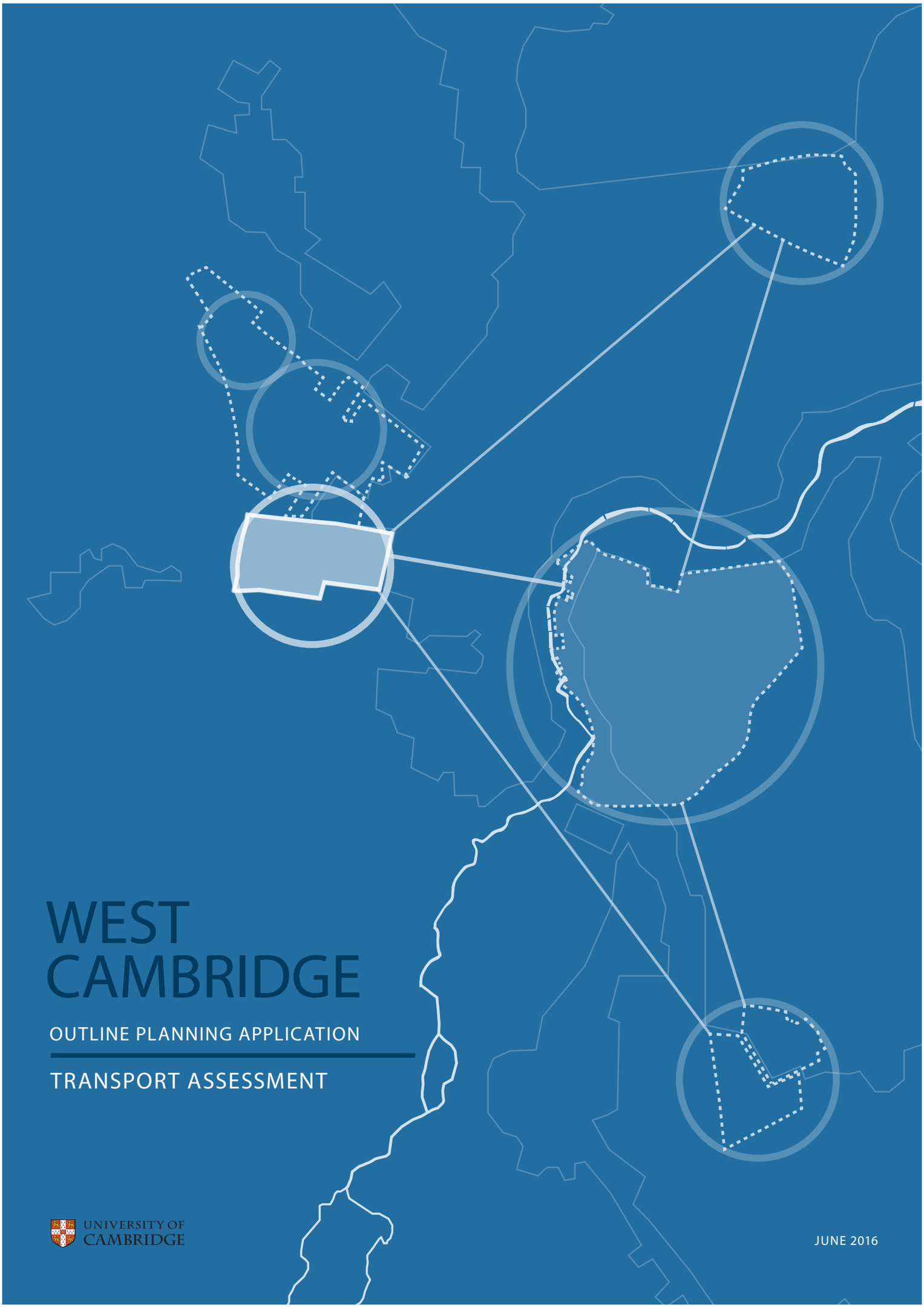

WEST CAMBRIDGE

OUTLINE PLANNING APPLICATION

TRANSPORT ASSESSMENT

UNIVERSITY OF CAMBRIDGE

JUNE 2016

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Executive Summary

West Cambridge Development proposals

1. This application is submitted for outline planning permission relating to the intensification of development of an extant site at West Cambridge for academic and commercial research, and various associated facilities.

2. The promoter of the Development, the University of Cambridge, is one of the world's leading universities. It is renowned for the excellence of its teaching and research, and it makes a significant contribution to the prosperity of the city of Cambridge and the UK economy. To maintain its reputation as a world leader, the University must continue to develop and grow. The University wishes to support the phenomenal success of the Cambridge area for fostering high technology research and development by ensuring future opportunities may come to fruition within Cambridge.

3. An existing masterplan for West Cambridge that was granted an approval in 1999 - subsequently reviewed in 2004 - forms the basis of the current development on the Site. Together with the pre-existing development on the Site, the 1999 masterplan envisaged just under 275,000m^2 of development, of academic, research institute and commercial research, as well as ancillary use shared facilities, sports, and residential uses.

4. Whilst the academic and residential components of this extant consent have been delivered to the anticipated levels, the completed commercial research and shared facilities components are well below the envisaged 1999 masterplan quanta.

5. The Cambridge Local Plan 2014: Proposed Submission Policy 18 promotes the densification of the existing West Cambridge through a revised masterplan subject to a number of conditions. It is within this context that the University of Cambridge is producing a new masterplan for the Site which significantly increases the amount of development to approximately 500,280m^2.

6. The University already has a proud reputation throughout the City for promoting its travel demand management strategy, and has always been proactive in delivering improvements to it – indeed the University was founding member of the Travel for Work Partnership established in co-operation with the County Council. This philosophy will be continued at West Cambridge, which will have different travel characteristics to similar research development in the United Kingdom, or indeed to similar developments throughout Cambridge, as a result of the following:

   - the strong travel demand management strategy being promoted;
   - the extensive non-car mode infrastructure proposed as mitigation;
   - all on-site car parking being subjected to the University's motor proctorial control and management; and
   - the land uses within the Development having car parking provision lower than the levels identified in the Cambridge Local Plan for such facilities.

West Cambridge and transport policy

7. The Development accords well with national transport policy and guidance to deliver sustainable development:

i) its sustainable location within Cambridge, and the incorporation of employment well located adjacent to residential land-uses reducing the need to travel - supporting the stated aspirations and objectives of paragraph 34 of the National Planning Policy Framework; and

ii) by promoting ways to reduce the traffic impact of this development and the University's other activities within Cambridge, and by controlling traffic generation, the Development supports the policy of the Department for Transport's Circular 02/2013.

8. The development also accords with important local transport and planning policy requirements:

i) of Policy 18 of the Cambridge Local Plan - by including a comprehensive transport strategy for the site, incorporating a sustainable transport plan to minimise reliance on private cars, as well as enhancing links for walking, cycling and public transport (including access for all) to the city centre, railway station(s), other principal educational and employment sites, and other key locations within the city to support sustainable development;

ii) by improving the local footpath and cycleway network as an integral part of a wider transport system – thus improving access to the surrounding countryside – according with the Cambridgeshire Rights of Way Improvement Plan; and

iii) of the measures identified within the Cambridge Long-Term Transport Strategy, the public transport strategy would deliver enhanced public transport services.

Proposed Assessment Strategy for West Cambridge

9. West Cambridge is being brought forward within the context of wide-reaching planning uncertainty, including:

i) the Cambridge Local Plan still being the subject of an Inquiry;

ii) clarity upon the form and programme for the A14 Huntingdon – Cambridge Improvement Scheme following the publication of the Secretary of State's Decision in May 2016;

iii) the deliberations and a decision surrounding the Greater Cambridge City Deal and Long Term Transport Strategies; and

iv) Highways England's need to consider measures along the M11.

These would have a significant and substantial effect upon the strategic movements of vehicles across the region, and influence the future access and movement strategy of West Cambridge – particularly in the mid- to late phases of the development.

10. As the outline planning application will be submitted prior to the detailed definition of these measures, as discussed with the Joint Authorities (Cambridge City Council – the planning authority, Cambridgeshire County Council – the local highway authority, and Highways England – the strategic highway authority), an Adaptive Phased Approach has been adopted, incorporating:

i) a graduated approach – the assessment process reflecting current transport planning policy where travel demand management measures are introduced first, followed by any necessary highway infrastructure measures to mitigate the residual traffic impact; as well as

ii) an adaptive approach – where, to maintain future flexibility, the proposed mitigation for later phases responds to the quanta of development within the individual phase proposals, the timescales for the delivery, changes in future travel behaviour patterns, emerging transport policy, and the current uncertainty relating to the area-wide transport enhancement proposals delivered by others.

11. As such, this Transport Assessment provides a detailed assessment of the trip generation of an indicative first phase of development only, relating to the 2021 scenario, and the associated mitigation strategy. The vehicular trip generation from West Cambridge is compared against that arising from the Extant Consent for this site, and shown within this Transport Assessment to be lower.

12. Further information relating to the traffic impact, highway capacity assessment and mitigation relating to later phases of West Cambridge (i.e., for 2021 onwards) will be provided subsequently in the context of further clarity being reached.

13. The development proposals and required transport mitigation identified in this Transport Assessment are independent of the emerging City Deal proposals, and will adequately mitigate the transport impact of the development. As such, the West Cambridge outline planning application does not rely on the City Deal proposals for mitigation. If the City Deal measures do come forward and supersede any of the mitigation proposed by the University, it is expected that relevant agreed levels of contribution for specific mitigation identified herein could be reallocated (with the University and County's agreement) to support these City Deal measures.

Transport Strategy for West Cambridge

14. The overall transport strategy for the Development responds to a number of important national regional and local objectives, which may be summarised as follows:

i) providing development components, development layout and disposition of uses designed from the outset to be inherently sustainable, pedestrian and cyclist friendly, being based upon the provision of an integrated transport system as well as minimising the distance to travel overall;

ii) encouraging the use of sustainable forms of transport such as walking, cycling, and public transport, thus reducing the dependency on the motor vehicle;

iii) minimising the vehicular traffic impact of the development;

iv) assisting in reducing the number and severity of personal injury collisions on the local roads; and

v) implementing a Travel Plan / Travel Demand Management strategy for the development.

Assessment Methodology

15. Initial assessment of the transport impact of West Cambridge was undertaken using Cambridgeshire County Council's land use and transport model, the Cambridge Sub Regional Model (CSRM). Following a review of the model results with the Joint Highway Authorities, it was concluded that the CSRM was not the most appropriate tool in which to assess West Cambridge traffic impact as being an area-wide strategic transport model, it was of insufficient sensitivity to assess impact across the local network accurately.

16. Within the context of an assessment of an Initial Phase of development in 2021 with relatively small development impact, it was agreed that a more local approach to the assessment of impact was appropriate. A methodology was therefore agreed with the Joint Authorities, based upon Peter Brett Associates' first-principles modelling approach.

Assessment of traffic impact from West Cambridge

17. The results from the modelling show:

    i) the West Cambridge vehicle trip generation reported in the original 1997 application - upon which the highway mitigation strategy was derived - is 12% higher than the equivalent Do Minimum assessment derived from the Peter Brett Associates analysis; and

    ii) the reduction in car parking provision within the Do Something Initial Phase of Development proposals results in a reduced trip generation from West Cambridge.

18. As such, when compared to the 2015 Base flows, the percentage increases in link flows for the 2021 Do Something Development will be less than for the 2021 Do Minimum scenario.

19. The traffic impact assessment concluded that:

    i) the differences between the 2015 Base Year and 2021 Do Minimum scenarios (i.e., With the Consented Development only and none of the proposed West Cambridge densification) indicate that the network will experience significant increases in peak hour flows;

    ii) the differences between the 2021 Do Minimum and 2021 Do Something scenarios (i.e., the impact of the densification of West Cambridge) would be minimal. There are only a limited number of links that experience flow increases across the local highway, mainly due to the proposed changes to the Development access strategy;

    iii) the junction capacity assessment identifies that in 2021 with the Proposed Development, the local junctions would operate within capacity.

Transport Mitigation Measures

20. As there may be a degree of variability in future projections (which can be attributed to a number of factors including fuel prices, Government policy etc), a pragmatic management strategy has been formulated for West Cambridge which is designed to be resilient to change. This strategy would:

    i) control vehicular trips across the network;

    ii) where necessary, provide measures to preserve and / or enhance conditions on particular links;

    iii) manage Development impact on some sensitive strategic links; and

    iv) improve pedestrian and cyclist movement across the network.

Conclusions

21. Overall, the Transport Assessment concludes that:

    i) the Development accords well with national and local transport policy;

    ii) the development also accords with important local transport and planning policy requirements:

iii) as the outline planning application will be submitted in the context of uncertainty relating to local development and infrastructure mitigation, that the adopted Adaptive Phased Approach provides a robust and reasonable manner of assessment, in a flexible manner;

iv) that a detailed assessment of the vehicular trip generation of an indicative first phase of development shows that when compared to the traffic impact of the consented – and mitigated – West Cambridge Development, that the impact of the Development proposals is minimal;

v) as there may be a degree of variability in future projections (which can be attributed to a number of factors including fuel prices, Government policy etc), the traffic management strategy formulated for West Cambridge is pragmatic, and is designed to be resilient to change;

vi) further assessments of Development impact beyond the Initial Phase will be provided at later date, and will be supported by additional assessments of the future emerging conditions on the network. Further mitigation strategies will be derived and agreed for these phases;

vii) the overall transport strategy for the Development responds to a number of important national regional and local objectives; and as such

viii) there are no transport-based reasons why outline planning consent should not be granted for the West Cambridge Development.

1 Introduction

1.1 Background

1.1.1 Peter Brett Associates LLP (referred to from here as Peter Brett Associates or PBA) has been commissioned by The University of Cambridge to prepare a Transport Assessment to accompany an application for planning permission relating to the intensification of development of an extant site at West Cambridge for academic and commercial research, and various associated facilities.

1.1.2 The promoter of the Development, the University of Cambridge, is one of the world's leading universities. It is renowned for the excellence of its teaching and research, and it makes a significant contribution to the prosperity of the city of Cambridge and the UK economy.

1.1.3 To maintain its reputation as a world leader, the University must continue to develop and grow. The University wishes to support the phenomenal success of the Cambridge area for fostering high technology research and development by ensuring future opportunities may come to fruition within Cambridge.

1.2 West Cambridge Development

1.2.1 An existing masterplan for West Cambridge that was granted an approval in 1999 (planning application reference C/97/0961/OP) - subsequently reviewed in 2004 - forms the basis of the current development on the Site. Together with the pre-existing development on the Site, the 1999 masterplan envisaged just under 275,000m^2 of development, approximately 47% of which would be academic, 15% research institute and 22% commercial research. The remaining 16% would consist of shared facilities, sports, and residential uses. The academic and residential components have been delivered to the anticipated levels, but the completed commercial research and shared facilities components are well below the envisaged 1999 masterplan quanta.

1.2.2 The Cambridge Local Plan 2014: Proposed Submission Policy 18 promotes the densification of the West Cambridge through a revised masterplan subject to a number of conditions. It is within this context that the University of Cambridge is producing a new masterplan for the Site which significantly increases the amount of development to approximately 500,280m^2.

1.2.3 The University already has a proud reputation throughout the City for promoting its travel demand management strategy, and has always been proactive in delivering improvements to it – indeed the University was founding member of the Travel for Work Partnership (now called Travel for Cambridgeshire) established in co-operation with the County Council. This philosophy will be continued at West Cambridge, which will have different travel characteristics to similar development in the United Kingdom, or indeed to similar developments throughout Cambridge as a result of the following:

- car parking being subjected to the University's motor proctorial control and management;
- the predominant academic research land uses within the Development having car parking provision lower than the levels identified in the Cambridge Local Plan for research facilities;
- the University-related commercial research facilities - with the nearby residential accommodation provided in North West Cambridge - demonstrably having far lower car trip generation rates than equivalent commercial science park facilities.

1.3 Surrounding Transport Context – and the Adaptive Phased Approach

1.3.1 The Transport Assessment addresses the transport–related issues of West Cambridge set within the context of the local planning and transport policy for the local Cambridgeshire area.

1.3.2 West Cambridge is being brought forward within the context of some uncertainty, including:

i) the Cambridge Local Plan still being the subject of an Inquiry;

ii) the emerging form and programme for the A14 Huntingdon – Cambridge Improvement Scheme following the publication of the Secretary of State's Decision in May 2016;

iii) the on-going deliberations surrounding the Greater Cambridge City Deal strategy; and

iv) Highways England's need to consider measures along the M11.

1.3.3 These would have a significant and substantial effect upon the strategic movements of vehicles across the region, and influence the future access and movement strategy of West Cambridge – particularly in the mid- to late phases of the development.

1.3.4 As the outline planning application will be submitted prior to the detailed definition of these measures, as discussed with the Joint Authorities (Cambridge City Council – the planning authority, Cambridgeshire County Council – the local highway authority, and Highways England – the strategic highway authority), the Adaptive Phased Approach has been adopted:

i) this Transport Assessment provides a detailed assessment of the vehicular trip generation of an indicative first phase of development only, relating to the 2021 scenario;

ii) this vehicular trip generation from West Cambridge is compared against that arising from the Extant Consent for this site;

iii) a detailed mitigation strategy is considered to respond to any further impact arising from the indicative first phase of development;

iv) whilst the supporting traffic flow information and potential effects reported in the Environmental Statement Transport Chapter for the 2031 Full Development assessment is contained within this Transport Assessment, an indicative mitigation strategy for the later phases of development will be considered;

v) an Adaptive Phased Approach will be adopted relating to the provision of measures to allow the mitigation strategy to respond to the quanta of development within each subsequent individual phase proposals, the timescales for delivery, changes in future travel behaviour patterns, emerging transport policy, and the current uncertainty identified above relating to the wider transport and planning proposals;

vi) as such, further information relating to traffic impact, highway capacity assessment and mitigation will be provided subsequently relating to later phases of West Cambridge in the context of further clarity being provided.

Further details are provided later in the Transport Assessment.

1.4 Summary of the Transport Assessment

1.4.1 The Transport Assessment addresses the transport – related issues of the Development set within the context of the local planning and transport policy for Cambridge.

1.4.2 The Transport Assessment also identifies a transport strategy and a travel demand strategy for the Development which is designed to:

i) accord with the wider transport strategy for Cambridge;

ii) "manage down" the number of trips made by private car; and

iii) increase the capacity of the existing highway network where necessary.

1.5 Structure of the Transport Assessment

1.5.1 The structure of the Transport Assessment has been scoped with the Joint Authorities in 2015 and 2016. It considers national, regional and local planning and transport policy guidance as it relates to the development, reviews existing travel patterns in the area, and sets out mode-specific strategies and targets, aimed at promoting journeys to and from the Site on foot, by bicycle and public transport. These will be further supported by measures set out in the Framework Travel Plan which has also been submitted to accompany the application for planning permission. Both documents specifically address the following in accordance with the Scoping agreed with the key stakeholders in 2015 and 2016 – this reflects the now-archived - albeit not replaced - Department for Transport's 'Guidance on Transport Assessment' document (dated 2007):

- reducing the need to travel, especially by car;
- sustainable accessibility;
- dealing with residual vehicular trips; and
- mitigation measures for all modes of transport.

1.5.2 Junction and link capacity assessments have been undertaken for the highway network in the vicinity of the proposed development, to enable an assessment of potential impacts of trips generated by the Development on the surrounding local and trunk road network.

1.5.3 The report concludes that the Development is well-located for academic and commercial research development in accordance with national, regional and local policy. The transport strategy defined for the proposed development is set firmly within the context of the excellent location and accessibility characteristics of the Site, based on:

i) the local residential offer provided at the emerging North West Cambridge for both key worker and private accommodation - reducing the both distance travelled by the University workers, and the use of private car where non-car modes of travel can be adopted;

ii) maximising the opportunity for non-car travel, particularly by delivering an excellent public transport system; and

iii) delivering strong pedestrian and cycling connectivity with Cambridge.

1.5.4 Overall, therefore, this Transport Assessment identifies a co-ordinated, integrated and sustainable transport strategy for West Cambridge within which development can proceed, within the context of the wider transport and development strategy for the whole of Cambridge.

1.5.5 The scope of this Transport Assessment has been agreed with the highway authorities. It contains five sections split into five parts, as follows:

Part 1 - Background

Section 2 - Background and Development Proposals *summarises the rationale and policy background supporting the Development, and provides details of the development proposals;*

Section 3 - Existing Conditions *summarises the transport network and conditions surrounding the Development for all modes of travel;*

Section 4 - Summary of Policy Review *lists the existing National and Local policy, guidance and emerging strategies included in this review, and provides a summary of how the Development accords with this policy;*

Part 2 - Development Access and Movement Details

Section 5 - Access and Movement Strategy *reviews the overall accessibility of the Site for pedestrians, cyclists, public transport users, and cars – then sets out the accessibility strategies for each mode to enhance connectivity and accessibility both on- and off-site to encourage local journeys by more sustainable modes of travel;*

Section 6 – Pedestrian and Cycle Access Strategy *considers the Policy background, Travel Demand Management measures, the On-site infrastructure strategy and the Off-site infrastructure strategy with respect to Pedestrian and Cycle movement;*

Section 7 - Public Transport Strategy *considers the Policy background, Route Identification and Selection, Strategy Principles, Scenario Detail, On-site infrastructure, and Information and Incentives with respect to bus movement;*

Section 8 – Car Parking Provision, Vehicular Access and Site Layout *considers Parking Policy background, the Local Plan car and cycle parking standards, and Site Layout and Vehicular Access issues and proposals;*

Section 9 - Travel Demand Management Strategy *summarises how vehicle trips from the development will be "managed" down;*

Section 10 - Construction Access Strategy *provides greater detail of the Construction Management Strategy, and the Construction Environmental Management Plan;*

Part 3 - Future Performance of the network With and Without the Development

Section 11- Construction Traffic *assesses the potential Construction traffic generation from the development, and potential effects on the surrounding network;*

Section 12 – Summary of the Supporting Modelling work *reports the transport modelling, and the options tested;*

Section 13 – Development Trip Generation *reports the predicted vehicle trip generation, and compares this to the Consented Development quanta;*

Section 14 – 2021 Initial Phase – Trip Impact Analysis *summarises the link flow impacts as a consequence of background growth due to the local consented development, as well as the Development proposals, and reports the junction capacity assessment;*

Part 4 - Additional Management Measures

Section 15 - Further Travel Management Measures *considers the proposed measures to manage any transport effects of the Development;*

Part 5 - Conclusions

Section 16 – Conclusions *completes the Transport Assessment.*

PART 1 BACKGROUND

Part 1 of the Transport Assessment contains the following sections:

Section 2 - Background and Development Proposals

Section 3 - Existing Conditions

Section 4 - Summary of Policy Review

2 Background and Development Proposals

2.1 Introduction

2.1.1 This section summarises the site location and existing land uses on-site. Details of the Development proposals are also outlined.

2.2 Site Location

2.2.1 The Development is located to the west of the existing conurbation of Cambridge, as shown in Figures 2.1 and 2.2, and remains within the site boundary of the extant 1999 West Cambridge Development masterplan approval.

2.2.2 The centre of the Site is approximately 2km west of the City Centre of Cambridge – measured from JJ Thomson Avenue to the junction of Sidney Street and St Andrews Street. The strategic location of the Development is shown in Figure 2.1.

2.2.3 The Site is located immediately to the east of the section of the M11 motorway between Junctions 12 and 13. The site is bordered to the north by Madingley Road (the A1307 - which routes between M11 Junction 13 and the centre of Cambridge) and to the east by Clerk Maxwell Road. Immediately to the south, the Coton Path is aligned along the southern boundary – beyond that is agricultural land.

2.2.4 A 292 space Park-and-Cycle car park is located in the north-eastern corner of the Site. This facility will be removed as part of the proposals, the spaces provided elsewhere within the Development.

2.2.5 The Site lies within the administrative area of Cambridge City Council.

2.3 Extant Development Background

Development Quanta

2.3.1 West Cambridge is currently a mixed-use development with academic and commercial research uses, with associated facilities.

2.3.2 Figure 2.1 highlights the site plan in the context of the surrounding area. It is bordered to the north by Madingley Road, the west by the M11 motorway, the east by the existing residential dwellings along Clerk Maxwell Road and a recreational ground, and to the south by farmland.

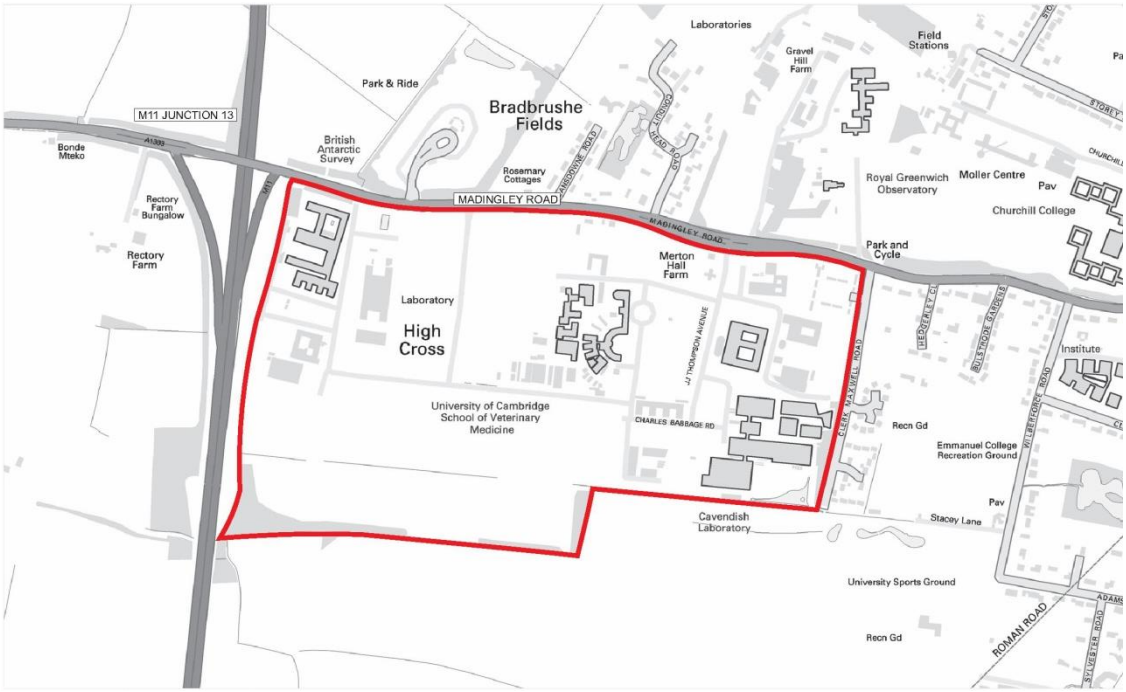


Figure 2.1: Site Location

2.3.3 Approval to the masterplan was originally granted in 1999 (planning application reference C/97/0961/OP), and subsequently reviewed in 2004. The Development has subsequently progressed with the elements of the original consent being delivered at different rates. The consented and delivered development mix is shown in Table 2.1.

Table 2.1: Development Area Summary

Land-Use (GFA)	Development pre-1997	Outline Consent 1999	Development Completion	Delivery completion (%)	Remaining Development
Academic Research (m^2)	44,000	73,000	88,257	75.4	**28,743**
Research Institute (m^2)	13,500	24,000	15,402	41.0	**22,098**
Commercial Research (m^2)	13,972	41,000	24,984	45.4	**29,988**
Shared Facilities (m^2)	0	18,000	1,671	9.3	**16,329**
Sports (m^2)	0	10,120	6,060	59.9	**4,060**
Residential (m^2)	680	10,000	10,680	100.0	**0**
Total (m^2)	**72,152**	**176,120**	**147,054**	**59.2**	**101,218**
Car Parking	**3,150 spaces**				

2.3.4 In addition to the formal spaces, further uncontrolled car parking is available locally on-road – including along the Western Access Road (currently being subjected to car parking prohibition), and off-site along Clerk Maxwell Road, where approximately 85 - 90 car parking spaces are provided.

2.3.5 The car parking space provision consented in 1999 reflected the prevailing earlier car-dominated access and movement philosophy, and is in excess of what would be considered appropriate now.

Transport Assessment Work submitted to Support the Extant Consent

2.3.6 Hannah, Reed and Associates (referred to as "Hannah Reed" from here) prepared the Transportation Study to support the University of Cambridge's original 1997 West Cambridge Development planning application. This was subsequently approved by the Joint Authorities – Cambridge City Council, the local planning authority, Cambridgeshire County Council, the local highway authority, and the strategic highway authority, the Highways Agency (now referred to as Highways England).

2.3.7 Hannah Reed derived the Development-generated AM Peak Hour vehicle movements incrementally informed by a series of data sources, and reporting the assessed movements accruing to the following aspects – these vehicle flows are shown figuratively on the Diagrams enclosed in Appendix 2.1:

i) Total University Staff Movements (1995) (Diagram TS 1);

ii) Re-distribution of University Staff vehicle movements following the relocation to West Cambridge (Diagram TS2);

iii) Additional vehicle movements related to University Staff Growth 1996 – 2025 (Diagram TS3);

iv) West Cambridge Research Park - Projected Vehicle Movements (Diagram TS4);

v) Total Additional Vehicle Movements 2025 (Whole University) (Diagram TS5); and

vi) Madingley Road Total Traffic Flows 2025 (Diagram TS7).

2.3.8 The vehicle flows assigning to the development accesses shown in Diagram TS7 would reflect those from the entire Consented development – including from the development consented in advance of the 1997 West Cambridge Development application, as well from that consented in 1999. Table 2.2 summarises the flows assessed as accruing to the consented West Cambridge Development, as were agreed with the Joint Authorities in 1999:

Table 2.2: 2025 Consented West Cambridge Development Vehicle Trip Generation

Access	AM Peak		
	Out	In	Two-way Total
High Cross	81	708	789
"Cavendish Complex" (i.e., JJ Thomson Avenue)	82	711	793
Clerk Maxwell Road	0	100	100
TOTAL VEHICLES	**163**	**1,519**	**1,682**

Source – Hannah Reed Diagram TS7

2.3.9 The above Consented trips are expressed as a trip rate per car parking space for each of the 3,150 spaces:

Table 2.3: Trip rate per car parking space

Access	AM Peak		
	Out	In	Two-way Total
Consented Trip Rate per Car Parking space	0.052	0.482	0.534

Notes: Vehicle trip rate pre space
Assuming the Consented trip generation within Table 2.2, and 3,150 car parking spaces

Section 106 Commitments

2.3.10 To mitigate the transport impacts of the West Cambridge Development, the University of Cambridge completed a Section 106 Agreement.

2.3.11 The series of measures and triggers identified within this Agreement are shown in Appendix 2.2.

2.3.12 The majority of the necessary highway mitigation measures to mitigate vehicular impact have been implemented. The relatively minor measures outstanding include:

i) a traffic signal enhancement of the Madingley Road / Northampton Street / Queen's Road Roundabout – was deferred at the specific request of Cambridgeshire County Council; and

ii) a second mitigation of the Madingley Road / JJ Thomson Avenue priority junction – installing a traffic signal enhancement.

