Proposed Office Development, Harton Quay, South Shields
Reference number GB01T20E39/TA01

03/12/2020




TRANSPORT ASSESSMENT

muse DEVELOPMENTS

SYSTRA

PROPOSED OFFICE DEVELOPMENT, HARTON QUAY, SOUTH SHIELDS

TRANSPORT ASSESSMENT

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1. INTRODUCTION

1.1 Preamble

1.1.1 SYSTRA Ltd has been appointed by MUSE Developments and South Tyneside Council (STC) to prepare this Transport Assessment (TA) and the accompanying Travel Plan (TP) to support a planning application for a proposed office development within South Shields town centre, South Tyneside, Harton Quay (hereafter referred to as the Development). The proposed layout of the Development can be seen in Appendix A.

1.2 Background

1.2.1 The development will complement the ongoing South Shields 365 Vision Masterplan. South Shields 365 Vision is an ambitious initiative with the purpose of regenerating and revitalising South Shields town centre. This sets out a sustainable economic vision for South Shields with the purpose of creating new opportunities for residents, businesses and visitors. This includes the creation of an expanded employment, retail and leisure offer which ensures that a greater amount of spend is retained in the borough.

1.2.2 Fundamental to the local economy is the provision of a range of attractions and experiences, adding value, and creating a unique offer which encourages repeat trips to the area. This will aid South Tyneside Council's ambition to create a vibrant town centre which will be a place of all year round employment, cultural, leisure and retail activity for residents, businesses and visitors.

1.2.3 Taking this vision forward is a major step to securing a sustainable future for South Shields. It sets out major interventions which will transform the town and provide lasting improvements to the way the town functions. This will include employment, shopping and leisure offer and the way people can travel, improvements to both will make it easy for visitors to enjoy the town centre.

1.2.4 The 365 Vision Masterplan achieved outline planning approval in 2015.

1.2.5 This 365 Vision Masterplan has already delivered substantial improvements to the town centre. The initial stages include:

1. 'The Word', a cultural attraction, exhibition centre and library and public realm works to the Market Place. This was granted planning permission in October 2014 and opened to the public in October 2016.
2. Creation of a new transport interchange and accompanying building. This was granted planning permission in December 2015 and construction work was completed in August 2019. This was supported by extensive works to the surrounding public realm that were completed incrementally by March 2020.
3. A number of highway improvement schemes were implemented to coincide with the opening of the Transport Interchange. This includes scheme to improve capacity at junctions around the town centre as well as providing improvements for sustainable transport. These have been delivered at the Coronation Street/Ferry

Street Roundabout, Station Road/Crossgate Roundabout, Crossgate/A1018 Town Hall Junction.

4. A planning application for an A2 and B1(a) office building was approved in 2016 and a revised application was again approved in 2020, which would be located upon the existing Mile End Road car park.

1.3 Report Purpose

1.3.1 The purpose of this TA report is to consider the traffic and transport implications of the Development and to provide a comprehensive and systematic review of transport issues relating to it. The TA identifies the anticipated transport impacts of the scheme and outlines any necessary improvements to accessibility and safety for all modes of travel, particularly for alternatives to the car, such as walking, cycling and public transport.

1.3.2 This TA will identify the impact of the Development and adopts an approach that seeks to address:

- **Sustainable accessibility** – promote accessibility by all modes of travel, in particular public transport, cycling and walking and assess the likely travel behaviour or travel patterns to and from the site;
- **Identifying residual trips** – provide accurate quantitative and qualitative analyses of the predicted impacts of residual trips from the proposed development and ensure that suitable measures are proposed to manage these impacts;
- **Assess parking capacity** – the development is proposed to be constructed on an existing car park. The assessment will seek to understand the implications this has for parking demand and supply.

1.4 Report Structure

1.4.1 Following this introductory chapter, the remainder of this TA report is structured as follows:

- **Chapter 2: Policy Context** – reviews the relevant current and emerging national, regional and local transport policies, guidance documents and the development brief and how the proposed development accords with these.
- **Chapter 3: Baseline Conditions** – describes the baseline travel and transport conditions at the site and on the surrounding highway network. It includes a review of personal injury collision records and summarises the results of the car park surveys.
- **Chapter 4: Proposed Development** – sets out the development proposals within the context of the wider South Shields Masterplan. It includes an overview of the access strategy and a review of car and cycle parking.
- **Chapter 5: Trip Generation Assessment** – details the methodology used to ascertain total person trip generation and how these trips have been assigned to the local transport and highway networks.
- **Chapter 6: Car Parking Assessment** – considers the potential traffic and transportation impacts of the proposed development on car parking.
- **Chapter 7: Summary and Conclusions** – provides a summary and conclusion by highlighting the key points raised within the report.

1.4.2 All technical appendices are included at the end of this TA for information.

2. POLICY CONTEXT

2.1 Introduction

2.1.1 Before considering the proposed development, it is important to examine the context of the site and how this relates to relevant planning policies and guidelines. This section of the report sets out these elements, providing and overall spatial and planning context for the development proposal.

2.1.2 Policies have been adopted in national guidelines such as the most recent Transport White Paper (2011) that seek to encourage more sustainable modes than the car and a planning system which places greater emphasis on the link between transport and land use planning policies to encourage transport decisions at a local level that are compatible with environmental and community goals and best reflect local circumstances and requirements.

2.1.3 The following national, regional and local planning documents have been reviewed:

- The Transport White Paper;
- The National Planning Policy Framework (NPPF);
- Planning Practice Guidance (NPPG);
- South Shields 365 Town Centre Vision;
- Tyne and Wear Local Transport Plan 3 (LTP3); and
- South Tyneside Vision 2011-31.

2.2 National Planning Policy

2.2.1 The Transport White Paper (2011)

2.2.2 The Government's vision for a sustainable local transport system is set out in the January 2011 Transport White Paper: "Creating Growth, Cutting Carbon – Making Sustainable Local Transport Happen."

2.2.3 The White Paper acknowledges that transport provision is essential for economic growth if the Government is to improve the economic deficit which it is currently facing. The Paper also recognises however, that the current levels of carbon emissions from transport cannot be sustained if the nation is to meet its national commitments on climate change as well as creating a safer and cleaner environment in which to live. The Government highlights sustainable transport solutions as a means by which the economy can grow which will also see a positive impact on the local environment.

2.2.4 Whilst the Paper outlines the funding options which will be available for sustainable transport schemes, it also recognises that investment alone will not be enough and that help needs to be given to people to ensure that the transport choices they make are good for society. The Paper recognises that it is at the local level where most can be done to encourage sustainable transport modes and implement sustainable transport schemes. Solutions should be developed for the places they serve, tailored for the specific needs and behaviour patterns of individual communities.

2.2.5 Within the Paper, sustainable transport considers more than just public transport, walking and cycling schemes and acknowledges that it is not feasible for some trips to be undertaken by these modes. There is therefore a realisation that the car will continue to be an important

mode of transport and a focus should be given to making car travel greener through electric and other low emission vehicles.

2.2.6 National Planning Policy Framework

2.2.7 The Government's National Planning Policy Framework (NPPF) replaced the majority of previous Planning Policy Statements (PPS) and Planning Policy Guidance Notes (PPG) documents on 27 March 2012. It has subsequently been reviewed and updated in July 2018 and again in February 2019.

2.2.8 It sets out the Government's expectations and requirements from the planning system. It provides guidance for local councils to use when defining their own personal local and neighbourhood plans. This approach allows the planning system to be customised to reflect the needs and priorities of individual communities.

2.2.9 The NPPF defines the delivery of sustainable development through three roles:

- an economic objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
- a social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and
- an environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

2.2.10 It notes that to achieve sustainable development, these roles should be sought jointly and simultaneously through the planning system.

2.2.11 At the heart of the NPPF is a presumption in favour of sustainable development (paragraph 10).

2.2.12 Paragraph 108 states "In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

- appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;
- safe and suitable access to the site can be achieved for all users; and
- any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree".

2.2.13 Paragraph 109 states "development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe".

2.2.14 Paragraph 110 states "Within this context, applications for development should:

- give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;
- address the needs of people with disabilities and reduced mobility in relation to all modes of transport;
- create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;
- allow for the efficient delivery of goods, and access by service and emergency vehicles; and
- be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations".

2.2.15 Paragraph 111 states that, "All developments that will generate significant amounts of movement should be supported by a Travel Plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed".

2.2.16 National Planning Practice Guidance

2.2.17 The Government's National Planning Practice Guidance (NPPG) was launched on 6th March 2014 by the Department for Communities and Local Government (DCLG) as a web-based resource.

2.2.18 Within the NPPG, the 'Travel Plans, Transport Assessments and Statements in Decision-Taking' guidance provides advice on when transport assessments and transport statements are required, what they are and what they should contain.

2.2.19 Paragraph 6 sets out the importance of the Travel Plans (TPs), Transport Assessments (TAs) and Transport Statements (TSs) saying that they can positively contribute to:

- "Encouraging sustainable travel;
- lessening traffic generation and its detrimental impacts;
- reducing carbon emissions and climate impacts;
- creating accessible, connected, inclusive communities;
- improving health outcomes and quality of life;
- improving road safety; and
- reducing the needs for new development to increase existing road capacity or provide new roads."

2.2.20 The NPPG recommends that the following key principles should be taken into account whilst preparing TA, TP or TS reports, which should be:

- "proportionate to the size and scope of the proposed development to which they relate and build on existing information wherever possible;
- established at the earliest practicable possible stages of development proposal;
- tailored to local circumstances (other locally-determined factors and information beyond those which are set out in this guidance may need to be considered in these studies provided there is robust evidence for doing so locally);
- brought forward through collaborative ongoing working between the Local Planning Authority/ Transport Authority, Transport Operators, Rail Network Operators, Highways Agency where there must be implications for the strategic road network and other relevant bodies. Engaging communities and local business in Travel Plans, Transport Assessments and

Statements can be beneficial in positively supporting higher levels of walking and cycling (which in turn can encourage greater social inclusion, community cohesion and healthier communities)."

2.2.21 In determining whether a TA or TS will be needed for a proposed development, the NPPG states on Paragraph 13 that "Local planning authorities should take into account the following considerations:

- the Transport Assessment and Statement policies (if any) of the Local Plan;
- the scale of the proposed development and its potential for additional trip generation;
- existing intensity of transport use and availability of public transport;
- proximity to nearby environmental designations or sensitive areas;
- impact on other priorities/strategies (such as promoting walking and cycling);
- cumulative impacts of multiple developments within an area; and
- whether there are particular types of impacts around which to focus on the Transport Assessment or Statement (e.g. assessing traffic generated at peak times)."

2.3 Local Planning Policy

2.3.1 South Shields 365 Town Centre Vision

2.3.2 The South Shields 365 Town Centre Vision document sets out a sustainable economic vision for South Shields which will help create new opportunities for residents, businesses and visitors. It identifies the economic core of the headland comprising three distinct geographic 'character areas' namely the Riverside, the town centre and the Foreshore with each serving a distinct economic function for South Shields.

2.3.3 Fundamental to the strategy is linking these areas to ensure a broader experience for residents and visitors and for increasing internal expenditure. This needs to be supported by improving permeability and legibility within the town centre connecting the traditional heart of the centre with the new opportunities.

2.3.4 While this development did not form part of the South Shields 365 Town Centre Vision Masterplan it is intended as a complimentary development and therefore it is important to consider the policy as it has a indirect impact on the development.

2.3.5 Tyne and Wear Local Transport Plan 3 (LTP3)

2.3.6 LTP3 is the thirds Local Transport Plan and covers the time period 2011 to 2021. The vision for LTP3 is:

> "Tyne and Wear will have a fully integrated and sustainable transport network, allowing everyone the opportunity to achieve their full potential and have a high quality of life. Our strategic networks will support the efficient movement of people and goods within and beyond Tyne and Wear, and a comprehensive network of pedestrian, cycle and passenger transport links will ensure that everyone has access to employment, training, community services and facilities."

2.3.7 In order to achieve this vision, five goals have been set:

- to support the economic development, regeneration and competitiveness of Tyne and Wear, improving the efficiency, reliability and integration of transport networks across all modes;

- to reduce carbon emissions produced by local transport movements, and to strengthen our networks against the effects of climate change and extreme weather events;
- to contribute to healthier and safer communities in Tyne and Wear, with higher levels of physical activity and personal security;
- to create a fairer Tyne and Wear, providing everyone with the opportunity to achieve their full potential and access a wide range of employment, training, facilities and services; and
- to protect, preserve and enhance our natural and built environments, improving people's quality of life and creating high quality public places.

2.3.8 South Tyneside Vision 2011-31

2.3.9 The South Tyneside Vision comprises of 10 strategic outcomes, including the aim to have better transport in the area.

2.3.10 Another key focus is the regeneration of town centres, including South shields, with mention given to the South Shields 365 schemes.

2.3.11 One specific transport related goal that has been set out is to "deliver significant investment in modernising and improving footpaths", which is likely to encourage walking as a sustainable transport option.

2.4 Summary

2.4.1 This section has highlighted that the proposal is considered to accord with the transport related aspects of the planning policies included in the national and local planning documents.

3. EXISTING CONDITIONS

3.1 Introduction

3.1.1 The Development is located west of the Coronation Street roundabout along Mill Dam, Commercial Road and Harton Quay in South Shields Town Centre, the largest urban settlement in South Tyneside.

3.2 Site Description

3.2.1 The Development is located centrally within the town and therefore benefits from the variety of facilities and sustainable travel opportunities.

3.2.2 Figure 1 shows the location of the proposed Development in relation to town centre.

Figure 1. Site Extent and Location

3.2.3 The recently completed Transport Interchange, which incorporates the bus and Metro station is located to the east of town centre approximately 450m away. All bus services that leave the Interchange travel west to access the bus stops on Coronation Street approximately 100 metres east of the Development. It is considered that site users would benefit from high levels of accessibility to public transport services.

3.2.4 The Development is in close proximity to small shops and supermarkets, medical practices, salons etc encouraging link and pass-by trips. These are easily accessible via a very developed pedestrian network which has seen substantial improvements as part of the 365 Masterplan.

3.3 Highway Network

3.3.1 The following section describes the local highway network.

3.3.2 South Shields Town Centre

3.3.3 The road network in South Shields is typical of a town centre in that it seeks to find the right balance between access by general traffic, access for servicing and access by public transport. Its road network benefits from its geography, as vehicles in South Shields are there to visit South Shields rather than are passing through on the way to somewhere else. As such its road network does not experience substantial congestion even during peak hours. Growth in traffic levels within the town centre is considered to be development driven.

3.3.4 A number of highway improvement schemes have been implemented to coincide with the opening of the Transport Interchange. This includes scheme to improve capacity at junctions around the town centre as well as providing improvements for sustainable transport. These have been delivered at the Coronation Street/Ferry Street Roundabout, Station Road/Crossgate Roundabout, Crossgate/A1018 Town Hall Junction.

3.3.1 There are a number of car parks located in South Shields, some used more frequently than others. Car parks located to the north of King Street (North Street) and the car parks in the central area (Oyston Street and Garden Lane) are well used throughout the day. The car parks located to the rear of Fowler Street are less well used.

3.3.2 The South Shields 365 Vision masterplan will mean that some existing car parks will be removed to make space for development units.

3.3.3 Although some spaces will be lost, development of the South Shields 365 Vision masterplan has also delivered a new car park at Harton Quays which was opened to the public in 2016 and the town centre masterplan also includes for the development of a MSCP at the existing Oyston Street car park.

3.3.4 The nearest strategic road to the site is the A19 dual carriageway which runs approximately 4.5 kilometres southwest of the site. It runs north to south and links Northumberland and North Tyneside to South Tyneside, Sunderland and Middlesbrough via the Tyne Tunnel.

3.3.5 The key access route from the A19 corridor is via the A194 Western Approach which runs in a north easterly direction to South Shields town centre. The other main access routes to South Shields are via the A183 Coast Road (from the south via the east coast) and the A1018 Westoe Road (from the south towards Sunderland).

A194

3.3.6 The A194 road is a dual carriageway. It runs northeast from its start at junction 65 of the A1(M) near Washington, and the first 3 miles (4.8 km) are motorway standard, designated the A194(M) and subject to the national speed limit. There are various intermediate junctions with the A182 and the A195 before the motorway section ends at the A184 Whitemare Pool junction.

3.3.7 The A194 from Whitemare Pool is subject to a 50mph speed limit until the A19 Lindisfarne junction. North of this junction the A194 is subject to a 40mph speed limit until Laygate where it is reduced to 30mph as it passes through the residential areas of South Tyneside.

A183

3.3.8 The A183 road runs from South Shields, through Sunderland and towards Chester-le-Street in County Durham. It is a major route in South Tyneside, Sunderland and Chester-le-Street

serving many areas and landmarks along its route. The A183 is subject to a 30mph speed limit as it passes through the town centre on an easterly approach to the foreshore.

A1018

3.3.9 The A1018 runs between South Shields and the A19 near Seaham, County Durham via Sunderland. The A1018 is subject to a range of speed limits but is 30mph as it passes through the residential areas of South Tyneside towards the town centre.

Harton Quay

3.3.10 Harton Quay is single carriageway running from the Coronation Street connecting to Brewery Lane and Daltons Lane. Harton Quay has cycle lanes along part of the carriageway. A raised plateau exists at the junction to control speeds in the area.

B1344

3.3.11 The B1344 runs between the proposed development roundabout and Sandhaven beach where it connects with the A183. The B1344 runs through residential areas and is highly pedestrianised with footpaths and numerous pedestrian crossings running the length of the carriageway. The speed limit near to the proposed development site is 30mph.

Commercial Road

3.3.12 Commercial Road connects the proposed development to Rekendyke Industrial Estate. Commercial Road has a 30mph speed limit with pedestrian provision with footpaths and pedestrian crossings along the road.

3.4 Public Transport Accessibility

Buses

3.4.1 Major improvements to the current bus services in the town centre have been implemented with the new Transport Interchange opening in August 2019 replacing the previous spread of bus stops throughout the town centre.

3.4.2 A number of new bus stops have been provided around the town centre as part of the masterplan development. Of these, three upgraded bus stops have been installed on Coronation Street, giving public transport users easy access to the future and existing facilities at the Market Place, ASDA and the proposed office development. An additional bus stop has been provided for journeys southbound on Station Road.

3.4.3 There is a comprehensive network of existing bus services in South Tyneside and the site is well located for access to a range of bus routes.

3.4.4 The closest stops to the site are:

- Ferry Street-Coronation Street (Services: 10, E1, T503).
- Coronation Street (Services: 2, 3, 12, 18, 26 Crusader, 27 Crusader, 960, X20)
- Coronation Street-Cornwallis Street (Services: 4, 5, 17, 20 Prince Bishops, 30, 50, 50A)
- Commercial Road-Holborn House (Services: T503)

3.4.5 The following services are available within the town centre. These timetables were correct as of 2020; however, there may be a reduced number or disruption to the bus services due to

the impact of COVID-19. Nonetheless it is anticipated that services will return to the same scale in the post-COVID scenario

Table 1. Buses Available in South Shields Town Centre

SERVICE	ROUTE	MON – SAT DAYTIME FREQUENCY PER HOUR
1/2	South Shields – Biddick Hall – South Shields	2 (till 10:00)
3	South Shields – Biddick Hall – South Shields	5
4	South Shields – Biddick Hall – South Shields	5
5	South Shields – Boldon - Jarrow	2
7/8	South Shields – Marsden – South Shields	7
10/11	South Shields – ST Hospital – Jarrow – Cobalt	2
12	South Shields – ST Hospital – The Lonnen	2
17	South Shields – Whiteleas – South Shields	6
18	South Shields – Brockley Whins – South Shields	6
E1	South Shields – Whitburn – Sunderland	3
E2	South Shields – Whitburn – Sunderland	3
E6	South Shields – Whitburn – South Shields	3
20	Durham – Houghton – Sunderland – South Shields	5
X20	South Shields - Fellgate	1
26	Newcastle – Heworth Metro – Jarrow – South Shields	3
27	Newcastle – Heworth Metro – Jarrow – South Shields	3
30	South Shields – Cleadon – Boldon	1
50/50A	South Shields – Washington – Chester-le-street – Durham	2
T503	South Shields – Simonside – Boldon	1
516	South Shields – South Tyneside Hospital	1
960	South Shields – Hebburn – Waterview Park	2 services all day

Metro

3.4.6 The Metro is also located within the new Transport Interchange; therefore, the Proposed Development is easily accessible by this mode.

3.4.7 South Shields is the end stop on the Yellow Line, shown below in the Metro Network Map in Figure 2. There are regular services to Sunderland (via Pelaw) and Newcastle city centres, operating between approximately 05:30 and midnight Monday to Saturday, and 07:00 until midnight on Sundays.

