic counts and traffic models from planning applications on the Science Park at that time. This included traffic surveys from 2017 and network LinSig models.

Baseline Conditions

The PSOBC tested the performance of the local highway network with and without increased development in the NEC area. Details of the assumed levels of development are set out in Table 4 of the PSOBC. The PSOBC indicated that in the future year (2031) the highway network is predicted to be operating over capacity without development in the NEC area. The PSOBC also showed that there was significant delay in both the AM and PM peaks (Figure 13) with the A14 / A10 Milton Interchange being one of the major pinch points as well as the junctions on Milton Road south of the A14.

The Cambridge to Ely Strand 3 Report indicated that the high levels of parking provided within the NEC area encouraged use of the car which resulted in higher car mode shares than was the case at other major employment sites in Cambridge such as the Cambridge Biomedical Campus. It was also noted that, whilst the NEC area is well located in terms of access to the strategic road network, the Milton Interchange acts as a significant throttle to traffic flows from the A10 and A14 onto Milton Road. This is an important issue when considering the potential transport impact of further development in the NEC Area.

The evidence from both the A14 improvement scheme and the Ely to Cambridge Study indicates that the A14 Cambridge Northern Bypass is very likely to be operating over capacity between the Girton and Milton interchanges by 2031, even with the recent improvements, and without development in the NEC area or a fully built out new town north of Waterbeach. The provision of extra capacity on this stretch of the A14 would likely be challenging and costly and could also be counterproductive in terms of the wider available capacity of the M11 and A14 west of Girton and east of Milton.

The NECTER highlighted that, because of the constraint created by Milton Interchange and the A14 Cambridge Northern Bypass, without mitigation or measures to limit car use and provide alternatives for many trips into the NEC area, development traffic would displace other traffic on to less appropriate routes. These include Kings Hedges Road and other routes through the city, as well as routes through villages to the north of the A14. Analysis has shown that, whilst growth in the NEC area would contribute to an increase in flows on the A10, the largest movements associated with development of the NEC area would be from the east and west on the A14 and from the south on the M11. The NECTER highlighted the following elements that were vital to delivering development of the NEC area in a sustainable way for transport:

- Providing a form and mix of development that enables access to many services and facilities by residents, workers and visitors to be made locally or without the need to travel by car, supported by a policy of demand and parking management for developments in the NEC area
- Reducing the number of trips that are made to and from the NEC area by car and providing infrastructure and services to allow for these trips to be made by other means.

[10] 2018-Ely-to-Cambridge-corridor-transport-study PSOBC.pdf
[11] 2018-Ely-to-Cambridge-corridor-transport-study-Cambridge-NE-fringe-report.pdf

The NECTER included an update of the baseline transport conditions in the area around the NEC area and noted that, despite the area being served by the Cambridgeshire Guided Busway (The Busway) and Cambridge North Station, the existing levels of congestion on the highway network at peak times impacted on the effectiveness of access not just for vehicular traffic but also non-car modes particularly active travel. In addition, a number of barriers to pedestrian and cycle access, such as the railway, A14, the width of Milton Road and the lack of crossing points, internal fencing within the site as well as fencing along the Busway reduce permeability into and within the NEC Area for active travel and public transport routes.

One result of the review of the baseline transport conditions was that the predominant mode of travel into the NEC Area in the 2011 census was private car driver (71%[12]). Further analysis of accessibility by non-car-modes indicated that almost 50% of existing employees had no realistic public transport option for accessing the NEC area. It is important to note that, at the time of the 2011 census, neither Cambridge North station nor the Busway were open. Travel Plan Plus data for the NEC Area showed that in 2019 the mode share for car driver or car share driver had reduced to 56% which is likely, in part, to be due to both the opening of the Busway and Cambridge North Station, and also due to efforts by existing land owners/businesses to reduce reliance on accessing the site as a car driver. While both the Busway and Cambridge North Station have had an impact on the accessibility of the NEC area by non-car modes it is clear there is still more to do if the site is to achieve the level of mode shift indicated by the Ely to Cambridge Study and the NECTER.

Trip Generation

The historic approach to assessing the impact of a development site on the local highway network was to predict the likely level of vehicle trips that would be generated by the site and then develop highway mitigation measures to facilitate the predicted level of trips. This practice is known as predict and provide. However, the Ely to Cambridge Study and the NECTER indicated that this would be difficult in the NEC area as testing of the available capacity on the surrounding road network, together with the existing levels of congestion on the highway network and the permeability barriers for active travel and public transport modes identified around and within the site, meant it would be difficult, and undesirable in policy terms, to provide sufficient highway capacity to accommodate the additional vehicle trips associated with predict and provide. Therefore, in order to enable the comprehensive development of the NEC area to come forward it became clear that an alternative way of dealing with the trip making of the NEC area and identifying the mitigation was required. The option chosen for the NEC area is to apply a trip budget which sets a limit on the number of car trips that can be accommodated on the highway network. The Council has implemented trip budgets for large developments elsewhere in the County most notably at Alconbury Weald in Huntingdonshire, and Waterbeach New Town just north of the NEC area. In addition there are limits to the numbers of cars that are allowed to access the Cambridge Biomedical Campus thorough the imposition of a maximum number of cars that can park on the site. This is in line with the emerging vision-led approach to transport planning advocated in the emerging (at time of writing) revised NPPF.

Trip Budget

The trip budget concept emerged from the Ely to Cambridge Study which used the CSRM and indicated that the highway network around the NEC area, primarily Milton Road, Kings

[12] Travel by Car or Van

Hedges Road and the A14, was congested in all the scenarios tested. The Ely to Cambridge Study indicated that the highway network around the NEC Area could accommodate 3,900 car trips in the AM (0800-0900) and 3,000 car trips in the PM (1700-1800) peaks. This was further refined in the NECTER which looked at the capacity of the local road network in more detail using the observed traffic counts undertaken in relation to planning applications within the Cambridge Science Park (2017). These counts were used to determine the spare capacity on the local road network around the NEC area. This work indicated that the surrounding highway network was already operating over its operational capacity in 2017, especially at Milton Interchange and the Golden Hind Junction, with the overall network operating at -13% Practical Reserve Capacity (PRC[13]) in the AM peak and -11.9% PRC in the PM peak. When the 2031 future year was tested using the predict and provide method the level of delay increased with the network shown to operate at between -53.1% and -180.6% PRC depending on the development scenario tested.[14]

The NECTER then tested the 2031 future year with the Development Trip Budget, the purpose of these tests was to understand the level of mode shift that would be required for each of the development options set out above to achieve similar local highway performance to that seen in the 2017 base scenario.[15] The resulting number of External Vehicle trips for the AM and PM peak periods are set out in Table 1 below.