2.3.13 Other physical mitigation measures remain outstanding for various reasons - including development triggers not having been reached, or other undelivered measures being linked to the requirement. Some of the undelivered measures were not implementable as they are outside of the University's land ownership and the relevant freeholders were not party to the original Section 106 agreement. Discussions have taken place with neighbouring landowners but commitment to delivery cannot be secured by the University at this time. Notwithstanding, the measures identified in Section 6 would deliver a similar facility responding to this requirement.

2.4 Development Vision

2.4.1 The University aspires to develop the Site into a high quality academic and research campus, and to review the existing masterplan to deliver a greater density of development to the same high levels of quality.

2.4.2 The University has a vision for the Site that aspires to provide a high quality urban environment that is well integrated to the city centre and surrounding suburbs, as well as emerging developments such as the North West Cambridge development. The vision comprises five themes which collectively provide the purpose of the Proposed Development, to:

1. optimise the amount of development on Site, supporting the City and Region as a world leader in research and development.

2. support the commercialisation of knowledge through entrepreneurship and collaboration with industry.

3. create and sustain a high quality place by transforming the physical and social environment for Site users and neighbours across the City.

4. deliver adaptable and efficient space to support viability and long term value creation.

5. deliver sustainable development, proactively investing in the quality of place and integration within the City.

2.5 Aims and Aspirations

2.5.1 As explained above, the University already has a proud reputation throughout the City for promoting its travel demand management strategy, and has always been proactive in delivering improvements to it. This philosophy will be continued at the Development, which will have significantly different travel characteristics to such typical developments elsewhere in the United Kingdom. This will be as a result of the following:

i) controlling parking on-site at the academic sites by using the University's motor Proctorial control;

ii) key workers and commercial research workers being able to live at the North West Cambridge Development in close proximity not only to their place of work but also requisite community and leisure facilities;

iii) each occupier appointing the Individual Travel Plan Coordinator role for all occupiers of the development;

iv) the University-related commercial research facilities, with nearby residential accommodation, demonstrably having far lower car trip generation rates than equivalent commercial science park facilities;

v) academic research land uses within the Development having limited car parking and a lower car-based trip generation than commercial research land uses.

2.5.2 An effective travel demand management strategy would form a fundamental part of minimising car impact on the surrounding highway network, and maximising sustainable modes of travel. At the heart of delivering this travel demand management strategy is this Framework Travel Plan and the subsequent Individual Travel Plans.

2.6 Development Proposals

2.6.1 An outline planning application, the subject of this Transport Assessment, is to be submitted in 2016 to support the further densification of development at the West Cambridge site, above that already approved under the 1999 outline consent. This is in accordance with the Proposed Submission document of the Cambridge Local Plan 2014.

2.6.2 The new application will seek permission for additional floorspace, comprising commercial research floorspace, along with Academic research providing a mix of teaching and research space.

2.6.3 The new proposals seek to densify the existing site beyond the previous outline consent, as highlighted within Policy 18: West Cambridge Area of Major Change, in the Proposed Submission document of the Cambridge Local Plan 2014.

2.6.4 The Proposed Development will achieve the Development Vision through a series of parameter plans and a broadly defined description. This will allow flexibility in the description of the development. This reflects a key aim of the Proposed Development, to build in flexibility into the planning consent, so that the University can respond to changes in academic and commercial demand over the next twenty years or so, without needing to revisit the outline planning permission.

2.6.5 The Proposed Development comprises five parameter plans as follows:

- Land use;
- Building zones;
- Building heights;
- Access and movement; and
- Open space and landscape.

2.6.6 The Access Parameter Plan is appended in Appendix 2.3

Full Development (2031)

2.6.7 The Development incorporates both additional D1 academic research, and B1 commercial research, among other land uses, selected to respond to the needs of the University, and to densify the use of the Development. The University is seeking the assessment as a worst case of the following quanta of each land-use for the development at West Cambridge specified in Table 2.4. This additional development increases the total floor area from 248,272m^2 to 500,280m^2.

Table 2.4: Total Existing and Proposed Full Development - Land Use Mix

Land-Use (GFA)	**(m^2)**
Academic Research (m^2)	**257,909**
Commercial Research and Research Institute (m^2)	**210,386**
Nursery (m^2)	**3,150**
Shop, Café Restaurant, Pub - A1-A5 (m^2)	**1,000**
Assembly and Leisure	**10,160**
Residential (m^2)	**10,000 (206 units)**
Ancillary Infrastructure (data centre, energy centre)	**7,675**
Total (m^2)	**500,280**
Car Parking (spaces)	**4,390**

2.6.8 The Proposed Development would be constructed in phases depending on market demand and would likely occur over a 15 year period. The assumed opening date for all construction to be complete and the Proposed Development to be fully built-out is 2031.

Initial Phase of Development (2021)

2.6.9 As an Initial Phase, the University is seeking agreement to following additional quanta of each land-use at West Cambridge specified in Table 2.5. When considered in the context of existing areas to be demolished, this approximately equates to a further 40,000m^2 of academic and commercial development to that already consented.

2.6.10 As part of this Initial Phase, the University is seeking consent to a total of 2,571 car parking spaces. This provision is 579 spaces lower than the 1999 Consented level of car parking spaces.

Table 2.5: Total Existing and Proposed Initial Phase of Development - Land Use Mix

Land-Use (GFA)	**(m^2)**
Academic Research (m^2)	168,259 (+ 66,000)
Commercial Research and Research Institute (m^2)	92,386 (+52,000)
Nursery (m^2)	1,900
Shop, Café Restaurant, Pub - A1-A5 (m^2)	350
Assembly and Leisure	6,060
Residential (m^2)	10,680
Ancillary Infrastructure (data centre, energy centre)	7,675 (+ 3,160)
Total (m^2)	287,310
Car Parking (spaces)	**2,571**

Commentary

2.6.11 The Development has been formulated to ensure future flexibility in delivering the transport strategy throughout the implementation process, and reflects the following key principles for access and movement:

i) good permeability and accessibility for non-motorised users, particularly pedestrians and cyclists;

ii) enhanced connectivity for pedestrians to surrounding existing areas, including to local recreational footpaths;

iii) excellent accessibility to public transport through the provision of bus routes through the Site;

iv) non-primary vehicular routes – the ability to design these as shared surface with speeds controlled to 20mph or less as set out in the “Manual for Streets” would be established with reference to the bus strategy; and

v) good access for academic and commercial research to bus routes and transport nodes to increase potential patronage.

2.6.12 The Transport Assessment includes further details of the Development proposals and transport implications.

2.7 Site Access

Vehicular Access

2.7.1 Vehicular access to the West Cambridge site is from Madingley Road. There are currently two main vehicular access points to the site:

- at JJ Thomson Avenue, by a ghost island priority junction; and
- at High Cross – the previous priority junction has been upgraded to a traffic light controlled junction as part of the North West Cambridge site infrastructure.

2.7.2 To the east of the site, a further priority junction is formed at Clerk Maxwell Road. Clerk Maxwell Road provides vehicle access to the existing 292 space Park and Cycle facility located to the north-east of the Site, and several pedestrian and cycle accesses to the site.

2.7.3 The existing JJ Thomson Avenue access would be upgraded to a traffic signal controlled junction with a controlled pedestrian and cyclist toucan crossing at a later stage of the West Cambridge Development in accordance with the Section 106 Agreement relating to the existing West Cambridge outline permission of 1999. Whilst the toucan crossing has been delivered, the full signalisation of this junction has been deferred awaiting the conclusions of this West Cambridge Masterplan Review.

2.7.4 As shown on Figure 2.3, there are four main roads on site:

- JJ Thomson Avenue;
- Charles Babbage Road;
- High Cross Road; and
- the Western Access Road.

2.7.5 These would all be retained and used as the principal means for movement to and across the Site. Additional secondary roads would be constructed to increase connectivity across the Site. All existing and new vehicle routes and accesses would also allow for pedestrian and cycle movements.

2.7.6 Vehicle access will be provided to the Development by a series of existing, enhanced and new vehicular access points off Madingley Road as shown on Figure 2.3. These will be delivered through the duration of the Development, to a programme to be determined. These access points are:

i) the existing traffic signal controlled High Cross junction - which would be subjected during Phase 1 to an enhancement to include a ban on the right turn into the site from Madingley Road, with these trips reassigned to JJ Thomson Avenue;

ii) the existing JJ Thomson Avenue priority junction – which could be subjected during later Post - Phase 1 phases to a traffic signal controlled upgrade;

iii) the existing Clerk Maxwell Road priority junction, which could be subject to a potential introduction of traffic signal control; and

iv) a new traffic signal controlled, restricted movement (right in / left out), access junction onto Madingley Road at the western end of the site, which would connect to the Western Access Road. This would be delivered during later - Post-Phase 1 - phases. This junction would intercept strategic traffic movements between the site and the west, including from the M11. This early interception would help to maintain conditions at other local junctions – such as High Cross.

2.7.7 In addition, a further existing priority junction between JJ Thomson Avenue and High Cross, currently closed, would provide limited movement service access-only to the occupiers immediately adjacent to Madingley Road.

Pedestrian and Cyclist Access

2.7.8 Pedestrian / cyclist access to the Development and the surrounding area will be by a series of connections to the local area:

i) from the existing traffic signal controlled Madingley Road / High Cross junction;

ii) from the existing toucan crossing at the Madingley Road / JJ Thomson Avenue priority junction;

iii) at a proposed toucan crossing at the Madingley Road / Clerk Maxwell Road junction;

iv) the existing access to the Vet School site from Madingley Road; and

v) by regular connections to the existing Coton path to the south – connecting to the west - across the M11 by the existing footbridge, providing a connection towards Coton and Madingley – and the east – to Clerk Maxwell Road, Wilberforce Road and towards Adams Road and the City;

vi) a second east-west pedestrian and cycle route would be formed, accessing from the existing entrance approximately halfway along Clerk Maxwell Road, continuing westwards across JJ Thomson Avenue and through a new open space corridor linking up with High Cross Road.

2.7.9 The Access is summarised on the Access Parameter Plan, contained in Appendix 2.3.

2.8 Surrounding Development

2.8.1 There are two other major consented developments in the vicinity of the Development which are planned to be implemented simultaneously. These are shown on Figure 2.2.

NIAB Site

2.8.2 The NIAB Site is an area located to the north-east of Huntingdon Road between Girton Road and Oxford Road, and is generally referred to by the name of the current occupant (the National Institute of Agricultural Botany).

2.8.3 Cambridge City Council granted outline planning permission for the first phase of development including an access road and 187 homes on the NIAB 'frontage land' adjoining Huntingdon Road in 2004, and construction commenced in 2010.

2.8.4 A further application was submitted for the area between Histon Road and Huntingdon Road for a further 1,593 homes, a new school, community facilities, local shops, roads, footpaths and cycleways. This application was considered by the Joint Development Control Committee and approved in July 2010.

2.8.5 Access to the NIAB Site would be gained from Huntingdon Road to the south-west, and from Histon Road to the east. The vehicular accesses to the NIAB site are via new signal controlled junctions to accommodate the forecast increase in demand onto the local highway network, whilst enabling priority for the proposed Guided Bus route and other bus services.

North West Cambridge Development

2.8.6 North West Cambridge Development is a mixed-use extension to Cambridge, covering an area of 150 hectares, also promoted by the University of Cambridge. It is bounded by the M11, Madingley Road and Huntingdon Road, and is located immediately opposite West Cambridge.

2.8.7 North West Cambridge is The University of Cambridge's response to the increasing need to provide affordable housing for both staff and graduates, and also the growing demand for more research facilities within Cambridge. The Development will consist of 1,500 University Key Worker homes, accommodation for 2,000 post-graduates, and the construction of 1,500 private dwellings. In addition to the planned residential development, North West Cambridge will also provide up to 100,000m^2 of academic / commercial research space, as well as general community and leisure facilities - including a hotel, primary school, and care home.

2.8.8 A resolution to grant Planning Permission was passed in August 2012, and formalised in February 2013 with the signing of a Section 106 agreement. Construction of Phase 1 commenced in August 2014, and is expected to continue through to 2017.

2.8.9 Vehicular access is provided at three locations: two are situated to the north of the site, to Huntingdon Road; the other access is to the south of the site via Madingley Road – forming the northern arm of the proposed Madingley Road / West Cambridge / High Cross Access. The Development will further provide new, quality, strategic cyclepath links aligned east-west and north-south through the Development, as well as new bus services to link to West Cambridge, the NIAB Development, and the proposed Cambridgeshire Science Park Rail station.

Other Strategic Developments

2.8.10 Discussions with the Highways England and Cambridgeshire County Council have identified the strategic residential developments that need to be considered as part of this assessment. The developments below have been consented, or are likely to be in the future. Prospective sites have not been included. These sites are summarised in Table 2.6, with further details contained in Appendix 2.4.

Table 2.6: Strategic Development - Residential

Development	Growth 2011 - 2031
Clay Farm and Showground	2,165
North West Cambridge (within SCDC area) – referred to above	*1,850*
North West Cambridge (within City Council area) – referred to above	*1,155*
NIAB Main – referred to above	*1,593*
Eastern Gateway, Soham	600
North Ely, Ely	3,000
Cambridge East	1,200
Northstowe Phase 2	1,945
Trumpington Meadows (Cambridge Southern Fringe)	1,171
Cambourne	499
Northstowe Phase 1	1,500
Cambourne West	1,200
Alconbury Weald	3,485
Eastern Expansion, St Neots	2,570
Bearscroft Farm	750
Total	**22,518**

2.8.11 These discussions have further identified other strategic employment developments. These sites are summarised in Table 2.7:

Table 2.7: Strategic Development – Employment (Jobs)

Development	Growth 2011 - 2031
Wider City Centre Area	10,785
Addenbrooke's	5,210
Northstowe	5,817
Cambourne	2,304
Granta Park	2,592
Babraham	831
West Cambridge and North West Cambridge (City Council area)	3,873
West Cambridge and North West Cambridge (SCDC area)	2,234
ARM / Capita Park (City)	396
Others (SCDC)	1,767
Total	**35,809**

2.8.12 Further details of each of the development quanta assessed within this Report are contained in Sections 12 onwards.

2.9 Area-Wide Travel Demand Management Strategy context

2.9.1 Developer-funded infrastructure throughout the Cambridge area will continue to complement existing and proposed walking, cycling and public transport facilities which, in addition to LTP-funded schemes, will help to make more complete networks.

2.9.2 The proposed Development is also considered within the context of a series of transport infrastructure schemes and travel demand management measures being promoted through this region. These are considered in greater detail below.

Long Term Transport Strategy

2.9.3 The Long Term Transport Strategy (LTTS) was consulted upon in 2014. It forms part of the Cambridgeshire Local Transport Plan, and identifies major infrastructure requirements needed to address the existing capacity constraints of Cambridgeshire's transport network, and the further infrastructure that is required to accommodate the transport demands associated with the planned growth.

2.9.4 The eight objectives of the Long Term Transport Strategy are:

- to ensure that the transport network supports sustainable growth and continued economic prosperity;
- to improve accessibility to employment and key services;
- to encourage sustainable alternatives to the private car, including rail, bus, guided bus, walking and cycling, car sharing and low emission vehicles;
- to encourage healthy and active travel, supporting improved well-being;
- to make the most efficient use of the transport network;
- to reduce the need to travel;
- to minimise the impact of transport on the environment; and
- to prioritise investment where it can have the greatest impact;

2.9.5 The LTTS proposals identified measures that are promoted within the City Deal - of interest local to West Cambridge:

- to provide direct, segregated, high-quality pedestrian / cycle links to the west of Cambridge potentially aligned alongside the bus route identified within the City Deal;
- a more comprehensive network of cycling and walking links to and from key destinations around the county from Cambridge;
- bus priority measures on the A1307, A428 and A1303 and proposals for additional park and ride capacity;
- the LTTS further supports the provision of additional capacity provided by the A14 Huntingdon – Cambridge, and identifies that capacity enhancements along the M11 should be considered – including enhanced junction capacity, and a Smart Motorway (hard shoulder running) scheme.

Greater Cambridge City Deal

2.9.6 The Greater Cambridge City Deal was promoted by Central Government, the local councils, businesses and the University of Cambridge, and aims to secure hundreds of millions of pounds of investment in the transport infrastructure, housing and skills needed to see future economic growth for the areas surrounding Cambridge City and South Cambridgeshire District Councils. The transport proposals are shown indicatively on the plan included in Appendix 2.5.

2.9.7 The delivery of the City Deal has been separated across 3 tranches. ‘Tranche 1’ will deliver transport improvements in the five years from April 2015, and aims to be completed by 2020. ‘Tranche 2’ and ‘Tranche 3’’ focus more on providing mitigation measures and long-term initiatives which will result from the increased pressure on the transport network. These are expected to be delivered after 2025.

2.9.8 Of direct relevance to West Cambridge - albeit the route around West Cambridge has not been confirmed yet:

i) a segregated orbital bus route will be delivered in the five years from April 2015. This segregated orbital bus route will follow between the employment in the north and north-west of the city, the new residential communities to the west of Cambridge, and the Addenbrooke's Biomedical Campus to the south, avoiding the congested city centre. This scheme will deliver significant capacity for public transport; and

ii) improvements to west to east movements along Madingley Road are proposed. This includes the provision of a new segregated busway between the west – via Madingley Mulch Roundabout – and the east – to Grange Road.

2.9.1 Associated with these new route proposals are further proposals that are currently being considered for travel demand management measures to assist changes in travel patterns away from the car. These include:

i) investment by bus operators in new routes and services, taking advantage of the proposed peak-time congestion points to remove traffic from key bus routes (see below);

ii) enhanced pedestrian and cyclist infrastructure improving links in, across and to Cambridge;

iii) peak time congestion control points to create a low-traffic zone for only buses, cyclists local taxis and emergency vehicles;

iv) a workplace parking levy, charging employers for the provision of commuter car parking spaces;

v) on-street car parking controls, introducing residents' parking zones to ensure workplace car parking is not displaced;

vi) Smart transport technology to assist travellers making smart travel choices – including 'digital way finding', real-time traffic alerts and intelligent traffic signals at junctions to provide priority for buses and cyclists;

vii) expand on the existing travel planning service to assist businesses, schools and individuals to adapt to the changing travel options; and

viii) improvements to public space, and by reducing congestion, improvements to air quality.

Cambridgeshire Guided Busway

2.9.2 The Cambridgeshire Guided Busway scheme running from Huntingdon to Cambridge, linking the strategic development areas at Longstanton / Oakington (Northstowe) is an important element in the sustainable growth strategy. Since the opening of this scheme in 2011, it has achieved its predicted passenger levels. This scheme has the ability to continue to assist further in reducing congestion by extracting City-destined car-borne trips from the network, and re-moding these trips to the Cambridgeshire Guided Busway - some of the future proposals concerning the busway involve extending the existing service to the new Cambridgeshire Science Park Rail station and further afield to Peterborough.

A14 Cambridge - Huntingdon Improvement Scheme

2.9.3 As an essential part of a strategy to accommodate the large numbers of vehicle movements associated with strategic development across the region, Highways England published their proposals for the A14 between Huntingdon and Cambridge. This planned upgrade will relieve congestion and help to connect communities along the A14 corridor. As shown on the summary plan in Appendix 2.6, this scheme consists of:

- widening a section of the A1 trunk road between Brampton and Alconbury;
- removing the road viaduct over the railway at Huntingdon;
- Huntingdon Town Centre Improvements;
- a new bypass to the south of Huntingdon;
- detrunking the A14 between Ellington and Swavesey;
- widening the carriageway on the A14 between Swavesey and Girton;
- a new local access road;
- improvements to the Cambridge Northern Bypass; and
- junction improvements.

2.9.4 These proposals were the subject of examination through the Development Consent Order process in 2015. The Secretary of State published a positive decision in May 2016. It is anticipated that construction would commence in 2017, and will be completed in 2021.

Other measures

2.9.5 Other schemes and measures being developed include:

i) extension of demand management measures in Cambridge; and

ii) the upgrade of the Felixstowe to Nuneaton via Ely rail line for freight connections to extract heavy goods vehicle movements from the highway network.

2.9.6 Further details are provided within the Policy Section (Section 4) of this Transport Assessment.

2.10 Pre-application Consultation and Scoping

2.10.1 Peter Brett Associates has worked in close co-operation with Cambridge City Council, Cambridgeshire County Council and Highways England through the Local Plan Inquiry process, and through the development of these proposals.

2.10.2 In addition to meeting the planning and highway authorities, the University, supported by Peter Brett Associates, has attended a series of meetings and presentations to various groups and organisations including:

i) the West and North West Cambridge Cycling Group;

ii) the West Cambridge Community Group; and

iii) various residents associations and groups.

2.10.3 Initial discussions have also been held with the Traffic Managers of both of the main local bus operators – Stagecoach Cambridge and Go Whippet, to discuss the potential public transport strategy for the Site, as set out in Section 7. These discussions further involved the County Council's Public Transport Engineers.

Scoping

2.10.4 As agreed with Highways England and Cambridgeshire County Council, this Transport Assessment considers the following aspects:

- Introduction
- Background and Development Proposals;
- Existing Conditions and Future Baseline Conditions;
- Summary of Policy Review;
- Development Access and Movement Strategy broken down into the following elements:
  - Access and Movement Strategy;
  - Pedestrian and Cycle Access Strategy;
  - Public Transport Strategy;
  - Site Layout, Vehicular Access and Parking Provision;
  - Travel Demand Management Strategy;
- Future Person Trip Rate, Distribution, Assignment and Mode Share
- Construction Access Strategy;
- Traffic and Junction Impact Analysis;
- Mitigation Strategy; and
- Conclusions.

2.10.5 In addition to Scoping, Transport Review Meetings have been and continue to be held with representatives from the County and City Councils and Highways England. These discussions have helped to inform the preparation of this document.

2.11 Assessment Methodology and Adaptive Phased Approach to Mitigation

2.11.1 The principles of the proposed strategy to address transport issues associated with West Cambridge have been discussed and agreed with the Joint Authorities. This is set out below, and is summarised as incorporating:

i) a graduated approach – the assessment process reflecting current transport planning policy where travel demand management measures are introduced first, followed by any necessary highway infrastructure measures to mitigate the residual traffic impact; as well as

ii) as an adaptive approach – where, to maintain future flexibility, the proposed mitigation for later phases responds to the quanta of development within the individual phase proposals, the timescales for the delivery, changes in future travel behaviour patterns,

emerging transport policy, and the current uncertainty relating to the area-wide transport enhancement proposals delivered by others.

2.11.2 An outline planning consent is being sought by the University to allow development to be implemented incrementally over a number of years, set within the context of the allocated status for this Site.

2.11.3 The transport strategy for West Cambridge is therefore being brought forward against a background of uncertainty in relation to the area-wide transport enhancement proposals. Further assessment work will be provided to support later phases of the Proposed Development once further details of these transport improvement proposals have been confirmed.

2.11.4 As the outline planning application will be submitted prior to the definition of these wider improvements schemes – e.g., for the A14 , for the M11, and for City Deal - as discussed and agreed with the Joint Authorities (Cambridge City Council - the planning authority, Cambridgeshire County Council - the highway authority, and Highways England):

i) this Transport Assessment provides a detailed assessment of the impact of an indicative first phase of development only, relating to the 2021 scenario;

ii) a detailed mitigation strategy is developed to respond to this indicative first phase of development in the context of the previously consented development;

iii) reflecting current transport policy, an Adaptive Phased Approach will be adopted relating to the provision of mitigation measures to allow the mitigation strategy to respond to the quanta of development within the individual phase proposals, the timescales for delivery, changes in future travel behaviour patterns, emerging transport policy, and the current uncertainty relating to the transport enhancement proposals;

iv) as such, further information relating to traffic impact, highway capacity assessment and mitigation will be provided subsequently relating to later phases of Development in the context of further clarity relating to these proposals.

2.12 Summary of the Methodology

Initial assessment work

2.12.1 Initial assessment of the transport impact of West Cambridge was undertaken using Cambridgeshire County Council's land use and transport model, the Cambridge Sub Regional Model (CSRM).

2.12.2 Following a review of the model results with the Joint Highway Authorities, it was concluded that the CSRM was not the most appropriate manner in which to assess West Cambridge traffic impact as being an area-wide strategic transport model, it was of insufficient sensitivity to assess impact across the local network accurately.

2.12.3 Within the context of an assessment of an Initial Phase of development in 2021 with relatively small development impact, it was agreed that a more local approach to the assessment of impact was appropriate – and would provide a robust assessment due to the absence of assessment of the reassignment effects. The following methodology was therefore agreed with the Joint Authorities, based upon Peter Brett Associates' Transport Modelling.

2015 Base Year Methodology

2.12.4 The 2015 Base Year Scenario is being prepared for the purposes of the Environmental Impact Assessment, and to advise the existing conditions across the network.

2.12.5 The 2015 vehicle flows will be derived across the network from traffic count surveys, from a series of sources, including inter alia:

i) traffic count surveys undertaken along Madingley Road in November 2015 as part of the West Cambridge Development Annual Monitoring (commissioned by the University);

ii) the traffic count survey - including automatic traffic counts and manual part-classified junction turning counts - undertaken across the area in June 2015 as part of this West Cambridge Development (commissioned by the University following the initial Transport Assessment Scoping in May 2015);

iii) traffic count survey data provided by Cambridgeshire County Council; and

iv) traffic count survey data from Highways England's TRADS database.

2.12.6 The flows from West Cambridge are assessed with reference to the observations at one of the departmental buildings at West Cambridge, used in the earlier approved assessment of movements to the adjacent North West Cambridge.

2.12.7 Growth factors from the Department for Transport's TEMPRO model will be used to convert all the survey results to the necessary common year.

2021 Initial Phase Assessment Methodology

2.12.8 The 2021 Assessment considers both the Do Minimum and Do Something scenarios.

2.12.9 Two Do Minimum assessments are considered for each scenario:

i) for the Transport Assessment - considering the Future Year flow scenario assuming the delivery of consented development across Cambridge Sub-Region – including that consented at West Cambridge; and

ii) for the Environmental Impact Assessment – considering the flow scenario assuming the existing development at West Cambridge (i.e., with no further development within the terms of the Extant Consent).

2.12.10 The Do Something assessment in each scenario is identical for both the Transport Assessment and Environmental Impact Assessment.

2.12.11 Both the Consented (Do Minimum) and Initial (Do Something) Phase of West Cambridge Development - identified in Tables 2.1 and 2.5 - are assumed to be completed by 2021.

2.12.12 The 2015 network traffic flows will be inflated by the vehicle trips identified by Peter Brett Associates' Spreadsheet Model arising from the consented strategic development delivered by 2021 assigning along each link.

2.12.13 The methodology used to evaluate the transport impact of the forecast movements generated by the Initial Phase of Development for the Transport Assessment is influenced by the Consented Development detailed in Table 2.1. The University has already provided full mitigation for the trip generation from the Consented Development.

2.12.14 These 2021 flows, being based in part on observation from the surveys in 2015, would already include movements associated with West Cambridge. For the purposes of assessing the 2021 Do Minimum scenario for the Transport Assessment, to avoid double counting the existing West Cambridge development-generated vehicle trips:

i) the Observed 2015 West Cambridge vehicle movements are deducted by link;

ii) these Observed 2016 West Cambridge vehicle movements are replaced with the predicted Consented West Cambridge flows identified by the Spreadsheet Model.

2.12.15 To provide reassurance to the accuracy of these flow increases, the resulting increases in link flow will be considered with reference to the appropriate growth factor obtained from the Department for Transport's TEMPRO model.

2.12.16 When the link flows obtained from this first-principles approach are compared to the equivalent link flows from the CSRM, it shows that the CSRM flows are lower. As this first-principles approach does not account for reassignment or redistribution effects, the adopted methodology is shown to provide a robust assessment of future conditions.

2.12.17 Further details are provided in Section 12 onwards.

3 Existing Conditions

3.1 Introduction

3.1.1 This section presents detail of the current and permitted land-uses; the pedestrian and cycle infrastructure; public transport provision; highway network and emerging development proposals from the local authority and local developers.

3.1.2 This section identifies that:

i) the Development is well-located with respect to existing pedestrian and cycle infrastructure to accommodate non-motorised movement, and that the existing bus services already connect to a series of popular destinations;

ii) existing journey to work trips by Cambridge residents and University employees involve a much lower car driver mode share than the United Kingdom average; and

iii) that there are no existing road safety issues in the vicinity of the Site.

3.2 Site Location and Existing Use

3.2.1 The proposed Development is shown in Figures 2.1 and 2.2, being located to the north-west of the existing urban conurbation of Cambridge, approximately 3km north-west of the centre of the city.

3.2.2 The Site is located immediately to the east of the section of the M11 motorway between Junctions 13 and 14, is bordered to the north by the Class A Madingley Road (A1303) which routes between Junction 13 of the M11 and the centre of Cambridge. Clerk Maxwell Road, a residential distributor road, is located to the east. Agricultural land occupies the land between the Site and Barton Road to the south.

3.2.3 West Cambridge is a mixed-use development, with the predominantly academic and commercial research elements and ancillary land-uses. Outline planning consent was originally granted in 1999, and subsequently the Development has progressed with the elements of the original consent being delivered at different rates. The consented and delivered development mix is shown in Table 2.1.

3.3 Existing Pedestrian and Cycle Facilities

Pedestrian and Cycle Access Points to West Cambridge

3.3.1 As shown on the Access Parameter Plan in Appendix 2.3, the existing walking and cycling access points to West Cambridge from the north are:

- at the Madingley Road junctions with JJ Thomson Avenue;
- at High Cross;
- adjacent to the British Antarctic Survey building at the Western Access – a pedestrian-only access;
- at the Veterinary School access road; and
- from the Park and Cycle facility.

3.3.2 From the south, the Coton Path, a pedestrian and cycle route, connects West Cambridge to the city centre via Adams Road and Burrell's Walk.

3.3.3 From the east, there is a pedestrian and cycle shared use path from Clerk Maxwell Road to JJ Thomson Avenue.

Public Rights of Way

3.3.4 The Public Rights of Way in the vicinity of the development are shown on Figure 3.1. In summary:

i) Footpath 31a routes on a west to east along the southern periphery of the Site, commencing from the western corner of the site (adjacent to the M11). Extending to the east, this footpath connects with Wilberforce Road where it terminates;

ii) Footpath 9 commences at the same point as Footpath 31a, but routes to a south-east direction where it terminates at an area of agricultural land.

iii) Footpath 6 routes on a south-west to south east access linking from Barton Road to nearby Coton (extending over the M11) where it terminates.

iv) Bridleway 5 is located to the south of Madingley Road between the M11 southbound on-slip and the West Cambridge Development, and runs on a north-south axis.

