A14 Study Output 2

Strategic Outline Case (2D) - Appendices

Department for Transport

May 2012

ATKINS

Plan Design Enable

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Appendix A. Study Governance

A.1. Study Steering Group

The Study Steering Group has ownership of the study objectives. It is chaired by DfT Director of Roads. It will meet to review outputs and then as necessary (likely to be infrequent) to monitor, and ensure, progress. Additional members may be invited to attend by the Chair of the SSG in an observatory or advisory role and to report on progress of relevant studies as appropriate.

Membership comprises:

- DfT Director of Roads (Chair)
- Greater Cambridge Greater Peterborough LEP Chair (Vice Chair)
- Senior HA representative
- DfT Sub-National Policy and Delivery Deputy-Director
- DfT Analytical representative (to provide advice on modelling, appraisal and analysis)
- DfT Freight representative
- Cambridge City Council Leader/Portfolio holder
- Cambridgeshire County Council Leader/Portfolio Holder
- Huntingdonshire District Council Leader
- South Cambridgeshire District Council Leader
- South East Midlands LEP representative
- New Anglia LEP representative
- Representative from Suffolk CC
- Representative from Northamptonshire CC
- Hutchison Ports – Senior Executive
- External expert adviser

The Study Steering Group is supported by:

- DfT SRO and Head of DfT Roads Policy Division
- DfT Project Manager
- GCGP LEP officer representative

A.2. Project Board (PB)

The Project Board has week to week control of the study, likely to meet regularly every 4 weeks. Additional members may be invited to attend by the Chair of the PB in an observatory or advisory role and to report on progress of relevant studies as appropriate. The Core Project Board members (indicated in bold) are expected to attend every meeting, the Wider Project Board members will get all relevant papers, will be invited to attend meetings where relevant issues are to be discussed and may request to attend meetings they feel are relevant.

Membership comprises:

- **DfT SRO and Head of DfT Roads Policy Division**
- **DfT project manager**. Responsible for day to day contact with the Consultant, including issuing instructions, and for coordinating any DfT/OGD input into the study.
- DfT rail freight representative
- DfT Freight Policy and Lorry Charging Division representative
- DfT analytical representative
- **Highways Agency representative**
- Cambridge City Council representative
- **Cambridgeshire County Council representative**
- **Greater Cambridgeshire and Greater Peterborough LEP representative**

- Huntingdon District Council representative
- South Cambridgeshire District Council representative
- **Northamptonshire CC representative**
- **Suffolk CC representative**
- **Haven Gateway Partnership**
- Freight Transport Association
- Network Rail representative
- Environmental representative

Appendix B. Social and Distributional Impacts

B.1. Introduction

The vulnerable groups assessed are drawn from Department's Guidance on Transport Innovation Funds (TAG Unit 3.12.4) and aim to cover groups affected by the following characteristics of a scheme:

- High levels of **noise** are experienced adjacent to busy transport corridors. The evidence suggests that children are vulnerable to high levels of noise, which affects their concentration when learning;
- Similarly, poor **air quality** is also experienced in areas adjacent to busy and congested road corridors, which often pass through deprived urban areas. Whilst it is well understood that poor air quality has serious health implications, particularly respiratory disease, there is limited evidence on the social groups that are at particular risk;
- Children and older people are at particular risk from **accidents** on the road network (as pedestrians), whilst young male drivers and motorcyclists are also high risk groups. There is also a clear link between pedestrian accidents and social class: children from Social Class V are five times more likely to be involved in fatal accidents than those from Social Class I;
- Certain groups of people have particular concerns about their **personal security** when using the transport network, including women (who value the ability to call for help if needed), younger people (who fear bullying), older people (many of whom wish to see greater control of youth behaviour) and disabled people (who often feel vulnerable to bullying and verbal abuse);
- **Severance** of communities by traffic and transport infrastructure is a particular problem for people without access to a car, some older people, people with disabilities, and school children, because they are often reliant on walking in the local community and in some cases have restricted mobility;
- **Accessibility** to services is often a particular problem for young people living in rural areas (access to further education and employment), school children (availability of school buses), some older people (physical mobility in boarding / alighting and on board the vehicle), disabled people (physical accessibility and lack of information), black and minority ethnic (BME) communities (routes to specialist shopping centres or places of worship) and carers (who have complex travel needs);
- The **affordability** of transport (both in terms of public transport fares and the costs of running a car) is often a problem for young people and low income households, particularly for travel to employment and education; and
- Low-income households and deprived communities often do not benefit from the **transport user** benefits resulting from improvements to the transport system if they are not users of the network, either because they do not have access to a car or have limited travel horizons in their use of public transport.

Social and Distributional Impacts (SDI) data, including Indices of Multiple Deprivation (IMDs), are available at Lower Super Output Area and Output Area levels. These data have been disaggregated to a postcode level to facilitate further interrogation.

B.2. Public Transport SDI Analysis

B.2.1. Approach

The core components for two bus route packages were mapped and a 1km buffer drawn around each of these (shown in the maps in Section B.2.2). Analysis of the SDI data was carried out for each of the proposed packages.

B.2.2. Maps of the Schemes

Figure B.1 Citi5 Bus Route

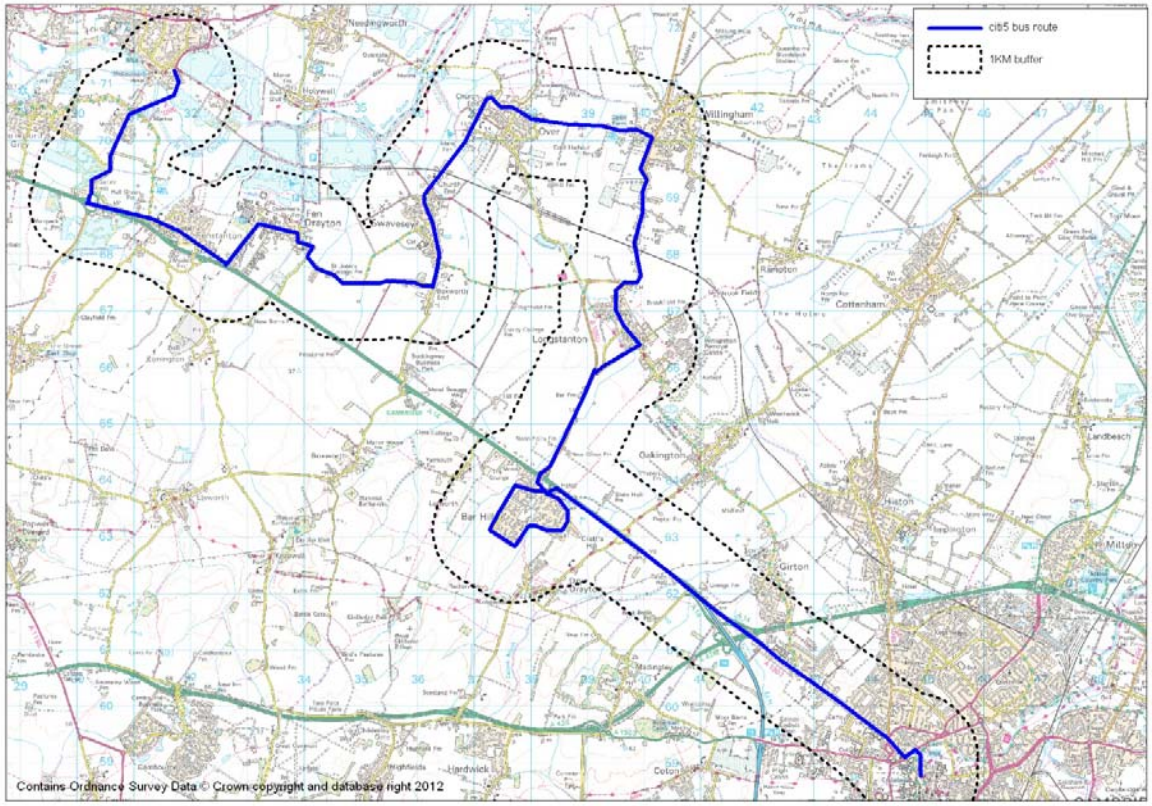
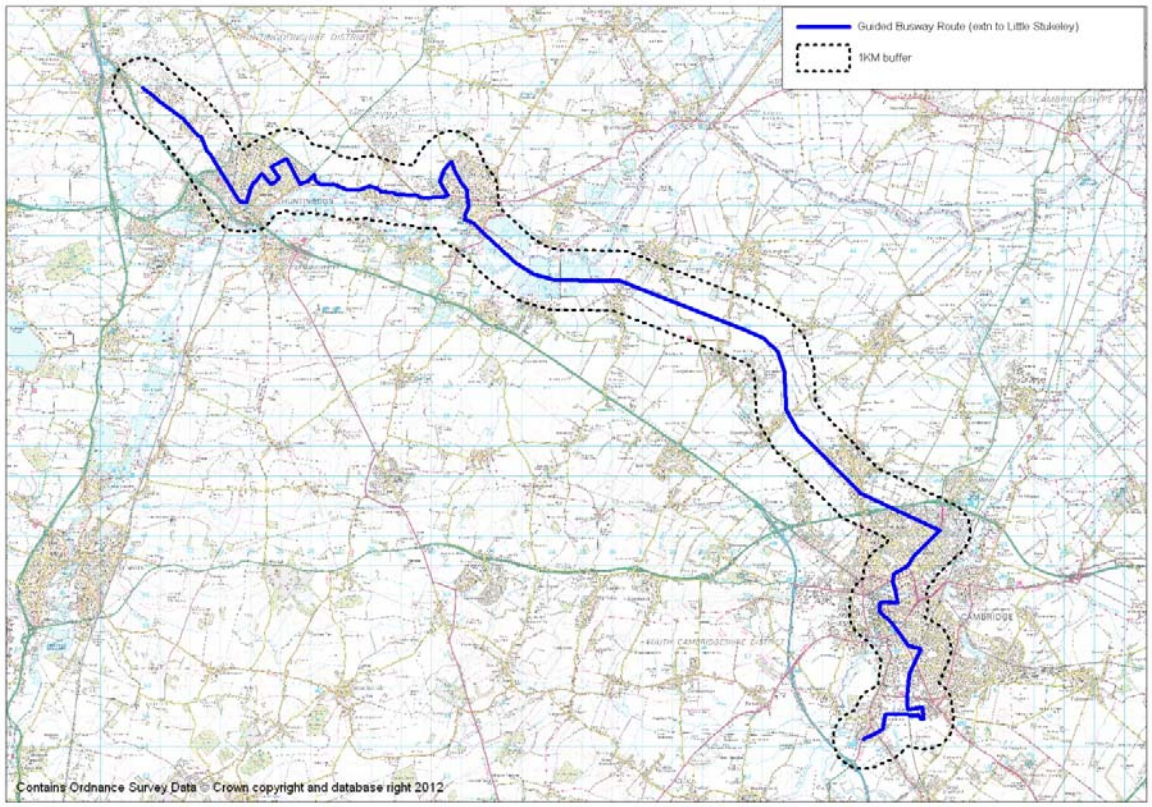


Figure B.2 Guided Busway Route



B.2.3. Lower Super Output Area

10% of the population of Cambridgeshire falls within the top 20% most deprived in the country. Of the population living within 1km of the citi5 route, none falls into that category. The 1km buffer of the Guided Busway route (with extension to Little Stukeley) includes a greater population, of which 2.5% falls into the top 20% IMD.

The proportion of Jobseekers Allowance claimants were lower in both the package area 1km buffers (1% and 1.7%) than Cambridgeshire as a whole (1.9%).

The proportion of Disability Living Allowance claimants were also lower than the Cambridgeshire total (4.3%).

Table B.1 A14 Packages: Lower Super Output Area SDI Data

	Population*	Pop within top 20% IMD (2010 Overall)	Pop within top 20% IMD (2010 Income)	Jobseekers Allowance Claimants % (2011)	Disability Living Allowance Claimants % (2011)
Cambridgeshire	**708726**	**9.8%**	**8.2%**	**1.9%**	**4.3%**
citi5	50665	0%	0%	1.0%	2.3%
Guided Busway	116129	2.5%	2.6%	1.7%	3.5%

*Apart from Cambridgeshire, population data is within a 1km buffer of Package

B.2.4. Output Area

The postcode data for each of the package buffers was compared to vulnerable groups within Cambridgeshire as a whole. This is noted in Table B.2, where the following colour coding has been used to indicate the difference to Cambridgeshire proportions:

>10% more
>5% less
+-5%
>5% more
>10% more

The communities within 1km buffer of both of the packages show similar proportions of Females and Age 65+. The proportion of Young People within the package areas was higher than Cambridgeshire as a whole; and the Guided Busway package had an increased proportion of households without a car, and of BME (Black and Ethnic Minority) to that of Cambridgeshire.