Table 1: Development external vehicular trip budget

Period	Number of vehicles
AM peak hour	3,900 vehicle trips
PM peak hour	3,000 vehicle trips

The figures set out above relate to the number of vehicle trips permitted to be generated on Milton Road as a result of the development of the NEC Area. It is interesting to note that this level of trips is very similar to the actual level of trips to and from the Science Park observed in the 2017 traffic surveys. This means that, in order for additional development in the NEC area to come forward, there will need to be significant reduction in trip making by private car for the existing land uses to give the required headroom on the highway network for trips made by new sites within the NEC area.

This trip budget is not specific to any quantum of development in the NEC area. However, evidence available from other locations in both the UK and in Europe indicates that there are limits to how low the car (driver) mode share of a development can realistically be pushed and therefore it is important to understand the car mode shares that result from different level of development in the NEC area.

Development Quanta

At the time the NECTER was written it was not clear what the preferred level of development would be in the NEC area and therefore a range of development options were tested. These were compared to the existing development on the site (in 2018) and subsequent further tests looked at consented development (at 2019). The land use scenarios tested in the NECTER are set out below:

[13] PRC is a measure of the degree of saturation of a traffic signalised junction or network. A positive PRC indicates that a junction has spare capacity and may be able to accept more traffic. A negative PRC indicates that the junction is over capacity and is suffering from traffic congestion

[14] nec-aap-transport-evidence-base.pdf (greatercambridgeplanning.org) Table 19

[15] nec-aap-transport-evidence-base.pdf (greatercambridgeplanning.org) Table 20

Table 2: Land Use Scenarios

	Existing (2018)	2019 + Consented	HIF* Scenario	Option 1	Option 2	Option 3	Option 4
Jobs	12,000	17,300	18,900	18,200	23,200	27,000	23,200
Dwellings	n/a	n/a	9,200	5,500	6,650	7,600	8,700

** HIF – Housing Infrastructure Fund, this was a government scheme and, in this case, focused on the redevelopment of the parcel of land that contains the Waste Water Treatment works site.*

Person Trip Rates

To understand the number of all-mode person trips likely to be generated by each of the scenarios above, the TRICS data set, an industry-standard tool, has been interrogated. The trip rates used in this assessment are those use in the NECTER (and by the developers representing individual parcels within the NEC Area) and are set out in the table below.

Table 3: Person Trip Rates

Trip rate type	AM peak (08:00-09:00)			PM peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Residential (per dwelling)	0.185	0.791	0.976	0.507	0.231	0.738
Business Park (per job)	0.439	0.045	0.485	0.025	0.311	0.336
Industrial Park (per job)	0.423	0.228	0.651	0.107	0.388	0.495

The resulting person trip generation of the development scenarios tested in the NECTER are summarised in Table 4.

Table 4: Person Trips

Development Scenarios	AM peak (08:00-09:00)			PM peak (17:00-18:00)		
	Arrive	Depart	Total	Arrive	Depart	Total
Existing 2018	5,190	690	5,890	370	3,750	4,120
2018+Consented (2019)	7,360	1,010	8,380	560	5,290	5,850
HIF scenario	10,050	8,460	18,500	5,340	8,120	13,460
Option 1	8,320	5,370	13,690	3,390	6,510	9,900
Option 2	10,530	6,510	17,050	4,100	8,210	12,320
Option 3	12,160	7,460	19,620	4,690	9,490	14,180
Option 4	11,660	8,110	19,770	5,130	9,140	14,260

From this it is possible to see that the flows associated with the 'Existing' and 'Existing +Consented' scenarios result in very unbalanced flows, with high 'in' flows in the morning and 'out' flows in the evening peaks. In comparison, the development scenarios tested in the NECTER have more balanced arrival and departure profiles, as all the development scenarios tested include an element of residential development which means that there is an opportunity for workers to live closer to their place of work than is currently the case in the NEC area. This is important as this means that public transport services are more likely to

have passengers in both directions with more balanced arrival and departure profiles which helps with the long-term commercial viability of the services in the long run.

Car Driver Mode Share

If the trip budget set out above is to be achieved that there will need to a significant shift away from the private car for access to the NEC area. The required Car Driver Mode shares for the development scenarios tested in the 2019 NECTER are set out below.

Table 5: Car Driver Mode Share

	Existing (Census 2011)	HIF Scenario	Option 1	Option 2	Option 3	Option 4
Car Mode share	71%	29%	38%	29%	25%	26%

From this it is clear to see that there is a need to more than halve the car driver mode share recorded in the 2011 Census if the NEC area is to stay within the trip budget. It is important to note, however, that since the 2011 Census both the Busway and Cambridge North Station have opened which has improved connectivity into the NEC area. From other data sources it is evident that the reliance on the private car for access to the NEC area has reduced with Travel Plan Plus data for October 2023 indicating that the car mode drive mode share is around 29% (although this represents an increase since October 2022 where around 23% was recorded). This compares to 71% car driver at the time of the 2011 census, and 56% in the 2019 Travel Plan Plus data. This suggests that the post-pandemic mode share for the Cambridge Science Park is comparable to the mode shares indicated in the NECTER as seen in Table 5 above. This is very encouraging but still means that, if additional development is to be accommodated in the NEC area over and above that currently consented, this will require significant shift to non-car modes of travel for the trips generated by existing land uses within the NEC area to ensure the overall site remains within its trip budget as there is no scope for additional car trips to the NEC Area despite the reductions seen in the number of car trip in to the area.

It is possible that all of the development options tested above will be deliverable in transport terms as a result of known range of public transport and active travel schemes proposed for the Greater Cambridge area which (once built and operational) will help to provide a more comprehensive network of sustainable transport modes with improved access to the NEC area by non-car modes. Experience and benchmarking from other locations shows that the areas that achieve the most significant reductions in car mode share are located where there is a comprehensive public transport and/or active travel network offer. This will be the case for NEC once the known schemes are operational. The sites shown to be achieving the lowest car mode shares have also introduced additional site-specific measures to facilitate sustainable travel and discourage use of private cars for access to the area.

Mitigation

The initial list of schemes required to accompany the NEC site and facilitate access by non-car modes was set out in Table 55 of the NECTER, and for convenience is set out below.

Internal Measures

- Spatial framework development promoting connectivity and permeability
- Segregated crossing point(s) on Milton Road
- Crossing points on the busway to reduce barrier effect

- Highway site access improvements
- Intra-site shuttle system
- NEC parking strategy - including low levels of onsite parking provision and monitoring of parking in the surrounding residential areas
- Travel Plan Measures and Travel Monitoring - including e-bikes/e-scooters, incentive programmes, transport subsidies, etc
- Potential changes to development mix/quantum to reduce vehicle impact and increase internalisation levels e.g. monitor secondary school demand and add provision if needed
- Marketing support to attract residents to the area that are more likely to use alternative travel modes other than car
- Incentive scheme to maximise resident-to-employee ratio - potential for a particular housing development associated with employers in the area or for tax reductions for people who work and live in the area.