3.3.5 There are currently no dedicated equestrian facilities within the development, albeit Bridleway 5 links between the M11 Coton Path foot/cycle bridge to Madingley Road along the western boundary. There is no clear continuation of this bridleway from its termination at Madingley Road.

Pedestrian Facilities

Walking Route Network

3.3.6 The existing pedestrian facilities are shown on Figure 3.1.

3.3.7 There are two good pedestrian connections between West Cambridge and the city centre:

- using the existing pedestrian facilities along Madingley Road; and
- via the Coton Path Corridor - a much quieter route that connects to Adams Road (a residential street) and Burrell's Walk (a dedicated pedestrian and cycle path).

3.3.8 In the vicinity of West Cambridge, Madingley Road has footways along both sides of the carriageway. The footway along the south terminates at the West Cambridge High Cross junction, opposite the North West Cambridge Development High Cross access. The footway along the south varies from between 1.5m and 2m wide, and generally has no median strip. The footway on the north varies between 1.5m and 2m wide and has a median strip along the majority of Madingley Road. The footways are illuminated by the carriageway lighting system.

3.3.9 There are four controlled crossings along Madingley Road:

i) a pelican crossing to the west of the Madingley Road / Northampton Street Roundabout;

ii) a pelican crossing to the east of the Madingley Road / Grange Road traffic signal controlled junction;

iii) a toucan crossing to the east of the Storey's Lane / Madingley Road junction – a footpath leads from here to the south eventually to join Clarkson Road; and

iv) a toucan crossing of the Madingley Road park and ride site entrance.

3.3.10 There is some severance between West Cambridge and the north due to Madingley Road, but this has been reduced recently with the traffic signal controlled junction enhancement of the Madingley Road / North West Cambridge / High Cross Site Access, and the recent delivery of a new toucan signal controlled crossing between the Madingley Road / JJ Thomson Avenue / Madingley Rise junctions.

On-site facilities

3.3.11 Within the West Cambridge Development, JJ Thomson Avenue, Charles Babbage Road and High Cross have footways with generous widths on both sides of the carriageway – a typical arrangement is shown on Plate 3.1.

Plate 3 1: Existing Footway arrangement along High Cross

3.3.12 Within the Development, Charles Babbage Road has been subject to an urban realm scheme and traffic calming, resulting in it forming an attractive link for pedestrians – this is shown on Plate 3.2.

Plate 3 2: Charles Babbage Road

3.3.13 There is a footway on the western side of the Western Access connecting from Charles Babbage Road to Madingley Road.

Cycling Facilities

Cycling Route Network

3.3.14 The local cycling network in the vicinity of the development is shown on Figure 3.2, compiled using information from Cambridgeshire County Council website and to other attractors to the south and west of the City. As shown on this figure, Cambridge is exceptionally well provided with cycling facilities.

3.3.15 An off-road cycle path routes eastwards from the western bend of Storey's Way, continues around the Observatory, then southwards along an access road to Madingley Road. This route was provided as part of the Section 106 Agreement for the West Cambridge Development.

3.3.16 Across the wider Cambridge area, there are National Cycle Network routes 1, 11, 12, 51, 53, and 63. National Cycle Route 51 passes close to the Development, as shown on Figure 3.2. This connects Huntingdon to the west and Newmarket to the east. A section of this route runs south-east to north-west adjacent to the Site along Huntingdon Road (A1307) from Cambridge Road towards Cambridge City Centre. The cycle route is formed with on-road cycle lanes along both sides of Huntingdon Road. It is signed throughout as National Cycle Route 51. Route 51 is a high quality route, and free of motorised traffic which passes through ancient pastureland. The path stretches across East Side Common and provides improved cycle links for the local villages into Huntingdon.

3.3.17 Cambridgeshire County Council has recently delivered the Madingley Road Phase 1 Combined Cycleway / Footway proposals, a quality cycleway along the northern verge, significantly enhancing the cycling and walking infrastructure along this route. These works are shown in Appendix 3.1, and consisted of:

i) upgrading the existing combined footway / cycleway within the northern verge to 3m wide between the east of Madingley Rise and Lady Margaret Road;

ii) enhancing the cycleway crossings of minor roads such as Storey's Way and Madingley Rise;

iii) providing an on-road cycle lane from Queen's Road to the Park and Ride site on the southern side of Madingley Road.

3.3.18 At the junctions on Madingley Road with Lady Margaret Road and Grange Road there are cycle advance stop lines with pens.

3.3.19 The Coton Path runs along the southern boundary of the Development and connects Coton, one kilometre to the west, with the city centre via Adams Road and Burrell's Walk with limited motorised traffic. Plate 3.3 shows the path between Adams Road and the Development (left) and along the south of the Development boundary (right).

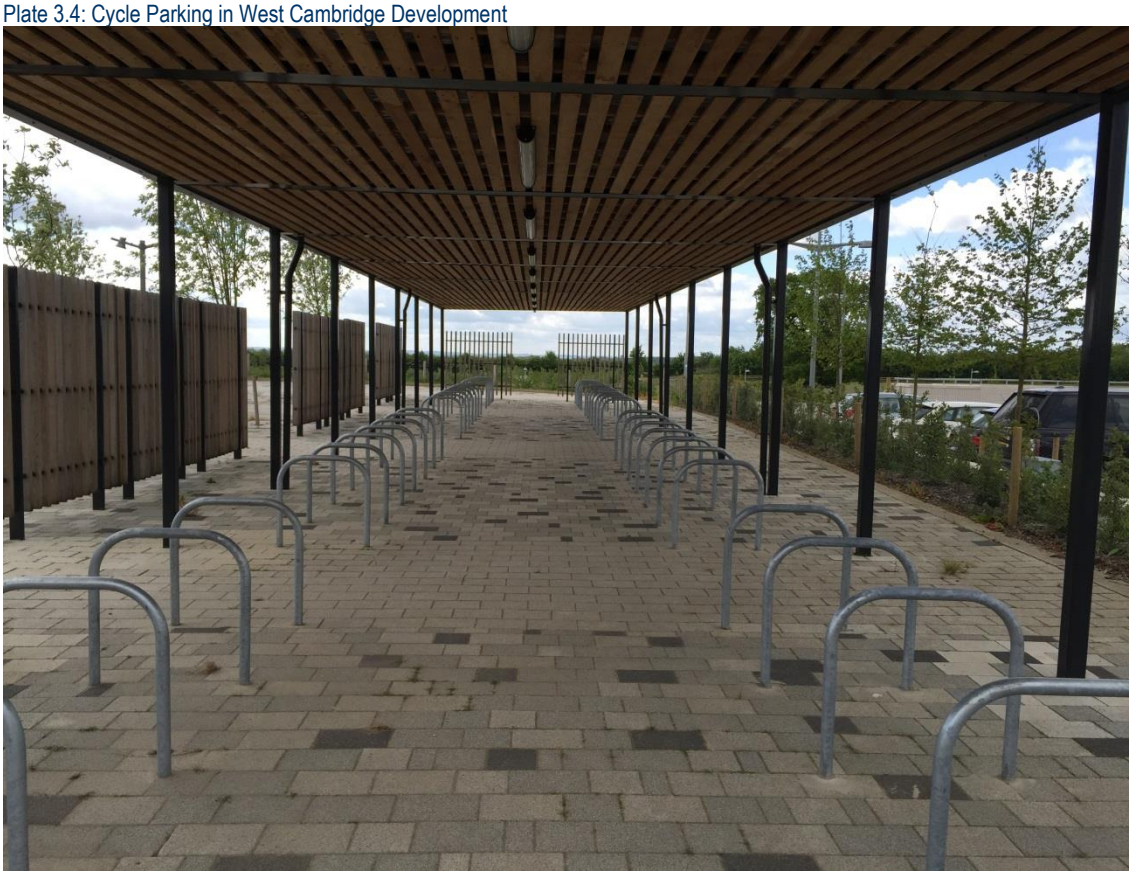
Plate 3.3: Coton Path linking the south of West Cambridge with Adams Road

On-site facilities

3.3.20 Along JJ Thomson Avenue, High Cross and Charles Babbage Road, there are substantial shared cycle and footways on either side of the carriageway, with those of the former two roads separated by tree-lined grass verges.

3.3.21 Across the Development, there are a number of covered, secure cycle parking areas with Sheffield stands and lighting such as that shown in Plate 3.4. There is also parking provided within development plots, generally in the form of Sheffield stands.

Plate 3.4: Cycle Parking in West Cambridge Development



3.3.22 There is also an existing park and cycle facility located off Clerk Maxwell Road. This is also intended to intercept car trips from the west and from the M11 and bound for the City Centre, with Clerk Maxwell Road providing a safe cycle access onto the Adams Road / Burrell's Walk route. The site provides 292 parking spaces.

Associated Off-site Cycle Parking

3.3.23 Within the City Centre, there are various cycle parking locations that would encourage and promote the use of cycling into Cambridge:

i) the Grand Arcade Cycle Park is located off Corn Exchange Street and provides space for approximately 500 cycles that includes free parking for 200 spaces (the other 300 spaces are charged parking). Pedestrians can access the cycle park via the lifts or stairs inside Grand Arcade or from Fisher Square. Cyclists can access the cycle park from Corn Exchange Street. From the centre of the Development, the approximate distance to the Grand Arcade Cycle Park is 3.5km, a 14 minute cycle time, a relatively easy cycle. The distance between the Grand Arcade Cycle Park and Cambridge Rail Station is approximately 1.7km, a further 6 minute cycle time. The cycle park closes at 11:30pm each day;

ii) Park Street Cycle Park is located on the ground floor of Park Street Car Park and provides covered space for 285 cycles. Cyclist and pedestrian access is provided from Park Street, and there is a pedestrian-only access from Bridge Street. The cycle park is currently open 7 days a week, 24 hours a day. From the centre of the Development, the approximate distance to the Grand Arcade Cycle Park is 3.5km, a 14 minute cycle time, a relatively easy cycle. The distance between the Grand Arcade Cycle Park and Cambridge Rail Station is approximately 1.7km, a further 6 minute cycle time;

3.3.24 Other cycle parks exist around Cambridge, such as bicycle stands located on East Road, Downing Site at the University, and at the Addenbrooke's Hospital. Further cycle parking located close to the Site is along Madingley Rise, but this cycle parking is for the use of the university alone.

3.3.25 Whilst the only currently proposed amendments to the University's cycle parking provision are related to specific development proposals, it is part of the University's approach to sustainable transportation to keep cycle parking provision in their facilities throughout the city under review.

Other Development-related cycle and pedestrian infrastructure enhancement proposals

3.3.26 A series of pedestrian and cycle infrastructure proposals have been promoted by others within the area.

3.3.27 The Long Term Transport Strategy (LTTS) to in Section 2.9 forms part of the Cambridgeshire Local Transport Plan, and identifies major infrastructure requirements needed to address the existing capacity constraints of Cambridgeshire's transport network, As part of this Strategy, a third city centre cycle park will be provided, although no timescale has been given at this stage.

3.3.28 A new 2,900 space cycle park has been provided at Cambridge Rail Station as part of the planned station improvements.

3.3.29 As further referred to in Section 2.9, the Cambridge City Deal includes cycling proposals within the Greater Cambridge area. As part of the City Deal Bus Priority scheme along Madingley Road, there will an improvement of the existing cycle infrastructure along this road.

3.3.30 As part of the North West Cambridge development proposals, the following cycle infrastructure improvements were agreed along Madingley Road;

i) a traffic signal controlled pedestrian and cyclist crossing incorporated into the Madingley Road – High Cross - North West Cambridge Development access junction; and

ii) a new toucan crossing on Madingley Road adjacent to JJ Thomson Avenue / Madingley Rise – this was completed in Autumn 2015.

Existing Cycle Movements

3.3.31 A travel pattern survey was undertaken in May 2015, seeking information about staff and students' travel habits over the course of two weeks.

3.3.32 The post code data for the existing cycle user occupants of West Cambridge has been analysed along broad travel corridors, the output is reported in Appendix 3.2 and summarised in Table 3.1 along the broad movement corridors:

Table 3.1: Observed Cycle to Work Movements to West Cambridge (2015)

	Cyclists				Total			
Corridor	**Staff**	**Students**	**Total**	**%**	**Staff**	**Students**	**Total**	**%**
North, beyond Girton	11	2	13	3%	50	2	52	7%
North of City	64	61	125	26%	82	61	143	20%
North-east, beyond Milton	2	0	2	0%	23	0	23	3%
North-east area of City	8	33	41	9%	9	34	43	6%
South-east area of City	44	30	74	16%	54	33	87	12%
South-east, towards Balsham	2	2	4	1%	7	2	9	1%
South area of City	11	55	66	14%	21	60	81	12%
Towards Great Shelford	4	0	4	1%	19	0	19	3%
South-west, beyond Barton	2	0	2	0%	2	0	2	0%
West Cambridge, North-west of City and Girton	36	92	128	27%	49	116	165	23%
West along the A1303 Corridor , beyond Coton	13	2	15	3%	56	5	61	9%
North-west, towards St Ives	1	0	1	0%	13	0	13	2%
Other	0	0	0	0%	6	0	6	1%
Total	198	277	475	100%	391	313	704	100%

Source: SDG – University of Cambridge – Travel Survey and Segmentation Study – October 2015
Response rates of 34% Staff and 10% Students were reported.

3.3.33 This information will inform the derivation of the Development Cycle Strategy, with:

i) up to 30% of movement to the north, across Madingley Road;

ii) around 25% of movement to the east, along the existing facilities along Madingley Road;

iii) around 40% of movement passing to the east, along the Coton Path, continuing along towards the City; but

iv) with a limited number, only around 3% of existing cycle movements, assigning to the west across the motorway.

3.4 Existing Bus Services

3.4.1 Whilst walking and cycling offer an attractive alternative to the private car for many short- and medium- distance trips, bus travel can also be an effective option. In particular, quality bus services offer the potential to replace car travel locally (such as to adjacent developments), to other destinations across Cambridge, and further afield. In conjunction with rail, it is a realistic option to the car for longer distance trips.

3.4.2 In this section, details of existing bus services are set out. These comprise existing local and long distance services on Madingley Road, the park & ride service from a site north of Madingley Road, and the guided busway that serves northern areas of Cambridge. Each of these is described in turn below.

Existing Bus Services on Madingley Road

3.4.3 Bus services along Madingley Road are provided by two operators: Stagecoach and Whippet. Stagecoach operates services Citi 4, Uni 4 and X5 and Whippet provides services 1, 2, 3, 8 and X3. Places served by these routes are Cambourne, Huntingdon, Papworth, St Ives, St Neots and further afield to Bedford, Milton Keynes and Oxford. Table 3.2 shows details of the services provided, as at March 2016, these are shown on Figure 3.3.

Table 3.2: Bus Routes and Daytime Frequencies

Service (Operator)	Route	Frequency (minutes)	
		Mon – Sat	Sunday
1 (Whippet)	Cambridge, West Cambridge, Cambourne, Lower Cambourne, Papworth, Hilton, St Ives	M-F peaks only 1 journey	No service
2 (Whippet)	Cambridge, Coton, Madingley, Dry Drayton, Hardwick, Toft, Caldecote, Knapwell, Elsworth, Conington, Boxworth	M-F peaks only 1 journey	No service
3 (Whippet)	Cambridge, West Cambridge, Cambourne, Lower Cambourne, Papworth, Hilton, Godmanchester, Huntingdon	Peaks only 1-2 journeys	No service
X3 (Whippet)	Cambridge, West Cambridge, Cambourne, Lower Cambourne, Papworth, Godmanchester, Huntingdon	60	No service
8 (Whippet)	Cambridge, Coton, Madingley, Dry Drayton, Bar Hill, Boxworth, Conington*, Knapwell*, Elsworth*, Papworth*	Off peak only 2 or 3 journeys	No service
Citi 4 (Stagecoach)	Cambridge, Great Cambourne, Upper Cambourne, Lower Cambourne	20	60
Uni 4 (Stagecoach)	Addenbrooke's, City Centre, West Cambridge, Madingley Road Park & Ride	M-F only 20	No service
X5 (Stagecoach)	Cambridge, St Neots, Bedford, Milton Keynes, Buckingham, Bicester, Oxford	30	30

3.4.4 The most frequent services are both operated by Stagecoach. Service Citi 4 is one of a network of seven "Citi" branded routes serving the Cambridge urban area and surrounding area, and provides a 20 minute frequency service from Cambourne via Madingley Road to the city centre. In the evenings and on Sundays there is an hourly service on the route.

3.4.5 The Uni 4 service provides a link between the Madingley Road Park and Ride site, the University's West Cambridge campus, the south of the city centre and Addenbrooke's Hospital – it does not serve the main city centre area – and operates every 20 minutes during Monday to Friday daytimes only. This route is supported financially by the University of Cambridge.

3.4.6 Longer distance links are provided by:

i) Stagecoach service X5 - every 30 minutes to St Neots, continuing to Bedford, Milton Keynes and Oxford; and

ii) Whippet with service X3 operating hourly to Papworth and Huntingdon.

3.4.7 Further lower frequency services provide key commuter links from outlying areas of the City.

3.4.8 The Development is well-located, being adjacent to well-established and successful existing bus services that connect to a range of destinations in Cambridge itself and more widely through Cambridgeshire.

Park & Ride

3.4.9 Cambridge has a well-established park & ride system, the nearest site to the Development being located to the north of Madingley Road. This car parking facility is open 24 hours a day including bank holidays.

3.4.10 The 'Red' park & ride service operates from Madingley Road to the city centre and then continues via Newmarket Road to Cambridge Airport. Services operate every 10 minutes from 0700 to 2020 on Monday to Friday and 0800 to 2020 on Saturday, and every 15 minutes from 0900 to 1830 on Sunday.

3.4.11 The main role of this Madingley Road park & ride facility is to intercept car trips from the west and from the M11 inbound to the City Centre. Whilst this facility may not be directly relevant to improving accessibility to West Cambridge, it does decrease the traffic volumes along Madingley Road. The Red service also provides a fast link from the Cambridge Airport area to the Development and, via interchange at the Newmarket Road park & ride site, from East Cambridgeshire.

Guided Busway

3.4.12 The northern area of Cambridge is also served by the Cambridge Guided Busway, a strategic bus-based rapid transit scheme connecting the communities of Cambridge, St Ives and Huntingdon, along with, in future, the new Northstowe Community. Whilst the Guided Busway will not directly serve the Development, the high quality characteristics of the service, which are more akin to a tram than a conventional bus, make it an attractive mode of transport in its own right and an integral part of the Cambridge public transport network. Through interchange to other bus services, it provides an alternative to the car for trips to and from the Development.

3.5 Existing Rail Services

3.5.1 Rail travel, in conjunction with bus, offers an attractive alternative to the private car for many longer distance trips to West Cambridge.

3.5.2 The nearest rail station is Cambridge Rail Station, which is approximately 4 kilometres to the south-east of the West Cambridge development. This is also shown on Figure 2.1.

3.5.3 Table 3.3 provides detail on the daytime frequencies of services to certain key destinations which can be accessed from the station.

Table 3.3: Key Destinations and Service Frequencies of Cambridge Rail station

Operator	Destination	Journey Time (minutes)	Frequency (per hour)	
			Mon – Sat	Sunday
CrossCounty	Birmingham New Street	157	1	1
	Ely (via a combination of Cross Country, Abellio and Great Northern)	13	3	3
	Peterborough	49	1	1
	Stansted Airport	30	2	2
Abellio Greater Anglia	Ipswich	78	1	1
	London Liverpool Street	70	2	2
	Norwich	80	1	1
	Tottenham Hale	69	2	2
Great Northern	King's Lynn	46	1	No direct service
	London King's Cross	45	4	3
	Stevenage	35	2	1

3.5.4 In total, there are around five to six trains per hour on average to London throughout the day. Abellio Greater Anglia offers a direct service twice an hour (an approximate 70 minute journey) and Great Northern offers a direct service four times per hour (an approximate 45 minute journey).

3.5.5 The location of the rail station, 1.5km to the south-east of the city centre, has historically been an issue with its weak bus service connections, there are currently no direct links from the western side of Cambridge. Passengers for the rail station must currently alight in the city centre and either use another bus, or walk to their destinations.

3.5.6 The rail station and city centre are linked by around eighteen buses per hour on the main Citi 1, 3, 7 and 8 services, which also provides regular direct links to Addenbrooke's Hospital, Cherry Hinton, Fulbourn, Fen Ditton, Arbury, Impington, Histon, Cottenham, Saffron Walden and a number of villages south of Cambridge. Journey time from the city centre to the rail station is under 10 minutes and Plusbus tickets are available for integrated rail and bus travel.

3.6 Existing Road Network

3.6.1 As shown on Figure 2.1, the Site is located to the south of a radial route leading between the M11 and the centre of Cambridge – the A1303 Madingley Road.

Vehicle access to the Site

3.6.2 Highway access to the site is exclusively from Madingley Road. Madingley Road borders the north of the Development, and is a single lane carriageway which fluctuates in width from approximately 7.5m to approximately 15m at the junction with JJ Thomson Avenue. In the vicinity of the Development there is a speed limit of 40mph, albeit this reduces to 30mph towards the centre of Cambridge near JJ Thomson Avenue. Madingley Road leads from the A428 Madingley Mulch Roundabout to the inner Cambridge Ring Road, and is the main arterial route into the city from the west.

3.6.3 As shown on Figure 2.3, there are two junctions from Madingley Road which provide vehicular access to the site:

i) Madingley Road / High Cross / North West Cambridge Access - a four armed traffic signal controlled crossroads located some 100 metres to the east of the Madingley Road / Park and Ride access junction, recently implemented to provide access to the new North West Cambridge Development to the north. The West Cambridge High Cross access road is a single carriageway road with a width of approximately 7.3 metres, which flares on the approach to the junction to provide two exit lanes. The inbound Madingley Road movements have dedicated both left- and right-turn lanes;

ii) Madingley Road / JJ Thomson Avenue / Madingley Rise – a staggered priority junction with single lane dualling providing right-turning lane facilities. Madingley Rise, to the north, forms the access road to the Earth Science Facility, and is used by University employees, students and visitors. The JJ Thomson Avenue junction to the south forms the main vehicular access to the West Cambridge Development. JJ Thomson Avenue is also a single carriageway road with a width of approximately 7.5 metres but which widens to two lanes on the approach to the junction providing a left-turn flare of approximately 29 metres.

A further priority junction between JJ Thomson Avenue and High Cross, currently closed, provides limited cyclist and pedestrian access to an area of the Site occupied by the Vet School only.

3.6.4 In addition to these junctions, Clerk Maxwell Road is a local access road and forms the eastern boundary to the site. Currently, this road provides access to a small number of residential homes and the Park and Cycle site which is located at the north-east corner of the Development. There is no direct vehicular access from Clerk Maxwell Road to the Development, albeit three pedestrian and cyclist accesses into the Development are served from this road. The junction of Clerk Maxwell Road with Madingley Road is formed by a ghost island priority junction.

Local Highway Network

3.6.5 As shown on Figure 2.1, the local highway network provides direct access between the development and the M11 strategic highway network – Madingley Road intersects with the M11 at Junction 13. An indirect link is also provided to the A14 by Huntingdon Road to M11 Junction 14 (A14 Junction 31).

3.6.6 The M11 is located to the west of the Site, and routes in a north / south axis. It links between the North Circular Road in London, passes Bishop's Stortford, Harlow, and Stansted Airport before passing to the immediate west of the Site at the merger with the A14 at Junction 14.

3.6.7 The A14 East also connects to the A428, a strategic road that links Coventry to Cambridge via Bedford and Northampton.

3.6.8 To the north of the Site lies the A14 on an east / west axis from Cambridge. To the east, the A14 connects to Newmarket, Bury St Edmunds, and Ipswich, terminating at the sea port of Felixstowe. To the west the A14 passes Huntingdon, crossing the A1 before continuing around Kettering and terminating at Junction 19 of the M1, the start of the M6.

3.6.9 Only limited movement access is possible at the two closest junctions to the M11, the A428 and the A14:

i) the A14 is accessed via Huntingdon Road at A14 Junction 31, however westbound movements only are provided for – eastbound access to the A14 and southbound access to the M11 are not possible. The nearest A14 eastbound access from the Development is via Histon Road, the A14 Junction 32;

ii) the M11 is accessed via Madingley Road, but only southbound movements are accommodated towards London; and

iii) the A428 cannot be directly accessed from the M11. A route to this link is formed along Madingley Road to the west.

Summary

3.6.10 Madingley Road provides convenient access to West Cambridge from the south (via the M11), from the west (from Madingley Road and the A428), and from the east (towards the City centre).

3.6.11 Whilst these movements are well-catered for, access to/from the north is poor as M11 Junction 13 has no north-facing diverge and or merge lanes. Approaching the site by car from the north or north-west - including areas to the north of the City centre, and from the A14 / A11 corridor - must use one of:

i) the M11 and U-turn at M11 Junction 12;

ii) drive through the City and enter via Madingley Road; or

iii) drive along Huntingdon Road and through either North West Cambridge or Storey's Way / Madingley Road.

3.6.12 Both the Huntingdon Road and Madingley Road Corridors are subject to levels congestion during the AM and PM peak hours, the congestion being more pronounced during the AM peak in the eastbound direction towards the city centre.

3.7 Observed Existing Journey mode share

3.7.1 To understand current travel patterns and existing mode share in the vicinity of the Development, existing travel patterns have been reviewed with reference to the readily available sources of data for the proposed land-uses including:

i) the existing Census 2011 Journey to Work data for the urban area of Cambridge;

ii) the existing Census 2011 Journey to Work data for England;

iii) Cambridgeshire County Council's Travel for Work Partnership from the 2014 surveys for the University of Cambridge – reflecting more closely the mode share of the academic research area staff; and

iv) Cambridgeshire County Council's Travel for Work Partnership from the 2014 surveys for the Cambridge Science Park – reflecting more closely the mode share of the commercial research area staff.

These data sources are considered individually below.

2011 Census

3.7.2 Information relating to the journey to work mode, and home and work locations is available in the 2011 Census. Two data sets have been reviewed:

i) the Site is located in the Super Output Area referenced E02003725 covering the Cambridge urban area - as shown in Appendix 3.3. The mode share from the 2011 Census for journeys to work in this area for workers employed within this area are shown in Table 3.4:

Table 3.4: Census 2011 Mode Share for journey to work within Cambridge

PT passenger		Car Driver	Car Passenger	Motor Cycle	Bicycle	Pedestrian	Other - (Taxi, Metro, U'ground)	Single Occupancy Car Driver
Bus	Rail							
8.3%	4.5%	50.0%	4.0%	1.1%	21.6%	10.0%	0.3%	46.0%

Source – Census 2011 – Nomis Super Output Areas referenced E002319, E02003720, E02003721, E02003722, E02003723, E02003724, E02003725, E02003726, E02003727, E02003728, E02003729, E02003730, E02003731– excluding Work from Home trips

ii) the mode share from the 2011 Census for journeys to work for workers employed within England is shown in Table 3.5:

Table 3.5: Census 2011 Mode Share for England - journey to work

PT passenger		Car Driver	Car Passenger	Motor Cycle	Bicycle	Pedestrian	Other - (Taxi, Metro, U'ground)	Single Occupancy Car Driver
Bus	Rail							
7.9%	5.6%	60.2%	5.3%	0.9%	3.1%	11.3%	5.6%	54.9%

Source – Census 2011 - Nomis

Travel to Work Partnership – University of Cambridge

3.7.3 Reference is made to the Travel for Cambridgeshire survey of the travel patterns of the University employees at the West Cambridge Development – this is considered to represent reasonably the mode share of the Academic Research staff. The results are summarised in Appendix 3.4, the results are summarised in Table 3.6:

Table 3.6: Base Total External Trip Generation – West Cambridge

PT passenger		Car Driver	Car Passenger	Motor Cycle	Bicycle	Pedestrian	Worked at home, or at other location	Single Occupancy Car Driver
Bus	Rail							
5.7%	2.3%	35.8%	8.0%	0.8%	47.5%	6.36%	1.7%	27.8%

Source – Travel to Work Survey 2014 produced for University of Cambridge (Travel for Cambridgeshire for West Cambridge)

Travel to Work Partnership – Cambridge Science Park

3.7.4 Further reference is made to the Travel Plan Plus Area Report produced by Travel for Cambridgeshire of the travel patterns of the employees at the Cambridge Science Park – this is considered to represent reasonably the mode share of the Commercial Research staff. The results are summarised in Appendix 3.4, the results are summarised in Table 3.7:

Table 3.7: Base Total External Trip Generation – Commercial Research

PT passenger		Car Driver	Car Passenger	Motor Cycle	Bicycle	Pedestrian	Worked at home, or at other location	Single Occupancy Car Driver
Bus	Rail							
5.0%	1.4%	62.8%	8.8%	0.8%	21.6%	4.7%	3.7%	54.0%

Source – Travel to Work Survey 2014 produced for The Travel Plan Plus Area (Travel for Cambridgeshire for the Cambridge Science Park area)

Commentary

3.7.5 This mode share data supports anecdotal evidence relating to general movement both in Cambridge, as well specifically by the University's employees:

i) the Single Occupancy Car Driver mode share for Cambridge is lower than across England, with all the non-car modes corresponding higher;

ii) the Single Occupancy Car Driver mode share for University employees at West Cambridge is lower than reported in the Census for Cambridge – supporting evidence of the tradition of non-car mode choice by University employees;

iii) the non-car share for University employees (car share, cycling, bus) observed at West Cambridge is significantly higher than for employees at the Science Park;

iv) that the restrictions on parking at the University's facilities may reduce the Single Occupancy Car Driver share.

3.7.6 The Car Driver and Single Occupancy Car Driver mode shares for the Cambridge Science Park commercial research areas are significantly higher than that reported for the West Cambridge Development - which itself includes the sort of commercial research and development facilities (e.g. Microsoft and Schlumberger) expected to operate from the Development. This reflects the nature of the Cambridge Science Park Development - having been car-orientated from the outset, having greater on-site parking provision, no on-site worker accommodation, no on-site community and general absence of a non-car mode travel culture.

3.7.7 The University is confident that West Cambridge Development - being set up from the outset to be sustainable, bicycle and pedestrian friendly, to include a sustainable mix of uses reducing the need to travel and with a non-car travel culture form the outset, combined with an effective Site-Wide Travel Plan - will result in sustainable development, and in transport terms out-perform the Cambridge Science Park.

3.8 Initial Traffic Data Review

3.8.1 This Section summarises the traffic data collection strategy on the surrounding highway network.

3.8.2 Both Automatic Traffic Count Surveys and Manual Turning Count surveys were undertaken to collect observed traffic flow data at local junctions in the vicinity of the Site. In addition, data was extracted from the TRADS database, and also from Cambridgeshire County Council's Cordon Survey, which provides data from the County's Annual Traffic Monitoring Report. This sub-section summarises:

i) the junctions considered around West Cambridge;

ii) reviews the results of the Automatic Traffic Count Surveys (including the Automatic Traffic Count Survey data obtained from the TRADS database and the Cambridgeshire County Council's Cordon surveys).

