NORTH WEST cambridge

Transport Assessment: Appendices

September 2011

Appendix 1 – Description of the Development, and Parameters Plan 02 - Access

DESCRIPTION OF DEVELOPMENT

1.1 The Planning Application seeks planning permission with details of appearance, landscaping, layout, scale and (save for the matters submitted in respect of zones A and C) access reserved within the parameters set out in the Parameter Plans and Statements.

1.2 The development proposals comprise:

Zone B:

- Up to 3,000 dwellings; (Class C3 and C4)
- Up to 2,000 student bedspaces; 98,000 sq.m. (Class C2)
- Up to 100,000 sq.m. new employment floorspace, of which:
  - Up to 40,000 sq.m. commercial employment floorspace (Class B1(b) and sui generis research uses)
  - At least 60,000 sq.m. academic employment floorspace (Class D1)
- Up to 5,300 sq.m. gross retail floorspace (Use Class A1/A2/A3/A4/A5) (of which the supermarket is not more than 2,000 sq.m. net floorspace)
- Senior living; up to 6,500sq.m. (Class C2)
- Community centre; up to 500 sq.m. (Class D1)
- Indoor sports provision, up to 450 sq.m. (Class D1)
- Police; up to 200 sq.m. (Class B1)
- Primary Health Care; up to 700 sq.m. (Class D1)
- School; 3,750 sq.m. (Class D1)
- Nurseries; up to 2,000 sq.m. (Class D1)
- Community Residential; up to 500 sq.m. (Class C3)
- Hotel (130 rooms); up to 7,000 sq.m. (Class C1)
- Access roads
- Pedestrian, cycle and vehicle routes
- Parking
- Energy Centre; up to 1,000 sq.m.
- Provision and/or upgrade of services and related service media and apparatus including pumping stations, substations and pressure regulators
- Drainage works (including sustainable ground and surface water attenuation and control)
- Open space and landscaping (including parks, play areas, playing fields, allotments, water features, formal/informal open space, maintenance sheds, pavilions and support facilities)
- Earthworks to provide revised ground contours
- Demolition of existing buildings

Zone A: Huntingdon Road - Highway and Utility Works

- Construction of a new three arm and a new four arm signal controlled junctions, including pedestrian and cycle crossings, to provide access to the Proposed Development from Huntingdon Road
- Installation of a toucan crossing across Huntingdon Road

- Construction of an unsegregated footway/cycleway on the southern side of Huntingdon Road
- Diversion and/or replacement and/or protection of existing utilities affected by the proposed highway works
- Provision of new telecommunications infrastructure and connection to existing utility infrastructure situated along Huntingdon Road
- Related landscaping, accommodation works, street furniture, drainage, telemetry and utilities

Zone C: Madingley Road - Highway and Utility Works

- Junction improvement works at the High Cross/Madingley Road junction to alter it from a three arm priority junction to a four arm signal controlled junction, including pedestrian and cycle crossings, to provide access to the Proposed Development
- Installation of a toucan crossing across Madingley Road
- Diversion and/or replacement and/or protection of existing utilities affected by the proposed highway works
- Installation of a retaining wall along Madingley Road
- Provision of a new pumped foul water rising main, including chamber connection, and new telecommunications, electricity and gas infrastructure and the associated connection to existing utility infrastructure situated along Madingley Road
- Related landscaping, accommodation works, street furniture, drainage, telemetry and utilities

KEY

Contextual Information:

- Existing and retained buildings
- Open land (reference NWC/OPA/PAR/03)
- Open land within school site (reference NWC/OPA/PAR/03)
- Primary street
- Secondary street
- Primary pedestrian/cycle route
- Secondary pedestrian/cycle route

For Approval:

- Application site boundary
- Primary street zone*
- Secondary street zone *
- Primary pedestrian/cycle route zone *
- Secondary pedestrian/cycle route zone *
- Restricted Access Zone
- Market Square pedestrianised Zone

* Zones may overlap

All information other than that identified as being for approval is shown for contextual purposes only.

North West Cambridge

NWC/OPA/PAR/02 - Access Parameter Plan: Zone B

September 2011

UNIVERSITY OF CAMBRIDGE

0 10 50 100m

Scale 1:5000@A1

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Appendix 2 - Relevant extracts from the North West Cambridge Area Action Plan

2. VISION, OBJECTIVES & DEVELOPMENT PRINCIPLES
Policy NW1: Vision

North West Cambridge will create a new University quarter, which will contribute to meeting the needs of the wider city community, and which will embody best practice in environmental sustainability. Development will be of the highest quality and support the further development of the University, Cambridge and the Sub-Region as a centre of excellence and a world leader within the fields of higher education and research, and will address the University's long-term development needs to 2021 and beyond. There will be a new local centre which will act as a focus for the development and which will also provide facilities and services for nearby communities. A revised Green Belt and a new landscaped urban edge will preserve the unique character of Cambridge, enhance its setting and maintain the separate identity of Girton village.

2.1 Cambridge University has identified this area, which is in its ownership, as its only option to address its long-term development needs for a number of uses, including housing. The Structure Plan 2003 accepted that the Area Action Plan location should be released from the Green Belt for development following a boundary review, and that once released it should be reserved for predominantly University-related uses and only brought forward for development when the University could show a clear need for the land to be developed. The evidence base produced for the examination of the soundness of this Area Action Plan, and specifically the evidence produced by the University, identifies a clear need for the land to be brought forward for development, with a current need for University key worker affordable housing.

2.2 The University's development needs arise from its requirement to:

- Continue to fulfil its mission to contribute to society through the pursuit of education, learning and research at the highest international levels of excellence;
- Respond positively to Government policy for growth in the higher education sector; and
- Work actively to support the expansion of the knowledge-based economy.

To achieve its objectives the University will remain a collegiate organisation, primarily residentially based. To this end it seeks additional student housing to reflect the rising student population and to reduce the proportion of postgraduate students relying on the commercial housing sector. Given the longstanding difficulties in the local housing market the University needs to achieve a fourfold increase in its provision of housing available to staff. This need is to deal with recruitment and retention problems arising from local house prices and rental levels.

2.3 The University's development needs relate not only to academic buildings. The University's research activities are increasingly carried out collaboratively with public and charitable sector research institutes, and industry. It needs to be able to provide a range of opportunities for such collaborations from small embedded units within academic departments to sites for major research facilities proximate to related University activities. Above all the University needs to be able to respond rapidly to opportunities arising from breakthroughs in research, technological advances and new funding sources.

2.4 The University's stated aspirations during the early stages of the plan making process for development at North West Cambridge for the period up to 2025 include:

a. Accommodation for 2,000 undergraduate and postgraduate students which might include accommodation at new colleges or extensions to existing ones;

b. 2,000 to 2,500 dwellings, a “significant proportion” of which should be affordable housing for University staff;
c. Academic facilities;
d. Sui-generis research institutes;
e. Commercial research and development space;
f. Hotel and conference facilities;
g. Community facilities such as a primary school and shops;
h. Public open recreational space; and
i. Nature conservation areas.

2.5 The vision will guide the development of the planning policy framework and help create a high quality development that seeks to help meet the aspirations of the University.

Objectives of the Area Action Plan

a) To contribute to meeting the long-term development needs of Cambridge University;
b) To create a sustainable community;
c) To make the best use of energy and other natural resources, to be built as an exemplar of sustainable living with low carbon and greenhouse gas emissions and be able to accommodate the impacts of climate change;
d) To create a satisfactory mix of uses, taking into account:
i. Identified University development needs
ii. The need for affordable housing for University and

College staff;

e) To secure a wide range of housing types and tenures;
f) To secure high quality development of both built form and open spaces;
g) To create a community which respects and links with adjoining communities;
h) To achieve a modal split of no more than 40% of trips to work by car (excluding car passengers) and to maximise walking, cycling and public transport use;
i) To maintain the purposes of the Green Belt;
j) To provide an appropriate landscape setting and high quality edge treatment for Cambridge;
k) To provide appropriate separation between Cambridge and the village of Girton to maintain village character and identity;
l) To provide standards for infrastructure provision including renewable energy, open space, car and cycle parking, sewerage and surface water drainage;
m) To provide an appropriate level of community services and facilities to serve the development satisfactorily;
n) To determine appropriate phasing of development taking into account that development should only proceed when the University can prove the need for it;
o) To secure the infrastructure needs of the development, including green infrastructure; and
p) To protect special geological interest, existing wildlife and wildlife corridors and secure a net increase in biodiversity.

2.6 These objectives relate to the Area Action Plan and Masterplanning and to the preparation and determination of planning applications. They are derived from national and regional planning guidance, the Structure Plan, local circumstances and from the evidence base.

6. TRAVEL

Policy NW11: Sustainable Travel

Development and transport systems will be planned in order to reduce the need to travel and maximise the use of sustainable transport modes to encourage people to move about by foot, cycle and bus, to achieve a modal share of no more than 40% of trips to work by car (excluding car passengers). This will include the provision of car clubs, employee travel plans, residential travel planning, and other similar measures.

6.1 Development in North West Cambridge will be in the form of a mixeduse development which will allow the daily needs of occupants to be met within walking or cycling distance, thus minimising the need to travel beyond the development.

6.2 Where travel is necessary, however, development will be planned to make this as sustainable as possible, particularly by:

a. Maximising use of sustainable transport modes by the provision of safe and convenient routes and higher densities to encourage people to move about by foot, cycle and bus;
b. Specifying appropriate standards for infrastructure provision within the development, including car and cycle parking;
c. Providing sustainable transport infrastructure to link the development to key destinations in Cambridge and to the wider network.

6.3 Transport modelling3 for North West Cambridge has shown that an 8 percent reduction in the modal share for journeys to work by car drivers (reducing the modal share from 45 percent to 37 percent) is achievable, if the right conditions are created as part of the development. These conditions include:

a. Good levels of day-to-day facilities and service provision in the local centre within the development, to encourage trips to be internalized within the site;
b. Provision of high quality, high frequency public transport to give a high standard of public transport accessibility within the development and to key destinations, including the City Centre and

Cambridge Railway Station;

c. High quality cycle provision, including safe and convenient routes and a large amount of high quality cycle parking, to support growth in cycling's modal share;
d. Car parking provision below maximum standards as much as possible, combined with controls on on-street parking across the development site;
e. Car sharing facilities within the development, through the use of car clubs or other similar measures;
f. Employee travel plans and residential travel planning, including personal journey to work travel planning for residents of the development.

6.4 A Transport Assessment will be required alongside any planning application to allow the travel impact to be properly assessed and adequately mitigated. This will include mitigation against environmental impacts, such as noise, pollution and impact on amenity and health.

Access to Development

Policy NW12: Highway Infrastructure

Development will be subject to sufficient highway capacity being available to serve all stages of development, including on the adjacent strategic road network. Development will contribute to measures to mitigate any significant adverse traffic impacts on

the M11, A14 and the surrounding highway network, if this is shown to be necessary by transport assessments.

Policy NW13: Vehicular Access
Vehicular access to the development area will be from Huntingdon Road and Madingley Road. The number of vehicular access points to the development area will be minimised, especially from Huntingdon Road, and there will be no access for private motor vehicles to and from Storey's Way.

Policy NW14: Madingley Road to Huntingdon Road Link
A new route will be developed linking Madingley Road and Huntingdon Road. This road will be designed as part of the development and its design will be based on low vehicle speeds. It will give priority to provision for walking, cycling and public transport, including safe and convenient crossings for pedestrians and cyclists, in order to encourage travel by more sustainable modes.

Policy NW15: Highway Provision
Highway provision will be funded by development, as appropriate, and the provision of key links will be timed to relate to the commencement of development, or to the first occupation, of the relevant phase of development.

6.5 The overall approach to transport is to provide for the necessary vehicular trips associated with the development whilst managing the need to travel by car and promoting the use of other sustainable modes of travel. In accordance with Department for Transport Circular 2/07 (Planning and the Strategic Road Network), development in North West Cambridge will be based on a preference for solutions to travel demand which do not require the provision of new strategic road capacity. However, the Strategic Highway Authorities (Highways Agency and Cambridgeshire County Council) need to be assured that development can be delivered in such a way that it minimises any additional burden on other users of the strategic road network. Thus, if transport assessments indicate adverse impacts from development on the strategic road network (despite the use of all possible demand management measures) then development will need to contribute to appropriate mitigation measures on the strategic road network which are necessary to cater safely and efficiently for anticipated traffic levels.

6.6 A limited number of vehicular accesses are proposed in order to limit the impact upon the key radial corridors of Huntingdon Road and Madingley Road. A maximum of two accesses from Huntingdon Road are proposed. One main access from Madingley Road is proposed for general traffic, as indicated on the concept diagram and preferred highway option diagram (Figure 6.1*).* A secondary access into the development from Madingley Road may be required to serve the eastern part of the site. The potential need for, and purpose of, a secondary access will be explored through masterplanning and any planning application and associated transport assessments. If theneed for a secondary access is demonstrated, the decision on the most appropriate route for such a road will have regard to the environmental and landscape impact of any such road on the immediate and wider area, the impact on residential amenity and the operation of existingactivities, land ownership constraints and deliverability, and timing and phasing in relation to the development.

6.7 A new road is proposed as part of the development of North West Cambridge, as shown in Figure 6.1. This road is intended primarily to provide access for the proposed development. Nevertheless, a link road from Madingley Road to Huntingdon Road will only be possible if its impacts on the transport network and on amenity are acceptable: it is important that the road should not release suppressed demand for car travel and hence create adverse traffic impacts. The design will provide for cycling and public transport, in order to encourage movements by more sustainable modes (see Policies NW16 and NW17). The new road linking to Huntingdon Road will be located on the western side of the strategic gap to provide a staggered junction with development

proposed to the north of Huntingdon Road. It will need to be designed to avoid impacts on the purposes of the Green Belt and the amenity of the strategic gap within the development area. The existing buildings in the Green Belt on the eastern side of the strategic gap should be demolished and the area returned to the open countryside to maximise the openness of the Green Belt.

6.8 The design will also need to consider how the route would relate to the wider road network and development proposed north east of Huntingdon Road (the NIAB site). In conjunction with other development there is potential for a link from Huntingdon Road to the B1049 (Histon Road/Cambridge Road), giving the potential for linkage with the Cambridgeshire Guided Busway (CGB). The design of the junction at Huntingdon Road must be capable of linking satisfactorily with the proposed route from Huntingdon Road to the B1049 (Histon Road/Cambridge Road) to ensure the wider transport benefits are achieved, particularly in terms of segregated public transport provision.

Policy NW16: Public Transport Provision
High quality public transport provision will be provided to support development, including:

a) Providing segregated bus priority routes through the development, along internal routes;
b) Linkage of bus routes within the development to the wider bus network, including enhanced bus services along Huntingdon Road and the proposed Madingley Road to Huntingdon Road link route;
c) Provision of bus stops, shelters and real time passenger information, with the majority of development being within 400m easy walking distance of a bus stop; and
d) Support for residential travel plans and employee travel plans, including measures to encourage bus use, funded by development.

6.9 Providing high quality public transport is essential to achieving sustainable development in North West Cambridge and the proposed modal shift. Development will therefore be expected to encourage bus use as much as possible for trips to and from external destinations and for work journeys to the site. The development area has the advantage of being close to the existing bus route networks, but needs to be well linked to them.

6.10 It is proposed that there will be two principal public transport routes within the area, as shown in Figure 6.1:

1. A route internal to the development area, running north-west to south-east through the site; and
2. A route, running internally through the area between Huntingdon Road and Madingley Road. These routes will be designed to be consistent with wider public transport improvements emerging from the County Council's Long Term Transport Strategy.

6.11 Development will be planned to give short walking distances to these routes: no more than 400m. The two routes will intersect giving a wide range of route options.

6.12 The north-west to south-east route will act as a public transport spine through the new development and will provide:

a. Connection to the Madingley Road to Huntingdon Road route, to allow a new bus service to operate through the development and then continue into the City Centre with possible onward connection to Cambridge Railway Station and Addenbrooke's Hospital;

b. Connection to Huntingdon Road in the north-west of the site. This provides the facility for some (but not all) existing bus services on Huntingdon Road to divert into the site, thereby taking advantage of bus priority facilities that could be provided;
c. Direct connection to development in the north-west corner of the development; and
d. A link between the Madingley Road to Huntingdon Road route and major development sites, employment locations and Park and Ride sites.

6.13 The proposed route, running between Huntingdon Road and Madingley Road, provides the option for buses to avoid the City Centre (although many services will have this as a destination) and gives more direct connections to other areas of the City. It will provide links with development north of Huntingdon Road and with the University's West Cambridge site to the south. A connection could be provided from the Madingley Road Park and Ride site to allow bus services to operate into the University's West Cambridge site and/or onwards to the NIAB site.

6.14 This route, if continued north-eastwards beyond Huntingdon Road, also allows connection with the CGB scheme at the B1049 (Histon Road/Cambridge Road). The CGB will provide (from 2009) a high quality public transport system from Huntingdon/St Ives to Cambridge. The CGB passes through the Cambridge Northern Fringe, giving the opportunity to connect North West Cambridge with wider public transport provision, including the proposed Chesterton Sidings station.

Policy NW17: Cycling Provision
New and improved cycle links will be provided as part of the development, including:

a) Giving priority to cycling links between Huntingdon Road and Madingley Road and to the City Centre;
b) Giving priority to cycling within the development, including connections to key destinations, including the local centre, bus stops, the primary schools, employment, and adjacent development; and
c) Linking the development with the surrounding walking and cycling network and orbital routes including links to nearby villages and open countryside.

6.15 Development will be designed to maximise the permeability of the site and the legibility of cycling routes to encourage trips to be made b cycling and so reduce the dependence on private cars. Within the development area, excellent facilities therefore need to be provided for cyclists including:

a. High quality cycle provision within the development providing maximum permeability for cyclists to the surrounding cycl network and to the local centre;
b. Cycle parking provision for all development, including the local centre;
c. Cycle storage for all dwellings; and
d. Schemes to promote cycling, including consideration of cycle sharing schemes and information on routes to residents and employees.

6.16 Cycle facilities within the development need to be linked to the wider cycle network, as outlined in 'Protection and Funding for the Future Expansion of the City Cycle Network' (2004). This includes links to the City Centre, to development north of Huntingdon Road, and to West Cambridge, as well as linking the new community to the wider countryside for recreation.

6.17 Radial provision is needed to give cyclists spinal routes through the new development which link with existing routes, including to and from the City Centre. This will give alternatives to existing cycle routes along Huntingdon Road and Madingley Road (although existing routes may also be improved).

6.18 Orbital cycle routes are also needed to connect with radial provision and with links north-eastwards to the B1049 (Histon Road/Cambridge Road) and beyond, as well as southwards to the Coton path, and University buildings. Safe and convenient cycle crossing facilities at Huntingdon Road and Madingley Road will be an essential part of the orbital provision. This will also give the potential to provide a more convenient cycle route to key destinations, including the proposed new rail station at Chesterton Sidings.

Policy NW18: Walking Provision
Development will be required to provide attractive, direct and safe walking routes as part of the development, including:

a) Giving priority to walking links between Huntingdon Road and Madingley Road, to adjacent development and to the City Centre;
b) Giving priority to walking routes within the development connecting to key destinations, including the local centre, bus stops, the primary schools and employment; and
c) Linking the development with the surrounding walking network, including links to an improved rights of way network and to nearby villages and open countryside.

6.19 Development will be designed to maximise the permeability of the site and the legibility of walking routes to encourage trips to be made by walking and so reduce the dependence on private cars. The majority of walking trips generated by the development will be internal to the development site, but opportunities also exist for walking trips to be made to key external destinations, including schools and colleges in the vicinity of the site, the University's West Cambridge site and Cambridge City Centre.

6.20 A grid system of direct walking routes should be provided within the development sites, providing maximum permeability to destinations within the development, particularly the local centre. The grid system should connect to existing walking routes on Huntingdon Road and Madingley Road, via as many connections as possible. Where feasible these links should be in the form of separate cycle and footpath links and should include safe and convenient routes to bus stops

Policy NW19: Parking Standards
Car and cycle parking will be provided in accordance with the standards set out in Appendix 1 and 2. In applying these standards, the overall aim will be to minimise the amount of car parking and to maximise the amount of cycle parking in order to encourage the use of more sustainable modes.

6.21 The amount of car and cycle parking will be in accordance with the standards set out in Appendix 1 and 2 of this Plan – for car parking these are **maximum** standards, and for cycle parking **minimum** standards. The standards will be applied to discourage unnecessary car use and to encourage cycle use.

6.22 The amount of residential and employee car parking will have a significant effect upon levels of car use and needs to be minimised in order to make the car a less preferred option. In particular, student residential parking will be very low and subject to proctorial control.

6.23 The amount of car parking needs to be related to public transport accessibility. Where this is high, as is proposed for this area, less car parking is necessary, particularly for employee parking. The quantity of car parking also relates to the urban form. Where higher residential densities are proposed, car parking should not be allowed to dominate design. The provision of measures such as car clubs, along with other 'softer' measures, with initial funding from development should be explored to minimise the need for individual car ownership and the associated parking demands.

6.24 In order to make cycling a more attractive option, the amount of convenient cycle parking provided as part of development will be maximised and will comply with the principles set out in Appendix 2.

APPENDIX 1: CAR PARKING STANDARDS

1 Introduction

1.1 The standards set out in this document define the appropriate levels of car parking for various types of development. These levels should not be exceeded but many may be reduced where lower car use can reasonably be expected. These standards are derived from the Cambridge Local Plan 2006 and the Cambridge East Area Action Plan.

1.2 Car parking standards are defined for most land uses, however for some land use types whose transport patterns are difficult to generalize (for instance training centres and museums), it is not possible to establish general parking standards. For these very specific uses, car parking provision will be approved on merit, on the basis of a Transport Assessment and negotiation.

2 Application of the Standards

2.1 Parking for disabled people will be required for their exclusive use at all sites in accordance with Section 7. It should be noted that under the Disability Discrimination Act (1995) it is the responsibility of site occupiers to ensure that adequate provision is made for the needs of disabled people.

2.2 Levels of car parking below the stated levels, including car-free developments, will be supported where:

a. The site has good access to High Quality Public Transport bus services, pedestrian and cycle routes; and
b. For residential developments, the site is within close proximity to shops and other local services; and
c. Reduced car ownership/use can be encouraged by provision of car pooling/car share clubs; and
d. Reduced car ownership/use can be enforced by means of aplanning condition or obligation, on-street controls, or other methods to ensure that increased on-street parking pressure will not occur.

2.3 Some developments may have an exceptional need for vehicle parking in addition to that specified in the standards. Where this can be shown to be necessary, either by the applicant or the local planning authorities, such parking should be provided in addition to that stated in the following sections. Such additional parking may be necessary where there will be shift-working staff and non-motorised travel options are not viable, for example. Preliminary discussions and Transport Assessments will play a key role in demonstrating the need for such additional parking.

2.4 Where reference is made to staff numbers, this relates to the typical number of staff working at the same time.

3 Residential Uses

A RESIDENTIAL DWELLINGS

3.1 Table 1 gives the car parking standards for residential uses. In addition to these ratios, provision should be made for visitors at the ratio of one space for every four units, provided that off-street car parking spaces resulting from the development would not be above 1.5car parking spaces per dwelling. Visitor parking should be marked appropriately.

Table 1: Residential Development

Dwelling Size	Maximum Standards
Up to 2 bedrooms	1 car parking space
3 or more bedrooms	2 car parking spaces

B OTHER RESIDENTIAL DEVELOPMENTS

3.2 In addition to the application of the parking standards defined in Table 2, covering the needs of residents, visitors and staff, developers should demonstrate that their proposal provides for any particular exceptional needs, such as service vehicles.

3.3 It is recognised that there is a functional difference between a development which is entirely or largely for student residential accommodation, and the non-residential elements of Colleges where there may be a variety of other uses including administrative and teaching activities. In these circumstances it may be appropriate to make additional car parking provision commensurate with the relevant standards for such uses as "offices" and "higher and further education".

Table 2: Other Residential Developments

Type of Development	Maximum Standards
Guest houses and hotels	2 spaces for every 3 bedrooms and 1 space per resident staff.

	Off-street coach parking to be conveniently located in relation to developments of 40 or more bedrooms. Where there are rooms specifically designed for people with disabilities, disabled parking of at least 1 space for each room so designed should be provided.
Nursing homes	1 space for every 8 residents, 1 space for every 2 members of staff.
	Provision must be made for ambulance parking.
Retirement homes / sheltered houses	1 space per 4 units, 1 space for every 2 members of staff.
	Provision must be made for ambulance parking. A secure, covered, enclosed area with electricity sockets needs to be provided for electric buggies.
Student residential accommodation where proctorial control or alternative control on car parking exist	1 space per 10 bed spaces or an area for both pick-up / drop-off at the end of term time and visitor parking. 1 space per resident warden / staff.
	Where there are rooms specifically designed for people with disabilities, disabled parking of at least 1 space for each room so designed should be provided.
Student residential accommodation where proctorial control does not exist or where control exists but the development will house conference delegates	1 space per 3 bed spaces. 1 space per resident warden / staff.
	Where there are rooms specifically designed for people with disabilities, disabled parking of at least 1 space for each room so designed should be provided. Controls will be necessary to limit use of car parking outside conference times.
Residential schools, college or training centre	On merit.
	Where there are rooms specifically designed for people with disabilities, disabled parking of at least 1 space for each room so designed should be provided.
Hospitals	On merit.

4 Retail, Culture, Leisure and Sports Uses

Table 3: Retail, Culture, Leisure and Sports Uses

Use	Maximum Standards
Food retail	1 space per 50 m^2 Gross Floor Area (GFA) up to 1,400 m^2 and 1 per 18 m^2 thereafter, including disabled.
Non-food retail	1 space per 50 m^2 GFA, including disabled.
Financial and professional services	1 space per 40 m^2 GFA, including disabled car parking.
Food and drink takeaways	1 space per 20 m^2 drinking / dining area, including disabled. 1 space for proprietor when resident.

Table 4: Assembly, Culture, Leisure and Sports Uses

Use	Maximum Standard
Museums, Exhibition venues	On merit.
Sports and recreational facilities, swimming baths	2 spaces for every 3 staff, plus 1 space for every 4 seats, including disabled.
Cinema	1 space for every 5 seats, including disabled.
Stadia	1 space for every 15 seats, including disabled.
Places of assembly including, theatre, auditoria and concert hall	1 space for every 4 seats, including disabled and staff car parking.
Place of worship	1 space for every 8 seats, including disabled.
Public halls / community centres	1 space per 20 m^2 of public space, including disabled.

4.1 Transport Assessments will play a key role in determining the level of car parking, particularly for mixed-use developments retail parks where linked trips might lead to a level of parking the standards.

4.2 A picking up and dropping off point for taxis and mini-buses to be provided for uses in Table 4.

5 Office Use

Table 5: Business and Industrial Uses

Use	Maximum Standards
Offices, General Industry	1 space per 40 m^2 GFA, including disabled.
Storage	1 space per 100 m^2 GFA, including disabled.

5.1 Access will primarily rely on public transport, cycling and walking.

6 Non-Residential Institutions

Table 6: Non-Residential Institutions

Use	Maximum Standards
Clinics and Surgeries	1 space for every professional member of staff plus 2 spaces per consulting room.
Non-residential schools	2 spaces for every 3 staff.
Non-residential higher and further education	2 spaces for every 3 staff.
Crèches	2 spaces for every 3 staff.

7 Provision for People with Disabilities

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

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

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

7.4 Disabled car parking spaces should be marked either 'disabled' or with a wheelchair marking.

APPENDIX 2: CYCLE PARKING STANDARDS

1 Introduction

1.1 The standards in the tables below set out minimum requirements in terms of cycle parking for new developments and changes in use. These standards are derived from the Cambridge Local Plan 2006 and the Cambridge East Area Action Plan.

1.2 In addition to the application of these standards, new developments will have to comply with the following principles:

a. Cycle racks or stands should conform to the design and dimensions as set out at the end of these standards;
b. For residential purposes cycle parking should be within a covered, lockable enclosure. For individual houses this could be in the form of additional space in a shed or garage. For flats or student accommodation either individual lockers or cycle stands within a lockable, covered enclosure are required. The cycle parking should be easily accessible and convenient to use;
c. Cycle parking for employees should be in a convenient, secure location and where practical covered;
d. Short stay cycle parking, e.g. for visitors or shoppers, should be located as near as possible to the main entrance of buildings and covered by natural surveillance or CCTV. For large developments, the cycle parking facility should be covered;
e. References to staff should be taken to mean the peak number of staff expected to be on site at any one time;
f. All cycle parking should be located to minimise conflicts between cycles and motor vehicles;
g. Some flexibility will be applied to applications where it can be demonstrated that strict adherence to the standards for a multipurpose site is likely to result in a duplication of provision.

Table 1: Residential Use

Type of Development	Minimum Number of Spaces
Residential dwellings	1 space per bedroom up to 3 bedroom dwellings. Then 3 spaces for 4 bedroom dwellings, 4 spaces for 5 bedroom dwellings etc. Some level of visitor cycle parking, in particular for large housing developments.
Guest houses and hotels	1 space for every 2 members of staff and 2 spaces for every 10 bedrooms.
Nursing homes	1 visitor space for every 10 residents and 1 space for every 2 members of staff.
Retirement homes/ sheltered houses	1 space for every 6 residents and 1 space for every 2 members of staff.
Student residential accommodation	2 spaces per 3 bedspaces. 1 visitor space per 5 bedspaces.
Residential schools, college or training centre	(as above)
Hospitals	On merit.

Table 2: Retail, Culture, Leisure and Sports Uses

Type of Development	Minimum Number of Spaces
Food retail	1 space per 25 m^2 GFA up to 1,500 m^2 thereafter 1 per 75 m^2
Non-food retail	1 space per 25 m^2 GFA up to 1,500 m^2 thereafter 1 per 75 m^2
Financial and professional services	1 space per 30 m^2 GFA to include some visitor parking.
Food and drinks	1 space for every 10 m^2 of dining area.
Museums, Exhibition venues	1 for every 2 members of staff Visitors: on merit.
Sports and recreational facilities and swimming baths	1 space for every 25 m^2 net floor area or 1 space for every 10 m^2 of pool area and 1 for every 15 seats provided for spectators.
Places of assembly including cinema, theatre, stadia, auditoria and concert halls	1 space for every 3 seats.
Place of worship, public halls and community centres	1 space per 15 m^2 of public floor area.

Table 3: Office Uses

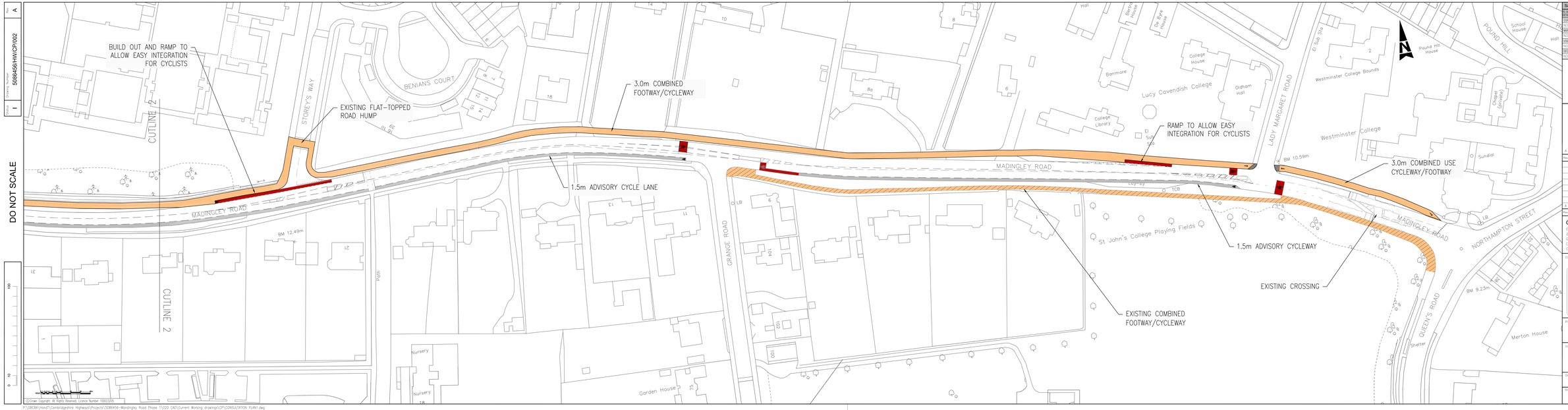
Type of Development	Minimum Number of Spaces
Offices	1 space for every 30 m^2 GFA to include some visitor parking.
General industry	1 space for every 40 m^2 GFA to include some visitor parking.
Storage and other B use classes	On merit.

Table 4: Non-Residential Institutions

Type of Development	Minimum Number of Spaces
Clinics and surgeries	2 spaces per consulting room and 1 space for every 3 professional members of staff.
Non-residential schools	Cycle spaces to be provided for 50% of children between 5 and 12 and 75% of children over 12 years.
Non-residential higher and further education	Cycle parking for all students using the site and 1 for every 2 members of staff.
Crèches and Nurseries	1 space for every 2 members of staff. 1 visitor space per 5 children.

Appendix 3 - Cycle Infrastructure plans – NCR51, CCC's Madingley Road Enhancements, CCC's Silver Street – Burrell's Walk proposals

North West Cambridge
Transport Assessment



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F:\GBCBM\Harrell\Cambridgeshire Highways\Projects\50864566-Mandingley Road Phase 1\020 CAD\Current Working drawings\CP\CONSULTATION PLAN1.dwg

Drawn by: 50864566HWCP002

Scale: 1

Size: A

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS NORMALLY ASSOCIATED WITH THE TYPES OF WORK SHOWN ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS:

CONSTRUCTION
NONE

MAINTENANCE/CLEANING
NONE

USE
NONE

DECOMMISSIONING/DEMOLITION
NONE

Rev.	Description	By	Date	Chk'd	Auth
A	ORIGINAL ISSUE	GS	01/10	GW	RLB

Rev.	Purpose of Issue	Date	Auth
A	FOR CONSULTATION	01/10	RLB

Cambridgeshire Highways
Design and Engineering Services
2/5 Wellbrook Court
Girton Road
Cambridge
CB3 0NA
Fax: (01223) 814520
Tel: (01223) 814440
cambridgeshirehighways@atkinsglobal.com

Client

Cambridgeshire Highways working for Cambridgeshire County Council

Project

MADINGLEY ROAD PHASE 1

Title

CONSULTATION PLAN

Original Size	Designed/Drawn	Checked	Authorised
1:500	GS	GW	RLB
	Date 08/01/10	Date 08/01/10	Date 08/01/10

Status	Drawing Number	Rev.
I	50864566/HW/CP/002	A

Rev A

Drawing Number 50864568/HW/CP/001

Scale 1

DO NOT SCALE

A0

CYCLE PRIORITY CROSSING

ON-ROAD CYCLE LANE TO MERGE INTO OFF-ROAD COMBINED USE CYCLEWAY/FOOTWAY

1.5m ADVISORY CYCLE LANE

3.0m COMBINED CYCLEWAY/FOOTWAY

LOW TREE BRANCH TO BE REMOVED

CYCLE PRIORITY CROSSING

3.0m COMBINED CYCLEWAY/FOOTWAY

CYCLE PRIORITY CROSSING

INDICATIVE CYCLE PRIORITY CROSSING

1.5m ADVISORY CYCLE LANE

1.5m ADVISORY CYCLE LANE

EXISTING MANDATORY CYCLE LANE TO BE INTEGRATED WITH NEW ADVISORY LANE

PICTURE COURTESY OF PATRICK LINGWOOD (CYCLING ENGLAND)

Madingley Road Park & Ride

Rosemary Cottages

BM 18.76m

LB

LANSDOWNE ROAD

Salix

Whitehouse

CONDUIT HEAD ROAD

El Sub Sta

Merton Farm

Cottages

Transport House

Merton Hall Farm

UNIVERSITY ACCESS

CUTLINE 1

JJ THOMSON AVENUE

The Whittle Laboratory

Tennis Tennis Court Court

CHARLES BABBAGE ROAD

MADINGLEY ROAD

EXISTING MANDATORY CYCLE LANE

3.0m COMBINED CYCLEWAY/FOOTWAY

TELECOMMS CABINET & MOBILE PHONE MAST

Tennis Courts

Tennis Courts

TREES TO BE FELLED ARE TO BE REPLACED BY SEMI-MATURED SAPLINGS

3.0m COMBINED CYCLEWAY/FOOTWAY

CUTLINE 2

1.5m ADVISORY CYCLE LANE

EXISTING MANDATORY CYCLE LANE TO BE INTEGRATED WITH NEW ADVISORY LANE

1.5m ADVISORY CYCLE LANE

CLERK MAXWELL ROAD

Gilling House

HEDGERLEY CLOSE

Blenheim Court

Churchill Court

Churchill Court

BULSTRODE GARDENS

WILBERFORCE ROAD

Stone

KEY

COMBINED CYCLEWAY/FOOTWAY

ON-ROAD ADVISORY CYCLE LANE

EXISTING COMBINED CYCLEWAY/FOOTWAY

RED CYCLEWAY SURFACING

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DESCRIBED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS:

CONSTRUCTION
NONE

MAINTENANCE/CLEANING
NONE

USE
NONE

DECOMMISSIONING/DEMOLITION
NONE

Rev	Description	By	Date	Chk'd	Auth
A	ORIGINAL ISSUE	GS	01/10	GW	RLB

Rev	Purpose of Issue	Date	Auth
A	FOR CONSULTATION	01/10	RLB

Cambridgeshire Highways

Design and Engineering Services
2/3 Wellbrook Court
Girton Road
Cambridge
CB3 0NA

Fax: (01223) 814520
Tel: (01223) 814400
cambridgeshirehighways@atkinsglobal.com

Client

Cambridgeshire Highways working for Cambridgeshire County Council

Project

MADINGLEY ROAD PHASE 1

Title

CONSULTATION PLAN

Original Scale	Designed/Drawn/Checked	Authorised
1:500	GS GW	RLB
	Date 08/01/10 Date 08/01/10	Date 08/01/10

Status	Drawing Number	Rev
I	50864568/HW/CP/001	A

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Drawing Name: 50864568-001 1:500 Map Date: Jan 08, 2010 2:24pm Plotted by: Hand

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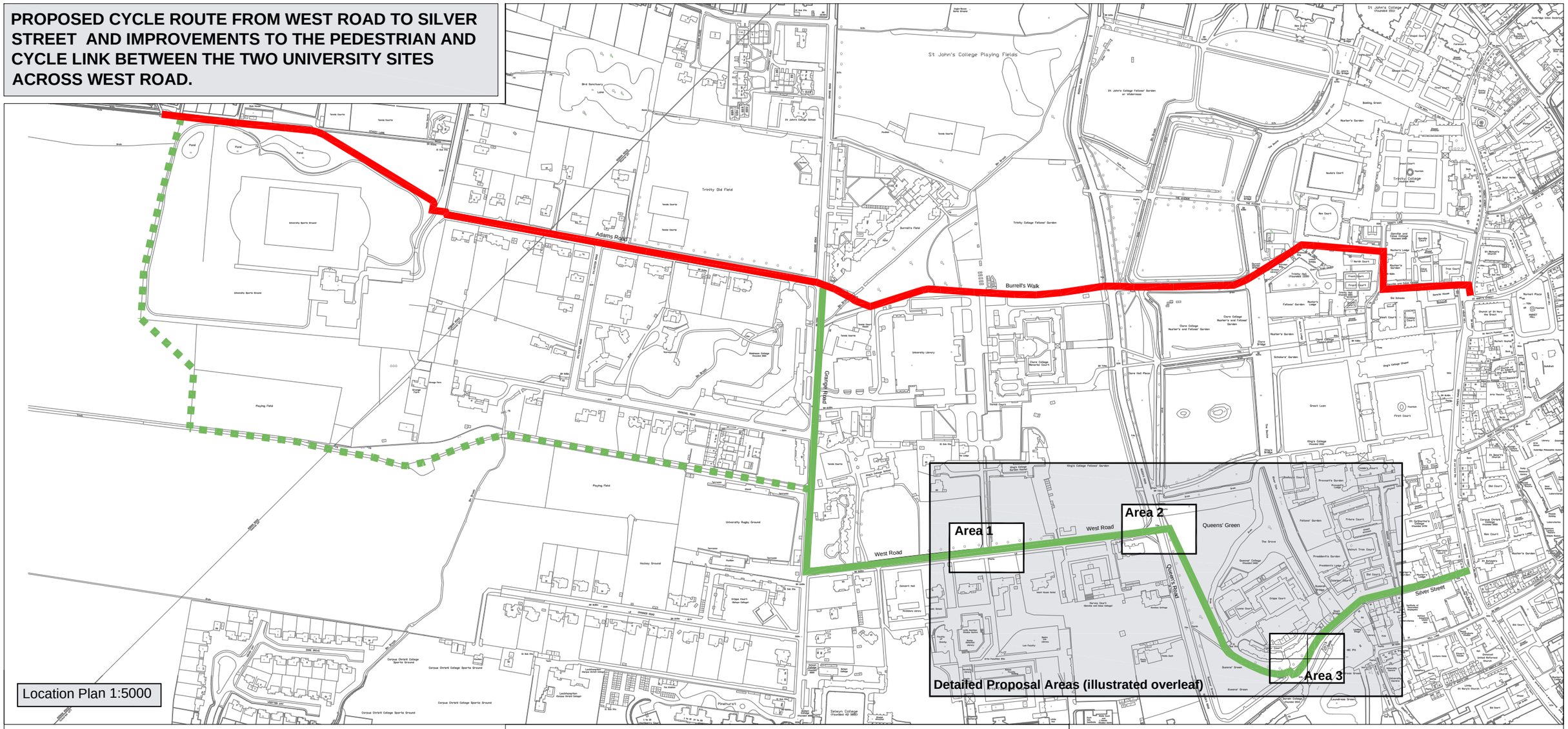
P:\GBCBA\Hand\Cambridgeshire Highways\Projects\50864568-Madingley Road Phase 1\020 CAD\Current Working drawings\CP\CONSULTATION PLAN1.dwg

PROPOSED CYCLE ROUTE FROM WEST ROAD TO SILVER STREET AND IMPROVEMENTS TO THE PEDESTRIAN AND CYCLE LINK BETWEEN THE TWO UNIVERSITY SITES ACROSS WEST ROAD.



Introduction:
The current cycle route from the west of Cambridge to the central University sites and colleges is via Burrell's Walk and Garret Hostel Lane (see Location Plan above). When the University West Cambridge site was proposed for development it was recognised that the cycle traffic on this route would increase significantly as a result and that this route was already very congested, particularly on Garret Hostel Lane, and could not easily accommodate additional users.

Consequently the section 106 agreement for this site provides for a new route from the West Cambridge site to Silver Street via West Road and Queens' Green. The aim of the new route is to provide an attractive alternative route to Burrell's Walk and Garret Hostel Lane. The long term plan is for this new route to connect via the Rugby Club access to the Coton Footpath (see Location Plan above).

Existing Footway / Cycleway

Proposed Footway / Cycleway

KEY
- Existing route
- Proposed alternative route
- Potential future link to Coton footpath

The Proposal:

This consultation relates to the proposed works on West Road, at the junction of West Road and Queen's Road, across Queens' Green and on Silver Street.

We would like to hear your views on the proposals for the 3 elements of this route:

1) West Road
2) Junction of West Road/Queen's Road and path across Queens' Green
3) Works on Silver Street.

CAMBRIDGE CITY COUNCIL

ENVIRONMENT AND PLANNING DEPARTMENT
Environmental Projects
CAMBRIDGE CITY COUNCIL

Proposed West Cambridge to Silver Street Cycle Route

1) West Road

Through traffic, other than buses and cycles, from Grange Road to Queen's Road would no longer be permitted under the proposals for the West Road/Queen's road junction. It is, therefore, considered that an area of raised carriageway on West Road (see plan 1 - opposite) to link the two University sites would be more appropriate and significantly less visually intrusive than the initial proposal for speed cushions included in the section 106 agreement. Amendments to the bus stop location and pay and display parking bays will also improve visibility and safety for bus users.

2) West Road/Queen's Road Junction

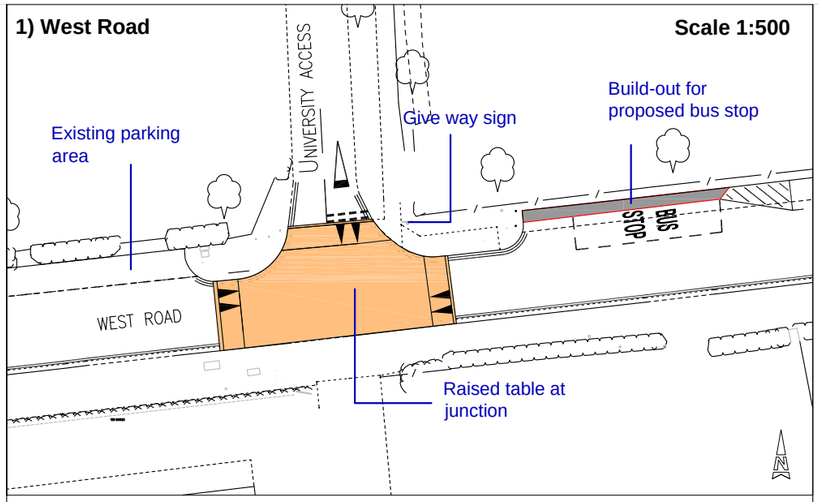
The proposal is for a new signalled junction (see plan 2 - opposite) which will provide cyclists with a safe and direct means of crossing from West Road to Queens' Green and vice versa. In order to allow for the necessary cycle and pedestrian phases, and prevent a significant increase in traffic congestion on Queen's Road, it is proposed to only allow buses and cyclists to exit West Road at this junction with a 'no entry except buses sign' and a cycle by-pass lane. To provide adequate green time for pedestrians and cyclists, buses and cyclists will be prohibited from turning left out of West Road. Existing buses only turn right at this junction and cyclists heading north will be able to use the existing off-road facility. The design of this junction provides a pedestrian crossing point on all arms of the junction.

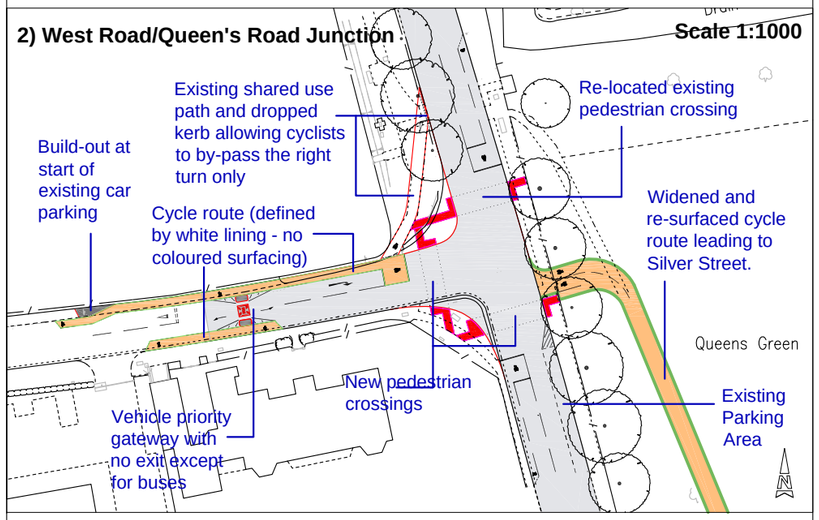
It is proposed that the path across Queens' Green will be surfaced with a natural looking resin bonded local gravel (as used on the path across Coe Fen) at a width of 3 metres. The width of the existing carstone path varies from 1.5-3m, although in the wetter winter months this path becomes a wide muddy strip as users spread out onto the grass to avoid the muddy puddles. 3 metres is the minimum recommended width for a shared path, allowing pedestrians and cyclists to pass each other with relative ease, and should significantly reduce the damage to surrounding grass.

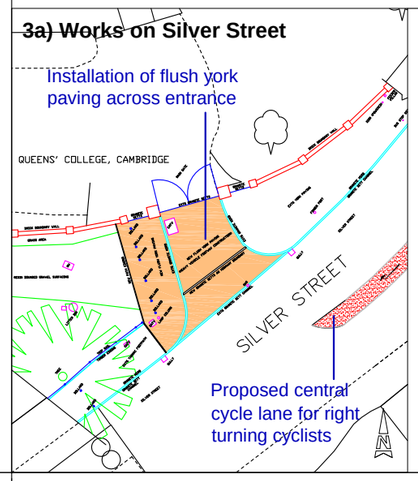
The proposal is then for the path to widen out as it approaches the West Road junction to allow for queuing cyclists waiting to cross with a further widening at the end for pedestrians to access the southern pedestrian crossing. A 'no-dig' method of construction is proposed to avoid damage to tree roots as the path passes underneath tree canopies and permeable surfacing will be used for this section. To achieve consistency, it is proposed that the path leading to the coach stop is also re-surfaced at its current width.

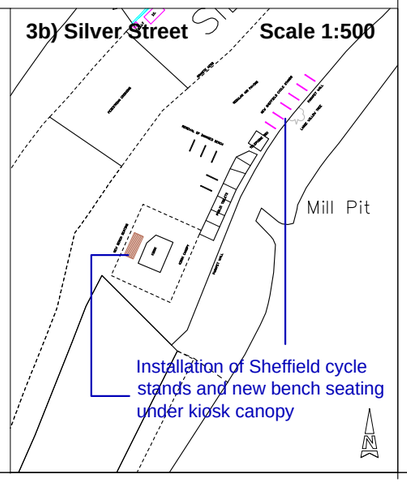
3) Works on Silver Street

Improvements to the cycle and pedestrian route as it exits and enters the Queens' Green path from Silver Street by the entrance to Queens' College are proposed (see plan 3 - opposite). The existing tarmac surfacing will be replaced with Yorkstone, continuing the footway across the entrance as a flush surface, thus giving a higher priority to pedestrians and cyclists on the path over the few vehicles using the entrance. Additional cycle parking near the bridge is also proposed.









Questionnaire:

Please give us your views by completing the following questionnaire.

1) Do you support the proposed improvements to West Road?

Yes ☐
No ☐

Comments……

……

2) Do you support the proposals for the West Road / Queen's Road junction?

Yes ☐
No ☐

Comments……

……

3) Do you support the proposals for an improved path on Queens' Green?

Yes ☐
No ☐

Comments……

……

4) Do you support the proposals for Silver Street?

Yes ☐
No ☐

Comments

……

……

Please return the questionnaire by 26th March to the FREEPOST address below:

Cambridge City Council
Planning Department
Freepost ANG 6390
Cambridge
CB2 3YA
Or submit your views online at www.cambridge.gov.uk/cycling

For further information contact:Clare Rankin on 01223 457108 or e-mail cycling@cambridge.gov.uk

A staffed exhibition will be held at the Central Library conference room (2nd Floor) on Wednesday 17th March from 3 - 7.30pm. Please come along to view the plans and ask any questions

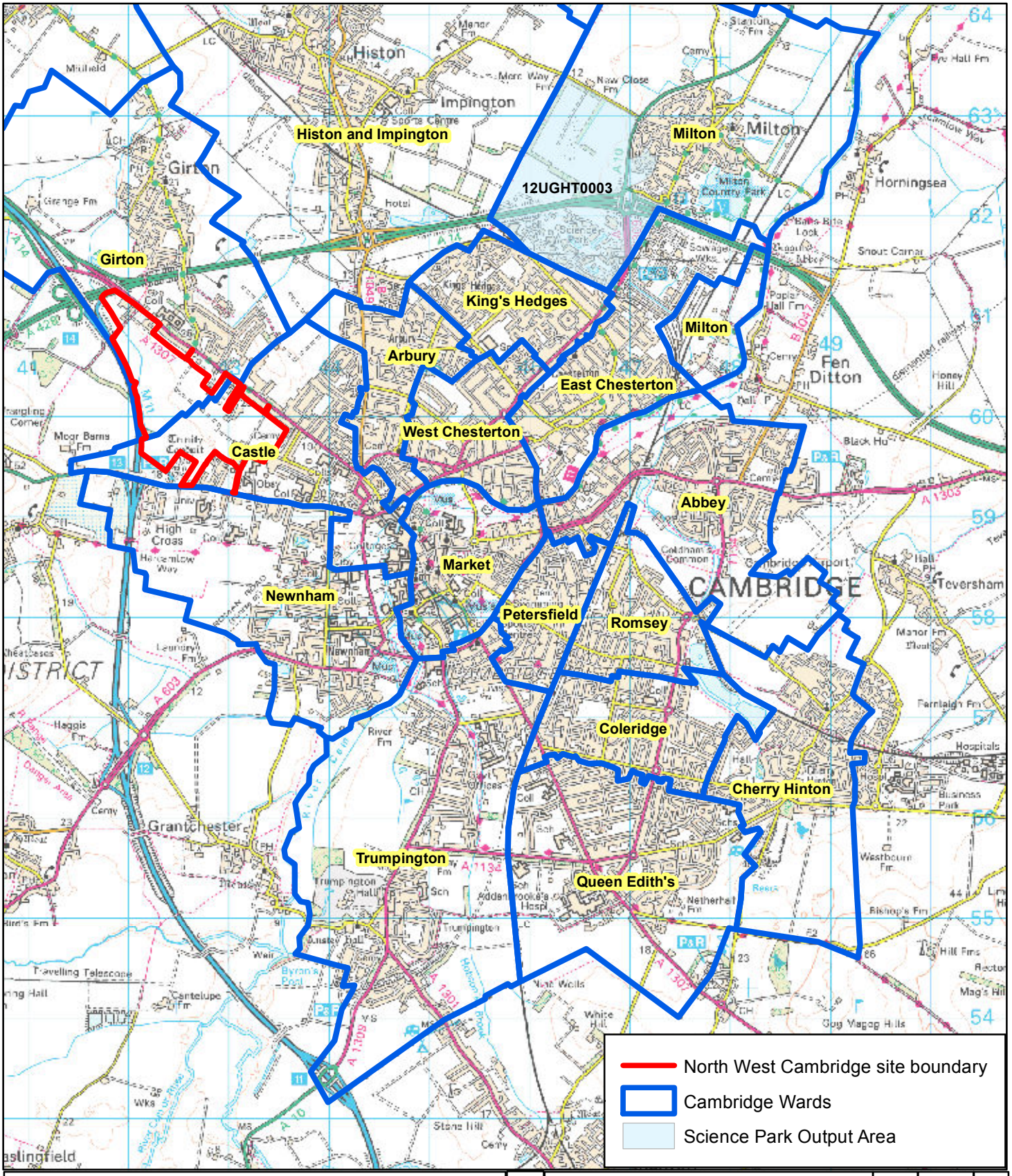
CAMBRIDGE CITY COUNCIL

ENVIRONMENT AND PLANNING DEPARTMENT
Environmental Projects
CAMBRIDGE CITY COUNCIL

Proposed West Cambridge to Silver Street Cycle Route

Appendix 4 - Ward Plan

North West Cambridge
Transport Assessment



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Mark	Revision	Drawn	Date	Chkd

Drawing Status: APPENDIX ITEM

Client: UNIVERSITY OF CAMBRIDGE

NORTH WEST CAMBRIDGE

WARD MAP

Date	30/6/2011
A4 Scale	NTS
Drawn	JP
Checked	KT

Drawing Number: APPENDIX 5

Revision:

PETER BRETT ASSOCIATES - CONSULTING ENGINEERS
11 PROSPECT COURT, COURTEENHALL ROAD, BLISWORTH NORTHAMPTON NN7 3DG
Tel: 01604 878300, Fax: 01604 878333, E-mail: northampton@pba.co.uk, Website: www.pba.co.uk, © Peter Brett Associates

Appendix 5 - Traffic Survey Data

North West Cambridge
Transport Assessment

SKY HIGH TRAFFIC SURVEYS

A SUBSIDIARY OF SKY HIGH PLC

Job Number	6875
Client:	Peter Brett Associates
Project:	Cambridge ATC Report
Location:	West of Grange Drive Jct.
Site No.	1
Road	Wk1 - A1307 Huntingdon Road
Day	7 Day Ave.
Direction	Westbound Eastbound

Vehicle Class Summary

M'Cycle & P'Cycle	1%
Cars	92%
LGV	6%
OGV1 & PSV	1%
OGV2	1%

	Westbound						Eastbound						Combined					
	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total
00:00	0	49	2	0	1	52	1	23	3	1	1	28	1	72	5	1	2	80
01:00	0	25	4	0	0	30	0	13	3	0	1	18	0	39	7	0	1	48
02:00	0	24	2	0	0	27	0	13	3	0	1	17	0	37	5	0	1	43
03:00	0	15	3	0	0	18	0	12	6	1	0	19	0	27	9	1	0	37
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05:00	1	24	4	1	0	30	2	47	6	2	1	58	3	71	10	3	1	88
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07:00	2	182	14	1	2	201	8	656	36	5	3	709	10	838	50	7	5	909
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23:00	2	102	5	0	0	109	0	52	4	0	0	58	2	155	9	0	0	167
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SKY HIGH TRAFFIC SURVEYS

A SUBSIDIARY OF SKY HIGH PLC

Job Number	6875
Client:	Peter Brett Associates
Project:	Cambridge ATC Report
Location:	West of Grange Drive Jct.
Site No.	1
Road	Wk2 - A1307 Huntingdon Road
Day	7 Day Ave.
Direction	Westbound Eastbound

Vehicle Class Summary

M'Cycle & P'Cycle	1%
Cars	91%
LGV	6%
OGV1 & PSV	2%
OGV2	1%

	Westbound						Eastbound						Combined					
	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total
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SKY HIGH TRAFFIC SURVEYS

A SUBSIDIARY OF SKY HIGH PLC

Job Number	6875
Client:	Peter Brett Associates
Project:	Cambridge ATC Report
Location:	West of Whitehouse Lane Jct.
Site No.	2
Road	Wk1 - A1307 Huntingdon Road
Day	7 Day Ave.
Direction	Westbound Eastbound

Vehicle Class Summary

M'Cycle & P'Cycle	5%
Cars	89%
LGV	5%
OGV1 & PSV	1%
OGV2	0%

	Westbound						Eastbound						Combined					
	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total
00:00	5	78	4	0	0	87	1	40	4	0	1	47	6	118	8	0	1	133
01:00	3	42	6	0	0	50	0	22	4	0	1	28	3	64	10	0	1	78
02:00	1	32	5	0	0	38	0	20	5	0	1	25	2	52	9	0	1	64
03:00	0	21	3	0	0	25	0	17	7	0	0	25	0	38	10	0	0	49
04:00	0	17	3	0	0	21	0	26	9	1	1	36	1	43	12	1	1	57
05:00	1	28	5	1	0	36	6	72	8	1	1	87	7	100	13	2	1	123
06:00	1	71	12	1	0	86	16	216	19	3	2	255	17	287	31	3	2	341
07:00	4	220	16	1	1	241	37	854	40	8	5	944	41	1074	56	9	6	1185
08:00	8	339	17	1	1	367	67	922	38	25	14	1066	76	1261	55	26	15	1432
09:00	8	320	31	3	1	363	66	761	47	10	5	889	74	1081	78	13	6	1253
10:00	11	320	40	3	2	375	36	537	36	1	2	613	47	857	76	4	3	988
11:00	17	383	34	3	2	439	23	515	39	4	1	581	40	898	73	7	3	1020
12:00	26	467	33	2	1	530	18	533	31	2	1	585	44	1000	64	4	3	1115
13:00	37	481	32	4	2	556	27	515	32	2	1	577	64	996	64	7	3	1133
14:00	31	524	30	2	2	589	18	460	29	3	1	511	49	984	59	5	3	1100
15:00	38	605	34	3	1	682	22	458	32	2	0	514	60	1063	66	5	2	1195
16:00	56	814	31	4	1	906	21	417	23	1	1	463	77	1231	54	5	2	1369
17:00	73	887	27	4	3	995	18	501	23	1	1	544	91	1388	51	6	4	1538
18:00	50	654	21	2	3	730	16	491	17	1	1	527	66	1146	38	3	4	1257
19:00	29	435	10	2	1	477	11	418	10	1	0	440	40	853	20	3	2	917
20:00	18	318	7	1	1	344	5	223	7	1	1	237	23	541	14	2	2	581
21:00	14	273	7	1	1	295	7	160	6	0	0	174	21	433	13	1	1	469
22:00	14	238	6	0	0	259	5	145	8	0	0	159	19	384	14	1	0	418
23:00	11	155	8	0	0	174	3	86	6	0	0	96	14	241	14	1	0	270
Total	458	7721	421	40	24	8665	423	8410	478	69	40	9420	882	16131	899	109	64	18085

SKY HIGH TRAFFIC SURVEYS

A SUBSIDIARY OF SKY HIGH PLC

Job Number	6875
Client:	Peter Brett Associates
Project:	Cambridge ATC Report
Location:	West of Whitehouse Lane Jct.
Site No.	2
Road	Wk2 - A1307 Huntingdon Road
Day	7 Day Ave.
Direction	Westbound Eastbound

Vehicle Class Summary

M'Cycle & P'Cycle	5%
Cars	90%
LGV	5%
OGV1 & PSV	0%
OGV2	0%

	Westbound						Eastbound						Combined					
	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total
00:00	5	76	3	0	1	85	1	37	3	0	0	42	6	113	7	0	1	126
01:00	3	42	5	0	0	50	0	23	2	0	0	26	3	65	8	0	0	76
02:00	1	31	4	0	0	36	0	17	4	0	1	21	1	48	7	0	1	57
03:00	0	20	3	0	0	23	0	14	8	0	0	23	1	34	11	0	0	46
04:00	0	16	4	0	0	20	0	23	6	0	1	30	1	39	10	0	1	50
05:00	1	24	6	0	1	32	6	75	11	1	0	92	7	99	16	1	1	124
06:00	1	67	14	0	1	83	15	216	19	2	1	254	17	283	33	2	2	337
07:00	5	216	17	1	1	240	30	841	40	7	4	921	35	1056	57	8	6	1161
08:00	7	326	20	1	0	356	63	913	40	20	10	1046	71	1239	60	21	10	1402
09:00	8	324	26	1	2	361	67	774	46	7	3	896	74	1098	72	8	5	1257
10:00	10	312	35	2	2	360	33	575	37	2	1	648	43	886	72	3	3	1008
11:00	17	385	33	2	2	439	24	512	36	2	1	575	42	898	69	4	3	1015
12:00	29	472	34	3	1	540	17	508	32	3	1	562	46	980	67	6	3	1102
13:00	35	484	28	3	1	552	19	483	32	3	1	538	55	967	60	6	3	1090
14:00	25	530	29	2	2	587	12	443	31	2	1	489	37	973	60	4	4	1076
15:00	34	585	33	2	1	656	18	432	32	1	1	483	52	1016	65	3	2	1139
16:00	53	805	30	3	2	894	17	426	26	2	1	471	70	1232	56	5	3	1365
17:00	71	876	28	4	1	980	17	494	19	0	1	532	89	1370	47	4	2	1512
18:00	51	633	19	3	1	707	16	457	13	2	1	489	66	1091	32	5	2	1196
19:00	25	427	8	2	2	464	14	386	9	1	0	410	40	813	17	3	2	874
20:00	18	323	7	0	1	348	5	224	6	0	1	236	23	546	13	0	1	584
21:00	15	275	7	1	0	297	6	147	5	0	0	159	21	422	12	1	0	456
22:00	14	245	8	0	0	267	7	120	7	0	0	134	21	365	14	1	0	402
23:00	11	157	6	1	0	175	5	82	7	0	0	93	16	239	12	1	0	268
Total	441	7651	405	32	23	8552	394	8221	471	54	32	9171	835	15872	876	86	54	17723

SKY HIGH TRAFFIC SURVEYS

A SUBSIDIARY OF SKY HIGH PLC

Job Number	6875
Client:	Peter Brett Associates
Project:	Cambridge ATC Report
Location:	80m West of Park & Ride Access
Site No.	3
Road	Wk1 - A1303 Madingley Road
Day	7 Day Ave.
Direction	Westbound Eastbound

Vehicle Class Summary

M'Cycle & P'Cycle	1%
Cars	94%
LGV	4%
OGV1 & PSV	0%
OGV2	0%

	Westbound						Eastbound						Combined					
	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total
00:00	1	49	2	0	0	52	1	43	4	1	1	50	2	93	5	1	1	102
01:00	1	24	1	0	0	26	0	24	4	1	1	30	1	48	5	1	1	56
02:00	1	19	2	0	0	22	0	13	4	1	1	19	1	32	6	1	1	42
03:00	0	20	2	0	0	22	0	12	4	0	2	17	1	31	5	0	2	39
04:00	0	16	1	0	0	17	1	20	3	0	1	25	1	36	4	0	1	42
05:00	0	31	2	0	0	33	2	48	7	1	1	58	2	79	8	1	1	92
06:00	0	72	8	0	1	81	8	173	15	1	2	199	8	245	23	1	2	279
07:00	2	224	12	1	1	239	17	821	38	7	3	885	18	1045	50	7	4	1124
08:00	4	322	16	2	1	345	21	1019	29	13	4	1087	25	1342	45	15	5	1432
09:00	2	286	23	2	1	315	15	862	35	6	2	920	17	1148	58	8	3	1234
10:00	3	276	28	2	2	312	10	549	31	3	1	594	13	825	60	5	3	906
11:00	3	348	31	3	2	386	4	475	32	2	1	514	8	823	62	5	3	900
12:00	4	444	28	2	2	480	8	468	27	2	1	506	12	912	56	4	3	986
13:00	5	444	27	2	2	479	6	439	23	4	1	473	11	883	50	6	3	952
14:00	6	530	26	2	1	567	7	394	23	3	1	428	13	924	49	6	2	995
15:00	8	625	26	2	2	662	5	378	21	2	1	408	13	1003	46	4	3	1069
16:00	16	939	34	2	3	993	7	362	18	2	1	390	23	1301	52	4	3	1383
17:00	13	1039	20	3	2	1077	8	431	12	3	0	454	21	1470	32	6	2	1531
18:00	9	706	16	1	1	734	8	408	8	1	1	425	17	1114	24	2	1	1159
19:00	4	350	10	0	1	365	5	348	10	0	0	362	8	698	20	0	1	727
20:00	5	233	5	1	0	243	4	206	8	0	1	220	9	439	13	1	1	463
21:00	5	193	5	0	0	205	1	156	7	0	0	164	6	349	13	1	0	369
22:00	1	188	5	1	0	196	1	135	5	0	0	142	2	324	10	1	1	337
23:00	2	105	4	0	0	112	1	93	3	0	0	98	3	198	7	0	1	209
Total	94	7483	336	26	22	7960	139	7879	368	54	26	8467	234	15362	703	80	48	16427

SKY HIGH TRAFFIC SURVEYS

A SUBSIDIARY OF SKY HIGH PLC

Job Number	6875
Client:	Peter Brett Associates
Project:	Cambridge ATC Report
Location:	80m West of Park & Ride Access
Site No.	3
Road	Wk2 - A1303 Madingley Road
Day	7 Day Ave.
Direction	Westbound Eastbound

Vehicle Class Summary

M'Cycle & P'Cycle	1%
Cars	94%
LGV	4%
OGV1 & PSV	0%
OGV2	0%

	Westbound						Eastbound						Combined					
	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total
00:00	1	43	2	0	0	46	0	33	3	0	1	37	1	76	5	0	1	83
01:00	1	24	1	0	0	27	0	14	1	0	1	16	1	38	3	0	1	43
02:00	1	19	2	0	0	21	0	8	2	0	1	11	1	27	4	0	1	33
03:00	0	15	1	0	0	17	0	9	4	0	1	14	0	25	5	0	1	31
04:00	0	16	1	0	0	17	2	16	1	0	0	19	2	32	2	0	0	36
05:00	0	27	4	0	0	32	2	37	6	1	1	47	2	64	10	1	1	78
06:00	0	70	7	0	0	78	6	173	16	1	1	197	6	243	23	1	1	275
07:00	2	209	14	1	1	227	16	808	29	5	3	862	18	1017	44	6	4	1089
08:00	3	315	16	3	1	338	20	1017	31	11	4	1083	24	1333	47	13	5	1421
09:00	3	277	25	2	2	308	15	886	34	6	3	943	18	1163	58	8	4	1251
10:00	2	284	31	2	1	320	11	532	34	4	2	583	13	816	65	6	3	903
11:00	4	344	31	1	1	381	6	474	28	1	1	511	10	818	58	2	3	892
12:00	5	461	26	1	1	494	6	432	26	2	1	467	11	893	52	3	2	961
13:00	5	462	25	1	2	496	5	424	23	1	2	456	11	886	47	3	4	952
14:00	7	509	27	2	1	546	6	378	25	1	2	412	13	887	52	3	3	958
15:00	6	621	28	2	2	659	5	373	19	0	1	399	11	994	47	2	3	1058
16:00	12	930	26	3	3	974	7	376	15	0	0	398	19	1307	41	3	3	1373
17:00	12	1014	20	3	2	1050	8	410	12	2	1	433	20	1424	31	5	2	1483
18:00	9	701	13	1	1	725	4	374	8	0	0	387	13	1075	21	1	1	1112
19:00	5	328	10	0	1	343	4	310	9	1	0	325	9	638	19	1	1	668
20:00	3	218	5	0	0	227	4	189	6	1	1	200	6	408	11	1	1	427
21:00	4	188	4	0	0	197	1	125	5	0	1	133	6	313	9	0	1	329
22:00	2	173	6	0	0	181	0	102	4	0	1	107	2	275	10	1	1	288
23:00	1	98	2	0	0	102	2	65	4	0	0	71	3	163	6	0	0	173
Total	89	7347	328	23	18	7806	132	7569	344	39	28	8111	221	14916	672	63	46	15917

SKY HIGH TRAFFIC SURVEYS

A SUBSIDIARY OF SKY HIGH PLC

Job Number	6875
Client:	Peter Brett Associates
Project:	Cambridge ATC Report
Location:	West of Clerk Maxwell Road Jct.
Site No.	4
Road	Wk1 - A1303 Madingley Road
Day	7 Day Ave.
Direction	Westbound Eastbound

Vehicle Class Summary

M'Cycle & P'Cycle	2%
Cars	91%
LGV	6%
OGV1 & PSV	0%
OGV2	0%

	Westbound						Eastbound						Combined					
	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total
00:00	1	50	2	0	0	53	1	46	4	1	1	53	2	97	6	1	1	106
01:00	1	25	1	0	0	28	0	26	4	1	1	33	1	51	6	1	1	60
02:00	1	20	3	0	0	24	0	15	5	1	1	22	1	35	8	1	1	47
03:00	0	21	2	0	0	23	0	11	4	0	2	18	1	32	6	0	2	41
04:00	0	21	2	0	0	23	1	20	3	0	1	25	1	41	6	0	1	49
05:00	0	36	2	0	0	39	2	48	8	1	1	59	2	84	10	1	1	98
06:00	1	86	11	1	0	99	8	144	16	2	2	171	9	230	27	2	2	270
07:00	4	309	22	3	1	337	16	597	46	3	4	665	19	906	68	5	4	1002
08:00	13	426	25	2	1	466	17	689	41	6	3	755	29	1115	65	8	3	1221
09:00	13	396	34	3	1	447	14	643	47	4	1	709	27	1039	80	7	2	1155
10:00	8	333	41	2	1	386	13	440	46	3	1	504	22	773	88	5	3	890
11:00	7	355	41	3	1	407	12	413	48	4	1	477	19	767	89	7	2	884
12:00	6	426	35	2	2	471	20	466	39	3	1	530	26	892	75	5	3	1000
13:00	11	433	34	1	2	481	12	421	37	3	1	475	23	854	71	5	3	956
14:00	10	464	36	3	1	514	11	407	38	4	1	461	21	871	75	7	2	975
15:00	9	523	34	2	2	569	12	428	36	3	1	480	21	950	70	4	3	1049
16:00	16	736	35	1	2	791	22	469	26	2	1	520	38	1205	62	3	3	1311
17:00	14	759	26	3	1	803	26	571	20	3	1	620	40	1329	47	5	2	1423
18:00	10	540	23	1	1	575	18	511	19	2	0	550	28	1052	42	3	1	1125
19:00	3	323	13	0	1	341	15	410	16	0	0	442	18	733	30	0	2	782
20:00	6	226	6	0	1	239	9	245	12	1	0	266	15	471	17	1	1	505
21:00	6	199	5	0	0	211	3	169	8	0	0	180	9	368	13	1	1	390
22:00	2	197	6	1	1	205	2	147	6	0	0	155	3	344	12	1	1	361
23:00	2	111	4	0	0	118	2	97	4	0	0	103	4	208	8	0	1	221
Total	145	7016	444	27	19	7651	234	7434	533	47	25	8272	379	14450	977	74	44	15923

SKY HIGH TRAFFIC SURVEYS

A SUBSIDIARY OF SKY HIGH PLC

Job Number	6875
Client:	Peter Brett Associates
Project:	Cambridge ATC Report
Location:	West of Clerk Maxwell Road Jct.
Site No.	4
Road	Wk2 - A1303 Madingley Road
Day	7 Day Ave.
Direction	Westbound Eastbound

Vehicle Class Summary

M'Cycle & P'Cycle	2%
Cars	91%
LGV	6%
OGV1 & PSV	0%
OGV2	0%

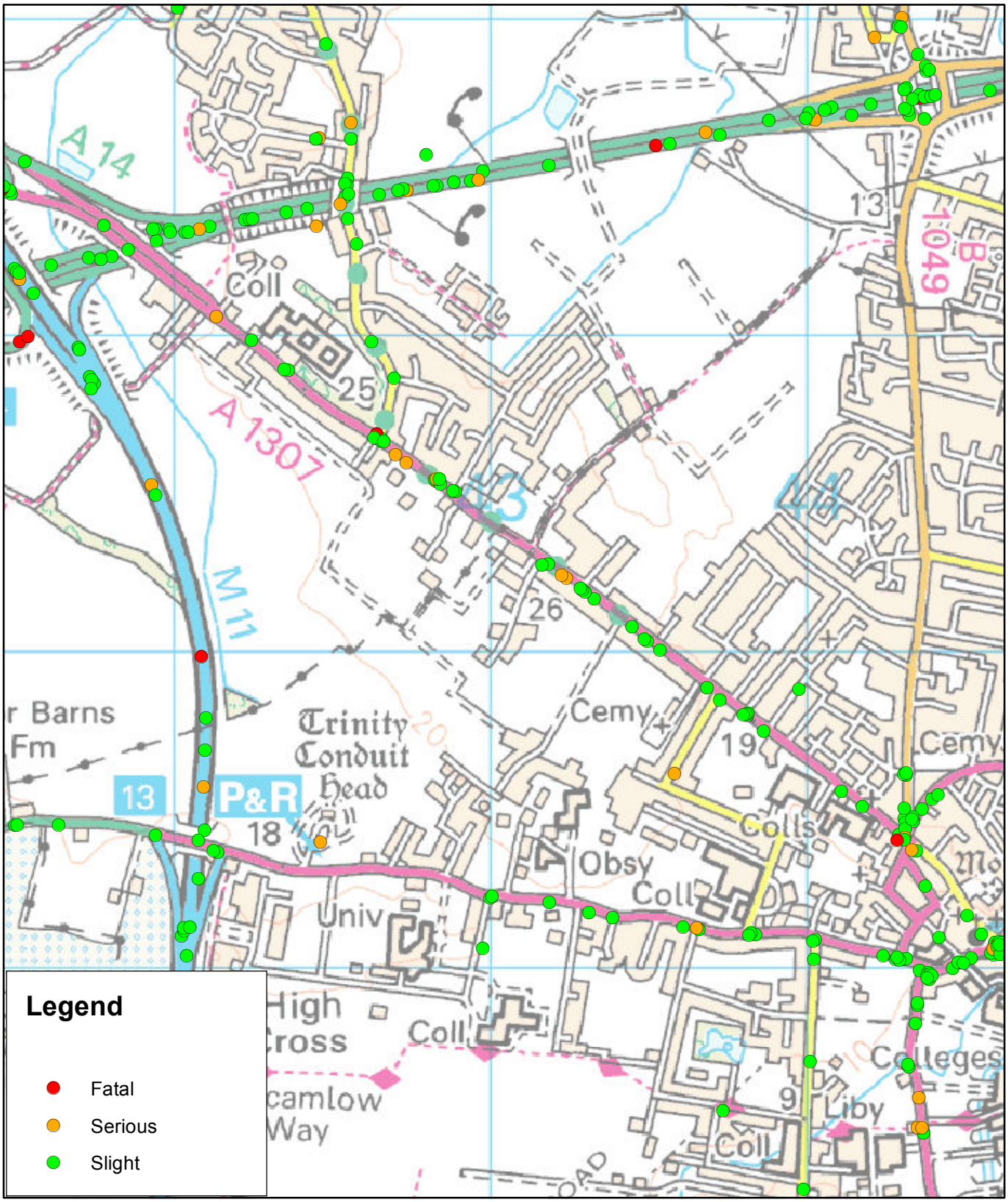
	Westbound						Eastbound						Combined					
	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total	M'Cycle & P'Cycle	Cars	LGV & PSV (2Axle Rigid)	OGV1 & PSV (3/4Axle Rigid)	OGV2 (3+Axle Artic)	Total
00:00	1	45	3	0	0	49	1	38	3	0	2	43	2	83	6	0	2	92
01:00	2	25	1	0	0	28	0	15	2	0	1	19	2	40	3	0	1	47
02:00	1	20	2	0	0	23	0	10	3	0	1	14	1	30	5	0	1	36
03:00	0	15	1	0	0	16	0	10	3	0	1	14	0	25	4	0	1	31
04:00	0	21	3	0	0	23	1	17	2	0	0	19	1	37	4	0	0	43
05:00	1	32	4	0	0	37	2	35	6	1	1	45	3	67	10	1	1	82
06:00	1	88	10	1	0	100	6	142	18	2	1	168	7	230	28	2	1	268
07:00	5	290	21	2	1	320	14	588	41	2	2	647	19	878	62	4	3	967
08:00	10	426	23	3	1	463	15	695	42	4	3	760	26	1121	65	7	5	1223
09:00	18	404	41	2	1	466	15	662	48	3	2	731	33	1066	89	6	3	1197
10:00	10	340	42	3	1	395	15	431	49	3	1	498	25	770	91	6	2	893
11:00	7	362	42	1	2	415	14	414	46	2	0	476	21	776	88	2	3	890
12:00	7	427	35	1	1	471	17	445	38	3	1	504	24	872	73	4	2	975
13:00	12	446	34	1	2	496	15	404	31	2	2	454	27	850	65	3	4	950
14:00	10	460	34	2	1	507	12	395	36	1	1	445	22	855	70	3	2	952
15:00	8	518	32	1	1	561	14	432	32	0	1	479	22	950	64	2	2	1040
16:00	14	735	31	2	1	783	23	479	26	1	2	531	37	1214	57	3	3	1314
17:00	13	748	25	4	0	790	25	538	22	1	1	587	37	1286	47	5	1	1377
18:00	9	524	20	1	0	554	16	487	20	1	0	525	25	1011	39	2	0	1078
19:00	4	312	13	0	0	330	14	376	15	1	0	406	19	688	28	1	0	736
20:00	3	213	7	0	0	223	8	227	9	1	1	246	11	439	16	1	1	469
21:00	5	191	4	1	0	201	3	147	6	0	1	157	8	338	10	1	1	359
22:00	2	184	6	0	0	192	2	115	5	0	1	123	4	299	11	0	1	315
23:00	2	104	3	0	0	109	3	76	4	0	0	83	5	180	7	0	0	192
Total	147	6929	438	26	14	7553	236	7176	505	30	26	7972	382	14105	943	55	40	15526

Count_Program	Count_Type	Road_No	Road_Name	Day	Date	All_Vehicl	HGV_Flow	Bus_Coac	HGV+PSV	Pedal Cycles	Grid Ref		Remarks
CAM RADIAL 2009	12HR DIR	B1049	HISTON ROAD	MONDAY	05/10/2009	20954	448	205	653	1061	544359	261566	VERY COLD/DULL/OVERCAST
CAM RADIAL 2009	12HR DIR	A1307	HUNTINGDON ROAD	MONDAY	05/10/2009	9710	204	253	457	38	542206	261014	VERY COLD/DULL/OVERCAST
CAM RADIAL 2009	12HR DIR	A1303	MADINGLEY ROAD	WEDNESI	23/09/2009	15115	166	239	405	228	542233	259341	CLOUDY/SUNNY
CAM RADIAL 2009	12HR DIR	C198	GIRTON ROAD	MONDAY	05/10/2009	4765	40	79	119	818	542554	261331	VERY COLD/DULL/OVERCAST

Count_Program	Count_Type	Road_No	Road_Name	Day	Date	All_Veh_Flow	HGV_Flow	PSV_Flow	HGV+PSV	Grid_1	Grid_2
CAM RADIAL 2006	12HR DIR	A1307	HUNTINGDON ROAD	MONDAY	09/10/2005	10358	172	268	440	542196.2	261019.8
DOT LINK 2006	12HR DIR	M11	NR MERGEPOINT WITH A14	TUESDAY	31/03/2006	32112	6204	119	6323	541494.8	261218.4
DOT LINK 2006	12HR DIR	A1307	HUNTINGDON ROAD	TUESDAY	26/09/2006	13968	394	378	772	544071	259585
CAM RADIAL 2006	12HR DIR	A1303	MADINGLEY ROAD	WEDNESDAY	27/09/2006	13325	291	230	521	542211.7	259343.7
CAM RADIAL 2006	12HR DIR	C198	GIRTON ROAD	MONDAY	09/10/2006	4619	65	76	141	542557.6	261334.3
CAM RADIAL 2006	12HR DIR	B1049	HISTON ROAD	MONDAY	27/11/2006	20379	516	290	806	544351.9	261542.2
CAM S/L 2007	12HR DIR	C290	BRIDGE STREET	MONDAY	19/03/2007	2538	82	781	863	544728.9	258940.5
DOT LINK 2007	12HR DIR	A14	GIRTON - HISTON	MONDAY	18/06/2007	52782	8231	244	8475	543188.7	261548.4
DOT LINK 2007	12HR DIR	A428 - A14	BETWEEN M11 & A14	MONDAY	25/06/2007	18251	1781	71	1852	541785.3	261276.6
DOT LINK 2007	12HR DIR	A1303	MADINGLEY ROAD	MONDAY	24/09/2007	12062	293	477	770	543212.7	259201.1
CAM RADIAL 2007	12HR DIR	A1303	MADINGLEY ROAD	WEDNESDAY	26/09/2007	14686	267	303	570	542211.7	259343.7
CAM RADIAL 2007	12HR DIR	B1049	HISTON ROAD	MONDAY	08/10/2007	21678	506	298	804	544351.9	261542.2
CAM RADIAL 2007	12HR DIR	A1307	HUNTINGDON ROAD	MONDAY	08/10/2007	9636	289	263	552	542196.2	261019.8
CAM RADIAL 2007	12HR DIR	C198	GIRTON ROAD	MONDAY	08/10/2007	4485	52	81	133	542557.6	261334.3
DOT LINK 2007	12HR DIR	A1134	LADY MARGARET RD	MONDAY	29/10/2007	8971	257	14	271	544331.9	259101
CAM S/L 2008	12HR DIR	C290	BRIDGE STREET	MONDAY	17/03/2008	2381	60	725	785	544728.9	258940.5
CAM RADIAL 2008	12HR DIR	A1303	MADINGLEY ROAD	WEDNESDAY	24/09/2008	14686	217	266	483	542211.7	259343.7
CAM RADIAL 2008	12HR DIR	B1049	HISTON ROAD	MONDAY	06/10/2008	21587	335	309	644	544351.9	261542.2
CAM RADIAL 2008	12HR DIR	A1307	HUNTINGDON ROAD	MONDAY	06/10/2008	9702	227	271	498	542196.2	261019.8
CAM RADIAL 2008	12HR DIR	C198	GIRTON ROAD	MONDAY	06/10/2008	4426	31	85	116	542557.6	261334.3
CAM S/L 2009	12HR DIR	C290	BRIDGE STREET	MONDAY	16/03/2009	2393	33	723	756	544728.9	258940.5

Appendix 6 - Road Safety Assessment

North West Cambridge
Transport Assessment



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Mark	Revision	Drawn	Date	Chkd

Drawing Status: APPENDIX ITEM

Client: UNIVERSITY OF CAMBRIDGE

NORTH WEST CAMBRIDGE

PERSONAL INJURY COLLISION PLOT

Date	30/6/2011
A4 Scale	NTS
Drawn	JP
Checked	KT

Drawing Number: APPENDIX 7

Revision:

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Summary of Observed Personal Injury Accidents on links

NORTH WEST CAMBRIDGE -
Accident Calculations for links
within 1 km of site boundary

Observed Data										Anticipated (National) Data										
		2009 two way flows																	No of Accidents	
Ref	Link	Total Observed Accidents	12 Hr W'day 2 way flow	12 Hr W'day to 24 Hr 7-day	2009 - 2007 reduction factor	2009 Approx AADT 2 way flow	2007 Approx AADT 2 way flow	Link Length (Km)	Rate (PIA/MV-km)	Link Type	Speed Limit		Base Link only Accident Rate	Link only Accident Rate ß	Adjusted Link only Accident Rate	Base Link & Junction Accident Rate	Link & Junction Accident Rate ß	Adjusted Link & Junction Accident Rate	Link only Accident Rate	Link & Junction Accident Rate
	Note		1	2	3	4							5							
1	Huntingdon Road - A14 Bridge to Girton Road Junction	5			0.99	11433	11346	0.43	0.249	8	60	Older S2 Roads	0.226	0.973	0.187	0.381	0.973	0.315	2	3
								0.54			40		0.297	0.984	0.265	0.844	0.984	0.754	3	8
2	Huntingdon Road - Girton Road Junction to Storeys Way Junction	23			0.99	17632	17498	1.34	0.538	9	40	Older S2 Roads	0.297	0.983	0.263	0.844	0.983	0.749	11	32
3	Girton Road	10	4765	1.24	0.94	5718	5382	0.81	1.257	9	40	Older S2 Roads	0.297	0.983	0.263	0.844	0.983	0.749	2	6
4	Madinley Road - M11 Southbound On-slip to JJ Thompson Road Junction	2			0.97	15899	15407	0.70	0.102	8	40	Older S2 A Roads	0.297	0.984	0.265	0.844	0.984	0.754	5	15
5	Madinley Road - JJ Thompson Road Junction to Storeys Way Junction	8			0.97	15433	14955	0.96	0.305	9	40	Older A S2 Roads	0.297	0.983	0.263	0.844	0.983	0.749	7	20

1 From Traffic Monitoring Report 2009 (CCC) Table 3
2 Factor from Huntingdon Road data 2007 - 2005
3 Factor found by using flows from the Traffic Monitoring Report 2009 (CCC) Table 3, and dividing the 2009 New Site flows by 2007 New Site flows.
4 From Sky High Traffic Surveys
5 Assuming 2000 Base, 2007 Average Year of Accident Data = 7

Junction Accident Calculation
NORTH WEST CAMBRIDGE - JUNCTIONS WITHIN 1 KM of SITE BOUNDARY

											1997 BASE			2005	
Ref	Junction	Total Observed Accidents	Junction Type	Coba Junction type	Coeff 'a'	Power 'b'	Formula Type	Major Peak Inflow AADT	Minor Peak Inflow AADT	(f)	(A) Predicted accidents per year	Total Anticipated accidents in 5 years	β	(A) Predicted accidents per year	Total Anticipated accidents in 5 years
1	Huntingdon Road and Girton Road Junction	5	Priority with Single Lane Dualling	26	0.195	0.460	C	14422	2691	38.81	1.049	5	Major BU 0.991		5
2	Madinley Road and JJ Thompson Road Junction	0	Priority with Single Lane Dualling	26	0.195	0.460	C	15181	1494	22.68	0.820	4	Major BU 0.991		4

Appendix 7 - Review of current policy, guidance and emerging strategies and how these relate to North West Cambridge

A7.1 Introduction

A7.1.1 This chapter lists the existing National, Regional and Local policy, guidance and emerging strategies relevant to the North West Cambridge Development.

A7.2 National Policy

Planning Policy Statements and Guidance

A7.2.1 PPS1 Delivering Sustainable Development – February 2005 – "… sets out the overarching planning policies on the delivery of sustainable development through the planning system". It emphasises the importance of planning in creating sustainable communities, and states that planning authorities should, in preparing development plans, seek to, inter alia:

- provide improved access to all jobs, health, education, shops, leisure and community facilities, open space, sport and recreation, by ensuring that new development is located where everyone can access services or facilities on foot, bicycle or public transport rather than having to rely on access by car;
- reduce the need to travel and encourage accessible public transport provision to secure more sustainable patterns of transport development;
- promote the more efficient use of land through higher density, mixed-use development.

A7.2.2 The Supplement to PPS1 'Planning and Climate Change' outlines the role planning plays in reducing emissions and stabilising climate in its decision making processes. More specifically the document outlines key objectives and principles to be taken into account by planning bodies in the development of regional and area-based spatial strategies, and by local authorities in the preparation of local development documents. This includes selecting land for development where there is or is the potential for 'a realistic choice of access by means other than the private car and for opportunities to service the site through sustainable transport'.

A7.2.3 PPS3 - Planning Policy Statement 3, Housing, was reissued in June 2011, to provide a national policy framework for planning and housing. This document emphasises the Government's strategic objective of creating sustainable, inclusive, mixed communities in all areas.

A7.2.4 According to PPS3, in order to fulfil the Government's strategic objectives, new developments should attempt to fulfil the following planning criteria:

- be easily accessible and well connected to public transport, community facilities, key services and infrastructure;
- be well-integrated with existing buildings and the local area;
- take a design-led approach to the provision of car parking space.

A7.2.5 Planning Policy Guidance 13: Transport - 2001 - sets out the overall strategy for a sustainable transport system, with the objectives of integrating planning and transport at the national, regional, strategic and local level to:

- ‘promote more sustainable transport choices for people and for moving freight;
- promote accessibility to jobs, shopping, leisure facilities and services by public transport, walking and cycling, and;
- reduce the need to travel, especially by car’.

A7.2.6 PPG13 also states that a key planning objective is to ensure that jobs, shopping, leisure facilities and services are accessible by public transport, walking and cycling. It also encourages giving greater priority to walking by reducing the actual walking distance between the land-uses, and to public transport. This is to be achieved by locating development within the urban boundary, close to existing transport facilities.

A7.2.7 Paragraph 49 states that in developing and implementing policies on parking, local authorities should, inter alia:

- ensure that, as part of a package of planning and transport measures, levels of parking provided in association with development will promote sustainable transport choices;
- encourage the shared use of parking;
- require developers to provide designated parking spaces for disabled people in accordance with current good practice;
- require convenient safe and secure cycle parking in development at least at levels consistent with the cycle strategy in the local transport plan.

Emerging National Planning Policy

A7.2.8 The Government has published the draft National Planning Policy Framework (“the Draft NPPF”) for consultation in July 2011. Upon adoption, the NPPF will replace the current suite of national Planning Policy Statements, Planning Policy Guidance notes and some Circulars with a single, streamlined document.

A7.2.9 While the NPPF is to be read as a whole in the context of Transport considerations, the Draft NPPF states:

“at paragraph 84 that the objectives of transport policy are to:

- facilitate economic growth by taking a positive approach to planning for development; and
- support reductions in greenhouse gas emissions and congestion, and promote accessibility through planning for the location and mix of development.”

A7.2.10 Paragraph 89 of the Draft NPPF notes that; “Planning strategies should protect and exploit opportunities for the use of sustainable transport modes for the movement of goods or people. Therefore, developments should be located and designed where practical to:

- accommodate the efficient delivery of goods and supplies;

- give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;
- create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians;
- incorporate facilities for charging plug-in and other ultra-low emission vehicles; and
- consider the needs of disabled people by all modes of transport.

A7.2.11 Paragraph 90 of the Draft NPPF recognises that a key tool to facilitate this will be a Travel Plan and that all developments which generate significant amounts of movement, as determined by local criteria, should be required to provide a Travel Plan.

Paragraphs 91 and 92 of the Draft NPPF note that planning policies should aim for a balance of land uses within their area so that people can be encouraged to minimise journey lengths for employment, shopping, leisure, education and other activities and that for larger scale residential developments in particular, planning policies should promote a mix of uses in order to provide opportunities to undertake day-to-day activities including work on site. Where practical, particularly within large-scale developments, key facilities such as primary schools and local shops should be located within walking distance of most properties.

Guidance on Transport Assessment (DfT, 2007)

A7.2.12 'Guidance on Transport Assessment' was issued by the Department for Transport and Communities and Local Government in March 2007. This superseded the 'Guidelines for Traffic Impact Assessment' produced by the Institution of Highways and Transportation (IHT), 1994.

A7.2.13 Paragraph 4.3 of the Guidance on Transport Assessment notes that a Transport Assessment should address the following key issues:

- reducing the need to travel, especially by car;
- sustainable accessibility;
- dealing with residual trips (the remaining vehicular trips left over after the promotion of more sustainable modes of travel), and;
- mitigation measures.

A7.2.14 Where a proposed development has adverse affects on the highway network, paragraph 4.90 identifies that '…transport mitigation should focus on maximising sustainable accessibility to the development. At the outset, the mitigation plan should consider measures such as improvements to development site layout to facilitate walking and cycling as well as accessibility to the local public transport infrastructure, improvements to walking and cycling provisions in the vicinity of the development site, and improvements to the local public transport network'.

Highways Agency (HA) Circular 02/2007 : Planning and the Strategic Road Network

A7.2.15 Relevant guidance is also set out in Circular 02/2007 'Planning and the Strategic Road Network' published in March 2007, which outlines the role of the Highways Agency in developing regional planning policy, dealing with individual planning applications, and their impact on the strategic road network.

A7.2.16 This document also reflects these key elements of Government policy, stating in paragraph 8 that: "It is Government Transport Policy, wherever possible, to look for alternatives to building new roads …".

A7.2.17 Paragraph 8 also states that: "Any strategic road capacity constraint on sustainable economic development should be identified at the RSS stage. Where appropriate, measures to overcome such constraints should be promoted through the Regional Transport Strategy (RTS) although the presumption should be to give preference, where possible, to solutions other than the provision of new road capacity".

A7.2.18 This policy focus is further emphasised in Paragraphs 27 and 29:

"In general terms, Government policy is no longer to attempt to cater for unrestrained road traffic growth. In working with developers, the Agency will expect to see proposals that include ways to reduce the traffic impact of the development. Developers can no longer expect that all the traffic they might produce will be allowed without restraint. This would lead to ever-increasing congestion, which poses a threat to economic growth and the environment. While the Agency will work with the relevant stakeholders and developers in order to promote development, it will need to take into account the impact that such growth will have on the ability of the strategic road network to function effectively".

It goes on to state that "In many locations there are constraints on what the environment and society can tolerate in terms of the infrastructure requirements to cater for traffic growth, as well as the environmental impact of the traffic. This applies to the traffic generated by developments as well as general traffic growth".

A7.2.19 The key emphasis of this document reflects national guidance, stressing the obligation placed on every developer to 'manage down' traffic generation from the new development, and to provide evidence that proposals for measures to reduce traffic generation from the site have been considered. The document comments that 'preference should be given wherever possible to solutions other than the construction of new roads'.

A7.3 Regional Policy and Guidance

The East of England Plan (March 2010)

A7.3.1 The East of England Plan: The recently published Localism Bill provides for the abolition of Regional Spatial Strategies and is expected to be enacted in November 2011; although the abolition of individual Regional Spatial Strategies is not expected to take effect until the consequence of abolition has been the subject of Strategic Environmental Assessment. Until the East of England Plan is formally abolished it remains, therefore, part of the statutory Development Plan. The current state of play is that decisions must be in accordance with the statutory Development Plan unless material considerations require otherwise. In the meantime, LPAs are entitled to take account of the Government's intention to abolish Regional Strategies as a material consideration but the weight to be given will for the time being be limited.

The Revision to the Regional Spatial Strategy for the East of England was originally published by the Secretary of State for Communities and Local Government in May 2008, with a subsequent draft revision published in March 2010. To meet housing demand, the subsequent Regional Spatial Strategy for the East of England made provision for 57,400 new homes to be built in Cambridgeshire between 1999 and 2016, with 47,500 in the Cambridge Sub-Region (see Section 4). The East of England Plan supports the development of the Proposed Development, by virtue of Policies CSR1-CRS3 of this plan. In addition the housing growth targets identified in the East of England Plan were based upon delivery rates from the earlier Structure Plan, prepared by the County Council with involvement from the District Councils. Together with relevant sections of the Milton Keynes South Midlands Sub-Regional Strategy 2005, the RSS had constituted the Regional Spatial Strategy (RSS) for the East of England. The original RSS covered the period until 2021, the draft revision covered the period to 2031, and set a vision, objectives and core strategy for the longer term.

A7.3.2 The overall objectives of the East of England Plan included, inter alia, the following:

To reduce the region's impact on, and exposure to, the effects of climate change by:

- locating development so as to reduce the need to travel;
- effecting a major shift in travel away from car use towards public transport, walking and cycling.

To realise the economic potential of the region and its people by:

- providing for job growth broadly matching increases in housing provision and improving the alignment between the locations of work places and homes;
- ensuring adequate and sustainable transport infrastructure.

A7.3.3 In terms of the overall spatial strategy, this sought to ensure that development "maximises the potential for people to form more sustainable relationships between their homes, workplaces, and other concentrations of regularly used services and facilities, and their means of travel between them…" (Policy SS1).

A7.3.4 The Regional Transport Strategy gave a clear priority to increase passenger and freight movement by more sustainable modes (Policy T1), to bring about a significant change in travel behaviour (Policy T2), and to pursue traffic management measures for highway use (Policy T3). It highlights the national importance of providing a robust access strategy to four regional airports – Stansted, Luton, Norwich and Southend (Policy T5), and a sustainable and reliable freight movement strategy to the regions ports (Policy T6).

A7.3.5 Within urban areas, Local Transport plans, Local Development Documents and other plans and strategies identified ways to bring about a shift away from car use to public transport, walking and cycling (Policy T4). "This should be achieved through the following types of measures, in combination as appropriate to local circumstances:

- ensuring urban extensions and other major developments are linked from the outset into the existing urban structure through safe, well designed pedestrian and cycling routes and a high standard of public transport;
- capitalising on opportunities provided by new development to achieve area wide improvements in public transport services, footpaths and cycle networks;
- promoting public transport through quality partnerships or other agreements to deliver enhanced services, improved interchange, increased access, higher levels of public visibility, better travel information, and appropriate traffic management measures; and
- improvement to local networks for walking and cycling, including increasing the attractiveness and safety of the public realm."

A7.3.6 Policy T14: Parking, stated that "Parking Controls, such as the level of supply or the charges, should be used as part of packages for managing transport demand and influencing travel change, alongside measures to improve public transport accessibility, walking and cycling. It also states that the standards in PPG13 should be treated as maximums, but that parking standards should take account of location, land-use and accessibility.

A7.3.7 Policy T15: Transport Investment Priorities, identified the Cambridge area as likely to come under increasing transport pressure as a result of underlying traffic growth and the development strategy of the RSS, and further work in these areas should focus on developing the evidence to establish the interventions needed to address any problems. Strategic Transport Infrastructure priorities of relevance to Cambridge include:

- Cambridgeshire Guided Busway (due to open November 2009 but delayed);
- Addenbrooke's access road (due for completion Summer 2010);
- A14 Ellington to Fen Ditton Improvement (draft orders were published in September 2009);
- Cambridge Road User Charging (including Chesterton New Station) - although congestion charging is unlikely to be progressed now.

A7.3.8 More detailed sub-area policies were set out for the Cambridge Sub-Region, including Policy CS4, which stated that new transport infrastructure requirements arising from development in the sub-region should build upon the existing high quality public transport systems, high levels of cycling and demand management measures.

A7.4 Local Policy and Guidance – Structure Plan and Local Plans

Cambridgeshire and Peterborough Structure Plan 2003

A7.4.1 Following the approval of the East of England Plan in May 2008, the majority of the policies in the Cambridgeshire and Peterborough Structure Plan 2003 were replaced. A small number of Structure Plan policies have been 'saved' and will remain valid until superseded by the revised East of England Plan (to be determined by the Government).

A7.4.2 Relevant saved policies include

i) Policy P8/10 – Transport Investment Priorities, setting out a number of transport schemes to be sought over the Structure Plan period to meet strategic requirements and the needs of major developments, including, inter alia:

- A14 improvements;
- Cambridge to Huntingdon Rapid Transit (busway);
- bus routes which cater for orbital movement around Cambridge;
- bus priorities on key radial routes into Cambridge;
- Chesterton rail station and interchange.

ii) Policy P9/9 – Cambridge Sub-Region Transport Strategy, includes the following:

- recognition of the need to accommodate some orbital movement around Cambridge;
- demand management measures in Cambridge City to discourage car use;
- the development of more widespread facilities to encourage walking and cycling.

Cambridge Local Plan

A7.4.3 The Cambridge Local Plan was adopted in July 2006, setting out policies and proposals for future development and land use to 2016. Most of the policies in the plan are saved until replaced by the Local Development Framework, except for:

i) a small number of policies (eight) which have been deleted;

ii) Policy 9/7 and proposal sites 9.07 and 9.11 which have been superseded with the adoption of the North West Cambridge Area Action Plan.

A7.4.4 Relevant transport-related policies that have been saved include:

i) Policy 8/2 - Transport Impact - developments will only be permitted where they do not have an unacceptable transport impact. Proposals must include sufficient information in order for the likely impact to be assessed;

ii) Policy 8/3 - Mitigating Measures - for development likely to place a demand on the transport system, suitable mitigating measures will be required. Financial contributions will be sought towards improvements in transport infrastructure in particular to support public transport, cycling and walking. A staff travel plan will be required for non-residential developments;

iii) Policy 8/4 - Walking and Cycling Accessibility - to support walking and cycling, all development will be designed to:

a) give priority for these modes over cars;

b) ensure maximum convenience for these modes;

c) be accessible to those with impaired mobility; and

d) link with the surrounding walking and cycling network.

iv) Policy 8/5 - Pedestrian and Cycle Network - new developments will safeguard land along identified routes for the expansion of the walking and cycling network. In addition, funding for high quality physical provision of these routes will be required, both within and adjacent to the proposed development site. Any existing routes should be retained and improved wherever possible;

v) Policy 8/6 - Cycle Parking - developments will provide cycle parking in accordance with the Parking Standards, in number, location and design. Planning applications must include full details of the proposed cycle parking.

vi) Policy 8/7 - Public Transport Accessibility - all development within the urban extensions must be served by a high quality 1 public transport service within a 400 metre walk. Developers will be required to ensure the provision of services from the first occupation of development for a period of up to five years.

(1 A high quality public transport service is one that provides a 10 minute frequency during peak periods and a 20 minute frequency inter-peak. Weekday evening service frequencies should be ½ hourly until 11pm. Saturday service frequencies should be ½ hourly 7am until 6pm, then hourly until 11pm: Sunday service frequencies should be hourly 8am until 11pm)

vii) Policy 8/8 - Land for Public Transport - development will not be permitted where it would inhibit the expansion of high quality public transport:

a) alongside existing radial classified roads, for bus lanes, guideways and junction improvements;

b) around existing or potential public transport nodes for improved interchange facilities; and

c) along the particular public transport routes identified on the Proposals Map.

viii) Policy 8/10 - Off-Street Car Parking - off-street car parking must be in accordance with the Parking Standards.

ix) Policy 8/11 - New Roads - any proposed road must:

a) be designed to give high priority to the needs of pedestrians and cyclists, including safety;

b) restrict through-access for general motor traffic where possible;

c) minimise additional car traffic in the surrounding area; and

d) be acceptable to the Highway Authority in all other respects.

A7.4.5 Chapter 9 of the Local Plan – Areas of Major Change, provides a framework for the delivery of major development in and around Cambridge:

i) Policy 9/1 states that substantive development will not be permitted in advance of the approval of further policy / guidance;

ii) Policy 9/2 states that each Area of Major Change shall only commence once a detailed transport network has been agreed for the area;

iii) Policy 9/3 lists key requirements for development in the urban extensions, including ensuring that the site is fully integrated into transport networks, is served by High Quality Public Transport Services, and that the site will create a comprehensive network of footpaths and cycle routes linking into the wider network.

South Cambridgeshire Local Plan

A.7.4.6 The South Cambridgeshire Local Plan was adopted in February 2004. The adopted policies contained within it have now been almost entirely replaced by the policies in the adopted Local Development Framework documents (or are no longer in force for other reasons). As of January 2010, only one Local Plan 2004 policy remained in force : Policy CNF6 - Expansion of Existing Sites - to be superseded by the Gypsy and Traveller DPD when it is adopted.

A7.5 Local Policy and Guidance – Local Development Frameworks

Cambridge Local Development Framework

A7.5.1 The Cambridge Local Development Framework will include the following:

i) The Cambridge Development Strategy (The Core Strategy) Development Plan Document (DPD). This sets out the general spatial vision and objectives for the delivery of the LDF. Preparation of the informal preferred options report has been undertaken and consultation on this is scheduled to commence in November 2010;

ii) The Site Specific Allocations DPD - issues and options consultation on this is anticipated to commence in October 2010;

iii) Cambridge Development Control Policies DPD – issues and options consultation on this is anticipated to commence in October 2010;

iv) Area Action Plans – setting out policies to guide development in specific areas. The North West Cambridge Area Action Plan was adopted in October 2009;

v) Other documents including Supplementary Planning Documents.

A7.5.2 The Issues and Options Report of the Cambridge Development Strategy sets out a number of key issues and options prior to the preparation of the Preferred Options Report relating to the main components of the spatial strategy proposed. Although development at West and North West Cambridge is identified as an option, no other reasonable alternatives were identified for consideration because the implementation of this element of the spatial strategy is already in progress since the Structure Plan identifies this site for University-related development.

South Cambridgeshire Local Development Framework

A7.5.3 The South Cambridgeshire Local Development Framework contains the following:-

i) The Core Strategy Development Plan Document (DPD) - adopted in January 2007;

ii) The Site Specific Policies DPD - adopted in January 2010;

iii) The Development Control Policies DPD - adopted in July 2007;

iv) Area Action Plans – setting out policies to guide development in specific areas. The North West Cambridge Area Action Plan was adopted in October 2009;

v) Other documents including Supplementary Planning Documents.

A7.5.4 The Site Specific Policies Development Plan Document was adopted in 2010 and contains the following relevant policies and standards:

i) Policy SP/2 - North West Cambridge Huntingdon Road to Histon Road, including:

7 - Development and transport systems will be planned in order to integrate with adjoining development in Cambridge City, to reduce the need to travel and to maximise the use of sustainable transport modes, so as to achieve a modal share of no more than 40% of trips by car (excluding passengers). This will include the provision of car clubs, employee travel plans, residential travel planning, and other similar measures;

8 - Adequate highway capacity will be required to serve all stages of development. Planning permission will be subject to conditions requiring that sufficient highway capacity is available in the A14 corridor between Girton and Milton throughout the development for the traffic forecast to be generated by each phase of development;

9 - Vehicular access shall be made available from both Histon Road and Huntingdon Road. There shall be no vehicular access to the A14;

10 - Car parking will be provided in accordance with the maximum standards for Cambridge as set out in Appendix 2 (*of the Development Plan Document*) and secure cycle parking in accordance with the cycle standards for Cambridge as set out in Appendix 3 (*also of the Development Plan Document*). Car clubs will be encouraged in order to minimise the amount of land given over to car parking. This must be explored through the Transport Assessment and Travel Plan;

11 - The development will be highly accessible and permeable to all its residents on foot, by cycle and High Quality Public Transport (HQPT), to support sustainable transport, recreation and health. HQPT will be provided to serve the development, including segregated bus priority through the development linking effectively with the route through the adjoining development in Cambridge City and into the wider bus network. There will be a network of strong internal and external cycle and footpath links to neighbouring parts of the urban and rural areas.

ii) Appendix 2 (*of the Development Plan Document*) contains Car Parking Standards. Maximum car parking levels are set out by land-use, but may be reduced where lower car use can reasonably be expected (where the site has good access to high quality public transport or is in close proximity to shops and other services, or where reduced car ownership / use can be encouraged or enforced. For residential uses, the standard is 1 car parking space for dwellings with up to 2 bedrooms, and 2 car parking spaces for dwellings with 3 or more bedrooms. In addition, provision should be made for visitors at the ratio of 1 space for every 4 units (provided that off-street car parking spaces resulting from the development would not be above the district-wide average of 1.5 car parking spaces per dwelling);

iii) Appendix 3 (*of the Development Plan Document*) contains Cycle Parking Standards, expressed as minima. For residential uses, these are 1 space per bedroom for up to 3 bedroom dwellings (3 spaces for 4 bedroom dwellings, 4 spaces for 5 bedroom dwellings etc);

iv) Policy SP/16 - Cambridgeshire Guided Busway - states that land is safeguarded for the Busway, and that the Council will use its powers under Section 106 to secure financial contributions at an appropriate level towards the development of relevant parts of it.

A7.5.5 The Development Control Policies Development Plan Document contains the following relevant policies:

i) Policy DP/1 - Sustainable Development - states that development will only be permitted where it is demonstrated that it is consistent with the principles of sustainable development, as appropriate to its location, scale and form. It should, inter alia, minimise the need to travel and reduce car dependency;

ii) Policy DP/3 - Development Criteria - states that “All development proposals should provide, as appropriate to the nature, scale and economic viability ….”, inter alia:

b. appropriate access from the highway network that does not compromise safety, enhanced public and community transport and cycling and pedestrian infrastructure;

c. car parking, with provision kept to a minimum;

d. safe and secure cycle parking;

i. financial contributions towards the provision and maintenance of infrastructure, services and facilities required by the development in accordance with Policy DP/4.

In addition, the policy states that planning permission will not be granted where the proposed development would have on unacceptable adverse impact, inter alia, from traffic generated.

iii) Policy DP/4 - Infrastructure and New Developments - states that planning permission will only be granted for proposals that have made suitable arrangements for the improvement or provision of infrastructure necessary to make the scheme acceptable in planning terms, which may include that relating to pedestrians, cyclists, equestrians, highways and public and community transport;

iv) Policy DP/6 Construction Methods – refers to the need for any haul roads to be agreed with the Local Planning Authority and designed to minimise impact on residents, business and existing highways. Construction traffic for the major sites such as North West Cambridge will need to be routed to avoid roads passing through villages;

v) Policy TR/1 - Planning for More Sustainable Travel - states that:

"1. Planning permission will not be granted for developments likely to give rise to a material increases in travel demands unless the site has (or will attain) a sufficient standard of accessibility to offer an appropriate choice of travel by public transport or other non-car travel modes(s);

2. In considering planning applications the Council will seek to ensure that every opportunity is taken to increase integration of travel modes and accessibility to non-motorised modes by appropriate measures including:

a. securing appropriate improvements to public and community transport (including infrastructure requirements) in accordance with the aims of the Local Transport Plan;

b. securing on-site and / or off-site design proposals that promote integrated travel and access by non-motorised modes as far as practicable (including walking and cycling) and facilitate and encourage their use;

c. minimising the amount of car parking provision in new developments, compatible with their location, by encouraging shared use parking (where appropriate) and restricting car parking to the maximum levels;

d. ensuring that new developments are located and designed at the outset with permeable layouts to facilitate and encourage short distance trips by cycle and walking, including to public transport interchanges;

e. requiring safe and secure cycle parking;

3. The Local Transport Plan road user hierarchy will be taken into account in the determination of planning applications to ensure adequate emphasis has been placed on the relevant modes, although no modes should be promoted to the exclusion of others."

vi) Policy TR/2 - Car and Cycle Parking Standards - states that:

"1. Car parking should be provided in accordance with the maximum standards set out in Appendix 1 (*of the Development Control Policies Development Plan Document*), to reduce over-reliance on the car and to promote more sustainable forms of transport;

2. In some locations, such as those with good accessibility to facilities and services, and served by High Quality Public Transport, the Council will seek to reduce the amount of car parking provided. Where opportunities arise, for example, on mixed-use sites, shared use parking and car pooling will be encouraged to minimise provision;

3. Cycle parking should be provided in accordance with the minimum standards set out in Appendix 2 (*of the Development Control Policies Development Plan Document*) to ensure the provision of adequate secure parking."

vii) Policy TR/3 Mitigating Travel Impact, states that:

"1. New developments will be required to mitigate their travel impact, including their environmental impact, such as noise, pollution and impact on amenity and health. This may mean ensuring adequate provision is made for integrated and improved transport infrastructure or appropriate mitigation measures, through direct improvements and Section 106 contributions, in accordance with the tests in Circular 05/2005;

2. Financial contributions will be sought towards improvements in transport infrastructure in the wider area affected by increased development, in particular to support public transport, cycling and walking.";

3. For proposals for 'major development' or where a proposal is likely to have 'significant transport implications', the Council will require developers to submit the following alongside planning applications:

   a. a Transport Assessment; and

   b. a Travel Plan;

4. All other planning applications should be accompanied by a Transport Statement to demonstrate that the development will achieve adequate mitigation of its transport impacts;

5. Travel Plans should demonstrate how it is intended to meet the tests in the first paragraph above. In appropriate cases the content of the Travel Plan may be reflected in planning conditions or a planning obligation. Travel Plans should have measurable outputs, related to targets or aims in the LTP, and provide monitoring and enforcement arrangements. A Travel Plan could also help address a particular local traffic problem associated with a planning application, which might otherwise have to be refused on local traffic grounds. The weight to be accorded to a Travel Plan will be influenced by the extent to which it affects the acceptability of the proposal and how far it can be enforced. Planning conditions or obligations may be appropriate means of securing the provision of some or all of a Travel Plan, including a requirement for the production of an annual monitoring and progress report;

6. In relation to outline planning applications, a framework for the preparation of Travel Plans will be submitted with the application proposal;

viii) Appendix 1 (*of the Development Control Policies Development Plan Document*) contains standards for car parking provision;

ix) Appendix 2 (*of the Development Control Policies Development Plan Document*) contains standards for cycle parking provision;

North West Cambridge Area Action Plan

A7.5.6 The North West Cambridge Area Action Plan was adopted in October 2009, and forms part of the Development Plan for Cambridge City and South Cambridge District. It establishes an overall vision and objectives for, and sets out policies and proposals to guide the development of land at North West Cambridge to contribute towards meeting the development needs of Cambridge University. This document has superseded the Cambridge Local Plan with respect to development in this area.

A7.5.7 Transport-related policies are as follows:

i) Policy NW11: Sustainable Travel - development and transport systems will be planned in order to reduce the need to travel and maximise the use of sustainable transport modes to encourage people to move about by foot, cycle and bus, to achieve a model share of no more than 40% of trips to work by car (excluding car passengers). This will include the provision of car clubs, employee travel plans, residential travel planning, and other similar measures;

ii) Policy NW12: Highway Infrastructure - development will be subject to sufficient highway capacity being available to serve all stages of development, including on the adjacent strategic road network. Development will contribute to measures to mitigate any significant adverse traffic impacts on the M11, A14 and the surrounding highway network, if this is shown to be necessary by transport assessments;

iii) Policy NW13: Vehicular Access - vehicular access to the development area will be from Huntingdon Road and Madingley Road. The number of vehicle access points to the development area will be minimised, especially from Huntingdon Road, and there will be no access for private motor vehicles to and from Storey's Way;

iv) Policy NW14: Madingley Road to Huntingdon Road Link - a new route will be developed linking Madingley Road and Huntingdon Road. This road will be designed as part of the development and its design will be based on low vehicle speeds. It will give priority to provision for walking, cycling and public transport, including safe and convenient crossings for pedestrians and cyclists, in order to encourage travel by more sustainable modes;

v) Policy NW15: Highway Provision - highway provision will be funded by development, as appropriate, and the provision of key links will be timed to relate to the commencement of development, or to the first occupation, of the relevant phase of development;

vi) Policy NW16: Public Transport Provision - high quality public transport provision will be provided to support development, including:

a) providing segregated bus priority routes through the development, along internal routes;

b) linkage of bus routes within the development to the wider bus network, including enhanced bus services along Huntingdon Road and the proposed Madingley Road to Huntingdon Road link route;

c) provision of bus stops, shelters and real time passenger information, with the majority of development being within 400m easy walking distance of a bus stop; and

d) support for residential travel plans and employee travel plans, including measures to encourage bus use, funded by development.

vii) Policy NW17: Cycling Provision - new and improved cycle links will be provided as part of the development, including:

a) giving priority to cycling links between Huntingdon Road and Madingley Road and to the City Centre;

b) giving priority to cycling within the development, including connections to key destinations, including the local centre, bus stops, the primary schools, employment, and adjacent development; and

c) linking the development with the surrounding walking and cycling network and orbital routes including links to nearby villages and open countryside.

viii) Policy NW18: Walking Provision - development will be required to provide attractive, direct and safe walking routes as part of the development, including:

a) giving priority to walking links between Huntingdon Road and Madingley Road, to adjacent development and to the City Centre;

b) giving priority to walking routes within the development connecting to key destinations, including the local centre, bus stops, the primary schools and employment; and

c) linking the development with the surrounding walking network, including links to an improved rights of way network and to nearby villages and open countryside.

ix) Policy NW19: Parking Standards - car and cycle parking will be provided in accordance with the standards set out in Appendix 1 and 2 (*of the North West Cambridge Area Action Plan*). In applying these standards, the overall aim will be to minimise the amount of car parking and to maximise the amount of cycle parking in order to encourage the use of more sustainable modes.

A7.6 Local Policy and Guidance – Transport

Cambridgeshire Local Transport Plan

A7.6.1 The Cambridgeshire Local Transport Plan issued in March 2006 set out the objectives, strategy, transport targets and programme for the period 2006 - 2011. It is one of number of planning and transport plans and strategies aimed at ensuring that large-scale development can take place in the county in a sustainable way.

A7.6.2 The long-term transport strategy identifies two tools – widening choice and managing demand - to meet the LTP's objectives in the three strategy areas : transport corridors, urban areas and their hinterlands, and rural areas. The initiatives developed on that basis included the following:

Along Transport Corridors

Widening choice:

- seeking to run bus services to frequencies of 15 minutes or better;
- providing bus information through multiple delivery media to reach as many sectors of the community as possible;
- new high quality transport schemes, such as the Cambridgeshire Guided Busway;
- a new rail interchange as Chesterton in Cambridge;
- enhanced coach facilities and cycle / pedestrian links at interchange / Park and Ride sites.

Managing demand:

- speed reduction measures where appropriate;
- measures to tackle congestion at the worst bottlenecks (for example, along the A141 and the A142/A10);
- bus priority measures to improve public transport journey times.

In Urban Areas and their hinterlands

Widening choice:

- improved, more frequent and more accessible bus services;
- improved interchange facilities between bus and rail;
- an enhanced network of cycle and pedestrian routes both in towns and linking to surrounding villages and countryside;
- encouraging the provision of more accessible taxis;
- improved pedestrian facilities.

Managing demand:

- road safety measures;
- traffic calming;
- speed reduction measures;
- parking policies to restrict parking through price or physical regimes will be linked to the provision of public transport where high levels of access by more sustainable modes of transport exist.

Key elements of The LTP programme include:

- measures to tackle congestion such as improvement to public transport, walking and cycling especially in Cambridge and the market towns;

- two major schemes - the Cambridgeshire Guided Busway and Chesterton interchange.

A7.6.3 Cambridgeshire County Council is consulting on the updated Local Transport Plan (LTP3) – until April 2010 – which is currently being prepared.

A7.7 Summary and conclusions

A7.7.1 By promoting the selected land-use mixes on the North West Cambridge Development, the University of Cambridge is actively reducing the demand to travel. This includes:

i) providing significant levels of Key Worker and post-graduate student housing to accommodate locally those who would otherwise have to travel longer distances from outside into the city;

ii) delivering a mix of both employment and residential accommodation on the development;

iii) providing a food store on the development to reduce the length and number of car-based journey to retail trips;

iv) providing a primary school and other community facilities within the development.

A7.7.2 The North West Cambridge Development accords well with national and regional transport policy and guidance to deliver sustainable development:

- the sustainable location of the North West Cambridge Development within Cambridge, and the incorporation of mixed employment and residential land-uses reducing the need to travel support the aspirations and objectives of Planning Policy Statement 1, Planning Policy Statement 3, and Planning Policy Guidance 13;

- by locating the development so as to reduce the need to travel, by implementing a parking strategy, and by effecting a major shift in travel away from car use, the North West Cambridge Development supports the policies of the East of England Plan;

- promoting ways to reduce the traffic impact of this development and the University's other activities within Cambridge, and by "managing down" traffic generation, the North West Cambridge Development supports the policy of the Highways Agency's Circular 02/2007.

A7.7.3 The development also accords with key local transport and planning policy objectives:

- by incorporating bus route and all vehicle links between Madingley Road and Huntingdon Road, and by developing more widespread facilities to encourage walking and cycling, the North West Cambridge Development supports the saved policies within the Cambridgeshire and Peterborough Structure Plan;

- by integrating the proposed development and transport infrastructure to the adjacent existing development, by implementing a rigorous travel demand management strategy and Travel Plan, and by making the development highly accessible to all residents on foot, by cycle and by high quality public transport, the North West Cambridge Development supports the policies of the South Cambridgeshire Local Development Framework;

- the specific transport-related policies of the North West Cambridge Area Action Plan regarding sustainable travel, highway infrastructure, vehicular access, the provision of links between Huntingdon Road and Madingley Road, quality public transport, and walking and cycling provision.

A7.7.4 Of the measures identified within the Cambridge Long-Term Transport Strategy, the North West Cambridge Development access strategy already incorporates proposals for both the bus-only link, and the new road for all vehicles between Huntingdon Road and Madingley Road: the public transport strategy would deliver enhanced public transport services, and would be complementary and beneficial to another measure if delivered, the expanded Madingley Road Park and Ride site.

A7.7.5 This Transport Assessment, to be submitted in support of the outline planning application, identifies in detail the transport strategy and travel demand management measures to ensure that the site will be developed in accordance with national and regional policy, as well as the broad long-term strategy for the development of Cambridge as set out in the local planning documentation.

A7.7.6 Indeed, it may be concluded that, overall, the proposals for the development of North West Cambridge, and the transport strategy evolving to support it, will make a substantial and significant contribution to sustainable development objectives and policies for the Cambridge area.