Local Measures

- New segregated link from Milton Road P&R to site avoiding interaction with Milton Road
- Additional P&R spaces at key locations around Cambridge
- Park and cycle opportunities at P&R locations
- P&R shuttle system
- Variable Message Signage (VMS) at key locations to inform drivers of P&R spaces and congestion issues at Milton Road/Milton Interchange.

Strategic Measures

- Additional bus services – extra service buses to enhance links to key areas
- Additional rail services to be delivered by rail operating companies
- Delivery of already planned cycle improvements
- Plugging gaps in the wider cycle network to enhance routes to key residential areas
- Delivery of the wider public transport and active travel networks including the GCP programme of measures.

From this we can see that the comprehensive redevelopment of the NEC requires developers within the area to contribute to the delivery of the GCP schemes, and other measures set out above, to significantly improve accessibility to this and the wider Greater Cambridge Area by non-car modes, alongside measures to reduce car-borne travel and comply with the trip budget.

Development Mix

The NECTER identified that the development mix (i.e. the mix of homes and employment and other supporting land uses within the new development) has a significant role to play in reducing the level of car trips generated on the surrounding highway network. A well-balanced development mix can help encourage internalisation of trips by enabling residents and employees to meet their daily requirements by short trips made within the site, without having to travel outside the site. These shorter trips are more easily made by active travel modes and public transport. The level of internalisation of trips is a key factor in reducing car trips on the surrounding highway network.

Given the low level of external car trips that are allowed via the trip budget it is vital that the development of the NEC area comes forward in a way that maximises internalisation by providing a sustainable mix of development on site, as well as ensuring there are viable alternatives to the private car for those external journeys that still need to be made.

To this end, the NECTER considered the impact that the ratio of homes to jobs has on the trip generation and internalisation of the site. Key to this is the likely level of internalisation associated with different trip purposes. The information below uses information from the UK Department for Transport's National Trip End Model (NTEM) and the Trip End Model Presentation Program (TEMPro).

Table 6: TEMPro home-based journey purpose distribution – combined modes

	Work Related	Education	Shopping	Personal Business	Leisure (recreation/ Social)	Leisure (visiting friends and Family)
AM Peak	37%	48%	6%	6%	2%	2%
PM Peak	47%	6%	15%	8%	10%	14%

Source: TEMPro Home-based Journey Purpose data, all travel modes, origin and destination combined, for Cambridge MSOAs 001-004 and South Cambridgeshire 007 in 2031.

A review of the 2011 Census 'Distance Travel to Work' dataset was undertaken and trends within Cambridge as a whole were examined to estimate the potential relationship between people working and living within the NEC area. This analysis identified the proportion of residents who have the potential to be employees in the area and vice versa, thus avoiding an external trip either to or from the study area. Given that the NEC area is approximately 2km from edge to edge, this figure is used in the following assessments.

The 2011 Census data used in the NECTER indicated that, on average, 30% of all employed Cambridge residents work within 2km of where they live, which equates to 18% of the total Cambridge workforce.

The actual level of internalisation of commute trips, therefore, depends on the ratio of homes to jobs within the NEC area. The result of this exercise indicated that the optimal ratio of homes to jobs in the NEC area is 0.80. The table below sets out the ratio of homes to jobs for each of the development scenarios tested in the NECTER.

Table 7: Ratio of Homes to jobs

	Existing	HIF Scenario	Option 1	Option 2	Option 3	Option 4
Ratio of homes to jobs	N/A	0.49	0.31	0.29	0.28	0.38

From this it is possible to see that none of the development scenarios tested in the NECTER achieve the optimal ratio of homes to jobs meaning that the levels of internalisation for all the proposed development scenarios will be lower than the optimum level set out above and therefore this will reduce the levels of internalisation possible and require more investment to facilitate access to the site by non-car modes.

Table 8: The overall development trip internalisation levels by scenario – AM Peak

Development scenario	**% employment generated commute trips internalised (max 18%)**	**% residential generated commute trips internalised (max 11%)**	**% residential generated non-commute trips internalised (max 36%)**	**% of all development generated trips internalised**
HIF Scenario	11%	11%	36%	24%

Option 1	7%	11%	36%	19%
Option 2	7%	11%	36%	19%
Option 3	7%	11%	36%	19%
Option 4	9%	11%	36%	21%
Average	8%	11%	36%	20%

Table 9: The overall development trip internalisation levels by scenario – PM Peak

Development scenario	**% employment generated commute trips internalised (max 18%)**	**% residential generated commute trips internalised (max 14%)**	**% residential generated non-commute trips internalised (max 21%)**	**% of all development generated trips internalised**
HIF Scenario	12%	11%	21%	17%
Option 1	8%	12%	21%	14%
Option 2	8%	12%	21%	14%
Option 3	8%	12%	21%	14%
Option 4	9%	11%	21%	15%
Average	9%	12%	21%	15%

This shows that, on average, with the land use mix for each development scenario tested, the level of internalisation ranges between 15% and 20% of all trips. Based on the evidence in the NECTER it is possible to see that the ratio of homes to jobs impacts on the possible levels of internalisation that can be achieved within the NEC area.

The following section sets out the revised development scenarios that have been considered since the NECTER was written in 2019.

Revised Development Scenarios

The following section looks at the more recent development scenarios (source: Greater Cambridge Shared Planning Service) namely:

- Draft NEC AAP
- Draft NEC AAP + Consented
- Developer Aspirations
- With CWWTP in situ

The quantum of development included in each of these scenarios is:

Table 10: Development Quanta

Land Use	Draft NEC AAP	Draft NEC AAP + Consented	Developer Aspirations	With CWWTP in situ
Residential (units)	8,350	7,835	7,395	90
Business Park (Jobs)	24,971	30,786	68,264	67,445
Industrial Park (Jobs)	1,497	1,579	1,886	1,759

It is important to note that the job numbers above include *all* jobs including those existing across the AAP area and not just the new jobs as these are key to understanding the full impact of each development scenario. The person trip generation of each of these scenarios is as set out below. The trips associated with the earlier development scenarios are included for comparison.

Table 11: Development Trips

Development Scenarios	AM			PM		
	Arrive	Depart	Total	Arrive	Depart	Total
Existing	5,190	690	5,890	370	3,750	4,120
+Consented	7,360	1,010	8,380	560	5,290	5,850
HIF scenario	10,050	8,460	18,500	5,340	8,120	13,460
Option 1	8,320	5,370	13,690	3,390	6,510	9,900
Option 2	10,530	6,510	17,050	4,100	8,210	12,320
Option 3	12,160	7,460	19,620	4,690	9,490	14,180
Option 4	11,660	8,110	19,770	5,130	9,140	14,260
Draft NEC AAP	13,128	8,238	21,365	5,189	10,319	15,508
Draft NEC AAP + Consented	15,632	8,158	23,791	5,126	12,109	17,236
Developer Aspirations	32,134	9,829	41,963	6,135	24,193	30,328
With CWWTP in situ	29,190	4,208	33,399	2,336	20,938	23,274

From this we can see that the revised development options all result in higher levels of person trips than any of the options included in the NECTER. It is also interesting to note that the flows are less balanced into and out of the site than some of the previous scenarios tested which will have an impact on the level of internalisation that can be achieved and the viability of the proposed public transport services as set out in the NECTER. The developer aspirations and the option with the CWWTP remaining in situ both result in higher levels of trips and in increased tidality of flows i.e. high flows arriving in the AM peak and departing in the PM peak. This is likely to have severe impacts on both the performance of the highway network and also public transport services as services will run empty (or almost empty) in one direction in each peak making the on-going commercial viability of the services harder to maintain.

