Oxford to Cambridge Expressway

Corridor Assessment Report

Appendix G: Traffic Appraisal for Corridor Assessment

PCF Stage 1

May 2018

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1. Introduction

1.1 Background

The Oxford to Cambridge (Ox-Cam) Expressway project is currently embarking on Highways England PCF Stage 1 – Option Identification. Due to the sheer size of the study area and the complexity of the project, Stage 1 has been divided into two parts: Stage 1A covering the assessment of corridors and identification of a preferred corridor and Stage 1B which will examine route options after the preferred corridor has been selected.

We are currently in Stage 1A and all the work undertaken during this phase will culminate in a Sifting Workshop to take place in early May 2018. During this workshop all the technical teams will present the evidence prepared by each discipline to assess the comparative merits of the corridor options. This evidence will be presented and evaluated within the context of a framework which will allow the benefits of each corridor to be assessed against a number of criteria.

The criteria used for this assessment is directly connected to the client supplied Strategic Objectives for the Ox-Cam project. The Strategic Objectives have been translated into project specific intervention objectives in accordance WebTAG which address known problems and opportunities within the study area as identified in the Stage 0 studies.

The sifting workshop will identify a Preferred Corridor based on the evidence presented and the evidence used to drive the decision making process will be captured within the Corridor Assessment Report (CAR).

1.2 Purpose of this Report

The purpose of this report is to record the process undertaken by the Traffic Modelling, Appraisal and Economics Team in deriving the evidence used to inform the Sifting Workshop – clearly it will be limited to the part of the sifting workshop that relates to traffic impacts of the corridor options. Other disciplines will be covered elsewhere in the CAR.

The report covers the origins of the traffic model that forms the basis of this work, how the model was used, the outputs from the model and the interpretation of this information. It also provides a summary of the Strategic and Intervention Objectives.

This report will ultimately inform relevant sections of the CAR.

2. Project Objectives

2.1 Strategic and Intervention Objectives

The Strategic Objectives are provided by the Department for Transport and are based on those used in Stage 0 of the project. The one difference is a further Objective - "Strategic Transformation" - added to reflect the opportunities provided by the National Infrastructure Commission (NIC) in its 2017 report 'Partnering for Prosperity: A new deal for the Cambridge-Milton Keynes-Oxford Arc'.

The Intervention Objectives are developed from the Strategic Objectives and reflect the particular issues and opportunities arising within our study area in accordance with WebTAG. Both the Strategic and Intervention Objectives are summarised in Table 2.1

Table 2.1: Strategic and Intervention Objectives

Strategic Theme	Description	Intervention Objectives
Connectivity	Provide an east-west strategic road link between Milton Keynes and Oxford that delivers enhanced connectivity through faster, safer and more reliable connections across the corridor in the broad arc from Oxford to Cambridge via Milton Keynes.	1. Reduce journey times 2. Improve journey time reliability 3. Promote resilience 4. Safety performance of the project delivery 5. Safety performance of the finished product
Strategic Transformation	Support the creation of an integrated corridor between Oxford and Cambridge, reflecting and advancing plans for infrastructure, housing, business investment and development.	1. Alignment with other transport infrastructure 2. Alignment with known and aspirational development
Economic Growth	Unlock the economic potential in the corridor by facilitating strategic growth to the benefit of the UK economy through increased productivity, employment and housing, and maximising synergies with potential growth associated with East West Rail.	Maximise sustainable growth opportunities within the Arc and beyond for existing and new communities. 1. Economic Density, 2. Access to gateways and freight terminals 3. Dependent development including jobs and housing, 4. Skills Impact
Skills and Accessibility	Promote accessibility and wider socio-economic benefits by improving access to job opportunities at key employment centres, developments, and at education, leisure, health, and retail facilities whilst creating wider employment opportunities.	Improve wider access to jobs by 1. reducing journey times, 2. supporting access to public transport and 3. improve connection between homes and employment