Table B.2 A14 Packages: Output Area SDI Data

	Pop	House-holds	Females %	Young Males %	Under 16%	65+ %	% BME	% No Car Households	% Young People (16-25)
Cambridgeshire	**708704**	**288319**	**51%**	**7%**	**20%**	**15%**	**5%**	**20%**	**13%**
citi5	50797	18817	49%	13%	15%	12%	4%	21%	25%
Guided Busway	116364	46234	50%	10%	17%	12%	8%	27%	21%

*Apart from Cambridgeshire, population data is within a 1km buffer of Package

B.3. Highway SDI Analysis

B.3.1. Approach

For the assessment carried out as part of Output 2C, the core components for twenty-one packages were mapped and a 1km buffer drawn around each of these. Analysis of the SDI data was carried out for each package. The analysis below refers only to those packages recommended for further study in Output 3 and which are the subject of this Strategic Outline Case.

B.3.2. Lower Super Output Area

At a Lower Super Output Area, none of the package buffers had any population within the top 20% most deprived areas (this is compared to 10% overall in Cambridgeshire).

The proportion of Jobseekers Allowance claimants were lower in all the package area 1km buffers (0.8 – 1.3%) than Cambridgeshire as a whole (1.9%).

The proportion of Disability Living Allowance claimants were generally lower than the Cambridgeshire total (4.3%) apart from a very slight increase to 4.4% in Package G(part)J(d) and G(part)J(r).

Table B.3 A14 Packages: Lower Super Output Area SDI Data

	Population*	Pop within top 20% IMD (2010 Overall)	Pop within top 20% IMD (2010 Income)	Jobseekers Allowance Claimants % (2011)	Disability Living Allowance Claimants % (2011)
Cambridgeshire	**708726**	**69670 (10%)**	**58394 (8%)**	**1.9%**	**4.3%**
DS	7485	0	0	0.8%	2.1%
GB*CR(d)	9911	0	0	0.8%	2.2%
GB*CR(r)	9911	0	0	0.8%	2.2%
GDS(r)	9960	0	0	0.8%	2.2%
G(part)J(d)	8665	0	0	1.3%	4.4%
G(part)J(r)	8665	0	0	1.3%	4.4%

*Apart from Cambridgeshire, population data is within a 1km buffer of Package

B.3.3. Output Area

The postcode data for each of the package buffers was compared to vulnerable groups within Cambridgeshire as a whole. This is noted in Table B.4, where the following colour coding has been used to indicate the difference to Cambridgeshire proportions:

>10% more
>5% less
+-5%
>5% more
>10% more

The communities within 1km buffer of each of the packages show similar proportions of Women, Young Males, Under 16s, Young People, Age 65+ and BME (Black and Ethnic Minority) to that of Cambridgeshire as a whole.

The package areas all show lower proportions of households without a car.

Table B.4 A14 Packages: Output Area SDI Data

	Pop	House-holds	Females %	Young Males %	Under 16%	65+ %	% BME	% No Car Households	% Young People (16-25)
Cambridgeshire	**708704**	**288319**	**51%**	**7%**	**20%**	**15%**	**5%**	**20%**	**13%**
DS	7467	2953	51%	8%	18%	15%	5%	11%	15%
GBCR(d)	10033	3945	51%	7%	19%	15%	4%	11%	13%
GBCR(r)	10033	3945	51%	7%	19%	15%	4%	11%	13%
GDS(r)	10080	3965	51%	7%	19%	15%	4%	11%	13%
G(part)J(d)	8237	3182	51%	6%	22%	13%	5%	11%	11%
G(part)J(r)	8237	3182	51%	6%	22%	13%	5%	11%	11%

*Apart from Cambridgeshire, population data is within a 1km buffer of Package

B.3.4. Maps

The above data is shown on the following maps, with the percentages of each group coloured as a proportion of the total population of the particular Output, or Lower Super Output, Area. These maps include all of the highway components that were originally considered (i.e. those that have been ruled out, as well as those remaining in the packages being taken forward).

Figure B.3 Young People (16-25)