Appendix 8 - Background CSRM Model information

North West Cambridge
Transport Assessment

Cambridge Sub Regional Model (CSRM) Forecasting Methodology and Assumptions

Cambridgeshire County Council

October 2009

QM

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Remarks	Draft v0.1 for internal review	Draft v0.2 for internal review	FINAL Draft for Issue v1.0	Minor revisions at client request, for client review. Draft only.
Date	17/08/2009	9/10/2009	13/10/09	28/10/09
Prepared by	Vera Jakimovska Tim Gent	Vera Jakimovska Tim Gent Andrew Young Gordon Deane Diana Kabeizi	Tim Gent Andrew Young	Tim Gent Diana Kabeizi
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Signature		***Tim Gent***	***Tim Gent***	***Tim Gent***
Authorised by			Tim Gent	Tim Gent
Signature			***Tim Gent***	***Tim Gent***
Project number				11641237
File reference				P:\P12\1237 CCC TIF\TEXT\REPORTS\Forecasting\Release 2 - Nov 09\CSRM Forecasting Methodology and Assumptions FINAL_Release2.doc

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1 Introduction

1.1 PURPOSE OF REPORT

1.1.1 This report provides a summary of the forecasting Reference Case for the Cambridge Sub Regional Model (CSRM), including both the methodology for future year forecasting, and the assumptions regarding land use, transport demand and supply characteristics. A summary is given of results for the future Reference Case model runs, for the years covering the period from 2011 to 2031. The Reference Case used is identical to the Do Minimum scenario developed for the Cambridge TIF submission, and hence includes those transport enhancements which are assumed to go ahead in the absence of TIF.

1.2 ABOUT CSRM

1.2.1 The CSRM is an integrated land use, transport demand and network assignment model that allows stand-alone testing of road, PT, cycle, walk schemes, standard economic benefit tests using the highway and demand model with fixed trip ends, as well as complex tests of strategic policy options incorporating land use responses. The model was developed for Cambridgeshire County Council (CCC) and is a successor to the previous CHUMMS model which was developed originally for the Cambridge-Huntingdon multi-modal study, and was also applied (in an adapted version) for the CHUMMS A14 study and Cambridgeshire Long-term Transport Plan. More details on the model implementation are given in the Model Development and Validation Report (WSP, 2009, MDVR).

1.2.2 The key features of the CSRM model structure, shown in Figure 1.1 are:

- A linked land use model to generate trip ends from forecast planning data and travel accessibilities.
- A detailed Transport Demand Model (TDM), using WSP's *MEPLAN* software. It includes traveller responses including choice of mode/submode, change of macro time period of travelling, and trip redistribution among destinations. Travellers are segmented by income, trip purpose and car ownership. This model is compliant with current Department for Transport guidance for variable demand modelling including the assessment of road pricing schemes.
- A public transport, walk and cycle assignment submodel (PT-Walk-Cycle) also implemented in *MEPLAN*.
- A highway assignment submodel (LHM) using Atkins' SATURN software for light and heavy good vehicle (HGV) assignment, described in detail in a separate report.

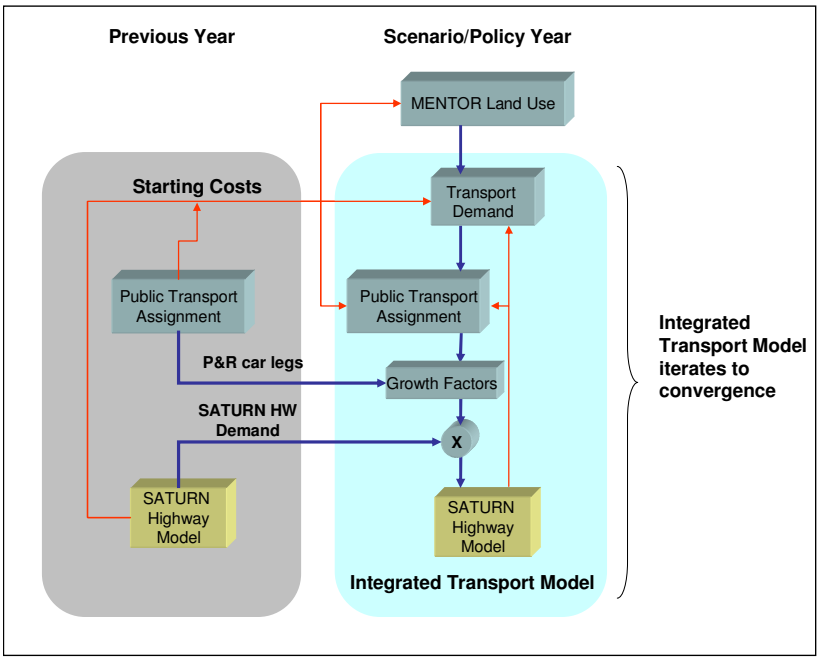


Figure 1.1 CSRM modelling framework

1.2.3 CSRM provides the means to determine what the demand for travel will be in the future, given a particular set of assumptions about population, employment, GDP, fuel cost, transport infrastructure, scope and cost of public transport services.

1.3 REFERENCE CASE (TIF DO MINIMUM)

1.3.1 The Reference Case model runs were developed to represent the transport demand and supply for the years 2011, 2016, 2021, 2026 and 2031, using the assumptions outlined in this report. Table 1.1 below summarises the model inputs and assumptions which comprise the Reference Case, and their source.

1.3.2 The Reference Case scheme contains:

- Reference Case A14 assumptions for transport, housing and employment,
- Widening of the A14,
- No road user-charging.

1.3.3 It may be noted that the majority of these inputs relate in some way to a particular future scenario, which may be subject to review or update. The Reference Case as reported here has been constructed to represent the Do Minimum scenario for the CCC Transport Innovation Fund (TIF) submission. Care has been taken in the construction of the model to allow for updates of all assumptions to update (for example) land use development assumptions or transport schemes should an alternative Do Minimum scenario be required.

Table 1.1 Inputs and Assumptions comprising the CSRM Reference Case

Inputs/Assumption	Source
Land use developments (housing and commercial developments)since 2001.	CCC sources / DfT TEMPRO 5.4
Employment and population trends between the base and forecast years	CCC sources / DfT TEMPRO 5.4
Freight traffic growth	East of England Regional Model / National Road Traffic Forecasts
Adjustments over time of other factors which affect transport demand. These include fuel costs, values of time, public transport fares and car occupancy rates	WebTAG / factors agreed with TIF consultancy team
Transport supply changes (highways and PT network changes).	As specified by CCC and their consultants for TIF work

1.4 CSRM INTERNAL STUDY AREA

1.4.1 Figure 1.2 shows the CSRM internal study area, which comprises the four Cambridgeshire district authorities: Cambridge City, South Cambridgeshire, East Cambridgeshire and Huntingdonshire. The rest of Great Britain outside the study area is represented by external model zones.

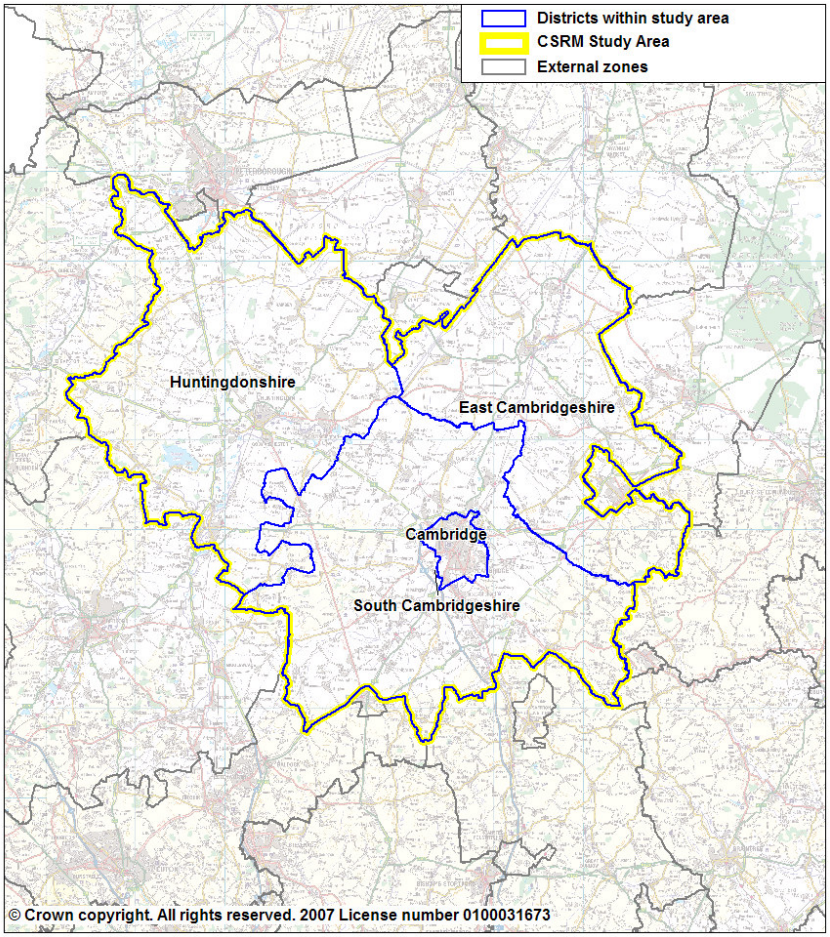


Figure 1.2 CSRM Study area

1.5 REPORT STRUCTURE

1.5.1 The report is structured to describe the creation of the future Reference Case model simulation runs in Sections 2 to 7.

- Section 2 outlines the assumptions relating to the land use model, including employment, housing and commercial developments.
- Section 3 outlines the assumptions relating to changes in travel demand.
- Section 4 defines the transport supply assumptions for vehicle operating costs, public transports fares, value of time, car occupancy.
- Section 5 describes the road and PT network changes over time.
- Section 6 describes the model running mechanism in forecast mode, and
- Section 7 gives an overview of the Reference Case forecast results.

2 Planning Data Input Assumptions in CSRM Land Use Model

2.1 OVERVIEW

2.1.1 CSRM utilises a Land Use model which allows the model to explicitly respond to planned land use developments, and to reflect the influence of transport availability on future land use decisions.

2.1.2 The application of the Land Use model is in line with WebTAG unit 3.1.3, which states that some studies may require the use of a land-use/transport interaction model to generate forecasts of land-use dependent on input land-use policies and the changes in accessibility brought about by conditions on the transport system.

2.1.3 WebTAG defines 'Land Use' in this context as a range of human activities, the state of the built environment, and also some aspects of the natural environment. In the context of CSRM, this corresponds to:

- Activities: All trip-generating activities, categorised as employment, education, shopping, leisure, visiting friends/relatives and personal business trips.
- Built environment: Representing dwellings available, and commercial floorspace categorised by industry type. Transport connectivity represented through generalised costs imported from CSRM transport model.
- Natural environment: Not represented.

2.1.4 WebTAG states that such 'Land-use' is of relevance to 'transport' for three reasons:

- land-using activities and the interactions between them generate the demands for transport;
- those activities and interactions are to a greater or lesser extent influenced by the availability of transport; and
- the linkages between transport and activities may be important to the appraisal of transport strategies - especially when trying to consider whether the transport system is providing the kinds of accessibilities that activities (i.e. people and businesses) require, rather than simply providing mobility.

2.1.5 In CSRM these aims are addressed by using the land use model to simulate residential location, employment location and related activity locations in order to produce a comprehensive set of trip origins and destinations[1] to pass to the Transport Demand Model.

2.1.6 Section 6 of this document describes in detail how the Land Use and Transport components of CSRM interact when running through time. In the remainder of this section the planning data inputs to the Land Use model are described. Within the current section, information is organised as follows:

[1] Strictly speaking the land use model provides planning data forecasts from which trip productions and trip attractions are derived for input to the Travel Demand Model. This note refers to these trip ends in the more easily understood terms of origins and destinations.

- Section 2.2: Describes information available, processing and assumptions for Dwellings development;
- Section 2.3: Describes information available, processing and assumptions for Employment, including a comparison against household growth;
- Section 2.4: Describes information available, processing and assumptions for Commercial Floorspace, including a comparison against employment growth;
- Section 2.5: Describes the floorspace growth across the study area;
- Section 2.6-2.7: Describe the demographic assumptions in the model;
- Section 2.8: Supplies a broad overview of how the Land Use Model links with the Transport Demand Model.
- Appendix A: Details of allocation of strategic sites growth to transport zone within the model.

2.2 DWELLINGS

USE OF DWELLINGS WITHIN THE LAND USE MODEL

2.2.1 For each modelled future year, the LU model is provided with an absolute number of dwellings in each modelled zone. This figure does not determine precisely the number of future households: it can be thought of as both a target AND a constraint (total demand for dwellings in a zone cannot exceed the input figures). The Land Use model allocates households to dwellings within each zone according to demand, and based on employment opportunities and proximity to services. The cost of a household locating within a given zone will increase if demand is high, and fall if demand is low, relative to the number of dwellings available.

2.2.2 The model therefore requires the growth in dwellings by zone to be specified, throughout the modelled period (2006-2031). The dwellings growth input to the model has been produced by merging the following datasets:

- CCC development plans for 11 strategic sites around Cambridge and 4 further sites in Cambridgeshire (including Northstowe);
- CCC estimates of the distribution and timing of development outside strategic sites (at ward level) to 2021, in line with RSS targets
- TEMPRO 5.4 projections of total dwellings development in the sub-region.

2.2.3 In merging the datasets, the locally sourced CCC data has been applied to determine spatial distribution and rate of development to 2021. These have been scaled to meet TEMPRO totals for the sub-region in 2021. In 2026 and 2031 developments are again assumed to match TEMPRO totals, with spatial detail applied on the assumption that distribution of dwellings in 2021 is maintained, plus development of any remaining capacity at strategic sites.

2.2.4 The following sections describe in more detail the data sources, their content and processing.

STRATEGIC SITES GROWTH AND CAPACITIES

2.2.5 The Research Group at Cambridgeshire County Council (CCC) provided an up to date set of ward level dwellings forecasts in July 2008. These forecasts separate the growth at strategic sites from the other development areas, with the latter figures being published at ward level. The figures provided by CCC for the strategic sites are shown

in Table 2.1. These were then allocated to model zones using proportions that were set up manually based on further information from CCC (Sustainable Communities group). Appendix A shows how the development at each Strategic Site was allocated to transport zones within the model.

Table 2.1 Planned Dwelling Growth at Strategic Sites to 2021

Strategic Site Name	2007-2011	2011-2016	2016-2021	Total to 2021
Cambridge North West:	**1,200**	**2,980**	**550**	**4,740**
Huntingdon/Histon Road	*400*	*1,380*	*0*	*1,780*
Huntingdon/Madingley Road	*0*	*1,200*	*350*	*1,550*
Arbury Camp[2]	*800*	*400*	*200*	*1,400*
Northern Fringe[3]**:**	**0**	**0**	**0**	**0**
Sewerage Works	*0*	*0*	*0*	*0*
Chesterton Sidings	*0*	*0*	*0*	*0*
Southern Fringe:	**2,090**	**2,330**	**0**	**4,420**
Bell School	*500*	*150*	*0*	*650*
Clay Farm	*800*	*1,500*	*0*	*2,300*
Glebe Farm	*200*	*100*	*0*	*300*
Trumpington Meadows	*350*	*250*	*0*	*600*
TM / Monsanto	*240*	*330*	*0*	*570*
Cambridge East:	**500**	**2,900**	**3,850**	**7,250**
North of Newmarket Road	*500*	*1,550*	*1,000*	*3,050*
North of Cherry Hinton	*0*	*1,350*	*1,350*	*2,700*
Airport	*0*	*0*	*1,500*	*1,500*
Northstowe	550	3,200	4,400	8,150
Loves Farm	850	400	650	1,900
North Bridge	400	500	350	1,250
Cambourne	1,200	800	0	2,000
TOTAL	**6,790**	**13,110**	**9,800**	**29,700**

2.2.6 Post-2021 account was also taken of the planned capacity of each site. Table 2.2 below summarises the advised capacities in comparison to the strategic growth in Table 2.1. Estimates of site capacities were taken from CCCs published map (CCC, "Map 2 – Cambridge Sub-Region Housing Supply on Sites Providing 100+ Dwellings @ 30 June 2008"), with the exception of the 3 sites outside Cambridge (shaded in the table) for which capacities originally quoted by CCC Sustainable Communities in 2007 have been used.

2.2.7 Based on consideration of these capacities, it has been assumed that the remaining capacity at Northstowe is used to 2031, and that a net capacity of 4,750 dwellings is available at the Airport site (netting off the over-development North of Newmarket road). No adjustments have been made to correct apparent over-development at other sites, though no further development has been allowed.

[2] Site also known as 'Orchard Park'

[3] Development of the Northern Fringe Sites at the Sewage Works and Chesterton Sidings was originally included, but removed when development of these sites was rejected by CCC in 2008.

Table 2.2 Strategic Site Capacities

Macro Zones	SITE CAPACITY	Strategic Growth (to 2021)	Remaining Capacity
Huntingdon/Histon Road	2,325	1,780	545
Huntingdon/Madingley Road	1,780	1,550	230
Arbury Camp	900	1,400	-500
Bell School	347	650	-303
Clay Farm / Glebe Farm	2,530	2,600	-70
Trump. Meadows / Monsanto *	1,230	1,170	60
Airport / N. of Cherry Hinton *	10,250	4,200	6,050
North of Newmarket Road	1,750	3,050	-1,300
Northstowe	10,000	8,150	1,850
Loves Farm	1,921	1,900	21
North Bridge	1,277	1,250	27
Cambourne	2,014	2,000	14

** Strategic Sites which share a transport zone have been merged in this table.*

TOTAL SUB-REGIONAL GROWTH AND GROWTH OUTSIDE STRATEGIC SITES

2.2.8 Figures supplied by CCC[4] show the total sub-regional growth to 2021 both within the strategic sites and for developments outside the strategic sites. These figures were compiled by CCC at Ward level, allowing allocation of growth sites to model zones.

2.2.9 The CCC figures are compared with TEMPRO 5.4 growth in Table 2.3 below. CCC figures suggest more growth than TEMPRO 5.4 up to 2016 but significantly lower growth from 2016 to 2021. CCC were not able to provide figures post-2021.

Table 2.3 Cumulative Growth in Dwellings in the Cambridge Sub-Region

Period	TEMPRO 5.4 (Study Area Total)	CCC Figures		
		Strategic Sites(1)	Other Developments(2)	Total
2001-2006	13,938	0	11,300	11,300
2001-2011	30,562	6,790	26,350	33,140
2001-2016	48,319	19,900	30,900	50,800
2001-2021	67,484	29,700	34,000	53,700
2001-2026	86,549	*33,000*	*53,549*	*86,549*
2001-2031	111,688	*36,300*	*75,388*	*111,688*

Note: (1) Strategic site figures for 2026 and 2031 include assumed take up of spare capacity, see 2.2.7. (2) For 2026 and 2031 the total 'other developments' is calculated as the difference between the TEMPRO figure and the total in Strategic Sites.

2.2.10 The following charts show the cumulative growth from 2001 to 2021 both study area wide and by district, comparing the CCC figures with the TEMPRO data. The study area wide chart also shows the WSP assumed data for cumulative dwellings growth in the Strategic Sites and elsewhere in 2026 and 2031.

[4] Supplied August 2008 by CCC Research Group

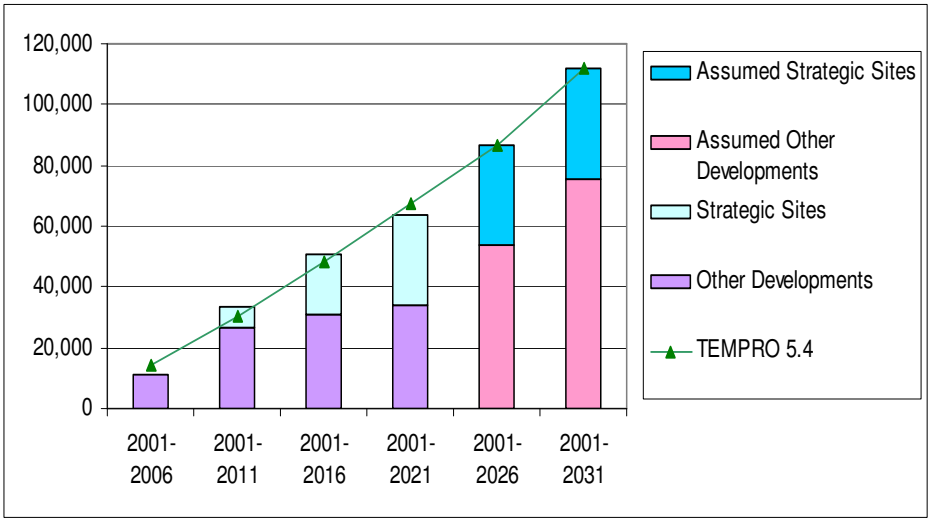


Figure 2.1 Cumulative Growth in Dwellings from CCC and TEMPRO

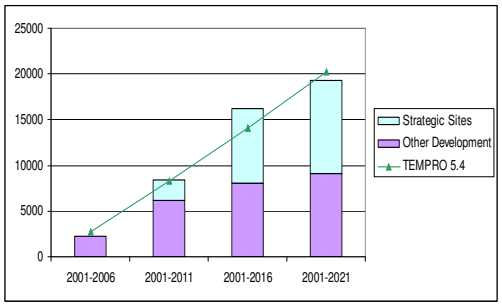


Figure 2.2 Growth in Dwellings (Cambridge City)

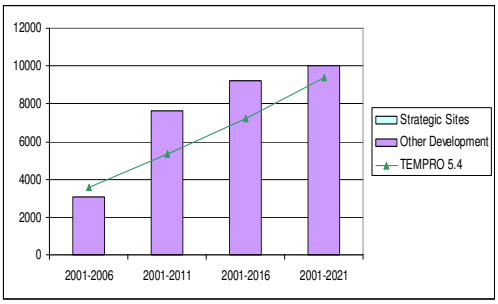


Figure 2.3 Growth in Dwellings (East Cambs)

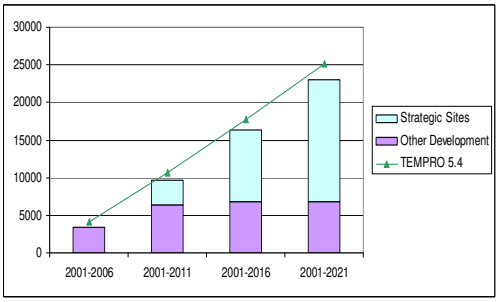


Figure 2.4 Growth in Dwellings (South Cambs)

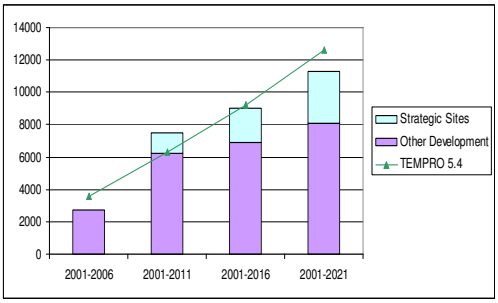


Figure 2.5 Growth in Dwellings (Huntingdonshire)

2.2.11 Using these data sources, the method used to calculate sub-regional dwellings growth at zone level was therefore as follows:

- TEMPRO 5.4 total dwellings growth was assumed for 2001-21, 2021-26 and 2026-31;
- The relative build rate in the periods 2001-06, 2006-11, 2011-16 and 2016-21 was taken from the CCC total figures (equivalent to applying an uplift of 4% to the CCC figures in each year to match the TEMPRO 5.4 total in 2021).
- The spatial allocation to ward level was taken directly from the CCC figures for 2001-2021 (including strategic sites). (District level TEMPRO totals were not used to 2021).

- The spatial allocation was further refined so that all dwellings forecasts could be derived at Transport Zone level (and from there summed back to Land Use Zones). For the non-strategic sites the correspondence between wards and transport zones was assumed to remain constant in each forecast year, based on zone-matching in 2001. For the strategic sites, growth has been manually allocated to the transport model zones based on information provided by CCC on likely development patterns (see Appendix A).
- For 2021-2031TEMPRO5.4 totals by district were maintained, with CCC data used as follows:
  - Additional strategic site capacity was assumed to be used, spread evenly between model zones and years (Northstowe and Cambridge East as identified in 2.2.7 – note that this spare capacity lies entirely within South Cambridgeshire district);
  - The remaining development at zone level required to reach the TEMPRO 5.4 totals in each district was derived assuming that development patterns continue as for 2001-2021 (i.e. the zones with the greatest development to 2021 would also have the greatest development potential post-2021).

SUMMARY OF RESULTING DWELLINGS GROWTH AND LOCATIONS

2.2.12 Figure 2.6 to Figure 2.10 below illustrate the resulting dwellings growth by year and transport zone which is input to the model as targets. Figure 2.11 summarises the total growth from 2001 to 2031 by Transport Zone to illustrate the development hotspots.

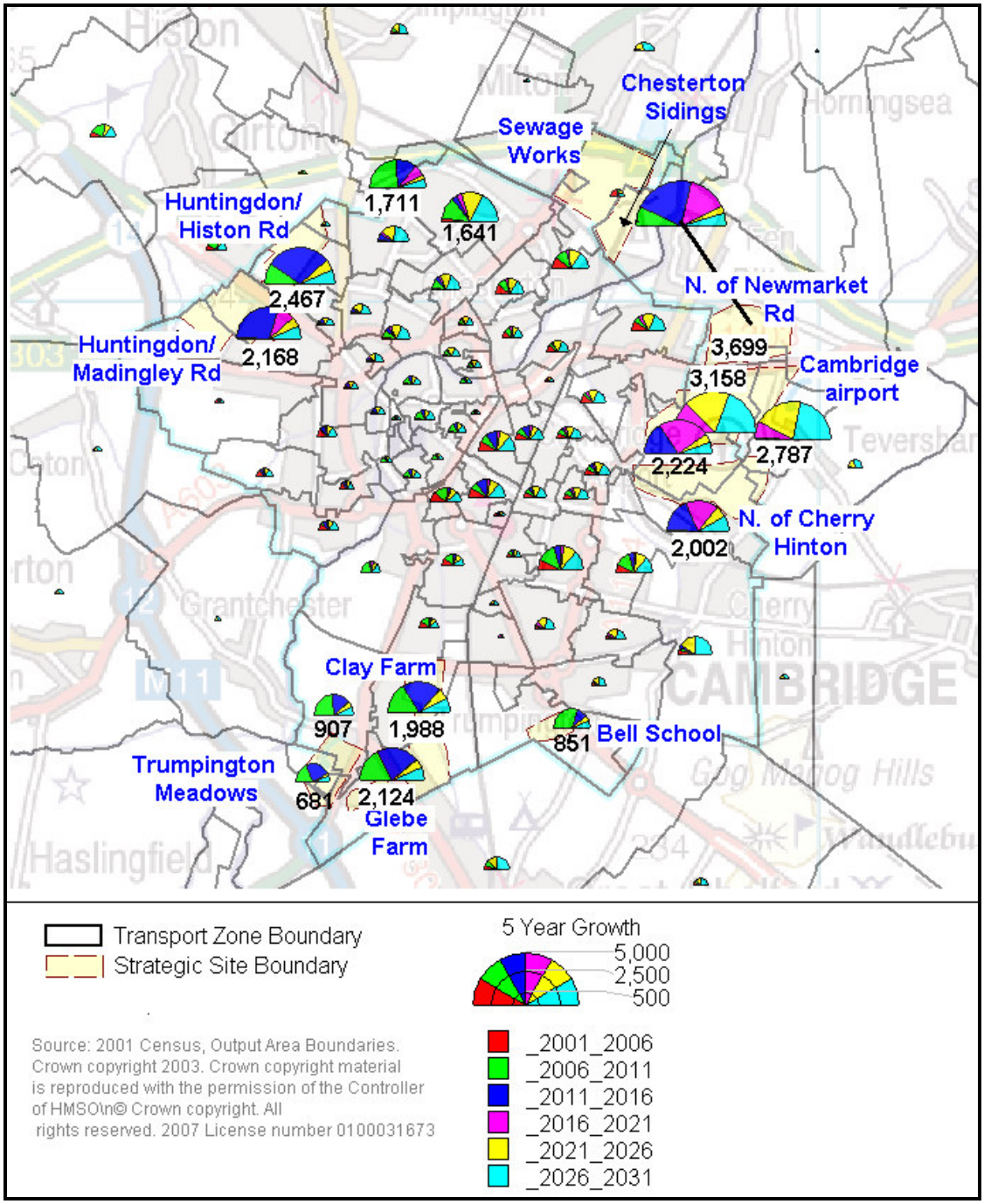


Figure 2.6 Expected Dwellings Growth in Cambridge

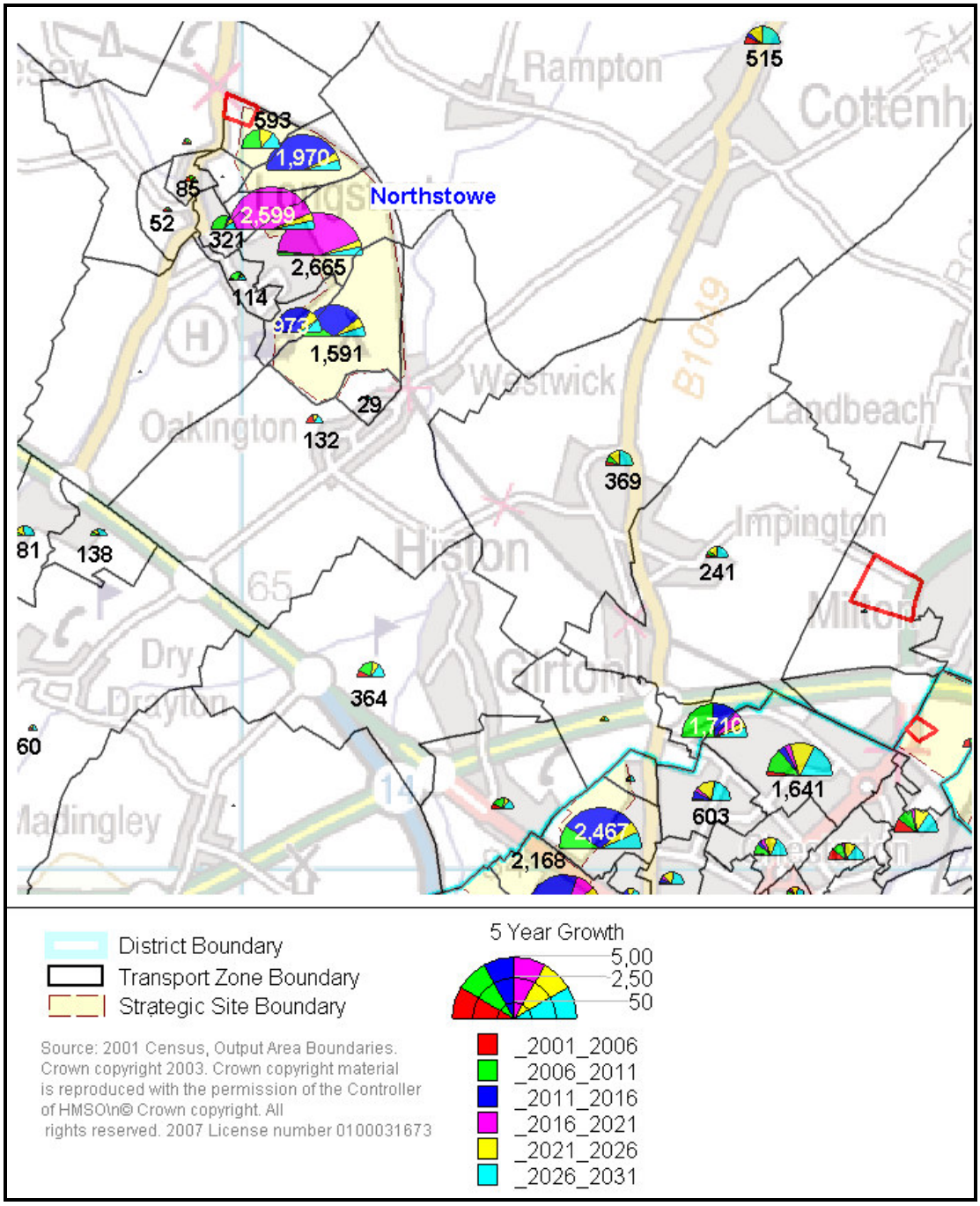


Figure 2.7 Expected Dwellings Growth in Northstowe

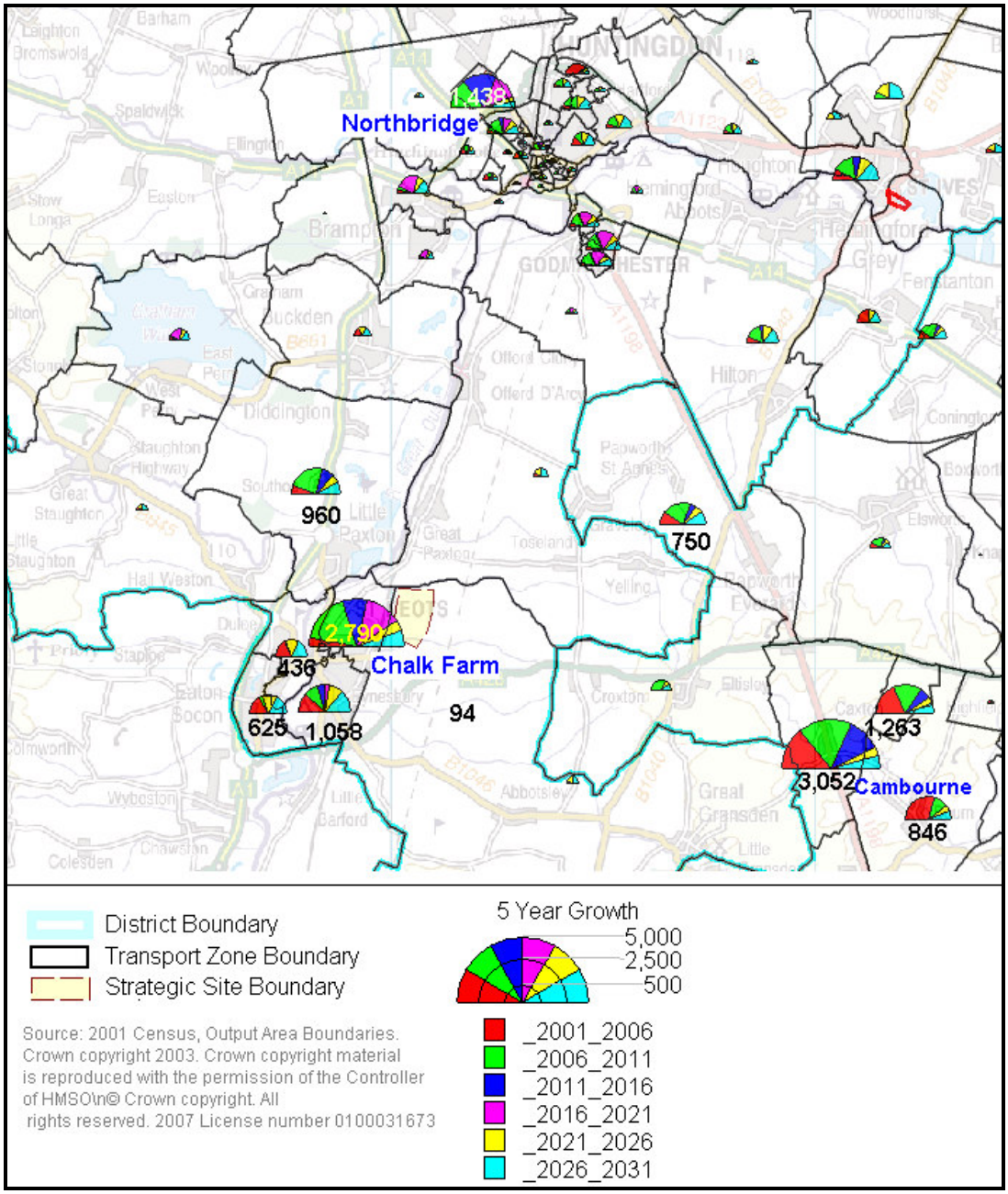


Figure 2.8 Expected Dwellings Growth in Huntingdonshire

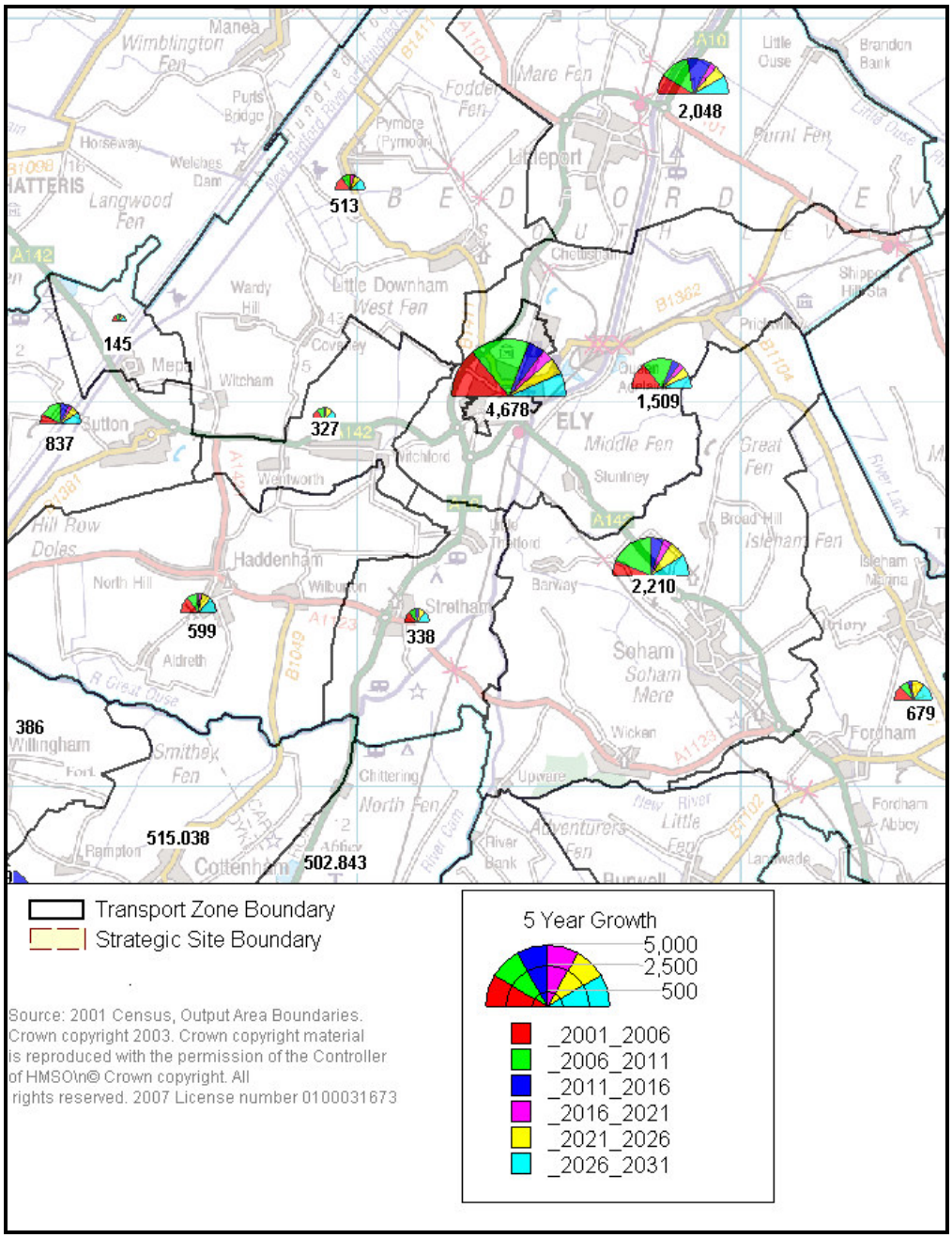


Figure 2.9 Estimated Dwellings Growth in East Cambridgeshire

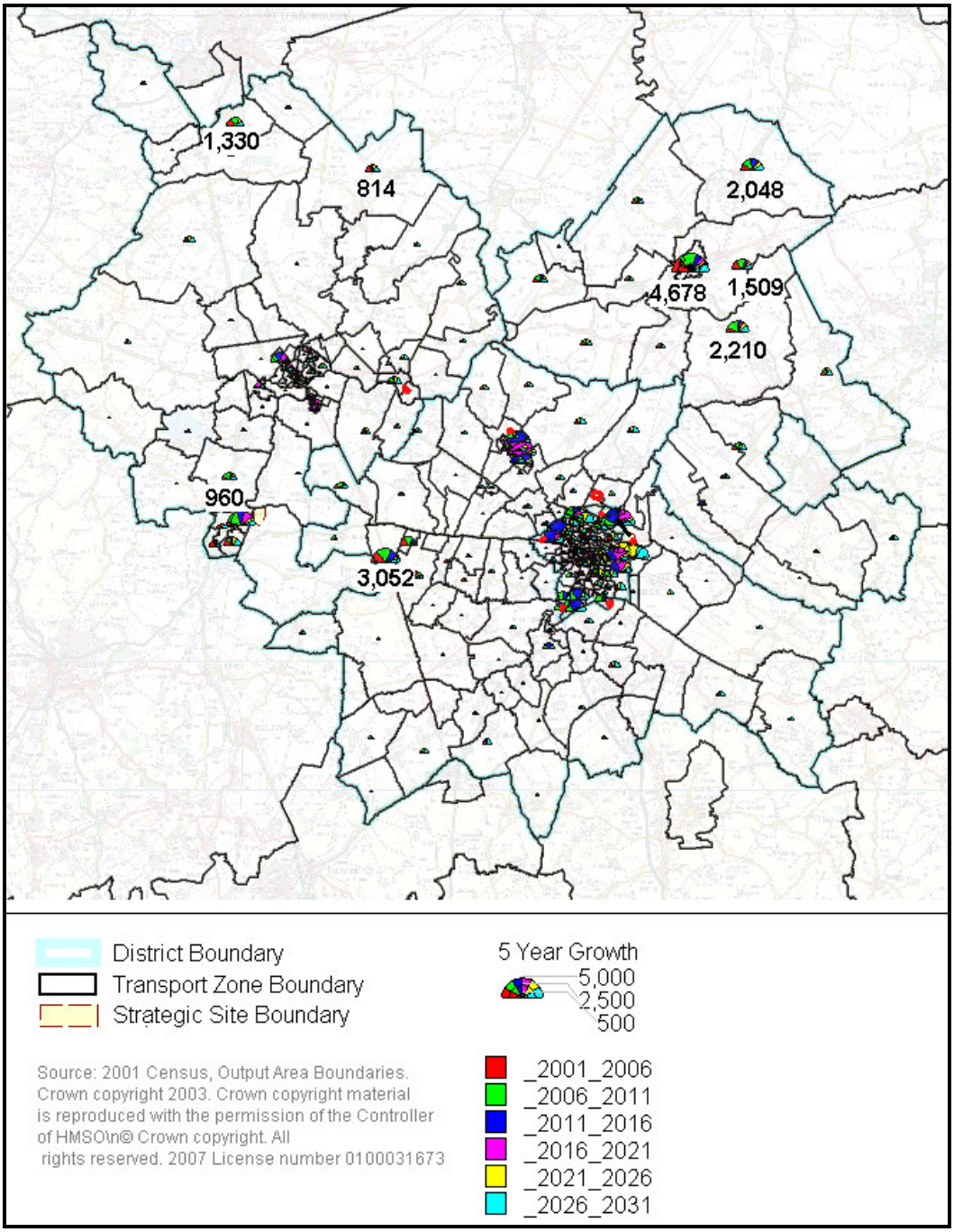


Figure 2.10 Estimated Dwellings Rural Areas

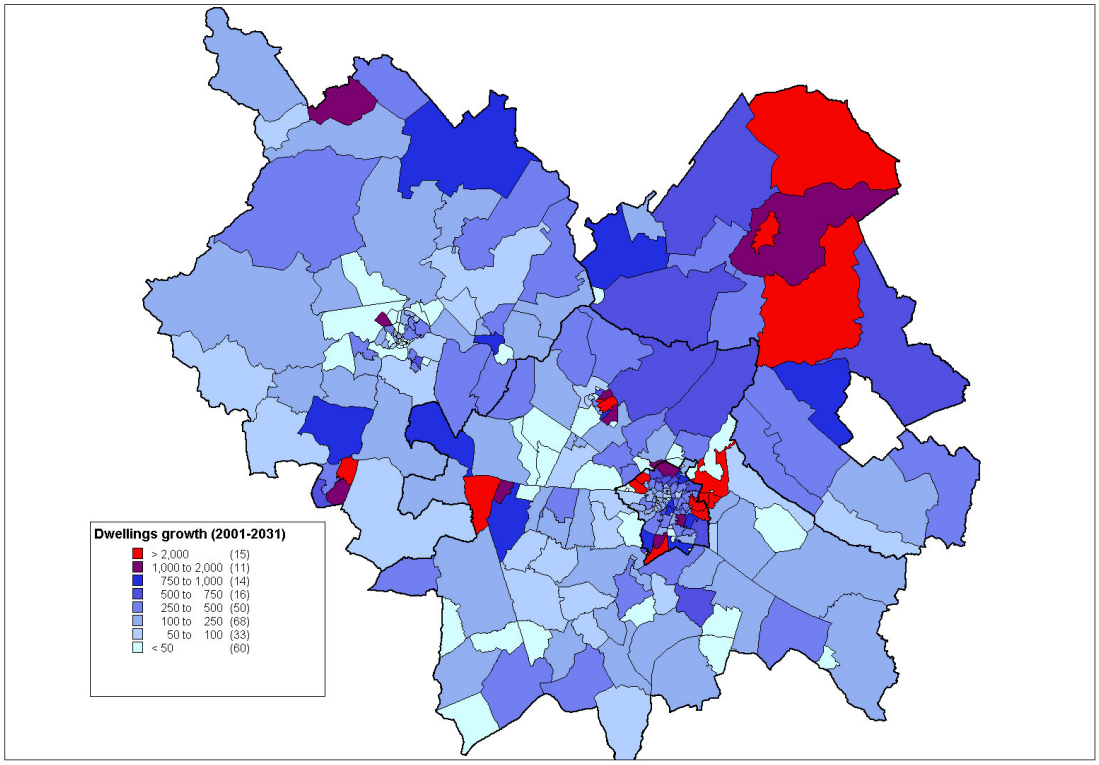


Figure 2.11 Estimated Dwellings growth across the study area

2.2.13 Figure 2.11 above shows a summary of the extent of dwellings growth across the study area, highlighting those zones with total growth in excess of 2,000 dwellings. Note that though Ely and surroundings appear to be a development hotspot, Ely itself is a very large urban zone, and the development from 2001-2006 forms a significant proportion of the total (see Figure 2.3)

2.3 EMPLOYMENT

USE OF EMPLOYMENT IN THE LAND USE MODEL

2.3.1 For the purposes of land use modelling, employment is divided into:

- Endogenous employment, which is generated by the model based on the needs of the local population for services (Education, Retail, Services).
- Exogenous employment (sometimes known as Basic employment) which is defined to be those jobs related to markets that are external to the study area. This includes all Industrial, Transport/Warehousing, Agriculture, and Government jobs, and varying proportions of other employment.

2.3.2 The base year employment[5] is taken from Census 2001, which provides a breakdown of employment into 20 factors (10 industrial classifications, each divided into full-time and part-time).

[5] It should be made clear that "employment" in this context refers to the number of people employed as opposed to the number of jobs. The land use model only considers the first job of each employed person (as declared in the Census) which is relevant to peak period travel. In reality, 'double-jobbing' means that the number of full and part-time jobs is slightly greater, but the census does not capture information to allow validation of this.

2.3.3 These factors are further divided into exogenous and endogenous parts, based on analysis of the Annual Business Inquiry (ABI) data and observation activity descriptions provided with Valuation Office Floorspace data (See description of floorspace data in Section 2.4).

2.3.4 For future years, growth in total employment and exogenous employment are input to the model from TEMPRO 5.4 at study area level:

2.3.5 In forecasting mode, the model is free to locate all types of employment according to availability of suitable floorspace and workforce. In addition, future year levels of endogenous employment are generated by the model based on the requirements of the local residents.

2.3.6 In summary:

- 2001 base year employment is derived from the 2001 Census;
- The model determines the demand for endogenous employment (services), and hence the mix and locations of these services;
- The exogenous (basic) employment is input into the model (from TEMPRO 5.4), but the locations are determined within the model itself;
- The total employment within the study area is an input (from TEMPRO 5.4) which constrains the overall total of exogenous plus endogenous employment by industry.

2.3.7 Appendix B contains more details regarding the derivation of employment numbers from 2001 Census and TEMPRO 5.4, and the correspondence between employment types in the two datasets.

SUMMARY OF EMPLOYMENT PROJECTIONS

2.3.8 Table 2.4 shows how the total modelled employment is divided between exogenous workers (input in each model run) and endogenous workers that the model must create and locate. Economically active students have been removed from the employment data because their work-related trip making activities are not represented in CSRM: these trips are assumed to be outside the peak hours, and hence it is more appropriate to represent students' education trips only. The proportion of endogenous employment rises from 35% to 38% during the study period, arising from the change in employment mix projected by TEMPRO.

2.3.9 Figure 2.12 shows in detail how the employment in the Sub-Region breaks down in 2001 based on these categories, contrasting the amount of Exogenous and Endogenous employment in each category. Four employment types are divided between endogenous and exogenous parts: Retail&Catering, Finance&Business, Education and Leisure/Health/Other. These form 28% of the total employment in 2001.

Table 2.4 Endogenous and Exogenous Employment in CSRM

Model Year	Exogenous Employment	Endogenous Employment	Total Modelled Employment at Workplace	Economically Active Students	TEMPRO 5.4 Total Workplace Workers
2001	163,847	64,862	228,709	5,523	234,232
2006	170,316	70,489	240,805	5,959	246,763
2011	176,990	70,857	247,847	6,133	253,980
2016	190,609	77,736	268,345	6,640	274,985
2021	201,636	82,733	284,368	7,037	291,405
2026	219,126	88,327	307,453	7,608	315,061
2031	241,229	93,069	334,298	8,272	342,570

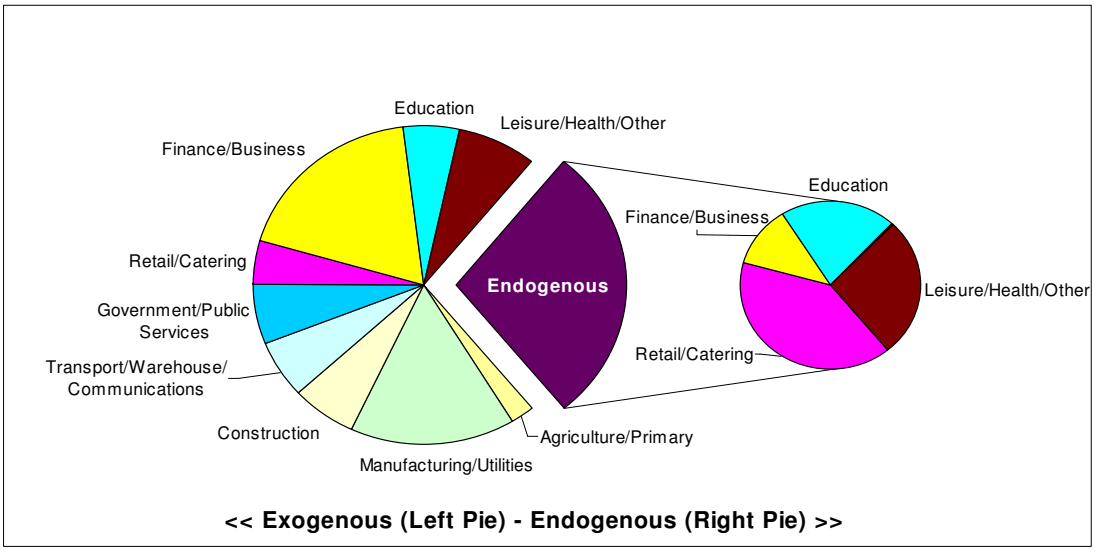


Figure 2.12 Mix of Employment in 2001 showing mix of Exogenous and Endogenous Employment

2.3.10 Figure 2.13 shows employment inputs graphically through time, illustrating how both the total employment (endogenous and exogenous) and the proportion by industry type alters from 2001 to 2031. Note that the proportion of agriculture, manufacturing and construction decreases, whilst retail, finance & business and recreation/health/other all expand. As discussed above, these projections are based on employment mix in the TEMPRO 5.4 employment forecasts. The result is entirely in keeping with anticipated shift towards service sector employment through time.

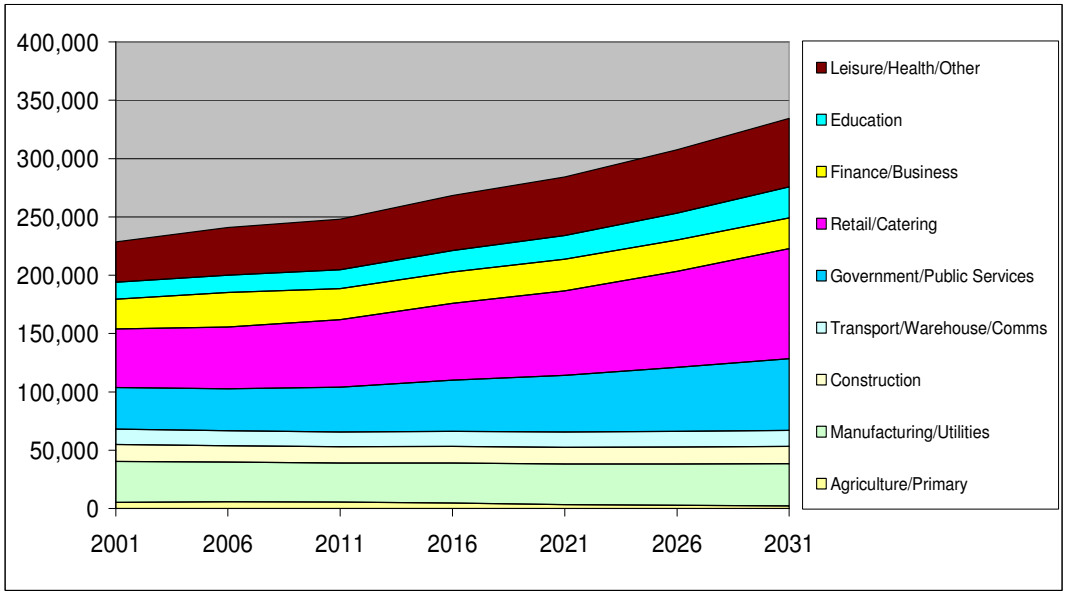


Figure 2.13 Employment Through Time by Industry Type

EMPLOYMENT VS HOUSEHOLDS IN TEMPRO 5.4

2.3.11 Figure 2.14 compares TEMPRO 5.4 forecasts for numbers of workers (at their workplace) and households. Based on this analysis, there will be continued demand for incommuters in the sub-region, increasing particularly in Cambridge itself.

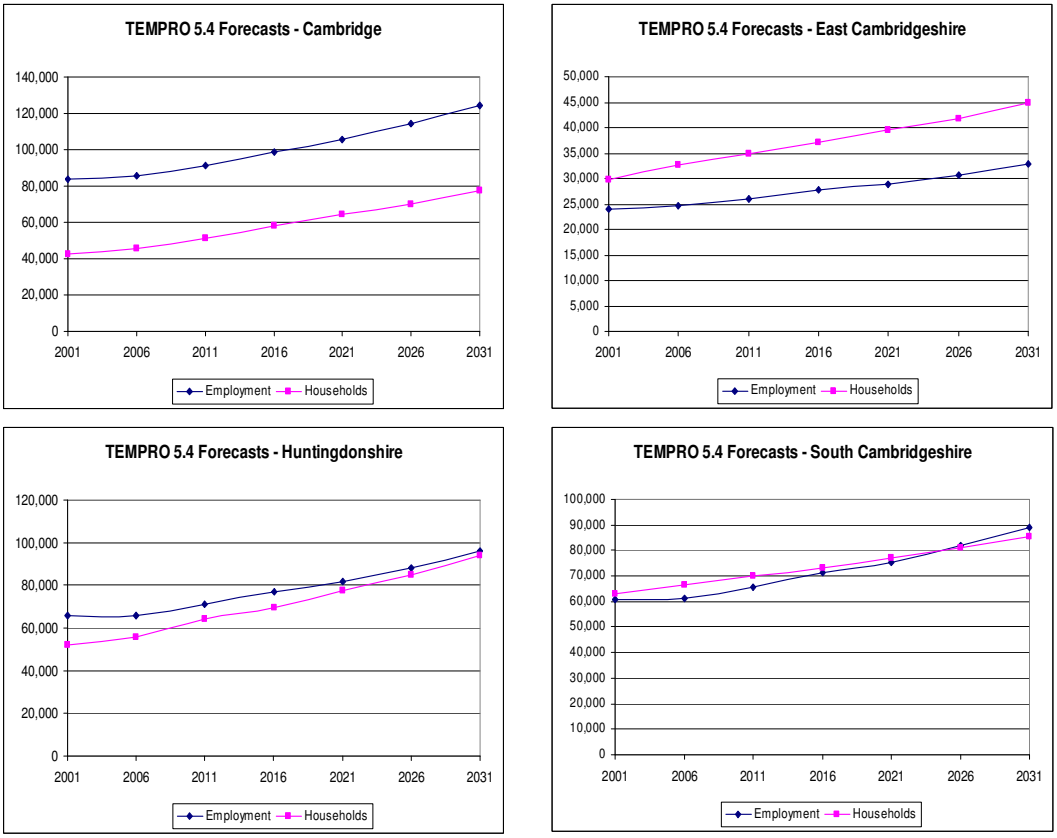


Figure 2.14 Comparison of Households and Employment (TEMPRO 5.4)

2.4 COMMERCIAL FLOORSPACE

USE OF FLOORSPACE WITHIN THE LAND USE MODEL

2.4.1 Within the land use model, certain types of employment can only be located where floorspace is available to accommodate business activities:

- Industrial/manufacturing employment requires factory floorspace;
- Warehousing/Storage/Transport requires warehouse floorspace;
- Retail employment requires retail floorspace;
- Finance/Business employment requires office floorspace;
- Leisure/Health/Recreation/Other employment requires floorspace of those types, categorised as ‘miscellaneous’ or ‘other’.

2.4.2 The requirement for floorspace to be available provides a realistic constraint on employment location. However, the constraint is not absolute as the density of occupation (jobs per square metre) can vary if demand for floorspace is high (and hence floorspace costs rise) within a zone.

2.4.3 This also allows commercial planning data to be entered into the model in the form of floorspace forecasts, which control the areas of employment growth. Floorspace is additionally used as an attractor for destination choice for singly constrained trip types (all discretionary trips and non-home based trips).

2.4.4 The model therefore requires a planning estimate of floorspace changes (increases and decreases) by model zone and floorspace type (industrial, warehouse, retail, office and other), for each model year.

DATA SOURCES FOR FLOORSPACE

2.4.5 Estimates of future floorspace changes were provided by Cambridgeshire County Council, who liaised with planning officers in individual districts. The data was compiled by the Council's Strategic Planning department and is based on planning applications received by the Districts and allocations in the Local Development Frameworks. The information provided was divided as follows:

- For commercial developments >5,000 sqm, a time period (2007-2011, 2011-2021, 2021-2031) was provided;
- For other developments, no year was specified. For these developments, CCC advised that those with detailed planning permission be assumed complete by 2011, and otherwise completion be in 2011-2021.

2.4.6 For each development, a Use Class was specified by CCC, and these were mapped to appropriate modelled employment factors within the model (see

2.4.7 Table 2.5 below). Across each 10 year period, we have assumed that developments happen evenly, so that half of the floorspace is completed in each 5 year model run period.

Table 2.5 Correspondence between Use Classes and Model Floorspace Types

Use Class	Class Description	Model Floorspace Type
B1	Business general	Office
B1a	Offices (excluding financial services)	Office
B1b	R&D , studios, laboratories etc	Office*
B1c	Light Industry	Industrial Floorspace
B2	General Industry	Industrial Floorspace
B8	Storage and Distribution	Warehousing
RTC	Retail Floorspace (Convenience)	Retail Floorspace
RTD	Retail Floorspace (Comparison)	Retail Floorspace
RTU	Retail Floorspace (Unknown type)	Retail Floorspace
A2	Shops	Retail Floorspace
A3	Finance and professional	Office
A4	Restaurants and cafes	Retail Floorspace
A5	Takeaway	Retail Floorspace
C1	Hotels etc	Retail Floorspace
C2	Residential Institutions	Miscellaneous (Leis/Health/Other)
D1	Non Residential- Institutions	Miscellaneous (Leis/Health/Other)
D2	Cinemas etc	Miscellaneous (Leis/Health/Other)
SuiG	Shops and services	Retail Floorspace

* Use Class B1b was initially assigned to Industrial usage, but in future developments there are a series of large R&D and laboratory developments, which have been assumed to be more akin to Office usage.

BALANCE BETWEEN FLOORSPACE AND EMPLOYMENT

2.4.8 Given the location of certain employment types is constrained according to floorspace available, it is useful to determine whether the floorspace and employment forecasts are consistent, providing appropriate space for the employment in the model. An exact match is not required, though there should be a suitable correspondence. (The Land Use model will respond by lowering/raising the price of floorspace according to demand, and also adjusting the occupancy rates: assigning more jobs per square metre where demand or unit cost is high).

2.4.9 The following graphs compare growth assumptions for floorspace with the expected growth in employment for each individual district and for the study area as a whole. As described in Section 2.3.6, the total employment is constrained to TEMPRO 5.4 totals at study area level only, allowing re-allocation between districts. However, a comparison of model floorspace capacity against TEMPRO at district level is helpful in assessing whether the level of floorspace development is sufficient (or excessive) to match projected employment growth.

2.4.10 Figure 2.15 shows that growth in industrial and warehouse floorspace outstrips employment growth considerably across the study area. However, retail employment growth is in excess of floorspace available. For office and miscellaneous (other) floorspace, the growth is more evenly matched, though the timing of development may require reviewing.

2.4.11 The district level charts show that the excess industrial/warehouse floorspace is chiefly in Cambridge and South Cambridgeshire, whereas Huntingdon and Cambridge have too little retail floorspace.

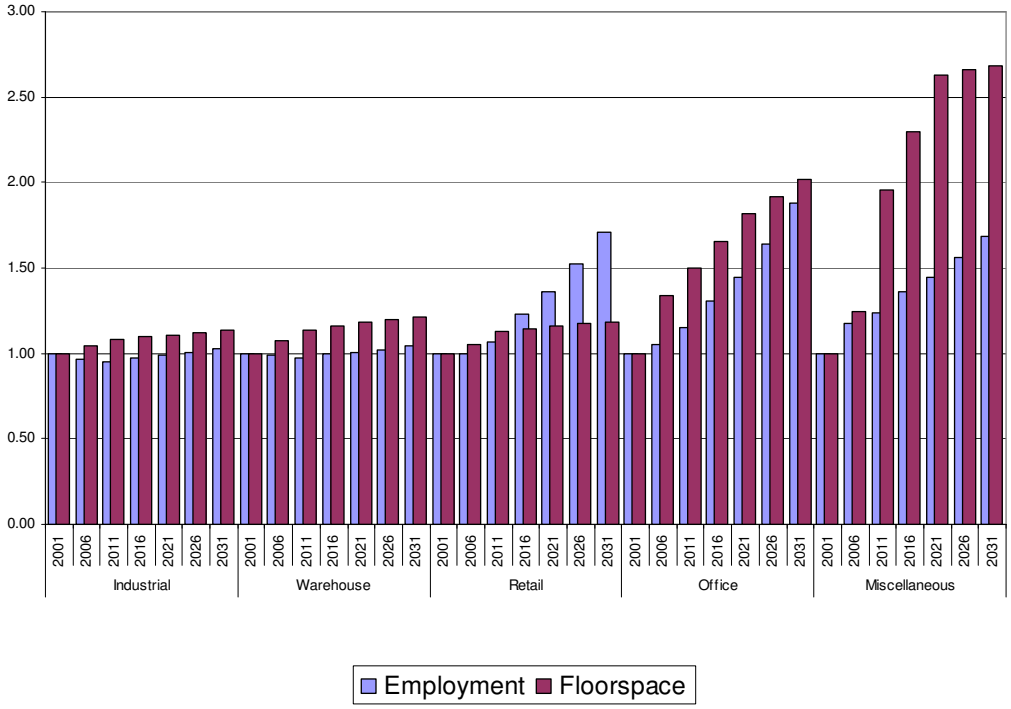


Figure 2.15 Expected Jobs and Floorspace Growth (Indexed, 2001=1)

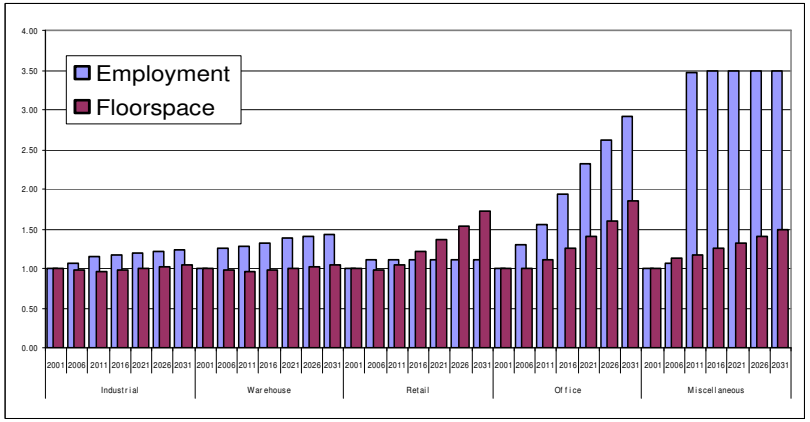


Figure 2.18 Expected Jobs and Floorspace Growth in East Cambs

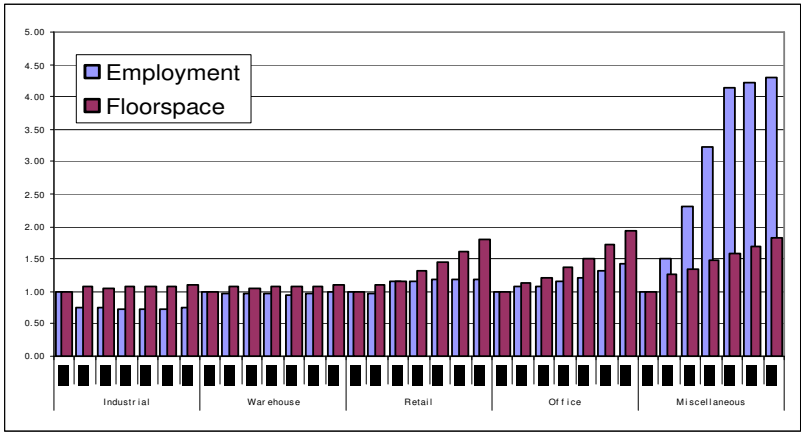


Figure 2.16 Expected Jobs and Floorspace Growth in Cambridge

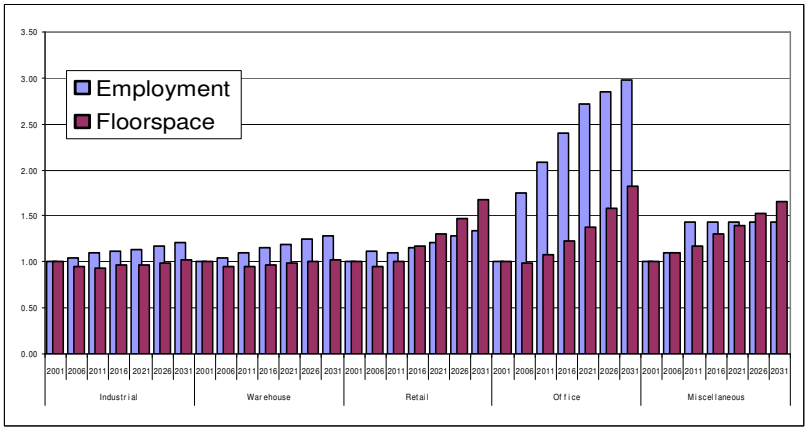


Figure 2.19 Expected Jobs and Floorspace Growth in South Cambs

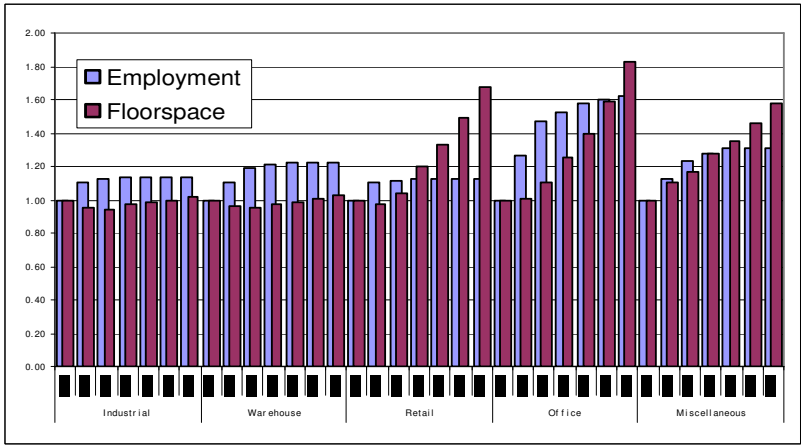


Figure 2.17 Expected Jobs and Floorspace Growth in Huntingdonshire

Table 2.6 Estimated Square Metres Per Employee

	2001	2006	2011	2016	2021	2026	2031
Industrial	54	59	61	60	60	60	60
Warehouse	98	107	115	114	116	115	115
Office	19	24	25	24	24	22	21
Retail	24	26	26	23	21	19	17
Miscellaneous	11	12	18	19	21	19	18

2.5 DISTRIBUTION OF FLOORSPACE GROWTH

2.5.1 The maps on the following pages illustrate the spatial distribution of floorspace by broad employment type, across the model Land Use zones.

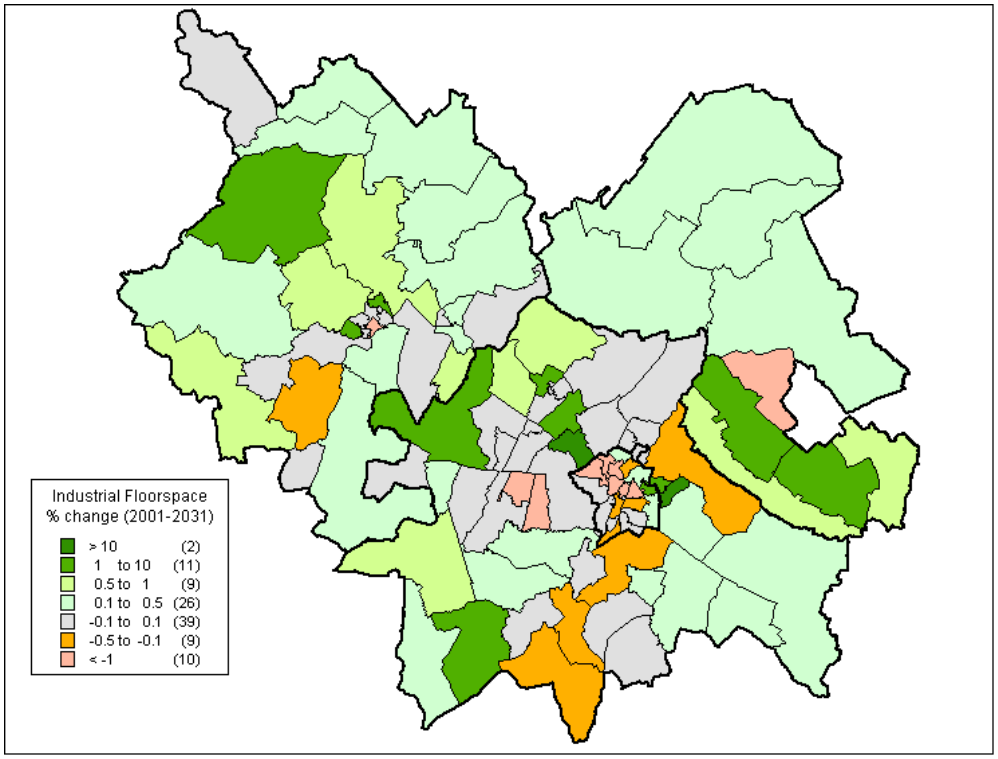


Figure 2.20 Expected Growth in Industrial Floorspace (Relative to 2001 VOA Figures)

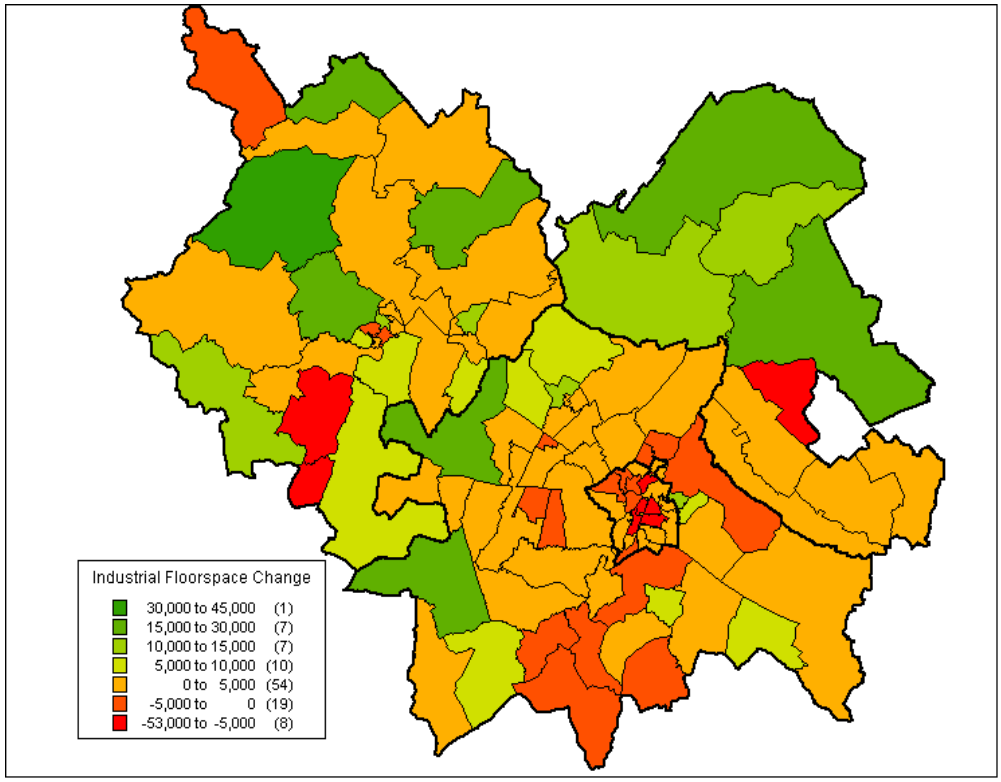


Figure 2.21 Distribution and Magnitude of Changes in Industrial Floorsp (Sq. Metres)

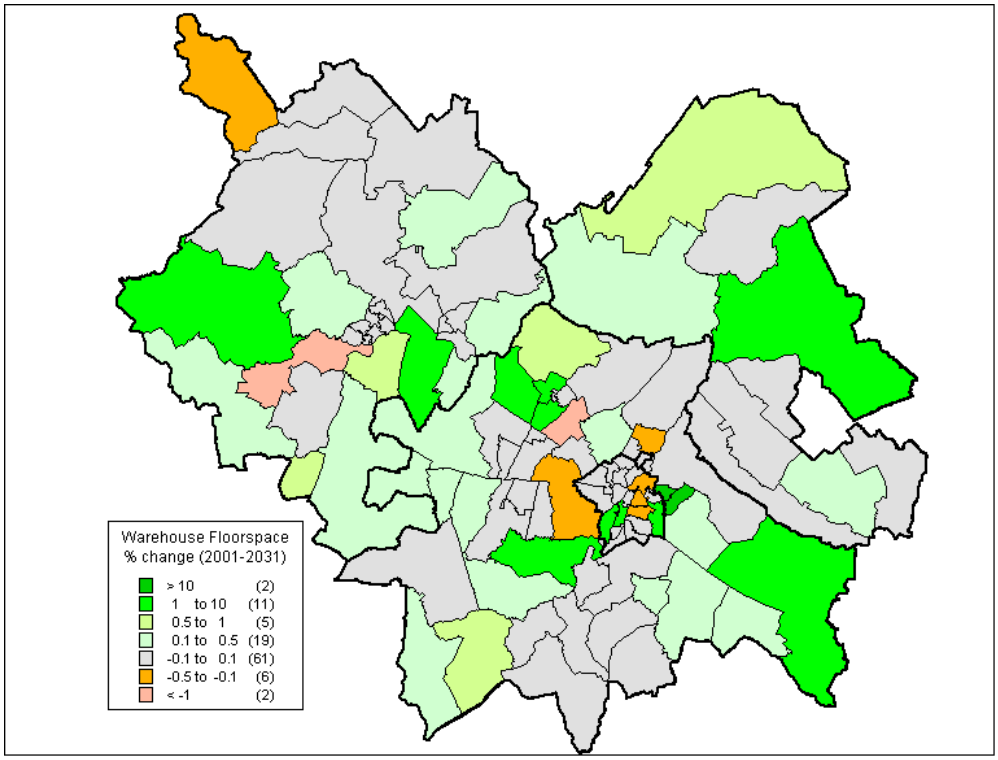


Figure 2.22 Expected Growth in Warehouse Floorsp. (Relative to 2001 VOA Figures)

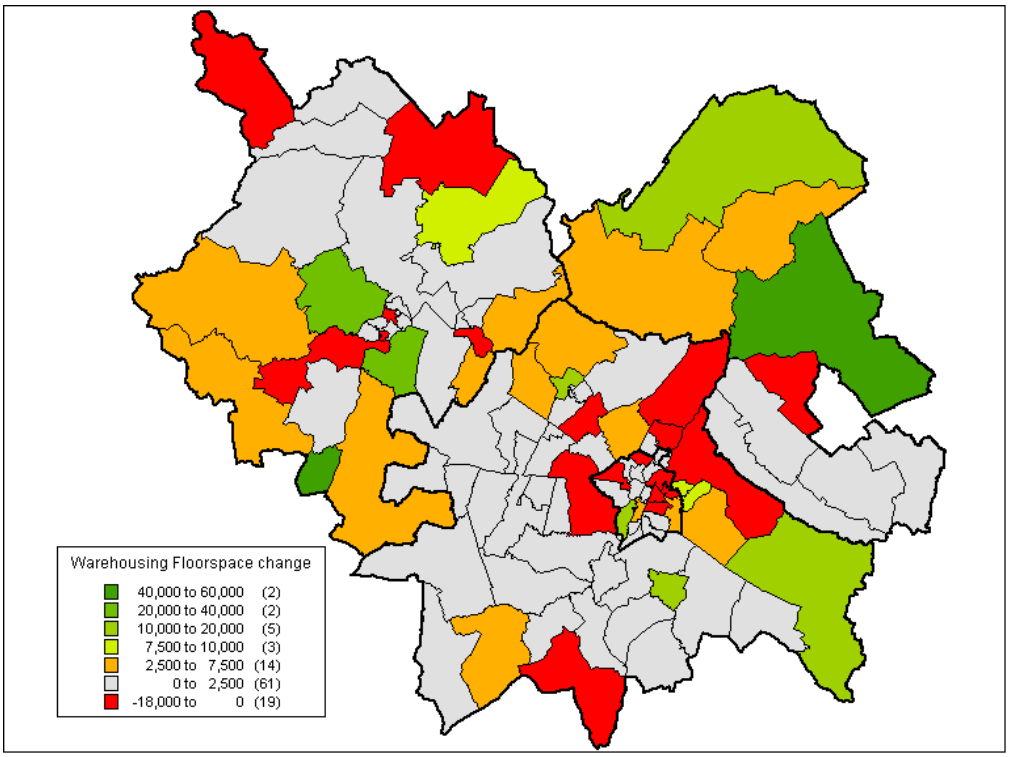


Figure 2.23 Distribution and Magnitude of Changes in Warehouse Flsp. (Sq. Metres)

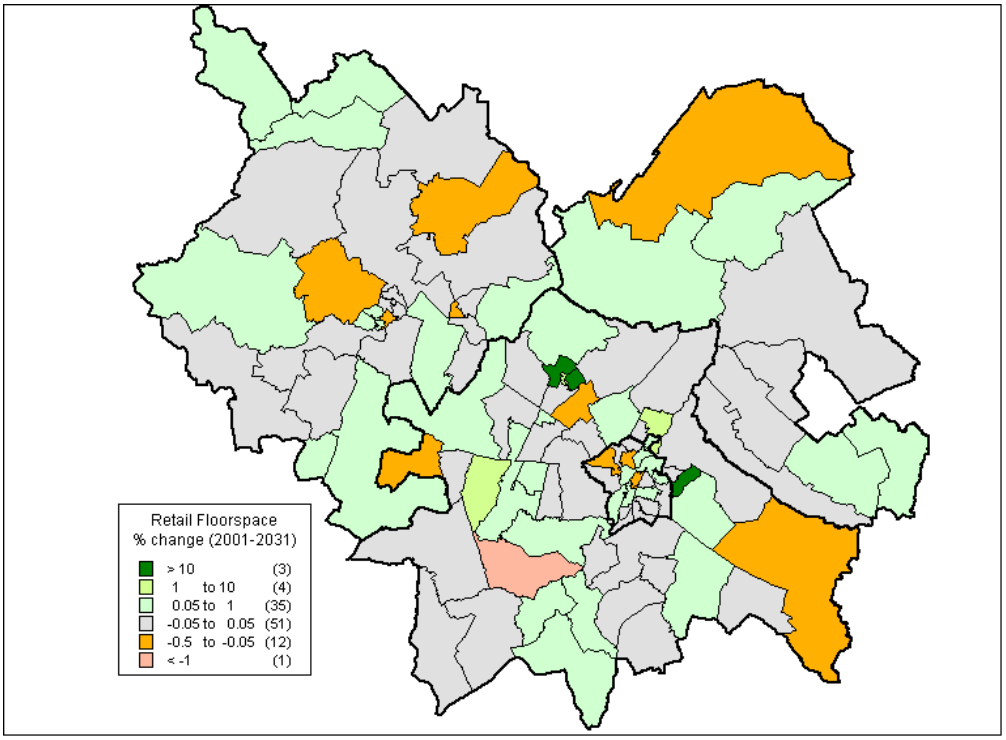


Figure 2.24 Expected Growth in Retail Floorspace (Relative to 2001 VOA Figures)

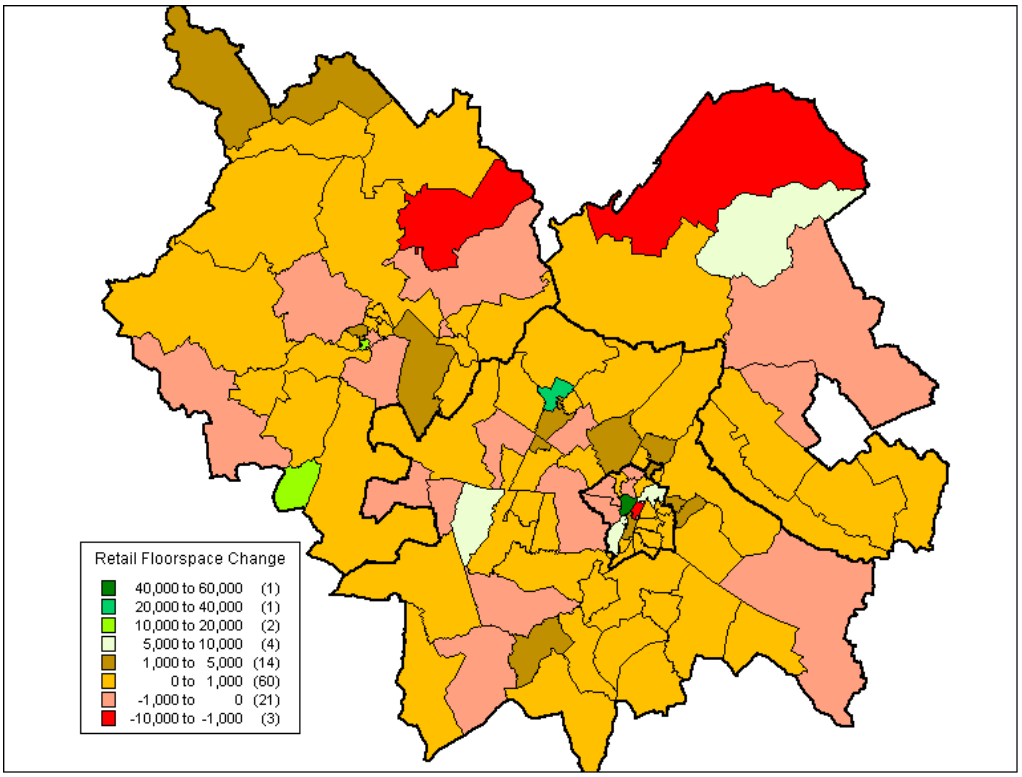


Figure 2.25 Distribution and Magnitude of Changes in Retail Floorspace (Sq. Metres)

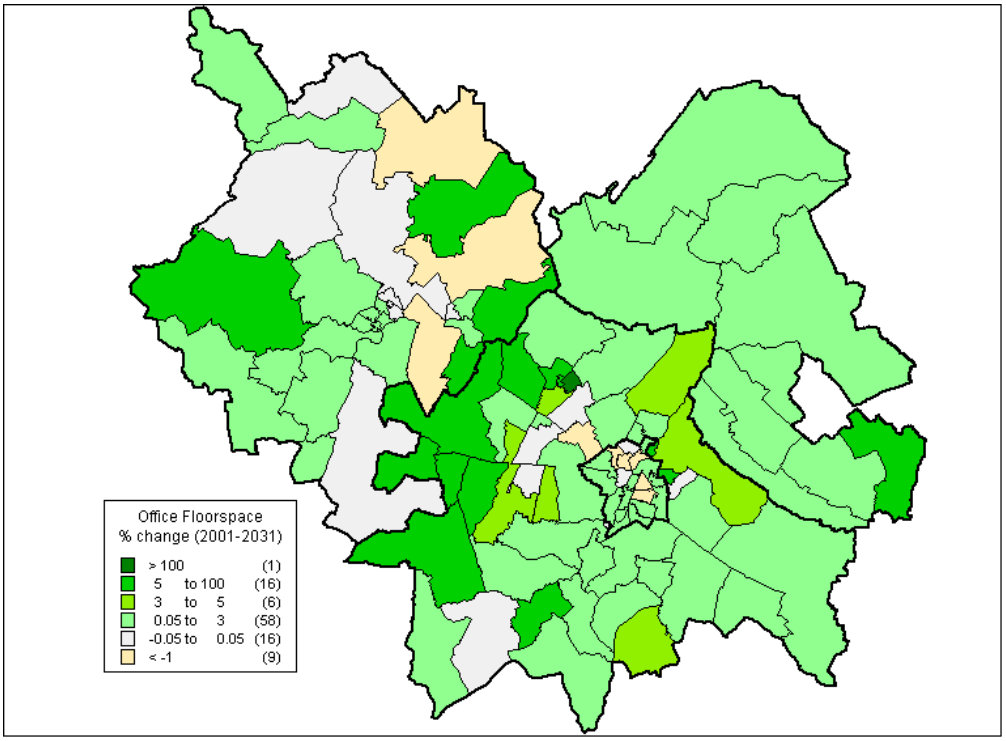


Figure 2.26 Expected Growth in Office Floorspace (Relative to 2001 VOA Figures)

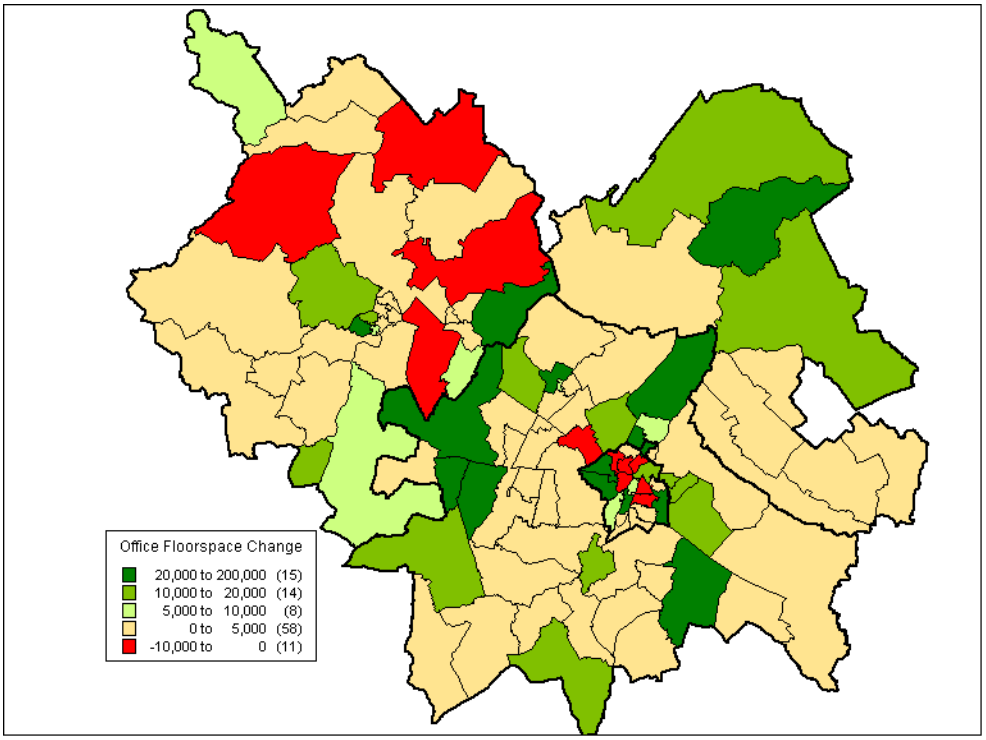


Figure 2.27 Distribution and Magnitude of Changes in Office Floorsp. (Square Metres)

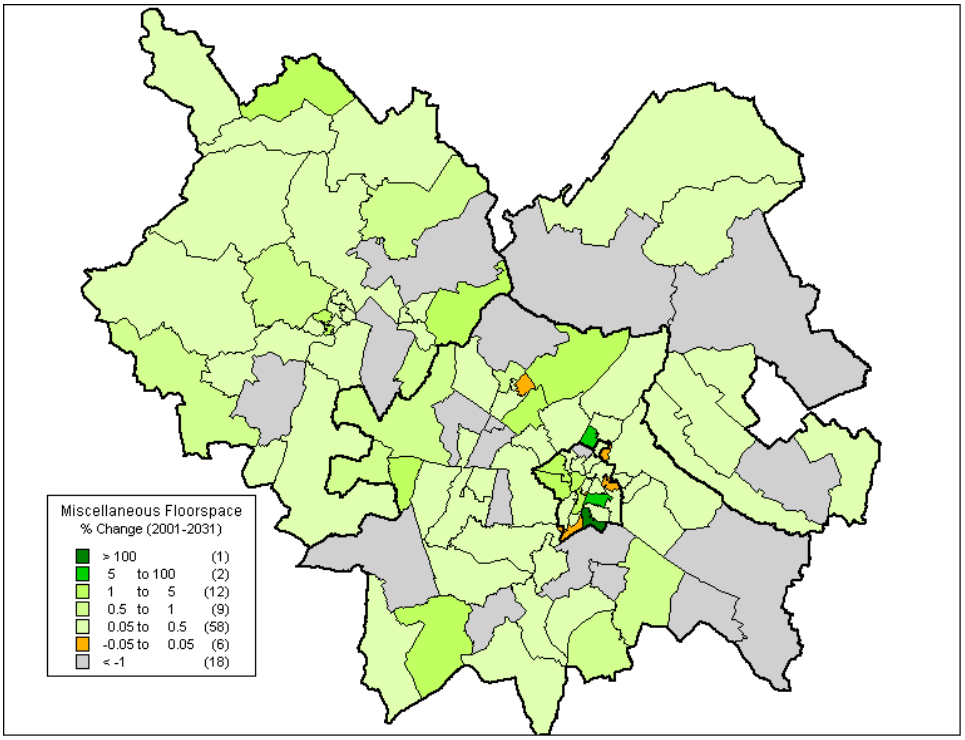


Figure 2.28 Expected Growth in Leis/Health/Other Floorsp. (Relative to 2001 VOA)

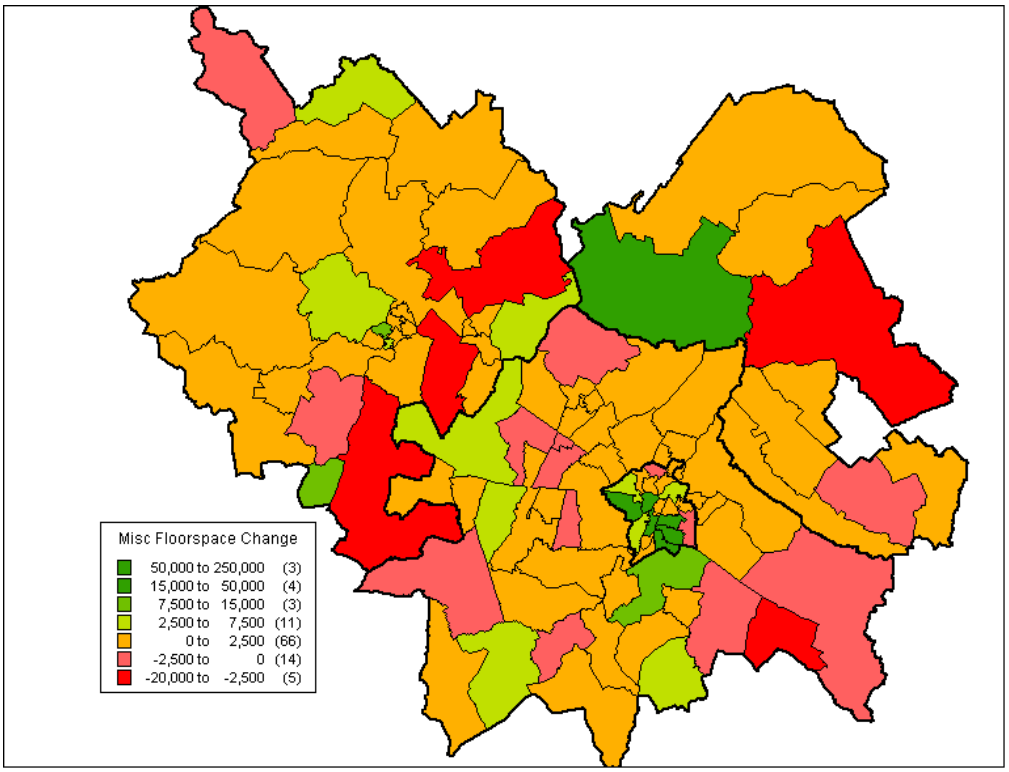


Figure 2.29 Distribution and Magnitude of Changes in Leis/Health/Other (Sq.m)

2.6 OUTCOMMUTERS

2.6.1 The model assumes that a number of workers resident in the study area will commute to external locations such as Haverhill, Saffron Walden and London. The 2001 out-commuting numbers and destinations have been taken directly from the 2001 Census. As the number of jobs in these areas and attractiveness to Cambridgeshire residents cannot be determined within the model, the future number of out-commuters to each external zone is input directly to the model based on separate calculations.

2.6.2 These projections are calculated as a uniform growth across all destination zones, using TEMPRO 5.4 jobs growth in the study area.

2.7 GROWTH IN STUDENTS AND NON-EMPLOYED RESIDENTS

2.7.1 In addition to population changes driven by employment (and hence growth in employed households), the Land Use model incorporates growth in numbers of students and non-employed individuals. These factors are determined by inputting to the model projected figures for:

- Non-employed households, separated into the unemployed and retired or otherwise economically inactive;
- Numbers of student households;
- Numbers of communal establishment residents, both students and non-employed.

NON-EMPLOYED HOUSEHOLDS

2.7.2 Non-employed households comprise the retired, economically inactive and unemployed populations. Their numbers are assumed to grow through time based on:

- TEMPRO 5.4 projected growth in the population aged 65 and over;
- TEMPRO 5.4 projected shift to 1 adult households (being less affluent, retired households are assumed to make this transition at half the rate projected for the population as a whole);
- An assumed decrease in the 65+ population who are in retired households of 1% p.a. (due to increases in age that the population retires);
- The number of unemployed households is assumed to fall at 0.4% p.a. (a lower rate of decrease than that assumed in TEMPRO 5.4).

2.7.3 Table 2.7 below summarises the change in student and non-employed households as input to the model. Note that these figures are input as study area totals, with household location determined by the model based on availability of dwellings and attractiveness of locations to each type of resident.

Table 2.7 Forecasts of Student and Non-Employed Households

		Forecasting Year						
Household Status	**Adults**	**2001**	**2006**	**2011**	**2016**	**2021**	**2026**	**2031**
Unemployed	1	6,628	7,261	7,116	6,974	6,834	6,697	6,564
	2+	4,240	4,645	4,552	4,461	4,372	4,284	4,199
Retired/economically inactive	1	21,268	23,300	27,949	33,282	37,101	40,497	46,412
	2+	16,448	18,020	19,482	20,841	21,165	21,310	22,356
Student Households		2,972	3,562	3,737	3,963	4,251	4,567	4,912

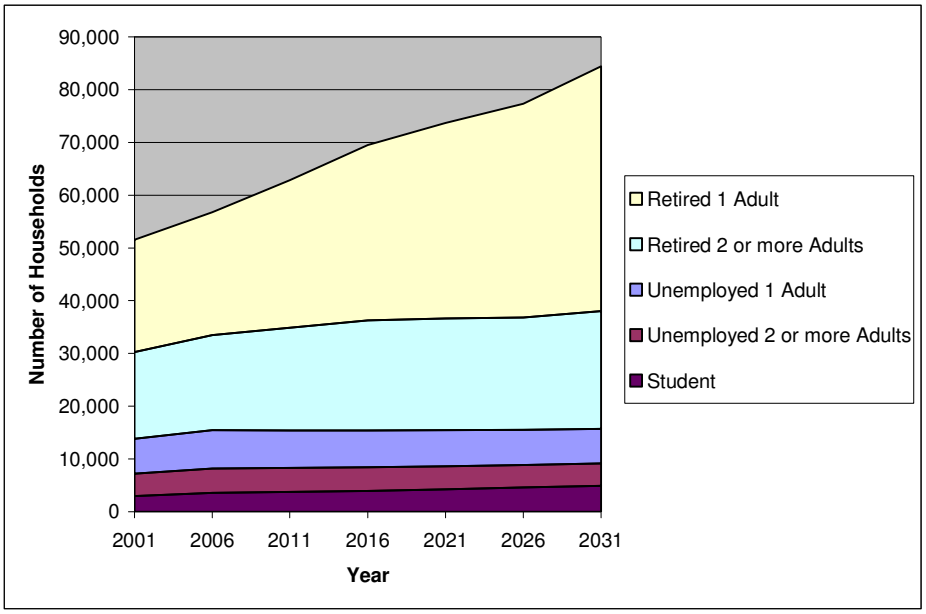


Figure 2.30 Growth in number of Unemployed, Retired and Student Households

STUDENTS

2.7.4 In the Land Use model, students are located in both households and in communal establishments (i.e. halls of residence). It has not been possible to obtain firm projections of growth in student numbers, however informal advice from the University of Cambridge, Anglia Ruskin University and CCC has established the following general assuptions:

- Growth in student numbers at Anglia Ruskin of 2% p.a.
- Growth in undergraduate numbers at Cambridge University of 0.5% p.a.
- Growth in postgraduate numbers at Cambridge University of 2% p.a.

2.7.5 These assumptions lead to an increase in the number of students from approximately 23,000 in 2001 to 38,000 in 2031 (65% growth).

2.7.6 Based on 2001 Census, 55% of students live in communal establishments, and the remaining 45% in households. This proportion is assumed to be constant through time, which provides the total number of students in halls of residence. Growth in

students in halls of residence has been provided by the universities, covering planned developments in north-west Cambridge (2,500 places) and at Cambridge railway station (1,300 places). The remaining growth in places in halls has been spread across Cambridge based on 2001 patterns.

2.7.7 The total number of student households is calculated using an assumption that the household size remains constant at 3.5 students per household. As for non-employed households, student households are free to locate in any dwellings across the study area.

OTHER COMMUNAL ESTABLISHMENT RESIDENTS

2.7.8 No change is made to numbers of other (non-employed) communal establishment residents (i.e. assumed fixed through time). These residents are largely retired or in other residential medical care, and are therefore not expected to participate significantly in trip generation.

2.8 LINKING THE LAND USE AND TRANSPORT DEMAND MODELS

2.8.1 Table 5.1 of the Model Development and Validation Report lists the outputs from the Land Use Model which are utilised as trip ends (productions and attractions) within the Transport Demand Model. The mechanism for future years is essentially as described there, with the following exceptions:

- For Discretionary and Employer's Business trips, the external trip ends (both production and attraction) cannot be derived in the model. The base year numbers are simply scaled according to growth in study area population[6].
- The zone-matching relationships used to convert trip ends from Land Use Model Zones to Transport Demand Model Zones are altered in future years based on projected changes within the Land Use zones. The proportions used vary by trip type as well as by year and are calculated based on the land-use assumptions specified earlier in this chapter, which were derived at transport zone level for precisely this reason.

2.8.2 For further information on the connections between the Land Use Model and the Transport Demand Model see Chapter 5 of the MDVR (WSP, 2009) and Section 6 of this report.

[6] Growth from 2006 to future years was established during previous Land Use model runs, therefore requiring update for scenarios with significantly altered population growth.

3 Changes in Travel Demand Input Assumptions

3.1 TRIP RATES

3.1.1 TAG Unit 3.1.2, Section 5 (DfT, June 2005) suggests that total trip rates vary relatively little between areas with quite different costs of travel, once significant differences between “person types” are allowed for, and provided that all trips (including relatively short walk trips) are included. However, trip lengths and mode choices (and thus the total travel by each mode) vary significantly according to the characteristics of the travel choices available.

3.1.2 A good simplification in multi-modal forecasting is, therefore, to treat the total number of trips as being constant within each planning scenario, but - at least in principle - to model changes in mode and destination choices in response to changes in generalised cost which arise both from congestion and the impact of policy action.

3.1.3 In CSRM this is achieved by using the Land Use Model to generate future year trip ends which are responsive to land use changes (employment, housing and commercial developments), but assume **fixed trip rates by trip type and person type**. (For policy-testing, these Reference Case trip ends are identical in the Do Minimum and Do Something). The TDM then determines the transport demand response based on changes in generalised costs through time or between scenarios.

3.1.4 The MDVR report (WSP, 2009) describes the derivation of the trip rates for the model base year (2006).

3.1.5 Though fixed future year trip rates are assumed in the Reference Case and current policy tests, changes to trip rates and their impact on transport demand, e.g. possible gradual reduction in trip rates due to tele-commuting, can be included in further policy scenarios, if required.

3.2 HIGHWAY DEMAND PIVOTING

3.2.1 The Transport Demand Model incorporated within CSRM produces synthetic matrices in an *absolute* form (that is the absolute number of trips is forecast in each year, rather than being expressed as a change from the previous year), for highway trips as well as public transport and slow modes (walk and cycle).

3.2.2 Because the synthetic highway matrices are not suitable for direct assignment within SATURN, a matrix pivoting process has been developed whereby the base year (2006) SATURN matrices are scaled in line with growth in the synthetic growth forecast by CSRM. The mechanism for carrying out the pivoting is described in section 6.13 of the MDVR (WSP, 2009). In this section the implementation of future year scalings is explained.

3.2.3 The basic method for scaling future year demand is derived using the following four matrices (terminology here is equivalent to that in section 6.13 of the MDVR, but refers specifically to future years):

- B denotes the 2006 Base year (validated) SATURN matrix;

- X denotes the equivalent 2006 CSRM synthetic highway demand matrix (aggregated to SATURN User Classes and converted to vehicle trips as described in the MDVR section 6.12);
- Y denotes the future year CSRM forecast synthetic matrix;
- F denotes the forecast SATURN matrix, which is derived as:
  - F[o,d,uc] = B[o,d,uc] * (Y[o,d,uc] / X[o,d,uc])

3.2.4 There are however a series of modifications to this process, as follows:

- In future years (as in the base year), the scaling process is constrained so that district level scalings are maintained (i.e. the scalings for zone pairs within a district-district pair are adjusted so that the district-district scaling is always correct).
- Exogenous adjustments are added to account for external-external trips and goods vehicle trips not dealt with by CSRM (see 3.3 below).
- Where transport or land use developments in the Reference Case will radically alter demand for specific zones, special steps have been taken to ensure the impacts are passed to SATURN.

3.2.5 The latter category includes the following specific cases:

- The Park and Ride site at Cowley Road was relocated to Milton (north of the A14) in 2008, and is represented by a new zone in CSRM/SATURN in 2011, which hence has no prior demand in 2006. To accommodate this, all trips from Cowley Road Park & Ride site in B (the SATURN Base Year matrix) are moved to Milton Park & Ride site for runs in 2011 onwards. Changes to the CSRM network ensure that previous Cowley Road users transfer to the new site (as would be anticipated) after 2011 (matrix Y), and the scaling applied compares future year Milton Park and Ride demand with 2006 Cowley Road Park and Ride demand.
- There are two new Park and Ride sites (St Ives and Longstanton/Northstowe) which only exist in future years and have no base travel demand volume to scale from. The travel demand to/from these zones is copied directly from the synthetic forecast matrix Y to the SATURN forecast matrix F.
- To simulate the effect of the movement of part of Huntingdonshire Regional College from one site to another it was agreed with Atkins that the travel demand associated with the zone containing the original site should be split. We assume that 20% of the original travel demand will be transferred to the zone containing the new site and 80% will remain with the original zone.
- For zones with very high rates of house-building, the travel demand in future years is many times greater than the demand in the base and will be expected to follow very different travel patterns (both because the new residents will differ from any existing residents, and because new transport linkages have been developed). For selected zones where this applies, the synthetic demand is transferred directly to the SATURN future year matrix (i.e. F[o,d,uc] = Y[o,d,uc]).

Table 3.1 Growth Zones identified for scaling process

Area	Site	Transport Zone	Abs Growth	%age Growth
Cambridge North West	Huntingdon/Madingley Rd	14	2,168	>500%
	Huntingdon/Histon Road	15	2,468	>500%
	Arbury Camp	73	1,711	>1,000%
Southern Fringe	Bell School	51	851	>1,000%
	Clay Farm/Glebe Farm	58	2,125	>500%
	Clay Farm	61	1,988	>250%
	Trumpington Meadows	62	907	>500%
	TM / Monsanto	1441	681	new site
Cambridge East	North of Newmarket Road	1487	3,699	>1,000%
	Airport	76	3,158	>15,000%
		1474	2,788	>2,500%
	North of Cherry Hinton	6	2,224	>1,500%
		17	2,003	>250%
Northstowe	Northstowe	1429	1,591	new site
		1448	973	new site
		1449	2,665	>1,500%
		1450	2,600	>15,000%
		1452	594	new site
		1453	1,970	new site
Other sites	North Bridge	1205	1,438	new site
	Loves Farm	1272	2,791	>200%
	Cambourne	1417	1,263	>250%
		1418	3,053	>1,500%

3.2.6 The assumptions relating to growth zones and the addition of new Park and Ride sites are scenario specific, and may be altered when considering alternative growth projections or transport plans.

3.3 GOODS VEHICLE AND THROUGH TRIPS DEMAND

3.3.1 There are two key traffic types which for which trip patterns and numbers are not derived within the Transport Demand Model:

- **Good vehicle trips:** Heavy Goods Vehicles (HGVs) and Light Goods Vehicles (LGVs) used for goods transport are not modelled in the demand model.
- **External-external ('through trips'):** Trips which cross the study area but do not have either end within the study area are not modelled, for any vehicle type of trip purpose.

3.3.2 In each case, a modification has been applied outside the Transport Demand Model, as part of the pivoting process between CSRM and the SATURN LHM, whereby the growth in CSRM synthetic demand is applied to the SATURN base year matrices. The alterations to SATURN demand are summarised in Table 3.2.

Table 3.2 Sources for Goods Vehicle demand forecasts

Sector	Vehicle size	Purpose	LHM User Classes[7]	Source for forecast matrix
External-External (through trips)	All light vehicles inc. LGVs	All inc. LGV goods transport	1-8 (all lights)	EERM
	HGV	Goods transport	9-10 (HGV1, HGV2)	EERM
To/from study area	LGVs	Passenger transport	1-8 (all lights)	TDM growth factors
	LGVs	Goods transport	5 (EB)	Exogenous scaling factor (see text)
	HGVs	Goods transport	9-10 (HGV1, HGV2)	NRTF growth factor

3.3.3 Light Goods Vehicles used for **passenger transport** are included in the LHM matrices and TDM passenger model in the same way as cars. LGVs are not separated by trip purpose in CSRM, although a significant proportion of LGVs used for passenger transport is included in the Employer's Business (EB) user class.

3.3.4 In terms of the HGV and LGV trips for goods delivery, in the base year goods vehicles were included in the Road Side Interviews (RSIs), so that base year Goods Vehicle (GV) demand (both HGVs and LGVs) is fully represented in the SATURN highway matrix as described in the highway assignment submodel (LHM) documentation (Atkins, SATURN LHM LMVR, July 2009).

3.3.5 The TDM passenger model is expected to produce around 10% fewer LGV goods delivery trips than the RSI or the LHM in the base year, as described in the MDVR (WSP, 2009 – see Section 6.14).

3.3.6 The future LGV demand forecasting therefore required an additional growth adjustment regarding LGVs carrying goods. The approach adopted is to apply a separate growth trajectory adjustment to a proportion of the EB purpose within the future TDM (passenger) model. Specifically, the forecast SATURN highway demand matrices for Employers' Business traffic (SATURN User Class 5) with one trip-end in the Study Area and one trip-end outside it are multiplied by a factor of between 1.08 and 1.16 (depending on the time of day).

3.3.7 Similarly, SATURN's demand matrices for HGVs (User Classes 9 and 10, excluding external-external trips) are scaled before assignment in future years using growth rates taken from the National Road Traffic Forecasts (DfT, NRTF, 1997)[8]

[7] Atkins, Cambridge Sub Regional Model - Highway Model Component: Model Development and Validation Report, July 2009

[8] For trips to/from zones 2012 and 2014 (the A14 service areas, which are internal zones mostly used by through traffic), a separate multiplier derived from TEMPRO has been used, supplied by Atkins and applied in the same manner as the NRTF factors.

3.3.8 External-external trips are modified using absolute changes in external-external trips for all modes (UC 1 to 10) taken from the East of England Regional Model (EERM), as supplied by Atkins for this purpose. The files supplied are described in Forecast Highway Matrices for CRSM (Atkins, Technical Note 9, 2009). The figures applied in the Reference Case run correspond to an EERM forecast which includes A14 widening in 2016.

4 Transport Demand Model (TDM) Structure and Definition

4.1 OVERVIEW

4.1.1 This chapter describes the transport schemes coded into the CSRM as a representation of the Reference Case level of public transport services, public transport infrastructure, walk and cycle provision.

4.1.2 The representation of PT, walk and cycle network schemes is based on information provided by CCC, Atkins and SDG.

4.2 TRANSPORT SUPPLY IN THE REFERENCE CASE SCENARIO

4.2.1 Section 1.3 describes how the Reference Case has been defined to coincide with a situation where the A14 is widened, no road-pricing or Transport Innovation Fund (TIF) schemes are implemented, and housing and employment develop according to existing allocations for Cambridgeshire (as described in Section 2).

4.2.2 In addition to A14 widening, the Reference Case assumes completion of the Cambridge Guided Bus development, and that additionally public transport and cycle provision expands to support the development of the new housing areas around Cambridge.

4.3 HIGHWAY INFRASTRUCTURE

4.3.1 All aspects of highway infrastructure supply have been provided through the incorporation of the SATURN Local Highway Model in CSRM. The SATURN model and networks are provided by CCC's consultants Atkins. The method of incorporation of the SATURN model in CSRM is described in the Model Development and Validation Report (WSP, 2009). SATURN network data is used to inform the bus timings, both in model preparation and to constrain bus speeds during model running (WSP, 2009, MDVR Section 3.3).

4.4 SOURCES FOR REFERENCE CASE SCHEME SPECIFICATION

4.4.1 The original specifications for coding of public transport and cycle infrastructure in the Reference Case have in most cases been received from Cambridgeshire County Council's consultants SDG and Atkins, and where specific documents were provided, these are referenced in what follows. The final service details have been reviewed by SDG, and changes made to represent the most up to date thinking on the Reference Case schemes.

4.5 BUS AND GUIDED BUS SERVICES AND INFRASTRUCTURE

4.5.1 The details of the Reference Case bus and guided bus schemes are laid out in the following tables and figures.

4.5.2 From the outset, the definition of do minimum transport schemes has been linked to the employment and housing developments committed to occur in the Cambridge Sub-Region, with the PT schemes supporting those schemes. Table 4.1 gives a summary of the key development sites and the PT provision coded in the Reference Case. Section 2 of this report provides a detailed description of the development sites themselves.

4.5.3 Table 4.2 provides further details of the public transport schemes that serve new developments and their representation in the model by model year. Additional comments are given for the schemes that are not represented in the current version of the model. In most cases this is because there was insufficient impact on effective transport supply levels within the model, or because the service could be effectively represented without explicit changes to coding.

4.5.4 Figures 4.1 to 4.9 which follow show the routes of the new and altered services outlined in these tables. Table 4.3 then provides details of the service type, frequency and journey time for each of the new or altered services.

Table 4.1 PT Schemes implemented for each development site

Area	SITE	2007-2011	2011-2016	2016-2021	Services Implemented
Cambridge North West	Huntingdon/ Histon Road	400	1,380	0	No new PT services coded in the Ref Case. Location of new housing and services gives no effective level of service change.
	Huntingdon/ Madingley Road	0	1,200	350	
	Arbury Camp	800	400	200	Citi 4 (Year: 2011)
Northern Fringe	Sewerage Works	0	0	0	Low quality Northern Fringe bus (Year: 2016 -2021)
	Chesterton Sidings	0	0	0	
Southern Fringe	Bell School	500	150	0	Guided Bus (D01e/f) & citi4 (Year: 2011)
	Clay Farm	800	1,500	0	Guided Bus (D01a/c/b/d/e/f) (Year: 2011)
	Glebe Farm	200	100	0	Guided Bus (D01a/c/b/d) (Year: 2011)
	Trumpington Meadows/Monsanto	590	580	0	Guided Bus (D01a/c/b/d) (Year: 2011)
Cambridge East	North of Newmarket Road	500	1,550	1,000	High Quality service No 2 (D01h: Year 2011), amended Service 26
	Airport	0	1,350	1,350	High Quality service No 1, 3&4 (D01g, D01j, D01k: Year 2016)
	North of Cherry Hinton	0	0	1,500	High Quality service No 4 & 3 (D01j, D01k: Year 2016)
Northstowe	Northstowe	550	3,200	4,400	Guided Bus access link adjustment (Year: 2016)[9]
Other sites	Loves Farm	850	400	650	No new PT service assumed and limited impact on Cambridge
	North Bridge	400	500	350	
	Cambourne	1,200	800	0	Citi 4 (Year:2006/2011)

[9] Before 2016 the guideway bypasses Northstowe along the (previous) rail line but from 2016 some services are expected to pass directly through Northstowe before re-joining the guideway. The impact of this is represented in the model using reduced access times from Northstowe zones, but with no alteration to bus times to Cambridge.

Table 4.2 Details of public transport schemes represented in CSRM

Strategy/ Development	Scheme	Open by	Development Served	Details of Service and Coding
Guided Bus	Guided Bus Infrastructure and base services	2011	Northstowe / Arbury Park / Southern Fringe	Coded. Services D01a+c (See Figure 4.1D01b+d (Figure 4.2), D01e+f (See Figure 4.3
	Guided Bus related: Frequency reduction of existing A14 services (1A/5, 553-6)	2011	n/a	Future year frequency reduced to 1 bus per hour (original frequency was 2 for 1A/5, and 3 for 553-6 buses per hour).
	Guided Bus (Northstowe re-routing)	2016	Northstowe	Before 2016 GB bypasses Northstowe, but GB is expected to go through Northstowe once housing development is in place. The impact is represented in the model through access time reduction for the zones that are within the Northstowe region. Physical rerouting and re-timings are not implemented
Southern Fringe	Amended Service 26 to call at Trumpington Meadows	2011	Trumpington Meadows	Frequency increased from <1 per hour to 4 per hour. Physical rerouting is not implemented, but the model represents the effect of the bus service calling at Trumpington Meadows via an access link connecting Trumpington Meadow zone to bus service network.
	New Service (Trumpington Meadows-City Centre)	2011	Trumpington Meadows, Clay Farm ,Glebe Farm	The service has not been explicitly modelled at this stage but the model represents the effect of service change through a combination of the amended Service 26 and the guided bus service.

Strategy/ Development	Scheme	Open by	Development Served	Details of Service and Coding
	Modifications to 113 service. (From 9 Nov 2003, bus 113 was renumbered 13/13A).	2011	Bell School	Coded – increase in frequency from 2 to 4 per hour.
Cambridge North West Developments	Infrastructure: North-South Spine Road through University Site (from Huntingdon Road through to Madingley Road). Journey time improvement	2016	University Site	Location of new housing and services gives no effective service increase – maintained level of service to new residents. Therefore no service coded.
	New Service: North of University Site via Madingley Road and on to Railway Station.	2011	University Site	"Uni 4" has been extended to Madingley Park and Ride site.
	Re-routing of some existing services though the University site (with journey time improvement)	2016	University Site	Location of new housing and services gives no effective level of service change, but current service level maintained. Therefore not coded.
Cambridge East	New Route/Service (D01g): From East Cambridge to city centre (via Coldhams Common). High quality route.	2016	Airport	See Figure 4.4.