Planning for the Future	Reduce the impact of new housing on local roads for communities and contribute to better safety, security and health whilst promoting sustainable transport modes.	1. Provide infrastructure that facilitates access for traffic onto the SRN ("Right traffic on the right roads") 2. Promote access to public transport 3. Support future transport technology (improved safety, electric vehicles, low emission vehicles etc.) 4. Improve walking, cycling, and horse riding links between communities and core traffic generators 5. Integrate with existing and known future multimodal projects
Environment	To provide a healthy, natural environment by reducing congestion and supporting sustainable travel modes and promoting equality and opportunity.	1. Improve the net environmental impact of transport on communities. 2. Reduce the impact of new infrastructure on natural & historic environment by design 3. No net ecology loss
Innovation	Apply innovative technology wherever possible to support the sustainable planning, construction and operation of transport measures.	1. Promote the use of current and future technologies to support shorter journey times and reliability 2. Promote technology use to enable customers to adopt sustainable transport

This report covers the assessment of the Corridor Options for the traffic related Intervention Objectives; namely:

- Connectivity 1 – Reduce journey times
- Connectivity 2 – Improve journey time reliability
- Connectivity 3 – Promote resilience
- Connectivity 5 – Safety performance of the finished product
- Skills and Accessibility 1 – Improve wider access to jobs by reducing journey times

The definition of each Intervention Objective and the source of the evaluation information is considered in the following section.

2.2 Definition of the Intervention Objectives

The traffic related Intervention Objectives used in this report to assess the corridor options are defined in Table 2.2. Further, the source of evaluation information is also supplied.

Table 2.2 – Definition of Intervention Objectives

Intervention Objective	Definition	Source of Evaluation Information
Connectivity 1 – Reduce journey times	The reduction in total vehicle hours travelled within the study area over the 60-year evaluation period.	The reduction in vehicle hours is sourced from the traffic model and monetised over the 60-year evaluation period using TUBA.
Connectivity 2 – Improve journey time reliability	Reliability is defined in WebTAG as the variation in journey time that transport users are unable to predict resulting in a more stressful experience and less willingness to pay for travel (i.e. greater perceived cost of a journey).	This is calculated using bespoke HE Journey Time variability tool.
Connectivity 3 – Promote resilience	Resilience is defined as the ability to provide and maintain an acceptable level of service in the face of challenges to normal operation (such as inclement weather and road traffic conditions).	This is a qualitative assessment based on the amount of online vs offline route kilometres for each option
Connectivity 5 – Safety performance of the finished product	The reduction in the number of Killed, Serious and Slight Injury casualties within the study area over the 60-year evaluation period	The predicted reduction in the number of collisions and monetised over the 60-year evaluation period is calculated from the DfT approved methodologies (COBALT)
Skills and Accessibility 1 – Improve wider access to jobs by reduce journey times	Reduction in journey time to employment centres for the working population	Percentage increase in potential labour market within 45-minute journey time of employment centres using journey times from the traffic model.

3. The Traffic Model

3.1 Introduction

The traffic model used to inform the Corridor Sifting is the South East Regional Transport Model (SERTM) which has been developed as one of five strategic models by Highways England. This was regarded as the most appropriate model for use on Ox-Cam given its geographical coverage and it had been newly calibrated/validated for use on Highways England projects. During the development of the model a number of early versions were released for use. The Design Freeze 3 (DF3) version was issued to the project team in September 2017 and was subsequently used for the updating of the Stage 0 Strategic Outline Business Case. This model has also been used to provide the inputs to the Corridor Sifting exercise summarised in this report.

3.2 The South East Regional Transport Model

As noted above the traffic appraisal feeding into the Corridor Sifting has made use of the SERTM DF3 version. The model has been used exactly in its original form without any additional network or zonal amendments. This was deemed appropriate given the strategic level of assessment being undertaken.

Details on the calibration and validation of the model can be found in the SERTM Modal Validation Report (0003-UA008080-UT22R-04-MVR).

The approach taken to future year traffic forecasting for the Corridor Sifting was in accordance with the SERTM Model Forecasting Report (0004-UA008080-UT22R-02). For the purposes of the Corridor Sifting fixed demand forecasting only was used. Again, this was deemed appropriate given the strategic level of assessment being undertaken.

