North Uttlesford Garden Community
Opportunities for Enhanced Sustainable Transit Systems in the North of Uttlesford

On behalf of Grosvenor Britain & Ireland Ltd
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1 Introduction & Purpose of Report

1.1 Appointment

1.1.1 Peter Brett Associates (now part of Stantec) is acting on behalf of Grosvenor Britain & Ireland Ltd (Grosvenor) who have been appointed by the land owners to promote a site to the north of Great Chesterford in Essex through the Local Plan process, to be known as the North Uttlesford Garden Community (NUGC). This report specifically has been jointly instructed by Grosvenor, Uttlesford District Council and Essex County Council and explores opportunities for enhanced sustainable transit systems in the north of Uttlesford.

1.1.2 PBA has been involved in numerous Garden Communities since the Government’s announcement at the start of 2017 to use garden cities and towns as a way of supporting much-needed housing delivery across 14 key regions in the UK. In September 2018, PBA was delighted to win the Ebbsfleet Garden City Design Competition as part of the H.A.L.O model team. In the judges’ view, the HALO concept fulfilled exactly what they had hoped for: an approach to design that was radical, but realisable. The panel was also excited by its possibilities, particularly because the design reflected the ‘three magnets’ concept developed by the garden city movement’s founder, Ebenezer Howard through its focus on health and wellbeing.

1.1.3 NUGC has a significant opportunity to play a pivotal role in supporting the success and growth of the southern cluster of research and science parks, whilst further complementing economic development in the sub-region by providing a work-live-play balance that responds to the needs of our changing society.

1.1.4 Taking a role alongside the landowners and the Local Authority, Grosvenor as master developer for this new Garden Community sits well with their strategic objectives. Grosvenor’s strategy is guided by a philosophy entitled ‘Living Cities’ through which they aim to make a long-term contribution to the future success of the places and communities in which we work. Grosvenor is committed to and focused on shaping and delivering a beautiful and successful new community at North Uttlesford, governed by the people who live and work within it.

1.2 Wider Project Background

1.2.1 The site comprises a 466 hectare (ha) area of primarily agricultural land to the north of Great Chesterford, Uttlesford, Essex. The site is centred on OS grid reference 552454mE 245271mN.

1.2.2 The site lies within the administrative boundary of Uttlesford District Council (UDC). The district boundary forms the northern and western boundaries of the site and the South Cambridgeshire District lies beyond this.

1.2.3 The site is bound by the A11 to the west and the B184 to the south-west. Park Road branches from the B184 and bisects the centre of the site. Cow Lane borders a small section of the south-east site boundary.

1.2.4 The site is predominantly surrounded by agricultural land to the west, north and east. The village of Great Chesterford is situated just south of the site. Currently the site, referred to as the North Uttlesford Garden Community (NUGC), is identified in the Uttlesford Local Plan where it is described as follows:

North Uttlesford – The whole garden community will comprise 5,000 new dwellings, of which a minimum of 1,900 homes will be built by 2033 and a range of local employment opportunities and services and facilities including schools, health, retail and leisure. This garden community will maximise opportunities for economic linkages with the Wellcome Genome Campus and Chesterford Research Park.
1.2.5 The site is being locally led by UDC through the Local Plan as the location is considered suitable for housing and due to the proximity of several large employment opportunities present in the area in South Cambridgeshire and Uttlesford, notably the Wellcome Trust Genome Campus, Chesterford Research Park, Granta Park, and Babraham Research, as well as the proximity of existing strategic transport networks.

1.3 Purpose of Report

1.3.1 In August 2018, the Ministry of Housing, Communities, & Local Government (MHCLG) published the Garden Communities Prospectus.

1.3.2 The prospectus invites bids for ‘ambitious, locally supported, proposals for new garden communities at scale’ where in return the MHCLG will provide tailored assistance to help design and deliver the vision for these places with assistance being prioritised in areas where there is sufficient demand for housing and where economic growth can be realised. The Prospectus sets out several criteria that need to be met for the proposals to be considered for Government assistance.

1.3.3 This report was prepared to demonstrate and justify the need for Government support in the context of exploring the value of enhanced sustainable transit systems in the north of Uttlesford to deliver transformational (economic, environmental and social) transport outcomes to the wider area and to the settlement. In this case, the transport outcomes from such a system are particularly unique as the area of influence of such a scheme would stretch across three local planning authorities, Uttlesford, South Cambridgeshire and Cambridge City.

1.3.4 This report sets out a high-level appreciation and review of these enhanced sustainable transit opportunities and why further support and funding would be justified based on the criteria presented in the Prospectus.

1.3.5 Uttlesford District Council and Grosvenor have already developed transport strategies to support identified growth at North Uttlesford Garden Community within the local plan period and beyond, to deliver 5,000 new homes. These strategies and supporting technical work are set out in the Local Plan evidence base and as part of Grosvenor’s representations to the Local Plan, and are listed as follows:

- Uttlesford Local Plan Transport Study, December 2016, White Young Green;
- South Cambridgeshire Junction Assessments, May 2017, White Young Green;
- Uttlesford District Transport Study Technical Notes 1 - 8, February 2017 to May 2018, White Young Green;
- A505 Corridor Improvement Feasibility Study: A10 to the A11, January 2018, White Young Green;
- Uttlesford Local Plan Transport Study Addendum Report 2, May 2018, White Young Green;
- NUGC Transport Vision and Strategy, April 2018, Peter Brett Associates; and
- Representations Relating to Transport (Regulation 19 Consultation), August 2018, Peter Brett Associates.

1.3.6 As Uttlesford District Council is an ambitious local authority, this report seeks to explore the opportunities that could further enhance sustainable transport connections in the wider area. This work is ongoing and demonstrates alternative ways that sustainable transport connections can be achieved in the north of Uttlesford, which could complement the robust strategies set out in the Local Plan evidence base and Grosvenor’s transport strategy. Implementation of these proposed sustainable transit systems are not necessary to deliver the
1.3.7 The approach set out in this report is one that looks past planning boundaries and explores opportunities for a step change in travel, through enhanced connectivity which could be delivered through joint working with neighbouring local authorities, interest groups and statutory bodies. It is an approach which offers benefits both in the North of Uttlesford but also across the wider area and into South Cambridgeshire.

1.4 The Background to Enhanced Sustainable Transit Systems

1.4.1 Enhanced sustainable transit systems are a fundamental part of the transport infrastructure solution for many urban and suburban areas around the world. In the UK, several tram and light-rail systems have been developed over the past 40 years. However, these have largely been developed as fixed rail systems which have been demonstrated to be costly and can therefore only usually be justified for very large passenger flows (typically 5,000-10,000 passengers per hour, each line, each direction\(^1\)) generated by large cities.

1.4.2 Therefore, and more recently, more flexible systems have been explored which use modern technologies to overcome some of the limitations of conventional fixed rail mass-transit systems. The aim of such systems to provide levels of service that are so attractive that the use of enhanced sustainable transit systems becomes the decision of choice across all sectors of society whilst the capital and operating costs are reduced to levels that are affordable for areas such as Cambridge, South Cambridgeshire and the north of Uttlesford. Therefore, and whilst the precise nature of a system would clearly be determined at subsequent stages of design and assessment, for the purposes of this report the term ‘Sustainable Transit’ is used to describe a system that does not require rail or track bed infrastructure.