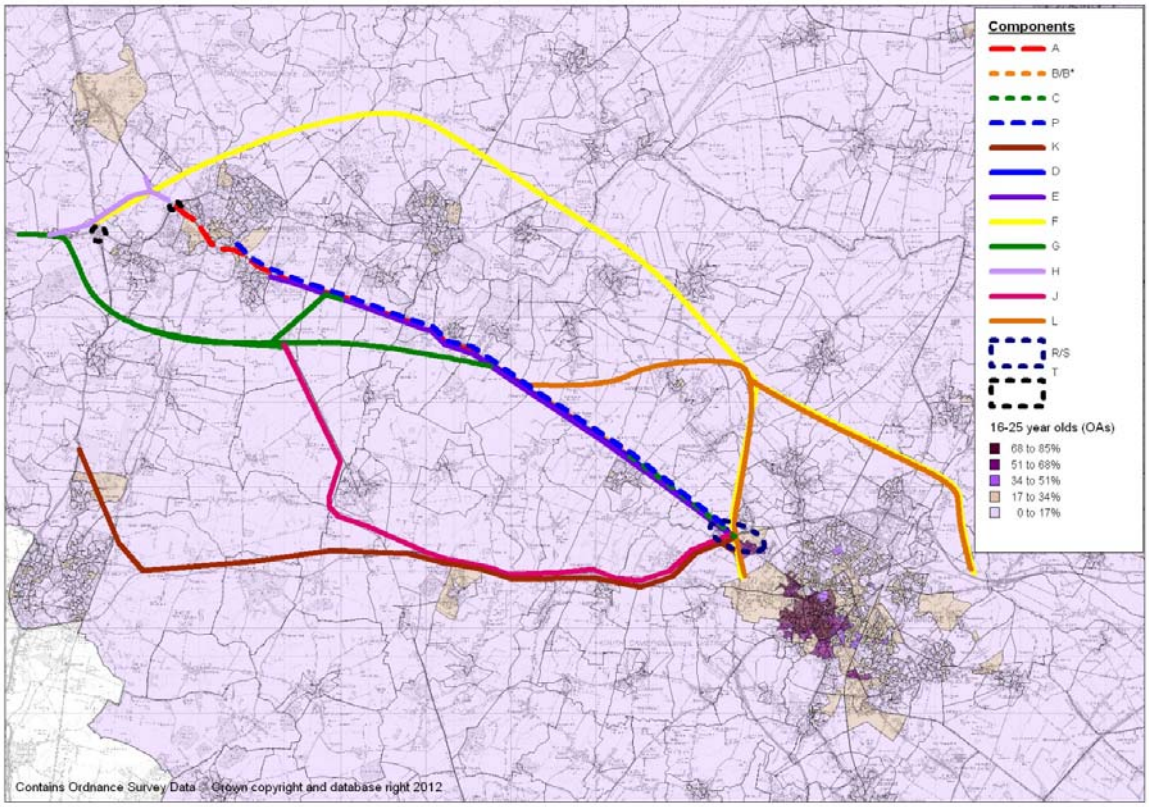


Figure B.4 Proportion Aged 65+

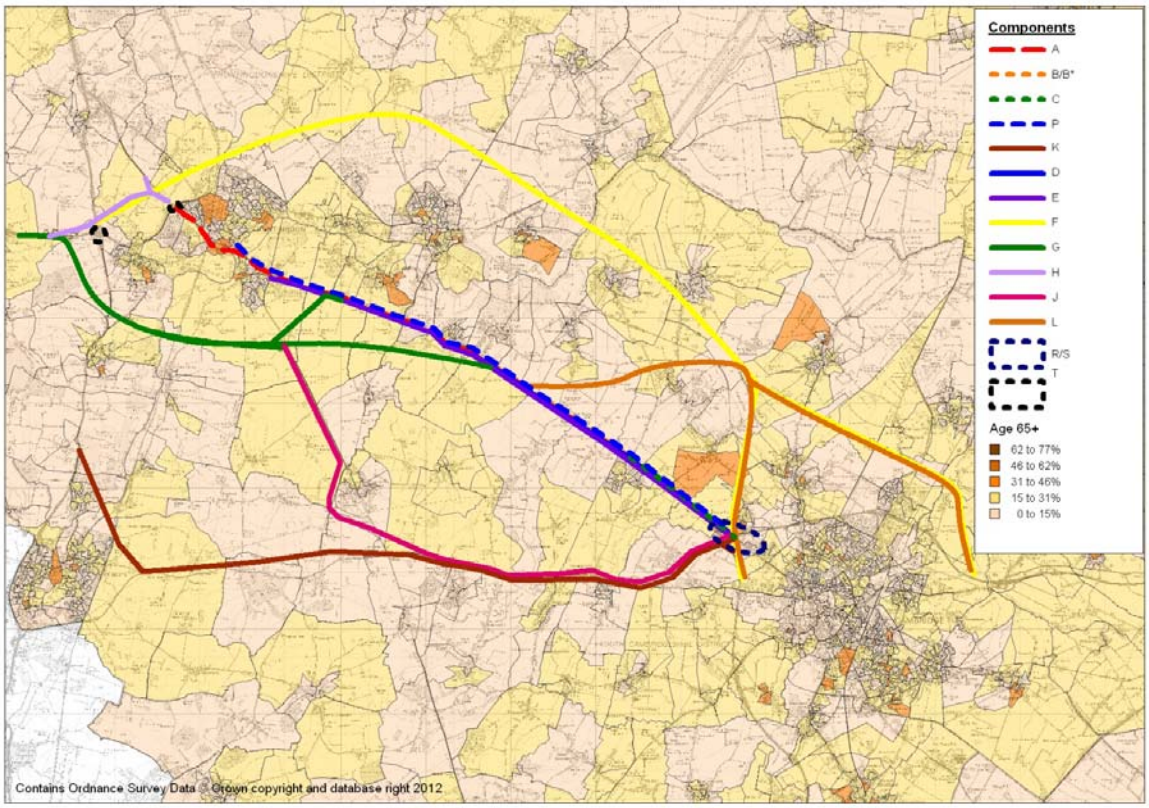


Figure B.5 Proportion of Females

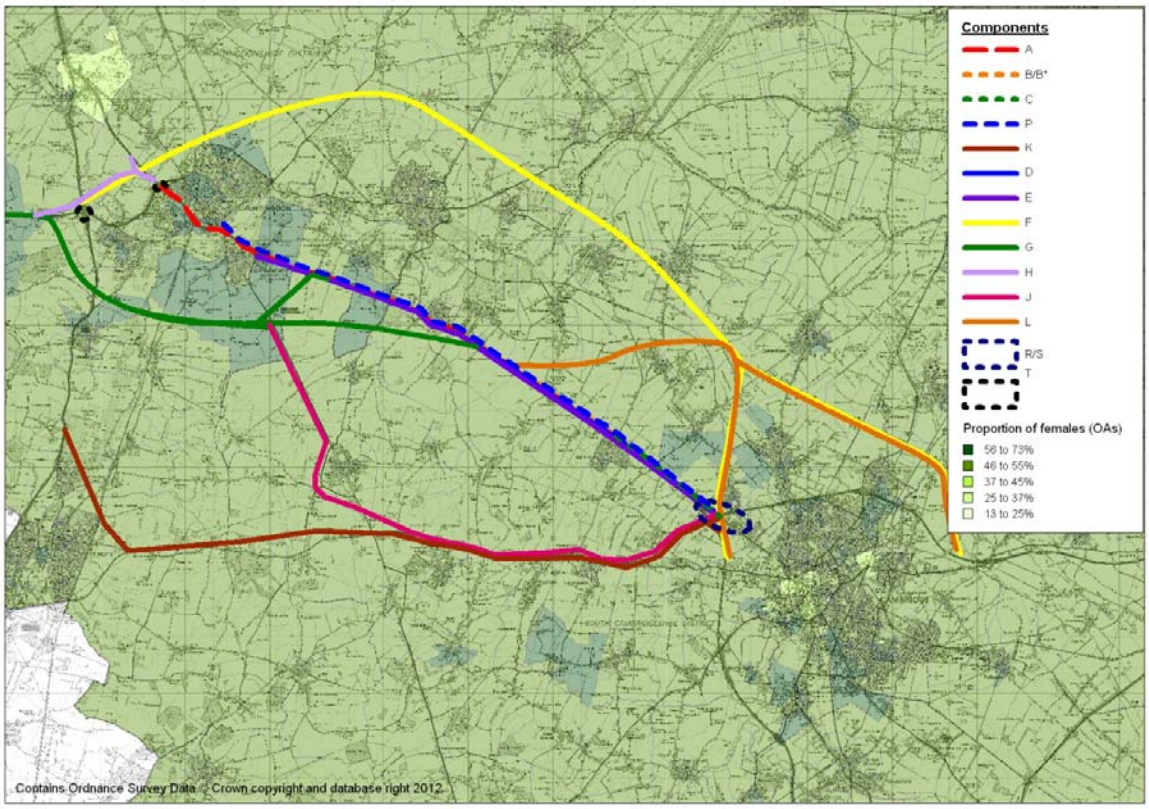


Figure B.6 Proportion of No Car Households

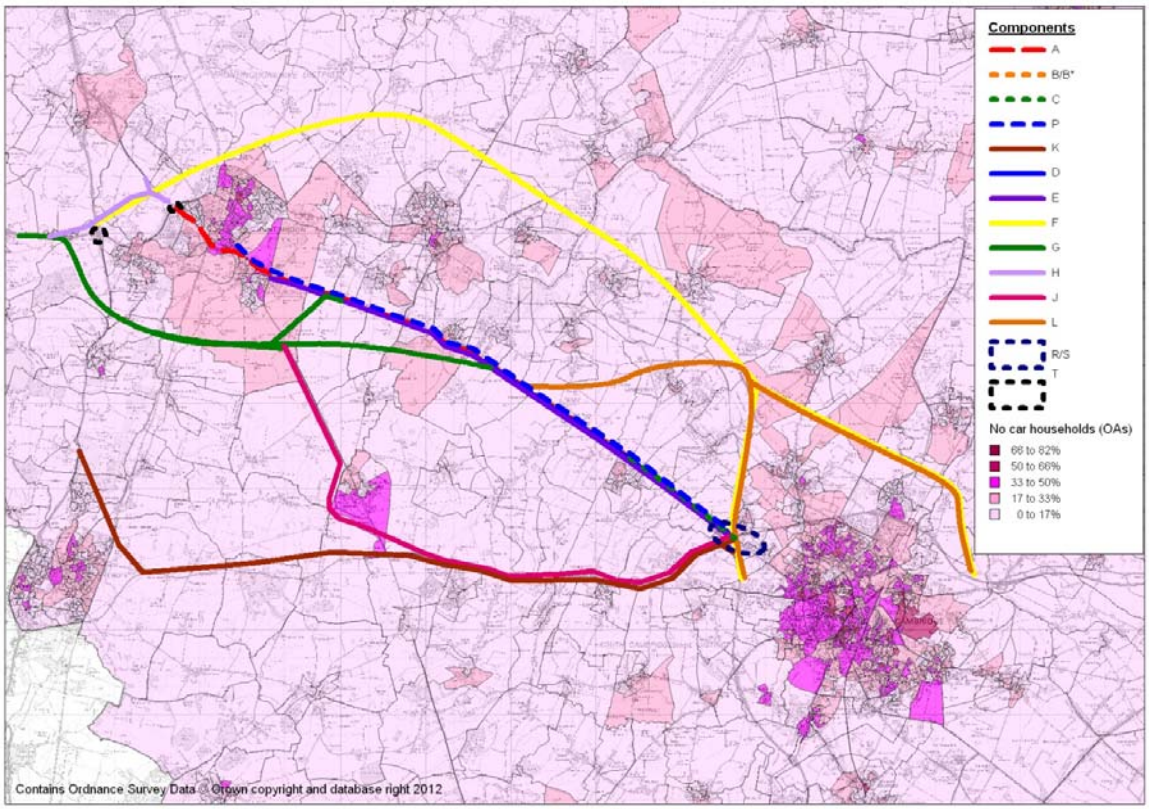


Figure B.7 Proportion of Under 16s

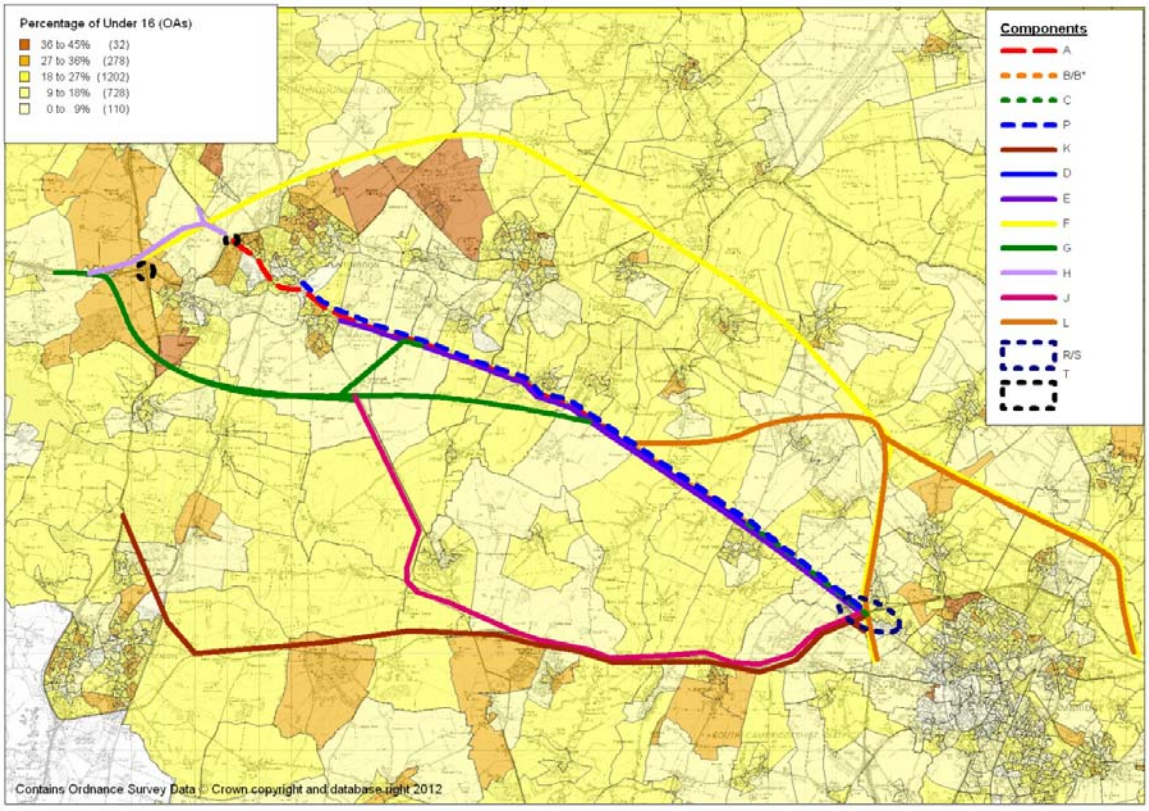


Figure B.8 Proportion of Young Males

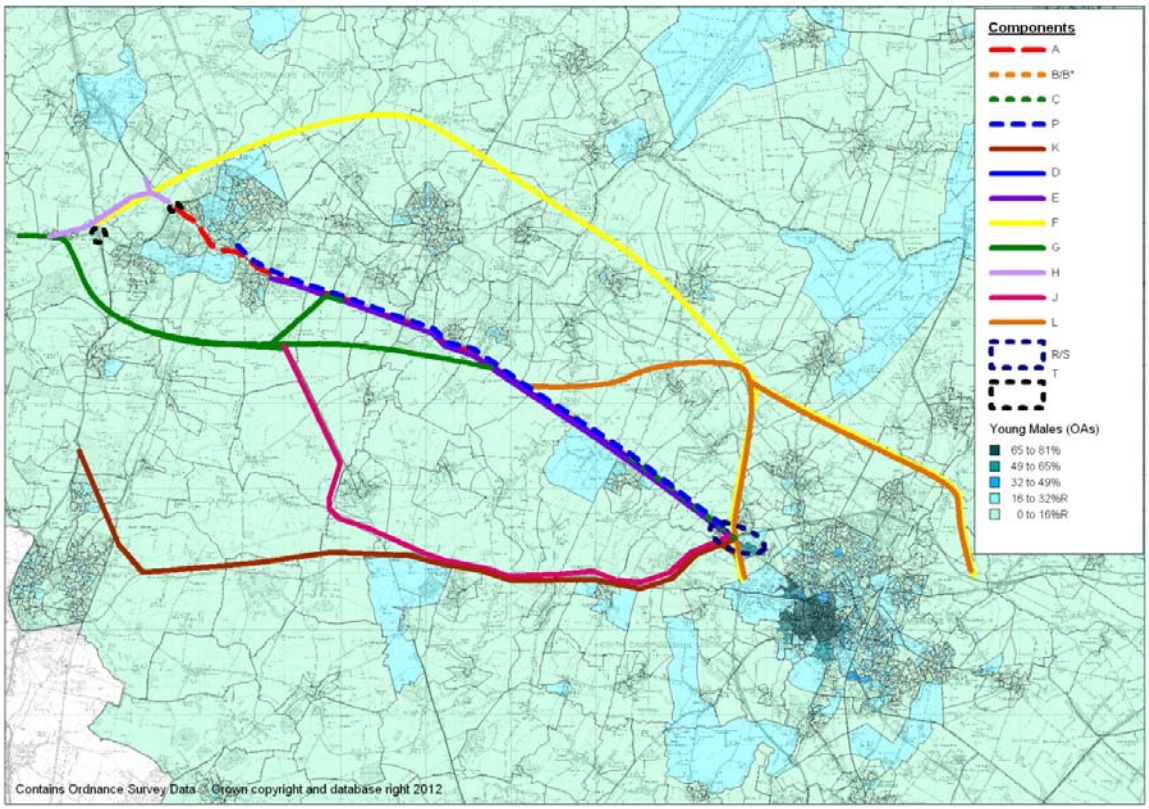
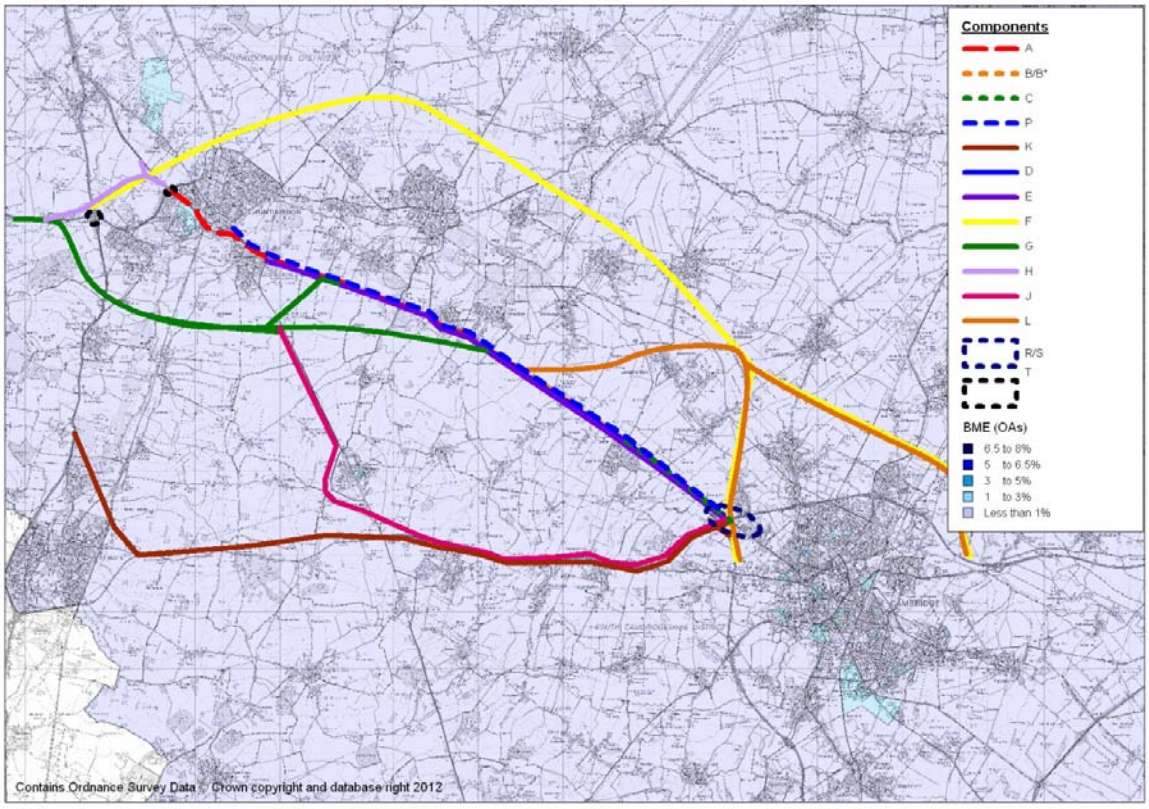


Figure B.9 Proportion of Black and Ethnic Minority



Appendix C. A14 Challenge Responses

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Working Paper: ideas received via the A14 Challenge

The A14 Challenge Survey closed on 31 January. Using the on-line survey and via email over 220 responses were submitted.