3.8.3 Manual Classified Turning Counts were commissioned by the University in June 2015 at the following junctions:

- A428 / A1303 Madingley Mulch Roundabout
- M11 Junction 13 East Roundabout
- M11 Junction 13 West Roundabout
- Madingley Road / Northampton Street/ Queen's Road Roundabout
- A1303 Cambridge Road Crossroads
- Huntingdon Road / Girton Road Priority Junction
- Madingley Road / Madingley Rise / JJ Thomson Avenue Crossroads
- Storey's Way / Huntingdon Road Priority Junction
- Storey's Way / Madingley Road Priority Junction

3.8.4 Automatic Traffic Count Surveys were also commissioned by the University in June 2015 over a 24 hour period for 14 days at the following locations;

- Barton Road – 15m west of junction with Grantchester Road
- JJ Thomson Avenue – 70m south of Junction with Madingley Road
- Grange Road – 50m north of Clarkson Road
- Madingley Road – 150m west of M11 Junction 13

3.8.5 Traffic Count Survey data was also obtained from Cambridgeshire County Council from the Annual Cordon Survey. These were conducted for a 12 hour period between 07:00-19:00 at Histon Road – immediately south of the A14 Junction 32.

3.8.6 Traffic data were also obtained from Highways England's Traffic Flow Data System (TRADS) for sites on the strategic trunk road network on the following links:

- M11 Junction 12 – 13 (2015 – by combining TRADS link data and the slip road flow observations)
- M11 Junction 13 – Junction 14 (2014)
- M11 between A14 / Huntingdon Road
- A14 Junction 29 – Junction 30
- A14 – north east of M11 Junction 14
- A14 – west of Junction 32
- A428 – west of M11 Junction 14

3.8.7 The 2015 Base flows are shown figuratively in Appendix 3.5.

3.9 Road Safety

3.9.1 To understand road safety issues in the vicinity of the Site, an assessment was undertaken at key local links and junctions within 1km of the Development site boundary.

3.9.2 Road traffic collision personal injury summary data was obtained from Cambridgeshire County Council for the last available full five year period of January 2010 to May 2015. The collision data and the assessment area are included in Appendix 3.6, along with a plot showing the location of all personal injury collisions.

3.9.3 The study area covered the length of Madingley Road commencing approximately 400m west of the Madingley Road / Cambridge Road crossroad junction to the west of the site, and terminating at Grange Road to the east of the site. This is an approximate 4km stretch of Madingley Road, further details of the study area, and the location of these collisions are shown in Appendix 3.6.

3.9.4 The observed number of combined link and minor junction personal injury collisions (PICs – formerly known as personal injury accidents), and major junction personal injury collisions are reported on each link and junction in Table 3.8. The comparable number that could be anticipated on these was also calculated with reference to the Department for Transport's Design Manual for Roads and Bridges, Volume 13 - these calculations are also contained in Appendix 3.6 and the results are summarised and compared with the observed level of personal injury collisions in Table 3.8.

Table 3.8: Summary of Observed and Anticipated Personal Injury Collisions (5 Years)

	Observed PICs	Anticipated PICs
Links	**Number (Rate – PICs per million vehicle km)**	**Number (Rate – PICs per million vehicle km)**
1) Madingley Road -400m west of Cambridge Road Junction to Cambridge Road junction.	7	3
2) Madingley Road -Cambridge Road and M11 off-slip	2	6
3) Madingley Road -M11 off-slip to west of JJ Thomson Avenue	4	9
4) Madingley Road -West of JJ Thomson Avenue to east of Grange Road	4	6
Junctions	**Observed PICs**	**Anticipated PICs**
1) Madingley Road – Cambridge Road crossroad junction	7	6
2) Madingley Road – M11 off-slip signalised junction	1	6
3) Madingley Road – M11 on-slip signalised junction	1	6
4) Madingley Road – Park & Ride signalised junction	4	5
5) Madingley Road – High Cross priority junction	1	3
6) Madingley Road - JJ Thomson Avenue priority junction	2	3
7) Madingley Road – Clerk Maxwell priority junction	2	2
8) Madingley Road –Wilberforce Road priority junction	2	2
9) Madingley Road – Storey's Way priority junction	5	6
10) Madingley Road - Grange Road signalised junction	4	6

Notes: Link only rates have also been calculated for roads where there are no adjoining junctions along its length.
Collisions within 20m of the major junctions identified in this table have been allocated to the junctions. Any other collision occurring at minor unspecified junctions are allocated to the link in question. The link rates have therefore been calculated as a combined link and minor junction personal injury collision rate apart from those identified separately in the table above.

3.9.5 A total of 46 collisions were observed along Madingley Road within the study area. Of the observed incidents:

- 1 was classified as a fatal injury collision
- 12 were classified as a serious injury collision, and
- 33 were classified as slight in severity.

3.9.6 A review of the individual junctions and links is contained in Appendix 3.6.

3.9.7 There are a high number of collisions involving vulnerable road users – albeit it is acknowledged that:

i) motorcycle usage in Cambridge is generally 25% higher than the rest of the UK; and

ii) Cambridge City is recognised as having a high number of cycle movements.

3.9.8 The road safety assessment has identified three existing road safety issues – at:

i) the Madingley Road / Storey's Way priority junction;

ii) Madingley Road / Grange Road signalised junction; and

iii) Madingley Road / Cambridge Road crossroads.

3.9.9 Whilst the proposed development will not result in any detriment to the existing highway safety conditions within the site vicinity, as part of the West Cambridge Development remedial measures are proposed at these two locations - further details of these proposed measures are discussed in Sections 6.6 and 15.

4 Summary of Policy Review

4.1 Introduction

4.1.1 This section summarises existing national and local policy, guidance and emerging strategies and provides an assessment of the performance of the proposed development against these policies. A detailed summary is included in Appendix 4.1.

4.1.2 This section identifies that the Development accords well with national and regional transport policy and guidance to deliver sustainable development, as well as with the key local transport and planning policy objectives. It shows that, overall, the proposals for the Development, and the transport strategy evolving to support it, will make a substantial and significant contribution to sustainable development objectives and policies for the Cambridge area.

4.2 Policy, guidance and emerging strategy documents reviewed

4.2.1 The following documents were reviewed:

National Policy Guidance

- National Planning Policy Framework (NPPF);
- Planning Practice Guidance;
- Circular 02/2013 'Strategic Road Network and the Delivery of Sustainable Transport';

Local Policy and Guidance

- Cambridge Local Plan 2014;
- Greater Cambridge City Deal;

Local Transport Policy and Guidance

- Cambridgeshire Local Transport Plan 2011-2026; and
- Transport Strategy for Cambridge / South Cambridgeshire

4.3 Analysis and application of current policy, guidance and emerging strategies

4.3.1 It is concluded that the Development accords well with national transport policy and guidance to deliver sustainable development:

i) its sustainable location within Cambridge, and the incorporation of employment well located adjacent to residential land-uses reducing the need to travel - supporting the stated aspirations and objectives of paragraph 34 of the National Planning Policy Framework; and

ii) by promoting ways to reduce the traffic impact of this development and the University's other activities within Cambridge, and by "managing down" traffic generation, the Development supports the policy of the Department for Transport's Circular 02/2013.

4.3.2 The development also accords with important local transport and planning policy requirements:

i) of Policy 18 of the Cambridge Local Plan - by including a comprehensive transport strategy for the site, incorporating a sustainable transport plan to minimise reliance on private cars – including an assessment of the level, form and type of car parking on the site, as well as enhancing links for walking, cycling and public transport links (including access for all) to the city centre, railway station(s), other principal educational and employment sites, and other key locations within the city to support sustainable development;

ii) by improving the local footpath and cycleway network as an integral part of a wider transport system – thus improving access to the surrounding countryside – according with the Cambridgeshire Rights of Way Improvement Plan; and

iii) of the measures identified within the Cambridge Long-Term Transport Strategy, the public transport strategy would deliver enhanced public transport services.

4.3.3 This Transport Assessment identifies the transport strategy and travel demand management measures to ensure that the Site will be developed in accordance with national and local policy, as well as the broad long-term strategy for the development of Cambridge as set out in the local planning documentation

4.3.4 Overall, the proposals for the Development, and the transport strategy evolving to support it, will make a substantial and significant contribution to the achievement of sustainable development objectives and policies for the Cambridge area.

PART 2 DEVELOPMENT ACCESS AND MOVEMENT DETAILS

Part 2 of the Transport Assessment contains the following sections:

Section 5 - Access and Movement Strategy

Section 6 - Pedestrian and Cycle Strategy

Section 7 - Public Transport Strategy

Section 8 - Car Parking Provision, Vehicular Access and Site Layout

Section 9 - Travel Demand Management Strategy

Section 10 - Construction Access Strategy

5 Access and Movement Strategy

5.1 Introduction and Policy background

5.1.1 As summarised in Section 4, both national and local planning / transport policy have a series of objectives to integrate planning and transport at all levels, through the promotion of development uses located to enable good accessibility by non-car modes of transport.

5.1.2 This policy context for sustainable travel is established within the National Planning Policy Framework. This Framework emphasises that development and transport systems should be planned in order to reduce the need to travel and increase the use of sustainable transport modes to encourage people to move about by foot, cycle and bus.

5.2 Transport objectives

5.2.1 The overall transport strategy for the Development responds to a number of important national regional and local objectives, which may be summarised as follows:

i) providing development components, development layout and disposition of uses designed from the outset to be inherently sustainable, pedestrian and cyclist friendly, being based upon the provision of an integrated transport system as well as minimising the distance to travel overall;

ii) encouraging the use of sustainable forms of transport such as walking, cycling, and public transport, thus reducing the dependency on the motor vehicle;

iii) minimising the traffic impact of the development;

iv) assisting in reducing the number and severity of personal injury collisions on the local roads;

v) integrating the development proposals with the wider existing and proposed transport network;

vi) reducing “greenhouse gas “ vehicle emissions; and

vii) implementing a Travel Plan / Travel Demand Management strategy for the development.

5.3 Summary of the Development Access and Movement Strategy

5.3.1 The Access and Movement Strategy set out in the following five sections reviews the overall accessibility of the Site for pedestrians, cyclists and public transport users, which enable the mode use targets stated in Section 10 to be set. It also sets out the accessibility strategies for each mode to enhance connectivity and accessibility both on- and off-site to encourage local journeys by sustainable modes of travel.

5.3.2 The basis for the access and movement strategy for the Development is set out on the Access Parameters Plan for the development prepared by Aecom, reproduced in Appendix 2.3.

5.3.3 This strategy provides public transport connections for the major residential and employment areas along a high density development public transport priority route.

5.3.4 The elements of this Development Access and Movement Strategy are considered individually in the following sections:

- Section 6 – Pedestrian and Cycle Strategy;
- Section 7 – Public Transport Strategy;
- Section 8 – Site Layout, Vehicular Access and Parking Provision;
- Section 9 – Travel Demand Management Strategy;
- Section 10 – Construction Access Strategy.

6 Pedestrian and Cycle Strategy

6.1 Introduction

6.1.1 It is widely acknowledged that Walking forms the most important mode of travel for local trips, and across the UK offers the greatest potential to replace short distance car trips of less than 2km (as set out in previous Government Policy such as PPG13). Similarly, and also across the UK, Cycling offers the greatest potential to replace short- and medium-distance car trips up to 5km. Local evidence referred to by the Highway Authorities suggests that people within Cambridge Walk and Cycle further distances than the national average. As such, Walking and Cycling form essential elements of the Access and Movement Strategy for the Development.

6.1.2 This Section considers further the following aspects of Pedestrian and Cycle movement:

i) Summary of the Policy background;

ii) Travel Demand Management measures to promote Walking and Cycling usage;

iii) On-site infrastructure strategy;

iv) Off-site infrastructure strategy – considered by the three individual major corridor routes.

6.1.3 This Section identifies that the Development is well-located for Walking and Cycling with respect to existing Pedestrian and Cycle facilities, and to connect to other emerging developments and infrastructure proposals in the area. The Development will deliver safe, high-quality Walking and Cycling infrastructure in the area further to support and encourage Walking and Cycling modes. As such, it is concluded that Walking and Cycling will form a significant percentage of the mode share for local trips, reflecting and responding positively to local and national policy guidance and strategies.

6.1.4 The proposed strategy outlined in this section was derived following:

i) a series of workshops with the West and North West Cambridge Cycling Group, a community group set up to seek local information relating to existing operational issues;

ii) an initial response from the Cambridge Cycling Campaign;

iii) a review of existing Cycle movement data – including the Strava Heatmap, and an analysis of home postcode information for existing occupants of West Cambridge, as provided by the University; and

iv) further meetings with the Highway and Cycling Officers of Cambridge City and Cambridgeshire County Councils.

6.1.5 As agreed with the Joint Authorities, as equestrian movements will not contribute in any measurable degree towards the stated objectives of reducing car-based journeys to work, the provision of new equestrian facilities across the Site to support the existing bridleway will not form a part of the strategy.

6.2 Policy background

6.2.1 The National Planning Policy Framework states that

- a core land-use planning principle is that development should "make the fullest possible use of … Walking and Cycling, and focus significant development in locations which are or can be made sustainable"; and

- "developments should be located and designed …. to create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians".

6.2.2 This policy context is supported by the objectives of the Cambridgeshire Rights of Way Improvement Plan, i.e., an emphasis of the need to improve and promote the public rights of way network in the area, give priority to Walkers and Cyclists throughout the Site, and to provide quality links to the surrounding Walking and Cycling network.

6.2.3 The proposed Development Walking and Cycling strategy further reflects fully the policy identified within the NPPF and the Transport Strategy for Cambridge and South Cambridgeshire by:

i) implementing travel demand management strategy techniques to enhance the status of Pedestrian and Cycling modes;

ii) providing enhanced infrastructure where necessary to assist Pedestrian and Cyclist movements.

6.3 Likely Future Cycle Movements

6.3.1 Using the dataset obtained from the University travel survey undertaken in May 2015, an assessment has been undertaken of the likely movements. This assesses the home post code data for existing cycle users likely to be located at West Cambridge in 2021 (i.e., including for the existing occupiers, and those potentially relocating to West Cambridge). As per Table 3.1, these home locations has been analysed along the same broad travel corridors. The output is reported in Appendix 6.1 and summarised in Table 6.1.

6.3.2 This assessment supports the earlier Development Cycle Strategy in Section 3, with:

i) around 30% of movement to the north, across Madingley Road;

ii) around 25% of movement to the east, along the existing facilities along Madingley Road;

iii) around 40% of movement passing to the east, along the Coton Path, continuing along towards the City; but

iv) with a limited number, only around 3% of existing cycle movements, assigning to the west across the motorway.

Table 6.1: Likely Cycle to West Cambridge Movements (2021)

Cyclists					Total			
Corridor	Staff	Students	Total	%	Staff	Students	Total	%
North, beyond Girton	17	2	19	3%	59	2	61	6%
North of City	95	75	170	24%	118	79	197	19%
North-east, beyond Milton	2	0	2	0%	40	0	40	4%
North-east area of City	14	48	62	9%	22	57	79	7%
South-east area of City	63	51	114	16%	84	58	142	13%
South-east, towards Balsham	4	2	6	1%	18	2	20	2%
South area of City	21	82	103	15%	32	101	133	13%
Towards Great Shelford	8	1	9	1%	26	0	26	2%
South-west, beyond Barton	2	0	2	0%	2	0	2	0%
West Cambridge, North-west of City and Girton	45	144	189	27%	60	189	249	24%
West along the A1303 Corridor , beyond Coton	20	3	23	3%	74	7	81	8%
North-west, towards St Ives	1	0	1	0%	23	0	23	2%
Other	0	0	0	0%	6	0	6	1%
Total	292	408	700	100%	564	495	1059	100%

Source: SDG – University of Cambridge – Travel Survey and Segmentation Study – October 2015
The net likely Cycle movement responses should be considered in the context of the response rates of 34% Staff and 10% Students reported.

6.4 Measures to promote Walking and Cycling usage

6.4.1 This section presents a Walking and Cycle Strategy to be brought forward with the proposals for West Cambridge, in the context of the new development at the North West Cambridge and the surrounding existing Cycling infrastructure.

6.4.2 Reflecting the post code data in Table 6.1, the West Cambridge Development Strategy proposes changes to the wider network of routes to:

- ensure good permeability through West Cambridge;
- strengthen links between West Cambridge and the adjacent North West Cambridge;
- improve access to the surrounding area, including to the City Centre.

6.4.3 This Strategy is based on:

- a review of the existing Walking and Cycling network;
- Walking and Cycling infrastructure improvements already proposed or under construction by others; and
- an initial assessment of Walking and Cycle demand forecasts to identify further improvements that may be required to ensure future levels can be safely and efficiently accommodated.

6.4.4 The measures that are to be implemented at the Development to encourage Walking and Cycling include:

6.4.5 ***Design concept*** – a principal objective is to deliver a compact mixed-use development that would encourage sustainable travel choices, particularly Walking and Cycling – as emphasised in the Department for Transport's Manual for Streets (2007);

6.4.6 ***Site Design and Layout*** – the following principles have been incorporated in the Development design to reduce the number of car trips to and from the Site by encouraging Walking and Cycling:

- in terms of cycle link capacity, reference has been made to the guidance for potential peak hour flows reported in the London Cycling Design Standards (updated 2014 - Transport for London) to ensure that the cycling facility is ft for purpose. These width guidance standards and flow categories are summarised in Table 6.2 and Table 6.3 respectively:

Table 6.2: Summary of guidance on widths

	Recommended minima		
Cycle Lanes	**2.0 metres**		
	Lanes of 1.5 to 2 metres may be acceptable provided that the adjacent traffic lane does not have fast-moving traffic and a high proportion of HGVs and is not less than 3.2 metres wide.)		
Near-side lead-in lanes to ASLs	**1.5 metres**		
	This should be for short lead-ins only, allowing space for cyclists to pass waiting traffic and access the ASL. Site-specific physical and traffic conditions may dictate that a 1.2- to 1.5-metre lead-in is preferable to no lead-in.		
Bus / Cycle lanes	**4.5 metres**		
	This should be for short lead-ins only, allowing space for cyclists to pass waiting traffic and access the ASL. Site-specific physical and traffic conditions may dictate that a 1.2- to 1.5-metre lead-in is preferable to no lead-in.		
Cycle tracks		**one-way**	**two-way**
Including segregated lanes	very low / low flow medium flow high / very high flow	1.5 metres 2.2 metres 2.5 metres +	2.0 metres 3.0 metres 4.0 metres +

Source: Figure 4.11, LCDS Summary of guidance on widths on carriageway

Table 6.3: Flow categories for Cyclists

	Peak hour categories for Cyclists on lane / track		Daily flow categories for Cyclists on carriageway			
	Peak Hour		Peak Hour		24-hour	
	one-way	two-way	one-way	two-way	one-way	two-way
Very Low	<100	<100	<600	<600	<800	<800
Low	100-200	100-300	600-1,000	600-2,000	800-1,600	800-2,000
Medium	200-800	300-1,000	1,000-4,000	2,000-6,000	1,600-5,500	2,000-8,000
High	800-1,200	1,000-1,500	4,000-5,000	6,000-8,000	5,500-6,000	8,000-10,00
Very High	1,200+	1,500+	50,0+	8,000+	6,000+	10,00+

Source: Figures 4.12a and b, LCDS - Peak hour flow categories for cyclists

- to ensure that the focus of the accessibility strategy for the Site remains strongly in favour of sustainable modes of transport, the Site has been provided with permeable footways and Cycleways across the development, with Pedestrian crossings delivered on the site access roads along the desire lines;

- as shown on Figure 6.1, for the on-site provision the following is proposed:

  - **North - South connections** - between Madingley Road and Coton Path using the Western Access, High Cross, JJ Thomson Avenue and Clerk Maxwell Road. These links will be supported with controlled crossings on Madingley Road;

  - **East - West Shared Space Link** - to provide the main east - west spine for Pedestrians and Cyclists connecting Clerk Maxwell Road and High Cross with access to a number of plots and lower-hierarchy Cycle routes;

  - as with North West Cambridge, all vehicle routes will be designed for a 20mph speed limit using passive speed management measures - such as constrained widths and the use of shared surface areas. This low-speed environment is primarily to control vehicle speeds, but in so doing will create a safer and more attractive environment for Pedestrians and Cyclists;

- the footpaths and Cycleways throughout the development will create links to existing public rights of way, and Cycle routes.

6.4.7 ***Services and Facilities*** – a series of measures will be implemented within the Development to encourage Walking and Cycling, including:

- footways would be provided on both sides of the on-site streets and at the Site Access locations. Controlled crossing points would be provided, and traffic calming measures would be present to reduce traffic speed and to ease Pedestrian movement;

- high levels of quality Cycle parking - at least to the adopted Cambridge Local Plan 2014 minimum Cycle parking standards - will be provided within private covered, secure, lit and well-located areas at the destinations, as well as further provision through the Development. The intention is to reflect the existing quality cycle parking provided on site, such as outside the Sports Centre (which was complimented by the Cambridge Cycle Campaign in recent correspondence);

- all major employers would be required to provide associated shower and changing room facilities for Pedestrians and Cyclists after their journeys; and

- application of a Cycle Parking Provision and Management Strategy – see Section 8. Cycle parking will be provided as near as possible to the main entrance of the buildings, and will be covered by natural surveillance or CCTV.

6.5 On-site Infrastructure

6.5.1 The Pedestrian and Cycle infrastructure strategy within the Development, shown on Figure 6.1, has been determined to respond to the following three aspirations:

i) to provide full permeability throughout the Development;

ii) to provide connectivity between the Development and the surrounding area; and

iii) to enhance existing connectivity between surrounding areas using routes through the Development.

6.5.2 The on-site infrastructure strategy for within West Cambridge responds to the following issues raised by Cambridge Cycling Campaign of:

i) lack of clear pedestrian-cycle segregation;

ii) two tier provision – concerns over mixing with motor vehicles or pedestrians; and

iii) lack of continuity of Cycle paths, and the priority afforded to motor vehicles.

6.5.3 Whilst the Cambridge Cycling Campaign identified as an issue wide junctions formed with large radii, the infrastructure provided for the on-site roads has to reflect the likely range of users. Notwithstanding, all routes within the Development will be designed in accordance with the principles of the suite of Manual for Streets design guidance to contain vehicle speeds and flows, and to provide a quality streetscape.

6.5.4 These Pedestrian and Cycle connections through the Development will ensure quality accessibility and connectivity to the surrounding areas. They will also significantly enhance and improve the linkages between existing developments – such as Madingley and Coton and the City Centre, and Girton and North West Cambridge and the south of Cambridge – by providing direct quality links on desire lines.

6.5.5 As shown in Appendix 3.1, Cambridgeshire County Council has delivered a combined cycleway / footway along much of Madingley Road, albeit that this is not contiguous between the City and the Park and Ride Site – a gap is formed in the provision to the west of Madingley Rise. Whilst comments have been received from the City Council suggesting that the University provide infrastructure to complete this link, this gap would not affected the movements to West Cambridge as the on-site facilities would provide a quality alternative, negating the need for this.

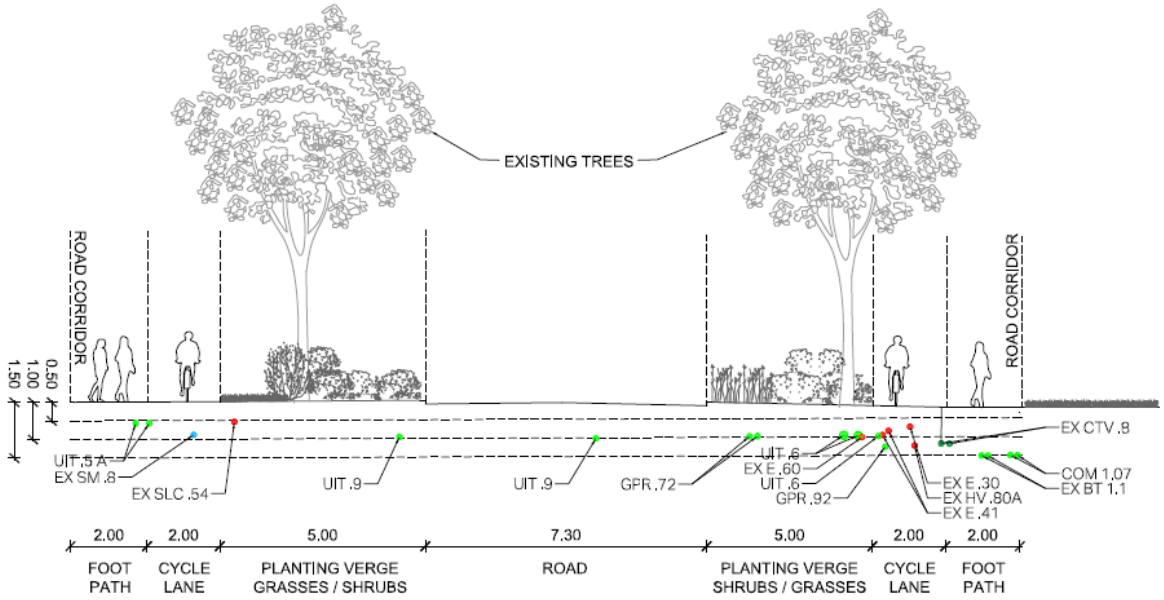
6.5.6 The proposed cross-sections for the main roads within the development are detailed.

JJ Thomson Avenue and High Cross

6.5.7 JJ Thomson Avenue, High Cross and the Western Access Road will deliver North - South connectivity through the Development.

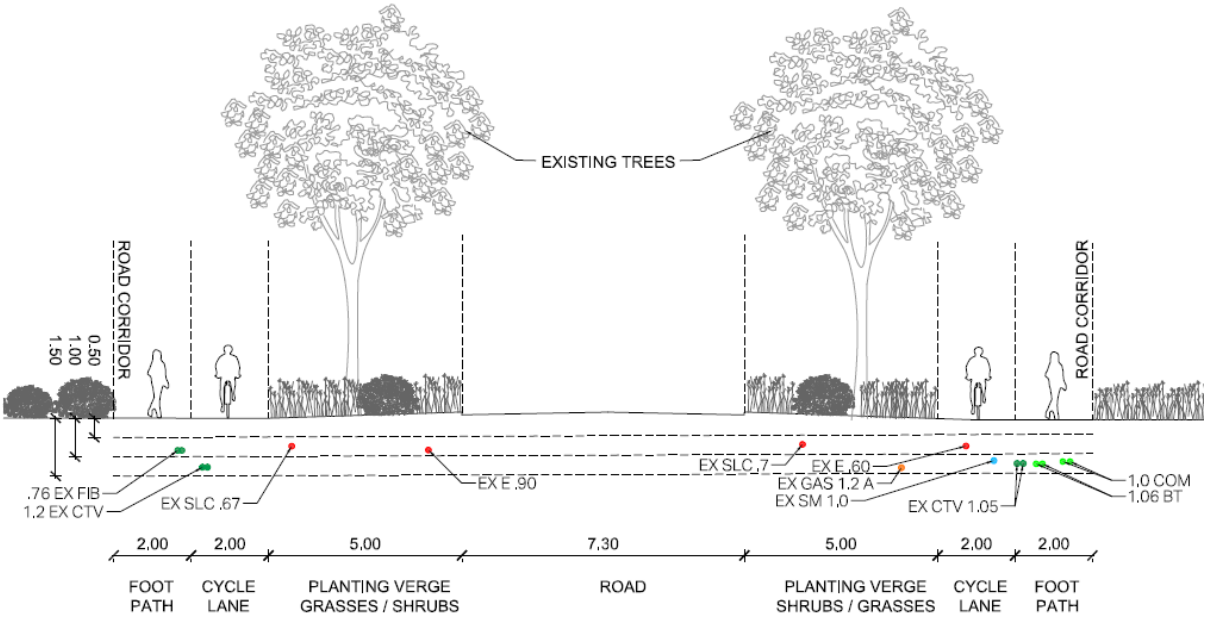
6.5.8 JJ Thomson Avenue and High Cross will cater for the majority of the through-development north – south Pedestrian and Cycling provision, so will be designed to accommodate higher volumes of movement. The proposed cross sections of 7.3 metre carriageways for vehicles, with 2.0 metre with-flow segregated Cycle tracks and 2.0 metre wide footways. The Cycle tracks are segregated from the carriageway by a 5.0 metre buffer of trees, with a further 2.0 metre planted buffer between the plot boundaries and the footways. This is shown in Figures 6.2 and 6.3 respectively:

Figure 6.2: JJ Thomson Avenue Proposed Road Cross Sections



(Source: AECOM)

Figure 6.3: High Cross Proposed Road Cross-Section



(Source: AECOM)

Western Access Road

6.5.9 As the level of Walking and Cycling movement along the Western Access Road will be lower than JJ Thomson Avenue or High Cross, the infrastructure provision would therefore be correspondingly less.

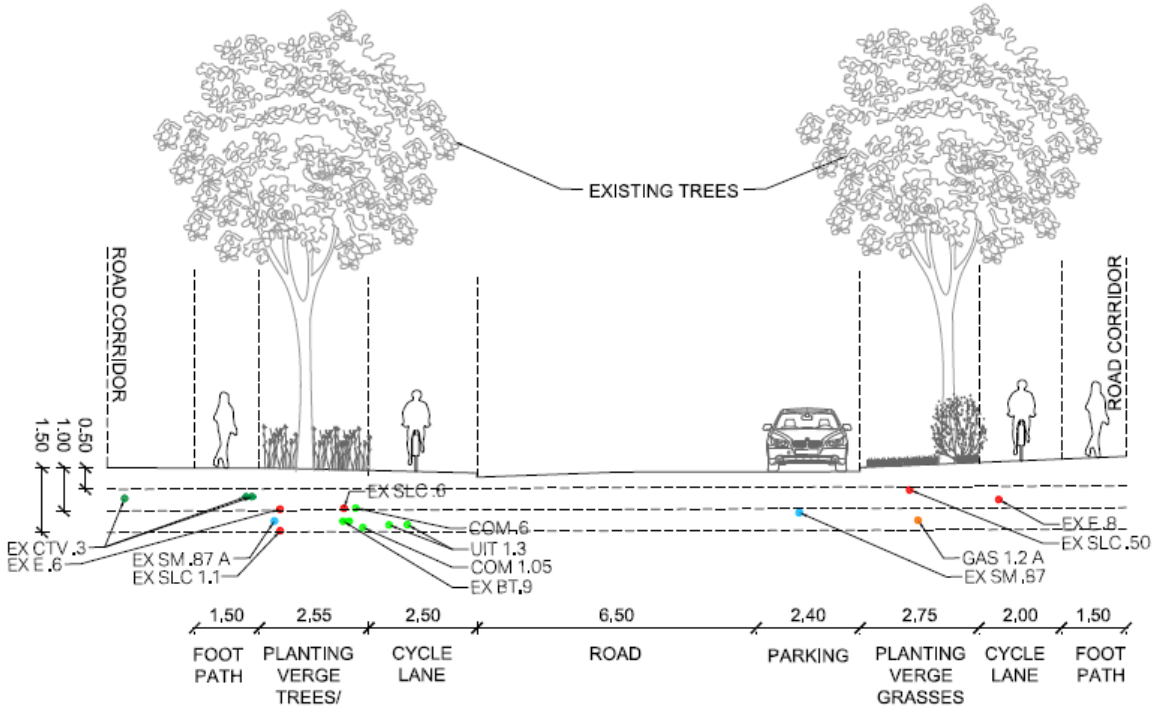
6.5.10 To facilitate these new movements, the existing on-carriageway car parking along this road will be removed as part of the West Cambridge car parking strategy. The resultant carriageway will be 6.8 metres wide, with a 3.0 metre two-way Cycle track on the eastern side of the road. There will be a 1.5 metre wide footway on the western side.