1.4.3 The City of Cambridge is currently proposing the development of the Cambridge Autonomous Metro (CAM). The expansion, of this scheme, is central to several proposals considered in this report.

1.5 Structure of Report

1.5.1 This report is structured as follows:

- **Section 2: The Existing & Emerging Transport Networks**
  This Section of the report highlights existing connectivity constraints all modes

- **Section 3: The Opportunity Presented for Sustainable Transit**
  This Section of the report sets out the unique set of circumstances in the area and why enhanced connectivity in the area needs to be promoted.

- **Section 4: Patterns of Travel Demand**
  This Section of the report sets out how people travel and how these demands may increase over time

- **Section 5: Network Options, Opportunities and Constraints**
  This Section of the report identifies key movement corridors within the network and opportunities and constraints associated with them

- **Section 6: Overview of Technologies & Future Proofing**
  This Section of the report sets out the modal technologies that could provide the services required and considers how, as technologies emerge, sufficient future proofing is important.

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\(^1\) Greater Cambridge Partnership, AVRT Feasibility Study (Professor John Miles)
Section 6: Next Steps
This Section of the report sets out where further assistance from Government could focus and how the principles of a network could be developed further.
2 The Existing & Emerging Transport Network

2.1 Introduction

2.1.1 To determine the potential benefits of delivering a Sustainable Transit system in the north of Uttlesford and in conjunction with the NUGC, it is important to understand the local context of existing and future baseline conditions for all modes of transport and identify any existing or potential barriers to the use of non-car modes. Typically, when dealing with new settlements in rural locations, there are significant gaps in the existing sustainable transport infrastructure and these need to be infilled to ensure that the demands generated by the development are met and the new residents are not overly reliant on trips made by private car.

2.1.2 However, addressing these existing gaps in transport infrastructure is also able to unlock the latent demand for sustainable travel associated with existing communities which allows the transference of existing trips on the highway network to non-car modes. In this way, additional capacity for trips associated with a new development which are made by private vehicle can be accommodated with minimal detriment to existing conditions, even on an already congested network.

2.1.3 Local Plan Policy TA4 point 6 – “Rapid Transit Corridors” seeks to support connectivity to Cambridge from the north of the district. A key aspiration (Local Plan Paragraph 3.99) in the delivery of NUGC is for 60% of the associated trips generated through the course of an average weekday to be undertaken by sustainable modes of transport. In order to achieve this aspiration, investments need to be made in infrastructure and the potential of a Sustainable Transit route is one such proposal that can help to achieve a step change in sustainable mobility, but importantly also providing significantly improved infrastructure enhancements for other employment growth areas in the neighbouring locality.

2.2 Existing Connectivity to Key Local Destinations

2.2.1 This sub-section details the connectivity of the NUGC site and the north of the Uttlesford district to some of the key local destinations. It sets out that despite close proximity to one another, all destinations have challenges in connectivity that results in an over reliance on the car as a default means of transport for often short journeys. This is also evidenced further in section 4 of this report through analysis of current modal share at the research parks. The ability to connect these currently disparate locations has been the thrust of the Transport Strategy for the NUGC site and also remains the core message of this report that explores the opportunities for Sustainable Transit connectivity.

2.2.2 The location of the NUGC is shown on Figure 2.1
2.2.3 Cambridge is the biggest settlement in the study area. Located some 10km north of the site, Cambridge provides significant employment opportunities, services and facilities. Access to Cambridge is readily achievable by car and rail. Whilst bus connections are available these are limited in service frequency.

2.2.4 By road, access to the strategic network can be achieved via the M11 J9a at Stump Cross which is a dumbbell interchange and provides access to the A11 north and south as well as to the A1301 to Sawston.

2.2.5 To the south of Junction 9a, the M11/A11 junction is a fork interchange which only provides for movements travelling from the M11 northbound to the A11 northbound, or from the A11 southbound to the M11 southbound. This means that traffic wishing to access the M11
northbound towards Cambridge must travel via the A1301 and through the A505/A1301 (McDonalds) roundabout or via the A11 and the A1307 which connects Cambridge with Haverhill. This is a single carriageway road with intermittent short sections of dual carriageway. The M11 to the south of NUGC provides a link to Stansted Airport, an important employer and transport hub within the wider Uttlesford District.

2.2.6 Congestion on both routes to Cambridge can be a problem at peak times and there have been calls to convert the A1307 and A505 into a dual-carriageway roads subject to further studies. Further details are set out later in this section.

2.2.7 To access Cambridge by rail, the closest station to the site is located at Great Chesterford, approximately 1.3 kilometres to the south. Journey times from Great Chesterford and Cambridge are 16 minutes. Whittlesford Parkway station is located around 3.5 kilometres to the north of the NUGC site and is served by more frequent and faster train services. There are generally three services per hour in the direction of Cambridge and journey times are approximately 15 minutes. The delivery of Cambridge North and the proposals for Cambridge South station have and will enhance rail access to the north and south of the City.

2.2.8 The nearest bus route to the site is the Citi 7 bus route between Cambridge and Saffron Walden. The Citi 7 route has a 20-minute frequency between Cambridge and Sawston, although this decreases to a 60-minute frequency between Sawston and Saffron Walden which limits accessibility to local destinations. Journey times between the site and Cambridge by Bus are more than an hour.

2.2.9 In general terms, connectivity between the site and Cambridge is good although peak hour highway congestion is problematic. The rail corridor provides alternative access to the City from the site but the fixed nature of the infrastructure means that access to the network from parts of the site and other surrounding origins and destinations is difficult meaning the value of rail is reduced without additional last mile connectivity to the stations. Current bus provision between the site and Cambridge is limited.

**Saffron Walden**

2.2.10 Saffron Walden is the District Centre for Uttlesford and is 7km to the south of the site. Access between the site and the town by foot and bicycle is currently limited by a lack of infrastructure. However, Essex County Council published its Cycling Action Plan for Uttlesford District in March 2018 which considers a range of improvements across the district, including new on and off-road cycle provision between Great Chesterford and Saffron Walden. Vehicular access is possible via the Walden Road which runs into the town centre. The nearest bus route to the site is the Citi 7 bus route between Cambridge and Saffron.

2.2.11 Great Chesterford is served by the Citi 7 bus route which provides a 60-minute frequency to Saffron Walden.

**Great Chesterford**

2.2.12 Located to the south of NUGC, Great Chesterford has a tight network of generally pleasant walkable and cyclable streets, and safe pedestrian access from the site can be achieved via Jackson’s Lane and the High Street, as well as from an existing public right of way (PRoW). Owing to the network of village streets, connectivity between the site and Great Chesterford Railway Station is considered good. However, some consideration should be given to potential targeted improvements to address minor localised deficiencies in the network.

**Chesterford Research Park**

2.2.13 To the south of the NUGC, Walden Road provides pedestrian access to the Chesterford Research Park. Although an existing connection, the limited width of the footway, lack of lighting and fast-moving traffic means that connectivity between the site and the Research Park is currently poor for pedestrians and cyclists. Public Bus access is limited to the City 7.
2.2.14 Businesses located at the Chesterford Research Park utilise dedicated bus services provided by the campus due to the lack of regular quality public services. These services provide access to Cambridge and Saffron Walden as well as the surrounding villages, and it is estimated from the 2015 Chesterford Research Park Travel Plan surveys that around 15% access the Campus via bus.