Strategy/ Development	Scheme	Open by	Development Served	Details of Service and Coding
	New Route/Service (D01h): From East Cambridge to city centre (via Newmarket Road).	2011	North of Newmarket Road	See Figure 4.5.
	New Route/Service (D01j): From East Cambridge to Southern Fringe (west). High Quality Route.	2016	Airport / Trumpington Meadows / Glebe Farm	See Figure 4.6.
	New Route/Service (D01k): East Cambridge - Southern Fringe (east)	2016	Airport / Clay Farm	See Figure 4.7.
	New Route/Service: From East Cambridge to Northern Fringe via Newmarket Road / Milton Road.	2021	Airport / North of Newmarket Road / Chesterton East	See Figure 4.8
Citi 4 Enhancement in 2007	Revised Citi 4 Route	2006 /2011	Arbury Park, Cambourne	Now in operation. 2007 timetable used for the coding. Coded in base and future years, with the frequency of 3 buses per hour. See Figure 4.9

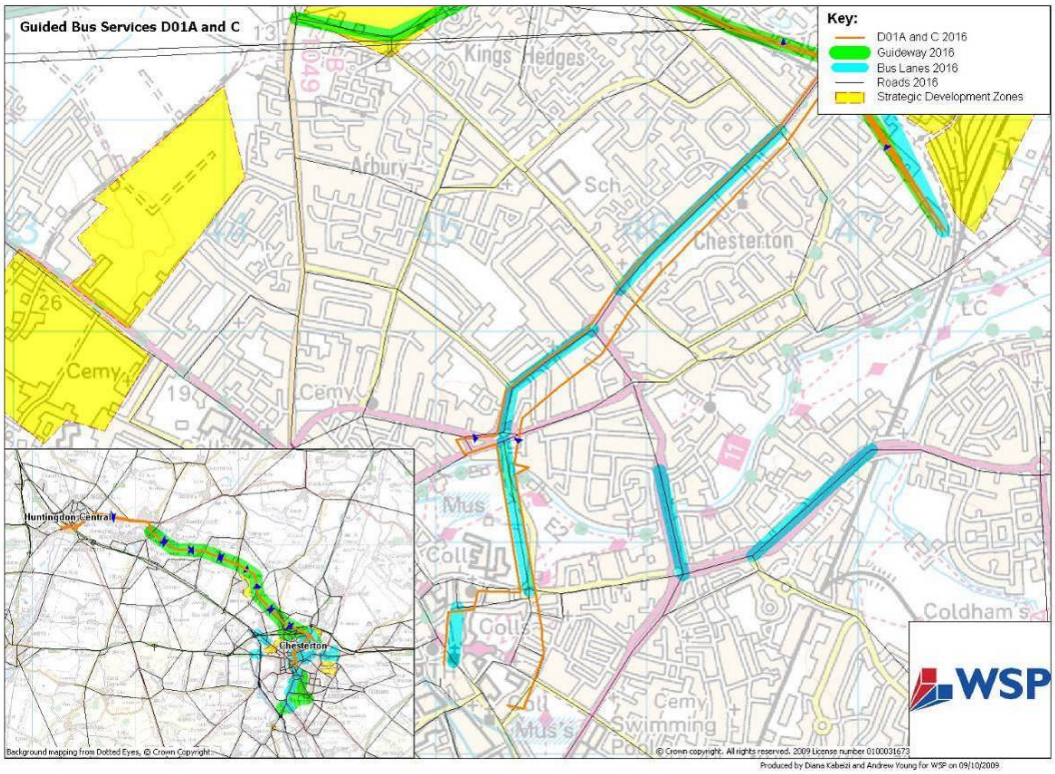


Figure 4.1 Guided bus D01a&c (two way)

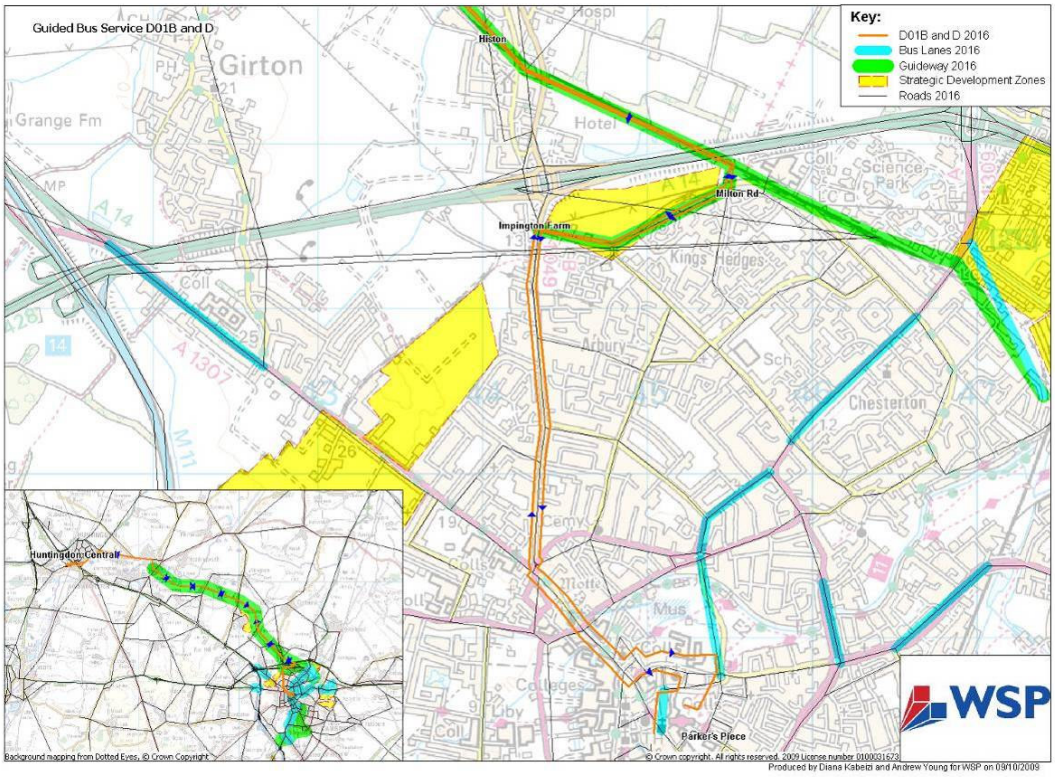


Figure 4.2 Guided bus Do1b&d (two way)

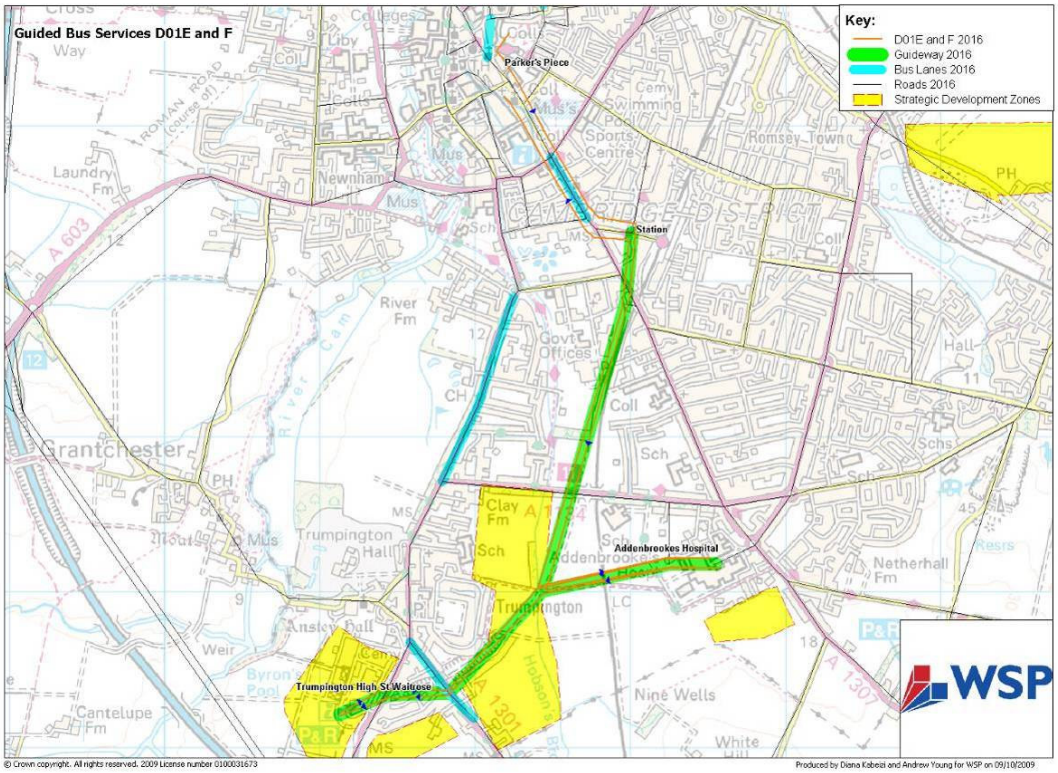


Figure 4.3 Guided bus D01e&f (two way)

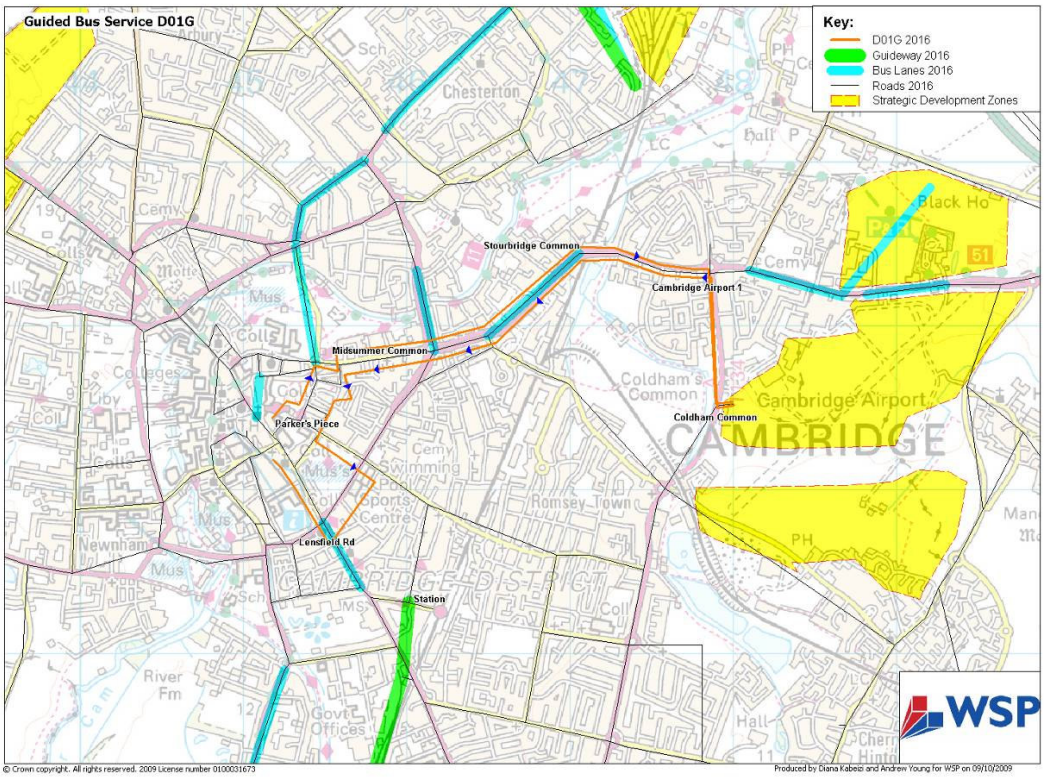


Figure 4.4 High quality service 1 (D01g)

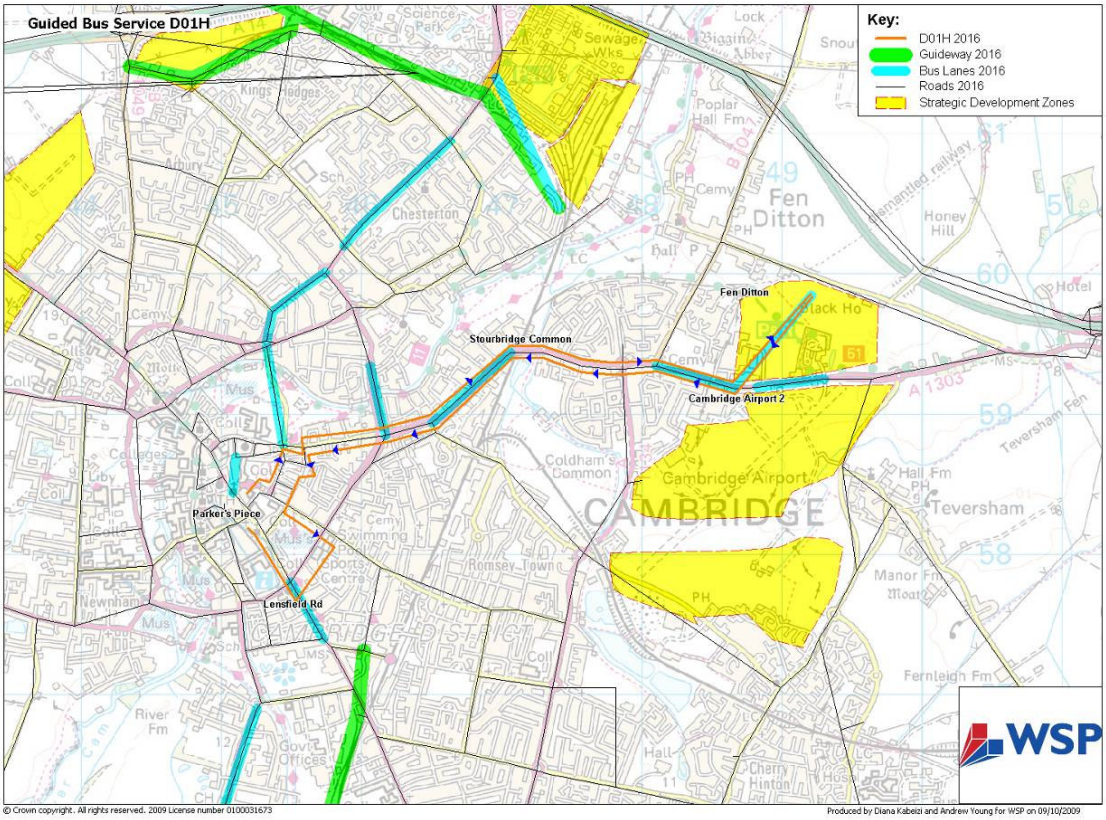


Figure 4.5 High Quality service 2 (D01h)

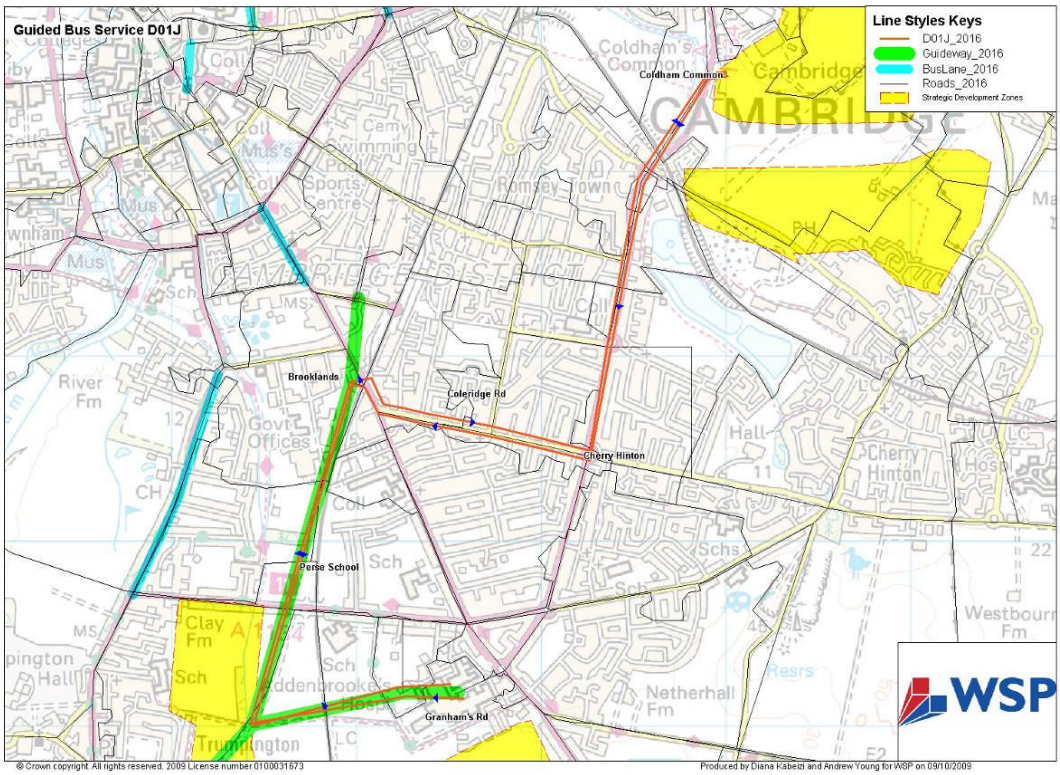


Figure 4.6 High quality Service 3 (D01j)

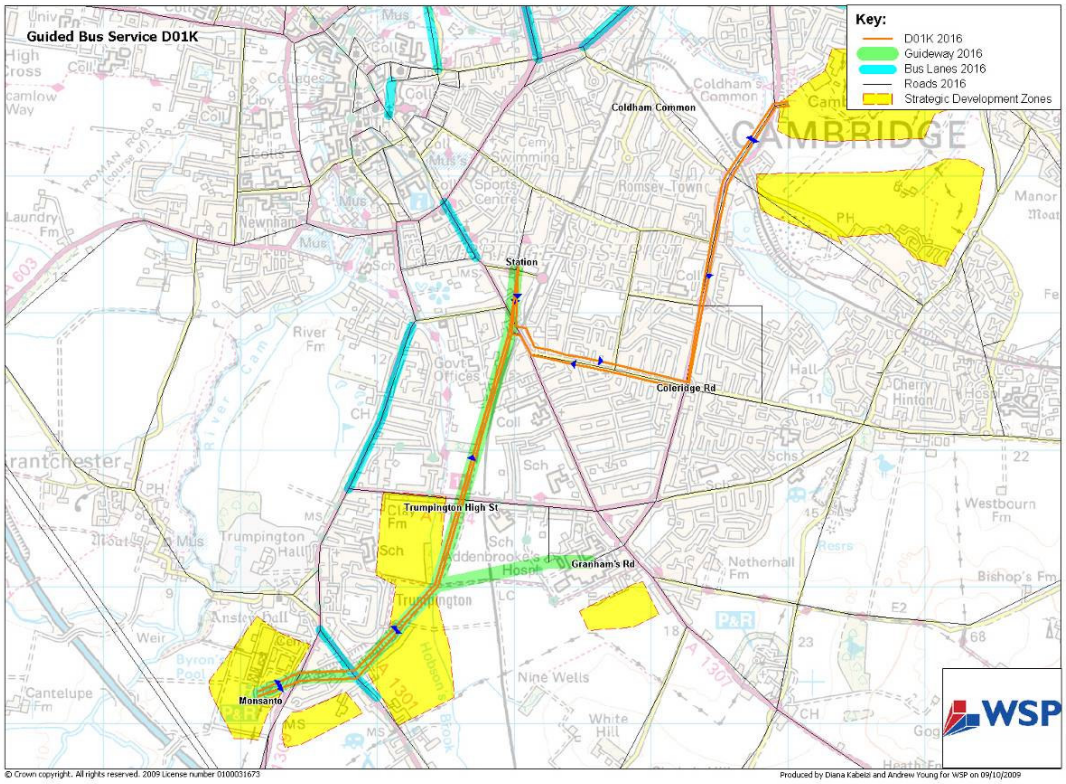


Figure 4.7 High Quality service 4 (D01k)

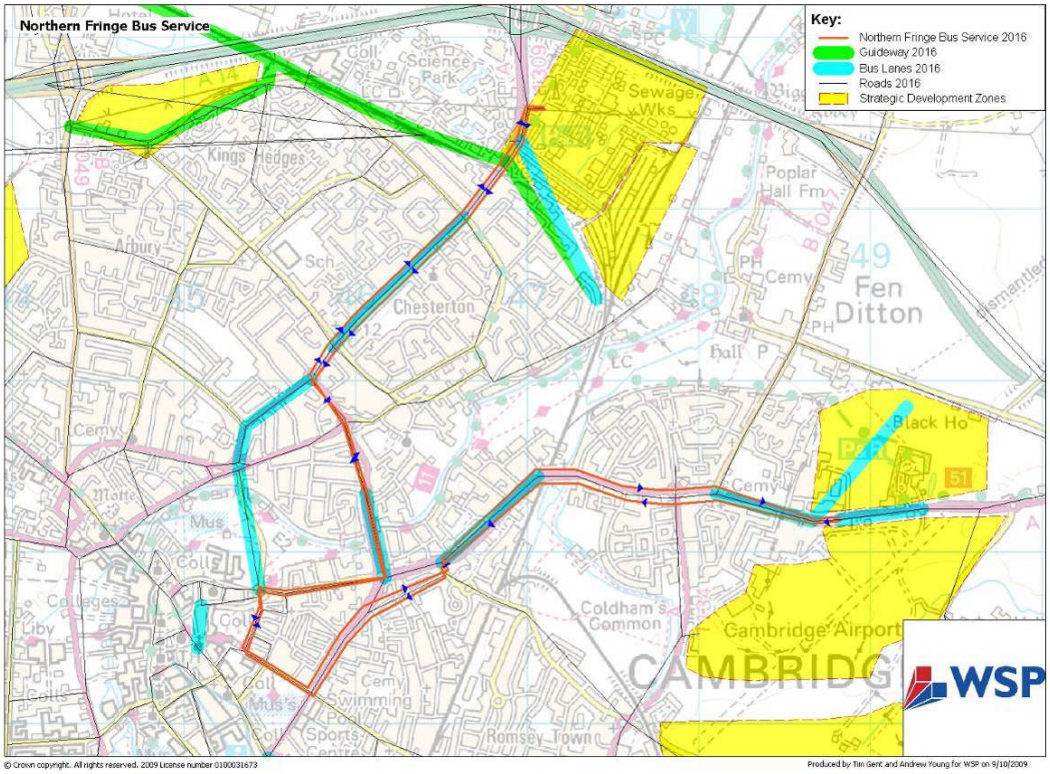


Figure 4.8 Northern Fringe Bus service

Figure 4.9 Citi4 additional service

Table 4.3 Service Details for new / amended services

Bus Number	Service Type (as Coded)	Origin	Destination	Frequency (bus per hour)				2021 Journey Time (min)[10]
				2006	2011	2016	2021-2031	
D01a/D01c (Figure 4.1)	Guided Bus	Huntingdon	Cambridge via Milton Road & Chesterton Stn	-	4	4	4	-
D01b/D01d (Figure 4.2)	Guided Bus	Huntingdon	Cambridge via Histon Rd	-	2	2	2	51
D01e/D01f (Figure 4.3)	Guided Bus	Trumpington P&R	Cambridge via Addenbrookes	-	3	3	3	13
D01g (Figure 4.4)	Bus	Cambridge East (North of Newmarket Road)	City Centre	-	-	3	3	15
D01h (Figure 4.5)	Bus	Cambridge East (Airport)	City Centre	-	6	6	6	18
D01j (Figure 4.6)	Guided Bus	Cambridge East (Airport)	Addenbrookes	-	-	3	3	15
D01k (Figure 4.7)	Guided Bus	Trumpington P&R	Cambridge East (Airport) via rail station	-	-	3	3	18
Service 13/13a	Bus	Cambridge	Haverhill	2	4	4	4	64
Service 26	Bus	Cambridge	Royston	< 1	4	4	4	52
Northern Fringe (Figure 4.8)	Bus	North of New Market Rd	Chesterton (was Sewage works site)	-	-	6	6	31
Frequency reduction of existing A14 services	Bus (1A/5)	Huntingdon	Cambridge	2	1	1	1	66
	Bus (553-556)	Huntingdon	Cambridge	3	1	1	1	72

[10] End to end journey time of service

4.5.5 Note that the service types given in Table 4.3 for specific services indicate the designation in terms of mode choice, in which bus and guided bus are distinct and competing modes. In reality bus services will be able to make use of guideways, and guided buses will frequently travel on road or by bus lanes, which the model allows. The distinction between the modes is one of perceived comfort, convenience and image. As described in section 4.9 of the MDVR (WSP, 2009), this distinction is represented by a weighting on the in vehicle time for guided bus services. In the reference case, all services which make use of the guideways are designated as guided bus.

4.5.6 Section 5.11 gives further details of the calculation of future bus timings for model input and during model running.

BUS AND GUIDED BUS SPEEDS

4.5.7 It has been agreed to use the speed assumptions below for the coding of the Complementary Measures (CM) public transport services (SDG/Atkins, 2009):

- Urban normal road free flow speed 30kph
- Urban road with bus lane average 30kph
- Long distance guided busway average 80kph
- Urban guided busway average 45kph

CAMBRIDGESHIRE GUIDED BUSWAY

4.5.8 The Guided Bus will provide a reliable, fast and frequent link between Cambridge and the more rural market towns of Huntingdon and St Ives avoiding the long queues on the A14. Where guided buses travel on normal roads they will use bus priority measures, including new bus lanes and bus priority traffic signals.

4.5.9 The guided bus (GB) infrastructure has been laid out in CSRM in accordance with the information received from CCC/Atkins, with the following figure from the CGB leaflet being used as a guideline to coding.

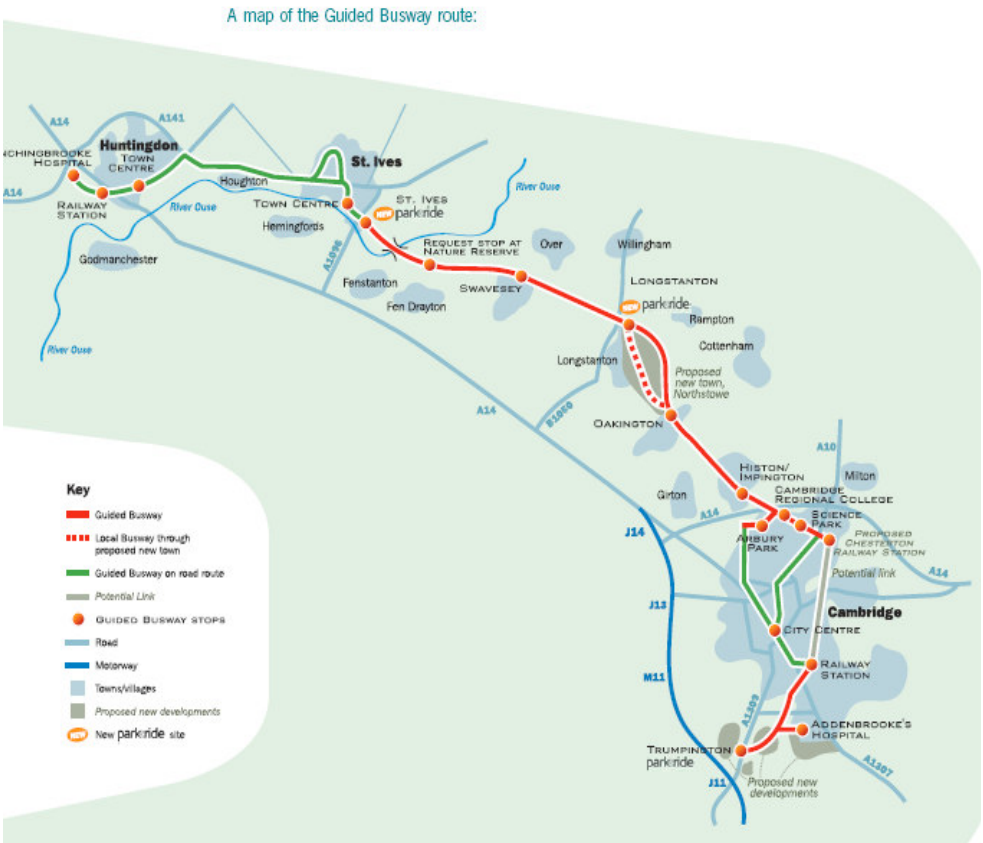


Figure 4.10 CCC leaflet on Guided Bus service *(Source: CCC website, 2007)*

4.5.10 As outlined in the tables above, the services on this core section of guideway are those denoted by CCC as D01a – D01f, D01j and D01k. The representation of these services in CSRM is shown in Figures 4.1-4.3, 4.6 and 4.7.

4.6 CHESTERTON STATION

4.6.1 A new rail station at Chesterton (see location in Figure 4.11 below) is included in the Reference Case in 2016. Chesterton station will lie in the northern part of the Cambridge urban area, approximately 3.5 km north of Cambridge Station and south of Waterbeach Station (5km to the north). The new station is intended to improve access to rail for residents of north Cambridge and villages to the north-west and north-east of Cambridge.

4.6.2 Chesterton Rail Station has been coded according to the timetable developed for the Major Scheme Business Case (Atkins, *Addendum to MSBC for Chesterton Interchange*, 2008), which shows all services which will call at Chesterton station and provides timings between stations. Figure 5.1 on page 12 shows the location of the station which was sufficient for the purposes of modelling the cycle, walk and bus access. Car journeys to Chesterton station are modelled in the SATURN LHM. The MSBC document also indicates there will be 400 parking spaces for the rail station users.

4.6.3 The change to rail services coded in CSRM are:

- Rail services from London Kings cross terminating in Cambridge will visit Cambridge station but will terminate at Chesterton.
- Rail services currently running between Cambridge and Stansted airport will run to./from Chesterton, calling at Cambridge.

4.6.4 Some additional changes indicated in the MSBC Addendum document have not been fully coded. These changes related to service connections to Waterbeach and King's Lynn. Based on the information provided these were not judged to provide net changes in service levels which would impact on traveller behaviour.

4.6.5 Figure 4.11 below shows the model zones from which access to Chesterton station by car is allowed. This overlaps with the car catchments of Cambridge and Waterbeach stations, though the overlap has been restricted around Waterbeach itself, and to the south and east of Cambridge. Access by non-car modes is allowed from any zone (e.g. guided bus from St Ives).

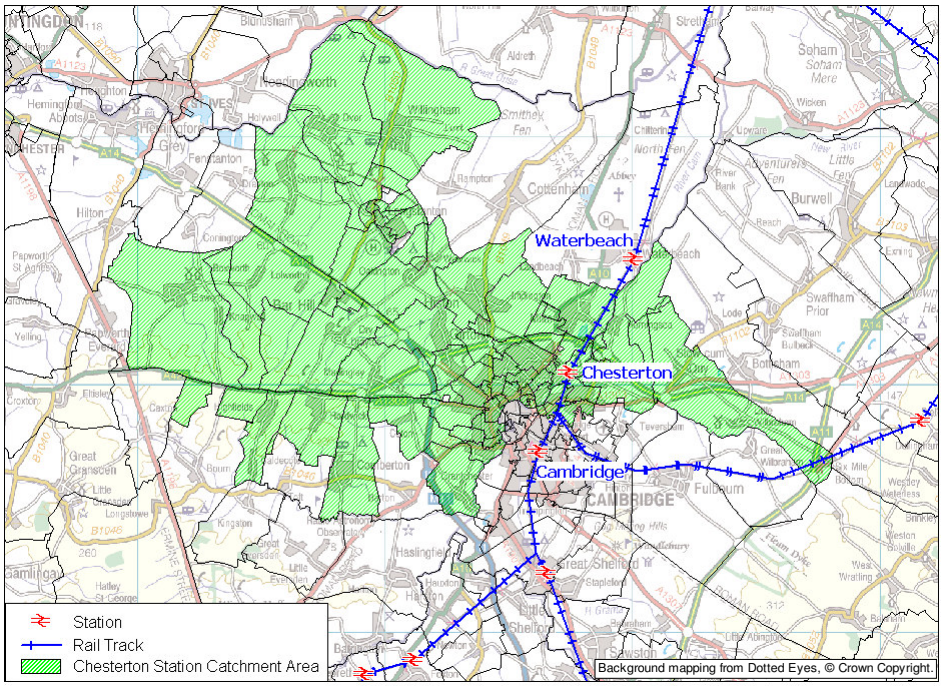


Figure 4.11 Zones with access to Chesterton Station by car

4.7 WALK AND CYCLE

4.7.1 Table 4.4 shows the proposed reference case developments to cycling infrastructure which have been included in the model as additional to 2006 infrastructure. Figure 4.12 illustrates the locations of all cycle lanes and other cycle-only routes from 2016 onwards. Note that cyclists are also able to use all road links, and the expected existence of cycle lanes beside guideways is dealt with by allowing cyclists to use guideway links. The latter point principally adds connectivity along the Cambridge-Histon-Northstowe-St Ives corridor, since all other guideway sections have existing parallel road or cycle links).

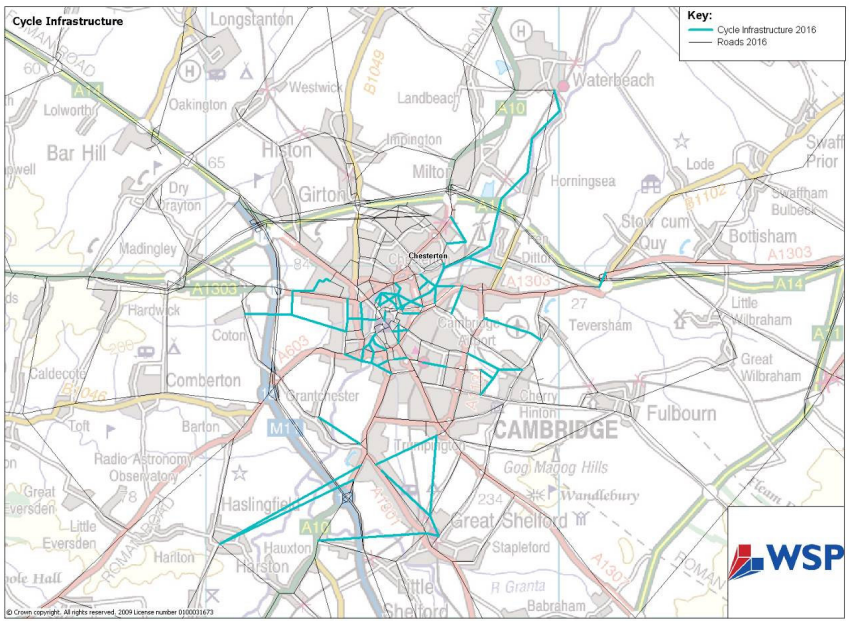


Figure 4.12 Reference Case Cycle Infrastructure from 2016

Table 4.4 Cycling schemes by development and phasing (time period)

STRATEGY	SCHEME	OPEN BY	DEVELOPMENT SERVED	ACTION TAKEN
Southern Fringe	Glebe Farm – Shelford (walk/cycle)	2016	Glebe Farm	Coded in CSRM Reference Case|
	Byron's Pool to Haslingfield (walk/cycle)		N/A	
	Hauxton to Great Shelford (walk/cycle)		N/A	
	Trumpington Meadows to Grantchester (walk/cycle)		Trumpington Meadows / Glebe Farm	
Cambridge NW	Orbital cycling route to Histon Road	2016	University Land & NIAB	Substantial improvements coded in the CM (TIF Do Something) scenario. No change assumed for the TIF Do Minimum Case.
Other	Riverside Bridge	2011	N/A	Coded in CSRM Reference Case|
East Cambridge	Coldham's Common link	2016		Coded in CSRM Reference Case|

5 Transport Supply Characteristics

5.1 OVERVIEW

5.1.1 The variables required to update general economic growth and global costs that are experienced study wide are:

- Growth in vehicle operating costs (i.e. fuel price) for cars and goods vehicles,
- Car occupancies – change in number of non-driver car passengers,
- Growth in values of time,
- Growth in bus/guided bus fares,
- Growth in rail fares.

5.1.2 The following sections detail how changes in these attributes have been dealt with within CSRM. Note that many policy-test scenarios will use identical assumptions to the Reference Case scenario described here.

5.2 VEHICLE OPERATING COSTS (VOC)

5.2.1 Because distance and time skims are more typically available from SATURN than monetary cost skims, the vehicle operating costs (VOCs) are implemented in the TDM to reconstruct the monetary cost of car journeys for use in the choice models. The operating cost function and parameters have been implemented to be entirely consistent with those used in the SATURN LHM and were supplied by Atkins (Atkins, 2008).

5.2.2 See Section 4.3 of the MDVR for further information on the base year implementation of VOC.

5.2.3 This section documents the assumptions made for the future year VOC for cars and LGVs only. HGVs are an entirely exogenous input into CSRM model, in the form of separate User Class matrices within the SATURN Local Highway (LHM) model. Motorcycles and LGVs used for passenger transport are included in the SATURN LHM matrices and TDM passenger model in the same way as cars.

5.2.4 There are two causes of changes in fuel VOC over time:

- improvements in vehicle efficiency;
- and changes in the cost of fuel.

5.2.5 Vehicle efficiency assumptions (DfT, TAG 3.5.6, DfT, February 2007) indicate an improvement in vehicle efficiency over time (see Table 5.1). The changes in average car fuel efficiency also reflect the increasing proportion of traffic that is diesel over time (see Table 5.2). Diesel cars are expected to remain more fuel efficient than petrol cars. Therefore the changes in VOCs also reflect changes in the proportion of traffic using either petrol or diesel.

Table 5.1 Change in Vehicle Efficiency

Vehicle Category	Change in Vehicle Efficiency					
	2005-2010		2010-2015		2015-2020	
	(%)	(% pa)	(%)	(% pa)	(%)	(% pa)
Petrol Car	-4.18	-0.85	-5.96	-1.22	-7.18	-1.48
Diesel Car	-5.95	-1.22	-5.84	-1.2	-6.03	-1.24
Average Car	-6.49	-1.33	-7.62	-1.57	-8.21	-1.7

Source: WebTAG Unit 3.5.6, Table 13, (February 2007)

Table 5.2 Proportion of Car Fleet Using Petrol or Diesel (%)

Year	Petrol	Diesel
2002	79	21
2003	78	22
2004	77	23
2005	76	24
2006	75	25
2007	74	26
2008	72	28
2009	71	29
2010	69	31
2025 onwards	decreasing to	increasing to
	57	43

Source: WebTAG Unit 3.5.6, Table 12, (February 2007)

5.2.6 The changes in the cost of fuel (resource costs) are shown in Table 5.3. The figures represent the change in resource cost per litre for the average car / LGV. The changes reflect changes in the resource costs of petrol and diesel, the forecast increase in the proportion of traffic that are diesel cars, and that the resource cost of diesel is forecast to remain above the resource cost of petrol.

Table 5.3 Forecast growth in the resource cost of fuel

Year	Petrol %pa	Diesel %pa
2005-2006	8.12	6.53
2006-2007	-6.37	-6.3
2007-2008	-7.46	-7.33
2008-2009	-8.06	-7.91
2009-2010	-6.93	-6.79
2010-2015	0.8	0.78
2015-2020	0.86	0.84
2020-2025	0	0
2025+	0	0

Source: WebTAG Unit 3.5.6, Table 14 (February 2007)

5.2.7 TAG 3.5.6 assumes relatively small changes in fuel costs in real terms from 2010. Fuel duty is assumed to remain constant in real terms beyond the increases announced in the 2006 Budget reflected in the cost calculation, and VAT is assumed to remain at 17.5%.

5.2.8 The operating cost function and parameters have been implemented in CSRM to be entirely consistent with those used in the SATURN LHM and were supplied by Atkins (Atkins, 2008). Vehicle operating costs are calculated in units of *Pence per Kilometre* (format supported by SATURN modelling software, used for highway assignment) and represent the average actual cost to users of running a specific type of vehicle for a number of kilometres.

5.2.9 The parameters used to calculate the fuel consumption element of VOCs were derived from TAG 3.5.6 (DfT, February 2007). Atkins took this information and used the TAG parameters with average speeds of travel by time period to obtain an average pence per kilometre cost which is used in the model (Atkins, 2008).

5.2.10 The following table summarises the vehicle operating costs implemented for each of the time periods for the base and Reference Case future year model runs.

Table 5.4 VOC for the base and reference future years

Purpose/ Value of time category	Time Period	Pence per Kilometre per vehicle					
		2006	2011	2016	2021	2026	2031
All other trips / Non work car	AM	6.49	6.07	5.87	5.67	5.20	5.25
	IP	6.39	5.80	5.51	5.28	5.26	5.31
	PM	6.49	6.07	5.87	5.67	5.20	5.25
Employer's Business / Work car	AM	12.50	11.73	11.56	11.42	10.96	11.01
	IP	12.29	11.73	11.49	11.30	10.83	10.88
	PM	12.50	11.73	11.56	11.42	10.96	11.01

5.3 CAR OCCUPANCY

5.3.1 Car and LGV occupancies were also supplied by Atkins and are based on Department for Transport TAG 3.5.6 (see LHM report, Atkins, 2008). This provides standard assumptions on change in car occupancy over time, as a function of the car ownership projections underlying the NTEM tripends. Goods vehicles are included as matrices of PCU (passenger car units), so their occupancies are not relevant.

5.3.2 The car occupancy values, as calculated by Atkins, are given for HBW, Other (shopping, personal business, visiting friends and relatives), and Employer's Business. The Table 5.5 shows vehicle occupancies for the base, and future Reference Case forecasts.

5.3.3 For Education trips, CSRM uses different occupancies for the outbound and return legs in the AM peak and interpeak when generating 1-hour car vehicle trips for highway matrix pivoting; however, it uses the average values below in supply (cost) calculation. The higher occupancies are used for outbound AM peak and return interpeak trips, with the lower occupancies used for return AM peak and outbound interpeak trips. PM peak trips continue to use the occupancies in Table 5.5, the asymmetric occupancies being specified in Table 5.6. The asymmetric occupancies are scaled through time by applying the WebTAG derived car occupancy rates supplied by Atkins in October 2008. The most natural route was to assume that the occupancies in each direction varied proportionally to the supplied occupancy rates throughout the time period of the model, but it was discovered that this led to an occupancy rate of 1.87 in one direction and 0.93 in the other in 2031, which is not realistic. As a consequence we adopted the following formula: OF= ([(SF-1)*(OB-1)]/[SB-1])+1 where SF and SB are the supplied education occupancies in the relevant year and in 2006, and OB and OF are the education occupancies in that particular direction that we are using in the model in 2006 and will be applying in the relevant year. This ensures that the occupancies in the model change in proportion to the occupancies with which we were supplied while also guaranteeing that we do not have unrealistic occupancies of less than 1.

Table 5.5 Car occupancies in the base and future Reference Case

Purpose	Time Period	2006	2011	2016	2021	2026	2031
Home based work	AM	1.114	1.077	1.042	1.007	1.000	1.000
	IP	1.096	1.061	1.027	1.000	1.000	1.000
	PM	1.104	1.075	1.047	1.020	1.000	1.000
Employer's Business	AM	1.224	1.195	1.167	1.139	1.112	1.085
	IP	1.162	1.139	1.116	1.094	1.072	1.051
	PM	1.156	1.121	1.086	1.053	1.021	1.000
Other (discretionary)	AM	1.652	1.597	1.545	1.494	1.444	1.396
	IP	1.635	1.582	1.532	1.482	1.435	1.389
	PM	1.705	1.660	1.617	1.574	1.533	1.493
Education	AM	1.652	1.597	1.545	1.494	1.444	1.396
	IP	1.635	1.582	1.532	1.482	1.435	1.389
	PM	1.705	1.660	1.617	1.574	1.533	1.493

Table 5.6 Car Occupancies for Education Trips in the AM Peak and Interpeak Periods

Time Period	Out/Return	2006	2011	2016	2021	2026	2031
AM	Out	2.200	2.099	2.005	1.912	1.822	1.735
	Return	1.100	1.092	1.084	1.076	1.069	1.061
IP	Out	1.100	1.092	1.084	1.076	1.069	1.061
	Return	2.200	2.099	2.005	1.912	1.822	1.735

5.3.4 Assumed decline in car passenger occupancy in CSRM is in line with the DfT guidance (TAG Unit 3.5.6, February 2007) and for example for the AM peak period it is -0.48% per year for business car journeys and -0.67% per year for "other" car journeys (commuting, discretionary, education trips).

5.3.5 We can see that car occupancies for e.g. commuting journeys are fairly low in the base year, and further decline in occupancies from 2021 for IP period, and 2026 for the AM and PM time period was not feasible.

5.4 VALUES OF TIME

5.4.1 Values of time (VoTs) are used to represent the relative importance of cost versus time for different trip purpose and traveller type segments. Car and LGV VOTs were also supplied by Atkins and are based on Department for Transport TAG 3.5.6 (see LHM report, Atkins, 2008).

5.4.2 The change in the values of time through time is more or less in line with the forecast GDP change. CSRM increases the values of time for each segment or vehicle type in line with official guidance, based on forecast GDP and population growth (see Table 5.7).

Table 5.7 Forecast Growth in the Working and Non-Working Values of Time

Range of Years	GDP Growth (%pa)	Population Growth (%pa)	Work VOT Growth (%pa)	Non-Work VOT Growth (%pa)
2002-2003	2.25	0.27	1.98	1.58
2003-2004	2.50	0.27	2.22	1.78
2004-2005	3.50	0.28	3.21	2.57
2005-2006	3.25	0.28	2.96	2.37
2006-2007	2.75	0.28	2.46	1.97
2007-2011	2.50	0.29	2.20	1.76
2011-2021	2.25	0.31	1.94	1.55
2021-2031	1.75	0.20	1.55	1.24
2031-2051	2.00	0.01	1.99	1.59
2051-2061	1.75	-0.06	1.81	1.45
2061 onwards	2.00	0.00	2.00	1.60

Source: WebTAG Unit 3.5.6, Table 3, (February 2007)

5.4.3 Resulting VOTs in the base and future Reference Case forecasts are shown in Table 5.8. Since WebTAG does not distinguish between Education trips and Other trips the VOTs for both purposes are identical.

5.4.4 The VOTs for EB trips are an amalgam of the VOTs for drivers and for passengers based on assumptions of the ratios between the two over time. These two VOTs are shown by income group for 2006 in the Addendum to the MDVR (WSP, 2009) in Table 2.1. The ratios of passengers to drivers vary by time period, but since the resultant differences in overall VOTs are small the average of the three VOTs by time period has been quoted below.

Table 5.8 Values of Time (£/hour) used in Reference Case model forecasts

Purpose and Income	2006	2011	2016	2021	2026	2031
HBW Low (< £17,500)	3.05	3.33	3.60	3.89	4.13	4.39
HBW Medium (£17,500 to £35,000)	4.59	5.02	5.42	5.85	6.22	6.62
HBW High (>£35,000)	6.74	7.36	7.95	8.59	9.14	9.72
EB Low	9.23	10.32	11.36	12.50	13.50	14.58
EB Medium	18.11	20.24	22.28	24.53	26.49	28.61
EB High	38.19	42.68	46.99	51.73	55.86	60.33
Education Low	4.06	4.44	4.79	5.18	5.51	5.86
Education Medium	4.96	5.42	5.85	6.32	6.72	7.15
Education High	6.03	6.60	7.12	7.69	8.18	8.70
Other Low	4.06	4.44	4.79	5.18	5.51	5.86
Other Medium	4.96	5.42	5.85	6.32	6.72	7.15
Other High	6.03	6.60	7.12	7.69	8.18	8.70

Notes: In the LHM both EB and Education have no segmentation by income level, the VOT segmentation quoted here is specific to the Transport Demand Model. It has been assumed within the model that all students in Tertiary Education are Low Income.

5.4.5 The income bands listed above are defined in 2006 prices (see Section 4.5 for details of their derivation). Since the model works in 2006 prices throughout the band definitions are assumed to rise in line with RPI. For Education the income split is assumed to be constant in all years, for the remaining purposes the income split is constructed from the GSeC split with the income split within each GSeC a constant. As the GSeC split is generated by the Land Use Model from the employment within the study area, it is possible that the income split for these purposes will vary over time.

5.5 BUS/GUIDED BUS FARES

5.5.1 Derivation of rail fares for the base year is described in Section 4.7 of the MDVR (WSP, 2009).

5.5.2 TAG Unit 3.15.3 (DfT, July 2008) acknowledges that forecasts of changes in public transport fares can be problematic, especially over longer forecasting periods. It then suggests that fares may change in real terms over time for three main reasons:

- the costs of operating public transport services may change at a rate different to the rate of inflation;
- the demand for public transport may change and one of the responses available is to change fare levels so that constant subsidy or operating surpluses are maintained; and
- policy intervention, although under current political structures, this may be rare outside London.

5.5.3 Guided Bus is not implemented in the base year but is introduced in 2011. In the Reference Case scenario, the fares for Guided Bus have been assumed to be the same as for regular bus services.

5.5.4 For the bus/GB fares after 2007, annual fare changes in line with recent DfT studies are assumed. These expected annual changes are:

- For buses, **an increase of 3% over and above the RPI** (i.e. a 3% increase in real terms) **for 2007-2010, and increase 2% in real terms beyond 2010** (i.e. assumptions made in other studies for English, non-metropolitan areas).

5.5.5 As part of the CCC TIF study, the 2% assumption was also checked against projected rises in PT operating cost. The rise in PT operating costs from 2016 onwards is projected as 2% p.a. in real terms (Source: SDG analysis for CCC, 2009), and the assumptions are therefore aligned.

5.5.6 We have assumed the same annual fare growth for longer distance coaches.

5.6 RAIL FARES

5.6.1 Derivation of rail fares for the base year is described in Section 4.7 of the MDVR (WSP, 2009).

5.6.2 From 2007 onwards, an **annual increase of 1% in real terms** is assumed (Chapter B of PDFH 2002 v4.0 suggests RPI+1% across all rail tickets to be applied in future. This is also confirmed in TAG Unit 3.15.4, DfT, April 2009).

5.7 PARKING CHARGES

5.7.1 Parking charges are assumed to rise in line with inflation only, and therefore remain constant in 2006 prices. The CSRM modelling package allows different parking charging options to be tested as a part of further policy tests.

5.8 TOLLS AND OTHER ROAD USER CHARGING

5.8.1 The Reference case scenarios assume no toll roads within the CSRM study area.

5.9 WEIGHTING OF TIME BY JOURNEY STAGE

5.9.1 Weightings of time are used to distinguish the time spent accessing and waiting for public transport from the other journey stages when constructing the generalised cost of travel on which the travellers' choices are based.

5.9.2 The CSRM assumes no changes in PT wait and access time weightings between the base and future years. However, the weighting used for the in-vehicle time on Guided Bus (GB) services (introduced in 2011) does form part of forecasting assumptions.

5.9.3 The GB services are intended be of high quality and comfort, and the ride quality on guided sections should be superior to normal bus services. To reflect the differentiation between GB and normal bus services, the GB in-vehicle time weighting has been chosen to be 0.9 (i.e. between that for bus which is 1 and rail which is 0.8).

5.9.4 This is in line with TAG 3.11.1 (DfT, January 2007) which confirms that "in some instances, factors may be applied to the in-vehicle times that reflect people's preferences for the various modes. This is most likely to be relevant where the influence of fare on the choice of routes and services is likely to be quite weak and, as a result, the fare term may be excluded from the generalised cost formulation used at the assignment stage. These in-vehicle time factors may be interpreted as mode-specific values of in-vehicle time. Thus, instead of an in-vehicle value of time of unity being used, as might be used in models for multimode transport studies, non-unity values of in-vehicle time are used to represent the inherent, relative attractiveness of the various modes".

5.9.5 There is some literature support for the value chosen: see for instance Whelan et al. (2008) who conducted a Stated Preference experiment in the north of England into Bus Rapid Transit (BRT) which found that "travel on-board BRT imposes 92% of the disutility of an equivalent journey by conventional bus, and travel by Light Rail 78% of the disutility".

5.10 PT CROWDING

5.10.1 TAG Unit 3.11.1 (DfT, January 2007) suggests that crowding should only be modelled where it is likely to have a significant effect on traveller behaviour or where an effect on crowding is one of the objectives of the scheme. Given that PT crowding is not significant in the CSRM study area (apart from AM/PM peak rail services going to/from London), it has been decided not to include an overcrowding feature for PT services in the model.

5.10.2 The volume to capacity ratios will be monitored when forecasting to determine whether crowding will become a problem in the future and will recommend further policy runs if this is the case.

5.11 BUS JOURNEY TIMES

5.11.1 TAG Unit 3.11.1 suggest for submodes that run on-street (mainly bus) it is important that journey times in the PT assignment model are consistent with the level of traffic congestion. The guidance then confirms that "This will require some linkage of on-street PT mode link times in the PT network to assigned journey times from a highway assignment model. In congested urban situations it may not be appropriate to take bus times from a published timetable. In any case this will not be possible when forecasting and a link to a highway assignment model will be necessary to estimate PT on-street journey times for forecast years".

5.11.2 This section describes the approach used to calculate future year bus/GB times in the absence of service timetables for the Reference Case scenario.

5.11.3 Bus times between bus stops in the **base year** are calculated by controlling the whole route time to the timetabled duration (MDVR, WSP, 2009). Hence where there is a bus stop, the time taken through the network to the next interchange point is calculated based on the congested link speeds, output from the SATURN LHM assignment, and then weighted to the overall timetable time. This approach means that:

- Total end-end journey time for each service matches the published timetable,
- Journey times between bus stops are proportional to the LHM congestion-based times on each link.

5.11.4 In CSRM, in future year scenario tests, the modelled bus times are a function of:

- input coded times and
- congested link times generated from the LHM assignment.

5.11.5 The final journey times are the maximum of coded input times, and the sum for all links between the two bus stops of either congested times (if buses run with traffic on that link) or free-flow time (if buses run on segregated sections, e.g. bus lanes).

5.11.6 The SATURN LHM assigns pre-loads of bus services on the network, so that the contribution of bus services to road congestion is also taken into account. However, the LHM does not take account of bus dwell times.

5.11.7 Table 5.9 describes how the calculation of bus times for altered or new services has been undertaken in the future year Reference Case scenarios.

Table 5.9 Calculation of bus/GB times for the future year scenarios

Type of service	Future year impact	Future Year - INPUT service times	Resulting times
Existing services (Future Service same as in Base year)	New segregated infrastructure (bus lanes) made available on some parts of existing routes.	On sections with **no change in infrastructure Base year times are kep**t (but modelled times will tend to rise where congestion increases). For sections using **new segregated infrastructure** the bus time is assumed to be at least 30 Km/h for Urban bus lanes, 45 Km/h for Urban Guideways, 80 Km/h for long distance Guideways (1Km or more in length).	For the sections of bus routes with improvements in infrastructure (bus lanes added), journey times will decrease. For all on-road sections with no infrastructure change, the input journey times will remain at 2006 levels, and increase where congestion levels increase.
New bus services or existing services where **the route is diverted**.	Running on existing infrastructure with other traffic, and/or using new segregated infrastructure for part of the route.	There are no advised timetable times for new future year services. For existing links, Reference Case input times on links which exist in 2006 are taken from the average speed of buses on each link (calculated from the Base Year). For new infrastructure speeds assumed are as quoted above.	For new services using segregated infrastructure (or existing services diverted to use it), the journey times will tend to decrease. For all on-road sections with no infrastructure change, the input journey times will remain at 2006 levels, and increase where congestion levels increase.

5.12 RAIL JOURNEY TIME

5.12.1 Rail journey times for existing services are assumed to be fixed between the base and the future years, as described in Table D.2 of the MDVR (WSP, 2009).

5.13 SOFT MEASURES

5.13.1 The Reference Case scenario does not include modelling of soft measures (travel plans or other Smarter Choice initiatives), or provision of improved walking and cycling infrastructure beyond that which has been mentioned in Section 4.7.

6 Mechanism for Running Through Time

6.1 OVERVIEW

6.1.1 This section describes the mechanism for running the CSRM through time. This is the method used for all forecasting with the CSRM, including the Reference Case itself and testing of alternative transport packages, as well as land use and other assumptions.

6.1.2 Figure 6.1 shows in detail the interactions that occur within the Integrated Transport Model. Figure 6.2 shows how the various model elements interact over the course of a CSRM run through time.

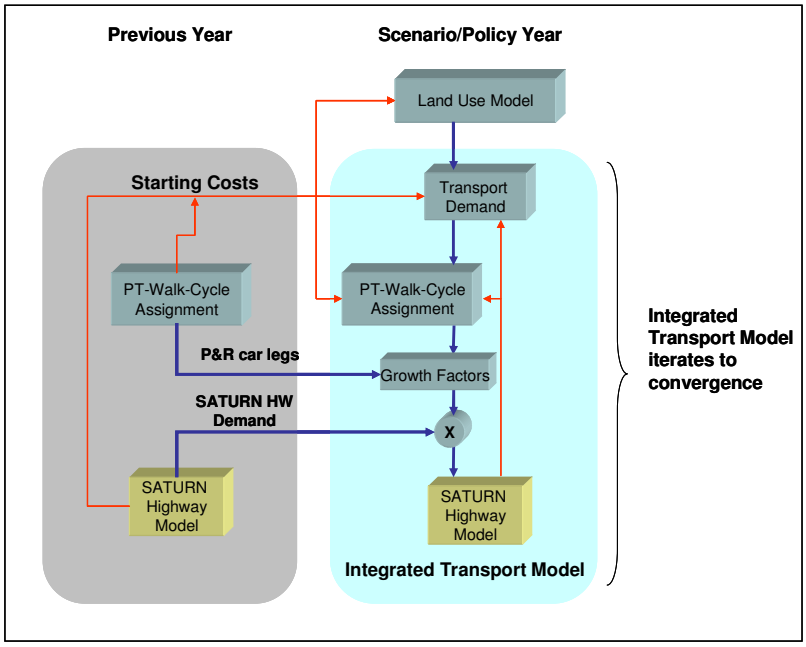


Figure 6.1 Diagram of Interactions within Integrated Transport Model

6.1.3 The CSRM runs in 5 year steps, a Base Year in 2006, and future years 2011, 2016, 2021, 2026 and 2031. For each year the model has two main constituent parts: a Land Use Model which determines the overall pattern of land use across the Study Area, and consequently the overall pattern of transport demand; and an Integrated Transport Model which takes the output of the Land Use Model and calculates the resultant pattern of trips.

6.1.4 The Integrated Transport Model itself has a number of distinct parts. The Transport Demand Model takes the Land Use Model output and generates from this the detailed trip demand matrices. This demand is passed to the PT-Walk-Cycle Assignment Model which assigns the travel by these three modes of travel, and to the SATURN LHM which assigns the travel by car and LGV/HGV.

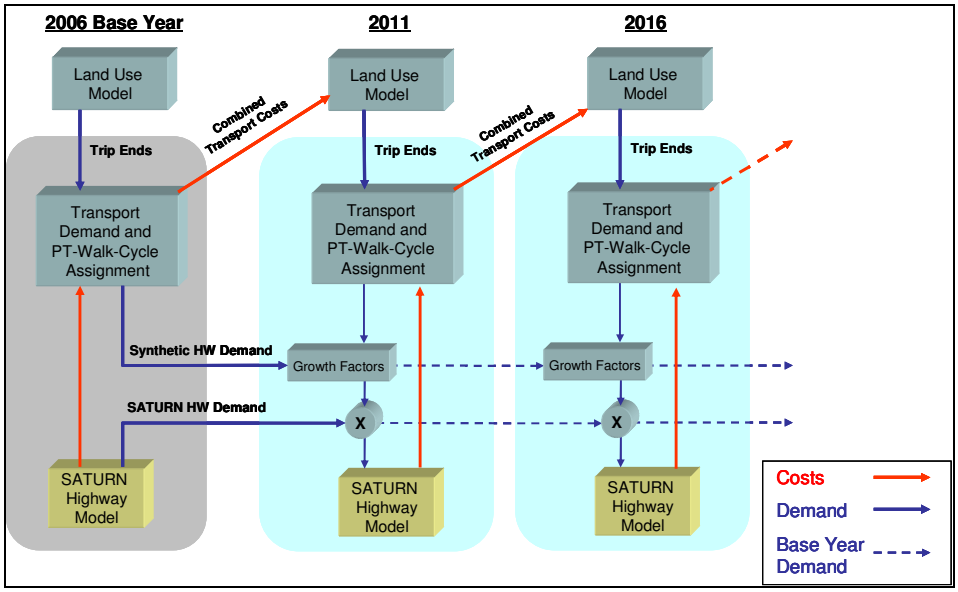


Figure 6.2 Diagram of Interactions between Run Years

6.1.5 Each of these component parts require inputs that change between run years representing changes in the real world to which the model outputs respond. The Land Use Model has input to it assumptions on population growth, employment growth and growth in numbers of dwellings (see Chapter 2 for details). The Integrated Transport Model requires future year SATURN and PT-Walk-Cycle networks as well as assumptions about values of time; car occupancies; PT fares, routes and timetables; the costs of car travel; and for road pricing scenarios the congestion charge and where it will apply.

6.1.6 There are also model inputs that derive from the model itself. Both the Land Use Model and the Integrated Transport Model use transport costs that are output by the CSRM. The Integrated Transport Model also uses highway demand that has been output by previous years of the CSRM.

6.2 RELATIONSHIP BETWEEN THE LAND USE AND TRANSPORT MODELS

6.2.1 As mentioned above, the Land Use Model requires a set of combined transport costs from the Integrated Transport Model. If the Land Use Model is to be run for year *n* then the costs are taken from an Integrated Transport Model run in year (*n*-5). The transport costs are lagged in this way because the actions that result from decisions about land use are unlikely to take place immediately: e.g. individuals moving house or businesses relocating cannot move immediately in response to current year costs. Using lagged transport costs therefore results in a more realistic modelling of land use changes. The transport costs supplied to the Land Use model are combined across all transport modes, but with the disaggregation by purpose and person type preserved and converted into a suitable Land Use model segmentation.

6.2.2 The Land Use Model also supplies trip ends for the Transport Demand Model to process. It is the processing of these trip ends that ultimately generates trips that are assigned by either the SATURN Highway Model or the PT-Walk-Cycle Assignment Model.

6.3 RELATIONSHIP OF 2006 TO FUTURE YEARS

6.3.1 The Base Year run in 2006 supplies three things to the future year runs:

- Combined Transport Costs in 2006 (supplied to the 2011 Land Use Model only);
- Synthetic Highway Demand for 2006;
- SATURN Highway Demand for 2006.

6.3.2 The highway demand (both generated synthetically and by the SATURN LHM) for 2006 is used in all future year runs. These demand matrices are crucial inputs into the pivoting process that have been explained in Section 3.2 (Matrix Pivoting). The use of both sets of demand matrices is necessary in order to ensure that in future years the assumptions of highway demand in the Transport Demand Model are consistent with the assumptions of highway demand that are input to the LHM.

6.3.3 The demand inputs for 2006 have been validated against observed flows as described in the MDVR (WSP, 2009), and as a consequence the Integrated Transport Model is not required to iterate to reach a converged solution. For future years it is necessary to iterate to determine the point at which demand is in equilibrium with congestion and other transport costs.

6.4 RELATIONSHIPS WITHIN THE INTEGRATED TRANSPORT MODEL

6.4.1 As the Integrated Transport Model iterates to a converged solution there are three means by which the components feedback one to another:

- The LHM supplies highway costs to both the Transport Demand Model and the PT-Walk-Cycle Assignment Model;
- The Transport Demand Model supplies trip demand matrices to the PT-Walk-Cycle Assignment Model;
- The Transport Demand Model and PT-Walk-Cycle Assignment Model both supply derived highway demand to the LHM.

6.4.2 In each iteration, changes in the highway congestion and routing costs from the LHM affect the derived highway demand from the Transport Demand Model and the PT-Walk-Cycle Assignment Model. This in turn affects the highway demand assigned by the LHM, which alters the highway costs output from the LHM at the next iteration.

6.4.3 Much of this is dealt with in detail in the MDVR (WSP, 2009) so we will not dwell on it here.

6.5 COST SUPPLY FROM THE HIGHWAY ASSIGNMENT MODEL

6.5.1 The output from the SATURN LHM includes, for each SATURN User Class, a matrix of times, distance and (for Road Pricing scenarios) monetary cost associated with travelling between all the available zone pairs by car. These skims are used by the Transport Demand Model in cost generation.

6.5.2 The speed of traffic as determined in the SATURN LHM also impacts upon modelled bus speeds, constraining speeds for on-road services as outlined in the MDVR.

6.6 MODELLED BEHAVIOUR CHANGE

6.6.1 CSRM allows the population in aggregate to change patterns of travel behaviour through time in three ways: by changing their trip end locations (origins and destinations); by changing their mode of travel; and by changing their time of travel. All this occurs as a response to inputs to the model. Some of the key choice mechanisms that can result in these changes as a response to future year inputs are:

- New PT routes make travel by PT less expensive and/or more convenient and so encourage increased PT usage.

- As the population of the study area rises and car ownership levels increase, the model will initially show a greater number of car trips. This increases congestion and so as the model iterates this will encourage modal shift, time of day shift (to less congested periods) or change in the destination of car trips.
- Population growth in towns and cities increases the demand for services and employment. This will encourage businesses to locate in these settlements (as part of the Land Use model running). A combination of this can result in an increase in short trips, which will cause some modal shift to walk and cycle.
- New developments that have improved PT connections will (within the Land Use Model) attract residents with a greater propensity to use PT, whether through their demographic mix or due to the accessibility of work locations by PT travel. As such these developments will show higher levels of PT usage.

6.7 MODEL OUTPUTS

6.7.1 CSRM outputs used within the model itself have been discussed above. Some key outputs available for analysis of trends in residence, employment and travel choices are:

- Population and number of dwellings and households by district;
- Employment by district, both in aggregate and by employment type;
- Changes in trip patterns, both by origin and destination and in terms of modal split;
- Derivative data on trips, e.g. average trip lengths and costs, both in aggregate and by mode and purpose;
- Usage of specific PT services, e.g. Park and Ride sites.

6.7.2 Examples of these outputs for the Reference Case are shown in Section 7.

7 Summary of Reference Case Forecasts

7.1 INTRODUCTION

7.1.1 This section of the report outlines results from the Reference Case runs carried out for 2011-2031. The figures shown represent results from model runs using the validated base (2006) model as outlined in the MDVR (WSP, September 2009).

7.2 POPULATION, EMPLOYMENT AND TRIP GENERATION

The following figures detail the population and employment changes within the study area over time. Total study area population is an output of the Land Use model, which results from the numbers of households formed, and the demographic mix of those households. The location of the population will be heavily influenced by the number of dwellings and accessibility of services and employment. As shown in Table 7.1, Cambridge and South Cambridgeshire are the most rapidly growing districts in both percentage and absolute terms.

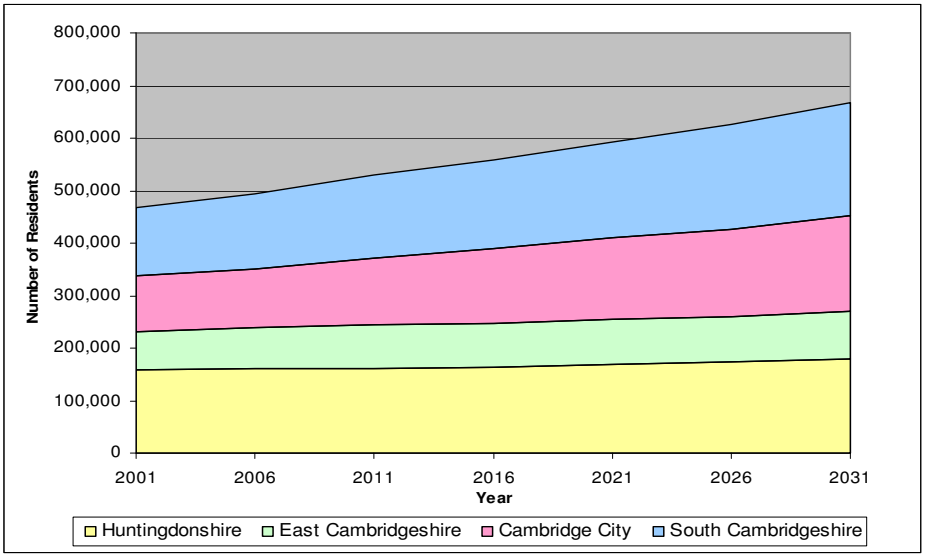


Figure 7.1 Total Population within the Study Area by District

Table 7.1: Population Growth by District within the Study Area

District	2001-2031 Absolute Growth	2001-2031 Percentage Growth
Cambridge City	72,756	67%
South Cambridgeshire	88,369	68%
East Cambridgeshire	17,018	23%
Huntingdonshire	23,101	15%
Total Study Area	201,244	43%

7.2.1 Figure 7.2 shows the total employment by location of employment. Outcommuters (those residents working outside the Study Area) are included as part of the total, so that overall the chart represents the amount of employment taken up by residents of the Study Area. Incommuters to the study area are shown separately for comparison. Note that the Land Use model creates incommuters as a 'balance' between the total employment created in the study area and that which is taken up by residents. Therefore the drop in incommuters in 2011 represents a period where employment in the Study Area is growing more slowly relative to the number of residents taking up that employment.

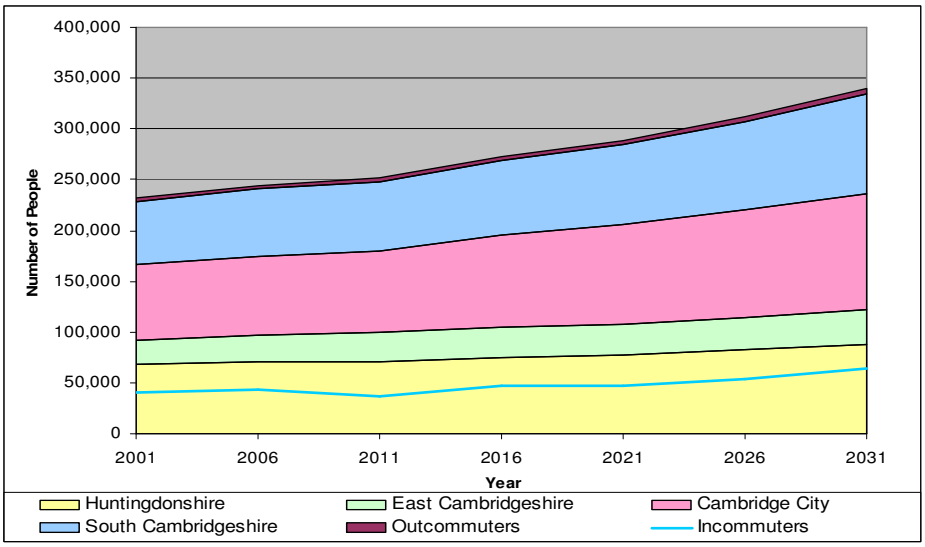


Figure 7.2 Employment by District

7.2.2 The following table shows the proportions of employment by district, as well as the proportions of incommuters and outcommuters to the total modelled study area employment. Also shown are the growths in these figures from 2001 to 2031, both in absolute and as a percentage of 2001 employment values. Though employment in Cambridge City and South Cambridgeshire is again growing faster than in other districts, comparison with Table 7.1 shows that employment is growing in a more even manner than population.

Table 7.2: Employment Growth by District and Commuter Type within the Study Area

	2001 Proportions	2031 Proportions	2001-2031 Absolute Growth	2001-2031 %age Growth
Cambridge City	32.5%	34.1%	39,486	53%
South Cambridgeshire	27.2%	29.4%	36,093	58%
East Cambridgeshire	10.6%	10.1%	9,382	39%
Huntingdonshire	29.7%	26.5%	20,635	30%
Total Study Area	100%	100%	105,596	46%
Incommuters	17.7%	19.1%	23,395	58%
Outcommuters	1.4%	1.5%	1,637	50%

7.2.3 The following four figures show the number of trips by purpose that originate within each of the four districts or originate outside the Study Area. This includes return trips for Home-Based purposes (hence a resident of Cambridge working in Huntingdonshire will create HBW trip growth for both districts).

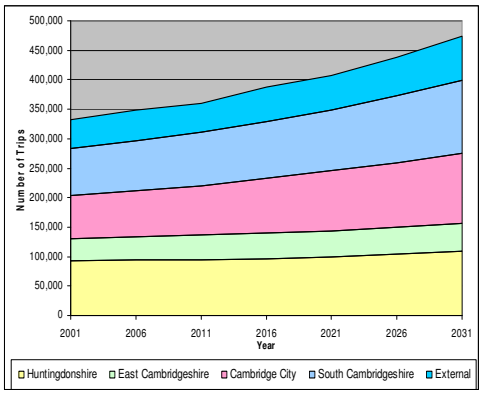


Figure 7.3 HBW Trip Origins by District

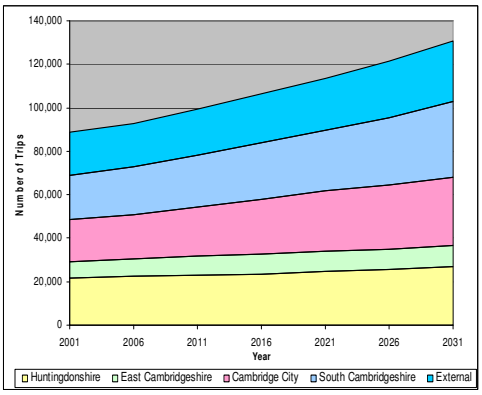


Figure 7.4 EB Trip Origins by District

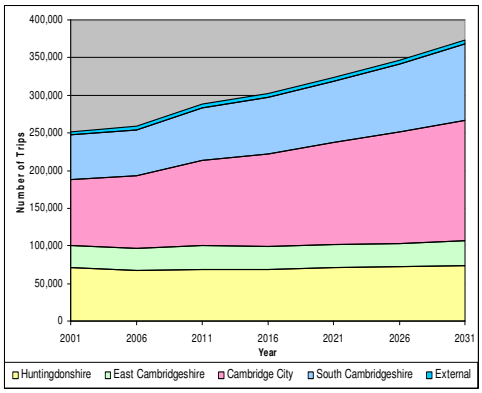


Figure 7.5 Education Trip Origins by District

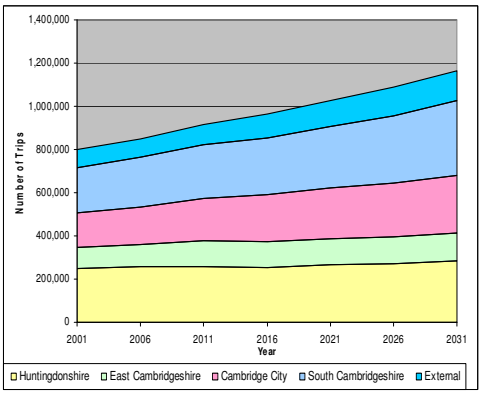


Figure 7.6 Discretionary Trip Origins by District

7.2.4 The following table supplies further information on the four charts above, giving the proportional growth in the number of trips over the period 2001-2031. It can be seen that while Discretionary trips grow roughly with the increase in population, Home Based Work, and especially Employer's Business trips grow much more in line with the increase in employment. Growth in education trips is focussed in Cambridge and South Cambridgeshire.

Table 7.3: Growth in Trips from 2001 to 2031 by Purpose and District

	Home Based Work	Employer's Business	Education	Discretionary
Cambridge City	60%	63%	82%	68%
South Cambridgeshire	57%	71%	70%	64%
East Cambridgeshire	25%	31%	12%	31%
Huntingdonshire	19%	24%	5%	14%
External	50%	39%	16%	64%
Total	42%	47%	48%	46%

7.3 TRIP CHARACTERISTICS BY MODE

7.3.1 Figure 7.7 and Table 7.4 show the number of trips made by each mode of travel, as well as the modal split over time. It can be seen that in the Reference Case the modal split stays relatively constant but with a small increase in the proportions of public transport and cycling at the expense of walking.

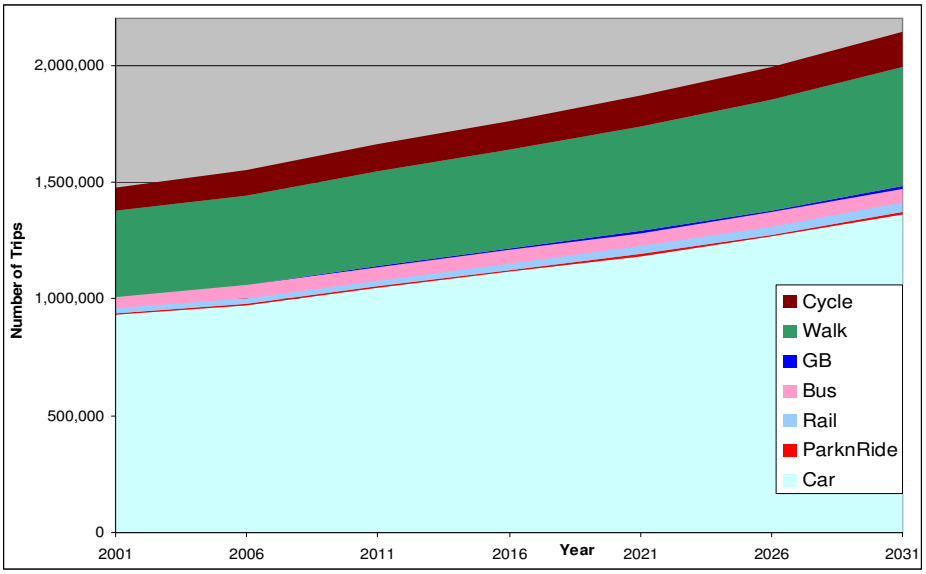


Figure 7.7 Number of Trips by Mode of Travel

Table 7.4 Modal Split over Time

Year	Car	PT	Walk	Cycle
2001	63.6%	4.7%	25.0%	6.7%
2006	63.2%	5.1%	24.8%	6.8%
2011	63.4%	5.2%	24.5%	6.9%
2016	63.8%	5.3%	24.0%	6.9%
2021	63.7%	5.3%	24.0%	7.0%
2026	64.0%	5.2%	23.7%	7.1%
2031	63.9%	5.2%	23.7%	7.1%

7.3.2 The following charts show the changes in trip characteristics over time by mode of travel. Figure 7.8 shows the variation in the average distance of trips; Figure 7.9 shows the relative variation in average speed from the base figures in 2006.

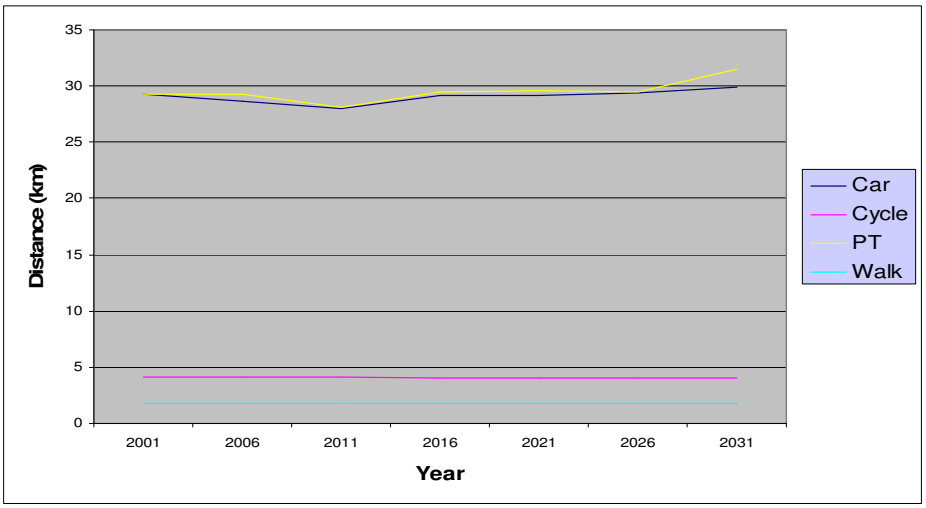


Figure 7.8 Average Distance by Mode of Travel

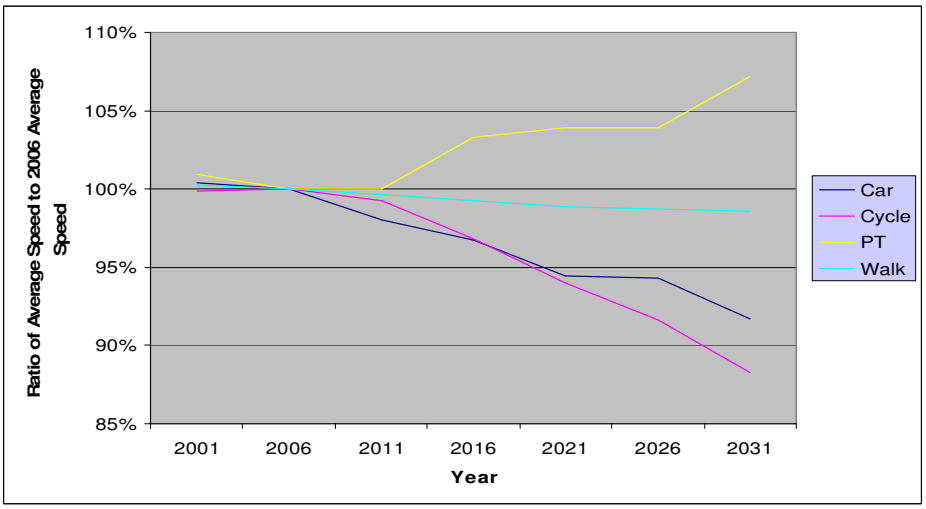


Figure 7.9 Average Speed of Trips by Mode of Travel

7.3.3 It is notable that Car and Cycle speeds drop over time. The drop in car speeds is easily explained by an increase in congestion over time. The cycle speeds have the same explanation: It has been assumed that that on any link used by both cycle and motor vehicles the cyclists will travel at half the speed of the motor vehicles around them. As a consequence when increased congestion causes the speeds on these links to drop the speeds of the cyclists on these links also drop.

7.4 TRIP CHARACTERISTICS BY PURPOSE AND TIME OF DAY

7.4.1 Figure 7.10 and Table 7.5 show the changes in the number of trips in each of the three modelled time periods over the course of the Reference Case run. The table demonstrates what is suggested by the chart, namely that the proportions of trips within each of the time periods changes very little.

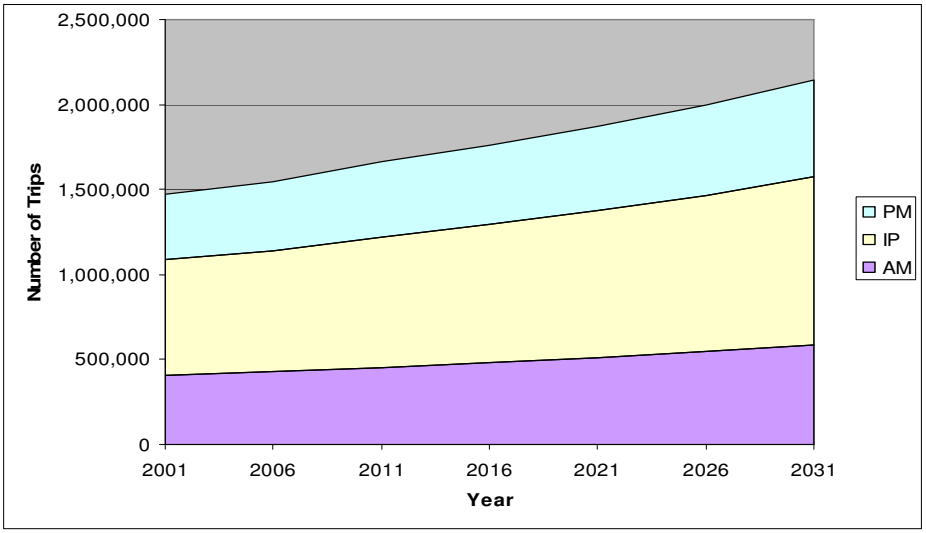


Figure 7.10 Number of Trips by Time of Day of Travel

Table 7.5 Time of Day Split over Time

Year	AM	IP	PM
2001	27.8%	45.8%	26.3%
2006	27.6%	46.0%	26.4%
2011	27.3%	46.3%	26.4%
2016	27.4%	46.1%	26.5%
2021	27.3%	46.2%	26.5%
2026	27.4%	46.1%	26.5%
2031	27.4%	46.1%	26.5%

7.4.2 Figure 7.11 shows the increase in trips by purpose over the course of the timeframe modelled. The chart shows that the pattern of trips by purpose stays broadly similar between 2001 and 2031.

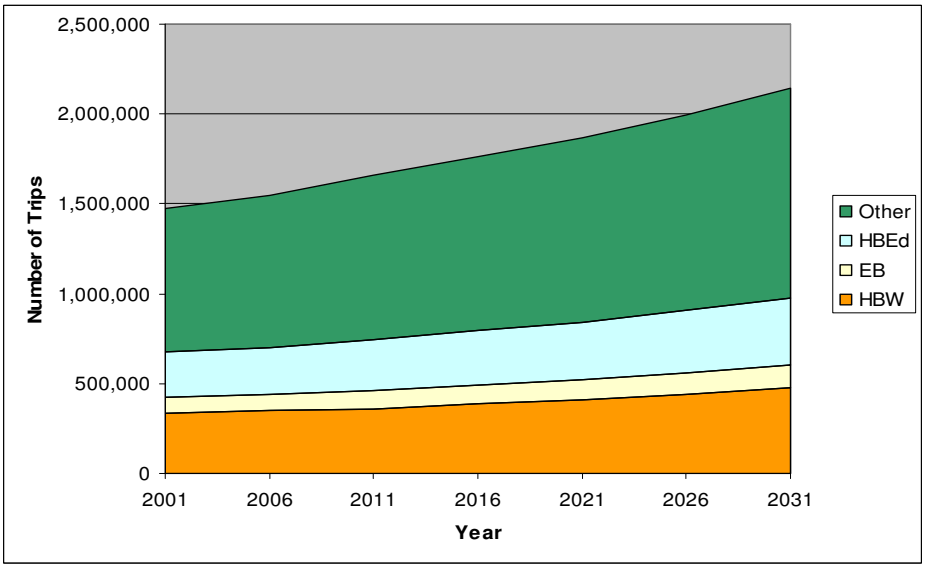


Figure 7.11 Number of Trips by Purpose of Travel

7.4.3 The following charts show show the change in trip distance and speed over time by purpose of trip.

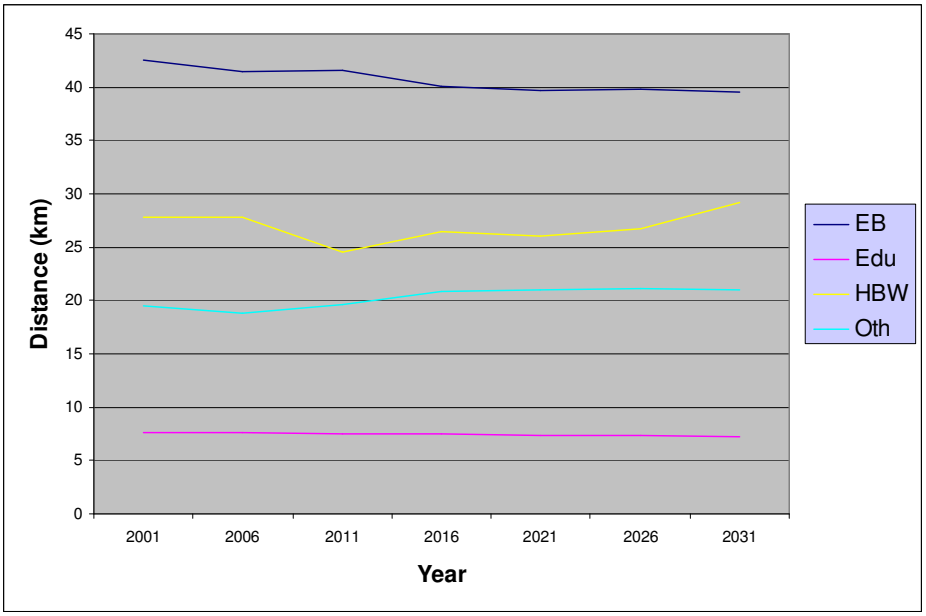


Figure 7.12 Average Trip Distance by Purpose of Travel

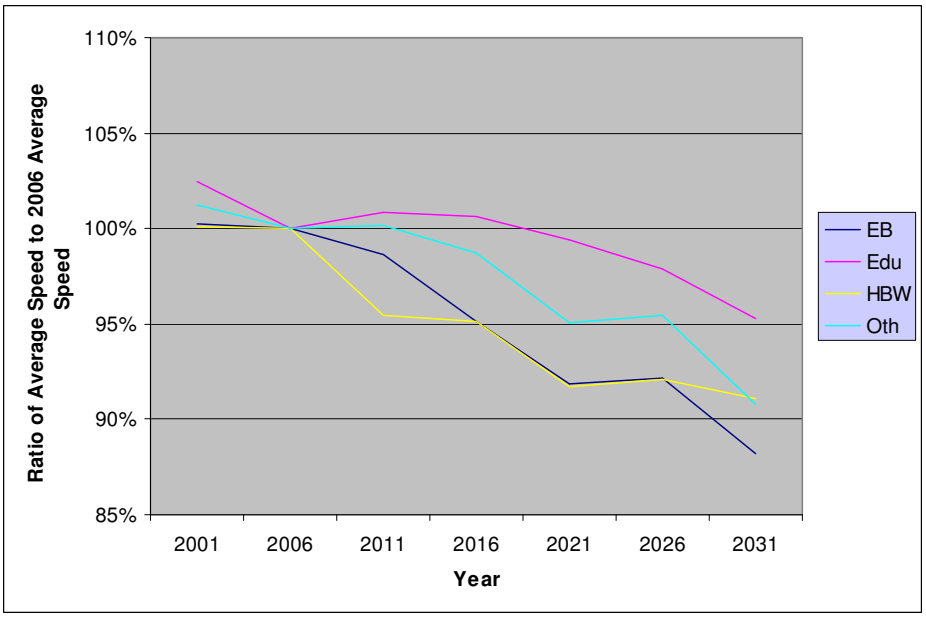
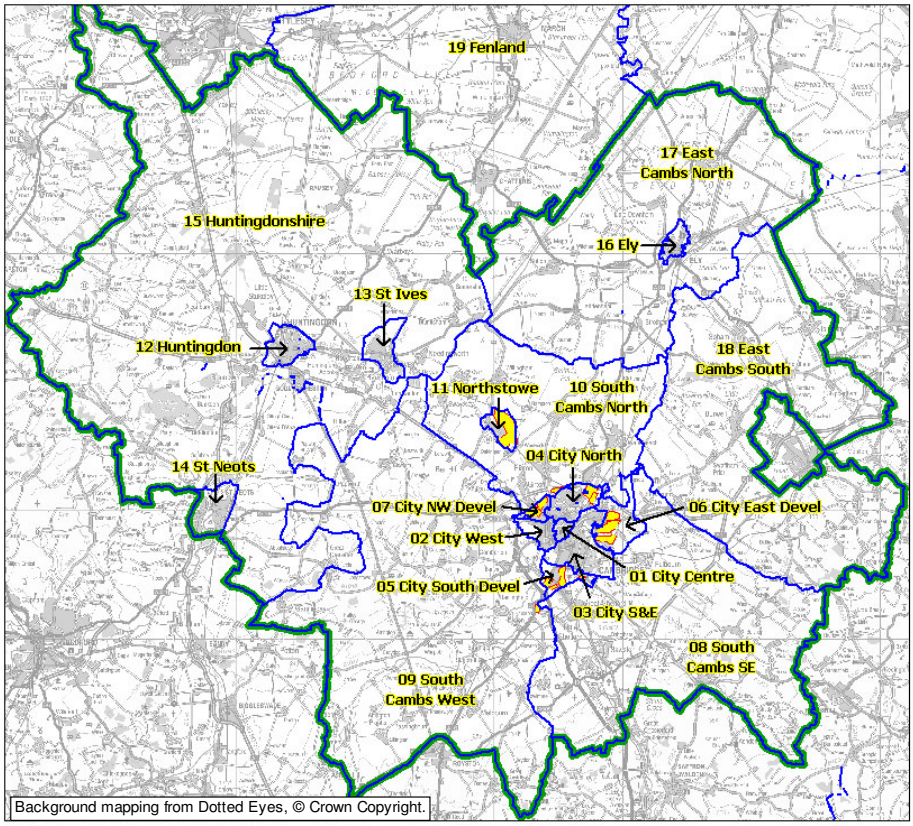


Figure 7.13 Average Speed of Trips by Purpose of Travel

7.5 MODEL RESULTS BY GEOGRAPHIC AREA (SECTOR)

7.5.1 This section concludes with a comparison between the base year (2006) and 2021 trip characteristics by sector. We have split the Study Area into 18 internal and 4 external sectors. The 18 internal sectors and Fenland are shown with their boundaries in Figure 7.14. Also shown on the map are the boundaries of the study area and the strategic development sites.

Figure 7.14: Study Area and Sectors



7.5.2 Figure 7.15 and Figure 7.16 show the change in trip volumes originating and terminating in each sector in both percentage and absolute terms. As expected, the areas with most percentage growth are those with large housing developments in future years. St Ives shows a small drop in trip volumes, which is likely to be due to the relatively low growth in dwellings and floorspace in the sector, coupled with the improved connectivity of Huntingdon and Cambridge (A14 and Guided Bus) increasing the attractiveness of the larger settlements relative to the smaller intermediate settlements..

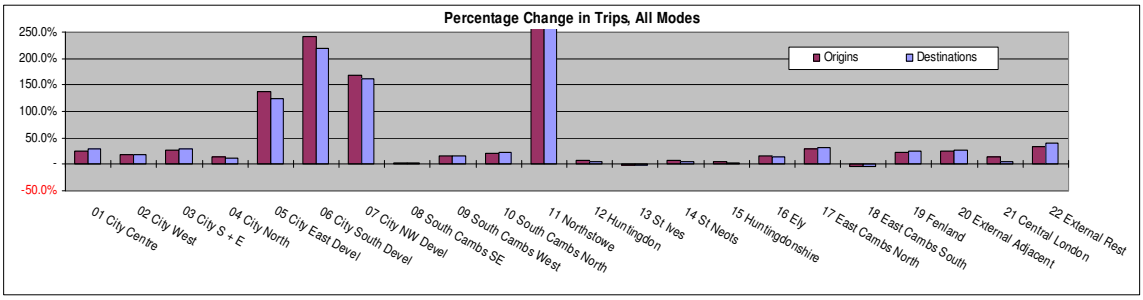


Figure 7.15 Percentage Change in Trip Volumes, 2006-2021[11]

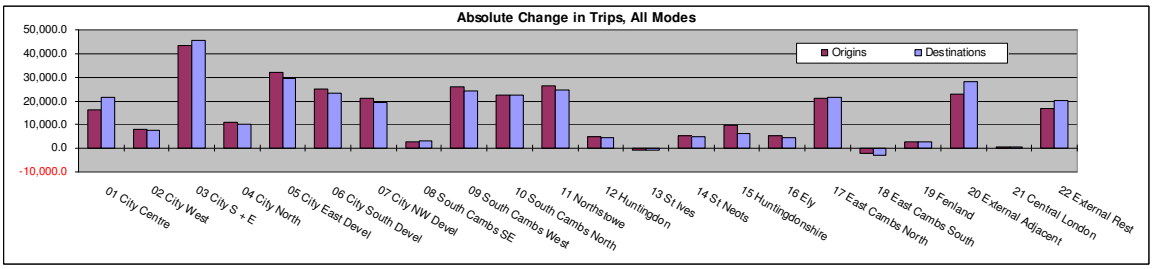


Figure 7.16 Absolute Change in Trip Volumes, 2006-2021

7.5.3 The remaining charts show the changes in trip characteristics, calculated with reference to the sector within which the trip originated. The first chart denotes the changes in average distance and speed for all modes, the remaining two show the changes in average distance, speed and cost for Car and Bus trips respectively. With regard to the latter it should be noted that the large increase in costs (fares) seen for all sectors is a consequence of the 2% above inflation year-on-year bus fare increases coded into the model. The decrease in average speed for both car and bus is a result of the worsening road congestion through time.

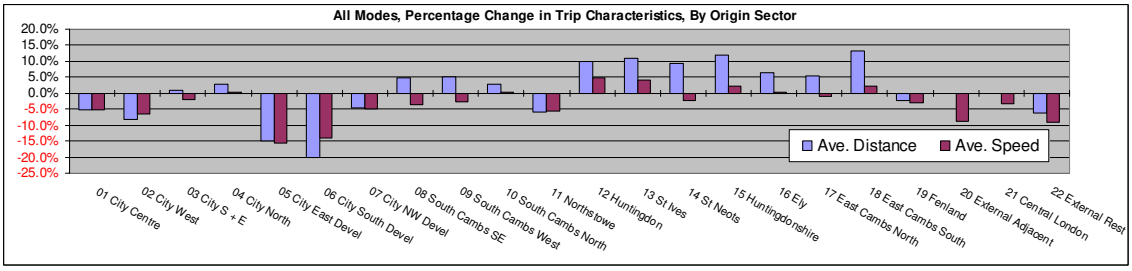


Figure 7.17 Changes in Average Distance and Speed for All Trips by Origin, 2006-21

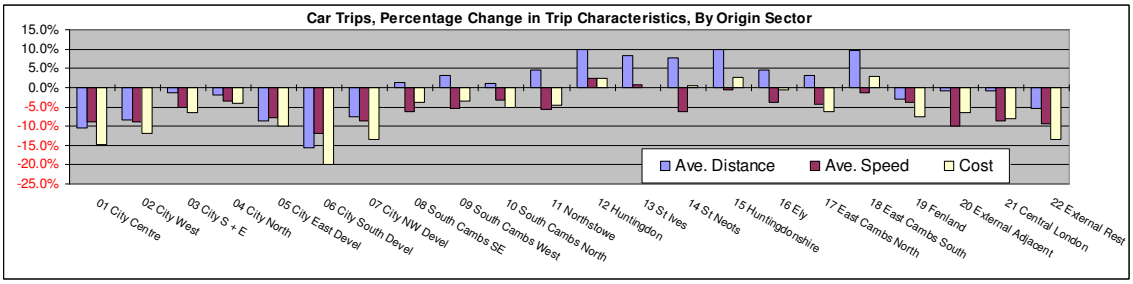


Figure 7.18: Changes in Average Distance, Speed and Cost for Car Trips by Origin, 2006-21

[11] For ease of reference, this chart has been cropped at 250%. Trips to and from Northstowe grow by almost 700% over this period

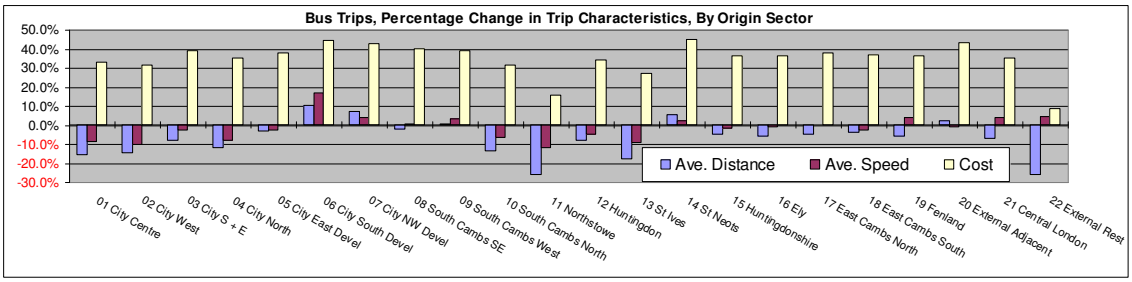


Figure 7.19: Change in Average Distance, Speed and Cost for Bus Trips by Origin, 2006-21

8 References

Atkins, 13 November 2008, updated 17 April 2009. *Technical Note 9, Forecast Highway Matrices for CRSM*

Atkins, October 2008, *Value of time and resource cost_new_v1j.xls*

Atkins, May 2008, *Addendum to the Major Scheme Business Case – Chesterton Interchange, Addendum Final*

Atkins, July 2009. *Cambridge Sub Regional Model - Highway Model Component: Model Development and Validation Report*

Department of the Environment, Transport and the Regions. *National Road Traffic Forecast, 1997.*

DfT, February 2007, The TAG Unit 3.5.6 – Values of Time and Operating Cost

DfT, June 2006. The TAG Unit 3.10.2, Variable Demand Modelling – Scope of the model

DfT, June 2006. *The TAG Unit 3.10.3, Variable Demand Modelling – Key processes*

DfT, July 2008. *The TAG Unit 3.15.1 Draft, Forecasting Using Transport Models*

DfT, July 2008. *The TAG Unit 3.15.3 Draft, Forecasting and Sensitivity Tests for Public Transport Schemes.*

DfT, January 2007. *The TAG Unit 3.11.1, Model Structures and Traveller Responses for Public Transport Schemes.*

DfT, April 2009. *The TAG Unit 3.15.4, Rail Passenger Demand Forecasting Methodology.*

WSP, September 2009. *Cambridge Sub Regional Model (CSRM) Transport Demand and Public Transport Model Development and Validation Report*

Other sources used for coding of future transport schemes, not cited in text:

Atkins, *Cambridge North West Transport Study, Final Report*, 2006. Available at http://www.cambridgeshire.gov.uk/transport/strategies/longterm/developmentareas/northwest/

CCC Sustainable Communities (Huw Nicholas)*, Cambridge Southern Fringe 106 Requirements for Walking, Cycling and Equestrian Network Development*, 2007.

Cambridgeshire County Council Guided Bus Website, 2007. Available at http://www.cambridgeshire.gov.uk/transport/guided/

Cambridgeshire County Council, Cambridge City Council, *Local Transport Plan (LTP),* 2006-2011, 2005.

Cambridgeshire County Council, *Guided Bus Facts*, 2008. available on http://www.cambridgeshire.gov.uk/NR/rdonlyres/EF2D4AF0-A488-404F-BC4B-F3E4E83A33AC/0/GuidedBuswayfactsFINALJul08.pdf

Steer Davies Gleave, *Cambridge Area Transport Strategy – Road User Charging Complementary Measures*, March 2007.

Steer Davies Gleave, *Cambridge East Public Transport Routes Specification, 2007, PT routes_Specification.xls,* May 2006.

Steer Davies Gleave, *Cambridge East Sustainable Transport Strategy, Final report*, November 2006.

SDG/Atkins, May 2008, *Bus frequencies - ref and CM_22_5_08.xls*

SDG/Atkins, May 2008, *Guided bus, Cambridge East high quality buses layouts, D01a/b/c/d/e/f/g/h/j/k_labelled.JPG*

SDG/Atkins, May 2008, *Cambridge East high quality bus services journey time, D01g-D01k journey times.xls.*

SDG Meeting Note,*Review of complementary measures coding, 24th June 2009-10-07*

SDG File, *Complementary measures, DM Coding and DM Service coding, 29th June 2009*

Appendices, Figures & Tables

Appendix A Allocation Of Strategic Site Growth To Transport Zones

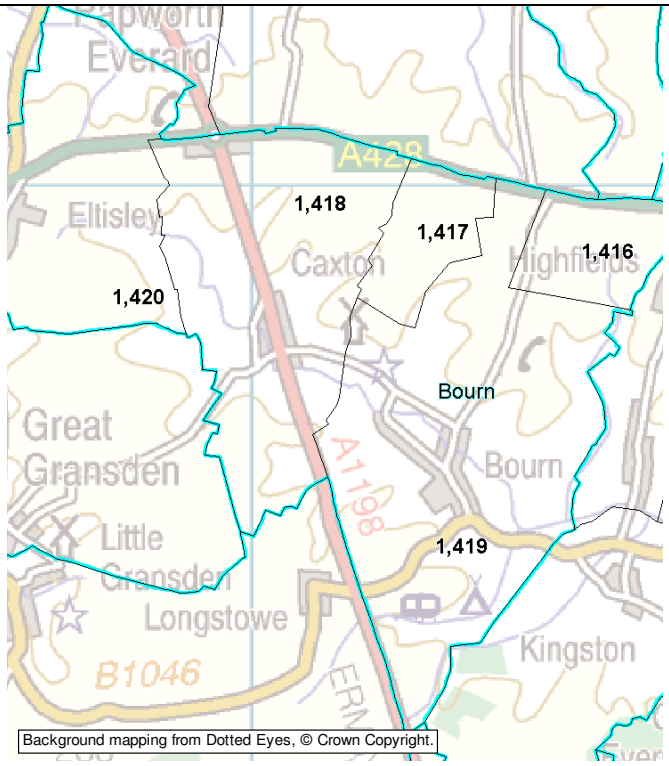
Table A1 – Assignment of Dwelling Growth to Model Transport Zones

	CCC Ward Level Forecasts (See Note 1)					Modelling Assumptions						Derived values			
Strategic Site Name	**2007-2011**	**2011-2016**	**2016-2021**	**Total to 2021**	**CCC Declared Ward**	**Ward**	**Transport Zone**	**%age (See Note**	**200 6-11**	**2011-16**	**2016-21**	**2006-11**	**2011-16**	**2016-21**	**Notes**
Cambourne	1,200	800	0	2,000	Bourn	Bourn	1417	20%				240	160	0	See Map A1
							1418	80%				960	640	0	
Loves Farm	850	400	650	1,900	Grandsden and the Offords	St Neots Priory Park	1272	100%				850	400	650	See Map A2 and Note 3 below.
North Bridge	400	500	350	1,250	Alconbury & The Stukeleys	Alconbury and The Stukeleys	1205	100%				400	500	350	See Map A3
Northstowe	550	3,200	4,400	8,150	Northstowe	Longstanton	1452		50%	0%	0%	275	0	0	Allocations in Northstowe vary by development year. See Map A4.
						Longstanton	1453		0%	50%	0%	0	1600	0	
						Longstanton	1450		0%	0%	50%	0	0	2200	
						Longstanton	1449		0%	0%	50%	0	0	2200	
						Longstanton	1448		0%	20%	0%	0	640	0	
						Cottenham	1429		50%	30%	0%	275	960	0	
Northern Fringe	0	0	0	0		n/a						0	0	0	No development
Sewerage Works	0	0	0	0	East Chesterton	n/a						0	0	0	
Chesterton Sidings	0	0	0	0		n/a						0	0	0	
Southern Fringe	**2,090**	**2,330**	**0**	**4,420**											See Map A5
Bell School	500	150	0	650		Granham's Rd	51	100%				500	150	0	
Clay Farm	800	1,500	0	2,300		Trumpington	61	50%				400	750	0	
						Queen Edith's	58	50%				400	750	0	
Glebe Farm	200	100	0	300		Trumpington	58	100%				200	100	0	
Trumpington Meadows	350	250	0	600		Trumpington	62	100%				350	250	0	
TM / Monsanto	240	330	0	570		Haslingfield and the Everdens	1441	100%				240	330	0	
Cambridge East	**500**	**2,900**	**3,850**	**7,250**											See Map A6
North of Newmarket Road	500	1,550	1,000	3,050	The Wilbrahams	The Wilbrahams	1487	100%				500	1550	1000	
North of Cherry Hinton	0	1,350	1,350	2,700	Cherry Hinton	Cherry Hinton	6	50%				0	675	675	
						Abbey	17	50%				0	675	675	
Airport	0	0	1,500	1,500	Teversham	Teversham	1474	25%				0	0	375	
						Teversham	76	50%				0	0	750	
						Abbey	6	25%				0	0	375	
Arbury Camp	800	400	200	1,400	Histon and Impington	Histon and Impington	73	100%				800	400	200	See Map A7
Cambridge NW	**400**	**2,580**	**350**	**3,330**	Castle										
Huntingdon/Histon Road	400	1,380	0	1,780		Castle	15	100%				400	1380	0	
Huntingdon/ Madingley Rd	0	1,200	350	1,550		Castle	14	100%				0	1200	350	
TOTAL	6,790	13,110	9,800	29,700								6,790	13,110	9,800	Derived Total to 29,700

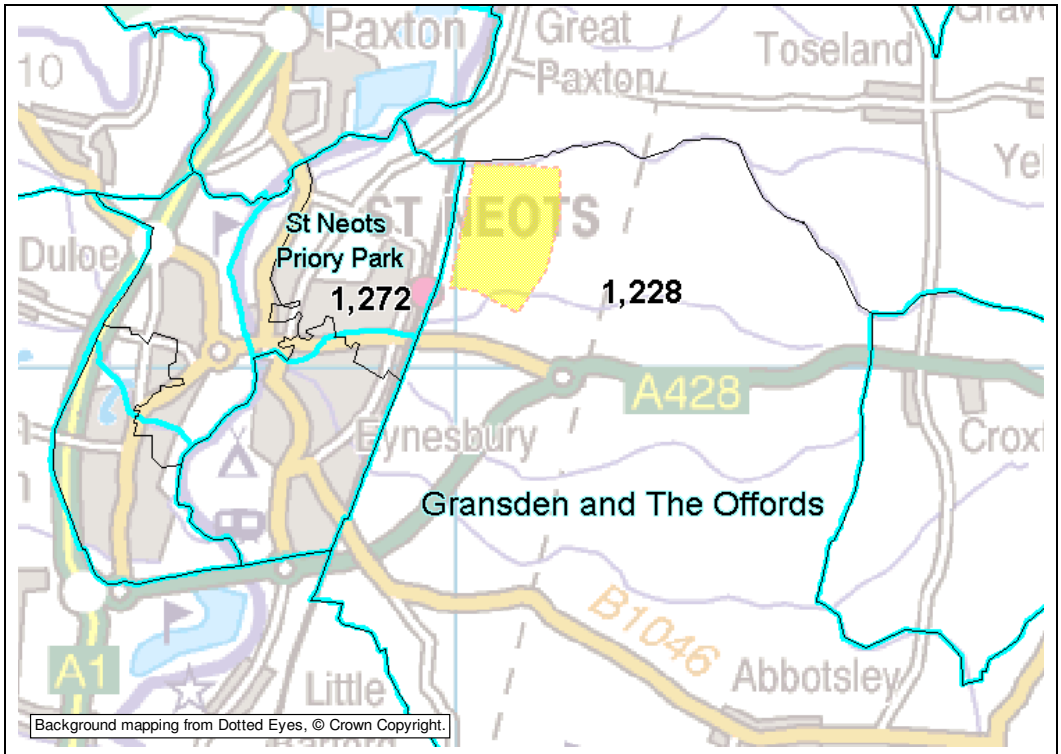
Note 1: CCC Research Group, July 2008.

Note 2: The percentages in this column are the percentage of the growth allocated to each Ward within development area that has been allocated to each Transport Zone for the purposes of the model.

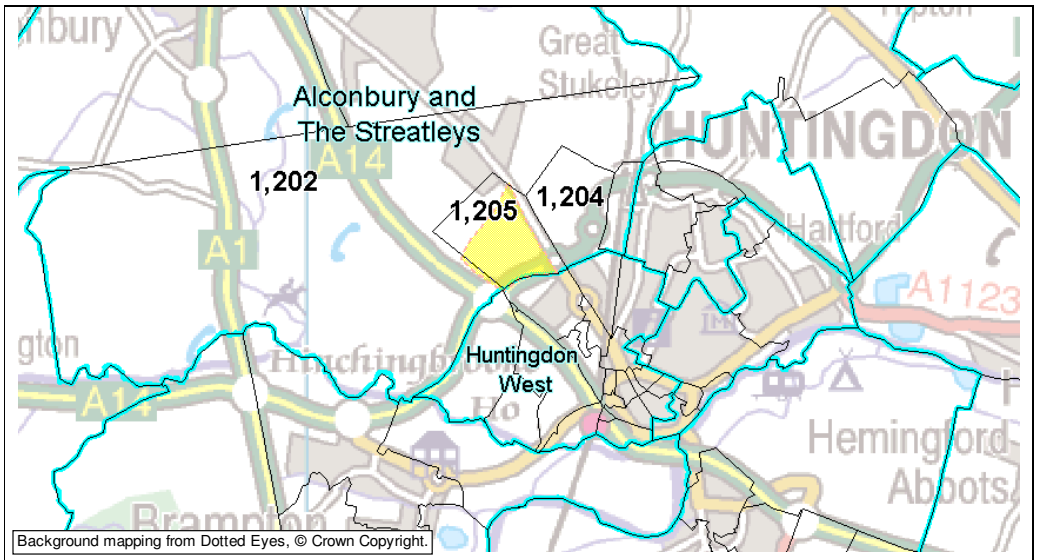
Note 3: St Neots Urban Extension has been placed WITHIN St Neots in the model, to reflect likely transport linkages which do not exist in Zone 1228 (Grandsden Ward) – See Map A2.



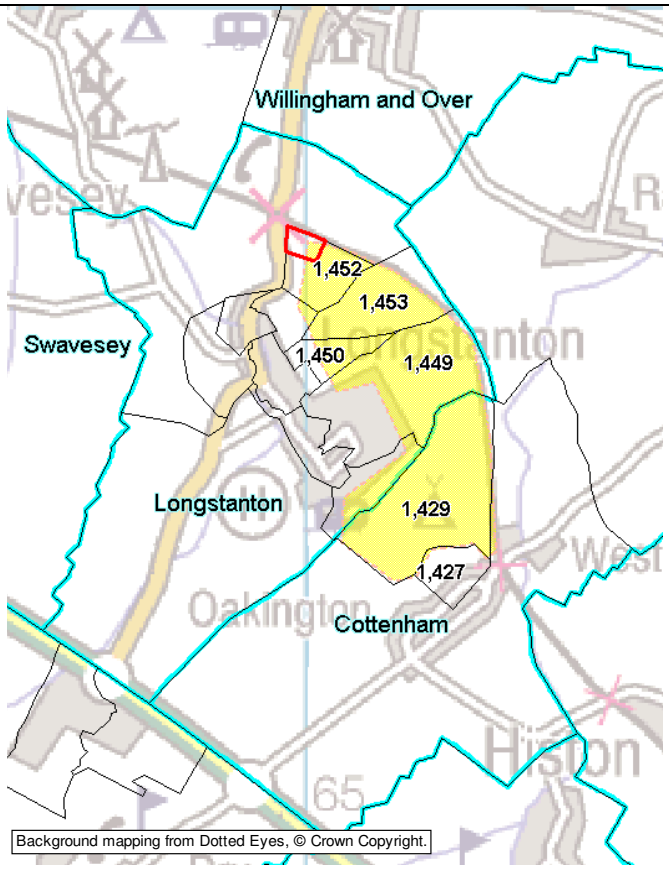
Map A1 – Cambourne



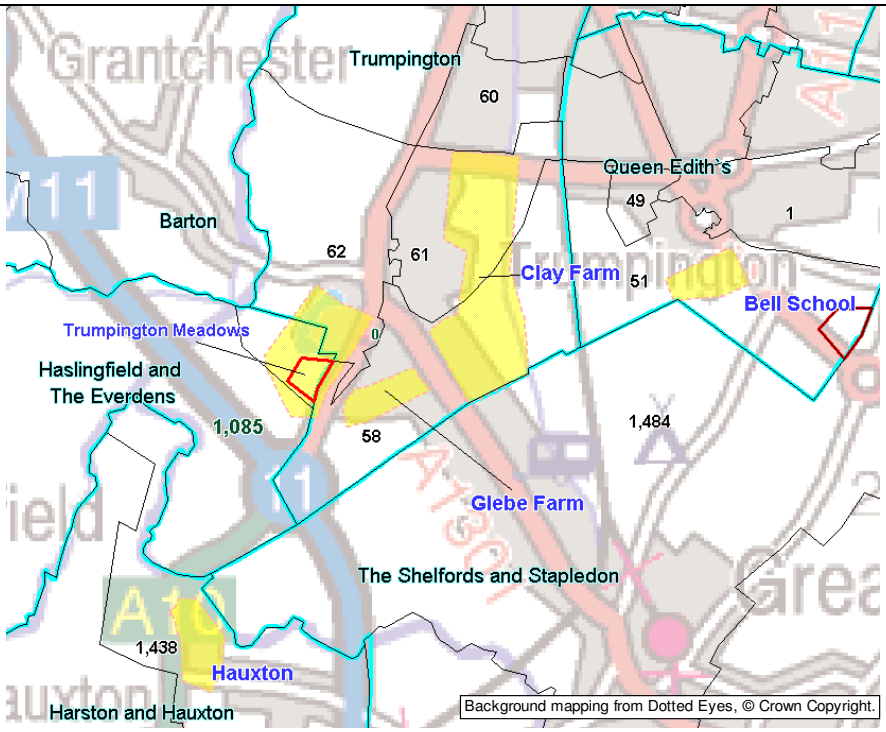
Map A2 – Loves Farm (St Neots Urban Extension) – See Note 3



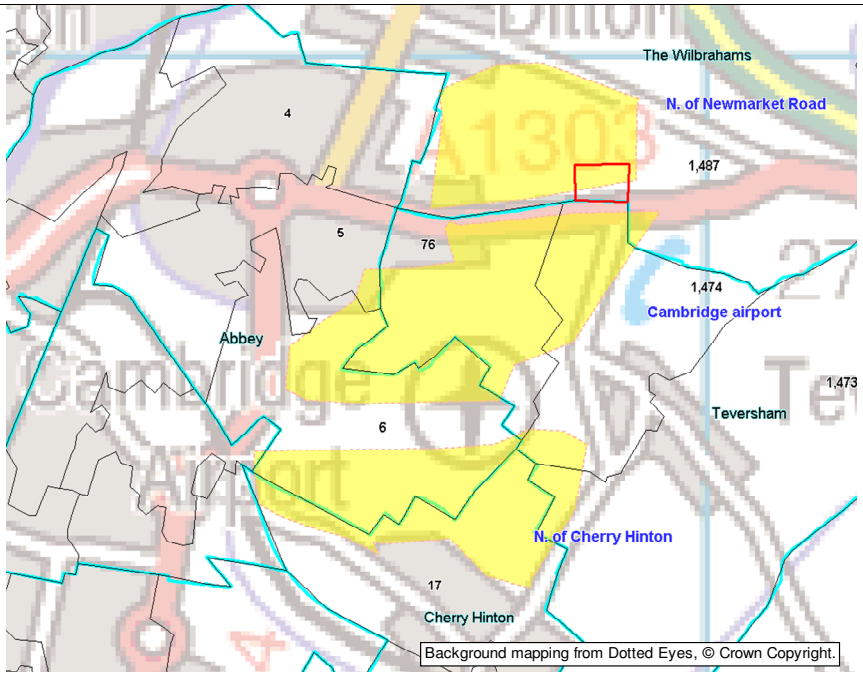
Map A3 – Northbridge



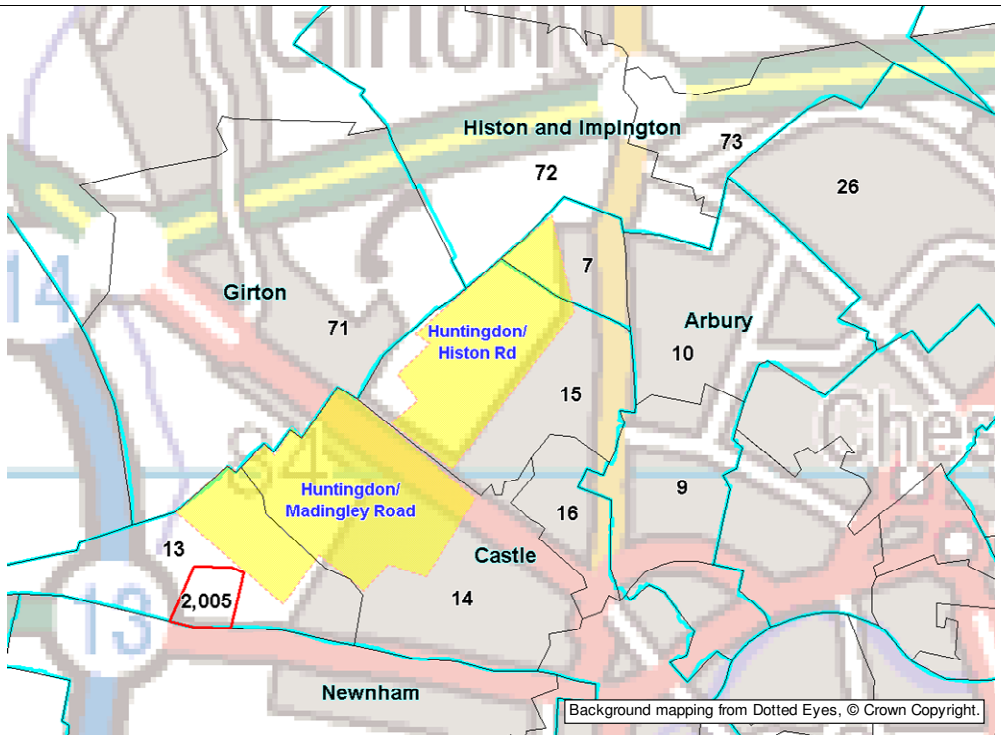
Map A4 - Northstowe



Map A5 – Southern Fringe



Map A6 – Cambridge East



Map A7 – Cambridge North-West and Arbury

Appendix B Employment Data Sources and Processing

The exogenous employment input to the model is derived from TEMPRO v5.4 (total workplace workers). The preparation of the data involves the following steps:

- TEMPRO Employment categories are matched to modelled SIC categories, using the bulk categories A-E in Table A.1
- An adjusted TEMPRO total is calculated, removing a fixed proportion of workers who are identified in the 2001 Census as being full-time students – these are modelled as students only in CSRM, and so are not relevant to our future employment growth in the model.
- The 2001 employment figures in CSRM (taken from Census data, and divided in CSRM into 20 factors: 10 SICs by FT/PT employment), is scaled at the rate of growth of the equivalent TEMPRO bulk categories, so that the relative growth of (say) retail vs industrial from TEMPRO is applied.
- The total employment in CSRM is re-scaled in each model year to match the adjusted TEMPRO total. (This is necessary because the previous step does not preserve totals).
- The corresponding exogenous employment determined in the 2001 CSRM model is scaled by identical factors.

This procedure produces exogenous employment inputs for CSRM which are consistent with:

- TEMPRO Total Workplace Workers;
- TEMPRO Employment growth by the bulk categories (Education, Retail, Services/Recreation, Business, Industry/Construction/Transport and Agriculture).
- Modelled sub-regional patterns of exogenous and endogenous employment, and proportions of working students in 2001 Census.

Table A.1 Correspondence of TEMPRO and CSRM Employment Categories

MODEL		BULK CATEGORY	TEMPRO CODE	TEMPRO DESC.
SIC 8	Education	A	E03	Primary & Secondary Schools
			E04	Higher Education
			E05	Adult Education
SIC 5*	Retail, catering and repairs	B	E06	Hotels, Campsites, etc.
			E07	Retail Trade
			E11	Restaurants & Bars
SIC 10*	Other services NES	C	E08	Health, Medical
			E12	Recreation & Sport
			E09	Services & Eqpt Rental
SIC 6*	Finance and business services	D	E14	Business
SIC 9	Government and compulsory public services			
SIC 2*	Mining, Manufacturing and utilities	E	E10	Industry, Construct, Transport
SIC 3	Construction			
SIC 4*	Transport, storage and communication			
SIC 1	Agriculture, forestry & fishing	F	E13	Agriculture & Fishing

* Employment types which are assigned to a floorspace type within the Land Use model, and can only locate where floorspace is available.

Technical Note: NWC CSRM Runs Summary of Transport Demand Results

Project:	CSRM: North-West Cambridge Modelling Support	**To:**	Gerry Corrance, CCC
Subject:	Demand Model Results	**From:**	WSP
Date:	3rd March 2011	**cc:**	John Hopkins, PBA
Ref:	WSP 11641256 TN005		

1. Introduction

1.1.1. This Technical Note reviews the main results of the CSRM runs included within each North-West Cambridge (NWC) modelling scenario. Initially, the modelled scenarios are 020B Do Minimum (for the years 2011, 2016, 2021 and 2026) and 021B Do Something (for 2021 and 2026 only).

1.1.2. The contents are based on information presented at the meeting of 22 February 2011 with the County Council, PBA and Highways Agency, and provide a permanent record of the presentation at that meeting.

2. Travel Demand Results

2.1. Total Site-Specific Movements

2.1.1. The output from CSRM has been compared with the data supplied by PBA from their Person Trip Analysis v9[1]. Comparisons of initial run results took place intermittently during the project, with draft results being shared with John Hopkins of PBA. It was agreed during these discussions that the model results were sufficiently close to the travel demand and mode share envisaged in the Travel Plan, and therefore no further modifications of the model inputs were required.

2.1.2. Figure 2.1 compares mode shares for travel to and from the site (excluding internal trips) in the AM Peak period (7am-10am). For both arrivals and departures, the car mode share is very similar. The Public Transport mode share appears significantly lower in CSRM for the AM arrivals, with only 4% of total trips compared with 8% in the Travel Plan. However, it should be noted that the difference in absolute arrivals is only 127 trips, and hence does not impact significantly on the car trip totals.

2.1.3. There is evidently a large difference between CSRM and Travel Plan in terms of the balance of walk and cycle trips, though taken together there is a reasonable correspondence between the proportion of these 'slow modes' in the CSRM and Travel Plan figures.

[1] 110202 NWC Trip Generation Version 9 with full mode shift - issued to WSP for information only.xls, supplied by John Hopkins 2 Feb 2011

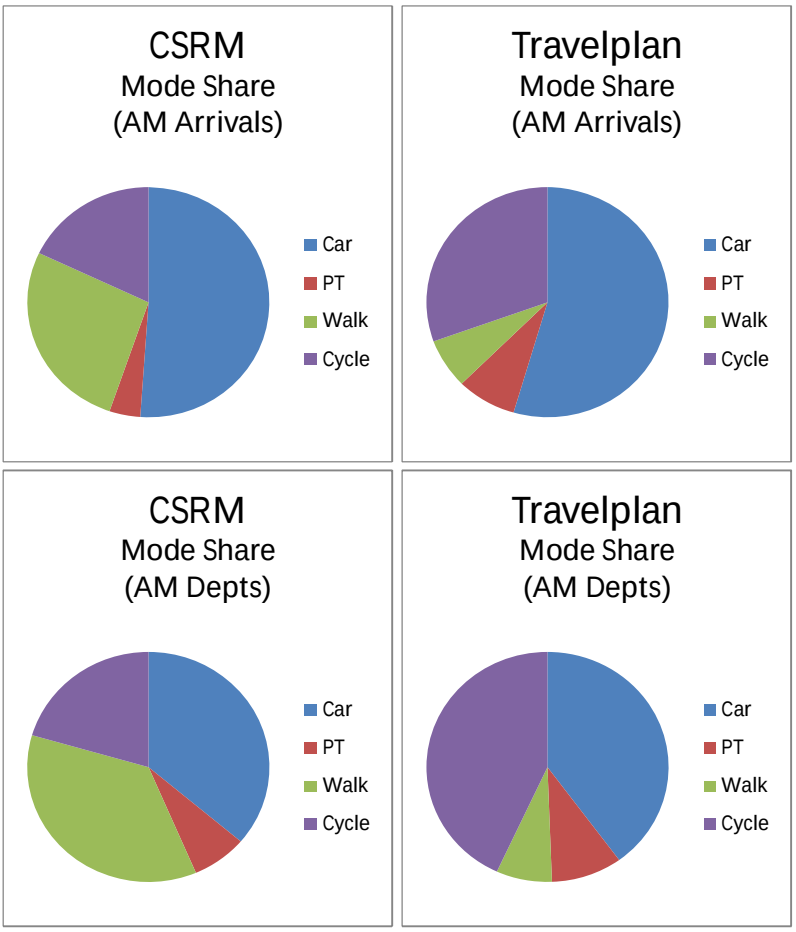
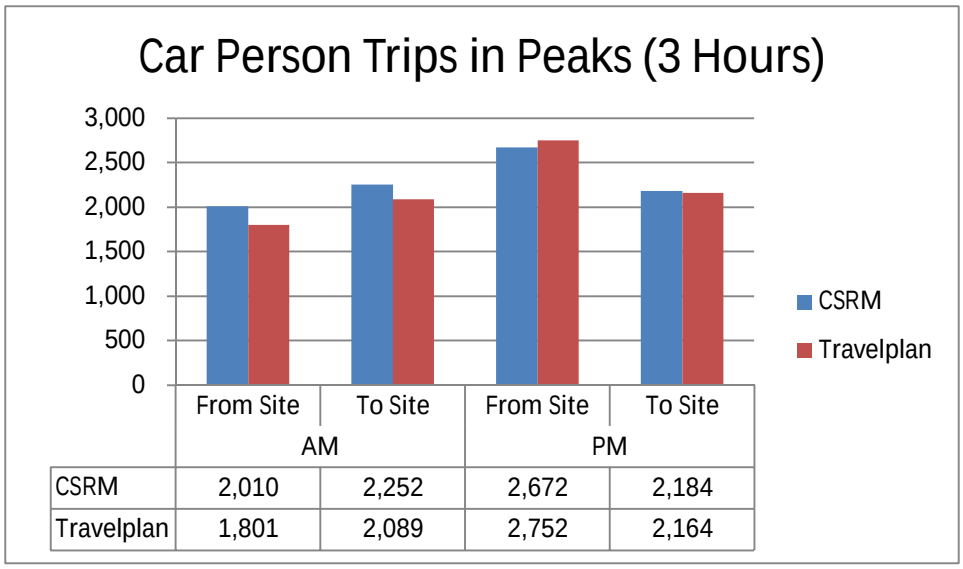


Figure 2.1: Comparison of Mode Shares in the AM Peak (7am-10am) in CSRM and Travel Plan (excluding trips internal to NWC site) [2]

2.1.4. The similarity between the two sets of data with regards to car trips is confirmed when considering the total number of car trips to/from the site in the AM Peak (7am-10am) and the PM Peak (4pm-7pm) (Figure 2.2). The CSRM estimates that there are more trips to/from the site by car in the AM peak by about 200 trips each way. The comparison in the PM Peak is closer, with the differences between the two sets of data being <100 trips each way compared with the Travel Plan.