Charles Babbage Road

6.5.11 Charles Babbage Road will provide direct East – West connectivity through the Development for all movement.

6.5.12 Charles Babbage Road has a 6.5 metre carriageway for vehicles, with each side of the carriageway having a planting and tree buffer with a Cycle track of 2.0 metres (east verge) or 2.5 metres (west verge) and 1.5 metre footway. This is shown in Figure 6.4:

Figure 6.4: Charles Babbage Road Proposed Road Cross-Section



(Source: AECOM)

Cycle Priority at Side Roads

6.5.13 To maintain their attractiveness, the proposed with-flow segregated Cycle tracks along the main routes through West Cambridge must be continuous and as such retain priority over side road junctions and vehicular accesses to plots. To achieve this, the priority along the Cycle track would be clearly identified when crossing the side road - this would also serve to slow on-site vehicle speeds.

Figure 6.5: Example of side road treatment

6.5.14 Inter-visibility between Cyclists and Motorists is essential to provide each with sufficient time to assess the situation on the approach and enhance safety. This means that the proposed landscaping – the tree species and hedgerows - will be designed so these should not inhibit visibility for Motorists or Cyclists on approach to the side roads such as the East - West shared space link which crosses JJ Thomson Avenue and High Cross, and accesses to major occupiers.

Summary

6.5.15 The strategy outlined above provides only a limited number of routes that require cyclists to be on-road: these are confined to quiet none-through routes.

6.5.16 The 'with-traffic' provision on the main routes will have a segregated provision either adjacent to the road (e.g. the Western Access Road) or adjacent to the footway (e.g. Charles Babbage Road, High Cross, JJ Thomson Avenue).

6.5.17 As new on-site infrastructure is delivered, cyclists would be provided with continuous routes, with priority over side road movements.

6.6 Off-site infrastructure enhancements

6.6.1 The Development is anticipated to generate increased levels of Cycling and Walking trips across the network. To enhance the existing Pedestrian and Cyclist connectivity further, the following Pedestrian and Cycle infrastructure enhancements will be provided by the Development. These proposals are entirely compatible with the proposals of the County Council and other developers in the area referred to previously, and are shown on Figure 6.6.

6.6.2 The Off-site Walking and Cycling infrastructure enhancement strategy shown on Figure 6.7, responds to the comments of the North West Cambridge Cycling Group and the Cambridge Cycling Campaign and considers the following elements:

- resolving existing road safety issues;
- to the north – towards North West Cambridge, Girton and Huntingdon Road;
- to the City Centre – along Coton Path, Adams Road and Burrell's Walk;
- towards the City Centre – along Grange Road, Sidgwick Avenue, and Silver Street.

6.6.3 Several of the Walking and Cycling infrastructure enhancements on these routes involve the delivery of a "Cycle Street". A Cycle Street enhances the priority of Cycle movements over those of motor vehicles through a combination of measures including:

- the implementation of road markings emphasising the Cycle route;
- rationalised car parking bays - to achieve good inter-visibility between all road users;
- appropriate waiting and loading restrictions;
- removed centre line road markings;
- narrowed road carriageways and other traffic-calming measures - generally using sinusoidal speed humps).

6.6.4 The objective of these Cycle Streets is to reduce vehicle speeds to those of a typical Cyclist - thereby removing a major potential conflict caused by overtaking manoeuvres.

6.7 Resolving existing road safety issues, and environmental improvements

6.7.1 As identified in the Road Safety Review in Section 3, there appear to be two existing road safety issues on the local network disproportionally affecting cyclists:

i) a number of conflicts between cyclists / motor cyclists and motorists both passing from west to east at the Madingley Road / Storey's Way junction; and

ii) a similar number of conflicts at Madingley Road / Grange Road traffic signal controlled junction between left-turning motorists and cyclists travelling straight ahead.

6.7.2 In addition, the University will contribute towards the costs of implementing a reduction in the existing 40mph speed limit on Madingley Road (see below).

6.7.3 These measures are considered further.

Madingley Road / Storey's Way ghost island priority junction

6.7.4 Three collisions have occurred at this junction between cyclists / motor cyclists and vehicles, all of whom were passing from west to east.

6.7.5 The Madingley Road / Storey's Way junction is a ghost island priority junction, with the extent of the right turning lane defined by two physical islands within the carriageway. A toucan crossing is located approximately 30m to the east of Storey's Way. Whilst a cycleway has recently been delivered by Cambridgeshire County Council in the northern verge along Madingley Road, from on-site observation a significant percentage of cyclists continue to travel on the carriageway of Madingley Road.

6.7.6 Whilst the physical islands provide some protection for vehicles waiting to turn into Storey's Way, as well as some limited protection for pedestrians crossing Madingley Road, they provide a constraint to the available carriageway width. It appears that this reduction in carriageway width results in vehicles drifting towards the channel where cyclists will generally be, and the conflicts occur.

6.7.7 It is suggested that these islands are unnecessary to provide the protection for the turning vehicles –especially within the Cambridge urban context – and that priority is provided for crossing Cyclists and Pedestrians at the toucan crossing immediately adjacent.

6.7.8 To assist in resolving this existing issue, the University will work with Cambridgeshire County Council in promoting scheme to remove the physical islands - to be replaced with at-grade carriageway construction, to extend the advisory cycle lane across the junction up to the dropped kerb to access the toucan to the east. This concept is shown on Figure 6.8.

Madingley Road / Grange Road junction

6.7.9 Four collisions have occurred at this junction between cyclists and vehicles:

i) two cyclists passing from east to west being struck by left turning vehicles; and

ii) one cyclist passing west to east being struck by a vehicle;

iii) one cyclist changing lane to pass from west to south being struck by a vehicle.

6.7.10 On the eastern approach to this junction, the Advanced Stop Line is connected by a short length – approximately 15m - of feeder cycle lane. Whilst the western approach has an Advanced Stop Line, there is no feeder cycle lane. It is suggested that this feeder lane is encouraging cyclists to increase speeds through the junction, potentially undertaking, leaving them vulnerable to the motorists turning ahead of them.

6.7.11 To assist in resolving this existing issue, the University will work with Cambridgeshire County Council in promoting a scheme to resolve this. The works would include:

i) extending the advanced stop line on both Madingley Road approaches to 7.5m;

ii) review whether cycle “head-start” green times can be included within the traffic sign controls; and

iii) providing a road-side safety mirror on the traffic signal posts – this will both alert motorists of this issue, as well as making approaching cyclists more conspicuous to motorists.

Environmental Improvements

6.7.12 A 40mph speed limit is in force on Madingley Road adjacent the West Cambridge Development between the M11 Junction 13 and the approaches to the JJ Thomson Avenue junction.

6.7.13 Whilst this speed limit was appropriate when the traffic regulation order was applied - for the suburban Madingley Road link, being on the outskirts of Cambridge - conditions along Madingley Road have changed significantly subsequently. With the implementation of the North West Cambridge Development and the West Cambridge Development proposals, Madingley Road will be increasingly used by pedestrians and cyclists. As such, a speed limit slower than 40mph would be appropriate.

6.7.14 To provide an environmental enhancement in the locality of West Cambridge, the University will provide a contribution towards the costs of the necessary traffic regulation order to implement this reduced speed limit. The lower vehicle speeds will provide benefit for existing users of Madingley Road, as well as for the pedestrians and cyclists generated by West Cambridge

6.8 Off-site infrastructure enhancements towards the north

6.8.1 As shown on Figure 6.6, movement towards the north – along Madingley Road and through North West Cambridge to Girton and along Huntingdon Road – can make use of the extensive Walking and Cycling facilities provided by:

- Cambridgeshire County Council - along both Madingley Road and Huntingdon Road; and
- the University - the facilities provided through North West Cambridge – including the Ridgeway, and the North West Cambridge north - south Pedestrian and Cycle links.

6.8.2 To enable the users of West Cambridge Development to utilise these facilities all require quality crossings of Madingley Road. Madingley Road is a major arterial road connecting central Cambridge with the strategic M11 Junction 13. As such, Madingley Road can present a barrier to accessibility; hence there is the need to ensure safe and efficient crossings for Pedestrians and Cyclists.

6.8.3 North West Cambridge and West Cambridge have amended - or propose to amend - the Site Access junctions along Madingley Road to improve vehicular accessibility to these developments. Whilst provision has also been made for controlled crossing of Madingley Road by Pedestrians and Cyclists, these existing facilities would need to be further enhanced to accommodate the expected increased Pedestrian and Cyclist flows. More significant infrastructure would be required.

6.8.4 Whilst the highest movement of Pedestrians and Cyclists are predicted at the centrally located High Cross junction, to minimise the impact on vehicle movements along Madingley Road the strategy includes for the adoption of a series of crossings to disperse the movements to a series of locations. Indeed, this would also provide a benefit of offering Pedestrians and Cyclists more direct routes to their destinations within West Cambridge. Pedestrian and Cyclist controlled crossings exist or are proposed at the following locations on Madingley Road:

- around the existing Madingley Road / High Cross junction – albeit that this junction would be enhanced during the duration of West Cambridge;
- between Madingley Rise and JJ Thomson Avenue – where a new at-grade toucan crossing has recently been delivered (see Appendix 6.2);
- between Observatory Drive and Clerk Maxwell Road – a new toucan crossing is proposed to enhance movement between Observatory Drive / Storey's Way and Clerk Maxwell Road – see below;
- the Storey's Way junction – an existing toucan crossing which provides a link to the segregated path which connects Madingley Road to Clarkson Road; and
- between Lady Margaret Road and Grange Road – working with Cambridgeshire County Council and Cambridge City Council to investigate the need for a shared use pedestrian / cyclist crossing (a "Cycle Zebra" crossing) to enable full use of the existing facilities provided in both verges of Madingley Road, and if shown to be appropriate, to make contributions towards its delivery.

Grade separated crossing options at the Madingley Road / High Cross junction

6.8.5 Peter Brett Associates' Modelling was used to assess the optimum location for crossings between West Cambridge and North West Cambridge Developments across Madingley Road. This work indicated that the ideal location would be at the High Cross junction, as:

- this appears best to reflect the key desire line for Cyclists and Pedestrians between the developments, resulting in the maximum usage; and

- it minimises the demand at the alternative at-grade toucan crossing at Madingley Road / Madingley Rise / JJ Thomson Avenue, thus reducing the impact on the vehicle network capacity.

6.8.6 The Madingley Road / High Cross junction that was delivered as part of the North West Cambridge Development is shown in Figure 6.9. This scheme includes feeder Cycle lanes and Advanced Stop Lines, with at-grade Cyclist and Pedestrian crossing facilities on all arms.

6.8.7 Whilst these facilities are appropriate for the initial phase of development, the predicted use at this junction by Pedestrians and Cyclists following the full delivery of West Cambridge suggests that these existing at-grade facilities would be unlikely to accommodate the level of movement through this junction without impacting adversely on the vehicle capacity along Madingley Road. A number of options would be considered, including:

- enhanced at-grade facilities - providing wider feeder Cycle lanes, segregated Cycle lanes with separate signal phases for Cyclists, or Cycle crossings running parallel to the Pedestrian crossings – shown indicatively on Figures 6.10 and 6.11. To maintain sufficient vehicle capacity at this junction, this is likely to result in an increase of the size of the junction - which would require further land;

- a Bridge (Figure 6.12) or Tunnel (Figure 6.13) grade-separated crossings - given the desire line and constraints of existing infrastructure and land ownership, and noting the difficulties associated with providing better at-grade Cycle facilities, alternative potential Bridge or Tunnel grade-separated crossings were investigated.

6.8.8 The University will work with Cambridgeshire County Council to deliver a quality junction providing a reasonable balance of capacity for all modes – albeit not during the first phase of development, but at the appropriate time within the development delivery.

Enhanced crossing between Observatory Drive and Clerk Maxwell Road

6.8.9 To enhance direct movement between the Walking and Cycling route on Observatory Drive and Clerk Maxwell Road – accessing the eastern side of West Cambridge – an enhanced uncontrolled crossing of Madingley Road is proposed. This is shown on Figure 6.14.

Clerk Maxwell Road

6.8.10 Uncontrolled car parking is allowed on-road along Clerk Maxwell Road, where approximately 85 -90 car parking spaces are available. From observation, these spaces are regularly occupied, resulting in a poor quality link for cyclists and local residents, as well as increasing vehicle activity along this link.

6.8.11 The parking on this road would be susceptible to overspill car parking from West Cambridge.

6.8.12 As discussed and agreed with the Joint Authorities, the University would contribute towards the costs of this existing on-road car parking being removed from both sides of the carriageway, and being replaced with two mandatory cycle lanes. This would provide significant betterment for residents and cyclists, and improve the quality of the public realm on this link.

Shared use Pedestrian / Cyclist crossing between Lady Margaret Road and Grange Road

6.8.13 To enable better use to be made of the existing Madingley Road on- and off-road cycle facilities, the University will work with Cambridgeshire County Council and Cambridge City Council to investigate the demand for a shared use pedestrian / cyclist crossing (a "Cycle Zebra" crossing) between Lady Margaret Road and Grange Road, and if concluded to be appropriate, to make contributions towards its delivery. The approximate location is shown on Figure 6.7.

6.9 Off-site infrastructure enhancements towards the East

6.9.1 Movement between West Cambridge and the East is focused along Coton Path and Adams Road. Whilst this route can make use of the extensive existing Walking and Cycling facilities, it is intended further to enhance this existing infrastructure.

6.9.2 These elements are shown on Figure 6.15, and considered individually.

Coton Path

6.9.3 The Coton Path is located along the southern boundary of West Cambridge, and forms part of a quality, direct link between Adams Road (the eastern side, leading to the City) and Coton (to the west) for Pedestrians and Cyclists.

6.9.4 The home post code data summarised in Section 3 identifies that there are only a limited number of users of West Cambridge cycling in from the west, using the western end of this facility. As such, the proposed infrastructure enhancements for West Cambridge are focussed towards the east, being the greater percentages of existing users are resident – this ensures the maximum benefit from the mitigation.

6.9.5 To enhance Walking and Cycling, the University would make contributions towards the delivery of the following improvements to the existing Coton Path route, reflecting the concerns of the West and North West Cambridge Cycling Group, and the Cambridge Cycling Campaign:

- as shown on Figure 6.1, at the western end of West Cambridge, a new Cycle and Pedestrian route will be provided between the M11 bridge crossing and the Western Access Road within West Cambridge. This will reduce the distance between these two points by approximately 250 metres, providing better access to locations within West Cambridge;
- the Coton Path will be widened within the boundary of the West Cambridge site, where achievable, to improve connections to the east;
- improved connections to Coton Path will be redesigned to improve the layout for pedestrians and cyclists accessing West Cambridge. The key connections to be improved include those at the end of Clark Maxwell Road), the Cavendish Laboratory areas and that to the east of the Hauser Forum Building. The Cavendish Laboratory access would provide a new access to Coton Path that gives cyclists an alternative route between the existing Hauser Forum and Broers Building which can then become pedestrian only;
- as suggested by the Cambridge Cycle Campaign, maintenance to the existing vegetation that currently reduces the effective width of this route constraining forward visibility;
- the route would be realigned where possible to remove the sharp turns along Coton Path directly to the south of West Cambridge; and

- the eastern terminus of the Coton Path – the junction with Wilberforce Road and Adams Road – will be redesigned providing a more direct and continuous route for Cyclists while also slowing passing vehicles – thus prioritising Cycle movements. Details are shown on Figure 6.16.

Adams Road

6.9.6 Adams Road is a 7.3m wide single carriageway accessing residential properties, University facilities and a sports field to the north.

6.9.7 Whilst Pedestrians may make use of the existing footways in either verge, the easy movement of Cyclists along Adams Road is obstructed and constrained by the parked vehicles on either side. As the residential properties are provided with off-road car parking, Cambridge City Council has suggested that much of the car parking is commuter parking.

6.9.8 As shown on Figure 6.15, it is proposed that a Cycle Street environment could be created along Adams Road. As part of this, the University will contribute to the necessary traffic regulation orders to rationalise parking to provide more road space for Cycling.

6.9.9 As well as the car parking control, the Cycle Street scheme would require traffic-calming and the implementation of a 20mph speed restriction, to which the University will contribute.

6.9.10 This would deliver a high capacity, two-way on-road Cycle route along Adam Road to enhance movements to the east – and indeed, these proposals reflect the aspirations of the Cambridge Cycling Campaign.

Grange Road / Adams Road / Burrell's Walk Traffic Signal Controlled Junction

6.9.11 The existing Grange Road / Adams Road / Burrell's Walk junction is a four-arm traffic signal controlled junction. Pedestrian and Cycle movements are assisted by the provision of advanced stop lines on each of the three carriageway approaches, and the provision of Push-to-Walk buttons on each corner.

6.9.12 Following the enhancements to the Pedestrian and Cyclist route to West Cambridge, the junction will be reviewed:

- the junction signal timings will be reset better to accommodate the increased Pedestrian and Cyclist movements along Adams Road;
- consider whether cycle "head-start" green times can be included within the traffic sign controls; and
- to consider the delivery of further Cycle priority, by increasing the advanced stop line on the carriageway approaches to provide Cycle stacking space.

6.9.13 The existing speed table infrastructure at this junction will remain, but the road markings will be renewed.

6.10 Off-site infrastructure enhancements towards the City Centre

6.10.1 Existing Pedestrian and Cycle movement further to the east - beyond Adams Road towards the City Centre - is currently focussed on the existing Burrell's Walk.

6.10.2 Whilst acknowledging that there are some enhancements that could be made to the Burrell's Walk route – generally focussing these enhancements towards Pedestrian measures - it is intended that further Cyclist links be provided to the City Centre both to reduce the demand on Burrell's Walk, and to enhance the available capacity. These would utilise either of:

- the Grange Road – Sidgwick Avenue – Silver Street route, and
- the Grange Road – West Road – Queen's Green - Silver Street route.

6.10.3 These two routes are considered in greater detail, in addition to the potential measures along Burrell's Walk.

Grange Road – Sidgwick Avenue – Silver Street

6.10.4 As shown on Figure 6.15, a new, fast and high-capacity Cycle route could be created between the Grange Road / Adams Road junction and the City Centre – this will be an attractive signed alternative route to the relatively limited Cycle capacity offered by Burrell's Walk, thus controlling the existing and future number of movements along this route. This proposed route will follow the Grange Road – Sidgwick Avenue – Silver Street corridor.

6.10.5 Due to the potential volume of Cyclists and the width of the component links on this route - Grange Road, Sidgwick Avenue and Silver Street - a Cycle Street layout will be adopted.

6.10.6 Vehicle speeds along Grange Road are currently restricted by traffic-calming measures - speed humps and build-outs. Whilst these have some benefit for Cyclists by reducing vehicle speeds, they result in a highly-engineered feel to the road, one that is not conducive to easy Cycling.

6.10.7 The following, shown on Figure 6.15, is proposed as part of the Cycle Street infrastructure along the length of Grange Road:

- the existing speed humps and carriageway build-outs will be removed;
- given the use of this route by buses, the carriageway will be narrowed to 5.5 metres along its length and the centre line markings removed;
- the mandatory Cycle lanes will also be removed
- Cycle route markings and sinusoidal road humps will be provided;
- the speed tables at the junctions with Burrell's Walk and Sidgwick Avenue will remain, but the road markings will be renewed.

6.10.8 By controlling and reducing vehicle speeds, and by providing priority for cyclists over motorists, the attractiveness of Grange Road for motorists will be reduced, encouraging motorists to use other routes.

6.10.9 The following is proposed as part of the Cycle Street infrastructure along the length of Sidgwick Avenue – thus providing continuity to the cycle network along this corridor:

- sinusoidal road humps will be introduced along Sidgwick Avenue, to reduce vehicle speeds without being a detriment to Cyclist comfort;
- Cycle route markings will be provided;
- the University will also promote the implementation of a 20mph Zone in order to reduce vehicle speeds and improve conditions for Cyclists;

6.10.10 It is concluded that traffic speeds and flows along Silver Street are already appropriate - the rising bollards are effective at constraining vehicle movements.

6.10.11 Silver Street will remain as existing, but with a refurbishment of the signage and road markings.

Grange Road / Sidgwick Avenue Traffic Signal Controlled Junction

6.10.12 The existing Grange Road / Sidgwick Avenue junction is a priority junction, with Sidgwick Road forming the minor arm approach.

6.10.13 As part of the enhancements to Pedestrian and Cyclist routes to West Cambridge, two improvement options shown on Figure 6.17 have been considered

- a mini roundabout scheme; or
- a traffic signal controlled junction scheme.

6.10.14 A traffic signal controlled junction scheme could include:

- the existing Grange Road / Sidgwick Avenue priority junction being signalised;
- advanced stop lines being provided on all approaches – this will provide enhanced priority and protection to right-turning Cyclists; and
- consideration of whether cycle "head-start" green times can be included within the traffic sign controls;
- the junction signal timings being set to accommodate the increased Cyclist movements along Grange Road (North) / Sidgwick Avenue;
- the speed table at the junction remaining, but the road markings being renewed.

6.10.15 The mini roundabout scheme would remove the existing priority junction arrangement, and replace it with a mini roundabout and a suitable signing and marking scheme.

6.10.16 Further discussions would be required with the Joint Authorities to confirm the optimum solution.

Queen's Road / Sidgwick Avenue / Silver Street Traffic Signal Controlled Junction

6.10.17 The existing Queen's Road / Sidgwick Avenue / Silver Street junction is a traffic signal controlled junction. The following improvements would be considered to enhance Cyclist priority:

- advanced stop lines being reviewed on all approaches – this will provide enhanced priority and protection to right-turning Cyclists;
- the junction signal timings being set to accommodate the increased Cyclist movements along Sidgwick Avenue / Silver Street;
- whether cycle "head-start" green times can be included within the traffic sign controls; and
- reviewing the road markings, with the existing white lines repainted.

Grange Road – West Road – Queen's Green - Silver Street

6.10.18 An alternative fast and high-capacity Cycle route parallel to the Burrell's Walk route could be considered between the Grange Road / Adams Road junction and the City Centre along the Grange Road – West Road – Queen's Green - Silver Street corridor.

6.10.19 Instead of routing along Sidgwick Avenue as described above, as shown on Figure 6.15, the proposed route would follow along West Road to Queen's Road, crossing Queen's Road using new toucan crossing infrastructure, and across Queen's Green to Silver Street.

6.10.20 The Extant West Cambridge Development had a Section 106 commitment to provide contributions towards a traffic signal controlled junction scheme at Queen's Road / West Road junction, and an enhanced cyclepath crossing of Queen's Green to Silver Street. This is shown on the Hannah Reed drawing reference 95044/ PC08A included in Appendix 6.3. The University will work with the County and City Councils to understand the issues involved in providing this enhancement to the proposed traffic signal controlled Queen's Road / West Road junction enhancement, the cycle crossing facility of Queen's Road, and the crossing of Queen's Green. If the amended scheme is shown to be feasible, the University would make appropriate contributions to its delivery.

Burrell's Walk

6.10.21 As either the Grange Road / Sidgwick Avenue / Silver Street or the Grange Road / West Road / Queen's Green / Silver Street routes are being promoted for Cyclists as an alternative higher capacity, quicker route into the City Centre, the importance of the existing Burrell's Walk / Garret Hostel Lane will be reduced to that of a secondary Cycle route.

6.10.22 Whilst Cyclists would not be restricted from using Burrell's Walk, as part of the strategy of downgrading this route new signs would identify for Cyclists that access to Burrell's Walk be relocated to its Pedestrian access 50 metres south along Grange Road, opposite the entrance to Robinson College.

6.10.23 The Extant West Cambridge Development had a reference to providing contributions towards the delivery of a widened bridge and path along Burrell's Walk. This is shown on the Hannah Reed drawing reference 95044/ PC04 included in Appendix 6.4. The University will work with the County and City Councils to understand the issues involved in providing this enhancement. If the amended scheme is shown to be feasible, the University would make a contribution to its delivery if deemed necessary alongside the alternative (West Road or Sidgwick Avenue) cycle route enhancements (see above).

6.10.24 Notwithstanding whether these physical measures are progressed, the existing route will be subject to a general maintenance to improve its quality – potentially including:

- the trimming back of the existing vegetation that currently reduces the effective width of this route, restricts daylight permeability, and constrains forward visibility;
- a repainting of the existing road markings;
- enhanced signage – identifying that Burrell's Walk is used by both Pedestrians and Cyclists to seek more considerate cycling.

This would enhance the environment for all users - in particular those with visual impairments - whilst improving the perceived personal security by reducing hiding areas, and increasing capacity.

6.10.25 The reduction in the number of Cyclists on this route would improve conditions for Pedestrians.

6.11 Conclusions

6.11.1 The Development is well-located for Walking and Cycling with respect to existing Pedestrian and Cycle facilities.

6.11.2 The infrastructure proposals for West Cambridge would:

i) deliver quality Cycle and Pedestrian connectivity throughout the Development;

ii) enhance Pedestrian and Cyclist safety off-site for both users of West Cambridge, and for all other Walkers and Cyclists;

iii) deliver improved strategic connections to key local destinations - such as the residential, employment and retail offer at North West Cambridge, and the residential development at Girton and at NIAB, as well as towards the facilities within the City;

iv) significantly enhance the existing Pedestrian and Cycle provision to the surrounding area by providing and improving direct routes across the Development; and

v) overall, preserve and enhance the attraction of Pedestrian and Cyclist modes of travel.

6.11.3 The Development will deliver direct, high-quality Walking and Cycling routes in the area, to support and encourage travel using these modes. In addition, further infrastructure will be provided to enhance the connectivity to Cambridge City Centre. As such, it is considered that Walking and Cycling will form a significant percentage of the mode share for local off-site trips, reflecting local and national policy guidance and strategies.

7 Public Transport Strategy

7.1 Introduction

7.1.1 As noted previously, bus travel is an attractive alternative to the private car for many short- and medium- distance trips, offering the potential to replace car travel locally (such as to adjacent developments), to other destinations across Cambridge, and further afield. As such, public transport forms an essential element of the Access and Movement Strategy for the Development.

7.1.2 This section considers in detail the following aspects of a public transport strategy that would support the West Cambridge Development aspirations, would provide benefit to the surrounding area, and would be complementary to the emerging Greater Cambridge City Deal proposals:

i) Policy background;

ii) Public Transport Requirement

iii) Development Services;

iv) Scenario Detail;

v) On-site public transport infrastructure; and

vi) Information and Incentives.

7.1.3 Initial discussions have also been held with various stakeholders to agree the potential public transport strategy for the Site, including with

i) the Traffic Managers of both of the main local bus operators – Stagecoach Cambridge and Go Whippet; and

ii) the County Council's Public Transport officers.

7.1.4 This section shows that the Development is well-located, being adjacent to well-established and successful existing bus services that connect to a range of destinations in Cambridge itself and more widely through Cambridgeshire. It also identifies that the Development will contribute towards enhanced and additional bus services to increase bus usage, as well as providing quality infrastructure through the Development. It concludes that whilst bus usage will provide a non-car alternative mode share for short, medium, and longer distance trips (reflecting local and national policy guidance and strategies), the Development bus strategy would also reduce car trips between other origins and destinations apart from the Development itself.

7.2 Policy background

7.2.1 The policy context for public transport is established within the National Planning Policy Framework, published in March 2012, that states that

- there should be a positive balance in the transport system towards sustainable transport modes, and that this should give people a real choice about the way in which they travel (paragraph 29);

- the development should ensure that the use of sustainable transport modes can be maximised (paragraph 34);

- developments should be located and designed to have access to high quality public transport facilities (paragraph 35).

7.3 Bus Service Strategy

7.3.1 The scale of the proposed Development means that there will be both a high quantum of demand for public transport, and a number of locations that will need to be connected to West Cambridge. New and enhanced bus services will be phased in to align with the development quantum and consequent growth in demand. Ultimately, the links are expected to be as shown on Figure 7.1, derived with reference to the Travel Habit Survey undertaken in May 2015 by the University (see Section 7.8). These are summarised below:

- to the local Rail Stations – to both the existing Cambridge and future Cambridge North (Chesterton) Stations;
- to the City Centre;
- to the University / NHS sites in South Cambridge - including Addenbrooke's Hospital and the Cambridge Biomedical Campus;
- to various residential and employment / research sites around northern Cambridge - including North West Cambridge, the NIAB site and the Cambridge Science Park;
- residential areas along the A14 corridor - including St Ives and Huntingdon; and
- residential areas on the A428 corridor - including St Neots and the proposed Bourn Airfield proposals and Cambourne fringe developments.

7.3.2 The Site would need to be well served by local bus routes to deliver mode shift away from the private car for Journey to Work trips. The University's already active travel policy encourages staff and students to use public transport, cycle or walk wherever possible; to date this has been a highly successful measure and the future development of bus services in this corridor would enable bus mode share to be further enhanced.

7.3.3 The Public Transport Strategy has been developed to cater for the demand flows identified earlier, and in the context of existing - and committed - public transport service proposals in the area. The proposals will cater for several user groups, including:

- staff working on various University (and other) employment sites, largely travelling at peak times;
- staff travelling between different University and NHS Trust sites within the city, generally during the working day;
- residents living in the Development sites accessing employment, retail and leisure activities in Cambridge city centre or via one of the rail stations, travelling throughout the day;
- Students travelling to and from the University teaching, research, leisure and accommodation facilities, travelling throughout the day; and
- business visitors to West Cambridge, largely travelling to the city by rail within the working day.

7.3.4 To make the bus network as accessible and simple to use as possible, the University will work with the County Council and operators to be able to offer network ticketing, allowing for passengers from destinations other than Cambridge city centre to make journeys on other services and transfer using the same ticket stored on a smartcard, mobile phone or EMV wave and pay card. Emerging developments in ticketing and payment technology mean that measures such as daily and weekly price capping could also be included within this aspiration in due course.