**Wellcome Genome Campus**

2.2.15 To access the Wellcome Genome Campus by foot and cycle, residents would need to travel south through Great Chesterford and along Frogge Street. The most direct route is via the Stump Cross junction. Whilst cyclists can travel this way on carriageway, there is no segregated footway or cycleway provision at this junction.

2.2.16 The overall connectivity between Great Chesterford and the Wellcome Genome Campus could be improved further for pedestrians and cyclists through partnerships between local authorities and development promoters.

2.2.17 Businesses located at the Wellcome Genome Campus utilise dedicated bus services provided due to the lack of regular quality public services. These services provide access to Cambridge and Saffron Walden as well as the surrounding villages. Based on September 2017 staff travel surveys, 32% of all employees access the Campus via these buses.

**Granta Park**

2.2.18 Access for pedestrians and cyclists to the north from the site and the existing village is limited to the existing PROW, which provides a route from within the site towards Abington and Granta Park. These PROWs utilise private roads and are classified as footpaths; therefore, they may not be suitable for cycle travel. Due to the limited accessibility of these PROWs for cyclists and the lack of street lighting which would make the routes attractive to pedestrians, these routes would require improvement to improve upon the current connectivity between the site and Granta Park.

2.2.19 Public transport connectivity between the site and Granta Park is not currently possible despite the proximity of the two locations.

**2.3 Future Transport Context**

2.3.1 Central to the case being made for enhanced sustainable transit is the wider investments being made in Transport in area and in networks and modal technologies that would be complementary or adaptable to the proposals we seek to explore further. These investments are summarised below.

**Cambridge Autonomous Metro (CAM)**

2.3.2 The Cambridgeshire Autonomous Metro (CAM) is being promoted by the Cambridge and Peterborough Combined Authority. It is predicated on a concept that seeks to best deliver the transport outputs and benefits that a Cambridge mass transit scheme should achieve, while maximising value for money and affordability. It is a network that would serve Cambridge but also the surrounds with the Mayor currently envisaging a network such as presented below extracted from a presentation in January 2018 by Steer Davies Gleave on the CAM.
2.3.3 From the above it is apparent that a network of tunnels within Cambridge would be fed by surface routes from outside of the City. One such route (J) has more recently manifest itself as the Cambridge South East Transport Study and is set out in more detail in the subsequent sub-section of this report. It was concluded that if the transport benefits of CAM as a mass rapid transit system are to be realised, a segregated system is optimal outside Cambridge. It is already proposed that CAM would be segregated in Cambridge either by tunnels, or by following existing segregated corridors such as the guided busway route. Further details on the CAM technology is set out in Section 6.2 of this report.

**Cambridge South East Transport Study**

2.3.4 The Cambridge South East Transport Study emerged from the rising concern about the levels of congestion, air quality and worsening journey times along the A1307 into Cambridge. Initially a range of wider options were considered by the Greater Cambridge Partnership and key stakeholders, including re-opening the Cambridge to Haverhill railway, creating a bypass for Linton and dualling the A1307. However, the rail and dualling options were ruled out as they were found not to be deliverable within the scope of the Greater Cambridge Partnership.

2.3.5 The process of reviewing these benefits and costs associated with each approach, led to the emergence of the three improvement schemes which were consulted on until 9th April 2018.

2.3.6 The short-term strategy (Phase 1) elements include for bus priority, junction improvements, walking and cycling measures and road safety improvements along the A1307 between Haverhill and Cambridge. However, and more crucially to this report is the recent endorsement that a dedicated Mass Transit Route has also been agreed to be assessed and developed in further detail as part of the Phase 2 works to improve public transport connectivity between the A11 and biomedical campus.

2.3.7 The Mass Transit route preferred would involve providing a segregated route between the A11 close to the NUGC and the Cambridge Biomedical Campus via Sawston. This route would form part of the Cambridgeshire Autonomous Metro being proposed by the Combined Authority. It also includes for a new Park and Ride near the A505 / A11 junction at Granta

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2 https://www.greatercambridge.org.uk/transport/transport-projects/cambridge_south_east_study/cambridge_south_east_study-background/
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Park. The mass transit route would also be used by pedestrians and cyclists and would form part of the Sawston Greenway. The indicative route proposed is set out overleaf.

2.3.8 Further technical and environmental assessment work is now being progressed alongside the detailed route alignment evaluation. The output of the further work will be an Outline Business Case for adoption of a preferred proposal to proceed to implementation. The route is currently shown to terminate at the A11.

Whittlesford Parkway Masterplan

2.3.9 The Greater Cambridge Partnership is also proposing that Whittlesford Parkway station and the surrounds be subject of a comprehensive masterplan exercise as a pre-cursor to investment being made. Several local transport issues have arisen within the vicinity of the station throughout recent years such as local congestion, bus turning issues at the station, and safety at the crossing towards Duxford on the A505 and thus cycle access. Together, with the increasing range of developments proposed for the area, increasing travel demands, the station and surrounding area is to be considered in this context.

2.3.10 The station and surrounding area is recognised as an important gateway to nationally significant employment centres for example to Stansted Airport to the south and therefore, the aim of the masterplan process is to improve sustainable connectivity (with onward travel from rail to bus, walking, cycling and the road network) and greater capacity for growth in public transport use.

2.3.11 The study reviews the existing passenger arrangements and interchange facilities at Whittlesford Parkway in addition to the provision for a new multi-modal transport interchange inclusive of a new bus terminal, improved cycle access, increased long stay car parking, short-term parking, cycle parking, drop-off facility, taxi point and disabled parking including the potential that a full transport interchange can be developed at the station. If a full interchange were to proceed this would offer major benefits for sustainable transport for those in South Cambridgeshire and the north of Uttlesford, including the NUGC and those wishing to access the station from the A505 and A1307 corridors.

A505 Multi-Modal Study

2.3.12 The Cambridgeshire and Peterborough Combined Authority has already committed £1.5m over the period 2018 to 2021 towards preparing a study and outline business case for
improvements to the A505 corridor to unlock strategic growth in the area. This project will be commissioned shortly with an announcement expected in February 2019 and as a multi-modal study will need to consider all modes as part of any transport strategy. The findings will inevitably build on the Cambridge SE work being undertaken.

2.4 Summary

2.4.1 This section of the report has demonstrated that despite geographical proximity, a number of significant locations around NUGC will require improvements to interconnectivity by modes other than the car. This is the focus of the current transport vision and strategy for the North Uttlesford Garden Community which proposes improved pedestrian and cycle connectivity between the research parks and to the emerging Mass Rapid Transport proposals to the north of the site at Granta Park. It also incorporates a comprehensive public transport strategy, linking the sites with NUGC through a traditional bus based system.

2.4.2 Investment is coming to the area and preliminary studies have already provided the foundations for transformational change in the area. However, it is clear that an enhanced sustainable transit network which connects all key origins and destinations could work and as such there are further opportunities to explore further.

2.4.3 The work undertaken thus far by Grosvenor as part of a wider emerging transport strategy has sought to improve these existing links and this study into enhanced sustainable transit opportunities is complementary to this previous work.
3 The Opportunity for Sustainable Transit

3.1 Introduction

3.1.1 This Section of the report provides context of the area in which the new community is proposed. It outlines the uniqueness of the area in terms of its economic importance to the sub-region, region and increasingly the UK. The Sustainable Transit proposals set out further into this report have the potential to complement the site and the area more generally and to help to deliver the opportunities highlighted below.