A summary of the key technical aspects and assumptions made in the traffic modelling can be found in Table 3.1.

Table 3-1: Summary of Technical Aspects and Assumptions for Traffic Modelling

	Assumptions/Notes
Traffic model	South East Regional Transport Model (SERTM)
Software	SATURN version 11.3.12 (consistent with original SERTM)
Base year	2015 (consistent with original SERTM)
Area covered	Detail (simulation): entire south east of England, from The Wash and Oxford to Southampton (consistent with original SERTM) Fixed speeds: London and other towns / main cities (including Oxford, Milton Keynes, Bedford, Cambridge and Aylesbury) (consistent with original SERTM) Less detail (buffer): rest of UK (south west, Midlands, north, Wales and Scotland) (consistent with original SERTM)
Roads modelled	Detail (simulation): all motorways and ‘A’ roads, plus all ‘B’ roads and any ‘C’ roads that play a material role in allowing traffic to access the Strategic Road Network (consistent with original SERTM) Less detailed (buffer): all motorways and ‘A’ roads, and all important ‘B’ roads that could affect the long distance routing of traffic (consistent with original SERTM)
Junctions modelled	Detail (simulation) with bespoke junction modelling: all junctions on or within 2km of the Strategic Road Network (consistent with original SERTM) Detail (simulation) with template junction modelling: all other junctions within the simulation area (consistent with original SERTM)
Zoning system	2306 zones (2173 zones, are internal, 87 external, 8 sea ports, 8 airports and 20 spare zones), largely based on the 2011 Census MSOAs (Middle Layer Super Output Area). In the external network, zones are based on districts. (All consistent with original SERTM).
User classes	Car Employer’s business, Car Commute, Car Other, LGV and HGV
Time periods	Weekday AM period: average 07:00 – 10:00 Weekday IP period: average 10:00 – 16:00 Weekday PM period: average 16:00 – 19:00 Weekday Off-peak: not assessed Weekends: not assessed (All the above is consistent with original SERTM)
Validation	See SERTM Local Modal Validation Report (0003-UA008080-UT22R-04-MVR).

Coding of expressway corridors	In accordance with the RTM Network Coding Manual i.e. dual carriageways links and grade-separated junctions (at assumed locations where the expressway would cross key 'A' roads and motorways).
Forecast years	Opening year: 2025 (changed from 2021); Intermediate year: 2031 (consistent with original SERTM); Final year: 2041 (consistent with original SERTM)
Future traffic growth	NTEM7.0 trip end data for cars, RTF factors for LGVs and HGVs (all consistent with original SERTM)
Future site specific developments	Not used (consistent with original SERTM)
Future highway schemes	As per original SERTM, but with adjustments associated with changing the first forecast year from 2021 to 2025
Variable Demand Modelling (VDM)	Excluded (consistent with original SERTM).

3.3 Transport Modelling

3.3.1 Forecast Scenarios

The SERTM has three forecast modelled years as follows:

- 2025
- 2031
- A final year of 2041.

The forecast demand has been developed using NTEM 7.0 data for car growth and RTF15 factors for LGV and HGV. It should be noted that no local authority, site specific planning data was used for SERTM forecast model development.

The impacts of the proposed scheme are based on the differences between the network performance of the two modelled scenarios: Do Minimum and Do Something.

A consistent Do Minimum scenario has been used to appraise all options and it includes committed Local Authority and Highways England schemes. Each Do Something scenario is based on the do minimum network with the addition of one of the five options as described below.