[2] In this and all subsequent charts, the NWC travel demand is derived by taking the difference between the DM and DS model runs (020B and 021B respectively) for Zone 14, where the current site lies.



	From Site	To Site	From Site	To Site
	AM		PM	
CSRM	2,010	2,252	2,672	2,184
Travelplan	1,801	2,089	2,752	2,164

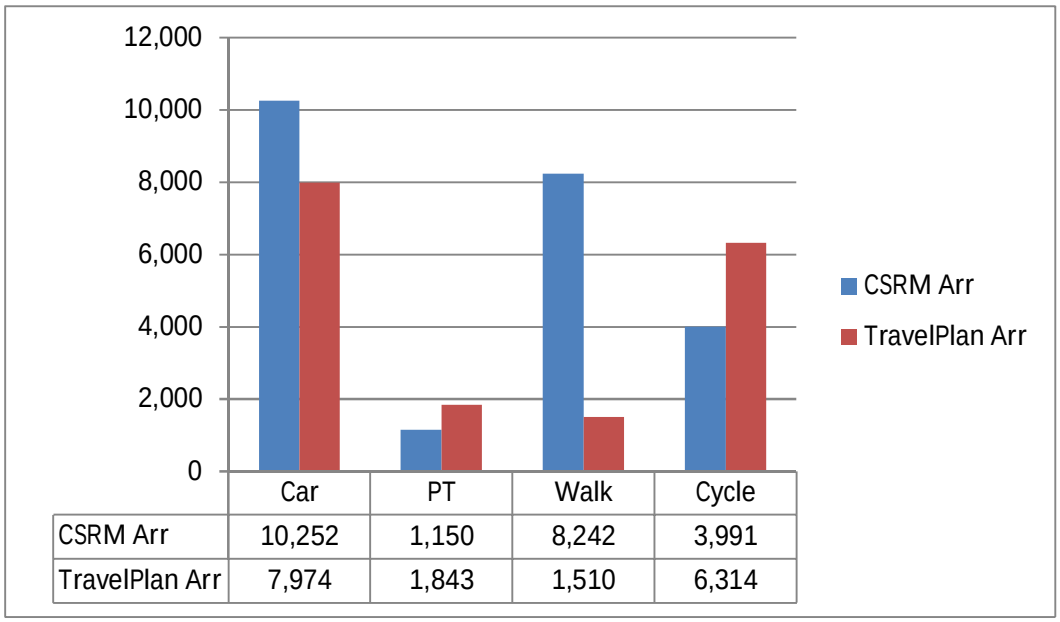
Figure 2.2: Car Trips to/from the NWC site in the AM and PM Peaks (excluding trips internal to NWC site)

2.1.5. Figure 2.3 shows the number of trips made across the whole day by mode to/from the NWC site, which results in an overall pattern similar to that shown in Figure 2.1 above.[3]

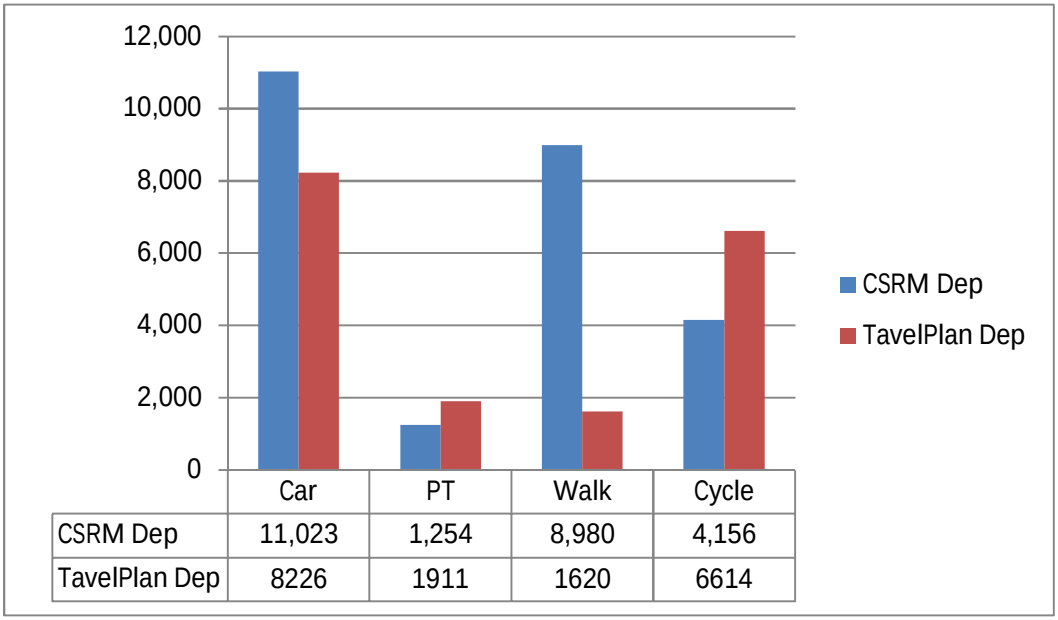
Trips by Purpose

2.1.6. Further analysis showed a larger variation by trip purpose. The PBA figures have more discretionary trip-making than the CSRM data, including a lot more shopping trips by car. This is reversed when it comes to work trips, with the CSRM figures showing more of these than the PBA data. This was discussed with PBA during initial testing and model runs, and tests undertaken to adjust CSRM proportions. It proved unrealistic to achieve this without increasing the amount of car trips in CSRM overall greatly, taking them above the Travel Plan totals. On balance it was agreed that the trip purpose differences should not be adjusted.

[3] It is important to note that CSRM includes trips which start and finish outside the 7am-7pm period, eg.return trips with outward legs before 7am are included. . As a consequence of this it is possible that CSRM overestimates the number of trips relative to the methodology used by PBA which considers only 7am-7pm.



	Car	PT	Walk	Cycle
CSRM Arr	10,252	1,150	8,242	3,991
TravelPlan Arr	7,974	1,843	1,510	6,314



	Car	PT	Walk	Cycle
CSRM Dep	11,023	1,254	8,980	4,156
TavelPlan Dep	8226	1911	1620	6614

Figure 2.3: Total number of Arrivals(top) and Departures (below) associated with the NWC site (All Day, Excluding Internal Trips)

Time of Day Proportions

2.1.7. Table 2.1 compares the proportion of trips made during the AM and PM periods, which is very similar between CSRM and the Travel Plan. In addition, the proportion of the 7am-10am trips assumed to be made between 8am and 9am in the Travel Plan is approximately 42-44% which is approximately in line with the CSRM assumptions. Though these proportions appear very close, it should be noted that the CSRM proportions are extremely sensitive to the mix of trip purposes. Hence given the difference in the trip purpose mix between the two sources, this apparent agreement cannot be seen as indicating a broader agreement in the overall trip-making patterns.

Table 2.1: Proportion of Car trips made during each Time Period

	CSRM	TravelPlan
%AM 7am-10am	28%	26%
%PM 4pm-7pm	27%	27%
Other	45%	47%

Trip Internalisation

2.1.8. All of the figures presented above consider trips to/from destinations outside the NWC site only. In terms of overall internalisation rates (Table 2.2) the two datasets match well. It has been found that CSRM matches or exceeds the levels of internalisation of work-trips (commuting and employer's business) predicted by the Travel Plan for all categories, **without** any further adjustment to account for the high-level of matching between university staff living on site and academic jobs. For the car mode, CSRM predicts a significantly higher proportion of internalisation of work trips, but a much lower proportion overall. This latter difference is explained entirely by the high number of internal car shopping trips predicted by the Travel Plan.

Table 2.2: Proportion of trips made by purpose and mode that are internal to the NWC site

All Modes	**CSRM**	**Travel Plan**
Work Trips	13%	11%
All Trips	23%	25% (20%)
Car Mode	**CSRM**	**Travel Plan**
Work Trips	9%	2%
All Trips	10%	22% (28%)

(Figures in brackets indicate differences between Travel Plan Production and Attraction proportions.)

2.2. Site Travel Demand – Origins and Destinations of NWC Trips

2.2.1. The following maps show the pattern of trip-making in CSRM to and from Zone 14 (which contains the NWC site – most of the trip-making associated with Zone 14 is in practice NWC related). Figure 2.4 and Figure 2.5 show the pattern of the Home-Based Work trips to/from the site in the AM Peak. A high proportion of trips that originate within Zone 14 have destinations within Cambridge. Trips to Zone 14, in contrast, originate from a much wider area. Both figures show that trips to/from areas outside Cambridge are predominantly undertaken by car. This becomes ever more pronounced as one moves further out of the city. Within Cambridge there is a high proportion of walk and cycle trips to the zone, but very little PT usage.

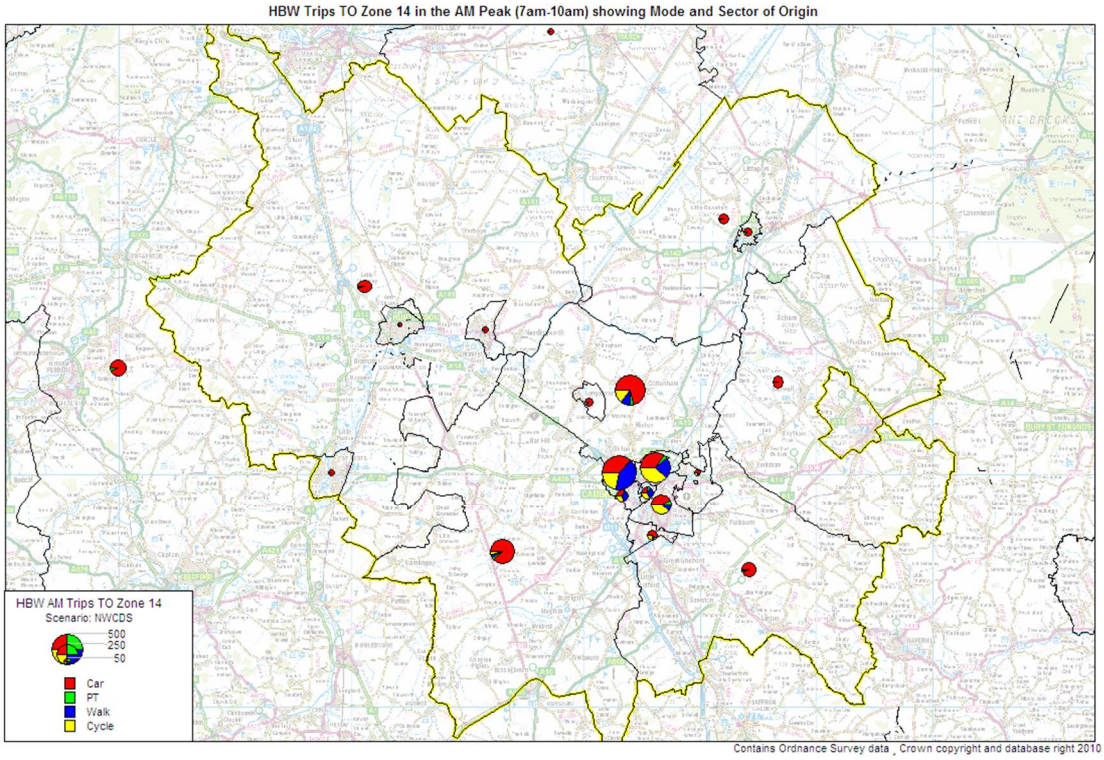


Figure 2.4: Home-based work (commuting) Trips TO Zone 14 in the AM Peak (7am-10am)

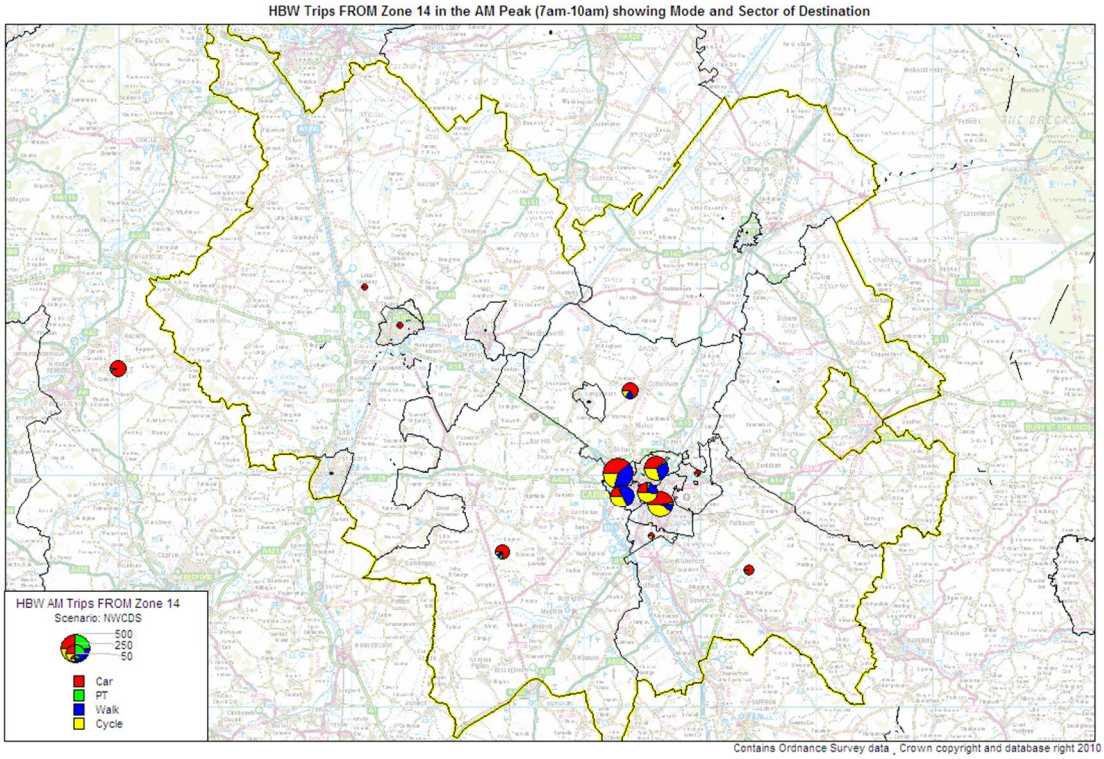


Figure 2.5: Home-based work (commuting) Trips FROM Zone 14 in the AM Peak

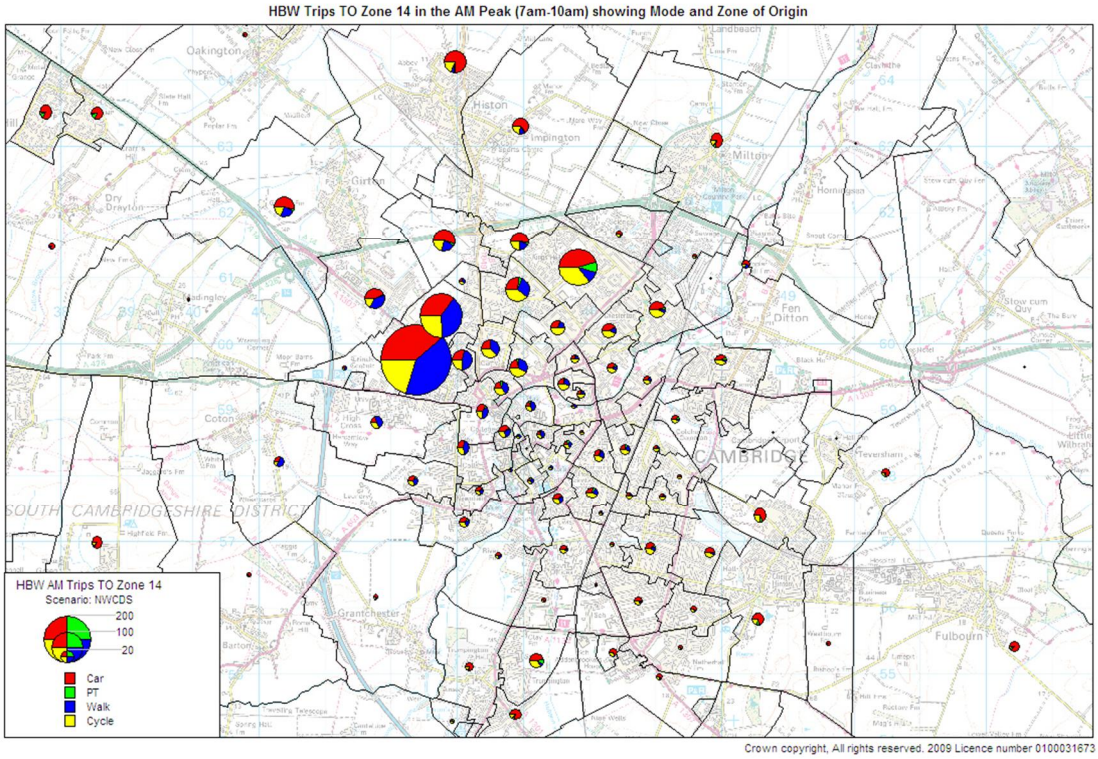


Figure 2.6: Home-based work (commuting) Trips TO Zone 14 in the AM Peak

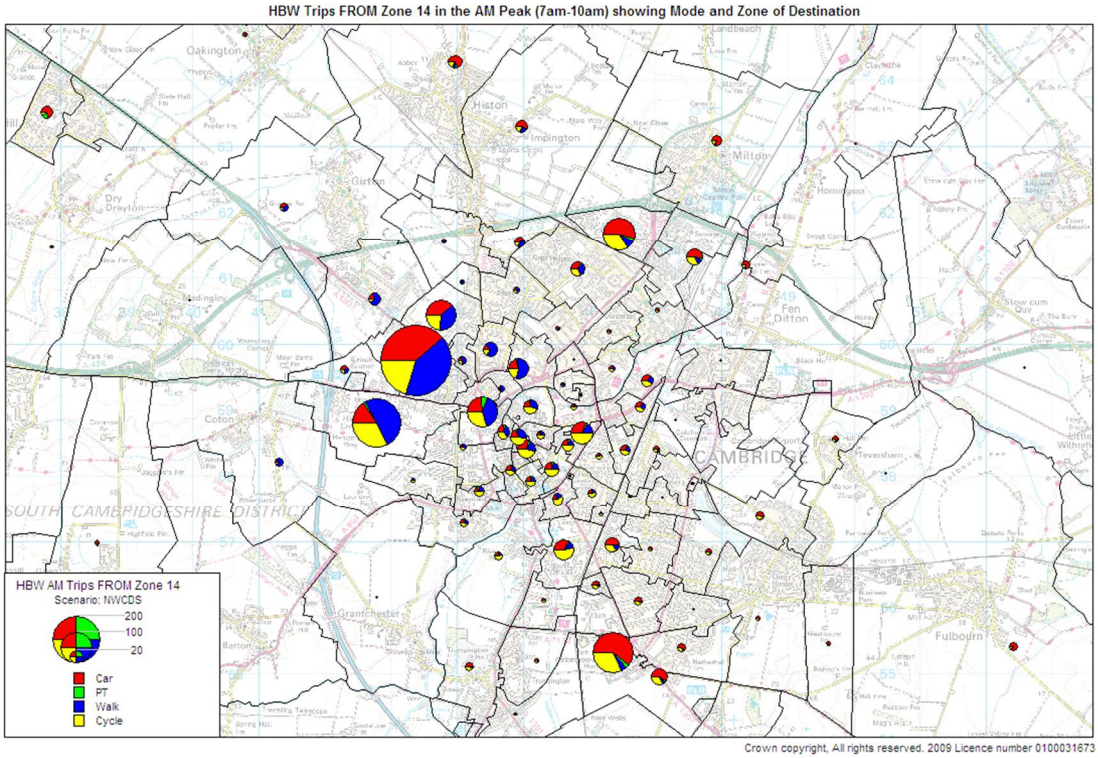


Figure 2.7: Home-based work (commuting) Trips FROM Zone 14 in the AM Peak

2.2.2. Figure 2.6 and Figure 2.7 show the equivalent data at a finer scale focusing on Cambridge. Workers in Zone 14 are drawn heavily from the north-west of the city and the areas of South Cambridgeshire immediately to the north and west. Working Residents in Zone 14 have workplaces mainly in Zone

14 and surrounding zones and the City Centre, although there are high concentrations of employment in the north of the city at the Science Park and in the south of the city at Addenbrookes.

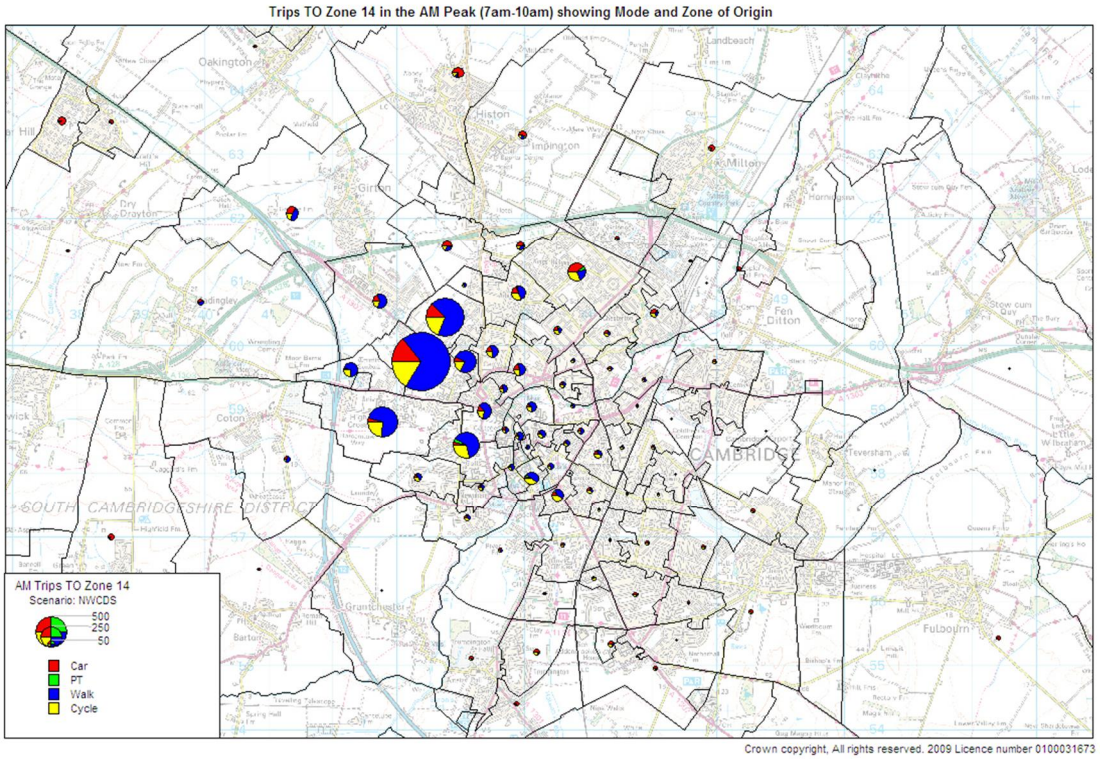


Figure 2.8: Trips TO Zone 14 in the AM Peak for all Purposes

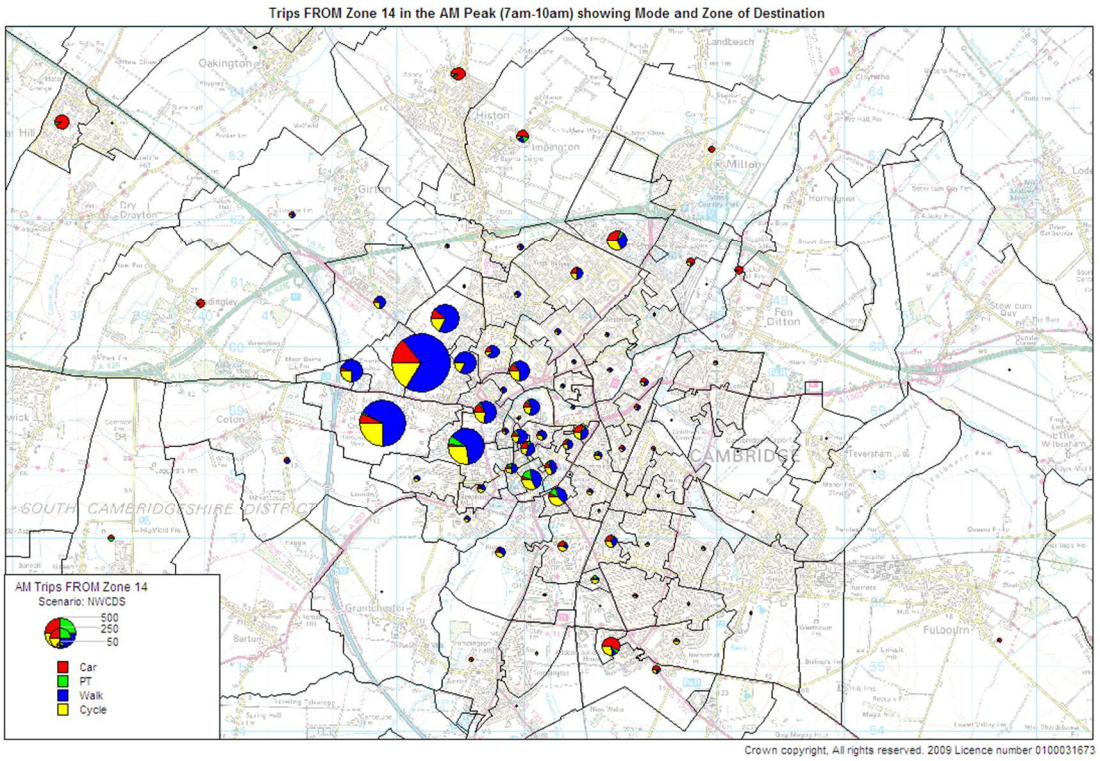


Figure 2.9: Trips FROM Zone 14 in the AM Peak for all Purposes

2.2.3. Figure 2.8 and Figure 2.9 show the modal share for all trips to/from Zone 14 (including the work trips shown previously). This results in a trip making pattern that is much more concentrated around the north-west and centre of Cambridge, especially with regards to trips to Zone 14. It is noticeable that the car mode share over all trips made is a lot lower than that seen for the home-based work trips. The majority of trips made are on foot, with cycling taking up most of the remainder to/from many zones.

Version Control:

Version	Date	By	Reviewed by	Authorised (TN only)	Notes
1.0	23/2/11	ACY	DF/TJG		WSP Internal draft
1.2	28/2/11	TJG			Revised and edited
1.3	28/2/11	ACY			Further revisions following TJG guidance.
1.4	1/3/11	ACY			Updated following comments
1.4	02/03/11		LSD		Reviewed
2.0	3/4/11	TJG			Revised in response to LSD review
2.0	03/03/11		LSD	***LSD***	Reviewed

Technical Note: NWC CSRM Runs Specification and Input Assumptions

Project:	CSRM: North-West Cambridge Modelling Support	**To:**	Gerry Corrance, CCC
Subject:	Specification and Assumptions	**From:**	Atkins / WSP
Date:	3rd March 2011	**cc:**	John Hopkins, PBA
Ref:	WSP 11641256 TN004		

1. Introduction

1.1.1. This technical note describes the model input assumptions and reviews the main results of the CSRM runs included within each North-West Cambridge (NWC) modelling scenario. Initially, the modelled scenarios are 020B Do Minimum (for the years 2011, 2016, 2021 and 2026) and 021B Do Something (for 2021 and 2026 only).

1.1.2. The note is structured as follows:

- Section 2: Land Use Assumptions – Study area wide and site-specific changes to housing, employment, floorspace and demographics.
- Section 3: Transport Infrastructure – Highways and Public Transport services.

1.1.3. This note builds on previous correspondence between the University's Consultant (PBA), WSP and Atkins, particularly WSP's TN003 (WSP, January 2011) reviewing the land use assumptions and travel plan approach. The work described herein is as specified in WSP and Atkins proposal to Cambridgeshire County Council, dated 24 January 2011.

1.1.4. A separate note (TN005) has been prepared by WSP summarising the Travel Demand results from CSRM, as presented to CCC and PBA on 22 February 2011.

2. Land Use Assumptions

2.1. Introduction

2.1.1. This section outlines the land use assumptions used for the CSRM model runs. The assumptions considered relate to:

- Study-area wide assumptions (i.e. for the whole the Cambridge Sub-Region, comprising the four districts of Huntingdonshire, East Cambridgeshire, South Cambridgeshire and Cambridge City). These assumptions include the total growth in dwellings and employment levels.

- Site-specific assumptions: These were specified by PBA specifically for the study.

2.1.2. The sections below consider each of these in turn.

2.2. Study-Area Wide Assumptions

2.2.1. The original CSRM development trajectories were produced for the Cambridgeshire TIF submission. These were aligned with Regional Spatial Strategy targets for housing and employment, via the NTEM dataset (formerly TEMPRO) v5.4 to provide overall levels of growth within the Sub-Region. Site specific allocations were provided by CCC in August 2008[1].

2.2.2. This section describes how these original assumptions have been updated for the current runs.

Dwellings – original assumptions

2.2.3. The original TIF assumptions combined information from CCC (who had consulted the Districts) on Ward-level dwellings growth and strategic sites with the NTEM 5.4 projections for total development. CCC provided information up to 2021 and beyond this point it was assumed that the remaining space in the Strategic Sites would be built out, and the remaining development to the RSS totals would come from smaller sites.

2.2.4. In the resulting trajectory, the non-strategic developments (background growth) are a very significant proportion of the total housing supply, forming approximately 50% of the additional supply to 2021, and a larger proportion thereafter. This is shown below in

2.2.5. Figure 2.1 along with the NTEM 5.4 assumptions, and the more recent NTEM 6.1 assumptions for the same period.

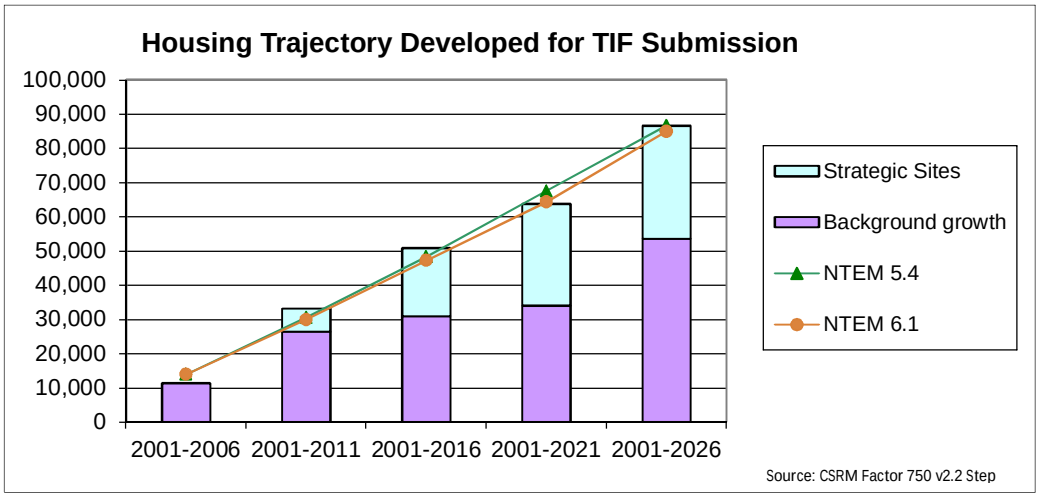


Figure 2.1: Cumulative Housing Trajectory constructed for TIF

[1] See *CSRM Forecasting Methodology and Assumptions,* WSP, Nov 2009

Dwellings – Revised Assumptions

2.2.6. In preparation for the current NWC runs, PBA requested (with CCC's agreement) that the dwellings assumptions be revised to take account of lower actual and anticipated development at the key strategic sites. _

2.2.7. Table 2.1 below compares the original CSRM TIF assumptions for strategic sites with the figures requested by PBA (taken from *Post A14 CSRM Modelling Scoping Note*, PBA, revised version 18 Jan 2011).

Table 2.1: Strategic Site development assumed for the NWC DS Run

Strategic Site Name	CSRM TIF Reference Case Total to 2021	Core Scenario, as specified by PBA	Difference
Cambridge North West:	**4,730**	**5,900**	**-1,170**
- Huntingdon / Histon Rd (NIAB)	*1,780*	*1,780*	
- North West Cambridge Development	*1,550*	*1,500 Market Houses plus 1,500 Key Worker Houses*	*-1,450*
- Arbury Camp (Orchard Park)	*1,400*	*1,120*	*280*
Northern Fringe	0	0	
Sewage Works	0	0	
Chesterton Sidings	0	0	
Cambridge Southern Fringe:	**4,420**	**4,420**	
- Bell School	*650*	*650*	
- Clay Farm	*2,300*	*2,300*	
- Glebe Farm	*300*	*300*	
- Trumpington Meadows	*600*	*600*	
- TM / Monsanto	*570*	*570*	
Cambridge East:	**7,250**	***0***	**7,250**
- North of Newmarket Road	*3,050*	*0*	*3,050*
- North of Cherry Hinton	*2,700*	*0*	*2,700*
- Airport	*1,500*	*0*	*1,500*
Northstowe	8,150	1,500	6,650
Loves Farm	1,900	1,900	0
North Bridge	1,250	1,250	0
Cambourne	2,000	1,000	1,000
TOTAL	**29,700**	**15,970**	**13,730**

2.2.8. It was subsequently agreed that the rates of background growth outside the strategic sites should also be reviewed, and that this should be assumed to be in line with the latest data from the Annual Monitoring Reports (AMRs) published annually by Cambridge City Council and East Cambridgeshire, Huntingdonshire and South Cambridgeshire District Councils. As part of this review the list of strategic developments in each AMR was compared with those for the Core Scenario specified for the NWC runs. It was found that the AMRs included some strategic development at Cambridge East (sites adjacent to the airport, but still theoretically available without the airport itself being vacated) – these are assumed not to take place in the Core Scenario. The AMRs also included developments acknowledged in footnotes as being dependent on the A14 (e.g. NIAB2 and Northstowe above

1,500 dwellings). Otherwise the assumptions were broadly comparable. The final dwellings trajectories were therefore produced as follows:

- For each strategic site, the total growth to 2026 was taken solely from the NWC Core Scenario assumptions. This totals 15,970 dwellings across the Sub-Region;
- Adjusted AMR trajectories for each district were calculated by removing strategic sites not included in the Core Scenario, but retaining all other AMR growth (this reduces the total development from 65,142 in the AMRs to 55,768 – see table in Figure 2.3 below);
- The total sub-regional growth for the model was taken to be the total of this adjusted AMR growth to 2026;

The remaining dwellings (39,798 dwellings to address the gap between the 15,970 at strategic sites and the adjusted AMR total) were derived by adjusting the existing level of background growth (shown in

- Figure 2.1). The existing quantities of these developments were scaled down proportionately across the entire sub-region.

2.2.9. Note that this approach produces dwellings assumptions which match precisely the strategic site totals provided by PBA for this work, and the total Sub-Regional development from the adjusted AMR. It was beyond the scope of this work to update the detailed development patterns for background growth. Though the Sub-Region wide totals have been scaled, the **pattern** of background growth by Ward and District remains identical to that in the previous TIF model runs, rather than as in the revised AMR profile. In particular, in the AMRs there is a definite shift towards development in Huntingdonshire which has not been reflected in inputs to these runs.

2.2.10. The resultant dwellings trajectories, compared with those previously used within the CSRM, as well as the NTEM 6.1 figures and the AMR trajectories are shown in Figure 2.2 and Figure 2.3 below – firstly by district, and then for the SubRegion as a whole. Also shown are the Core Scenario Strategic Site growth assumptions used within the runs.[2]

[2] Source: P:\P12\1256 NW Cambridge\ANALYSIS\[Trajectory Analysis for LU Model - FINAL for NWDM T020 + T021.xls] AMR vs CSRM NWC vs TEMPRO

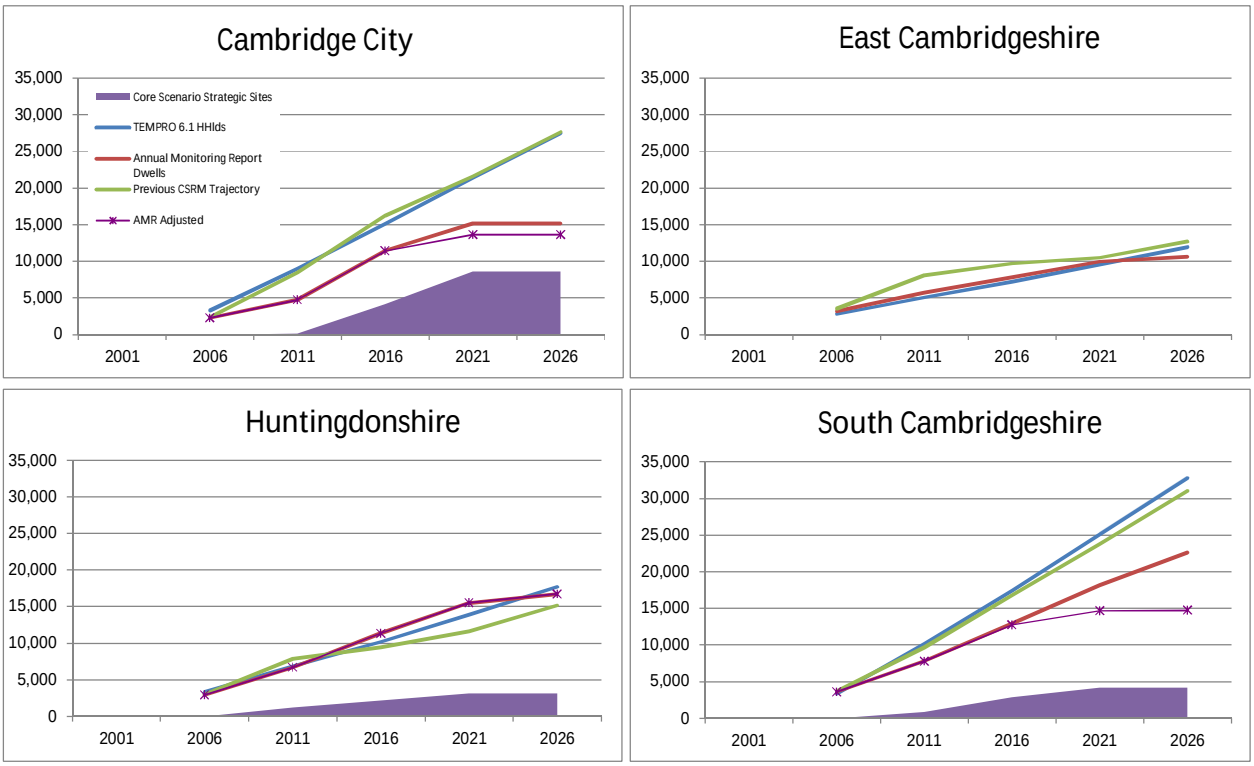
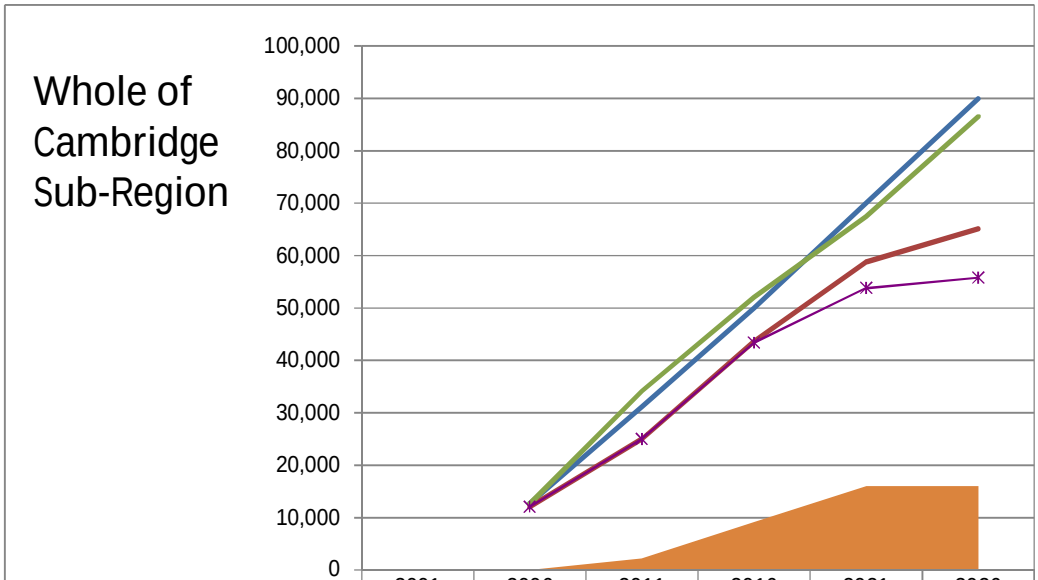


Figure 2.2: Housing Trajectories for the four districts, as adjusted for the NWC runs
(Note that there are no strategic sites in East Cambridgeshire, and therefore no adjustments have been made to the AMR)



	2001	2006	2011	2016	2021	2026
Core Scenario Strategic Sites		0	2,235	9,183	15,970	15,970
TEMPRO 6.1 HHlds		12,761	31,167	50,005	70,044	89,952
AMR Dwells		12,014	25,010	43,597	58,829	65,142
Prev CSRM		12,619	34,120	52,102	67,484	86,549
AMR Adjusted		12,014	24,996	43,383	53,805	55,768

Figure 2.3: The Cambridge Sub-Region Housing Trajectory, as adjusted for the NWC runs

Floorspace available for Employment

2.2.11. No changes were made to the floorspace available for employment at the sub-regional level as part of these runs.

Employment and Population

2.2.12. The original TIF Reference Case included employment growth figures taken from NTEM 5.4. For the current run, these were updated to NTEM 6.1; these revised figures, published as draft by DfT in January 2010, include the anticipated effect of the recession on employment levels (for the Cambridge Sub-Region, employment in 2026 is reduced by 14% compared with NTEM 5.4).

2.2.13. **NOTE:** This revised trajectory is NOT balanced against the total household growth as would have been the case with previous CSRM runs which matched NTEM 5.4 employment and dwellings growth trajectories. Analysis was carried out by WSP to check that the trajectories of housing and employment used in the runs were broadly in line. In particular, comparison of the balance between employment, employed residents, in-commuting and out-commuting confirmed that the overall patterns of commuting would remain stable.

2.2.14. The growth in other elements of the population and the make-up of households were taken from previous relationships established in the CSRM Land Use Model, and from assumptions common to both NTEM 5.4 and NTEM 6.1. These include:

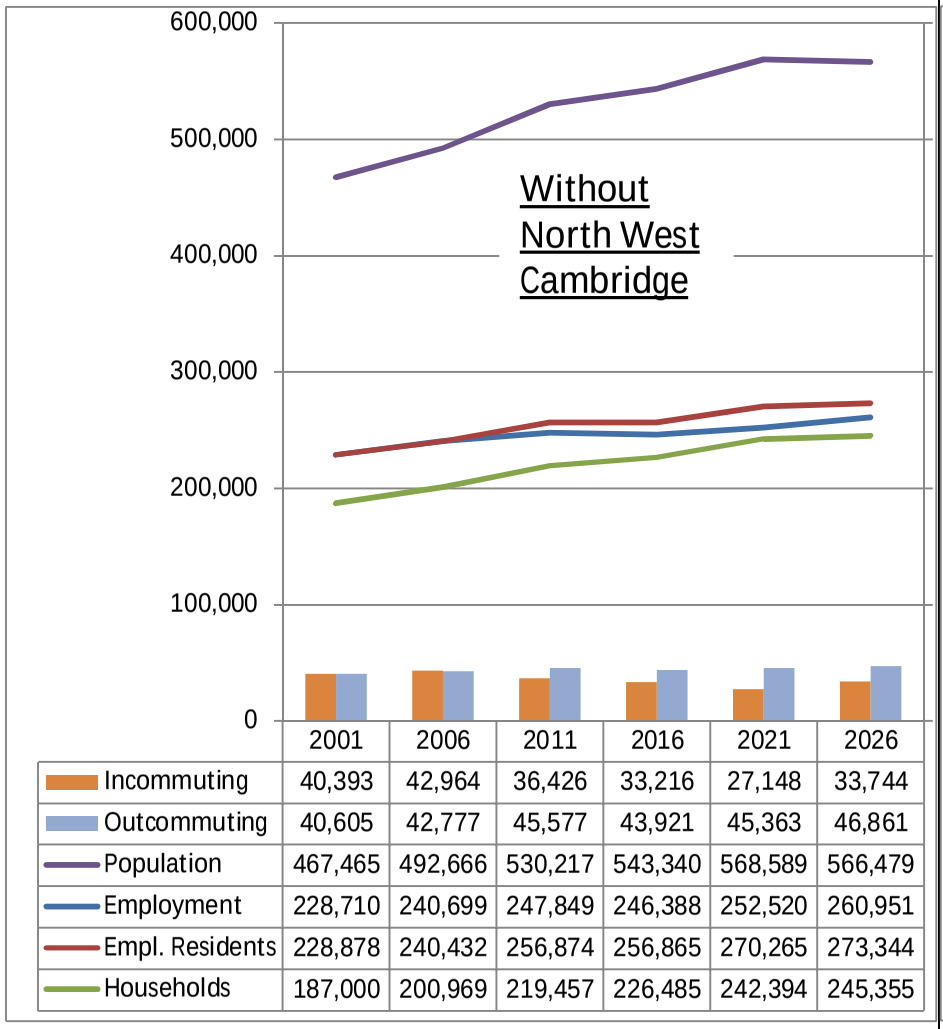
- The growth in non-employed (including retired) households to 2021 was taken from NTEM. However, the growth rate was reduced in 2021-2026 due to the significantly lower dwellings growth rate, and to allow space for growth in employed households, in line with the proportion of employed vs non-employed households to 2021.
- The increase in the proportion of 1 adult households, based on assumptions common to NTEM 5.4 and 6.1.
- The number of children in each household was derived by the model, using established factors based on location, household size and household type.

NWC Do Minimum (DM) and Do Something (DS) Assumptions

2.2.15. The dwelling and employment figures discussed previously include development at the North-West Cambridge site to the level proposed by the University, and hence correspond to the 'Do Something' scenario. For the 'Do Minimum' run, the total of 3,000 dwellings at the NWC site were removed both locally, and from the overall dwellings provision. Similarly, the total study-area wide employment was reduced in the DM run by 3,000, corresponding to the specialist academic employment made possible by development at the site (See Table 2.2 – specifically the line headed Academic Research) The on-site provision of 2,000 student places (see Table 2.2 again – specifically the line headed Collegiate) is also removed in the DM, decreasing the total student population by this amount.

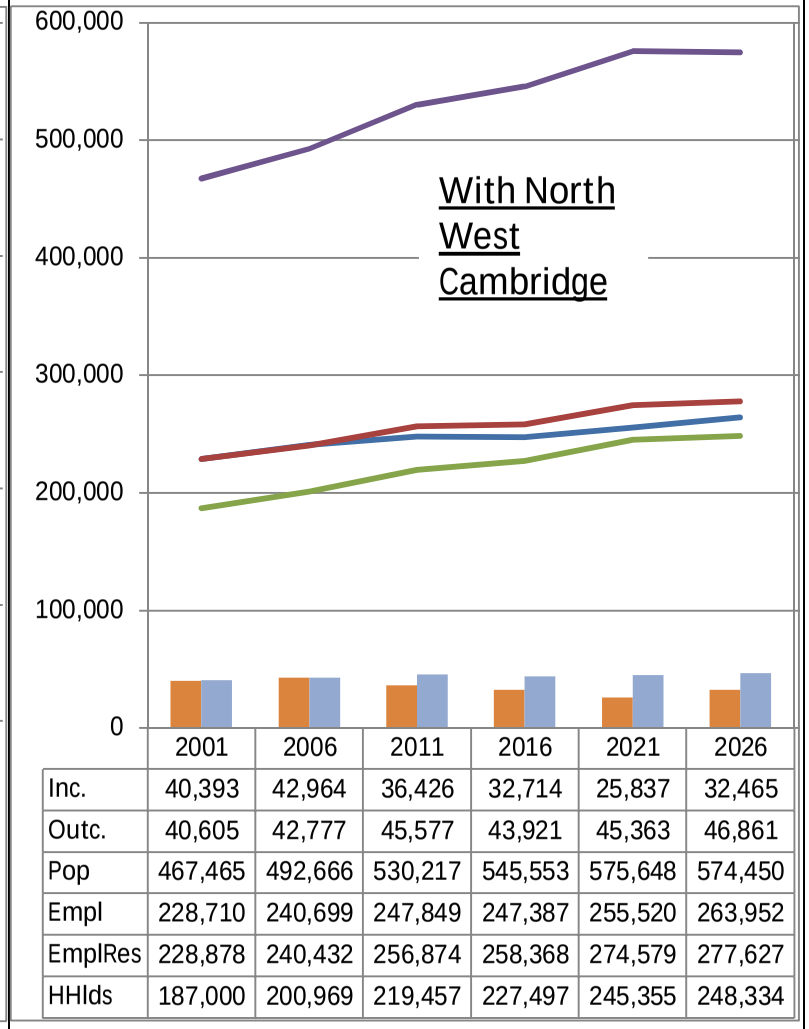
Resulting Population and Employment Trajectory

2.2.16. The combination of the changes to the housing and employment trajectories (and resultant changes to the population of the SubRegion and the number of employed residents therein) results in the trajectories shown in Figure 2**.4** and Figure 2.5



	2001	2006	2011	2016	2021	2026
Incommuting	40,393	42,964	36,426	33,216	27,148	33,744
Outcommuting	40,605	42,777	45,577	43,921	45,363	46,861
Population	467,465	492,666	530,217	543,340	568,589	566,479
Employment	228,710	240,699	247,849	246,388	252,520	260,951
Empl. Residents	228,878	240,432	256,874	256,865	270,265	273,344
Households	187,000	200,969	219,457	226,485	242,394	245,355

Figure 2.5[3]: Population and Employment Trajectories in the NWC DM scenario



	2001	2006	2011	2016	2021	2026
Inc.	40,393	42,964	36,426	32,714	25,837	32,465
Outc.	40,605	42,777	45,577	43,921	45,363	46,861
Pop	467,465	492,666	530,217	545,553	575,648	574,450
Empl	228,710	240,699	247,849	247,387	255,520	263,952
EmplRes	228,878	240,432	256,874	258,368	274,579	277,627
HHlds	187,000	200,969	219,457	227,497	245,355	248,334

Figure 2.4: Population and Employment Trajectories in the NWC DS scenario

[3] Source: Run T420+T421 Analysis\[M154B_M155B_Final_LU_Model Analysis.xls]Employment Balance

2.3. NWC Site Specific Land Use Assumptions

2.3.1. The land use assumptions pertaining to the NWC site were comprehensively re-evaluated based on information provided by PBA. The full details provided to WSP along with the modelling assumptions made are presented in Table 2.2.[4]

Table 2.2: The Land Use Specification for the NWC site

	Client Specification		CSRM
Market Housing	1,500 units		1,500
Key Worker Housing	1,500 units		1,500 dwellings for middle-income earners
Collegiate	2,000 units		2,000 students on site in Communal Dwellings
Academic Research	60,000m^2	Total (100,000m^2)	Academic research modelled as 3,000 jobs, commercial as floorspace
Commercial Research	40,000m^2		
Local Centre / Community	2,400m2 consisting of 800m2 retail floor area local retail, 250m2 local centre pub, 300m2 non-local centre 'potential' retail, 800m2 University Mensa café. Further Local Centre / Community facilities include 850m2 community centre, 300m2 Police office, 700m2 PCT		Modelled as employment and trip attractors
Food Store	Retail floor area –net 2,000 m^2 (Gross floor area of 2,900m2)		
Hotel and conference facility	Hotel - 150 bed spaces Conference - 250 delegate spaces		
Nursery	Two units totalling 2,000m^2		Not explicitly modelled – CSRM generates as required
Senior Care	Assumed to be 75 units Sheltered Accommodation		
Primary School	3 form entry		

2.3.2. As discussed in paragraph 2.2.15 above, the housing on site, the Collegiate dwellings and the 3,000 academic employees are treated as achievable in the Sub-Region only if they are located at this site. Hence they are removed from both the local and study area wide totals in the DM run.

2.3.3. The Commercial Research, Community facilities, Food Store and Hotel have been modelled as the appropriate types of floorspace. These then attract the relevant employment and trips.

2.3.4. The Nursery, Primary School and Senior Care facility have not been explicitly modelled. Trips generated by/attracted to such facilities are produced automatically by CSRM from the population numbers based on factors established from observed data during the model development.

[4] The first two columns are Table 1 from *Post A14 CSRM Modelling Scoping Note*, PBA, revised version 18 Jan 2011.

3. Transport Infrastructure and Services

3.1. Infrastructure Changes

3.1.1. Table 3.1 shows which elements of infrastructure are included in each modelled scenario.

Table 3.1: Infrastructure in each SATURN Network

	DM (020)				DS (021)	
Description	**2011**	**2016**	**2021**	**2026**	**2021**	**2026**
NWC internal infrastructure – roads coded at 24kph, lengths taken from site plans downloaded from www.nwcambridge.co.uk in April 2010, junction configurations taken from plans provided 1/2/2011					✓	✓
NWC bus diversions coded using "high resource" scenario from information provided 7/2/2011					✓	✓
Cambridge West – limited internal infrastructure, zone centroid connector relocated to central position	✓	✓	✓	✓	✓	✓
Cambridge West – improvements to Madingley Road, taken from plans provided 1/2/11			✓	✓	✓	✓
NIAB internal infrastructure		✓	✓	✓	✓	✓
Cambridge East – completely removed from all models						
Northstowe – very limited infrastructure for reduced size of settlement, at northern end of site (near Longstanton P&R)		✓	✓	✓	✓	✓
Removed A14 Ellington to Fen Ditton improvement scheme, and M11 widening	✓	✓	✓	✓	✓	✓
Improvements to A14 between Brampton Hut and Fen Ditton, and M11 between Girton and Trumpington – coded as a 5% increase in capacity					✓	✓
Added signalised nodes for Guided Bus level crossings	✓	✓	✓	✓	✓	✓
Updated DM buses to reflect the anticipated changes brought about by the Cambridgeshire Guided Bus	✓	✓	✓	✓	✓	✓

3.1.2. Note that "Do Something" networks for 2011 and 2016 were provided to WSP for their model run: these are identical to the 2011 and 2016 Do Minimum networks, respectively.[5]

3.2. Bus Services

3.2.1. A number of bus services were reconfigured as defined by PBA in various copies of Figure 3 in their TN7 Public Transport Strategy.[6] WSP were requested to model the 'High Resource Scenario' in this note. Clarification of the services and routes was required via David Harrison of PBA. The resulting service alterations are as follows:

- Uni 4: In 2014 (modelled in 2016) the service is extended so that it terminates in the centre of the NWC site. The middle section of its route is altered so that the service passes through the centre of Cambridge in both directions. The exact route was defined in an e-mail by

[5] SATURN NWCDM Networks are labelled V20_0_0. SATURN NWCDS Networks are labelled V21_0_0. Both sets of networks were supplied by Atkins to WSP on 09/02/2011.
[6] The original document was received on 19/01/2011, and was re-sent by PBA on 02/02/2011. Further revisions were received on 03/02/2011 (new Figures 1-3 only) and 07/02/2011.

David Harrison of PBA on 3rd February. The service runs with a frequency of one bus every 20mins. In 2020 (modelled in 2021) the frequency of the service changes to one bus every 10mins between NWC and the City Centre, and one bus every 30mins between the City Centre and Addenbrookes.[7]

- Citi 5: In 2020 (modelled in 2021) the route of the service is altered so that it passes through the NWC site in both directions, rather than running along the section of the Huntingdon Road between the two site access points as previously. The frequency of the service is one bus every 10mins.
- Science Park: This is a new service to be introduced in 2017 (modelled in 2021). The route takes it from Madingley Road P&R Site through the NWC and NIAB sites, along King Hedges Road to the Science Park. Following discussions with PBA it was decided that the route should be coded as passing along King Hedges Road rather than the parallel guideway. The service frequency is one bus every 30mins.
- Citi 4: This service has a route change in 2020 (modelled in 2021). The service will take a more direct route from the Madingley Road to the City Centre via the junction at the bottom of Castle Hill, rather than the previous route via Silver Street. There will be no changes to the frequency of the service. The altered route is coded to follow the route shown in the first version of Figure 3 from TN7 received by WSP in both directions. The updated version of Figure 3 received on 3rd February showed that the intention was for the service to pass through the City Centre along different routes in each direction. Further communication with PBA led to an agreement that the recoding required would take longer than the benefits from the process warranted, and that the original coding should be kept.

3.2.2. In addition a Citi 8 service was proposed from 2017. However, in the High Resource Scenario being modelled this service would be merged into the rerouted Citi 5 from 2020, and so has not appeared in the modelling.

Results of Bus Coding – Travel times and loadings

3.2.3. The following table shows the 2026 services for which PBA supplied timetables in their draft Travel Plan. The table shows the services, the timetabled journey time of the services as extracted by WSP for the bus coding, the actual time the services take from end-to-end, as well as loading indicators for the services.

3.2.4. Note that the modelled timings and loadings are essentially model OUTPUTS, but are shown here for ease of reference in considering the bus coding. The loads given relate to the usage of the services across the entire 3hr (AM&PM) and 6hr (IP) periods.

[7] It is also planned to extend the service to the north-west corner of the NWC site in 2020, however it was not necessary to code this extension explicitly to provide that desired level of service.

Table 3.2: 2026 NWC DS Bus Service Outputs

TOD	Service	Direction	Timetabled Time (mins)	Modelled Time (mins)	Maximum Passengers[8]	Average Passengers[9]
AM (7am-10am)	Uni 4	Southbound - to City	20	16.7	277	207
		Southbound - from City	15	18.7	24	13
		Northbound	37	37.3	231	86
	Citi 5	Southbound	26	25.5	181	124
		Northbound	26	26.0	77	58
	Science Park	Clockwise	18[10]	18.0	64	47
		Anticlockwise	18[7]	18.0	34	25
IP (10am-4pm)	Uni 4	Southbound - to City	20	17.9	213	154
		Southbound - from City	15	17.1	32	19
		Northbound	37	37.2	345	146
	Citi 5	Southbound	26	25.7	181	127
		Northbound	26	26.0	137	93
	Science Park	Clockwise	18	18.0	22	18
		Anticlockwise	18	18.0	48	39
PM (4pm-7pm)	Uni 4	Southbound - to City	20	16.5	191	136
		Southbound - from City	15	18.6	17	10
		Northbound	37	38.4	193	84
	Citi 5	Southbound	26	27.7	107	75
		Northbound	26	26.1	158	108
	Science Park	Clockwise	18	18.0	24	16
		Anticlockwise	18	18.0	54	42

3.2.5. The division in Table 3.2 between the Southbound Uni 4 “to City” and the Southbound Uni 4 “from City” has been made at the point at which the service has been coded as changing from a 10minute frequency to a 30minute frequency. Based on the combined service times for the two sections of route the entire route is matching its timetabled length to a reasonable degree of accuracy.

3.2.6. This division in the results for the Southbound Uni 4 also shows that the service is well used up until the point at which the frequency changes to one bus every 30minutes. At this point anyone travelling further south receives a 10minute penalty (this being the average time one would spend waiting for a bus travelling further if one boarded an arbitrary Uni 4 bus) if they stay on the service. The remaining section of the southbound route is relatively poorly utilised. The northbound service has a reasonable level of utilisation along the entire route.

3.2.7. The Science Park service is relatively poorly used throughout the day in both directions. This is consistent with the results from the Orbital Bus Service test for CCC which suggested that the service was relatively ill utilised between NWC and the Science Park. (It doesn’t help the usage of this service that (unlike the OBS) it is designed to travel along the road between the Cambridge Road and the Science Park instead of via the much quicker guideway.)

[8] Total number of passengers passing the busiest point on the route in the time period.
[9] Average number of passengers passing all points along the route, in given time period
[10] Due to the lack of a road network for both the West Cambridge site and the Science Park the decision was made to code the Science Park service between Madingley Road P&R Site and the Science Park only. The sections of route within the Science Park and between Madingley Road P&R Site and the West Cambridge site have not been coded, and the timetabled time for this service has therefore been reduced from 24mins to 18mins in all time periods.

Version Control

Version	Date	By	Reviewed by	Authorised (TN only)	Notes
1.0	9/2/11	NP			Atkins issued draft with Infrastructure to WSP
1.1	23/2/11	ACY	DF/TJG		WSP Internal draft
1.2	28/2/11	TJG			Revised and edited
1.3	28/2/11	ACY	TJG/DF		Further revisions following TJG guidance. **DRAFT to Atkins.**
1.4	1/3/11	ACY			Updated following comments from TJG and DF
1.41	02/03/11		LSD		
2.0	3/03/11	TJG			Revised in response to LSD review
2.1	03/03/11		LSD	***LSD***	LSD Reviewed

Appendix 9 - Indicative Bus Service timetables

Citi 5 timetables

CITY CENTRE, Emmanuel Street E4	00	10	20	30	40	50
City Centre, Bridge Street	04	14	24	34	44	54
NORTH WEST CAMBRIDGE, Central Square	14	24	34	44	54	04
Bar Hill, Tesco	26	36	46	56	06	16
BAR HILL, Appletrees	31	41	51	01	11	21
NORTH WEST CAMBRIDGE, Central Square	41	51	01	11	21	31
City Centre, Bridge Street	51	01	11	21	31	41
CITY CENTRE, Emmanuel Street E4	55	05	15	25	35	45

Evenings and Sunday daytimes

CITY CENTRE, Emmanuel Street E4	00	30
City Centre, Bridge Street	04	34
NORTH WEST CAMBRIDGE, Central Square	14	44
Bar Hill, Tesco	26	56
BAR HILL, Appletrees	31	01
NORTH WEST CAMBRIDGE, Central Square	41	11
City Centre, Bridge Street	51	21
CITY CENTRE, Emmanuel Street E4	55	25

Sunday evenings

00
04
14
26
31
41
51
55

Uni 4 timetables

Monday to Friday daytimes

ADDENBROOKE'S, Bus Station D	...	...	05	...	...	35
Brooklands Avenue	...	...	10	...	...	40
CITY CENTRE, Emmanuel Street E4	00	10	20	30	40	50
City Centre, Silver Street	06	16	26	36	46	56
Grange Road	09	19	29	39	49	59
West Cambridge, JJ Thomson Avenue	16	26	36	46	56	06
Madingley Road, Park & Ride East	19	29	39	49	59	09
NORTH WEST CAMBRIDGE, Central Square	22	32	42	52	02	12
North West Cambridge, Block D10 (NW)	26	36	46	56	06	16

North West Cambridge, Block D10 (NW)	09	19	29	39	49	59
NORTH WEST CAMBRIDGE, Central Square	13	23	33	43	53	03
Madingley Road, Park & Ride East	16	26	36	46	56	06
West Cambridge, JJ Thomson Avenue	19	29	39	49	59	09
Grange Road	26	36	46	56	06	16
City Centre, Silver Street	29	39	49	59	09	19
CITY CENTRE, Downing Street DS	33	43	53	03	13	23
Brooklands Avenue	...	53	...	...	23	...
ADDENBROOKE'S, Bus Station D	...	58	...	...	28	...

Saturday daytimes

ADDENBROOKE'S, Bus Station D	...	...
Brooklands Avenue	...	...
CITY CENTRE, Emmanuel Street E4	20	50
City Centre, Silver Street	26	56
Grange Road	29	59
West Cambridge, JJ Thomson Avenue	36	06
Madingley Road, Park & Ride East	39	09
NORTH WEST CAMBRIDGE, Central Square	42	12
North West Cambridge, Block D10 (NW)	46	16

North West Cambridge, Block D10 (NW)	19	59
NORTH WEST CAMBRIDGE, Central Square	23	03
Madingley Road, Park & Ride East	26	06
West Cambridge, JJ Thomson Avenue	29	09
Grange Road	36	16
City Centre, Silver Street	06	19
CITY CENTRE, Downing Street DS	43	23
Brooklands Avenue	...	...
ADDENBROOKE'S, Bus Station D	...	...

Science Park service timetables

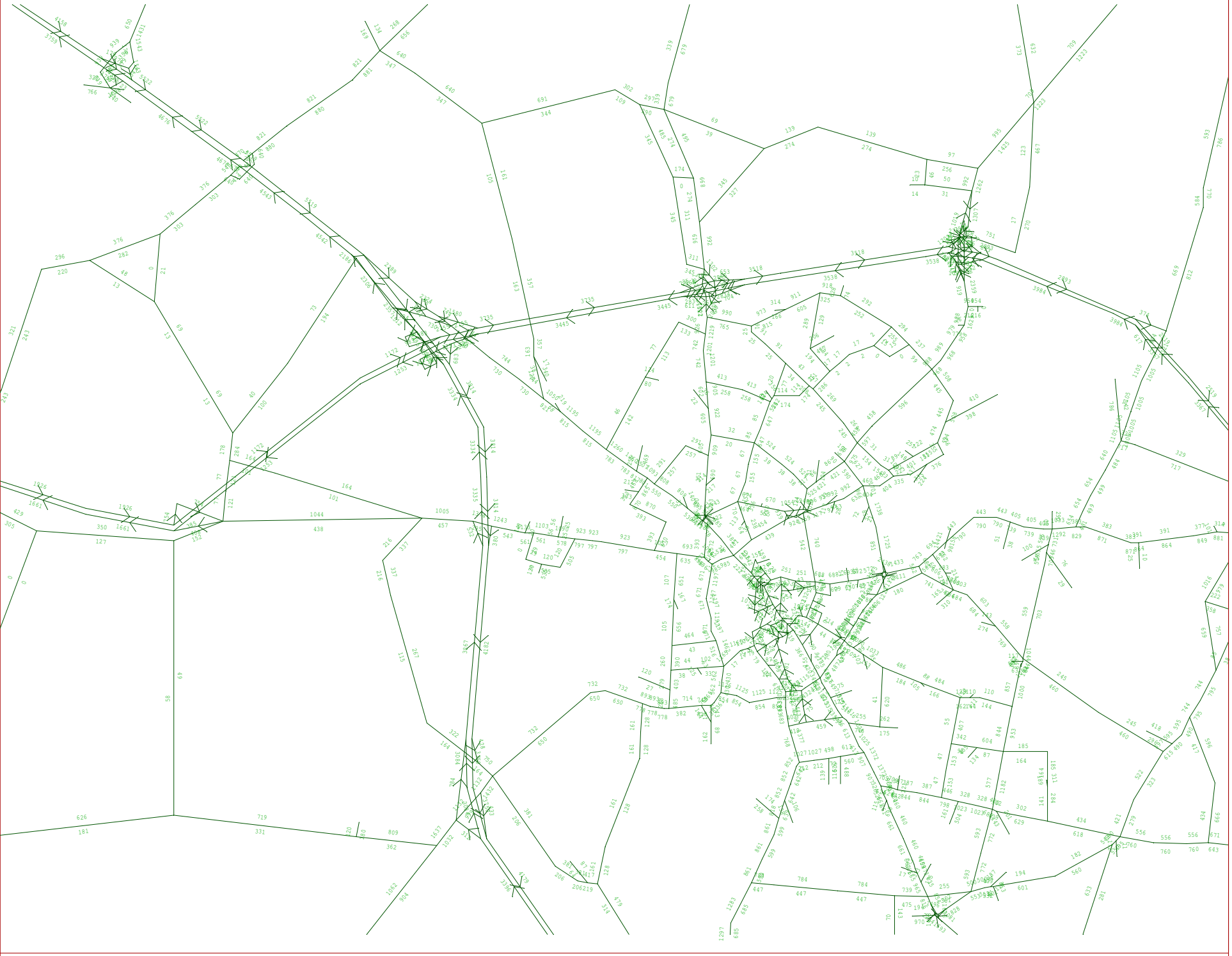
West Cambridge, JJ Thomson Avenue	00	30
Madingley Road, Park & Ride East	03	33
NORTH WEST CAMBRIDGE, Central Square	06	36
NIAB Site	11	41
ORCHARD PARK, Stanley Avenue	16	46
King's Hedges Road, Regional College	19	49
Science Park, Circular Spine Road o/s 290	21	51
SCIENCE PARK, o/s 138	24	54

SCIENCE PARK, o/s 138	05	35
Science Park, Circular Spine Road opp 290	08	38
King's Hedges Road, Regional College	10	40
ORCHARD PARK, Stanley Avenue	13	43
NIAB Site	18	48
NORTH WEST CAMBRIDGE, Central Square	23	53
Madingley Road, Park & Ride East	26	56
West Cambridge, JJ Thomson Avenue	29	59

North West Cambridge
Transport Assessment

Appendix 10 – CSRM Model Output

North West Cambridge
Transport Assessment



SATURN

Atkins Ltd /
DVV / ITS

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Link Annot:

Actual flow

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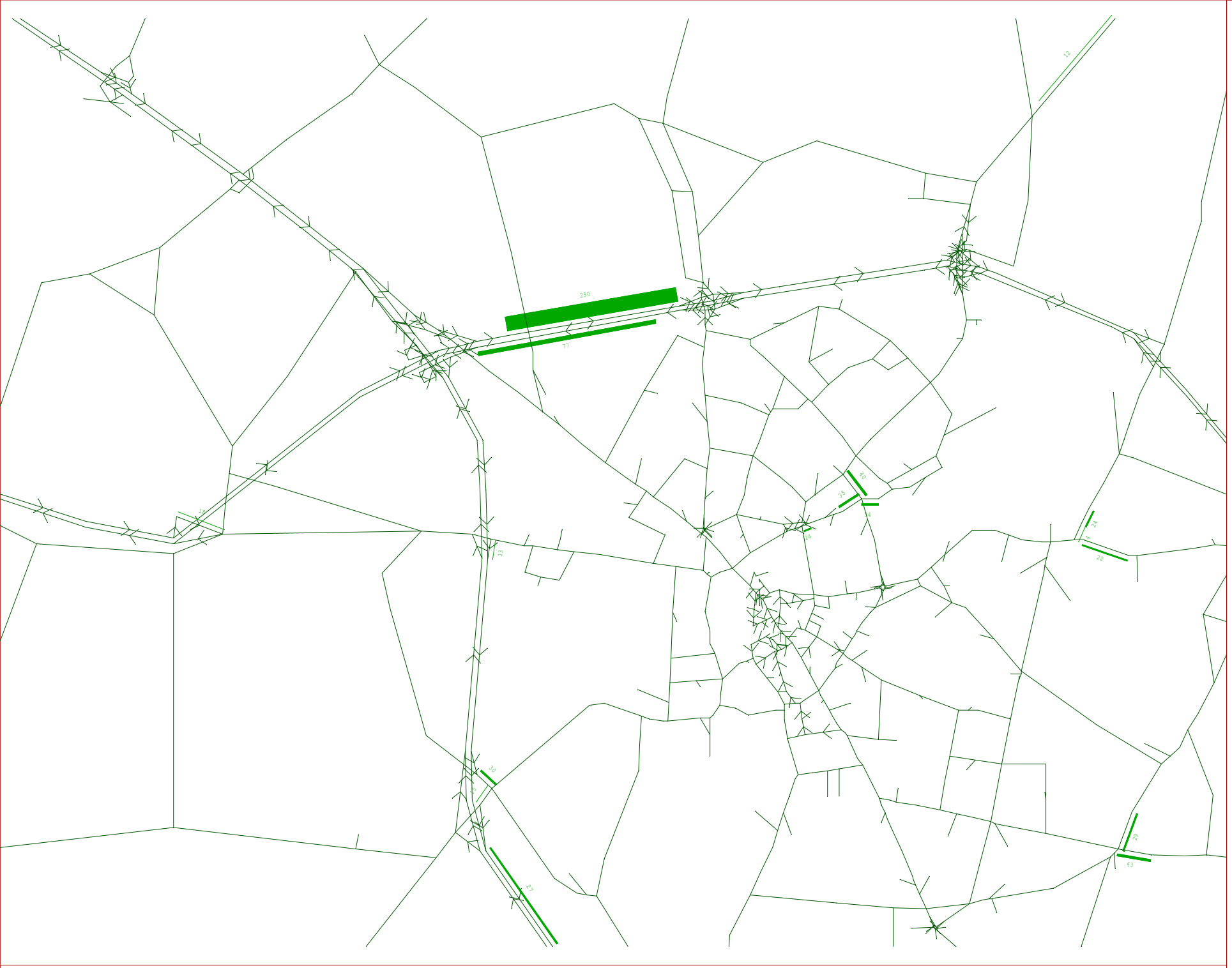
ATKINS (SATU

Cambridge LHM 2026 NWC DM AM - 08/02/11 18- 2-11



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DVV / ITS

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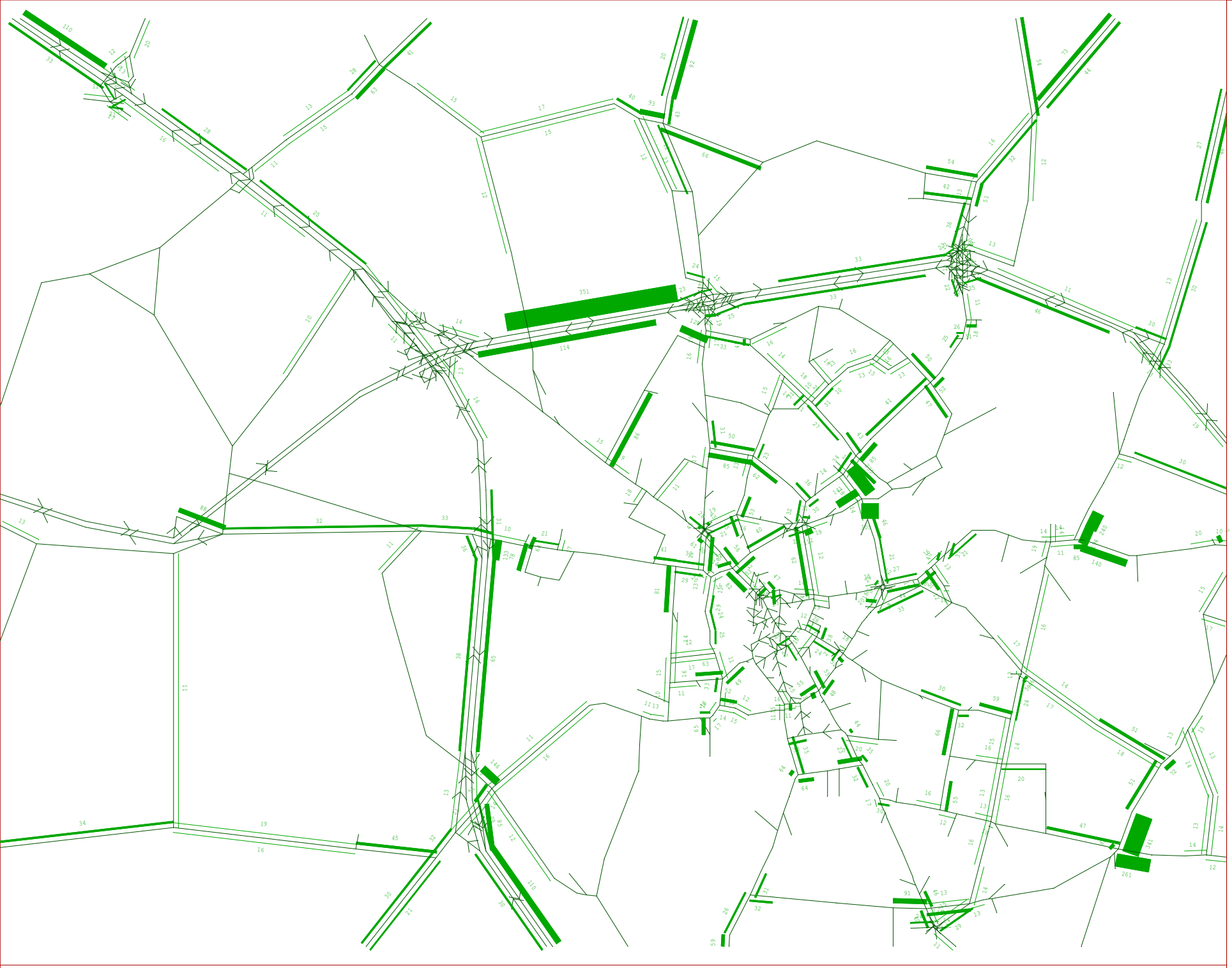

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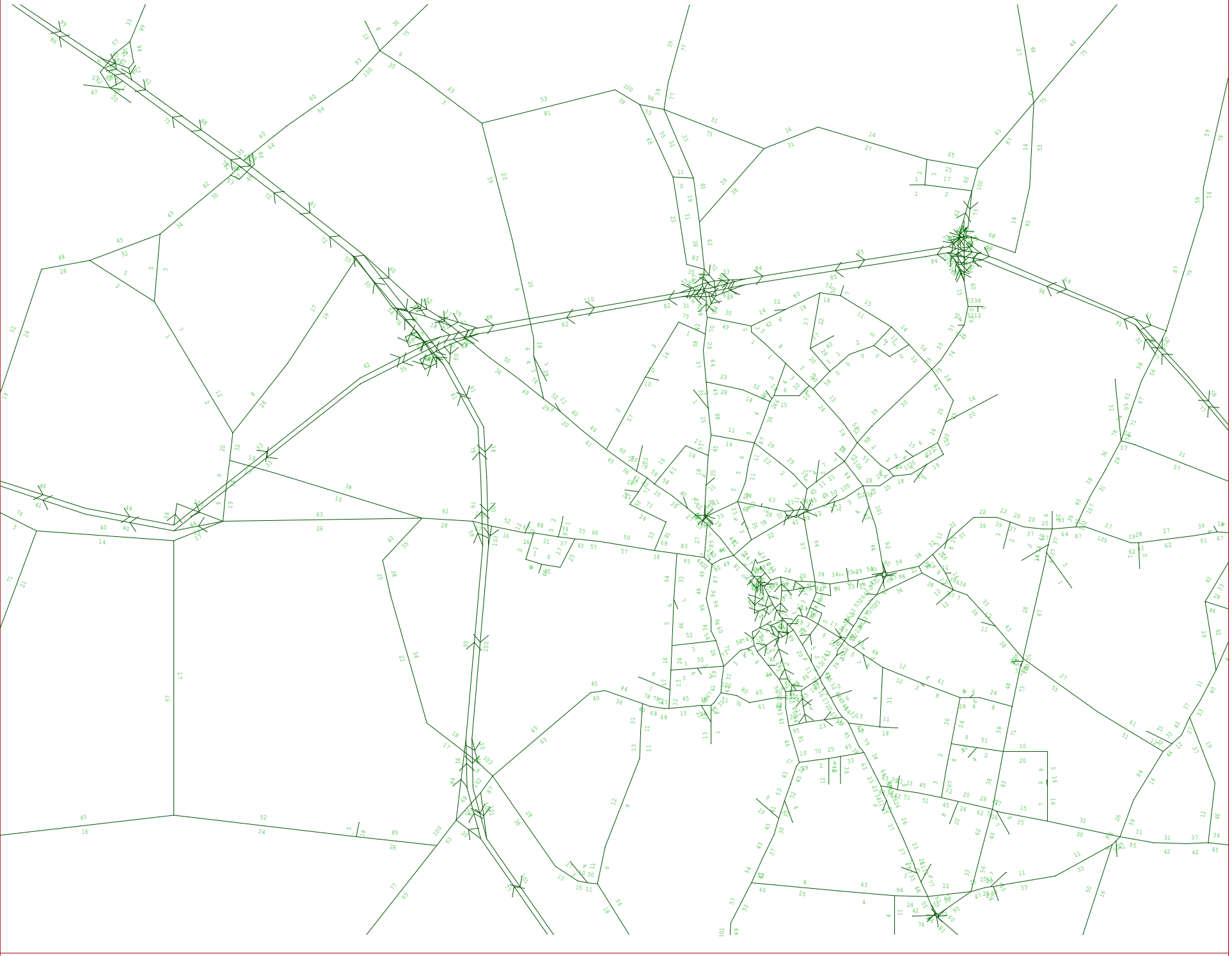

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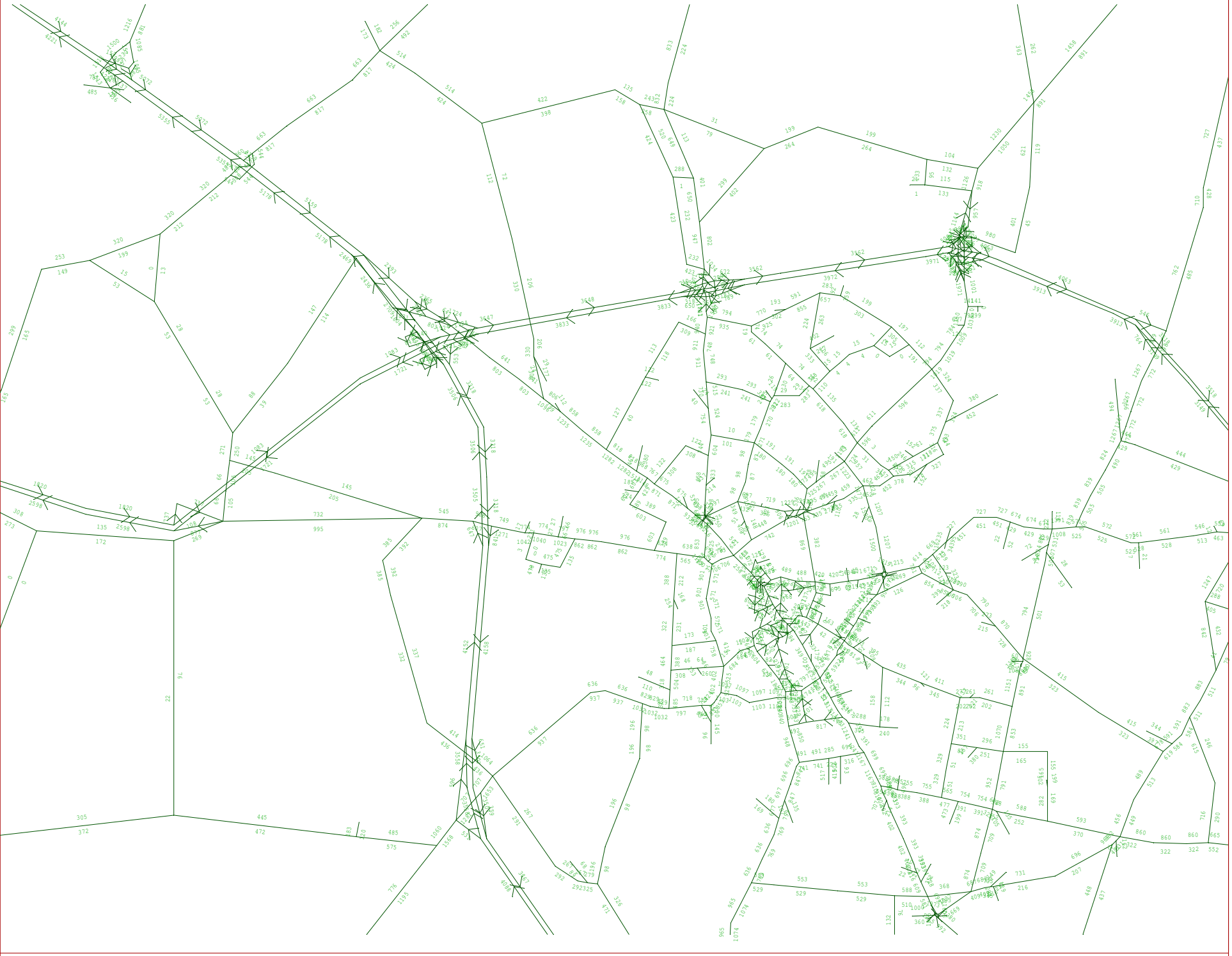

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DVV / ITS

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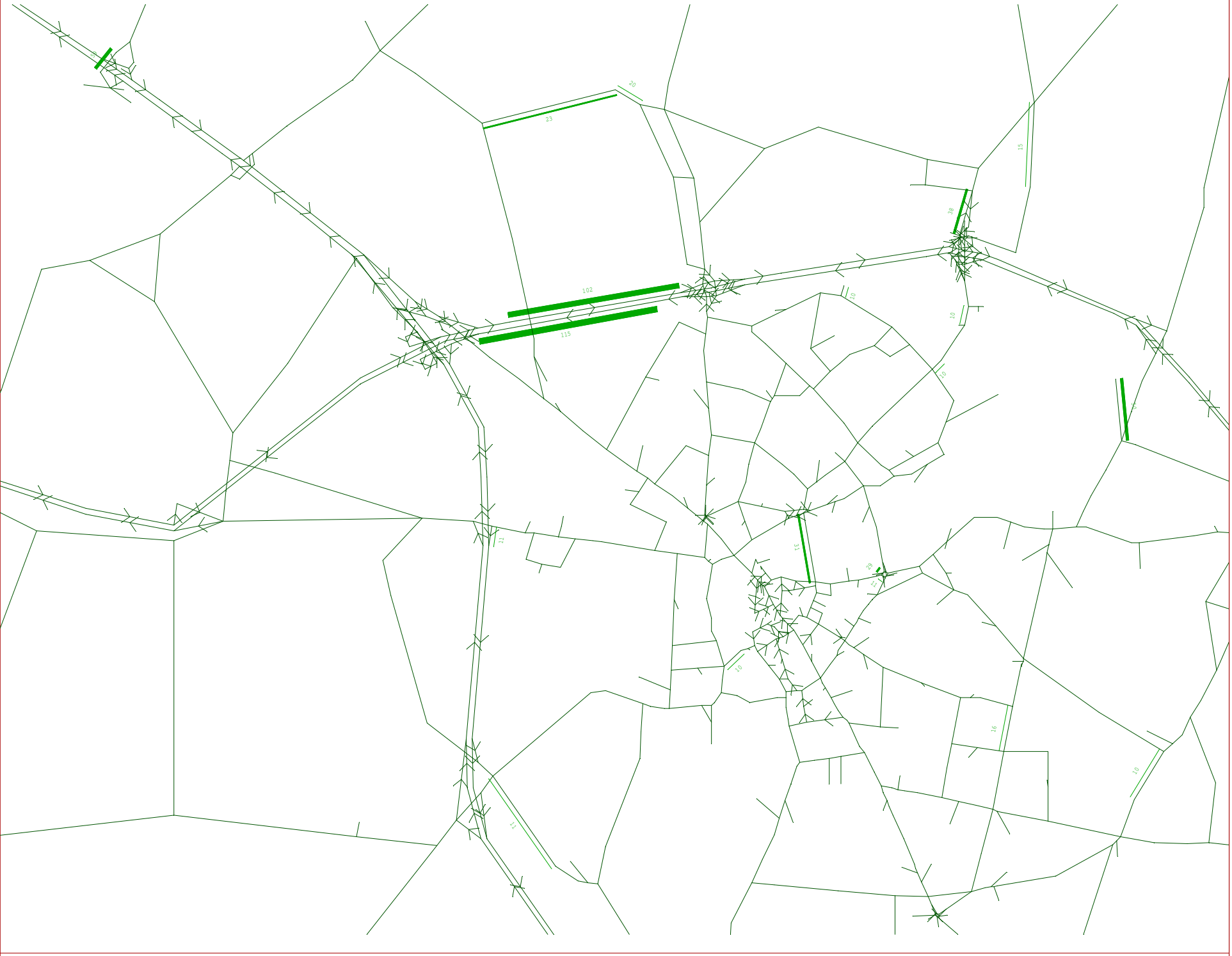

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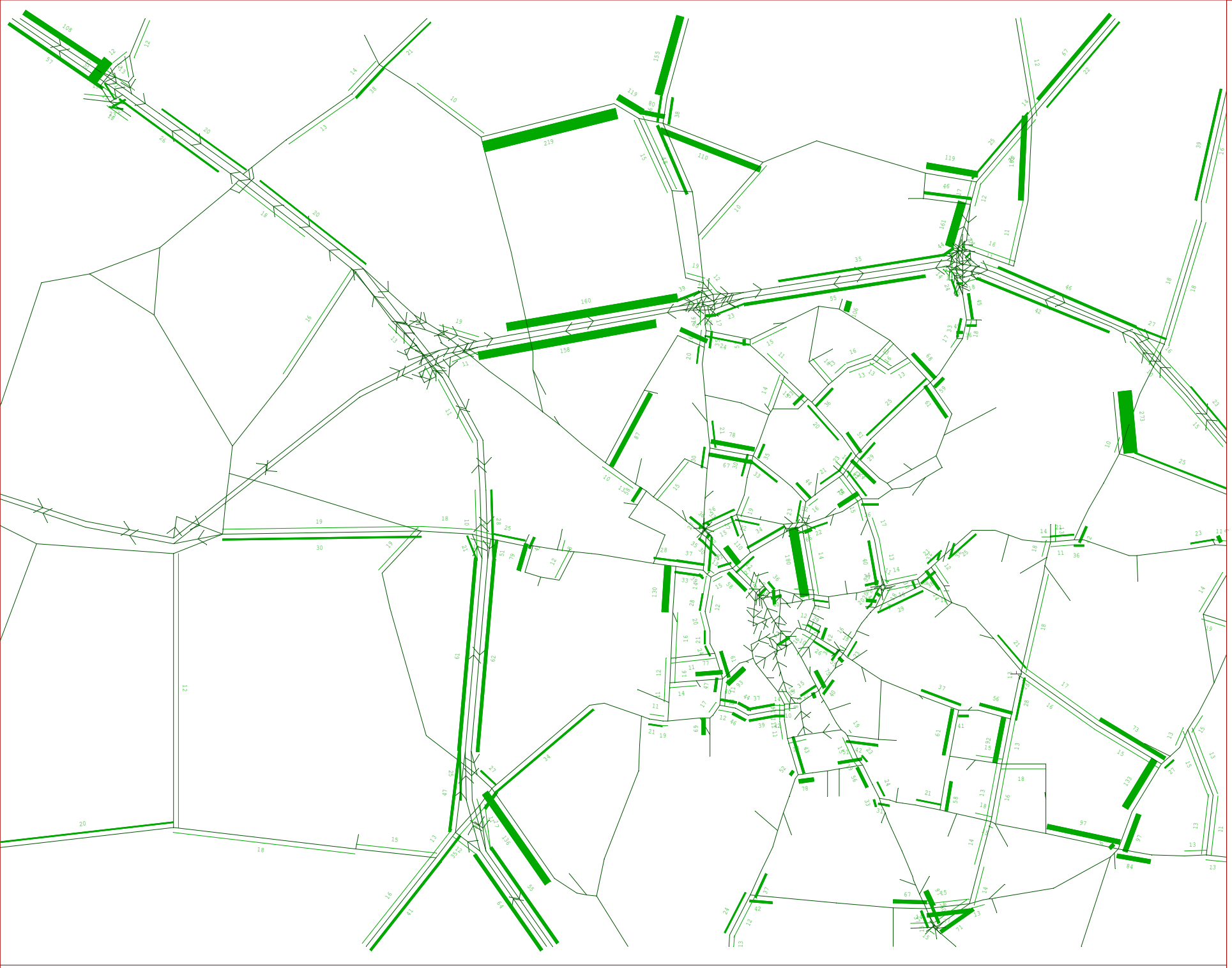

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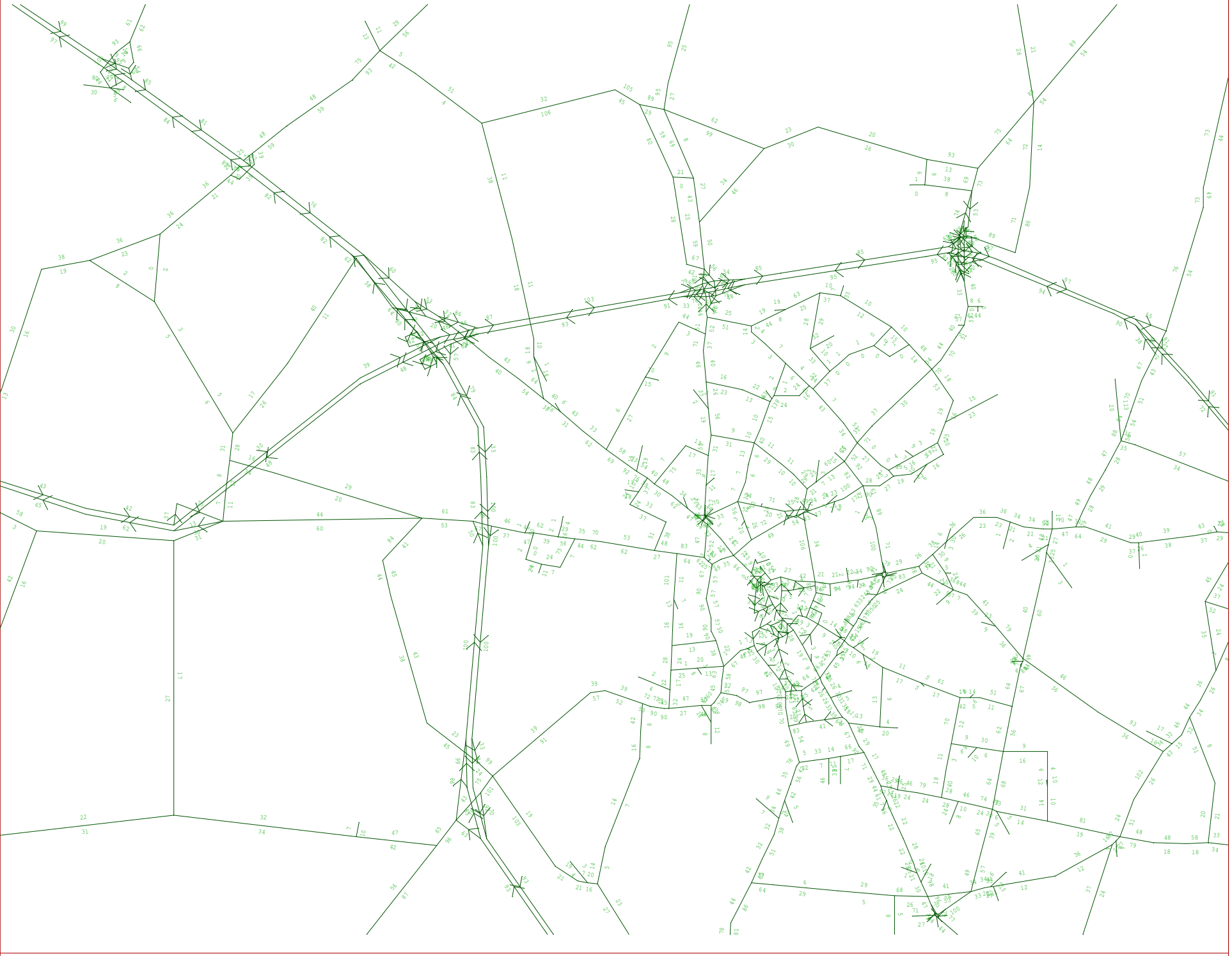

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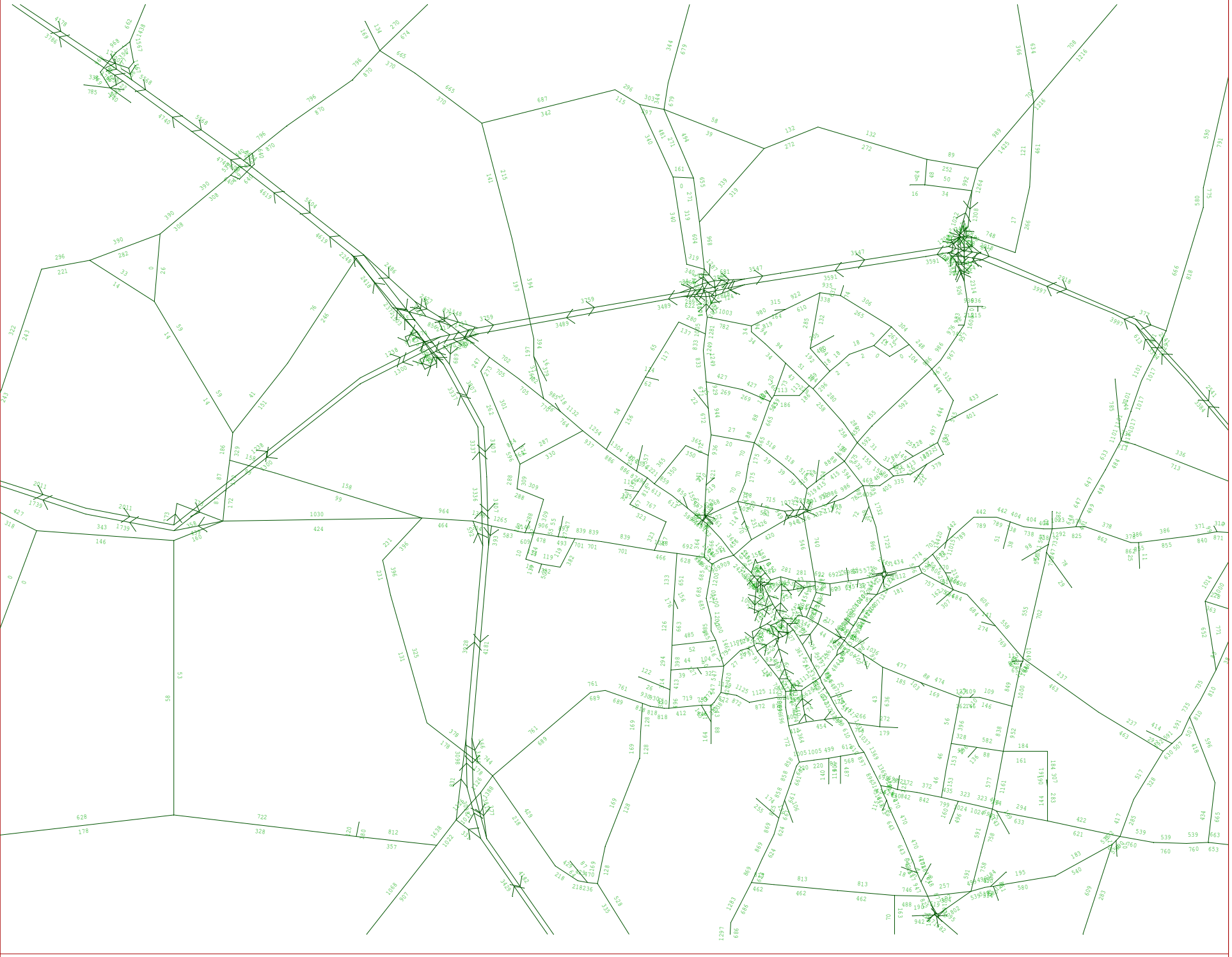

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Actual flow

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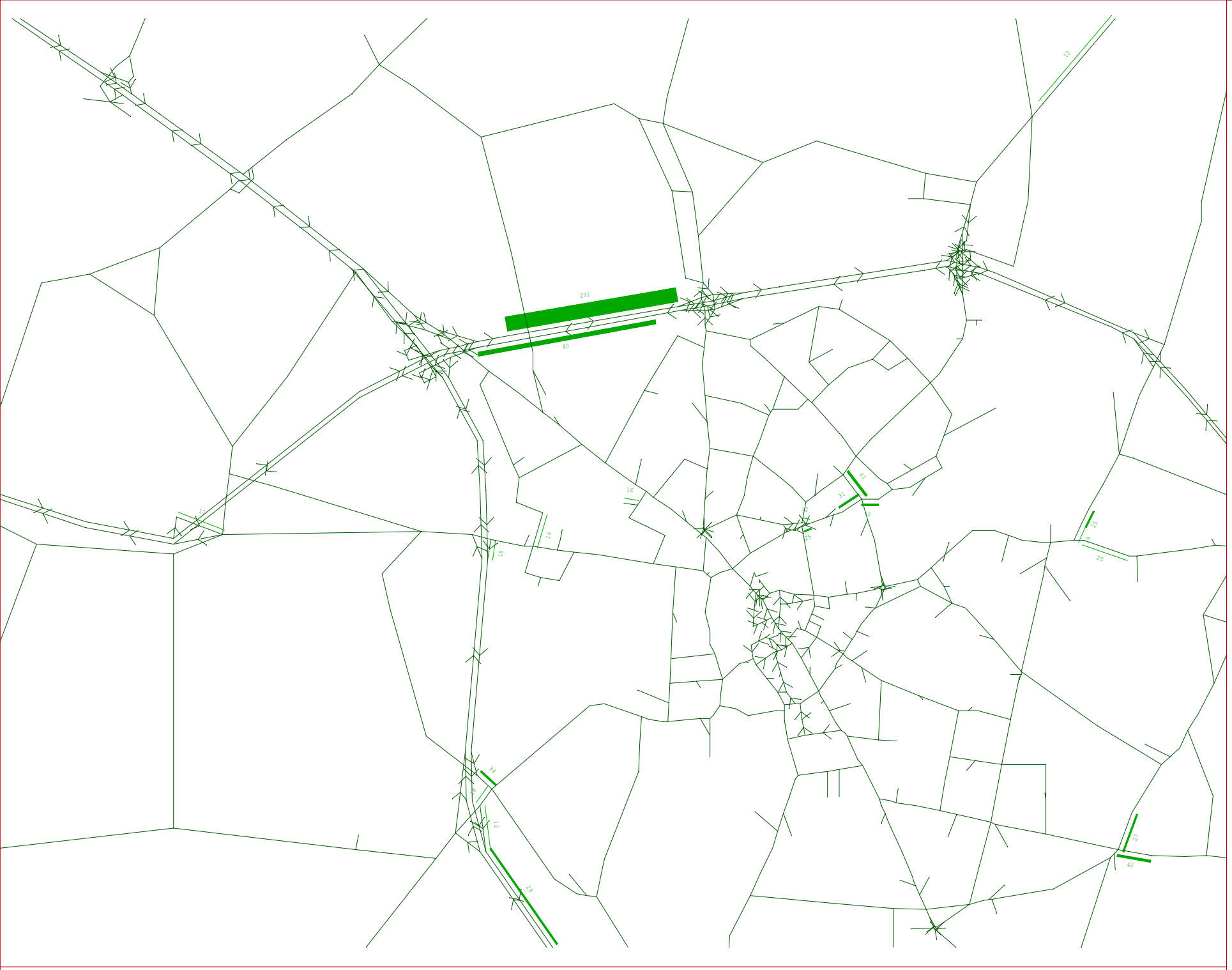
Cambridge LHM 2026 NWC DS (no A14 measures) AM - 23/ 24- 2-11



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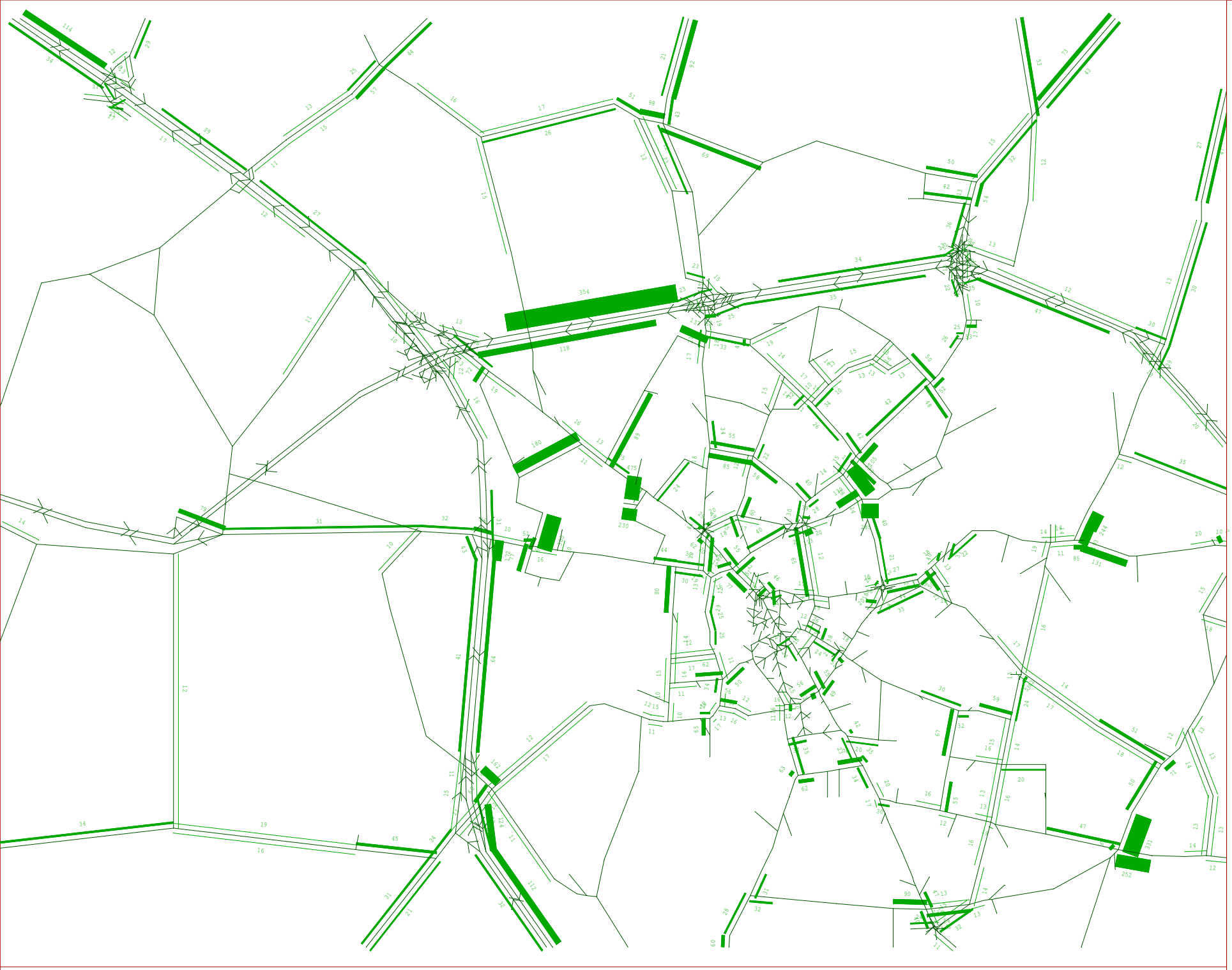

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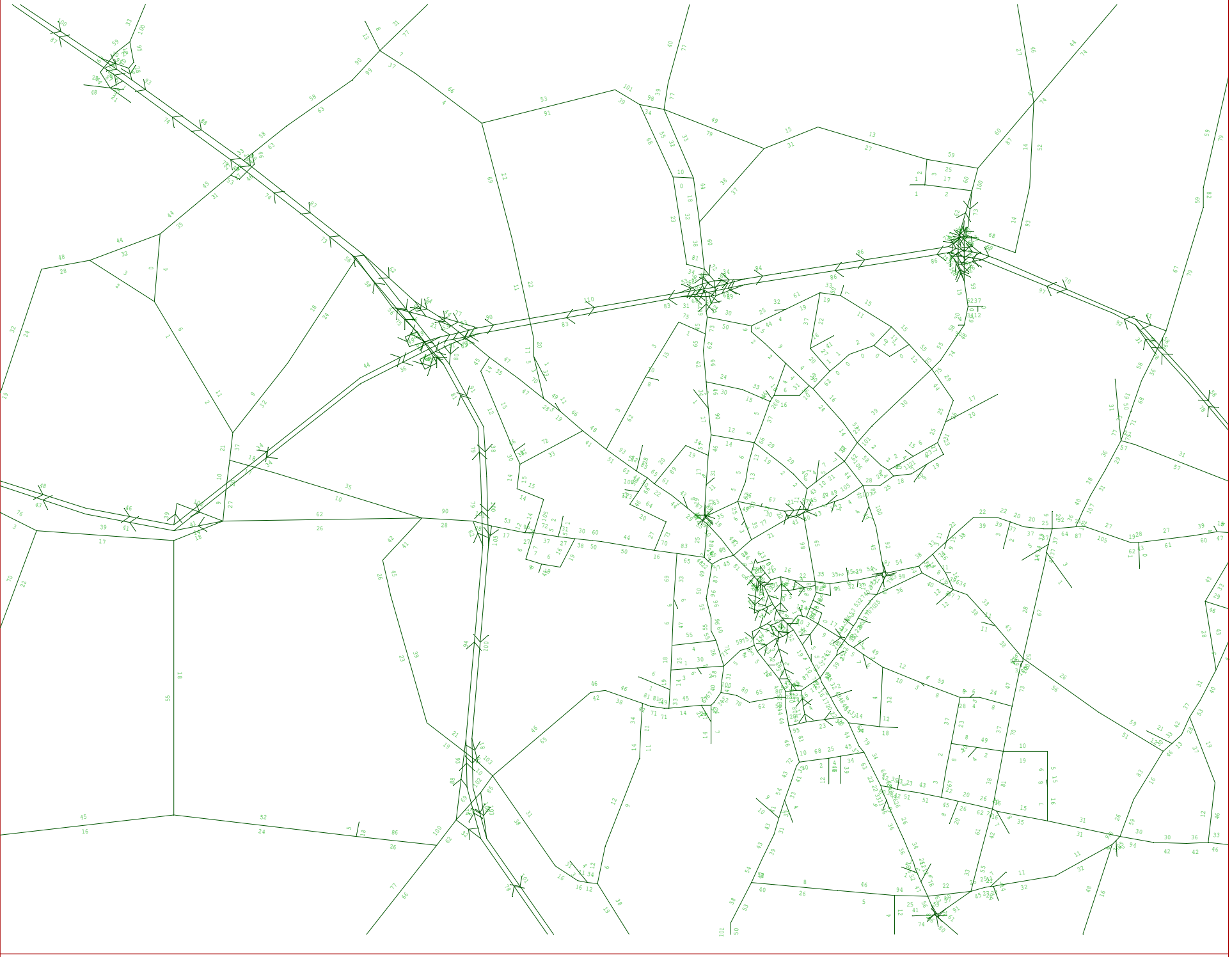

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VoverC %

Cambridge LHM 2026 NWC DS (no A14 measures) AM - 23/ 24- 2-11

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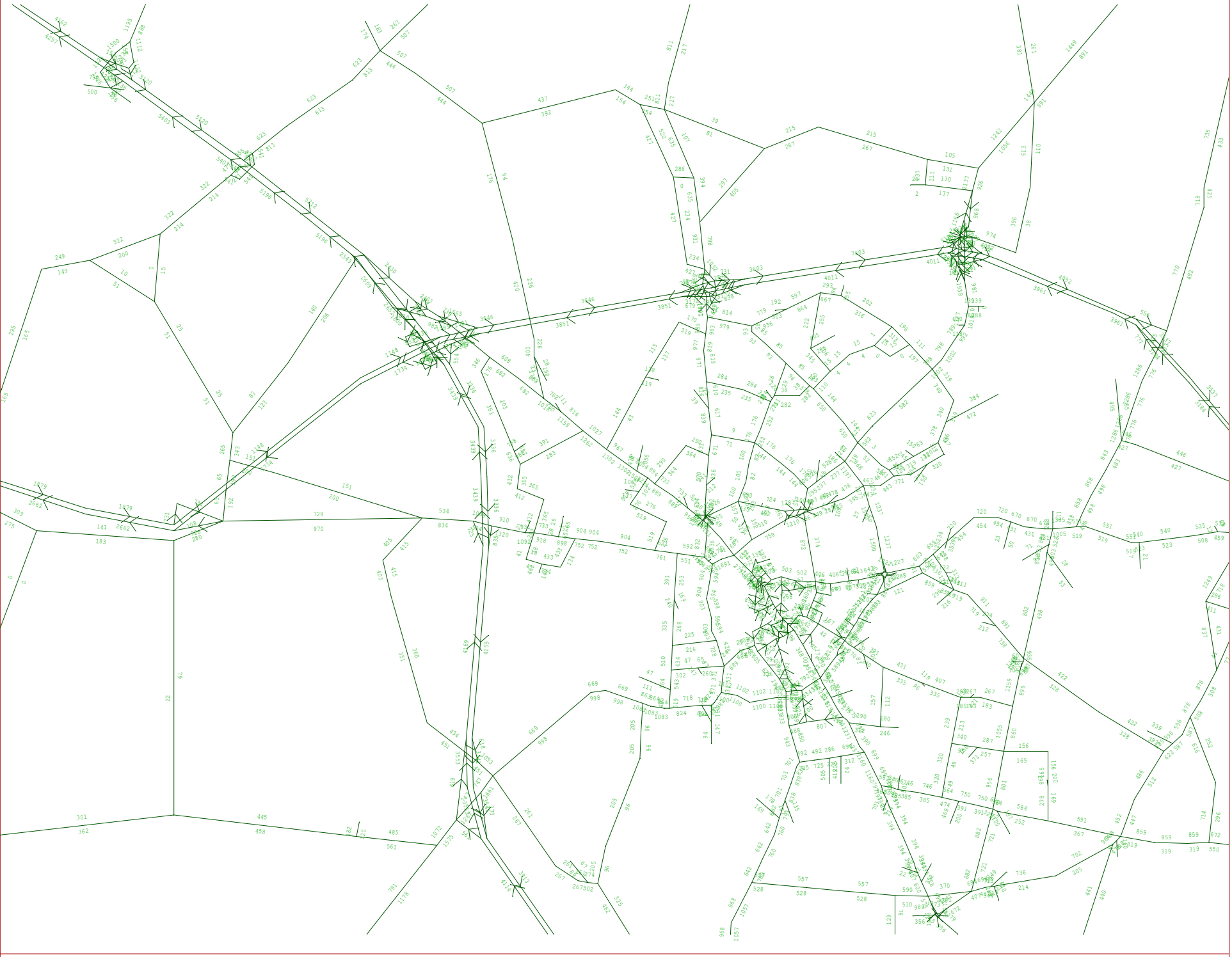

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Link Annot:

Actual flow

Cambridge LHM 2026 NWC DS (no A14 measures) PM - 23/ 24- 2-11

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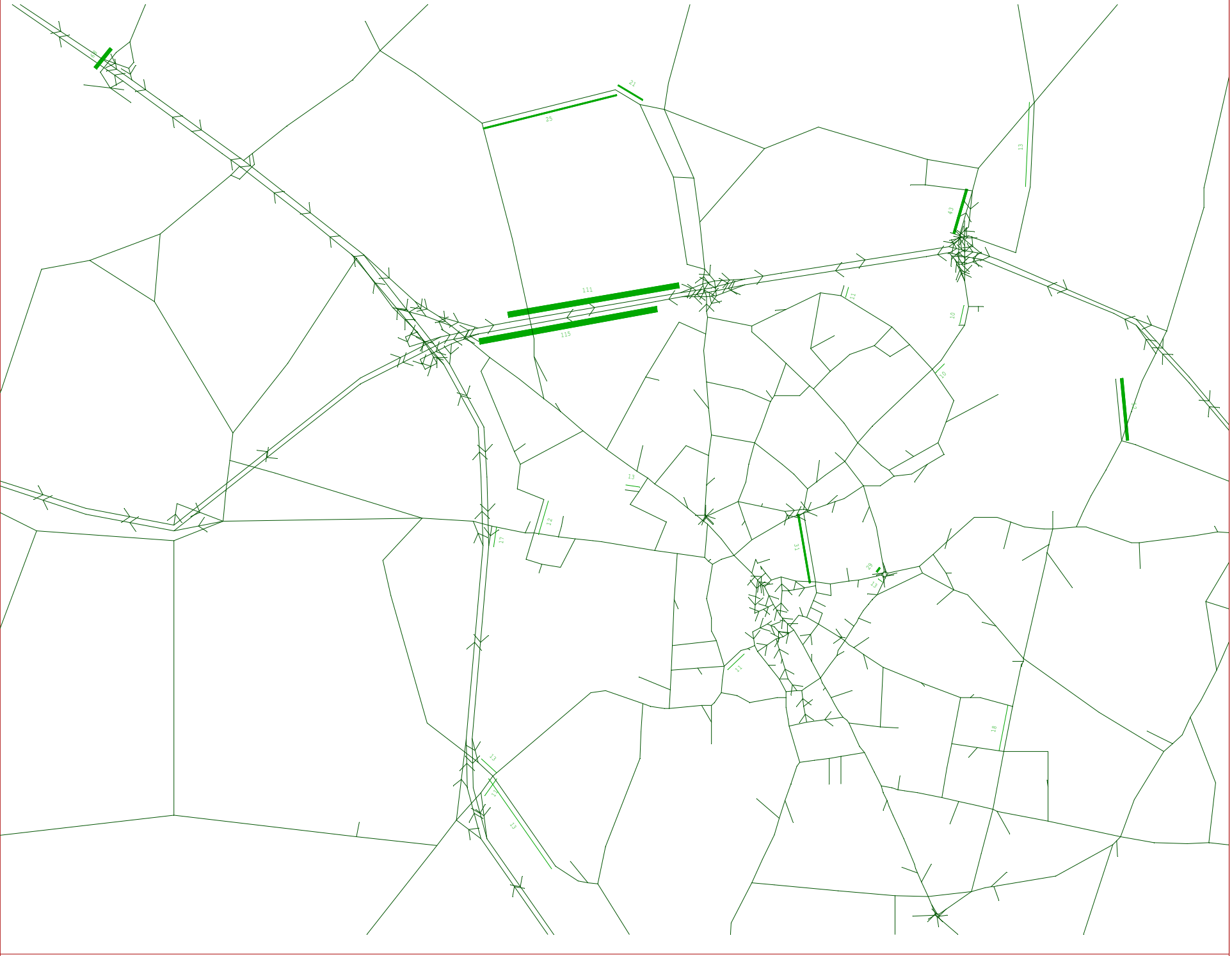

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Q Average

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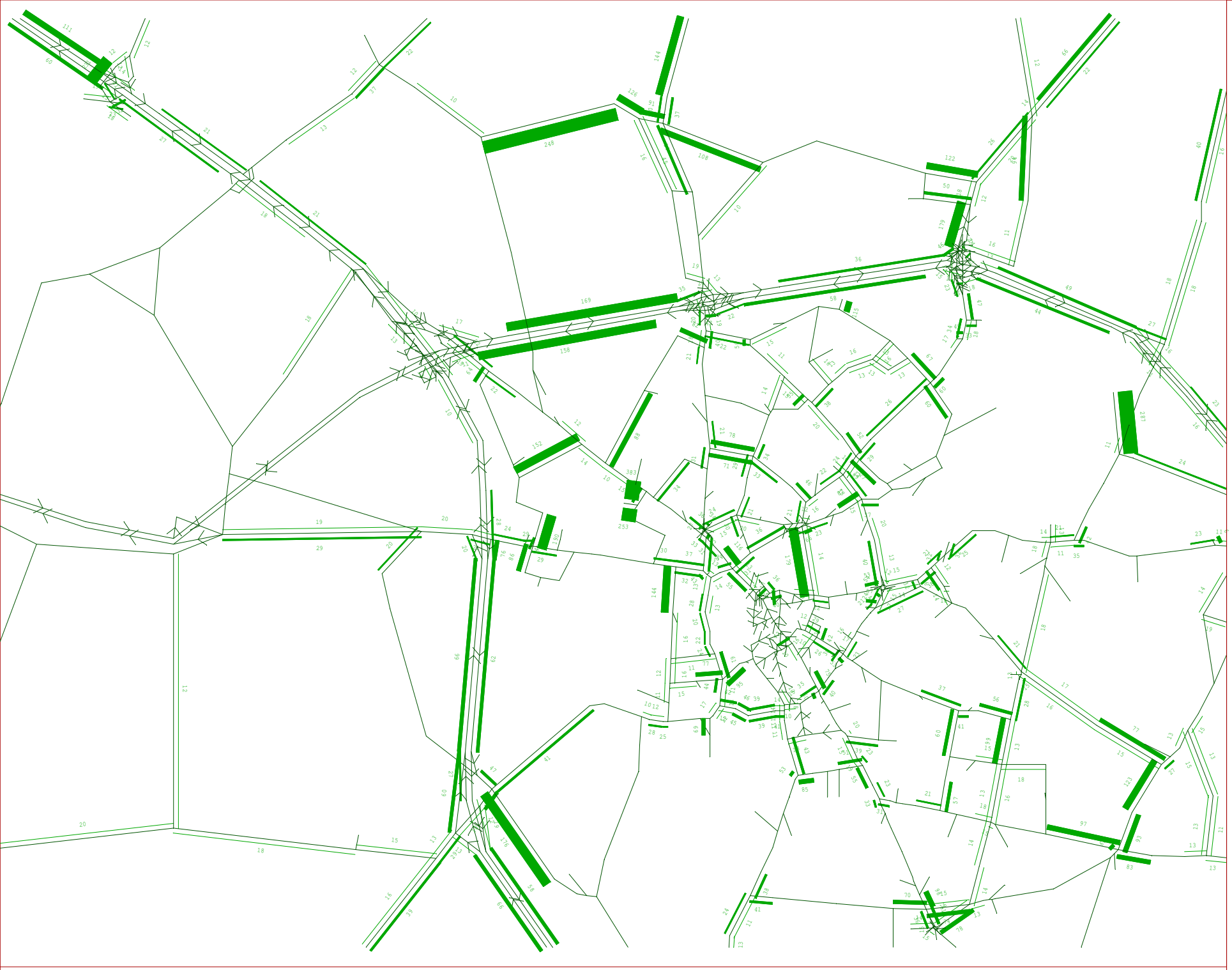
ATKINS (SATU