With higher numbers of person trips generated by the higher development quanta, the required car driver mode shares that the revised development scenarios are required to achieve in order that trip budgets are met are significantly lower as set out in the table below.

Table 12: Car Driver Mode Share

Development Scenario	Car Mode Share
Existing	71%
HIF Scenario	29%
Option 1	38%
Option 2	29%

Option 3	25%
Option 4	26%
Draft NEC AAP	26%
Draft NEC AAP + Consented	21%
Developer Aspirations	14%
With CWWTP in situ	7%

CCC undertook a contextual review of the available evidence as to the car driver mode shares achieved in the best-in-class situations in this country and in Europe. This work concluded that, in the Cambridge area with the existing and proposed levels of sustainable transport, a car driver mode share of 21-25% should be achievable. Based on this information, it is reasonable to assume that the Draft NEC AAP and the Draft NEC AAP + Consented development scenarios, which have projected car driver mode shares of 26% and 21% respectively, ought to be deliverable in transport terms with suitable investment in non-car measures.

A revised list of mitigation required is set out in the S106 strategy for NEC AAP note (2024) which sets out the schemes and the financial contributions required from developers. In considering the mitigation required, the distribution of trips to and from the NEC area used in the recent Brookgate Planning application and appeal has been used to inform the schemes that are needed to facilitate access to the NEC Area by non-car modes to enable development to come forward whilst restricting the number of car trips to within the trip budget.

The list of Strategic Schemes that the developers are required to contribute to is;

- Waterbeach to Cambridge.
- Bus improvements for Cambridge.
- Chisholm Trail.
- Waterbeach Greenway.
- Milton Road.
- Cambourne to Cambridge.
- 10 other greenways.
- St Ives Greenway.
- Additional 1,000 Park and Ride spaces in and around Cambridge.
- New Controlled Parking Zones in the area around NEC.

In addition to this there will need to be good local and internal connectivity to facilitate ease of movement from the adjoining residential areas by active modes of travel. It is important to note that it is assumed that the crossings over Milton Road will be grade separated so as to facilitate the high volumes of pedestrian and cycle crossings of Milton Road required, without severely impacting on the operation of the highway network.

Two scenarios, Developer Aspirations and that where the Cambridge Waste Water Treatment Plant stays in situ, result in car driver mode shares of 14% and 7% respectively as well as imbalanced arrival and departure and significantly reduced levels of internalisation. This is considered likely to be undeliverable, even with the existing provision and the strategic mitigation listed above.

Therefore, if these levels of development are to come forward, there would need to be significant additional investment to facilitate a further transformative change to the trip

patterns and modal choice in Cambridge over and above the revised strategic mitigation list set out above as the likely level of trips associated with these scenarios would exceed the capacity of the strategic schemes.

In addition, it is possible that the existing infrastructure for sustainable travel such as the Cambridge North station, bus stops and active travel routes within and close to the NEC area would struggle to cope with the required levels of pedestrians and cyclists without significant additional intervention. Similarly, pedestrian and cyclist demand to cross Milton Road would also add greater weight to the requirement for the crossings of Milton Road to be grade separated. Without this the impact on Milton Road would be severe and the trip budget would have to be reduced further.

To date there are no further schemes in the pipeline and therefore, this would require further study to understand what measures might be required and therefore means that the deliverability of these development scenarios cannot be guaranteed at this point in time.

Ratio of Dwellings to Jobs

Table 13: Ratio of dwellings to jobs

	Total jobs	Total dwellings	Dwellings to jobs ratio
Existing	12,000	0	0.00
+Consented	17,300	0	0.00
HIF scenario	18,900	9,200	0.49
Option 1	18,007	5,500	0.31
Option 2	23,077	6,650	0.29
Option 3	26,998	7,600	0.28
Option 4	23,130	8,700	0.38
Draft NEC AAP	26,438	8,350	0.32
Draft NEC AAP + Consented	32,365	8,225	0.27
Developer Aspirations	70,149	7,395	0.11
With CWWTP in situ	69,204	90	0.01

From this we can see that the ratio of homes to jobs in all of the revised development scenarios are significantly below the optimal ratio of 0.80 homes per job, with the developer aspirations and with CWWTP in situ options resulting in very unbalanced development mixes due to the significantly lower levels of residential development on the site. This will lead to very low levels of internalisation and, whilst the two NEC AAP options might realistically expect to achieve 15 to 20% internalisation, the developer aspiration option will struggle to achieve even 15% internalisation, and internalisation will be de minimis for the CWWTP option.

SUMMARY

The evidence set out in this report builds on the published NECTER (2019) to assess the likely levels of internalisation achievable by each of the emerging development scenarios and the resulting car-mode shares and assesses whether these are likely to be achievable with the known package of mitigation in the Greater Cambridge Area.

The result of this exercise is that it is considered that the emerging developer aspirations are unlikely to be deliverable within the trip budget for the NEC area, even though the NEC area

is already well connected to sustainable travel modes and will, with further investment, become one of the most sustainable sites in the Greater Cambridge area.

The proposed development mix currently indicated by the developers within in the NEC area with its significant increased number of jobs on the site will lead to an imbalance of development trips which will reduce internalisation to a minimum level and will mean that the vast majority of employment trips will continue to travel from significant distances as is the case currently. This will likely result in demand exceeding capacity of both the existing, and future proposed, networks and would therefore require further mitigation to be provided that is currently unknown and unplanned. This calls into question the deliverability of the higher development quanta at this stage.

Appendix 2: Transport Mitigation

INTRODUCTION

The North East Cambridge (NEC) area is subject to significant growth with a focus on commercial floorspace development on existing developed land, and a mixture of housing and commercial development on land that is currently the waste water treatment facility. This area will only come forward for development should this facility be relocated (subject to a live DCO Application as of June 2024).

The Draft NEC Area Action Plan (NECAAP) outlines a quantum of development that could come forward for the whole of the NEC area and is supported by a transport evidence base (North East Cambridge Area Action Plan Transport Evidence Base (September 2019)).

This technical note details the trips for each mode generated by the Draft NECAAP plus Consented quanta of development (GCSPS June 2024), the transport initiatives that will be required to facilitate the level of trip generation, the number of trips that each transport initiative will facilitate, and the relating contributions to these projects.

As the development quantum increases in the area then the vehicle trip budget (as defined in the Transport Evidence Base) will mean that the car driver mode share will reduce and the number of trips by non-car modes, and resulting non car mode share, will need to increase.