7.3.5 The Route Strategy is set out below, showing proposed services for 2021 and, potentially longer term, for 2031.

7.4 2021 Route Proposals

7.4.1 **Uni 4** – acknowledging that the existing service reference and route is currently being reviewed:

i) revised to serve Cambridge Rail Station, en-route to and from Addenbrooke's Hospital and to operate on a loop around the Cambridge Biomedical Campus, enhancing access to developments on the site;

ii) increased frequency, potentially to every 10 minutes over the core North West Cambridge to Cambridge Rail Station section, and operation extended to Saturdays between North West Cambridge and the rail station. The section between Cambridge Rail Station and Addenbrooke's would operate every 20 minutes on Monday to Friday only.

7.4.2 **Citi 4:**

i) for the Initial Phase of development, to be revised to divert from a section of Madingley Road via High Cross to JJ Thomson Avenue, to operate within the West Cambridge Development;

i) no changes would be made to the frequency of the Citi 4 service.

7.4.3 **Orbital Service**:

i) operation of a new hourly service from West Cambridge via North West Cambridge, NIAB and the Science Park to Chesterton station (subject to the NIAB Development delivering the through-route from Huntingdon Road to Histon Road);

ii) Service provided initially by high quality minibuses, reflecting the relatively low levels of demand.

7.5 2031 Route Proposals

7.5.1 **Uni 4**:

i) as per the 2021 enhancement, subject to review of demand over the Silver Street to Addenbrooke's section with the introduction of an enhanced orbital service that extends to Addenbrooke's,

ii) it may no longer be necessary to operate the Uni 4 beyond the rail station (see below). This would require passengers travelling to/from Addenbrooke's to change buses at the rail station.

7.5.2 **Citi 4**:

ii) to be revised to divert from a section of Madingley Road to operate via the West Cambridge Development (Stagecoach suggested that they may initially divert alternate journeys through the site);

iii) increased frequency - potentially to every 10 minutes;

iv) Citi 4 will provide links to West Cambridge from the city centre and the A428 corridor; and

v) whilst Stagecoach agree in-principle with this approach, this would be subject to confirmation with reference to the likely demand.

7.5.3 **Orbital Service**:

i) Significant enhancement of the proposed Orbital Service with increased frequency and higher quality vehicles;

ii) the service would be extended beyond the currently proposed route to serve West Cambridge, then continue via the M11 motorway to Trumpington Meadows, the Cambridge Biomedical Campus and Addenbrooke's Hospital;

iii) the service would then give links to West Cambridge from Chesterton Rail Station, North Cambridge and South Cambridge;

iv) it is likely that the operation will be on a 20 minute frequency on Monday to Friday only.

7.5.4 **Guided Bus**:

i) there is the potential for the introduction of a variation service to the existing Guided Busway Service B, running from Hinchingbrooke– Huntingdon – Cambridge;

ii) the variation would operate from Orchard Park via North West Cambridge and West Cambridge;

iii) this would be in addition to the existing frequency on Service B and would provide direct links from the A14 corridor;

iv) subject to confirmation of demand, operation on a 30 minute frequency.

7.5.5 Other alternatives:

i) as there are interchange facilities between a range of high frequency services available in the City, it is not considered appropriate to operate direct through-services from eastern Cambridge to West Cambridge;

ii) this will be reviewed regularly, and in the event that a critical mass of demand emerges, this could then be served by cross-linking of routes or additional services.

7.6 Bus Specification

7.6.1 Services would be delivered with high-quality, low-emission vehicles with low floor, step-free access.

7.6.2 To increase the potential for bicycle use, the operators would be encouraged to provide cycle carriers on buses on these routes.

7.6.3 Operation on the guided busway would require high specification buses with low-emission engines, luxury leather seats, air conditioning or air chill, power sockets for phones / laptops and free wireless internet. These measures have proved to be attractive to potential users, and the operation of vehicles with similar features on the other non-Guided Busway routes listed above would be encouraged to enhance their appeal, and contribute to a higher take-up.

7.7 On-Site Bus Infrastructure

7.7.1 In order to facilitate an attractive bus service with good, safe headway through the Site and hence to users to the service, the following would be provided:

- high quality bus stops;
- bus priority measures - selected vehicle detection for buses through the traffic signal controlled junctions to improve the flow of buses or enable passengers to access facilities (acknowledging that this would cause a decrease in capacity for other movements); and
- information and incentives.

7.7.2 These are considered further in this section.

Bus Stops

7.7.3 High quality bus stops act as the gateway to the network, and as such are the 'shop window' that are seen by travellers on all modes as they make their journeys. Bus stops would be equipped at this Development with the following:

- a high quality, 3 sided shelter;
- seating and lighting;
- comprehensive timetable information, including network maps and fare details;
- a flag indicating services calling at the stop;
- off-bus ticketing facilities to speed boarding times such as smartcards, renewable online and mobile applications to speed boarding times;
- Real Time Passenger Information (RTPI) screens indicating departure times of the next bus;
- a raised kerb to assist the less mobile or those with pushchairs to access the bus;
- litter bins in close proximity but not obstructing access to and from the bus;
- cycle stands to allow cycle-bus interchange; and
- 'Bus stop' cage markings and an associated clearway order to keep bus stops free of other parked vehicles.

7.7.4 Provision of these facilities, and their prompt maintenance and repair by the bus operator or Development management, would ensure that the point of access to bus services is kept to a high standard, and would act as an attractor to public transport services within the Development.

7.7.5 It is considered that three pairs of bus stops would be required on the development site. The provision of these would be phased to reflect the progress of the emerging Development.

Bus priority measures

7.7.6 Bus priority would be provided by the use of Selective Vehicle Detection (SVD) technology at traffic signals controlling the entrances to the Site from Madingley Road – especially to the junctions with High Cross, and with JJ Thomson Avenue. This would detect approaching buses, and alter signal phases accordingly to ensure the minimum of delay to the bus.

Information and incentives

7.7.7 In addition to the provision of quality physical infrastructure, the provision of tailored information and incentives is now a mainstream method of attracting additional patronage to public transport networks around the UK.

7.7.8 To increase the use of public transport at the Development, journey planning and real time information on the services will be made readily available to residents, visitors, students and employees at the Development, be it at the bus stop, by telephone, SMS text messaging or the Internet. Portals are already available for remote access to bus information, for example through http://www.travelineeastanglia.co.uk which provides details of timetables, or http://www.cambridgeshirebus.info which provides Real Time Passenger Information. Traveline also operate a telephone service.

7.7.9 The management of the Development will ensure the bus stop information will be well-maintained. Any alterations to services will be advertised in advance and correct timetables inserted at stops as close as possible to the change date. This includes alterations to the wider network as shown on timetable panels in the shelters.

7.8 Accessibility to Future Bus Routes

7.8.1 An assessment has been undertaken of the current and potential University occupiers able to access easily the proposed development bus services. This assessment uses the Travel Habit Survey undertaken in May 2015 by the University of their Staff and Students, and considers:

i) the existing and future University users likely to be located at West Cambridge in 2021 (i.e., including for the existing occupiers, and those potentially relocating to West Cambridge);

ii) those existing and future University users resident within 400m of the routes travelled by the proposed bus routes to service West Cambridge;

iii) whilst many responses would be resident within 400m to more than one of these service routes, each response is assumed to use one service only, this service assumed to be the most frequent.

7.8.2 The assessment of the net responses is contained in Appendix 7.1, and summarised in Table 7.1.

7.8.3 The reported survey response rates were 34% of all Staff and 10% of all Students. Should the output reported in Table 7.1 be factored to reflect a full response by both Staff and Students, the numbers within easy access of the bus services would be significantly higher.

Table 7.1: Current and Potential West Cambridge Occupiers resident within 400m of the Development bus service routes

Service	Staff			Students			Total
	Current	Potential	Total	Current	Potential	Total	
Uni 4	27	19	46	101	90	191	237
Citi 4	16	6	22	15	9	24	46
X3	2	2	4	28	22	50	54
Orbital Services	17	17	34	0	0	0	34
Guided Busway Services	12	15	27	5	11	16	43

Source: SDG – University of Cambridge – Travel Survey and Segmentation Study – October 2015
These reflect response rates of 34% Staff and 10% Students.

7.8.4 This analysis of the home post code data of the current and potential occupiers of West Cambridge confirms that the service routes would both provide easy access to public transport, and would assist the commercial viability of these routes.

7.9 Summary

7.9.1 This section shows that the Development is well-located, being adjacent to well-established and successful existing bus services that connect to a range of destinations in Cambridge itself and more widely through Cambridgeshire. .

7.9.2 It identifies that the West Cambridge Development would contribute towards additional bus services further to:

i) enhance existing services to increase bus usage;

ii) provide quality infrastructure through the Development; and

iii) assist in the delivery of the Greater Cambridge City Deal aspirations.

7.9.3 The provision of a quality bus strategy will encourage the use of bus to form a significant percentage of the mode share for short, medium, and longer distance trips, and would reflect local and national policy guidance and strategies.

7.9.4 The University's already active travel policy has encouraged staff and students to use public transport, cycle or walk wherever possible; to date this has been a highly successful measure and the future development of bus services in this corridor would enable this to be further enhanced.

7.9.5 The assessment of the home post code data of the current and potential occupiers of West Cambridge confirms that the service routes would both provide easy access to public transport, which would assist the commercial viability of these routes.

7.9.6 Initial discussions held with various stakeholders regarding the potential public transport strategy for the Site - including with the Traffic Managers of both of the main local bus operators and the County Council's Public Transport officers – support the proposed strategy in principle.

8 Car Parking Provision, Vehicular Access and Site Layout

8.1 Introduction

8.1.1 Appropriate levels of car and cycle infrastructure form an essential element of the travel demand management strategy. Providing for the necessary vehicular and cycle trips associated with the development will help manage travel by car, and reflect the need to promote the use of other sustainable modes of travel.

8.1.2 This section considers in detail the following aspects:

i) Car parking strategy;

ii) Initial and Future car parking maxima;

iii) Area Action Plan cycle parking standards;

iv) Site Layout and Vehicular Access.

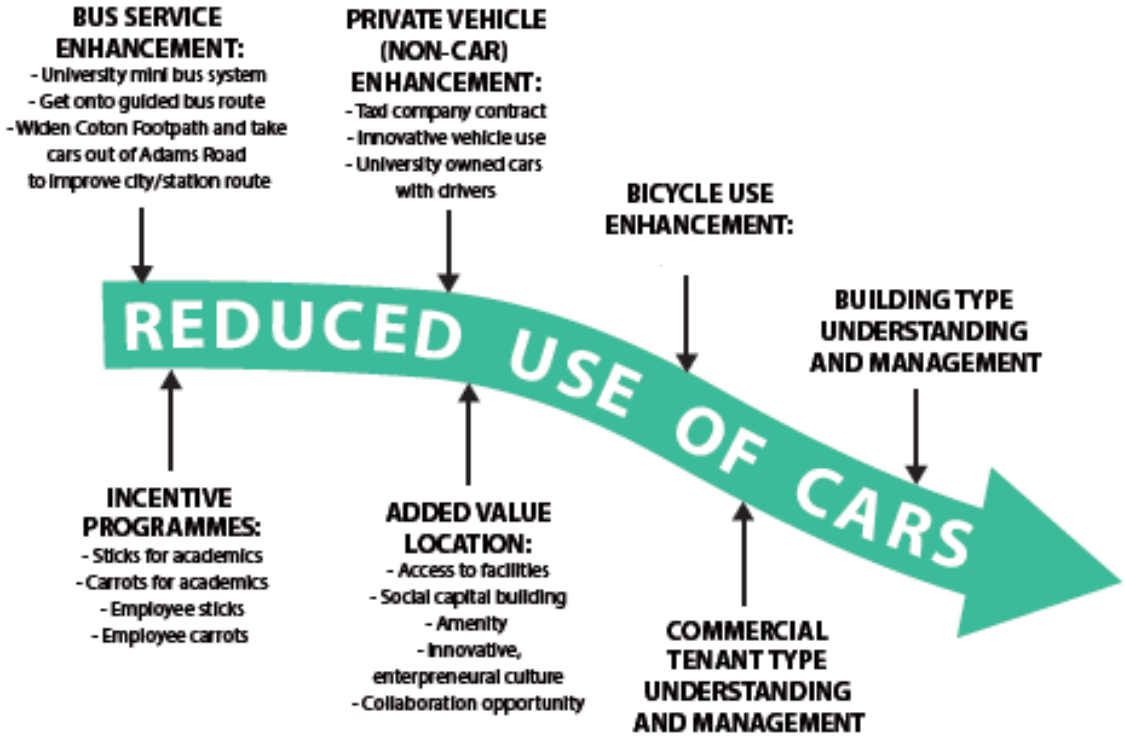
8.1.3 This section identifies the car and cycle parking provision in accordance with the Area Action Plan standards. It shows how the Development access strategy and site layout have been designed to ensure the focus of the accessibility strategy for the Site remains strongly in favour of sustainable modes of transport.

8.2 Car Parking strategy

8.2.1 The University is committed to delivering a high quality development. Under-provision of car parking within the Site could be detrimental to the street-scene, with “fly-parking” occurring across the area. Similarly, an over-generous provision would be equally likely to be detrimental to the sustainability credentials of the Development, with excessive numbers of car driver trips attracted by the easy car parking provision.

8.2.2 To reflect that the public transport services will increase in frequency and coverage as the Development progresses - hence making non-car travel easier and a more generous car parking provision less essential - it is proposed that the maximum car parking provision decreases towards the later phases of the West Cambridge construction. Any future reduction in car parking provision over time will need to be carefully managed and timed to follow wider transport improvements, the University needing to ensure that any loss of provision reflects a demonstrable improvement in accessibility by non-car modes. This was summarised by Aecom in Plate 8.1:

Plate 8.1 – Future car parking provision responding to improvements in accessibility



8.3 Initial and Future Car Parking Maxima

8.3.1 The proposed maximum car parking standards to be applied at West Cambridge have been derived with initial reference to the maximum car parking standard applied at the adjacent North West Cambridge Development, and the current car parking patronage at West Cambridge. The proposed car parking maximum standards through the life of the West Cambridge Development are summarised in Table 8.1. The University will review this provision, and seek to reduce car parking provision if appropriate as West Cambridge progresses.

Table 8.1: Car Parking Maximum Provision Proposals

Land-Use	Development Phase	Car Parking Provision (Maxima)
Commercial and Academic Research – North West Cambridge Area Action Plan Standard	*B1 Offices, General Industry – applied to Commercial Research*	*1 space per 40m^2 GFA*
	Non-residential higher education – applied to Academic Research	*2 spaces for every 3 staff - to be applied as 1 space per 60m^2 GFA* (The 2 spaces per 3 staff being the University's standard rate of car parking provision)
Academic Research	Initial	1 car parking space per 4 staff
		No provision for students
	Later	1 car parking space per 5 staff
		No provision for students
Commercial Research	Initial	1 car parking space per 40m^2 GFA
	Later	1 car parking space per 70m^2 GFA

8.3.2 Using the above standards, the following car parking will be provided:

Table 8.2: Car Parking Provision

Development Phase	Car Parking Provision (spaces)
Extant Consent Car Parking Provision	3,150
Initial Phase	2,570
Full Development	4,390

8.3.3 It is noted that:

i) the Initial Phase car parking provision is 18% lower than the Consented car parking provision, despite a higher total floorspace. This reflects the sustainability objectives of West Cambridge, with the provision of a lower rate of car parking provision;

ii) despite a proposed 102% increase in floorspace as a result of the Full Development proposals, the University is only seeking a 39% increase in the proposed levels of car parking;

iii) whilst not directly proportionate to car parking provision, the West Cambridge trip generation will reflect the car parking provision. This would imply that the Initial Phase of Development would have a lower trip generation than the Consented Development, and that the increase in traffic for the Full Development will be lower than a proportionate increase in floorspace.

Provision for people with disabilities

8.3.4 At least 5% of the total number of car parking spaces should be reserved for disabled people, rounded up to the nearest whole space. Where parking provision is below the standards the required proportion of spaces reserved for disabled people will therefore be higher than 5%.

8.3.5 Higher ratios than the 5% given above may be required in some cases by the local planning authority, for example at medical facilities, residential care homes, community facilities and any other uses where a higher proportion of disabled users / visitors will be expected. It should be noted that provision at the above levels or any required by the local planning authority does not guarantee that the requirements of the Disability Discrimination Act will be met, which is the responsibility of the building occupier or service provider.

8.3.6 Spaces for disabled people should be located adjacent to entrances, be convenient to use; and have dimensions that conform to Part M of Building Regulations. If it is impossible to accommodate car parking spaces within the site, disabled car parking spaces should not be located at a distance more than 100 metres from the site.

Off-site car parking

8.3.7 The University would contribute towards the replacement of the existing on-road car parking along Clerk Maxwell Road with mandatory cycle lanes. This would provide significant betterment for residents and cyclists, and improve the quality of the public realm on this section.

8.3.8 In order to control further the overspill parking from West Cambridge, the University will work with local residents and the Highway Authority to review the potential for on-street parking control on local streets - such as Hedgerley Close, Wilberforce Road and Adams Road. This could include:

i) a Car Parking Zone scheme – similar to the scheme offered by North West Cambridge - reflecting the emerging City Deal proposals; or

ii) a prohibition of on-street car parking.

8.3.9 The University will contribute towards the Highway Authority's costs for implementing any necessary traffic regulation orders to support this off-site car parking strategy.

8.4 Cycle parking

8.4.1 The cycle parking strategy is also intended to support the travel demand management strategy for the Development. The Cambridge area already has a strong cycle culture, and the Development is well-located with respect to existing and proposed cycle facilities.

8.4.2 Similarly, cycle parking spaces will be provided as a minimum in accordance with the standards set out in the Draft Cambridge Local Plan (2014). These are summarised in Table 8.3.

Table 8.3: Minimum Cycle Parking Provision Proposals

Land-Use	Cycle Parking Provision - Minima
Offices, general industry	2 space for every 5 members of staff or 1 per 30 sq. m Gross Floor Area (whichever is greater) Some visitor parking on merit
Non-residential higher and further education	2 for every 5 members of staff Cycle parking for 70 per cent of students based on anticipated peak number of students on site at any one time

Source – Cambridge City Council - Cambridge Local Plan 2014: Proposed Submission - Appendix L – Car and Cycle Parking Requirements

8.4.3 In order to allow for cycles with large baskets, folding bikes and those with additional attachments, etc. a minimum of 20 per cent of the cycle parking spaces required should be of a Sheffield-type design.

8.4.4 To accommodate the likely circa 3,600 students and 7,200 staff within the Initial Phase, the Initial Phase of Development would be provided with around 7,000 cycle parking spaces to reflect these standards.

8.5 Vehicular Access

Site Access

8.5.1 The local road network surrounding the Development is shown on Figure 2.3.

8.5.2 As shown on the Parameter Plan 02 – Access included in Appendix 2.3, vehicle access will be provided to the Development by a series of existing, enhanced and new vehicular access points off Madingley Road as shown on Figure 2.3. These will be delivered through the duration of the Development, to a programme to be determined. These access points are:

i) the existing traffic signal controlled High Cross junction - which could be subjected during Phase 1 to an enhancement to include a ban on the right turn into the site from Madingley Road;

ii) the existing JJ Thomson Avenue priority junction – which could be subjected during later Post - Phase 1 phases to a traffic signal controlled upgrade;

iii) the existing Clerk Maxwell Road priority junction, which could be subject to a potential introduction of traffic signal control; and

iv) a new traffic signal controlled, restricted movement (right in / left out), access junction onto Madingley Road at the western end of the site, which would connect to the Western Access road. This would be delivered during later - Post Phase 1 phases. This junction would intercept strategic traffic movements between the site and the west, including from the M11 – this early interception would help to maintain conditions at other local junctions – such as High Cross.

8.5.3 The location of these access points to the Development is designed to intercept the maximum number of development-bound trips on the strategic highway network before these trips travel through the residential areas of Cambridge, thus minimising the impact of the development.

8.5.4 In addition, a further limited-movement priority junction providing cycle and pedestrian access to the Vet School between JJ Thomson Avenue and High Cross, currently closed for vehicles, would provide service access only to the occupiers immediately adjacent to Madingley Road. This is shown indicatively on Figure 8.1.

Site Access Roads

8.5.5 All routes within the Development will be designed to contain vehicle speeds and flows to a maximum of 20mph, to provide a quality streetscape. This would be achieved primarily through the adoption of the design philosophies of the Department for Transport's 'Manual for Streets' for all roads. The adoption of these principles would not only encourage traffic speeds to reduce on these routes and increase car journey times relative to public transport, but would also help to provide a more desirable environment for pedestrians and cyclists as a result of the lower vehicle speeds and lower overall traffic levels.

8.5.6 The Site layout has been designed to ensure that it strongly favours sustainable modes of transport; the road hierarchy of the Site has been designed to limit the permeability of the Site for vehicles and to enhance accessibility for pedestrians and cyclists.

Servicing

8.5.7 The service access to individual plots will be provided from suitable development access routes. These will be identified within the individual reserved matters applications for each plot.

8.5.8 To assist in managing service vehicle exhaust emissions, the University will consider low or zero emission technology for their site-based vehicles.

8.6 Summary

8.6.1 This section considers aspects of car and cycle infrastructure associated with the Development.

8.6.2 The maximum car and minimum cycle parking provision on the Development has been calculated with reference to local guidance and from observation of current usage.

8.6.3 The University is committed to delivering a high quality development. Under-provision of car and cycle parking within the Site could be detrimental to the street scene.

8.6.4 The Development Access Strategy and site layout have been designed to ensure the focus of the accessibility strategy for the Site remains strongly in favour of sustainable modes of transport over the private car.

9 Travel Demand Management Strategy

9.1 Introduction

9.1.1 To support the objectives of the transport strategy to maintain the existing low car-based mode share, and to achieve mode shift away from private car use, a comprehensive travel demand strategy has been developed for the Development to manage the number of vehicular trips generated by the Site. This will be achieved by the promotion of alternative means of travel, and on the locational and accessibility advantages of the Site.

9.1.2 A central element of the travel demand management strategy for the Development is the implementation of a site-wide Framework Travel Plan for the Site. Due to the scale of the development, an overall Framework Travel Plan has been developed by the University to cover travel demand management issues for the whole Development site. This Transport Assessment is therefore supported by the Framework Travel Plan which should be read in conjunction with this document. The Framework Travel Plan sets out the overall travel demand management strategy and framework for the Development. The purpose of the Framework Travel Plan is to reduce the quantum of single occupancy private car trips associated with all activities at the Development.

9.2 Objectives

9.2.1 The main objective is to reduce the reliance on the private car and reduce the quantum of private car trips. In order to assess whether this objective is being met, the Framework Travel Plan reflects a target maximum 26.4% Single Occupancy Car Driver mode share for journey to work trips.

9.2.2 The overall broad objectives of the travel demand management strategy for the Development are:

- to reduce reliance on the private car with a long-term strategy of mode shift away from single occupancy car use;
- to build upon good urban design principles that improve the permeability of the development for promoting walking, cycling and public transport use;
- to provide more appropriate levels of parking;
- to promote the use of car sharing where appropriate;
- to minimise costly road traffic congestion and further damage to the environment in the context of sustainable development which is consistent with Government policy; and
- to encourage a high level of community involvement in travel behaviour change initiatives.

9.3 Summary of the Framework Travel Plan

9.3.1 The Framework Travel Plan, also submitted in support of the Outline Planning Application, also provides the over-arching framework within which the individual commercial Workplace Travel Plans will operate.

9.3.2 To ensure effective implementation and management of the Framework Travel Plan and transport strategy, the University will provide and support the following:

- sufficient staff resource be allocated to provide a Development Transport Coordinator – supported in this role by:
  - individual Sustainable Travel Behaviour Champions identified from within the community to assist in delivering sustainable travel proposals; and
  - individual workplace Travel Plan Coordinators to implement and manage their own measures and strategies;
- the establishment and running of the Transport Stakeholders' Group consisting of key stakeholders - including the University, planning and highway authorities, public transport operators, and representatives of the Development;
- a one-off fall-back Fund for the implementation, management, monitoring and review of the Framework Travel Plan and funding necessary measures in the event of significant variation from the forecast traffic impact for a sustained period of time.

9.3.3 The Framework Travel Plan has the following structure:

- a summary of the development proposals for the Development;
- a review of the local and national policy context for travel planning;
- a review of the current transport-related context for the development;
- a summary of the overall travel demand management strategy for the Development;
- details of the management structure, mode shift targets and monitoring arrangement of the Development Framework Travel Plan strategy;
- details of the individual developer / occupier Travel Plan obligations;
- a preliminary implementation and programme for the strategy.

9.3.4 The Framework Travel Plan has been prepared in accordance with current national guidance and best practice on travel planning, in particular, the Department for Transport's 'Good Practice Guidelines: Delivering Travel Plans through the Planning Process' (April 2009), and 'Making Residential Travel Plans Work: Good Practice Guidelines for New Development' (September 2005).

9.3.5 The Framework Travel Plan is the first issue of a working document that will be consistently monitored, reviewed and revised by the University's Travel Plan Co-ordinator. Given the length of time over which the development will be implemented, changing transport and planning policies, and the potential for different outcomes to that set out in this Transport Assessment, the Framework Travel Plan and the transport measures need to be flexible and able to adapt to changing circumstances. Mechanisms for periodic review are therefore proposed so that outcomes can be compared with forecast.

9.3.6 In the event of significant variation from forecast values for a sustained period of time, the Development Transport Coordinator, working with the Transport Stakeholders Group, will consider the need for (and if necessary implement) measures designed to help meet the forecast outcomes over time.

10 Construction Access Strategy

10.1 Introduction

10.1.1 This section summarises the strategy to manage the traffic impact construction activity.

10.1.2 Until Contractors are appointed by the University, the details of the Construction Access Strategy will, perforce, be limited. The strategy will be defined in greater detail upon appointment.

10.2 Summary of the Construction Environmental Management Plan

10.2.1 As part of the Construction Access Strategy, a Construction Environmental Management Plan (CEMP) has been prepared, and is submitted in support of the Outline Planning Application. The CEMP will set out the University's aim to reduce the transport impacts of the construction traffic servicing the Site, and the movements associated with construction waste. It will apply to all the individual construction sites within the Development. The strategy consists of the following main elements:

i) design:

- minimising the requirement for material to be imported or exported. For example, the movement of earthworks material off-site will be reduced to a minimum by maximising the use of raised material into the landscaping;

- specifying materials and construction techniques that are resource-friendly;

ii) using locally sourced materials where possible, to reducing haulage lengths;

iii) managing effectively the supply of goods to construction sites - this can significantly reduce both road vehicle mileage and construction costs and wastage;

iv) encouraging the development of sustainable supply chains for construction materials; and

v) managing the movement of workers into the development - all construction sites within the Development will have comprehensive Construction Travel Plans, detailing how their workforce will travel to the Site.

10.2.2 Construction Environmental Management Plans will be prepared to provide details of all Construction traffic movements during the life of a construction project - i.e. from design to demobilisation. The Construction Environmental Management Plan will consider the following elements:

i) Design;

ii) On-site logistics;

iii) Access Strategy;

iv) Procurement strategy;

v) Operational Efficiency;

vi) Delivery Practice;

vii) Demand Smoothing;

viii) Managing Construction Traffic;

ix) Pedestrian Routing;

x) Targets and Monitoring; and

xi) Waste Management

10.2.3 The developed CEMP will be supported by a Construction Travel Plan.

10.3 Further measures

10.3.1 The CEMP will also identify approaches that can be used to improve the efficiency of the logistics management for the development. It also considers ways to link with and/or exploit construction activity and practices taking place on other parts of Cambridge. These measures would reduce the Site traffic, and the number of movements removing the generated waste.

10.3.2 A Construction Routing Strategy will be defined within the CEMP, specifying:

i) the routes to be used for heavy vehicle construction movements – assumed to be from the M11 Junction 13 and Madingley Road;

ii) identifying routes along which heavy vehicle construction may not pass – assumed to include Madingley Road to the east of Clerk Maxwell Road;

iii) managing the movement of workers into the Development - all construction sites within the Development will have comprehensive Construction Travel Plans, detailing how their workforce will travel to the Site;

iv) the cycle and pedestrian access routes during construction, to ensure that construction-related vehicles do not impact upon these users.

10.3.3 As well as implementing measures to increase the efficiency of the logistics operation and minimising the impact of the construction operation, the University will:

i) require all construction contractors be members of the Construction Logistics and Cycle Safety initiative (CLOCS); and

ii) seek that all construction vehicles are fitted with cycle safety equipment.

PART 3 PERFORMANCE OF THE NETWORK IN THE FUTURE YEAR

Part 3 of the Transport Assessment contains the following sections:

Section 11 - Construction Traffic

Section 12 - Summary of the Supporting Modelling Work

Section 13 - Development Trip Generation

Section 14 - 2021 Initial Phase – Trip Impact Analysis

11 Construction Traffic

11.1 Introduction

11.1.1 This section identifies the potential peak movements associated with the construction of the Development, and assesses the effects of these movements on the surrounding highway network.

11.2 Assessment of the peak Construction movements

11.2.1 The assessment of the peak construction movements is contained in Appendix 11.1.

11.2.2 The assumed first phase peak Daily Construction traffic flows are summarised in Table 11.1:

Table 11.1 – Peak Daily Construction Movements

Activity	Max Light Vehicle Movts / day			Max Heavy Vehicle Movts / day			Max Total Vehicle Movts / day		
	In	Out	Tot	In	Out	Tot	In	Out	Tot
Earthworks	10	10	20	82	82	164	92	92	184
On-Site Drainage	4	4	8	4	4	8	8	8	16
Carriageway construction	6	6	12	60	60	120	66	66	132
Building construction	10	10	20	0	0	0	10	10	20
Total	**30**	**30**	**60**	**146**	**146**	**292**	**176**	**176**	**352**

11.2.3 These flows are used to assess the impact of the Development on the surrounding highway network.

11.3 Assessment of the peak Construction impact

11.3.1 Of the Construction flows summarised above, only a limited number of car and HGV movements would typically occur during the peak hours: the working hours of most operatives would not coincide with the network peak, and construction processes would be programmed to avoid reliance on deliveries of concrete and bituminous materials during the more congested periods. As there would be only a limited number of Construction movements in the peak hours, no peak hour assessment has been made.