The following provides a sample of ideas submitted to the A14 Challenge that may have the scope to cost-effectively address the issues identified by output 1 (and revisited in output 2A). These ideas are arranged by theme. Ideas that relate to enforcing existing rules regulations on driver behaviour and vehicles, and HGV restrictions will be considered separately by the Department.

At this stage in the study, the ideas received could usefully be used to infill or begin to optimise the initial packages already identified. Where options overlap with those on the Output 2A long list, the most similar package reference or component ID is given in square brackets. An opportunity exists to return to the ideas and views submitted in more detail, if and when they should become relevant to the shortlisted options under detailed assessment.

The inclusion of information here about a particular option is to enhance the range of opinions and views available to the study – it does not imply any assessment of the merit of options.

Freight

- Upgrade the rail network for heavy goods from Felixstowe to the North and West [F7, F19, F3, F13], including:
    - Double tracking between Ely and Soham (recently announced in the Autumn Statement)
    - Syston resignalling
    - 4 tracking Syston – Wigston
    - Grade separation of Wigston North Junction (allowing freight traffic to traverse the Midland Mainline and avoid conflicts with passenger services).
    - Gauge clearance between Syston and Stoke, providing an alternative route to the West Coast Mainline which also relieves congestion on the WCML between Nuneaton and Crewe.

- Encourage modal shift by upgrading the freight rail links from the ports and transfer as much freight as possible to rail, bringing mode share for freight at the Haven Ports up to same level as Southampton [F7, F19, F3, F13]
- Sites for strategic road/rail Interchange depots in the region, serving freight movement from the Thames ports and the Channel Tunnel as well as Felixstowe [OD]
- Greater incentives to encourage cargo to come via the underused ports of Hull and Grimsby which are served by good roads for distribution to the north.
- Critical rail freight should be given priority (e.g. perishable goods) as they have no option but to travel through peak times
- Discourage HGVs using M11/A14 route from Dover to North
- Scope for carrying more freight originating at London Gateway ports on East and West Coast mainlines, including gauge clearance via the Hertford Loop.

Travel demand management

- Reducing local commuting demand along A14 corridor –
- Smarter choices, behavioural change measures [123]
- Review how transport needs of future developments can be met, without excessive car dependency [98]
- Workplace parking controls [32]

Improvements to public transport and sustainable alternatives

- Smart ticketing– multi-modal, multi-operator)
- Improved longer distance public transport (e.g. Huntingdon railway station to Cambridge, Cambridge to Birmingham by rail)
- Fast direct buses from Huntingdon to employment centres in Cambridge with a possible new Park and Ride site at Godmanchester [113,114, MA, MB]
- Additional bus services, increasing the bus network scope [114, MB]
- Extension of the guided busway
- Expansion of guided busway services [114, MB]

- Better cycling provision [120]
- Extra direct buses to more destinations off the busway [114, MB]
- Better connections between local villages and the Busway Park & Ride and railway stations (feeder routes) [114, MB]
- Provide new bus routes to directly serve major employment areas.[114, MB]
- Provide better evening local bus services. Some communities wouldn't do anything to resolve peak hour issues
- New park and ride facility at Brampton Racecourse or Alconbury [113, MA]
- Improved East-West passenger rail links (Cambridge to Bedford rail link)
- Parkway rail station at Impington, better advertising of Whittlesford
- Railway station at Abbots Ripton
- Railway link from Cambourne to Cambridge

Demand management/sustainable travel planning

- Personalised travel planning [123]
- Introduce car share schemes [123]
- Encourage local firms to support people wishing to work at home [123]
- Encourage non motorised transport e.g. cycle/ walking lanes [120]

Major improvements to existing roads:

- Upgrade existing A14 to a modern/higher standard, D3 min with free-flow junctions (many suggested motorway standard)
- Improve Cambridge Northern Bypass using collector/distributor lanes to resolve merging/exiting traffic issues [18, 82-86]
- Improvements to hotspots needed
- Managed motorway technology/ATM [92]
- Add a hard shoulder/emergency refuges to the A14 [116]
- Remodel Spittals (free-flow) and Girton (particularly the cloverleaf 270 degree turning movements), grade separation at Brampton Hut [H, R, S]
- Improve and rationalise junctions, providing longer merges/acceleration lanes, local distributor/collector roads [78, 79, 82 – 86]
- Dual remaining single carriageway sections of A428 and improve connection between A428 and A421 (via the A1) [GJ, K]
- Upgrade low standard dual carriageway A1 between Baldock and Alconbury, providing an alternative north-south route, starting with Black Cat Interchange
- Provide direct access between M11 and A428 (northbound to westbound) and vice versa (eastbound to southbound) [J,K]
- Controlled access to A14 [92, 78, 79]
- Dual the A10 from Cambridge to Ely in conjunction with new Northern Strategic Route (see, under new offline roads)

Complementary improvements to existing roads

- Close lay-bys on A14 (and providing other, safer stopping places) [117]
- HGV parking and rest facilities (e.g. 2 places east and west of existing strategic route) [89a, 122]
- Provide emergency refuges [116]
- Close and rationalise minor junctions and accesses [78, 79, 82 – 86]
- Improved signage and lighting
- Re-phasing signals [92]
- Speed limits [112]
- Low noise road surfaces and road side noise barriers

New offline sections of road:

- Huntingdon Southern Bypass [G]
- D2 Northern Brampton/Spittals Bypass [H]
- Strategic route options via A428 near Caxton Gibbet, connecting with A1 – there were suggestions of an offline tolled section or a single-carriageway Northern Bypass to St.Neots [J, K]
- New routes for local traffic on settlements parallel near to the A14 [D, E, P]
- Value engineered/phased Ellington to Fen Ditton scheme (including re-routing of A14 away from Huntingdon) [GDS(d)]
- New offline tolled alignment between Girton and Fenstanton, with downgrade to existing parallel A14

- Parallel route new alignment between Ellington and Caxton Gibbet, or between Ellington and Girton, principally for HGVs [GJ, GDS, GPR]
- Local distributor/collector/relief routes north of the A14 to service villages, both at eastern end (Bar Hill to Milton) and western end (near Stukeleys)
- Local access roads (many parallel to existing, to reduce conflict between local and strategic traffic) [D, E, P]
- Separate northern strategic route options between Huntingdon and the A14 east of Cambridge Quy Roundabout (possibly Newmarket) [F], existing A14 then used for local traffic
- Local traffic northern route options (e.g. A1123, A142)
- Extend M11 to A1 either at Huntingdon or Peterborough with no local access

Tolling new road infrastructure

There was a range of views on acceptability, and what fair and workable tolling might encompass. A prevalent view was that tolled road should be attractive to through traffic, otherwise demand will shift to non-tolled alternative roads - traffic management measures may be needed to prevent this. There were differing views about whether non-tolled alternative should/should not exist for local traffic. The following views were suggested:

- Revenues of £20m-£30m are achievable, and under value of time assumptions rationally work/HGV trips may be willing to pay £3 to achieve a 20 min time saving
- Tolling levels should be set to £1.50 per car, £3 for HGVs
- All those in favour, and expressing a view on the mechanics of tolling suggest ANPR or TAG technology used to collect revenue
- Tolls to manage demand and yield – varying toll by time of day, and by user type
- A variable number of tolled and toll free lanes on the same section of the road.
- Toll single occupant vehicles, or reduce rates for car sharers
- Tolls restricted to peak periods only

Funding and finance suggestions

- Business Rate Supplement/Tax Increment Financing (‘TxIF’)
- Work place parking levy (for demand management)
- Section 278
- Site-Specific Business Rates income
- Community Infrastructure Levy
- EU Grants (TEN-T programme)
- Huntingdon/Cambridge A14 Low Emission Zone

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Appendix D. Schematic Illustrations of Modal Packages (core highway components only)