Option A: Southern Corridor via Aylesbury

The route diverges from the A34 North of Abingdon, just after the A4103 junction. The route then follows a new alignment to Junction 8A of the M40, where it then follows the existing A418 alignment until Aylesbury. The route then forms a northern Aylesbury by-pass reconnecting to the A418 between Aylesbury and Wing

Option B: East-West Rail Corridor via Bicester

There are three variations on the routes for Option B. All three alignments follow parallel to the existing east-west rail corridor, and travel along a southern Milton Keynes corridor. There are a number of sub-options around Oxford:

- Oxford sub-option 1: This route diverges from the A34 at the A415 junction at Abingdon. From there it travels offline avoiding Abingdon Airfield by passing on the west, until the route joins the existing A420. The route runs along the A420 until it re-joins the A34 and turns to the north until it intersects junction 9 of the M40. From this intersection the alignment diverges to the east where bypasses Bicester between Graven Hill and Ambrosden, passing across the A41 and then from the A41 to the east-west rail corridor.
- Oxford sub-option 2: Diverging from the A34 north of Abingdon at the same point as corridor Option A, this route follows a new alignment south of Oxford before turning northbound shortly after the A4074. It crosses the A40 and travels along the new road to the M40 where it would intersect a new junction. It then travels from this new motorway junction, across the A41 west of Bicester to the east-west rail corridor.
- Oxford sub-option 3: Beginning in a similar manner to sub-option 2, this route passes to the south of Oxford via a new road but instead of turning north it continues east to junction 8A of the M40. From this point the route utilises the M40 by turning north to a new junction, approximately 11km away, before turning north to pass the A41 west of Bicester and joining the east-west rail corridor.

Option C: Northern Corridor via Bicester and Buckingham

There are also three sub-options for corridor option C. The three variations are primarily similar to those in corridor option B and will still be referred to as corridor sub-options 1, 2 & 3. All sub-options merge to the east of Bicester, bypassing around the town to join the A4421. From here they continue north to the A421 where they travel east, passing south of Buckingham on an upgraded alignment. Once the routes reach Milton Keynes, they deviate from the existing A421 alignment to the south, utilising the same southern bypass as outlined in corridor option B.

Corridors Modelled

Sub-options 2 and 3 are very similar, both being aligned to the east of Oxford and connecting to the fixed element of the route of option B and C East of Bicester. It was considered that this slight difference in alignment would not result in a significant difference when tested within the SERTM model due to the similarity in location, length and connection to the wider strategic network between the two sub-options. Therefore, only the sub-options 1 and 2 have been tested at this stage. If sub-option 2 proves to be one of the most beneficial variations, then sub-option 3 can be refined and modelled in detail at a further stage.

Therefore, the list of 5 options assessed within the SERTM model include:

- Option A
- Option B1
- Option B2
- Option C1
- Option C2

3.3.2 Corridor Option Coding

Each of the corridor options has been coded within the SERTM forecast model to reflect the changes to main trunk routes and urban road network as a result of the scheme. Given that the options alignments and junction arrangements are still only in the concept stage, a simplified coding approach was taken ensuring the capacities and saturation flows were sufficient to minimise any delays along the scheme route and at scheme junctions with other roads.

It should be noted that Do Minimum scenario already includes A428 Black Cat to Caxton Gibbet scheme and which creates an Expressway standard route between Cambridge and Milton Keynes and therefore scheme coding for Do Something is limited to different options of ‘a missing link’ between Abingdon and J13 on the M1.

The entire length of the Expressway has been coded as a 2 lane dual carriageway, with grade separated junctions at intersections with key existing roads. All local access roads are redirected.

The Expressway has been coded with a maximum speed of 113kph and speed at capacity of 74kph. This is considered realistic for a corridor of this nature.

3.4 Methodology and Assumptions

3.4.1 Overview

The economic assessment involves the determination of costs and benefits of a scheme using travel demand, traffic flows, journey times and other inputs from a traffic model. By comparing the costs with the benefits of a scheme over a 60-year appraisal period, a Benefit Cost Ratio (BCR) can be calculated, which contributes to the value for money of the scheme.

3.4.2 Assessment Tools

The tools that have been used to conduct the economic appraisal are:

TUBA – Latest version 1.9.9 (July 2017) has been used to derive travel time, Vehicle Operating Cost (VOC) benefits as well as changes in Indirect Tax; and

Cost and Benefit to Accidents – Light Touch (COBA-LT) Latest Version 2013.2 (parameter file 2017.1) has been used to derive the accident benefits for the scheme.