The investment into the transport infrastructure identified in this note is specifically to facilitate growth resulting from the NEC area. The transport infrastructure requirements considered in this note include a greater number of schemes than those included in the original NEC AAP Infrastructure Development Plan (IDP 2019). This is a result of a review of the trip distribution which indicated that there was a need to consider the impact of development in the NEC area on the wider Cambridge sub region. These trips are then used to define appropriate contributions from development in the NEC area towards this infrastructure.

This note sets out the mitigation needed for the Draft NEC plus Consented quanta of development by considering the following:

1. The distribution of trips generated by development in the NEC area;
2. The trips generated by development within the NEC area;
3. The trips for each mode of travel in each peak period;
4. The transport infrastructure package that is required to facilitate the development within the NEC area;
5. The trips assigned to each transport infrastructure scheme from development in the NEC area;
6. Comment on GCP Scheme Capacity to accommodate the likely level of additional trips assumed from the NEC area;
7. The contribution from each development parcel in the NEC area towards each scheme;
8. Detail of the funding gap and how any shortfall in funding from the NEC area can be overcome.

BACKGROUND

Transport infrastructure schemes promoted by the Greater Cambridge Partnership (GCP), and the Cambridgeshire and Peterborough Combined Authority (CPCA) will help facilitate development in the NEC area. Notwithstanding the presence of the Busway and Cambridge North Station, the additional sustainable transport infrastructure identified will help facilitate a mode switch from private car to active travel and public transport. The highway network surrounding the NEC area has reached its operational capacity meaning that it is not possible to follow the traditional methodology of predicting the number of trips and building additional road capacity required to mitigate the impacts. Significant further urban road capacity is also not desirable in policy terms. Therefore, development in the NEC area will be dependent on the provision of significant additional transport infrastructure to facilitate access into the area by non-car modes.

The mitigation set out in this appendix is required to ensure that the NEC area will be able to provide the infrastructure necessary to mitigate the effects of the development (i) within the NEC area and (ii) outside the NEC area but necessary to mitigate its wider impacts, comprising infrastructure schemes being delivered by other bodies including GCP and the CPCA. There is a requirement for all developments within the area to contribute to the delivery of this package. In summary, development in the NEC area will be required to:

- Deliver all infrastructure within their site boundaries as part of each development;
- Directly deliver other internal measures and local junction works where applicable; and
- Contribute to the area-wide Strategic Transport Mitigation Package as detailed below.

This note shows that many trips to and from the NEC area travel from other parts of Cambridgeshire and beyond and, therefore, the transport impact from development in the NEC area is greater than just the A10 corridor as originally highlighted in the 2019 NECTER. The details within this technical note will therefore form the basis of an updated IDP.

This allows an updated list of strategic schemes required to facilitate the development of the NEC area to be detailed, along with the contributions from the NEC area to these schemes. The contribution for each scheme from the NEC area has been derived from the trips related to the NEC AAP plus consented quantum of development. This then results in a contribution per unit of development for each parcel of Development within the NEC area.

TRIP DISTRIBUTION

The distribution of vehicular trips associated with the NEC area was analysed using information from the Brookgate application at Cambridge North (see S/22/02771). Appendix C of the Highways Technical Note, dated October 2022 and prepared by PJA Transport Consultants on behalf of the applicant, based the distribution of the trips generated on 2011 census data and also took into account the future housing growth in different areas of the sub-region. This is the same methodology as used in the Brookgate application. A summary of the distribution of trips is detailed in Table 1 below.

Table 1: Distribution of trips (2011 census travel to work data)

Corridor From / To	**%**
A14 North West	15
A428 West	8
A10 North	22
A14 East	15
City	27
South	8
Internal Trips	5
Total	100

PERSON TRIP GENERATION

The trips associated with the Development in the NEC Area have been based on the trip rates used in the NECTER and these in turn are based on TRICS data. The person trip rates used in the following assessment are set out in Table 2 below.

Table 2: Assumed Person Trip Rates

Trip rate type	**AM peak (08:00-09:00)**			**PM peak (17:00-18:00)**		
	Arrive	Dep	Total	Arrive	Dep	Total
Residential (per dwelling)	0.185	0.791	0.976	0.507	0.231	0.738
Business Park (per Job)	0.439	0.052	0.491	0.032	0.323	0.355
Industrial Park (per Job)	0.423	0.228	0.651	0.107	0.388	0.495

The development quantum associated with the Draft NEC AAP + Consented development Scenario is as follows.

Table 3: Draft NEC AAP + Consented development Quantum

Scenario	Total B1/R&D (Jobs)	Total B2/B8 (Jobs)	Residential (units)
Draft NEC AAP + Consented	30,786	1,579	7,835

Note: The floor space planned has been converted into jobs using the same calculations as in the NECTER which assumes 19 sqm/Job for Business Park and 36sqm/Job Industrial Estate.

The resulting person trips associated with the above level of development are derived by multiplying the number of jobs and number of residential units by the relevant trip rates and are set out in Table 4 below.

Table 4: Draft NEC AAP + Consented Development Person Trips

	AM peak (08:00-09:00)			PM peak (17:00-18:00)		
	Arrive	**Depart**	**Total**	**Arrive**	**Depart**	**Total**
Residential	1,449	6,197	7,647	3,972	1,766	5,739
Employment	14,183	1,961	16,144	1,154	10,343	11,497
Total	**15,632**	**8,158**	**23,791**	**5,126**	**12,109**	**17,236**

The following section sets out how these trips have been distributed across the different corridors according to the proportions in Table 1.

DISTRIBUTION ACROSS THE CORRIDORS

The table below shows the arrival and departure profile of the person trips on each of the routes highlighted in table 1.

Table 5: Distribution of Trips

Corridor	**AM peak (08:00-09:00)**			**PM peak (17:00-18:00)**		
	Arrive	**Depart**	**Total**	**Arrive**	**Depart**	**Total**
A14 North West	2,345	1,224	3,569	769	1,816	2,585
A428 West	1,251	653	1,903	410	969	1,379
A10 North	3,439	1,795	5,234	1,128	2,664	3,792
A14 East	2,345	1,224	3,569	769	1,816	2,585
City	4,221	2,203	6,423	1,384	3,269	4,654
South	1,251	653	1,903	410	969	1,379
Internal Trips	782	408	1,190	256	605	862
Total	**15,632**	**8,158**	**23,791**	**5,126**	**12,109**	**17,236**

The Trip Budget for the site sets the number of development-related external car trips that can be accommodated on the surrounding road network without a severe deterioration in network performance. These are set out below.