3.4.8 These timetables were correct as of 2020; however, there may be a reduced number or disruption to the metro services due to the impact of COVID-19. Again, it is anticipated that services will return to the same scale in the post-COVID scenario.

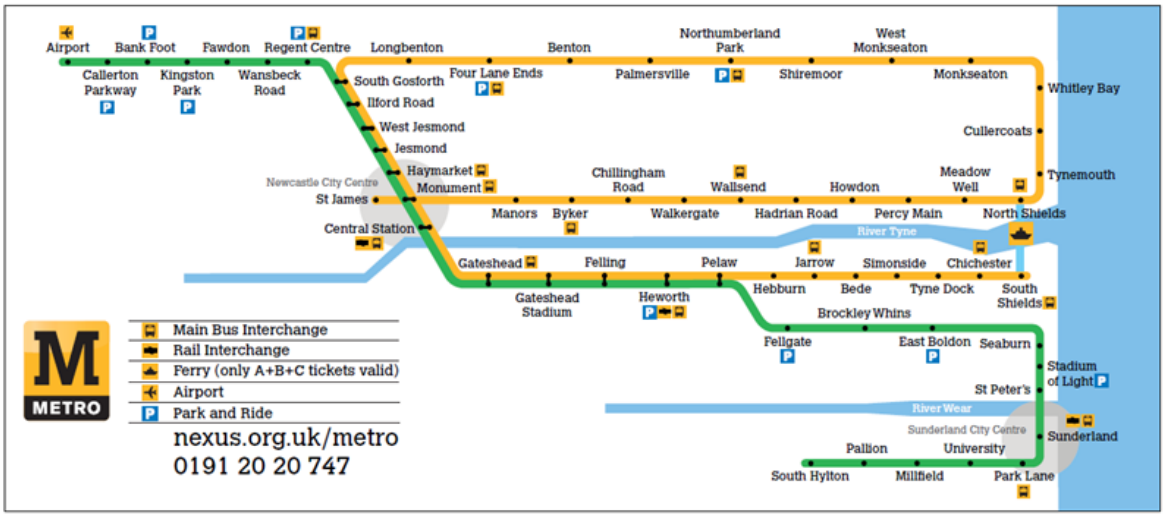


Figure 2. Tyne and Wear Metro Network

Shields Ferry

3.4.9 The Shields Ferry service provides a frequent and fast service across the River Tyne it allows a passenger to get to the other side in just seven minutes. The ferry runs every 30 mins between 07:00 and 18:30.

3.4.10 The ferry jetty is located approximately 170m to the north of the development and provides a convenient mode to access the development from North Tyneside.

3.4.11 Public Transport - Rail

3.4.12 Newcastle Central Station is approximately 17 km from South Shields town centre. The train station offers the following regional and nationwide services:

- East Coast main line operates northwards to Scotland and southwards to Yorkshire and London;
- Tyne Valley line operates westwards to Hexham and Carlisle;
- TransPennine rail operates to Leeds and Manchester; and
- Cross-Country line runs to the Midlands and south-west England.

3.4.13 Additionally, Sunderland train station is approximately 15 km from South Shields. This station offers more local connections to other areas in Tyne and Wear and some national routes. Services available include:

- Journeys to Metrocentre and Hexham;
- Durham Coast line running south-east to Middlesbrough; and
- Grand Central services from Sunderland to Tees Valley, Yorkshire and London.

3.4.14 Both rail stations can be accessed by the Metro, taking 27 minutes to travel from South Shields to Central Station (Newcastle) or 39 minutes to travel from South Shields to Sunderland.

3.5 Walking Accessibility

3.5.1 The Development's town centre location means that the site is highly accessible via walking, both as a sole mode of transport and also as part of a linked trip with public transport. The town centre has a good provision of pedestrian areas and footways, including within close proximity to the site.

3.6 Cycle Network

3.6.1 South Shields town centre is surrounded by national cycle routes:

- Route 14 runs from Darlington in County Durham north-east to Hartlepool, then north-west through Durham to Consett and routing back north-east to South Shields along the south side of the River Tyne.
- Route 72 of the National Cycle Network starts in Kendal and makes its way around the Cumbrian coast via Barrow-in-Furness and Whitehaven to Silloth.
- Route 1 is a long distance cycle route connecting Dover and the Shetland Islands - via the east coast of England and Scotland.

3.6.2 In the South Tyneside area, route 14 and 72 are mainly on-road cycle routes with some off-road sections whereas route 1 is almost entirely off-road and traffic free. In addition, there are on-road cycle facilities along the length of King George Road.

3.6.3 All the cycle routes run to within 1km of the proposed development and the existing sustainable transport facilities within the town centre and therefore cycling to the town centre for recreation, commuting or for interchange is a real possibility.

3.6.4 Advisory cycle routes exist which connect from these strategic routes into the town centre central area, these are predominantly on quiet roads rather than via dedicated cycle facilities. To support these advisory cycle routes, the town centre masterplan introduced a 20mph speed limit for the central area and therefore interaction with general traffic is safer. Cyclists will therefore be encouraged to travel on the carriageway mixing with general traffic, indeed many cyclists prefer this.

3.6.5 It is thought that by making peripheral traffic-free cycle routes more accessible to the town centre and making the town centre more attractive and safe for cyclists, then more visitors and staff will find cycling into South Shields an attractive, safe and convenient option of travel.

3.7 Taxi

3.7.1 There are currently various taxi pick-up and drop-off locations across the town centre. Taxis can also be accessed via apps to precise locations that are not designated pick-up or drop-off locations.

3.8 Accessibility Summary

3.8.1 The development is located in an existing urban area and as such is already highly accessible by sustainable forms of transport including walking, cycling and public transport.

3.8.2 The current conditions for walking, cycling and public transport will be enhanced by measures identified in the South Shields 365 Vision masterplan proposed alongside the Development's opportunities. This includes the Transport Interchange, which was opened to the public in August 2019 and a revitalised public realm which is being delivered in phases.

3.8.3 The construction works included implementation of a 20mph zone which improves the attractiveness and safety of walking and cycle.

3.8.4 This specific development is well placed to benefit from these measures given its proximity to the town centre. It also benefits from upgraded pedestrian routes which connect to these facilities.

3.8.5 To summarise, the physical features being implemented as part of the wider masterplan, which will be complemented by measures introduced as part of the Development, will provide opportunities to encourage existing and future users to travel to and around the town centre by sustainable modes of transport.

3.9 Collision Analysis

3.9.1 A review of collision data has been undertaken for incidents between the years 2015 to 2019, using the CrashMap database.

3.9.2 The data was taken for collision locations within a 200m radius of the site, shown below in Figure 3.

Figure 3. Collision Locations

3.9.3 The collisions have been broken down by year and severity in Table 2.

Table 2. Collisions Per Year 2015 –2019 (Source: CrashMap)

YEAR	SLIGHT	SEVERE	FATAL
2015	1	0	0
2016	0	0	0
2017	2	0	0
2018	0	0	0
2019	0	0	0
Total	3	0	0

3.9.4 Within 200m of the site, a total of 3 collisions occurred in the period 2015 –2019, of which none were serious and three were slight. No fatalities were recorded in this time period.

3.9.5 There were two slight collisions within a close proximity to the site, both on the roundabout leading to the development. The collision leading from Commercial Road involved four vehicles with one casualty. The collision from Coronation street involved two vehicles and one casualty.

3.9.6 The final collision occurred on the B1344/Church Way roundabout involving two vehicles and one casualty.

3.9.7 The number of collisions is considered to be small given the presence of a roundabout within the study area and the proximity to the town centre. In conclusion, it is considered that the proposed development is unlikely to raise any additional highway safety concerns.

4. PROPOSED DEVELOPMENT

4.1 Proposed Development

4.1.1 The proposed office development comprises of a 60,000 sq. ft office space, with four to five floors plus associated parking to be located via an undercroft. The proposed site plan is shown in Appendix A.

Site Access

4.1.2 The undercroft car park will be accessed from Harton Quay on the western side of the proposed building. Pedestrian access will be available from the north west of the site on Harton Quay and a further staff entrance from internally to the car park.

4.1.3 Appendix B shows the site accesses for pedestrians and vehicles from the local highway network.

Car Parking Provision

4.1.4 It is proposed to provide 22 associated car parking spaces underneath the building these will include 2 accessible bays and two electric vehicle charging points.

4.1.5 South Tyneside Council's Supplementary Planning Document 6 (SPD6) describes the provision of parking required.

4.1.6 The location of the Development is just outside the town centre area identified on Figure 3.1. of SPD6 i.e. it sits within the urban area zone. The standard states that maximum parking spaces should be provided at a rate of 1 space per 30m^2 GFA. This would equate to circa 180 parking spaces. However given the location of the Development right on the periphery of the town centre zone, this is considered to be a substantial over-provision. The level of provision proposed will act as a demand management tool encouraging travel by sustainable transport. In addition there are a number of car parks across the town centre where additional parking can be accommodated, this includes the proposed Multi Story Car Park (MSCP) that was identified within the 365 Vision Masterplan. This was identified in the masterplan to accommodate additional traffic generated by the development of the town centre.

4.1.7 For disabled parking, bays must be 5.0m by 2.4m with additional cross-hatched space available to the side and rear of the space, and also "should be provided at a rate of 6% of the total provision, rounded up to the nearest whole space. The proposed disabled bays meet the number and size requirement outlined in the SPD.

Cycle Parking

4.1.8 Cycle parking will be provided in the undercroft car park. It is proposed to provide space for up to 25 bicycles. In addition, outdoor cycle parking for visitors will be provided close to the main entrance off Harton Quay in the north Eastern corner of the development site. This is proposed to provide five racks (ten spaces).

4.1.9 The proposed layout of the car park is shown in Figure 4 below.

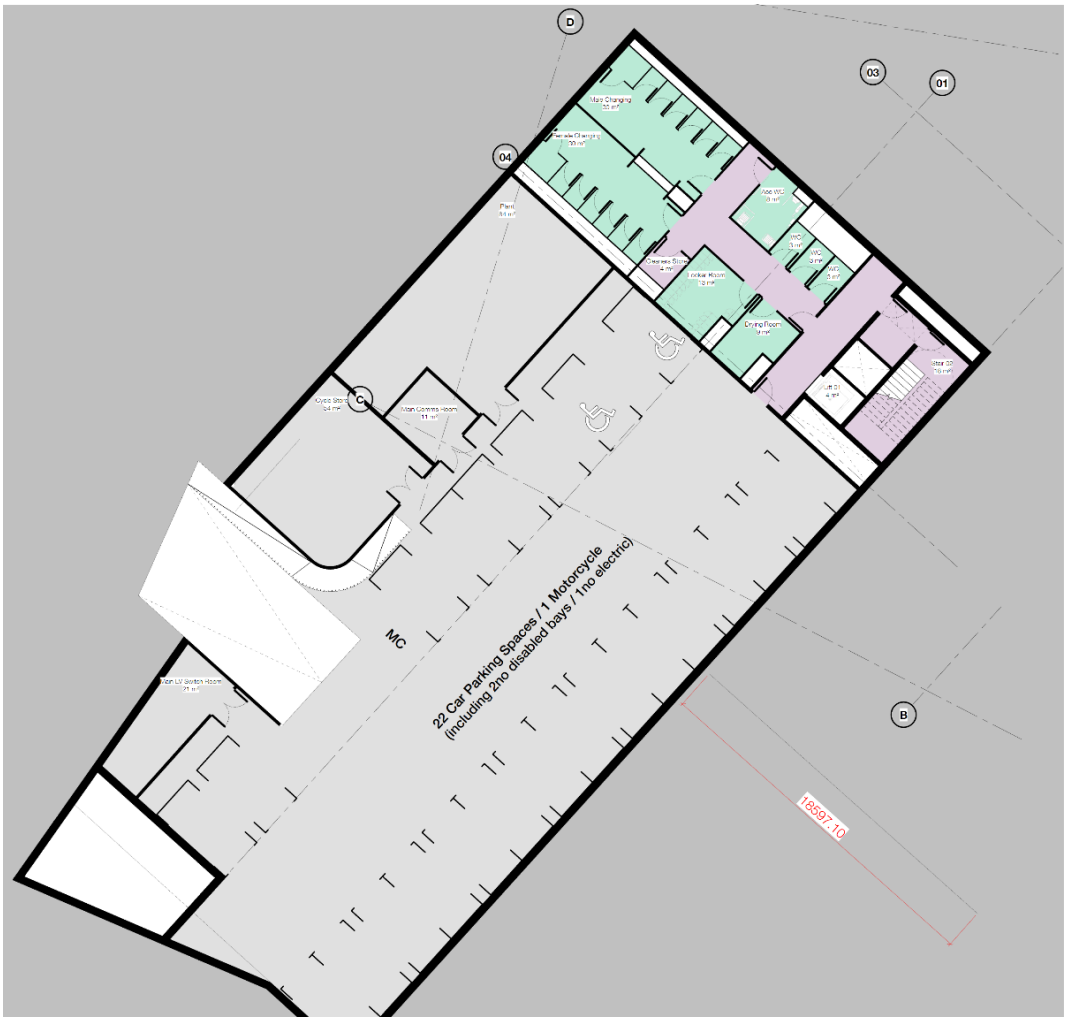


Figure 4. Harton Quay Car Park Layout

Servicing

4.1.10 It is expected that all servicing will take place from Harton Quay with larger vehicle being able to turn around at the end of the road next to The Customs House.

5. TRIP GENERATION ASSESSMENT

5.1 Overview

5.1.1 The proposed development will have a land use of B1 (a) (office) use.

5.1.2 The office development will operate on weekdays; therefore, this assessment focuses on trip generation during the weekday peak hours of the local highway network. The Transport Assessment report for the consented South Shields Masterplan confirmed the weekday peak hours of the local highway network based on traffic survey data. The weekday network peak hours are:

- Weekday AM Peak hour: 08:30 – 09:30; and
- Weekday PM Peak hour: 16:45 – 17:45.

5.2 Proposed B1 Office Use – Trip Generation

5.2.1 Methodology

5.2.2 The trip generation associated with the proposed development has been calculated using weekday peak hour total person trip rates (per 100m^2 GFA) for the proposed B1 Office. Thereafter, the trip rates have been applied to the Gross Floor Area of the proposed building to calculate the number of total person trips. The journey to work mode split for South Shields Town Centre has been applied to the total person trip generation to identify the level of multi-modal trips generated during the peak hours of the local highway network.

5.2.3 Total Person Trip Rates and Generation

5.2.4 SYSTRA has interrogated the TRICS database (version 7.7.3) for similar town centre B1 office developments. The full TRICS output has been provided in Appendix A for review.

5.2.5 The proposed trip rates are presented in Table 3 below

Table 3. Trip Rate (B1 Office)

	AM PEAK		PM PEAK	
	ARR.	DEP.	ARR.	DEP.
Total Person Trip Rate (per 100sqm GFA)	2.494	0.202	0.157	2.211
Total Person Trip Rate (5574sqm)	139	11	9	123

5.2.6 The TRICS outputs peaks for the morning and evening peaks are expected to occur between 08:00 – 09:00hrs and 17:00 – 18:00hrs respectively. These time periods will be overlain on the network peak periods to result in a robust assessment.

5.2.7 The full TRICS output is Provided in Appendix C.

5.2.8 The 2011 Census Origin Destination dataset from Nomis was used to generate a modal split to project onto the person trip generation data for the Development.

5.2.9 Specifically, dataset 'WU03EW – Location of usual residence and place of work by method of travel to work (MSOA level)' has been used. The application site is located on the boundary of 'South Tyneside 001' and 'South Tyneside 002' Mid-layer Super Output Areas (MSOAs).

5.2.10 Both MSOAs have been chosen as the workplace destinations, with all other MSOAs as origins (i.e. where people commuting to the above MSOAs will travel from). This data has been extracted for all travel modes and the mode split calculated from the totals of each travel mode as a percentage of the overall number of trips.

5.2.11 The resulting travel mode split, and number of trips is shown in Table 4 below.

Table 4. Census Base Model Split

TRAVEL MODE	COUNT	MODE SPLIT
Car Driver	4,128	56%
Bus	1,238	17%
On Foot	805	11%
Car Passenger	462	6%
Metro	425	6%
Bicycle	160	2%
Taxi	51	1%
Motorcycle	48	1%
Total	**7,317**	**100%**

5.2.12 Table 5 applies the multi-modal split to the total person trip generation Shown in Table 3.

Table 5. Multi-Modal Trips

MODE	PERCENTAGE	AM PEAK		PM PEAK	
		Arrivals	Departures	Arrivals	Departures
Car Driver	**56%**	78	6	5	69
Bus	**17%**	24	2	1	21
On Foot	**11%**	15	1	1	14
Car Passenger	**6%**	8	1	1	7
Metro	**6%**	8	1	1	7

MODE	PERCENTAGE	AM PEAK		PM PEAK	
		Arrivals	Departures	Arrivals	Departures
Bicycle	**2%**	3	0	0	2
Taxi	**1%**	1	0	0	1
Motorcycle	**1%**	1	0	0	1
Total	**100%**	139	11	9	123

5.2.13 As shown in the tables above the development will generate approximately 84 vehicle trips in the morning peak and 74 vehicle trips in the evening peak.

6. DISTRIBUTION & ASSIGNMENT

6.1.1 As the development provides 22 parking spaces any traffic above this will need to assign to alternative parking in the town centre. This is currently some uncertainty regarding where these additional trips will park. It is understood that there are currently discussions with South Tyneside Council regarding the potential for some spaces within the Mill Dam car park to be allocated for the express use of this development.

6.1.2 However as this remains to be resolved, it is intended to distribute the trips to the proposed MSCP. This is considered to be a robust assessment as it results in a more traffic being directed to sensitive sections of the rod network i.e. increasing right turners at the Crossgate/ Garden lane signals and the Coronation Street roundabout.

6.1.3 The following table shows how the final destination of the predicted vehicle trips.

Table 6. **Parking Distribution**

LOCATION	AM		PM	
	Arrivals	Departures	Arrivals	Departures
Harton Quay Carpark	22	2	1	20
Proposed Multi Story Carpark	56	5	4	50
Total	78	6	5	69

6.1.4 In order to distribute the traffic on the highway network to these two locations, two different distributions were required.

6.1.5 To derive the wider distribution, or how the vehicle trips will approach the town centre, the 2011 census journey to work data has been extracted from the NOMIS database for the Middle Super Output Area (MSOA) E02001768 : South Tyneside 001.

6.1.6 Using South Tyneside 001 as the Place of work and all other MSOAs as the usual residence a route was assigned to each based on shortest journey time, the number of car or van drivers was proportioned and summed to derive a distribution. The full assessment can be seen in Appendix B.

6.1.7 Table 7 provides a summary of the calculated wider distribution.

Table 7. Census Base Model Split

ROUTE (TO/FROM)	PROPORTION %
Ferry Street	2%
A183 Anderson Street	2%
Westoe Road	6%
Beach Road	7%
A194 Western Approach	83%

6.1.8 As shown in Table 7 above the largest proportion of the development traffic will enter and exit the network along the A194 Western Approach.

6.1.9 Form this point two separate distributions are required.

6.1.10 The 22 trips to and from Harton Quay will arrive /depart via the Coronation Street roundabout. The distribution is provided within the traffic flow diagrams provided in Appendix D.

6.1.11 As discussed, the remining trips have been distributed to the proposed MSCP. The distribution is also provided within the traffic flow diagrams provided in Appendix D.

7. TRAFFIC FLOWS

7.1.1 Due to the ongoing COVID-19 pandemic it is not currently possible to undertake representative traffic surveys. Therefore, historic survey data has been used.

7.1.2 Traffic surveys were undertaken to support the consented town Centre 365 masterplan. It was agreed during scoping discussions that this data could be used in this assessment.

7.1.3 It was agreed to growth the traffic surveys up to 2020 levels using TEMPro.

Traffic Surveys

7.1.4 Classified junction turning counts and vehicle queue length surveys were undertaken at the following junctions:

- Junction 1 – Coronation Street Roundabout
- Junction 2 – Crossgate Roundabout
- Junction 3 – Crossgate / Garden Lane Signals

Assessment Periods

7.1.5 The traffic impact assessment is based on the weekday morning and evening peak hours of the local highway network against the peak hours identified in the TRICS assessment. This results in a robust assessment. The weekday peak hours of the local highway network are as follows:

- AM Peak: 08:30 - 09:30
- PM Peak: 16:45 - 17:45

Assessment years

7.1.6 This TA assesses the impact of the proposed development at the Application Year (2020) and the Design Year (2030).

7.1.7 Full Traffic Flow Diagrams are included in Appendix B.

7.2 Background Traffic Growth

7.2.1 The 2013 baseline traffic flows have been factored to the base assessment year using local traffic growth factors from the National Transport Model (NTM) datasets modified in the Trip End Model Presentation Program (TEMPro v7).