Cambridge LHM 2026 NWC DS (no A14 measures) PM - 23/ 24- 2-11



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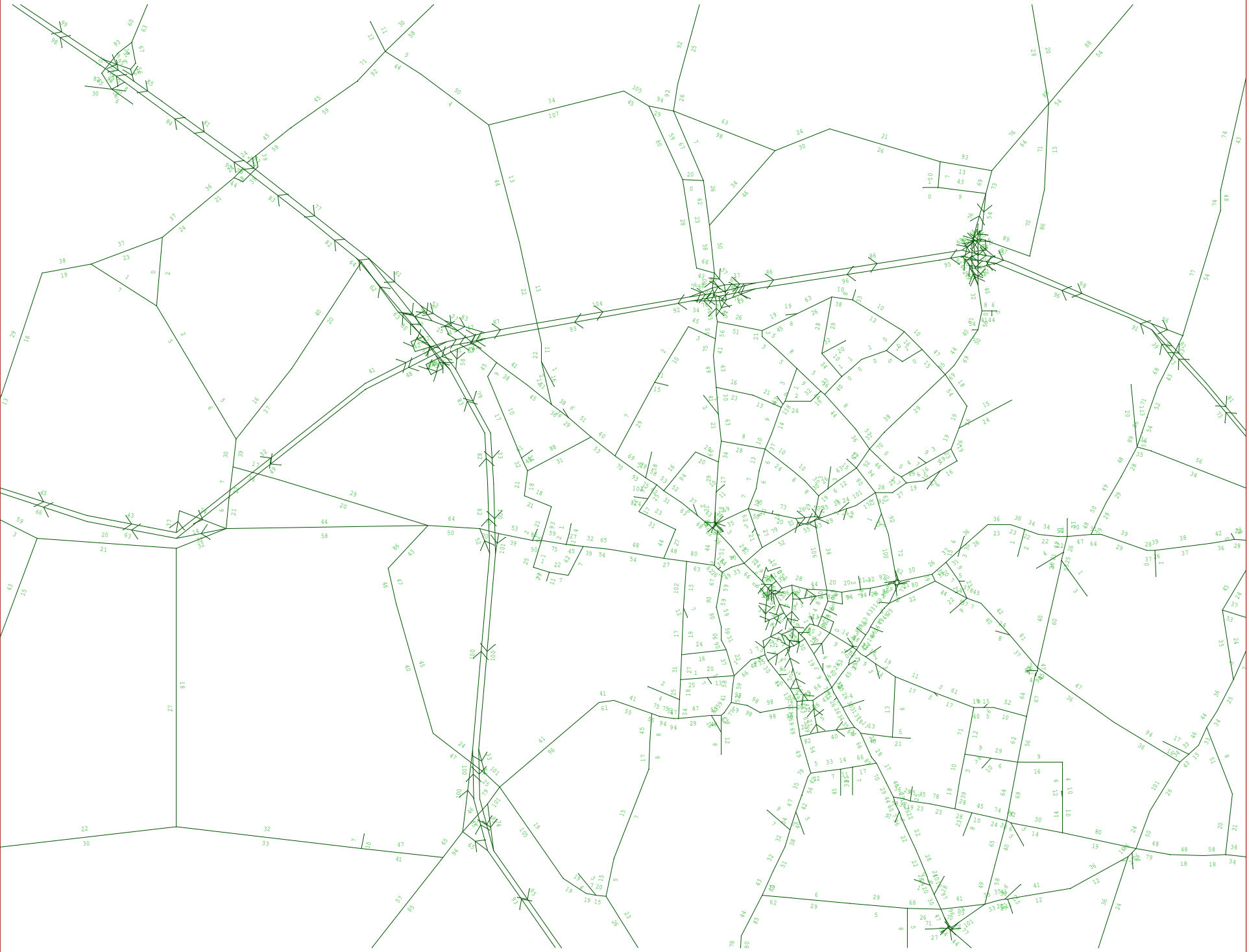
Cambridge LHM 2026 NWC DS (no A14 measures) PM - 23/ 24- 2-11

24- 2-11
ATKINS (SATU



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Scale 49331

Link Annot:

VoverC %

Cambridge LHM 2026 NWC DS (no A14 measures) PM - 23/ 24- 2-11

24- 2-11
ATKINS (SATU

Appendix 11 - 2026 Junction Capacity Assessment – Computer Output

North West Cambridge
Transport Assessment

Full Input Data And Results

Full Input Data And Results

User and Project Details

Project:	
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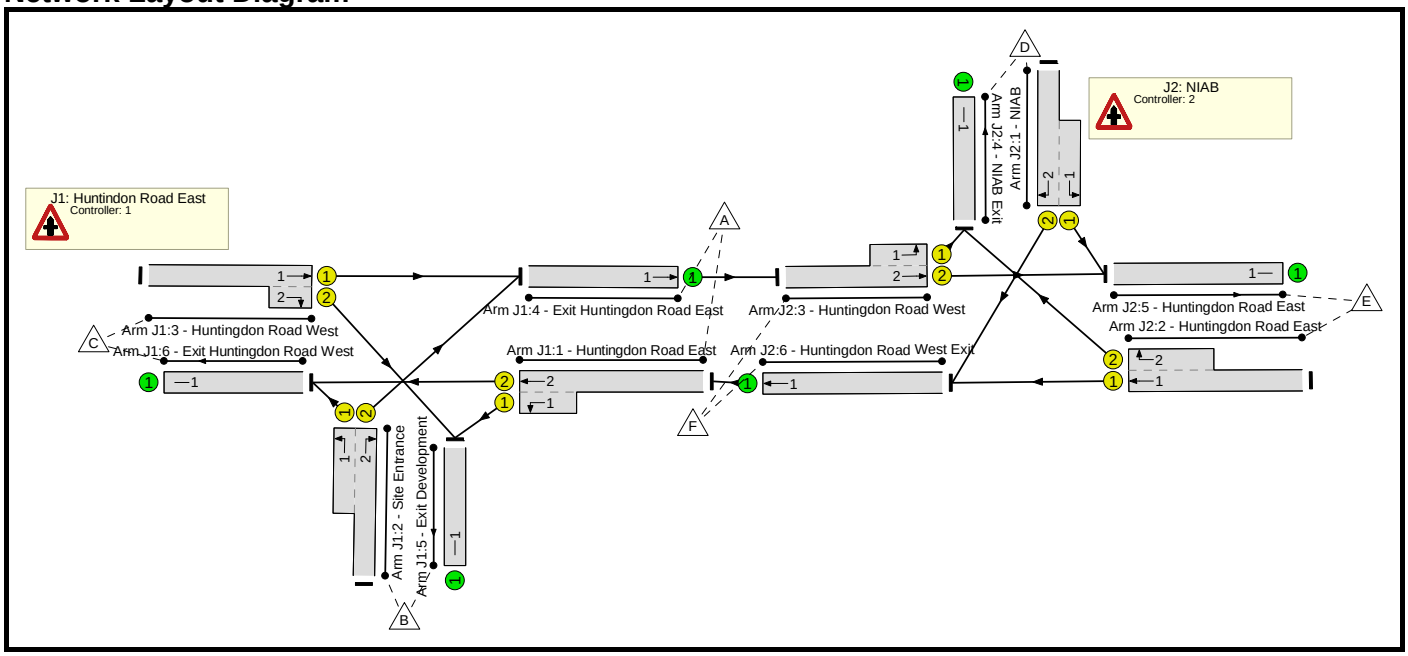
Location:	
File name:	Huntindon Road East NIAB_050911.lsg3x
Author:	
Company:	
Address:	
Notes:	

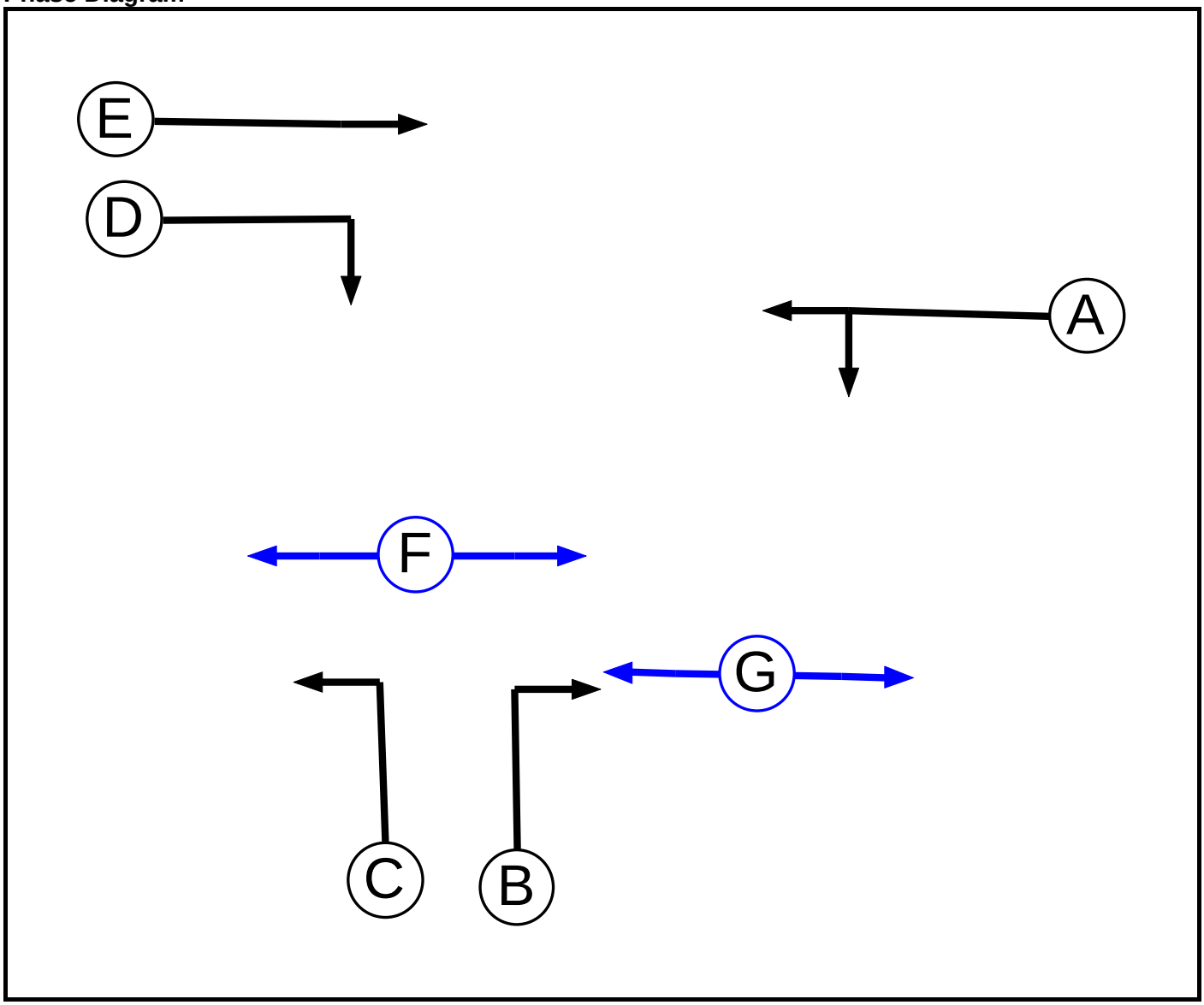
Network Layout Diagram



Full Input Data And Results

C1

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Traffic		7	7
F	Pedestrian		4	4
G	Pedestrian		5	5

Full Input Data And Results

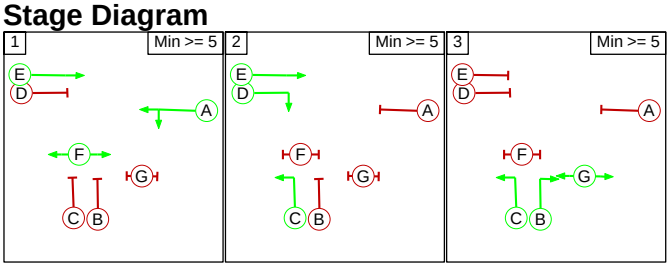
Phase Intergreens Matrix

		Starting Phase						
		A	B	C	D	E	F	G
Terminating Phase	A		5	7	5	-	-	9
	B	5		-	5	5	7	-
	C	5	-		-	-	7	-
	D	5	5	-		-	-	11
	E	-	5	-	-		-	-
	F	-	5	5	-	-		-
	G	3	-	-	3	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A E F
2	C D E
3	B C G

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

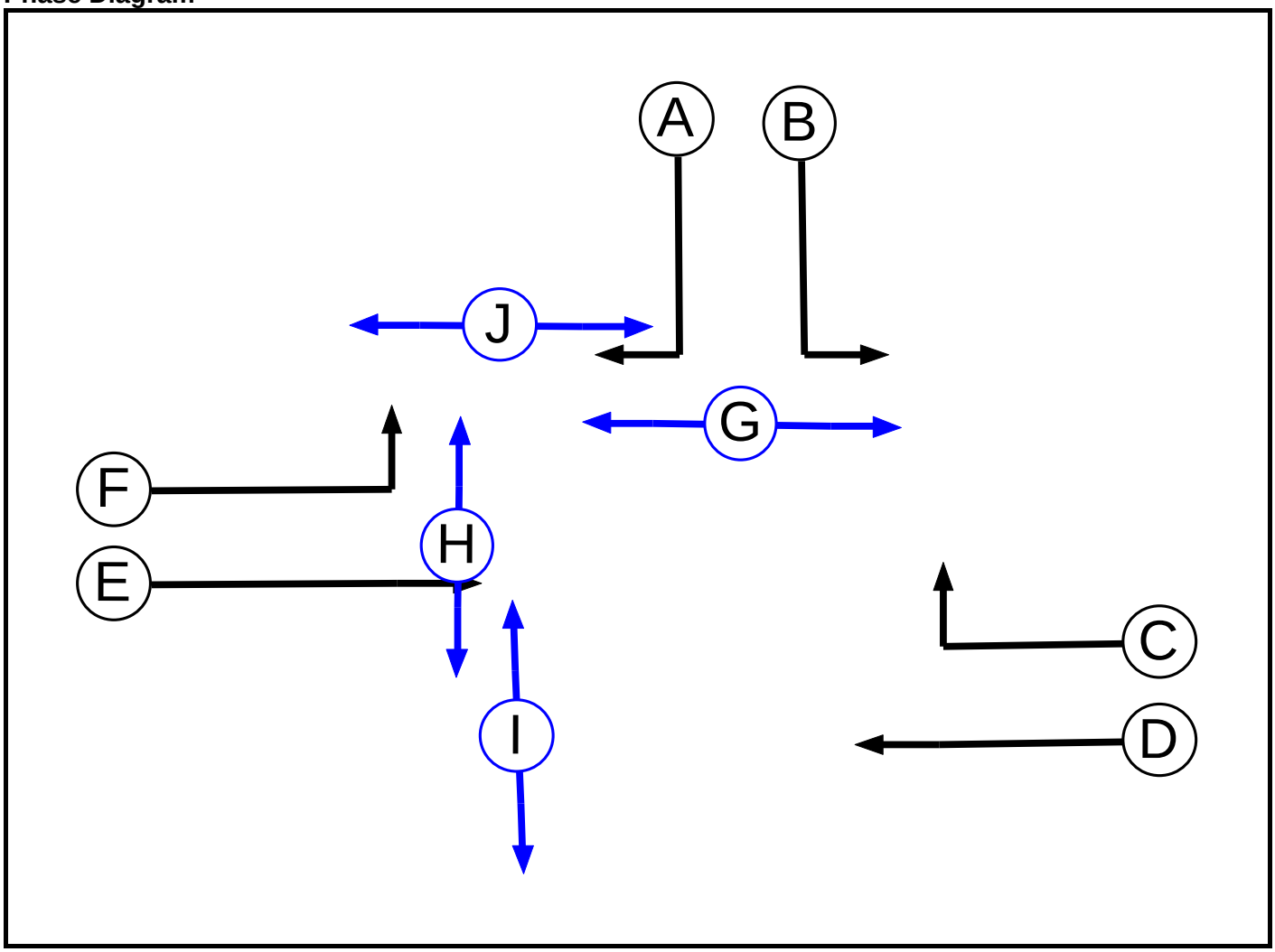
Prohibited Stage Change

		To Stage		
		1	2	3
From Stage	1		7	9
	2	7		11
	3	7	5	

Full Input Data And Results

C2

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Traffic		7	7
F	Traffic		7	7
G	Pedestrian		4	4
H	Pedestrian		5	5
I	Pedestrian		5	5
J	Pedestrian		4	4

Full Input Data And Results

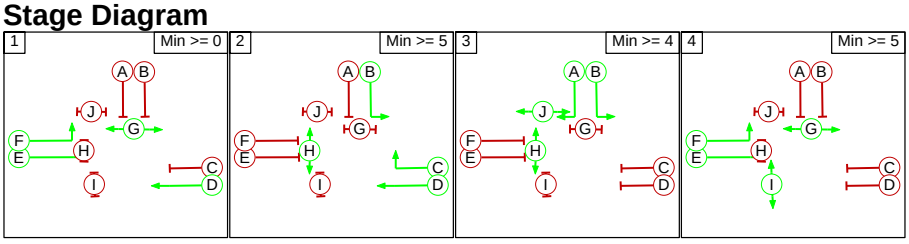
Phase Intergreens Matrix

		Starting Phase									
		A	B	C	D	E	F	G	H	I	J
Terminating Phase	A		-	5	5	5	-	7	-	11	-
	B	-		-	-	5	-	7	-	-	-
	C	5	-		-	5	6	-	-	-	11
	D	5	-	-		-	-	-	-	11	-
	E	5	6	5	-		-	-	7	-	-
	F	-	-	5	-	-		-	7	-	9
	G	5	5	-	-	-	-		-	-	-
	H	-	-	-	-	7	7	-		-	-
	I	1	-	-	1	-	-	-	-		-
	J	-	-	1	-	-	4	-	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	D E F G
2	B C D H
3	A B H J
4	E F G I

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

		To Stage			
		1	2	3	4
From Stage	1		7	9	11
	2	7		11	11
	3	7	5		11
	4	2	7	9	

Full Input Data And Results

Give-Way Lane Input Data

Junction: J1: Huntindon Road East
There are no Opposed Lanes in this Junction

Junction: J2: NIAB
There are no Opposed Lanes in this Junction

Full Input Data And Results

Lane Input Data

Junction: J1: Huntindon Road East												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
J1:1/1 (Huntingdon Road East)	U	A	2	3	4.0	Geom	-	3.50	0.00	Y	Arm J1:5 Left	15.00
J1:1/2 (Huntingdon Road East)	U	A	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J1:6 Ahead	Inf
J1:2/1 (Site Entrance)	U	C	2	3	6.0	Geom	-	3.25	0.00	Y	Arm J1:6 Left	30.00
J1:2/2 (Site Entrance)	U	B	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J1:4 Right	15.00
J1:3/1 (Huntingdon Road West)	U	E	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J1:4 Ahead	Inf
J1:3/2 (Huntingdon Road West)	U	D	2	3	3.0	Geom	-	3.50	0.00	Y	Arm J1:5 Right	15.00
J1:4/1 (Exit Huntingdon Road East)	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:5/1 (Exit Development)	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:6/1 (Exit Huntingdon Road West)	U		2	3	60.0	Inf	-	-	-	-	-	-

Full Input Data And Results

Junction: J2: NIAB

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
J2:1/1 (NIAB)	U	B	2	3	6.0	Geom	-	3.00	0.00	Y	Arm J2:5 Left	15.00
J2:1/2 (NIAB)	U	A	2	3	60.0	Geom	-	3.00	0.00	Y	Arm J2:6 Right	15.00
J2:2/1 (Huntingdon Road East)	U	D	2	3	60.0	Geom	-	3.00	0.00	Y	Arm J2:6 Ahead	Inf
J2:2/2 (Huntingdon Road East)	U	C	2	3	6.0	Geom	-	3.00	0.00	Y	Arm J2:4 Right	Inf
J2:3/1 (Huntingdon Road West)	U	F	2	3	4.0	Geom	-	3.00	0.00	Y	Arm J2:4 Left	15.00
J2:3/2 (Huntingdon Road West)	U	E	2	3	60.0	Geom	-	3.00	0.00	Y	Arm J2:5 Ahead	Inf
J2:4/1 (NIAB Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:5/1 (Huntingdon Road East)	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:6/1 (Huntingdon Road West Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'DS AM'	08:00	09:00	01:00	
2: 'DS PM'	17:00	18:00	01:00	

Scenario 1: 'DS PM' (FG2: 'DS PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination						
		A	B	C	D	E	F	Tot.
Origin	A	0	0	0	0	0	0	0
	B	1	0	167	18	182	0	368
	C	4	12	0	62	736	0	814
	D	0	5	18	0	20	0	43
	E	0	253	973	63	0	0	1289
	F	0	0	0	0	0	0	0
	Tot.	5	270	1158	143	938	0	2514

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 1: DS PM
Junction: J1: Huntindon Road East	
J1:1/1 (short)	258
J1:1/2 (with short)	1249(In) 991(Out)
J1:2/1 (short)	167
J1:2/2 (with short)	368(In) 201(Out)
J1:3/1 (with short)	814(In) 802(Out)
J1:3/2 (short)	12
J1:4/1	1003
J1:5/1	270
J1:6/1	1158
Junction: J2: NIAB	
J2:1/1 (short)	20
J2:1/2 (with short)	43(In) 23(Out)
J2:2/1 (with short)	1289(In) 1226(Out)
J2:2/2 (short)	63
J2:3/1 (short)	80
J2:3/2 (with short)	998(In) 918(Out)
J2:4/1	143
J2:5/1	938
J2:6/1	1249

Full Input Data And Results

Lane Saturation Flows

Junction: J1: Huntindon Road East							
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat flow (PCU/Hr)**
J1:1/1 (Huntingdon Road East)	3.50	0.00	Y	Arm J1:5 Left	15.00	100.0 %	1786
J1:1/2 (Huntingdon Road East)	3.50	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1965
J1:2/1 (Site Entrance)	3.25	0.00	Y	Arm J1:6 Left	30.00	100.0 %	1848
J1:2/2 (Site Entrance)	3.50	0.00	Y	Arm J1:4 Right	15.00	100.0 %	1786
J1:3/1 (Huntingdon Road West)	3.50	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1965
J1:3/2 (Huntingdon Road West)	3.50	0.00	Y	Arm J1:5 Right	15.00	100.0 %	1786
J1:4/1 (Exit Huntingdon Road East Lane 1)	Infinite Saturation Flow						Inf
J1:5/1 (Exit Development Lane 1)	Infinite Saturation Flow						Inf
J1:6/1 (Exit Huntingdon Road West Lane 1)	Infinite Saturation Flow						Inf

Junction: J2: NIAB							
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat flow (PCU/Hr)**
J2:1/1 (NIAB)	3.00	0.00	Y	Arm J2:5 Left	15.00	100.0 %	1741
J2:1/2 (NIAB)	3.00	0.00	Y	Arm J2:6 Right	15.00	100.0 %	1741
J2:2/1 (Huntingdon Road East)	3.00	0.00	Y	Arm J2:6 Ahead	Inf	100.0 %	1915
J2:2/2 (Huntingdon Road East)	3.00	0.00	Y	Arm J2:4 Right	Inf	100.0 %	1915
J2:3/1 (Huntingdon Road West)	3.00	0.00	Y	Arm J2:4 Left	15.00	100.0 %	1741
J2:3/2 (Huntingdon Road West)	3.00	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1915
J2:4/1 (NIAB Exit Lane 1)	Infinite Saturation Flow						Inf
J2:5/1 (Huntingdon Road East Lane 1)	Infinite Saturation Flow						Inf
J2:6/1 (Huntingdon Road West Exit Lane 1)	Infinite Saturation Flow						Inf

Full Input Data And Results

Scenario 2: 'DS AM' (FG1: 'DS AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination						
		A	B	C	D	E	F	Tot.
Origin	A	0	0	1	0	0	0	1
	B	0	0	78	4	188	0	270
	C	1	78	0	22	1025	0	1126
	D	0	21	58	0	76	0	155
	E	0	176	627	27	0	0	830
	F	0	0	0	0	0	0	0
	Tot.	1	275	764	53	1289	0	2382

Traffic Lane Flows

Lane	Scenario 2: DS AM
Junction: J1: Huntindon Road East	
J1:1/1 (short)	197
J1:1/2 (with short)	883(In) 686(Out)
J1:2/1 (short)	78
J1:2/2 (with short)	270(In) 192(Out)
J1:3/1 (with short)	1126(In) 1048(Out)
J1:3/2 (short)	78
J1:4/1	1240
J1:5/1	275
J1:6/1	764
Junction: J2: NIAB	
J2:1/1 (short)	76
J2:1/2 (with short)	155(In) 79(Out)
J2:2/1 (with short)	830(In) 803(Out)
J2:2/2 (short)	27
J2:3/1 (short)	26
J2:3/2 (with short)	1239(In) 1213(Out)
J2:4/1	53
J2:5/1	1289
J2:6/1	882

Full Input Data And Results

Lane Saturation Flows

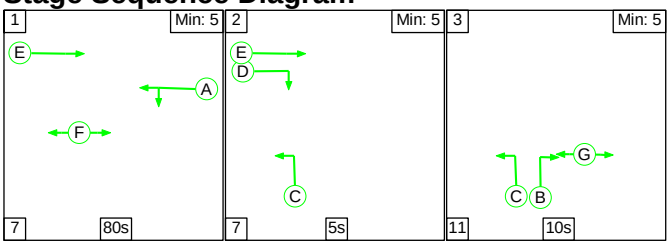
Junction: J1: Huntindon Road East							
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat flow (PCU/Hr)**
J1:1/1 (Huntingdon Road East)	3.50	0.00	Y	Arm J1:5 Left	15.00	100.0 %	1786
J1:1/2 (Huntingdon Road East)	3.50	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1965
J1:2/1 (Site Entrance)	3.25	0.00	Y	Arm J1:6 Left	30.00	100.0 %	1848
J1:2/2 (Site Entrance)	3.50	0.00	Y	Arm J1:4 Right	15.00	100.0 %	1786
J1:3/1 (Huntingdon Road West)	3.50	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1965
J1:3/2 (Huntingdon Road West)	3.50	0.00	Y	Arm J1:5 Right	15.00	100.0 %	1786
J1:4/1 (Exit Huntingdon Road East Lane 1)	Infinite Saturation Flow						Inf
J1:5/1 (Exit Development Lane 1)	Infinite Saturation Flow						Inf
J1:6/1 (Exit Huntingdon Road West Lane 1)	Infinite Saturation Flow						Inf

Junction: J2: NIAB							
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat flow (PCU/Hr)**
J2:1/1 (NIAB)	3.00	0.00	Y	Arm J2:5 Left	15.00	100.0 %	1741
J2:1/2 (NIAB)	3.00	0.00	Y	Arm J2:6 Right	15.00	100.0 %	1741
J2:2/1 (Huntingdon Road East)	3.00	0.00	Y	Arm J2:6 Ahead	Inf	100.0 %	1915
J2:2/2 (Huntingdon Road East)	3.00	0.00	Y	Arm J2:4 Right	Inf	100.0 %	1915
J2:3/1 (Huntingdon Road West)	3.00	0.00	Y	Arm J2:4 Left	15.00	100.0 %	1741
J2:3/2 (Huntingdon Road West)	3.00	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1915
J2:4/1 (NIAB Exit Lane 1)	Infinite Saturation Flow						Inf
J2:5/1 (Huntingdon Road East Lane 1)	Infinite Saturation Flow						Inf
J2:6/1 (Huntingdon Road West Exit Lane 1)	Infinite Saturation Flow						Inf

Full Input Data And Results

Scenario 1: 'DS PM' (FG2: 'DS PM', Plan 1: 'Network Control Plan 1')
C1

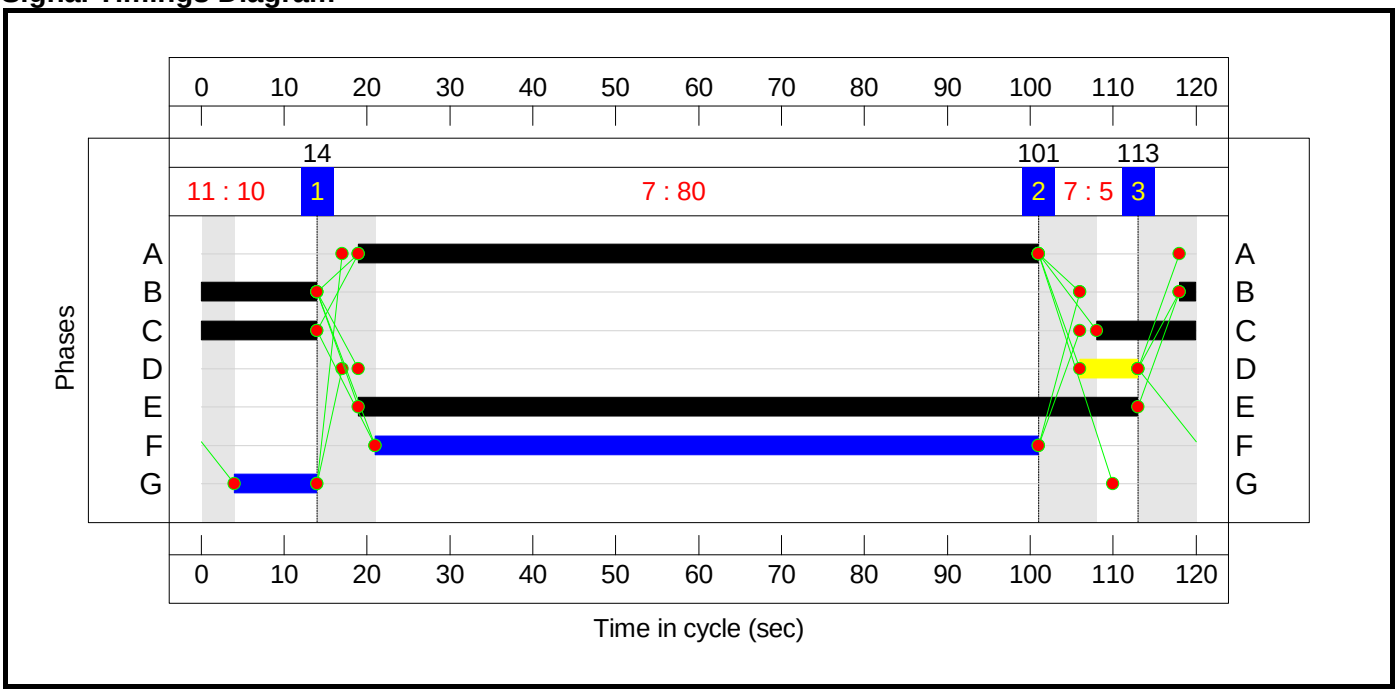
Stage Sequence Diagram



Stage Timings

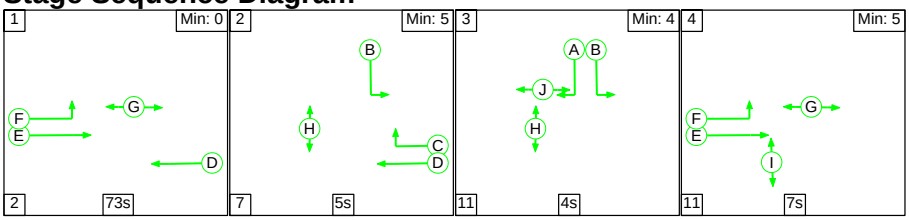
Stage	1	2	3
Duration	80	5	10
Change Point	14	101	113

Signal Timings Diagram



C2

Stage Sequence Diagram

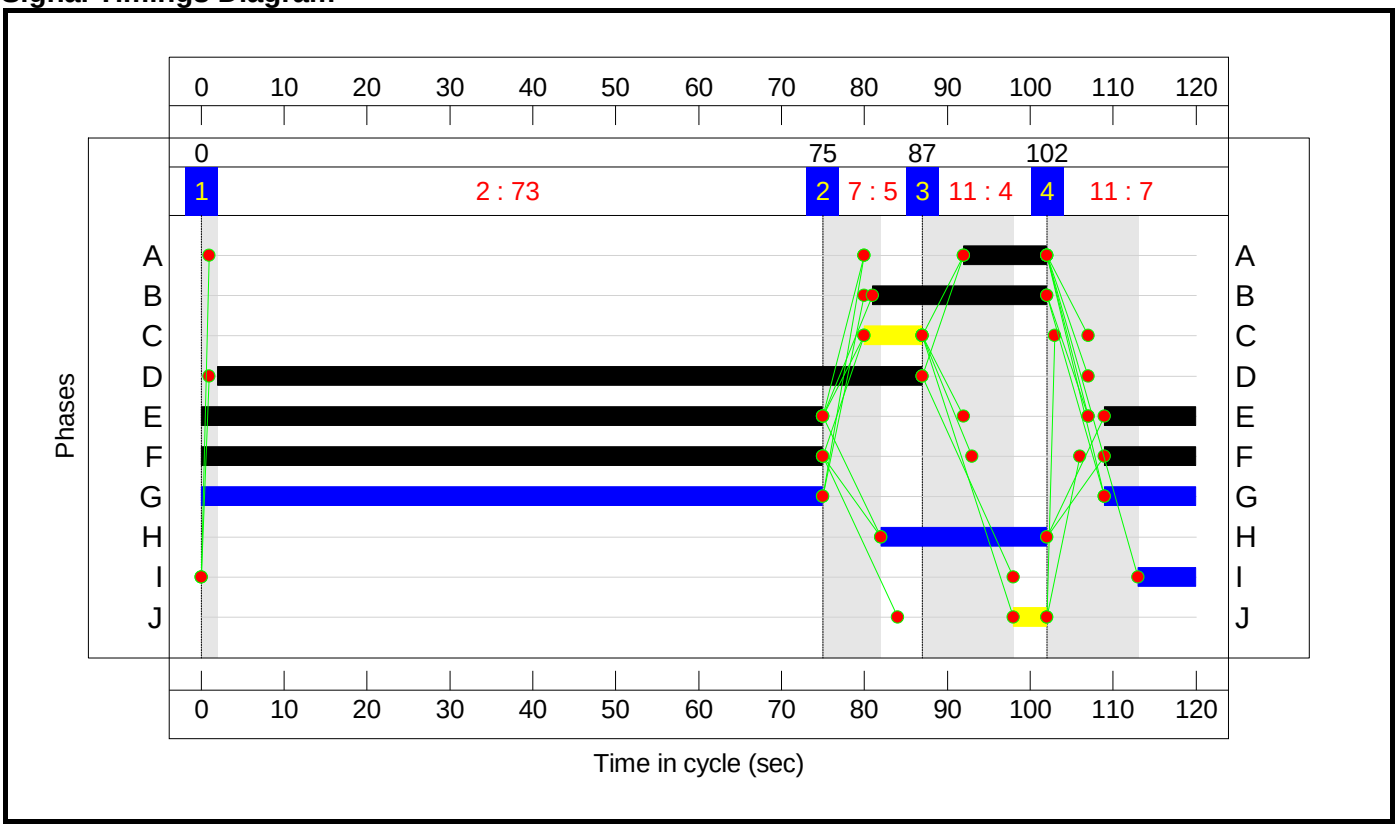


Stage Timings

Stage	1	2	3	4
Duration	73	5	4	7
Change Point	0	75	87	102

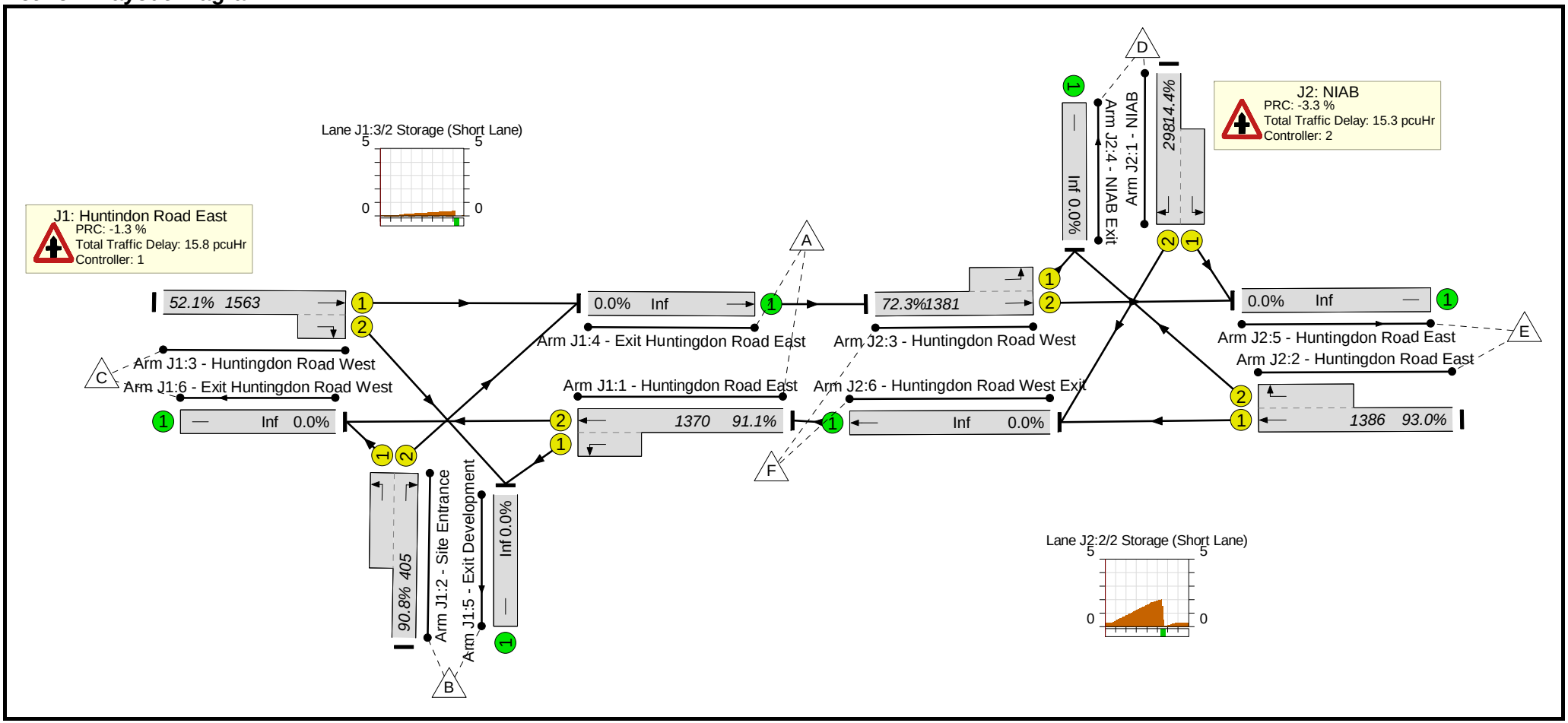
Full Input Data And Results

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**93.0%**
J1: Huntindon Road East	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**91.1%**
1/2+1/1	Huntingdon Road East Left Ahead	U	N/A	N/A	C1:A		1	82	-	1249	1965:1786	1370	91.1%
2/2+2/1	Site Entrance Right Left	U	N/A	N/A	C1:B C1:C		1	16:26	-	368	1786:1848	405	90.8%
3/1+3/2	Huntingdon Road West Ahead Right	U	N/A	N/A	C1:E C1:D		1	94:7	-	814	1965:1786	1563	52.1%
4/1	Exit Huntingdon Road East Ahead	U	N/A	N/A	-		-	-	-	1003	Inf	Inf	0.0%
5/1	Exit Development	U	N/A	N/A	-		-	-	-	270	Inf	Inf	0.0%
6/1	Exit Huntingdon Road West	U	N/A	N/A	-		-	-	-	1158	Inf	Inf	0.0%
J2: NIAB	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**93.0%**
1/2+1/1	NIAB Left Right	U	N/A	N/A	C2:A C2:B		1	10:21	-	43	1741:1741	298	14.4%
2/1+2/2	Huntingdon Road East Right Ahead	U	N/A	N/A	C2:D C2:C		1	85:7	-	1289	1915:1915	1386	93.0%
3/2+3/1	Huntingdon Road West Left Ahead	U	N/A	N/A	C2:E C2:F		1	86	-	998	1915:1741	1381	72.3%
4/1	NIAB Exit	U	N/A	N/A	-		-	-	-	143	Inf	Inf	0.0%
5/1	Huntingdon Road East	U	N/A	N/A	-		-	-	-	938	Inf	Inf	0.0%
6/1	Huntingdon Road West Exit Ahead	U	N/A	N/A	-		-	-	-	1249	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**14.4**	**16.7**	**0.0**	**31.1**	**-**	**-**	**-**	**-**
J1: Huntindon Road East	**-**	**-**	**0**	**0**	**0**	**6.4**	**9.4**	**0.0**	**15.8**	**-**	**-**	**-**	**-**
1/2+1/1	1249	1249	-	-	-	0.6	4.8	-	5.4	15.6	13.7	4.8	18.5
2/2+2/1	368	368	-	-	-	4.6	4.1	-	8.7	85.1	6.9	4.1	11.0
3/1+3/2	814	814	-	-	-	1.2	0.5	-	1.7	7.5	9.4	0.5	9.9
4/1	1003	1003	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	270	270	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	1158	1158	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: NIAB	**-**	**-**	**0**	**0**	**0**	**8.0**	**7.3**	**0.0**	**15.3**	**-**	**-**	**-**	**-**
1/2+1/1	43	43	-	-	-	0.5	0.1	-	0.6	52.8	0.7	0.1	0.8
2/1+2/2	1289	1289	-	-	-	5.7	5.9	-	11.7	32.6	35.9	5.9	41.8
3/2+3/1	998	998	-	-	-	1.7	1.3	-	3.0	10.8	11.6	1.3	12.9
4/1	143	143	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	938	938	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	1249	1249	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

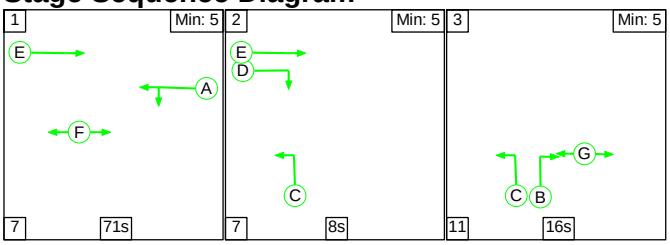
C1	PRC for Signalled Lanes (%):	-1.3	Total Delay for Signalled Lanes (pcuHr):	15.81	
C2	PRC for Signalled Lanes (%):	-3.3	Total Delay for Signalled Lanes (pcuHr):	15.28	
	PRC Over All Lanes (%):	-3.3	Total Delay Over All Lanes(pcuHr):	31.09	Cycle Time (s): 120

Full Input Data And Results

Scenario 2: 'DS AM' (FG1: 'DS AM', Plan 1: 'Network Control Plan 1')

C1

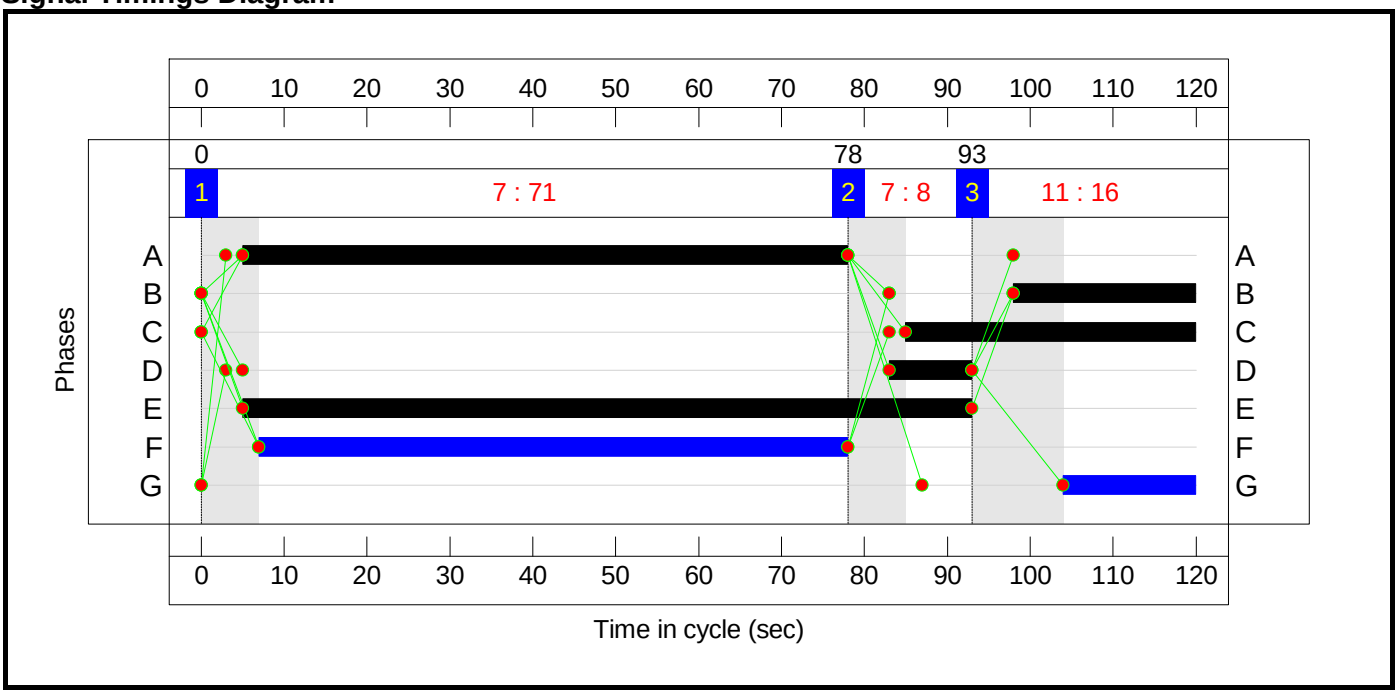
Stage Sequence Diagram



Stage Timings

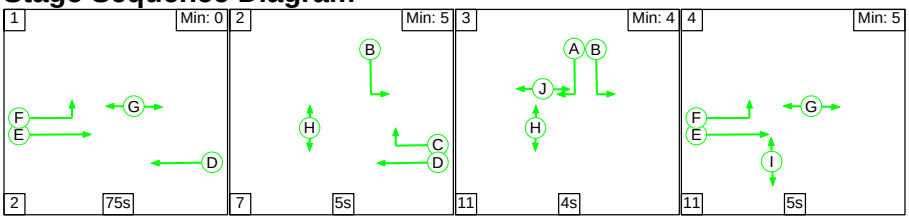
Stage	1	2	3
Duration	71	8	16
Change Point	0	78	93

Signal Timings Diagram



C2

Stage Sequence Diagram

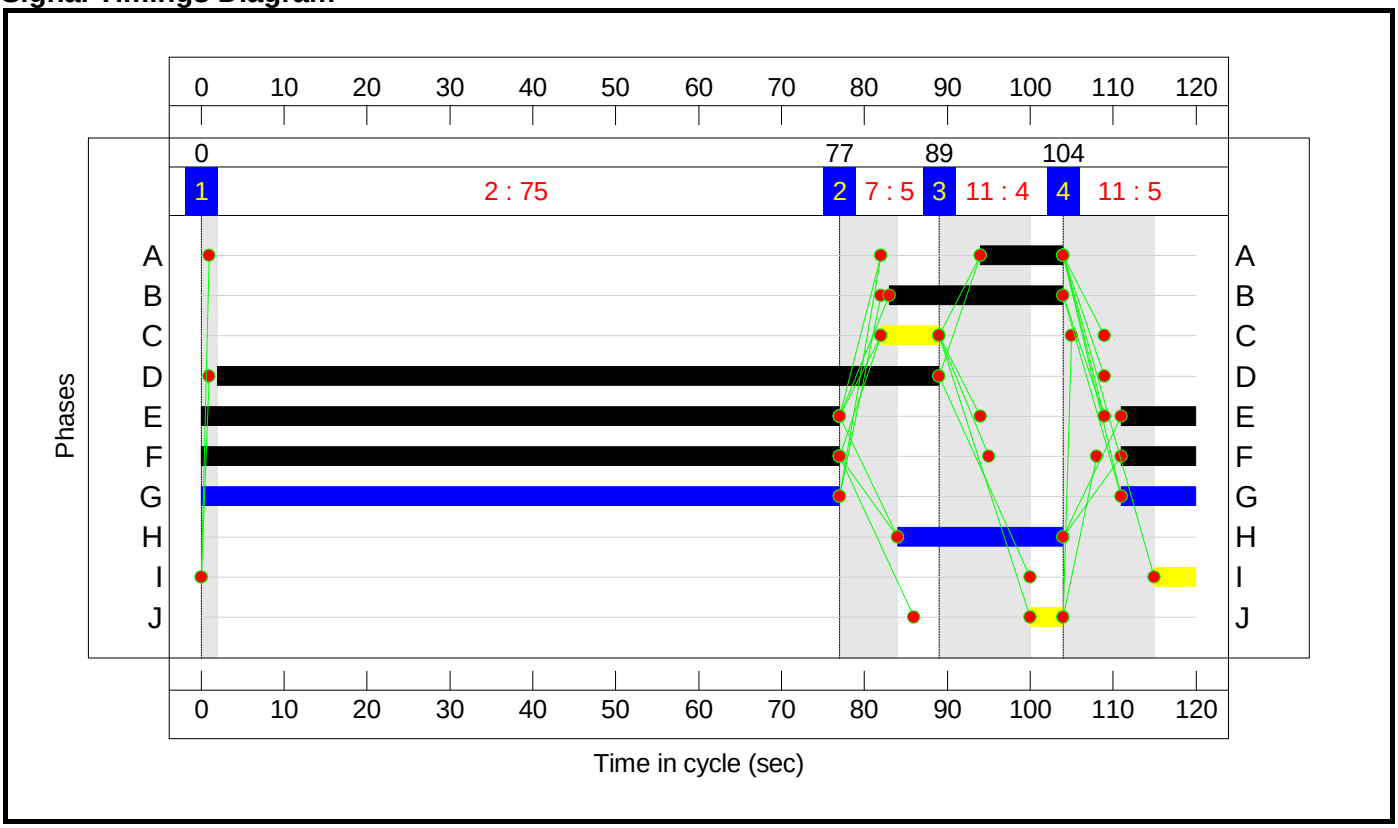


Stage Timings

Stage	1	2	3	4
Duration	75	5	4	5
Change Point	0	77	89	104

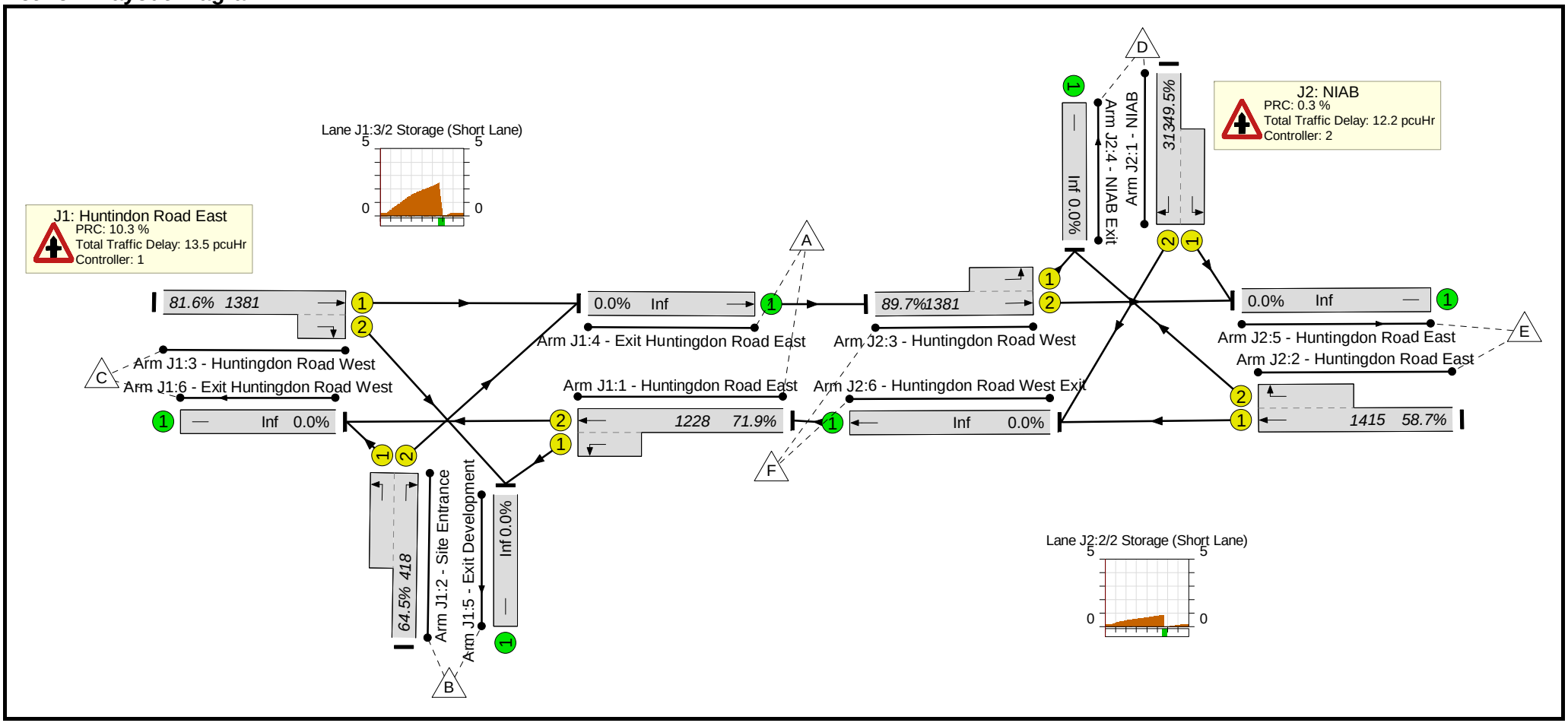
Full Input Data And Results

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.7%**
J1: Huntindon Road East	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**81.6%**
1/2+1/1	Huntingdon Road East Left Ahead	U	N/A	N/A	C1:A		1	73	-	883	1965:1786	1228	71.9%
2/2+2/1	Site Entrance Right Left	U	N/A	N/A	C1:B C1:C		1	22:35	-	270	1786:1848	418	64.5%
3/1+3/2	Huntingdon Road West Ahead Right	U	N/A	N/A	C1:E C1:D		1	88:10	-	1126	1965:1786	1381	81.6%
4/1	Exit Huntingdon Road East Ahead	U	N/A	N/A	-		-	-	-	1240	Inf	Inf	0.0%
5/1	Exit Development	U	N/A	N/A	-		-	-	-	275	Inf	Inf	0.0%
6/1	Exit Huntingdon Road West	U	N/A	N/A	-		-	-	-	764	Inf	Inf	0.0%
J2: NIAB	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**89.7%**
1/2+1/1	NIAB Left Right	U	N/A	N/A	C2:A C2:B		1	10:21	-	155	1741:1741	313	49.5%
2/1+2/2	Huntingdon Road East Right Ahead	U	N/A	N/A	C2:D C2:C		1	87:7	-	830	1915:1915	1415	58.7%
3/2+3/1	Huntingdon Road West Left Ahead	U	N/A	N/A	C2:E C2:F		1	86	-	1239	1915:1741	1381	89.7%
4/1	NIAB Exit	U	N/A	N/A	-		-	-	-	53	Inf	Inf	0.0%
5/1	Huntingdon Road East	U	N/A	N/A	-		-	-	-	1289	Inf	Inf	0.0%
6/1	Huntingdon Road West Exit Ahead	U	N/A	N/A	-		-	-	-	882	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**16.0**	**9.7**	**0.0**	**25.7**	**-**	**-**	**-**	**-**
J1: Huntindon Road East	**-**	**-**	**0**	**0**	**0**	**9.2**	**4.3**	**0.0**	**13.5**	**-**	**-**	**-**	**-**
1/2+1/1	883	883	-	-	-	2.4	1.3	-	3.7	15.0	11.0	1.3	12.2
2/2+2/1	270	270	-	-	-	3.0	0.9	-	3.9	52.1	5.8	0.9	6.7
3/1+3/2	1126	1126	-	-	-	3.7	2.2	-	5.9	18.9	22.0	2.2	24.2
4/1	1240	1240	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	275	275	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	764	764	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: NIAB	**-**	**-**	**0**	**0**	**0**	**6.8**	**5.3**	**0.0**	**12.2**	**-**	**-**	**-**	**-**
1/2+1/1	155	155	-	-	-	2.0	0.5	-	2.5	58.3	2.5	0.5	3.0
2/1+2/2	830	830	-	-	-	2.0	0.7	-	2.7	11.9	12.5	0.7	13.2
3/2+3/1	1239	1239	-	-	-	2.8	4.1	-	6.9	20.1	17.3	4.1	21.4
4/1	53	53	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1289	1289	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	882	882	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

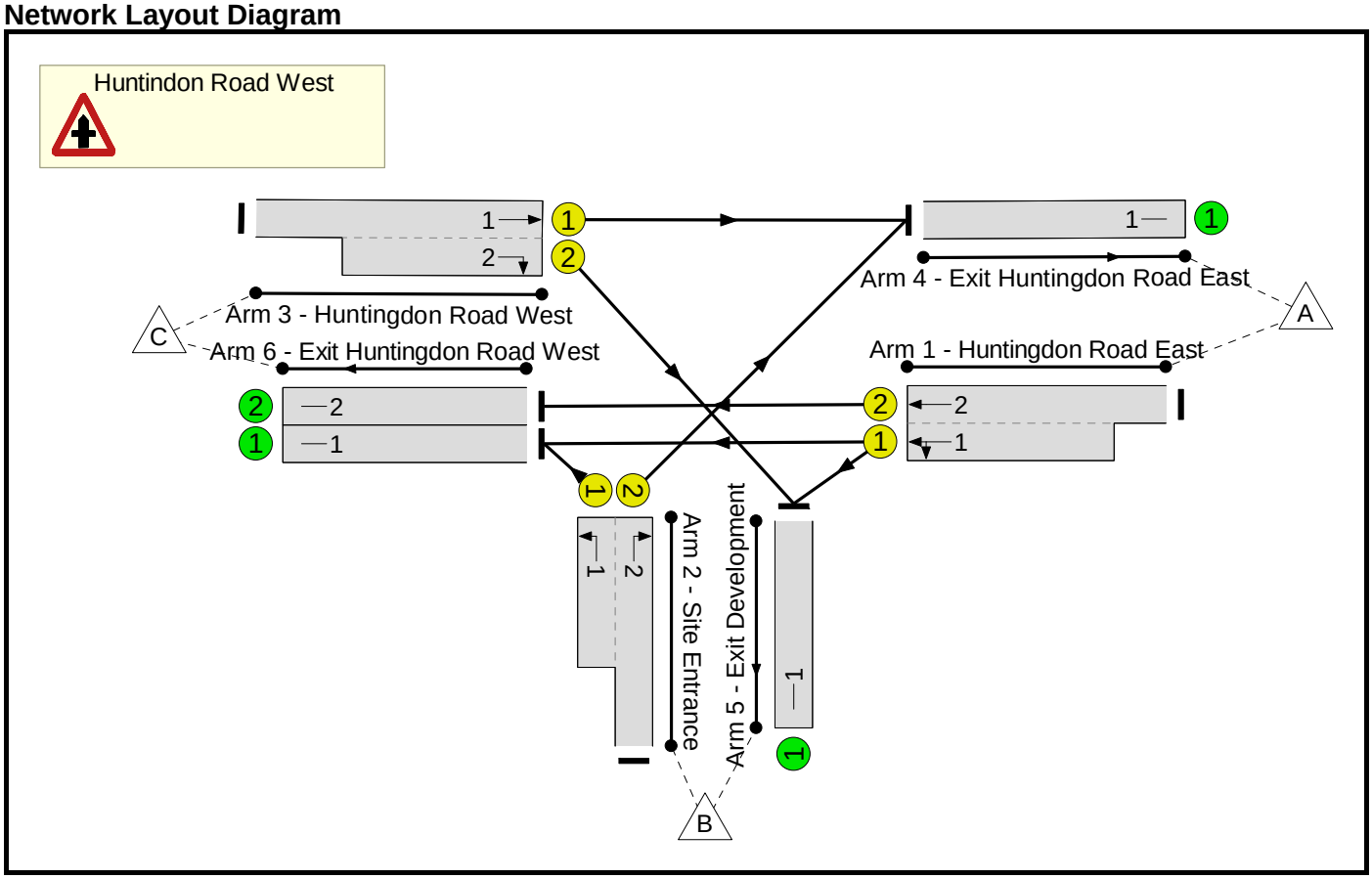
C1	PRC for Signalled Lanes (%):	10.3	Total Delay for Signalled Lanes (pcuHr):	13.51	
C2	PRC for Signalled Lanes (%):	0.3	Total Delay for Signalled Lanes (pcuHr):	12.16	
	PRC Over All Lanes (%):	0.3	Total Delay Over All Lanes(pcuHr):	25.67	Cycle Time (s): 120

Full Input Data And Results

User and Project Details

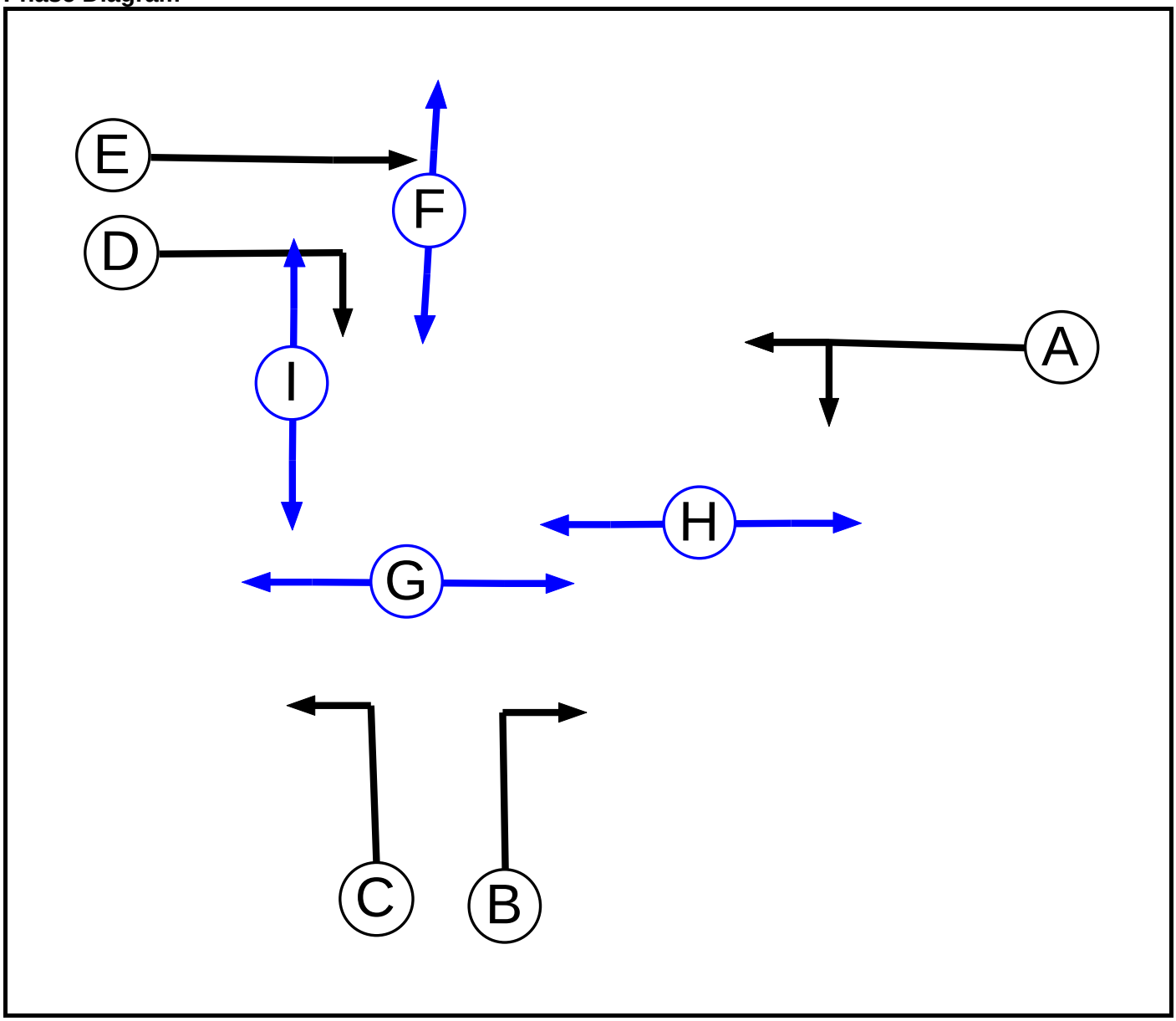
Project:	
Title:	
Location:	
File name:	Huntindon Road West 050911.lsg3x
Author:	
Company:	
Address:	
Notes:	

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Traffic		7	7
F	Pedestrian		5	5
G	Pedestrian		4	4
H	Pedestrian		4	4
I	Pedestrian		4	4

Full Input Data And Results

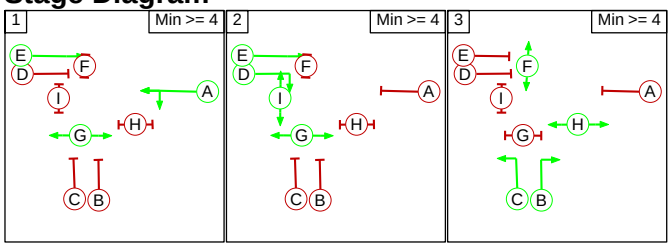
Phase Intergreens Matrix

		Starting Phase								
		A	B	C	D	E	F	G	H	I
Terminating Phase	A		5	6	5	-	-	-	10	10
	B	5		-	5	5	-	7	-	-
	C	5	-		-	-	-	7	-	9
	D	5	5	-		-	8	-	11	-
	E	-	5	-	-		8	-	-	-
	F	-	-	-	8	8		-	-	-
	G	-	6	6	-	-	-		-	-
	H	5	-	-	2	-	-	-		-
	I	2	-	3	-	-	-	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A E G
2	D E G I
3	B C F H

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

		To Stage		
		1	2	3
From Stage	1		10	10
	2	5		11
	3	8	9	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Huntindon Road West
There are no Opposed Lanes in this Junction

Full Input Data And Results

Lane Input Data

Junction: Huntindon Road West

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (Huntingdon Road East)	U	A	2	3	9.0	Geom	-	3.25	0.00	Y	Arm 5 Left Arm 6 Ahead	15.00 Inf
1/2 (Huntingdon Road East)	U	A	2	3	60.0	Geom	-	3.25	0.00	N	Arm 6 Ahead	Inf
2/1 (Site Entrance)	U	C	2	3	6.0	Geom	-	3.25	0.00	Y	Arm 6 Left	16.00
2/2 (Site Entrance)	U	B	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 4 Right	15.00
3/1 (Huntingdon Road West)	U	E	2	3	60.0	Geom	-	3.50	0.00	Y	Arm 4 Ahead	Inf
3/2 (Huntingdon Road West)	U	D	2	3	8.0	Geom	-	3.25	0.00	Y	Arm 5 Right	15.00
4/1 (Exit Huntingdon Road East)	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1 (Exit Development)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (Exit Huntingdon Road West)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/2 (Exit Huntingdon Road West)	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'DS AM'	08:00	09:00	01:00	
2: 'DS PM'	17:00	18:00	01:00	

Scenario 1: 'DS AM' (FG1: 'DS AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	68	637	705
	B	28	0	219	247
	C	674	206	0	880
	Tot.	702	274	856	1832

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 1: DS AM
Junction: Huntindon Road West	
1/1 (short)	340
1/2 (with short)	705(In) 365(Out)
2/1 (short)	219
2/2 (with short)	247(In) 28(Out)
3/1 (with short)	880(In) 674(Out)
3/2 (short)	206
4/1	702
5/1	274
6/1	491
6/2	365

Lane Saturation Flows

Junction: Huntindon Road West							
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat flow (PCU/Hr)**
1/1 (Huntingdon Road East)	3.25	0.00	Y	Arm 5 Left	15.00	20.0 %	1902
				Arm 6 Ahead	Inf	80.0 %	
1/2 (Huntingdon Road East)	3.25	0.00	N	Arm 6 Ahead	Inf	100.0 %	2080
2/1 (Site Entrance)	3.25	0.00	Y	Arm 6 Left	16.00	100.0 %	1774
2/2 (Site Entrance)	3.25	0.00	Y	Arm 4 Right	15.00	100.0 %	1764
3/1 (Huntingdon Road West)	3.50	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1965
3/2 (Huntingdon Road West)	3.25	0.00	Y	Arm 5 Right	15.00	100.0 %	1764
4/1 (Exit Huntingdon Road East Lane 1)	Infinite Saturation Flow						Inf
5/1 (Exit Development Lane 1)	Infinite Saturation Flow						Inf
6/1 (Exit Huntingdon Road West Lane 1)	Infinite Saturation Flow						Inf
6/2 (Exit Huntingdon Road West Lane 2)	Infinite Saturation Flow						Inf

Full Input Data And Results

Scenario 2: 'DS PM' (FG2: 'DS PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	21	661	682
	B	25	0	321	346
	C	583	155	0	738
	Tot.	608	176	982	1766

Traffic Lane Flows

Lane	Scenario 2: DS PM
Junction: Huntindon Road West	
1/1 (short)	329
1/2 (with short)	682(In) 353(Out)
2/1 (short)	321
2/2 (with short)	346(In) 25(Out)
3/1 (with short)	738(In) 583(Out)
3/2 (short)	155
4/1	608
5/1	176
6/1	629
6/2	353

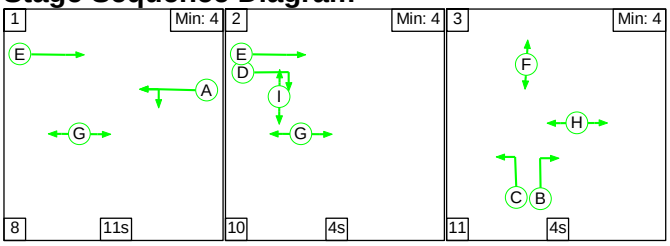
Full Input Data And Results

Lane Saturation Flows

Junction: Huntindon Road West							
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat flow (PCU/Hr)**
1/1 (Huntingdon Road East)	3.25	0.00	Y	Arm 5 Left	15.00	6.4 %	1928
				Arm 6 Ahead	Inf	93.6 %	
1/2 (Huntingdon Road East)	3.25	0.00	N	Arm 6 Ahead	Inf	100.0 %	2080
2/1 (Site Entrance)	3.25	0.00	Y	Arm 6 Left	16.00	100.0 %	1774
2/2 (Site Entrance)	3.25	0.00	Y	Arm 4 Right	15.00	100.0 %	1764
3/1 (Huntingdon Road West)	3.50	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1965
3/2 (Huntingdon Road West)	3.25	0.00	Y	Arm 5 Right	15.00	100.0 %	1764
4/1 (Exit Huntingdon Road East Lane 1)	Infinite Saturation Flow						Inf
5/1 (Exit Development Lane 1)	Infinite Saturation Flow						Inf
6/1 (Exit Huntingdon Road West Lane 1)	Infinite Saturation Flow						Inf
6/2 (Exit Huntingdon Road West Lane 2)	Infinite Saturation Flow						Inf

Scenario 1: 'DS AM' (FG1: 'DS AM', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

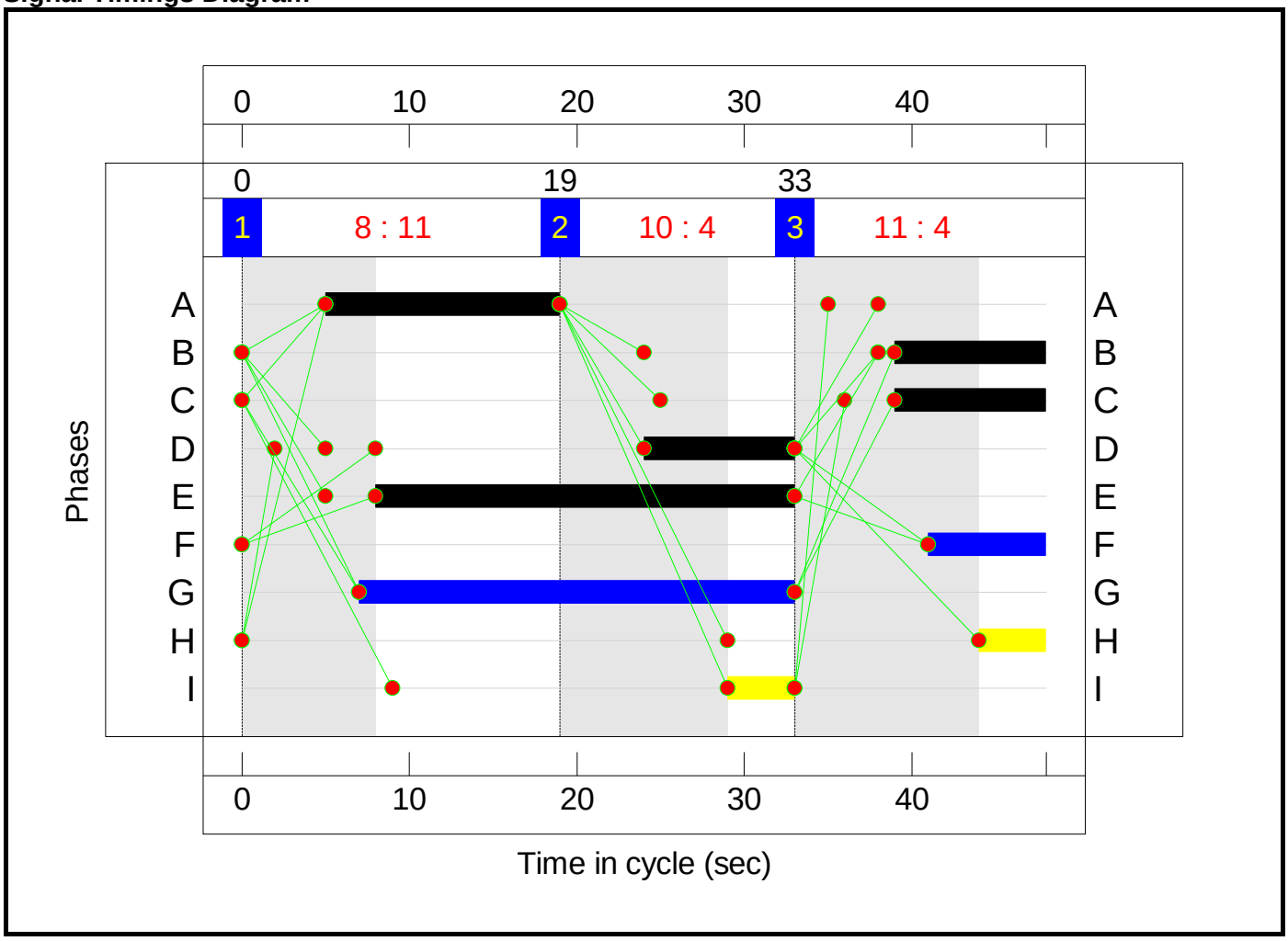


Stage Timings

Stage	1	2	3
Duration	11	4	4
Change Point	0	19	33

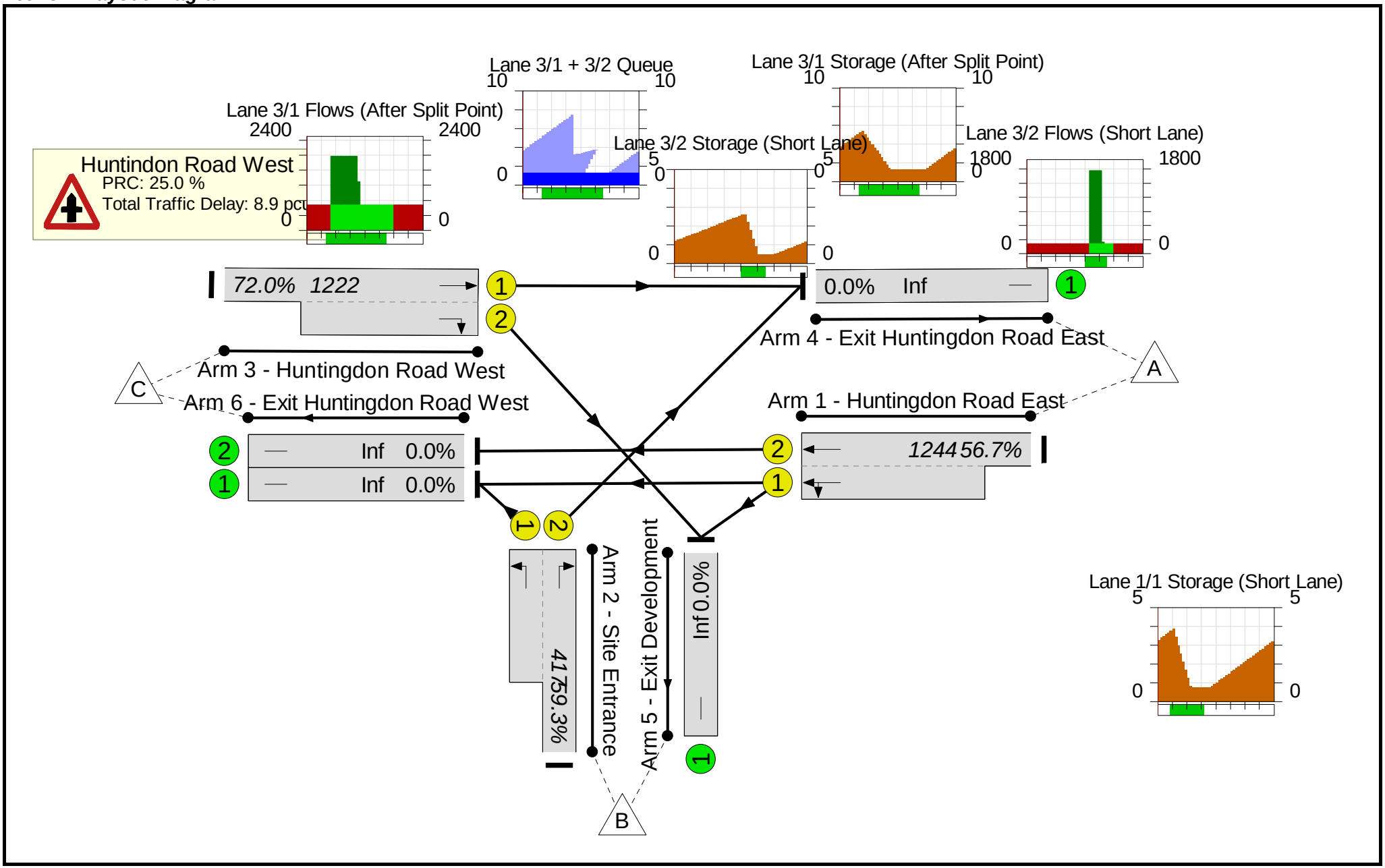
Full Input Data And Results

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**72.0%**
Huntindon Road West	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**72.0%**
1/2+1/1	Huntingdon Road East Left Ahead	U	N/A	N/A	A		1	14	-	705	2080:1902	1244	56.7%
2/2+2/1	Site Entrance Right Left	U	N/A	N/A	B C		1	9	-	247	1764:1774	417	59.3%
3/1+3/2	Huntingdon Road West Ahead Right	U	N/A	N/A	E D		1	25:9	-	880	1965:1764	1222	72.0%
4/1	Exit Huntingdon Road East	U	N/A	N/A	-		-	-	-	702	Inf	Inf	0.0%
5/1	Exit Development	U	N/A	N/A	-		-	-	-	274	Inf	Inf	0.0%
6/1	Exit Huntingdon Road West	U	N/A	N/A	-		-	-	-	491	Inf	Inf	0.0%
6/2	Exit Huntingdon Road West	U	N/A	N/A	-		-	-	-	365	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**6.3**	**2.7**	**0.0**	**8.9**	**-**	**-**	**-**	**-**
Huntindon Road West	**-**	**-**	**0**	**0**	**0**	**6.3**	**2.7**	**0.0**	**8.9**	**-**	**-**	**-**	**-**
1/2+1/1	705	705	-	-	-	2.7	0.7	-	3.4	17.1	4.1	0.7	4.7
2/2+2/1	247	247	-	-	-	1.2	0.7	-	1.9	27.5	2.6	0.7	3.3
3/1+3/2	880	880	-	-	-	2.4	1.3	-	3.7	15.1	6.2	1.3	7.5
4/1	702	702	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	274	274	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	491	491	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	365	365	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

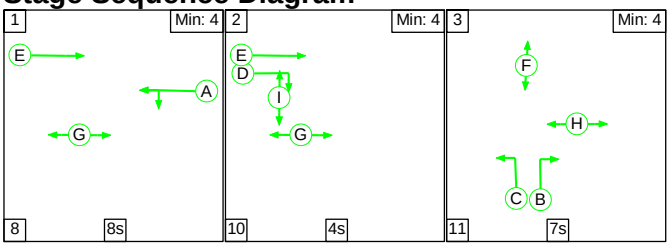
Full Input Data And Results

C1	PRC for Signalled Lanes (%):	25.0	Total Delay for Signalled Lanes (pcuHr):	8.93			
	PRC Over All Lanes (%):	25.0	Total Delay Over All Lanes(pcuHr):	8.93	Cycle Time (s):	48	

Full Input Data And Results

Scenario 2: 'DS PM' (FG2: 'DS PM', Plan 1: 'Network Control Plan 1')

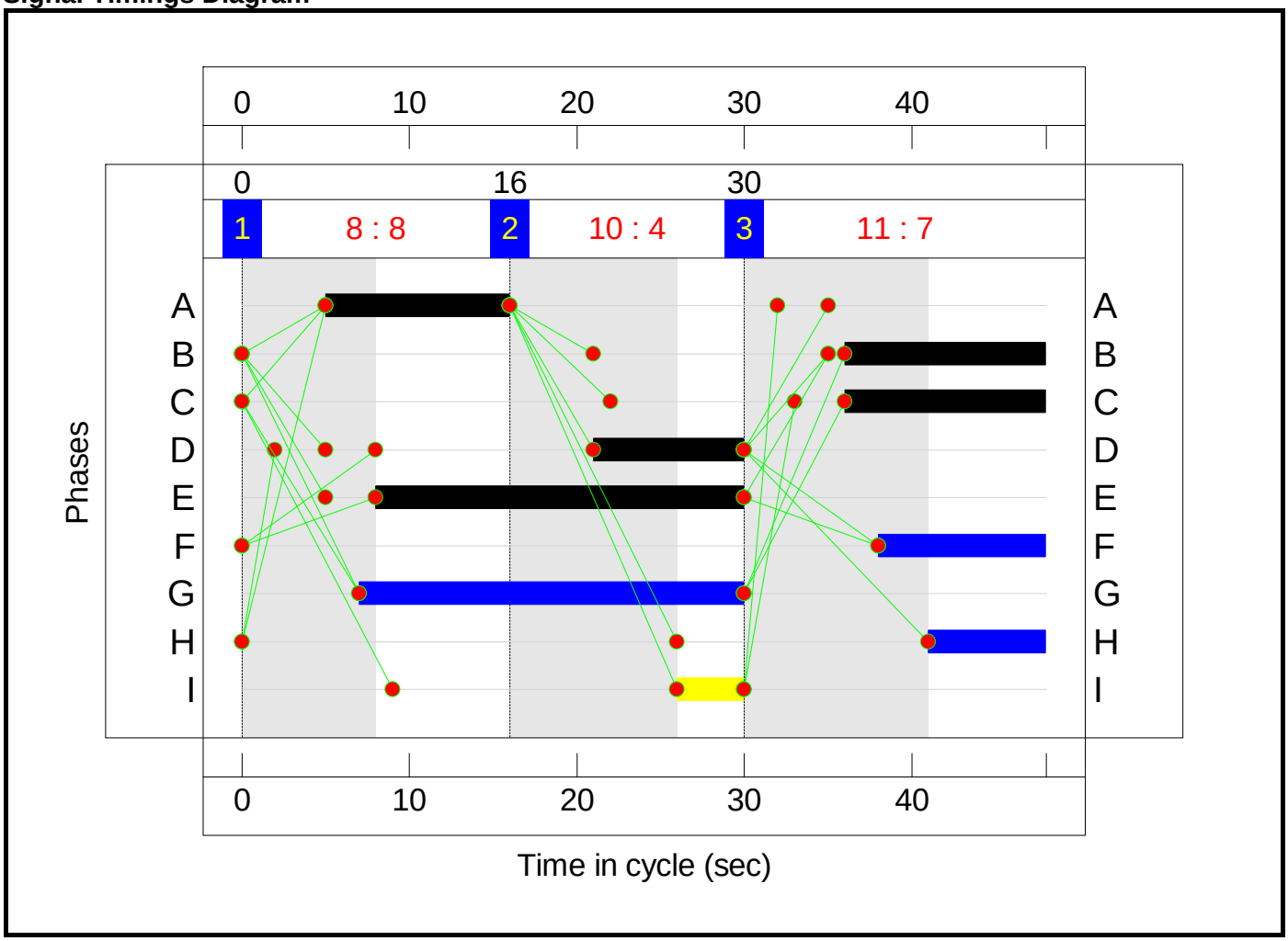
Stage Sequence Diagram



Stage Timings

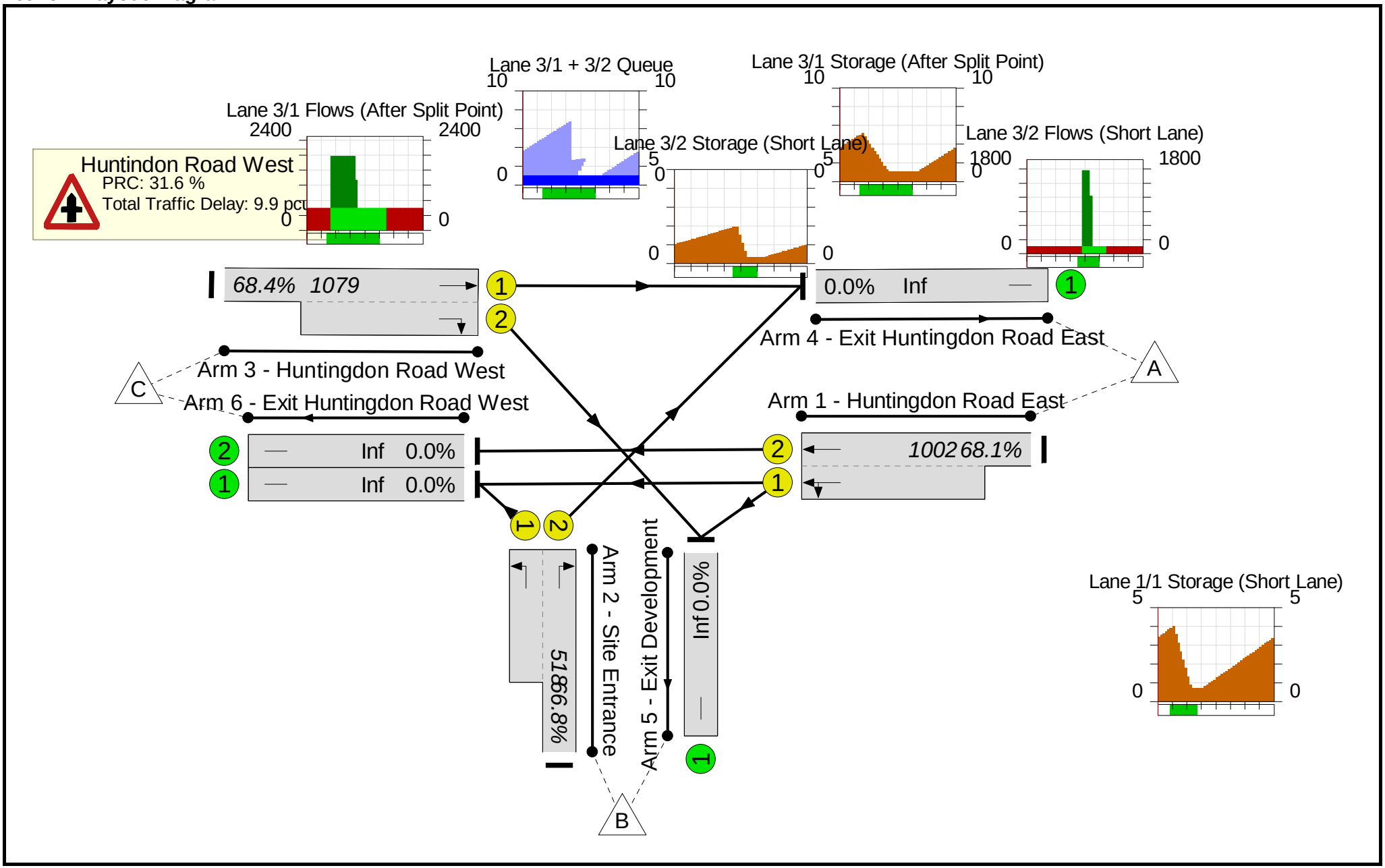
Stage	1	2	3
Duration	8	4	7
Change Point	0	16	30

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**68.4%**
Huntindon Road West	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**68.4%**
1/2+1/1	Huntingdon Road East Left Ahead	U	N/A	N/A	A		1	11	-	682	2080:1928	1002	68.1%
2/2+2/1	Site Entrance Right Left	U	N/A	N/A	B C		1	12	-	346	1764:1774	518	66.8%
3/1+3/2	Huntingdon Road West Ahead Right	U	N/A	N/A	E D		1	22:9	-	738	1965:1764	1079	68.4%
4/1	Exit Huntingdon Road East	U	N/A	N/A	-		-	-	-	608	Inf	Inf	0.0%
5/1	Exit Development	U	N/A	N/A	-		-	-	-	176	Inf	Inf	0.0%
6/1	Exit Huntingdon Road West	U	N/A	N/A	-		-	-	-	629	Inf	Inf	0.0%
6/2	Exit Huntingdon Road West	U	N/A	N/A	-		-	-	-	353	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**6.8**	**3.1**	**0.0**	**9.9**	**-**	**-**	**-**	**-**
Huntindon Road West	**-**	**-**	**0**	**0**	**0**	**6.8**	**3.1**	**0.0**	**9.9**	**-**	**-**	**-**	**-**
1/2+1/1	682	682	-	-	-	3.1	1.1	-	4.1	21.9	4.2	1.1	5.3
2/2+2/1	346	346	-	-	-	1.5	1.0	-	2.5	25.8	3.7	1.0	4.7
3/1+3/2	738	738	-	-	-	2.2	1.1	-	3.3	16.0	5.7	1.1	6.7
4/1	608	608	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	176	176	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	629	629	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	353	353	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

C1	PRC for Signalled Lanes (%):	31.6	Total Delay for Signalled Lanes (pcuHr):	9.90			
	PRC Over All Lanes (%):	31.6	Total Delay Over All Lanes(pcuHr):	9.90	Cycle Time (s):	48	

TRANSYT 14

Version: 14.0.0.167 [07/10/10 - RC1]
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The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Last run: 05/09/2011 15:44:14
Analysis Set used for last run: A1 - AM DS

File: J:\23035 - North-West Cambridge\assessments\Assessments\J11 - P&R - NWC\September 2011\Tests following meeting with council\For Report\Madeningley Rd-NWC-P&R AM no right turn give way sensitivity.t14
Report generation date: 05/09/2011 15:49:01

« A1 - AM DS
- » Summary
- » Network Diagram
- » Analysis and Demand Sets
- » Network Options
- » Traffic Nodes
- » Links
- » Traffic Streams
- » Flow Allocation Tool Tables
- » Signal Timings
- » TRANSYT 12 Tables
- » Link Results
- » Traffic Stream Results
- » Network Results
- » Point to Point Journey Time

A1 - AM DS

Summary

Data Errors and Warnings

No errors or warnings

File summary

File Description

Title	(untitled)
Driving Side	Left
Date	18/02/2010
Status	(new file)
Enumerator	TRLLIMITED\jbinning
Results Upto Date	True
Template Image	

Units

Speed Units	Distance Units	Fuel Economy Units	Fuel Rate Units	Mass Units	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
kph	m	mpg	l/h	kg	perHour	s	-Hour	perHour

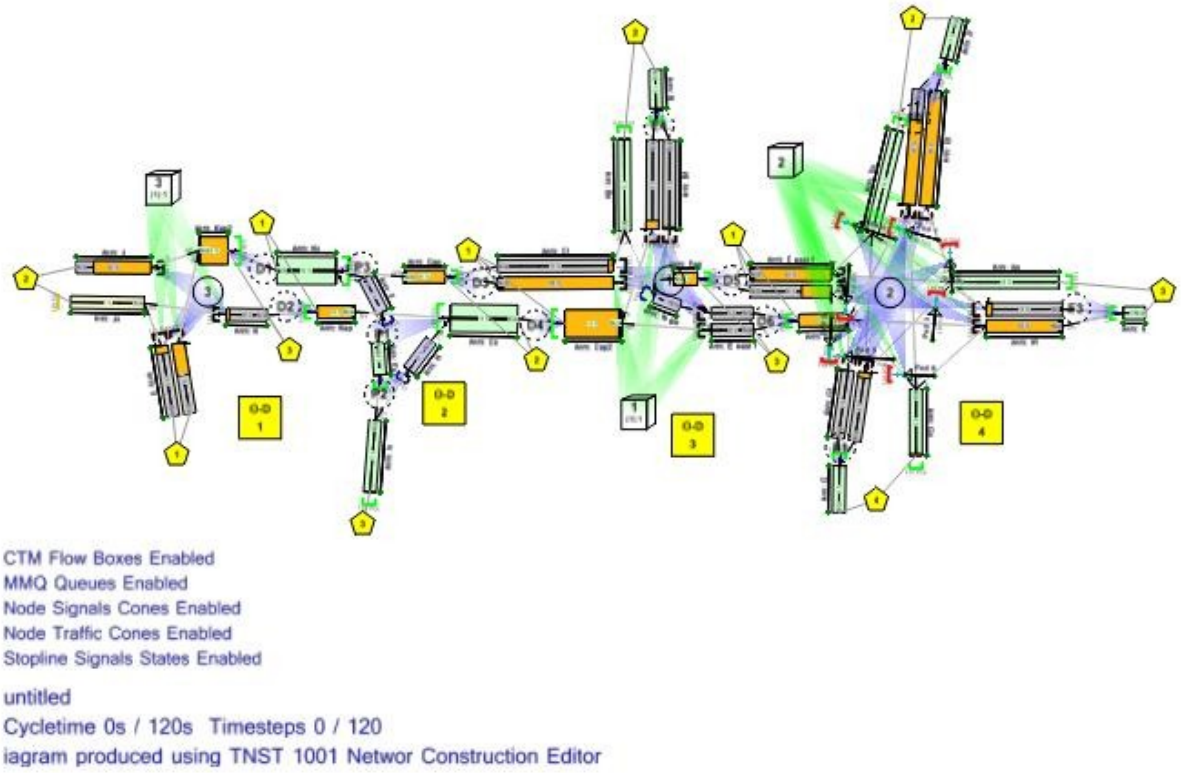
Sorting

Sorting Direction	Sorting Type	Ignore Prefixes When Sorting	Link Grouping	Source Grouping
Ascending	Numerical	False	Normal	Normal

Run Summary

Analysis Set Used	Run Start Time	Run Finish Time	Modelling Start Time (HH:mm)	Cycle Time Used (s)	Total Network Delay (PCU-hr/hr)	Highest DOS (%)	LTSWith Highest DOS	Number Of Oversaturated LTS	Percentage Of Oversaturated LTS (%)	LTSWith Worst Signalised PRC	LTSWith Worst Unsignalised PRC	LTSWith Worst Overall PRC	Network Within Capacity
A1 - AM DS	05/09/2011 15:43:29	05/09/2011 15:44:14	08:00	120	38.45	92.54	E east f/1	1	2	Ped 4	N gw/1	N gw/1	False

Network Diagram



Analysis and Demand Sets

Analysis Sets

Name	Description	Demand Set	Include In Report	Locked

AM DS		D1	True	False

Demand Sets

Name	Description	Composite	Demand Sets	Start Time (HH:mm)	Locked
AM		False		08:00	False

Network Options

Network Timings

Network Cycle Time (s)	Resolution	Number Of Steps	Time Segment Length (min)	Number Of Time Segments	Modelled Time Period (min)
120	1	120	60	1	60

Signals Options

Equal Length Multiple Cycling	Start Displacement (s)	End Displacement (s)	Phase Minimum Broken Penalty (£)	Phase Maximum Broken Penalty (£)	Intergreen Broken Penalty (£)
True	2	3	10000.00	10000.00	10000.00

Traffic Options

Traffic Model	DOS Threshold (%)	Flow Scaling Factor (%)	Cruise Scaling Factor (%)	Cruise Times Or Speeds	Use Link Stop Weightings	Use Link Delay Weightings	Exclude Pedestrian Links	Random Delay Mode	Type of Vehicle-in-Service	Type Of Random Parameter
PDM	90	100	100	Cruise Speeds	True	True	False	Complex	Uniform (TRANSYT)	Uniform (TRANSYT)

Bus Parameters

Dispersion Coefficient1	Dispersion Coefficient2	Acceleration (ms^[-2])	Travel Time Coefficient1	Travel Time Coefficient2
70	15	0.47	30	85

Tram Parameters

Dispersion Coefficient1	Dispersion Coefficient2	Acceleration (ms^[-2])	Travel Time Coefficient1	Travel Time Coefficient2
70	15	0.47	30	85

Optimisation Options

Auto Redistribute	Optimisation Type	Optimisation Level	Hill Climb Increments	Shotgun Number Of Runs	SAStart Temperature	SACooling Factor	Random Seed	Use Enhanced Optimisation	Optimisation Order	Locked Green Splits
True	HillClimb	Extended - Offsets And Green Splits	15,40,-1,15,40,1,-1,1,-15,-5,-1,15,1	N/A	N/A	N/A	N/A	False	1,2,3	

Economics

Unit Of Cost	Monetary Value Of Delay (£ per PCU-hr)	Monetary Value Of Stops (£ per 100 stops)
£	14.20	2.60

Fuel Consumption

Proportion Car Petrol	Proportion Car Diesel	Proportion LGVPetrol	Proportion LGVDiesel	Proportion OGV1	Proportion OGV2	Proportion PSV	Mean Weight Car Petrol (kg)	Mean Weight Car Diesel (kg)	Mean Weight LGVPetrol (kg)	Mean Weight LGVDiesel (kg)	Mean Weight OGV1 (kg)	Mean Weight OGV2 (kg)	Mea Weig PSV (k
0.493	0.323	0.011	0.045	0.028	0.031	0.011	1250.00	1250.00	2000.00	2000.00	20000.00	35000.00	13000

Fuel Parameters

ID	Extrapolated	Description
2010	True	Year 2010 base figures (WebTAG data March 2010)

Car Petrol

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
104.29	448.37	-491.30	217.81	N/A	ByWeights

Car Diesel

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
48.10	645.03	-5775.90	454.16	N/A	ByWeights

LGVPetrol

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
162.86	672.32	-7789.90	1052.13	N/A	ByWeights

LGVDiesel

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
108.25	599.63	-4483.10	831.10	N/A	ByWeights

OGV1

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
156.45	2600.98	-37830.60	3244.46	N/A	ByWeights

OGV2

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
361.33	4202.69	-49470.40	3828.06	N/A	ByWeights

PSV

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
411.56	3064.65	-42064.30	3652.63	N/A	ByWeights

Traffic Nodes

Traffic Nodes

Traffic Node	ID	Name	Description
1	1		
2	2		
3	3		
D1	D1		
D2	D2		
D3	D3		
D4	D4		
D5	D5		
D6	D6		
F1	F1		
F2	F2		
F3	F3		
F4	F4		
P1	P1		
P2	P2		
P3	P3		

Links

Links

Link	ID	Name	Description	Traffic Node	Length (m)	Traffic Model	Has Restricted Flow	Saturation Flow (PCU/hr)	Cell Saturation Flow (PCU/hr)	Is Signal Controlled	Controller Stream	Phase	Phase2 Enabled	Phase2	Is Give Way	P
Ped 1	Ped 1			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	I	False	(N/A)	False	
Ped 2	Ped 2			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	J	False	(N/A)	False	
Ped 3	Ped 3			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	K	False	(N/A)	False	
Ped 4	Ped 4			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	L	False	(N/A)	False	
Ped 5	Ped 5			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	M	False	(N/A)	False	
Ped 6	Ped 6			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	N	False	(N/A)	False	
Ped 7	Ped 7			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	O	False	(N/A)	False	
Ped 8	Ped 8			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	P	False	(N/A)	False	

Link Modelling

Link	Stop Weighting (%)	Delay Weighting (%)	Exclude From Results Calculation	Max Queue Storage (PCU)	Has Queue Limit	Queue Limit (PCU)	Excess Queue Penalty (£)	Has Degree Of Saturation Limit	Degree Of Saturation Limit (%)	Excess Degree Of Saturation Penalty (£)	Low Degree Of Saturation Penalty (£)
Ped 1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 2	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 3	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 4	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 5	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 6	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 7	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 8	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)

Link Modelling (Advanced)

Link	Normal Dispersal Type	Normal Dispersal Coefficient	Normal Travel Time Coefficient	Initial Queue (PCU)	Point1 Time Step (s)	Point2 Time Step (s)	Type of Vehicle-in-Service	Vehicle-in-Service	Type Of Random Parameter	Random Parameter
Ped 1	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 2	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 3	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 4	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 5	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 6	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Ped 7	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 8	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Link Flows

Link	Total Flow (On Link) (PCU/hr)	Uniform Flow Name	Uniform Flow (Into Link) (PCU/hr)	Upstream Flow (Into Link) (PCU/hr)	Link Sensitivity Multiplier (%)	Cruise Sensitivity Multiplier (%)	Calculated Cruise Speed (kph)
Ped 1	0		0	0	100	100	1.00
Ped 2	0		0	0	100	100	1.00
Ped 3	0		0	0	100	100	1.00
Ped 4	0		0	0	100	100	1.00
Ped 5	0		0	0	100	100	1.00
Ped 6	0		0	0	100	100	1.00
Ped 7	0		0	0	100	100	1.00
Ped 8	0		0	0	100	100	1.00

Link Sources - default sources for entry links

Link	Entry Source Traffic Type	Entry Cruise Time (seconds)	Entry Cruise Speed (kph)	Entry Free Running Speed (kph)	Entry Stationary Time (seconds)	Entry Profile Type	Entry DIRECTFlows (PCU/hr)
Ped 1	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0
Ped 2	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0
Ped 3	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0
Ped 4	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0
Ped 5	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0
Ped 6	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0
Ped 7	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0
Ped 8	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0

Traffic Streams

Traffic Streams

Traffic Stream	ID	Name	Description	Length (m)	Traffic Model	Has Restricted Flow	Saturation Flow Source	Saturation Flow (PCU/hr)	Cell Saturation Flow (PCU/hr)	Is Signal Controlled	Controller Stream	Phase	Phase2 Enabled	Phase2
1	1			100.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	4210	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			80.00	NetworkDefault	True	SumOfLanes	1945	(N/A)	True	2	A	False	(N/A)
2	2			80.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	True	2	B	False	(N/A)

1	1			80.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	True	1	D	False	(N/A)
2	2			80.00	NetworkDefault	True	SumOfLanes	1854	(N/A)	True	1	E	False	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			10.00	CPDM	True	SumOfLanes	1400	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2155	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			70.00	CPDM	True	SumOfLanes	1400	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2055	(N/A)	True	3	A	False	(N/A)
1	1			153.00	NetworkDefault	True	SumOfLanes	1915	(N/A)	True	3	A	False	(N/A)
1	1			40.00	NetworkDefault	True	SumOfLanes	1961	(N/A)	True	2	C	False	(N/A)
2	2			40.00	NetworkDefault	True	SumOfLanes	1828	(N/A)	True	2	D	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	3600	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			30.00	NetworkDefault	True	SumOfLanes	1741	(N/A)	True	1	B	False	(N/A)
2	2			30.00	NetworkDefault	True	SumOfLanes	1781	(N/A)	True	1	C	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			243.00	NetworkDefault	True	SumOfLanes	1741	(N/A)	True	1	A	False	(N/A)
2	2			100.00	NetworkDefault	True	SumOfLanes	1915	(N/A)	True	1	A	False	(N/A)
2	2			243.00	NetworkDefault	True	SumOfLanes	3600	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			40.00	NetworkDefault	True	SumOfLanes	1687	(N/A)	True	2	F	False	(N/A)
2	2			40.00	NetworkDefault	True	SumOfLanes	1880	(N/A)	True	2	E	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			10.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			20.00	NetworkDefault	True	SumOfLanes	2033	(N/A)	True	2	G	False	(N/A)
2	2			20.00	NetworkDefault	True	SumOfLanes	2155	(N/A)	True	2	H	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1915	(N/A)	True	3	C	False	(N/A)
2	2			100.00	NetworkDefault	True	SumOfLanes	1741	(N/A)	True	3	B	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	False	(N/A)	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	4210	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			153.00	NetworkDefault	True	SumOfLanes	3600	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			7.00	CPDM	True	SumOfLanes	1741	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)

Traffic Stream Lanes

Traffic Stream	ID	Name	Description	Use RR67	Surface Condition	Site Quality Factor	Gradient (%)	Width (m)	Proportion That Turn (%)	Turning Radius (m)	Nearside Lane	Saturation Flow (PCU/hr)
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1400
1	1			True	N/A	N/A	0	4.00	0	10.00	False	2155
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1400
1	1			True	N/A	N/A	0	3.00	0	10.00	False	2055
1	1			True	N/A	N/A	0	3.00	0	10.00	True	1915
1	1			True	N/A	N/A	0	3.50	3	20.00	True	1961
1	1			True	N/A	N/A	0	3.50	100	20.00	True	1828
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3600
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741
1	1			True	N/A	N/A	0	3.00	100	20.00	True	1781
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105

2	2			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741
1	1			True	N/A	N/A	0	3.00	0	10.00	True	1915
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
2	2			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.25	100	10.00	True	1687
1	1			True	N/A	N/A	0	3.25	96	45.00	True	1880
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.50	21	30.00	True	1945
1	1			True	N/A	N/A	0	3.50	0	15.00	True	1965
1	1			True	N/A	N/A	0	3.50	0	25.00	True	1965
1	1			True	N/A	N/A	0	3.50	100	25.00	True	1854
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1965
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	4.00	100	25.00	False	2033
1	1			True	N/A	N/A	0	4.00	0	25.00	False	2155
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.00	0	20.00	True	1915
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
2	2			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
2	2			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741

Traffic Stream Modelling

Traffic Stream	Stop Weighting (%)	Delay Weighting (%)	Exclude From Results Calculation	Max Queue Storage (PCU)	Has Queue Limit	Queue Limit (PCU)	Excess Queue Penalty (£)	Has Degree Of Saturation Limit	Degree Of Saturation Limit (%)	Excess Degree Of Saturation Penalty (£)	Low Degree Of Saturation Penalty (£)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	8.00	True	11	100.00	True	90	500.00	0.00
2	100	100	False	12.00	True	11	100.00	True	90	500.00	0.00
1	100	100	False	25.00	True	20	100.00	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
1	100	100	False	0.00	True	19	100.00	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)

2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	True	30	100.00	False	(N/A)	(N/A)	(N/A)
2	100	100	False	0.00	True	30	100.00	True	90	100.00	0.00
2	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)

Traffic Stream Modelling (Advanced)

Traffic Stream	Normal Dispersal Type	Normal Dispersal Coefficient	Normal Travel Time Coefficient	Initial Queue (PCU)	Point1 Time Step (s)	Point2 Time Step (s)	Type of Vehicle-in-Service	Vehicle-in-Service	Type Of Random Parameter	Random Parameter
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Flows

Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)	Bus Flow (PCU/hr)	Tram Flow (PCU/hr)	Cruise Sensitivity Multiplier (%)	Calculated Cruise Speed (kph)
1	490	490	0	0	100	1.00
1	23	23	0	0	100	1.00
1	1280	1280	0	0	100	1.00
1	583	583	0	0	100	1.00
1	351	351	0	0	100	1.00
1	1020	1020	0	0	100	1.00
2	129	129	0	0	100	1.00
1	565	565	0	0	100	1.00

2	0	0	0	0	100	1.00
1	1130	1130	0	0	100	1.00
1	618	618	0	0	100	1.00
1	116	116	0	0	100	1.00
1	10	10	0	0	100	1.00
1	278	278	0	0	100	1.00
1	964	964	0	0	100	1.00
1	304	304	0	0	100	1.00
1	473	473	0	0	100	1.00
2	17	17	0	0	100	1.00
1	1004	1004	0	0	100	1.00
1	5	5	0	0	100	1.00
2	18	18	0	0	100	1.00
1	140	140	0	0	100	1.00
1	140	140	0	0	100	1.00
2	1125	1125	0	0	100	1.00
2	582	582	0	0	100	1.00
1	200	200	0	0	100	1.00
2	151	151	0	0	100	1.00
1	243	243	0	0	100	1.00
1	116	116	0	0	100	1.00
1	0	0	0	0	100	1.00
2	10	10	0	0	100	1.00
1	135	135	0	0	100	1.00
1	160	160	0	0	100	1.00
2	432	432	0	0	100	1.00
1	394	394	0	0	100	1.00
1	464	464	0	0	100	1.00
1	304	304	0	0	100	1.00
1	1396	1396	0	0	100	1.00
1	1396	1396	0	0	100	1.00
1	0	0	0	0	100	1.00

Traffic Stream Sources - default sources for entries

Traffic Stream	Normal Cruise Time (seconds)	Normal Cruise Speed (kph)	Bus Free Running Speed (kph)	Tram Free Running Speed (kph)
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
2	7.50	48.00	Buses Not Permittted	Trams Not Permitted

Traffic Stream Sources - sources for internals

Traffic Stream	Source	Source Type	Source Link	Source Traffic Stream	Source Total Flow (PCU/hr)	Source Normal Flow (PCU/hr)	Source Bus Flow (PCU/hr)	Source Tram Flow (PCU/hr)	Normal Cruise Time (seconds)	Normal Cruise Speed (kph)	Bus Free Running Speed (kph)	Tram Free Running Speed (kph)
1	1	TrafficStream	N/A	A/1	473	473	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	A/1	17	17	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Df/1	200	200	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted

1	2	TrafficStream	N/A	E east f/1	804	804	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Gf/2	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	B/1	5	5	0	0	2.25	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	B/1	18	18	0	0	2.25	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cf/1	140	140	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	N gw/1	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kx/1	1280	1280	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	E west f/1	565	565	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Bf/2	18	18	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Eap/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Eap/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Eap2/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Eap2/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Bf/1	5	5	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Cf/2	1125	1125	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Af/1	473	473	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Gf/1	0	0	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Df/2	145	145	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kx/1	116	116	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cx/2	278	278	0	0	5.25	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kap/1	0	0	0	0	11.48	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cap/1	0	0	0	0	18.23	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Cap/1	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Cap2/1	0	0	0	0	18.23	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	D/1	200	200	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	D/1	151	151	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	E east f/1	216	216	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Af/2	17	17	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Gf/2	10	10	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	F/1	116	116	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted

1	1	TrafficStream	N/A	G/1	0	0	0	0	1.50	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	G/1	10	10	0	0	1.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Af/1	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	E east f/2	129	129	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Df/2	6	6	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	H/1	278	278	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Fx/1	116	116	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	K/1	304	304	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	If/1	160	160	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cx/2	304	304	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	J/1	964	964	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	If/2	432	432	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kap2/1	0	0	0	0	11.48	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	E west f/2	0	0	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted

Give Way Data

Traffic Stream	Opposed Traffic	Use Step-wise Opposed Turn Model	Number Of Storage Spaces	Radius Of Turn (m)	Visibility Restricted	Visibility Restricted By	Visibility Restricted By Link	Visibility Restricted By Traffic Stream
1	Movement	False	(N/A)	(N/A)	False	N/A	N/A	N/A
1	AllTraffic	False	(N/A)	(N/A)	False	N/A	N/A	N/A
1	AllTraffic	True	0	15.00	False	N/A	N/A	N/A

Flow Allocation Tool Tables

Normal Input Flows (PCU/hour) for OD Matrix: 1

		To		
		1	2	3
From	1	0	160.00000	432.00000
	2	0	0	964.00000
	3	0	304.00000	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		If/1,If/2		592	592	0	0	0	0	0	0
2		J/1	Jx/1	964	964	0	0	464	464	0	0
3		K/1	Kap2/1	304	304	0	0	1396	1396	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		If/1,Jx/1	160
2		If/2,Kap2/1	432
3		J/1,Kap2/1	964
4		K/1,Jx/1	304

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	160
2	True	Normal	N/A	N/A	432
3	True	Normal	N/A	N/A	964
4	True	Normal	N/A	N/A	304

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Normal Input Flows (PCU/hour) for OD Matrix: 2

		To		
		1	2	3
From	1	0	1280.00000	116.00000
	2	304.00000	0	278.00000
	3	0	0	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		Kx/1	Kap/1	1396	1396	0	0	304	304	0	0
2		Cx/2	Cap/1	582	582	0	0	1280	1280	0	0
3			Ix/1	0	0	0	0	394	394	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		Kx/1,F/1,Fx/1,Ix/1	116
2		Kx/1,Cap/1	1280
3		Cx/2,H/1,Ix/1	278
4		Cx/2,Kap/1	304

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	116
2	True	Normal	N/A	N/A	1280
3	True	Normal	N/A	N/A	278
4	True	Normal	N/A	N/A	304

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Normal Input Flows (PCU/hour) for OD Matrix: 3

		To		
		1	2	3
From	1	0	140.00000	1125.00000
	2	18.00000	0	5.00000
	3	565.00000	12.00000	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		Cf/1,Cf/2	Cap2/1	1265	1265	0	0	583	583	0	0
2		B/1	Bx/1	23	23	0	0	140	140	0	0
3		E west f/1	Eap/1	565	565	0	0	1130	1130	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		Cf/1,Bx/1	140
2		Cf/2,Eap/1	1125
3		B/1,Bf/1,Eap/1	5
4		B/1,Bf/2,Cap2/1	18
5		E west f/1,Cap2/1	565

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	140
2	True	Normal	N/A	N/A	1125
3	True	Normal	N/A	N/A	5
4	True	Normal	N/A	N/A	18
5	True	Normal	N/A	N/A	565

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0

Normal Input Flows (PCU/hour) for OD Matrix: 4

		To			
		1	2	3	4
From	1	0	216.00000	804.00000	129.00000
	2	145.00000	0	200.00000	6.00000
	3	473.00000	17.00000	0	0
	4	0	10.00000	0	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		E east f/1,E east f/2	Eap2/1	1149	1149	0	0	618	618	0	0
2		D/1	Dx/1	351	351	0	0	243	243	0	0
3		A/1	Ax/1	490	490	0	0	1004	1004	0	0
4		G/1	Gx/1	10	10	0	0	135	135	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		E east f/1,Ax/1	804
2		E east f/1,Dx/1	216
3		E east f/2,Gx/1	129
4		D/1,Df/1,Ax/1	200
5		D/1,Df/2,Gx/1	6
6		D/1,Df/2,Eap2/1	145
7		A/1,Af/1,Gx/1	0
8		A/1,Af/1,Eap2/1	473
9		A/1,Af/2,Dx/1	17
10		G/1,Gf/1,Eap2/1	0
11		G/1,Gf/2,Ax/1	0
12		G/1,Gf/2,Dx/1	10

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	804
2	True	Normal	N/A	N/A	216
3	True	Normal	N/A	N/A	129
4	True	Normal	N/A	N/A	200
5	True	Normal	N/A	N/A	6
6	True	Normal	N/A	N/A	145
7	True	Normal	N/A	N/A	0
8	True	Normal	N/A	N/A	473
9	True	Normal	N/A	N/A	17
10	True	Normal	N/A	N/A	0
11	True	Normal	N/A	N/A	0
12	True	Normal	N/A	N/A	10

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0
6	False	Disabled	N/A	N/A	0
7	False	Disabled	N/A	N/A	0
8	False	Disabled	N/A	N/A	0
9	False	Disabled	N/A	N/A	0
10	False	Disabled	N/A	N/A	0
11	False	Disabled	N/A	N/A	0
12	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0
6	False	Disabled	N/A	N/A	0
7	False	Disabled	N/A	N/A	0
8	False	Disabled	N/A	N/A	0
9	False	Disabled	N/A	N/A	0
10	False	Disabled	N/A	N/A	0
11	False	Disabled	N/A	N/A	0
12	False	Disabled	N/A	N/A	0

Signal Timings

120s cycle time; 120 steps

Controller Stream

ID	Name	Description	Gaining Delay Type	Signals Manipulation Mode	Multiple Cycling	Offset Relative To	Offset Valid	Offset (s)	Auto Redistribute	Optimisation Level	Use Sequence
1			Absolute	StageBased	Single	1	True	0	True	Offsets And Green Splits	1

2			Absolute	StageBased	Single	1	True	22	True	Offsets And Green Splits	1
3			Absolute	StageBased	Double	1	True	16	True	Offsets And Green Splits	1

Phases

Controller Stream	ID	Minimum Green (s)	Maximum Green (s)	Relative Start Displacement (s)	Relative End Displacement (s)	Dummy
1	A	7	120	2	3	False
1	B	7	120	2	3	False
1	C	7	120	2	3	False
1	D	7	120	2	3	False
1	E	7	120	2	3	False
2	A	7	120	2	3	False
2	B	7	120	2	3	False
2	C	7	120	2	3	False
2	D	7	120	2	3	False
2	E	7	120	2	3	False
2	F	7	120	2	3	False
2	G	7	120	2	3	False
2	H	7	120	2	3	False
2	I	4	4	0	0	False
2	J	4	4	0	0	False
2	K	4	4	0	0	False
2	L	4	4	0	0	False
2	M	5	5	0	0	False
2	N	4	4	0	0	False
2	O	4	4	0	0	False
2	P	4	4	0	0	False
3	A	7	120	2	3	False
3	B	7	120	2	3	False
3	C	7	120	2	3	False

Library Stages

Controller Stream	ID	Phases In Stage	User Stage Minimum (s)
1	1	A,D	7
1	2	D,E	7
1	3	C,B	7
2	1	A,C,M,I	1
2	2	B,A,P	1
2	3	D,G	1
2	4	G,H,N,K	1
2	5	J,E,F,O,M	1
3	1	A	7
3	2	B,C	7

Losing/ Gaining delays at each Controller Stream

Controller Stream	Delay	Type	Phase	From Stage	To Stage	Relative Delay	Absolute Delay
2	1	Losing	B	2	3	8	N/A
2	2	Losing	A	2	3	8	N/A
2	3	Gaining	L	2	3	1	11
2	4	Gaining	G	2	3	0	11
2	5	Losing	G	4	5	3	N/A
2	6	Losing	H	4	5	3	N/A

2	7	Losing	K	4	5	3	N/A
2	8	Gaining	O	4	5	3	3
2	9	Losing	I	1	2	1	N/A
2	10	Losing	C	1	2	1	N/A
2	11	Losing	P	2	3	4	N/A

Stage Sequences

Controller Stream	ID	Stage IDs	Stage Ends	Multiple Cycling Stage IDs	Multiple Cycling Stage Ends
1	1	1,2,3	59,71,97		
2	1	1,2,3,4,5	52,62,82,91,115		
3	1	1,2	30,53	1,2	90,113

Resultant Stages

Controller Stream	Stage Index	Is Base Stage	Library Stage ID	Phases In This Stage	Stage Start (s)	Stage End (s)	Stage Duration (s)	User Stage Minimum (s)	Stage Minimum (s)
1	1	True	1	A,D	102	59	77	7	7
1	2	True	2	D,E	64	71	7	7	7
1	3	True	3	C,B	76	97	21	7	7
2	1	True	1	A,C,M,I	4	52	48	1	2
2	2	True	2	B,A,P	58	62	4	1	1
2	3	True	3	D,G	75	82	7	1	7
2	4	True	4	G,H,N,K	89	91	2	1	2
2	5	True	5	J,E,F,O,M	101	115	14	1	7
3	1	True	1	A	118	30	32	7	7
3	2	True	2	B,C	35	53	18	7	7
3	3	False	1	A	58	90	32	7	7
3	4	False	2	B,C	95	113	18	7	7

Resultant Phase Green Periods

Controller Stream	Phase	Green Period	Is Base Green Period	Start Time (s)	End Time (s)	Duration (s)
1	A	1	True	102	59	77
1	B	1	True	71	97	26
1	C	1	True	76	97	21
1	D	1	True	102	71	89
1	E	1	True	64	71	7
2	A	1	True	4	70	66
2	B	1	True	58	70	12
2	C	1	True	0	53	53
2	D	1	True	75	82	7
2	E	1	True	101	115	14
2	F	1	True	101	115	14
2	G	1	True	73	94	21
2	H	1	True	87	94	7
2	I	1	True	2	53	51
2	J	1	True	98	115	17
2	K	1	True	89	94	5
2	M	1	True	101	52	71
2	N	1	True	82	91	9
2	O	1	True	94	115	21
2	P	1	True	55	66	11
3	A	1	False	58	90	32
3	A	2	True	118	30	32
3	B	1	True	35	53	18

3	B	2	False	95	113	18
3	C	1	True	35	53	18
3	C	2	False	95	113	18

Intergreen Matrix for Controller Stream 1

		To				
		A	B	C	D	E
From	A	-	5	5		5
	B	5	-			
	C	5		-	5	5
	D			5	-	
	E	5		5		-

Interstage Matrix for Controller Stream 1

		To		
		1	2	3
From	1	-	5	5
	2	5	-	5
	3	5	5	-

Banned Stage transitions for Controller Stream 1

		To		
		1	2	3
From	1	-		
	2		-	
	3			-

Intergreen Matrix for Controller Stream 2

		To															
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
From	A	-			5	5	7		5		4		2			7	
	B		-	5		5			5						4	7	
	C		5	-		5		9	7			7			3		2
	D	5			-	5			5		3	7					
	E	5	7	5	5	-		9	5	7					3		2
	F	5					-		5	7			3				
	G			5		5		-						7			7
	H	5	5	5	5	5	7		-		4		2	7			
	I					6	6			-							
	J	9			10				9		-						
	K			6	6							-					
	L	10					8		11				-				
	M							7	7					-			
	N		9	10		10									-		
	O	6	6													-	
	P			12		12		7									-

Interstage Matrix for Controller Stream 2

		To				
		1	2	3	4	5
	1	-	6	9	9	7

From	2	12	-	13	7	12
	3	7	7	-	7	7
	4	10	9	6	-	10
	5	9	9	10	9	-

Banned Stage transitions for Controller Stream 2

		To				
From		1	2	3	4	5
	1	-				
	2		-			
	3			-		
	4				-	
	5					-

Intergreen Matrix for Controller Stream 3

		To		
From		A	B	C
	A	-	5	5
	B	5	-	
	C	5		-

Interstage Matrix for Controller Stream 3

		To			
From		1	2	3	4
	1	-	5		
	2	5	-		
	3			-	
	4				-

Banned Stage transitions for Controller Stream 3

		To			
From		1	2	3	4
	1	-			
	2		-		
	3			-	
	4				-

TRANSYT 12 Tables

Resultant Stages

Controller Stream	Stage Index	Is Base Stage	Library Stage ID	Phases In This Stage	TRANSYT Stage Start (s)	TRANSYT Preceding Interstage (s)	TRANSYT Stage Minimum (s)
1	1	True	1	A,D	97	5	12
1	2	True	2	D,E	59	5	12
1	3	True	3	C,B	71	5	12
2	1	True	1	A,C,M,I	115	9	11
2	2	True	2	B,A,P	52	6	7
2	3	True	3	D,G	62	13	20
2	4	True	4	G,H,N,K	82	7	9
2	5	True	5	J,E,F,O,M	91	10	17
3	1	True	1	A	113	5	12
3	2	True	2	B,C	30	5	12

3	3	False	1	A	53	5	12
3	4	False	2	B,C	90	5	12

Resultant Phase Green Periods

Controller Stream	Phase	Green Period	TRANSYT Starting Stage (s)	TRANSYT Ending Stage (s)	TRANSYT Start Lag (s)	TRANSYT End Lag (s)
1	A	1	1	2	5	0
1	B	1	3	1	0	0
1	C	1	3	1	5	0
1	D	1	1	3	5	0
1	E	1	2	3	5	0
2	A	1	1	3	9	8
2	B	1	2	3	6	8
2	C	1	1	2	5	1
2	D	1	3	4	13	0
2	E	1	5	1	10	0
2	F	1	5	1	10	0
2	G	1	3	5	11	3
2	H	1	4	5	5	3
2	I	1	1	2	7	1
2	J	1	5	1	7	0
2	K	1	4	5	7	3
2	M	1	5	2	10	0
2	N	1	4	5	0	0
2	O	1	5	1	3	0
2	P	1	2	3	3	4
3	A	1	3	4	5	0
3	A	2	1	2	5	0
3	B	1	2	3	5	0
3	B	2	4	1	5	0
3	C	1	2	3	5	0
3	C	2	4	1	5	0

Stage Timings (TRANSYT 12 timings)

120s cycle time; 120 steps

Controller Stream	Number of Stages	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
1	3	97	59	71		
2	5	115	52	62	82	91
3	4	113	30	53	90	

Link Green Times

Link	Traffic Node	Controller Stream	Phase	Green Period 1		
				Start	End	Duration
Ped 1	2	2	I	2	53	51
Ped 2	2	2	J	98	115	17
Ped 3	2	2	K	89	94	5
Ped 4	2	2	L			
Ped 5	2	2	M	101	52	71
Ped 6	2	2	N	82	91	9
Ped 7	2	2	O	94	115	21
Ped 8	2	2	P	55	66	11

Traffic Stream Green Times

Arm	Traffic Stream ID	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
J	1	3	3	A	58	90	32	118	30	32
K	1	3	3	A	58	90	32	118	30	32
Af	1	2	2	C	0	53	53			
Af	2	2	2	D	75	82	7			
Bf	1	1	1	B	71	97	26			
Bf	2	1	1	C	76	97	21			
Cf	1	1	1	A	102	59	77			
Cf	2	1	1	A	102	59	77			
Df	1	2	2	F	101	115	14			
Df	2	2	2	E	101	115	14			
E east f	1	2	2	A	4	70	66			
E east f	2	2	2	B	58	70	12			
E west f	1	1	1	D	102	71	89			
E west f	2	1	1	E	64	71	7			
Gf	1	2	2	G	73	94	21			
Gf	2	2	2	H	87	94	7			
If	1	3	3	C	35	53	18	95	113	18
If	2	3	3	B	35	53	18	95	113	18

Link Results

Link Results: Summary

Link	Major Link	Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Of Penalties (£ per hr)	Unwei Perfor Index h
Ped 1	(N/A)	0	0	0	False	1800	780	0	False	Unrestricted	51.00	52.00	470000.00	0.
Ped 2	(N/A)	0	0	0	False	1800	270	0	False	Unrestricted	17.00	18.00	130000.00	0.
Ped 3	(N/A)	0	0	0	False	1800	90	0	False	Unrestricted	5.00	6.00	10000.00	0.
Ped 4	(N/A)	0	0	0	False	0	0	0	False	-100	0.00	0.00	0.00	0.
Ped 5	(N/A)	0	0	0	False	1800	1080	0	False	Unrestricted	71.00	72.00	660000.00	0.
Ped 6	(N/A)	0	0	0	False	1800	150	0	False	Unrestricted	9.00	10.00	50000.00	0.
Ped 7	(N/A)	0	0	0	False	1800	330	0	False	Unrestricted	21.00	22.00	170000.00	0.
Ped 8	(N/A)	0	0	0	False	1800	180	0	False	Unrestricted	11.00	12.00	70000.00	0.