3.2 Reduce Vehicular Travel Distances

3.2.1 The site is fundamentally located in an excellent position to maximise the opportunities for use of sustainable modes of transport. This is primarily due to NUGC’s position relative to existing major employment hubs and areas identified for growth in jobs.

3.2.2 Generally, large scale development, including comparable garden communities which do not benefit from this same locational advantage, must deliver jobs within the site to reduce the need to travel off-site and to promote sustainable travel patterns. Whilst the employment offer within NUGC will be strong, it also offers a broad range of major employers close to the site which presents the opportunity for existing and future workers at these job growth areas to live locally, reducing commuting distances and potentially increasing the uptake of non-car modes of travel.

3.2.3 The economic pull of the Cambridge job market has seen commute distances increase significantly between 2001 and 2011\(^3\) with ever more journeys being made from further south and longer commutes being made to access this employment. Longer distance commuting has an economic, social and environmental cost that policy makers must strive to address. The ability to reduce travel distances and increase the opportunities for more sustainable travel needs to be maximised. Therefore, putting housing amongst key employment areas ‘makes sense’.

3.2.4 Chesterford Research Park, Wellcome Genome Campus, Granta Park, Babraham Institute and the Cambridge Biomedical Campus are all within 10km of NUGC. Due to the scale of these nearby employers, several which are subject to significant expansion programmes, there is likely to be a strong functional link between the garden community and many of these

\(^3\) https://www.cchpr.landecon.cam.ac.uk/Downloads/Cambridge-TTWA-Final
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employment sites and therefore the need for sustainable connections between them is paramount.

3.2.5 National Planning Policy through the National Planning Policy Framework (NPPF) promotes sustainable development and states that transport policies have an important role to play in delivering it and in contributing to wider sustainability and health objectives. It stresses that the transport system needs to be balanced in favour of sustainable transport where people have a real choice in how they travel. It also goes on to say that in preparing Local Plans, local planning authorities should support a pattern of development which facilitates the use of sustainable modes of transport. The proposals to introduce a step change in transport provision for the area with NUGC serving as a catalyst for delivery, are aligned with the NPPF.

We consider that proposals to explore better sustainable connectivity between housing and employment would accord with the criteria to develop 'integrated, forward looking and accessible transport options that support economic prosperity and wellbeing for residents'.

3.3 Supporting Economic Growth

3.3.1 In September 2018, the Cambridgeshire and Peterborough Independent Economic Review (CPIER) reported its findings. This Commission was established by the Cambridgeshire and Peterborough Combined Authority (CPCA) in June 2017. It is chaired by Dame Kate Barker, and its other members are: Dr David Cleevely CBE, Sir David Arculus, Dame Carol Black, Matthew Bullock, Professor Diane Coyle CBE, Mark Dorsett, Warren East, Professor Alan Hughes, Professor Andy Neely, John Shropshire OBE and Lord David Willetts.

3.3.2 The report concludes that the success of Cambridgeshire and Peterborough is 'a project of national importance' with its businesses being at the forefront of a new industrial revolution, and its academic offer from Cambridge being 'world-beating'. The report suggests that to realise the true potential of these existing assets and opportunities several factors need to be addressed. If they can be than there will be reward to the UK more widely.

3.3.3 The report suggests that as the government seeks to transform UK business through the Industrial Strategy, and increase productivity, the Cambridgeshire area must be central but that the area’s success cannot be taken for granted. The report states the following regarding the Greater Cambridge economy which is the area that relates most directly to this report:

‘businesses have brought about revolutionary advances in a wide array of fields, transforming lives around the world. The impacts of business growth have not been entirely positive, however. Growth in employment has not been matched by corresponding house-building, or developments in infrastructure. Consequently, house prices have soared and journey times have increased as congestion has intensified. This has meant that many have been forced to endure unpleasant commutes, or been priced away from the city altogether due to the unaffordability of rents. This is bad for both people and businesses, and we believe is an unsustainable approach to growth. We are rapidly approaching the point where even high-value businesses may decide that being based in Cambridge is no longer attractive. If nothing is done, the damage to society from the continuing drift away of less well-paid workers may become irreparable, the ageing of the city (whose housing ladder’s bottom rung is out of reach of the vast majority of the young) will threaten its dynamism, and the cost to people’s mental health of commuting-induced stress and housing insecurity will soar. Cambridge is at a decisive moment in its history where it must choose whether it wants to once again reshape itself for growth, or let itself stagnate and potentially wither. We believe the latter would be disastrous for its people and the UK economy. Therefore, we conclude that improvements in infrastructure, and further development, must start in and around Cambridge.’

3.3.4 The report also highlights the importance of ‘agglomeration’ which is the desire of companies to be near (or readily connected) to other similar companies. Agglomeration economies are well understood and that where critical concentrations exist, this then further attracts other similar companies to the area. The findings expand to say that the knowledge-intensive
sectors in and around Cambridge and the southern part of the area are strongly clustered, densifying and highly dependent on their location. For this vital section of the local and indeed the national economy, it is ‘Cambridge or overseas’. This should not be overlooked.

3.3.5 The report considers the issues of infrastructure and investment and states that the level of investment in the infrastructure of Cambridgeshire has been inadequate for too long with the most acute constraints in the southern part of the area. It suggests that a package of transport and other infrastructure projects to alleviate the growing pains of Greater Cambridge should be considered the single most important infrastructure priority facing the Combined Authority in the short to medium term. These should include the use of better digital technology to enable more efficient use of current transport resources.

3.3.6 The provision of the new houses at the NUGC are designed, in part, to support the economic development associated with forecast growth at Granta Park, Babraham Research Campus, Wellcome Genome Campus and Cambridge Biomedical Centre and provide convenient places for future employees of these facilities to reside. Therefore, it is understood that a Sustainable Transit system allowing quick and easy access to these facilities, via direct access or potential interchange with works proposed as part of the Cambridge South East Transport Study would positively contribute to growth along the corridor by improving local sustainable transport links between homes and jobs.

We consider that the proposals to introduce a step change in transport provision for the area would fully support the findings of the CPIER and present an opportunity to facilitate economic growth in the area for the benefit of the whole Country.

3.4 Capitalising on Existing Public Sector Investments

3.4.1 The site benefits from a unique set of public body funding opportunities that have emerged over the last few years in Cambridgeshire. These funding and delivery partner opportunities set the development, and any associated Sustainable Transit network, apart from many others proposing similar schemes to deliver growth.

3.4.2 The GCP’s transport vision is to deliver a world class transport system that makes it easy to get into, out of, and around Cambridge in ways that enhance the environment and retain the beauty of the city. The GCP considers that transport infrastructure is essential in supporting the delivery of sustained growth, prosperity and quality of life for the people of Greater Cambridge.

3.4.3 Both the CPCA and GCP consider addressing the existing issues on the transport networks to the south east of Cambridge to be a necessity, particularly considering their potential to be exacerbated by the growth in travel demand associated with the NUGC and the forecast growth at key employment sites. This, combined with the demonstrable appetite of both public bodies to consider innovative and larger scale solutions to these issues, indicates that a sustainable transit system for NUGC is in line with current strategic thinking at a political level and is likely to be supported on this basis.

We consider that the emerging GCP and CPCA proposals to bring Mass Transit to the area through the CAM / Cambridge South East proposals alongside better rail interchange at Whittlesford, can be used as a platform to further integrate and benefit both districts in a cost effective and mutually beneficial way.