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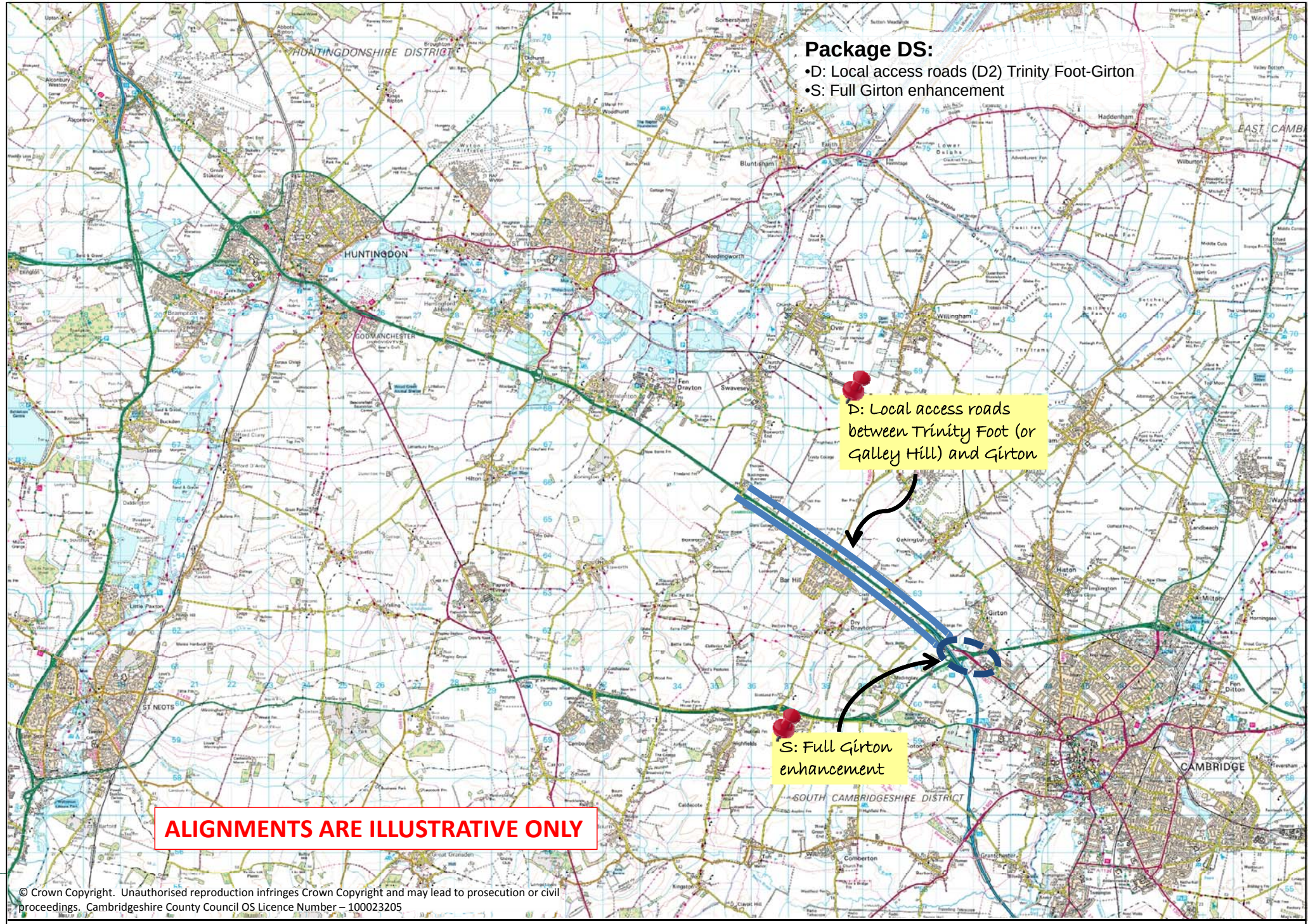
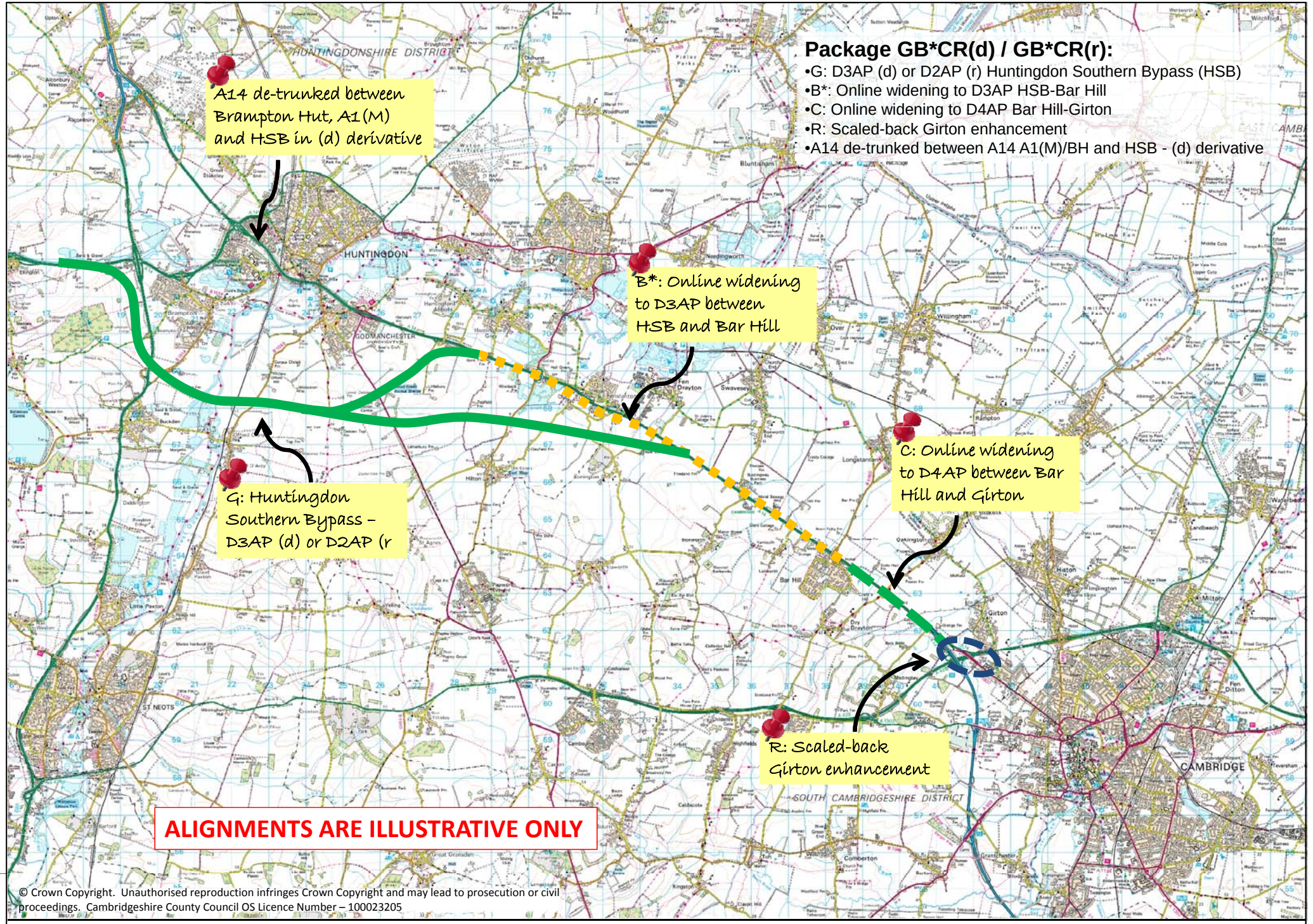
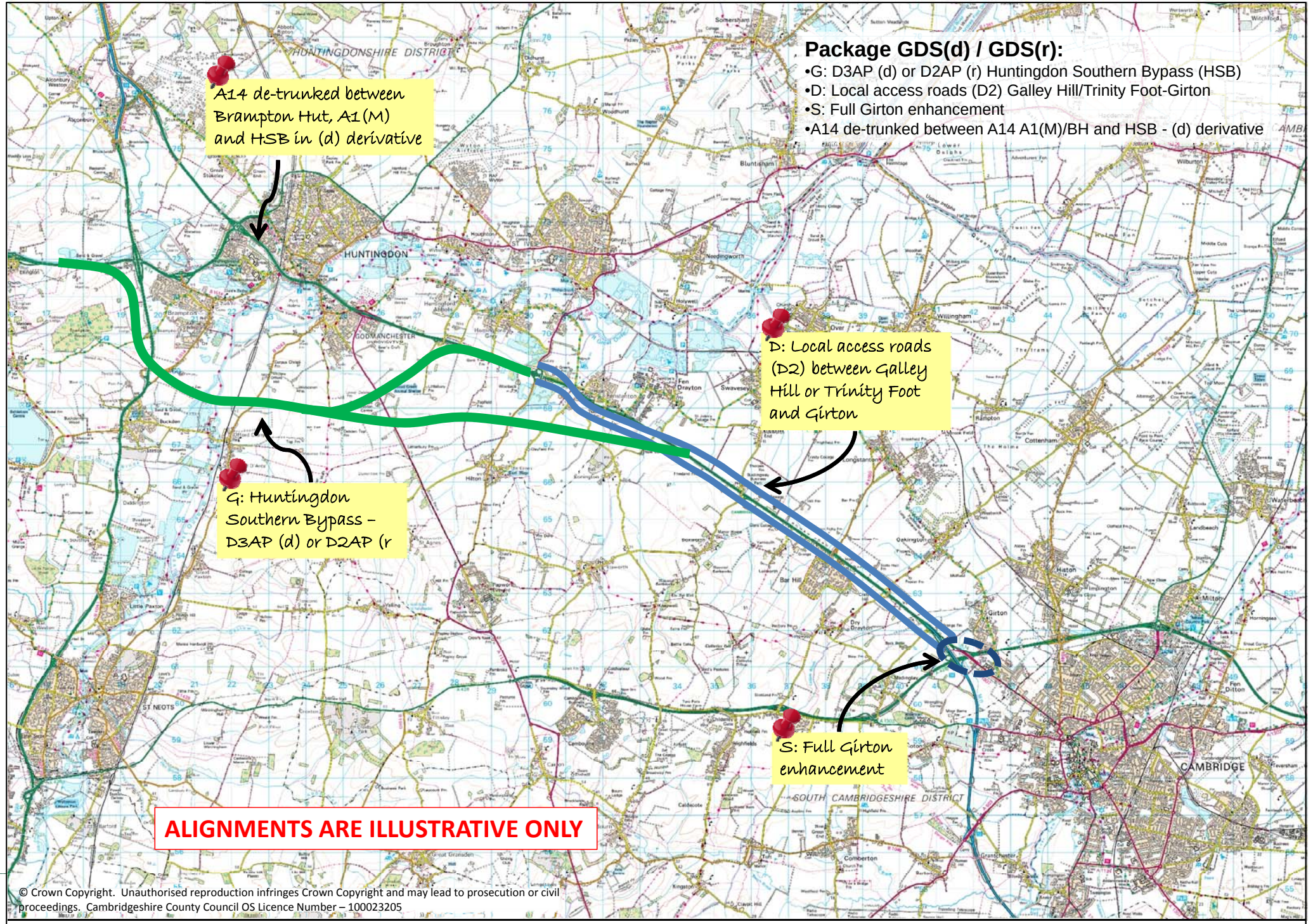


A14 Study Output 2: Option Generation & Initial Sifting Report
Package DS

ATKINS





A14 Study Output 2: Option Generation & Initial Sifting Report
Package GDS9d) / GDS(r)

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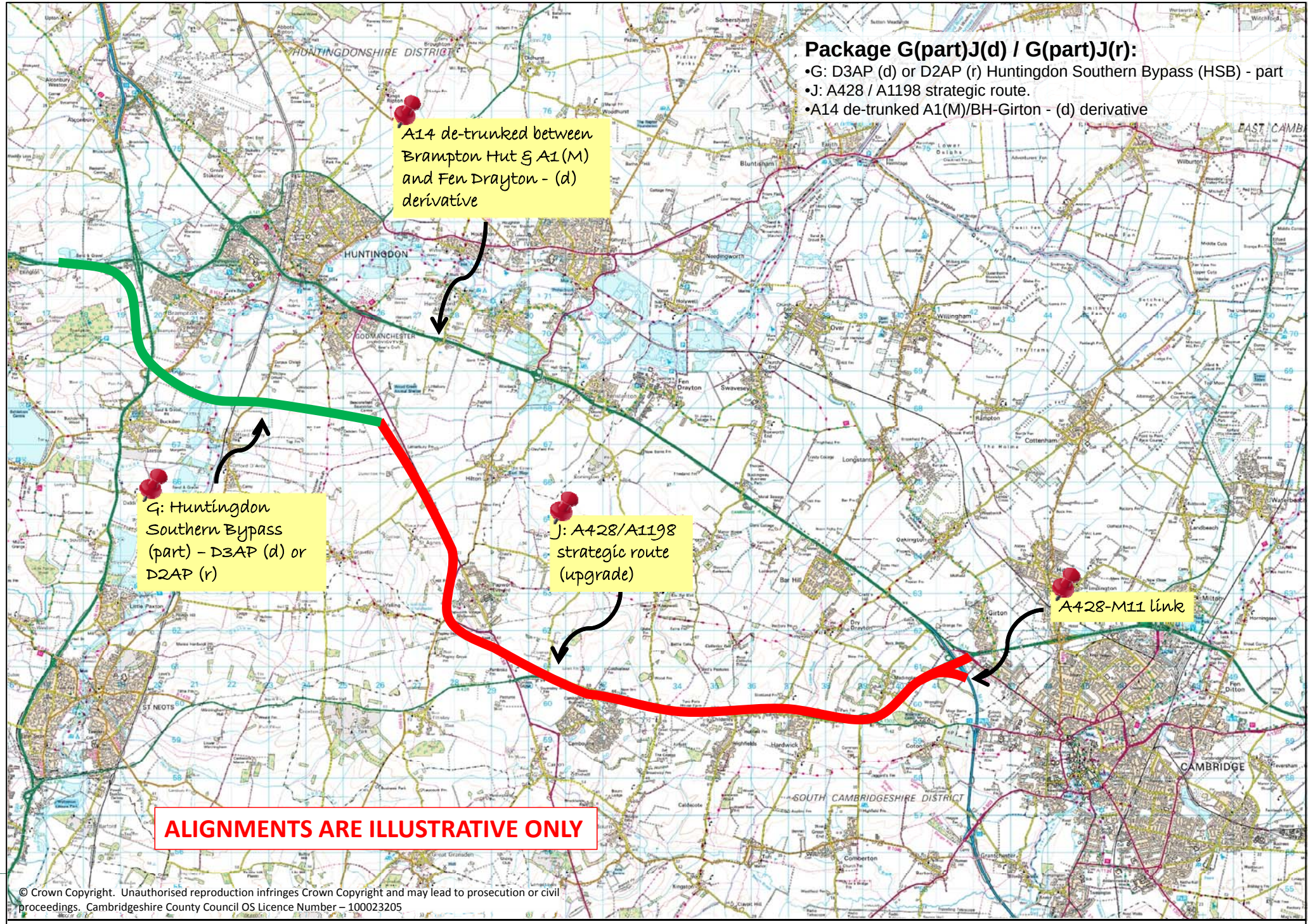