Table 6: Vehicular Trip Budget

Period	**Development external vehicular trips**
AM peak hour	3,900 vehicle trips
PM peak hour	3,000 vehicle trips

As stated in Appendix 1, in setting out the approach to the trip budget, CCC has undertaken a benchmarking exercise that indicates that a car driver mode share of 21% ought to be achievable in the NEC area given the existing levels of connectivity by sustainable transport modes and the known future GCP/other schemes, assuming the developers provide suitable contributions to the mitigation package. In reality the level of car trip generation will be limited to 21% car driver mode share with the main focus on arrivals in the AM peak and departures in the PM peak as these are primarily employment trips which will be travelling longer distances that the residential trips due to the nature of the existing distribution of trips.

This results in slightly more car trips that the agreed trip budget but this is considered acceptable at this stage as there is no account taken of the low car nature of the planned residential aspect of the development and also the level of internalisation assumed at this stage is very low (5%); it is expected that, in reality, the level of internalisation will be in the region of 10-15% assuming the development mix provides for this as per the Draft AAP+ Consented development quantum.

This does give significant weight to the need to provide grade separated crossings to remove interaction between pedestrians and cyclists with motorised traffic on Milton Road, as any interaction would render the trip as external to the site rather than an internal trip.

Table 7: Number of trips by non-car modes

	AM			PM		
	Arrive	**Depart**	**Total**	**Arrive**	**Depart**	**Total**
Non-Car Trips	12,350	6,445	18,795	4,050	9,566	13,616

The table below sets out the distribution of the non-car trips across the different corridors based on the proportions shown in Table 1.

Table 8: Distribution of non-car trips across the routes

Corridor	**AM**			**PM**		
	Arrive	**Depart**	**Total**	**Arrive**	**Depart**	**Total**
A14 North West	1,852	967	2,819	607	1,435	2,042
A428 West	988	516	1,504	324	765	1,089
A10 North	2,717	1,418	4,135	891	2,105	2,996
A14 East	1,852	967	2,819	607	1,435	2,042
City	3,334	1,740	5,075	1,093	2,583	3,676
South	988	516	1,504	324	765	1,089
Internal to the site	617	322	940	202	478	681
Total	12,350	6,445	18,795	4,050	9,566	13,616

The section below sets out the mode share for the future year non car trips to and from the NEC area.

MODE SHARE

To help inform the likely future year mode share, the mode share from the 2021 Census, as well as the results from the Travel Plan Plus data for the Science Park Area for 2023, have been used. The results of this are set out in Table 9 below.

It is acknowledged that the 2021 Census was significantly impacted by the pandemic with large sections of the population working from home. The Census data shown in Table 9 nets off working from home and shows the modal split for those workers actually travelling to work at that time.

The information in Table 9 below assumes that the car driver mode share for the AM Peak arrivals and the PM peak departures is fixed at 21%. The remaining trips therefore need to be made by non-car modes and the proportions use in this assessment have been informed by those assumed in the draft developer Transport Strategy for the NEC area.

Table 9: 2040 Mode shares

	Existing		AM Peak (2040)		PM Peak (2040)	
Mode	**MSOA Cambridge 003 2021 Census**	**CSP TP+ 2023**	**Arrive**	**Depart**	**Arrive**	**Depart**
Bus	6.3%	3.7%	15%	17%	17%	15%
Rail	1.9%	4.1%	15%	17%	17%	15%
Walk	12.7%	8.8%	10%	10%	10%	10%
Cycle/Scooter	31.7%	36.5%	33%	34%	34%	33%
Motorcycle	1.4%	0.6%	2%	2%	2%	2%
Passenger/Taxi	5.6%	1.7%	4%	4%	4%	4%
Car Driver	38.8%	41.9%	21%	16%	16%	21%
Other	1.6%	2.6%				
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

From the information set out in Table 9 above it is possible to see that the car driver mode share will need to fall further (to 21%) than that seen in the latest Travel Plan Plus data for the Science Park area. Given the distances that are assumed to be travelled by prospective employees in the NEC area, even with the inclusion of housing on the site and the new development at Waterbeach, the largest shift away from car will need be to public transport (either bus or rail) and this will require significant additional public transport capacity in the surrounding area.

DRAFT NEC AAP + CONSENTED MODE SHARE

This section allocates the non-car trips set out in Table 7 to the different modes using the information in Table 8.

Table 10: Draft NEC AAP + Consented Total Trips by mode

	AM Peak			PM Peak		
Mode	**Arrive**	**Depart**	**Total**	**Arrive**	**Depart**	**Total**
Bus	2,345	1,387	3,732	871	1,816	2,688
Rail	2,345	1,387	3,732	871	1,816	2,688
Walk	1,563	816	2,379	513	1,211	1,724
Cycle/Scooter	5,159	2,774	7,933	1,743	3,996	5,739
Motorcycle	313	163	476	103	242	345
Car Passenger	625	326	952	205	484	689
Car Driver	3,283	1,305	4,588	820	2,543	3,363
Total	**15,632**	**8,158**	**23,791**	**5,126**	**12,109**	**17,236**

Due to the need to limit the number of car trips generated by the NEC Area due to the vehicle trip budget, the key focus of this exercise is the distribution of non-car trips.

However, when it comes to distributing the trips by different modes across the various corridors the following adjustments have been made.

- Rail flows from West and North West have been moved to bus - because there are currently no railway lines to the west and north west of Cambridge.
- Outside of the City 75% of the walking trips have been moved to cycle as this is more appropriate for the distances involved.

The results of this exercise are set out in Tables 11 and 12 for the AM peak and Tables 13 and 14 for the PM peak below.

Table 11: Draft NEC AAP + Consented AM Peak Arrivals distributed by non-car mode

	Total	Bus	Rail	Walk	Bike Scoot	MC	Taxi
A14 North West	1,852	703	0	59	950	47	94
A428 West	988	375	0	31	506	25	50
A10 North	2,717	516	516	86	1,393	69	138
A14 East	1,852	352	352	59	950	47	94
City	3,334	633	633	422	1,393	84	169
South	988	188	188	31	506	25	50
Internal	617	117	117	20	317	16	31
Total	**12,350**	**2,884**	**1,806**	**707**	**6,015**	**313**	**625**

Table 12: Draft NEC AAP + Consented AM Peak Departures distributed by non-car mode

	Total	Bus	Rail	Walk	Bike Scoot	MC	Taxi
A14 North West	1,028	416	0	31	508	24	49
A428 West	548	222	0	16	271	13	26
A10 North	1,508	305	305	45	745	36	72
A14 East	1,028	208	208	31	508	24	49
City	1,850	374	374	220	749	44	88
South	548	111	111	16	271	13	26
Internal	343	69	69	10	169	8	16
Total	**6,853**	**1,706**	**1,068**	**369**	**3,221**	**163**	**326**

Table 13: Draft NEC AAP + Consented PM Peak Arrivals distributed by non-car mode

	Total	Bus	Rail	Walk	Bike Scoot	MC	Taxi
A14 North West	646	261	0	19	319	15	31
A428 West	344	139	0	10	170	8	16
A10 North	947	192	192	28	468	23	45
A14 East	646	131	131	19	319	15	31
City	1,163	235	235	138	471	28	55
South	344	70	70	10	170	8	16
Internal	215	44	44	6	106	5	10
Total	**4,306**	**1,072**	**671**	**232**	**2,024**	**103**	**205**