3.5 Helping to Meet Housing Need & Mitigating the Impact of Growth

3.5.1 Significant levels of housing growth are forecast in the locality of the NUGC site, both within Uttlesford and the South Cambridge districts. This growth in the number of residents will increase the demand for travel on the existing transport network.

3.5.2 Uttlesford’s Regulation 19 Local Plan indicates that the new housing requirement for the district during the Local Plan period 2011-2033 is at least 14,000 dwellings. NUGC is expected
to deliver a minimum of 1,925 homes to be built by 2033 and this is expected to represent much of the housing growth in the northern area of the district.

3.5.3 Due to the proximity of the NUGC to the administrative boundary between Uttlesford and South Cambridgeshire, the forecast growth in in the South Cambridgeshire district is also likely to have a significant impact on the transport network surrounding the site. South Cambridgeshire’s Local Plan adopted in September 2018 identified the need for 19,000 new homes within the district up to end of the Local Plan period to 2031.

3.5.4 However, further housing proposals including as part of the Wellcome Campus expansion are proposed outside of the Local Plan process and as such demands could be greater again in the area.

3.5.5 One of the key benefits of provision of a Sustainable Transit link would be to minimise the impact of the NUGC development on the surrounding highway network. This would potentially allow the funding set aside for highway improvement schemes intended to mitigate this impact to be diverted towards alternative works which would ensure that future residents would have presumption towards suitable modes of travel.

The provision of transport networks that link housing to employment will help to deliver homes in an area of the Country where demand is significant and the affordability gap greatest. The potential to address cross boundary challenges through the provision of infrastructure and homes which benefit each District.

3.6 Linking Communities

3.6.1 Finally, as previously set out, the benefits of provision of a Mass Transit link to address existing gaps in the network for sustainable access to a range of key destinations will benefit the wider community, as well as future residents of NUGC. Mass Transit has the potential to unlock suppressed demand of travel in the surrounding area which may allow existing residents without access to a private car to re-enter the workforce or obtain access to employment opportunities which may otherwise have been closed off to them.

3.6.2 Furthermore, a rapid transit link has the potential to enable the transference of existing trips made to via the surrounding highway network to public transport, due to the potential increase in accessibility or reduced journey times available. This has the dual benefit of increasing the sustainability credential of Uttlesford and South Cambridgeshire as whole, moving towards ‘normalising’ the use of public transport, but also freeing up existing capacity of the road network and reducing severance between communities.

We consider that the emerging GCP and CPCA proposals to bring Mass Transit to the area through the CAM / Cambridge South East proposals alongside better rail interchange at Whittlesford, can be used as a platform to further integrate and benefit the wider area and NUGC in a cost effective and mutually beneficial way.

3.7 Summary of the ‘Opportunity for Mass Transit’

3.7.1 This Section of the report has set out how the site, which sits centrally to some of the Country’s most important research and development employment sites, can be used as a catalyst to improve connectivity between Districts and centres of research with onward connectivity into central Cambridge via the Cambridge Biomedical Campus. It has demonstrated how investment in infrastructure is consistent with the Cambridge and Peterborough Independent Economic Review which determines that the industries in this location need support or risk them being lost to overseas through the provision of affordable housing and efficient transport infrastructure.

3.7.2 The opportunity presented by the proposals being promoted by Greater Cambridge Partnership and the Cambridge and Peterborough Combined Authority is also an important one. The work required to deliver a Mass Transit system close to the site is already taking
place and therefore the associated costs of expanding any network would be, in relative terms, cost effective and potentially more viable accordingly.

3.7.3 Crucially the opportunity exists to support housing growth in the area. The costs of locating housing further from employment because of limited land supply and the effect of employees being forced to live further from their places of work due to affordability issues is significant. The introduction of well-connected homes in the right areas is a challenge that needs to be addressed and can be through well considered public transport networks.
4 Patterns of Travel Demand

4.1 Introduction

4.1.1 This section considers in further detail the local travel patterns in the area of influence of the potential sustainable transit system. It considers the main flows of people around the area currently, and how this might be expected to grow and change in the future with the planned growth at NUGC and in the life science cluster of research parks.

4.1.2 One of the unique benefits of a sustainable transit system in this area is that it would have cross boundary benefits for those in the northern part of the Uttlesford District, the areas in South Cambridgeshire around the research parks and would also improve accessibility for those in the Cambridge City District itself through linking with the existing plans for mass transit in this area.

4.2 Current Travel Demand Patterns (2011)

4.2.1 Figure 4.1 shows the existing demands for journeys to work between the northern areas of Uttlesford, South Cambridgeshire District and Cambridge City.

4.2.2 It is clear from a review of this existing data that:

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4 2011 Census Journey to Work Data
i) There is a high demand for travel between Uttlesford District into Cambridge. The reverse flow is currently relatively low, as there are no major areas of demand generation apart from Saffron Walden.

ii) There is a moderate amount of movement within the research park zone in South Cambridgeshire, even though there are relatively low levels of housing within the area of influence of these parks.

iii) There is a strong relationship between the South Cambridgeshire research park zone and Cambridge, as well as the north of the Uttlesford District. With relatively few major employers in the north of the Uttlesford district there is an attraction to South Cambridgeshire research parks.

4.2.3 Graph 4.1 of intra-zonal or "short" trips illustrates the impact of the existing deficits in walking and cycling infrastructure in this area as well as the impacts of an absence of a critical mass of housing in the area on modal choice. It illustrates that at all four research parks, between 54% and 86% of trips within the immediate employment zone itself are undertaken by car, and only 14% - 46% by active modes. This data is from the 2011 Census so older than the more recent travel surveys undertaken at Chesterford Research Park and the Wellcome Genome Campus.

Graph 4.1 – Modal Choice for Internal Trips at the existing research parks – i.e. inside the immediate workplace zone or MSOA (2011 Census)

4.2.4 The impact of the existing deficits in public transport at the larger scale are highlighted in Graph 4.2, showing modal choice for longer journeys outside the immediate employment zone. In this case, between 68% and 91% of journeys outside the immediate employment zone are undertaken by car. The Wellcome Genome Campus has the lowest vehicular mode share of all the parks, presumably because of its relative proximity to Whittlesford Parkway rail station and investment in shuttle bus services. Babraham Research Institute, Chesterford Research Park and Granta Park all have a vehicular mode share in excess of 85% according
to the 2011 data, albeit more recent travel surveys at Chesterford Research Park indicates improvements on this figure.

4.2.5 It is clear that there is a compelling case for need for improved sustainable modes in the area, as this has the potential to unlock significant reductions in existing car-based travel in the area.

4.3 Future Travel Demand Patterns

4.3.1 The area will experience significant job and housing growth, both in the next Local Plan period to 2033 and beyond.

4.3.2 Policy S/5 of the adopted Cambridge and South Cambridgeshire Local Plan identifies 22,000 new jobs for the Local Plan Area.

4.3.3 As part of the evidence base for the emerging regulation 19 Uttlesford District Local Plan, White Young Green undertook an assessment of the performance of the local highway corridors in the context of this planned growth, including the A505 corridor and M11. At the time of the study 4,000 jobs were assumed in the research parks and 21,000 in Cambridge City as well as jobs growth in the surrounding districts. This showed the A505 corridor operating over 100% stress, even without the growth identified in the Uttlesford District Local Plan.