7.2.2 The South Tyneside geographical area was chosen as the area definition and growth factors extracted for car driver trips for weekday AM and PM peak periods have been extracted.

Table 8. TEMPRO / NTM local traffic growth factors

Growth Period	Traffic Growth	
	AM Peak	PM Peak
2013 - 2020	1.097344532	1.094668865

7.2.3 Given the location of South Shields it is expected that any growth in background traffic will be development driven to the 2030 assessment year.

7.3 Committed Development

7.3.1 Committed developments are “land with current planning permission or allocated in the adopted development plans for development (particularly residential development)”. As such, the consented South Shields town centre masterplan has been considered as a committed development.

7.3.2 The consented 365 masterplan included for a 300 space MSCP. A concurrent planning application for an increase in the number of parking spaces to 407 is being brought forward. A car park does not in itself generate trips, however, it will result in a redistribution of trips around the network from other car parks.

7.4 Assessment scenarios

7.4.1 An overview of the scenarios considered in this assessment is summarised in Table 9.

Table 9. Operational Assessment Scenarios

Assessment Year	Scenario	
	Base + Committed	Base + Committed + Development
2020	AM, PM	AM, PM

8. OPERATIONAL ASSESSMENT

8.1.1 This section considers the impact of the development proposals on the key junctions within the study area. It provides a summary of the findings from the operational junction capacity assessments that have been undertaken. The scope of the assessment has been discussed and agreed with the local highway authority during the scoping stage.

8.1.2 Operational capacity assessments have been undertaken to determine the development traffic impact at the following junctions:

- Junction 1 – Coronation Street Roundabout
- Junction 2 – Crossgate Roundabout
- Junction 3 – Crossgate / Garden Lane / Town Hall Signals

8.1.3 The junctions under consideration in this assessment have recently been upgraded in order to support the Town Centre 365 Masterplan. As these improvements are on the ground now these are the layouts considered in this assessment.

8.1.4 The assessments have been undertaken using TRL industry-standard modelling software Junctions 9, with the ARCADY module for roundabout junctions and Linsig3 for the signalised junctions.

8.1.5 The ARCADY models return results in RFC (Ratio of Flow to Capacity) and mean maximum queues (MMQ) in each 15-minute time segment, measured in the number of passenger car units (PCUs). Theoretically, RFC values between 0.00 and 0.85 indicate good operating conditions; values of between 0.85 and 1.00 represent variable operation (i.e. queues building at the junction resulting in increased vehicle delay moving through the junction); values in excess of 1.00 represent overloaded conditions.

8.1.6 LinSig reports a Degree of Saturation (DoS) for each link (i.e. demand / available capacity) and MeanMaxQueue recorded in Passenger Car Units (PCUs).

8.1.7 A DoS between 0.00 and 0.90 is generally considered as representing stable operating conditions, values between 0.90 and 1.00 represents a constrained scenario (i.e. possible queues building up at the junction and increases in vehicle delay). DoS beyond 1.00 represents overloaded conditions and a junction working beyond theoretical capacity.

8.1.8 The full junction modelling reports for all demand sets are provided in Appendix E.

8.2 Junction 1 – Coronation Street Roundabout

8.2.1 The Coronation Street / Station Road / Commercial Road/ Harton Quay Roundabout is a 5 arm roundabout located to the north east of the development site. The junction has recently had an improvement scheme installed which involved the signalisation of the northern arm (B1344) and the opposing circulatory. The scheme was proposed to provide a bus priority measure to assist their rerouting via Coronation Street rather than aimed at improving capacity. This, as demonstrated as part of the 365 Masterplan assessment, can lead to some queuing occurring at busy times for example when the Customs House is emptying after a performance.

8.2.2 A decision was therefore made by South Tyneside Council to temporarily turn off the traffic signals, reverting the junction to a simple priority roundabout arrangement. The intention being that the traffic signals could be switched back on if the roll out of the masterplan

development warranted it. As such the operation of the Coronation Street junction will be undertaken both with the signals in operation and without. Discussions can then be held with South Tyneside Council regarding the most appropriate arrangement.

8.2.3 The following table presents the summary results of the junction assessment with the traffic signals in operation.

Table 10. Junction 1 Summary Results (with signals)

	0830 - 0930		1645-1745	
	DoS (%)	Queue (PCU)	DoS (%)	Queue (PCU)
	2020 Base + Com Dev			
Coronation St Ahead Left	33.4%	1.4	59.1%	5.2
Station Rd Ahead Left	37.6%	0.3	39.1%	0.4
Commercial Rd Ahead Left	42.7%	0.4	28.8%	0.2
Harton Quay Ahead Left	4.8%	0.0	9.6%	0.1
B1344 Ahead Left	53.7%	4.8	81.5%	9.9
Cric E Ahead	11.0%	0.1	12.6%	0.1
Cric E Right	7.2%	0.0	13.6%	0.1
Circ Station Rd Ahead	8.8%	0.0	17.8%	0.1
Circ Station Rd Right	3.0%	0.0	3.1%	0.0
Circ Commercial Rd Ahead	2.8%	0.0	1.7%	0.0
Circ Commercial Rd Right	21.5%	0.1	18.7%	0.1
Circ W Ahead	25.9%	0.2	18.8%	0.1
Circ W Right	14.5%	0.1	14.6%	0.1
Cric N Right Ahead	28.9%	2.9	34.7%	3.6
	PRC : 67.7 Cycle Time : 60s		PRC : 10.4 Cycle Time : 60s	
	2020 Base + Com Dev + Dev			
Coronation St Ahead Left	32.9%	1.5	60.7%	5.5
Station Rd Ahead Left	40.3%	1.1	39.1%	0.4
Commercial Rd Ahead Left	43.8%	0.4	28.8%	0.2
Harton Quay Ahead Left	5.0%	0.0	12.2%	0.1
B1344 Ahead Left	65.6%	5.5	86.0%	10.8
Cric E Ahead	10.1%	0.1	13.6%	0.1
Cric E Right	8.2%	0.0	13.6%	0.1
Circ Station Rd Ahead	9.8%	0.1	17.8%	0.1
Circ Station Rd Right	3.1%	0.0	3.1%	0.0
Circ Commercial Rd Ahead	4.0%	0.0	1.7%	0.0
Circ Commercial Rd Right	21.5%	0.1	18.7%	0.1
Circ W Ahead	25.9%	0.2	18.8%	0.1
Circ W Right	14.5%	0.1	14.6%	0.1
Cric N Right Ahead	26.5%	2.6	35.5%	3.7
	PRC : 37.2 Cycle Time : 60s		PRC : 4.6 Cycle Time : 60s	

8.2.4 As shown in Table 10, the results of the modelling in both the base + committed and base + committed + development scenario never exceed the 0.90 DoS threshold. The junction is considered to operate well within capacity in all scenarios tested.

8.2.5 It should be noted that the reported queue on the northern circulatory exceeds the available space in the PM peak. This implies that the queue will block back and interfere with the operation on the down steam arms. However there is significant reserve capacity on both the Western circulatory and the Harton Quay arms and it is not considered that this will cause an significant increase to delay. In addition, the queues on the northern circulatory are shown to

fully clear every cycle meaning the time in which the queue would block back would only occur for a few seconds each cycle during the evening peak scenario.

8.2.6 Table 11 shows the operation of the junction without the signals in operation i.e. as the junction is currently operating.

Table 11. Junction 1 Summary Results (without signals)

	0830 - 0930		1645-1745	
	RFC	Queue (PCU)	RFC	Queue (PCU)
	2020 Base + Com Dev			
Station Road	0.43	0.7	0.39	0.6
Commercial Road	0.35	0.5	0.24	0.3
Harton Quay	0.04	0.0	0.08	0.1
Ferry Street	0.22	0.3	0.38	0.6
Coronation Street	0.29	0.5	0.50	1.2
	2020 Base + Com Dev + Dev			
Station Road	0.43	0.7	0.39	0.6
Commercial Road	0.35	0.5	0.24	0.3
Harton Quay	0.04	0.0	0.08	0.1
Ferry Street	0.22	0.3	0.38	0.6
Coronation Street	0.29	0.5	0.50	1.2

8.2.7 The results of the modelling in both the base + committed and base + committed + development scenario, show the junction never exceeds the 0.85 RFC threshold. The junction is considered to operate well within capacity in all scenarios tested.

8.2.8 The junction is shown to operate well within capacity whether the traffic signals are active or not. Also, the addition of the development traffic is shown to have no significant effect on the queue length or delay in the peak hours.

8.2.9 If the parking strategy for the development changes and the Mill Dam car park is the preferred option for overflow parking the traffic which is currently assigned to the MSCP would instead be added to the Station Road Arm in the AM and the Harton Quay Arm in the PM. Given that these arms are currently reporting operation well within capacity it is not anticipated that that the additional circa 50 trips would cause severe queuing or delay.

8.3 Junction 2 – Crossgate Roundabout

8.3.1 The Crossgate/ Station Road / A194 roundabout is a three-arm priority roundabout located to the south of the proposed development.

8.3.2 Table 12 provides summary results of junction assessment.

Table 12. Junction 2 Summary Results

	0830 - 0930		1645-1745	
	RFC	Queue (PCU)	RFC	Queue (PCU)
	2020 Base + Com Dev			
B1303 Station Road	0.03	0.0	0.60	1.7
A194 Crossgate	0.03	0.0	0.34	0.5
Maxwell Street	0.05	0.0	0.14	0.2
A194 Western Approach	0.02	0.0	0.41	0.7

	2020 Base + Com Dev + Dev			
B1303 Station Road	0.39	0.7	0.62	1.8
A194 Crossgate	0.27	0.4	0.34	0.5
Maxwell Street	0.09	0.1	0.14	0.2
A194 Western Approach	0.54	1.2	0.41	0.7

8.3.3 As shown in the table above the junction is shown to operate well within capacity in both the base + committed and base + committed + development scenario, show the junction never exceeds the 0.85 RFC threshold. The junction is considered to operate well within capacity in all scenarios tested and the addition of the development traffic is shown to have no significant effect on the queue length or delay in the peak hours.

8.3.4 Given the performance of this junction, i.e. so far within theoretical capacity, the results are unlikely to change whether the overspill development traffic is travelling to Mill Dam or the proposed MSCP.

8.4 Junction 3 – Crossgate / Garden Lane / Town Hall Signals

8.4.1 The Crossgate / Garden Lane junction operates as part of a linked junction with the Westoe Road / Fowler Street / Beach Road signals adjacent to the Town Hall. Table 13 summarises the results of the junction assessment considering both junctions.

Table 13. Junction 3 Summary Results

	0830 - 0930		1645-1745	
	DoS (%)	Queue (PCU)	DoS (%)	Queue (PCU)
	2020 Base + Com Dev			
Beach Rd Left	20.9%	2.5	28.1%	3.6
Beach Rd Left Right	32.5%	4.6	24.2%	3.2
Beach Rd Link NB Ahead	32.6%	4.0	24.2%	0.7
Beach Rd Link NB Right	41.7%	8.2	43.7%	4.1
Fowler St Ahead	14.9%	1.1	10.2%	0.8
Beach Rd Link SB Ahead	18.3%	1.2	29.2%	2.6
Beach Rd Link SB Right	59.9%	8.9	62.6%	7.4
Westoe Rd Left	31.2%	2.9	40.6%	3.4
Westoe Rd Ahead Ahead2	82.1%	11.3	81.8%	9.3
Crossgate EB link Left Left2	47.7%	8.8	45.6%	5.0
Crossgate EB link Right	82.2%	8.8	81.3%	7.8
Crossgate WB Link Ahead Right	64.5%	10.7	79.0%	12.7
Garden Lane Left Right	73.6%	4.5	82.9%	10.1
Crossgate EB Ahead Left	68.4%	10.8	80.9%	13.5
	PRC : 9.5 Cycle Time : 88s		PRC : 8.5 Cycle Time : 88s	
	2020 Base + Com Dev + Dev			
Beach Rd Left	20.9%	2.5	28.1%	3.6
Beach Rd Left Right	33.0%	4.7	24.2%	3.2
Beach Rd Link NB Ahead	32.7%	5.2	24.2%	4.4
Beach Rd Link NB Right	41.7%	8.4	44.1%	9.6
Fowler St Ahead	14.9%	1.1	10.2%	0.8
Beach Rd Link SB Ahead	18.2%	1.0	28.8%	4.2
Beach Rd Link SB Right	60.8%	9.1	59.9%	7.2
Westoe Rd Left	32.6%	3.1	38.5%	3.3
Westoe Rd Ahead Ahead2	82.1%	11.3	78.7%	8.8
Crossgate EB link Left Left2	47.8%	8.4	47.1%	6.0
Crossgate EB link Right	82.2%	8.8	88.5%	9.4

Crossgate WB Link Ahead Right	73.5%	10.1	85.4%	13.6
Garden Lane Left Right	81.0%	5.3	87.4%	12.0
Crossgate EB Ahead Left	72.0%	12.3	83.3%	14.5
	PRC : 9.5 Cycle Time : 88s		PRC : 1.7 Cycle Time : 88s	

8.4.2 As shown in Table 13, the results of the modelling in both the base + committed and base + committed + development scenario never exceed the 0.90 DoS threshold. The junction is considered to operate well within capacity in all scenarios tested.

8.4.3 Also, the addition of the development traffic is shown to have no significant effect on the queue length or delay in the peak hours.

8.4.4 If the parking strategy were to change and Mill Dam become the preferred car park for overflow parking. The development traffic travelling through this junction would redistribute but would take routes that are anticipated to have less of an impact upon the operation of the junction. For example, trips from Westoe Road or Beach Road would travel straight through the junction on Crossgate rather than turning right into Garden Lane. In the opposing direction, traffic travelling to Westoe Road or Beach Road will approach the junction from Crossgate travelling straight ahead rather than looking to turn left from the Garden Lane arm. The operation of the junction would be expected to improve under these circumstances and therefore this report provides the more robust assessment of the network given the options for parking which are currently available.

8.5 Summary

8.5.1 This section has summarised the junction modelling exercise which has been undertaken to assess the impact of the proposed development. This has demonstrated that the surrounding highway network can accommodate the additional traffic generated by the development without significant queuing or delay. The impact of development traffic on the road network is considered to not result in a severe impact.

9. SUMMARY AND CONCLUSION

9.1 Summary

9.1.1 This section of the TA concludes with a summary of the key points:

9.1.2 SYSTRA has been appointed by MUSE Developments and South Tyneside Council to prepare this Transport Assessment and the accompanying Travel Plan to support a planning application for the proposed development of a B1(a) office building within South Shields town centre, South Tyneside.

9.1.3 The site is deemed to be in a sustainable location with excellent opportunities for it to be accessed by sustainable travel modes, particularly walking and public transport. The site is located around 400m from the new Transport Interchange and has a number of bus stops within close proximity.

9.1.4 A review of personal injury collision records for 2015 - 2019 for the local highway network indicates that the area has a good road safety record. Only three collisions have been reported within the vicinity of the site. On review on the causation factors for these incidents, it is unlikely that this was a result of the layout of the local highway network. It is concluded that the proposed development is unlikely to be detrimental to highway safety.

9.1.5 A trip generation exercise has been undertaken using the TRICS database which shows that the development will generate approximately 84 vehicle trips in the morning peak and 74 in the evening peak.

9.1.6 Traffic has been distributed based upon journey to work census data then assigned to the network based upon an analysis of journey time.

9.1.7 The junction modelling exercise has demonstrated that the surrounding highway network can accommodate the additional traffic generated by the development without significant queuing or delay.

9.1.8 The Travel Plan submitted alongside this TA will aim to promote the use of sustainable travel modes for accessing the site and will focus on promoting sustainable travel behaviours amongst staff who make the most regular journeys.

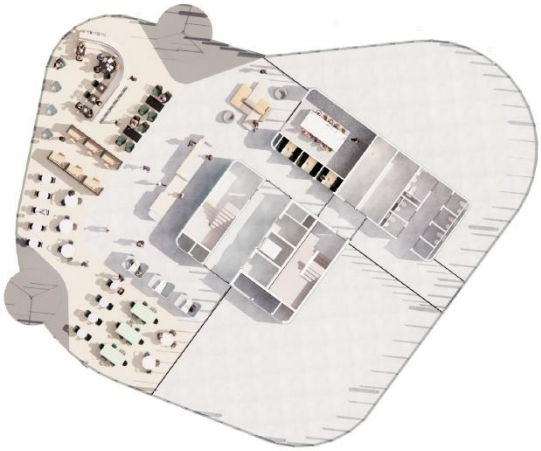
9.2 Conclusion

9.2.1 In light of the findings set out in this Transport Assessment, SYSTRA considers that the proposed development of a B1(a) office building is unlikely to result in highway or parking impacts. As such, SYSTRA concludes that the proposed development and associated planning application is not severe in line with NPPF and is acceptable in traffic and transport terms.

APPENDIX A – Site Layout

Site Layout – Exterior

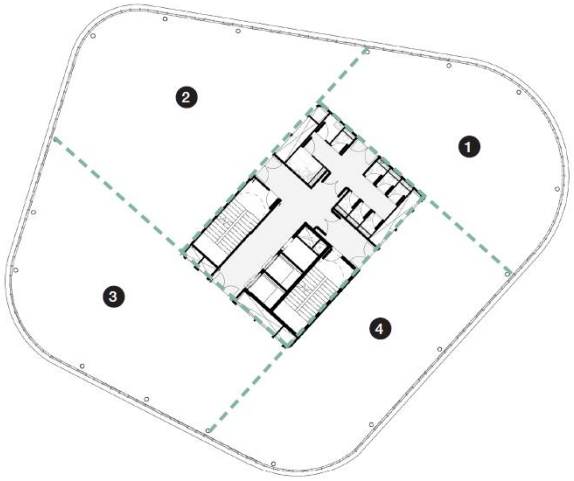
Site Layout – Interior



Level 00

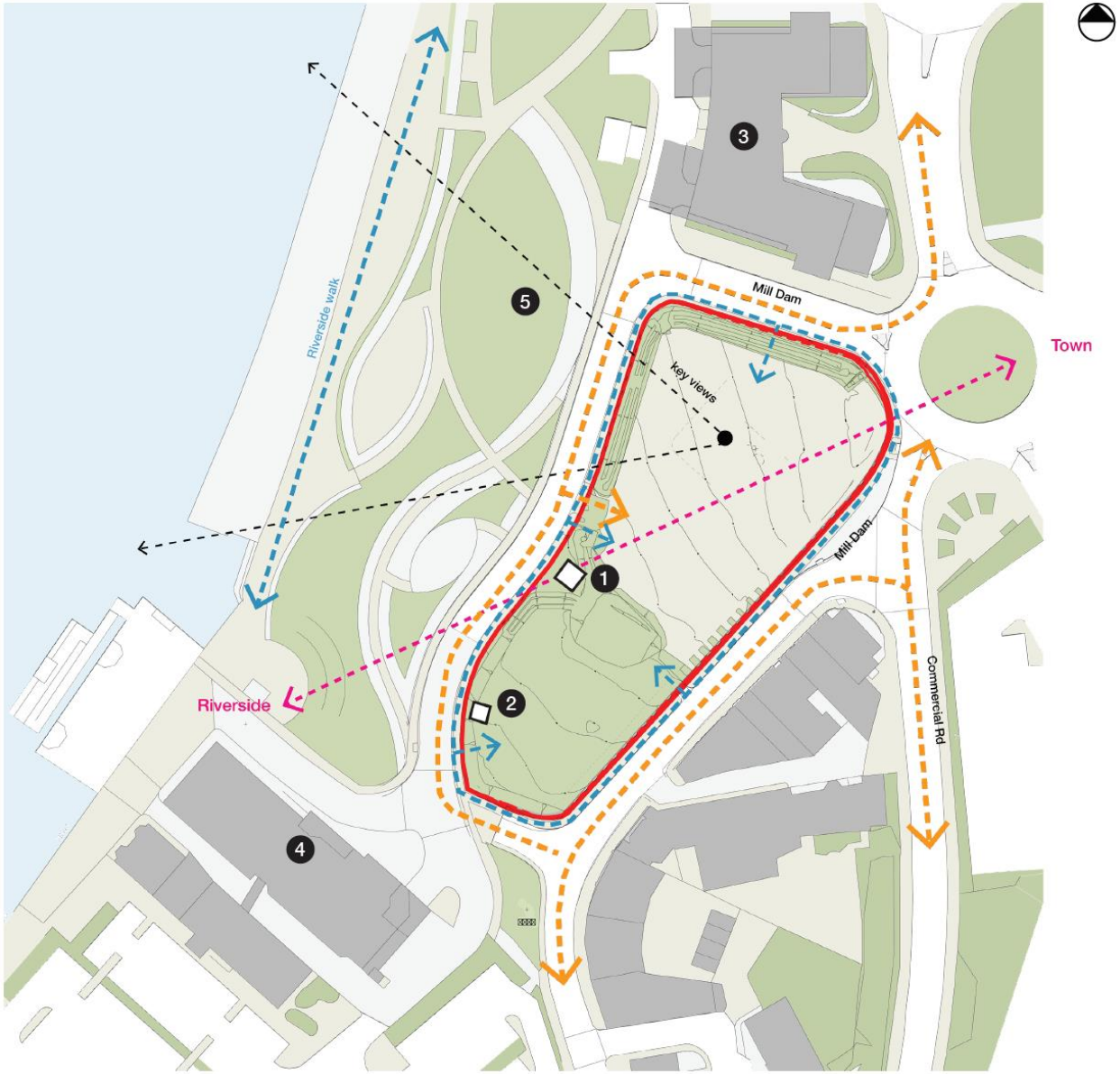
Level 01 - 03 Typical office

Level 04



Floorplate split

APPENDIX B – Site Access Plan



- Site Boundary
- Vehicular movement
- Pedestrian movement
- 1 Exisiting Substation
- 2 Historic Glassworks Chimney
- 3 BT Building
- 4 Customs House
- 5 Riverside Park

APPENDIX C – TRICS Output

TRICS 7.7.3
Trip Rate Parameter: Gross floor area

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use 02 - EMPLOYMENT
Category A - OFFICE
MULTI-MODAL TOTAL PEOPLE

Selected regions and areas:

2	SOUTH EAST		
	ES	EAST SUSSI	1 days
	SO	SLOUGH	1 days
3	SOUTH WEST		
	BR	BRISTOL CI	1 days
4	EAST ANGLIA		
	CA	CAMBRIDG	1 days
	NF	NORFOLK	1 days
	SF	SUFFOLK	1 days
8	NORTH WEST		
	GM	GREATER M	2 days
9	NORTH		
	TV	TEES VALLE	1 days
	TW	TYNE & WE	1 days
10	WALES		
	MT	MERTHYR T	1 days
	PS	POWYS	1 days
	SW	SWANSEA	2 days
11	SCOTLAND		
	DU	DUNDEE CI	1 days
	EB	CITY OF ED	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.
Parameter: Gross floor area
Actual Range: 2090 to 8793 (units: sqm)
Range Selected by User: 2000 to 10000 (units: sqm)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/12 to 19/10/18

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.
Selected survey days:
Monday 3 days
Tuesday 4 days
Wednesday 1 days
Thursday 5 days
Friday 3 days
This data displays the number of selected surveys by day of the week.