Appendix E. Qualitative Strategic and Economic Case indicators

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PT and Freight Packages

Package Ref	Notes	Support the growth of the Greater Cambridge economy		Improve access to labour markets	Access to goods, services, people and places	Fit with wider transport and Government objectives	GENERAL COMMENTS
		Housing developments unlocked	Impact on commercial development	Assessment of travel times to key employment sites	Change in ease of access to key locations including schools, hospitals etc	Fit with EU transport policy and wider UK Government objectives	
		7-point scale: -3 to +3					
PUBLIC TRANSPORT / TRAVEL DEMAND PACKAGES							
M(A)	*Would need to be supported by enhanced service provision.*	0	0	0	1	1 - potentially some decongestion benefits to TEN designated route; potentially some increase in active travel to/from P&R plus reduced car use and related local air pollution which may bring minor health benefits; potentially positive impact on access to health and education facilities depending on extent / scope of improvements.	Public transport provision an essential component of providing access to new developments but unlikely to unlock signfificant housing developments in isolation. Impact is clearly positive but difficult to identify with ininitial scoring system adopted here. Labour catchment to key employment sites will be enhanced depending on site locations and extent of works.
M(B)		0	0	0	1	1 - potentially some decongestion benefits to TEN designated route; potentially some increase in active travel to/from bus services plus reduced car use and related local air pollution which may bring some health benefits; potentially positive impact on access to health and education facilities depending on extent / scope of improvements.	Public transport provision an essential component of providing access to new developments but unlikely to unlock signfificant housing developments in isolation. Extension of CGB to Enterprise Zone at Alconbury a potentially important intervention for extending labour catchment.
M(AB)		1	1	1	2	1 - potentially some decongestion benefits to TEN designated route; potentially some increase in active travel to/from bus services plus reduced car use and related local air pollution which may bring some health benefits; potentially positive impact on access to health and education facilities depending on extent / scope of improvements.	Public transport provision an essential component of providing access to new developments but unlikely to unlock signfificant housing developments in isolation. Providing both enhanced park and ride services plus extenstions to CGB will increase impact against these indicators including labour market impacts where greater public transport 'reach' will extend labour pool to potential employees without access to a car.
FREIGHT PACKAGES							
O(ABCD)	*Assumes that timetabling would be reviewed to maximise benefits.*	0	1	0	0		Likely positive, but very minor, impact across all indicators with some freight modal shift providing some very marginal headroom for further development in the corridor and some very minor impact on labour catchments. Provision of strategic rail freight interchanges could bring commercial / employment opportunities, with general rail freight improvements enhancing employment potential of sites/destinations served.
O(D)		0	0	0	0		As above.

Highway Packages

Package Ref	Notes	Support the growth of the Greater Cambridge economy		Improve access to labour markets	Access to goods, services, people and places	Fit with wider transport and Government objectives	GENERAL COMMENTS
		Housing developments unlocked	Impact on commercial development	Assessment of travel times to key employment sites	Change in ease of access to key locations including schools, hospitals etc	Fit with EU transport policy and wider UK Government objectives	
		7-point scale: -3 to +3					
LOCAL ACCESS ROADS (LARs) OPTIONS							
DS		1	1	2	1	1 - limited capacity enhancements on a Trans European Network (TEN) link but LARs should leave more headroom for strategic traffic; positive contribution to economic growth through partial removal of highway bottleneck at Girton and lower section of A14; may result in marginal but negative health impact if get increased local air pollution and shift from active travel modes; some impact on accessibility to education.	Local access roads provide potential increased capacity for housing development art Cambridge end of study area including Northstowe; lack of improvements elsewhere including north/ west of Bar Hill limits wider development impacts but addressing Girton bottleneck could enhance labour catchment for key employment sites eg: Cambridge Science Park.
HUNTINGDON SOUTHERN BYPASS (HSB) PLUS WIDENING/LOCAL ACCESS ROADS OPTIONS**							
GB*CR(d)	*All strategic traffic via HSB. A14 de-trunked.*	3	3	3	2	3 - signficant capacity enhancements on a Trans European Network (TEN) link providing enhanced EU connectivity; positive contribution to economic growth through partial removal of highway bottleneck at Girton and lower section of A14; may result in marginal but negative health impact if get increased local air pollution and shift from active travel modes; positive impact on highway-based accessibility to education.	Significant increased highway capacity provides potential headroom for housing growth at key sites throughout corridor. Enhamcements also extend drive time isochrones bringing labour market impacts but smaller scale Girton improvements could potentially impact on extent of these benefits.
GB*CR(r)	*Strategic N-S traffic remains on 'old' A14.*	2.5	2.5	2.5	2	3 - signficant capacity enhancements on a Trans European Network (TEN) link providing enhanced EU connectivity; positive contribution to economic growth through partial removal of highway bottleneck at Girton and lower section of A14; may result in marginal but negative health impact if get increased local air pollution and shift from active travel modes; positive impact on highway-based accessibility to education.	Benefits assessed to be broadly as for preceding option but could be marginally less beneficial if strategic traffic retained on 'old' A14 were to impact on headroom for accommodating housing growth in Huntingdon area.
GDS(r)	*Strategic N-S traffic remains on 'old' A14.*	2.5	2.5	2.5	2	3 - signficant capacity enhancements in a Trans European Network (TEN) corridor (LARs increased available capacity for strategic traffic) providing enhanced EU connectivity; positive contribution to economic growth through removal of highway bottleneck at Girton and lower section of A14; may result in marginal but negative health impact if get increased local air pollution and shift from active travel modes; positive impact on highway-based accessibility to education.	Benefits assessed to be broadly as for GB*CR as generalised capacity increases throughout corridor should provide for broadly similar levels of housing / commercial growth and labour market effects overall.

Package Ref	Notes	Support the growth of the Greater Cambridge economy		Improve access to labour markets	Access to goods, services, people and places	Fit with wider transport and Government objectives	GENERAL COMMENTS
		Housing developments unlocked	Impact on commercial development	Assessment of travel times to key employment sites	Change in ease of access to key locations including schools, hospitals etc	Fit with EU transport policy and wider UK Government objectives	
		7-point scale: -3 to +3					
NEW ROUTE OPTIONS							
G(part)J (d)	*All strategic traffic via new route. A14 de-trunked.*	2	2	2	2	2 - significant highway capacity enhancements overall but not to the TEN route itself - if A14 detrunked then strategic route less direct which may have EU connectivity consequences; positive contribution to wider economic growth through general increase in highway capacity; may result in marginal but negative health impact if get increased local air pollution and shift from active travel modes; positive impact on highway-based accessibility to education.	Improvements to A428/A1198 provide general headroom in corridor and potentially unlock housing developments across wider area; however the new strategic route is lengthy and unclear as to how much strategic traffic will divert and hence what spare capacity will be available in main A14 corridor for growth. Impact will clearly be positive and significant but difficult to distinguish impacts from preceding new route options at this stage.
G(part)J(r)	*Strategic N-S traffic remains on 'old' A14.*	2	2	2	2	2 - significant highway capacity enhancements overall but not to the TEN route itself - if A14 detrunked then strategic route less direct which may have EU connectivity consequences; positive contribution to wider economic growth through general increase in highway capacity; may result in marginal but negative health impact if get increased local air pollution and shift from active travel modes; positive impact on highway-based accessibility to education.	With strategic traffic retained on old A14 and hence limited diversion to new route the headroon for housing and commercial development likely to be lower compared to preceding options. However improvements to A428/A1198 would extend labour catchments for key employment sites in Cambridge.

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Appendix F. Deliverability

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Deliverability Issues

Potential deliverability issues (in terms of environmental constraints, engineering constraints and public/political acceptability) were initially considered on a component basis, before looking at the overall packages to see whether any additional issues arose when components were combined.
The table below reflects this methodology: the assessments for each component are listed in the rows labelled Component 1-4 (with the order being that in which the components appear in the package name).

	Package	DS	GB*CR	GDS	G(part)J
Environmental constraints	Component 1	Limited impact on environmental designations between Trinity Foot and Girton. Constraints around Fenstanton if Local Access Roads extended to Galley Hill: Listed buildings close to the route; County Wildlife Sites abutting or in close proximity (important local wetland areas); Historic Landfill site - Conington; Properties abutting route around Fenstanton. Potential for greater impact than on-line widening as footprint of scheme likely to be bigger.	Provides relief to Huntingdon. Constraints around Fenstanton if the Huntingdon Southern Bypass ties in to the west of Fenstanton: Listed buildings close to the route; County Wildlife Sites abutting or in close proximity (important local wetland areas); Historic Landfill site - Conington; Properties abutting route around Fenstanton.	Provides relief to Huntingdon. Constraints around Fenstanton if the Huntingdon Southern Bypass ties in to the west of Fenstanton: Listed buildings close to the route; County Wildlife Sites abutting or in close proximity (important local wetland areas); Historic Landfill site - Conington; Properties abutting route around Fenstanton.	Provides relief to Huntingdon.
	Component 2	Impacts can largely be mitigated over time.	Constraints around Fenstanton if online widening extended to Galley Hill: Listed buildings close to the route; County Wildlife Sites abutting or in close proximity (important local wetland areas); Historic Landfill site - Conington; Properties abutting route around Fenstanton.	Limited impact on environmental designations between Trinity Foot and Girton. Constraints around Fenstanton if Local Access Roads extended to Galley Hill: Listed buildings close to the route; County Wildlife Sites abutting or in close proximity (important local wetland areas); Historic Landfill site - Conington; Properties abutting route around Fenstanton. Potential for greater impact than on-line widening as footprint of scheme likely to be bigger.	Limited impact on environmental designations.
	Component 3		Limited impact on environmental designations.	Impacts can largely be mitigated over time.	
	Component 4		As for option S but less impact.		
Engineering constraints	Component 1	Off-line construction presents fewer challenges, and lower impact during construction.	Off-line construction presents fewer challenges, lower impact during construction, includes new structures for river and rail crossings. Potential for less complicated junction arrangements depending on the d/r derivative.	Off-line construction presents fewer challenges, lower impact during construction, includes new structures for river and rail crossings. Potential for less complicated junction arrangements depending on the d/r derivative.	Off-line construction presents fewer challenges, lower impact during construction, includes new structures for river and rail crossings. Potential for less complicated junction arrangements depending on the d/r derivative.
	Component 2	Large number of structures.	Limited engineering constraints envisaged, though some potential issues around Fenstanton with extended widening. Issues during construction.	Off-line construction presents fewer challenges, and lower impact during construction.	Limited engineering constraints envisaged for section adjacent to A1198. Constraints with existing overbridges around Cambourne.
	Component 3		Limited engineering constraints envisaged. Issues during construction.	Large number of structures.	
	Component 4		Large number of structures, but scaled back from S.		
Acceptability (public / political)	Component 1	Local access roads have potential to be more contentious than on-line widening. Acceptability issues around potential impacts on Fenstanton with extended Local Access Roads.	Proximity to populous areas. Extent of new route through open countryside.	Proximity to populous areas. Extent of new route through open countryside.	Proximity to populous areas. Extent of new route through open countryside.
	Component 2	Similar to on-line widening, changes to configuration of existing junction.	On-line widening perceived as less contentious than off-line option.	Local access roads have potential to be more contentious than on-line widening. Acceptability issues around potential impacts on Fenstanton with extended Local Access Roads.	Additional capacity in existing transport corridor. Potential impacts on Papworth/Cambourne.
	Component 3		On-line widening perceived as less contentious than off-line option.	Similar to on-line widening, changes to configuration of existing junction.	
	Component 4		Similar to on-line widening, changes to configuration of existing junction.		
Permissions / Planning / Orders	All components	Scale of all packages likely to require development consent from Major Infrastructure Planning Unit. All packages likely to need CPO, though this can be progress outwith the other processes. Scope for LARs to be delivered by LA, but unlikely that these would be viewed as a local project, more likely to be seen as something of national significance. Most packages likely to take a minimum of 5 years from decision to proceed to start of construction.			
Timescales / phasing	All components	Issues envisaged if attempt to progress one element of a package in isolation through the planning/approvals processes. On that basis phasing considered in relation to construction/opening.			
	Whole package	No phasing, though option exists to put in temporary connections between LARs and mainline carriageway.			A428 element of J, then G/A1198 element of J
	Packages containing G		G would always be last option delivered/opened, but otherwise sequencing as for other packages.	G would always be last option delivered/opened, but otherwise sequencing as for other packages.	G would always be last option delivered/opened, but otherwise sequencing as for other packages.
Inter-dependencies	All packages	No known links to other projects/scheme delivery. All links related to land-use planning aspirations. Assumed that Northstowe needs some improvement between Bar-Hill and Girton, but consideration should be given to phasing/likely build-out rates as part of the planning approvals process. HA requirement likely to be nil-detriment Alconbury may need Spittals improvements but not known at this stage. Raises questions about potential demand to keep viaduct to maintain access from the east. Questions around proposed timescales. Waterbeach - potential impacts on CNB			

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Appendix G. Package Assessment Methodology

G.1. Introduction

This Appendix provides an overview of the methodology used for assessing the relative performance of the packages against the assessment criteria for the Strategic and Economic Cases.