4.3.4 In addition, a separate employment study undertaken by Bidwells as part of the North Uttlesford Garden Community Vision Document reviewed the planned jobs growth at each of the research parks and in the area immediately surrounding the North Uttlesford Garden Community.
4.3.5 Table 4.1 below is an extract from this Bidwells report, indicating the potential future levels of growth at the parks.

Table 4.1 – Built and Planned Growth – Research Parks (Bidwells Employment Study, 2018)

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>BUILT</th>
<th>FUTURE GROWTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chesterford Research Park</td>
<td>Total area of Masterplan 94,575m² GIA</td>
<td>Planning Consent for 22,526m² in 7 buildings (GIA)</td>
</tr>
<tr>
<td></td>
<td>Built out = 48,545m² GIA</td>
<td>Building 60 - 3,150m² consent given for refurbishment (14/2/18)</td>
</tr>
<tr>
<td></td>
<td>Vacancies: very limited</td>
<td>Future phases: 6 buildings totalling 23,504m² GIA</td>
</tr>
<tr>
<td></td>
<td>Building 60 - 3,150m², awaiting refurbishment</td>
<td>There is some scope for growth over and above that covered by the Masterplan, including land along the drive way. All other areas are farmed or wooded. Intensification of the existing built areas may also be feasible</td>
</tr>
<tr>
<td></td>
<td>Two small rooms in The Cottage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All occupiers must have research element to their work.</td>
<td></td>
</tr>
<tr>
<td>Welbeck Genome Campus, Hinxton</td>
<td>46,700m² of a 59,000m² consent has been built out for B1b use</td>
<td>The 25-year Vision published in 2016 suggests 85,000m² of further development.</td>
</tr>
<tr>
<td>Grant Park: TWI</td>
<td>10,495m²</td>
<td>Outline consent for 33,445m² B1 space over 5 development pads</td>
</tr>
<tr>
<td></td>
<td>Includes office and conference facilities, laboratory space,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>engineering hall, D1 space, central service spine, resonance testing building</td>
<td></td>
</tr>
<tr>
<td>Grant Park: BioMed</td>
<td>71,200m² in 11 research and development / office buildings. (The park also includes creche, health and fitness, sports facilities, conference centre)</td>
<td>4,100m² B1 consent with reserved matters</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7,000 m² development option, no consent</td>
</tr>
<tr>
<td>Babraham Research Park</td>
<td>28,000m² of R&amp;D, incubator and office space</td>
<td>R&amp;D2. Approval for 10,000m² B1b space,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aging buildings that could be redeveloped with greater density and further growth of lettable space within the campus</td>
</tr>
<tr>
<td>Unity Park</td>
<td>4,100m² in three buildings at Iconix Park</td>
<td>Outline consent for 16,588m² NIA for B class use, including detailed consent for the Works Building of 5,653m²</td>
</tr>
<tr>
<td>TOTAL</td>
<td>208,960m²</td>
<td>182,398m²</td>
</tr>
</tbody>
</table>

4.3.6 In addition to jobs growth at the research parks, the North Uttlesford Garden Community will also bring additional jobs to the north of the district as part of the Garden Community ethos. Based on the employment study submitted, it has been assumed that around 4300 jobs will be delivered at the NUGC.

4.3.7 Combining the assumptions in the relevant transport studies, Figure 4.2 summarises the future travel demand associated with these jobs, assuming the following:

- 2,400 jobs at Granta Park
- 2,050 jobs at Wellcome Genome Campus
- 900 jobs at Babraham Research Park
- 1,400 jobs at Chesterford Research Park
- 4,360 jobs at NUGC.

4.3.8 The attractions to and from the Wellcome Genome Campus are likely to be even higher than shown with the recently submitted planning application for 150,000m² of employment use, retail, leisure, hotel and 1,500 dwellings.

4.3.9 No account has been taken of additional demand likely to be generated by housing in the area or for journeys other than associated with the job growth, so total demand in the area is likely to be higher still.

4.3.10 For the purposes of this high level study, the origins of workers travelling to these new jobs is assumed to reflect that observed in the 2011 Census. Clearly with the addition of the NUGC housing on the doorstep of these research parks, the demand for a transit system in this specific area would increase from that set out below.

Figure 4.2 – Forecast Job Growth

4.3.11 It is clear that with the significant growth planned for the area within the Local Plan period and beyond, an ambitious approach to delivering sustainable travel in the area would be most desirable in this location.
4.3.12 As the planned Cambridge South East Study Mass Transit system will help address the tidal movement into Cambridge for employment, with the NUGC and growth in the research parks, there is an exciting opportunity to explore how this network might be expanded to the wider research parks and rail station, addressing in part some of the historic challenges to sustainable travel in this nationally important job sector growth area.

4.4 Conclusions

4.4.1 Based on a high-level review of travel demand in the area, the following is apparent:

i. There is a strong dual movement of cross-boundary travel demand in this area, between Cambridge, South Cambridgeshire and the north of the Uttlesford district.

ii. With future growth, there will be increased demand for these movements.

iii. The modal choice for journeys in the area is significantly skewed towards the private car, reflecting the poor sustainable mode connectivity of the area to the major generators of demand.

iv. Studies of local high corridor performance in the future growth context indicate that an ambitious approach to sustainable travel will have the most benefit in desirability terms in the long term if the area is to continue to grow and develop.

v. With the planned mass transit scheme connecting Cambridge to a new Park and Ride near Granta Park, there is an opportunity to extend a sustainable transit network to offer onward connections to the research parks and NUGC, unlocking sustainable travel for an area traditionally dominated by car movement, reducing dependency on car-based modes, reducing CO₂ emissions and extending the life of strategic highway infrastructure assets in the area.

4.4.2 The following section considers some potential network options for such a system and the high-level constraints and opportunities associated with each.
5 Network Options, Opportunities & Constraints

5.1 Introduction

5.1.1 With the need for investment in active modes of travel in the area established, this section considers some of the network options for a potential sustainable transit system in the area. These are based on the current understanding of potential growth locations. This is not an exhaustive list of options for a potential network, but highlights some which could be explored further as part of more detailed feasibility work, subject to receipt of the Garden Community Prospectus funding.

5.1.2 As mentioned earlier, the Cambridge South East Transport Study is proposing a mass transit system (CAM) from the Cambridge biomedical campus at Addenbrookes to terminate at a new Park and Ride at Granta Park. These network options focus on building upon this proposed CAM network with new sustainable transit corridors.

5.1.3 All network options include one of both of the following:

- An extension to the proposed CAM network, with the intention that CAM vehicles (or other sustainable transit technologies) penetrate the area.
- Sustainable corridors to the key hubs on the network which provide facilities for active modes, but also would be compatible with autonomous “pod” type vehicles to enable “last mile” journeys to be completed by sustainable modes.

5.1.4 In addition, there is the additional benefit that the NUGC site is a large green field where the provision of all necessary on-site infrastructure is not constrained by any existing physical built form aside from the usual considerations in terms of landscape and heritage factors.

5.1.5 Finally, it should be noted that all the networks considered in this section are not discrete options as the network can be delivered in phases, providing flexibility to respond to significant new travel demand where necessary.