Selected survey types:
Manual count 16 days
Directional ATC Count 0 days
This data displays the numb the total a whilst ATC surveys are undertaking using machines.

Selected Locations:

Town Centre	6
Edge of Town Centre	10
Suburban Area (PPS6 Out of	0
Edge of Town	0
Neighbourhood Centre (PPS	0
Free Standing (PPS6 Out of T	0
Not Known	0

This data displays the numb Edge of To Suburban Neighbourho Edge of To Town Centre and Not Known.

Selected Location Sub Categories:

Industrial Zone	0
Commercial Zone	3
Development Zone	3
Residential Zone	0
Retail Zone	0
Built-Up Zone	9
Village	0
Out of Town	0
High Street	0
No Sub Category	1

This data displays the numb Industrial Developm Residential Z Retail Zon Built-Up Z Village Out of Tov High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

A1	1 days
B1	15 days

This data displays the numb which can be found within the Library module of TRICS®.

Filter by Use Class Breakdown:
All Surveys Included

Population within 500m Range:
All Surveys Included

Population within 1 mile:
5,001 to 10,000 2 days
10,001 to 15,000 1 days
15,001 to 20,000 4 days
20,001 to 25,000 1 days

25,001 to 50,000 7 days
50,001 to 100,000 1 days
This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:
5,001 to 25,000 1 days
25,001 to 50,000 1 days
75,001 to 100,000 2 days
125,001 to 250,000 6 days
250,001 to 500,000 3 days
500,001 or More 3 days
This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:
0.6 to 1.0 7 days
1.1 to 1.5 7 days
1.6 to 2.0 2 days
This data displays the numb within a radius of 5-miles of selected survey sites.

Travel Plan:
Yes 6 days
No 10 days
This data displays the numb and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:
No PTAL Present 16 days
This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 BR-02-A-02 PLANNING BRISTOL CITY
ST THOMAS STREET

BRISTOL
Town Centre
Built-Up Zone
Total Gross floor area: 5736 sqm
Survey dat FRIDAY 29/11/2013 Survey Typ MANUAL

2 CA-02-A-05 OFFICES CAMBRIDGESHIRE
NEW ROAD

PETERBOROUGH
Town Centre
Built-Up Zone
Total Gross floor area: 8793 sqm
Survey dat TUESDAY 16/12/2014 Survey Typ MANUAL

3 DU-02-A-0 OFFICES DUNDEE CITY
GREENMARKET

DUNDEE
Edge of Town Centre
Development Zone
Total Gross floor area: 3200 sqm
Survey dat THURSDAY 27/04/2017 Survey Typ MANUAL

4 EB-02-A-06 REGUS OFF CITY OF EDINBURGH
ST ANDREW SQUARE

EDINBURGH
Town Centre
Built-Up Zone
Total Gross floor area: 4500 sqm
Survey dat WEDNESDA 16/03/2016 Survey Typ MANUAL

5 ES-02-A-12 COUNCIL C EAST SUSSEX
VICARAGE LANE

HAILSHAM
Edge of Town Centre
Built-Up Zone
Total Gross floor area: 3640 sqm
Survey dat THURSDAY 26/11/2015 Survey Typ MANUAL

6 GM-02-A-0 REGUS GREATER MANCHESTER
FOUNTAIN STREET

MANCHESTER
Town Centre
Built-Up Zone
Total Gross floor area: 3960 sqm
Survey dat MONDAY 26/09/2016 Survey Typ MANUAL

7 GM-02-A-0 LEASED OF GREATER MANCHESTER
NEW MOUNT STREET

MANCHESTER
Edge of Town Centre
Built-Up Zone
Total Gross floor area: 2500 sqm
Survey dat MONDAY 26/09/2016 Survey Typ MANUAL

8 MT-02-A-0 COUNCIL C MERTHYR TYDFIL
CASTLE STREET

MERTHYR TYDFIL
Edge of Town Centre
Built-Up Zone
Total Gross floor area: 5250 sqm
Survey dat THURSDAY 17/10/2013 Survey Typ MANUAL

9 NF-02-A-03 OFFICES NORFOLK
NORTH QUAY

GREAT YARMOUTH
Edge of Town Centre
Commercial Zone

Total Gross floor area: 5500 sqm
Survey dat TUESDAY 12/09/2017 Survey Typ MANUAL
10 PS-02-A-01 COUNCIL C POWYS
SEVERN ROAD

WELSHPOOL
Edge of Town Centre
No Sub Category
Total Gross floor area: 3920 sqm
Survey dat TUESDAY 12/05/2015 Survey Typ MANUAL
11 SF-02-A-02 OFFICES SUFFOLK
BATH STREET

IPSWICH
Edge of Town Centre
Commercial Zone
Total Gross floor area: 6505 sqm
Survey dat FRIDAY 19/07/2013 Survey Typ MANUAL
12 SO-02-A-02 COUNCIL C SLOUGH
BATH ROAD

SLOUGH
Edge of Town Centre
Built-Up Zone
Total Gross floor area: 5050 sqm
Survey dat THURSDAY 27/02/2014 Survey Typ MANUAL
13 SW-02-A-0 OFFICES SWANSEA
LANGDON ROAD

SWANSEA
Edge of Town Centre
Development Zone
Total Gross floor area: 6630 sqm
Survey dat FRIDAY 25/10/2013 Survey Typ MANUAL
14 SW-02-A-0 OFFICE SWANSEA
KINGS ROAD

SWANSEA
Edge of Town Centre
Development Zone
Total Gross floor area: 2225 sqm
Survey dat THURSDAY 24/10/2013 Survey Typ MANUAL
15 TV-02-A-04 COUNCIL C TEES VALLEY
CORPORATION ROAD

MIDDLESBROUGH
Town Centre
Commercial Zone
Total Gross floor area: 3950 sqm
Survey dat TUESDAY 08/10/2013 Survey Typ MANUAL
16 TW-02-A-0 OFFICES TYNE & WEAR
MULGRAVE TERRACE

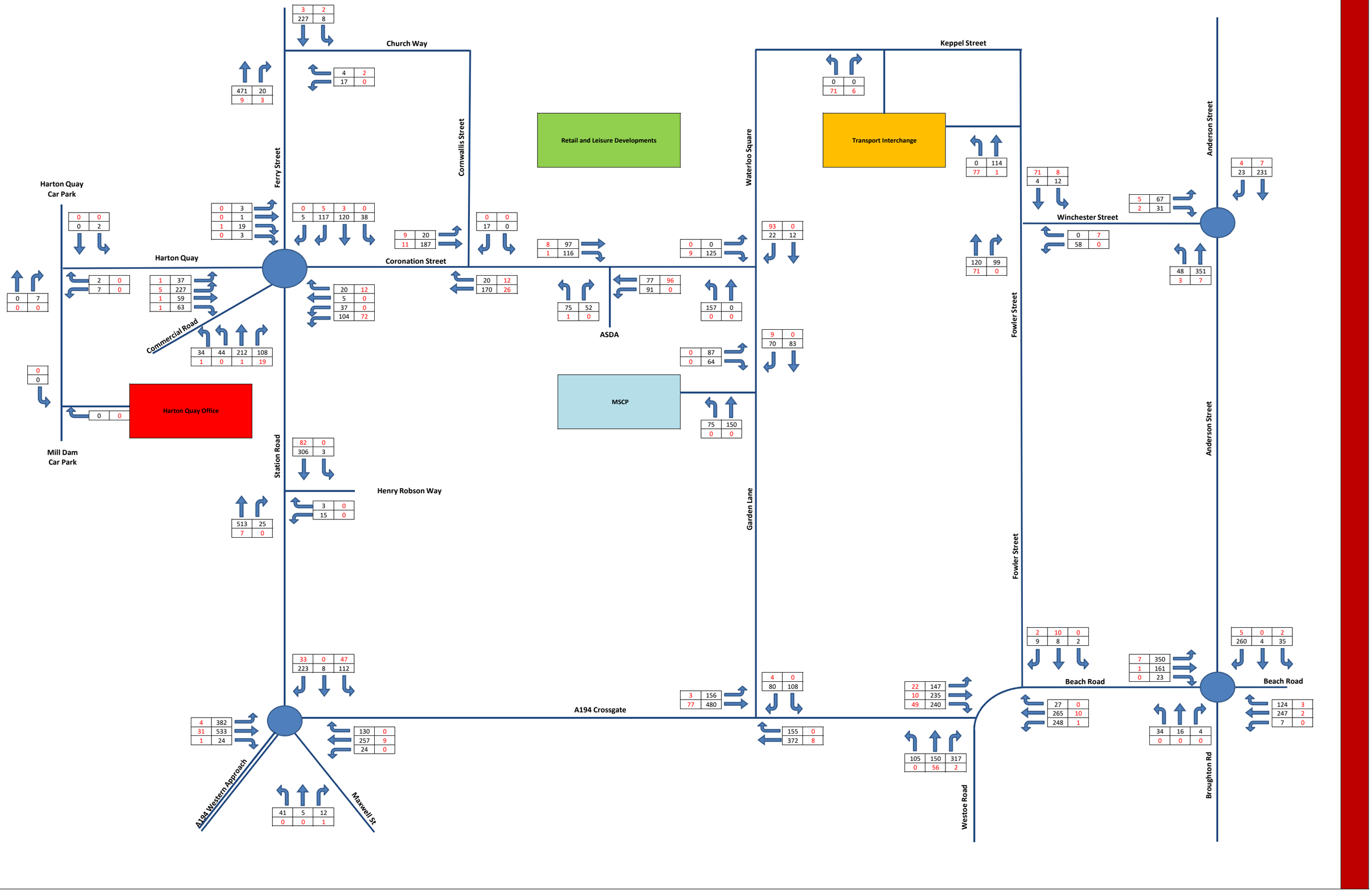
GATESHEAD
Town Centre
Built-Up Zone
Total Gross floor area: 2090 sqm
Survey dat MONDAY 13/06/2016 Survey Typ MANUAL

This section provides a list o it displays the selecte the day of th and whether the survey was a manual classified count or an ATC count.

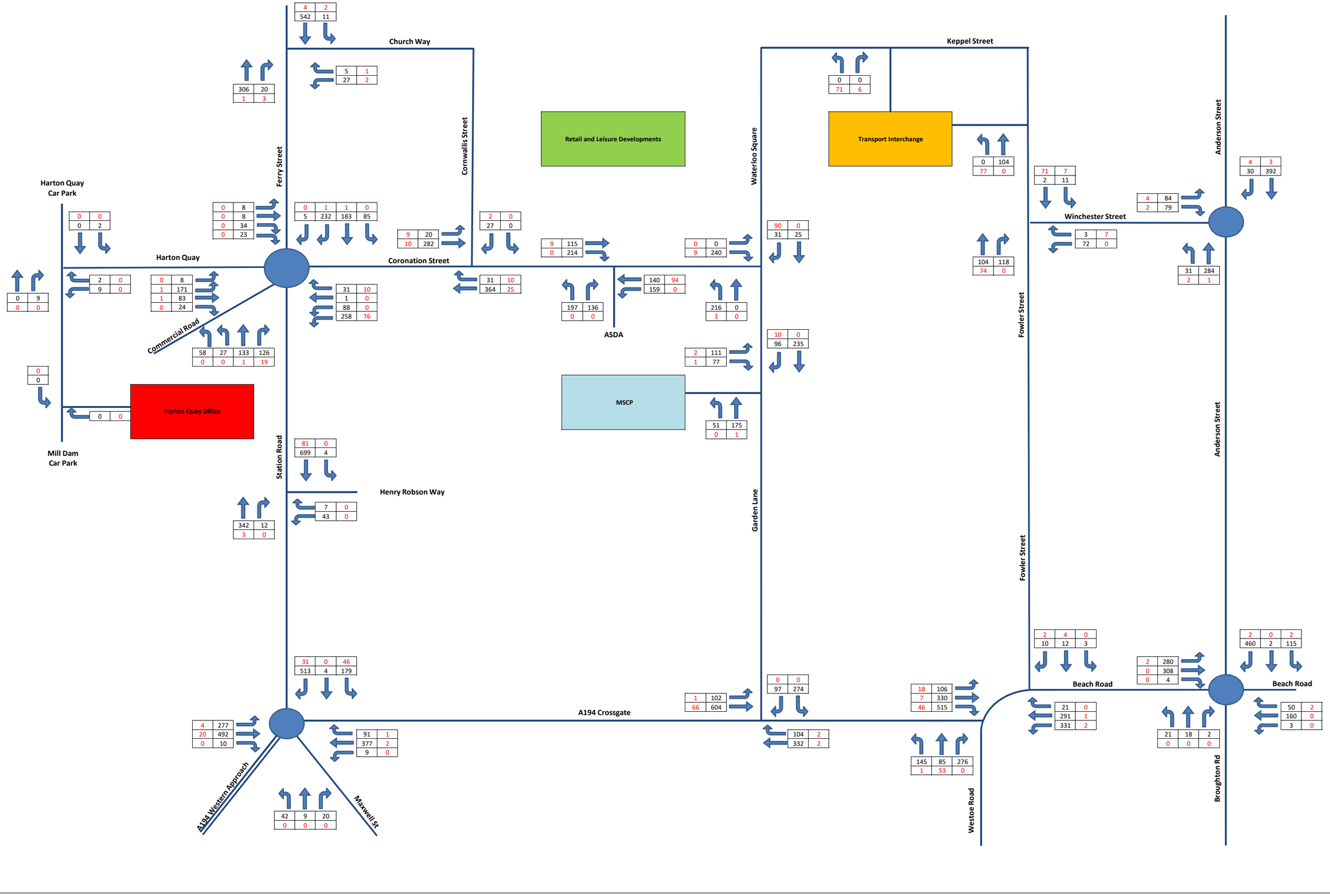
TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE
Calculation Factor: 100 sqm
Count Type: TOTAL PEOPLE

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00-01:00									
01:00-02:00									
02:00-03:00									
03:00-04:00									
04:00-05:00									
05:00-06:00									
06:00-07:00									
07:00-08:00	16	4591	0.995	16	4591	0.071	16	4591	1.066
08:00-09:00	16	4591	2.494	16	4591	0.202	16	4591	2.696
09:00-10:00	16	4591	1.73	16	4591	0.444	16	4591	2.174
10:00-11:00	16	4591	0.775	16	4591	0.553	16	4591	1.328
11:00-12:00	16	4591	0.648	16	4591	0.606	16	4591	1.254
12:00-13:00	16	4591	1.148	16	4591	1.63	16	4591	2.778
13:00-14:00	16	4591	1.556	16	4591	1.318	16	4591	2.874
14:00-15:00	16	4591	0.941	16	4591	0.843	16	4591	1.784
15:00-16:00	16	4591	0.534	16	4591	0.78	16	4591	1.314
16:00-17:00	16	4591	0.355	16	4591	1.46	16	4591	1.815
17:00-18:00	16	4591	0.157	16	4591	2.211	16	4591	2.368
18:00-19:00	16	4591	0.049	16	4591	0.941	16	4591	0.99
19:00-20:00									
20:00-21:00									
21:00-22:00									
22:00-23:00									
23:00-24:00									
Daily Trip Rates:			11.382			11.059			22.441