As described in Chapter 2 of the main report, no new transport model runs have been undertaken at this stage of the study. The assessment has therefore made best use of existing information only.

Where possible, quantitative assessments of the indicators have been undertaken. However, where there are gaps in information, information is no longer considered current, or where quantitative information is not readily available, indicators have been assessed qualitatively using professional judgement (assumptions are clearly stated).

Reliance on existing information has limited the level of detail and robustness of the assessment of the public transport and freight packages. New runs of the Great Britain Freight Model (GBFM) have been undertaken to provide baseline information on freight flows on the A14 corridor and forecasts of changes in freight movements as a result of the proposed freight packages. However at this stage, the resulting impacts of these changes on the performance of the A14 in general has not been tested.

As a result, the assessment of these packages is, by default, in outline only with an emphasis on identifying the relative performance of packages within each mode. Where possible, initial estimates of key outcomes (such as public transport patronage) have been derived and used as the basis for what is a largely qualitative assessment of the packages.

G.2. Scoring System

A qualitative scoring system has been applied to the presentation of results for all indicators, both those based on qualitative assessments and those where quantitative estimates of impacts have been generated. This serves a number of purposes:

- it facilitates comparison;
- it helps the reviewer assimilate large amounts of data; and
- it focuses the assessment on the relative performance of the packages, rather than on consideration of absolute values where quantitative estimates exist, which at this stage would be misleading.

A seven point scale has been used; consisting of Large, Moderate and Slight Adverse, Neutral and Slight, Moderate and Large Positive categories (-3 to 3), consistent with the WebTAG approach.

For those indicators assessed on the basis of quantitative data (for highway packages), each package was allocated to a category from the seven point on the basis of thresholds derived from the range of results produced across the range of packages.

For instance, for indicators based on time savings, it was assumed that the boundary between Slight and Moderate Positive would fall one third of the way between the minimum and maximum reduction in time calculated across the range of packages and that the boundary between the Moderate and Large Positive categories would fall two thirds of the way between the minimum and maximum reduction calculated. The Adverse categories were allocated boundaries at the equivalent levels of increases in travel time.

The scores presented in the main report are consistent with those presented in Output 2C and were generated for all 21 highway packages, 3 public transport packages and 2 freight packages considered at that stage.

The highway scores derived on the basis of thresholds and ranges of scores as described above were therefore generated from scores for all 21 highway packages considered at that stage, rather than just the 6 presented in this report.

The scores have been retained to ensure consistency between Output 2C and 2D reporting.

G.3. Assessment Framework

Table G.1 at the end of Appendix summarises the assessment framework for the Strategic and Economic cases. It identifies the range of impacts (1st column) against which the packages have been assessed and provides a description of:

- the specific assessment criteria used (2nd column);
- whether the assessment was based on a qualitative [1] or quantitative estimate (3rd column);and
- the indicators used to inform the assessment (also 3rd column);

The DfT's guidance on proportionality of appraisal was followed in developing the assessment framework. The implication is that, when a particular impact is very unlikely to drive a decision to retain or reject a package at this stage, assessment is not required at this stage. Instead assessment will be undertaken for the packages recommended for further work during Output 3.

More detailed information on the approach to the assessment of the individual indicators within the Strategic and Economic Cases is set out in the remainder of this Appendix.

G.4. Assessing the Strategic Case

The following criteria in the Strategic Case will be common to all packages:

- the strategic aims and responsibilities of the promoting organisations;
- the identified problem (e.g. scale, timescales, key drivers); and,
- the consultation that has taken place with relevant stakeholders.

The following sections provide further detail on the ways in which the entries for each of the variable indicators were derived for the highway packages.

The public transport and freight packages were assessed against the same indicators but, as described above, all assessments were on a qualitative basis due to the lack of available information on package impacts on the A14.

G.4.1.1. Reduce lost productive time

For highway packages, changes in total travel time along the study corridor relative to the Do Minimum were calculated on the basis of trip numbers and average travel time by time of day on each link. The total change in travel time across the working day was used as a proxy for the relative scale of impact of each package on productive business time.

In each case, packages were allocated to categories from the seven point scale using the process of identifying category boundaries from the range of package results described above

G.4.1.2. Support the growth of the wider UK economy

Changes in total travel cost in the study corridor relative to the Do Minimum were calculated for each package on the basis of trip numbers and average travel time and distance by time period on each link. Time and distance costs were converted to equivalent monetary values using the parameters adopted in the A14 EFD model for the conversion process, accounting for the proportion of trips in each time period made by cars and goods vehicles and for each journey purpose. These calculations provided an estimate of total monetary cost incurred by all trips on each link in the study corridor for each highway package. The

[1] Qualitative assessments will use a 7 point assessment scale: large adverse, moderate adverse, slight adverse, neutral, slight positive, moderate positive, large positive. In some cases, it will be sufficient to use a 3 point scale (adverse, neutral, positive). The scale used is consistent with WebTAG and should be sufficient to distinguish the relative impacts of different options.

reduction across the corridor achieved relative to the Do Minimum was then calculated, to provide an estimate of the benefit to the UK economy of reduced journey costs. The change in all day travel costs was used, focussing on strategic trips only to reflect the importance to this objective of those trips using the corridor for longer trips (for instance from the ports to the Midlands).

Packages were allocated to categories from the seven point scale using the process of identifying category boundaries from the range of package results described above.

G.4.1.3. Support the economic growth of greater Cambridge

Journey times

Changes in total travel cost along the study corridor (calculated as described above) also formed the basis of this indicator. Consideration of distance costs was added to the time impacts identified in the draft assessment framework to allow a more comprehensive understanding of the relative impacts of packages that involved rerouting. Total travel cost savings across the day for both strategic and local trips were used.

Packages were allocated to categories from the seven point scale using the process of identifying category boundaries from the range of package results described above.

Housing developments unlocked

A qualitative assessment, based on professional judgement, was undertaken of the potential for each package to unlock proposed housing development sites. Consideration was given to known proposed developments including Northstowe, NIAB and West of Cambridge, Northbridge and Bearscroft Farm, and Alconbury. Consideration also given to wider development proposals e.g. St Neots where a package directly impacts on them. Packages that bring large increases in transport capacity may also facilitate wider housing growth from smaller scale and windfall sites.

Impact on commercial development

A qualitative assessment, based on professional judgement, was undertaken of the potential for each package to unlock proposed developments which contain an employment component including Northstowe, Alconbury and the Enterprise Zone, and the University site at west Cambridge. Packages that bring large increases in transport capacity may also facilitate wider employment and commercial development growth from sites elsewhere in the corridor.

G.4.1.4. Improve access to labour markets

Journey time changes

The focus of the access to labour market criterion is on travel times experienced during peak commuting journey times. The indicator used therefore focussed on changes in travel time in the study corridor in the morning peak, focussing on local trips rather than strategic trips as they were considered more representative of commuting journeys.

As described above, total time savings were calculated by multiplying total trips on each link in the corridor by average journey time in the morning peak for each package and comparing the total with the Do Minimum total.

Packages were allocated to categories from the seven point scale using the process of identifying category boundaries from the range of package results described above.

Journey times to key employment sites

A qualitative assessment was undertaken, based on professional judgement, of the likely impact of packages on travel time isochrones to key existing employment sites in Cambridge (Science and Business Parks, other destinations in the City) and Huntingdon.

G.4.1.5. Improve quality of life/welfare

The emphasis of the quality of life indicator is on journey times and particularly level of congestion experienced during commuting trips. The indicator used was therefore the change in average journey speed on trips in the study corridor during the morning peak to combine journey time changes and congestion

effects in a single measure. The focus was again on local trips rather than strategic trips as they were considered more representative of commuting journeys.

Packages were allocated to categories from the seven point scale using the process of identifying category boundaries from the range of package results described above.

G.4.1.6. Reduce number of accidents on the A14 in the core study area

As volume of travel is a key influence on accident numbers, the change in accident impacts was estimated on the basis of the change from the Do Minimum in vehicle kilometres in the study corridor, accounting for all trips and journey lengths.

Packages were allocated to categories from the seven point scale using the process of identifying category boundaries from the range of package results described above.

It is recognised that this approach is likely to overstate the negative impact of offline routes that add to journey length as it does not account for their additional effect of moving traffic to newer routes which benefit from more recent design standards and fewer junctions. However this effect is unlikely to change the balance of effects between options.

G.4.1.7. Reduce air quality and noise impacts

The scale of impact of highway packages on air quality and noise depends largely on scale and location of changes in traffic flow.

Impacts on air quality were considered on the basis of changes from the Do Minimum in flows through Huntingdon (and therefore influencing the Huntingdon AQMA) and the additional AQMAs along the A14 corridor. To account for the relative scale of the different areas, flows in each case were weighted by distance through the area. The indicator was therefore based on the change in vehicle kilometres on links in the AQMAs, allowing for all trips across the day. It is noted that this approach does not account for changes in the central Cambridge AQMA but it was judged that the main source of differentiation between options would be the relative scale of impacts on the Huntingdon and A14 corridor areas.

Noise impacts were calculated on the basis of change in flows across the corridor, again distance weighted to take account of the relative length of each section. The indicator was therefore based on the change in vehicle kilometres on all links allowing for all trips across the day.

In each case, packages were allocated to categories from the seven point scale using the process of identifying category boundaries from the range of package results described above

G.4.2. Constraints and interdependencies

Consideration, at a strategic level, of a range of deliverability issues for each highway package:

- environmental constraints;
- engineering constraints;
- acceptability (public/political);
- permissions / planning / orders; and
- timescales / phasing.

The information was gathered at a workshop with attendees representing the Highways Agency and Cambridgeshire County Council as well as Atkins specialists.

As part of the deliverability discussion, consideration was given to the identification of relationships with other schemes / projects; and land-use planning dependencies.

G.4.3. Fit with wider transport & government objectives

A qualitative assessment, based on professional judgement, was undertaken of the fit of the packages with wider European Union transport objectives and wider UK government objectives, focusing on EU TEN-T designations, potential impacts on health, the potential wider economic benefits from the interventions, and impacts on widening accessibility of education facilities.

G.5. Assessing the Economic Case

A mix of qualitative and quantitative indicators has also been used to assess the relative performance of the packages against the Economic Case assessment criteria, as described below.

The following sections provide further detail on the ways in which the entries for each of the variable indicators were derived for the highway packages.

The public transport and freight packages were assessed against the same indicators but, as described above, all assessments were on a qualitative basis due to the lack of available information on package impacts on the A14.

G.5.1. Economy impacts

G.5.1.1. Connectivity

Impacts on distance and journey times were combined in a single measure of change in total journey cost (in monetary terms) for trips in the study corridor. As described above, time and distance costs were converted to equivalent monetary values using the parameters adopted in the A14 EFD model for the conversion, accounting for the proportion of trips in each time period by cars and goods vehicles and by journey purpose. These calculations provided an estimate of total monetary cost incurred by all trips on each link in the study corridor in each package. The reduction achieved relative to the Do Minimum was then calculated, to provide an estimate of the overall improvement in journey costs. The change in all day travel costs was used, separating out the impacts on strategic and local trips.

Packages were allocated to categories from the seven point scale using the process of identifying category boundaries from the range of package results described above.

G.5.1.2. Reliability

Reliability comprises incident delays and daily travel time variability. Both dimensions were combined in a single indicator for each package as they are largely influenced by the same factors. The assessment was based on the INCA (Incident Delay Assessment) evaluation undertaken for the cancelled A14 EFD scheme. A qualitative assessment scale was used with the A14 EFD scheme being benchmarked as providing a value of '10'. Each of the highway packages was then assessed by judging how well it would perform compared to the A14 EFD scheme based on:

- additional capacity provided for the A14 online section;
- the length of the improvement for the A14 online section; and
- the extent of additional routes away from the existing A14 corridor coupled with the extent to which capacity is retained in the A14 corridor.