3.4.3 Appraisal Period

In line with WebTAG guidance, the impacts of the scheme have been assessed over the 60-year period after the scheme opening year. The results of the model have been interpolated and extrapolated to cover the whole appraisal period of 60 years.

In order to ensure a conservative approach to calculation of scheme benefits, it is assumed that there will be no growth in traffic flows after the final forecast year (2041).

3.4.4 Benefits Capture and Annualisation

The benefits and disbenefits captured in the assessment are not limited to traffic on the scheme itself. They are also based on changes in levels of congestion, accidents etc. on both the new road and existing roads across the model.

The impact of the introduction of the expressway has informed the area of study for each subsequent criteria. For example, the study area for the TUBA analysis is consistent with the traffic model area of coverage and covers all of Britain. The study area for the COBALT analysis only includes roads with the changes in traffic flow of more than 10% between the Do Minimum and Do Something scenario.

In accordance with the guidance the travel time benefits generated in the modelled time periods have been extended using annualisation factors. The annualisation factors are defined as a number of times each time period occurs over a full year.

In SERTM the AM and PM modelled hours represent an average hour of the respective three-hour peak period and, therefore, the annualisation factor for AM and PM equals 3 x 253 = 759 (where 253 is the number of working days per year). The modelled IP hour is an average hour of the 6h interpeak and the annualisation factor for IP is 6 x 253 = 1518.

3.4.5 Discounting and Units of Accounts

Cost and benefits occur in different years throughout the assessment period, e.g. the construction costs occur before the scheme opens, whilst the benefits occur in the 60 years afterwards. Also, it is considered that benefits that accrue now are considered to be more valuable than those that accrue further into the future.

Given the above, in order to compare benefits and costs it is essential that they are all converted to a common base and a common value (known as the Present Value Year).

The process used is called discounting and the Present Value Year is currently 2010. Discounting is undertaken internally within the assessment tools mentioned above, using the standard DfT discount rates of 3.5% per year for the first 30 years of appraisal and 3.0% per year thereafter.

The unit of account must also be consistent between costs and benefits in order to allow comparison between the two. There are two different units of accounts:

Market price unit of account – this refers to the prices paid by consumers for goods and services and therefore includes indirect taxation (e.g. VAT); and

Factor cost unit of account – this excludes indirect taxation. Prices paid by Government bodies are usually quoted in the factor cost unit of account as any tax paid is recovered by the Government and is therefore ignored.

While scheme benefits are calculated in market prices, scheme costs are usually quoted as factor costs.

The scheme costs must therefore be adjusted to market prices for economic assessment purposes – this is done within economic assessment software TUBA.

3.5 Connectivity 1 – Reducing Journey Times

The journey time reductions are calculated using the SERTM model and then travel time benefits are calculated with the use of TUBA software. TUBA is the industry-standard software used to derive a range of impacts including travel time benefits. TUBA assesses travel time savings over the entire modelled area and then applies monetary values (known as Values of Time (VOT)) to derive the monetary benefits of those time savings.

The results of TUBA assessment show that it will take less time to travel through the study area with the scheme in place. As demonstrated in

Table **3-1** all of the options provide significant journey time savings.

Table 3-1: Journey Time Savings in 2010 prices, discounted to 2010

Description	Option A (Benefits) (£m)	Option B1 (Benefits) (£m)	Option B2 (Benefits) (£m)	Option C1 (Benefits) (£m)	Option C2 (Benefits) (£m)
Journey time savings	2,530.1	2,398.8	2,430.6	2,310.5	2,436.6

3.6 Connectivity 2- Improve Journey Time Reliability

Reliability is defined in WebTAG as variation in journey time that transport users are unable to predict.

A "stress based" method has been adopted for this stage of the appraisal which is based on the assumption that reliability is linked to the decline in flows that occur as the capacity of the road is reached.

The stress test methodology compares the changes in stress that occur as a result of the implementation of the scheme.