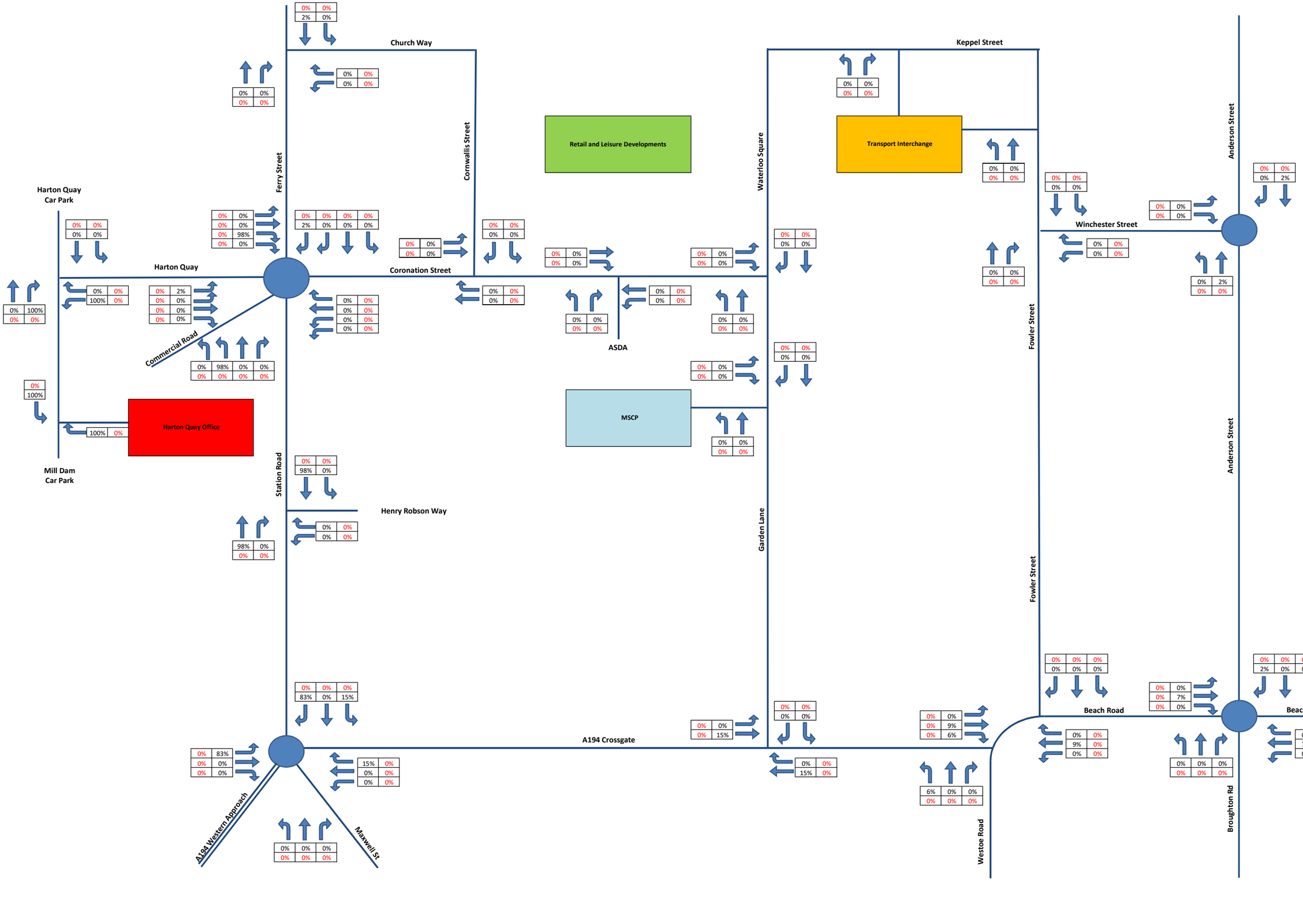
APPENDIX D – Traffic Flow Diagrams



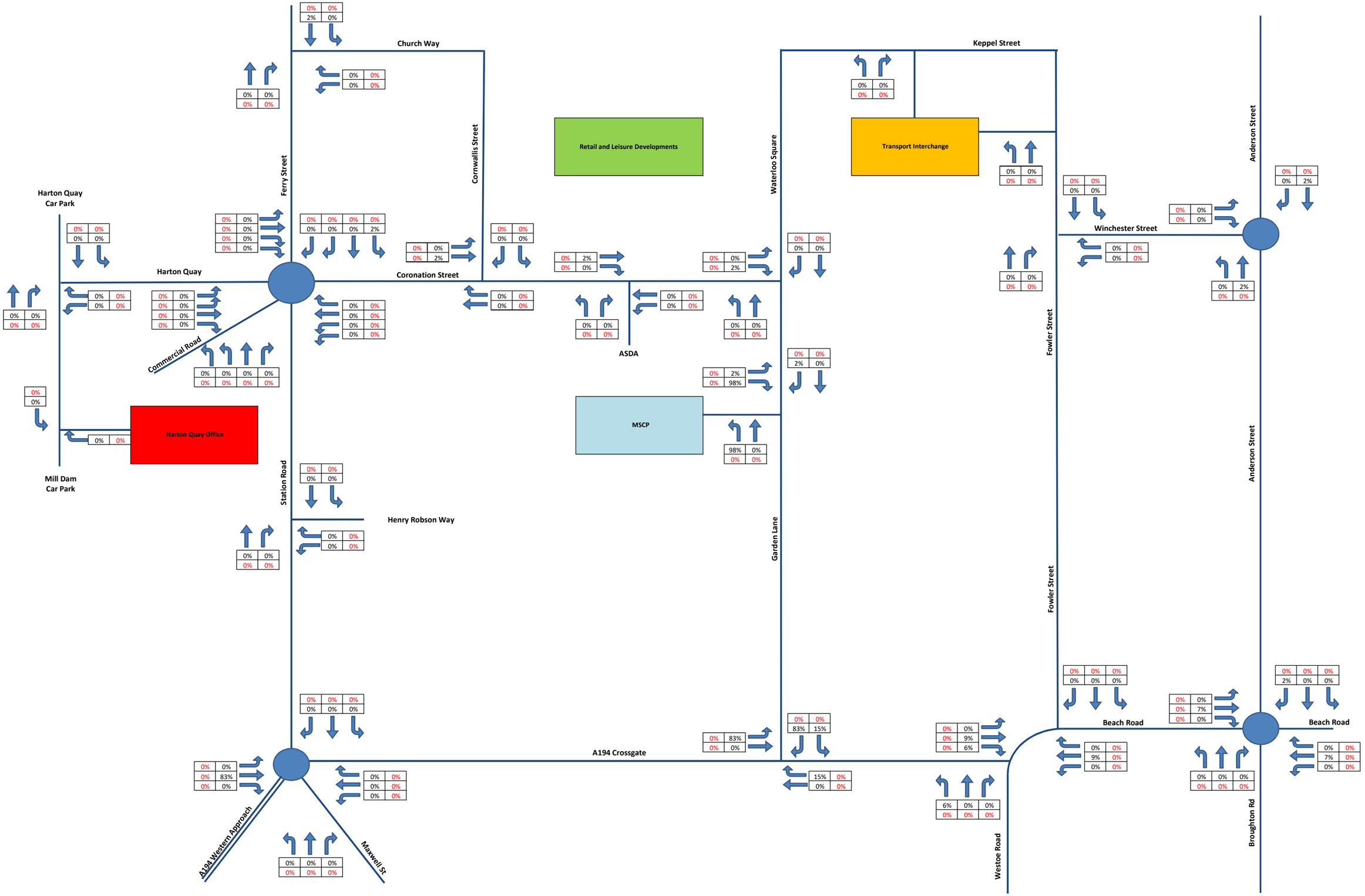
Client:	Project:	Highway Network:	Title:	Key:	
MUSE Developments	NEA1239 South Shields Town Centre Regeneration	Masterplan Network	2020 Reassigned Base + Com Dev - AM Peak - (08:30-09:30)	Cars / HGV + PSV	NEA1239/TF/21



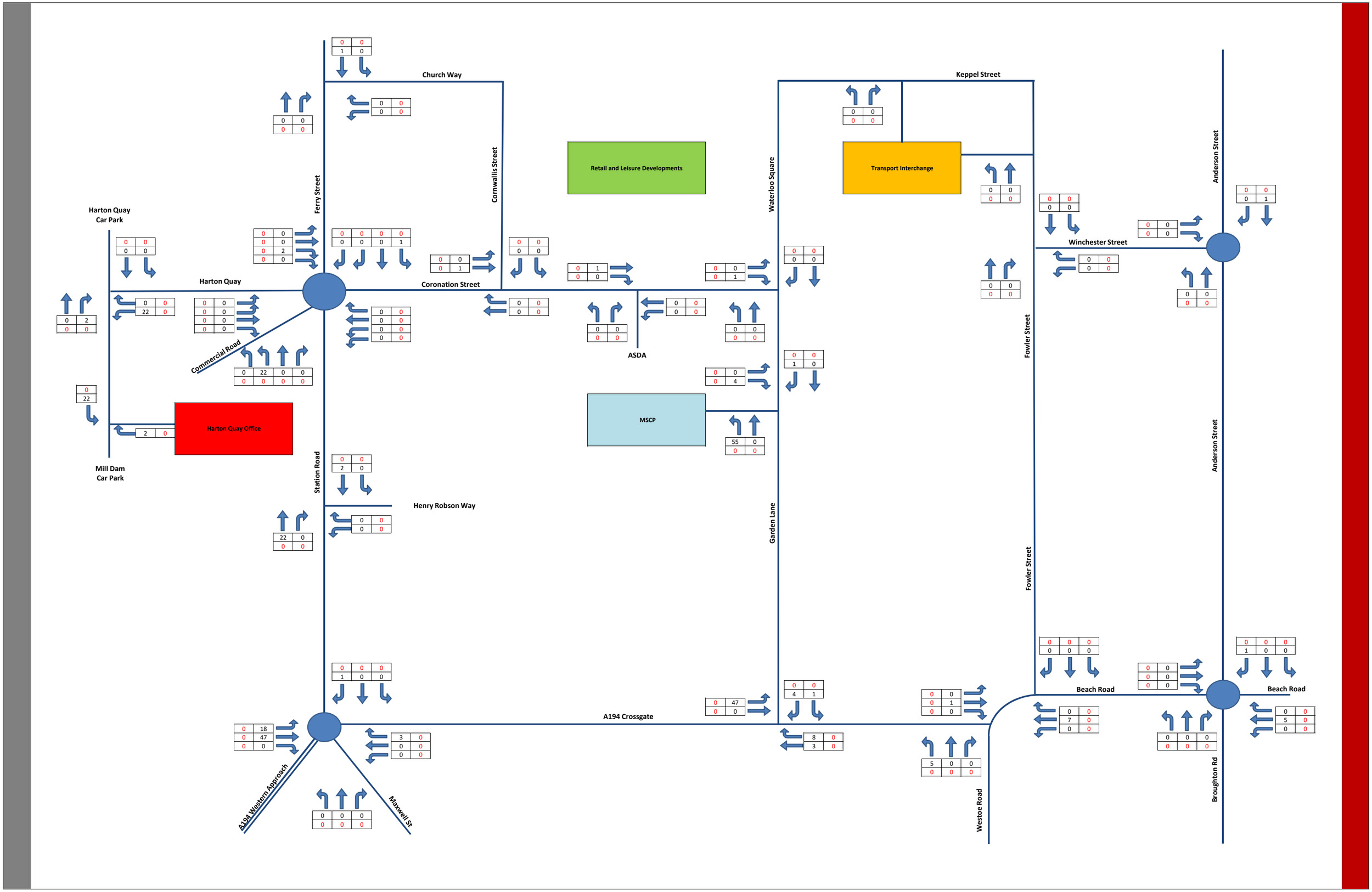
Client:	Project:	Highway Network:	Title:	Key:	
MUSE Developments	NEA1239 South Shields Town Centre Regeneration	Masterplan Network	2020 Reassigned Base + Com Dev - PM Peak (16:45-17:45)	Cars / HGV + PSV	NEA1239/TF/22



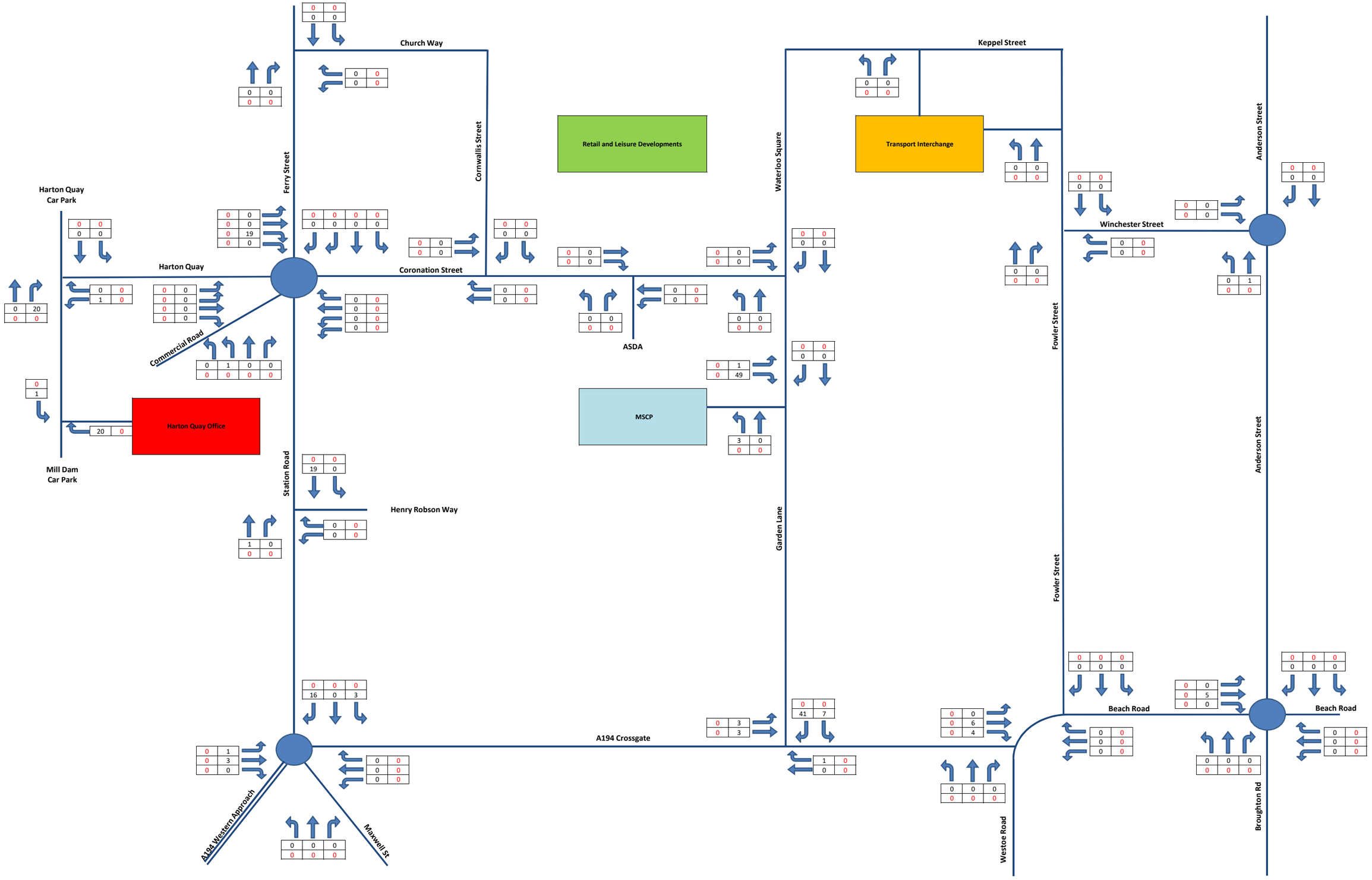
Client:	Project:	Highway Network:	Title:	Key:	
MUSE Developments	NEA1239 South Shields Town Centre Regeneration	Masterplan Network	Harton Quey Development flows HQ CP - Distribution %	Cars / HGV + PSV	0



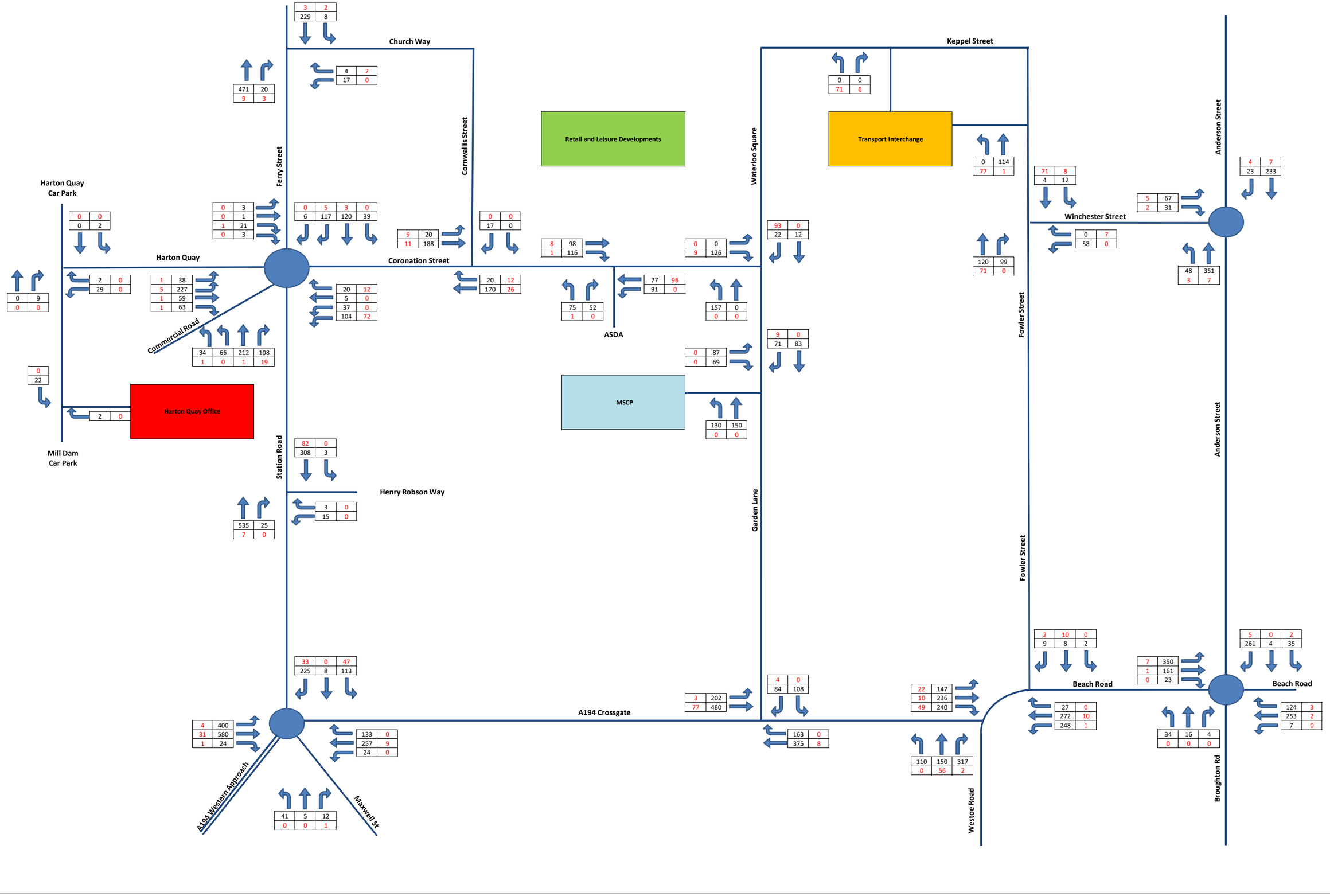
Client:	Project:	Highway Network:	Title:	Key:	
MUSE Developments	NEA1239 South Shields Town Centre Regeneration	Masterplan Network	Harton Quey Development flows Other CP - Distribution %	Cars / HGV + PSV	0



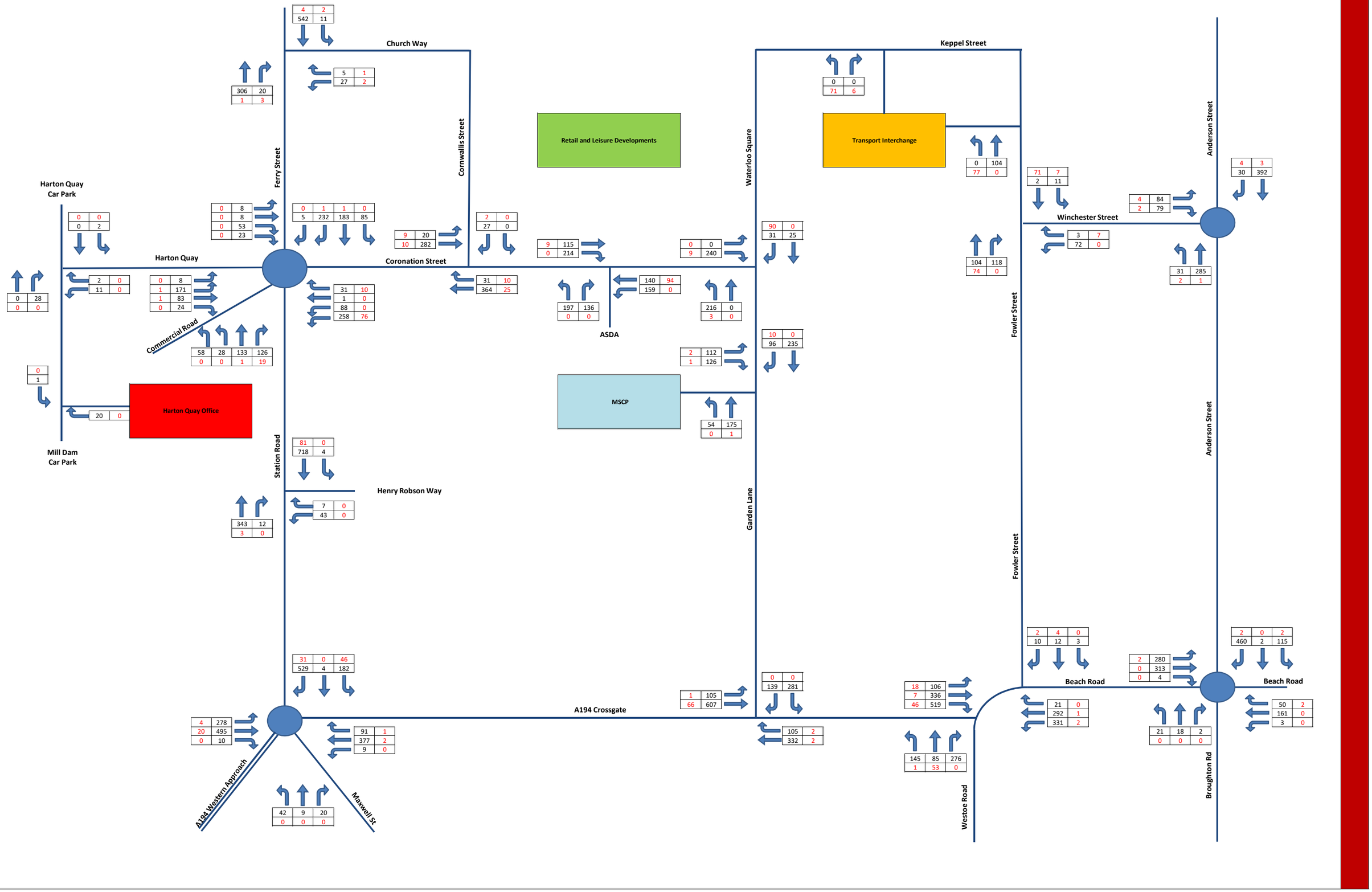
Client:	Project:	Highway Network:	Title:	Key:	
MUSE Developments	NEA1239 South Shields Town Centre Regeneration	Masterplan Network	Harton Quay Development flows - AM Peak - (08:30-09:30)	Cars / HGV + PSV	0