Scores less than 10 are indicative of schemes that were judged to perform less well than the A14 EFD scheme, while scores greater than 10 are schemes that would perform better than the A14 EFD scheme.

Packages were allocated to categories from the seven point scale using the process of identifying category boundaries from the range of package results described above.

G.5.1.3. Wider impacts

The key influence on the scale of impacts is changes in journey costs, particularly between employment areas in close proximity to each other. The indicator used for this measure was therefore the total change from the do minimum in journey costs (accounting for distance and time effects), calculated as described above. The focus was on local trips as these have the greatest influence on agglomeration impacts.

Packages were allocated to categories from the seven point scale using the process of identifying category boundaries from the range of package results described above.

G.5.1.4. Regeneration

An assessment of impacts against the regeneration criteria has not been carried out. In line with WebTAG guidance this is only relevant where an option impacts on a designated regeneration area.

G.5.2. Environmental impacts

G.5.2.1. Greenhouse gases, air quality and noise

Assessments against the greenhouse gas, air quality and noise criteria were supported by quantitative estimates of changes in vehicle kilometres and traffic flows. Greenhouse gases were assessed on the basis of total change in vehicle kilometres and air quality and noise were assessed as described for the Strategic Case.

G.5.2.2. Other criteria

To assess the potential impacts of the packages on the other environmental criteria, an indicator was agreed for each of the following: landscape, townscape, heritage, biodiversity and water environment. The choice of indicators reflects the availability of data and aligns with the proportionate appraisal approach described above. Data to inform the heritage, biodiversity and water criteria were drawn from the environmental constraints map maintained by Cambridgeshire County Council. The outline assessment described below does not reflect potential environmental mitigation measures for any of the packages. This will be examined in Output 3.

Consideration was also given to potential environmental issues as part of the constraints and deliverability assessment undertaken for the Strategic Case (see above).

G.5.2.3. Landscape

Assessment considered the potential impact of each package on open countryside based on the length of new road alignment which would pass through open countryside. Packages with no new alignment in open countryside scored zero. The remaining packages were allocated a score of -1, -2 or -3 (slight, moderate or large negative) with boundaries between scores being one third above the lowest length and a third below the highest length (i.e. the values were split into tertiles).

The scoring did not seek to assess the value or quality of the landscape nor the impact on particular views based on topography.

G.5.2.4. Townscape

A qualitative assessment identified potential adverse or beneficial effects of each package on centres of population. The assessment considered the potential change in proximity and flow of traffic in relation to centres of population.

Broadly the rules applied were as follows:

- where a highway package included a new alignment adjacent to or in the vicinity of a smaller settlement, the package scored -1;
- where a highway package would similarly affect one or more larger settlements the package scored -2;
- where a highway package would similarly affect the largest centre of population (i.e. Huntingdon), the package scored -3; and
- where the potential cumulative impact on multiple centres was thought to be severe, the package scored -3.

In the assessment, online widening was considered to have a greater impact than local access roads. The assessment included impacts on proposed centres of population such as Northstowe.

Beneficial impacts were captured as positive scores where a package has the potential to relieve a centre of population by removing traffic from its vicinity. On this basis those packages which would lead to the de-trunking of the existing A14 through Huntingdon, and therefore change the proximity and flow of traffic, received a score of +1. Packages which would result in north-south strategic traffic remaining on the existing A14 did not receive a positive score.

The adverse and beneficial scores were combined to give a net score. Scores ranged from -1 to -3.

G.5.2.5. Heritage

Assessment considered the number of designated heritage sites within one kilometre of each package alignment (based on information held by Cambridgeshire County Council). These include Scheduled Ancient Monuments, Listed Buildings and Registered Commons. At this stage in the assessment no differentiation was made as to the relative importance of the designations.

Packages with no heritage sites within one kilometre scored zero. The remaining packages were allocated a score of -1, -2 or -3 with boundaries between scores being one third above the lowest number of sites and a third below the highest number of sites (i.e. the values were split into tertiles). Scores ranged from -1 to -3.

G.5.2.6. Biodiversity

The assessment considered the number of sites with the following designations in the proximity of the package alignment:

- County Wildlife sites;
- Local Nature Reserves;
- National Nature Reserves;
- Special Areas of Conservation;
- SSSIs [2];
- Special Protection Areas; and
- RAMSAR [3] sites.

Packages with no such sites within one kilometre scored zero. Packages which directly impact (i.e. cross) one or more designated sites scored -3. Packages within one kilometre of one or more designated sites scored -2, and packages within two kilometres of one or more designated sites scored -1. Scores range from -1 to -3.

At this stage in the assessment no differentiation was made as to the relative importance of the designations (e.g. local, national or international) nor did the assessment include designations of particular species.

G.5.2.7. Water environment

Assessment considered the length of each package alignment passing through a Flood Zone 3 [4].

Packages with no alignment in Flood Zone 3 scored zero. The remaining packages were allocated a score of -1, -2 or -3 with boundaries between scores being one third above the lowest length and a third below the highest length (i.e. the values were split into tertiles).

G.5.3. Social impacts

Assessment of the relative performance of the packages against the social impact criteria is predominantly qualitative.

G.5.3.1. Social and distributional impacts

A qualitative assessment of the distributional impacts of the packages on vulnerable user groups has been carried out. Further information on the approach used is included in Appendix B – The definitions of vulnerable user groups are drawn from DfT Guidance[5] and include:

- children;
- older people;
- disabled people;
- black and minority ethnic communities;
- people without access to a car; and
- people on low incomes.

[2] SSSIs – Sites of Special Scientific Interest
[3] Ramsar sites are wetlands of international importance designated under the Ramsar Convention.
[4] Flood Zone 3 are those areas with a 1% per annum chance of flooding.
[5] WebTAG Unit 3.17

The assessment considered the proportion (relative to data for Cambridgeshire) and spatial distribution of each of the vulnerable user groups within a one kilometre buffer zone around each of the highway packages.

G.5.3.2. Physical activity

A qualitative assessment was undertaken on the extent to which each package would influence numbers and lengths of walking and cycling trips in the corridor.

G.5.3.3. Accidents

As volume of travel is a key influence on accident numbers, the change in accident impacts was estimated on the basis of the change from the Do Minimum in vehicle kilometres in the study corridor, accounting for all trips and journey lengths.

Packages were allocated to categories from the 7 point scale using the process of identifying category boundaries from the range of package results described above

It is recognised that this approach is likely to overstate the negative impact of offline routes that add to journey length as it does not account for their additional effect of moving traffic to newer routes which benefit from more recent design standards and fewer junctions. However this effect is unlikely to change the balance of effects between options.

G.5.3.4. Access to goods, services, people and places

A qualitative assessment, based on professional judgement, was undertaken of the likely impact of the packages on accessibility to key health facilities (e.g. Addenbrookes and Hinchingbrooke hospitals), education facilities (primary and secondary in Cambridge, Huntingdon, St Ives, and some villages in corridor, and tertiary education in Cambridge including at Cambridge Regional College and the two Universities), and services which are focussed in Cambridge and Peterborough. Scoring reflects enhanced highway-based accessibility in the form of larger increments in capacity. It is noted that PT options, however, provide further accessibility benefits by also being available to households without access to a car.

Qualitative assessments of the relative performance of the packages have been carried out for the physical activity, access to goods and services and severance criteria.

G.5.3.5. Severance

A qualitative assessment, based on professional judgement, was undertaken of the likely impact of each package on the ability of those making non motorised trips to make the trips that they want to.

G.5.3.6. Social criteria not assessed at this stage

Assessment against the security, affordability and option values criteria will be presented in Output 3 as part of the Economic Case information for those packages which are recommended for further work.

G.5.4. Public accounts

G.5.4.1. Cost to broad transport budget

Quantitative estimates of package costs have been used to generate a qualitative score based on ranges of costs. Similarly quantitative estimates of the potential of each package to generate revenue through tolling have been presented using a qualitative assessment score.

G.5.4.2. Potential for revenue generation

A preliminary assessment of the potential revenue generation from the tolling of new road sections within the highway packages has been made. The assessment has assumed that:

- tolling is only possible where a viable alternative for local traffic is available;
- when a toll is levied, only strategic traffic would use the new sections and hence incur a charge (the proportion of traffic classed as strategic has been taken from inspection of the A14 Do Minimum highway assignments);
- the charge would be levied in peak periods only (3 hours in AM and 3 hours in PM);
- the charge is made for each passage of the route; and

- freight vehicles are charged at a toll twice that of private cars (the assessment has been undertaken based on a toll of £3/£1.50 respectively).

It is anticipated that a proportion of strategic traffic could divert onto the local alternative as well as parallel strategic routes but this would be typically in the range of 20 to 30% of strategic traffic. Further work would be required to assess the scale and effects of re-assignment due to the toll and also whether further traffic engineering measures might assist in controlling the level of reassignment.

Packages were allocated to categories from the seven point scale using the process of identifying category boundaries from the range of package results described above, based on their potential revenue generation. Scores range from 0 to 3 as clearly no package would result in a reduction in toll revenue.

G.5.4.3. Indirect tax revenues

At this stage of the study no assessment of impacts on Indirect Tax Revenues will be carried out as suitable data is not available. Further assessment against this criterion will be undertaken in Output 3.

Table G.1 Approach to Assessment of the Strategic Outline Case and Economic Case

Impact		Assessment criteria	
THE STRATEGIC CASE			
Business strategy		The strategic aims & responsibilities of the promoting organisation(s)	
Identified problems		Description of the identified problem (e.g. scale, timescales, key drivers).	
Objectives (assessment against specific objectives derived from wider challenges identified in Output 1).		Reduce lost productive time	
		Support the economic growth of the wider UK economy	
		Support the economic growth of Greater Cambridge	Impacts on journey costs
			Housing development unlocked
			Commercial development unlocked
		Improve access to labour markets	Journey times to key employment sites
			Impact on commuting journey times
		Improve quality of life/welfare	
		Reduce number of accidents on the A14 in the core study area	
		Reduce air quality and noise impacts	Impact on AQMAs
			Noise Impact
Constraints		High level internal / external constraints e.g. technological environment, in-house delivery capability, contractual etc.	
Inter-dependencies		Internal/external factors upon which the successful delivery of the project are dependent.	
Fit with wider transport & government objectives		Fit within the EU legislative framework governing transport; and with other government priorities beyond transport	
Stakeholders		What consultation has taken place with relevant stakeholders?	
THE ECONOMIC CASE			
Economy	Connectivity	Do journeys will become shorter, quicker &/or cheaper	*Strategic Trip Costs*
			Local Trip Costs
	Reliability	Impact on the number of incidents and the day to day variability in journey times or the average minutes of lateness.	
	Regeneration	Not assessed. Assessment only required where an option impacts on a designated regeneration area.	
	Wider Impacts	Productivity and welfare changes	
Environment	Greenhouse gases	Change in CO_2 emissions.	
	Air quality/ noise	Affects on AQMAs - Impacts on local air quality.	
		Noise Impact	
	Landscape	Impact on open countryside	
	Townscape	Impact on centres of population	
	Heritage	Impact on designated sites	
	Biodiversity	Impact on designated sites	
	Water Environment	Impact on flood plain	
Social	Social and distributional	Impacts on specific demographic groups (e.g. children, older people, disabled people, Black and Minority Ethnic communities, people without access to a car and people on low incomes).	
	Physical activity	Impacts on levels of walking and cycling	
	Accidents	Change in number and severity of transport-related accidents.	
	Security	Not assessed in Output 2. Negative impacts would not lead to the elimination of an option/package at this stage.	
	Access to goods, services, people and places	Change in ease of access to key locations (e.g. colleges, hospitals).	
	Affordability	Not assessed in Output 2. Negative impacts would not lead to the elimination of an option/package at this stage.	
	Severance	Effects on hindrance of movement by non-motorised modes.	
	Option values	Not assessed in Output 2. Negative impacts would not lead to the elimination of an option/package at this stage.	
Public accounts	Cost to broad transport budget	Capital cost of the package. (£ million)	
		Potential for on-going revenue generation.	
	Indirect tax revenues	Not assessed at this time. Appropriate data not available.	

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