Table 14: Draft NEC AAP + Consented PM Peak Departures distributed by non-car mode

	Total	Bus	Rail	Walk	Bike Scoot	MC	Taxi
A14 North West	1,435	545	0	45	736	36	73
A428 West	765	291	0	24	392	19	39
A10 North	2,105	400	400	67	1,079	53	107
A14 East	1,435	272	272	45	736	36	73
City	2,583	490	490	327	1,079	65	131
South	765	145	145	24	392	19	39
Internal	478	91	91	15	245	12	24
Total	**9,566**	**2,234**	**1,399**	**548**	**4,659**	**242**	**484**

These tables show that a high number of trips to and from the NEC area will need to be made by walking, cycling and bus (both guided and standard), due to the limitations associated with the scope of existing rail services to cater for trips to and from the NEC area. It is important to note that the possible addition of East West Rail could provide scope for a significant increase in rail trips given the fact that 23% of trips are from the A14 West and A428 corridors. The potential implications of EWR will be kept under review as development of the NEC continues

INFRASTRUCTURE IN THE GREATER CAMBRIDGE REGION AND NEC AAP AREA

Due to the imposition of the Trip Budget, the number of cars does not increase significantly from that seen in the 2017 counts used to set the vehicular trip budget and therefore, with the exception of limited local access improvements, the NEC area will not require significant highway improvements. Instead, the focus of the mitigation for the site is on schemes designed to facilitate access by non-car modes of travel.

The GCP has a programme of investment designed to improve active travel and public transport connectivity for the Greater Cambridge area. The additional non car trips to and from the NEC AAP area will rely on this package of schemes that are being bought forward by the GCP. These schemes are listed below and are shown in Figure 1.

1. Waterbeach to Cambridge;
2. Public Transport Improvements in Cambridge;
3. Chisholm Trail;
4. Waterbeach Greenway;
5. Milton Road;
6. Cambourne to Cambridge;
7. 10 other greenways excluding Waterbeach;
8. Improvements to the St Ives Greenway;
9. Cambridge Guided Busway – Bus service support;
10. Newmarket Road corridor – Cambridge Eastern Access proposals;
11. New Controlled Parking Zones in Cambridge
12. Cambridge South East Transport Scheme.

As well as external schemes to the NEC area listed above, there are internal, and other, schemes which are required to facilitate movement within and to, the NEC area. These are under development with the consortium of developers and are listed below:

1. Strategic cycle and pedestrian connections to the area not included in the GCP package of schemes;
2. Improved crossing facilities over Milton Road to facilitate movement of pedestrians and cyclists between the Cambridge Science Park and sites to the east of Milton Road without impacting further on the operation of Milton Road for motor vehicles. Given the high numbers of pedestrians and cyclists that will be required to cross Milton Road, either to/from the residential elements of the area or to/from Cambridge North Station, the NECTER assessment shows that this will need to be grade separated; an at-grade crossing for the numbers involved would adversely impact the operation of Milton Road and would require the vehicular trip budget to be significantly reduced;
3. Pedestrian/cycle underpass under Milton Road between St Johns Innovation Centre and Cambridge Science Park;
4. Improved pedestrian/cycle crossing of Milton Road at its junction with the busway;
5. Pedestrian and cycle bridge over the railway line to the east of the site to provide access to the Chisholm Trail for onward journeys into Cambridge;
6. Intra-NEC area bus shuttle system;
7. Upgrade to walking and cycling on Milton Road between Cowley Road and the busway;
8. Improvements to Cowley Road as an access route to the area;
9. Provision for cycling on the Cambridge Science Park loop road.

GCP SCHEMES, TRIP DISTRIBUTION AND BUS AND CYCLE FLOWS

Tables 15 and 16 below distribute the bus and cycle trips from the NEC development as detailed in Tables 11 to 14 above to the GCP schemes. The generated bus and cycle total trips from Cambridge have been assumed to use bus, cycle and walk to access the NEC area, bus trips have been assigned to the GCP and CPCA planned improvements to the city bus services while the walk and cycle trips have been assigned to the various GCP schemes based on the distribution of trips above.

Table 15: Distribution of Active travel and Public Transport trips across the GCP Schemes – AM Peak

Distribution from NEC		GCP Scheme	Bus Trips Arrive	Bus Trips Depart	Cycle Trips Arrive	Cycle Trips Depart
Route	%					
A10 North	22	Waterbeach to Cambridge bus corridor;	516	305	0	0
City	13.5	Bus improvements for Cambridge;	317	187	0	0
City	27	Chisholm Trail;	0	0	696	374
A10 North	22	Waterbeach Greenway;	0	0	1393	745
City	13.5	Milton Road corridor;	317	187	696	374
A428 West	8	Cambourne to Cambridge bus corridor;	375	222	506	271
Greenways villages	17	10 other greenways excluding Waterbeach;	0	0	1022	547
A14 East	15	Cambridge Eastern Access	352	208	950	508
A14 North West	15	St Ives Greenway	0	0	950	508
A14 North West	15	Cambridge Guided Busway Bus Support	703	416	0	0
South	8	Cambridge South East Transport	188	111	506	271
		Total to GCP Schemes	2,767	1,637	6,720	3,599

Table 16: Trips Distribution of Active travel and public transport Trips across the GCP Schemes – PM Peak

Distribution from NEC		GCP Scheme	Bus Trips Arrive	Bus Trips Depart	Cycle Trips Arrive	Cycle Trips Depart
Route	%					
A10 North	22	Waterbeach to Cambridge bus corridor;	192	400	0	0
City	13.5	Bus improvements for Cambridge;	118	245	0	0
City	27	Chisholm Trail;	0	0	235	539
A10 North	22	Waterbeach Greenway;	0	0	468	1079
City	13.5	Milton Road corridor;	118	245	235	539
A428 West	8	Cambourne to Cambridge bus corridor;	139	291	170	392
Greenways villages	17	10 other greenways excluding Waterbeach;	0	0	344	792
A14 East	15	Cambridge Eastern Access	131	272	319	736
A14 North West	15	St Ives Greenway	0	0	319	736
A14 North West	15	Cambridge Guided Busway Bus Support	261	545	0	0
South	8	Cambridge South East Transport	70	145	170	392
		Total to GCP Schemes	1,028	2,143	2,261	5,206

From the information above it is possible to see that the arrival and departure trips are biased towards arrival in the AM peak and departure in the PM peak with the greater bias in the PM peak rather than the AM peak.

GCP SCHEMES SCHEME COST AND NEC CONTRIBUTION

To derive a contribution towards the bus and cycling infrastructure being progressed by the GCP, further analysis is undertaken of the scheme cost and the distribution to and from the NEC area in the peak periods.

The contributions are derived from the proportion of trips that are generated by the NEC area, in comparison to the overall number of trips on the corridor.