Client:	Project:	Highway Network:	Title:	Key:	
MUSE Developments	NEA1239 South Shields Town Centre Regeneration	Masterplan Network	Harton Quay Development flows - PM Peak - (16:45-17:45)	Cars / HGV + PSV	0



Client:	Project:	Highway Network:	Title:	Key:	
MUSE Developments	NEA1239 South Shields Town Centre Regeneration	Masterplan Network	Base 2020 + Com Dev + Dev AM (08:30-09:30)	Cars / HGV + PSV	0



Client:	Project:	Highway Network:	Title:	Key:	
MUSE Developments	NEA1239 South Shields Town Centre Regeneration	Masterplan Network	Base 2020 + Com Dev + Dev PM (16:45-17:45)	Cars / HGV + PSV	0

Appendix E – Model Outputs

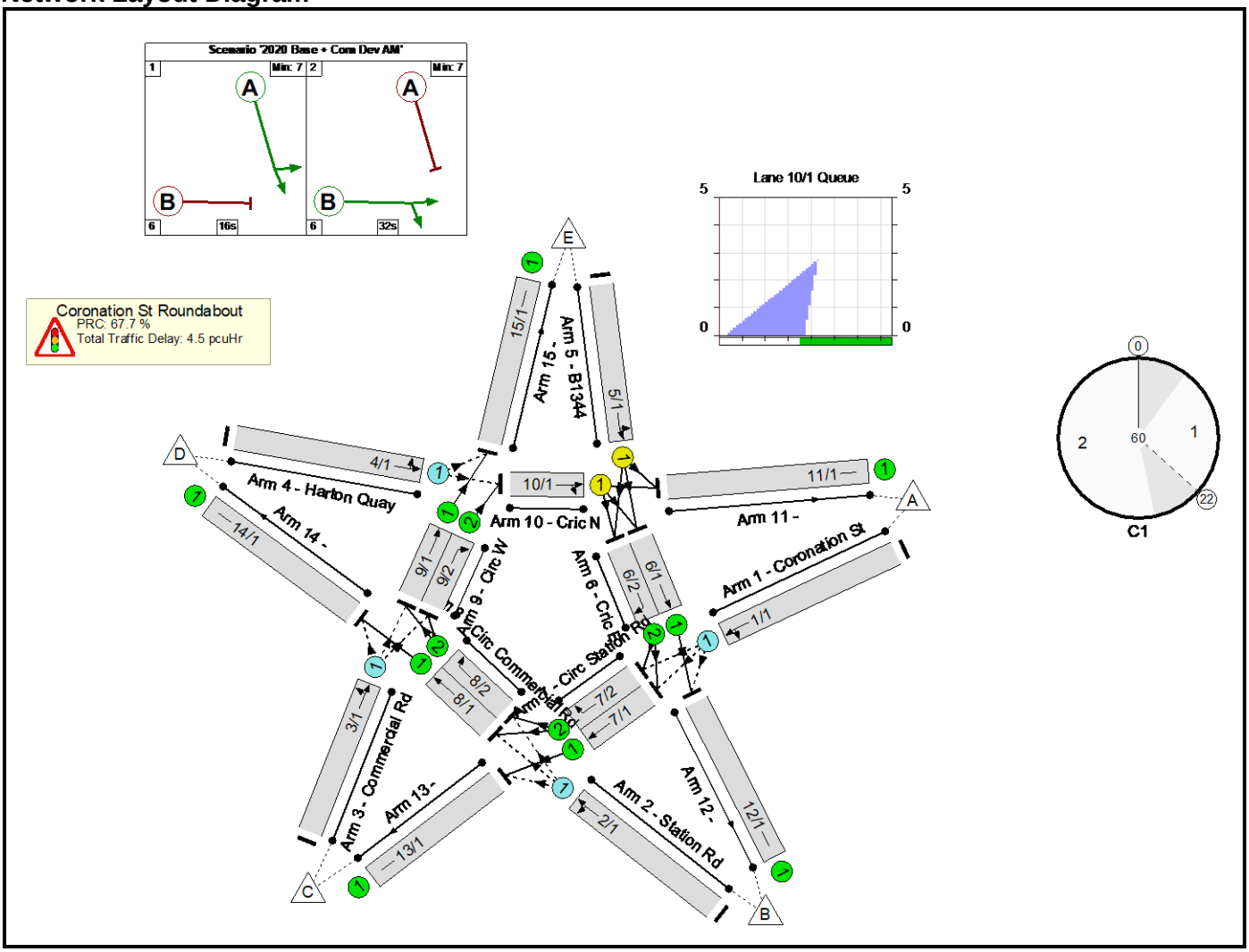
Basic Results Summary

User and Project Details

Project:	**South Shields Town Centre Regeneration**
Title:	**Coronation Street Roundabout Option 1**
Location:	South Shields, South Tyneside
Additional detail:	
File name:	Coronation St Signalised Roundabout.lsg3x
Author:	Rachel Broadbent
Company:	JMP
Address:	

Scenario 3: '2020 Base + Com Dev AM' (FG4: '2020 Base + Com Dev AM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Coronation Street Roundabout Option 1	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**53.7%**	**1260**	**0**	**0**	**4.5**	**-**	**-**
Coronation St Roundabout	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**53.7%**	**1260**	**0**	**0**	**4.5**	**-**	**-**
1/1	Coronation St Ahead Left	O	-		-	-	-	374	1980	1121	33.4%	374	0	0	0.3	3.1	1.4
2/1	Station Rd Ahead Left	O	-		-	-	-	449	1980	1193	37.6%	449	0	0	0.3	2.4	0.3
3/1	Commercial Rd Ahead Left	O	-		-	-	-	408	1980	956	42.7%	408	0	0	0.4	3.3	0.4
4/1	Harton Quay Ahead Left	O	-		-	-	-	29	1980	605	4.8%	29	0	0	0.0	3.1	0.0
5/1	B1344 Ahead Left	U	A		1	16	-	301	1980	561	53.7%	-	-	-	2.1	25.1	4.8
6/1	Cric E Ahead	U	-		-	-	-	214	1940	1940	11.0%	-	-	-	0.1	1.0	0.1
6/2	Cric E Right	U	-		-	-	-	139	1940	1940	7.2%	-	-	-	0.0	1.0	0.0
7/1	Circ Station Rd Ahead	U	-		-	-	-	171	1940	1940	8.8%	-	-	-	0.0	1.0	0.0
7/2	Circ Station Rd Right	U	-		-	-	-	59	1940	1940	3.0%	-	-	-	0.0	1.0	0.0
8/1	Circ Commercial Rd Ahead	U	-		-	-	-	54	1940	1940	2.8%	-	-	-	0.0	1.0	0.0
8/2	Circ Commercial Rd Right	U	-		-	-	-	417	1940	1940	21.5%	-	-	-	0.1	1.2	0.1
9/1	Circ W Ahead	U	-		-	-	-	503	1940	1940	25.9%	-	-	-	0.2	1.3	0.2
9/2	Circ W Right	U	-		-	-	-	282	1940	1940	14.5%	-	-	-	0.1	1.1	0.1

Basic Results Summary

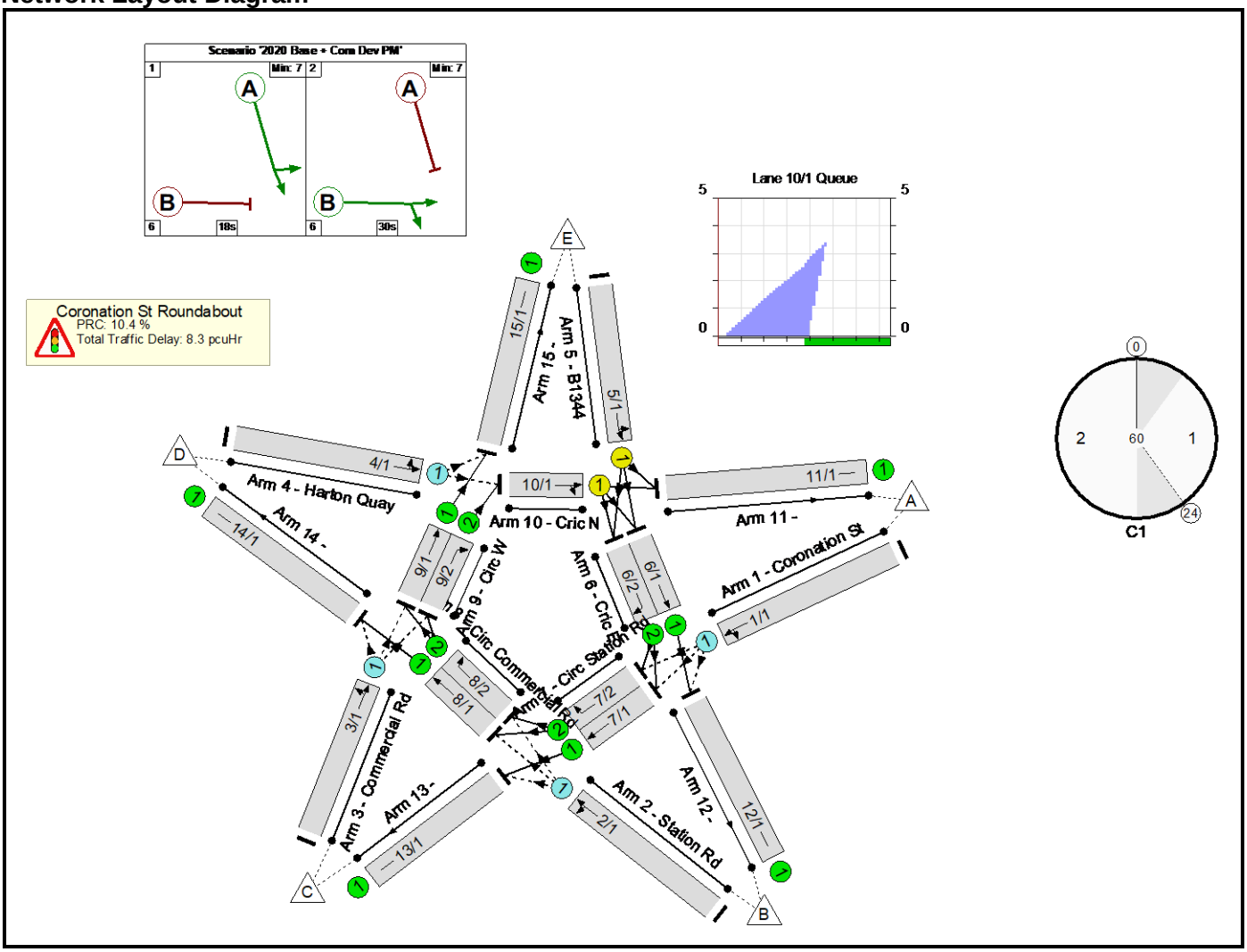
10/1	Cric N Right Ahead	U	B		1	32	-	308	1940	1067	28.9%	-	-	-	0.8	9.6	2.9

	C1	PRC for Signalled Lanes (%):	67.7	Total Delay for Signalled Lanes (pcuHr):	2.92	Cycle Time (s):	60
		PRC Over All Lanes (%):	67.7	Total Delay Over All Lanes(pcuHr):	4.52		

Basic Results Summary

Scenario 4: '2020 Base + Com Dev PM' (FG5: '2020 Base + Com Dev PM ', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Coronation Street Roundabout Option 1	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**81.5%**	**1351**	**0**	**0**	**8.3**	**-**	**-**
Coronation St Roundabout	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**81.5%**	**1351**	**0**	**0**	**8.3**	**-**	**-**
1/1	Coronation St Ahead Left	O	-		-	-	-	593	1980	1004	59.1%	593	0	0	1.2	7.5	5.2
2/1	Station Rd Ahead Left	O	-		-	-	-	393	1980	1004	39.1%	393	0	0	0.3	2.9	0.4
3/1	Commercial Rd Ahead Left	O	-		-	-	-	292	1980	1015	28.8%	292	0	0	0.2	2.5	0.2
4/1	Harton Quay Ahead Left	O	-		-	-	-	73	1980	758	9.6%	73	0	0	0.1	2.6	0.1
5/1	B1344 Ahead Left	U	A		1	18	-	511	1980	627	81.5%	-	-	-	4.8	33.9	9.9
6/1	Cric E Ahead	U	-		-	-	-	244	1940	1940	12.6%	-	-	-	0.1	1.1	0.1
6/2	Cric E Right	U	-		-	-	-	263	1940	1940	13.6%	-	-	-	0.1	1.1	0.1
7/1	Circ Station Rd Ahead	U	-		-	-	-	346	1940	1940	17.8%	-	-	-	0.1	1.1	0.1
7/2	Circ Station Rd Right	U	-		-	-	-	61	1940	1940	3.1%	-	-	-	0.0	1.0	0.0
8/1	Circ Commercial Rd Ahead	U	-		-	-	-	33	1940	1940	1.7%	-	-	-	0.0	0.9	0.0
8/2	Circ Commercial Rd Right	U	-		-	-	-	363	1940	1940	18.7%	-	-	-	0.1	1.1	0.1
9/1	Circ W Ahead	U	-		-	-	-	364	1940	1940	18.8%	-	-	-	0.1	1.1	0.1
9/2	Circ W Right	U	-		-	-	-	283	1940	1940	14.6%	-	-	-	0.1	1.1	0.1

Basic Results Summary

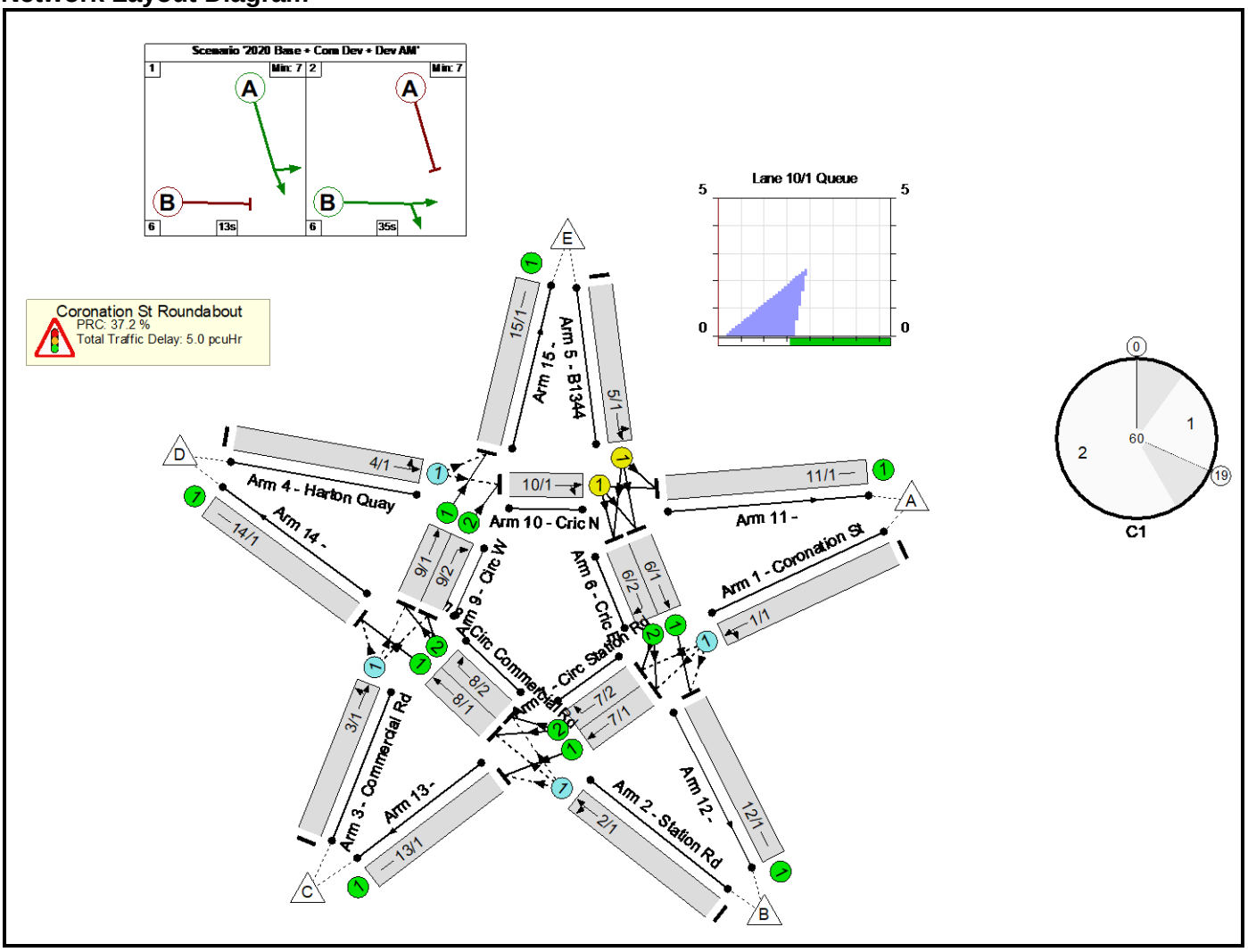
10/1	Cric N Right Ahead	U	B		1	30	-	348	1940	1002	34.7%	-	-	-	1.1	11.1	3.6

C1	PRC for Signalled Lanes (%):	10.4	Total Delay for Signalled Lanes (pcuHr):	5.88	Cycle Time (s): 60
	PRC Over All Lanes (%):	10.4	Total Delay Over All Lanes(pcuHr):	8.29	

Basic Results Summary

Scenario 5: '2020 Base + Com Dev + Dev AM' (FG6: '2020 Base + Com Dev + Dev AM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Coronation Street Roundabout Option 1	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**65.6%**	**1283**	**0**	**0**	**5.0**	**-**	**-**
Coronation St Roundabout	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**65.6%**	**1283**	**0**	**0**	**5.0**	**-**	**-**
1/1	Coronation St Ahead Left	O	-		-	-	-	374	1980	1138	32.9%	374	0	0	0.3	3.1	1.5
2/1	Station Rd Ahead Left	O	-		-	-	-	471	1980	1170	40.3%	471	0	0	0.3	2.6	1.1
3/1	Commercial Rd Ahead Left	O	-		-	-	-	408	1980	931	43.8%	408	0	0	0.4	3.4	0.4
4/1	Harton Quay Ahead Left	O	-		-	-	-	30	1980	604	5.0%	30	0	0	0.0	3.1	0.0
5/1	B1344 Ahead Left	U	A		1	13	-	303	1980	462	65.6%	-	-	-	2.7	32.0	5.5
6/1	Cric E Ahead	U	-		-	-	-	195	1940	1940	10.1%	-	-	-	0.1	1.0	0.1
6/2	Cric E Right	U	-		-	-	-	160	1940	1940	8.2%	-	-	-	0.0	1.0	0.0
7/1	Circ Station Rd Ahead	U	-		-	-	-	191	1940	1940	9.8%	-	-	-	0.1	1.0	0.1
7/2	Circ Station Rd Right	U	-		-	-	-	60	1940	1940	3.1%	-	-	-	0.0	1.0	0.0
8/1	Circ Commercial Rd Ahead	U	-		-	-	-	77	1940	1940	4.0%	-	-	-	0.0	1.0	0.0
8/2	Circ Commercial Rd Right	U	-		-	-	-	417	1940	1940	21.5%	-	-	-	0.1	1.2	0.1
9/1	Circ W Ahead	U	-		-	-	-	503	1940	1940	25.9%	-	-	-	0.2	1.3	0.2
9/2	Circ W Right	U	-		-	-	-	282	1940	1940	14.5%	-	-	-	0.1	1.1	0.1