Link Results: Stops And Delays

Link	Major Link	Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)
Ped 1	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 2	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Ped 3	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 4	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 5	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 6	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 7	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 8	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Link Results: Queues And Blocking

Link	Major Link	Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
Ped 1	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	52.00	0.00	52.00	False
Ped 2	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	18.00	0.00	18.00	False
Ped 3	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	6.00	0.00	6.00	False
Ped 4	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
Ped 5	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	72.00	0.00	72.00	False
Ped 6	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	10.00	0.00	10.00	False
Ped 7	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	22.00	0.00	22.00	False
Ped 8	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	12.00	0.00	12.00	False

Link Results: Fuel Consumption

Link	Major Link	Fuel Consumption Cruise (Litres per hour)	Fuel Consumption Delay (Litres per hour)	Fuel Consumption Stops (Litres per hour)	Fuel Consumption Total (Litres per hour)	Fuel Economy Total (Miles / gal)
Ped 1	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 2	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 3	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 4	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 5	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 6	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 7	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 8	(N/A)	0.00	0.00	0.00	0.00	Infinity

Link Results: Journey Times

Link	Major Link	Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)
Ped 1	(N/A)	0.00	0.00	0.00	0.00
Ped 2	(N/A)	0.00	0.00	0.00	0.00
Ped 3	(N/A)	0.00	0.00	0.00	0.00

Ped 4	(N/A)	0.00	0.00	0.00	0.00
Ped 5	(N/A)	0.00	0.00	0.00	0.00
Ped 6	(N/A)	0.00	0.00	0.00	0.00
Ped 7	(N/A)	0.00	0.00	0.00	0.00
Ped 8	(N/A)	0.00	0.00	0.00	0.00

Traffic Stream Results

Traffic Stream Results: Summary

Arm	TrafficStream	Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Penal (£ p hr)
A	1	490	490	0	False	2105	2105	23	False	330	120.00	0.00	0.0
B	1	23	23	0	False	2105	2105	1	False	9052	120.00	0.00	0.0
Cap	1	1280	1280	0	False	2105	2105	61	False	64	120.00	0.00	0.0
Cap2	1	583	583	0	False	4210	4210	14	False	622	120.00	0.00	0.0
D	1	351	351	0	False	2105	2105	17	False	500	120.00	0.00	0.0
E east f	1	1020	1020	0	False	1945	1102	93	True	8	66.00	32.00	1775
E east f	2	129	129	0	False	1965	229	56	False	78	12.00	0.00	0.0
E west f	1	565	565	0	False	1965	1490	38	False	164	89.00	30.00	0.0
E west f	2	0	0	0	False	1854	139	0	False	Unrestricted	7.00	0.00	0.0
Eap	1	1130	1130	0	False	2105	2105	54	False	86	120.00	0.00	0.0
Eap2	1	618	618	0	False	1965	1965	31	False	218	120.00	0.00	0.0
F	1	116	116	0	False	1333	1333	9	False	1049	120.00	0.00	0.0
G	1	10	10	0	False	2155	2155	0	False	21450	120.00	0.00	0.0
H	1	278	278	0	False	1374	1374	20	False	394	120.00	0.00	0.0
J	1	964	964	0	False	2055	1165	83	False	21	64.00	0.00	0.0
K	1	304	304	0	False	1915	1085	28	False	257	64.00	0.00	0.0
Af	1	473	473	0	False	1961	899	53	False	90	53.00	30.00	0.0
Af	2	17	17	0	False	1828	137	12	False	706	7.00	0.00	0.0
Ax	1	1004	1004	0	False	3600	3600	28	False	259	120.00	100.00	0.0
Bf	1	5	5	0	False	1741	406	1	False	8025	26.00	26.00	0.0
Bf	2	18	18	0	False	1781	341	5	False	1796	21.00	0.00	0.0
Bx	1	140	140	0	False	1800	1800	8	False	1186	120.00	100.00	0.0
Cf	1	140	140	0	False	1741	1146	12	False	719	77.00	32.00	0.0
Cf	2	1125	1125	0	False	1915	1261	89	False	12	77.00	0.00	0.2
Cx	2	582	582	0	False	3600	3600	16	False	519	120.00	0.00	0.0
Df	1	200	200	0	False	1687	225	89	False	12	14.00	26.00	0.0
Df	2	151	151	0	False	1880	251	60	False	66	14.00	0.00	0.0
Dx	1	243	243	0	False	1800	1800	14	False	641	120.00	100.00	0.0
Fx	1	116	116	0	False	1800	1800	6	False	1452	120.00	0.00	0.0
Gf	1	0	0	0	False	2033	390	0	False	Unrestricted	21.00	0.00	0.0
Gf	2	10	10	0	False	2155	162	6	False	1516	7.00	0.00	0.0
Gx	1	135	135	0	False	1800	1800	8	False	1233	120.00	0.00	0.0
If	1	160	160	0	False	1915	638	25	False	299	36.00	0.00	0.0
If	2	432	432	0	False	1741	580	74	False	34	36.00	0.00	0.0

Ix	1	394	394	0	False	1800	1800	22	False	357	120.00	0.00	0.0
Jx	1	464	464	0	False	Unrestricted	Unrestricted	0	False	Unrestricted	120.00	0.00	0.0
Kap	1	304	304	0	False	2105	2105	14	False	592	120.00	0.00	0.0
Kap2	1	1396	1396	0	False	4210	4210	33	False	202	120.00	0.00	0.0
Kx	1	1396	1396	0	False	3600	3600	39	False	158	120.00	0.00	0.0
N g w	1	0	0	0	False	0	0	0	False	-100	120.00	0.00	0.0

Traffic Stream Results: Stops And Delays

Arm	TrafficStream	Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)
A	1	7.50	N/A	0.26	0.00	0.04	0.50	0.50	0.00	0.00	0.00	0.00	0.00
B	1	7.50	N/A	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cap	1	1.00	N/A	1.32	0.00	0.47	6.68	6.68	0.00	0.00	0.00	0.00	0.00
Cap2	1	1.00	N/A	0.07	0.00	0.01	0.16	0.16	0.00	0.00	0.00	0.00	0.00
D	1	7.50	N/A	0.17	0.00	0.02	0.24	0.24	0.00	0.00	0.00	0.00	0.00
E east f	1	9.60	A	24.60	1.95	5.02	98.98	98.98	92.68	800.24	145.14	11.85	11.85
E east f	2	9.60	A	43.14	1.19	0.36	21.95	21.95	99.84	118.35	10.45	1.61	1.61
E west f	1	9.60	A	0.78	0.01	0.12	1.74	1.74	0.78	0.96	3.46	0.06	0.06
E west f	2	0.00	F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eap	1	1.00	N/A	0.99	0.00	0.31	4.41	4.41	0.00	0.00	0.00	0.00	0.00
Eap2	1	1.00	N/A	0.42	0.00	0.07	1.02	1.02	0.35	0.00	2.16	0.00	0.00
F	1	1.00	N/A	0.13	0.00	0.00	0.06	0.06	0.00	0.00	0.00	0.00	0.00
G	1	7.50	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H	1	5.25	N/A	0.33	0.00	0.03	0.36	0.36	0.00	0.00	0.00	0.00	0.00
J	1	7.50	A	17.84	2.84	1.94	67.85	67.85	85.46	711.02	112.77	26.44	26.44
K	1	18.36	B	5.94	0.45	0.05	7.12	7.12	40.90	121.09	3.26	1.56	1.56
A f	1	3.00	A	25.42	3.05	0.29	47.43	47.43	70.50	324.78	8.70	10.70	10.70
A f	2	3.00	A	53.69	0.24	0.01	3.60	3.60	93.05	15.56	0.26	0.51	0.51
A x	1	7.50	N/A	0.19	0.00	0.05	0.77	0.77	0.00	0.00	0.00	0.00	0.00
B f	1	2.25	A	35.71	0.05	0.00	0.70	0.70	75.05	3.75	0.00	0.12	0.12
B f	2	2.25	A	39.90	0.20	0.00	2.83	2.83	79.42	14.25	0.04	0.46	0.46
B x	1	7.50	N/A	0.08	0.00	0.00	0.05	0.05	0.07	0.00	0.10	0.00	0.00
C f	1	29.16	C	8.49	0.32	0.01	4.69	4.69	35.74	49.78	0.25	0.63	0.63
C f	2	12.00	B	25.92	4.63	3.48	115.04	115.04	79.17	788.83	101.88	11.17	11.17
C x	2	29.16	N/A	0.10	0.00	0.02	0.22	0.22	0.00	0.00	0.00	0.00	0.00
D f	1	3.00	A	100.82	2.84	2.76	79.54	79.54	133.18	191.54	74.81	8.55	8.55
D f	2	3.00	A	59.66	2.06	0.45	35.54	35.54	100.72	138.97	13.11	4.88	4.88
D x	1	7.50	N/A	0.16	0.00	0.01	0.15	0.15	0.00	0.00	0.00	0.00	0.00
F x	1	1.00	N/A	0.07	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00
G f	1	0.00	F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G f	2	1.50	A	52.53	0.14	0.00	2.07	2.07	91.45	9.08	0.06	0.29	0.29
G x	1	7.50	N/A	0.08	0.00	0.00	0.04	0.04	0.17	0.14	0.09	0.01	0.01
I f	1	7.50	A	15.51	0.65	0.04	9.79	9.79	69.76	109.12	2.50	3.58	3.58
I f	2	7.50	A	26.56	2.13	1.06	45.25	45.25	97.34	359.28	61.22	13.50	13.50
I x	1	7.50	N/A	0.28	0.00	0.03	0.44	0.44	0.00	0.00	0.00	0.00	0.00

Jx	1	7.50	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kap	1	1.00	N/A	0.14	0.00	0.01	0.17	0.17	0.00	0.00	0.00	0.00	0.00
Kap2	1	1.00	N/A	0.21	0.00	0.08	1.17	1.17	0.00	0.00	0.00	0.00	0.00
Kx	1	18.36	N/A	0.32	0.00	0.12	1.74	1.74	0.00	0.00	0.00	0.00	0.00
N g w	1	0.00	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues And Blocking

Arm	TrafficStream	Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
A	1	0.00	0.04	19.79	0.00	0.00	0.00	0.04	0.04	0.00	29.00	29.00	False
B	1	0.00	0.00	19.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
Cap	1	0.00	0.47	0.00	0.47	0.00	0.00	0.47	0.47	0.00	0.00	0.00	False
Cap2	1	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.01	2.00	0.00	2.00	False
D	1	0.00	0.02	19.79	0.00	0.00	0.00	0.02	0.02	0.00	3.00	3.00	False
E east f	1	0.00	33.29	8.00	6.38	5.03	502.85	5.02	10.14	0.00	0.00	0.00	False
E east f	2	0.00	4.36	12.00	0.00	0.00	0.00	0.36	4.02	0.00	0.00	0.00	False
E west f	1	0.00	0.15	25.00	0.00	0.00	0.00	0.12	0.15	8.00	0.00	8.00	False
E west f	2	0.00	0.00	13.94	0.00	0.00	0.00	0.00	0.00	9.00	0.00	9.00	False
Eap	1	0.00	0.31	0.00	0.31	0.00	0.00	0.31	0.31	2.00	0.00	2.00	False
Eap2	1	0.00	0.07	0.00	0.07	0.00	0.00	0.07	0.07	39.00	0.00	39.00	False
F	1	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
G	1	0.00	0.00	20.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
H	1	0.00	0.03	9.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	False
J	1	0.00	14.79	19.32	0.00	0.00	0.00	1.94	8.90	0.00	0.00	0.00	False
K	1	0.00	2.38	27.54	0.00	0.00	0.00	0.05	2.19	0.00	0.00	0.00	False
A f	1	0.00	11.46	7.37	0.55	0.00	0.00	0.29	8.83	0.00	0.00	0.00	False
A f	2	0.00	0.54	6.87	0.00	0.00	0.00	0.01	0.53	0.00	0.00	0.00	False
A x	1	0.00	0.05	33.84	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	False
B f	1	0.00	0.13	4.91	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	False
B f	2	0.00	0.49	5.02	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.00	False
B x	1	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	14.00	0.00	14.00	False
C f	1	0.00	1.70	39.77	0.00	0.00	0.00	0.01	1.62	0.00	0.00	0.00	False
C f	2	0.00	30.23	18.00	2.42	0.00	0.21	3.48	14.72	0.00	0.00	0.00	False
C x	2	0.00	0.02	82.24	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	False
D f	1	0.00	9.26	6.34	0.65	0.00	0.00	2.76	8.54	0.00	0.00	0.00	False
D f	2	0.00	5.19	7.07	0.00	0.00	0.00	0.45	4.81	0.00	1.00	1.00	False
D x	1	0.00	0.01	16.92	0.00	0.00	0.00	0.01	0.01	6.00	0.00	6.00	False
F x	1	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
G f	1	0.00	0.00	3.82	0.00	0.00	0.00	0.00	0.00	23.00	0.00	23.00	False
G f	2	0.00	0.31	4.05	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	False
G x	1	0.00	0.51	16.92	0.00	0.00	0.00	0.00	0.00	42.00	0.00	42.00	False
I f	1	0.00	1.95	18.00	0.00	0.00	0.00	0.04	1.82	0.00	0.00	0.00	False
I f	2	0.00	7.42	16.37	0.00	0.00	0.00	1.06	5.86	0.00	0.00	0.00	False
I x	1	0.00	0.03	16.92	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	False
J x	1	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False

Kap	1	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00	False
Kap2	1	0.00	0.08	0.00	0.08	0.00	0.00	0.08	0.08	0.00	0.00	0.00	False
Kx	1	0.00	0.12	51.78	0.00	0.00	0.00	0.12	0.12	0.00	0.00	0.00	False
N gw	1	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	120.00	0.00	120.00	False

Traffic Stream Results: Fuel Consumption

Arm	TrafficStream	Fuel Consumption Cruise (Litres per hour)	Fuel Consumption Delay (Litres per hour)	Fuel Consumption Stops (Litres per hour)	Fuel Consumption Total (Litres per hour)	Fuel Economy Total (Miles / gal)
A	1	3.96	0.04	0.00	4.00	2.82
B	1	0.19	0.00	0.00	0.19	2.82
Cap	1	0.00	0.47	0.00	0.00	2.82
Cap2	1	0.00	0.01	0.00	0.00	2.82
D	1	2.84	0.02	0.00	2.85	2.82
E east f	1	7.79	6.94	3.57	18.29	2.82
E east f	2	0.99	1.54	0.49	3.01	2.82
E west f	1	4.31	0.12	0.02	4.45	2.82
E west f	2	0.00	0.00	0.00	0.00	2.82
Eap	1	0.00	0.31	0.00	0.00	2.82
Eap2	1	0.00	0.07	0.00	0.00	2.82
F	1	0.10	0.00	0.00	0.11	2.82
G	1	0.08	0.00	0.00	0.08	2.82
H	1	1.57	0.03	0.00	1.60	2.82
J	1	7.79	4.75	7.95	20.50	2.82
K	1	4.44	0.50	0.47	5.41	2.82
Af	1	1.53	3.32	3.22	8.07	2.82
Af	2	0.05	0.25	0.15	0.46	2.82
Ax	1	8.12	0.05	0.00	8.17	2.82
Bf	1	0.01	0.05	0.04	0.10	2.82
Bf	2	0.04	0.20	0.14	0.38	2.82
Bx	1	1.13	0.00	0.00	1.14	2.82
Cf	1	3.25	0.33	0.19	3.76	2.82
Cf	2	10.74	8.06	3.36	22.16	2.82
Cx	2	13.50	0.02	0.00	13.52	2.82
Df	1	0.65	5.57	2.57	8.79	2.82
Df	2	0.49	2.49	1.47	4.45	2.82
Dx	1	1.96	0.01	0.00	1.98	2.82
Fx	1	0.10	0.00	0.00	0.11	2.82
Gf	1	0.00	0.00	0.00	0.00	2.82
Gf	2	0.02	0.15	0.09	0.25	2.82
Gx	1	1.09	0.00	0.00	1.10	2.82
If	1	1.29	0.69	1.08	3.06	2.82
If	2	3.49	3.17	4.06	10.72	2.82
Ix	1	3.19	0.03	0.00	3.22	2.82
Jx	1	3.75	0.00	0.00	3.75	2.82
Kap	1	0.00	0.01	0.00	0.00	2.82
Kap2	1	0.00	0.08	0.00	0.00	2.82
Kx	1	20.39	0.12	0.00	20.51	2.82
N gw	1	0.00	0.00	0.00	0.00	2.82

Traffic Stream Results: Journey Times

Arm	TrafficStream	Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)
A	1	49.00	1.06	46.40	7.76
B	1	2.30	0.05	47.94	7.51
Cap	1	0.00	0.83	0.00	0.00
Cap2	1	0.00	0.17	0.00	0.00
D	1	35.10	0.75	46.93	7.67
E east f	1	81.60	9.69	8.42	34.20
E east f	2	10.32	1.89	5.46	52.74
E west f	1	45.20	1.63	27.74	10.38
E west f	2	0.00	0.00	0.00	0.00
Eap	1	0.00	0.62	0.00	0.00
Eap2	1	0.00	0.24	0.00	0.00
F	1	1.16	0.04	31.90	1.13
G	1	1.00	0.02	47.98	7.50
H	1	19.46	0.43	45.15	5.58
J	1	96.40	6.79	14.20	25.34
K	1	46.51	2.05	22.67	24.30
A f	1	18.92	3.73	5.07	28.42
A f	2	0.68	0.27	2.54	56.69
A x	1	100.40	2.15	46.79	7.69
B f	1	0.15	0.05	2.85	37.96
B f	2	0.54	0.21	2.56	42.15
B x	1	14.00	0.29	47.47	7.58
C f	1	34.02	1.46	23.24	37.65
C f	2	112.50	11.85	9.49	37.92
C x	2	141.43	4.73	29.90	29.26
D f	1	8.00	5.77	1.39	103.82
D f	2	6.04	2.63	2.30	62.66
D x	1	24.30	0.52	47.02	7.66
F x	1	1.16	0.03	33.68	1.07
G f	1	0.00	0.00	0.00	0.00
G f	2	0.20	0.15	1.33	54.03
G x	1	13.50	0.28	47.47	7.58
I f	1	16.00	1.02	15.64	23.01
I f	2	43.20	4.09	10.57	34.06
I x	1	39.40	0.85	46.27	7.78
J x	1	46.40	0.97	48.00	7.50
Kap	1	0.00	0.10	0.00	0.00
Kap2	1	0.00	0.47	0.00	0.00
K x	1	213.59	7.24	29.49	18.68
N gw	1	0.00	0.00	0.00	0.00

Network Results

Run Summary

Analysis Set Used	Run Start Time	Run Finish Time	Modelling Start Time (HH:mm)	Cycle Time Used (s)	Total Network Delay (PCU-hr/hr)	Highest DOS (%)	LTSWith Highest DOS	Number Of Oversaturated LTS	Percentage Of Oversaturated LTS (%)	LTSWith Worst Signalised PRC	LTSWith Worst Unsignalised PRC	LTSWith Worst Overall PRC	Network Within Capacity
A1 - AM DS	05/09/2011 15:43:29	05/09/2011 15:44:14	08:00	120	38.45	92.54	E east f/1	1	2	Ped 4	N gw/1	N gw/1	False

Network Results: Summary

Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Of Penalties (£ per hr)	Unweighted Performance Index (£ per hr)	Performan Index (£ p hr)
8139	8139	0	False	0	0	93	True	-100	1771.00	476.00	1775.55	641.94	2417.49

Network Results: Stops And Delays

Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)
8.59	C	17.01	22.74	15.71	546.01	546.01	52.77	3756.75	538.11	95.93	95.93

Network Results: Queues And Blocking

Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
0.00	0.00	357.63	0.00	0.00	503.06	0.00	0.00	222.00	1.00	223.00	False

Network Results: Fuel Consumption

Fuel Consumption Cruise (Litres per hour)	Fuel Consumption Delay (Litres per hour)	Fuel Consumption Stops (Litres per hour)	Fuel Consumption Total (Litres per hour)	Fuel Economy Total (Miles / gal)
64.16	38.26	28.86	131.28	2.82

Network Results: Journey Times

Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)
733.66	57.88	12.68	25.60

Point to Point Journey Time

Journey Time (s) for OD Matrix: 1

		To		
		1	2	3
From	1	0.00000	30.51186	34.05672
	2	0.00000	0.00000	25.34365
	3	0.00000	31.79687	0.00000

Journey Time (s) for OD Matrix: 2

		To		
		1	2	3
From	1	0.00000	18.67655	28.65423
	2	29.25641	0.00000	42.61843
	3	0.00000	0.00000	0.00000

Journey Time (s) for OD Matrix: 3

		To		
		1	2	3
From	1	0.00000	45.23322	37.92382
	2	49.66121	0.00000	45.46466
	3	10.38171	0.00000	0.00000

Journey Time (s) for OD Matrix: 4

	To				
		1	2	3	4

From	**1**	0.00000	41.85775	41.89503	60.32074
	2	70.33257	0.00000	119.18415	77.91365
	3	36.17863	72.10697	0.00000	0.00000
	4	0.00000	69.19381	0.00000	0.00000

TRANSYT 14

Version: 14.0.0.167 [07/10/10 - RC1]
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The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Last run: 05/09/2011 15:31:53
Analysis Set used for last run: A1 - PM DS

File: J:\23035 - North-West Cambridge\assessments\Assessments\J11 - P&R - NWC\September 2011\Tests following meeting with council\For Report\Madeningley Rd-NWC-P&R PM no right turn give way sensitivity.t14
Report generation date: 05/09/2011 15:36:46

« A1 - PM DS
- » Summary
- » Network Diagram
- » Analysis and Demand Sets
- » Network Options
- » Traffic Nodes
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- » Traffic Streams
- » Flow Allocation Tool Tables
- » Signal Timings
- » TRANSYT 12 Tables
- » Link Results
- » Traffic Stream Results
- » Network Results
- » Point to Point Journey Time

A1 - PM DS

Summary

Data Errors and Warnings

No errors or warnings

File summary

File Description

Title	(untitled)
Driving Side	Left
Date	18/02/2010
Status	(new file)
Enumerator	TRLLIMITED\jbinning
Results Upto Date	True
Template Image	

Units

Speed Units	Distance Units	Fuel Economy Units	Fuel Rate Units	Mass Units	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
kph	m	mpg	l/h	kg	perHour	s	-Hour	perHour

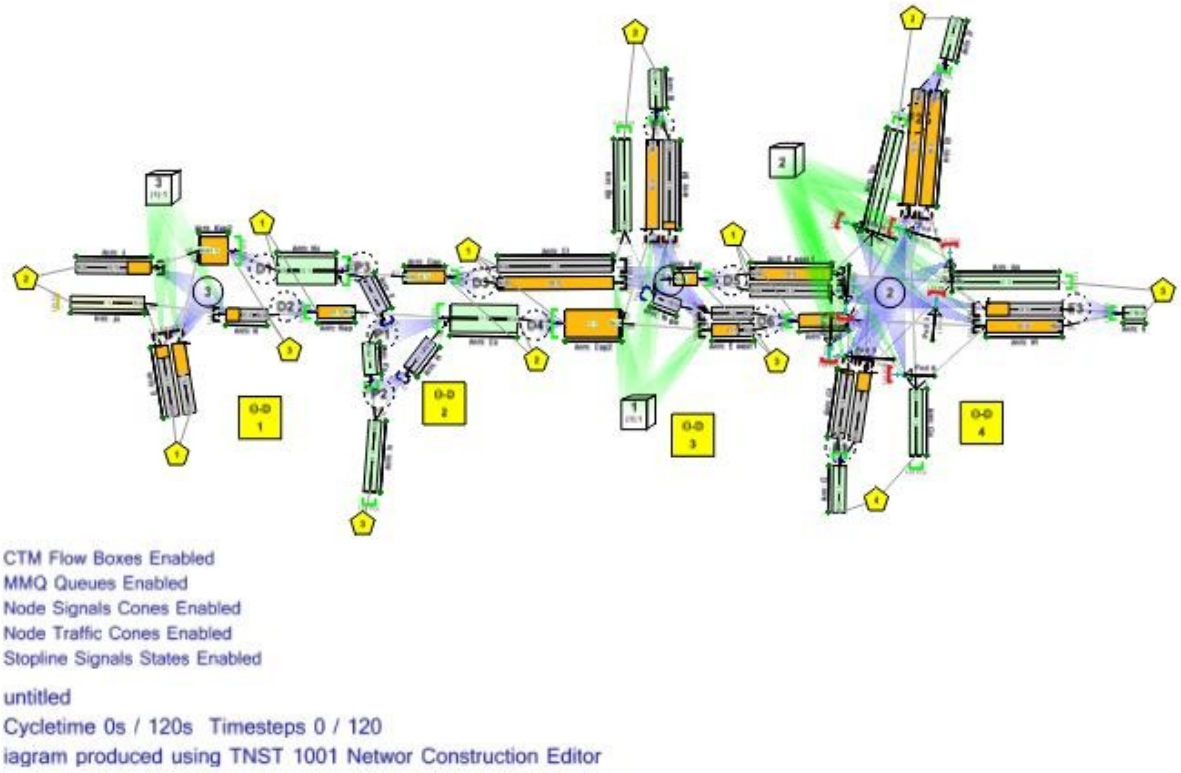
Sorting

Sorting Direction	Sorting Type	Ignore Prefixes When Sorting	Link Grouping	Source Grouping
Ascending	Numerical	False	Normal	Normal

Run Summary

Analysis Set Used	Run Start Time	Run Finish Time	Modelling Start Time (HH:mm)	Cycle Time Used (s)	Total Network Delay (PCU-hr/hr)	Highest DOS (%)	LTSWith Highest DOS	Number Of Oversaturated LTS	Percentage Of Oversaturated LTS (%)	LTSWith Worst Signalised PRC	LTSWith Worst Unsignalised PRC	LTSWith Worst Overall PRC	Network Within Capacity
A1 - PMDS	05/09/2011 15:30:45	05/09/2011 15:31:53	17:00	120	46.07	90.82	Af/1	1	2	Ped 4	N gw/1	N gw/1	False

Network Diagram



Analysis and Demand Sets

Analysis Sets

Name	Description	Demand Set	Include In Report	Locked

PM DS		D1	True	False

Demand Sets

Name	Description	Composite	Demand Sets	Start Time (HH:mm)	Locked
PM		False		17:00	False

Network Options

Network Timings

Network Cycle Time (s)	Resolution	Number Of Steps	Time Segment Length (min)	Number Of Time Segments	Modelled Time Period (min)
120	1	120	60	1	60

Signals Options

Equal Length Multiple Cycling	Start Displacement (s)	End Displacement (s)	Phase Minimum Broken Penalty (£)	Phase Maximum Broken Penalty (£)	Intergreen Broken Penalty (£)
True	2	3	10000.00	10000.00	10000.00

Traffic Options

Traffic Model	DOS Threshold (%)	Flow Scaling Factor (%)	Cruise Scaling Factor (%)	Cruise Times Or Speeds	Use Link Stop Weightings	Use Link Delay Weightings	Exclude Pedestrian Links	Random Delay Mode	Type of Vehicle-in-Service	Type Of Random Parameter
PDM	90	100	100	Cruise Speeds	True	True	False	Complex	Uniform (TRANSYT)	Uniform (TRANSYT)

Bus Parameters

Dispersion Coefficient1	Dispersion Coefficient2	Acceleration (ms^[-2])	Travel Time Coefficient1	Travel Time Coefficient2
70	15	0.47	30	85

Tram Parameters

Dispersion Coefficient1	Dispersion Coefficient2	Acceleration (ms^[-2])	Travel Time Coefficient1	Travel Time Coefficient2
70	15	0.47	30	85

Optimisation Options

Auto Redistribute	Optimisation Type	Optimisation Level	Hill Climb Increments	Shotgun Number Of Runs	SAStart Temperature	SACooling Factor	Random Seed	Use Enhanced Optimisation	Optimisation Order	Locked Green Splits
True	HillClimb	Extended - Offsets And Green Splits	15,40,-1,15,40,1,-1,1,-15,-5,-1,15,1	N/A	N/A	N/A	N/A	False	1,2,3	

Economics

Unit Of Cost	Monetary Value Of Delay (£ per PCU-hr)	Monetary Value Of Stops (£ per 100 stops)
£	14.20	2.60

Fuel Consumption

Proportion Car Petrol	Proportion Car Diesel	Proportion LGVPetrol	Proportion LGVDiesel	Proportion OGV1	Proportion OGV2	Proportion PSV	Mean Weight Car Petrol (kg)	Mean Weight Car Diesel (kg)	Mean Weight LGVPetrol (kg)	Mean Weight LGVDiesel (kg)	Mean Weight OGV1 (kg)	Mean Weight OGV2 (kg)	Mea Weig PSV (k
0.493	0.323	0.011	0.045	0.028	0.031	0.011	1250.00	1250.00	2000.00	2000.00	20000.00	35000.00	13000

Fuel Parameters

ID	Extrapolated	Description
2010	True	Year 2010 base figures (WebTAG data March 2010)

Car Petrol

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
104.29	448.37	-491.30	217.81	N/A	ByWeights

Car Diesel

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
48.10	645.03	-5775.90	454.16	N/A	ByWeights

LGVPetrol

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
162.86	672.32	-7789.90	1052.13	N/A	ByWeights

LGVDiesel

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
108.25	599.63	-4483.10	831.10	N/A	ByWeights

OGV1

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
156.45	2600.98	-37830.60	3244.46	N/A	ByWeights

OGV2

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
361.33	4202.69	-49470.40	3828.06	N/A	ByWeights

PSV

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
411.56	3064.65	-42064.30	3652.63	N/A	ByWeights

Traffic Nodes

Traffic Nodes

Traffic Node	ID	Name	Description
1	1		
2	2		
3	3		
D1	D1		
D2	D2		
D3	D3		
D4	D4		
D5	D5		
D6	D6		
F1	F1		
F2	F2		
F3	F3		
F4	F4		
P1	P1		
P2	P2		
P3	P3		

Links

Links

Link	ID	Name	Description	Traffic Node	Length (m)	Traffic Model	Has Restricted Flow	Saturation Flow (PCU/hr)	Cell Saturation Flow (PCU/hr)	Is Signal Controlled	Controller Stream	Phase	Phase2 Enabled	Phase2	Is Give Way	P
Ped 1	Ped 1			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	I	False	(N/A)	False	
Ped 2	Ped 2			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	J	False	(N/A)	False	
Ped 3	Ped 3			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	K	False	(N/A)	False	
Ped 4	Ped 4			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	L	False	(N/A)	False	
Ped 5	Ped 5			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	M	False	(N/A)	False	
Ped 6	Ped 6			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	N	False	(N/A)	False	
Ped 7	Ped 7			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	O	False	(N/A)	False	
Ped 8	Ped 8			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	P	False	(N/A)	False	

Link Modelling

Link	Stop Weighting (%)	Delay Weighting (%)	Exclude From Results Calculation	Max Queue Storage (PCU)	Has Queue Limit	Queue Limit (PCU)	Excess Queue Penalty (£)	Has Degree Of Saturation Limit	Degree Of Saturation Limit (%)	Excess Degree Of Saturation Penalty (£)	Low Degree Of Saturation Penalty (£)
Ped 1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 2	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 3	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 4	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 5	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 6	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 7	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 8	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)

Link Modelling (Advanced)

Link	Normal Dispersal Type	Normal Dispersal Coefficient	Normal Travel Time Coefficient	Initial Queue (PCU)	Point1 Time Step (s)	Point2 Time Step (s)	Type of Vehicle-in-Service	Vehicle-in-Service	Type Of Random Parameter	Random Parameter
Ped 1	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 2	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 3	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 4	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 5	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 6	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Ped 7	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 8	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Link Flows

Link	Total Flow (On Link) (PCU/hr)	Uniform Flow Name	Uniform Flow (Into Link) (PCU/hr)	Upstream Flow (Into Link) (PCU/hr)	Link Sensitivity Multiplier (%)	Cruise Sensitivity Multiplier (%)	Calculated Cruise Speed (kph)
Ped 1	0		0	0	100	100	1.00
Ped 2	0		0	0	100	100	1.00
Ped 3	0		0	0	100	100	1.00
Ped 4	0		0	0	100	100	1.00
Ped 5	0		0	0	100	100	1.00
Ped 6	0		0	0	100	100	1.00
Ped 7	0		0	0	100	100	1.00
Ped 8	0		0	0	100	100	1.00

Link Sources - default sources for entry links

Link	Entry Source Traffic Type	Entry Cruise Time (seconds)	Entry Cruise Speed (kph)	Entry Free Running Speed (kph)	Entry Stationary Time (seconds)	Entry Profile Type	Entry DIRECTFlows (PCU/hr)
Ped 1	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0
Ped 2	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0
Ped 3	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0
Ped 4	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0
Ped 5	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0
Ped 6	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0
Ped 7	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0
Ped 8	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0

Traffic Streams

Traffic Streams

Traffic Stream	ID	Name	Description	Length (m)	Traffic Model	Has Restricted Flow	Saturation Flow Source	Saturation Flow (PCU/hr)	Cell Saturation Flow (PCU/hr)	Is Signal Controlled	Controller Stream	Phase	Phase2 Enabled	Phase2
1	1			100.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	4210	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			80.00	NetworkDefault	True	SumOfLanes	1929	(N/A)	True	2	A	False	(N/A)
2	2			80.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	True	2	B	False	(N/A)

1	1			80.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	True	1	D	False	(N/A)
2	2			80.00	NetworkDefault	True	SumOfLanes	1854	(N/A)	True	1	E	False	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			10.00	CPDM	True	SumOfLanes	1400	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2155	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			70.00	CPDM	True	SumOfLanes	1400	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2055	(N/A)	True	3	A	False	(N/A)
1	1			153.00	NetworkDefault	True	SumOfLanes	1915	(N/A)	True	3	A	False	(N/A)
1	1			40.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	True	2	C	False	(N/A)
2	2			40.00	NetworkDefault	True	SumOfLanes	1828	(N/A)	True	2	D	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	3600	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			30.00	NetworkDefault	True	SumOfLanes	1741	(N/A)	True	1	B	False	(N/A)
2	2			30.00	NetworkDefault	True	SumOfLanes	1781	(N/A)	True	1	C	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			243.00	NetworkDefault	True	SumOfLanes	1741	(N/A)	True	1	A	False	(N/A)
2	2			100.00	NetworkDefault	True	SumOfLanes	1915	(N/A)	True	1	A	False	(N/A)
2	2			243.00	NetworkDefault	True	SumOfLanes	3600	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			40.00	NetworkDefault	True	SumOfLanes	1687	(N/A)	True	2	F	False	(N/A)
2	2			40.00	NetworkDefault	True	SumOfLanes	1879	(N/A)	True	2	E	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			10.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			20.00	NetworkDefault	True	SumOfLanes	2033	(N/A)	True	2	G	False	(N/A)
2	2			20.00	NetworkDefault	True	SumOfLanes	2155	(N/A)	True	2	H	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1915	(N/A)	True	3	C	False	(N/A)
2	2			100.00	NetworkDefault	True	SumOfLanes	1741	(N/A)	True	3	B	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	False	(N/A)	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	4210	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			153.00	NetworkDefault	True	SumOfLanes	3600	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			7.00	CPDM	True	SumOfLanes	1741	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)

Traffic Stream Lanes

Traffic Stream	ID	Name	Description	Use RR67	Surface Condition	Site Quality Factor	Gradient (%)	Width (m)	Proportion That Turn (%)	Turning Radius (m)	Nearside Lane	Saturation Flow (PCU/hr)
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1400
1	1			True	N/A	N/A	0	4.00	0	10.00	False	2155
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1400
1	1			True	N/A	N/A	0	3.00	0	10.00	False	2055
1	1			True	N/A	N/A	0	3.00	0	10.00	True	1915
1	1			True	N/A	N/A	0	3.50	0	20.00	True	1965
1	1			True	N/A	N/A	0	3.50	100	20.00	True	1828
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3600
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741
1	1			True	N/A	N/A	0	3.00	100	20.00	True	1781
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105

2	2			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741
1	1			True	N/A	N/A	0	3.00	0	10.00	True	1915
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
2	2			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.25	100	10.00	True	1687
1	1			True	N/A	N/A	0	3.25	97	45.00	True	1879
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.50	37	30.00	True	1929
1	1			True	N/A	N/A	0	3.50	0	15.00	True	1965
1	1			True	N/A	N/A	0	3.50	0	25.00	True	1965
1	1			True	N/A	N/A	0	3.50	100	25.00	True	1854
1	1			True	N/A	N/A	0	3.50	0	10.00	True	1965
1	1			True	N/A	N/A	0	3.50	0	10.00	True	1965
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	4.00	100	25.00	False	2033
1	1			True	N/A	N/A	0	4.00	0	25.00	False	2155
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.00	0	20.00	True	1915
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
2	2			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
2	2			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741

Traffic Stream Modelling

Traffic Stream	Stop Weighting (%)	Delay Weighting (%)	Exclude From Results Calculation	Max Queue Storage (PCU)	Has Queue Limit	Queue Limit (PCU)	Excess Queue Penalty (£)	Has Degree Of Saturation Limit	Degree Of Saturation Limit (%)	Excess Degree Of Saturation Penalty (£)	Low Degree Of Saturation Penalty (£)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	8.00	True	11	100.00	True	90	500.00	0.00
2	100	100	False	12.00	True	11	100.00	True	90	500.00	0.00
1	100	100	False	11.00	True	10	100.00	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
1	100	100	False	0.00	True	19	100.00	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)

2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	True	30	100.00	False	(N/A)	(N/A)	(N/A)
2	100	100	False	0.00	True	30	100.00	True	90	100.00	0.00
2	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)

Traffic Stream Modelling (Advanced)

Traffic Stream	Normal Dispersal Type	Normal Dispersal Coefficient	Normal Travel Time Coefficient	Initial Queue (PCU)	Point1 Time Step (s)	Point2 Time Step (s)	Type of Vehicle-in-Service	Vehicle-in-Service	Type Of Random Parameter	Random Parameter
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Flows

Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)	Bus Flow (PCU/hr)	Tram Flow (PCU/hr)	Cruise Sensitivity Multiplier (%)	Calculated Cruise Speed (kph)
1	982	982	0	0	100	1.00
1	282	282	0	0	100	1.00
1	910	910	0	0	100	1.00
1	1321	1321	0	0	100	1.00
1	348	348	0	0	100	1.00
1	918	918	0	0	100	1.00
2	13	13	0	0	100	1.00
1	1056	1056	0	0	100	1.00

2	0	0	0	0	100	1.00
1	911	911	0	0	100	1.00
1	1098	1098	0	0	100	1.00
1	99	99	0	0	100	1.00
1	41	41	0	0	100	1.00
1	736	736	0	0	100	1.00
1	534	534	0	0	100	1.00
1	584	584	0	0	100	1.00
1	922	922	0	0	100	1.00
2	60	60	0	0	100	1.00
1	756	756	0	0	100	1.00
1	17	17	0	0	100	1.00
2	265	265	0	0	100	1.00
1	16	16	0	0	100	1.00
1	16	16	0	0	100	1.00
2	894	894	0	0	100	1.00
2	1320	1320	0	0	100	1.00
1	174	174	0	0	100	1.00
2	174	174	0	0	100	1.00
1	430	430	0	0	100	1.00
1	99	99	0	0	100	1.00
1	7	7	0	0	100	1.00
2	34	34	0	0	100	1.00
1	18	18	0	0	100	1.00
1	250	250	0	0	100	1.00
2	475	475	0	0	100	1.00
1	835	835	0	0	100	1.00
1	834	834	0	0	100	1.00
1	584	584	0	0	100	1.00
1	1009	1009	0	0	100	1.00
1	1009	1009	0	0	100	1.00
1	0	0	0	0	100	1.00

Traffic Stream Sources - default sources for entries

Traffic Stream	Normal Cruise Time (seconds)	Normal Cruise Speed (kph)	Bus Free Running Speed (kph)	Tram Free Running Speed (kph)
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
2	7.50	48.00	Buses Not Permittted	Trams Not Permitted

Traffic Stream Sources - sources for internals

Traffic Stream	Source	Source Type	Source Link	Source Traffic Stream	Source Total Flow (PCU/hr)	Source Normal Flow (PCU/hr)	Source Bus Flow (PCU/hr)	Source Tram Flow (PCU/hr)	Normal Cruise Time (seconds)	Normal Cruise Speed (kph)	Bus Free Running Speed (kph)	Tram Free Running Speed (kph)
1	1	TrafficStream	N/A	A/1	922	922	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	A/1	60	60	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Df/1	174	174	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted

1	2	TrafficStream	N/A	E east f/1	582	582	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Gf/2	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	B/1	17	17	0	0	2.25	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	B/1	265	265	0	0	2.25	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cf/1	16	16	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	N gw/1	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kx/1	910	910	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	E west f/1	1056	1056	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Bf/2	265	265	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Eap/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Eap/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Eap2/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Eap2/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Bf/1	17	17	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Cf/2	894	894	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Af/1	922	922	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Gf/1	7	7	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Df/2	169	169	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kx/1	99	99	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cx/2	736	736	0	0	5.25	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kap/1	0	0	0	0	11.48	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cap/1	0	0	0	0	18.23	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Cap/1	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Cap2/1	0	0	0	0	18.23	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	D/1	174	174	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	D/1	174	174	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	E east f/1	336	336	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Af/2	60	60	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Gf/2	34	34	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	F/1	99	99	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted

1	1	TrafficStream	N/A	G/1	7	7	0	0	1.50	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	G/1	34	34	0	0	1.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Af/1	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	E east f/2	13	13	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Df/2	5	5	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	H/1	736	736	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Fx/1	99	99	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	K/1	584	584	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	If/1	250	250	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cx/2	584	584	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	J/1	534	534	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	If/2	475	475	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kap2/1	0	0	0	0	11.48	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	E west f/2	0	0	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted

Give Way Data

Traffic Stream	Opposed Traffic	Use Step-wise Opposed Turn Model	Number Of Storage Spaces	Radius Of Turn (m)	Visibility Restricted	Visibility Restricted By	Visibility Restricted By Link	Visibility Restricted By Traffic Stream
1	Movement	False	(N/A)	(N/A)	False	N/A	N/A	N/A
1	AllTraffic	False	(N/A)	(N/A)	False	N/A	N/A	N/A
1	AllTraffic	True	0	15.00	False	N/A	N/A	N/A

Flow Allocation Tool Tables

Normal Input Flows (PCU/hour) for OD Matrix: 1

		To		
		1	2	3
From	1	0	250.00000	475.00000
	2	0	0	534.00000
	3	0	584.00000	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		If/1,If/2		725	725	0	0	0	0	0	0
2		J/1	Jx/1	534	534	0	0	834	834	0	0
3		K/1	Kap2/1	584	584	0	0	1009	1009	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		If/1,Jx/1	250
2		If/2,Kap2/1	475
3		J/1,Kap2/1	534
4		K/1,Jx/1	584

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	250
2	True	Normal	N/A	N/A	475
3	True	Normal	N/A	N/A	534
4	True	Normal	N/A	N/A	584

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Normal Input Flows (PCU/hour) for OD Matrix: 2

		To		
		1	2	3
From	1	0	910.00000	99.00000
	2	584.00000	0	736.00000
	3	0	0	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		Kx/1	Kap/1	1009	1009	0	0	584	584	0	0
2		Cx/2	Cap/1	1320	1320	0	0	910	910	0	0
3			Ix/1	0	0	0	0	835	835	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		Kx/1,F/1,Fx/1,Ix/1	99
2		Kx/1,Cap/1	910
3		Cx/2,H/1,Ix/1	736
4		Cx/2,Kap/1	584

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	99
2	True	Normal	N/A	N/A	910
3	True	Normal	N/A	N/A	736
4	True	Normal	N/A	N/A	584

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Normal Input Flows (PCU/hour) for OD Matrix: 3

		To		
		1	2	3
From	1	0	16.00000	894.00000
	2	265.00000	0	17.00000
	3	1056.00000	5.00000	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		Cf/1,Cf/2	Cap2/1	910	910	0	0	1321	1321	0	0
2		B/1	Bx/1	282	282	0	0	16	16	0	0
3		E west f/1	Eap/1	1056	1056	0	0	911	911	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		Cf/1,Bx/1	16
2		Cf/2,Eap/1	894
3		B/1,Bf/1,Eap/1	17
4		B/1,Bf/2,Cap2/1	265
5		E west f/1,Cap2/1	1056

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	16
2	True	Normal	N/A	N/A	894
3	True	Normal	N/A	N/A	17
4	True	Normal	N/A	N/A	265
5	True	Normal	N/A	N/A	1056

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0

Normal Input Flows (PCU/hour) for OD Matrix: 4

		To			
		1	2	3	4
From	1	0	336.00000	582.00000	13.00000
	2	169.00000	0	174.00000	5.00000
	3	922.00000	60.00000	0	0
	4	7.00000	34.00000	0	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		E east f/1,E east f/2	Eap2/1	931	931	0	0	1098	1098	0	0
2		D/1	Dx/1	348	348	0	0	430	430	0	0
3		A/1	Ax/1	982	982	0	0	756	756	0	0
4		G/1	Gx/1	41	41	0	0	18	18	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		E east f/1,Ax/1	582
2		E east f/1,Dx/1	336
3		E east f/2,Gx/1	13
4		D/1,Df/1,Ax/1	174
5		D/1,Df/2,Gx/1	5
6		D/1,Df/2,Eap2/1	169
7		A/1,Af/1,Gx/1	0
8		A/1,Af/1,Eap2/1	922
9		A/1,Af/2,Dx/1	60
10		G/1,Gf/1,Eap2/1	7
11		G/1,Gf/2,Ax/1	0
12		G/1,Gf/2,Dx/1	34

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	582
2	True	Normal	N/A	N/A	336
3	True	Normal	N/A	N/A	13
4	True	Normal	N/A	N/A	174
5	True	Normal	N/A	N/A	5
6	True	Normal	N/A	N/A	169
7	True	Normal	N/A	N/A	0
8	True	Normal	N/A	N/A	922
9	True	Normal	N/A	N/A	60
10	True	Normal	N/A	N/A	7
11	True	Normal	N/A	N/A	0
12	True	Normal	N/A	N/A	34

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0
6	False	Disabled	N/A	N/A	0
7	False	Disabled	N/A	N/A	0
8	False	Disabled	N/A	N/A	0
9	False	Disabled	N/A	N/A	0
10	False	Disabled	N/A	N/A	0
11	False	Disabled	N/A	N/A	0
12	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0
6	False	Disabled	N/A	N/A	0
7	False	Disabled	N/A	N/A	0
8	False	Disabled	N/A	N/A	0
9	False	Disabled	N/A	N/A	0
10	False	Disabled	N/A	N/A	0
11	False	Disabled	N/A	N/A	0
12	False	Disabled	N/A	N/A	0

Signal Timings

120s cycle time; 120 steps

Controller Stream

ID	Name	Description	Gaining Delay Type	Signals Manipulation Mode	Multiple Cycling	Offset Relative To	Offset Valid	Offset (s)	Auto Redistribute	Optimisation Level	Use Sequence
1			Absolute	StageBased	Single	1	True	0	True	Offsets And Green Splits	1

2			Absolute	PhaseBased	Single	1	True	22	True	Offsets And Green Splits	1
3			Absolute	StageBased	Double	1	True	19	True	Offsets And Green Splits	1

Phases

Controller Stream	ID	Minimum Green (s)	Maximum Green (s)	Relative Start Displacement (s)	Relative End Displacement (s)	Dummy
1	A	7	120	2	3	False
1	B	7	120	2	3	False
1	C	7	120	2	3	False
1	D	7	120	2	3	False
1	E	7	120	2	3	False
2	A	7	120	2	3	False
2	B	7	120	2	3	False
2	C	7	120	2	3	False
2	D	7	120	2	3	False
2	E	7	120	2	3	False
2	F	7	120	2	3	False
2	G	7	120	2	3	False
2	H	7	120	2	3	False
2	I	4	4	0	0	False
2	J	4	4	0	0	False
2	K	4	4	0	0	False
2	L	4	4	0	0	False
2	M	5	5	0	0	False
2	N	4	4	0	0	False
2	O	4	4	0	0	False
2	P	4	4	0	0	False
3	A	7	120	2	3	False
3	B	7	120	2	3	False
3	C	7	120	2	3	False

Library Stages

Controller Stream	ID	Phases In Stage	User Stage Minimum (s)
1	1	A,D	7
1	2	D,E	7
1	3	C,B	7
2	1	A,C,M,I	1
2	2	B,A,P	1
2	3	D,G	1
2	4	G,H,N,K	1
2	5	J,E,F,O,M	1
3	1	A	7
3	2	B,C	7

Losing/ Gaining delays at each Controller Stream

Controller Stream	Delay	Type	Phase	From Stage	To Stage	Relative Delay	Absolute Delay
2	1	Losing	B	2	3	2	N/A
2	2	Losing	A	2	3	2	N/A
2	3	Losing	K	4	5	3	N/A
2	4	Losing	G	4	5	3	N/A
2	5	Losing	H	4	5	3	N/A
2	6	Gaining	O	4	5	3	3

2	7	Losing	O	5	1	2	N/A
2	8	Losing	F	5	1	3	N/A
2	9	Losing	E	5	1	3	N/A

Stage Sequences

Controller Stream	ID	Stage IDs	Stage Ends	Multiple Cycling Stage IDs	Multiple Cycling Stage Ends
1	1	1,2,3	45,57,94		
2	1	1,2,3,4,5	59,69,83,92,111		
3	1	1,2	27,53	1,2	87,113

Resultant Stages

Controller Stream	Stage Index	Is Base Stage	Library Stage ID	Phases In This Stage	Stage Start (s)	Stage End (s)	Stage Duration (s)	User Stage Minimum (s)	Stage Minimum (s)
1	1	True	1	A,D	99	45	66	7	7
1	2	True	2	D,E	50	57	7	7	7
1	3	True	3	C,B	62	94	32	7	7
2	1	True	1	A,C,M,I	1	59	58	1	5
2	2	True	2	B,A,P	64	69	5	1	5
2	3	True	3	D,G	76	83	7	1	7
2	4	True	4	G,H,N,K	90	92	2	1	2
2	5	True	5	J,E,F,O,M	102	111	9	1	4
3	1	True	1	A	118	27	29	7	7
3	2	True	2	B,C	32	53	21	7	7
3	3	False	1	A	58	87	29	7	7
3	4	False	2	B,C	92	113	21	7	7

Resultant Phase Green Periods

Controller Stream	Phase	Green Period	Is Base Green Period	Start Time (s)	End Time (s)	Duration (s)
1	A	1	True	99	45	66
1	B	1	True	57	94	37
1	C	1	True	62	94	32
1	D	1	True	99	57	78
1	E	1	True	50	57	7
2	A	1	True	0	71	71
2	B	1	True	64	71	7
2	C	1	True	119	59	60
2	D	1	True	76	83	7
2	E	1	True	102	114	12
2	F	1	True	102	114	12
2	G	1	True	76	95	19
2	H	1	True	88	95	7
2	I	1	True	1	59	58
2	J	1	True	99	111	12
2	K	1	True	90	95	5
2	M	1	True	102	59	77
2	N	1	True	83	92	9
2	O	1	True	95	113	18
2	P	1	True	61	69	8
3	A	1	False	58	87	29
3	A	2	True	118	27	29
3	B	1	True	32	53	21
3	B	2	False	92	113	21
3	C	1	True	32	53	21

3	C	2	False	92	113	21

Intergreen Matrix for Controller Stream 1

		To				
		A	B	C	D	E
From	A	-	5	5		5
	B	5	-			
	C	5		-	5	5
	D			5	-	
	E	5		5		-

Interstage Matrix for Controller Stream 1

		To		
		1	2	3
From	1	-	5	5
	2	5	-	5
	3	5	5	-

Banned Stage transitions for Controller Stream 1

		To		
		1	2	3
From	1	-		
	2		-	
	3			-

Intergreen Matrix for Controller Stream 2

		To															
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
From	A	-			5	5	7		5		4		2			7	
	B		-	5		5			5						4	7	
	C		5	-		5		9	7			7			3		2
	D	5			-	5			5		3	7					
	E	5	7	5	5	-		9	5	7					3		2
	F	5					-		5	7			3				
	G			5		5		-						7			7
	H	5	5	5	5	5	7		-		4		2	7			
	I					6	6			-							
	J	9			10				9		-						
	K			6	6							-					
	L	10					8		11				-				
	M							7	7					-			
	N		9	10		10									-		
	O	6	6													-	
	P			12		12		7									-

Interstage Matrix for Controller Stream 2

		To				
		1	2	3	4	5
From	1	-	5	9	9	7
	2	12	-	7	7	12
	3	7	7	-	7	7
	4	10	9	6	-	10

	5	10	9	10	9	-

Banned Stage transitions for Controller Stream 2

		To				
		1	**2**	**3**	**4**	**5**
From	**1**	-				
	2		-			
	3			-		
	4				-	
	5					-

Intergreen Matrix for Controller Stream 3

		To		
		A	**B**	**C**
From	**A**	-	5	5
	B	5	-	
	C	5		-

Interstage Matrix for Controller Stream 3

		To			
		1	**2**	**3**	**4**
From	**1**	-	5		
	2	5	-		
	3			-	
	4				-

Banned Stage transitions for Controller Stream 3

		To			
		1	**2**	**3**	**4**
From	**1**	-			
	2		-		
	3			-	
	4				-

TRANSYT 12 Tables

Resultant Stages

Controller Stream	Stage Index	Is Base Stage	Library Stage ID	Phases In This Stage	TRANSYT Stage Start (s)	TRANSYT Preceding Interstage (s)	TRANSYT Stage Minimum (s)
1	1	True	1	A,D	94	5	12
1	2	True	2	D,E	45	5	12
1	3	True	3	C,B	57	5	12
2	1	True	1	A,C,M,I	111	10	15
2	2	True	2	B,A,P	59	5	10
2	3	True	3	D,G	69	7	14
2	4	True	4	G,H,N,K	83	7	9
2	5	True	5	J,E,F,O,M	92	10	14
3	1	True	1	A	113	5	12
3	2	True	2	B,C	27	5	12
3	3	False	1	A	53	5	12
3	4	False	2	B,C	87	5	12

Resultant Phase Green Periods

Controller Stream	Phase	Green Period	TRANSYT Starting Stage (s)	TRANSYT Ending Stage (s)	TRANSYT Start Lag (s)	TRANSYT End Lag (s)
1	A	1	1	2	5	0
1	B	1	3	1	0	0
1	C	1	3	1	5	0
1	D	1	1	3	5	0
1	E	1	2	3	5	0
2	A	1	1	3	9	2
2	B	1	2	3	5	2
2	C	1	1	2	8	0
2	D	1	3	4	7	0
2	E	1	5	1	10	3
2	F	1	5	1	10	3
2	G	1	3	5	7	3
2	H	1	4	5	5	3
2	I	1	1	2	10	0
2	J	1	5	1	7	0
2	K	1	4	5	7	3
2	M	1	5	2	10	0
2	N	1	4	5	0	0
2	O	1	5	1	3	2
2	P	1	2	3	2	0
3	A	1	3	4	5	0
3	A	2	1	2	5	0
3	B	1	2	3	5	0
3	B	2	4	1	5	0
3	C	1	2	3	5	0
3	C	2	4	1	5	0

Stage Timings (TRANSYT 12 timings)

120s cycle time; 120 steps

Controller Stream	Number of Stages	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
1	3	94	45	57		
2	5	111	59	69	83	92
3	4	113	27	53	87	

Link Green Times

Link	Traffic Node	Controller Stream	Phase	Green Period 1		
				Start	End	Duration
Ped 1	2	2	I	1	59	58
Ped 2	2	2	J	99	111	12
Ped 3	2	2	K	90	95	5
Ped 4	2	2	L			
Ped 5	2	2	M	102	59	77
Ped 6	2	2	N	83	92	9
Ped 7	2	2	O	95	113	18
Ped 8	2	2	P	61	69	8

Traffic Stream Green Times

Arm	Traffic Stream ID	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
J	**1**	3	3	A	58	87	29	118	27	29
K	**1**	3	3	A	58	87	29	118	27	29
Af	**1**	2	2	C	119	59	60			
Af	**2**	2	2	D	76	83	7			
Bf	**1**	1	1	B	57	94	37			
Bf	**2**	1	1	C	62	94	32			
Cf	**1**	1	1	A	99	45	66			
Cf	**2**	1	1	A	99	45	66			
Df	**1**	2	2	F	102	114	12			
Df	**2**	2	2	E	102	114	12			
E east f	**1**	2	2	A	0	71	71			
E east f	**2**	2	2	B	64	71	7			
E west f	**1**	1	1	D	99	57	78			
E west f	**2**	1	1	E	50	57	7			
Gf	**1**	2	2	G	76	95	19			
Gf	**2**	2	2	H	88	95	7			
If	**1**	3	3	C	32	53	21	92	113	21
If	**2**	3	3	B	32	53	21	92	113	21

Link Results

Link Results: Summary

Link	Major Link	Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Of Penalties (£ per hr)	Unwei Perfor Index h
Ped 1	(N/A)	0	0	0	False	1800	885	0	False	Unrestricted	58.00	59.00	540000.00	0.
Ped 2	(N/A)	0	0	0	False	1800	195	0	False	Unrestricted	12.00	13.00	80000.00	0.
Ped 3	(N/A)	0	0	0	False	1800	90	0	False	Unrestricted	5.00	6.00	10000.00	0.
Ped 4	(N/A)	0	0	0	False	0	0	0	False	-100	0.00	0.00	0.00	0.
Ped 5	(N/A)	0	0	0	False	1800	1170	0	False	Unrestricted	77.00	78.00	720000.00	0.
Ped 6	(N/A)	0	0	0	False	1800	150	0	False	Unrestricted	9.00	10.00	50000.00	0.
Ped 7	(N/A)	0	0	0	False	1800	285	0	False	Unrestricted	18.00	19.00	140000.00	0.
Ped 8	(N/A)	0	0	0	False	1800	135	0	False	Unrestricted	8.00	9.00	40000.00	0.

Link Results: Stops And Delays

Link	Major Link	Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)
Ped 1	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 2	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 3	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Ped 4	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 5	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 6	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 7	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 8	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Link Results: Queues And Blocking

Link	Major Link	Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
Ped 1	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	59.00	0.00	59.00	False
Ped 2	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	13.00	0.00	13.00	False
Ped 3	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	6.00	0.00	6.00	False
Ped 4	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
Ped 5	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	78.00	0.00	78.00	False
Ped 6	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	10.00	0.00	10.00	False
Ped 7	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	19.00	0.00	19.00	False
Ped 8	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	9.00	0.00	9.00	False

Link Results: Fuel Consumption

Link	Major Link	Fuel Consumption Cruise (Litres per hour)	Fuel Consumption Delay (Litres per hour)	Fuel Consumption Stops (Litres per hour)	Fuel Consumption Total (Litres per hour)	Fuel Economy Total (Miles / gal)
Ped 1	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 2	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 3	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 4	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 5	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 6	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 7	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 8	(N/A)	0.00	0.00	0.00	0.00	Infinity

Link Results: Journey Times

Link	Major Link	Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)
Ped 1	(N/A)	0.00	0.00	0.00	0.00
Ped 2	(N/A)	0.00	0.00	0.00	0.00
Ped 3	(N/A)	0.00	0.00	0.00	0.00
Ped 4	(N/A)	0.00	0.00	0.00	0.00

Ped 5	(N/A)	0.00	0.00	0.00	0.00
Ped 6	(N/A)	0.00	0.00	0.00	0.00
Ped 7	(N/A)	0.00	0.00	0.00	0.00
Ped 8	(N/A)	0.00	0.00	0.00	0.00

Traffic Stream Results

Traffic Stream Results: Summary

Arm	TrafficStream	Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Penal (£ p hr)
A	1	982	982	0	False	2105	2105	47	False	114	120.00	0.00	0.0
B	1	282	282	0	False	2105	2105	13	False	646	120.00	0.00	0.0
Cap	1	910	910	0	False	2105	2105	43	False	131	120.00	0.00	0.0
Cap2	1	1321	1321	0	False	4210	4210	31	False	219	120.00	0.00	0.0
D	1	348	348	0	False	2105	2105	17	False	505	120.00	0.00	0.0
E east f	1	918	918	0	False	1929	1173	78	False	28	71.00	32.00	341.
E east f	2	13	13	0	False	1965	147	9	False	1034	7.00	0.00	0.0
E west f	1	1056	1056	0	False	1965	1310	81	False	24	78.00	30.00	0.0
E west f	2	0	0	0	False	1854	139	0	False	Unrestricted	7.00	0.00	0.0
Eap	1	911	911	0	False	1965	1965	46	False	116	120.00	0.00	0.0
Eap2	1	1098	1098	0	False	1965	1965	56	False	79	120.00	0.00	0.0
F	1	99	99	0	False	1272	1272	8	False	1184	120.00	0.00	0.0
G	1	41	41	0	False	2155	2155	2	False	5156	120.00	0.00	0.0
H	1	736	736	0	False	1378	1378	53	False	87	120.00	0.00	0.0
J	1	534	534	0	False	2055	1062	50	False	99	58.00	0.00	0.0
K	1	584	584	0	False	1915	989	59	False	69	58.00	0.00	0.0
Af	1	922	922	0	False	1965	1015	91	True	10	60.00	30.00	407.
Af	2	60	60	0	False	1828	137	44	False	129	7.00	0.00	0.0
Ax	1	756	756	0	False	3600	3600	21	False	376	120.00	100.00	0.0
Bf	1	17	17	0	False	1741	566	3	False	3228	37.00	26.00	0.0
Bf	2	265	265	0	False	1781	505	53	False	90	32.00	0.00	0.0
Bx	1	16	16	0	False	1800	1800	1	False	11150	120.00	100.00	0.0
Cf	1	16	16	0	False	1741	987	2	False	6066	66.00	32.00	0.0
Cf	2	894	894	0	False	1915	1085	82	False	21	66.00	0.00	0.0
Cx	2	1320	1320	0	False	3600	3600	37	False	173	120.00	0.00	0.0
Df	1	174	174	0	False	1687	197	88	False	13	12.00	26.00	0.0
Df	2	174	174	0	False	1879	219	79	False	26	12.00	0.00	0.0
Dx	1	430	430	0	False	1800	1800	24	False	319	120.00	100.00	0.0
Fx	1	99	99	0	False	1800	1800	6	False	1718	120.00	0.00	0.0
Gf	1	7	7	0	False	2033	356	2	False	4983	19.00	0.00	0.0
Gf	2	34	34	0	False	2155	162	21	False	375	7.00	0.00	0.0
Gx	1	18	18	0	False	1800	1800	1	False	9900	120.00	0.00	0.0
If	1	250	250	0	False	1915	734	34	False	194	42.00	0.00	0.0
If	2	475	475	0	False	1741	667	71	False	41	42.00	0.00	0.0
Ix	1	835	835	0	False	1800	1800	46	False	116	120.00	0.00	0.0

Jx	1	834	834	0	False	Unrestricted	Unrestricted	0	False	Unrestricted	120.00	0.00	0.0
Kap	1	584	584	0	False	2105	2105	28	False	260	120.00	0.00	0.0
Kap2	1	1009	1009	0	False	4210	4210	24	False	317	120.00	0.00	0.0
Kx	1	1009	1009	0	False	3600	3600	28	False	257	120.00	0.00	0.0
N gw	1	0	0	0	False	0	0	0	False	-100	120.00	0.00	0.0

Traffic Stream Results: Stops And Delays

Arm	TrafficStream	Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)
A	1	7.50	N/A	0.75	0.00	0.20	2.89	2.89	0.00	0.00	0.00	0.00	0.00
B	1	7.50	N/A	0.13	0.00	0.01	0.15	0.15	0.00	0.00	0.00	0.00	0.00
Cap	1	1.00	N/A	0.65	0.00	0.16	2.34	2.34	0.00	0.00	0.00	0.00	0.00
Cap2	1	1.00	N/A	0.20	0.00	0.07	1.02	1.02	0.00	0.00	0.00	0.00	0.00
D	1	7.50	N/A	0.17	0.00	0.02	0.23	0.23	0.00	0.00	0.00	0.00	0.00
E east f	1	9.60	A	12.41	1.78	1.38	44.93	44.93	89.82	783.54	41.00	10.34	10.34
E east f	2	9.60	A	43.83	0.15	0.00	2.25	2.25	99.30	12.78	0.13	0.16	0.16
E west f	1	9.60	A	11.09	1.61	1.64	46.21	46.21	19.48	156.97	48.75	2.58	2.58
E west f	2	0.00	F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eap	1	1.00	N/A	0.79	0.00	0.20	2.84	2.84	0.00	0.00	0.00	0.00	0.00
Eap2	1	1.00	N/A	1.16	0.00	0.35	5.01	5.01	0.96	0.00	10.57	0.00	0.00
F	1	1.00	N/A	0.12	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00
G	1	7.50	N/A	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H	1	5.25	N/A	1.49	0.00	0.31	4.33	4.33	0.00	0.00	0.00	0.00	0.00
J	1	7.50	A	11.18	1.41	0.25	23.55	23.55	62.51	318.70	15.12	10.71	10.71
K	1	18.36	B	13.76	1.81	0.42	31.70	31.70	72.78	399.95	25.11	5.33	5.33
Af	1	3.00	A	42.25	6.76	4.06	153.66	153.66	99.92	803.43	117.80	29.57	29.57
Af	2	3.00	A	63.16	0.89	0.17	14.95	14.95	101.55	56.00	4.93	1.96	1.96
Ax	1	7.50	N/A	0.13	0.00	0.03	0.40	0.40	0.00	0.00	0.00	0.00	0.00
Bf	1	2.25	A	27.77	0.13	0.00	1.86	1.86	65.92	11.19	0.01	0.36	0.36
Bf	2	2.25	A	40.12	2.67	0.29	41.94	41.94	84.87	216.32	8.58	7.22	7.22
Bx	1	7.50	N/A	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Cf	1	29.16	C	11.86	0.05	0.00	0.75	0.75	42.88	6.86	0.00	0.09	0.09
Cf	2	12.00	B	26.12	4.61	1.87	92.10	92.10	79.51	655.50	55.33	8.91	8.91
Cx	2	29.16	N/A	0.29	0.00	0.11	1.51	1.51	0.00	0.00	0.00	0.00	0.00
Df	1	3.00	A	105.73	2.52	2.59	72.56	72.56	136.26	167.53	69.56	7.61	7.61
Df	2	3.00	A	80.42	2.49	1.39	55.19	55.19	117.58	165.22	39.38	6.57	6.57
Dx	1	7.50	N/A	0.31	0.00	0.04	0.53	0.53	0.00	0.00	0.00	0.00	0.00
Fx	1	1.00	N/A	0.06	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00
Gf	1	1.50	A	41.35	0.08	0.00	1.14	1.14	80.92	5.66	0.01	0.18	0.18
Gf	2	1.50	A	55.16	0.49	0.03	7.40	7.40	94.12	31.17	0.83	1.03	1.03
Gx	1	7.50	N/A	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
If	1	7.50	A	14.40	0.91	0.09	14.20	14.20	68.33	165.58	5.24	5.48	5.48
If	2	7.50	A	22.24	2.07	0.86	41.67	41.67	89.60	375.13	50.48	13.66	13.66
Ix	1	7.50	N/A	0.86	0.00	0.20	2.85	2.85	0.00	0.00	0.00	0.00	0.00
Jx	1	7.50	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Kap	1	1.00	N/A	0.33	0.00	0.05	0.76	0.76	0.00	0.00	0.00	0.00	0.00
Kap2	1	1.00	N/A	0.13	0.00	0.04	0.54	0.54	0.00	0.00	0.00	0.00	0.00
Kx	1	18.36	N/A	0.19	0.00	0.05	0.77	0.77	0.00	0.00	0.00	0.00	0.00
N g w	1	0.00	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues And Blocking

Arm	TrafficStream	Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
A	1	0.00	0.20	19.79	0.00	0.00	0.00	0.20	0.20	0.00	81.00	81.00	False
B	1	0.00	0.01	19.79	0.00	0.00	0.00	0.01	0.01	0.00	33.00	33.00	False
Cap	1	0.00	0.16	0.00	0.16	0.00	0.00	0.16	0.16	0.00	0.00	0.00	False
Cap2	1	0.00	0.07	0.00	0.07	0.00	0.00	0.07	0.07	0.00	0.00	0.00	False
D	1	0.00	0.02	19.79	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	False
E east f	1	0.00	28.39	8.00	4.50	3.41	341.27	1.38	5.84	0.00	0.00	0.00	False
E east f	2	0.00	0.43	12.00	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.00	False
E west f	1	0.00	6.88	11.00	0.00	0.00	0.00	1.64	6.86	0.00	0.00	0.00	False
E west f	2	0.00	0.00	13.94	0.00	0.00	0.00	0.00	0.00	9.00	0.00	9.00	False
Eap	1	0.00	0.20	0.00	0.20	0.00	0.00	0.20	0.20	2.00	0.00	2.00	False
Eap2	1	0.00	0.35	0.00	0.35	0.00	0.00	0.35	0.35	8.00	0.00	8.00	False
F	1	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
G	1	0.00	0.00	20.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
H	1	0.00	0.31	9.00	0.00	0.00	0.00	0.31	0.31	0.00	0.00	0.00	False
J	1	0.00	6.04	19.32	0.00	0.00	0.00	0.25	4.56	0.00	0.00	0.00	False
K	1	0.00	9.14	27.54	0.00	0.00	0.00	0.42	6.60	0.00	0.00	0.00	False
A f	1	0.00	31.97	7.39	9.94	0.00	0.00	4.06	18.91	0.00	0.00	0.00	False
A f	2	0.00	2.07	6.87	0.00	0.00	0.00	0.17	2.02	0.00	0.00	0.00	False
A x	1	0.00	0.03	33.84	0.00	0.00	0.00	0.03	0.03	3.00	0.00	3.00	False
B f	1	0.00	0.38	4.91	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00	False
B f	2	0.00	7.72	5.02	0.42	0.00	0.00	0.29	6.62	0.00	0.00	0.00	False
B x	1	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	31.00	0.00	31.00	False
C f	1	0.00	0.23	39.77	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	False
C f	2	0.00	24.85	18.00	0.72	0.00	0.00	1.87	14.26	0.00	0.00	0.00	False
C x	2	0.00	0.11	82.24	0.00	0.00	0.00	0.11	0.11	0.00	0.00	0.00	False
D f	1	0.00	8.29	6.34	0.33	0.00	0.00	2.59	7.71	0.00	0.00	0.00	False
D f	2	0.00	7.00	7.07	0.00	0.00	0.00	1.39	6.52	0.00	0.00	0.00	False
D x	1	0.00	0.04	16.92	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.00	False
F x	1	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
G f	1	0.00	0.19	3.82	0.00	0.00	0.00	0.00	0.19	0.00	1.00	1.00	False
G f	2	0.00	1.09	4.05	0.00	0.00	0.00	0.03	1.08	0.00	0.00	0.00	False
G x	1	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	53.00	0.00	53.00	False
I f	1	0.00	3.00	18.00	0.00	0.00	0.00	0.09	2.66	0.00	0.00	0.00	False
I f	2	0.00	7.46	16.37	0.00	0.00	0.00	0.86	5.75	0.00	0.00	0.00	False
I x	1	0.00	0.20	16.92	0.00	0.00	0.00	0.20	0.20	0.00	0.00	0.00	False
J x	1	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
Kap	1	0.00	0.05	0.00	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.00	False

Kap2	1	0.00	0.04	0.00	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.00	False
Kx	1	0.00	0.05	51.78	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	False
N gw	1	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	120.00	0.00	120.00	False

Traffic Stream Results: Fuel Consumption

Arm	TrafficStream	Fuel Consumption Cruise (Litres per hour)	Fuel Consumption Delay (Litres per hour)	Fuel Consumption Stops (Litres per hour)	Fuel Consumption Total (Litres per hour)	Fuel Economy Total (Miles / gal)
A	1	7.94	0.20	0.00	8.14	2.82
B	1	2.28	0.01	0.00	2.29	2.82
Cap	1	0.00	0.16	0.00	0.00	2.82
Cap2	1	0.00	0.07	0.00	0.00	2.82
D	1	2.81	0.02	0.00	2.83	2.82
E east f	1	7.01	3.15	3.11	13.27	2.82
E east f	2	0.10	0.16	0.05	0.31	2.82
E west f	1	8.06	3.24	0.78	12.08	2.82
E west f	2	0.00	0.00	0.00	0.00	2.82
Eap	1	0.00	0.20	0.00	0.00	2.82
Eap2	1	0.00	0.35	0.00	0.00	2.82
F	1	0.09	0.00	0.00	0.09	2.82
G	1	0.33	0.00	0.00	0.33	2.82
H	1	4.17	0.30	0.00	4.47	2.82
J	1	4.32	1.65	3.22	9.19	2.82
K	1	8.53	2.22	1.60	12.35	2.82
Af	1	2.98	10.77	8.90	22.65	2.82
Af	2	0.19	1.05	0.59	1.83	2.82
Ax	1	6.11	0.03	0.00	6.14	2.82
Bf	1	0.04	0.13	0.11	0.28	2.82
Bf	2	0.64	2.94	2.17	5.75	2.82
Bx	1	0.13	0.00	0.00	0.13	2.82
Cf	1	0.37	0.05	0.03	0.45	2.82
Cf	2	8.53	6.45	2.68	17.67	2.82
Cx	2	30.62	0.11	0.00	30.73	2.82
Df	1	0.56	5.09	2.29	7.94	2.82
Df	2	0.56	3.87	1.98	6.41	2.82
Dx	1	3.48	0.04	0.00	3.51	2.82
Fx	1	0.09	0.00	0.00	0.09	2.82
Gf	1	0.01	0.08	0.05	0.15	2.82
Gf	2	0.05	0.52	0.31	0.88	2.82
Gx	1	0.15	0.00	0.00	0.15	2.82
If	1	2.02	1.00	1.65	4.67	2.82
If	2	3.84	2.92	4.11	10.87	2.82
Ix	1	6.75	0.20	0.00	6.95	2.82
Jx	1	6.74	0.00	0.00	6.74	2.82
Kap	1	0.00	0.05	0.00	0.00	2.82
Kap2	1	0.00	0.04	0.00	0.00	2.82
Kx	1	14.74	0.05	0.00	14.79	2.82
N gw	1	0.00	0.00	0.00	0.00	2.82

Traffic Stream Results: Journey Times

Arm	TrafficStream	Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)

A	1	98.20	2.25	43.65	8.25
B	1	28.20	0.60	47.17	7.63
Cap	1	0.00	0.42	0.00	0.00
Cap2	1	0.00	0.44	0.00	0.00
D	1	34.80	0.74	46.94	7.67
E east f	1	73.44	5.61	13.09	22.01
E east f	2	1.04	0.19	5.39	53.43
E west f	1	84.48	6.07	13.92	20.69
E west f	2	0.00	0.00	0.00	0.00
Eap	1	0.00	0.45	0.00	0.00
Eap2	1	0.00	0.66	0.00	0.00
F	1	0.99	0.03	32.16	1.12
G	1	4.10	0.09	47.90	7.52
H	1	51.52	1.38	37.37	6.74
J	1	53.40	2.77	19.27	18.68
K	1	89.35	5.21	17.15	32.12
Af	1	36.88	11.59	3.18	45.25
Af	2	2.40	1.10	2.18	66.16
Ax	1	75.60	1.60	47.16	7.63
Bf	1	0.51	0.14	3.60	30.02
Bf	2	7.95	3.12	2.55	42.37
Bx	1	1.60	0.03	47.94	7.51
Cf	1	3.89	0.18	21.32	41.02
Cf	2	89.40	9.47	9.44	38.12
Cx	2	320.76	10.80	29.71	29.45
Df	1	6.96	5.26	1.32	108.73
Df	2	6.96	4.03	1.73	83.42
Dx	1	43.00	0.93	46.07	7.81
Fx	1	0.99	0.03	34.02	1.06
Gf	1	0.14	0.08	1.68	42.85
Gf	2	0.68	0.54	1.27	56.66
Gx	1	1.80	0.04	47.94	7.51
If	1	25.00	1.52	16.44	21.90
If	2	47.50	3.92	12.10	29.74
Ix	1	83.50	1.94	43.04	8.36
Jx	1	83.40	1.74	48.00	7.50
Kap	1	0.00	0.22	0.00	0.00
Kap2	1	0.00	0.32	0.00	0.00
Kx	1	154.38	5.20	29.69	18.55
N gw	1	0.00	0.00	0.00	0.00

Network Results

Run Summary

Analysis Set Used	Run Start Time	Run Finish Time	Modelling Start Time (HH:mm)	Cycle Time Used (s)	Total Network Delay (PCU-hr/hr)	Highest DOS (%)	LTSWith Highest DOS	Number Of Oversaturated LTS	Percentage Of Oversaturated LTS (%)	LTSWith Worst Signalised PRC	LTSWith Worst Unsignalised PRC	LTSWith Worst Overall PRC	Network Within Capacity
A1 - PMDS	05/09/2011 15:30:45	05/09/2011 15:31:53	17:00	120	46.07	90.82	Af/1	1	2	Ped 4	N gw/1	N gw/1	False

Network Results: Summary

Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Of Penalties (£ per hr)	Unweighted Performance Index (£ per hr)	Performan Index (£ p hr)
9382	9382	0	False	0	0	91	True	-100	1761.00	476.00	748.80	766.02	1514.82

Network Results: Stops And Delays

Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)
7.95	C	17.68	30.44	15.63	654.26	654.26	51.31	4331.53	482.25	111.76	111.76

Network Results: Queues And Blocking

Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
0.00	0.00	343.65	0.00	0.00	341.27	0.00	0.00	216.00	1.00	217.00	False

Network Results: Fuel Consumption

Fuel Consumption Cruise (Litres per hour)	Fuel Consumption Delay (Litres per hour)	Fuel Consumption Stops (Litres per hour)	Fuel Consumption Total (Litres per hour)	Fuel Economy Total (Miles / gal)
68.79	45.85	33.62	148.26	2.82

Network Results: Journey Times

Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)
788.98	66.80	11.81	25.63

Point to Point Journey Time

Journey Time (s) for OD Matrix: 1

		To		
		1	2	3
From	1	0.00000	29.39909	29.74296
	2	0.00000	0.00000	18.68287
	3	0.00000	39.62200	0.00000

Journey Time (s) for OD Matrix: 2

		To		
		1	2	3
From	1	0.00000	18.55466	29.09647
	2	29.44935	0.00000	44.55629
	3	0.00000	0.00000	0.00000

Journey Time (s) for OD Matrix: 3

		To		
		1	2	3
From	1	0.00000	48.53311	38.11900
	2	50.00485	0.00000	37.65579
	3	20.69354	0.00000	0.00000

Journey Time (s) for OD Matrix: 4

	To				
		1	2	3	4

From	**1**	0.00000	29.82301	29.64216	60.94108
	2	91.08802	0.00000	124.03042	98.59813
	3	53.49887	82.22183	0.00000	0.00000
	4	50.36773	71.99099	0.00000	0.00000

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 3.0 (JUNE 2005)

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Run with file:-
"j:\23035 - Cambridge University Parking\Technical\Calcs\Transport\Assessments\Mad Rd Qeen St NH St\
Mad Rd - Q St - NH St DM AM.vai"
(drive-on-the-left) at 19:38:53 on Sunday, 8 May 2011

FILE PROPERTIES

RUN TITLE: Madingley Road / Qeen Street / Northampton Street
LOCATION:
DATE: 20/04/2011
CLIENT:
ENUMERATOR: scooper [BIR-DSK-009]
JOB NUMBER: 23035
STATUS: Preliminary
DESCRIPTION:

INPUT DATA

ARM A - Madingley Road
ARM B - Northampton Road
ARM C - Queen Street

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.27	6.63	0.00	46.00	20.00	80.0	0.622	28.598
ARM B	4.21	6.04	7.70	88.00	20.00	27.0	0.673	27.787
ARM C	5.05	7.70	0.00	12.90	20.00	80.0	0.636	31.092

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

ARM	FLOW SCALE(%)
A	100
B	100
C	100

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET TITLE: Madingley Road / Qeen Street / Northampton Street

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	12.02	18.04	12.02
ARM B	15.00	45.00	75.00	12.32	18.49	12.32
ARM C	15.00	45.00	75.00	8.39	12.58	8.39

DEMAND SET TITLE: Madingley Road / Qeen Street / Northampton Street

TIME	FROM/TO	TURNING PROPORTIONS TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
07.45 - 09.15	ARM A	0.000	0.359	0.641
		0.0	345.0	617.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.412	0.000	0.588
		406.0	0.0	580.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.715	0.285	0.000
		480.0	191.0	0.0
		(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
ARM A	12.02	27.12	0.443		0.0	0.8	11.5		0.07
ARM B	12.32	22.62	0.545		0.0	1.2	16.9		0.10
ARM C	8.39	27.89	0.301		0.0	0.4	6.3		0.05

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.419	0.000	0.001	-1.100
ARM B	0.155	0.279	0.003	-0.748
ARM C	0.379	0.000	0.002	-1.208

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	14.36	26.83	0.535		0.8	1.1	16.6		0.08
ARM B	14.72	21.60	0.681		1.2	2.1	29.4		0.14
ARM C	10.02	27.25	0.367		0.4	0.6	8.5		0.06

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.416	0.000	0.001	-1.088
ARM B	0.151	0.273	0.004	-0.714
ARM C	0.374	0.000	0.002	-1.181

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	17.59	26.43	0.665		1.1	1.9	27.9		0.11
ARM B	18.02	20.22	0.891		2.1	6.7	83.0		0.36
ARM C	12.27	26.45	0.464		0.6	0.9	12.6		0.07

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.413	0.000	0.001	-1.072
ARM B	0.147	0.266	0.004	-0.668
ARM C	0.367	0.000	0.003	-1.146

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	17.59	26.43	0.665		1.9	2.0	29.4		0.11
ARM B	18.02	20.20	0.892		6.7	7.3	106.1		0.43
ARM C	12.27	26.39	0.465		0.9	0.9	12.9		0.07

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.413	0.000	0.001	-1.072
ARM B	0.147	0.265	0.004	-0.667
ARM C	0.367	0.000	0.003	-1.143

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	14.36	26.82	0.535		2.0	1.2	18.1		0.08
ARM B	14.72	21.57	0.682		7.3	2.2	38.0		0.16
ARM C	10.02	27.15	0.369		0.9	0.6	9.0		0.06

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.416	0.000	0.001	-1.088
ARM B	0.151	0.273	0.004	-0.713
ARM C	0.373	0.000	0.002	-1.176

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
ARM A	12.02	27.11	0.444		1.2	0.8	12.3		0.07
ARM B	12.32	22.59	0.546		2.2	1.2	19.0		0.10
ARM C	8.39	27.85	0.301		0.6	0.4	6.6		0.05

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.419	0.000	0.001	-1.100
ARM B	0.154	0.279	0.003	-0.746
ARM C	0.378	0.000	0.002	-1.207

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.8	*
08.15	1.1	*
08.30	1.9	**
08.45	2.0	**
09.00	1.2	*
09.15	0.8	*

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	1.2	*
08.15	2.1	**
08.30	6.7	*******
08.45	7.3	*******
09.00	2.2	**
09.15	1.2	*

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.4	
08.15	0.6	*
08.30	0.9	*
08.45	0.9	*
09.00	0.6	*
09.15	0.4	

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1319.1	879.4	115.8	0.09	115.8	0.09
B	1352.0	901.3	292.5	0.22	292.5	0.22
C	920.1	613.4	55.9	0.06	55.9	0.06
ALL	3591.2	2394.1	464.2	0.13	464.2	0.13

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 19:39:18 on 08/05/2011]

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 3.0 (JUNE 2005)

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Run with file:-
"j:\23035 - Cambridge University Parking\Technical\Calcs\Transport\Assessments\Mad Rd Qeen St NH St\
Mad Rd - Q St - NH St DM PM.vai"
(drive-on-the-left) at 19:36:02 on Sunday, 8 May 2011

FILE PROPERTIES

RUN TITLE: Madingley Road / Qeen Street / Northampton Street
LOCATION:
DATE: 20/04/2011
CLIENT:
ENUMERATOR: scooper [BIR-DSK-009]
JOB NUMBER: 23035
STATUS: Preliminary
DESCRIPTION:

INPUT DATA

ARM A - Madingley Road
ARM B - Northampton Road
ARM C - Queen Street

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.27	6.63	0.00	46.00	20.00	80.0	0.622	28.598
ARM B	4.21	6.04	7.70	88.00	20.00	27.0	0.673	27.787
ARM C	5.05	7.70	0.00	12.90	20.00	80.0	0.636	31.092

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

ARM	FLOW SCALE(%)
A	100
B	100
C	100

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET TITLE: Madingley Road / Qeen Street / Northampton Street

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	9.44	14.16	9.44
ARM B	15.00	45.00	75.00	8.82	13.24	8.82
ARM C	15.00	45.00	75.00	11.26	16.89	11.26

DEMAND SET TITLE: Madingley Road / Qeen Street / Northampton Street

TIME	FROM/TO	TURNING PROPORTIONS TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
07.45 - 09.15	ARM A	0.000	0.581	0.419
		0.0	439.0	316.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.639	0.000	0.361
		451.0	0.0	255.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.618	0.382	0.000
		557.0	344.0	0.0
		(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
ARM A	9.44	25.93	0.364		0.0	0.6	8.3		0.06
ARM B	8.82	25.14	0.351		0.0	0.5	7.9		0.06
ARM C	11.26	27.52	0.409		0.0	0.7	10.0		0.06

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.408	0.000	0.002	-1.052
ARM B	0.162	0.294	0.002	-0.831
ARM C	0.376	0.000	0.002	-1.192

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	11.27	25.41	0.444		0.6	0.8	11.6		0.07
ARM B	10.54	24.62	0.428		0.5	0.7	10.9		0.07
ARM C	13.45	26.82	0.501		0.7	1.0	14.6		0.07

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.404	0.000	0.002	-1.031
ARM B	0.161	0.291	0.002	-0.814
ARM C	0.370	0.000	0.003	-1.162

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	13.80	24.70	0.559		0.8	1.2	18.1		0.09
ARM B	12.91	23.91	0.540		0.7	1.2	16.8		0.09
ARM C	16.47	25.86	0.637		1.0	1.7	24.7		0.11

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.398	0.000	0.002	-1.002
ARM B	0.159	0.287	0.002	-0.790
ARM C	0.363	0.000	0.003	-1.120

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	13.80	24.69	0.559		1.2	1.3	18.8		0.09
ARM B	12.91	23.90	0.540		1.2	1.2	17.4		0.09
ARM C	16.47	25.85	0.637		1.7	1.7	26.0		0.11

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.398	0.000	0.002	-1.001
ARM B	0.159	0.286	0.002	-0.790
ARM C	0.363	0.000	0.003	-1.120

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	11.27	25.39	0.444		1.3	0.8	12.4		0.07
ARM B	10.54	24.61	0.428		1.2	0.8	11.6		0.07
ARM C	13.45	26.80	0.502		1.7	1.0	15.7		0.08

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.404	0.000	0.002	-1.030
ARM B	0.161	0.290	0.002	-0.813
ARM C	0.370	0.000	0.003	-1.161

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
ARM A	9.44	25.92	0.364		0.8	0.6	8.8		0.06
ARM B	8.82	25.13	0.351		0.8	0.5	8.3		0.06
ARM C	11.26	27.50	0.410		1.0	0.7	10.7		0.06

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.408	0.000	0.002	-1.051
ARM B	0.162	0.293	0.002	-0.831
ARM C	0.376	0.000	0.002	-1.192

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.6	*
08.15	0.8	*
08.30	1.2	*
08.45	1.3	*
09.00	0.8	*
09.15	0.6	*

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.5	*
08.15	0.7	*
08.30	1.2	*
08.45	1.2	*
09.00	0.8	*
09.15	0.5	*

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.7	*
08.15	1.0	*
08.30	1.7	**
08.45	1.7	**
09.00	1.0	*
09.15	0.7	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	1035.3	690.2	78.1	0.08	78.1	0.08
B	968.1	645.4	73.0	0.08	73.0	0.08
C	1235.5	823.6	101.8	0.08	101.8	0.08
ALL	3238.8	2159.2	252.8	0.08	252.9	0.08

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 19:37:03 on 08/05/2011]

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 3.0 (JUNE 2005)

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THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
IN NO WAY RELIEVED OF THEIR RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:-
"j:\23035 - Cambridge University Parking\Technical\Calcs\Transport\Assessments\Mad Rd Qeen St NH St\
Mad Rd - Q St - NH St DS AM.vai"
(drive-on-the-left) at 19:28:20 on Sunday, 8 May 2011

FILE PROPERTIES

RUN TITLE: Madingley Road / Qeen Street / Northampton Street
LOCATION:
DATE: 20/04/2011
CLIENT:
ENUMERATOR: scooper [BIR-DSK-009]
JOB NUMBER: 23035
STATUS: Preliminary
DESCRIPTION:

INPUT DATA

ARM A - Madingley Road
ARM B - Northampton Road
ARM C - Queen Street

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.27	6.63	0.00	46.00	20.00	80.0	0.622	28.598
ARM B	4.21	6.04	7.70	88.00	20.00	27.0	0.673	27.787
ARM C	5.05	7.70	0.00	12.90	20.00	80.0	0.636	31.092

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

ARM	FLOW SCALE(%)
A	100
B	100
C	100

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET TITLE: Madingley Road / Qeen Street / Northampton Street

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	12.41	18.62	12.41
ARM B	15.00	45.00	75.00	12.06	18.09	12.06
ARM C	15.00	45.00	75.00	8.56	12.84	8.56

DEMAND SET TITLE: Madingley Road / Qeen Street / Northampton Street

TIME	FROM/TO	TURNING PROPORTIONS / TURNING COUNTS (VEH/HR) / (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
07.45 - 09.15	ARM A	0.000	0.322	0.678
		0.0	320.0	673.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.453	0.000	0.547
		437.0	0.0	528.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.711	0.289	0.000
		487.0	198.0	0.0
		(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
ARM A	12.41	27.06	0.459		0.0	0.8	12.2		0.07
ARM B	12.06	22.15	0.545		0.0	1.2	16.9		0.10
ARM C	8.56	27.64	0.310		0.0	0.4	6.6		0.05

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.418	0.000	0.001	-1.098
ARM B	0.153	0.277	0.003	-0.732
ARM C	0.377	0.000	0.002	-1.198

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	14.82	26.76	0.554		0.8	1.2	17.9		0.08
ARM B	14.40	21.04	0.685		1.2	2.1	29.8		0.15
ARM C	10.22	26.96	0.379		0.4	0.6	8.9		0.06

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.416	0.000	0.001	-1.086
ARM B	0.150	0.270	0.004	-0.695
ARM C	0.371	0.000	0.002	-1.168

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	18.15	26.35	0.689		1.2	2.2	30.8		0.12
ARM B	17.64	19.54	0.903		2.1	7.3	88.4		0.40
ARM C	12.52	26.11	0.480		0.6	0.9	13.4		0.07

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.412	0.000	0.001	-1.069
ARM B	0.145	0.262	0.005	-0.645
ARM C	0.365	0.000	0.003	-1.131

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	18.15	26.35	0.689		2.2	2.2	32.7		0.12
ARM B	17.64	19.51	0.904		7.3	8.1	116.3		0.49
ARM C	12.52	26.03	0.481		0.9	0.9	13.8		0.07

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.412	0.000	0.001	-1.069
ARM B	0.145	0.261	0.005	-0.645
ARM C	0.364	0.000	0.003	-1.128

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	14.82	26.76	0.554		2.2	1.3	19.6		0.08
ARM B	14.40	21.00	0.686		8.1	2.3	39.5		0.17
ARM C	10.22	26.83	0.381		0.9	0.6	9.5		0.06

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.416	0.000	0.001	-1.085
ARM B	0.149	0.270	0.004	-0.694
ARM C	0.370	0.000	0.003	-1.163

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
ARM A	12.41	27.06	0.459		1.3	0.9	13.1		0.07
ARM B	12.06	22.12	0.545		2.3	1.2	19.0		0.10
ARM C	8.56	27.60	0.310		0.6	0.5	6.9		0.05

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.418	0.000	0.001	-1.098
ARM B	0.153	0.276	0.003	-0.731
ARM C	0.376	0.000	0.002	-1.196

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.8	*
08.15	1.2	*
08.30	2.2	**
08.45	2.2	**
09.00	1.3	*
09.15	0.9	*

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	1.2	*
08.15	2.1	**
08.30	7.3	*******
08.45	8.1	********
09.00	2.3	**
09.15	1.2	*

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.4	
08.15	0.6	*
08.30	0.9	*
08.45	0.9	*
09.00	0.6	*
09.15	0.5	

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1361.6	907.7	126.2	0.09	126.2	0.09
B	1323.2	882.1	309.9	0.23	310.0	0.23
C	939.3	626.2	59.0	0.06	59.0	0.06
ALL	3624.1	2416.1	495.1	0.14	495.2	0.14

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 19:29:24 on 08/05/2011]

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 3.0 (JUNE 2005)

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THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
IN NO WAY RELIEVED OF THEIR RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:-
"j:\23035 - Cambridge University Parking\Technical\Calcs\Transport\Assessments\Mad Rd Qeen St NH St\
Mad Rd - Q St - NH St DS PM.vai"
(drive-on-the-left) at 19:32:46 on Sunday, 8 May 2011

FILE PROPERTIES

RUN TITLE: Madingley Road / Qeen Street / Northampton Street
LOCATION:
DATE: 20/04/2011
CLIENT:
ENUMERATOR: scooper [BIR-DSK-009]
JOB NUMBER: 23035
STATUS: Preliminary
DESCRIPTION:

INPUT DATA

ARM A - Madingley Road
ARM B - Northampton Road
ARM C - Queen Street

GEOMETRIC DATA

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.27	6.63	0.00	46.00	20.00	80.0	0.622	28.598
ARM B	4.21	6.04	7.70	88.00	20.00	27.0	0.673	27.787
ARM C	5.05	7.70	0.00	12.90	20.00	80.0	0.636	31.092

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

ARM	FLOW SCALE(%)
A	100
B	100
C	100

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET TITLE: Madingley Road / Qeen Street / Northampton Street

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	10.13	15.19	10.13
ARM B	15.00	45.00	75.00	8.80	13.20	8.80
ARM C	15.00	45.00	75.00	11.30	16.95	11.30

DEMAND SET TITLE: Madingley Road / Qeen Street / Northampton Street

TIME	FROM/TO	TURNING PROPORTIONS TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
07.45 - 09.15	ARM A	0.000	0.590	0.410
		0.0	478.0	332.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.628	0.000	0.372
		442.0	0.0	262.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.678	0.322	0.000
		613.0	291.0	0.0
		(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
ARM A	10.13	26.34	0.384		0.0	0.6	9.1		0.06
ARM B	8.80	25.01	0.352		0.0	0.5	7.9		0.06
ARM C	11.30	27.59	0.410		0.0	0.7	10.1		0.06

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.412	0.000	0.001	-1.069
ARM B	0.162	0.293	0.002	-0.827
ARM C	0.376	0.000	0.002	-1.196

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	12.09	25.90	0.467		0.6	0.9	12.7		0.07
ARM B	10.51	24.46	0.430		0.5	0.7	11.0		0.07
ARM C	13.49	26.90	0.502		0.7	1.0	14.6		0.07

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.408	0.000	0.002	-1.051
ARM B	0.160	0.290	0.002	-0.808
ARM C	0.371	0.000	0.002	-1.166

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	14.81	25.30	0.585		0.9	1.4	20.1		0.09
ARM B	12.87	23.71	0.543		0.7	1.2	17.0		0.09
ARM C	16.53	25.97	0.636		1.0	1.7	24.7		0.10

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.403	0.000	0.002	-1.026
ARM B	0.158	0.285	0.002	-0.784
ARM C	0.363	0.000	0.003	-1.125

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	14.81	25.29	0.586		1.4	1.4	21.0		0.10
ARM B	12.87	23.70	0.543		1.2	1.2	17.6		0.09
ARM C	16.53	25.95	0.637		1.7	1.7	25.9		0.11

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.403	0.000	0.002	-1.026
ARM B	0.158	0.285	0.002	-0.783
ARM C	0.363	0.000	0.003	-1.124

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	12.09	25.89	0.467		1.4	0.9	13.6		0.07
ARM B	10.51	24.44	0.430		1.2	0.8	11.7		0.07
ARM C	13.49	26.89	0.502		1.7	1.0	15.7		0.08

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.408	0.000	0.002	-1.050
ARM B	0.160	0.290	0.002	-0.808
ARM C	0.371	0.000	0.002	-1.165

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
ARM A	10.13	26.33	0.385		0.9	0.6	9.6		0.06
ARM B	8.80	24.99	0.352		0.8	0.5	8.4		0.06
ARM C	11.30	27.57	0.410		1.0	0.7	10.7		0.06

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	ENTRY WIDTH (.1M)	FLARE LENGTH (M)	INSCRIBED CIRC DIAM (M)	ENTRY ANGLE (10 DEGS)
ARM A	0.412	0.000	0.001	-1.068
ARM B	0.162	0.293	0.002	-0.826
ARM C	0.376	0.000	0.002	-1.195

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.6	*
08.15	0.9	*
08.30	1.4	*
08.45	1.4	*
09.00	0.9	*
09.15	0.6	*

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.5	*
08.15	0.7	*
08.30	1.2	*
08.45	1.2	*
09.00	0.8	*
09.15	0.5	*

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.7	*
08.15	1.0	*
08.30	1.7	**
08.45	1.7	**
09.00	1.0	*
09.15	0.7	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	1110.7	740.5	86.1	0.08	86.1	0.08
B	965.3	643.6	73.6	0.08	73.6	0.08
C	1239.6	826.4	101.7	0.08	101.7	0.08
ALL	3315.6	2210.4	261.4	0.08	261.5	0.08

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 19:33:05 on 08/05/2011]

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CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

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Run with file:-
"J:\23035 - Cambridge University Parking\Technical\Calcs\Transport\Assessments\Assessments\Mad Rise access\
Mad Road_Mad Rise_JJ Thompson\JJ Thompson_Mad'y Rd_Mad'y Rise - 2021 - AM Peak.vpi"
(drive-on-the-left) at 19:33:05 on Sunday, 12 June 2011

RUN INFORMATION
****

RUN TITLE: 23035 - JJ Thompson / Mad'y Rd / Mad'y Rise - 2021 - AM Peak
LOCATION:
DATE: 23/05/11
CLIENT:
ENUMERATOR:
JOB NUMBER:
STATUS:
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA

```
                                        MINOR ROAD (ARM D)
                                            I
                                            I
                                            I
                                            I
                                            I
                                            I
              MAJOR ROAD (ARM C) -------------------- MAJOR ROAD (ARM A)
                                     I
                                     I
                                     I
                                     I
                                     I
                                     I
                                MINOR ROAD (ARM B)
```

ARM A IS Madingley Road (E)
ARM B IS JJ Thompson Avenue (S)
ARM C IS Madingley Road (W)
ARM D IS Madingley Rise (N)

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

GEOMETRIC DATA

DATA ITEM	MINOR ROAD B	MINOR ROAD D
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 8.50 M.	(W) 9.00 M.
CENTRAL RESERVE WIDTH	(WCR) 8.00 M.	(WCR) 4.50 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 3.10 M.	(WA-D) 4.40 M.
- VISIBILITY	(VC-B) 177.0 M.	(VA-D) 200.0 M.
- BLOCKS TRAFFIC	YES	YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 200.0 M.	(VD-A) 51.0 M.
- VISIBILITY TO RIGHT	(VB-A) 77.0 M.	(VD-C) 50.0 M.
- LANE 1 WIDTH	(WB-C) 4.10 M.	(WD-A) -
- LANE 2 WIDTH	(WB-A) 3.30 M.	(WD-C) -
- WIDTH AT 0 M FROM JUNC.	-	5.00 M.
- WIDTH AT 5 M FROM JUNC.	-	5.00 M.
- WIDTH AT 10 M FROM JUNC.	-	4.50 M.
- WIDTH AT 15 M FROM JUNC.	-	4.00 M.
- WIDTH AT 20 M FROM JUNC.	-	3.50 M.
- LENGTH OF FLARED SECTION		2 VEHS

.SLOPES AND INTERCPET

(NB:Streams may be combined, in which case capacity

will be adjusted)

B-C Stream

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
746.46	0.26	0.26	0.10	0.10

B-AD Stream

Intercept For Stream B-AD	Slope For Opposing Stream A-C	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
707.64	0.25	0.25	0.10	0.10

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing Stream C-B	Slope For Opposing
0.15	0.15	0.35	

D-A Stream

Intercept For Stream D-A	Slope For Opposing Stream C-A	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
602.92	0.20	0.21	0.08	0.08

D-BC Stream

Intercept For Stream D-BC	Slope For Opposing Stream C-A	Slope For Opposing Stream B-A	Slope For Opposing Stream C-D	Slope For Opposing Stream B-D
525.24	0.19	0.19	0.08	0.08

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream A-D	Slope For Opposing
0.12	0.12	0.27	

C-B Stream

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-C	Slope For Opposing Stream D-B
742.73	0.26	0.26	0.26	0.26

A-D Stream

Intercept For Stream A-D	Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing Stream B-A	Slope For Opposing Stream B-D
742.73	0.29	0.29	0.29	0.29

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

Demand set: 23035 - JJ Thompson / Mad'y Rd / Mad'y Rise - 2021 - AM Peak

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	9.45	14.17	9.45
ARM B	15.00	45.00	75.00	0.94	1.41	0.94
ARM C	15.00	45.00	75.00	12.36	18.54	12.36
ARM D	15.00	45.00	75.00	0.93	1.39	0.93

TIME	FROM/TO	TURNING PROPORTIONS TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
07.45 - 09.15	ARM A	0.000	0.180	0.495	0.325
		0.0	136.0	374.0	246.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.827	0.000	0.173	0.000
		62.0	0.0	13.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.772	0.063	0.000	0.165
		764.0	62.0	0.0	163.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.378	0.000	0.622	0.000
		28.0	0.0	46.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
B-C	0.16	10.65	0.015		0.00	0.02	0.2		0.10
B-AD	0.78	8.25	0.094		0.00	0.10	1.5		0.13
A-BCD	3.09	10.67	0.289		0.00	0.40	6.0		0.13
D-A	0.35	7.27	0.048		0.00	0.05	0.7		0.14
D-BC	0.58	5.45	0.106		0.00	0.12	1.7		0.20
C-ABD	0.78	10.59	0.073		0.00	0.08	1.2		0.10

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-C	0.096	0.007			0.010
B-AD	0.080	0.017	0.022	0.005	0.008
C-ABD	0.105	0.009		0.009	
D-A	0.082	0.011			0.007
D-BC	0.054	0.020	0.019	0.003	0.005
A-BCD	0.094	0.018		0.009	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-C	0.19	10.28	0.019		0.02	0.02	0.3		0.10
B-AD	0.93	7.56	0.123		0.10	0.14	2.0		0.15
A-BCD	3.69	9.98	0.369		0.40	0.58	8.6		0.16
D-A	0.42	6.77	0.062		0.05	0.07	1.0		0.16
D-BC	0.69	4.65	0.148		0.12	0.17	2.5		0.25
C-ABD	0.93	10.24	0.091		0.08	0.10	1.5		0.11

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-C	0.093	0.009			0.010
B-AD	0.073	0.021	0.022	0.004	0.007
C-ABD	0.101	0.010		0.009	
D-A	0.077	0.013			0.007
D-BC	0.046	0.024	0.019	0.003	0.004
A-BCD	0.088	0.021		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-C	0.24	9.75	0.024		0.02	0.02	0.4		0.11
B-AD	1.14	6.61	0.172		0.14	0.20	3.0		0.18
A-BCD	4.51	9.02	0.501		0.58	0.98	14.6		0.22
D-A	0.51	6.05	0.085		0.07	0.09	1.3		0.18
D-BC	0.84	3.55	0.238		0.17	0.30	4.3		0.37
C-ABD	1.14	9.76	0.117		0.10	0.13	2.0		0.12

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-C	0.088	0.010			0.009
B-AD	0.064	0.025	0.022	0.004	0.006
C-ABD	0.097	0.013		0.008	
D-A	0.069	0.015			0.006
D-BC	0.035	0.030	0.019	0.002	0.003
A-BCD	0.079	0.026		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-C	0.24	9.75	0.024		0.02	0.02	0.4		0.11
B-AD	1.14	6.61	0.172		0.20	0.21	3.1		0.18
A-BCD	4.51	9.02	0.501		0.98	1.00	15.1		0.22
D-A	0.51	6.05	0.085		0.09	0.09	1.4		0.18
D-BC	0.84	3.54	0.238		0.30	0.31	4.6		0.37
C-ABD	1.14	9.76	0.117		0.13	0.13	2.0		0.12

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-C	0.088	0.010			0.009
B-AD	0.064	0.025	0.022	0.004	0.006
C-ABD	0.097	0.013		0.008	
D-A	0.069	0.015			0.006
D-BC	0.035	0.030	0.019	0.002	0.003
A-BCD	0.079	0.026		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-C	0.19	10.28	0.019		0.02	0.02	0.3		0.10
B-AD	0.93	7.56	0.123		0.21	0.14	2.2		0.15
A-BCD	3.69	9.98	0.369		1.00	0.60	9.0		0.16
D-A	0.42	6.77	0.062		0.09	0.07	1.0		0.16
D-BC	0.69	4.63	0.149		0.31	0.18	2.8		0.25
C-ABD	0.93	10.24	0.091		0.13	0.10	1.5		0.11

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-C	0.093	0.009			0.010
B-AD	0.073	0.021	0.022	0.004	0.007
C-ABD	0.101	0.010		0.009	
D-A	0.077	0.013			0.007
D-BC	0.046	0.024	0.019	0.003	0.004
A-BCD	0.088	0.021		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-C	0.16	10.65	0.015		0.02	0.02	0.2		0.10
B-AD	0.78	8.25	0.094		0.14	0.11	1.6		0.13
A-BCD	3.09	10.67	0.289		0.60	0.41	6.2		0.13
D-A	0.35	7.26	0.048		0.07	0.05	0.8		0.14
D-BC	0.58	5.43	0.106		0.18	0.12	1.9		0.21
C-ABD	0.78	10.59	0.073		0.10	0.08	1.2		0.10

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-C	0.096	0.007			0.010
B-AD	0.080	0.017	0.022	0.005	0.008
C-ABD	0.105	0.009		0.009	
D-A	0.082	0.011			0.007
D-BC	0.054	0.020	0.019	0.003	0.005
A-BCD	0.094	0.018		0.009	

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0

QUEUE FOR STREAM B-AD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.2
08.45	0.2
09.00	0.1
09.15	0.1

QUEUE FOR STREAM A-BCD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.4	
08.15	0.6	*
08.30	1.0	*
08.45	1.0	*
09.00	0.6	*
09.15	0.4	

QUEUE FOR STREAM D-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.1

QUEUE FOR STREAM D-BC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.2
08.30	0.3
08.45	0.3
09.00	0.2
09.15	0.1

QUEUE FOR STREAM C-ABD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	QUEUEING DELAY (MIN)	QUEUEING DELAY (MIN/VEH)	INCLUSIVE QUEUEING DELAY (MIN)	INCLUSIVE QUEUEING DELAY (MIN/VEH)
B-C	17.9	11.9	1.8	0.10	1.8	0.10
B-AD	85.3	56.9	13.4	0.16	13.4	0.16
A-BCD	338.6	225.7	59.5	0.18	59.5	0.18
D-A	38.5	25.7	6.2	0.16	6.2	0.16
D-BC	63.3	42.2	17.7	0.28	17.7	0.28
C-ABD	85.3	56.9	9.3	0.11	9.3	0.11
ALL	2607.0	1738.0	107.9	0.04	107.9	0.04

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 19:33:48 on 12/06/2011]

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CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

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Run with file:-
"J:\23035 - Cambridge University Parking\Technical\Calcs\Transport\Assessments\Assessments\Mad Rise access\
Mad Road_Mad Rise_JJ Thompson\JJ Thompson_Mad'y Rd_Mad'y Rise - 2021 - PM Peak.vpi"
(drive-on-the-left) at 13:31:00 on Thursday, 30 June 2011

RUN INFORMATION
****

RUN TITLE: 23035 - JJ Thompson / Mad'y Rd / Mad'y Rise - 2021 - PM Peak
LOCATION:
DATE: 23/05/11
CLIENT:
ENUMERATOR:
JOB NUMBER:
STATUS:
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA

```
                                        MINOR ROAD (ARM D)
                                            I
                                            I
                                            I
                                            I
                                            I
                                            I
              MAJOR ROAD (ARM C) -------------------- MAJOR ROAD (ARM A)
                                     I
                                     I
                                     I
                                     I
                                     I
                                     I
                                MINOR ROAD (ARM B)
```

ARM A IS Madingley Road (E)
ARM B IS JJ Thompson Avenue (S)
ARM C IS Madingley Road (W)
ARM D IS Madingley Rise (N)

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

GEOMETRIC DATA

DATA ITEM	MINOR ROAD B	MINOR ROAD D
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 8.50 M.	(W) 9.00 M.
CENTRAL RESERVE WIDTH	(WCR) 8.00 M.	(WCR) 4.50 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 3.10 M.	(WA-D) 4.40 M.
- VISIBILITY	(VC-B) 177.0 M.	(VA-D) 200.0 M.
- BLOCKS TRAFFIC	YES	YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 200.0 M.	(VD-A) 51.0 M.
- VISIBILITY TO RIGHT	(VB-A) 77.0 M.	(VD-C) 50.0 M.
- LANE 1 WIDTH	(WB-C) 4.10 M.	(WD-A) -
- LANE 2 WIDTH	(WB-A) 3.30 M.	(WD-C) -
- WIDTH AT 0 M FROM JUNC.	-	5.00 M.
- WIDTH AT 5 M FROM JUNC.	-	5.00 M.
- WIDTH AT 10 M FROM JUNC.	-	4.50 M.
- WIDTH AT 15 M FROM JUNC.	-	4.00 M.
- WIDTH AT 20 M FROM JUNC.	-	3.50 M.
- LENGTH OF FLARED SECTION		2 VEHS

.SLOPES AND INTERCPET

(NB:Streams may be combined, in which case capacity

will be adjusted)

B-C Stream

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
746.46	0.26	0.26	0.10	0.10

B-AD Stream

Intercept For Stream B-AD	Slope For Opposing Stream A-C	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
707.64	0.25	0.25	0.10	0.10

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing Stream C-B	Slope For Opposing
0.15	0.15	0.35	

D-A Stream

Intercept For Stream D-A	Slope For Opposing Stream C-A	Slope For Opposing Stream D-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-B
602.92	0.20	0.21	0.08	0.08

D-BC Stream

Intercept For Stream D-BC	Slope For Opposing Stream C-A	Slope For Opposing Stream B-A	Slope For Opposing Stream C-D	Slope For Opposing Stream B-D
525.24	0.19	0.19	0.08	0.08

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream A-D	Slope For Opposing
0.12	0.12	0.27	

C-B Stream

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-C	Slope For Opposing Stream D-B
742.73	0.26	0.26	0.26	0.26

A-D Stream

Intercept For Stream A-D	Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing Stream B-A	Slope For Opposing Stream B-D
742.73	0.29	0.29	0.29	0.29

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

Demand set: 23035 - JJ Thompson / Mad'y Rd / Mad'y Rise - 2021 - PM Peak

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	9.56	14.34	9.56
ARM B	15.00	45.00	75.00	2.17	3.26	2.17
ARM C	15.00	45.00	75.00	9.75	14.63	9.75
ARM D	15.00	45.00	75.00	4.00	6.00	4.00

TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
		TURNING PROPORTIONS (PERCENTAGE OF H.V.S)	TURNING COUNTS (VEH/HR)		
16.45 - 18.15	ARM A	0.000	0.078	0.865	0.056
		0.0	60.0	662.0	43.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.661	0.000	0.339	0.000
		115.0	0.0	59.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.937	0.008	0.000	0.055
		731.0	6.0	0.0	43.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.603	0.000	0.397	0.000
		193.0	0.0	127.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00									
B-C	0.74	9.36	0.079		0.00	0.09	1.2		0.12
B-AD	1.44	7.75	0.186		0.00	0.23	3.2		0.16
A-BCD	0.54	11.04	0.049		0.00	0.05	0.8		0.10
D-A	2.42	7.77	0.312		0.00	0.44	6.3		0.19
D-BC	1.59	5.28	0.302		0.00	0.42	5.9		0.27
C-ABD	0.08	9.65	0.008		0.00	0.01	0.1		0.10

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-C	0.88	8.71	0.101		0.09	0.11	1.6		0.13
B-AD	1.72	6.96	0.248		0.23	0.32	4.7		0.19
A-BCD	0.64	10.41	0.062		0.05	0.07	1.0		0.10
D-A	2.89	7.14	0.405		0.44	0.66	9.5		0.23
D-BC	1.90	4.55	0.418		0.42	0.69	9.7		0.37
C-ABD	0.09	9.11	0.010		0.01	0.01	0.1		0.11

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-C	1.08	7.81	0.139		0.11	0.16	2.3		0.15
B-AD	2.11	5.87	0.360		0.32	0.55	7.8		0.26
A-BCD	0.79	9.54	0.083		0.07	0.09	1.3		0.11
D-A	3.54	5.79	0.612		0.66	1.47	19.9		0.42
D-BC	2.33	3.45	0.676		0.69	1.80	23.0		0.79
C-ABD	0.11	8.37	0.013		0.01	0.01	0.2		0.12

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
B-C	1.08	7.78	0.139		0.16	0.16	2.4		0.15
B-AD	2.11	5.85	0.361		0.55	0.56	8.3		0.27
A-BCD	0.79	9.54	0.083		0.09	0.09	1.4		0.11
D-A	3.54	5.66	0.626		1.47	1.59	23.2		0.47
D-BC	2.33	3.41	0.683		1.80	1.97	28.5		0.90
C-ABD	0.11	8.35	0.013		0.01	0.01	0.2		0.12

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
B-C	0.88	8.68	0.102		0.16	0.11	1.8		0.13
B-AD	1.72	6.93	0.249		0.56	0.34	5.3		0.19
A-BCD	0.64	10.40	0.062		0.09	0.07	1.0		0.10
D-A	2.89	7.07	0.409		1.59	0.71	11.5		0.25
D-BC	1.90	4.53	0.420		1.97	0.75	12.7		0.40
C-ABD	0.09	9.08	0.010		0.01	0.01	0.2		0.11

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.00-18.15									
B-C	0.74	9.34	0.079		0.11	0.09	1.3		0.12
B-AD	1.44	7.74	0.186		0.34	0.23	3.6		0.16
A-BCD	0.54	11.03	0.049		0.07	0.05	0.8		0.10
D-A	2.42	7.74	0.313		0.71	0.46	7.3		0.19
D-BC	1.59	5.27	0.302		0.75	0.44	7.1		0.27
C-ABD	0.08	9.63	0.008		0.01	0.01	0.1		0.10

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.1	
17.15	0.1	
17.30	0.2	
17.45	0.2	
18.00	0.1	
18.15	0.1	

QUEUE FOR STREAM B-AD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.2	
17.15	0.3	
17.30	0.5	*
17.45	0.6	*
18.00	0.3	
18.15	0.2	

QUEUE FOR STREAM A-BCD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.1	
17.15	0.1	
17.30	0.1	
17.45	0.1	
18.00	0.1	
18.15	0.1	

QUEUE FOR STREAM D-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.4	
17.15	0.7	*
17.30	1.5	*
17.45	1.6	**
18.00	0.7	*
18.15	0.5	

QUEUE FOR STREAM D-BC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.4	
17.15	0.7	*
17.30	1.8	**
17.45	2.0	**
18.00	0.8	*
18.15	0.4	

QUEUE FOR STREAM C-ABD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-C	81.2	54.1	10.7	0.13	10.7	0.13
B-AD	158.3	105.5	32.9	0.21	32.9	0.21
A-BCD	59.2	39.5	6.2	0.11	6.2	0.11
D-A	265.7	177.1	77.7	0.29	77.7	0.29
D-BC	174.8	116.5	86.9	0.50	86.9	0.50
C-ABD	8.3	5.5	0.9	0.11	0.9	0.11
ALL	2806.5	1871.0	215.3	0.08	215.3	0.08

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

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CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

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RELEASE 3.0 (JUNE 2006)

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Run with file:-
"J:\23035 - Cambridge University Parking\Technical\Calcs\Transport\Assessments\Assessments\Girton Road\
Girton Road.vpi"
(drive-on-the-left) at 19:08:13 on Thursday, 9 June 2011

RUN INFORMATION

```
   RUN TITLE: Girton Road
    LOCATION: Cambridge
        DATE: 07/06/11
      CLIENT:
 ENUMERATOR: nfern [NPT-DSK-155]
 JOB NUMBER: 23035
      STATUS: Preliminary
DESCRIPTION: gemetry from OS + GE
```

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA

```
                    MAJOR ROAD (ARM C) --------------------- MAJOR ROAD (ARM A)
                                                I
                                                I
                                                I
                                                I
                                                I
                                                I
                                            MINOR ROAD (ARM B)
```

ARM A IS Hunt Rd Eastbound
ARM B IS Girton Road
ARM C IS Hunt Rd Westbound

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

GEOMETRIC DATA

DATA ITEM	MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 9.15 M.
CENTRAL RESERVE WIDTH	(WCR) 5.60 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 3.00 M.
- VISIBILITY	(VC-B) 120.0 M.
- BLOCKS TRAFFIC	YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 71.0 M.
- VISIBILITY TO RIGHT	(VB-A) 35.0 M.
- LANE 1 WIDTH	(WB-C) 5.00 M.
- LANE 2 WIDTH	(WB-A) 0.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
775.32	0.26	0.10

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
699.31	0.25	0.10	0.16	0.35

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
699.48	0.23	0.23

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: Do Min AM

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN: FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN): BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	9.30	13.95	9.30
ARM B	15.00	45.00	75.00	4.25	6.38	4.25
ARM C	15.00	45.00	75.00	10.26	15.39	10.26

TIME		TURNING PROPORTIONS / TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S) FROM/TO	ARM A	ARM B	ARM C
07.45 - 09.15		ARM A	0.000	0.000	1.000
			0.0	0.0	744.0
			(0.0)	(0.0)	(0.0)
		ARM B	0.100	0.000	0.900
			34.0	0.0	306.0
			(0.0)	(0.0)	(0.0)
		ARM C	0.848	0.152	0.000
			696.0	125.0	0.0
			(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
B-AC	4.27	10.09	0.423		0.00	0.72	10.2		0.17
C-AB	1.57	9.47	0.166		0.00	0.20	2.9		0.13
A-B	0.00								
A-C	9.34								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.106	0.012	0.013	0.005	0.007
C-AB	0.095	0.011		0.009	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-AC	5.09	9.54	0.534		0.72	1.11	15.8		0.22
C-AB	1.87	9.05	0.207		0.20	0.26	3.9		0.14
A-B	0.00								
A-C	11.15								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.095	0.015	0.013	0.004	0.006
C-AB	0.091	0.013		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-AC	6.24	8.76	0.712		1.11	2.29	30.8		0.37
C-AB	2.29	8.46	0.271		0.26	0.37	5.5		0.16
A-B	0.00								
A-C	13.65								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.078	0.018	0.013	0.003	0.005
C-AB	0.085	0.016		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-AC	6.24	8.76	0.712		2.29	2.37	35.1		0.39
C-AB	2.29	8.46	0.271		0.37	0.37	5.6		0.16
A-B	0.00								
A-C	13.65								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.078	0.018	0.013	0.003	0.005
C-AB	0.085	0.016		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-AC	5.09	9.54	0.534		2.37	1.18	19.0		0.23
C-AB	1.87	9.05	0.207		0.37	0.26	4.0		0.14
A-B	0.00								
A-C	11.15								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.095	0.015	0.013	0.004	0.006
C-AB	0.091	0.013		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-AC	4.27	10.09	0.423		1.18	0.75	11.7		0.17
C-AB	1.57	9.47	0.166		0.26	0.20	3.0		0.13
A-B	0.00								
A-C	9.34								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.106	0.012	0.013	0.005	0.007
C-AB	0.095	0.011		0.009	

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.7	*
08.15	1.1	*
08.30	2.3	**
08.45	2.4	**
09.00	1.2	*
09.15	0.7	*

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.2
08.15	0.3
08.30	0.4
08.45	0.4
09.00	0.3
09.15	0.2

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-AC	468.0	312.0	122.6	0.26	122.6	0.26
C-AB	172.1	114.7	24.8	0.14	24.8	0.14
A-B	0.0	0.0				
A-C	1024.1	682.7				
ALL	2622.1	1748.1	147.4	0.06	147.4	0.06

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
775.32	0.26	0.10

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
699.31	0.25	0.10	0.16	0.35

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
699.48	0.23	0.23

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: Do Min PM

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	7.68	11.51	7.68
ARM B	15.00	45.00	75.00	2.22	3.34	2.22
ARM C	15.00	45.00	75.00	13.70	20.55	13.70

TIME	FROM/TO	TURNING PROPORTIONS TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
16.45 - 18.15	ARM A	0.000	0.000	1.000
		0.0	0.0	614.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.073	0.000	0.927
		13.0	0.0	165.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.721	0.279	0.000
		790.0	306.0	0.0
		(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 2

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00									
B-AC	2.23	10.47	0.213		0.00	0.27	3.9		0.12
C-AB	3.84	9.86	0.390		0.00	0.63	9.2		0.16
A-B	0.00								
A-C	7.70								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.098	0.014	0.013	0.004	0.007
C-AB	0.099	0.009		0.009	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-AC	2.67	9.97	0.268		0.27	0.36	5.3		0.14
C-AB	4.58	9.51	0.482		0.63	0.91	13.6		0.20
A-B	0.00								
A-C	9.20								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.085	0.017	0.013	0.004	0.006
C-AB	0.095	0.011		0.009	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-AC	3.27	9.22	0.354		0.36	0.54	7.8		0.17
C-AB	5.62	9.02	0.622		0.91	1.58	23.3		0.29
A-B	0.00								
A-C	11.27								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.066	0.021	0.013	0.003	0.004
C-AB	0.090	0.013		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
B-AC	3.27	9.21	0.355		0.54	0.54	8.1		0.17
C-AB	5.62	9.02	0.622		1.58	1.62	24.8		0.29
A-B	0.00								
A-C	11.27								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.066	0.021	0.013	0.003	0.004
C-AB	0.090	0.013		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
B-AC	2.67	9.96	0.268		0.54	0.37	5.7		0.14
C-AB	4.58	9.51	0.482		1.62	0.96	14.6		0.21
A-B	0.00								
A-C	9.20								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.084	0.017	0.013	0.004	0.006
C-AB	0.095	0.011		0.009	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.00-18.15									
B-AC	2.23	10.47	0.213		0.37	0.27	4.2		0.12
C-AB	3.84	9.86	0.390		0.96	0.65	9.8		0.17
A-B	0.00								
A-C	7.70								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.098	0.014	0.013	0.004	0.007
C-AB	0.099	0.009		0.009	

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.3	
17.15	0.4	
17.30	0.5	*
17.45	0.5	*
18.00	0.4	
18.15	0.3	

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.6	*
17.15	0.9	*
17.30	1.6	**
17.45	1.6	**
18.00	1.0	*
18.15	0.6	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-AC	245.0	163.3	35.0	0.14	35.0	0.14
C-AB	421.2	280.8	95.3	0.23	95.3	0.23
A-B	0.0	0.0				
A-C	845.1	563.4				
ALL	2598.7	1732.5	130.3	0.05	130.4	0.05

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 19:08:54 on 09/06/2011]

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CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

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Run with file:-
"J:\23035 - Cambridge University Parking\Technical\Calcs\Transport\Assessments\Assessments\Girton Road\
Girton Road.vpi"
(drive-on-the-left) at 19:28:30 on Thursday, 9 June 2011

RUN INFORMATION

```
   RUN TITLE: Girton Road
    LOCATION: Cambridge
        DATE: 07/06/11
      CLIENT:
 ENUMERATOR: nfern [NPT-DSK-155]
 JOB NUMBER: 23035
      STATUS: Preliminary
DESCRIPTION: gemetry from OS + GE
```

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA

```
                    MAJOR ROAD (ARM C) --------------------- MAJOR ROAD (ARM A)
                                                I
                                                I
                                                I
                                                I
                                                I
                                                I
                                            MINOR ROAD (ARM B)
```

ARM A IS Hunt Rd Eastbound
ARM B IS Girton Road
ARM C IS Hunt Rd Westbound

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

GEOMETRIC DATA

DATA ITEM	MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 9.15 M.
CENTRAL RESERVE WIDTH	(WCR) 5.60 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 3.00 M.
- VISIBILITY	(VC-B) 120.0 M.
- BLOCKS TRAFFIC	YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 71.0 M.
- VISIBILITY TO RIGHT	(VB-A) 35.0 M.
- LANE 1 WIDTH	(WB-C) 5.00 M.
- LANE 2 WIDTH	(WB-A) 0.00 M.