The DfT guidance highlights that the stress method does not produce a direct quantification of the changes in reliability, and that it can only provide a broad indication of the impact of the proposal on reliability.

Reliability benefits are estimated by applying uplifts to travel time savings depending on indicative measure of reliability benefits to reflect Slight, Moderate or Large impacts which can be derived using the method described below.

In line with the guidance the difference between Do Minimum and Do Something stress should be restricted to the range of 75% - 125%. If any stress value is less than 75% or greater than 125%, the calculation should be based on values of 75% or 125% as appropriate. The impact of the assessment is the product of the flow and the difference in stress. The results of the stress test are expressed as a textual score;

Table **3-2** provide the context for the results.

Table 3-2: Journey Time Reliability Scores

Portion of Benefits	Impact Score
>3 Million	Large Impact (10% uplift of time savings)
1 – 3 Million	Moderate Impact (5% uplift of time savings)
200,000 – 1 Million	Slight Impact (2.5% uplift of time savings)
<200,000	Neutral impact (No uplift)

Table 3-3 provides a summary of average stress for Do Minimum and each of the options in the opening year of the scheme.

Table 3-3: Stress Analysis Results

Route	Do Minimum	Option A	Option B1	Option B2	Option C1	Option C2
Existing Route	59.9%	51.9%	50.1%	48.8%	52.0%	50.2%
New Route	N/A	46.8%	61.2%	42.7%	57.5%	42.3%

Whilst the Do Minimum scenario average stress value is higher than in Do Something scenarios it is below 75% threshold in both Do Minimum and Do Something which indicates a neutral impact and no uplift to journey time savings.

It can be concluded that a proportionate stress-based method which has been adopted for this stage of appraisal has failed to provide any quantified evidence of reliability benefits associated with the scheme. However, given that the scheme will result in significant travel time savings and accidents benefits it is prudent to suggest that there will a positive impact on journey time reliability which is to be captured through a more comprehensive method at the next stages of scheme appraisal.

3.7 Connectivity 3 – Promote Resilience

This is a qualitative assessment based on how each corridor option will enhance the ability of the wider network to withstand the challenges to normal operation (such as inclement weather and road traffic conditions). We have chosen to assess it based on the amount of online vs offline route for each option. The rational for this being that an offline section of route provides new additional road network whereas online upgrade simply improves the existing network. It therefore follows that the former has the potential for greater flexibility in the face of challenges and the latter does not.

Corridors A, B2 and C2 are wholly offline are therefore considered to provide maximum flexibility in times of challenges to the network. Corridors B1 and C1 have the potential to include sections of online upgrade. These options are not considered to have the same degree of flexibility.

3.8 Connectivity 5 - Safety Performance of the Finished Product

When the scheme is built the traffic is expected to transfer from the existing lower standard roads to a modern standard expressway which would generally result in significant accident savings.

An accident benefits assessment using COBALT has been adopted for this stage of the scheme appraisal. This prediction of benefits is a product of traffic flow and recommended accident rates for different types of road.

COBALT compares the predicted numbers of accidents with and without the scheme, and converts them into monetary values by multiplying the numbers of accidents by their monetised costs.

The COBALT network has been identified on the basis of a significant change in traffic flow between Do Minimum and Do Something scenarios as predicted by SERTM models (taken to be a change in flow of 10% or more).

Table 3-4 and Table 3-5 summarise the results of the COBALT analysis for the corridor options.

Table 3-4: Monetised safety benefits, in 2010 prices, discounted to 2010

Scenario	Accident Savings (£m)
Option A	74.8
Option B1	99.5
Option B2	65.9
Option C1	107.6
Option C2	70.4

Table 3-5: Reduction in Number of Casualties and Accidents

Scenario	Accident Type	
Option A	Reduction in number of Accidents	1,100
	Reduction in number of casualties:	
	Fatal	21
	Serious	301
	Slight	1,100
	Total	1,422
Option B1	Reduction in number of Accidents	1,763
	Reduction in number of casualties:	
	Fatal	33
	Serious	381
	Slight	1,426
	Total	1,841
Option B2	Reduction in number of Accidents	1,313
	Reduction in number of casualties:	
	Fatal	10
	Serious	267
	Slight	1,036
	Total	1,313
Option C1	Reduction in number of Accidents	1,812
	Reduction in number of casualties:	
	Fatal	40