Basic Results Summary

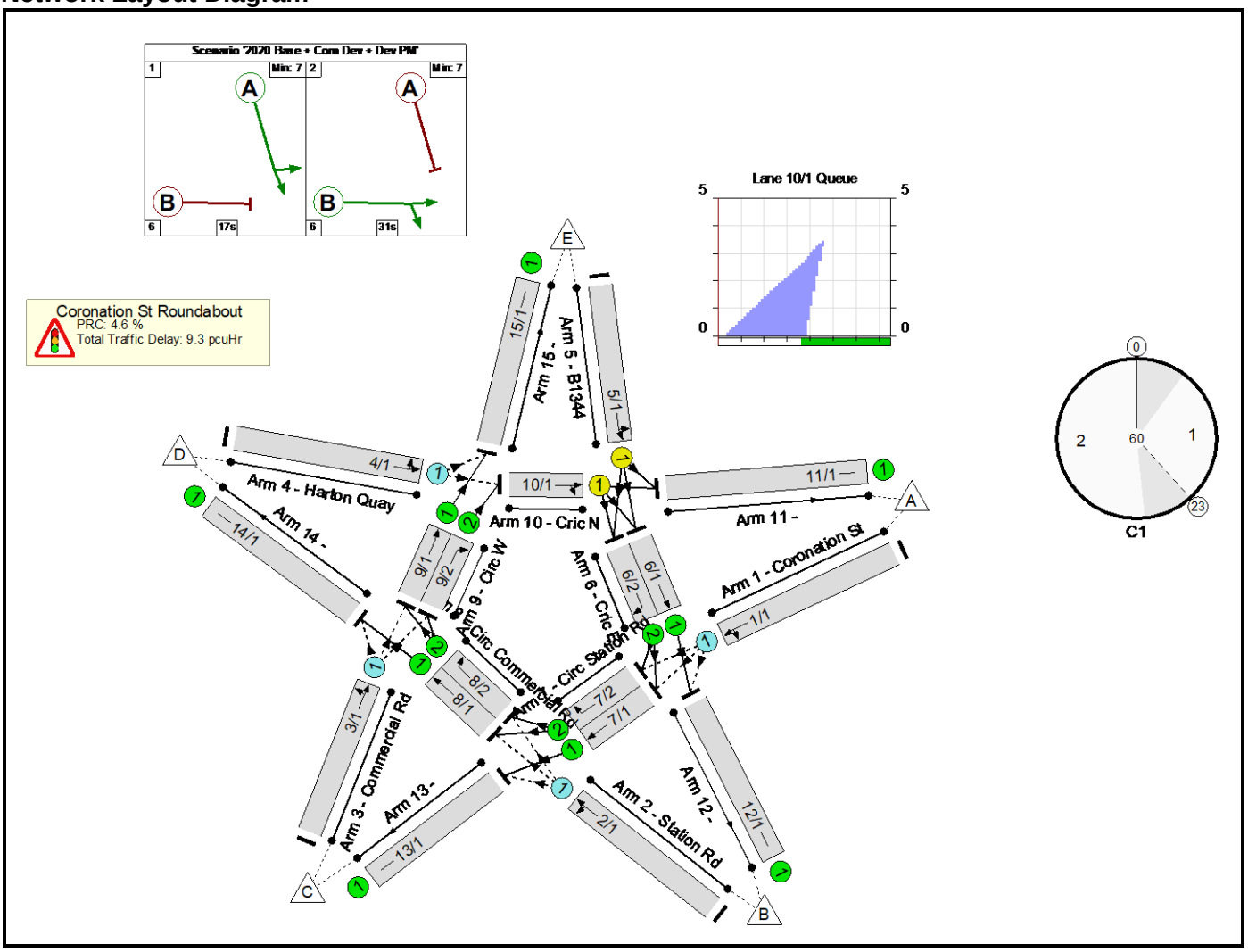
10/1	Cric N Right Ahead	U	B		1	35	-	309	1940	1164	26.5%	-	-	-	0.7	7.8	2.6

C1	PRC for Signalled Lanes (%):	37.2	Total Delay for Signalled Lanes (pcuHr):	3.36	Cycle Time (s): 60
	PRC Over All Lanes (%):	37.2	Total Delay Over All Lanes(pcuHr):	5.03	

Basic Results Summary

Scenario 6: '2020 Base + Com Dev + Dev PM' (FG7: '2020 Base + Com Dev + Dev PM ', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Coronation Street Roundabout Option 1	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**86.0%**	**1370**	**0**	**0**	**9.3**	**-**	**-**
Coronation St Roundabout	**-**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**86.0%**	**1370**	**0**	**0**	**9.3**	**-**	**-**
1/1	Coronation St Ahead Left	O	-		-	-	-	593	1980	976	60.7%	593	0	0	1.3	8.1	5.5
2/1	Station Rd Ahead Left	O	-		-	-	-	393	1980	1004	39.1%	393	0	0	0.3	2.9	0.4
3/1	Commercial Rd Ahead Left	O	-		-	-	-	292	1980	1015	28.8%	292	0	0	0.2	2.5	0.2
4/1	Harton Quay Ahead Left	O	-		-	-	-	92	1980	753	12.2%	92	0	0	0.1	2.7	0.1
5/1	B1344 Ahead Left	U	A		1	17	-	511	1980	594	86.0%	-	-	-	5.7	40.1	10.8
6/1	Cric E Ahead	U	-		-	-	-	263	1940	1940	13.6%	-	-	-	0.1	1.1	0.1
6/2	Cric E Right	U	-		-	-	-	263	1940	1940	13.6%	-	-	-	0.1	1.1	0.1
7/1	Circ Station Rd Ahead	U	-		-	-	-	346	1940	1940	17.8%	-	-	-	0.1	1.1	0.1
7/2	Circ Station Rd Right	U	-		-	-	-	61	1940	1940	3.1%	-	-	-	0.0	1.0	0.0
8/1	Circ Commercial Rd Ahead	U	-		-	-	-	33	1940	1940	1.7%	-	-	-	0.0	0.9	0.0
8/2	Circ Commercial Rd Right	U	-		-	-	-	363	1940	1940	18.7%	-	-	-	0.1	1.1	0.1
9/1	Circ W Ahead	U	-		-	-	-	364	1940	1940	18.8%	-	-	-	0.1	1.1	0.1
9/2	Circ W Right	U	-		-	-	-	283	1940	1940	14.6%	-	-	-	0.1	1.1	0.1

Basic Results Summary

10/1	Cric N Right Ahead	U	B		1	31	-	367	1940	1035	35.5%	-	-	-	1.1	10.6	3.7

C1	PRC for Signalled Lanes (%):	4.6	Total Delay for Signalled Lanes (pcuHr):	6.77	Cycle Time (s):	60	
	PRC Over All Lanes (%):	4.6	Total Delay Over All Lanes(pcuHr):	9.30			

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.0.2.5947

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 770558 software@trl.co.uk www.trlsoftware.co.uk

Filename: Import of Coronation St Rdbt v1.j9
Path: N:\PROJECTS\2020\Development and Infrastructure\South Shields Office and MSCP\Modelling
Report generation date: 03-Dec-20 4:14:33 PM

»(Default Analysis Set) - 2020 Base + Com Dev, AM
»(Default Analysis Set) - 2020 Base + Com Dev, PM
»(Default Analysis Set) - 2020 Base + Com Dev + Dev, AM
»(Default Analysis Set) - 2020 Base + Com Dev + Dev, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
A1 - 2020 Base + Com Dev								
1 - Station Road	0.7	5.51	0.41	A	0.6	5.86	0.39	A
2 - Commercial Road	0.5	4.62	0.34	A	0.3	3.84	0.24	A
3 - Harton Quay	0.0	4.38	0.03	A	0.1	4.22	0.08	A
4 - Ferry Street	0.3	3.40	0.22	A	0.6	4.34	0.38	A
5 - Coronation Street	0.5	4.93	0.29	A	1.2	7.44	0.50	A
A1 - 2020 Base + Com Dev + Dev								
1 - Station Road	0.7	5.71	0.43	A	0.6	5.87	0.39	A
2 - Commercial Road	0.5	4.70	0.35	A	0.3	3.84	0.24	A
3 - Harton Quay	0.0	4.38	0.04	A	0.1	4.31	0.10	A
4 - Ferry Street	0.3	3.41	0.22	A	0.6	4.40	0.38	A
5 - Coronation Street	0.5	4.94	0.29	A	1.2	7.59	0.51	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

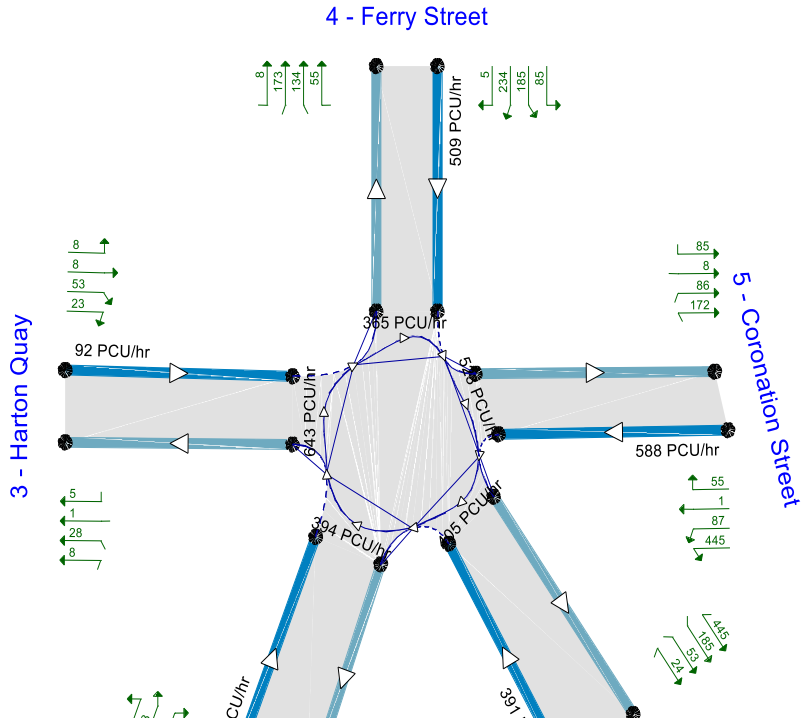
File Description

Title	Coronation Street Roundabout
Location	South Shields
Site number	1
Date	09-Jan-15

Version	
Status	Existing
Identifier	
Client	Muse Developments
Jobnumber	NEA1239
Enumerator	C Charlton
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D2	2020 Base + Com Dev	AM	FLAT	07:45	09:15	90	15
D3	2020 Base + Com Dev	PM	FLAT	16:45	18:15	90	15
D4	2020 Base + Com Dev + Dev	AM	FLAT	07:45	09:15	90	15
D5	2020 Base + Com Dev + Dev	PM	FLAT	16:45	18:15	90	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	(Default Analysis Set)	100.000

(Default Analysis Set) - 2020 Base + Com Dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Coronation St. Rdbt	Standard Roundabout	1, 2, 3, 4, 5	4.71	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Station Road	
2	Commercial Road	
3	Harton Quay	
4	Ferry Street	
5	Coronation Street	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Station Road	4.16	4.40	0.0	10.4	39.1	24.8	
2 - Commercial Road	4.12	5.31	5.0	24.3	39.1	27.8	
3 - Harton Quay	4.43	4.43	0.0	8.8	39.1	25.7	
4 - Ferry Street	4.96	6.16	7.9	6.1	39.1	30.6	
5 - Coronation Street	5.03	5.03	0.0	15.7	39.1	33.2	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Station Road	0.541	1229
2 - Commercial Road	0.604	1476
3 - Harton Quay	0.545	1279

4 - Ferry Street	0.580	1550
5 - Coronation Street	0.594	1487

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D2	2020 Base + Com Dev	AM	FLAT	07:45	09:15	90	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Station Road		✓	449	100.000
2 - Commercial Road		✓	408	100.000
3 - Harton Quay		✓	29	100.000
4 - Ferry Street		✓	301	100.000
5 - Coronation Street		✓	374	100.000

Origin-Destination Data

Demand (PCU/hr)

		To				
		1 - Station Road	**2 - Commercial Road**	**3 - Harton Quay**	**4 - Ferry Street**	**5 - Coronation Street**
From	**1 - Station Road**	0	37	44	213	155
	2 - Commercial Road	65	0	40	241	62
	3 - Harton Quay	22	3	0	3	1
	4 - Ferry Street	127	131	5	0	38
	5 - Coronation Street	283	37	5	49	0

Vehicle Mix

Heavy Vehicle Percentages

		To				
		1 - Station Road	**2 - Commercial Road**	**3 - Harton Quay**	**4 - Ferry Street**	**5 - Coronation Street**
From	**1 - Station Road**	0	0	0	1	0
	2 - Commercial Road	0	0	0	1	1
	3 - Harton Quay	0	0	0	0	0
	4 - Ferry Street	2	0	0	0	0
	5 - Coronation Street	28	0	0	24	0

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:45-08:00	1 - Station Road	449	449
	2 - Commercial Road	408	408
	3 - Harton Quay	29	29
	4 - Ferry Street	301	301
	5 - Coronation Street	374	374
08:00-08:15	1 - Station Road	449	449
	2 - Commercial Road	408	408
	3 - Harton Quay	29	29
	4 - Ferry Street	301	301
	5 - Coronation Street	374	374
08:15-08:30	1 - Station Road	449	449
	2 - Commercial Road	408	408
	3 - Harton Quay	29	29
	4 - Ferry Street	301	301
	5 - Coronation Street	374	374
08:30-08:45	1 - Station Road	449	449
	2 - Commercial Road	408	408
	3 - Harton Quay	29	29
	4 - Ferry Street	301	301
	5 - Coronation Street	374	374
08:45-09:00	1 - Station Road	449	449
	2 - Commercial Road	408	408
	3 - Harton Quay	29	29
	4 - Ferry Street	301	301
	5 - Coronation Street	374	374
09:00-09:15	1 - Station Road	449	449
	2 - Commercial Road	408	408
	3 - Harton Quay	29	29
	4 - Ferry Street	301	301
	5 - Coronation Street	374	374

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1 - Station Road	0.41	5.51	0.7	A
2 - Commercial Road	0.34	4.62	0.5	A
3 - Harton Quay	0.03	4.38	0.0	A
4 - Ferry Street	0.22	3.40	0.3	A
5 - Coronation Street	0.29	4.93	0.5	A

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	449	229	1105	0.406	446	0.7	5.463	A
2 - Commercial Road	408	468	1194	0.342	406	0.5	4.584	A
3 - Harton Quay	29	781	853	0.034	29	0.0	4.366	A
4 - Ferry Street	301	306	1372	0.219	300	0.3	3.391	A
5 - Coronation Street	374	352	1278	0.293	372	0.5	4.903	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	449	230	1104	0.407	449	0.7	5.511	A
2 - Commercial Road	408	471	1192	0.342	408	0.5	4.618	A
3 - Harton Quay	29	785	851	0.034	29	0.0	4.379	A
4 - Ferry Street	301	308	1371	0.219	301	0.3	3.399	A
5 - Coronation Street	374	353	1277	0.293	374	0.5	4.929	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	449	230	1104	0.407	449	0.7	5.511	A
2 - Commercial Road	408	471	1192	0.342	408	0.5	4.618	A
3 - Harton Quay	29	785	851	0.034	29	0.0	4.379	A
4 - Ferry Street	301	308	1371	0.219	301	0.3	3.399	A
5 - Coronation Street	374	353	1277	0.293	374	0.5	4.929	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	449	230	1104	0.407	449	0.7	5.511	A
2 - Commercial Road	408	471	1192	0.342	408	0.5	4.618	A
3 - Harton Quay	29	785	851	0.034	29	0.0	4.379	A
4 - Ferry Street	301	308	1371	0.219	301	0.3	3.399	A
5 - Coronation Street	374	353	1277	0.293	374	0.5	4.929	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	449	230	1104	0.407	449	0.7	5.511	A
2 - Commercial Road	408	471	1192	0.342	408	0.5	4.618	A
3 - Harton Quay	29	785	851	0.034	29	0.0	4.379	A
4 - Ferry Street	301	308	1371	0.219	301	0.3	3.399	A
5 - Coronation Street	374	353	1277	0.293	374	0.5	4.929	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	449	230	1104	0.407	449	0.7	5.511	A
2 - Commercial Road	408	471	1192	0.342	408	0.5	4.618	A
3 - Harton Quay	29	785	851	0.034	29	0.0	4.379	A
4 - Ferry Street	301	308	1371	0.219	301	0.3	3.399	A
5 - Coronation Street	374	353	1277	0.293	374	0.5	4.929	A

(Default Analysis Set) - 2020 Base + Com Dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Coronation St. Rdbt	Standard Roundabout	1, 2, 3, 4, 5	5.57	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D3	2020 Base + Com Dev	PM	FLAT	16:45	18:15	90	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Station Road		✓	393	100.000
2 - Commercial Road		✓	292	100.000
3 - Harton Quay		✓	73	100.000
4 - Ferry Street		✓	511	100.000
5 - Coronation Street		✓	593	100.000

Origin-Destination Data

Demand (PCU/hr)

		To				
		1 - Station Road	2 - Commercial Road	3 - Harton Quay	4 - Ferry Street	5 - Coronation Street
From	1 - Station Road	0	58	27	135	173
	2 - Commercial Road	24	0	8	174	86
	3 - Harton Quay	34	23	0	8	8
	4 - Ferry Street	186	235	5	0	85
	5 - Coronation Street	449	88	1	55	0

Vehicle Mix

Heavy Vehicle Percentages

		To				
		1 - Station Road	2 - Commercial Road	3 - Harton Quay	4 - Ferry Street	5 - Coronation Street
From	1 - Station Road	0	0	0	1	0
	2 - Commercial Road	0	0	0	1	1
	3 - Harton Quay	0	0	0	0	0
	4 - Ferry Street	2	0	0	0	0
	5 - Coronation Street	28	0	0	24	0

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
16:45-17:00	1 - Station Road	393	393
	2 - Commercial Road	292	292
	3 - Harton Quay	73	73
	4 - Ferry Street	511	511
	5 - Coronation Street	593	593
17:00-17:15	1 - Station Road	393	393
	2 - Commercial Road	292	292
	3 - Harton Quay	73	73
	4 - Ferry Street	511	511
	5 - Coronation Street	593	593
17:15-17:30	1 - Station Road	393	393
	2 - Commercial Road	292	292
	3 - Harton Quay	73	73
	4 - Ferry Street	511	511
	5 - Coronation Street	593	593
17:30-17:45	1 - Station Road	393	393
	2 - Commercial Road	292	292
	3 - Harton Quay	73	73
	4 - Ferry Street	511	511
	5 - Coronation Street	593	593
17:45-18:00	1 - Station Road	393	393

	2 - Commercial Road	292	292
	3 - Harton Quay	73	73
	4 - Ferry Street	511	511
	5 - Coronation Street	593	593
18:00-18:15	1 - Station Road	393	393
	2 - Commercial Road	292	292
	3 - Harton Quay	73	73
	4 - Ferry Street	511	511
	5 - Coronation Street	593	593

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1 - Station Road	0.39	5.86	0.6	A
2 - Commercial Road	0.24	3.84	0.3	A
3 - Harton Quay	0.08	4.22	0.1	A
4 - Ferry Street	0.38	4.34	0.6	A
5 - Coronation Street	0.50	7.44	1.2	A

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	393	405	1010	0.389	390	0.6	5.804	A
2 - Commercial Road	292	393	1239	0.236	291	0.3	3.821	A
3 - Harton Quay	73	643	928	0.079	73	0.1	4.205	A
4 - Ferry Street	511	346	1349	0.379	509	0.6	4.313	A
5 - Coronation Street	593	505	1187	0.500	588	1.2	7.309	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	393	407	1009	0.390	393	0.6	5.862	A
2 - Commercial Road	292	396	1237	0.236	292	0.3	3.836	A
3 - Harton Quay	73	647	926	0.079	73	0.1	4.218	A
4 - Ferry Street	511	348	1348	0.379	511	0.6	4.342	A
5 - Coronation Street	593	507	1186	0.500	593	1.2	7.443	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	393	407	1009	0.390	393	0.6	5.862	A

2 - Commercial Road	292	396	1237	0.236	292	0.3	3.836	A
3 - Harton Quay	73	647	926	0.079	73	0.1	4.218	A
4 - Ferry Street	511	348	1348	0.379	511	0.6	4.342	A
5 - Coronation Street	593	507	1186	0.500	593	1.2	7.443	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	393	407	1009	0.390	393	0.6	5.862	A
2 - Commercial Road	292	396	1237	0.236	292	0.3	3.836	A
3 - Harton Quay	73	647	926	0.079	73	0.1	4.218	A
4 - Ferry Street	511	348	1348	0.379	511	0.6	4.342	A
5 - Coronation Street	593	507	1186	0.500	593	1.2	7.443	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	393	407	1009	0.390	393	0.6	5.862	A
2 - Commercial Road	292	396	1237	0.236	292	0.3	3.836	A
3 - Harton Quay	73	647	926	0.079	73	0.1	4.218	A
4 - Ferry Street	511	348	1348	0.379	511	0.6	4.342	A
5 - Coronation Street	593	507	1186	0.500	593	1.2	7.443	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	393	407	1009	0.390	393	0.6	5.862	A
2 - Commercial Road	292	396	1237	0.236	292	0.3	3.836	A
3 - Harton Quay	73	647	926	0.079	73	0.1	4.218	A
4 - Ferry Street	511	348	1348	0.379	511	0.6	4.342	A
5 - Coronation Street	593	507	1186	0.500	593	1.2	7.443	A