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
775.32	0.26	0.10

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
699.31	0.25	0.10	0.16	0.35

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
699.48	0.23	0.23

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: Do something

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	8.77	13.16	8.77
ARM B	15.00	45.00	75.00	4.72	7.09	4.72
ARM C	15.00	45.00	75.00	9.61	14.42	9.61

TIME	TURNING PROPORTIONS TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S) FROM/TO	ARM A	ARM B	ARM C
07.45 - 09.15	ARM A	0.000	0.007	0.993
		0.0	5.0	697.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.238	0.000	0.762
		90.0	0.0	288.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.798	0.202	0.000
		614.0	155.0	0.0
		(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
B-AC	4.74	9.72	0.488		0.00	0.93	13.0		0.20
C-AB	1.94	9.60	0.203		0.00	0.25	3.7		0.13
A-B	0.06								
A-C	8.75								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.109	0.012	0.013	0.005	0.007
C-AB	0.096	0.010		0.009	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-AC	5.66	9.13	0.621		0.93	1.56	21.8		0.28
C-AB	2.32	9.20	0.252		0.25	0.33	5.0		0.15
A-B	0.07								
A-C	10.44								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.097	0.014	0.013	0.004	0.007
C-AB	0.092	0.012		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-AC	6.94	8.27	0.839		1.56	4.18	52.0		0.60
C-AB	2.84	8.65	0.329		0.33	0.48	7.2		0.17
A-B	0.09								
A-C	12.79								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.082	0.017	0.013	0.004	0.006
C-AB	0.087	0.015		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-AC	6.94	8.26	0.839		4.18	4.59	66.4		0.71
C-AB	2.84	8.65	0.329		0.48	0.49	7.3		0.17
A-B	0.09								
A-C	12.79								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.082	0.017	0.013	0.004	0.006
C-AB	0.087	0.015		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-AC	5.66	9.12	0.621		4.59	1.72	29.6		0.32
C-AB	2.32	9.20	0.252		0.49	0.34	5.2		0.15
A-B	0.07								
A-C	10.44								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.097	0.014	0.013	0.004	0.007
C-AB	0.092	0.012		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-AC	4.74	9.72	0.488		1.72	0.98	15.5		0.20
C-AB	1.94	9.60	0.203		0.34	0.26	3.9		0.13
A-B	0.06								
A-C	8.75								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.109	0.012	0.013	0.005	0.007
C-AB	0.096	0.010		0.009	

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.9	*
08.15	1.6	**
08.30	4.2	****
08.45	4.6	*****
09.00	1.7	**
09.15	1.0	*

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.3
08.15	0.3
08.30	0.5
08.45	0.5
09.00	0.3
09.15	0.3

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-AC	520.3	346.9	198.3	0.38	198.3	0.38
C-AB	213.3	142.2	32.3	0.15	32.3	0.15
A-B	6.9	4.6				
A-C	959.4	639.6				
ALL	2545.0	1696.7	230.6	0.09	230.6	0.09

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

.SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity

will be adjusted)

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
775.32	0.26	0.10

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
699.31	0.25	0.10	0.16	0.35

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
699.48	0.23	0.23

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100

Demand set: Do Something PM

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	7.60	11.40	7.60
ARM B	15.00	45.00	75.00	2.47	3.71	2.47
ARM C	15.00	45.00	75.00	12.70	19.05	12.70

TIME	FROM/TO	ARM A	ARM B	ARM C
		TURNING PROPORTIONS		
		TURNING COUNTS (VEH/HR)		
		(PERCENTAGE OF H.V.S)		
16.45 - 18.15	ARM A	0.000	0.020	0.980
		0.0	12.0	596.0
		(0.0)	(0.0)	(0.0)
	ARM B	0.162	0.000	0.838
		32.0	0.0	166.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.640	0.360	0.000
		650.0	366.0	0.0
		(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 2

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00									
B-AC	2.48	10.02	0.248		0.00	0.33	4.7		0.13
C-AB	4.59	9.87	0.465		0.00	0.85	12.5		0.19
A-B	0.15								
A-C	7.48								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.099	0.014	0.013	0.004	0.007
C-AB	0.099	0.009		0.009	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-AC	2.97	9.41	0.315		0.33	0.45	6.6		0.15
C-AB	5.48	9.53	0.576		0.85	1.31	19.5		0.24
A-B	0.18								
A-C	8.93								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.085	0.017	0.013	0.004	0.006
C-AB	0.095	0.011		0.009	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-AC	3.63	8.49	0.428		0.45	0.73	10.5		0.20
C-AB	6.72	9.05	0.742		1.31	2.71	38.6		0.40
A-B	0.22								
A-C	10.94								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.067	0.020	0.013	0.003	0.005
C-AB	0.091	0.013		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
B-AC	3.63	8.47	0.429		0.73	0.74	11.1		0.21
C-AB	6.72	9.05	0.742		2.71	2.85	44.0		0.42
A-B	0.22								
A-C	10.94								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.066	0.021	0.013	0.003	0.005
C-AB	0.091	0.013		0.008	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
B-AC	2.97	9.39	0.316		0.74	0.47	7.3		0.16
C-AB	5.48	9.53	0.576		2.85	1.41	21.9		0.26
A-B	0.18								
A-C	8.93								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.085	0.017	0.013	0.004	0.006
C-AB	0.095	0.011		0.009	

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.00-18.15									
B-AC	2.48	10.00	0.248		0.47	0.33	5.2		0.13
C-AB	4.59	9.87	0.465		1.41	0.89	13.5		0.19
A-B	0.15								
A-C	7.48								

EFFECT ON CAPACITY (PCU/MIN) OF MARGINAL CHANGES IN:

MARGINAL CHANGE:	LANE WIDTH (.1M)	MAJOR RD. WIDTH (.1M)	CENT RES WIDTH (.1M)	VIS TO LEFT (AHEAD FOR MAJOR) (M)	VISIBILITY TO RIGHT (M)
B-AC	0.098	0.014	0.013	0.004	0.007
C-AB	0.099	0.009		0.009	

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.3	
17.15	0.5	
17.30	0.7	*
17.45	0.7	*
18.00	0.5	
18.15	0.3	

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.8	*
17.15	1.3	*
17.30	2.7	***
17.45	2.8	***
18.00	1.4	*
18.15	0.9	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-AC	272.5	181.7	45.3	0.17	45.3	0.17
C-AB	503.8	335.8	149.9	0.30	149.9	0.30
A-B	16.5	11.0				
A-C	820.3	546.9				
ALL	2507.8	1671.9	195.2	0.08	195.2	0.08

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

[Printed at 19:29:35 on 09/06/2011]

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)

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Run with file:-
"j:\23035 - North-West Cambridge\Arcady\M11 J12 Roundabout\2026 Do Minimum\
M11 J12 Roundabout 2026 Do Min - AM Peak.vai"
(drive-on-the-left) at 16:21:55 on Wednesday, 9 March 2011

.FILE PROPERTIES
****

RUN TITLE: 23035 - M11 J12 Roundabout - 2026 Do Min - AM Peak
LOCATION:
DATE: 09/03/11
CLIENT:
ENUMERATOR: ktaylor [NPT-PDT-00929]
JOB NUMBER: 23035
STATUS:
DESCRIPTION:

.INPUT DATA
****
ARM A - A603 Barton Road
ARM B - Coton Road
ARM C - A603 Cambridge Road
ARM D - Grantchester Road

.GEOMETRIC DATA

T5

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	7.60	9.00	10.00	55.00	106.00	26.0	0.598	45.209
ARM B	2.50	7.30	17.00	25.00	112.00	0.0	0.470	28.247
ARM C	7.50	7.50	0.00	35.00	106.00	12.0	0.572	41.034
ARM D	3.30	8.80	15.00	25.00	112.00	46.0	0.435	28.098

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

.TRAFFIC DEMAND DATA

Only sets included in the current run are shown
.SCALING FACTORS
T13

IARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(07.45)AND ENDS(09.15)
.LENGTH OF TIME PERIOD -(90) MINUTES
.LENGTH OF TIME SEGMENT - (15) MINUTES

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

.DEMAND SET TITLE: 23035 - M11 J12 Roundabout - 2026 Do Min - AM Peak
T15

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	8.13	12.19	8.13
ARM B	15.00	45.00	75.00	2.58	3.86	2.58
ARM C	15.00	45.00	75.00	14.15	21.22	14.15
ARM D	15.00	45.00	75.00	9.59	14.38	9.59

DEMAND SET TITLE: 23035 - M11 J12 Roundabout - 2026 Do Min - AM Peak
T33

TIME	TURNING PROPORTIONS (PERCENTAGE OF H.V.S) FROM/T	ARM A	ARM B	ARM C	ARM D

07.45 - 09.15				
ARM A	0.000	0.000	0.911	0.089
	0.0	0.0	592.0	58.0
	(0.0)	(0.0)	(0.0)	(0.0)
ARM B	0.000	0.000	0.631	0.369
	0.0	0.0	130.0	76.0
	(0.0)	(0.0)	(0.0)	(0.0)
ARM C	0.517	0.208	0.249	0.026
	585.0	236.0	282.0	29.0
	(0.0)	(0.0)	(0.0)	(0.0)
ARM D	0.214	0.201	0.584	0.001
	164.0	154.0	448.0	1.0
	(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
ARM A	8.16	36.83	0.221	- - -	0.0	0.3	4.2	-	0.035
ARM B	2.58	20.13	0.128	- - -	0.0	0.1	2.2	-	0.057
ARM C	14.20	40.07	0.354	- - -	0.0	0.5	8.1	-	0.039
ARM D	9.62	22.09	0.436	- - -	0.0	0.8	11.1	-	0.080

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	9.74	35.18	0.277	- - -	0.3	0.4	5.7	-	0.039
ARM B	3.09	18.53	0.167	- - -	0.1	0.2	2.9	-	0.065
ARM C	16.96	39.88	0.425	- - -	0.5	0.7	10.9	-	0.044
ARM D	11.49	20.91	0.550	- - -	0.8	1.2	17.4	-	0.106

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	11.93	32.95	0.362	- - -	0.4	0.6	8.3	-	0.048
ARM B	3.78	16.37	0.231	- - -	0.2	0.3	4.4	-	0.079
ARM C	20.77	39.62	0.524	- - -	0.7	1.1	16.1	-	0.053
ARM D	14.07	19.30	0.729	- - -	1.2	2.6	35.7	-	0.185

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	11.93	32.90	0.363	- - -	0.6	0.6	8.5	-	0.048
ARM B	3.78	16.33	0.231	- - -	0.3	0.3	4.5	-	0.080
ARM C	20.77	39.62	0.524	- - -	1.1	1.1	16.4	-	0.053
ARM D	14.07	19.29	0.730	- - -	2.6	2.6	39.2	-	0.192

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	9.74	35.11	0.277	- - -	0.6	0.4	5.9	-	0.039
ARM B	3.09	18.49	0.167	- - -	0.3	0.2	3.1	-	0.065
ARM C	16.96	39.88	0.425	- - -	1.1	0.7	11.4	-	0.044
ARM D	11.49	20.89	0.550	- - -	2.6	1.2	19.5	-	0.108

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
ARM A	8.16	36.77	0.222	- - -	0.4	0.3	4.3	-	0.035
ARM B	2.58	20.09	0.129	- - -	0.2	0.1	2.3	-	0.057
ARM C	14.20	40.07	0.355	- - -	0.7	0.6	8.4	-	0.039
ARM D	9.62	22.07	0.436	- - -	1.2	0.8	12.1	-	0.081

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.3	
08.15	0.4	
08.30	0.6	*
08.45	0.6	*
09.00	0.4	
09.15	0.3	

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.1	
08.15	0.2	
08.30	0.3	
08.45	0.3	
09.00	0.2	
09.15	0.1	

.QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.5	*
08.15	0.7	*
08.30	1.1	*
08.45	1.1	*
09.00	0.7	*
09.15	0.6	*

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.8	*
08.15	1.2	*
08.30	2.6	***
08.45	2.6	***
09.00	1.2	*
09.15	0.8	*

.QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	894.7	596.5	36.9	0.04	36.9	0.04
B	283.5	189.0	19.3	0.07	19.3	0.07
C	1558.1	1038.7	71.2	0.05	71.2	0.05
D	1055.7	703.8	135.0	0.13	135.0	0.13
ALL	3792.1	2528.0	262.4	0.07	262.4	0.07

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)

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Web: www.trlsoftware.co.uk

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
IN NO WAY RELIEVED OF THEIR RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:-
"j:\23035 - North-West Cambridge\Arcady\M11 J12 Roundabout\2026 Do Minimum\
M11 J12 Roundabout 2026 Do Min - PM Peak.vai"
(drive-on-the-left) at 16:25:18 on Wednesday, 9 March 2011

.FILE PROPERTIES
****

RUN TITLE: 23035 - M11 J12 Roundabout - 2026 Do Min - PM Peak
LOCATION:
DATE: 09/03/11
CLIENT:
ENUMERATOR: ktaylor [NPT-PDT-00929]
JOB NUMBER: 23035
STATUS:
DESCRIPTION:

.INPUT DATA
****
ARM A - A603 Barton Road
ARM B - Coton Road
ARM C - A603 Cambridge Road
ARM D - Grantchester Road

.GEOMETRIC DATA

T5

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	7.60	9.00	10.00	55.00	106.00	26.0	0.598	45.209
ARM B	2.50	7.30	17.00	25.00	112.00	0.0	0.470	28.247
ARM C	7.50	7.50	0.00	35.00	106.00	12.0	0.572	41.034
ARM D	3.30	8.80	15.00	25.00	112.00	46.0	0.435	28.098

V = approach half-width
E = entry width
L = effective flare length
R = entry radius
D = inscribed circle diameter
PHI = entry angle

.TRAFFIC DEMAND DATA

Only sets included in the current run are shown
.SCALING FACTORS

T13

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(16.45)AND ENDS(18.15)
.LENGTH OF TIME PERIOD -(90) MINUTES
.LENGTH OF TIME SEGMENT - (15) MINUTES

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

.DEMAND SET TITLE: 23035 - M11 J12 Roundabout - 2026 Do Min - PM Peak

T15

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	11.71	17.57	11.71
ARM B	15.00	45.00	75.00	3.65	5.48	3.65
ARM C	15.00	45.00	75.00	8.84	13.26	8.84
ARM D	15.00	45.00	75.00	13.29	19.93	13.29

DEMAND SET TITLE: 23035 - M11 J12 Roundabout - 2026 Do Min - PM Peak

T33

TIME	TURNING PROPORTIONS (PERCENTAGE OF H.V.S) FROM/T	ARM A	ARM B	ARM C	ARM D

16.45 - 18.15				
ARM A	0.000	0.000	0.763	0.237
	0.0	0.0	715.0	222.0
	(0.0)	(0.0)	(0.0)	(0.0)
ARM B	0.000	0.000	0.486	0.514
	0.0	0.0	142.0	150.0
	(0.0)	(0.0)	(0.0)	(0.0)
ARM C	0.516	0.127	0.293	0.064
	365.0	90.0	207.0	45.0
	(0.0)	(0.0)	(0.0)	(0.0)
ARM D	0.255	0.167	0.557	0.022
	271.0	177.0	592.0	23.0
	(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00									
ARM A	11.76	37.07	0.317	- - -	0.0	0.5	6.8	-	0.039
ARM B	3.66	17.91	0.205	- - -	0.0	0.3	3.7	-	0.070
ARM C	8.87	38.21	0.232	- - -	0.0	0.3	4.5	-	0.034
ARM D	13.34	24.49	0.545	- - -	0.0	1.2	17.0	-	0.089

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	14.04	35.47	0.396	- - -	0.5	0.7	9.6	-	0.047
ARM B	4.38	15.88	0.276	- - -	0.3	0.4	5.5	-	0.087
ARM C	10.59	37.66	0.281	- - -	0.3	0.4	5.8	-	0.037
ARM D	15.93	23.78	0.670	- - -	1.2	2.0	28.2	-	0.126

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	17.19	33.35	0.516	- - -	0.7	1.1	15.4	-	0.062
ARM B	5.36	13.15	0.408	- - -	0.4	0.7	9.8	-	0.128
ARM C	12.97	36.90	0.352	- - -	0.4	0.5	8.0	-	0.042
ARM D	19.51	22.81	0.855	- - -	2.0	5.3	68.5	-	0.269

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	17.19	33.26	0.517	- - -	1.1	1.1	15.9	-	0.062
ARM B	5.36	13.08	0.410	- - -	0.7	0.7	10.3	-	0.130
ARM C	12.97	36.89	0.352	- - -	0.5	0.5	8.1	-	0.042
ARM D	19.51	22.81	0.855	- - -	5.3	5.5	81.4	-	0.297

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	14.04	35.34	0.397	- - -	1.1	0.7	10.1	-	0.047
ARM B	4.38	15.78	0.277	- - -	0.7	0.4	6.0	-	0.088
ARM C	10.59	37.64	0.281	- - -	0.5	0.4	6.0	-	0.037
ARM D	15.93	23.78	0.670	- - -	5.5	2.1	34.0	-	0.135

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.00-18.15									
ARM A	11.76	37.01	0.318	- - -	0.7	0.5	7.1	-	0.040
ARM B	3.66	17.85	0.205	- - -	0.4	0.3	4.0	-	0.071
ARM C	8.87	38.20	0.232	- - -	0.4	0.3	4.6	-	0.034
ARM D	13.34	24.48	0.545	- - -	2.1	1.2	18.9	-	0.091

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.5	
17.15	0.7	*
17.30	1.1	*
17.45	1.1	*
18.00	0.7	*
18.15	0.5	

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.3	
17.15	0.4	
17.30	0.7	*
17.45	0.7	*
18.00	0.4	
18.15	0.3	

.QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.3	
17.15	0.4	
17.30	0.5	*
17.45	0.5	*
18.00	0.4	
18.15	0.3	

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	1.2	*
17.15	2.0	**
17.30	5.3	*****
17.45	5.5	******
18.00	2.1	**
18.15	1.2	*

.QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1289.7	859.8	65.0	0.05	65.1	0.05
B	401.9	267.9	39.3	0.10	39.3	0.10
C	973.1	648.8	36.9	0.04	36.9	0.04
D	1463.1	975.4	248.0	0.17	248.0	0.17
ALL	4127.9	2751.9	389.2	0.09	389.3	0.09

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END OF JOB

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

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Run with file:-
"j:\23035 - North-West Cambridge\Arcady\M11 J12 Roundabout\2026 Do Something\
M11 J12 Roundabout 2026 Do Some - AM Peak.vai"
(drive-on-the-left) at 16:26:06 on Wednesday, 9 March 2011

.FILE PROPERTIES
****

RUN TITLE: 23035 - M11 J12 Roundabout - 2026 Do Some - AM Peak
LOCATION:
DATE: 09/03/11
CLIENT:
ENUMERATOR: ktaylor [NPT-PDT-00929]
JOB NUMBER: 23035
STATUS:
DESCRIPTION:

.INPUT DATA
****
ARM A - A603 Barton Road
ARM B - Coton Road
ARM C - A603 Cambridge Road
ARM D - Grantchester Road

.GEOMETRIC DATA

T5

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	7.60	9.00	10.00	55.00	106.00	26.0	0.598	45.209
ARM B	2.50	7.30	17.00	25.00	112.00	0.0	0.470	28.247
ARM C	7.50	7.50	0.00	35.00	106.00	12.0	0.572	41.034
ARM D	3.30	8.80	15.00	25.00	112.00	46.0	0.435	28.098

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

.TRAFFIC DEMAND DATA

Only sets included in the current run are shown
.SCALING FACTORS

T13

IARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(07.45)AND ENDS(09.15)
.LENGTH OF TIME PERIOD -(90) MINUTES
.LENGTH OF TIME SEGMENT - (15) MINUTES

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

.DEMAND SET TITLE: 23035 - M11 J12 Roundabout - 2026 Do Some - AM Peak

T15

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	8.61	12.92	8.61
ARM B	15.00	45.00	75.00	2.72	4.09	2.72
ARM C	15.00	45.00	75.00	14.09	21.13	14.09
ARM D	15.00	45.00	75.00	9.64	14.46	9.64

DEMAND SET TITLE: 23035 - M11 J12 Roundabout - 2026 Do Some - AM Peak

T33

TIME	TURNING PROPORTIONS (PERCENTAGE OF H.V.S) FROM/T	ARM A	ARM B	ARM C	ARM D

07.45 - 09.15				
ARM A	0.000	0.000	0.897	0.103
	0.0	0.0	618.0	71.0
	(0.0)	(0.0)	(0.0)	(0.0)
ARM B	0.000	0.000	0.638	0.362
	0.0	0.0	139.0	79.0
	(0.0)	(0.0)	(0.0)	(0.0)
ARM C	0.536	0.244	0.195	0.025
	604.0	275.0	220.0	28.0
	(0.0)	(0.0)	(0.0)	(0.0)
ARM D	0.228	0.214	0.556	0.001
	176.0	165.0	429.0	1.0
	(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
ARM A	8.65	37.06	0.233	- - -	0.0	0.3	4.5	-	0.035
ARM B	2.74	20.37	0.134	- - -	0.0	0.2	2.3	-	0.057
ARM C	14.14	39.95	0.354	- - -	0.0	0.5	8.0	-	0.039
ARM D	9.67	22.11	0.438	- - -	0.0	0.8	11.2	-	0.080

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
ARM A	10.32	35.45	0.291	- - -	0.3	0.4	6.1	-	0.040
ARM B	3.27	18.83	0.173	- - -	0.2	0.2	3.1	-	0.064
ARM C	16.89	39.74	0.425	- - -	0.5	0.7	10.9	-	0.044
ARM D	11.55	20.94	0.552	- - -	0.8	1.2	17.5	-	0.106

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	12.64	33.29	0.380	- - -	0.4	0.6	9.0	-	0.048
ARM B	4.00	16.73	0.239	- - -	0.2	0.3	4.6	-	0.078
ARM C	20.68	39.45	0.524	- - -	0.7	1.1	16.1	-	0.053
ARM D	14.15	19.33	0.732	- - -	1.2	2.6	36.2	-	0.186

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	12.64	33.24	0.380	- - -	0.6	0.6	9.2	-	0.049
ARM B	4.00	16.70	0.240	- - -	0.3	0.3	4.7	-	0.079
ARM C	20.68	39.45	0.524	- - -	1.1	1.1	16.4	-	0.053
ARM D	14.15	19.32	0.732	- - -	2.6	2.7	39.7	-	0.193

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
ARM A	10.32	35.39	0.292	- - -	0.6	0.4	6.3	-	0.040
ARM B	3.27	18.78	0.174	- - -	0.3	0.2	3.2	-	0.065
ARM C	16.89	39.74	0.425	- - -	1.1	0.7	11.3	-	0.044
ARM D	11.55	20.92	0.552	- - -	2.7	1.3	19.7	-	0.109

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
ARM A	8.65	37.01	0.234	- - -	0.4	0.3	4.6	-	0.035
ARM B	2.74	20.34	0.135	- - -	0.2	0.2	2.4	-	0.057
ARM C	14.14	39.95	0.354	- - -	0.7	0.6	8.4	-	0.039
ARM D	9.67	22.09	0.438	- - -	1.3	0.8	12.1	-	0.081

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.3	
08.15	0.4	
08.30	0.6	*
08.45	0.6	*
09.00	0.4	
09.15	0.3	

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.2
08.15	0.2
08.30	0.3
08.45	0.3
09.00	0.2
09.15	0.2

.QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.5	*
08.15	0.7	*
08.30	1.1	*
08.45	1.1	*
09.00	0.7	*
09.15	0.6	*

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.8	*
08.15	1.2	*
08.30	2.6	***
08.45	2.7	***
09.00	1.3	*
09.15	0.8	*

.QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	948.4	632.2	39.6	0.04	39.6	0.04
B	300.1	200.0	20.3	0.07	20.3	0.07
C	1551.2	1034.2	71.1	0.05	71.1	0.05
D	1061.2	707.5	136.5	0.13	136.5	0.13
ALL	3860.9	2573.9	267.4	0.07	267.5	0.07

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END OF JOB

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

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IN NO WAY RELIEVED OF THEIR RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:-
"j:\23035 - North-West Cambridge\Arcady\M11 J12 Roundabout\2026 Do Something\
M11 J12 Roundabout 2026 Do Some - PM Peak.vai"
(drive-on-the-left) at 16:26:47 on Wednesday, 9 March 2011

.FILE PROPERTIES
****

RUN TITLE: 23035 - M11 J12 Roundabout - 2026 Do Some - PM Peak
LOCATION:
DATE: 09/03/11
CLIENT:
ENUMERATOR: ktaylor [NPT-PDT-00929]
JOB NUMBER: 23035
STATUS:
DESCRIPTION:

.INPUT DATA
****
ARM A - A603 Barton Road
ARM B - Coton Road
ARM C - A603 Cambridge Road
ARM D - Grantchester Road

.GEOMETRIC DATA

T5

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	7.60	9.00	10.00	55.00	106.00	26.0	0.598	45.209
ARM B	2.50	7.30	17.00	25.00	112.00	0.0	0.470	28.247
ARM C	7.50	7.50	0.00	35.00	106.00	12.0	0.572	41.034
ARM D	3.30	8.80	15.00	25.00	112.00	46.0	0.435	28.098

V = approach half-width
E = entry width
L = effective flare length
R = entry radius
D = inscribed circle diameter
PHI = entry angle

.TRAFFIC DEMAND DATA

Only sets included in the current run are shown
.SCALING FACTORS

T13

IARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(16.45)AND ENDS(18.15)
.LENGTH OF TIME PERIOD -(90) MINUTES
.LENGTH OF TIME SEGMENT - (15) MINUTES

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

.DEMAND SET TITLE: 23035 - M11 J12 Roundabout - 2026 Do Some - PM Peak

T15

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	12.48	18.71	12.48
ARM B	15.00	45.00	75.00	3.34	5.01	3.34
ARM C	15.00	45.00	75.00	9.32	13.99	9.32
ARM D	15.00	45.00	75.00	13.15	19.72	13.15

DEMAND SET TITLE: 23035 - M11 J12 Roundabout - 2026 Do Some - PM Peak

T33

TIME	TURNING PROPORTIONS (PERCENTAGE OF H.V.S) FROM/T	ARM A	ARM B	ARM C	ARM D

16.45 - 18.15				
ARM A	0.000	0.000	0.767	0.233
	0.0	0.0	765.0	233.0
	(0.0)	(0.0)	(0.0)	(0.0)
ARM B	0.000	0.000	0.427	0.573
	0.0	0.0	114.0	153.0
	(0.0)	(0.0)	(0.0)	(0.0)
ARM C	0.540	0.125	0.269	0.066
	403.0	93.0	201.0	49.0
	(0.0)	(0.0)	(0.0)	(0.0)
ARM D	0.255	0.161	0.563	0.022
	268.0	169.0	592.0	23.0
	(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00									
ARM A	12.52	37.16	0.337	- - -	0.0	0.5	7.5	-	0.040
ARM B	3.35	17.59	0.190	- - -	0.0	0.2	3.4	-	0.070
ARM C	9.36	38.11	0.246	- - -	0.0	0.3	4.8	-	0.035
ARM D	13.20	24.30	0.543	- - -	0.0	1.2	16.9	-	0.089

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	14.95	35.57	0.420	- - -	0.5	0.7	10.6	-	0.048
ARM B	4.00	15.49	0.258	- - -	0.2	0.3	5.1	-	0.087
ARM C	11.18	37.54	0.298	- - -	0.3	0.4	6.3	-	0.038
ARM D	15.76	23.56	0.669	- - -	1.2	2.0	28.1	-	0.127

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
ARM A	18.31	33.47	0.547	- - -	0.7	1.2	17.5	-	0.066
ARM B	4.90	12.68	0.387	- - -	0.3	0.6	9.0	-	0.128
ARM C	13.69	36.76	0.372	- - -	0.4	0.6	8.7	-	0.043
ARM D	19.30	22.54	0.857	- - -	2.0	5.3	69.0	-	0.274

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
ARM A	18.31	33.38	0.549	- - -	1.2	1.2	18.1	-	0.066
ARM B	4.90	12.60	0.389	- - -	0.6	0.6	9.4	-	0.130
ARM C	13.69	36.75	0.373	- - -	0.6	0.6	8.9	-	0.043
ARM D	19.30	22.53	0.857	- - -	5.3	5.6	82.3	-	0.304

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
ARM A	14.95	35.44	0.422	- - -	1.2	0.7	11.2	-	0.049
ARM B	4.00	15.39	0.260	- - -	0.6	0.4	5.5	-	0.088
ARM C	11.18	37.52	0.298	- - -	0.6	0.4	6.5	-	0.038
ARM D	15.76	23.55	0.669	- - -	5.6	2.1	34.0	-	0.136

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.00-18.15									
ARM A	12.52	37.09	0.338	- - -	0.7	0.5	7.8	-	0.041
ARM B	3.35	17.52	0.191	- - -	0.4	0.2	3.6	-	0.071
ARM C	9.36	38.10	0.246	- - -	0.4	0.3	5.0	-	0.035
ARM D	13.20	24.29	0.543	- - -	2.1	1.2	18.8	-	0.091

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.5	*
17.15	0.7	*
17.30	1.2	*
17.45	1.2	*
18.00	0.7	*
18.15	0.5	*

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.2	
17.15	0.3	
17.30	0.6	*
17.45	0.6	*
18.00	0.4	
18.15	0.2	

.QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	0.3	
17.15	0.4	
17.30	0.6	*
17.45	0.6	*
18.00	0.4	
18.15	0.3	

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.00	1.2	*
17.15	2.0	**
17.30	5.3	*****
17.45	5.6	******
18.00	2.1	**
18.15	1.2	*

.QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	1373.7	915.8	72.7	0.05	72.7	0.05
B	367.5	245.0	36.0	0.10	36.0	0.10
C	1026.8	684.5	40.1	0.04	40.1	0.04
D	1448.0	965.3	249.1	0.17	249.1	0.17
ALL	4216.0	2810.7	397.8	0.09	397.8	0.09

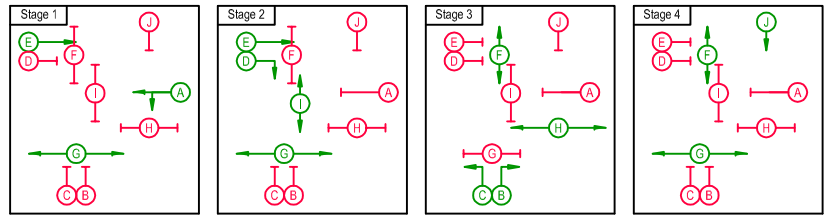
* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

Appendix 12 - Site Access Plans

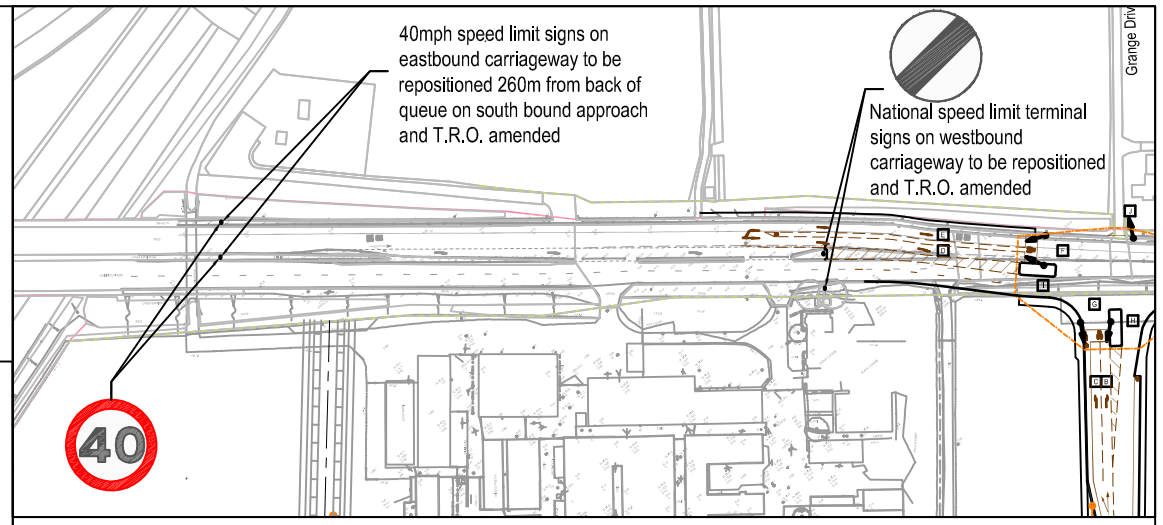
North West Cambridge
Transport Assessment

Staging At Huntingdon Road West



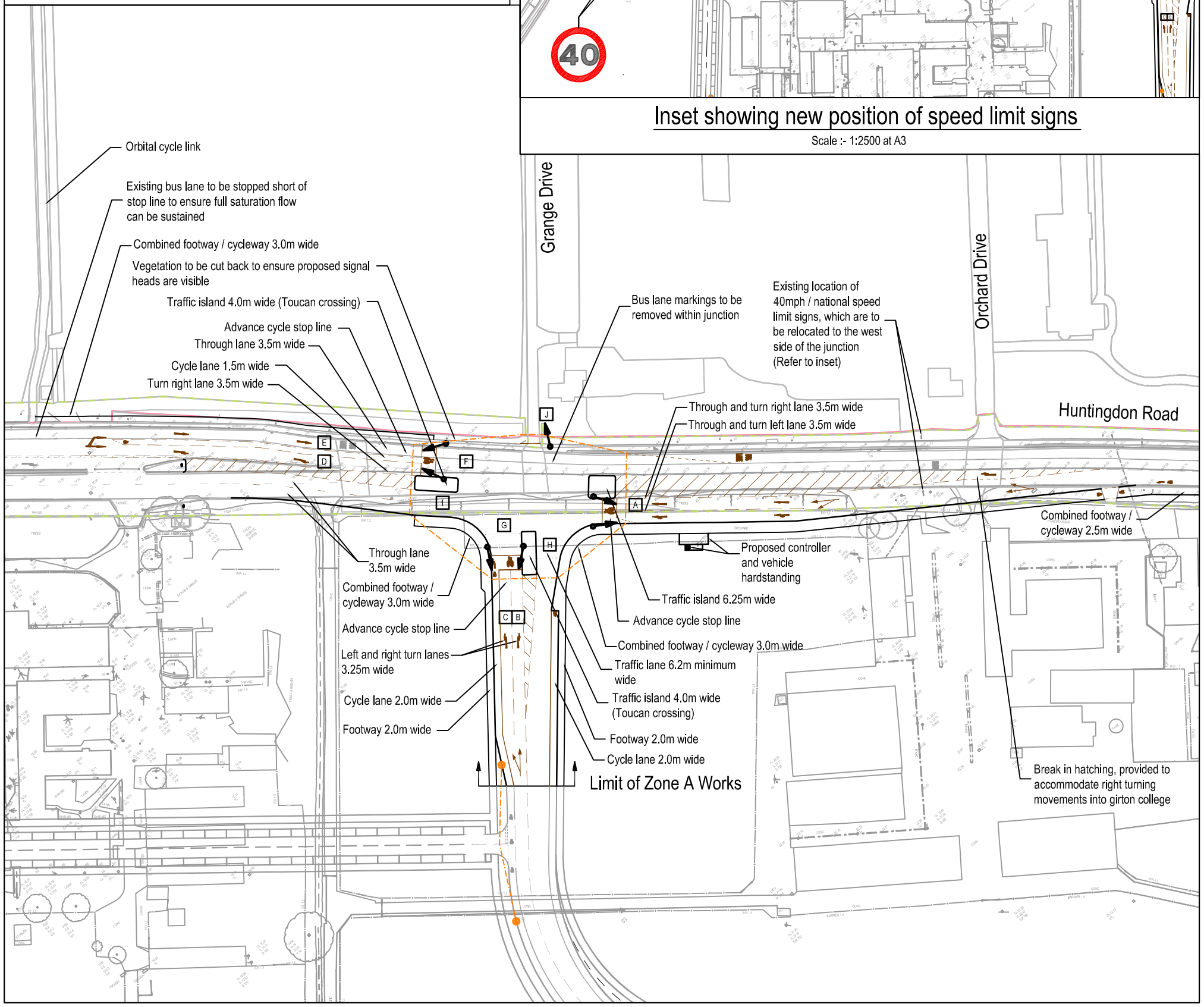
Note :- 4tage 4 to be called between stages 2 - 3 or 3 - 1 only.

Demand activated stage to release Grange Drive



Inset showing new position of speed limit signs

Scale :- 1:2500 at A3



KEY

Contextual Information :

- Roadmarkings
- Highway land boundary
- Visibility Splay

Carriageway works would be undertaken within the application site boundary wherever junction works are proposed and extend beyond the markings for junction works. The exact extent of carriageway works to be the subject of a condition.

For approval :

- Application site boundary
- Junction works

NOTES

1. All dimensions are in metres unless noted otherwise.
2. Secondary signal heads and other associated traffic signal infrastructure omitted for clarity.

Contextual information only not forming part of application

North West Cambridge

Illustrative Junction Plan 1 - Huntingdon Road Junction West

September 2011

UNIVERSITY OF CAMBRIDGE

0 10 20m
Scale 1:1250 @ A3

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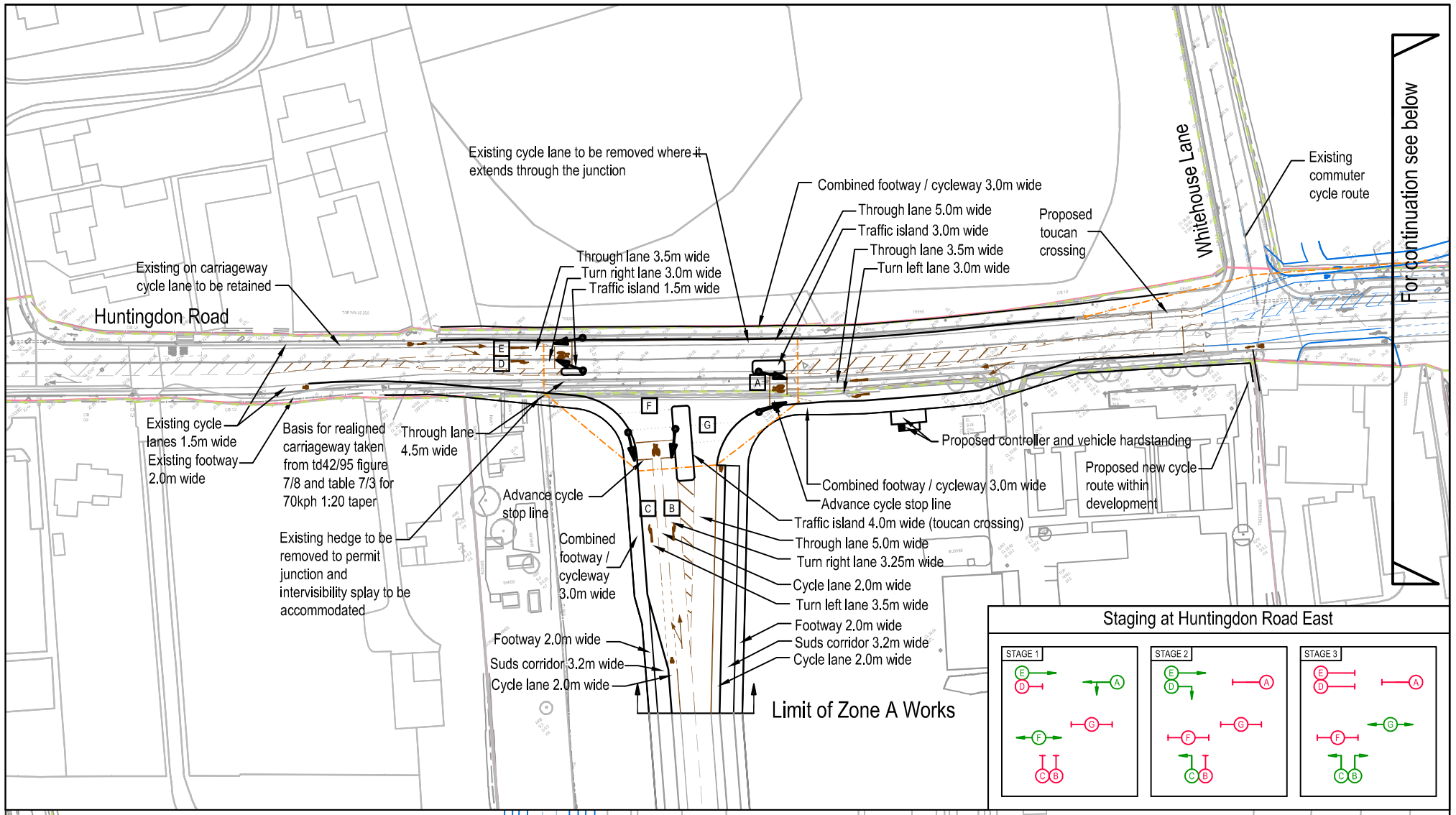

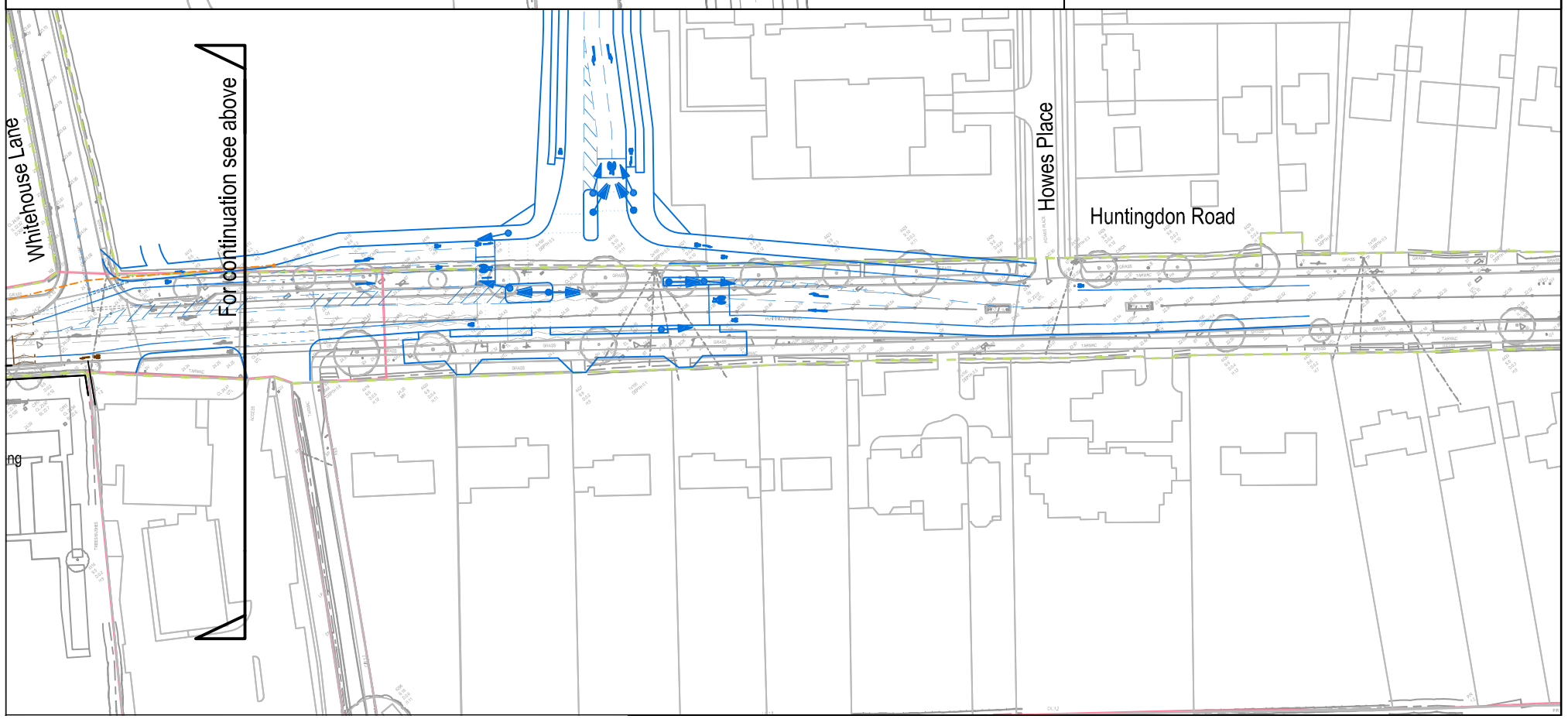

KEY

Contextual Information :

- Roadmarkings
- Highway land boundary
- Visibility Splay
- NIAB site access

Carriageway works would be undertaken within the application site boundary wherever junction works are proposed and extend beyond the markings for junction works. The exact extent of carriageway works to be the subject of a condition.

For approval :

- Application site boundary
- Junction works

NOTES

1. All dimensions are in metres unless noted otherwise.
2. Secondary signal heads and other associated traffic signal infrastructure omitted for clarity.

Contextual information only not forming part of application

North West Cambridge

Illustrative Junction Plan 2 - Huntingdon Road Junction East

September 2011

UNIVERSITY OF CAMBRIDGE

0 10 20m
Scale 1:1250@A3

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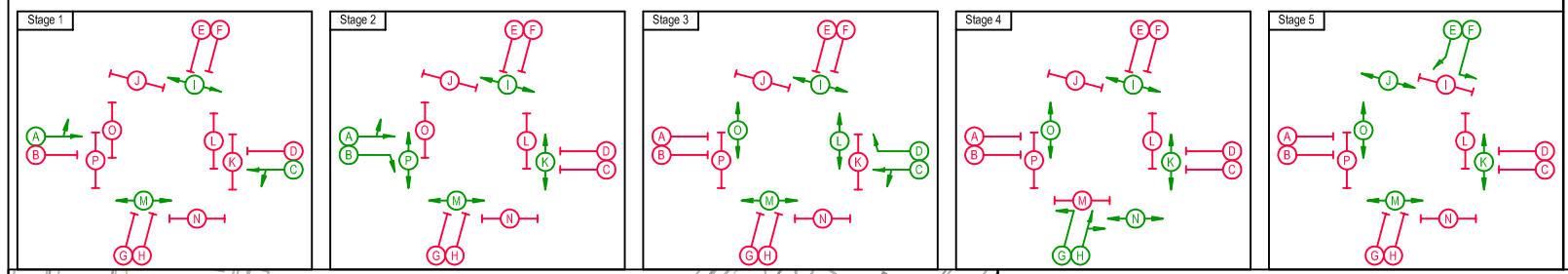
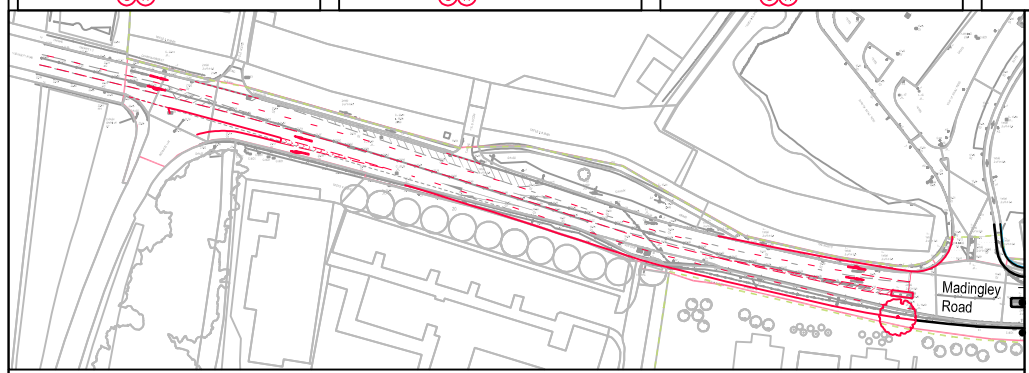
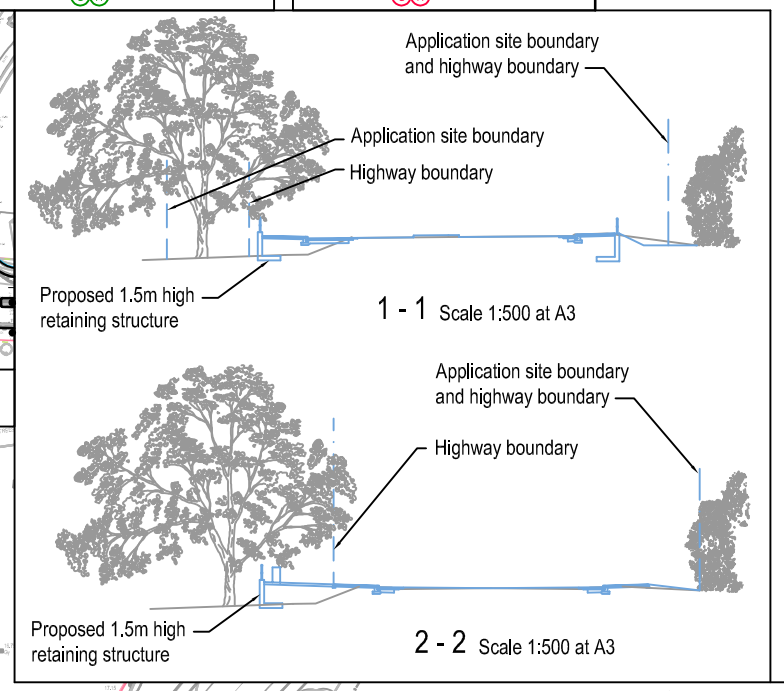
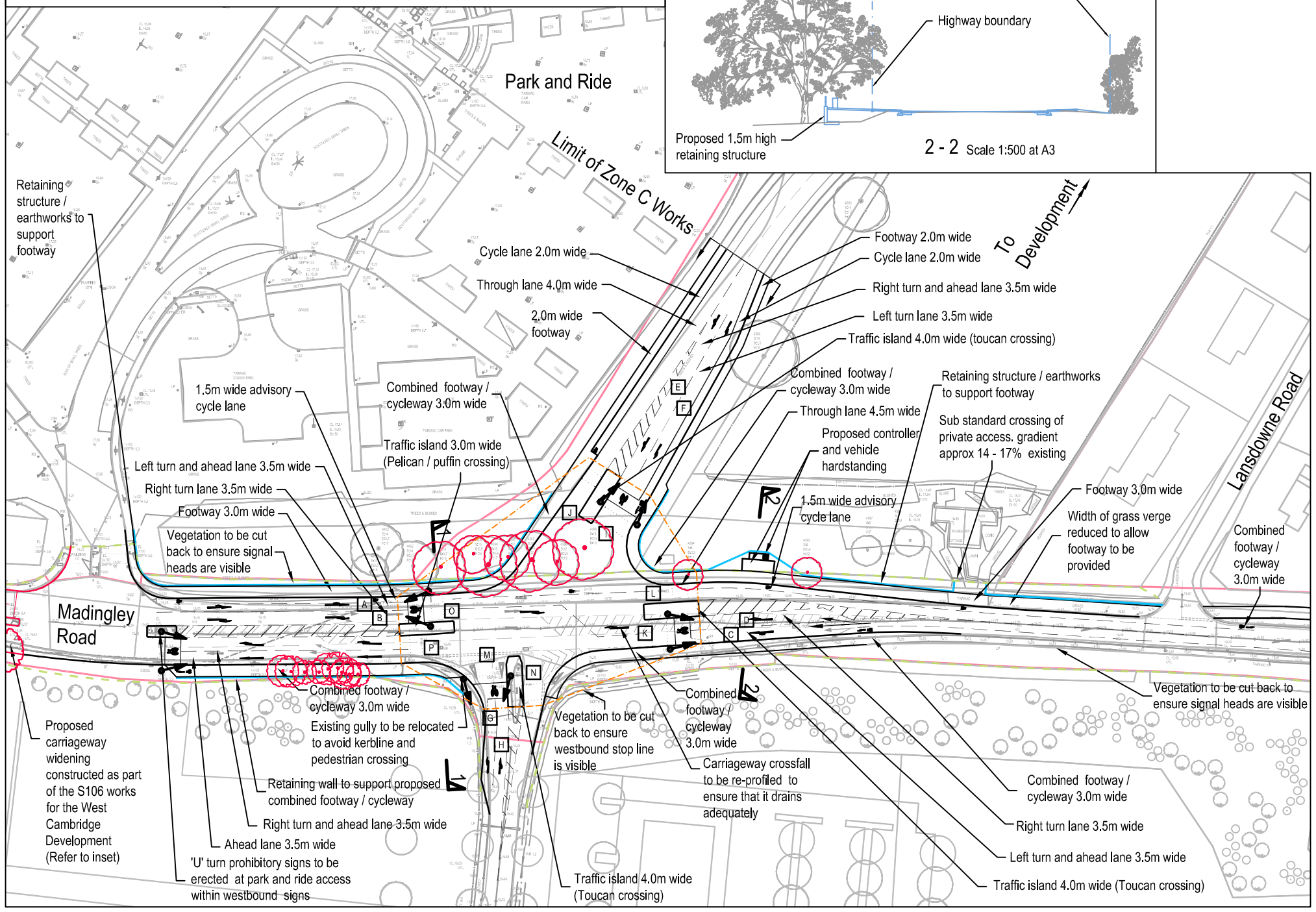
Staging At High Cross Junction





Inset showing West Cambridge Development S106 Works Scale :- 1:1250





KEY

Contextual Information :

- Roadmarkings
- Highway land boundary
- Visibility Splay
- Existing Tree to be removed
- West Cambridge Development S106 Works
- Retaining structure / earthworks to support footway

Sections

- Existing
- Proposed

Carriageway works would be undertaken within the application site boundary wherever junction works are proposed and extend beyond the markings for junction works. The exact extent of carriageway works to be the subject of a condition.

The footway/cycleway shown on this drawing includes (and seeks permission for) elements already forming part of Cambridgeshire County Council Madingley Road Phase 1 Cycleway Scheme. It is envisaged that those elements will be constructed by the County Council as currently proposed and that footways and/or cycleways newly proposed by the University will be tied into elements provided under that scheme. Details of any tie in would be for approval under condition.

For approval :

- Application site boundary
- Junction works

NOTES

1. All dimensions are in metres unless noted otherwise.
2. Secondary signal heads and other associated traffic signal infrastructure omitted for clarity.
3. All movements will be select vehicle detection capable, to generate a green aspect to oncoming buses.

Contextual information only not forming part of application

North West Cambridge

Illustrative Junction Plan 3 - Madingley Road Junction West

September 2011

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0 10 20m
Scale 1:1250 @ A3

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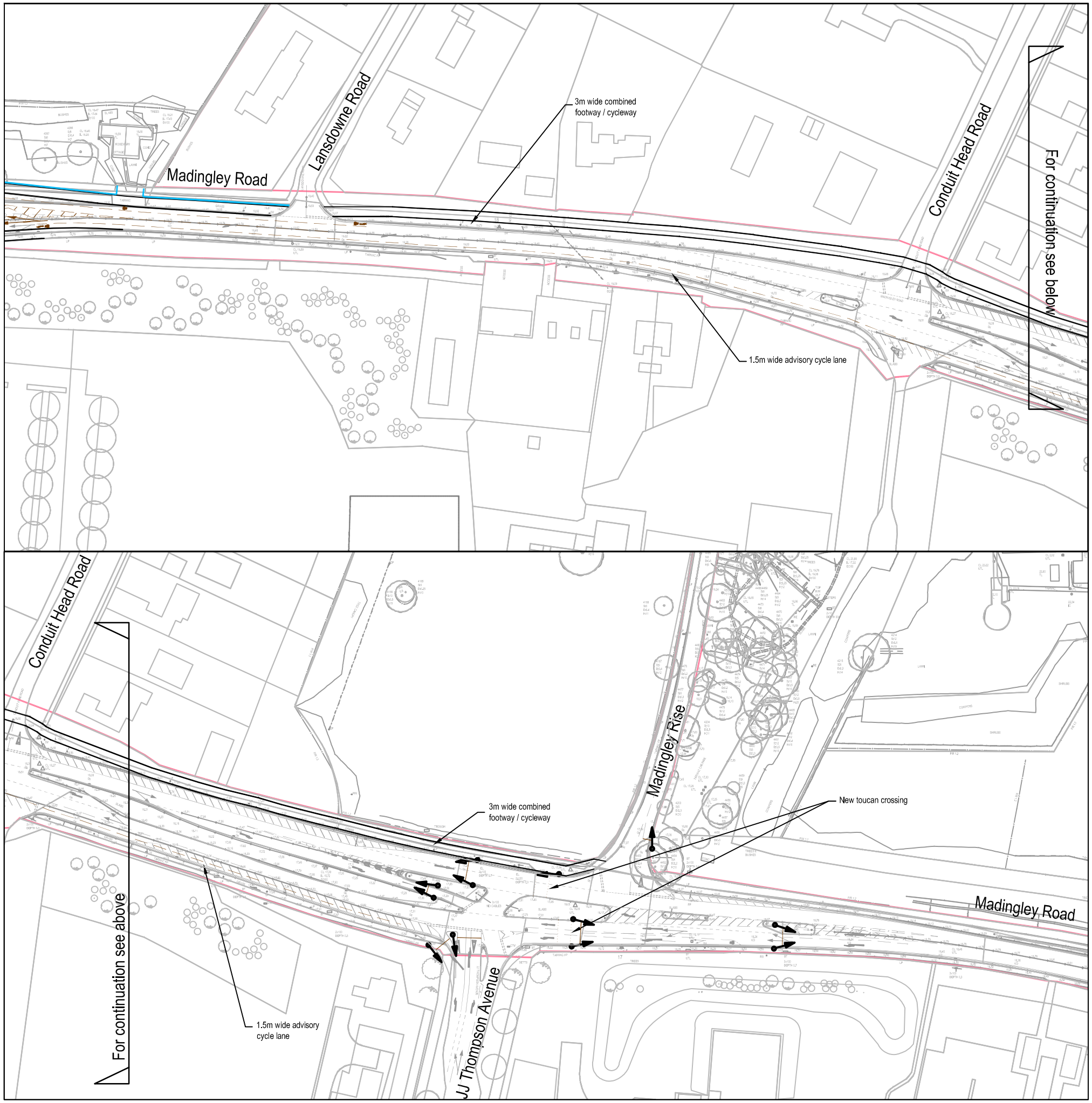

KEY

Contextual Information :

Roadmarkings

Carriageway works would be undertaken within the application site boundary wherever junction works are proposed and extend beyond the markings for junction works. The exact extent of carriageway works to be the subject of a condition.

The footway/cycleway shown on this drawing includes (and seeks permission for) elements already forming part of Cambridgeshire County Council Madingley Road Phase 1 Cycleway Scheme. It is envisaged that those elements will be constructed by the County Council as currently proposed and that footways and/or cycleways newly proposed by the University will be tied into elements provided under that scheme. Details of any tie in would be for approval under condition.

For approval :

Application site boundary

Junction works

Retaining Wall

Contextual information only not forming part of application

North West Cambridge

Illustrative Junction Plan 4 - Madingley Road Junction East

September 2011

UNIVERSITY OF CAMBRIDGE

0 10 20m

Scale 1:1250 @ A3

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Appendix 13 - Construction Movements

North West Cambridge
Transport Assessment

PETER BRETT ASSOCIATES 18/04/2011 Prepared by John Hopkins
Reviewed by

23035 NORTH WEST CAMBRIDGE - ANTICIPATED CONSTRUCTION MOVEMENTS FROM THE OFF-SITE HIGHWAY

Phase	Years	On Site Elements of work	Total Max Car, Light Vehicle and Heavy Movts / day	No Employees - assume 1.5 / vehicle	Max Car and Light Vehicle Movts / day - assume 1.5 ops / car	Peak HGV Movements	Max HGV Movts / day
			2-way		2-way		2-way
Phase 1 - 3 years	2012 to 2014 2012 being looked at only	i) Huntingdon Road East Access, Madingley Road Access, Site Primary Access Road, and Secondary Roads	105	Worst case assumption - 1 No. bitumen gang working at the same time 2 No. kerb gangs 1 No. lighting crew 1 No. highway drainage gang 2 No. finishing gangs Bitumen gang - 10 Ops; Kerb gangs - each with 3 Ops; Lighting Crew - each with 4 Ops; Highway drainage gang - each with 4 Ops Finishing gang - each with 3 No. Ops 3 management / administration Total - 33 No on site	22	Bitumen gang -72 No. tarmac deliveries (1 per 10 minutes) throughout the day from 7 - 7 Kerb gang - 5 No. concrete / material delvieries per gang (10 HGV) Lighting - 2 No. deliveries / day Highway drainage - 2 No. deliveries / day Finishing - 2 No. deliveries / day / gang	83
		ii) House building - 100 houses per year, focussed at the back half of Year 1 (ie, 5 houses / week)	69	Relatively regular number of daily trips due to number of units being constructed simulataneously. Worst case assumption for 5 completions / wk - 15 No. Groundworkers / Gen Labourers 15 No. brickies 10 No. roofers 15 No. plasterers 5 No. plumbers 10 No. decorators 7 No. electricians 10 No. finishing 2 No. Administration / management	59	Total deliveries of materials calculated at 10 HGV movts / house - equates to 50 No. per week, 10 per day	10
		iii) 2,900m2 Food Store	27	Peak level of movements during construction occurs during completion / finishing Worst case estimate assumptions 5 No. Groundworkers / Gen Labourers 5 No. decorators 5 No. fittings 3 No. electricians 5 No. finishing 2 No. Administration / management	17	Total deliveries of materials estimated as being 5 HGV movts /day	10
		iv) Community uses	33	Worst case estimate assumptions 5 No. Groundworkers / Gen Labourers 5 No. bricklayers 10 No. fittings and decorators 5 No. electricians 5 No. plumbers 4 No. Administration / management	23	Total deliveries of materials estimated as being 10 HGV movts /day	10
		v) On-site earthworks and landscaping (no movt of materials in / out)	8	Muckshifting gangs and fuel etc 2 digger 3 lorries 1 blade and roller 2 banksmen / ops 1 administrator / management	6	Fuel, Maintenance, landscaping delvieries - 2 HGV	2
		Highways and Utilities Works	60	Assuming 15 No. operatives per day	10	Assuming 20 No a day with back fill material	20
		TOTAL	262		127		135

242 127 135

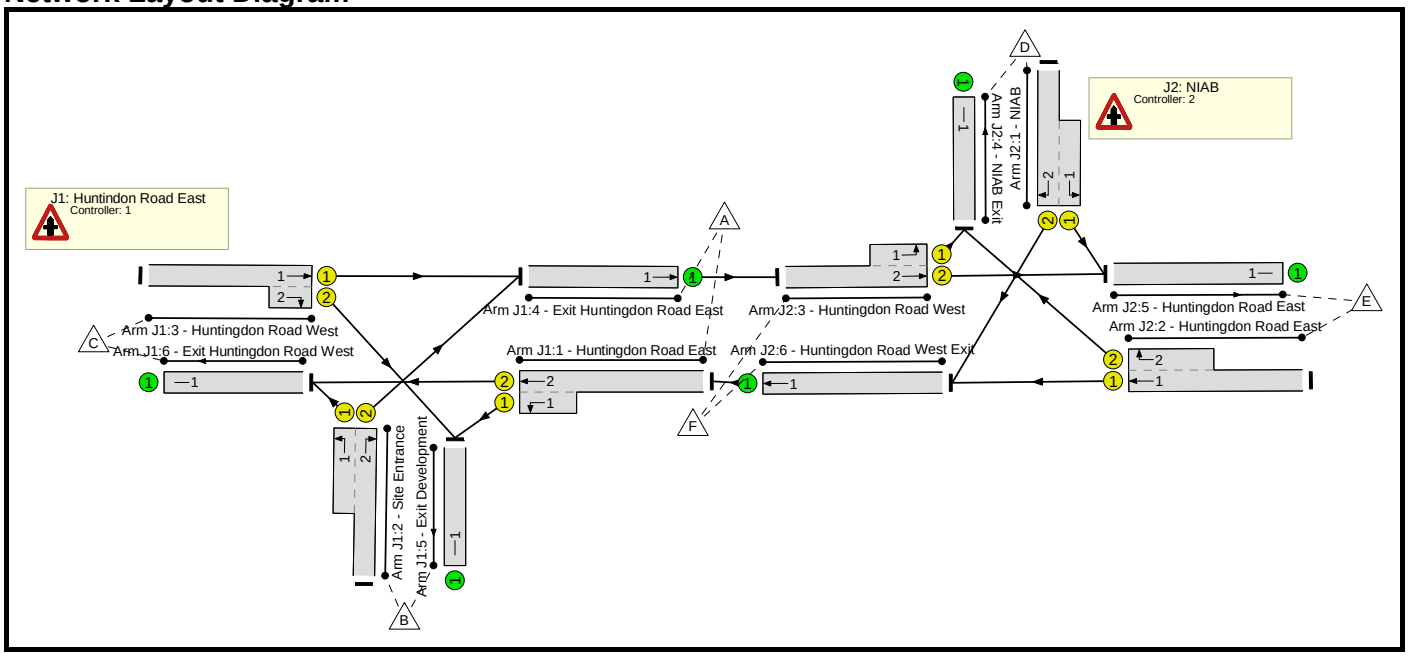
Appendix 14 - 2014 Junction Capacity Assessment – Computer Output

Full Input Data And Results

User and Project Details

Project:	
Title:	
Location:	
File name:	Huntindon Road East NIAB_050911 - 2014.lsg3x
Author:	
Company:	
Address:	
Notes:	

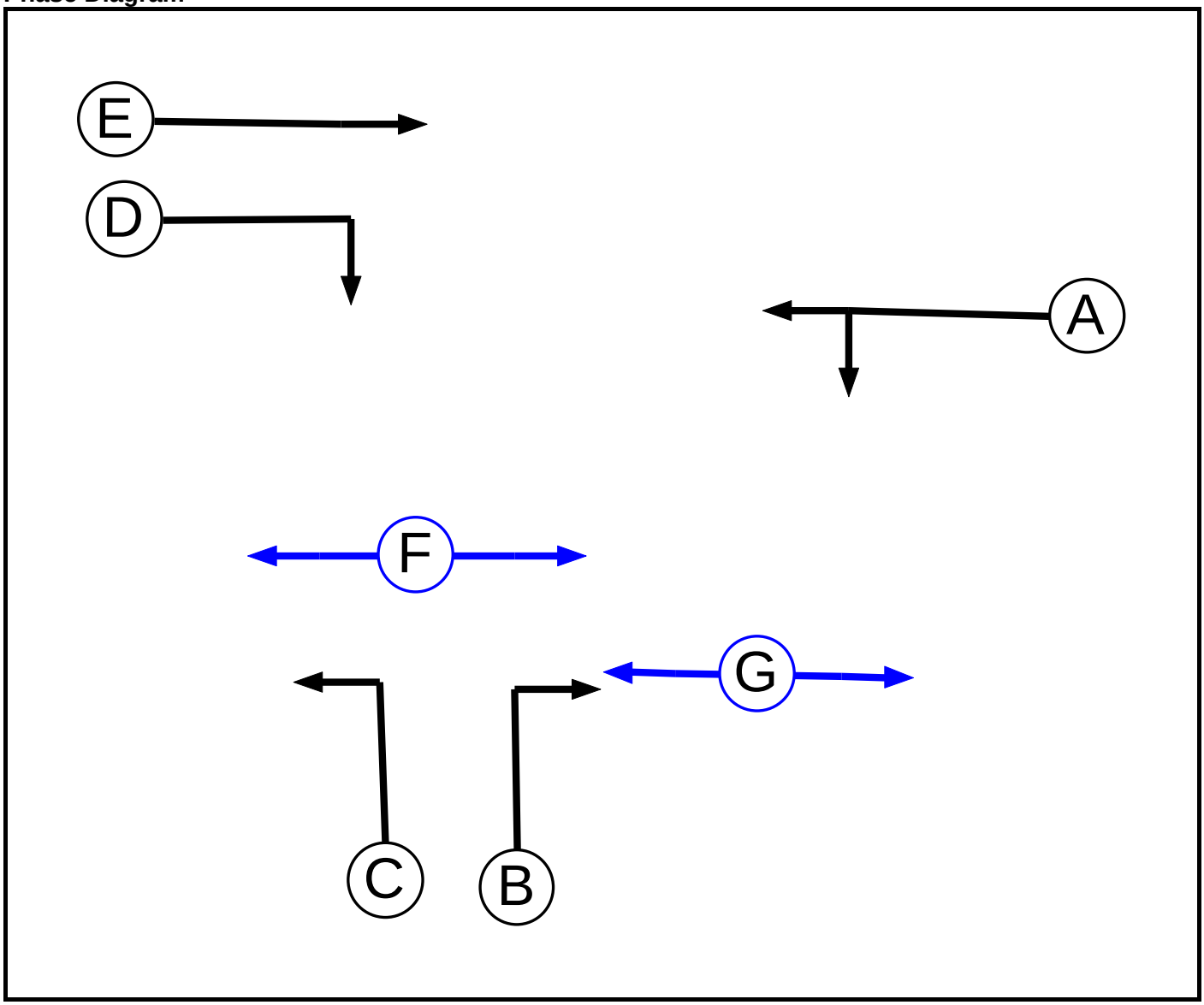
Network Layout Diagram



Full Input Data And Results

C1

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Traffic		7	7
F	Pedestrian		4	4
G	Pedestrian		5	5

Full Input Data And Results

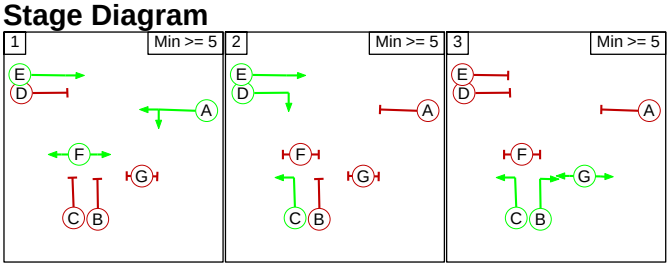
Phase Intergreens Matrix

		Starting Phase						
		A	B	C	D	E	F	G
Terminating Phase	A		5	7	5	-	-	9
	B	5		-	5	5	7	-
	C	5	-		-	-	7	-
	D	5	5	-		-	-	11
	E	-	5	-	-		-	-
	F	-	5	5	-	-		-
	G	3	-	-	3	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A E F
2	C D E
3	B C G

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

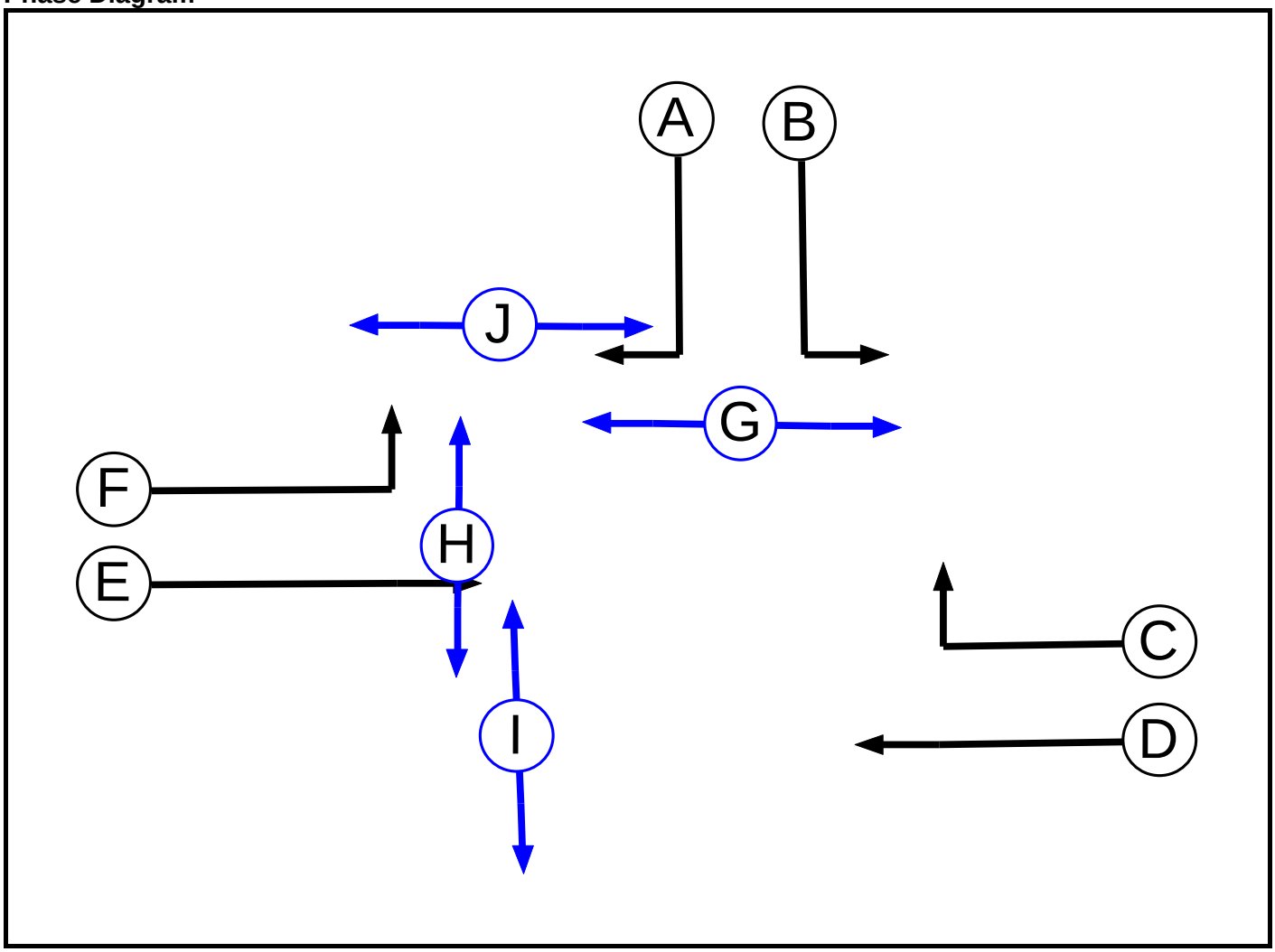
Prohibited Stage Change

		To Stage		
		1	2	3
From Stage	1		7	9
	2	7		11
	3	7	5	

Full Input Data And Results

C2

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Traffic		7	7
F	Traffic		7	7
G	Pedestrian		4	4
H	Pedestrian		5	5
I	Pedestrian		5	5
J	Pedestrian		4	4

Full Input Data And Results

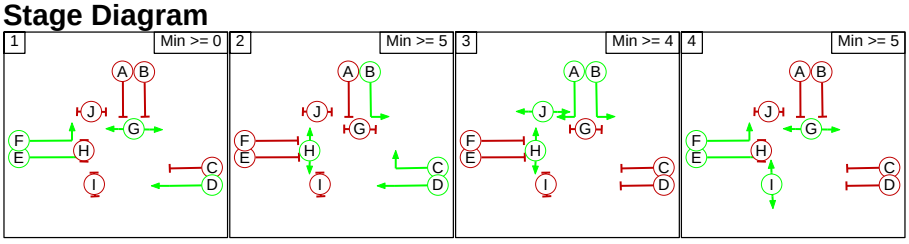
Phase Intergreens Matrix

		Starting Phase									
		A	B	C	D	E	F	G	H	I	J
Terminating Phase	A		-	5	5	5	-	7	-	11	-
	B	-		-	-	5	-	7	-	-	-
	C	5	-		-	5	6	-	-	-	11
	D	5	-	-		-	-	-	-	11	-
	E	5	6	5	-		-	-	7	-	-
	F	-	-	5	-	-		-	7	-	9
	G	5	5	-	-	-	-		-	-	-
	H	-	-	-	-	7	7	-		-	-
	I	1	-	-	1	-	-	-	-		-
	J	-	-	1	-	-	4	-	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	D E F G
2	B C D H
3	A B H J
4	E F G I

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

		To Stage			
		1	2	3	4
From Stage	1		7	9	11
	2	7		11	11
	3	7	5		11
	4	2	7	9	

Full Input Data And Results

Give-Way Lane Input Data

Junction: J1: Huntindon Road East
There are no Opposed Lanes in this Junction

Junction: J2: NIAB
There are no Opposed Lanes in this Junction

Full Input Data And Results

Lane Input Data

Junction: J1: Huntindon Road East												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
J1:1/1 (Huntingdon Road East)	U	A	2	3	4.0	Geom	-	3.50	0.00	Y	Arm J1:5 Left	15.00
J1:1/2 (Huntingdon Road East)	U	A	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J1:6 Ahead	Inf
J1:2/1 (Site Entrance)	U	C	2	3	6.0	Geom	-	3.25	0.00	Y	Arm J1:6 Left	30.00
J1:2/2 (Site Entrance)	U	B	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J1:4 Right	15.00
J1:3/1 (Huntingdon Road West)	U	E	2	3	60.0	Geom	-	3.50	0.00	Y	Arm J1:4 Ahead	Inf
J1:3/2 (Huntingdon Road West)	U	D	2	3	3.0	Geom	-	3.50	0.00	Y	Arm J1:5 Right	15.00
J1:4/1 (Exit Huntingdon Road East)	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:5/1 (Exit Development)	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:6/1 (Exit Huntingdon Road West)	U		2	3	60.0	Inf	-	-	-	-	-	-

Full Input Data And Results

Junction: J2: NIAB

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
J2:1/1 (NIAB)	U	B	2	3	6.0	Geom	-	3.00	0.00	Y	Arm J2:5 Left	15.00
J2:1/2 (NIAB)	U	A	2	3	60.0	Geom	-	3.00	0.00	Y	Arm J2:6 Right	15.00
J2:2/1 (Huntingdon Road East)	U	D	2	3	60.0	Geom	-	3.00	0.00	Y	Arm J2:6 Ahead	Inf
J2:2/2 (Huntingdon Road East)	U	C	2	3	6.0	Geom	-	3.00	0.00	Y	Arm J2:4 Right	Inf
J2:3/1 (Huntingdon Road West)	U	F	2	3	4.0	Geom	-	3.00	0.00	Y	Arm J2:4 Left	15.00
J2:3/2 (Huntingdon Road West)	U	E	2	3	60.0	Geom	-	3.00	0.00	Y	Arm J2:5 Ahead	Inf
J2:4/1 (NIAB Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:5/1 (Huntingdon Road East)	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:6/1 (Huntingdon Road West Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'DS AM'	08:00	09:00	01:00	
2: 'DS PM'	17:00	18:00	01:00	

Scenario 1: 'DS PM' (FG2: 'DS PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination						
		A	B	C	D	E	F	Tot.
Origin	A	0	0	0	0	0	0	0
	B	0	0	207	0	119	0	326
	C	0	70	0	80	807	0	957
	D	0	0	23	0	20	0	43
	E	0	114	1073	63	0	0	1250
	F	0	0	0	0	0	0	0
	Tot.	0	184	1303	143	946	0	2576

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 1: DS PM
Junction: J1: Huntindon Road East	
J1:1/1 (short)	114
J1:1/2 (with short)	1210(In) 1096(Out)
J1:2/1 (short)	207
J1:2/2 (with short)	326(In) 119(Out)
J1:3/1 (with short)	957(In) 887(Out)
J1:3/2 (short)	70
J1:4/1	1006
J1:5/1	184
J1:6/1	1303
Junction: J2: NIAB	
J2:1/1 (short)	20
J2:1/2 (with short)	43(In) 23(Out)
J2:2/1 (with short)	1250(In) 1187(Out)
J2:2/2 (short)	63
J2:3/1 (short)	80
J2:3/2 (with short)	1006(In) 926(Out)
J2:4/1	143
J2:5/1	946
J2:6/1	1210

Full Input Data And Results

Lane Saturation Flows

Junction: J1: Huntindon Road East							
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat flow (PCU/Hr)**
J1:1/1 (Huntingdon Road East)	3.50	0.00	Y	Arm J1:5 Left	15.00	100.0 %	1786
J1:1/2 (Huntingdon Road East)	3.50	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1965
J1:2/1 (Site Entrance)	3.25	0.00	Y	Arm J1:6 Left	30.00	100.0 %	1848
J1:2/2 (Site Entrance)	3.50	0.00	Y	Arm J1:4 Right	15.00	100.0 %	1786
J1:3/1 (Huntingdon Road West)	3.50	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1965
J1:3/2 (Huntingdon Road West)	3.50	0.00	Y	Arm J1:5 Right	15.00	100.0 %	1786
J1:4/1 (Exit Huntingdon Road East Lane 1)	Infinite Saturation Flow						Inf
J1:5/1 (Exit Development Lane 1)	Infinite Saturation Flow						Inf
J1:6/1 (Exit Huntingdon Road West Lane 1)	Infinite Saturation Flow						Inf

Junction: J2: NIAB							
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat flow (PCU/Hr)**
J2:1/1 (NIAB)	3.00	0.00	Y	Arm J2:5 Left	15.00	100.0 %	1741
J2:1/2 (NIAB)	3.00	0.00	Y	Arm J2:6 Right	15.00	100.0 %	1741
J2:2/1 (Huntingdon Road East)	3.00	0.00	Y	Arm J2:6 Ahead	Inf	100.0 %	1915
J2:2/2 (Huntingdon Road East)	3.00	0.00	Y	Arm J2:4 Right	Inf	100.0 %	1915
J2:3/1 (Huntingdon Road West)	3.00	0.00	Y	Arm J2:4 Left	15.00	100.0 %	1741
J2:3/2 (Huntingdon Road West)	3.00	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1915
J2:4/1 (NIAB Exit Lane 1)	Infinite Saturation Flow						Inf
J2:5/1 (Huntingdon Road East Lane 1)	Infinite Saturation Flow						Inf
J2:6/1 (Huntingdon Road West Exit Lane 1)	Infinite Saturation Flow						Inf

Full Input Data And Results

Scenario 2: 'DS AM' (FG1: 'DS AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination						
		A	B	C	D	E	F	Tot.
Origin	A	0	0	0	0	0	0	0
	B	0	0	125	0	97	0	222
	C	0	132	0	26	1038	0	1196
	D	0	0	79	0	76	0	155
	E	0	106	614	27	0	0	747
	F	0	0	0	0	0	0	0
	Tot.	0	238	818	53	1211	0	2320

Traffic Lane Flows

Lane	Scenario 2: DS AM
Junction: J1: Huntindon Road East	
J1:1/1 (short)	106
J1:1/2 (with short)	799(In) 693(Out)
J1:2/1 (short)	125
J1:2/2 (with short)	222(In) 97(Out)
J1:3/1 (with short)	1196(In) 1064(Out)
J1:3/2 (short)	132
J1:4/1	1161
J1:5/1	238
J1:6/1	818
Junction: J2: NIAB	
J2:1/1 (short)	76
J2:1/2 (with short)	155(In) 79(Out)
J2:2/1 (with short)	747(In) 720(Out)
J2:2/2 (short)	27
J2:3/1 (short)	26
J2:3/2 (with short)	1161(In) 1135(Out)
J2:4/1	53
J2:5/1	1211
J2:6/1	799

Full Input Data And Results

Lane Saturation Flows

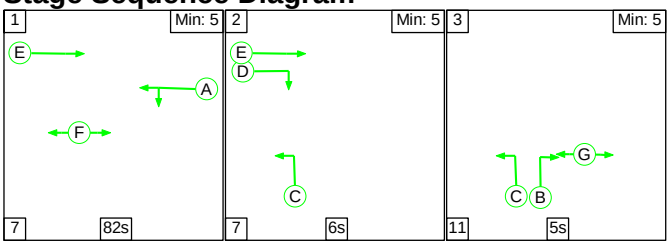
Junction: J1: Huntindon Road East							
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat flow (PCU/Hr)**
J1:1/1 (Huntingdon Road East)	3.50	0.00	Y	Arm J1:5 Left	15.00	100.0 %	1786
J1:1/2 (Huntingdon Road East)	3.50	0.00	Y	Arm J1:6 Ahead	Inf	100.0 %	1965
J1:2/1 (Site Entrance)	3.25	0.00	Y	Arm J1:6 Left	30.00	100.0 %	1848
J1:2/2 (Site Entrance)	3.50	0.00	Y	Arm J1:4 Right	15.00	100.0 %	1786
J1:3/1 (Huntingdon Road West)	3.50	0.00	Y	Arm J1:4 Ahead	Inf	100.0 %	1965
J1:3/2 (Huntingdon Road West)	3.50	0.00	Y	Arm J1:5 Right	15.00	100.0 %	1786
J1:4/1 (Exit Huntingdon Road East Lane 1)	Infinite Saturation Flow						Inf
J1:5/1 (Exit Development Lane 1)	Infinite Saturation Flow						Inf
J1:6/1 (Exit Huntingdon Road West Lane 1)	Infinite Saturation Flow						Inf

Junction: J2: NIAB							
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat flow (PCU/Hr)**
J2:1/1 (NIAB)	3.00	0.00	Y	Arm J2:5 Left	15.00	100.0 %	1741
J2:1/2 (NIAB)	3.00	0.00	Y	Arm J2:6 Right	15.00	100.0 %	1741
J2:2/1 (Huntingdon Road East)	3.00	0.00	Y	Arm J2:6 Ahead	Inf	100.0 %	1915
J2:2/2 (Huntingdon Road East)	3.00	0.00	Y	Arm J2:4 Right	Inf	100.0 %	1915
J2:3/1 (Huntingdon Road West)	3.00	0.00	Y	Arm J2:4 Left	15.00	100.0 %	1741
J2:3/2 (Huntingdon Road West)	3.00	0.00	Y	Arm J2:5 Ahead	Inf	100.0 %	1915
J2:4/1 (NIAB Exit Lane 1)	Infinite Saturation Flow						Inf
J2:5/1 (Huntingdon Road East Lane 1)	Infinite Saturation Flow						Inf
J2:6/1 (Huntingdon Road West Exit Lane 1)	Infinite Saturation Flow						Inf

Full Input Data And Results

Scenario 1: 'DS PM' (FG2: 'DS PM', Plan 1: 'Network Control Plan 1')
C1

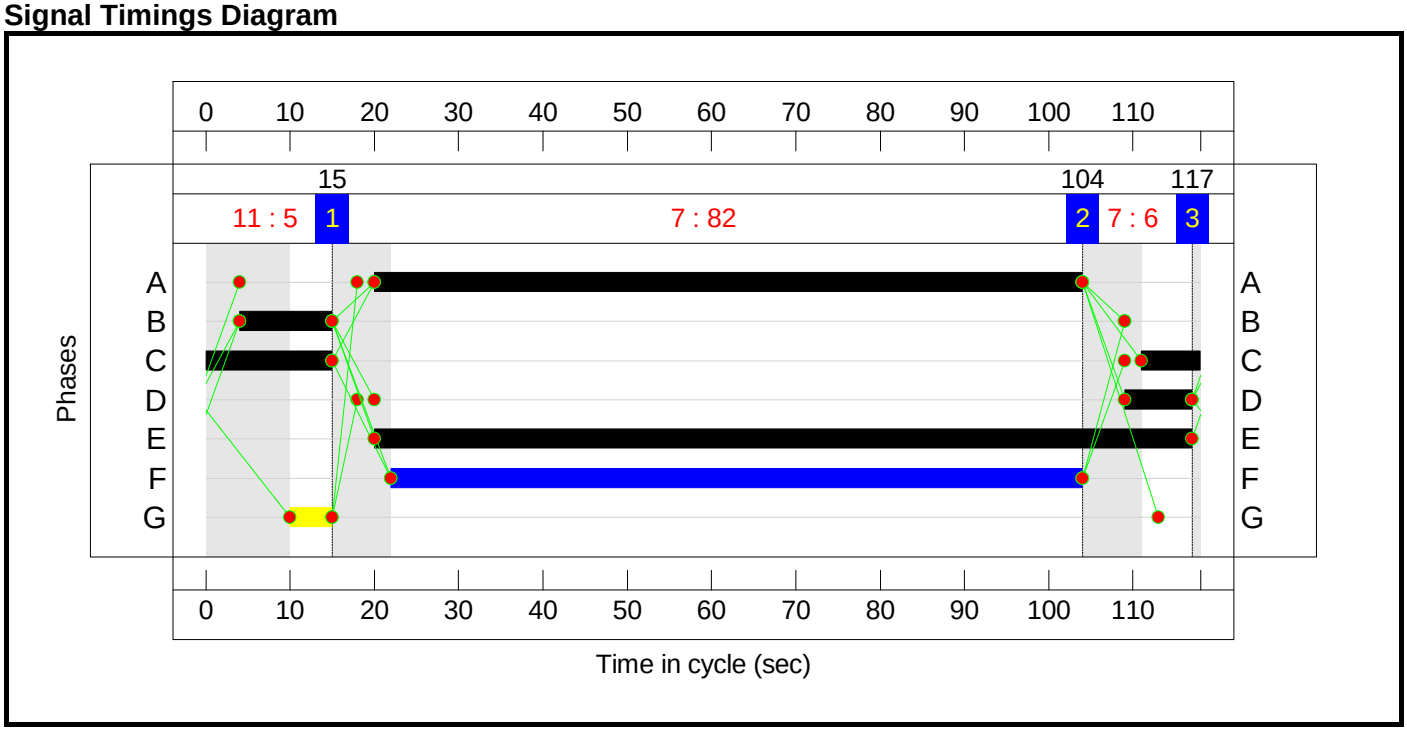
Stage Sequence Diagram



Stage Timings

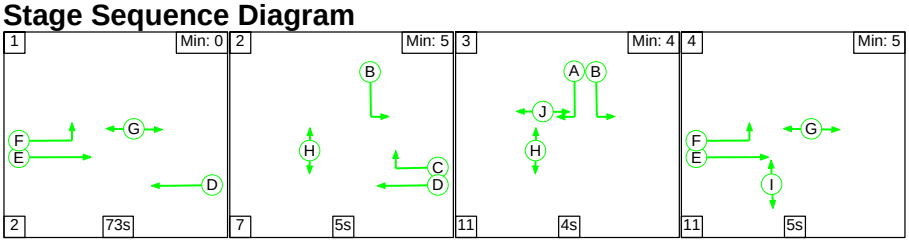
Stage	1	2	3
Duration	82	6	5
Change Point	15	104	117

Signal Timings Diagram



C2

Stage Sequence Diagram

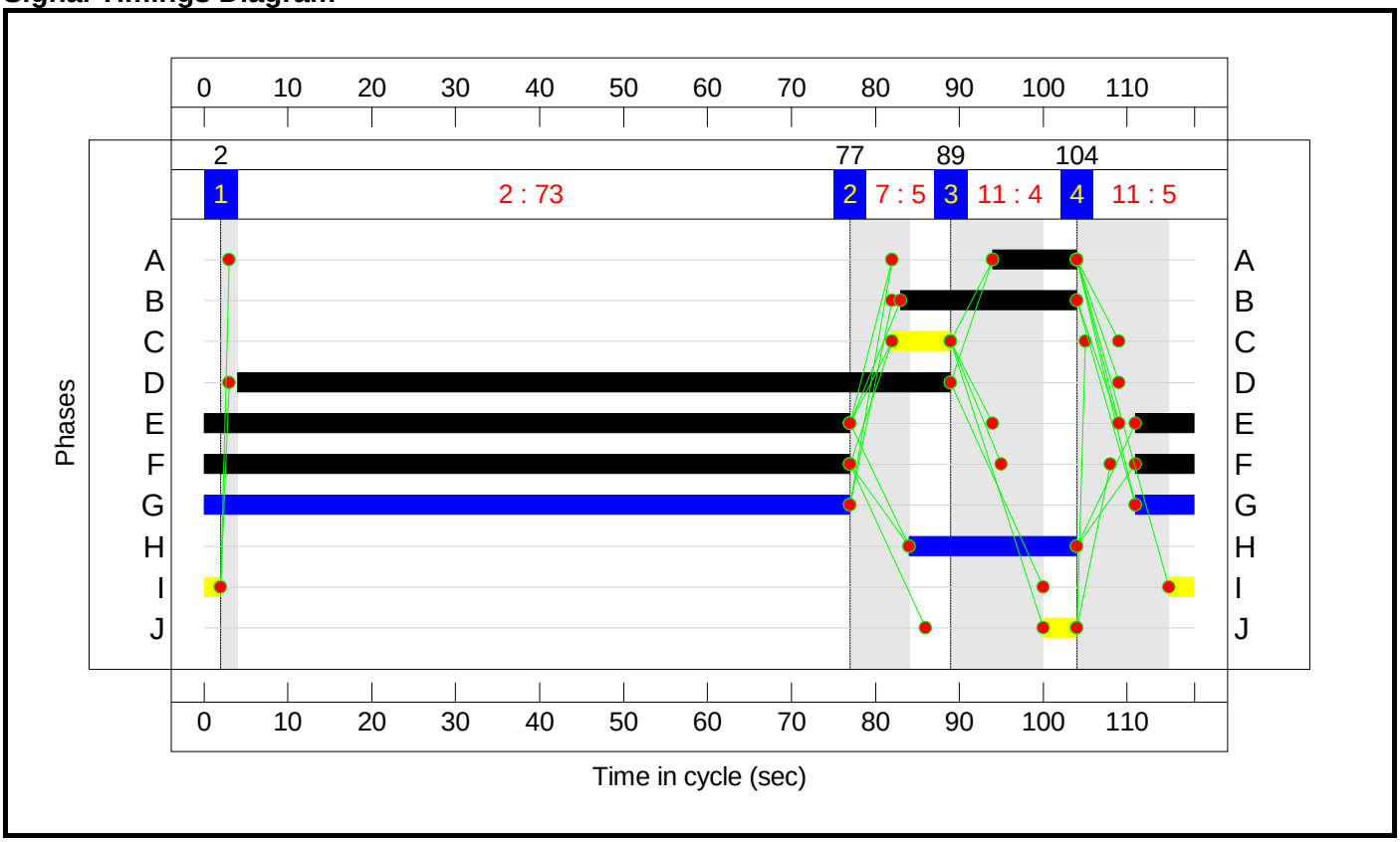


Stage Timings

Stage	1	2	3	4
Duration	73	5	4	5
Change Point	2	77	89	104

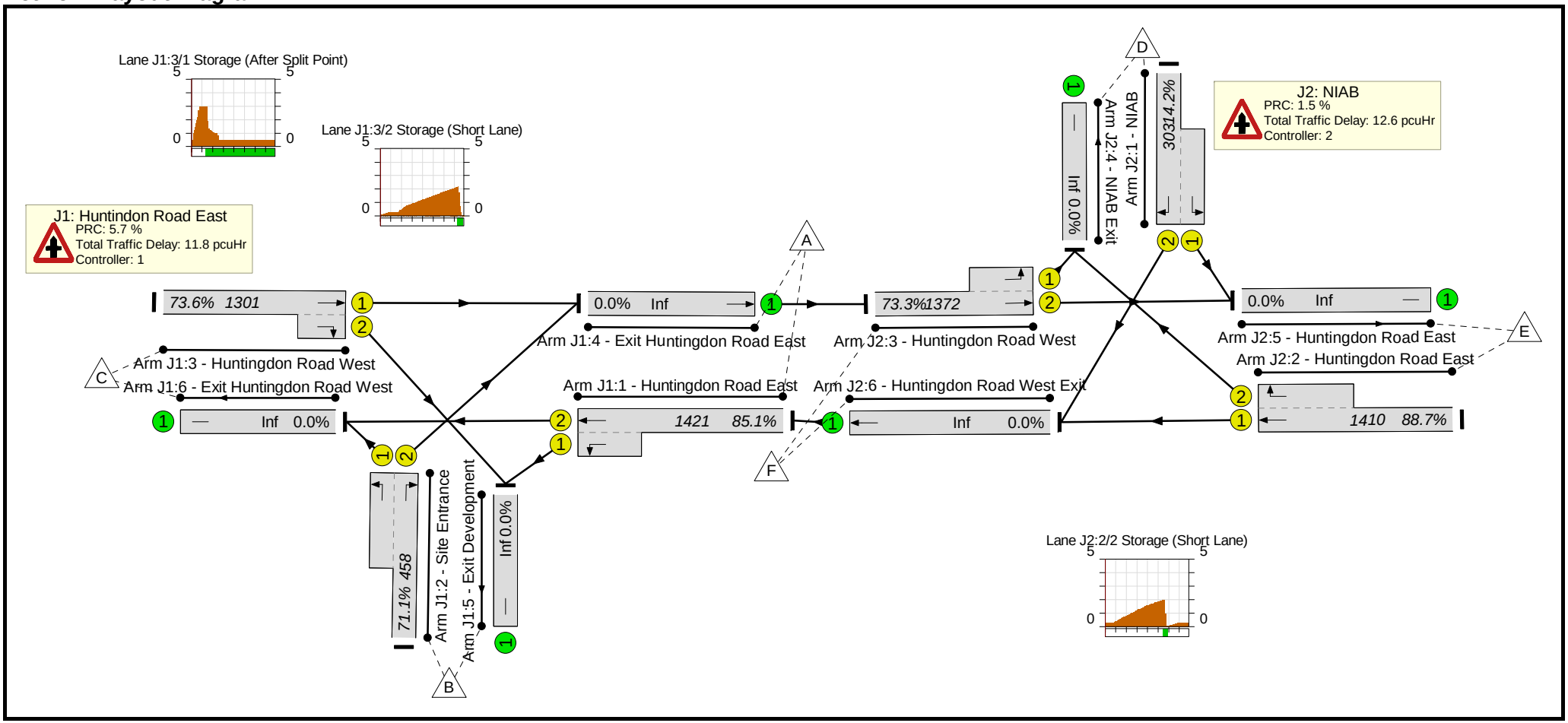
Full Input Data And Results

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**88.7%**
J1: Huntindon Road East	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**85.1%**
1/2+1/1	Huntingdon Road East Left Ahead	U	N/A	N/A	C1:A		1	84	-	1210	1965:1786	1421	85.1%
2/2+2/1	Site Entrance Right Left	U	N/A	N/A	C1:B C1:C		1	11:22	-	326	1786:1848	458	71.1%
3/1+3/2	Huntingdon Road West Ahead Right	U	N/A	N/A	C1:E C1:D		1	97:8	-	957	1965:1786	1301	73.6%
4/1	Exit Huntingdon Road East Ahead	U	N/A	N/A	-		-	-	-	1006	Inf	Inf	0.0%
5/1	Exit Development	U	N/A	N/A	-		-	-	-	184	Inf	Inf	0.0%
6/1	Exit Huntingdon Road West	U	N/A	N/A	-		-	-	-	1303	Inf	Inf	0.0%
J2: NIAB	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**88.7%**
1/2+1/1	NIAB Left Right	U	N/A	N/A	C2:A C2:B		1	10:21	-	43	1741:1741	303	14.2%
2/1+2/2	Huntingdon Road East Right Ahead	U	N/A	N/A	C2:D C2:C		1	85:7	-	1250	1915:1915	1410	88.7%
3/2+3/1	Huntingdon Road West Left Ahead	U	N/A	N/A	C2:E C2:F		1	84	-	1006	1915:1741	1372	73.3%
4/1	NIAB Exit	U	N/A	N/A	-		-	-	-	143	Inf	Inf	0.0%
5/1	Huntingdon Road East	U	N/A	N/A	-		-	-	-	946	Inf	Inf	0.0%
6/1	Huntingdon Road West Exit Ahead	U	N/A	N/A	-		-	-	-	1210	Inf	Inf	0.0%

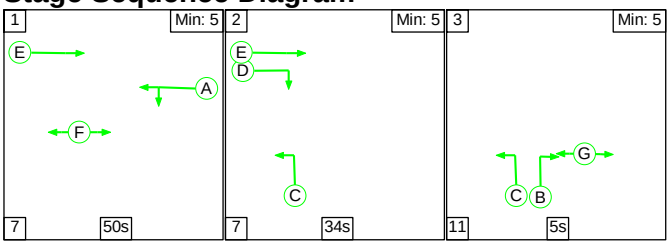
Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**13.9**	**10.6**	**0.0**	**24.4**	**-**	**-**	**-**	**-**
J1: Huntindon Road East	**-**	**-**	**0**	**0**	**0**	**6.4**	**5.4**	**0.0**	**11.8**	**-**	**-**	**-**	**-**
1/2+1/1	1210	1210	-	-	-	0.5	2.8	-	3.3	9.7	8.6	2.8	11.4
2/2+2/1	326	326	-	-	-	4.2	1.2	-	5.4	59.3	6.3	1.2	7.5
3/1+3/2	957	957	-	-	-	1.8	1.4	-	3.2	11.9	9.6	1.4	11.0
4/1	1006	1006	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	184	184	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	1303	1303	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: NIAB	**-**	**-**	**0**	**0**	**0**	**7.5**	**5.2**	**0.0**	**12.6**	**-**	**-**	**-**	**-**
1/2+1/1	43	43	-	-	-	0.5	0.1	-	0.6	51.6	0.7	0.1	0.8
2/1+2/2	1250	1250	-	-	-	4.9	3.7	-	8.6	24.7	30.6	3.7	34.3
3/2+3/1	1006	1006	-	-	-	2.1	1.4	-	3.4	12.3	13.6	1.4	15.0
4/1	143	143	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	946	946	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	1210	1210	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1	PRC for Signalled Lanes (%):	5.7	Total Delay for Signalled Lanes (pcuHr):	11.80	
C2	PRC for Signalled Lanes (%):	1.5	Total Delay for Signalled Lanes (pcuHr):	12.63	
	PRC Over All Lanes (%):	1.5	Total Delay Over All Lanes(pcuHr):	24.44	Cycle Time (s): 118

Full Input Data And Results
Scenario 2: 'DS AM' (FG1: 'DS AM', Plan 1: 'Network Control Plan 1')
C1

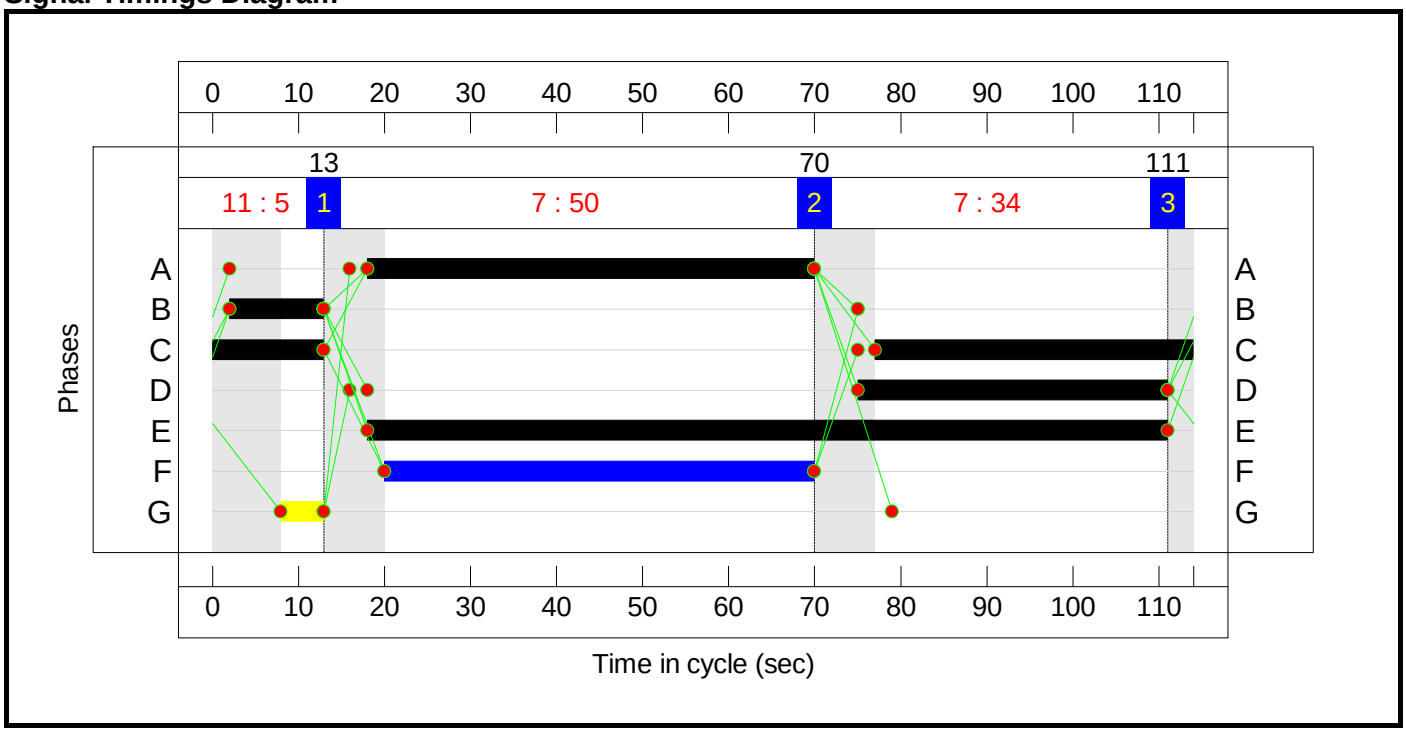
Stage Sequence Diagram



Stage Timings

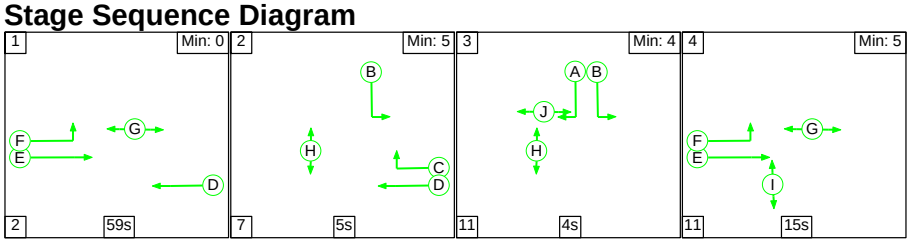
Stage	1	2	3
Duration	50	34	5
Change Point	13	70	111

Signal Timings Diagram



C2

Stage Sequence Diagram

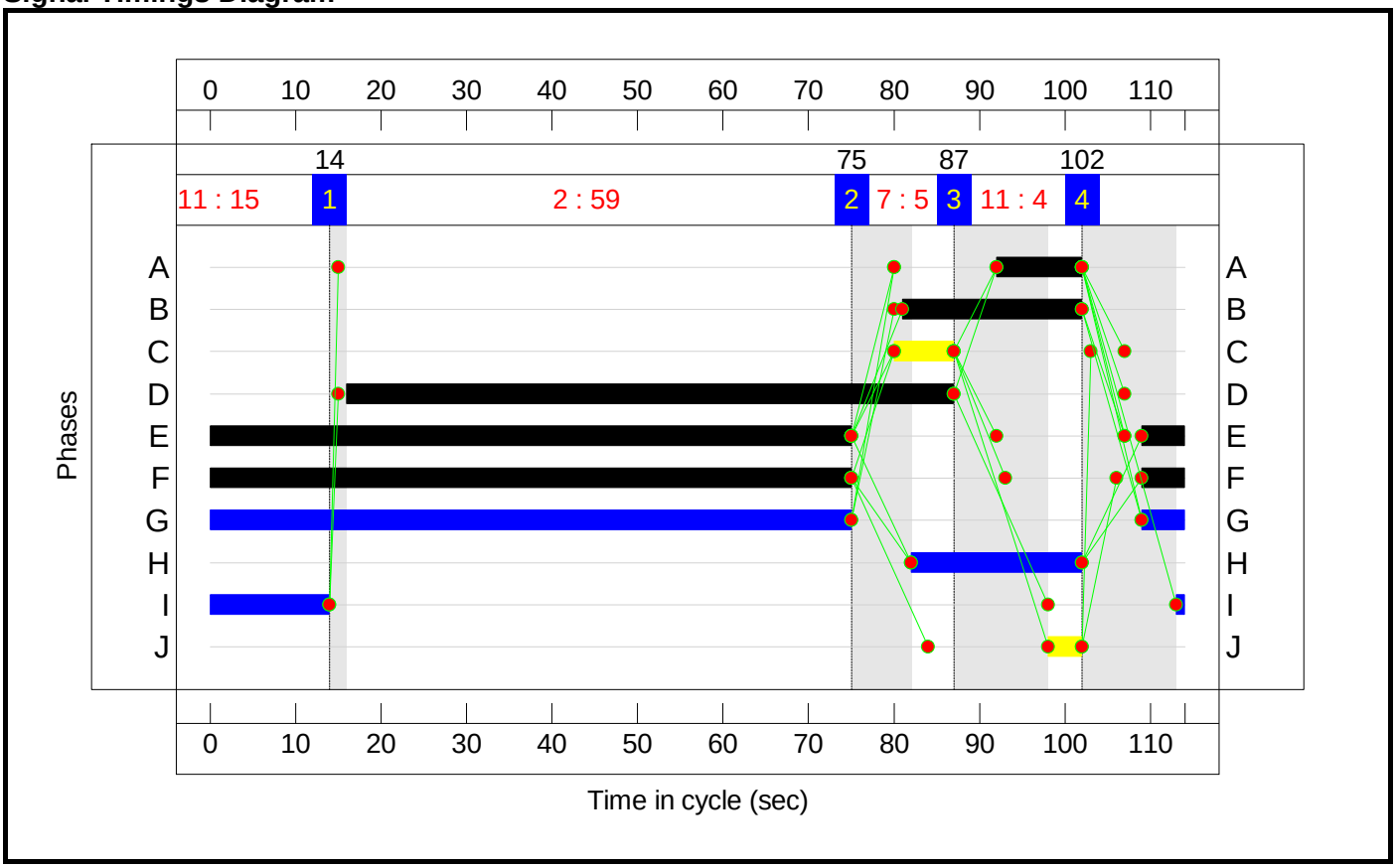


Stage Timings

Stage	1	2	3	4
Duration	59	5	4	15
Change Point	14	75	87	102

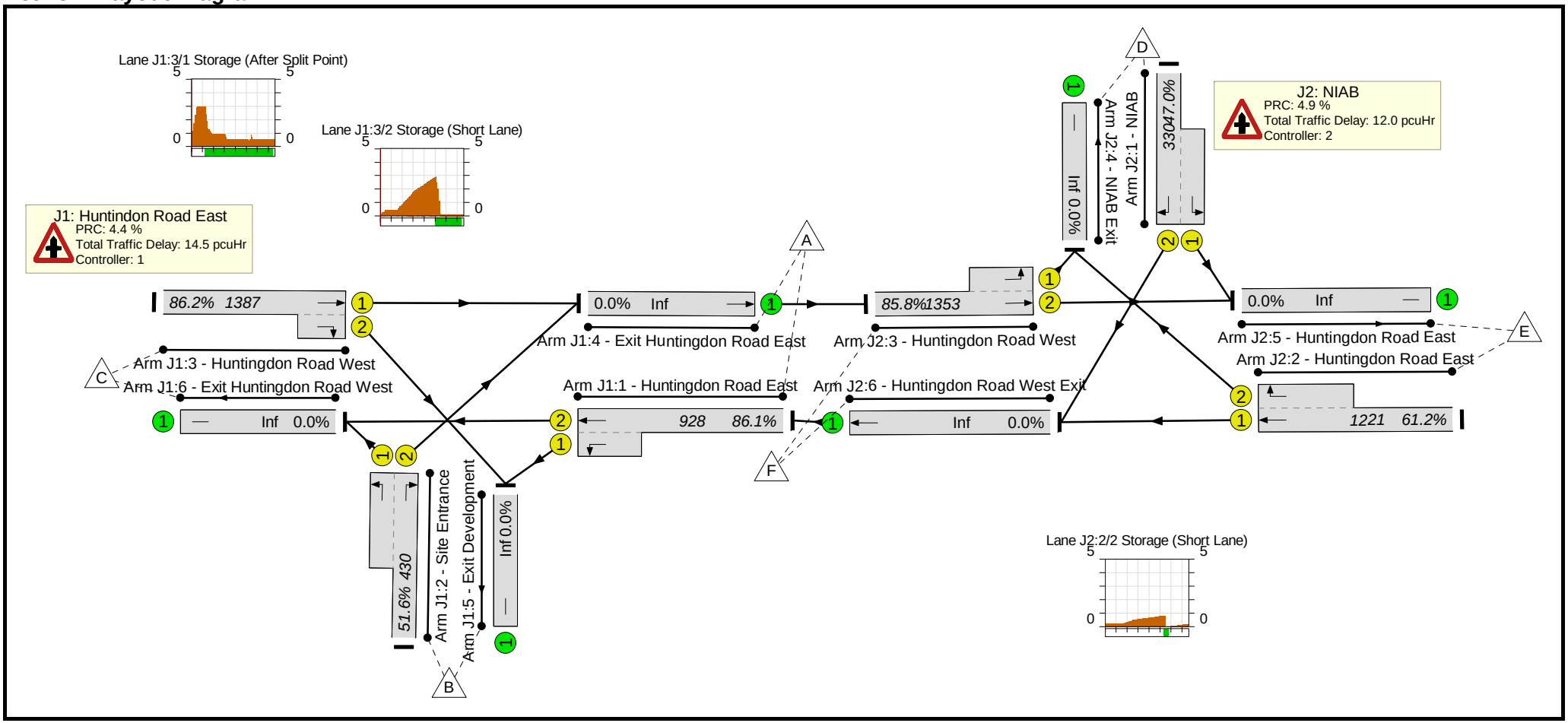
Full Input Data And Results

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**86.2%**
J1: Huntindon Road East	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**86.2%**
1/2+1/1	Huntingdon Road East Left Ahead	U	N/A	N/A	C1:A		1	52	-	799	1965:1786	928	86.1%
2/2+2/1	Site Entrance Right Left	U	N/A	N/A	C1:B C1:C		1	11:50	-	222	1786:1848	430	51.6%
3/1+3/2	Huntingdon Road West Ahead Right	U	N/A	N/A	C1:E C1:D		1	93:36	-	1196	1965:1786	1387	86.2%
4/1	Exit Huntingdon Road East Ahead	U	N/A	N/A	-		-	-	-	1161	Inf	Inf	0.0%
5/1	Exit Development	U	N/A	N/A	-		-	-	-	238	Inf	Inf	0.0%
6/1	Exit Huntingdon Road West	U	N/A	N/A	-		-	-	-	818	Inf	Inf	0.0%
J2: NIAB	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**85.8%**
1/2+1/1	NIAB Left Right	U	N/A	N/A	C2:A C2:B		1	10:21	-	155	1741:1741	330	47.0%
2/1+2/2	Huntingdon Road East Right Ahead	U	N/A	N/A	C2:D C2:C		1	71:7	-	747	1915:1915	1221	61.2%
3/2+3/1	Huntingdon Road West Left Ahead	U	N/A	N/A	C2:E C2:F		1	80	-	1161	1915:1741	1353	85.8%
4/1	NIAB Exit	U	N/A	N/A	-		-	-	-	53	Inf	Inf	0.0%
5/1	Huntingdon Road East	U	N/A	N/A	-		-	-	-	1211	Inf	Inf	0.0%
6/1	Huntingdon Road West Exit Ahead	U	N/A	N/A	-		-	-	-	799	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**15.8**	**10.7**	**0.0**	**26.5**	**-**	**-**	**-**	**-**
J1: Huntindon Road East	**-**	**-**	**0**	**0**	**0**	**7.9**	**6.5**	**0.0**	**14.5**	**-**	**-**	**-**	**-**
1/2+1/1	799	799	-	-	-	3.7	3.0	-	6.7	30.2	16.4	3.0	19.4
2/2+2/1	222	222	-	-	-	1.9	0.5	-	2.5	40.2	2.9	0.5	3.4
3/1+3/2	1196	1196	-	-	-	2.2	3.0	-	5.3	15.9	15.6	3.0	18.6
4/1	1161	1161	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	238	238	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	818	818	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
J2: NIAB	**-**	**-**	**0**	**0**	**0**	**7.8**	**4.2**	**0.0**	**12.0**	**-**	**-**	**-**	**-**
1/2+1/1	155	155	-	-	-	1.9	0.4	-	2.3	54.1	2.3	0.4	2.8
2/1+2/2	747	747	-	-	-	2.9	0.8	-	3.6	17.6	13.7	0.8	14.5
3/2+3/1	1161	1161	-	-	-	3.1	2.9	-	6.0	18.7	18.6	2.9	21.5
4/1	53	53	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	1211	1211	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	799	799	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