11.3.2 The following assumptions are made with respect to the assignment of these construction trips:

i) no heavy vehicle will be permitted to access the development from the east through the City of Cambridge – all movements will be from the M11 or A1303;

ii) the operatives are assumed to be resident locally, and would arrive from the following destinations:

- Madingley Road (East) - 30%
- A14 (North West) - 25% (reassigning via Madingley Road)
- M11 (South) - 10%
- A14 (East) - 25% (reassigning via Madingley Road)
- A1303 / A428 - 10%

iii) reflecting the potential supplier locations, it is assumed that material deliveries will arrive from the following destinations:

- Madingley Road (East) - 0%
- A14 (North West) - 35% (reassigning via M11 Junction 12)
- M11 (South) - 25%
- A14 (East) - 25% (reassigning via M11 Junction 12)
- A1303 / A428 - 15%

11.3.3 On the basis of this worst case assessment of the construction activity trip generation, a worst case assessment of the likely impact on daily flow is shown in Table 11.2 with respect to the 2015 Base Year flows. The flows in this table assume that all access will be from M11 Junction 13 and Madingley Road:

Table 11.2: Construction traffic impacts – Pre Opening

Link No	Link	Base 2015 Daily Flow (24hr, 7 day 1-way flows)		Estimated Daily Construction Traffic (1 way)			Increase	
		All Vehs	Heavy Vehs	Light Vehs	Heavy Vehs	All Vehs	All Vehs	Heavy Vehs
1.0	M11 - J12 - J13 - Nbd	41,825	6,496	3	124	127	0.3%	1.9%
1.0	M11 - J12 - J13 - Sbd	37,287	5,791	3	124	127	0.3%	2.1%
1.1	M11 J13 -J14 - Nbd	31,262	4,855	0	88	88	0.3%	1.8%
1.1	M11 J13 -J14 - Sbd	30,763	4,778	0	88	88	0.3%	1.8%
1.3	M11 J13 off-slip - Nbd	10,547	1,638	3	124	127	1.2%	7.6%
1.3	M11 J13 on-slip - Sbd	6,871	1,067	3	124	127	1.8%	11.6%
2.0	A14 West of J30 (Bar Hill) - Ebd	35,645	6,532	8	51	59	0.2%	0.8%
2.0	A14 West of J30 (Bar Hill) - Wbd	37,053	6,790	8	51	59	0.2%	0.8%
2.1	A14 North East of M11 J14 - Ebd	35,897	6,578	8	51	59	0.2%	0.8%
2.1	A14 North East M11 J14 - Wbd	35,779	6,557	8	51	59	0.2%	0.8%
2.2	A14 West of J32 Interchange - Ebd	31,842	5,835	8	37	44	0.1%	0.6%

Link No	Link	Base 2015 Daily Flow (24hr, 7 day 1-way flows)		Estimated Daily Construction Traffic (1 way)			Increase	
		All Vehs	Heavy Vehs	Light Vehs	Heavy Vehs	All Vehs	All Vehs	Heavy Vehs
2.2	A14 West of J32 Interchange - Wbd	29,753	5,452	8	37	44	0.1%	0.7%
3.0	A1303 East of Madingley Mulch Rbt Ebd	6,327	346	3	22	25	0.4%	6.3%
3.0	A1303 East of Madingley Mulch Rbt Wbd	11,248	616	3	22	25	0.2%	3.6%
3.1	Madingley Rd - East of Cambridge Rd Crossroads Wbd	11,034	604	3	22	25	0.2%	3.6%
3.1	Madingley Rd - East of Cambridge Rd Crossroads Ebd	6,207	340	3	22	25	0.4%	6.4%
3.2	Madingley Rd on Over Bridge M11 Ebd	13,177	721	6	146	152	1.2%	20.2%
3.2	Madingley Rd on Over Bridge M11 Wbd	5,725	313	3	22	25	0.4%	7.0%
3.3	Madingley Rd between M11 Sbd On Slip - Proposed Madingley Rd West Access Ebd	9,622	327	6	146	152	1.6%	44.6%
3.3	Madingley Rd between M11 Sbd On Slip - Proposed Madingley Rd West Access Wbd	9,415	320	6	146	152	1.6%	45.6%
3.4	Madingley Rd - West of P&R Access Wbd	9,415	320	6	146	152	1.6%	45.6%
3.4	Madingley Rd - West of P&R Access Ebd	9,622	327	6	146	152	1.6%	44.6%
3.5	Madingley Rd - East of P&R Access Wbd	9,333	317	6	146	152	1.6%	46.0%
3.5	Madingley Rd - East of P&R Access Ebd	9,127	310	6	146	152	1.7%	47.1%
3.6	Madingley Rd - East of Proposed High Cross Access Ebd	7,905	269	6	146	152	1.9%	54.3%
3.6	Madingley Rd - East of Proposed High Cross Access Wbd	8,196	279	6	146	152	1.9%	52.4%
3.7	Madingley Rd - East of JJ Thomson Ave Ebd	8,998	306	24	0	24	0.3%	0.0%
3.7	Madingley Rd - East of JJ Thomson Ave Wbd	9,061	308	24	0	24	0.3%	0.0%
3.8	Madingley Rd - East of Clerk Maxwell Rd Ebd	8,770	298	24	0	24	0.3%	0.0%

Link No	Link	Base 2015 Daily Flow (24hr, 7 day 1-way flows)		Estimated Daily Construction Traffic (1 way)			Increase	
		All Vehs	Heavy Vehs	Light Vehs	Heavy Vehs	All Vehs	All Vehs	Heavy Vehs
3.8	Madingley Rd - East of Clerk Maxwell Rd Wbd	9,098	309	24	0	24	0.3%	0.0%

(Links with minimal impact have not been reported)

11.3.4 In terms of impact due to the construction of the development, the largest increase in existing flows would be the increase of heavy vehicles on Madingley Road between the M11 and the Site Access, where there would be a circa 50% increase in existing heavy vehicles. Nevertheless, this would remain well within the overall capacity of the road – and subsumed within the negligible 0.4% all vehicle increase.

11.3.5 On all other routes, the increase in general traffic resulting from the construction activity is considered to be negligible.

12 Summary of the Supporting Modelling work

12.1 Introduction

12.1.1 This section summarises the modelling work undertaken to support the West Cambridge outline planning application.

12.1.2 Initial assessment of the transport impact of West Cambridge was undertaken using Cambridgeshire County Council's land use and transport model, the Cambridge Sub Regional Model (CSRM).

12.1.3 Following a review of the model results with the Joint Highway Authorities, it was concluded that the CSRM was not the most appropriate manner in which to assess West Cambridge traffic impact as being an area-wide strategic transport model, it was of insufficient sensitivity to assess impact across the local network accurately.

12.1.4 Within the context of an assessment of an Initial Phase of development in 2021 with relatively small development impact, it was agreed that a more local approach to the assessment of impact was appropriate. The following methodology was therefore agreed with the Joint Authorities.

12.1.5 To understand the potential traffic impact of the Initial Phase of the Proposed Development, analysis has been undertaken by comparing the results from Peter Brett Associates' Transport Model, using option tests commissioned for the Development following agreement in-principle with the Highway Authorities.

12.2 The Transport Model

12.2.1 The Transport Model was originally developed in conjunction with the Highway Authorities – Cambridgeshire County Council and the Highways Agency (now operating as Highways England) - to assess development trips resulting from the adjacent North West Cambridge Development. It has since been expanded to include the West Cambridge site, as well as the additional modelling zones for other development sites in the wider Cambridge area.

12.2.2 The modelling process estimated all trip numbers generated by the West Cambridge Development and other developments in the Cambridge area by combining a series of processes:

- the spreadsheet-based part of the modelling process produced trip matrices for different scenarios, transport modes and time periods;
- these trip matrices are then assigned on the transport network using the transport model software.

12.2.3 The main features of the Transport Model structure, shown in Plate 12.1 are:

- the Network and Zoning System:
  - Transport Network - a detailed road network was developed for the wider Cambridge area, including all of South Cambridgeshire and parts of Essex and Hertfordshire. The existing road network was extracted from a national digital road network (Navteq data) which included measured link speeds from GPS systems for individual links in the network, enabling network distances and travel times to be calculated;

- Zoning System – all development is loaded onto the network by a series of zones. These zones were devised in GIS, based on Census single and multiple output areas in and around Cambridge. Outside of Cambridge, these areas broaden to single and multiple wards, with larger zones representing local authorities on the periphery of the zoning system. In addition to the Census-based zones around the periphery of the model, a series of smaller zones were introduced for development areas, with multiple zones used for North West Cambridge and West Cambridge so that relatively short trips can be modelled sufficiently - typically by foot or bicycle;

- Spreadsheet Model, comprising of the various elements to assess:

  - the Development Land-Use Data - The assembly and calculation of land use data for all the development zones in the model for Housing, and for 'Other Uses' - for non-housing land uses;

  - Trip Generation by land-use types, using a series of data sources – including TRICS data and person trip surveys undertaken at West Cambridge;

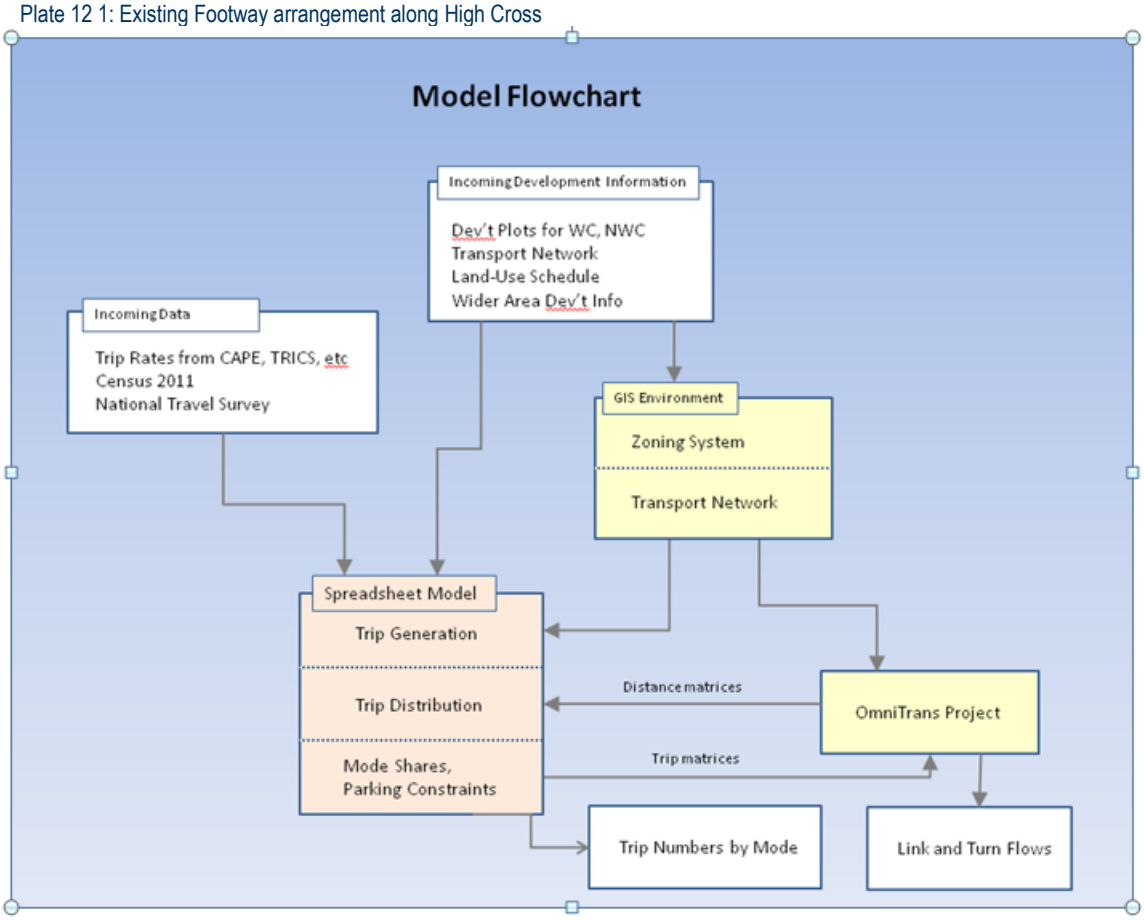
  - Distribution by land-use types, using a gravity model, calibrated with reference to available data (such as the Census journey-to-work data);

  - the Trip Matrices - by mode, by land-use;

  - adjustments to account for deterrence to car travel – such as car parking constraints;

- Post-Processing of Trip Matrices - the vehicle (car driver) matrices of development trips, output from the Spreadsheet Model for each scenario, are imported into OmniTrans, the transport model software, and assigned to the appropriate network.

Plate 12 1: Existing Footway arrangement along High Cross



12.2.4 Further details of the Peter Brett Associates' Spreadsheet Model are contained in Technical Note 7, contained in Appendix 12.1.

12.3 Options tested

12.3.1 Reference has been made in the Environmental Statement Transport Chapter to the following tests:

i) the effects of the Construction Phase of Development – this is assessed in the context of the 2015 Base flows;

ii) the operational effects of completion of the Initial Phase of Developments in 2021 – cumulative impact assessment; and

iii) the operational effects of the Full Development in 2031 – cumulative impact assessment.

12.3.2 The results from the 2015 and 2021 modelling option tests are reported within this Transport Assessment. Reflecting the adopted Adaptive Phased Approach (summarised in Section 2), the assessment of effects of the later phases beyond 2021 would be considered in the context of the emerging planning and transport infrastructure proposals for the area. As such, and as agreed with the Joint Planning and Highway Authorities, no further assessment of effects has therefore been reported beyond 2021 at this stage.

12.3.3 The following sections summarise the results of these 2015 and 2021 scenarios.

13 Development Trip Generation

13.1 Introduction

13.1.1 This section summarises the following:

i) the vehicle trip generation for the Consented West Cambridge Development – the Do Minimum scenario - as reported by Hannah Reed in 1997 in support of the outline planning application; and

ii) the revised West Cambridge Development vehicular trip generation arising in the 2021 Do Minimum and 2021 Do Something scenarios.

13.1.2 This section concludes that:

i) the total vehicle trips assessed for the Consented West Cambridge Development reported in 1997 is higher than has been assessed by Peter Brett Associates for the equivalent Do Minimum scenario;

ii) the total vehicle trips from the proposed Initial Phase of Development – the Do Something test - would be less than that assessed for the 2021 Do Minimum scenario. This is concluded to be as a consequence of reduction in car parking availability.

13.2 Vehicle trip generation to support the Consented 1997 Application scenario

13.2.1 As reported in Section 2.3, Hannah Reed prepared the Transportation Study to support the University of Cambridge's original 1997 West Cambridge Development planning application. This was subsequently approved by the Joint Authorities – Cambridge City Council, the local planning authority, Cambridgeshire County Council, the local highway authority, and the strategic highway authority, the Highways Agency (now referred to as Highways England).

13.2.2 The vehicle flows accruing to the consented West Cambridge Development were agreed with the Joint Authorities in 1999. These are summarised in Table 2.2, and summarised in Table 13.1.

13.2.3 The vehicle trip generation for the Consented – Do Minimum scenario - has been reassessed, and is reported below.

13.3 Predicted West Cambridge Development vehicular flows

13.3.1 The peak hour vehicle trip generation from West Cambridge has been reassessed, using the Peter Brett Associates Transport Model, and is summarised in Table 13.1 for the following scenarios:

i) 2015 Base Year (contained in Appendix 3.5);

ii) 2021 Do Minimum (i.e., With the 1999 Consented Development – contained in Appendix 13.1); and

iii) 2021 Do Something (i.e., With the Proposed Initial Phase of Development – contained in Appendix 13.2).

Table 13.1: Comparison of the 2015 and 2021 Do Minimum Peak Hour vehicle flows – Peter Brett Associates (2016) and Hannah Reed (1997)

Scenarios		Academic Research Staff		Commercial and Other land uses		Total	
		In	Out	In	Out	In	Out
2025 West Cambridge Consented Devt – Hannah Reed	***AM***					***163***	***1,519***
	PM	**-**	**-**	**-**	**-**	**-**	**-**
2015 Base	AM	174	31	363	67	537	98
	PM	49	291	76	303	125	595
2021 Do Minimum – 1999 Consented Devt	AM	258	45	1,035	136	1,294	181
	PM	72	425	164	837	236	1,262
2021 Do Something – Proposed Initial Phase of Devt	AM	241	42	773	103	1.014	145
	PM	67	395	121	629	188	1,024

13.4 Conclusions

13.4.1 It is noted that:

i) the Do Minimum vehicle trip generation used to assess the original 1997 application – upon which the highway mitigation strategy was derived - is 12% higher than the Do Minimum assessment derived from the Peter Brett Associates analysis;

ii) the vehicle trip generation from West Cambridge increases from that predicted for the 2015 Base in both 2021 scenarios, as further quanta of development would be completed;

iii) the reduction in car parking provision within the Do Something Initial Phase of Development proposals results in a reduced trip generation from West Cambridge;

13.4.2 As such, when compared to the 2015 Base flows, the percentage increases in link flows for the 2021 Do Something Development will be less than for the 2021 Do Minimum scenario.

14 2021 Initial Phase – Trip Impact Analysis

14.1 Introduction

14.1.1 This section summarises the impact of an indicative first phase of Development in 2021 in terms of link impacts, and the capacity of a number of local and strategic junctions.

14.1.2 This section reports the following:

i) an assessment of the link flow differences between the 2015 and 2021 Do Minimum scenarios;

ii) an assessment of the link flow differences between the 2021 Do Minimum and 2021 Do Something scenarios; and

iii) the capacities of a series of junctions in the area.

14.1.3 This section concludes that:

i) the differences between the 2015 Base Year and 2021 Do Minimum scenarios (i.e., With the Consented Development including the sites listed in Tables 2.6 and 2.7) indicate that the network will experience significant increases in peak hour flows;

ii) the differences between the 2021 Do Minimum and 2021 Do Something scenarios (i.e., the impact of the Development) would be minimal. There are only a limited number of links that experience flow increases across the local highway, mainly due to the proposed changes to the development access strategy;

iii) the junction capacity assessment identifies that in 2021 with the Proposed Development, the local junctions would operate within capacity.

14.2 Differences between 2015 Base and 2021 Do Minimum

14.2.1 The 2015 Base Year and 2021 Do Minimum (i.e., with the 1999 Consented Development) peak hour flows are compared in Table 14.1 in Appendix 14.1. The percentage differences are also reported.

14.2.2 From this comparison between the 2015 and 2021 Do Minimum peak hour flows, it is apparent that:

i) all links experience increases in the peak hour flows;

ii) the percentage link flow increases across the network reflect the increase in trip generation from West Cambridge – i.e., of approximately 100% - as summarised in Table 14.1; and

iii) the highest link flow impact is observed on the West Cambridge Development site accesses, reflecting the flow increases generated by West Cambridge. Whilst this peaks at over 200% on High Cross, this high percentage increase reflects the relatively low 2015 Base flow.

14.3 Differences between 2021 Do Minimum and 2021 Do Something

14.3.1 The 2021 Do Minimum and the 2021 Do Something (i.e., with the Initial Phase of the Proposed Development) peak hour flows are compared in Table 14.2 in Appendix 14.1. The percentage differences are also reported.

14.3.2 From this comparison between the 2021 Do Minimum and 2021 Do Something peak hour flows, it is apparent that:

i) the percentage link flow changes across the network reflect the reduction in trip generation from West Cambridge, as summarised in Table 14.1;

ii) most off-site links experience minimal increases - if any as a consequence of the Development;

iii) the greatest impact locally is on Madingley Road – peaking at 3% - a consequence of the local reassignment created by the new car park off Clerk Maxwell Road;

iv) the highest link flow impact is observed on the northern section of Clerk Maxwell Road, the consequence of the new car park access. These high percentage increases reflect more the relatively low 2021 Do Minimum flow rather than the increase in vehicle movements accessing the proposed car park at this location.

14.4 2021 Junction Capacity Assessments – Indicative First Phase of Development

Introduction

14.4.1 This section summarises the impact of an indicative first phase of Development on the capacity of a number of local and strategic junctions.

14.4.2 The capacity of the junctions surrounding the Site have been assessed assuming the future year flows, and using appropriate modelling software including:

- JCT Consultancy's LINSIG computer program - utilised to model the traffic signal controlled junctions along the Madingley Road Corridor; and
- TRL's PICADY program, the Priority Intersection Module within the Junctions9 computer suite - to assess the capacity of priority junctions.

14.4.3 Output from the modelling assessment work is contained in Appendices 14.2 and 14.3 to the following:

Madingley Road Corridor – consisting of

i) M11 J13 Northbound Off Slip / A1303 Madingley Road;

ii) M11 J13 Southbound On Slip / A1303 Madingley Road;

iii) Madingley Road / Park and Ride Site Access; and

iv) Madingley Road / Eddington Avenue (NWC Site Access) / High Cross (West Cambridge Site Access.

Site Accesses

v) High Cross Access junction (see above - modelled with LINSIG);

vi) Madingley Road / JJ Thomson Avenue junction (modelled with Junctions9); and

vii) Madingley Road / Clerk Maxwell Road junction (modelled with Junctions9).

Other junctions

viii) Madingley Road / Madingley Rise priority junction (modelled with Junctions9).

Madingley Road Corridor

14.4.4 The proposed Madingley Road Corridor has been assessed with the 2021 Do Something scenario flows for the following existing junctions using the LINSIG computer programme:

i) the M11 Off Slip traffic signal controlled junction;

ii) the M11 On Slip priority junction;

iii) the Park and Ride traffic signal controlled junction;

iv) the High Cross traffic signal controlled junction.

14.4.5 The results are summarised in Table 14.3, the computer output is contained in Appendix 14.2.

Table 14.3 - Summary of LINSIG results – 2021 Do Something – Existing junction arrangement

	Approach	AM			PM		
		Degree of Saturation		Queue (pcu)	Degree of Saturation		Queue (pcu)
M11 Off Slip	Madingley Rd (EB)	85%	83%	17	75%	56%	14
	Madingley Rd (WB)		31%	4		66%	16
	M11 Slip NB Left		32%	5		75%	17
	M11 Slip NB Right		85%	20		45%	8
M11 On Slip	Madingley Rd (EB)	31%	66%	1	84%	84%	9
	Madingley Rd (WB)		31%	0		74%	1
	M11 Slip SB		23%	0		55%	1
Park & Ride	Madingley Rd (EB)	82%	82%	22	79%	48%	11
	Madingley Rd (WB) Ah		19%	2		63%	9
	Madingley Rd (WB) RT		4%	0		20%	4
	Park & Ride Egress		15%	1		79%	10
High Cross	Madingley Rd (EB) LT+Ah	100%	59%	8	99%	27%	2
	Madingley Rd (EB) Ah		100%	46		66%	11
	Madingley Rd (WB)		73%	13		99%	46
	NWC Access LT		100%	20		92%	9
	High Cross		25%	1		96%	20
Cycle time		120 seconds			120 seconds		

14.4.6 These results show that the High Cross junction would operate with a maximum degree of saturation of 100%, albeit the mean maximum vehicle queue would be likely to cause blocking between the Park and Ride and High Cross Site Accesses. Notwithstanding, the following is noted:

i) this junction has previously been designed and assessed to accommodate the future year movements for both the North West and West Cambridge Developments using the capacity constrained CSRM;

ii) it is considered that the first-principles Transport Modelling assessment adopted for this development would represent a worst case: the methodology adopted to assess the future year flows would not assess likely reassignment effects across the network;

iii) the existing form of Madingley Road could be the subject of significant change should the City Deal proposals identify this link as the preferred route for the East – West public transport corridor; and

iv) the junction would still operate with a maximum degree of saturation of 100%, i.e., at practical capacity.

14.4.7 Notwithstanding, a minor capacity mitigation scheme has been assessed as shown on Figure 14.1, consisting of:

i) a two-to-one lane merger on the eastbound exit of the High Cross junction; and

ii) the west- to-south movement - the right turn inbound movement into West Cambridge – being banned, these movements being accommodated at the Madingley Road / JJ Thomson Avenue junction.

14.4.8 The potential Madingley Road Corridor has been reassessed with the 2021 Do Something scenario flows for the following junctions using the LINSIG computer programme:

i) the existing M11 Off Slip traffic signal controlled junction;

ii) the existing M11 On Slip priority junction;

iii) the existing Park and Ride traffic signal controlled junction;

iv) the mitigated High Cross traffic signal controlled junction – as above.

14.4.9 The results are summarised in Table 14.4, the computer output is contained in Appendix 14.2. These indicate that the Madingley Road Corridor is forecast to operate within capacity in the 2021 Do Something scenario.

Table 14.4 - Summary of LINSIG results – 2021 Do Something – Potential High Cross Junction Scheme

	Approach	AM			PM		
		Degree of Saturation		Queue (pcu)	Degree of Saturation		Queue (pcu)
M11 Off Slip	Madingley Rd (EB)	85%	83%	17	75%	56%	14
	Madingley Rd (WB)		31%	4		66%	16
	M11 Slip NB Left		32%	5		75%	17
	M11 Slip NB Right		85%	20		45%	8
M11 On Slip	Madingley Rd (EB)	23%	66%	1	55%	84%	9
	Madingley Rd (WB)		31%	0		74%	1
	M11 Slip SB		23%	0		55%	1
Park & Ride	Madingley Rd (EB)	32%	88%	27	63%	52%	8
	Madingley Rd (WB) Ah		32%	2		63%	13
	Madingley Rd (WB) RT		4%	0		20%	4
	Park & Ride Egress		12%	1		66%	9
High Cross	Madingley Rd (EB) LT+Ah	86%	84%	16	51%	36%	5
	Madingley Rd (EB) Ah		86%	18		51%	8
	Madingley Rd (WB)		51%	9		90%	31
	NWC Access LT		84%	9		89%	8
	High Cross		20%	1		89%	16
Cycle time		94 seconds			116 seconds		

14.4.10 Responding to the uncertainty to this assessment identified above, it is suggested that:

i) this mitigation option not be delivered immediately;

ii) this situation be monitored on a yearly basis, and

iii) if considered desirable by the occupiers of West and North West Cambridge, and the Joint Authorities, the amendments to the High Cross traffic signal scheme be implemented by the University.

Madingley Road / JJ Thomson Avenue

14.4.11 The existing Madingley Road / JJ Thomson Avenue priority junction has been assessed using the Junctions 9 computer programme.

14.4.12 Reflecting the reassessment of the Madingley Road Corridor reported in Table 14.4, the 2021 Do Something scenario flows for this priority junction assume that there are no right turning inbound movements at the Madingley Road / High Cross junction, and that these flows reassign to the Madingley Road / JJ Thomson Avenue junction. The results are shown in Table 14.5, the computer output is contained in Appendix 14.3.

14.4.13 The results in Table 14.5 indicate that the Madingley Road / JJ Thomson Avenue priority junction is forecast to operate within capacity in the 2021 Do Something scenario.

Table 14.5 - Summary of Junctions 9 Results – Madingley Road / JJ Thomson Avenue - 2021 Do Something (assuming the reassignment of inbound right turning trips from High Cross

Movement	AM Peak		PM Peak	
	Max RFC	MMQ	Max RFC	MMQ
JJ Thomson Ave Wbd – Madingley Rd (W)	0.03	0	0.21	0
JJ Thomson Ave Ebd – across Madingley Rd (E)	0.13	0	0.85	5
JJ Thomson Ave Ebd – across Madingley Rd (W) at the splitter island	0.13	0	0.57	1
Madingley Road (W) – JJ Thomson Ave	0.62	2	0.12	0

Notes: 1. RFC – Ratio of Flow to Capacity
2. A RFC of 0.85 was generally considered to represent the theoretical capacity of an approach to a junction, albeit that TRL's more recent advice is that the overall conditions at each junction need to be considered more holistically by the designer.

Madingley Road / Clerk Maxwell Road

14.4.14 The existing Madingley Road / Clerk Maxwell priority junction has been assessed with the 2021 Do Something scenario flows for this priority junction using the Junctions 9 computer programme. The results are shown in Table 14.6; the computer output is contained in Appendix 14.3.

14.4.15 These 2021 Do Something flows are a worst case, as the assessment included:

i) for the flows generated by the largest likely car park facility to be delivered at this location – a smaller facility could be delivered;

ii) assuming that all access and egress were delivered from Clerk Maxwell Road – i.e., that an alternative route to JJ Thomson Avenue were not delivered;

iii) the trips generated by the existing circa 85 – 90 on-street car parking spaces along Clerk Maxwell Road. As detailed in Section 6, the University will offer contributions towards the replacement of the existing on-street car parking along both sides of Clerk Maxwell Road with mandatory cycle lanes as part of the proposed improvement to cycling infrastructure on this route;

iv) the trips to the 'Park and Cycle' car park, which currently accommodates 292 car parking spaces currently accessed from Clerk Maxwell. This existing Park and Cycle facility will be replaced with the proposed 640 space multi-storey Development car park, these existing flows associated with the latter having been included within the assessment.

14.4.16 The results in Table 14.6 indicate that the Madingley Road / Clerk Maxwell priority junction would operate above capacity in the PM peak, during the 2021 Do Something scenario, as a consequence of the addition of the Proposed Development flows.

Table 14.6 - Summary of Junctions 9 results – Madingley Road / Clerk Maxwell Road - 2021 Do Something

Movement	AM Peak		PM Peak		PM Peak Adjusted Flows	
	Max RFC	MMQ	Max RFC	MMQ	Max RFC	MMQ
Clerk Maxwell Rd – Madingley Rd (W)	0.07	0	1.18	19	0.98	8
Clerk Maxwell Rd – Madingley Rd (E)	0.21	0	1.16	14	0.98	7
Madingley Road (W) – Clerk Maxwell Rd	0.39	1	0.06	0	0.06	0

14.4.17 Notwithstanding, this situation reflects the manner agreed with the Highway Authorities in which the 2021 Do Something flows have been assessed across the network – by adding the additional development flows onto the Observed. In this case, the West Cambridge proposals would remove the vehicle trip generation associated with the existing Park and Cycle and on-street car parking, significantly reducing the existing traffic flow along Clerk Maxwell Road. The junction has therefore been reassessed for the 2021 Do Something scenario, excluding the observed traffic flows to reflect a more realistic forecast traffic flow scenario. The results of this adjusted assessment are also shown in Table 14.6.

14.4.18 These results show that, as a worst case, the Clerk Maxwell Road exit would operate with a maximum RFC of 0.98, with the mean maximum vehicle queue of 8 vehicles. Whilst this arm is operating with a RFC higher than 0.85 (the RFC previously considered to reflect an approach arm at capacity), the following is noted:

i) the junction would operate with a RFC of 0.98 – i.e., within practical capacity;

ii) any queuing and delay in this situation occurs only on the Clerk Maxwell Road minor arm;

iii) the major Madingley Road arm would operate unaffected - the right-turn inbound approach from Madingley Road would operate well within capacity, and any queue could be accommodated within the available right turn ghost island stacking space;

iv) this Clerk Maxwell Road arm would operate above capacity for a short period of time – during the PM peak period of 1700-1800 when the occupants of the car park would be exiting; and

v) for the reasons stated in paragraph 4.4.15, this represents a worst case. The occupants of the car park would adjust their working times to respond to conditions on the network, potentially finishing earlier or later in the day when congestion was less.

14.4.19 Notwithstanding, a capacity mitigation scheme has been prepared, and is shown on Figure 6.14. This strategy would provide a simple traffic signal controlled enhancement to the Madingley Road / Clerk Maxwell Road junction, which could work in conjunction with an adjacent potential toucan crossing. The results for this assessment are summarised in Table 14.7, assuming that the toucan crossing is requested every cycle of the light sequence.