Scenario	Accident Type	
	Serious	414
	Slight	1,472
	Total	1,926
Option C2	Reduction in number of Accidents	1,256
	Reduction in number of casualties:	
	Fatal	17
	Serious	287
	Slight	963
	Total	1,268

3.9 Skills and Accessibility 1 – Reduce Journey Times

To assess the current journey times in the scheme appraisal area, analysis has been undertaken on key zone to zone movements in order to ascertain the impact of the corridor options on the working population that can reach the major employment centres in the region within a 45minute journey time limit.

Oxford, Milton Keynes and Cambridge have been selected as the employment destinations; this was justified by a review of the main commuting destinations in the model demand, which showed the vast majority being located in one of the 3 main centres. Four key zones within each of these centres have been chosen to represent the main commuting destinations based on the employment sites (such as business parks, hospitals and universities) contained therein. Therefore 12 destination zones in total have been used in the analysis.

The modelled journey times within the 2031 AM forecast models for both the do minimum and 5 corridor options were then analysed to produce a list of all origin zones which could reach these destination zones within a 45 minute limit. The working population for each of these origin zones was calculated using census data and then totalled up to represent the total working population that can access each employment area within the defined time for each modelled scenario.

The resulting analysis table below shows both these overall totals and the percentage change in working population access between the do minimum and each individual corridor option. From these results, Options A and B2 provide the greatest percentage increase in the working population who can reach Oxford than in the DM. The results for Milton Keynes are more changeable depending on the exact location zone, with Options A and B2 still providing sizeable benefits but with the other options matching the % increase in some cases.

Table 3-6 Working population able to reach key employment zones in 45 minutes

		Working population within 45 min drive in 2031 AM						% difference between DM and each scheme				
		DM	Opt A	Opt B1	Opt B2	Opt C1	Opt C2	Opt A	Opt B1	Opt B2	Opt C1	Opt C2
Oxford	South East Oxford - Business parks and mini plant	539862	650975	606281	732124	608416	607692	20.58%	12.30%	35.61%	12.70%	12.56%
	Oxford city centre - University sports ground, school and retail	560234	698492	582836	749944	593174	644948	24.68%	4.03%	33.86%	5.88%	15.12%
	Oxford city centre - University and retail	434105	494349	487104	496128	489847	477253	13.88%	12.21%	14.29%	12.84%	9.94%
	East Oxford - Hospitals, medical centres, retail	659042	913110	712493	867884	709573	851256	38.55%	8.11%	31.69%	7.67%	29.17%
Milton Keynes	Town centre - Business park	860672	964602	898502	964275	877263	864240	12.08%	4.40%	12.04%	1.93%	0.41%
	Town centre - MK hospital, business park	746819	774742	781220	769405	771107	773206	3.74%	4.61%	3.02%	3.25%	3.53%
	Town centre - The Open University	885142	905390	879550	896104	854434	846906	2.29%	-0.63%	1.24%	-3.47%	-4.32%
	Town centre - Retail park including Arena MK (Milton Keynes Dons)	606104	643567	659310	671793	664237	659498	6.18%	8.78%	10.84%	9.59%	8.81%
Cambridge	City centre - Half of University of Cambridge	531943	516256	511371	511371	512904	516457	-2.95%	-3.87%	-3.87%	-3.58%	-2.91%

	City centre - Other half of University of Cambridge	542807	536144	534330	531259	541680	541680	-1.23%	-1.56%	-2.13%	-0.21%	-0.21%
	City centre - Industrial estate and school	506636	506636	506636	506636	506636	506636	0.00%	0.00%	0.00%	0.00%	0.00%
	City centre - School/College and retail	490745	479635	484955	484955	488004	488495	-2.26%	-1.18%	-1.18%	-0.56%	-0.46%