C1	PRC for Signalled Lanes (%):	4.4	Total Delay for Signalled Lanes (pcuHr):	14.46	
C2	PRC for Signalled Lanes (%):	4.9	Total Delay for Signalled Lanes (pcuHr):	12.00	
	PRC Over All Lanes (%):	4.4	Total Delay Over All Lanes(pcuHr):	26.45	Cycle Time (s): 114

TRANSYT 14

Version: 14.0.0.167 [07/10/10 - RC1]
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The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Last run: 05/09/2011 20:48:27
Analysis Set used for last run: A1 - AM DS

File: J:\23035 - North-West Cambridge\assessments\Assessments\J11 - P&R - NWC\September 2011\Tests following meeting with council\For Report\September - 2014 assessments\Madeningley Rd-NWC-P&R AM no right turn give way - 2014.t14
Report generation date: 05/09/2011 20:50:42

« A1 - AM DS
- » Summary
- » Network Diagram
- » Analysis and Demand Sets
- » Network Options
- » Traffic Nodes
- » Links
- » Traffic Streams
- » Flow Allocation Tool Tables
- » Signal Timings
- » TRANSYT 12 Tables
- » Link Results
- » Traffic Stream Results
- » Network Results
- » Point to Point Journey Time

A1 - AM DS

Summary

Data Errors and Warnings

No errors or warnings

File summary

File Description

Title	(untitled)
Driving Side	Left
Date	18/02/2010
Status	(new file)
Enumerator	TRLLIMITED\jbinning
Results Upto Date	True
Template Image	

Units

Speed Units	Distance Units	Fuel Economy Units	Fuel Rate Units	Mass Units	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
kph	m	mpg	l/h	kg	perHour	s	-Hour	perHour

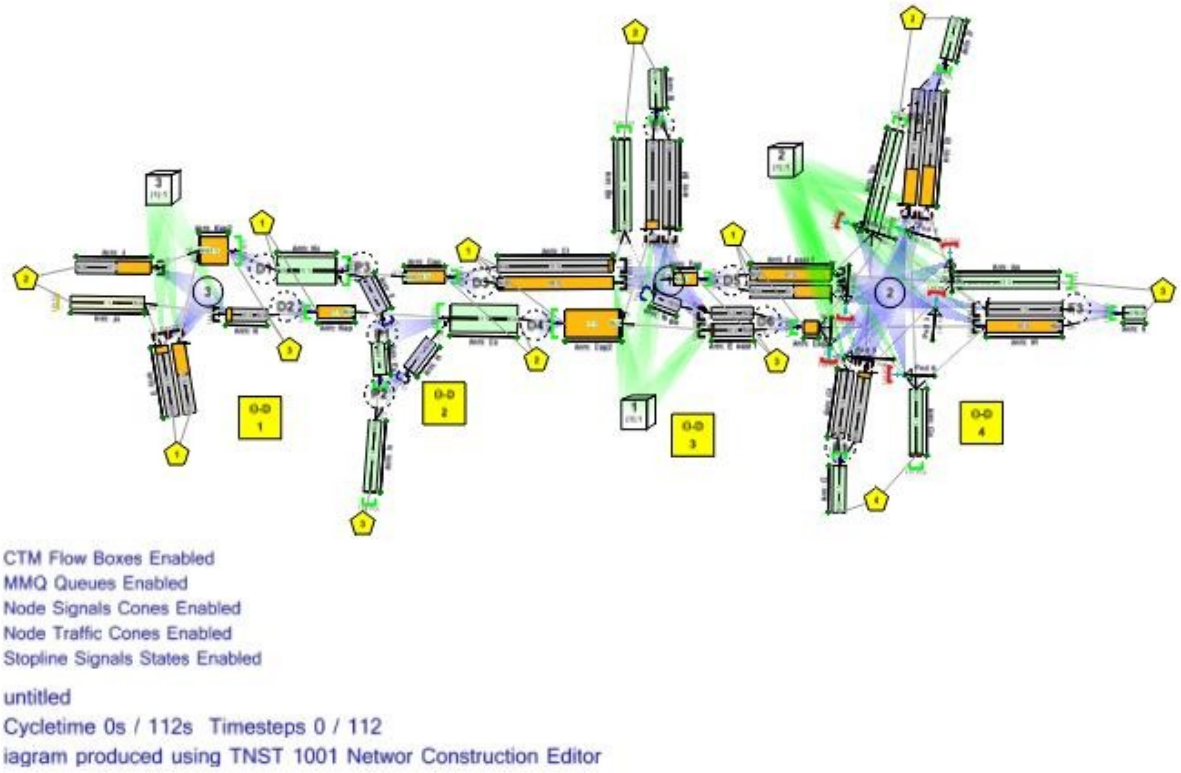
Sorting

Sorting Direction	Sorting Type	Ignore Prefixes When Sorting	Link Grouping	Source Grouping
Ascending	Numerical	False	Normal	Normal

Run Summary

Analysis Set Used	Run Start Time	Run Finish Time	Modelling Start Time (HH:mm)	Cycle Time Used (s)	Total Network Delay (PCU-hr/hr)	Highest DOS (%)	LTSWith Highest DOS	Number Of Oversaturated LTS	Percentage Of Oversaturated LTS (%)	LTSWith Worst Signalised PRC	LTSWith Worst Unsignalised PRC	LTSWith Worst Overall PRC	Network Within Capacity
A1 - AM DS	05/09/2011 20:47:51	05/09/2011 20:48:27	08:00	112	28.03	87.11	E east f/1	0	0	E east f/1	N gw/1	N gw/1	True

Network Diagram



Analysis and Demand Sets

Analysis Sets

Name	Description	Demand Set	Include In Report	Locked

AM DS		D1	True	False

Demand Sets

Name	Description	Composite	Demand Sets	Start Time (HH:mm)	Locked
AM		False		08:00	False

Network Options

Network Timings

Network Cycle Time (s)	Resolution	Number Of Steps	Time Segment Length (min)	Number Of Time Segments	Modelled Time Period (min)
112	1	112	60	1	60

Signals Options

Equal Length Multiple Cycling	Start Displacement (s)	End Displacement (s)	Phase Minimum Broken Penalty (£)	Phase Maximum Broken Penalty (£)	Intergreen Broken Penalty (£)
True	2	3	10000.00	10000.00	10000.00

Traffic Options

Traffic Model	DOS Threshold (%)	Flow Scaling Factor (%)	Cruise Scaling Factor (%)	Cruise Times Or Speeds	Use Link Stop Weightings	Use Link Delay Weightings	Exclude Pedestrian Links	Random Delay Mode	Type of Vehicle-in-Service	Type Of Random Parameter
PDM	90	100	100	Cruise Speeds	True	True	False	Complex	Uniform (TRANSYT)	Uniform (TRANSYT)

Bus Parameters

Dispersion Coefficient1	Dispersion Coefficient2	Acceleration (ms^[-2])	Travel Time Coefficient1	Travel Time Coefficient2
70	15	0.47	30	85

Tram Parameters

Dispersion Coefficient1	Dispersion Coefficient2	Acceleration (ms^[-2])	Travel Time Coefficient1	Travel Time Coefficient2
70	15	0.47	30	85

Optimisation Options

Auto Redistribute	Optimisation Type	Optimisation Level	Hill Climb Increments	Shotgun Number Of Runs	SAStart Temperature	SACooling Factor	Random Seed	Use Enhanced Optimisation	Optimisation Order	Locked Green Splits
True	HillClimb	Extended - Offsets And Green Splits	15,40,-1,15,40,1,-1,1,-15,-5,-1,15,1	N/A	N/A	N/A	N/A	False	1,2,3	

Economics

Unit Of Cost	Monetary Value Of Delay (£ per PCU-hr)	Monetary Value Of Stops (£ per 100 stops)
£	14.20	2.60

Fuel Consumption

Proportion Car Petrol	Proportion Car Diesel	Proportion LGVPetrol	Proportion LGVDiesel	Proportion OGV1	Proportion OGV2	Proportion PSV	Mean Weight Car Petrol (kg)	Mean Weight Car Diesel (kg)	Mean Weight LGVPetrol (kg)	Mean Weight LGVDiesel (kg)	Mean Weight OGV1 (kg)	Mean Weight OGV2 (kg)	Mea Weig PSV (k
0.493	0.323	0.011	0.045	0.028	0.031	0.011	1250.00	1250.00	2000.00	2000.00	20000.00	35000.00	13000

Fuel Parameters

ID	Extrapolated	Description
2010	True	Year 2010 base figures (WebTAG data March 2010)

Car Petrol

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
104.29	448.37	-491.30	217.81	N/A	ByWeights

Car Diesel

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
48.10	645.03	-5775.90	454.16	N/A	ByWeights

LGVPetrol

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
162.86	672.32	-7789.90	1052.13	N/A	ByWeights

LGVDiesel

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
108.25	599.63	-4483.10	831.10	N/A	ByWeights

OGV1

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
156.45	2600.98	-37830.60	3244.46	N/A	ByWeights

OGV2

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
361.33	4202.69	-49470.40	3828.06	N/A	ByWeights

PSV

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
411.56	3064.65	-42064.30	3652.63	N/A	ByWeights

Traffic Nodes

Traffic Nodes

Traffic Node	ID	Name	Description
1	1		
2	2		
3	3		
D1	D1		
D2	D2		
D3	D3		
D4	D4		
D5	D5		
D6	D6		
F1	F1		
F2	F2		
F3	F3		
F4	F4		
P1	P1		
P2	P2		
P3	P3		

Links

Links

Link	ID	Name	Description	Traffic Node	Length (m)	Traffic Model	Has Restricted Flow	Saturation Flow (PCU/hr)	Cell Saturation Flow (PCU/hr)	Is Signal Controlled	Controller Stream	Phase	Phase2 Enabled	Phase2	Is Give Way	P
Ped 1	Ped 1			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	I	False	(N/A)	False	
Ped 2	Ped 2			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	J	False	(N/A)	False	
Ped 3	Ped 3			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	K	False	(N/A)	False	
Ped 4	Ped 4			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	L	False	(N/A)	False	
Ped 5	Ped 5			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	M	False	(N/A)	False	
Ped 6	Ped 6			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	N	False	(N/A)	False	
Ped 7	Ped 7			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	O	False	(N/A)	False	
Ped 8	Ped 8			2	10.00	NetworkDefault	True	1800	(N/A)	True	2	P	False	(N/A)	False	

Link Modelling

Link	Stop Weighting (%)	Delay Weighting (%)	Exclude From Results Calculation	Max Queue Storage (PCU)	Has Queue Limit	Queue Limit (PCU)	Excess Queue Penalty (£)	Has Degree Of Saturation Limit	Degree Of Saturation Limit (%)	Excess Degree Of Saturation Penalty (£)	Low Degree Of Saturation Penalty (£)
Ped 1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 2	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 3	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 4	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 5	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 6	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 7	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 8	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)

Link Modelling (Advanced)

Link	Normal Dispersal Type	Normal Dispersal Coefficient	Normal Travel Time Coefficient	Initial Queue (PCU)	Point1 Time Step (s)	Point2 Time Step (s)	Type of Vehicle-in-Service	Vehicle-in-Service	Type Of Random Parameter	Random Parameter
Ped 1	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 2	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 3	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 4	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 5	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 6	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Ped 7	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 8	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Link Flows

Link	Total Flow (On Link) (PCU/hr)	Uniform Flow Name	Uniform Flow (Into Link) (PCU/hr)	Upstream Flow (Into Link) (PCU/hr)	Link Sensitivity Multiplier (%)	Cruise Sensitivity Multiplier (%)	Calculated Cruise Speed (kph)
Ped 1	0		0	0	100	100	1.00
Ped 2	0		0	0	100	100	1.00
Ped 3	0		0	0	100	100	1.00
Ped 4	0		0	0	100	100	1.00
Ped 5	0		0	0	100	100	1.00
Ped 6	0		0	0	100	100	1.00
Ped 7	0		0	0	100	100	1.00
Ped 8	0		0	0	100	100	1.00

Link Sources - default sources for entry links

Link	Entry Source Traffic Type	Entry Cruise Time (seconds)	Entry Cruise Speed (kph)	Entry Free Running Speed (kph)	Entry Stationary Time (seconds)	Entry Profile Type	Entry DIRECTFlows (PCU/hr)
Ped 1	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0
Ped 2	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0
Ped 3	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0
Ped 4	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0
Ped 5	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0
Ped 6	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0
Ped 7	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0
Ped 8	Normal	1.20	30.00	(N/A)	(N/A)	FLAT	0

Traffic Streams

Traffic Streams

Traffic Stream	ID	Name	Description	Length (m)	Traffic Model	Has Restricted Flow	Saturation Flow Source	Saturation Flow (PCU/hr)	Cell Saturation Flow (PCU/hr)	Is Signal Controlled	Controller Stream	Phase	Phase2 Enabled	Phase2
1	1			100.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	4210	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			80.00	CTM	True	SumOfLanes	1945	1800	True	2	A	False	(N/A)
2	2			80.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	True	2	B	False	(N/A)

1	1			80.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	True	1	D	False	(N/A)
2	2			80.00	NetworkDefault	True	SumOfLanes	1854	(N/A)	True	1	E	False	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			10.00	CPDM	True	SumOfLanes	1400	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2155	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			70.00	CPDM	True	SumOfLanes	1400	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2055	(N/A)	True	3	A	False	(N/A)
1	1			153.00	NetworkDefault	True	SumOfLanes	1915	(N/A)	True	3	A	False	(N/A)
1	1			40.00	NetworkDefault	True	SumOfLanes	1961	(N/A)	True	2	C	False	(N/A)
2	2			40.00	NetworkDefault	True	SumOfLanes	1828	(N/A)	True	2	D	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	3600	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			30.00	NetworkDefault	True	SumOfLanes	1741	(N/A)	True	1	B	False	(N/A)
2	2			30.00	NetworkDefault	True	SumOfLanes	1781	(N/A)	True	1	C	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			243.00	NetworkDefault	True	SumOfLanes	1741	(N/A)	True	1	A	False	(N/A)
2	2			100.00	NetworkDefault	True	SumOfLanes	1915	(N/A)	True	1	A	False	(N/A)
2	2			243.00	NetworkDefault	True	SumOfLanes	3600	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			40.00	NetworkDefault	True	SumOfLanes	1687	(N/A)	True	2	F	False	(N/A)
2	2			40.00	NetworkDefault	True	SumOfLanes	1880	(N/A)	True	2	E	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			10.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			20.00	NetworkDefault	True	SumOfLanes	2033	(N/A)	True	2	G	False	(N/A)
2	2			20.00	NetworkDefault	True	SumOfLanes	2155	(N/A)	True	2	H	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1915	(N/A)	True	3	C	False	(N/A)
2	2			100.00	NetworkDefault	True	SumOfLanes	1741	(N/A)	True	3	B	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	False	(N/A)	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	4210	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			153.00	NetworkDefault	True	SumOfLanes	3600	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			7.00	CPDM	True	SumOfLanes	1741	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)

Traffic Stream Lanes

Traffic Stream	ID	Name	Description	Use RR67	Surface Condition	Site Quality Factor	Gradient (%)	Width (m)	Proportion That Turn (%)	Turning Radius (m)	Nearside Lane	Saturation Flow (PCU/hr)
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1400
1	1			True	N/A	N/A	0	4.00	0	10.00	False	2155
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1400
1	1			True	N/A	N/A	0	3.00	0	10.00	False	2055
1	1			True	N/A	N/A	0	3.00	0	10.00	True	1915
1	1			True	N/A	N/A	0	3.50	3	20.00	True	1961
1	1			True	N/A	N/A	0	3.50	100	20.00	True	1828
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3600
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741
1	1			True	N/A	N/A	0	3.00	100	20.00	True	1781
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105

2	2			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741
1	1			True	N/A	N/A	0	3.00	0	10.00	True	1915
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
2	2			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.25	100	10.00	True	1687
1	1			True	N/A	N/A	0	3.25	96	45.00	True	1880
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.50	21	30.00	True	1945
1	1			True	N/A	N/A	0	3.50	0	15.00	True	1965
1	1			True	N/A	N/A	0	3.50	0	25.00	True	1965
1	1			True	N/A	N/A	0	3.50	100	25.00	True	1854
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1965
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	4.00	100	25.00	False	2033
1	1			True	N/A	N/A	0	4.00	0	25.00	False	2155
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.00	0	20.00	True	1915
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
2	2			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
2	2			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741

Traffic Stream Modelling

Traffic Stream	Stop Weighting (%)	Delay Weighting (%)	Exclude From Results Calculation	Max Queue Storage (PCU)	Has Queue Limit	Queue Limit (PCU)	Excess Queue Penalty (£)	Has Degree Of Saturation Limit	Degree Of Saturation Limit (%)	Excess Degree Of Saturation Penalty (£)	Low Degree Of Saturation Penalty (£)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	8.00	True	10	1000.00	True	90	500.00	0.00
2	100	100	False	12.00	True	11	100.00	True	90	500.00	0.00
1	100	100	False	25.00	True	20	100.00	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
1	100	100	False	0.00	True	19	100.00	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)

2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	True	30	100.00	False	(N/A)	(N/A)	(N/A)
2	100	100	False	0.00	True	30	100.00	True	90	100.00	0.00
2	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)

Traffic Stream Modelling (Advanced)

Traffic Stream	Normal Dispersal Type	Normal Dispersal Coefficient	Normal Travel Time Coefficient	Initial Queue (PCU)	Point1 Time Step (s)	Point2 Time Step (s)	Type of Vehicle-in-Service	Vehicle-in-Service	Type Of Random Parameter	Random Parameter
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Flows

Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)	Bus Flow (PCU/hr)	Tram Flow (PCU/hr)	Cruise Sensitivity Multiplier (%)	Calculated Cruise Speed (kph)
1	669	669	0	0	100	1.00
1	23	23	0	0	100	1.00
1	1217	1217	0	0	100	1.00
1	735	735	0	0	100	1.00
1	134	134	0	0	100	1.00
1	953	953	0	0	100	1.00
2	129	129	0	0	100	1.00
1	717	717	0	0	100	1.00

2	0	0	0	0	100	1.00
1	1082	1082	0	0	100	1.00
1	730	730	0	0	100	1.00
1	116	116	0	0	100	1.00
1	10	10	0	0	100	1.00
1	278	278	0	0	100	1.00
1	785	785	0	0	100	1.00
1	432	432	0	0	100	1.00
1	665	665	0	0	100	1.00
2	4	4	0	0	100	1.00
1	906	906	0	0	100	1.00
1	5	5	0	0	100	1.00
2	18	18	0	0	100	1.00
1	140	140	0	0	100	1.00
1	140	140	0	0	100	1.00
2	1077	1077	0	0	100	1.00
2	717	717	0	0	100	1.00
1	66	66	0	0	100	1.00
2	68	68	0	0	100	1.00
1	127	127	0	0	100	1.00
1	116	116	0	0	100	1.00
1	0	0	0	0	100	1.00
2	10	10	0	0	100	1.00
1	132	132	0	0	100	1.00
1	160	160	0	0	100	1.00
2	432	432	0	0	100	1.00
1	394	394	0	0	100	1.00
1	592	592	0	0	100	1.00
1	439	439	0	0	100	1.00
1	1217	1217	0	0	100	1.00
1	1333	1333	0	0	100	1.00
1	0	0	0	0	100	1.00

Traffic Stream Sources - default sources for entries

Traffic Stream	Normal Cruise Time (seconds)	Normal Cruise Speed (kph)	Bus Free Running Speed (kph)	Tram Free Running Speed (kph)
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
2	7.50	48.00	Buses Not Permittted	Trams Not Permitted

Traffic Stream Sources - sources for internals

Traffic Stream	Source	Source Type	Source Link	Source Traffic Stream	Source Total Flow (PCU/hr)	Source Normal Flow (PCU/hr)	Source Bus Flow (PCU/hr)	Source Tram Flow (PCU/hr)	Normal Cruise Time (seconds)	Normal Cruise Speed (kph)	Bus Free Running Speed (kph)	Tram Free Running Speed (kph)
1	1	TrafficStream	N/A	A/1	665	665	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	A/1	4	4	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Df/1	66	66	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted

1	2	TrafficStream	N/A	E east f/1	840	840	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Gf/2	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	B/1	5	5	0	0	2.25	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	B/1	18	18	0	0	2.25	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cf/1	140	140	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	N gw/1	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kx/1	1217	1217	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	E west f/1	717	717	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Bf/2	18	18	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Eap/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Eap/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Eap2/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Eap2/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Bf/1	5	5	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Cf/2	1077	1077	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Af/1	665	665	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Gf/1	0	0	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Df/2	65	65	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kx/1	116	116	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cx/2	278	278	0	0	5.25	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kap/1	0	0	0	0	11.48	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cap/1	0	0	0	0	18.23	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Cap/1	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Cap2/1	0	0	0	0	18.23	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	D/1	66	66	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	D/1	68	68	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	E east f/1	113	113	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Af/2	4	4	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Gf/2	10	10	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	F/1	116	116	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted

1	1	TrafficStream	N/A	G/1	0	0	0	0	1.50	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	G/1	10	10	0	0	1.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Af/1	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	E east f/2	129	129	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Df/2	3	3	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	H/1	278	278	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Fx/1	116	116	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	K/1	432	432	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	If/1	160	160	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cx/2	439	439	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	J/1	785	785	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	If/2	432	432	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kap2/1	0	0	0	0	11.48	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	E west f/2	0	0	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted

Give Way Data

Traffic Stream	Opposed Traffic	Use Step-wise Opposed Turn Model	Number Of Storage Spaces	Radius Of Turn (m)	Visibility Restricted	Visibility Restricted By	Visibility Restricted By Link	Visibility Restricted By Traffic Stream
1	Movement	False	(N/A)	(N/A)	False	N/A	N/A	N/A
1	AllTraffic	False	(N/A)	(N/A)	False	N/A	N/A	N/A
1	AllTraffic	True	0	15.00	False	N/A	N/A	N/A

Flow Allocation Tool Tables

Normal Input Flows (PCU/hour) for OD Matrix: 1

		To		
		1	2	3
From	1	0	160.00000	432.00000
	2	0	0	785.00000
	3	0	432.00000	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		If/1,If/2		592	592	0	0	0	0	0	0
2		J/1	Jx/1	785	785	0	0	592	592	0	0
3		K/1	Kap2/1	432	432	0	0	1217	1217	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		If/1,Jx/1	160
2		If/2,Kap2/1	432
3		J/1,Kap2/1	785
4		K/1,Jx/1	432

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	160
2	True	Normal	N/A	N/A	432
3	True	Normal	N/A	N/A	785
4	True	Normal	N/A	N/A	432

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Normal Input Flows (PCU/hour) for OD Matrix: 2

		To		
		1	2	3
From	1	0	1217.00000	116.00000
	2	439.00000	0	278.00000
	3	0	0	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		Kx/1	Kap/1	1333	1333	0	0	439	439	0	0
2		Cx/2	Cap/1	717	717	0	0	1217	1217	0	0
3			Ix/1	0	0	0	0	394	394	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		Kx/1,F/1,Fx/1,Ix/1	116
2		Kx/1,Cap/1	1217
3		Cx/2,H/1,Ix/1	278
4		Cx/2,Kap/1	439

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	116
2	True	Normal	N/A	N/A	1217
3	True	Normal	N/A	N/A	278
4	True	Normal	N/A	N/A	439

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Normal Input Flows (PCU/hour) for OD Matrix: 3

		To		
		1	2	3
From	1	0	140.00000	1077.00000
	2	18.00000	0	5.00000
	3	717.00000	12.00000	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		Cf/1,Cf/2	Cap2/1	1217	1217	0	0	735	735	0	0
2		B/1	Bx/1	23	23	0	0	140	140	0	0
3		E west f/1	Eap/1	717	717	0	0	1082	1082	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		Cf/1,Bx/1	140
2		Cf/2,Eap/1	1077
3		B/1,Bf/1,Eap/1	5
4		B/1,Bf/2,Cap2/1	18
5		E west f/1,Cap2/1	717

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	140
2	True	Normal	N/A	N/A	1077
3	True	Normal	N/A	N/A	5
4	True	Normal	N/A	N/A	18
5	True	Normal	N/A	N/A	717

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0

Normal Input Flows (PCU/hour) for OD Matrix: 4

		To			
		1	2	3	4
From	1	0	113.00000	840.00000	129.00000
	2	65.00000	0	66.00000	3.00000
	3	665.00000	4.00000	0	0
	4	0	10.00000	0	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		E east f/1,E east f/2	Eap2/1	1082	1082	0	0	730	730	0	0
2		D/1	Dx/1	134	134	0	0	127	127	0	0
3		A/1	Ax/1	669	669	0	0	906	906	0	0
4		G/1	Gx/1	10	10	0	0	132	132	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		E east f/1,Ax/1	840
2		E east f/1,Dx/1	113
3		E east f/2,Gx/1	129
4		D/1,Df/1,Ax/1	66
5		D/1,Df/2,Gx/1	3
6		D/1,Df/2,Eap2/1	65
7		A/1,Af/1,Gx/1	0
8		A/1,Af/1,Eap2/1	665
9		A/1,Af/2,Dx/1	4
10		G/1,Gf/1,Eap2/1	0
11		G/1,Gf/2,Ax/1	0
12		G/1,Gf/2,Dx/1	10

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	840
2	True	Normal	N/A	N/A	113
3	True	Normal	N/A	N/A	129
4	True	Normal	N/A	N/A	66
5	True	Normal	N/A	N/A	3
6	True	Normal	N/A	N/A	65
7	True	Normal	N/A	N/A	0
8	True	Normal	N/A	N/A	665
9	True	Normal	N/A	N/A	4
10	True	Normal	N/A	N/A	0
11	True	Normal	N/A	N/A	0
12	True	Normal	N/A	N/A	10

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0
6	False	Disabled	N/A	N/A	0
7	False	Disabled	N/A	N/A	0
8	False	Disabled	N/A	N/A	0
9	False	Disabled	N/A	N/A	0
10	False	Disabled	N/A	N/A	0
11	False	Disabled	N/A	N/A	0
12	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0
6	False	Disabled	N/A	N/A	0
7	False	Disabled	N/A	N/A	0
8	False	Disabled	N/A	N/A	0
9	False	Disabled	N/A	N/A	0
10	False	Disabled	N/A	N/A	0
11	False	Disabled	N/A	N/A	0
12	False	Disabled	N/A	N/A	0

Signal Timings

112s cycle time; 112 steps

Controller Stream

ID	Name	Description	Gaining Delay Type	Signals Manipulation Mode	Multiple Cycling	Offset Relative To	Offset Valid	Offset (s)	Auto Redistribute	Optimisation Level	Use Sequence
1			Absolute	StageBased	Single	1	True	0	True	Offsets And Green Splits	1

2			Absolute	PhaseBased	Single	1	True	2	True	Offsets And Green Splits	1
3			Absolute	StageBased	Double	1	True	6	True	Offsets And Green Splits	1

Phases

Controller Stream	ID	Minimum Green (s)	Maximum Green (s)	Relative Start Displacement (s)	Relative End Displacement (s)	Dummy
1	A	7	120	2	3	False
1	B	7	120	2	3	False
1	C	7	120	2	3	False
1	D	7	120	2	3	False
1	E	7	120	2	3	False
2	A	7	120	2	3	False
2	B	7	120	2	3	False
2	C	7	120	2	3	False
2	D	7	120	2	3	False
2	E	7	120	2	3	False
2	F	7	120	2	3	False
2	G	7	120	2	3	False
2	H	7	120	2	3	False
2	I	4	4	0	0	False
2	J	4	4	0	0	False
2	K	4	4	0	0	False
2	L	4	4	0	0	False
2	M	5	5	0	0	False
2	N	4	4	0	0	False
2	O	4	4	0	0	False
2	P	4	4	0	0	False
3	A	7	120	2	3	False
3	B	7	120	2	3	False
3	C	7	120	2	3	False

Library Stages

Controller Stream	ID	Phases In Stage	User Stage Minimum (s)
1	1	A,D	7
1	2	D,E	7
1	3	C,B	7
2	1	A,C,M,I	1
2	2	B,D,L,P	1
2	3	D,G	1
2	4	G,H,N,K	1
2	5	J,E,F,O,M	1
3	1	A	7
3	2	B,C	7

Losing/ Gaining delays at each Controller Stream

Controller Stream	Delay	Type	Phase	From Stage	To Stage	Relative Delay	Absolute Delay
1	1	Gaining	B	2	3	5	5
2	1	Losing	B	2	3	8	N/A
2	2	Losing	A	2	3	8	N/A
2	3	Gaining	L	2	3	11	11
2	4	Gaining	G	2	3	0	11
2	5	Losing	G	4	5	3	N/A

2	6	Losing	H	4	5	3	N/A
2	7	Losing	K	4	5	3	N/A
2	8	Gaining	O	4	5	3	3
2	9	Losing	I	1	2	1	N/A
2	10	Losing	C	1	2	3	N/A
2	11	Losing	P	2	3	4	N/A
2	12	Gaining	L	1	2	0	5
2	13	Gaining	P	1	2	0	5
2	14	Gaining	B	1	2	0	8
2	15	Gaining	D	1	2	0	8
2	16	Losing	B	2	4	2	N/A
2	17	Losing	D	2	4	2	N/A
2	18	Losing	A	1	2	3	N/A

Stage Sequences

Controller Stream	ID	Stage IDs	Stage Ends	Multiple Cycling Stage IDs	Multiple Cycling Stage Ends
1	1	1,2,3	63,79,99		
2	1	1,2,4,5	52,65,80,97		
3	1	1,2	28,49	1,2	84,105

Resultant Stages

Controller Stream	Stage Index	Is Base Stage	Library Stage ID	Phases In This Stage	Stage Start (s)	Stage End (s)	Stage Duration (s)	User Stage Minimum (s)	Stage Minimum (s)
1	1	True	1	A,D	104	63	71	7	7
1	2	True	2	D,E	68	79	11	7	7
1	3	True	3	C,B	84	99	15	7	7
2	1	True	1	A,C,M,I	106	52	58	1	4
2	2	True	2	B,D,L,P	60	65	5	1	5
2	3	True	4	G,H,N,K	76	80	4	1	4
2	4	True	5	J,E,F,O,M	90	97	7	1	7
3	1	True	1	A	110	28	30	7	7
3	2	True	2	B,C	33	49	16	7	7
3	3	False	1	A	54	84	30	7	7
3	4	False	2	B,C	89	105	16	7	7

Resultant Phase Green Periods

Controller Stream	Phase	Green Period	Is Base Green Period	Start Time (s)	End Time (s)	Duration (s)
1	A	1	True	104	63	71
1	B	1	True	84	99	15
1	C	1	True	84	99	15
1	D	1	True	104	79	87
1	E	1	True	68	79	11
2	A	1	True	106	55	61
2	B	1	True	60	67	7
2	C	1	True	102	55	65
2	D	1	True	60	67	7
2	E	1	True	90	97	7
2	F	1	True	90	97	7
2	G	1	True	72	83	11
2	H	1	True	76	83	7
2	I	1	True	104	53	61
2	J	1	True	87	97	10
2	K	1	True	74	83	9

2	L	1	True	57	65	8
2	M	1	True	90	52	74
2	N	1	True	71	80	9
2	O	1	True	83	97	14
2	P	1	True	57	65	8
3	A	1	False	54	84	30
3	A	2	True	110	28	30
3	B	1	True	33	49	16
3	B	2	False	89	105	16
3	C	1	True	33	49	16
3	C	2	False	89	105	16

Intergreen Matrix for Controller Stream 1

		To				
		A	**B**	**C**	**D**	**E**
From	**A**	-	5	5		5
	B	5	-			
	C	5		-	5	5
	D			5	-	
	E	5		5		-

Interstage Matrix for Controller Stream 1

		To		
		1	**2**	**3**
From	**1**	-	5	5
	2	5	-	5
	3	5	5	-

Banned Stage transitions for Controller Stream 1

		To		
		1	**2**	**3**
From	**1**	-		
	2		-	
	3			-

Intergreen Matrix for Controller Stream 2

		To															
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**
From	**A**	-			5	5	7		5		4		2			7	
	B		-	5		5			5						4	7	
	C		5	-		5		9	7			7			3		2
	D	5			-	5			5		3	7					
	E	5	7	5	5	-		9	5	7					3		2
	F	5					-		5	7			3				
	G			5		5		-						7			7
	H	5	5	5	5	5	7		-		4		2	7			
	I					6	6			-							
	J	9			10				9		-						
	K			6	6							-					
	L	10					8		11				-				
	M							7	7					-			
	N		9	10		10									-		
	O	6	6													-	

	P			12		12		7									-

Interstage Matrix for Controller Stream 2

		To			
		1	**2**	**3**	**4**
From	**1**	-	8	9	9
	2	12	-	11	11
	3	7	7	-	7
	4	10	9	6	-

Banned Stage transitions for Controller Stream 2

		To			
		1	**2**	**3**	**4**
From	**1**	-			
	2		-		
	3			-	
	4				-

Intergreen Matrix for Controller Stream 3

		To		
		A	**B**	**C**
From	**A**	-	5	5
	B	5	-	
	C	5		-

Interstage Matrix for Controller Stream 3

		To			
		1	**2**	**3**	**4**
From	**1**	-	5		
	2	5	-		
	3			-	
	4				-

Banned Stage transitions for Controller Stream 3

		To			
		1	**2**	**3**	**4**
From	**1**	-			
	2		-		
	3			-	
	4				-

TRANSYT 12 Tables

Resultant Stages

Controller Stream	Stage Index	Is Base Stage	Library Stage ID	Phases In This Stage	TRANSYT Stage Start (s)	TRANSYT Preceding Interstage (s)	TRANSYT Stage Minimum (s)
1	1	True	1	A,D	99	5	12
1	2	True	2	D,E	63	5	12
1	3	True	3	C,B	79	5	12
2	1	True	1	A,C,M,I	97	9	13
2	2	True	2	B,D,L,P	52	8	13
2	3	True	4	G,H,N,K	65	11	15

2	4	True	5	J,E,F,O,M	80	10	17
3	1	True	1	A	105	5	12
3	2	True	2	B,C	28	5	12
3	3	False	1	A	49	5	12
3	4	False	2	B,C	84	5	12

Resultant Phase Green Periods

Controller Stream	Phase	Green Period	TRANSYT Starting Stage (s)	TRANSYT Ending Stage (s)	TRANSYT Start Lag (s)	TRANSYT End Lag (s)
1	A	1	1	2	5	0
1	B	1	3	1	5	0
1	C	1	3	1	5	0
1	D	1	1	3	5	0
1	E	1	2	3	5	0
2	A	1	1	2	9	3
2	B	1	2	3	8	2
2	C	1	1	2	5	3
2	D	1	2	3	8	2
2	E	1	4	1	10	0
2	F	1	4	1	10	0
2	G	1	3	4	7	3
2	H	1	3	4	11	3
2	I	1	1	2	7	1
2	J	1	4	1	7	0
2	K	1	3	4	9	3
2	L	1	2	3	5	0
2	M	1	4	2	10	0
2	N	1	3	4	6	0
2	O	1	4	1	3	0
2	P	1	2	3	5	0
3	A	1	3	4	5	0
3	A	2	1	2	5	0
3	B	1	2	3	5	0
3	B	2	4	1	5	0
3	C	1	2	3	5	0
3	C	2	4	1	5	0

Stage Timings (TRANSYT 12 timings)

112s cycle time; 112 steps

Controller Stream	Number of Stages	Stage 1	Stage 2	Stage 3	Stage 4
1	3	99	63	79	
2	4	97	52	65	80
3	4	105	28	49	84

Link Green Times

Link	Traffic Node	Controller Stream	Phase	Green Period 1		
				Start	End	Duration
Ped 1	2	2	I	104	53	61
Ped 2	2	2	J	87	97	10
Ped 3	2	2	K	74	83	9
Ped 4	2	2	L	57	65	8
Ped 5	2	2	M	90	52	74

Ped 6	2	2	N	71	80	9
Ped 7	2	2	O	83	97	14
Ped 8	2	2	P	57	65	8

Traffic Stream Green Times

Arm	Traffic Stream ID	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
J	**1**	3	3	A	54	84	30	110	28	30
K	**1**	3	3	A	54	84	30	110	28	30
Af	**1**	2	2	C	102	55	65			
Af	**2**	2	2	D	60	67	7			
Bf	**1**	1	1	B	84	99	15			
Bf	**2**	1	1	C	84	99	15			
Cf	**1**	1	1	A	104	63	71			
Cf	**2**	1	1	A	104	63	71			
Df	**1**	2	2	F	90	97	7			
Df	**2**	2	2	E	90	97	7			
E east f	**1**	2	2	A	106	55	61			
E east f	**2**	2	2	B	60	67	7			
E west f	**1**	1	1	D	104	79	87			
E west f	**2**	1	1	E	68	79	11			
Gf	**1**	2	2	G	72	83	11			
Gf	**2**	2	2	H	76	83	7			
If	**1**	3	3	C	33	49	16	89	105	16
If	**2**	3	3	B	33	49	16	89	105	16

Link Results

Link Results: Summary

Link	Major Link	Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Of Penalties (£ per hr)	Unwei Perfor Index h
Ped 1	(N/A)	0	0	0	False	1800	996	0	False	Unrestricted	61.00	62.00	570000.00	0.
Ped 2	(N/A)	0	0	0	False	1800	177	0	False	Unrestricted	10.00	11.00	60000.00	0.
Ped 3	(N/A)	0	0	0	False	1800	161	0	False	Unrestricted	9.00	10.00	50000.00	0.
Ped 4	(N/A)	0	0	0	False	1800	145	0	False	Unrestricted	8.00	9.00	40000.00	0.
Ped 5	(N/A)	0	0	0	False	1800	1205	0	False	Unrestricted	74.00	75.00	690000.00	0.
Ped 6	(N/A)	0	0	0	False	1800	161	0	False	Unrestricted	9.00	10.00	50000.00	0.
Ped 7	(N/A)	0	0	0	False	1800	241	0	False	Unrestricted	14.00	15.00	100000.00	0.
Ped 8	(N/A)	0	0	0	False	1800	145	0	False	Unrestricted	8.00	9.00	40000.00	0.

Link Results: Stops And Delays

Link	Major Link	Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)

Ped 1	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 2	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 3	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 4	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 5	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 6	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 7	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 8	(N/A)	1.20	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Link Results: Queues And Blocking

Link	Major Link	Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
Ped 1	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	62.00	0.00	62.00	False
Ped 2	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	11.00	0.00	11.00	False
Ped 3	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	10.00	0.00	10.00	False
Ped 4	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	9.00	0.00	9.00	False
Ped 5	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	75.00	0.00	75.00	False
Ped 6	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	10.00	0.00	10.00	False
Ped 7	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	15.00	0.00	15.00	False
Ped 8	(N/A)	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	9.00	0.00	9.00	False

Link Results: Fuel Consumption

Link	Major Link	Fuel Consumption Cruise (Litres per hour)	Fuel Consumption Delay (Litres per hour)	Fuel Consumption Stops (Litres per hour)	Fuel Consumption Total (Litres per hour)	Fuel Economy Total (Miles / gal)
Ped 1	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 2	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 3	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 4	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 5	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 6	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 7	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 8	(N/A)	0.00	0.00	0.00	0.00	Infinity

Link Results: Journey Times

Link	Major Link	Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)
Ped 1	(N/A)	0.00	0.00	0.00	0.00
Ped 2	(N/A)	0.00	0.00	0.00	0.00
Ped 3	(N/A)	0.00	0.00	0.00	0.00
Ped 4	(N/A)	0.00	0.00	0.00	0.00
Ped 5	(N/A)	0.00	0.00	0.00	0.00
Ped 6	(N/A)	0.00	0.00	0.00	0.00
Ped 7	(N/A)	0.00	0.00	0.00	0.00
Ped 8	(N/A)	0.00	0.00	0.00	0.00

Traffic Stream Results

Traffic Stream Results: Summary

Arm	TrafficStream	Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Penal (£ p hr)
A	1	669	669	0	False	2105	2105	32	False	215	112.00	0.00	0.0
B	1	23	23	0	False	2105	2105	1	False	9052	112.00	0.00	0.0
Cap	1	1217	1217	0	False	2105	2105	58	False	73	112.00	0.00	0.0
Cap2	1	735	735	0	False	4210	4210	17	False	473	112.00	0.00	0.0
D	1	134	134	0	False	2105	2105	6	False	1471	112.00	0.00	0.0
E east f	1	953	953	0	False	1945	1094	87	False	15	61.00	32.00	0.0
E east f	2	129	129	0	False	1965	158	82	False	22	7.00	0.00	0.0
E west f	1	717	717	0	False	1965	1561	46	False	118	87.00	30.00	0.0
E west f	2	0	0	0	False	1854	215	0	False	Unrestricted	11.00	0.00	0.0
Eap	1	1082	1082	0	False	2105	2105	51	False	95	112.00	0.00	0.0
Eap2	1	730	730	0	False	1965	1965	37	False	169	112.00	0.00	0.0
F	1	116	116	0	False	1303	1303	9	False	1024	112.00	0.00	0.0
G	1	10	10	0	False	2155	2155	0	False	21450	112.00	0.00	0.0
H	1	278	278	0	False	1374	1374	20	False	394	112.00	0.00	0.0
J	1	785	785	0	False	2055	1174	67	False	50	60.00	0.00	0.0
K	1	432	432	0	False	1915	1094	39	False	153	60.00	0.00	0.0
Af	1	665	665	0	False	1961	1173	57	False	76	65.00	30.00	0.0
Af	2	4	4	0	False	1828	147	3	False	3572	7.00	0.00	0.0
Ax	1	906	906	0	False	3600	3600	25	False	297	112.00	100.00	0.0
Bf	1	5	5	0	False	1741	264	2	False	5185	15.00	26.00	0.0
Bf	2	18	18	0	False	1781	270	7	False	1402	15.00	0.00	0.0
Bx	1	140	140	0	False	1800	1800	8	False	1186	112.00	100.00	0.0
Cf	1	140	140	0	False	1741	1135	12	False	711	71.00	32.00	0.0
Cf	2	1077	1077	0	False	1915	1248	86	False	16	71.00	0.00	0.0
Cx	2	717	717	0	False	3600	3600	20	False	402	112.00	0.00	0.0
Df	1	66	66	0	False	1687	136	49	False	105	7.00	26.00	0.0
Df	2	68	68	0	False	1880	151	45	False	122	7.00	0.00	0.0
Dx	1	127	127	0	False	1800	1800	7	False	1317	112.00	100.00	0.0
Fx	1	116	116	0	False	1800	1800	6	False	1452	112.00	0.00	0.0
Gf	1	0	0	0	False	2033	236	0	False	Unrestricted	11.00	0.00	0.0

Gf	2	10	10	0	False	2155	173	6	False	1632	7.00	0.00	0.0
Gx	1	132	132	0	False	1800	1800	7	False	1264	112.00	0.00	0.0
If	1	160	160	0	False	1915	616	26	False	285	32.00	0.00	0.0
If	2	432	432	0	False	1741	560	77	False	30	32.00	0.00	0.0
Ix	1	394	394	0	False	1800	1800	22	False	357	112.00	0.00	0.0
Jx	1	592	592	0	False	Unrestricted	Unrestricted	0	False	Unrestricted	112.00	0.00	0.0
Kap	1	439	439	0	False	2105	2105	21	False	379	112.00	0.00	0.0
Kap2	1	1217	1217	0	False	4210	4210	29	False	246	112.00	0.00	0.0
Kx	1	1333	1333	0	False	3600	3600	37	False	170	112.00	0.00	0.0
N g w	1	0	0	0	False	0	0	0	False	-100	112.00	0.00	0.0

Traffic Stream Results: Stops And Delays

Arm	TrafficStream	Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)
A	1	7.50	N/A	0.40	0.00	0.07	1.05	1.05	0.00	0.00	0.00	0.00	0.00
B	1	7.50	N/A	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cap	1	1.00	N/A	1.17	0.00	0.40	5.61	5.61	0.00	0.00	0.00	0.00	0.00
Cap2	1	1.00	N/A	0.09	0.00	0.02	0.26	0.26	0.00	0.00	0.00	0.00	0.00
D	1	7.50	N/A	0.06	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00
E east f	1	9.60	A	17.66	1.88	2.80	66.37	66.37	25.42	154.48	87.82	3.04	3.04
E east f	2	9.60	A	77.06	1.20	1.57	39.21	39.21	132.61	125.33	45.73	2.14	2.14
E west f	1	9.60	A	1.09	0.02	0.19	3.09	3.09	4.86	28.64	6.24	0.44	0.44
E west f	2	0.00	F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eap	1	1.00	N/A	0.90	0.00	0.27	3.85	3.85	0.80	0.00	8.71	0.00	0.00
Eap2	1	1.00	N/A	0.54	0.00	0.11	1.56	1.56	0.48	0.00	3.52	0.00	0.00
F	1	1.00	N/A	0.13	0.00	0.00	0.06	0.06	0.00	0.00	0.00	0.00	0.00
G	1	7.50	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H	1	5.25	N/A	0.33	0.00	0.03	0.36	0.36	0.00	0.00	0.00	0.00	0.00
J	1	7.50	A	11.39	1.82	0.67	35.28	35.28	67.53	487.66	42.45	17.02	17.02
K	1	18.36	B	5.92	0.58	0.13	10.09	10.09	41.87	172.63	8.22	2.27	2.27
A f	1	3.00	A	15.68	2.53	0.37	41.13	41.13	59.16	381.56	11.83	12.63	12.63
A f	2	3.00	A	48.16	0.05	0.00	0.76	0.76	90.49	3.61	0.01	0.12	0.12
A x	1	7.50	N/A	0.17	0.00	0.04	0.60	0.60	0.00	0.00	0.00	0.00	0.00
Bf	1	2.25	A	40.85	0.06	0.00	0.81	0.81	83.16	4.15	0.01	0.13	0.13
Bf	2	2.25	A	41.19	0.20	0.00	2.92	2.92	83.47	14.95	0.08	0.48	0.48
Bx	1	7.50	N/A	0.08	0.00	0.00	0.05	0.05	0.08	0.00	0.11	0.00	0.00
Cf	1	29.16	C	6.93	0.26	0.01	3.83	3.83	33.35	46.42	0.28	0.59	0.59
Cf	2	12.00	B	24.12	4.61	2.61	102.47	102.47	82.07	801.65	82.24	11.08	11.08
Cx	2	29.16	N/A	0.12	0.00	0.02	0.35	0.35	0.00	0.00	0.00	0.00	0.00
Df	1	3.00	A	61.65	0.90	0.23	16.05	16.05	104.32	61.77	7.08	2.21	2.21
Df	2	3.00	A	58.76	0.93	0.18	15.76	15.76	101.26	63.15	5.71	2.21	2.21
Dx	1	7.50	N/A	0.08	0.00	0.00	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Fx	1	1.00	N/A	0.07	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00
Gf	1	0.00	F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gf	2	1.50	A	48.46	0.13	0.00	1.91	1.91	90.75	9.02	0.06	0.29	0.29

Gx	1	7.50	N/A	0.08	0.00	0.00	0.04	0.04	0.18	0.15	0.09	0.01	0.01
If	1	7.50	A	15.12	0.63	0.05	9.54	9.54	71.19	110.98	2.92	3.66	3.66
If	2	7.50	A	27.71	2.06	1.27	47.21	47.21	102.42	364.76	77.69	14.20	14.20
Ix	1	7.50	N/A	0.28	0.00	0.03	0.44	0.44	0.00	0.00	0.00	0.00	0.00
Jx	1	7.50	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kap	1	1.00	N/A	0.23	0.00	0.03	0.39	0.39	0.00	0.00	0.00	0.00	0.00
Kap2	1	1.00	N/A	0.17	0.00	0.06	0.83	0.83	0.00	0.00	0.00	0.00	0.00
Kx	1	18.36	N/A	0.29	0.00	0.11	1.55	1.55	0.00	0.00	0.00	0.00	0.00
N gw	1	0.00	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues And Blocking

Arm	TrafficStream	Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
A	1	0.00	0.07	19.79	0.00	0.00	0.00	0.07	0.07	0.00	29.00	29.00	False
B	1	0.00	0.00	19.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
Cap	1	0.00	0.40	0.00	0.40	0.00	0.00	0.40	0.40	0.00	0.00	0.00	False
Cap2	1	0.00	0.02	0.00	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.00	False
D	1	0.00	0.00	19.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
E east f	1	0.00	8.80	9.60	0.01	0.00	0.00	2.80	7.52	0.00	0.00	0.00	False
E east f	2	0.00	5.52	12.00	0.00	0.00	0.00	1.57	5.24	0.00	0.00	0.00	False
E west f	1	0.00	1.52	25.00	0.00	0.00	0.00	0.19	1.02	0.00	0.00	0.00	False
E west f	2	0.00	0.00	13.94	0.00	0.00	0.00	0.00	0.00	13.00	0.00	13.00	False
Eap	1	0.00	0.27	0.00	0.27	0.00	0.00	0.27	0.27	12.00	0.00	12.00	False
Eap2	1	0.00	0.11	0.00	0.11	0.00	0.00	0.11	0.11	26.00	0.00	26.00	False
F	1	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
G	1	0.00	0.00	20.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
H	1	0.00	0.03	9.00	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	False
J	1	0.00	8.96	19.32	0.00	0.00	0.00	0.67	5.90	0.00	0.00	0.00	False
K	1	0.00	3.93	27.54	0.00	0.00	0.00	0.13	3.21	0.00	0.00	0.00	False
Af	1	0.00	12.93	7.37	0.77	0.00	0.00	0.37	8.68	0.00	0.00	0.00	False
Af	2	0.00	0.11	6.87	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	False
Ax	1	0.00	0.04	33.84	0.00	0.00	0.00	0.04	0.04	1.00	0.00	1.00	False
Bf	1	0.00	0.13	4.91	0.00	0.00	0.00	0.00	0.13	0.00	1.00	1.00	False
Bf	2	0.00	0.48	5.02	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00	False
Bx	1	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	12.00	0.00	12.00	False
Cf	1	0.00	1.52	39.77	0.00	0.00	0.00	0.01	1.39	0.00	0.00	0.00	False
Cf	2	0.00	29.32	18.00	1.87	0.00	0.00	2.61	15.04	0.00	0.00	0.00	False
Cx	2	0.00	0.02	82.24	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	False
Df	1	0.00	2.19	6.34	0.00	0.00	0.00	0.23	2.11	0.00	0.00	0.00	False
Df	2	0.00	2.18	7.07	0.00	0.00	0.00	0.18	2.13	0.00	1.00	1.00	False
Dx	1	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
Fx	1	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
Gf	1	0.00	0.00	3.82	0.00	0.00	0.00	0.00	0.00	13.00	0.00	13.00	False
Gf	2	0.00	0.29	4.05	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.00	False
Gx	1	0.00	0.51	16.92	0.00	0.00	0.00	0.00	0.00	53.00	0.00	53.00	False
If	1	0.00	1.87	18.00	0.00	0.00	0.00	0.05	1.73	0.00	0.00	0.00	False

If	2	0.00	7.27	16.37	0.00	0.00	0.00	1.27	5.83	0.00	0.00	0.00	False
Ix	1	0.00	0.03	16.92	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	False
Jx	1	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
Kap	1	0.00	0.03	0.00	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.00	False
Kap2	1	0.00	0.06	0.00	0.06	0.00	0.00	0.06	0.06	0.00	0.00	0.00	False
Kx	1	0.00	0.11	51.78	0.00	0.00	0.00	0.11	0.11	0.00	0.00	0.00	False
N gw	1	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	112.00	0.00	112.00	False

Traffic Stream Results: Fuel Consumption

Arm	TrafficStream	Fuel Consumption Cruise (Litres per hour)	Fuel Consumption Delay (Litres per hour)	Fuel Consumption Stops (Litres per hour)	Fuel Consumption Total (Litres per hour)	Fuel Economy Total (Miles / gal)
A	1	5.41	0.07	0.00	5.48	2.82
B	1	0.19	0.00	0.00	0.19	2.82
Cap	1	0.00	0.39	0.00	0.00	2.82
Cap2	1	0.00	0.02	0.00	0.00	2.82
D	1	1.08	0.00	0.00	1.09	2.82
E east f	1	7.28	4.65	0.91	12.84	2.82
E east f	2	0.99	2.75	0.65	4.38	2.82
E west f	1	5.48	0.22	0.13	5.82	2.82
E west f	2	0.00	0.00	0.00	0.00	2.82
Eap	1	0.00	0.27	0.00	0.00	2.82
Eap2	1	0.00	0.11	0.00	0.00	2.82
F	1	0.10	0.00	0.00	0.11	2.82
G	1	0.08	0.00	0.00	0.08	2.82
H	1	1.57	0.03	0.00	1.60	2.82
J	1	6.35	2.47	5.12	13.94	2.82
K	1	6.31	0.71	0.68	7.70	2.82
Af	1	2.15	2.88	3.80	8.83	2.82
Af	2	0.01	0.05	0.03	0.10	2.82
Ax	1	7.32	0.04	0.00	7.37	2.82
Bf	1	0.01	0.06	0.04	0.11	2.82
Bf	2	0.04	0.20	0.15	0.39	2.82
Bx	1	1.13	0.00	0.00	1.14	2.82
Cf	1	3.25	0.27	0.18	3.69	2.82
Cf	2	10.28	7.18	3.33	20.80	2.82
Cx	2	16.63	0.02	0.00	16.66	2.82
Df	1	0.21	1.12	0.66	2.00	2.82
Df	2	0.22	1.10	0.66	1.99	2.82
Dx	1	1.03	0.00	0.00	1.03	2.82
Fx	1	0.10	0.00	0.00	0.11	2.82
Gf	1	0.00	0.00	0.00	0.00	2.82
Gf	2	0.02	0.13	0.09	0.24	2.82
Gx	1	1.07	0.00	0.00	1.07	2.82
If	1	1.29	0.67	1.10	3.06	2.82
If	2	3.49	3.31	4.27	11.07	2.82
Ix	1	3.19	0.03	0.00	3.22	2.82
Jx	1	4.79	0.00	0.00	4.79	2.82
Kap	1	0.00	0.03	0.00	0.00	2.82
Kap2	1	0.00	0.06	0.00	0.00	2.82
Kx	1	19.47	0.11	0.00	19.58	2.82

N gw	1	0.00	0.00	0.00	0.00	2.82

Traffic Stream Results: Journey Times

Arm	TrafficStream	Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)
A	1	66.90	1.47	45.58	7.90
B	1	2.30	0.05	47.94	7.51
Cap	1	0.00	0.73	0.00	0.00
Cap2	1	0.00	0.22	0.00	0.00
D	1	13.40	0.28	47.63	7.56
E east f	1	76.24	7.22	10.57	27.26
E east f	2	10.32	3.11	3.32	86.66
E west f	1	57.36	2.13	26.93	10.69
E west f	2	0.00	0.00	0.00	0.00
Eap	1	0.00	0.57	0.00	0.00
Eap2	1	0.00	0.31	0.00	0.00
F	1	1.16	0.04	31.72	1.13
G	1	1.00	0.02	47.98	7.50
H	1	19.46	0.43	45.15	5.58
J	1	78.50	4.12	19.05	18.89
K	1	66.10	2.91	22.68	24.28
A f	1	26.60	3.45	7.71	18.68
A f	2	0.16	0.06	2.81	51.16
A x	1	90.60	1.93	46.95	7.67
B f	1	0.15	0.06	2.51	43.10
B f	2	0.54	0.22	2.49	43.44
B x	1	14.00	0.29	47.47	7.58
C f	1	34.02	1.40	24.24	36.09
C f	2	107.70	10.81	9.97	36.12
C x	2	174.23	5.83	29.87	29.28
D f	1	2.64	1.19	2.23	64.65
D f	2	2.72	1.17	2.33	61.76
D x	1	12.70	0.27	47.52	7.58
F x	1	1.16	0.03	33.68	1.07
G f	1	0.00	0.00	0.00	0.00
G f	2	0.20	0.14	1.44	49.96
G x	1	13.20	0.28	47.48	7.58
I f	1	16.00	1.01	15.92	22.62
I f	2	43.20	4.22	10.23	35.21
I x	1	39.40	0.85	46.27	7.78
J x	1	59.20	1.23	48.00	7.50
Kap	1	0.00	0.15	0.00	0.00
Kap2	1	0.00	0.40	0.00	0.00
K x	1	203.95	6.91	29.53	18.65
N gw	1	0.00	0.00	0.00	0.00

Network Results

Run Summary

Analysis Set Used	Run Start Time	Run Finish Time	Modelling Start Time (HH:mm)	Cycle Time Used (s)	Total Network Delay (PCU-hr/hr)	Highest DOS (%)	LTSWith Highest DOS	Number Of Oversaturated LTS	Percentage Of Oversaturated LTS (%)	LTSWith Worst Signalised PRC	LTSWith Worst Unsignalised PRC	LTSWith Worst Overall PRC	Network Within Capacity

A1 - AM DS	05/09/2011 20:47:51	05/09/2011 20:48:27	08:00	112	28.03	87.11	E east f/1	0	0	E east f/1	N gw/1	N gw/1	True

Network Results: Summary

Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Of Penalties (£ per hr)	Unweighted Performance Index (£ per hr)	Performan Index (£ p hr)
7870	7870	0	False	0	0	87	False	-100	1634.00	476.00	0.00	470.58	470.58

Network Results: Stops And Delays

Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)
8.82	B	12.82	17.85	10.18	398.07	398.07	40.78	2830.92	378.56	72.51	72.51

Network Results: Queues And Blocking

Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
0.00	0.00	359.23	0.00	0.00	0.00	0.00	0.00	204.00	2.00	206.00	False

Network Results: Fuel Consumption

Fuel Consumption Cruise (Litres per hour)	Fuel Consumption Delay (Litres per hour)	Fuel Consumption Stops (Litres per hour)	Fuel Consumption Total (Litres per hour)	Fuel Economy Total (Miles / gal)
62.89	27.90	21.81	112.60	2.82

Network Results: Journey Times

Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)
714.13	47.32	15.09	21.65

Point to Point Journey Time

Journey Time (s) for OD Matrix: 1

		To		
		1	2	3
From	1	0.00000	30.11837	35.20703
	2	0.00000	0.00000	18.89362
	3	0.00000	31.78214	0.00000

Journey Time (s) for OD Matrix: 2

		To		
		1	2	3
From	1	0.00000	18.65388	28.63778
	2	29.28433	0.00000	42.64635
	3	0.00000	0.00000	0.00000

Journey Time (s) for OD Matrix: 3

		To		
		1	2	3
From	1	0.00000	43.67402	36.12192
	2	50.94846	0.00000	50.60508
	3	10.69412	0.00000	0.00000

Journey Time (s) for OD Matrix: 4

		To			
		1	2	3	4
From	1	0.00000	34.83277	34.92498	94.24055
	2	69.31836	0.00000	79.87878	76.89750
	3	26.57858	66.63838	0.00000	0.00000
	4	0.00000	65.03779	0.00000	0.00000

TRANSYT 14

Version: 14.0.0.167 [07/10/10 - RC1]
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The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Last run: 05/09/2011 19:21:35
Analysis Set used for last run: A1 - PM DS

File: J:\23035 - North-West Cambridge\assessments\Assessments\J11 - P&R - NWC\September 2011\Tests following meeting with council\For Report\September - 2014 assessments\Madeningley Rd-NWC-P&R PM no right turn give way - 2014.t14
Report generation date: 05/09/2011 19:26:48

« A1 - PM DS
- » Summary
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- » Signal Timings
- » TRANSYT 12 Tables
- » Link Results
- » Traffic Stream Results
- » Network Results
- » Point to Point Journey Time

A1 - PM DS

Summary

Data Errors and Warnings

No errors or warnings

File summary

File Description

Title	(untitled)
Driving Side	Left
Date	18/02/2010
Status	(new file)
Enumerator	TRLLIMITED\jbinning
Results Upto Date	True
Template Image	

Units

Speed Units	Distance Units	Fuel Economy Units	Fuel Rate Units	Mass Units	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
kph	m	mpg	l/h	kg	perHour	s	-Hour	perHour

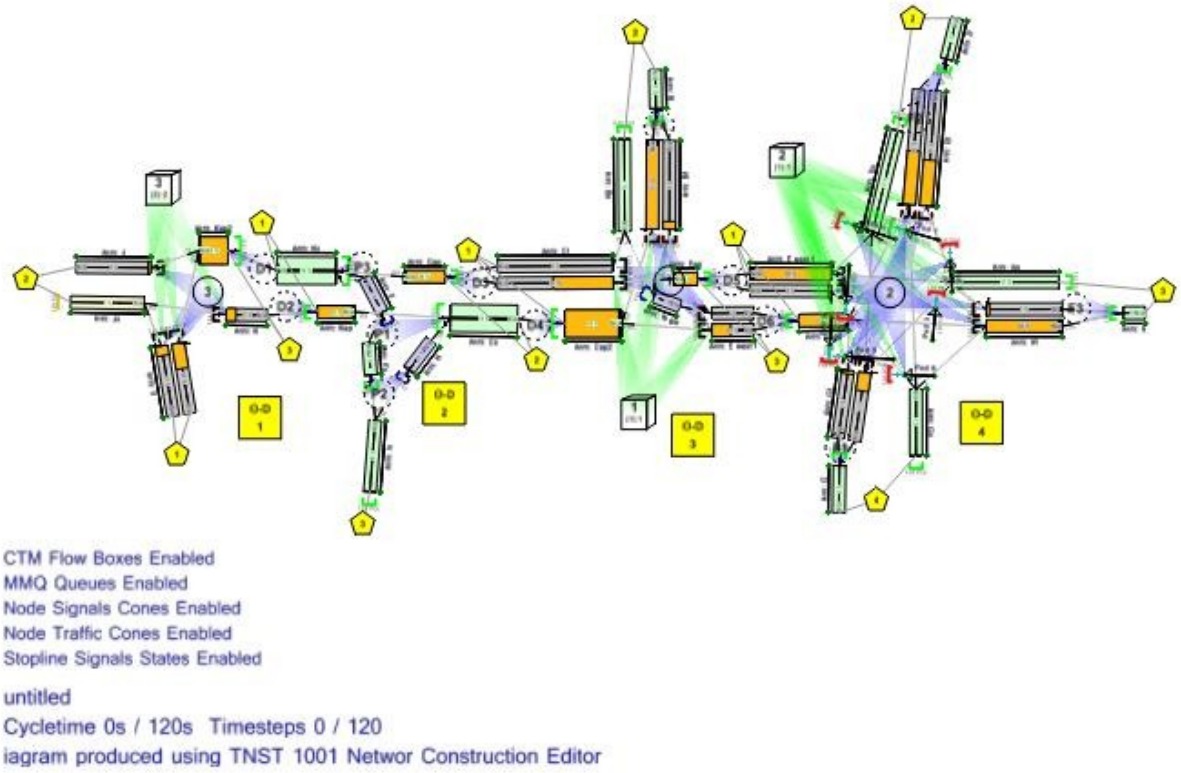
Sorting

Sorting Direction	Sorting Type	Ignore Prefixes When Sorting	Link Grouping	Source Grouping
Ascending	Numerical	False	Normal	Normal

Run Summary

Analysis Set Used	Run Start Time	Run Finish Time	Modelling Start Time (HH:mm)	Cycle Time Used (s)	Total Network Delay (PCU-hr/hr)	Highest DOS (%)	LTSWith Highest DOS	Number Of Oversaturated LTS	Percentage Of Oversaturated LTS (%)	LTSWith Worst Signalised PRC	LTSWith Worst Unsignalised PRC	LTSWith Worst Overall PRC	Network Within Capacity
A1 - PMDS	05/09/2011 19:21:33	05/09/2011 19:21:35	17:00	120	28.19	89.51	Af/1	0	0	Af/1	N gw/1	N gw/1	True

Network Diagram



Analysis and Demand Sets

Analysis Sets

Name	Description	Demand Set	Include In Report	Locked

PM DS		D1	True	False

Demand Sets

Name	Description	Composite	Demand Sets	Start Time (HH:mm)	Locked
PM		False		17:00	False

Network Options

Network Timings

Network Cycle Time (s)	Resolution	Number Of Steps	Time Segment Length (min)	Number Of Time Segments	Modelled Time Period (min)
120	1	120	60	1	60

Signals Options

Equal Length Multiple Cycling	Start Displacement (s)	End Displacement (s)	Phase Minimum Broken Penalty (£)	Phase Maximum Broken Penalty (£)	Intergreen Broken Penalty (£)
True	2	3	10000.00	10000.00	10000.00

Traffic Options

Traffic Model	DOS Threshold (%)	Flow Scaling Factor (%)	Cruise Scaling Factor (%)	Cruise Times Or Speeds	Use Link Stop Weightings	Use Link Delay Weightings	Exclude Pedestrian Links	Random Delay Mode	Type of Vehicle-in-Service	Type Of Random Parameter
PDM	90	100	100	Cruise Speeds	True	True	False	Complex	Uniform (TRANSYT)	Uniform (TRANSYT)

Bus Parameters

Dispersion Coefficient1	Dispersion Coefficient2	Acceleration (ms^[-2])	Travel Time Coefficient1	Travel Time Coefficient2
70	15	0.47	30	85

Tram Parameters

Dispersion Coefficient1	Dispersion Coefficient2	Acceleration (ms^[-2])	Travel Time Coefficient1	Travel Time Coefficient2
70	15	0.47	30	85

Optimisation Options

Auto Redistribute	Optimisation Type	Optimisation Level	Hill Climb Increments	Shotgun Number Of Runs	SAStart Temperature	SACooling Factor	Random Seed	Use Enhanced Optimisation	Optimisation Order	Locked Green Splits
True	HillClimb	Extended - Offsets And Green Splits	15,40,-1,15,40,1,-1,1,-15,-5,-1,15,1	N/A	N/A	N/A	N/A	False	1,2,3	

Economics

Unit Of Cost	Monetary Value Of Delay (£ per PCU-hr)	Monetary Value Of Stops (£ per 100 stops)
£	14.20	2.60

Fuel Consumption

Proportion Car Petrol	Proportion Car Diesel	Proportion LGVPetrol	Proportion LGVDiesel	Proportion OGV1	Proportion OGV2	Proportion PSV	Mean Weight Car Petrol (kg)	Mean Weight Car Diesel (kg)	Mean Weight LGVPetrol (kg)	Mean Weight LGVDiesel (kg)	Mean Weight OGV1 (kg)	Mean Weight OGV2 (kg)	Mea Weig PSV (k
0.493	0.323	0.011	0.045	0.028	0.031	0.011	1250.00	1250.00	2000.00	2000.00	20000.00	35000.00	13000

Fuel Parameters

ID	Extrapolated	Description
2010	True	Year 2010 base figures (WebTAG data March 2010)

Car Petrol

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
104.29	448.37	-491.30	217.81	N/A	ByWeights

Car Diesel

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
48.10	645.03	-5775.90	454.16	N/A	ByWeights

LGVPetrol

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
162.86	672.32	-7789.90	1052.13	N/A	ByWeights

LGVDiesel

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
108.25	599.63	-4483.10	831.10	N/A	ByWeights

OGV1

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
156.45	2600.98	-37830.60	3244.46	N/A	ByWeights

OGV2

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
361.33	4202.69	-49470.40	3828.06	N/A	ByWeights

PSV

A (x 10^[-2])	B (x 10^[-4])	C (x 10^[-7])	D (x 10^[-8])	E (x 10^[-8])	ECoefficient Mode
411.56	3064.65	-42064.30	3652.63	N/A	ByWeights

Traffic Nodes

Traffic Nodes

Traffic Node	ID	Name	Description
1	1		
2	2		
3	3		
D1	D1		
D2	D2		
D3	D3		
D4	D4		
D5	D5		
D6	D6		
F1	F1		
F2	F2		
F3	F3		
F4	F4		
P1	P1		
P2	P2		
P3	P3		

Links

Links

Link	ID	Name	Description	Traffic Node	Length (m)	Traffic Model	Has Restricted Flow	Saturation Flow (PCU/hr)	Cell Saturation Flow (PCU/hr)	Is Signal Controlled	Controller Stream	Phase	Phase2 Enabled	Phase2	Is Give Way	P
Ped 1	Ped 1			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	I	False	(N/A)	False	
Ped 2	Ped 2			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	J	False	(N/A)	False	
Ped 3	Ped 3			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	K	False	(N/A)	False	
Ped 4	Ped 4			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	L	False	(N/A)	False	
Ped 5	Ped 5			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	M	False	(N/A)	False	
Ped 6	Ped 6			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	N	False	(N/A)	False	
Ped 7	Ped 7			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	O	False	(N/A)	False	
Ped 8	Ped 8			2	100.00	NetworkDefault	True	1800	(N/A)	True	2	P	False	(N/A)	False	

Link Modelling

Link	Stop Weighting (%)	Delay Weighting (%)	Exclude From Results Calculation	Max Queue Storage (PCU)	Has Queue Limit	Queue Limit (PCU)	Excess Queue Penalty (£)	Has Degree Of Saturation Limit	Degree Of Saturation Limit (%)	Excess Degree Of Saturation Penalty (£)	Low Degree Of Saturation Penalty (£)
Ped 1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 2	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 3	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 4	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 5	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 6	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 7	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
Ped 8	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)

Link Modelling (Advanced)

Link	Normal Dispersal Type	Normal Dispersal Coefficient	Normal Travel Time Coefficient	Initial Queue (PCU)	Point1 Time Step (s)	Point2 Time Step (s)	Type of Vehicle-in-Service	Vehicle-in-Service	Type Of Random Parameter	Random Parameter
Ped 1	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 2	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 3	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 4	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 5	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 6	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Ped 7	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
Ped 8	Default	(35)	(80)	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Link Flows

Link	Total Flow (On Link) (PCU/hr)	Uniform Flow Name	Uniform Flow (Into Link) (PCU/hr)	Upstream Flow (Into Link) (PCU/hr)	Link Sensitivity Multiplier (%)	Cruise Sensitivity Multiplier (%)	Calculated Cruise Speed (kph)
Ped 1	0		0	0	100	100	1.00
Ped 2	0		0	0	100	100	1.00
Ped 3	0		0	0	100	100	1.00
Ped 4	0		0	0	100	100	1.00
Ped 5	0		0	0	100	100	1.00
Ped 6	0		0	0	100	100	1.00
Ped 7	0		0	0	100	100	1.00
Ped 8	0		0	0	100	100	1.00

Link Sources - default sources for entry links

Link	Entry Source Traffic Type	Entry Cruise Time (seconds)	Entry Cruise Speed (kph)	Entry Free Running Speed (kph)	Entry Stationary Time (seconds)	Entry Profile Type	Entry DIRECTFlows (PCU/hr)
Ped 1	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0
Ped 2	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0
Ped 3	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0
Ped 4	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0
Ped 5	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0
Ped 6	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0
Ped 7	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0
Ped 8	Normal	12.00	30.00	(N/A)	(N/A)	FLAT	0

Traffic Streams

Traffic Streams

Traffic Stream	ID	Name	Description	Length (m)	Traffic Model	Has Restricted Flow	Saturation Flow Source	Saturation Flow (PCU/hr)	Cell Saturation Flow (PCU/hr)	Is Signal Controlled	Controller Stream	Phase	Phase2 Enabled	Phase2
1	1			100.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	4210	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			80.00	NetworkDefault	True	SumOfLanes	1929	(N/A)	True	2	A	False	(N/A)
2	2			80.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	True	2	B	False	(N/A)

1	1			80.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	True	1	D	False	(N/A)
2	2			80.00	NetworkDefault	True	SumOfLanes	1854	(N/A)	True	1	E	False	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			10.00	CPDM	True	SumOfLanes	1400	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2155	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			70.00	CPDM	True	SumOfLanes	1400	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	2055	(N/A)	True	3	A	False	(N/A)
1	1			153.00	NetworkDefault	True	SumOfLanes	1915	(N/A)	True	3	A	False	(N/A)
1	1			40.00	NetworkDefault	True	SumOfLanes	1965	(N/A)	True	2	C	False	(N/A)
2	2			40.00	NetworkDefault	True	SumOfLanes	1828	(N/A)	True	2	D	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	3600	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			30.00	NetworkDefault	True	SumOfLanes	1741	(N/A)	True	1	B	False	(N/A)
2	2			30.00	NetworkDefault	True	SumOfLanes	1781	(N/A)	True	1	C	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			243.00	NetworkDefault	True	SumOfLanes	1741	(N/A)	True	1	A	False	(N/A)
2	2			100.00	NetworkDefault	True	SumOfLanes	1915	(N/A)	True	1	A	False	(N/A)
2	2			243.00	NetworkDefault	True	SumOfLanes	3600	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			40.00	NetworkDefault	True	SumOfLanes	1687	(N/A)	True	2	F	False	(N/A)
2	2			40.00	NetworkDefault	True	SumOfLanes	1879	(N/A)	True	2	E	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			10.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			20.00	NetworkDefault	True	SumOfLanes	2033	(N/A)	True	2	G	False	(N/A)
2	2			20.00	NetworkDefault	True	SumOfLanes	2155	(N/A)	True	2	H	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1915	(N/A)	True	3	C	False	(N/A)
2	2			100.00	NetworkDefault	True	SumOfLanes	1741	(N/A)	True	3	B	False	(N/A)
1	1			100.00	NetworkDefault	True	SumOfLanes	1800	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			100.00	NetworkDefault	False	(N/A)	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	2105	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			0.00	NetworkDefault	True	SumOfLanes	4210	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			153.00	NetworkDefault	True	SumOfLanes	3600	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)
1	1			7.00	CPDM	True	SumOfLanes	1741	(N/A)	False	(N/A)	(N/A)	(N/A)	(N/A)

Traffic Stream Lanes

Traffic Stream	ID	Name	Description	Use RR67	Surface Condition	Site Quality Factor	Gradient (%)	Width (m)	Proportion That Turn (%)	Turning Radius (m)	Nearside Lane	Saturation Flow (PCU/hr)
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1400
1	1			True	N/A	N/A	0	4.00	0	10.00	False	2155
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1400
1	1			True	N/A	N/A	0	3.00	0	10.00	False	2055
1	1			True	N/A	N/A	0	3.00	0	10.00	True	1915
1	1			True	N/A	N/A	0	3.50	0	20.00	True	1965
1	1			True	N/A	N/A	0	3.50	100	20.00	True	1828
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3600
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741
1	1			True	N/A	N/A	0	3.00	100	20.00	True	1781
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105

2	2			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741
1	1			True	N/A	N/A	0	3.00	0	10.00	True	1915
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
2	2			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.25	100	10.00	True	1687
1	1			True	N/A	N/A	0	3.25	97	45.00	True	1879
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.50	37	30.00	True	1929
1	1			True	N/A	N/A	0	3.50	0	15.00	True	1965
1	1			True	N/A	N/A	0	3.50	0	25.00	True	1965
1	1			True	N/A	N/A	0	3.50	100	25.00	True	1854
1	1			True	N/A	N/A	0	3.50	0	10.00	True	1965
1	1			True	N/A	N/A	0	3.50	0	10.00	True	1965
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	4.00	100	25.00	False	2033
1	1			True	N/A	N/A	0	4.00	0	25.00	False	2155
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.00	0	20.00	True	1915
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			True	N/A	N/A	0	3.50	0	10.00	False	2105
2	2			True	N/A	N/A	0	3.50	0	10.00	False	2105
1	1			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
2	2			False	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1800
1	1			True	N/A	N/A	0	3.00	100	15.00	True	1741

Traffic Stream Modelling

Traffic Stream	Stop Weighting (%)	Delay Weighting (%)	Exclude From Results Calculation	Max Queue Storage (PCU)	Has Queue Limit	Queue Limit (PCU)	Excess Queue Penalty (£)	Has Degree Of Saturation Limit	Degree Of Saturation Limit (%)	Excess Degree Of Saturation Penalty (£)	Low Degree Of Saturation Penalty (£)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	8.00	True	11	100.00	True	90	500.00	0.00
2	100	100	False	12.00	True	11	100.00	True	90	500.00	0.00
1	100	100	False	11.00	True	10	100.00	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
1	100	100	False	0.00	True	19	100.00	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)

2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	True	30	100.00	False	(N/A)	(N/A)	(N/A)
2	100	100	False	0.00	True	30	100.00	True	90	100.00	0.00
2	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
2	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
2	100	100	False	0.00	False	(N/A)	(N/A)	True	90	500.00	0.00
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	True	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)
1	100	100	False	0.00	False	(N/A)	(N/A)	False	(N/A)	(N/A)	(N/A)

Traffic Stream Modelling (Advanced)

Traffic Stream	Normal Dispersal Type	Normal Dispersal Coefficient	Normal Travel Time Coefficient	Initial Queue (PCU)	Point1 Time Step (s)	Point2 Time Step (s)	Type of Vehicle-in-Service	Vehicle-in-Service	Type Of Random Parameter	Random Parameter
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
2	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50
1	Default	35	80	0.00	0	0	NetworkDefault	Not-Included	NetworkDefault	0.50

Flows

Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)	Bus Flow (PCU/hr)	Tram Flow (PCU/hr)	Cruise Sensitivity Multiplier (%)	Calculated Cruise Speed (kph)
1	1124	1124	0	0	100	1.00
1	282	282	0	0	100	1.00
1	548	548	0	0	100	1.00
1	1459	1459	0	0	100	1.00
1	156	156	0	0	100	1.00
1	698	698	0	0	100	1.00
2	13	13	0	0	100	1.00
1	1194	1194	0	0	100	1.00

2	0	0	0	0	100	1.00
1	549	549	0	0	100	1.00
1	1206	1206	0	0	100	1.00
1	99	99	0	0	100	1.00
1	41	41	0	0	100	1.00
1	736	736	0	0	100	1.00
1	73	73	0	0	100	1.00
1	458	458	0	0	100	1.00
1	1114	1114	0	0	100	1.00
2	10	10	0	0	100	1.00
1	618	618	0	0	100	1.00
1	17	17	0	0	100	1.00
2	265	265	0	0	100	1.00
1	16	16	0	0	100	1.00
1	16	16	0	0	100	1.00
2	532	532	0	0	100	1.00
2	1194	1194	0	0	100	1.00
1	69	69	0	0	100	1.00
2	87	87	0	0	100	1.00
1	193	193	0	0	100	1.00
1	99	99	0	0	100	1.00
1	7	7	0	0	100	1.00
2	34	34	0	0	100	1.00
1	15	15	0	0	100	1.00
1	250	250	0	0	100	1.00
2	475	475	0	0	100	1.00
1	835	835	0	0	100	1.00
1	708	708	0	0	100	1.00
1	458	458	0	0	100	1.00
1	548	548	0	0	100	1.00
1	647	647	0	0	100	1.00
1	0	0	0	0	100	1.00

Traffic Stream Sources - default sources for entries

Traffic Stream	Normal Cruise Time (seconds)	Normal Cruise Speed (kph)	Bus Free Running Speed (kph)	Tram Free Running Speed (kph)
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	7.50	48.00	Buses Not Permittted	Trams Not Permitted
2	7.50	48.00	Buses Not Permittted	Trams Not Permitted

Traffic Stream Sources - sources for internals

Traffic Stream	Source	Source Type	Source Link	Source Traffic Stream	Source Total Flow (PCU/hr)	Source Normal Flow (PCU/hr)	Source Bus Flow (PCU/hr)	Source Tram Flow (PCU/hr)	Normal Cruise Time (seconds)	Normal Cruise Speed (kph)	Bus Free Running Speed (kph)	Tram Free Running Speed (kph)
1	1	TrafficStream	N/A	A/1	1114	1114	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	A/1	10	10	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Df/1	69	69	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted

1	2	TrafficStream	N/A	E east f/1	549	549	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Gf/2	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	B/1	17	17	0	0	2.25	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	B/1	265	265	0	0	2.25	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cf/1	16	16	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	N gw/1	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kx/1	548	548	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	E west f/1	1194	1194	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Bf/2	265	265	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Eap/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Eap/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Eap2/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Eap2/1	0	0	0	0	6.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Bf/1	17	17	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Cf/2	532	532	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Af/1	1114	1114	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Gf/1	7	7	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Df/2	85	85	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kx/1	99	99	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cx/2	736	736	0	0	5.25	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kap/1	0	0	0	0	11.48	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cap/1	0	0	0	0	18.23	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Cap/1	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	Cap2/1	0	0	0	0	18.23	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	D/1	69	69	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	D/1	87	87	0	0	3.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	E east f/1	149	149	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Af/2	10	10	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Gf/2	34	34	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	F/1	99	99	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted

1	1	TrafficStream	N/A	G/1	7	7	0	0	1.50	48.00	Buses Not Permittted	Trams Not Permitted
2	1	TrafficStream	N/A	G/1	34	34	0	0	1.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Af/1	0	0	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	E east f/2	13	13	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	3	TrafficStream	N/A	Df/2	2	2	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	H/1	736	736	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	Fx/1	99	99	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	K/1	458	458	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	If/1	250	250	0	0	7.50	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Cx/2	458	458	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	J/1	73	73	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	2	TrafficStream	N/A	If/2	475	475	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	Kap2/1	0	0	0	0	11.48	48.00	Buses Not Permittted	Trams Not Permitted
1	1	TrafficStream	N/A	E west f/2	0	0	0	0	1.00	48.00	Buses Not Permittted	Trams Not Permitted

Give Way Data

Traffic Stream	Opposed Traffic	Use Step-wise Opposed Turn Model	Number Of Storage Spaces	Radius Of Turn (m)	Visibility Restricted	Visibility Restricted By	Visibility Restricted By Link	Visibility Restricted By Traffic Stream
1	Movement	False	(N/A)	(N/A)	False	N/A	N/A	N/A
1	AllTraffic	False	(N/A)	(N/A)	False	N/A	N/A	N/A
1	AllTraffic	True	0	15.00	False	N/A	N/A	N/A

Flow Allocation Tool Tables

Normal Input Flows (PCU/hour) for OD Matrix: 1

		To		
		1	2	3
From	1	0	250.00000	475.00000
	2	0	0	73.00000
	3	0	458.00000	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		If/1,If/2		725	725	0	0	0	0	0	0
2		J/1	Jx/1	73	73	0	0	708	708	0	0
3		K/1	Kap2/1	458	458	0	0	548	548	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		If/1,Jx/1	250
2		If/2,Kap2/1	475
3		J/1,Kap2/1	73
4		K/1,Jx/1	458

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	250
2	True	Normal	N/A	N/A	475
3	True	Normal	N/A	N/A	73
4	True	Normal	N/A	N/A	458

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Normal Input Flows (PCU/hour) for OD Matrix: 2

		To		
		1	2	3
From	1	0	548.00000	99.00000
	2	458.00000	0	736.00000
	3	0	0	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		Kx/1	Kap/1	647	647	0	0	458	458	0	0
2		Cx/2	Cap/1	1194	1194	0	0	548	548	0	0
3			Ix/1	0	0	0	0	835	835	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		Kx/1,F/1,Fx/1,Ix/1	99
2		Kx/1,Cap/1	548
3		Cx/2,H/1,Ix/1	736
4		Cx/2,Kap/1	458

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	99
2	True	Normal	N/A	N/A	548
3	True	Normal	N/A	N/A	736
4	True	Normal	N/A	N/A	458

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0

Normal Input Flows (PCU/hour) for OD Matrix: 3

		To		
		1	2	3
From	1	0	16.00000	532.00000
	2	265.00000	0	17.00000
	3	1194.00000	5.00000	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		Cf/1,Cf/2	Cap2/1	548	548	0	0	1459	1459	0	0
2		B/1	Bx/1	282	282	0	0	16	16	0	0
3		E west f/1	Eap/1	1194	1194	0	0	549	549	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		Cf/1,Bx/1	16
2		Cf/2,Eap/1	532
3		B/1,Bf/1,Eap/1	17
4		B/1,Bf/2,Cap2/1	265
5		E west f/1,Cap2/1	1194

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	16
2	True	Normal	N/A	N/A	532
3	True	Normal	N/A	N/A	17
4	True	Normal	N/A	N/A	265
5	True	Normal	N/A	N/A	1194

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0

Normal Input Flows (PCU/hour) for OD Matrix: 4

		To			
		1	2	3	4
From	1	0	149.00000	549.00000	13.00000
	2	85.00000	0	69.00000	2.00000
	3	1114.00000	10.00000	0	0
	4	7.00000	34.00000	0	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Locations

ID	Name	Entries	Exits	Total Flow In (PCU/hr)	Normal Flow In (PCU/hr)	Bus Flow In (PCU/hr)	Tram Flow In (PCU/hr)	Total Flow Out (PCU/hr)	Normal Flow Out (PCU/hr)	Bus Flow Out (PCU/hr)	Tram Flow Out (PCU/hr)
1		E east f/1,E east f/2	Eap2/1	711	711	0	0	1206	1206	0	0
2		D/1	Dx/1	156	156	0	0	193	193	0	0
3		A/1	Ax/1	1124	1124	0	0	618	618	0	0
4		G/1	Gx/1	41	41	0	0	15	15	0	0

Paths

ID	Description	Path Items	Calculated Total Flow (PCU/hr)
1		E east f/1,Ax/1	549
2		E east f/1,Dx/1	149
3		E east f/2,Gx/1	13
4		D/1,Df/1,Ax/1	69
5		D/1,Df/2,Gx/1	2
6		D/1,Df/2,Eap2/1	85
7		A/1,Af/1,Gx/1	0
8		A/1,Af/1,Eap2/1	1114
9		A/1,Af/2,Dx/1	10
10		G/1,Gf/1,Eap2/1	7
11		G/1,Gf/2,Ax/1	0
12		G/1,Gf/2,Dx/1	34

Normal Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	True	Normal	N/A	N/A	549
2	True	Normal	N/A	N/A	149
3	True	Normal	N/A	N/A	13
4	True	Normal	N/A	N/A	69
5	True	Normal	N/A	N/A	2
6	True	Normal	N/A	N/A	85
7	True	Normal	N/A	N/A	0
8	True	Normal	N/A	N/A	1114
9	True	Normal	N/A	N/A	10
10	True	Normal	N/A	N/A	7
11	True	Normal	N/A	N/A	0
12	True	Normal	N/A	N/A	34

Bus Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0
6	False	Disabled	N/A	N/A	0
7	False	Disabled	N/A	N/A	0
8	False	Disabled	N/A	N/A	0
9	False	Disabled	N/A	N/A	0
10	False	Disabled	N/A	N/A	0
11	False	Disabled	N/A	N/A	0
12	False	Disabled	N/A	N/A	0

Tram Path Flows

Path	Permitted Flow Type	Allocation Type	Percentage (%)	Fixed Flow (PCU/hr)	Calculated Flow (PCU/hr)
1	False	Disabled	N/A	N/A	0
2	False	Disabled	N/A	N/A	0
3	False	Disabled	N/A	N/A	0
4	False	Disabled	N/A	N/A	0
5	False	Disabled	N/A	N/A	0
6	False	Disabled	N/A	N/A	0
7	False	Disabled	N/A	N/A	0
8	False	Disabled	N/A	N/A	0
9	False	Disabled	N/A	N/A	0
10	False	Disabled	N/A	N/A	0
11	False	Disabled	N/A	N/A	0
12	False	Disabled	N/A	N/A	0

Signal Timings

120s cycle time; 120 steps

Controller Stream

ID	Name	Description	Gaining Delay Type	Signals Manipulation Mode	Multiple Cycling	Offset Relative To	Offset Valid	Offset (s)	Auto Redistribute	Optimisation Level	Use Sequence
1			Absolute	StageBased	Single	1	True	0	True	Offsets And Green Splits	1

2			Absolute	PhaseBased	Single	1	True	11	True	Offsets And Green Splits	1
3			Absolute	StageBased	Double	1	True	30	True	Offsets And Green Splits	1

Phases

Controller Stream	ID	Minimum Green (s)	Maximum Green (s)	Relative Start Displacement (s)	Relative End Displacement (s)	Dummy
1	A	7	120	2	3	False
1	B	7	120	2	3	False
1	C	7	120	2	3	False
1	D	7	120	2	3	False
1	E	7	120	2	3	False
2	A	7	120	2	3	False
2	B	7	120	2	3	False
2	C	7	120	2	3	False
2	D	7	120	2	3	False
2	E	7	120	2	3	False
2	F	7	120	2	3	False
2	G	7	120	2	3	False
2	H	7	120	2	3	False
2	I	4	4	0	0	False
2	J	4	4	0	0	False
2	K	4	4	0	0	False
2	L	4	4	0	0	False
2	M	5	5	0	0	False
2	N	4	4	0	0	False
2	O	4	4	0	0	False
2	P	4	4	0	0	False
3	A	7	120	2	3	False
3	B	7	120	2	3	False
3	C	7	120	2	3	False

Library Stages

Controller Stream	ID	Phases In Stage	User Stage Minimum (s)
1	1	A,D	7
1	2	D,E	7
1	3	C,B	7
2	1	A,C,M,I	1
2	2	B,D,L,P	1
2	3	D,C	1
2	4	G,H,N,K	1
2	5	J,E,F,O,M	1
3	1	A	7
3	2	B,C	7

Losing/ Gaining delays at each Controller Stream

Controller Stream	Delay	Type	Phase	From Stage	To Stage	Relative Delay	Absolute Delay
2	1	Losing	C	1	2	3	N/A
2	2	Losing	A	1	2	3	N/A
2	3	Losing	B	2	4	3	N/A
2	4	Losing	D	2	4	3	N/A
2	5	Losing	K	4	5	2	N/A
2	6	Losing	G	4	5	3	N/A

2	7	Losing	H	4	5	3	N/A
2	8	Gaining	O	4	5	3	3
2	9	Losing	O	5	1	2	N/A
2	10	Losing	E	5	1	3	N/A
2	11	Losing	F	5	1	3	N/A

Stage Sequences

Controller Stream	ID	Stage IDs	Stage Ends	Multiple Cycling Stage IDs	Multiple Cycling Stage Ends
1	1	1,2,3	49,67,95		
2	1	1,2,4,5	60,72,87,101		
3	1	1,2	33,65	1,2	93,5

Resultant Stages

Controller Stream	Stage Index	Is Base Stage	Library Stage ID	Phases In This Stage	Stage Start (s)	Stage End (s)	Stage Duration (s)	User Stage Minimum (s)	Stage Minimum (s)
1	1	True	1	A,D	100	49	69	7	7
1	2	True	2	D,E	54	67	13	7	7
1	3	True	3	C,B	72	95	23	7	7
2	1	True	1	A,C,M,I	111	60	69	1	4
2	2	True	2	B,D,L,P	68	72	4	1	4
2	3	True	4	G,H,N,K	83	87	4	1	4
2	4	True	5	J,E,F,O,M	97	101	4	1	4
3	1	True	1	A	10	33	23	7	7
3	2	True	2	B,C	38	65	27	7	7
3	3	False	1	A	70	93	23	7	7
3	4	False	2	B,C	98	5	27	7	7

Resultant Phase Green Periods

Controller Stream	Phase	Green Period	Is Base Green Period	Start Time (s)	End Time (s)	Duration (s)
1	A	1	True	100	49	69
1	B	1	True	67	95	28
1	C	1	True	72	95	23
1	D	1	True	100	67	87
1	E	1	True	54	67	13
2	A	1	True	110	63	73
2	B	1	True	68	75	7
2	C	1	True	109	63	74
2	D	1	True	68	75	7
2	E	1	True	97	104	7
2	F	1	True	97	104	7
2	G	1	True	79	90	11
2	H	1	True	83	90	7
2	I	1	True	111	60	69
2	J	1	True	94	101	7
2	K	1	True	82	89	7
2	L	1	True	65	72	7
2	M	1	True	97	60	83
2	N	1	True	79	87	8
2	O	1	True	90	103	13
2	P	1	True	65	72	7
3	A	1	False	70	93	23
3	A	2	True	10	33	23
3	B	1	True	38	65	27

3	B	2	False	98	5	27
3	C	1	True	38	65	27
3	C	2	False	98	5	27

Intergreen Matrix for Controller Stream 1

		To				
		A	B	C	D	E
From	A	-	5	5		5
	B	5	-			
	C	5		-	5	5
	D			5	-	
	E	5		5		-

Interstage Matrix for Controller Stream 1

		To		
		1	2	3
From	1	-	5	5
	2	5	-	5
	3	5	5	-

Banned Stage transitions for Controller Stream 1

		To		
		1	2	3
From	1	-		
	2		-	
	3			-

Intergreen Matrix for Controller Stream 2

		To															
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
From	A	-			5	5	7		5		4		2			7	
	B		-	5		5			5						4	7	
	C		5	-		5		9	7			7			3		2
	D	5			-	5			5		3	7					
	E	5	7	5	5	-		9	5	7					3		2
	F	5					-		5	7			3				
	G			5		5		-						7			7
	H	5	5	5	5	5	7		-		4		2	7			
	I					6	6			-							
	J	9			10				9		-						
	K			6	6							-					
	L	10					8		11				-				
	M							7	7					-			
	N		9	10		10									-		
	O	6	6													-	
	P			12		12		7									-

Interstage Matrix for Controller Stream 2

		To			
		1	2	3	4
From	1	-	8	5	9
	2	12	-	12	11

	3	5	5	-	9
	4	10	9	10	-

Banned Stage transitions for Controller Stream 2

		To			
		1	**2**	**3**	**4**
From	**1**	-			
	2		-		
	3			-	
	4				-

Intergreen Matrix for Controller Stream 3

		To		
		A	**B**	**C**
From	**A**	-	5	5
	B	5	-	
	C	5		-

Interstage Matrix for Controller Stream 3

		To			
		1	**2**	**3**	**4**
From	**1**	-	5		
	2	5	-		
	3			-	
	4				-

Banned Stage transitions for Controller Stream 3

		To			
		1	**2**	**3**	**4**
From	**1**	-			
	2		-		
	3			-	
	4				-

TRANSYT 12 Tables

Resultant Stages

Controller Stream	Stage Index	Is Base Stage	Library Stage ID	Phases In This Stage	TRANSYT Stage Start (s)	TRANSYT Preceding Interstage (s)	TRANSYT Stage Minimum (s)
1	1	True	1	A,D	95	5	12
1	2	True	2	D,E	49	5	12
1	3	True	3	C,B	67	5	12
2	1	True	1	A,C,M,I	101	10	14
2	2	True	2	B,D,L,P	60	8	12
2	3	True	4	G,H,N,K	72	11	15
2	4	True	5	J,E,F,O,M	87	10	14
3	1	True	1	A	5	5	12
3	2	True	2	B,C	33	5	12
3	3	False	1	A	65	5	12
3	4	False	2	B,C	93	5	12

Resultant Phase Green Periods

Controller Stream	Phase	Green Period	TRANSYT Starting Stage (s)	TRANSYT Ending Stage (s)	TRANSYT Start Lag (s)	TRANSYT End Lag (s)
1	A	1	1	2	5	0
1	B	1	3	1	0	0
1	C	1	3	1	5	0
1	D	1	1	3	5	0
1	E	1	2	3	5	0
2	A	1	1	2	9	3
2	B	1	2	3	8	3
2	C	1	1	2	8	3
2	D	1	2	3	8	3
2	E	1	4	1	10	3
2	F	1	4	1	10	3
2	G	1	3	4	7	3
2	H	1	3	4	11	3
2	I	1	1	2	10	0
2	J	1	4	1	7	0
2	K	1	3	4	10	2
2	L	1	2	3	5	0
2	M	1	4	2	10	0
2	N	1	3	4	7	0
2	O	1	4	1	3	2
2	P	1	2	3	5	0
3	A	1	3	4	5	0
3	A	2	1	2	5	0
3	B	1	2	3	5	0
3	B	2	4	1	5	0
3	C	1	2	3	5	0
3	C	2	4	1	5	0

Stage Timings (TRANSYT 12 timings)

120s cycle time; 120 steps

Controller Stream	Number of Stages	Stage 1	Stage 2	Stage 3	Stage 4
1	3	95	49	67	
2	4	101	60	72	87
3	4	5	33	65	93

Link Green Times

Link	Traffic Node	Controller Stream	Phase	Green Period 1		
				Start	End	Duration
Ped 1	2	2	I	111	60	69
Ped 2	2	2	J	94	101	7
Ped 3	2	2	K	82	89	7
Ped 4	2	2	L	65	72	7
Ped 5	2	2	M	97	60	83
Ped 6	2	2	N	79	87	8
Ped 7	2	2	O	90	103	13
Ped 8	2	2	P	65	72	7

Traffic Stream Green Times

Arm	Traffic Stream ID	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration

J	**1**	3	3	A	70	93	23	10	33	23
K	**1**	3	3	A	70	93	23	10	33	23
Af	**1**	2	2	C	109	63	74			
Af	**2**	2	2	D	68	75	7			
Bf	**1**	1	1	B	67	95	28			
Bf	**2**	1	1	C	72	95	23			
Cf	**1**	1	1	A	100	49	69			
Cf	**2**	1	1	A	100	49	69			
Df	**1**	2	2	F	97	104	7			
Df	**2**	2	2	E	97	104	7			
E east f	**1**	2	2	A	110	63	73			
E east f	**2**	2	2	B	68	75	7			
E west f	**1**	1	1	D	100	67	87			
E west f	**2**	1	1	E	54	67	13			
Gf	**1**	2	2	G	79	90	11			
Gf	**2**	2	2	H	83	90	7			
If	**1**	3	3	C	38	65	27	98	5	27
If	**2**	3	3	B	38	65	27	98	5	27

Link Results

Link Results: Summary

Link	Major Link	Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Of Penalties (£ per hr)	Unwei Perfor Index h
Ped 1	(N/A)	0	0	0	False	1800	1050	0	False	Unrestricted	69.00	70.00	650000.00	0.
Ped 2	(N/A)	0	0	0	False	1800	120	0	False	Unrestricted	7.00	8.00	30000.00	0.
Ped 3	(N/A)	0	0	0	False	1800	120	0	False	Unrestricted	7.00	8.00	30000.00	0.
Ped 4	(N/A)	0	0	0	False	1800	120	0	False	Unrestricted	7.00	8.00	30000.00	0.
Ped 5	(N/A)	0	0	0	False	1800	1260	0	False	Unrestricted	83.00	84.00	780000.00	0.
Ped 6	(N/A)	0	0	0	False	1800	135	0	False	Unrestricted	8.00	9.00	40000.00	0.
Ped 7	(N/A)	0	0	0	False	1800	210	0	False	Unrestricted	13.00	14.00	90000.00	0.
Ped 8	(N/A)	0	0	0	False	1800	120	0	False	Unrestricted	7.00	8.00	30000.00	0.

Link Results: Stops And Delays

Link	Major Link	Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)
Ped 1	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 2	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 3	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 4	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Ped 5	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 6	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 7	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ped 8	(N/A)	12.00	B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Link Results: Queues And Blocking

Link	Major Link	Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
Ped 1	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	70.00	0.00	70.00	False
Ped 2	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	8.00	0.00	8.00	False
Ped 3	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	8.00	0.00	8.00	False
Ped 4	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	8.00	0.00	8.00	False
Ped 5	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	84.00	0.00	84.00	False
Ped 6	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	9.00	0.00	9.00	False
Ped 7	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	14.00	0.00	14.00	False
Ped 8	(N/A)	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	8.00	0.00	8.00	False

Link Results: Fuel Consumption

Link	Major Link	Fuel Consumption Cruise (Litres per hour)	Fuel Consumption Delay (Litres per hour)	Fuel Consumption Stops (Litres per hour)	Fuel Consumption Total (Litres per hour)	Fuel Economy Total (Miles / gal)
Ped 1	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 2	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 3	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 4	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 5	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 6	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 7	(N/A)	0.00	0.00	0.00	0.00	Infinity
Ped 8	(N/A)	0.00	0.00	0.00	0.00	Infinity

Link Results: Journey Times

Link	Major Link	Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)
Ped 1	(N/A)	0.00	0.00	0.00	0.00
Ped 2	(N/A)	0.00	0.00	0.00	0.00
Ped 3	(N/A)	0.00	0.00	0.00	0.00
Ped 4	(N/A)	0.00	0.00	0.00	0.00
Ped 5	(N/A)	0.00	0.00	0.00	0.00
Ped 6	(N/A)	0.00	0.00	0.00	0.00

Ped 7	(N/A)	0.00	0.00	0.00	0.00
Ped 8	(N/A)	0.00	0.00	0.00	0.00

Traffic Stream Results

Traffic Stream Results: Summary

Arm	TrafficStream	Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Penal (£ p hr)
A	1	1124	1124	0	False	2105	2105	53	False	87	120.00	0.00	0.0
B	1	282	282	0	False	2105	2105	13	False	646	120.00	0.00	0.0
Cap	1	548	548	0	False	2105	2105	26	False	284	120.00	0.00	0.0
Cap2	1	1459	1459	0	False	4210	4210	35	False	189	120.00	0.00	0.0
D	1	156	156	0	False	2105	2105	7	False	1249	120.00	0.00	0.0
E east f	1	698	698	0	False	1929	1206	58	False	73	73.00	32.00	0.0
E east f	2	13	13	0	False	1965	147	9	False	1034	7.00	0.00	0.0
E west f	1	1194	1194	0	False	1965	1457	82	False	22	87.00	30.00	0.0
E west f	2	0	0	0	False	1854	232	0	False	Unrestricted	13.00	0.00	0.0
Eap	1	549	549	0	False	1965	1965	28	False	258	120.00	0.00	0.0
Eap2	1	1206	1206	0	False	1965	1965	61	False	63	120.00	0.00	0.0
F	1	99	99	0	False	1299	1299	8	False	1212	120.00	0.00	0.0
G	1	41	41	0	False	2155	2155	2	False	5156	120.00	0.00	0.0
H	1	736	736	0	False	1378	1378	53	False	87	120.00	0.00	0.0
J	1	73	73	0	False	2055	856	9	False	1073	46.00	0.00	0.0
K	1	458	458	0	False	1915	798	57	False	74	46.00	0.00	0.0
Af	1	1114	1114	0	False	1965	1245	90	False	12	74.00	30.00	0.0
Af	2	10	10	0	False	1828	137	7	False	1271	7.00	0.00	0.0
Ax	1	618	618	0	False	3600	3600	17	False	483	120.00	100.00	0.0
Bf	1	17	17	0	False	1741	435	4	False	2460	28.00	26.00	0.0
Bf	2	265	265	0	False	1781	371	71	False	40	23.00	0.00	0.0
Bx	1	16	16	0	False	1800	1800	1	False	11150	120.00	100.00	0.0
Cf	1	16	16	0	False	1741	1030	2	False	6338	69.00	32.00	0.0
Cf	2	532	532	0	False	1915	1133	47	False	113	69.00	0.00	0.0
Cx	2	1194	1194	0	False	3600	3600	33	False	202	120.00	0.00	0.0
Df	1	69	69	0	False	1687	127	55	False	83	7.00	26.00	0.0
Df	2	87	87	0	False	1879	141	62	False	62	7.00	0.00	0.0
Dx	1	193	193	0	False	1800	1800	11	False	833	120.00	100.00	0.0
Fx	1	99	99	0	False	1800	1800	6	False	1718	120.00	0.00	0.0
Gf	1	7	7	0	False	2033	220	3	False	3046	11.00	0.00	0.0
Gf	2	34	34	0	False	2155	162	21	False	375	7.00	0.00	0.0
Gx	1	15	15	0	False	1800	1800	1	False	11900	120.00	0.00	0.0
If	1	250	250	0	False	1915	926	27	False	270	54.00	0.00	0.0
If	2	475	475	0	False	1741	841	56	False	77	54.00	0.00	0.0
Ix	1	835	835	0	False	1800	1800	46	False	116	120.00	0.00	0.0
Jx	1	708	708	0	False	Unrestricted	Unrestricted	0	False	Unrestricted	120.00	0.00	0.0
Kap	1	458	458	0	False	2105	2105	22	False	360	120.00	0.00	0.0

Kap2	1	548	548	0	False	4210	4210	13	False	668	120.00	0.00	0.0
Kx	1	647	647	0	False	3600	3600	18	False	456	120.00	0.00	0.0
N gw	1	0	0	0	False	0	0	0	False	-100	120.00	0.00	0.0

Traffic Stream Results: Stops And Delays

Arm	TrafficStream	Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)
A	1	7.50	N/A	0.98	0.00	0.31	4.34	4.34	0.00	0.00	0.00	0.00	0.00
B	1	7.50	N/A	0.13	0.00	0.01	0.15	0.15	0.00	0.00	0.00	0.00	0.00
Cap	1	1.00	N/A	0.30	0.00	0.05	0.65	0.65	0.00	0.00	0.00	0.00	0.00
Cap2	1	1.00	N/A	0.23	0.00	0.09	1.30	1.30	0.00	0.00	0.00	0.00	0.00
D	1	7.50	N/A	0.07	0.00	0.00	0.04	0.04	0.00	0.00	0.00	0.00	0.00
E east f	1	9.60	A	3.60	0.30	0.40	9.90	9.90	27.63	169.26	23.59	2.42	2.42
E east f	2	9.60	A	51.45	0.18	0.00	2.64	2.64	100.65	12.96	0.13	0.16	0.16
E west f	1	9.60	A	7.60	0.70	1.82	35.77	35.77	12.24	92.19	54.00	1.83	1.83
E west f	2	0.00	F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eap	1	1.00	N/A	0.35	0.00	0.05	0.77	0.77	0.30	0.00	1.62	0.00	0.00
Eap2	1	1.00	N/A	1.45	0.00	0.49	6.90	6.90	1.21	0.00	14.54	0.00	0.00
F	1	1.00	N/A	0.11	0.00	0.00	0.04	0.04	0.00	0.00	0.00	0.00	0.00
G	1	7.50	N/A	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H	1	5.25	N/A	1.49	0.00	0.31	4.33	4.33	0.00	0.00	0.00	0.00	0.00
J	1	7.50	A	10.83	0.22	0.00	3.12	3.12	56.89	41.29	0.24	1.33	1.33
K	1	18.36	B	16.01	1.65	0.38	28.93	28.93	77.27	331.13	22.78	4.44	4.44
Af	1	3.00	A	30.18	5.76	3.58	132.63	132.63	89.28	889.83	104.73	31.92	31.92
Af	2	3.00	A	52.83	0.14	0.00	2.08	2.08	91.70	9.08	0.09	0.29	0.29
Ax	1	7.50	N/A	0.10	0.00	0.02	0.25	0.25	0.00	0.00	0.00	0.00	0.00
Bf	1	2.25	A	34.29	0.16	0.00	2.30	2.30	73.48	12.47	0.02	0.40	0.40
Bf	2	2.25	A	55.96	3.25	0.87	58.49	58.49	100.16	240.06	25.37	8.52	8.52
Bx	1	7.50	N/A	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Cf	1	29.16	C	7.95	0.04	0.00	0.50	0.50	34.96	5.59	0.00	0.07	0.07
Cf	2	12.00	B	13.15	1.74	0.21	27.59	27.59	52.63	273.80	6.20	3.51	3.51
Cx	2	29.16	N/A	0.25	0.00	0.08	1.17	1.17	0.00	0.00	0.00	0.00	0.00
Df	1	3.00	A	70.11	1.03	0.32	19.08	19.08	107.51	64.98	9.21	2.38	2.38
Df	2	3.00	A	73.65	1.30	0.48	25.28	25.28	110.79	82.61	13.78	3.09	3.09
Dx	1	7.50	N/A	0.12	0.00	0.01	0.09	0.09	0.00	0.00	0.00	0.00	0.00
Fx	1	1.00	N/A	0.06	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00
Gf	1	1.50	A	48.42	0.09	0.00	1.34	1.34	87.73	6.13	0.02	0.20	0.20
Gf	2	1.50	A	55.16	0.49	0.03	7.40	7.40	94.12	31.17	0.83	1.03	1.03
Gx	1	7.50	N/A	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
If	1	7.50	A	9.94	0.64	0.05	9.80	9.80	55.84	136.62	2.99	4.48	4.48
If	2	7.50	A	13.78	1.45	0.36	25.81	25.81	69.94	310.62	21.59	10.66	10.66
Ix	1	7.50	N/A	0.86	0.00	0.20	2.85	2.85	0.00	0.00	0.00	0.00	0.00
Jx	1	7.50	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kap	1	1.00	N/A	0.24	0.00	0.03	0.43	0.43	0.00	0.00	0.00	0.00	0.00
Kap2	1	1.00	N/A	0.06	0.00	0.01	0.14	0.14	0.00	0.00	0.00	0.00	0.00

Kx	1	18.36	N/A	0.11	0.00	0.02	0.28	0.28	0.00	0.00	0.00	0.00	0.00
N gw	1	0.00	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues And Blocking

Arm	TrafficStream	Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
A	1	0.00	0.31	19.79	0.00	0.00	0.00	0.31	0.31	0.00	78.00	78.00	False
B	1	0.00	0.01	19.79	0.00	0.00	0.00	0.01	0.01	0.00	43.00	43.00	False
Cap	1	0.00	0.05	0.00	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.00	False
Cap2	1	0.00	0.09	0.00	0.09	0.00	0.00	0.09	0.09	0.00	0.00	0.00	False
D	1	0.00	0.00	19.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
E east f	1	0.00	10.21	8.00	0.08	0.00	0.00	0.40	1.23	0.00	0.00	0.00	False
E east f	2	0.00	0.44	12.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	False
E west f	1	0.00	4.90	11.00	0.00	0.00	0.00	1.82	4.88	0.00	0.00	0.00	False
E west f	2	0.00	0.00	13.94	0.00	0.00	0.00	0.00	0.00	15.00	0.00	15.00	False
Eap	1	0.00	0.05	0.00	0.05	0.00	0.00	0.05	0.05	9.00	0.00	9.00	False
Eap2	1	0.00	0.49	0.00	0.49	0.00	0.00	0.49	0.49	7.00	0.00	7.00	False
F	1	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
G	1	0.00	0.00	20.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
H	1	0.00	0.31	9.00	0.00	0.00	0.00	0.31	0.31	0.00	0.00	0.00	False
J	1	0.00	0.73	19.32	0.00	0.00	0.00	0.00	0.71	0.00	0.00	0.00	False
K	1	0.00	6.63	27.54	0.00	0.00	0.00	0.38	5.32	0.00	0.00	0.00	False
Af	1	0.00	34.83	7.39	10.25	0.00	0.00	3.58	17.19	0.00	0.00	0.00	False
Af	2	0.00	0.31	6.87	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	False
Ax	1	0.00	0.02	33.84	0.00	0.00	0.00	0.02	0.02	4.00	0.00	4.00	False
Bf	1	0.00	0.43	4.91	0.00	0.00	0.00	0.00	0.43	0.00	1.00	1.00	False
Bf	2	0.00	9.04	5.02	0.93	0.00	0.00	0.87	7.86	0.00	0.00	0.00	False
Bx	1	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	27.00	0.00	27.00	False
Cf	1	0.00	0.20	39.77	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	False
Cf	2	0.00	9.40	18.00	0.00	0.00	0.00	0.21	7.82	0.00	0.00	0.00	False
Cx	2	0.00	0.08	82.24	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	False
Df	1	0.00	2.52	6.34	0.00	0.00	0.00	0.32	2.45	0.00	0.00	0.00	False
Df	2	0.00	3.28	7.07	0.00	0.00	0.00	0.48	3.16	0.00	0.00	0.00	False
Dx	1	0.00	0.01	16.92	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	False
Fx	1	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
Gf	1	0.00	0.21	3.82	0.00	0.00	0.00	0.00	0.21	0.00	1.00	1.00	False
Gf	2	0.00	1.09	4.05	0.00	0.00	0.00	0.03	1.08	0.00	0.00	0.00	False
Gx	1	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	62.00	0.00	62.00	False
If	1	0.00	2.48	18.00	0.00	0.00	0.00	0.05	2.20	0.00	0.00	0.00	False
If	2	0.00	5.91	16.37	0.00	0.00	0.00	0.36	4.45	0.00	0.00	0.00	False
Ix	1	0.00	0.20	16.92	0.00	0.00	0.00	0.20	0.20	0.00	0.00	0.00	False
Jx	1	0.00	0.00	16.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	False
Kap	1	0.00	0.03	0.00	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.00	False
Kap2	1	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.00	False
Kx	1	0.00	0.02	51.78	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	False
N gw	1	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	120.00	0.00	120.00	False

Traffic Stream Results: Fuel Consumption

Arm	TrafficStream	Fuel Consumption Cruise (Litres per hour)	Fuel Consumption Delay (Litres per hour)	Fuel Consumption Stops (Litres per hour)	Fuel Consumption Total (Litres per hour)	Fuel Economy Total (Miles / gal)
A	1	9.09	0.30	0.00	9.39	2.82
B	1	2.28	0.01	0.00	2.29	2.82
Cap	1	0.00	0.05	0.00	0.00	2.82
Cap2	1	0.00	0.09	0.00	0.00	2.82
D	1	1.26	0.00	0.00	1.26	2.82
E east f	1	5.33	0.69	0.73	6.75	2.82
E east f	2	0.10	0.18	0.05	0.33	2.82
E west f	1	9.12	2.51	0.55	12.18	2.82
E west f	2	0.00	0.00	0.00	0.00	2.82
Eap	1	0.00	0.05	0.00	0.00	2.82
Eap2	1	0.00	0.48	0.00	0.00	2.82
F	1	0.09	0.00	0.00	0.09	2.82
G	1	0.33	0.00	0.00	0.33	2.82
H	1	4.17	0.30	0.00	4.47	2.82
J	1	0.59	0.22	0.40	1.21	2.82
K	1	6.69	2.03	1.33	10.05	2.82
Af	1	3.60	9.29	9.60	22.50	2.82
Af	2	0.03	0.15	0.09	0.27	2.82
Ax	1	5.00	0.02	0.00	5.01	2.82
Bf	1	0.04	0.16	0.12	0.32	2.82
Bf	2	0.64	4.10	2.56	7.30	2.82
Bx	1	0.13	0.00	0.00	0.13	2.82
Cf	1	0.37	0.04	0.02	0.43	2.82
Cf	2	5.08	1.93	1.06	8.07	2.82
Cx	2	27.70	0.08	0.00	27.78	2.82
Df	1	0.22	1.34	0.72	2.28	2.82
Df	2	0.28	1.77	0.93	2.98	2.82
Dx	1	1.56	0.01	0.00	1.57	2.82
Fx	1	0.09	0.00	0.00	0.09	2.82
Gf	1	0.01	0.09	0.06	0.16	2.82
Gf	2	0.05	0.52	0.31	0.88	2.82
Gx	1	0.12	0.00	0.00	0.12	2.82
If	1	2.02	0.69	1.35	4.06	2.82
If	2	3.84	1.81	3.21	8.86	2.82
Ix	1	6.75	0.20	0.00	6.95	2.82
Jx	1	5.72	0.00	0.00	5.72	2.82
Kap	1	0.00	0.03	0.00	0.00	2.82
Kap2	1	0.00	0.01	0.00	0.00	2.82
Kx	1	9.45	0.02	0.00	9.47	2.82
N gw	1	0.00	0.00	0.00	0.00	2.82

Traffic Stream Results: Journey Times

Arm	TrafficStream	Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)
A	1	112.40	2.65	42.46	8.48
B	1	28.20	0.60	47.17	7.63
Cap	1	0.00	0.20	0.00	0.00

Cap2	1	0.00	0.50	0.00	0.00
D	1	15.60	0.33	47.57	7.57
E east f	1	55.84	2.56	21.82	13.20
E east f	2	1.04	0.22	4.72	61.05
E west f	1	95.52	5.70	16.75	17.20
E west f	2	0.00	0.00	0.00	0.00
Eap	1	0.00	0.21	0.00	0.00
Eap2	1	0.00	0.82	0.00	0.00
F	1	0.99	0.03	32.31	1.11
G	1	4.10	0.09	47.90	7.52
H	1	51.52	1.38	37.37	6.74
J	1	7.30	0.37	19.64	18.33
K	1	70.07	4.37	16.03	34.37
Af	1	44.56	10.27	4.34	33.18
Af	2	0.40	0.16	2.58	55.83
Ax	1	61.80	1.31	47.35	7.60
Bf	1	0.51	0.17	2.96	36.54
Bf	2	7.95	4.28	1.86	58.21
Bx	1	1.60	0.03	47.94	7.51
Cf	1	3.89	0.16	23.57	37.11
Cf	2	53.20	3.72	14.32	25.15
Cx	2	290.14	9.75	29.75	29.41
Df	1	2.76	1.40	1.97	73.11
Df	2	3.48	1.85	1.88	76.65
Dx	1	19.30	0.41	47.24	7.62
Fx	1	0.99	0.03	34.02	1.06
Gf	1	0.14	0.10	1.44	49.92
Gf	2	0.68	0.54	1.27	56.66
Gx	1	1.50	0.03	47.95	7.51
If	1	25.00	1.21	20.64	17.44
If	2	47.50	2.81	16.92	21.28
Ix	1	83.50	1.94	43.04	8.36
Jx	1	70.80	1.48	48.00	7.50
Kap	1	0.00	0.16	0.00	0.00
Kap2	1	0.00	0.16	0.00	0.00
Kx	1	98.99	3.32	29.82	18.47
N gw	1	0.00	0.00	0.00	0.00

Network Results

Run Summary

Analysis Set Used	Run Start Time	Run Finish Time	Modelling Start Time (HH:mm)	Cycle Time Used (s)	Total Network Delay (PCU-hr/hr)	Highest DOS (%)	LTSWith Highest DOS	Number Of Oversaturated LTS	Percentage Of Oversaturated LTS (%)	LTSWith Worst Signalised PRC	LTSWith Worst Unsignalised PRC	LTSWith Worst Overall PRC	Network Within Capacity
A1 - PMDS	05/09/2011 19:21:33	05/09/2011 19:21:35	17:00	120	28.19	89.51	Af/1	0	0	Af/1	N gw/1	N gw/1	True

Network Results: Summary

Calculated Flow Entering LTS (PCU/hr)	Calculated Flow Out Of LTS (PCU/hr)	Flow Discrepancy (PCU/hr)	Adjusted Flow Warning	Calculated Sat Flow (PCU/hr)	Calculated Capacity (PCU/hr)	Degree Of Saturation (%)	DOS Threshold Exceeded	Practical Reserve Capacity (%)	Actual Green (s (per cycle))	Effective Green (s (per cycle))	Cost Of Penalties (£ per hr)	Unweighted Performance Index (£ per hr)	Performan Index (£ p hr)
7923	7923	0	False	0	0	90	False	-100	1762.00	476.00	0.00	476.99	476.99

Network Results: Stops And Delays

Mean Cruise Time Per PCU (s)	Signalled LoS	Mean Delay Per PCU (s)	Uniform Delay (PCU-hr/hr)	Random Plus Oversat Delay (PCU-hr/hr)	Unweighted Cost Of Delay (£ per hr)	Weighted Cost Of Delay (£ per hr)	Mean Stops Per PCU (%)	Uniform Stops (Stops per hr)	Random Stops (Stops per hr)	Unweighted Cost Of Stops (£ per hr)	Weighted Cost Of Stops (£ per hr)
7.66	B	12.81	19.15	9.04	400.24	400.24	37.81	2709.79	285.57	76.75	76.75

Network Results: Queues And Blocking

Initial Queue (PCU)	Mean Max Queue (PCU)	Max Queue Storage (PCU)	Average Link Excess Queue (PCU)	Average Limit Excess Queue (PCU)	Excess Queue Penalty (£ per hr)	Max End Of Green Queue (PCU)	Max End Of Red Queue (PCU)	Wasted Time Starvation (s (per cycle))	Wasted Time Blocking Back (s (per cycle))	Wasted Time Total (s (per cycle))	Estimated Blocking
0.00	0.00	343.65	0.00	0.00	0.00	0.00	0.00	228.00	2.00	230.00	False

Network Results: Fuel Consumption

Fuel Consumption Cruise (Litres per hour)	Fuel Consumption Delay (Litres per hour)	Fuel Consumption Stops (Litres per hour)	Fuel Consumption Total (Litres per hour)	Fuel Economy Total (Miles / gal)
55.93	28.05	23.09	107.06	2.82

Network Results: Journey Times

Distance Travelled (PCU-km/hr)	Time Spent (PCU-hr/hr)	Mean Journey Speed (kph)	Journey Time Per PCU (s)
641.04	45.05	14.23	20.47

Point to Point Journey Time

Journey Time (s) for OD Matrix: 1

		To		
		1	2	3
From	1	0.00000	24.94230	21.27671
	2	0.00000	0.00000	18.32670
	3	0.00000	41.87114	0.00000

Journey Time (s) for OD Matrix: 2

		To		
		1	2	3
From	1	0.00000	18.46953	29.00609
	2	29.40804	0.00000	44.51498
	3	0.00000	0.00000	0.00000

Journey Time (s) for OD Matrix: 3

		To		
		1	2	3
From	1	0.00000	44.62383	25.14686
	2	65.83817	0.00000	44.17532
	3	17.19548	0.00000	0.00000

Journey Time (s) for OD Matrix: 4

		To			
		1	2	3	4
From	1	0.00000	20.81607	20.79960	68.56164
	2	84.22316	0.00000	88.28661	91.73158
	3	41.66064	71.92990	0.00000	0.00000
	4	57.43441	71.79733	0.00000	0.00000