5.2 Option 1 - Improving Connectivity to the Proposed Cambridge SE Mass Transit

5.2.1 This option focuses on improving last-mile connectivity to the proposed terminus of the Cambridge South East Mass Transit system opposite Granta Park. It does not propose any extensions to the mass transit system. Figure 5.1 summarises the key principles of this option. The connectivity shown is not transport mode specific, so could be delivered through shuttle buses, walking and cycling provision or a combination of the both.
5.2.2 The focus is to create new sustainable movement corridors from the mass transit terminus at the Park and Ride, radiating out from the terminus like spokes in a wheel. These key corridors include:

a. West from the mass transit terminus, along the A505 towards Whittlesford Station and continuing south to the Wellcome Genome Campus.

b. South of the mass transit terminus, west of the A11 along the disused railway link towards the Wellcome Genome Campus.
c. South of the mass transit terminus, east of the A11 along the old link and into North Uttlesford Garden Community, before continuing east cross-country towards Chesterford Research Park.

d. North-west of the mass transit terminus towards Babraham Institute.

5.2.3 Table 5.1 provides a review of the potential contribution of this option to the key objectives of the Garden Communities in terms of economic, environmental and social factors. The Table is not exhaustive but provides an overview of some of the important aspects for consideration in taking forward the option for further feasibility assessment.

Table 5.1 – Improving Connectivity to the Proposed Cambridge SE Mass Transit System - Opportunities and Constraints

<table>
<thead>
<tr>
<th>Theme</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic</td>
<td>Improved cross-boundary connectivity for sustainable modes and flow of labour.</td>
</tr>
<tr>
<td></td>
<td>Potential journey time savings for workers through new transport corridors not impacted by highway congestion.</td>
</tr>
<tr>
<td>Physical / Environmental</td>
<td>Unlocking recreational routes and green corridors into the wider countryside.</td>
</tr>
<tr>
<td></td>
<td>Improved accessibility between rail and the research parks.</td>
</tr>
<tr>
<td>Social</td>
<td>Unlocks sustainable transport opportunities and mobility between Cambridge, South Cambridgeshire and Uttlesford</td>
</tr>
<tr>
<td></td>
<td>Improved accessibility to rail for the wider community and for recruitment at the new parks.</td>
</tr>
</tbody>
</table>

5.2.4 Subsequent stages of the feasibility work will need to explore in further detail the potential constraints associated with each option, including but not limited to land acquisition, physical and environmental factors such as drainage, structures etc.

5.3 Extension of Mass Transit – Option 2 – Chesterford Research Park

5.3.1 This option explores extending the transit system from its current terminus point to Chesterford Research Park via the North Uttlesford Garden Community. Figure 5.2 summarises the key principles of this option. It is assumed within this option that the recently refused Agri-Tech development proposal located west of the A11 and north of the Wellcome Genome Campus is not required to be served.
The key elements of this option are:

i. To extend the functionality and benefits of the mass transit system by extending a transit system into the research parks area and onwards into the northern part of the Uttlesford District, connecting Granta Park, NUGC and Chesterford Research Park.

ii. Improve the existing “last-mile” connectivity to the NUGC and Chesterford Research Park hubs, focusing particularly on connectivity to the Wellcome Genome Campus and onward connectivity in the northern part of the Uttlesford District through active mode measures and consideration of autonomous pod technologies for the shorter distances.
5.3.3 Table 5.2 provides a review of the contribution of this option to the key objectives of the Garden Communities in terms of economic, environmental and social factors. The Table is not exhaustive but provides an overview of some of the important aspects for consideration in taking forward the option for further feasibility assessment.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Economic</strong></td>
<td>Mass transit extension opens high volume sustainable links to north Uttlesford.</td>
</tr>
<tr>
<td></td>
<td>More reliable journey times as greater extent is transit-based and segregated from road systems</td>
</tr>
<tr>
<td></td>
<td>Unlock further growth areas in surrounding area</td>
</tr>
<tr>
<td><strong>Physical / Environmental</strong></td>
<td>Unlocking recreational routes and green corridors into the wider countryside.</td>
</tr>
<tr>
<td></td>
<td>Improved accessibility between rail and the research parks.</td>
</tr>
<tr>
<td></td>
<td>Potential to reduce CO$_2$ emissions associated with development in the area through sustainable transport options</td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td>Greater penetration of transit system into the north Uttlesford district bringing opportunities closer to the doorstep.</td>
</tr>
<tr>
<td></td>
<td>Opportunities to access the transit system from Great Chesterford by means other than the car.</td>
</tr>
</tbody>
</table>

5.3.4 Subsequent stages of the feasibility work will need to explore in further detail the potential constraints associated with each option, including but not limited to land acquisition, physical and environmental factors such as drainage, structures etc as well as relative capital and maintenance costs associated with the extension of the CAM system.

5.4 **Extension of Mass Transit – Option 3 – Wellcome Genome Campus**

5.4.1 This option also explores extending the mass transit system from its current terminus point but instead via the Wellcome Genome Campus and then on to NUGC and Chesterford Research Park. Figure 5.3 summarises the key principles of this option. This option assumes a higher concentration of growth around the Wellcome Genome Campus and provides better connectivity to Whittlesford Parkway Station which allows for multi-modal interchange from rail also.
Figure 5.3 – Extension of Mass Transit to Chesterford Research Park via Wellcome Genome Campus
5.4.2 The key elements of this option are:

i. To extend the mass transit system and run it closer to the existing main rail hub at Whittlesford Parkway and the Wellcome Genome Campus, before continuing over the A11 into NUGC and Chesterford Research Park.

ii. Improve the existing “last-mile” connectivity from the transit system to Whittlesford Parkway Station.

iii. To respond to additional job growth opportunities with potential to come forward on land opposite the Wellcome Genome Campus by bringing the transit system within walking and cycling distance of these opportunity areas.

5.4.3 Table 5.3 provides a review of the contribution of this option to the key objectives of the Garden Communities in terms of economic, environmental and social factors. The Table is not exhaustive but provides an overview of some of the important aspects for consideration in taking forward the option for further feasibility assessment.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic</td>
<td>Brings mass transit close to Whittlesford Rail Station, offering interchange opportunities from outside the districts to the major research parks and NUGC.</td>
</tr>
<tr>
<td></td>
<td>Unlocks prospective growth areas north of the existing Wellcome Genome Campus</td>
</tr>
<tr>
<td>Physical / Environmental</td>
<td>Unlocking recreational routes and green corridors into the wider countryside.</td>
</tr>
<tr>
<td></td>
<td>Improved accessibility between rail and the research parks for a wider catchment.</td>
</tr>
<tr>
<td>Social</td>
<td>Comprehensive linkage of research parks and housing growth areas helping ease through-commuting in this part of the district.</td>
</tr>
<tr>
<td></td>
<td>Improved connectivity to local rail hubs and wider area</td>
</tr>
<tr>
<td></td>
<td>Promotes healthier travel for short journeys across a wider catchment.</td>
</tr>
</tbody>
</table>

5.4.4 Again, subsequent stages of the feasibility work will need to explore in further detail the potential constraints associated with each option, including but not limited to land acquisition, physical and environmental factors such as drainage, structures etc as well as relative capital and maintenance costs associated with the extension of the CAM system or similar technology.
5.5 Conclusions

5.5.1 This section illustrates three potential options for improving connectivity in the area, the first through improvements to last-mile connectivity into the existing CAM network and options two and three an extension to the existing mass transit network into the area, all of which respond to the identified generators of travel demand, improving connectivity within the parks as well as cross-boundary.