Table 14.7 - Summary of LINSIG results – Madingley Road / Clerk Maxwell Road - 2021 Do Something

Movement	AM Peak		PM Peak	
	DOS	MMQ	DOS	MMQ
Madingley Road (E) – Left and Ahead	89%	21	89%	16
Clerk Maxwell Rd – Left and Right	25%	1	90%	9
Madingley Road (W) – Ahead	88%	8	72%	6
Madingley Road (W) – Right				
Pedestrian crossing (E)	64%	5	70%	4
Pedestrian crossing (W)	70%	12	70%	11

DOS – Degree of Saturation

14.4.20 Whilst this traffic signal controlled junction enhancement would operate within capacity, it is noted that:

i) the existing form of Madingley Road could be the subject of significant change should the City Deal proposals identify this link as the preferred route for the East – West public transport corridor;

ii) the priority junction form would experience queuing for the limited duration evening peak period only – a traffic signal controlled junction would affect vehicle movements throughout the remainder of the day, throughout the complete week;

iii) there would be a dis-benefit by providing another traffic signal controlled junction on Madingley Road, introducing further delay to vehicles travelling along the Madingley Road route;

iv) similarly, there would be a further dis-benefit by adding delay to vehicles exiting Clerk Maxwell Road outside of the peak hour; and

v) by using the adopted Adaptive Phased Approach, should conditions be shown to have deteriorated mitigation could be delivered at the start of the next phase.

14.4.21 It is therefore suggested that:

i) this mitigation option not be delivered immediately;

ii) this situation be monitored on a yearly basis, and

iii) if considered desirable by the residents and the Joint Authorities, the traffic signal scheme could be implemented by the University.

Madingley Road / Madingley Rise

14.4.22 The existing Madingley Road / Madingley Rise priority junction has been assessed with the 2021 Do Something scenario flows for this priority junction using the Junctions 9 computer programme. The results are shown in Table 14.8, the computer output is contained in Appendix 14.3.

14.4.23 These results indicate that the Madingley Road / Madingley Rise priority junction is forecast to operate within capacity in during the AM and PM Peaks during the forecast year scenario with the addition of the Proposed Development flows.

Table 14.8 - Summary of Junctions 9 results – Madingley Road / Madingley Rise - 2021 Do Something

Movement	AM Peak		PM Peak	
	Max RFC	MMQ	Max RFC	MMQ
Madingley Rise – Madingley Rd (E)	0.02	0	0.04	0
Madingley Rise – Madingley Rd (W)	0.02	0	0.09	0
Madingley Road (E) – Madingley Rise	0.06	0	0.01	0

14.5 Conclusions

14.5.1 The comparison between the 2015 and 2021 Do Minimum model peak hour flows (i.e., the impact of the background growth on the network without any of the additional trips generated by the Development) demonstrates that the M11 and the A1302 strategic highway corridors surrounding Cambridge will experience significant increases in peak hour flow. Similarly, the local highway network along Huntingdon Road and Madingley Road will experience significant increases. Northampton Street and Girton Road experience minor increases in traffic flow.

14.5.2 The comparison between the 2021 Do Minimum and 2021 Do Something model peak hour flows (.i.e., the direct comparison of the network Without - then With - the Development) indicates that there are no significant increases in traffic as a direct result of the proposed development along the network in the future year of 2021.

PART 4 TRAVEL MANAGEMENT MEASURES

Part 4 of the Transport Assessment contains Section 15:

Section 15 – Travel Management Measures

15 Travel Management measures

15.1 Introduction

15.1.1 This section of the report considers the proposed measures to manage any residual transport impacts of the Initial Phase of Development in 2021 above that of the Consented Development.

15.1.2 Further assessments of later phases will identify any further necessary mitigation measures.

15.1.3 Previous sections of the Transport Assessment set out the most likely outcome in terms of trip generation and traffic impact in the context of current and planned conditions.

15.1.4 As there may be a degree of variability in future projections (which can be attributed to a number of factors including fuel prices, Government policy etc), a pragmatic management strategy has been formulated for West Cambridge which is designed to be resilient to change. This strategy would:

i) control vehicular trips across the network;

ii) where necessary, provide measures to preserve and / or enhance capacity on particular links;

iii) manage Development impact on some sensitive strategic links; and

iv) improve pedestrian and cyclist movement across the network.

15.1.5 The development proposals, and required transport mitigation identified in this Transport Assessment, are independent of the emerging City Deal proposals, and will adequately mitigate the envisaged transport impact of the development. As such, the West Cambridge outline planning application does not rely on the City Deal proposals for mitigation. If the City Deal measures do come forward and supersede any of the mitigation proposed by the University, it is expected that relevant agreed levels of contribution for specific mitigation identified herein could be reallocated (with the University and County's agreement) to support these City Deal measures.

15.1.6 The West Cambridge 2021 Initial Phase Do Something option test has been run incorporating the benefit of the Development Travel Demand Management Strategy summarised in Section 9 - incorporating the proposed public transport strategy, the quality pedestrian and cycle strategy, and the controlled car parking provision. The results from this 2021 Do Something assessment identified there is a minor, if any, residual impact on the network when compared to the Consented situation.

15.1.7 This section therefore provides further information about the management measures as follows:

i) a summary of the transport management strategy measures already incorporated within the modelled output;

ii) a summary of the proposed further transport management measures;

iii) details and consideration of the effects of these further transport management measures:

- directed at vehicle trip reduction;

- physical interventions to preserve conditions and / or enhance capacity for all modes across the network;

- to manage vehicle generation;
- to enhance public transport provision; and
- to enhance pedestrian and cyclist facilities.

15.1.8 This section concludes that the overall effects of the proposed travel demand measures would:

i) control the number of vehicle movements; and

ii) offset any additional other mode trips generated by an initial first phase of the Proposed Development in 2021.

15.2 Summary of the transport management strategy incorporated within the modelling

15.2.1 As detailed in Section 12, the Initial Phase 2021 West Cambridge Do Something option test modelling incorporates the benefit of the overall Development travel demand management strategy (summarised in Section 9). The measures inherent in that assessment include:

i) the new residential offer in the area: the new market housing being provided at Darwin Green (to the north of Huntingdon Road); as well as the additional units at the North West Cambridge Development, located immediately to the north of Madingley Road – with student accommodation, market housing, and Key Worker housing for University staff;

ii) the Framework Travel Plan (see separate document);

iii) the proposed public transport strategy summarised in Section 7.

15.2.2 These measures were formulated in order to:

i) decrease the journey to work trip distance across the area by providing complementary land-uses;

ii) taking advantage of the conveniently located facilities on North West Cambridge – the retail, the primary education and the community facilities - that would reduce the need to travel elsewhere during the working day

iii) provide regular bus services to popular destinations to provide for as many longer distance movements as possible;

iv) reduce and control the total vehicular trip generation associated with the development.

15.2.3 As noted in Section 8, the Initial Phase of Development car parking is lower than was originally consented for West Cambridge in 1999. As such, the Development vehicle trip generation –and hence the impact of the Initial Phase of Development would be lower than that consented and mitigated previously.

15.2.4 In addition to the travel demand management measures already included in the modelling exercise referred to in Section 12, there are further measures that could be implemented to reduce further and control the vehicular trip generation of the Development, to minimise vehicle impact on the surrounding network. These are described later in this section.

15.3 Summary of further transport management measures

15.3.1 It has been agreed in principle with the highway authorities that the following additional measures would, in combination, form part of the transport strategy for the Development:

i) measures directed at maintaining and controlling a **reduced vehicle trip rate** across the strategic and local highway network – by applying a control on the car parking patronage across the Development;

ii) measures directed at **demand management** across the network – the extension of the SCOOT and MOVA traffic signal optimisation to any potential traffic signal enhancements along Madingley Road – possibly Clerk Maxwell Road – to reduce any additional queuing and delays as a consequence of the Development;

iii) a series of measures to improve conditions for **pedestrian and cyclists** – the proposed improvements to Pedestrian / Cyclist measures:

15.4 Measures directed at controlling and reducing vehicular trip generation

15.4.1 The provision of appropriate levels of car parking within the Development, combined with a series of parking management measures to reinforce the efficacy of this approach, are central to the Development travel demand management strategy.

15.4.2 Within the context of this strategy, delivery of a high quality development is a fundamental pre-requisite and therefore under-provision of car parking within the Site with consequential detriment to the street scene should be avoided.

15.4.3 The Development car parking strategy would complement the range of other measures to manage demand and to enhance the attraction of non-car modes of transport, and would hence reduce the demand for car parking.

15.4.4 The proposed 2,570 car parking spaces for the Initial Phase of Development would be 580 spaces lower than the Consented car parking provision of 3,150 spaces - an 18% reduction in number. This lower provision is considered appropriate in the context of:

i) the reductions in demand for car travel that would result from the accessibility of Development to non-car modes

ii) other travel demand management measures; and

iii) the proposed mix of land uses.

Management of car parking within the Development

15.4.5 Management of car parking would be delivered through a combination of provision, design and management measures.

Parking Provision

15.4.6 It is considered that the delivery of appropriate levels of parking - in the context of good design - would be self-policing, and hence reduce the need for active policing or other intervention by the University.

15.4.7 The proposed car parking strategy for the Development has been established with reference to data collected from the existing Development, and is lower than the parking provision consented in 1999. The Development parking provision levels have been set sufficiently robustly to ensure the delivery of a quality development whilst also contributing to achievement of the modal shift sought by the Area Action Plan.

Design

15.4.8 As part of delivery of the reduced levels of car parking referred to above, the University would:

i) provide appropriate levels of car and cycle parking carefully located to contain inconsiderate parking, encourage non-car modes of travel - such as cycling - and avoid the need for unsightly double yellow lines to be applied retrospectively with the associated restrictive and hostile impact to the environment; and

ii) incorporate appropriate road widths for the development street hierarchy - to ensure both that parking is focussed to designated locations, and that inconsiderate parking is so apparent and obvious to contain any transgression.

Management

15.4.9 The University will commit to apply and manage the agreed Parking Strategy on a long-term basis.

15.4.10 The University would implement a combination of car parking space allocation, control and monitoring measures. These would include:

i) for the academic research land-uses, applying the agreed Travel Plan measures to their staff;

ii) for the academic research land uses, providing sufficient car parking spaces to an appropriate, agreed, level of parking;

iii) for the academic research areas, extending the University's centrally-controlled existing car parking permit scheme;

iv) reviewing the occupation of the University's car parks;

v) reviewing the need to support a residents-only controlled parking zone scheme or off-site car parking prohibition on the surrounding existing residential areas – such as Clerk Maxwell Road and Adams Road (see below);

vi) as part of the regular review of the Travel Plan, undertaking that the Travel Plan Co-ordinator review parking conditions throughout the Development, for all times of day and for all conditions.

Management of car parking off-site

15.4.11 As part of the holistic car parking strategy for the West Cambridge Development, the University commits both to monitor parking conditions on the local roads, particularly to the east of the Development to ensure no "fly-parking" – car parking migrating out from the residential elements of the Development.

15.4.12 As detailed in Section 6, the University will offer contributions towards the replacement of the existing on-street car parking along Clerk Maxwell Road with two mandatory cycle lanes as part of the proposed improvement to cycling infrastructure on this route.

15.4.13 Should conditions deteriorate on further surrounding existing roads due to increased car parking, the University will offer funding to support the establishment of on-street residents-only controlled car parking zones, or a parking prohibition, or another method to manage car parking.

15.4.14 A controlled car parking zone had been offered previously by the University as mitigation for North West Cambridge within the vicinity of that development. It is likely that any controlled car parking zone scheme offered as part of the West Cambridge mitigation measures would reflect this implementation.

15.4.15 Any such off-site car parking management scheme would be implemented in conjunction with the local residents.

15.5 Physical interventions to preserve and improve conditions

15.5.1 Measures will be provided locally to preserve and improve environmental conditions.

Madingley Road speed limit

15.5.2 The University will contribute towards the costs of implementing a reduction in the existing 40mph speed limit on Madingley Road.

15.5.3 A 40mph speed limit is in force on Madingley Road adjacent the West Cambridge Development between the M11 Junction 13 and the approaches to the JJ Thomson Avenue junction. Whilst this speed limit was appropriate when the traffic regulation order was applied, conditions along Madingley Road have changed significantly subsequently. With the implementation of the North West Cambridge Development and the West Cambridge Development proposals, Madingley Road will be increasingly used by pedestrians and cyclists. As such, a speed limit slower than 40mph is appropriate.

15.5.4 To provide an environmental enhancement in the locality of West Cambridge, the University will provide a contribution towards the costs of the necessary traffic regulation order to implement this reduced speed limit. The lower vehicle speeds will provide benefit for existing users of Madingley Road, as well as for the pedestrians and cyclists generated by West Cambridge

Road Safety Schemes

15.5.5 As identified in Section 3.9, the road safety assessment has identified three existing issues to vulnerable road users at:

i) the Madingley Road / Storey's Way priority junction;

ii) Madingley Road / Grange Road signalised junction; and

iii) Madingley Road / Cambridge Road crossroads.

15.5.6 The University will work with Cambridgeshire County Council in promoting schemes, and contribute towards road safety measures to resolve these issues.

15.5.7 At the Madingley Road / Storey's Way junction, the scheme involves removing the existing physical islands which appear to form a constriction to movement. These will be replaced with at-grade carriageway construction, to extend the advisory cycle lane across the junction up to the dropped kerb to access the toucan to the east. This concept is shown on Figure 6.8.

15.5.8 The road safety scheme identified at Madingley Road / Grange Road junction would include works to:

i) extend the advanced stop line on both Madingley Road approaches to 5m;

ii) consider whether cycle "head-start" green times can be included within the traffic sign controls; and

iii) provide a road-side safety mirror on the traffic signal posts – this will both alert motorists of this issue, as well as making approaching cyclists more conspicuous to motorists.

15.5.9 To assist in resolving the existing safety issue at Madingley Road / Cambridge Road, the scheme would include:

i) review of the road marking scheme – including red centre line colouring;

ii) review of the advanced signage strategy; and

iii) vegetation maintenance.

15.6 Measures directed at demand management

15.6.1 Measures have been considered to manage vehicle trip demand at sensitive locations of the network. These measures comprise the provision of traffic signal optimisation apparatus – a relatively low-cost technique to reduce the total queuing and delays at the signals along the Madingley Road Corridor.

15.6.2 A LINSIG assessment undertaken of the linked traffic signal controlled junctions along this Madingley Road Corridor – between the M1 Junction 13 Northbound Off Slip, to the High Cross Access to West Cambridge - predicts that these would continue to work within capacity in the 2021 Initial Phase Do Something scenario.

15.6.3 Notwithstanding, to provide certainty of the future continued efficient operation of the M11, the University proposes that the existing MOVA and SCOOT traffic signal optimisation systems be extended along this route to any new signal controlled junction to minimise delays to traffic movements on this corridor, and hence reduce the chance of any obstruction to the operation of the M11. Typically, across the network, the MOVA and SCOOT optimisation systems would reduce any potential queuing and delay more than to increase stopline saturations.

15.7 Measures directed at improving conditions for Pedestrians and Cyclists

15.7.1 As detailed in Section 6, a comprehensive Walking and Cycle Strategy will be brought forward with the proposals for West Cambridge, in the context of the new development at the North West Cambridge and the surrounding existing Cycling infrastructure.

On-site Infrastructure

15.7.2 The Pedestrian and Cycle connections through the Development will both:

i) ensure quality accessibility and connectivity to the surrounding areas; and

ii) significantly enhance and improve the linkages between existing developments by providing direct quality links on desire lines.

15.7.3 The Site has been provided with permeable footways and cycleways across the development, with Pedestrian crossings delivered on the site access roads along the desire lines:

i) on the North - South connections - between Madingley Road and Coton Path using the Western Access, High Cross, JJ Thomson Avenue and Clerk Maxwell Road. These links will be supported with controlled crossings on Madingley Road;

ii) on the East - West Shared Space Link - to provide the main east-west spine for Pedestrians and Cyclists connecting Clerk Maxwell Road and High Cross with access to a number of plots and lower-hierarchy Cycle routes.

These footpaths and cycleways throughout the development will create links to existing public rights of way, and Cycle routes.

15.7.4 To maintain their attractiveness, the proposed with-flow segregated Cycle tracks along the main routes through West Cambridge would be:

i) continuous, and as such retain priority over side road junctions and vehicular accesses to plots by the track being level when crossing the side road;

ii) designed to provide good inter-visibility between cyclists and motorists to provide each with sufficient time to assess the situation on the approach and enhance safety – as such, the proposed landscaping will be designed so these should not inhibit visibility on the approaches to the side roads;

iii) designed in the context of all vehicle routes being designed for a 20mph speed limit using passive speed management measures to create a safer and more attractive environment for Pedestrians and Cyclists;

15.7.5 A series of further measures will be implemented within the Development to encourage walking and cycling, including:

- footways being provided on both sides of the on-site streets and at the Site Access locations. Controlled crossing points would be provided, and traffic calming measures would be present to reduce traffic speed and to ease Pedestrian movement;
- high levels of quality cycle parking - at least to the adopted Cambridge Local Plan 2014 minimum cycle parking standards - will be provided within private covered, secure, lit and well-located areas at the destinations, as well as further provision through the Development;
- all major employers would be required to provide associated shower and changing room facilities for walkers and cyclists after their journeys; and
- the application of a cycle parking provision and management strategy - cycle parking will be provided as near as possible to the main entrance of the buildings, and will be covered by natural surveillance or CCTV.

Off-site Infrastructure

15.7.6 To enhance the existing Pedestrian and Cyclist connectivity further, the following pedestrian and cycle infrastructure enhancements will be provided by the Development:

- providing remedial measures to assist in resolving existing road safety issues on two adjacent junctions, disproportionally affecting cyclists;
- along the corridor to the north – towards North West Cambridge, Girton and Huntingdon Road;
- along the corridor to the City Centre – along Coton Path, Adams Road and Burrell's Walk; and
- along the following corridor towards the City Centre – along Grange Road, Sidgwick Avenue, and Silver Street.

15.7.7 To provide an environmental enhancement in the locality of West Cambridge, the University will provide a contribution towards the costs of the necessary traffic regulation order to implement a reduced speed limit along Madingley Road adjacent the West Cambridge Development between the M11 Junction 13 and the approaches to the JJ Thomson Avenue junction. The lower vehicle speeds will provide benefit for existing users of Madingley Road, as well as for the pedestrians and cyclists generated by West Cambridge.

Conclusion

15.7.8 Collectively the measures to improve conditions for cyclists and pedestrians will ensure that conditions will be improved for them - this would be likely to increase the number of those choosing walking or cycling as their mode of travel.

15.8 Measures directed at enhancing Public Transport

15.8.1 The scale of the proposed Development means that there will be both a high quantum of demand for public transport, and a number of locations that will need to be connected to West Cambridge. New and enhanced bus services will be phased in to align with the development quantum and consequent growth in demand.

15.8.2 This analysis of the home post code data of the current and potential occupiers of West Cambridge confirms that the service routes would both provide easy access to public transport for many, and would assist the commercial viability of these routes.

On-site Bus infrastructure

15.8.3 In order to facilitate an attractive bus service with good, safe headway through the Site and hence to users to the service, the following would be provided:

- high quality bus stops;
- bus priority measures - selected vehicle detection for buses through any new traffic signal controlled junctions to improve the flow of buses or enable passengers to access facilities; and
- information and incentives.

Bus Strategy

15.8.4 As detailed in Section 7, a comprehensive Public Trans[ort Strategy will be brought forward with the proposals for West Cambridge, the implementation of the agreed bus services by the University will reflect the emerging Development construction phasing. The proposed final Bus Service provision is summarised as follows:

- Guided Bus: the potential for the introduction of a variation to Service B to operate from Orchard Park via North West Cambridge and West Cambridge. This would be in addition to the existing frequency on Service B and would provide links from the A14 corridor;
- Citi 4: to be revised to divert from a section of Madingley Road to operate via the West Cambridge development. Increased frequency, potentially to every 10 minutes. This will provide links to West Cambridge from the city centre and the A428 corridor. This would be subject to discussion with Stagecoach as the commercial operator of this service;
- Uni 4: revised to focus on giving a direct service to Cambridge rail station, instead of Addenbrooke's Hospital. Increased frequency, potentially to every 10 minutes, and operation extended to Saturdays;

- Orbital Service: significant enhancement of the proposed Orbital Service with increased frequency and higher quality vehicles. The service would be extended beyond the currently proposed route to serve West Cambridge, then continue via the M11 motorway to Trumpington Meadows, the Biomedical Campus and Addenbrooke's Hospital. The service would then give links to West Cambridge from Chesterton rail station, North Cambridge and South Cambridge.

Conclusions

15.8.5 The provision of a quality bus strategy will encourage the use of bus to form a significant percentage of the mode share for short, medium, and longer distance trips, and would reflect local and national policy guidance and strategies.

15.9 Measures directed at enhancing travel demand management – the West Cambridge Framework Travel Plan

Car Clubs / Pool cars

15.9.1 The University of Cambridge currently operates a business account Car Club membership whereby University Departments and Institutes can book vehicles at any Car Club location. The Car Club vehicles are already located at the West Cambridge and the Old Addenbrooke's Sites, and the University is planning to locate further Car Club vehicles at other sites.

15.9.2 As part of corporate membership, University staff can also have a personal account for use outside of work, at the current cost of £30 per year.

Car Sharing

15.9.3 Two local car share data bases are readily available, including:

i) Cambridge University's car share database - https://camuni.liftshare.com/default.asp; and

ii) the Cambridgeshire Liftshare - www.CamShare.co.uk.

15.9.4 Both of these will be encouraged and promoted to match similar journeys.

15.9.5 A higher priority will be given to car drivers who regularly car share in the provision of on-site car parking permits.

Cycling

15.9.6 The following initiatives will considered, and are discussed in more detail within the associated Framework Travel Plan document:

- Cycle Pools;
- "Cycle Buddy" schemes;
- Development of cycling services;
- Cycle training;
- Offer of discounted cycles and equipment; and
- Bus operator to provide cycle carries on buses.

Marketing and Promotion

15.9.7 Traditional tools of marketing and advertising (i.e. travel packs and leaflets) will be used in conjunction with measures that encourage a higher level of community involvement to create awareness and promote sustainable travel at the Development. This will be achieved using a number of techniques:

- recruiting Sustainable Travel Behaviour Champions;
- identifying influencers, communicators and networkers to create a sustainable working and educational culture in the Development;
- creating social networks within the community; and
- encouraging community participation through travel planning events.

15.10 Potential physical interventions directed at preserving capacity across the network

15.10.1 The capacity assessment of the junctions within the locality using the forecast 2021 future year flow has identified that two junctions could require minor enhancements:

i) Madingley Road / High Cross junction; and

ii) Madingley Road / Clerk Maxwell Road junction.

15.10.2 However, it is acknowledged that this future year assessment may be overly robust:

i) the first-principles Transport Modelling assessment adopted for this development would represent a worst case: the methodology adopted to assess the future year flows would not assess likely reassignment effects across the network; and

ii) the junctions would still operate within practical capacity.

15.10.3 It is therefore proposed that a cyclic monitoring strategy is proposed. Should this survey work identify that conditions deteriorate significantly, a fund will be provided to be expended on these enhancements to ensure that any increase in movement can be contained.

15.10.4 The monitoring would be undertaken biennially and consist of a classified turning and queue count for a day in an agreed neutral month, along with a queue survey. The first survey would be undertaken the first neutral month date after first occupation. These results would enable a better understanding of daily and hourly variation of flows along this route.

15.11 Summary

15.11.1 This Section summarises the proposed measures to manage any residual transport impacts of the Initial Phase of Development in 2021.

15.11.2 Conditions will be imposed requiring further assessments of later phases to identify any further necessary mitigation measures.

15.11.3 The following travel demand management measures have been considered.

i) the extension of the SCOOT and MOVA traffic signal optimisation to the proposed traffic signals along Madingley Road – JJ Thomson Avenue and Clerk Maxwell – to reduce any additional queuing and delays as a consequence of the Development;

ii) the development of a car parking management strategy with a reduced car parking provision;

iii) remedial measures proposed at three junctions to address highway safety concerns;

iv) significant improvements to Pedestrian / Cyclist measures both on and off-site:

v) significant enhancement to existing bus services;

vi) the Development Framework Travel Plan; and

vii) potential physical measures to preserve capacity at two junctions should cyclic monitoring demonstrate the requirement. It is therefore concluded that this suite of measures aimed at mode shift, demand management and improvement of conditions on the network would manage the transport effects of the Development.

PART 5 CONCLUSIONS

Part 5 of the Transport Assessment contains the Conclusions

16 Conclusions

16.1 This report sets out the results of the Transport Assessment undertaken to accompany the application for outline planning permission by the University of Cambridge develop land at West Cambridge.

16.2 An existing masterplan for West Cambridge was granted an approval in 1999, and this consent forms the basis of the current development on the Site. This consent envisaged 248,272m^2 of development - of academic, research institute and commercial research, as well as ancillary use shared facilities, sports, and residential uses.

16.3 The Cambridge Local Plan 2014: Proposed Submission Policy 18 promotes the densification of the existing West Cambridge through a revised masterplan, subject to a number of conditions. It is within this context that the University of Cambridge has produced a new masterplan for the Site which significantly increases the amount of development to approximately 500,280m^2.

16.4 The University already has a proud reputation throughout the City for promoting its travel demand management strategy, and has always been proactive in delivering improvements to it. This philosophy will be continued at West Cambridge.

16.5 The Development accords well with national transport policy and guidance to deliver sustainable development:

i) its sustainable location within Cambridge, and the incorporation of employment well located adjacent to residential land-uses reducing the need to travel - supporting the stated aspirations and objectives of paragraph 34 of the National Planning Policy Framework; and

ii) by promoting ways to reduce the traffic impact of this development and the University's other activities within Cambridge, and by "managing down" traffic generation, the Development supports the policy of the Department for Transport's Circular 02/2013.

16.6 The development also accords with important local transport and planning policy requirements:

i) of Policy 18 of the Cambridge Local Plan - by including a comprehensive transport strategy for the site, incorporating a sustainable transport plan to minimise reliance on private cars, as well as enhancing links for walking, cycling and public transport (including access for all) to the city centre, railway station(s), other principal educational and employment sites, and other key locations within the city to support sustainable development;

ii) by improving the local footpath and cycleway network as an integral part of a wider transport system – thus improving access to the surrounding countryside – according with the Cambridgeshire Rights of Way Improvement Plan; and

iii) of the measures identified within the Cambridge Long-Term Transport Strategy, the public transport strategy would deliver enhanced public transport services.

16.7 West Cambridge is being brought forward within the context of wide-reaching planning uncertainty – including:

i) the Cambridge Local Plan still being the subject of an Inquiry;

ii) the emerging form and programme for the A14 Huntingdon – Cambridge Improvement Scheme following the publication of the Secretary of State's Decision in May 2016;

iii) the deliberations and a decision surrounding the Greater Cambridge City Deal strategy; and

iv) Highways England's need to consider measures along the M11.

16.8 These would have a significant and substantial effect upon the strategic movements of vehicles across the region, and influence the future access and movement strategy of West Cambridge – particularly in the mid- to late phases of the development.

16.9 As the outline planning application will be submitted prior to the detailed definition of these measures, as discussed with the Joint Authorities (Cambridge City Council – the planning authority, Cambridgeshire County Council – the local highway authority, and Highways England – the strategic highway authority), an Adaptive Phased Approach has been adopted, incorporating:

i) a graduated approach – the assessment process reflecting current transport planning policy where travel demand management measures are introduced first, followed by any necessary highway infrastructure measures to mitigate the residual traffic impact; as well as

ii) an adaptive approach – where, to maintain future flexibility, the proposed mitigation for later phases responds to the quanta of development within the individual phase proposals, the timescales for the delivery, changes in future travel behaviour patterns, emerging transport policy, and the current uncertainty relating to the area-wide transport enhancement proposals delivered by others.

16.10 As such, this Transport Assessment provides a detailed assessment of the trip generation of an indicative first phase of development only, relating to the 2021 scenario, and the associated mitigation strategy. The vehicular trip generation from West Cambridge is compared against that arising from the Extant Consent for this site, and shown to be lower.

16.11 Further information relating to the traffic impact, highway capacity assessment and mitigation relating to later phases of West Cambridge (i.e., for 2021 onwards) will be provided subsequently in the context of further clarity being reached.

16.12 Within the context of an assessment of an Initial Phase of development in 2021 with relatively small development impact, it was agreed that a more local approach to the assessment of impact was appropriate. A methodology was therefore agreed with the Joint Authorities, based upon Peter Brett Associates' Transport Modelling.

16.13 The results from the modelling show:

i) the Do Minimum vehicle trip generation used to assess the original 1997 application – upon which the highway mitigation strategy was derived - is 12% higher than the Do Minimum assessment derived from the Peter Brett Associates analysis;

ii) the vehicle trip generation from West Cambridge increases from that predicted for the 2015 Base in both 2021 scenarios, as further quanta of development would be completed; and

iii) the reduction in car parking provision within the Do Something Initial Phase of Development proposals results in a reduced trip generation from West Cambridge.

16.14 As such, when compared to the 2015 Base flows, the percentage increases in link flows for the 2021 Do Something Development will be less than for the 2021 Do Minimum scenario.

16.15 The traffic impact assessment concluded that:

i) the differences between the 2015 Base Year and 2021 Do Minimum scenarios (i.e., With the Consented Development) indicate that the network will experience significant increases in peak hour flows;

ii) the differences between the 2021 Do Minimum and 2021 Do Something scenarios (i.e., the impact of the Development) would be minimal. There are only a limited number of links that experience flow increases across the local highway, mainly due to the proposed changes to the Development access strategy;

iii) the junction capacity assessment identifies that in 2021 with the Proposed Development, the local junctions would operate within capacity.

16.16 As there may be a degree of variability in future projections (which can be attributed to a number of factors including fuel prices, Government policy etc), a pragmatic management strategy has been formulated for West Cambridge which is designed to be resilient to change. This strategy would:

i) control vehicular trips across the network;

ii) where demonstrated to be necessary, provide physical measures to preserve and / or enhance capacity on particular links;

iii) manage Development impact on some sensitive strategic links; and

iv) improve pedestrian and cyclist movement across the network.

16.17 In summary:

i) the Development accords well with national and local transport policy;

ii) the development also accords with important local transport and planning policy requirements:

iii) as the outline planning application will be submitted in the context of uncertainty relating to local development and infrastructure mitigation, that the adopted Adaptive Phased Approach provides a robust and reasonable manner of assessment, in a flexible manner;

iv) that a detailed assessment of the vehicular trip generation of an indicative first phase of development shows that when compared to the traffic impact of the consented – and mitigated – West Cambridge Development, that the impact of the Development proposals is minimal;

v) as there may be a degree of variability in future projections (which can be attributed to a number of factors including fuel prices, Government policy etc), the traffic management strategy formulated for West Cambridge is pragmatic, and is designed to be resilient to change; and

vi) the overall transport strategy for the Development responds to a number of important national regional and local objectives.

16.18 As such, there are no transport-based reasons why planning consent should not be granted for the West Cambridge Development.