The overall number of trips on each corridor has been derived from Scheme Outline Business Case documents, modelled flows, or first principles. This then allows the NEC flows to be represented as a percentage of the overall flow on each scheme whether public transport users or cyclists. This percentage has then been multiplied by the scheme cost to derive the NEC Contribution.

The contributions to each of the GCP schemes is set out in Table 17 below. The scheme costs have been taken from the GCP Executive Board meeting 28th September 2023.

Within Table 17 (and 18) contributions have been derived for:

- Strategic transport schemes listed above;
- Local transport measures as detailed in the 2019 IDP;
- Internal transport measures as detailed in the 2019 IDP;
- Additional transport measures not detailed in the 2019 IDP which have been identified subsequently as a result of discussions with the developers transport consultants.

Table 17: - Strategic Schemes and Contributions based on AAP + consented quantum flows

Distribution from NEC	Strategic Transport - GCP Scheme	Scheme cost (£ Millions)	NEC %	NEC Contribution (£ Millions)
A10 North	Waterbeach to Cambridge bus corridor;	100.0	12%	21.1
City	Bus improvements for Cambridge;	Cost Per Bus/Per Year*	N/A	16.9
City	Chisholm Trail;	22.9	85%	17.7
A10 North	Waterbeach Greenway;	11.0	85%	7.9
City	Milton Road corridor;	32.0	30%	9.3
A428 West	Cambourne to Cambridge bus corridor;	181.0	14%	36.7
Greenways villages	10 other greenways excluding Waterbeach;	94.0	2%	1.5
A14 North West	St Ives Greenway	6.7	58%	3.3
A14 East/A428 West	Additional 1000 Park and Ride spaces in Cambridge;	10.0	N/A	1.5
City	New Controlled Parking Zones in the surrounding area.	0.5	N/A	0.5
South	Cambridge South East Transport	**	N/A	4.8
	Total	**£468.0**		**121.0**

** The contribution to the City bus improvements assumes that a typical double deck bus has a capacity of 80 passengers and therefore there is a need for an additional 14 busses in the AM peak and 10 buses in the PM peak which results in a total of 24 buses per day. In this initial assessment it is assumed that there will need to be 100% support for two years. This cost includes assumptions for services to and from Cambridge City Centre, Milton Road and Newmarket road areas.*

*** Due to the early stages of the revied CSETS Scheme, the contribution to the bus element of the scheme is based on the additional buses required to cater for the trips to and from the NEC area, while the cycle elements are assigned to the southern section of Chisholm trail and the costs generated based on the proportion of trips as with the other schemes.*

**** Trips from the Newmarket Road area have been assigned to the northern section of Chisholm Trail*

Contributions for strategic transport measures are shown above and are based on the total number of NEC trips as a proportion of the total trips on each of the infrastructure projects included.

Contributions for the local and internal measures are taken from the current understanding of the status of the schemes as detailed in the IDP. Many of these schemes are being investigated by the transport consultants, and these figures will need to be updated once the investigations reach the appropriate milestone.

Table 18: Local and Internal Transport Infrastructure Contributions

Local Measures as Per IDP	**Comment**	**Scheme cost (£ Millions)**
Park and Cycle opportunities at P and R locations	As per IDP	0.3
Consolidation hubs at three locations	As per IDP	2.4
	Total Costs	**2.7**
Internal Measures as Per IDP	**Comment**	**Scheme cost (£ Millions)**
Bridge over Milton Road to Cambridge Science Park;	As per IDP	17.9
Underpass between St Johns Innovation Centre and CSP;	As per IDP	10.1
Busway crossings to the area	As per IDP	0.6
Pedestrian and cycle bridge over the railway line;	As per IDP	6.0
Intra NEC area bus shuttle system;	As per IDP	9.0
	Total Costs	**43.6**
Additional Internal Measures not in IDP	**Comment**	**Scheme cost (£ Millions)**
Upgrade to underpass between Cowley Road and the busway;	Current estimated cost	1.0
Improvements to Cowley Road as an access route to the area;	Current estimated cost	2.0
Provision for cycling on the Cambridge Science Park loop road;	Current estimated cost	2.0
Improved crossing at Milton Road with the busway junction;	Current estimated cost	1.0
Improved cycle route to North Cambridge Academy Secondary School	Current estimated cost	1.5
	Total Cost	**7.5**
	Strategic Infrastructure	**121.0**

Total Infrastructure Costs	**175.0**

APPORTIONMENT OF CONTRIBUTION

It is proposed to use a Development Unit Equivalent (DUE) to apportion the costs set out above to the various development plots within the NEC area to ensure that the apportionment is equitable across the site.

This is where a common unit of development is used to assign the contribution across the site. The common unit is a single residential unit as used on other larger sites in Cambridgeshire namely Alconbury Weald and Waterbeach New Town.

The DUE is calculated by dividing the total number of person trips generated by the residential element of the scheme by the number of residential units.

Table 19: Residential Trips per dwelling

	Number	**Total Residential Person Trips**
Residential units	7,835	13,386

From this it was concluded that each residential unit generates 1.71 peak hour person trips per day.

The Number of Employment trips per sqm is derived in the same way by dividing the number of person trips by the level of development proposed. Table 17 below sets out the amount of commercial development that can be delivered by the same number of trips of B1 and B2 Development.

Table 20: DUE Calculation

	Person trips per sqm	**SQM per DUE**	**Total Floor Space (SQM)**	**No. of DUE**	**% of DUE**	**Breakdown of Contributions**
Business Park	0.045	38	584,934	15,245	63%	£110,999,041
Industrial Park	0.028	61	56,838	934	4%	£6,799,955
			Total Employment DUEs	**16179**	67%	
			Residential Units	7,835	33%	£57,047,734
			Total DUE	24,014	100%	£174,846,730

From this we can see that, based on DUEs, 67% of the development in the NEC area is commercial and therefore these elements will cover 67% of the contribution required.

The result of this is that each DUE is required to contribute £7,281 giving rise to the following contributions based on standard measures of development floorspace.

Table 21: DUE Summary

Land Use	**Unit Contribution**
Business Park per 10sqm	£1,897.63
Industrial Park per 10sqm	£1,196.37
Residential per unit	£7,281

CONCLUSION

This appendix has set out:

1. The methodology used to generate the infrastructure requirements for the quantum of development set out in the AAP + the additional committed development already approved
2. The costs associated with the total infrastructure bill, this being the sum of £174,846,730
3. The apportionment methodology to be used to assess the contribution per DUE

These values are based upon current construction costs (July 2024) and where they are contained within any Planning Section 106, they would be subject to indexation in accordance with BCIS from the date of adoption of this position statement.

The above technical evidence does not consider the cost of subsequent infrastructure requirements, should the level of development exceed that of the AAP + Committed Development scenario.

Experience locally and benchmarking concludes that a car mode share of less than 20% is not viable within the constraints of the existing, assuming the full implementation of the schemes outlined in the note above.

Glossary

To follow.