5.5.2 Although the three network types are presented as three discrete options above, the networks also have an element of overlap and essentially can be phased as appropriate. There are several different technologies that could essentially run on this network which are set out in brief in the following section, however the focus of the network is essentially on the extension of the CAM and improving connectivity to the key hubs using whichever technologies are considered most appropriate.
6 Overview of Technology and Future Proofing

6.1 Introduction

6.1.1 The types of vehicles providing transit systems varies greatly across the world, from mass rapid bus based systems through to fully segregated fixed path autonomous vehicles like those serving Heathrow Terminal 5.

6.1.2 As already highlighted, this study focuses on establishing the network options for a transit scheme based on growing travel demand rather than a detailed review of the benefits and constraints of specific technologies. As the networks have been developed with extension to the CAM at the centre, Section 6.2 provides a brief overview of the CAM based technology and the potential “pod” technologies which could serve the function of taking people the “last mile”. Section 6.3 sets out some of the key considerations for future feasibility work which could progress subject to support from MHCLG and the Garden Community Prospectus.

6.2 CAM and “Last Mile” Connectivity

6.2.1 As set out above, it is proposed that the CAM would operate on segregated infrastructure connecting the Cambridge biomedical campus with a new park and ride facility at Granta Park.

6.2.2 It is proposed that CAM vehicles would be high-quality, offering a level of ride quality, and would be zero-emission, powered by electric batteries recharged overnight and at route termini throughout the day without a need for overhead wires. The CAM would utilise bespoke rubber-tyred articulated vehicles, and have maximum speeds of 80 – 90km/h and a capacity of 100 – 250 people. An illustrative vehicle is shown below:

CAM: The vision

Image from Steer Davies Gleave Report

6.2.3 It is proposed that vehicles would have the ability to be operated autonomously, without a driver, using guidance technologies. Platooning technology, where a group of vehicles form a ‘chain’ and communicate wirelessly using “V2V” communications, could also be adopted when

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Opportunities for Enhanced Sustainable Transit Systems in the North of Uttlesford

technology allows, increasing capacity and fleet optimisation and reducing energy consumption.

6.2.4 It is the intention also that the CAM would be fully integrated with other public transport and active modes for first and last mile journeys. These are the journeys assumed to take place on the sustainable corridors identified in Section 5. For these journeys, a type of low speed autonomous transit system could be used (L-SATs) examples of which are shown below and extracted from a recent feasibility study into autonomous vehicles on the Cambridge Guided Busway⁶

⁶ A Feasibility Study to Explore the Potential for Running Autonomous Vehicle Trials in Cambridge utilising the unique aspects of the Guided Busway – Author Unknown.
6.3 Future Considerations for Mass Transit Infrastructure

6.3.1 In a world where technologies are continuously evolving, it will be important to ensure any transit system infrastructure is suitably future-proofed for use by a range of vehicles. As with any cutting-edge scheme there are relevant considerations which would need to be explored further as part of any feasibility work and to learn from others.

6.3.2 Some of these considerations which would form part of further feasibility assessment include:

- **Technology Consideration**: Reviewing to what extent existing technologies have been “tried and tested”. Identifying and understanding the risks with different technologies and the flexibility and adaptability of these technologies to allow a transit system to be able to respond effectively to a changing world.

- **Physical / Environmental Considerations**: Understanding the physical requirements for infrastructure to support different transit technologies and how this would look for a transit system in the research parks and NUGC. How could environmental impacts be reduced and how have schemes overcome physical or environmental constraints in the past.

- **Commercial Considerations**: Understanding what commercial models would be available for transit in the area and which is likely to be the most suitable in the local context. Would there be a need for a specific supplier to be brought on board with revenue through fares and advertising, or could partnerships be explored with the local public transport provider and local councils.

- **Programme and Cost Consideration**: Exploring the potential capital costs and operating costs associated with different systems, what funding sources could be identified to support the scheme and how phasing and overall delivery could be effectively managed through a scheme programme.

- **Legislative / Management Considerations**: Are there any legislative implications for the technologies, e.g. autonomous technologies. How might a scheme be implemented and managed in this context.

- **Social Considerations**: What studies have been undertaken to explore the inclusivity of different transit technologies and which options perform the best? Are there any examples of any unintended social consequences from implementation of transit systems
that should be considered further? How will a system be made inclusive and accessible to all?

6.4 Conclusions

6.4.1 Transit system vehicle technologies are developing quickly and there is significant investment in developing these technologies further (particularly autonomous vehicles) from Central Government. The Whittlesford Parkway Masterplan exercise and potential subsequent investment provides further impetus for an integrated sustainable transit system in this locality.

6.4.2 There is an excellent opportunity to work with these emerging technologies in a location which has its own strong focus on science and research. The campus-based layout of the research parks present chances to explore these technologies further, connecting the area together, instead of developing in isolation of one another.

6.4.3 Funding is sought from the Garden Communities Prospectus to explore these opportunities further through more detailed feasibility work, unlocking the potential that this area offers for a new transport system offering potential for transformational change in sustainable travel patterns, and with cross-boundary benefits that provide a platform for the continued delivery of jobs and housing in this important area beyond the Local Plan period to 2033.
7 Summary & Next Steps

7.1 Summary

7.1.1 This report has sought to demonstrate that the locational and economic circumstances that the NUGC finds itself within are exemplar in terms of the justification for further exploration into the ability to serve the site and the north of Uttlesford District by a sustainable transit system. The merits of the site are considered as follows:

a. A large green field site where the provision of all necessary on-site infrastructure is unconstrained by any existing built form.

b. The site is being promoted locally by UDC through the Local Plan process and Grosvenor as a long-term master developer with invested long-term contribution to the future success of the place and community.

c. The site is surrounded by some of the UK’s most important and cutting-edge industries where poor infrastructure and lack of affordable housing locally threaten to undermine their success and risk them being lost to overseas markets.

d. Significant investment in similar systems is already being made close to the site meaning that the expansion of such a network or system would be cost effective and efficient.

e. The more balanced tidality of the system with passenger flows into Cambridge and out to the Research Parks and employment areas in both South Cambridgeshire and Uttlesford Districts will assist any future business case justification.

f. Helping to address significant growth pressures resulting from housing and employment growth.

g. There is an opportunity for the site to play a role as a catalyst for wider sustainable transport provision across the local area.

7.1.2 It has been confirmed that implementation of these proposed sustainable transit systems are not necessary to deliver the NUGC allocation for 5,000 new homes, in light of the evidence already provided by WYG as part of the Local Plan evidence base and PBA as part of Grosvenor’s representations. However as an ambitious local authority, Uttlesford District Council supports continued exploration of the opportunities that could further enhance sustainable transport connections in the wider area.

7.2 Next Steps

7.2.1 With further technical and funding support, the high-level proposals set out in this report can be further developed to ensure that an appropriate technical evidence base is prepared to support the feasibility of sustainable transit systems in this location. This evidence base would then subsequently inform a Strategic Business Case to define the preferred proposals and which would allow further integration and alignment with Cambridge South East work that is underway.

7.2.2 We consider this to be a unique opportunity to link the districts of Cambridge City, South Cambridgeshire and Uttlesford delivering transformational change in travel behaviour through the delivery of sustainable public transport which would help to meet the criteria of the MHCLG Garden Communities Prospectus.