(Default Analysis Set) - 2020 Base + Com Dev + Dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Coronation St. Rdbt	Standard Roundabout	1, 2, 3, 4, 5	4.80	A

Junction Network Options

Driving side	Lighting

Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D4	2020 Base + Com Dev + Dev	AM	FLAT	07:45	09:15	90	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Station Road		✓	471	100.000
2 - Commercial Road		✓	408	100.000
3 - Harton Quay		✓	30	100.000
4 - Ferry Street		✓	303	100.000
5 - Coronation Street		✓	374	100.000

Origin-Destination Data

Demand (PCU/hr)

		To				
		1 - Station Road	2 - Commercial Road	3 - Harton Quay	4 - Ferry Street	5 - Coronation Street
From	1 - Station Road	0	37	66	213	155
	2 - Commercial Road	65	0	40	241	62
	3 - Harton Quay	23	3	0	3	1
	4 - Ferry Street	127	131	6	0	39
	5 - Coronation Street	283	37	5	49	0

Vehicle Mix

Heavy Vehicle Percentages

		To				
		1 - Station Road	2 - Commercial Road	3 - Harton Quay	4 - Ferry Street	5 - Coronation Street
From	1 - Station Road	0	0	0	1	0
	2 - Commercial Road	0	0	0	1	1
	3 - Harton Quay	0	0	0	0	0
	4 - Ferry Street	2	0	0	0	0
	5 - Coronation Street	28	0	0	24	0

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
07:45-08:00	1 - Station Road	471	471
	2 - Commercial Road	408	408
	3 - Harton Quay	30	30
	4 - Ferry Street	303	303
	5 - Coronation Street	374	374
08:00-08:15	1 - Station Road	471	471
	2 - Commercial Road	408	408
	3 - Harton Quay	30	30
	4 - Ferry Street	303	303
	5 - Coronation Street	374	374
08:15-08:30	1 - Station Road	471	471
	2 - Commercial Road	408	408
	3 - Harton Quay	30	30
	4 - Ferry Street	303	303
	5 - Coronation Street	374	374
08:30-08:45	1 - Station Road	471	471
	2 - Commercial Road	408	408
	3 - Harton Quay	30	30
	4 - Ferry Street	303	303
	5 - Coronation Street	374	374
08:45-09:00	1 - Station Road	471	471
	2 - Commercial Road	408	408
	3 - Harton Quay	30	30
	4 - Ferry Street	303	303
	5 - Coronation Street	374	374
09:00-09:15	1 - Station Road	471	471
	2 - Commercial Road	408	408
	3 - Harton Quay	30	30
	4 - Ferry Street	303	303
	5 - Coronation Street	374	374

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1 - Station Road	0.43	5.71	0.7	A
2 - Commercial Road	0.35	4.70	0.5	A
3 - Harton Quay	0.04	4.38	0.0	A
4 - Ferry Street	0.22	3.41	0.3	A
5 - Coronation Street	0.29	4.94	0.5	A

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	471	230	1104	0.426	468	0.7	5.650	A
2 - Commercial Road	408	491	1180	0.346	406	0.5	4.666	A
3 - Harton Quay	30	781	853	0.035	30	0.0	4.371	A
4 - Ferry Street	303	307	1372	0.221	302	0.3	3.399	A
5 - Coronation Street	374	354	1277	0.293	372	0.5	4.909	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	471	231	1104	0.427	471	0.7	5.706	A
2 - Commercial Road	408	494	1178	0.346	408	0.5	4.701	A
3 - Harton Quay	30	785	851	0.035	30	0.0	4.384	A
4 - Ferry Street	303	309	1371	0.221	303	0.3	3.407	A
5 - Coronation Street	374	355	1276	0.293	374	0.5	4.935	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	471	231	1104	0.427	471	0.7	5.706	A
2 - Commercial Road	408	494	1178	0.346	408	0.5	4.701	A
3 - Harton Quay	30	785	851	0.035	30	0.0	4.384	A
4 - Ferry Street	303	309	1371	0.221	303	0.3	3.407	A
5 - Coronation Street	374	355	1276	0.293	374	0.5	4.935	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	471	231	1104	0.427	471	0.7	5.706	A
2 - Commercial Road	408	494	1178	0.346	408	0.5	4.701	A
3 - Harton Quay	30	785	851	0.035	30	0.0	4.384	A
4 - Ferry Street	303	309	1371	0.221	303	0.3	3.407	A
5 - Coronation Street	374	355	1276	0.293	374	0.5	4.935	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	471	231	1104	0.427	471	0.7	5.706	A
2 - Commercial Road	408	494	1178	0.346	408	0.5	4.701	A
3 - Harton Quay	30	785	851	0.035	30	0.0	4.384	A
4 - Ferry Street	303	309	1371	0.221	303	0.3	3.407	A
5 - Coronation Street	374	355	1276	0.293	374	0.5	4.935	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	471	231	1104	0.427	471	0.7	5.706	A
2 - Commercial Road	408	494	1178	0.346	408	0.5	4.701	A

3 - Harton Quay	30	785	851	0.035	30	0.0	4.384	A
4 - Ferry Street	303	309	1371	0.221	303	0.3	3.407	A
5 - Coronation Street	374	355	1276	0.293	374	0.5	4.935	A

(Default Analysis Set) - 2020 Base + Com Dev + Dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Coronation St. Rdbt	Standard Roundabout	1, 2, 3, 4, 5	5.62	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)
D5	2020 Base + Com Dev + Dev	PM	FLAT	16:45	18:15	90	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1 - Station Road		✓	394	100.000
2 - Commercial Road		✓	292	100.000
3 - Harton Quay		✓	92	100.000
4 - Ferry Street		✓	511	100.000
5 - Coronation Street		✓	593	100.000

Origin-Destination Data

Demand (PCU/hr)

		To				
		1 - Station Road	2 - Commercial Road	3 - Harton Quay	4 - Ferry Street	5 - Coronation Street
From	1 - Station Road	0	58	28	135	173
	2 - Commercial Road	24	0	8	174	86
	3 - Harton Quay	53	23	0	8	8
	4 - Ferry Street	186	235	5	0	85
	5 - Coronation Street	449	88	1	55	0

Vehicle Mix

Heavy Vehicle Percentages

		To				
		1 - Station Road	2 - Commercial Road	3 - Harton Quay	4 - Ferry Street	5 - Coronation Street
From	1 - Station Road	0	0	0	1	0
	2 - Commercial Road	0	0	0	1	1
	3 - Harton Quay	0	0	0	0	0
	4 - Ferry Street	2	0	0	0	0
	5 - Coronation Street	28	0	0	24	0

Detailed Demand Data

Demand for each time segment

Time Segment	Arm	Demand (PCU/hr)	Demand in PCU (PCU/hr)
16:45-17:00	1 - Station Road	394	394
	2 - Commercial Road	292	292
	3 - Harton Quay	92	92
	4 - Ferry Street	511	511
	5 - Coronation Street	593	593
17:00-17:15	1 - Station Road	394	394
	2 - Commercial Road	292	292
	3 - Harton Quay	92	92
	4 - Ferry Street	511	511
	5 - Coronation Street	593	593
17:15-17:30	1 - Station Road	394	394
	2 - Commercial Road	292	292
	3 - Harton Quay	92	92
	4 - Ferry Street	511	511
	5 - Coronation Street	593	593
17:30-17:45	1 - Station Road	394	394
	2 - Commercial Road	292	292
	3 - Harton Quay	92	92
	4 - Ferry Street	511	511
	5 - Coronation Street	593	593
17:45-18:00	1 - Station Road	394	394

	2 - Commercial Road	292	292
	3 - Harton Quay	92	92
	4 - Ferry Street	511	511
	5 - Coronation Street	593	593
18:00-18:15	1 - Station Road	394	394
	2 - Commercial Road	292	292
	3 - Harton Quay	92	92
	4 - Ferry Street	511	511
	5 - Coronation Street	593	593

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
1 - Station Road	0.39	5.87	0.6	A
2 - Commercial Road	0.24	3.84	0.3	A
3 - Harton Quay	0.10	4.31	0.1	A
4 - Ferry Street	0.38	4.40	0.6	A
5 - Coronation Street	0.51	7.59	1.2	A

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	394	405	1010	0.390	391	0.6	5.813	A
2 - Commercial Road	292	394	1238	0.236	291	0.3	3.823	A
3 - Harton Quay	92	643	928	0.099	92	0.1	4.301	A
4 - Ferry Street	511	365	1338	0.382	509	0.6	4.368	A
5 - Coronation Street	593	523	1176	0.504	588	1.2	7.447	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	394	407	1009	0.391	394	0.6	5.871	A
2 - Commercial Road	292	397	1237	0.236	292	0.3	3.838	A
3 - Harton Quay	92	647	926	0.099	92	0.1	4.314	A
4 - Ferry Street	511	367	1337	0.382	511	0.6	4.400	A
5 - Coronation Street	593	526	1174	0.505	593	1.2	7.587	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	394	407	1009	0.391	394	0.6	5.871	A

2 - Commercial Road	292	397	1237	0.236	292	0.3	3.838	A
3 - Harton Quay	92	647	926	0.099	92	0.1	4.315	A
4 - Ferry Street	511	367	1337	0.382	511	0.6	4.400	A
5 - Coronation Street	593	526	1174	0.505	593	1.2	7.587	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	394	407	1009	0.391	394	0.6	5.871	A
2 - Commercial Road	292	397	1237	0.236	292	0.3	3.838	A
3 - Harton Quay	92	647	926	0.099	92	0.1	4.315	A
4 - Ferry Street	511	367	1337	0.382	511	0.6	4.400	A
5 - Coronation Street	593	526	1174	0.505	593	1.2	7.587	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	394	407	1009	0.391	394	0.6	5.871	A
2 - Commercial Road	292	397	1237	0.236	292	0.3	3.838	A
3 - Harton Quay	92	647	926	0.099	92	0.1	4.315	A
4 - Ferry Street	511	367	1337	0.382	511	0.6	4.400	A
5 - Coronation Street	593	526	1174	0.505	593	1.2	7.587	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
1 - Station Road	394	407	1009	0.391	394	0.6	5.871	A
2 - Commercial Road	292	397	1237	0.236	292	0.3	3.838	A
3 - Harton Quay	92	647	926	0.099	92	0.1	4.315	A
4 - Ferry Street	511	367	1337	0.382	511	0.6	4.400	A
5 - Coronation Street	593	526	1174	0.505	593	1.2	7.587	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.0.2.5947

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Filename: Import of Crossgate Roundabout Two Lane Station Rd Entry v1.j9
Path: N:\PROJECTS\2020\Development and Infrastructure\South Shields Office and MSCP\Modelling
Report generation date: 03-Dec-20 4:24:42 PM

»(Default Analysis Set) - 2020 Base + Com Dev , AM
»(Default Analysis Set) - 2020 Base + Com Dev, PM
»(Default Analysis Set) - 2020 Base + Com Dev + Dev, AM
»(Default Analysis Set) - 2020 Base + Com Dev + Dev, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	A1 - 2020 Base + Com Dev							
A - B1303 Station Road	0.0	2.06	0.03	A	1.7	6.81	0.60	A
B - A194 Crossgate	0.0	2.13	0.03	A	0.5	3.78	0.34	A
C - Maxwell Street	0.0	3.61	0.05	A	0.2	7.95	0.14	A
D - A194 Western Approach	0.0	1.78	0.02	A	0.7	3.02	0.41	A
	A1 - 2020 Base + Com Dev + Dev							
A - B1303 Station Road	0.7	4.69	0.39	A	1.8	6.98	0.62	A
B - A194 Crossgate	0.4	3.10	0.27	A	0.5	3.82	0.34	A
C - Maxwell Street	0.1	5.59	0.09	A	0.2	8.11	0.14	A
D - A194 Western Approach	1.2	3.89	0.54	A	0.7	3.03	0.41	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Crossgate Roundabout
Location	South Shields
Site number	1
Date	09-Jan-15
Version	1
Status	Existing

Identifier	
Client	Muse Developments
Jobnumber	NEA1239
Enumerator	C Charlton
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2020 Base + Com Dev	AM	LEVELS	07:45	09:15	90	15	✓
D2	2020 Base + Com Dev	PM	FLAT	16:45	18:15	90	15	✓
D4	2020 Base + Com Dev + Dev	AM	FLAT	07:45	09:15	90	15	✓
D5	2020 Base + Com Dev + Dev	PM	FLAT	16:45	18:15	90	15	✓

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	(Default Analysis Set)	✓	100.000	100.000

(Default Analysis Set) - 2020 Base + Com Dev , AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Crossgate Roundabout	Standard Roundabout	A, B, C, D	2.39	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A	B1303 Station Road	
B	A194 Crossgate	
C	Maxwell Street	
D	A194 Western Approach	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A - B1303 Station Road	6.70	6.70	0.0	47.6	45.4	66.0	
B - A194 Crossgate	5.76	7.00	8.0	12.0	45.5	47.0	
C - Maxwell Street	2.76	4.20	3.4	18.8	45.5	12.0	
D - A194 Western Approach	7.25	7.25	0.0	140.0	45.5	48.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A - B1303 Station Road	0.624	1834
B - A194 Crossgate	0.621	1814
C - Maxwell Street	0.523	1081
D - A194 Western Approach	0.708	2152

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2020 Base + Com Dev	AM	LEVELS	07:45	09:15	90	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Scaling Factor (%)
A - B1303 Station Road		LEVELS	100.000
B - A194 Crossgate		LEVELS	100.000
C - Maxwell Street		LEVELS	100.000
D - A194 Western Approach		LEVELS	100.000

LEVELS Data (Traffic)

Arm	Time rising	Flow rising (PCU/hr)	Time peak	Flow peak (PCU/hr)	Time falling	Flow falling (PCU/hr)
A - B1303 Station Road	07:45	20	08:15	50	08:30	20
B - A194 Crossgate	07:45	20	08:15	50	08:30	20

C - Maxwell Street	07:45	20	08:15	50	08:30	20
D - A194 Western Approach	07:45	20	08:15	50	08:30	20

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - B1303 Station Road	**B - A194 Crossgate**	**C - Maxwell Street**	**D - A194 Western Approach**
From	**A - B1303 Station Road**	0	230	8	305
	B - A194 Crossgate	130	0	24	280
	C - Maxwell Street	5	15	0	41
	D - A194 Western Approach	392	612	27	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - B1303 Station Road	**B - A194 Crossgate**	**C - Maxwell Street**	**D - A194 Western Approach**
From	**A - B1303 Station Road**	0	1	0	1
	B - A194 Crossgate	1	0	0	5
	C - Maxwell Street	0	0	0	0
	D - A194 Western Approach	2	4	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - B1303 Station Road	0.03	2.06	0.0	A	29	44
B - A194 Crossgate	0.03	2.13	0.0	A	29	44
C - Maxwell Street	0.05	3.61	0.0	A	29	44
D - A194 Western Approach	0.02	1.78	0.0	A	29	44

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	30	7	26	1818	0.016	30	23	0.0	0.0	2.030	A

B - A194 Crossgate	30	7	18	1802	0.017	30	38	0.0	0.0	2.102	A
C - Maxwell Street	30	7	45	1058	0.028	30	3	0.0	0.0	3.500	A
D - A194 Western Approach	30	7	19	2138	0.014	30	56	0.0	0.0	1.754	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	47	12	41	1809	0.026	47	36	0.0	0.0	2.060	A
B - A194 Crossgate	47	12	28	1796	0.026	47	60	0.0	0.0	2.130	A
C - Maxwell Street	47	12	71	1044	0.045	47	5	0.0	0.0	3.609	A
D - A194 Western Approach	47	12	30	2131	0.022	47	89	0.0	0.0	1.775	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	40	10	34	1813	0.022	40	30	0.0	0.0	2.047	A
B - A194 Crossgate	40	10	24	1799	0.022	40	50	0.0	0.0	2.118	A
C - Maxwell Street	40	10	60	1050	0.038	40	4	0.0	0.0	3.565	A
D - A194 Western Approach	40	10	25	2134	0.019	40	75	0.0	0.0	1.766	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	20	5	17	1823	0.011	20	15	0.0	0.0	2.013	A
B - A194 Crossgate	20	5	12	1806	0.011	20	25	0.0	0.0	2.086	A
C - Maxwell Street	20	5	30	1066	0.019	20	2	0.0	0.0	3.445	A
D - A194 Western Approach	20	5	13	2143	0.009	20	38	0.0	0.0	1.742	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	20	5	17	1823	0.011	20	15	0.0	0.0	2.013	A
B - A194 Crossgate	20	5	12	1806	0.011	20	25	0.0	0.0	2.086	A
C - Maxwell Street	20	5	30	1066	0.019	20	2	0.0	0.0	3.444	A

D - A194 Western Approach	20	5	13	2143	0.009	20	38	0.0	0.0	1.742	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	20	5	17	1823	0.011	20	15	0.0	0.0	2.013	A
B - A194 Crossgate	20	5	12	1806	0.011	20	25	0.0	0.0	2.086	A
C - Maxwell Street	20	5	30	1066	0.019	20	2	0.0	0.0	3.441	A
D - A194 Western Approach	20	5	13	2143	0.009	20	38	0.0	0.0	1.742	A

(Default Analysis Set) - 2020 Base + Com Dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Crossgate Roundabout	Standard Roundabout	A, B, C, D	4.81	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D2	2020 Base + Com Dev	PM	FLAT	16:45	18:15	90	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - B1303 Station Road		FLAT	✓	891	100.000
B - A194 Crossgate		FLAT	✓	483	100.000

C - Maxwell Street		FLAT	✓	71	100.000
D - A194 Western Approach		FLAT	✓	840	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - B1303 Station Road	**B - A194 Crossgate**	**C - Maxwell Street**	**D - A194 Western Approach**
From	**A - B1303 Station Road**	0	295	4	592
	B - A194 Crossgate	93	0	9	381
	C - Maxwell Street	9	20	0	42
	D - A194 Western Approach	287	543	10	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - B1303 Station Road	**B - A194 Crossgate**	**C - Maxwell Street**	**D - A194 Western Approach**
From	**A - B1303 Station Road**	0	22	0	6
	B - A194 Crossgate	1	0	0	0
	C - Maxwell Street	0	0	0	0
	D - A194 Western Approach	1	4	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - B1303 Station Road	0.60	6.81	1.7	A	891	1337
B - A194 Crossgate	0.34	3.78	0.5	A	483	725
C - Maxwell Street	0.14	7.95	0.2	A	71	107
D - A194 Western Approach	0.41	3.02	0.7	A	840	1260

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	891	223	571	1478	0.603	884	388	0.0	1.7	6.649	A

B - A194 Crossgate	483	121	602	1440	0.335	481	854	0.0	0.5	3.752	A
C - Maxwell Street	71	18	1060	527	0.135	70	23	0.0	0.2	7.872	A
D - A194 Western Approach	840	210	121	2066	0.407	837	1009	0.0	0.7	3.010	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	891	223	573	1476	0.603	891	389	1.7	1.7	6.807	A
B - A194 Crossgate	483	121	606	1437	0.336	483	858	0.5	0.5	3.777	A
C - Maxwell Street	71	18	1066	524	0.136	71	23	0.2	0.2	7.949	A
D - A194 Western Approach	840	210	122	2065	0.407	840	1015	0.7	0.7	3.023	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	891	223	573	1476	0.603	891	389	1.7	1.7	6.810	A
B - A194 Crossgate	483	121	606	1437	0.336	483	858	0.5	0.5	3.777	A
C - Maxwell Street	71	18	1066	524	0.136	71	23	0.2	0.2	7.950	A
D - A194 Western Approach	840	210	122	2065	0.407	840	1015	0.7	0.7	3.023	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	891	223	573	1476	0.603	891	389	1.7	1.7	6.810	A
B - A194 Crossgate	483	121	606	1437	0.336	483	858	0.5	0.5	3.777	A
C - Maxwell Street	71	18	1066	524	0.136	71	23	0.2	0.2	7.950	A
D - A194 Western Approach	840	210	122	2065	0.407	840	1015	0.7	0.7	3.023	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	891	223	573	1476	0.603	891	389	1.7	1.7	6.810	A
B - A194 Crossgate	483	121	606	1437	0.336	483	858	0.5	0.5	3.777	A
C - Maxwell Street	71	18	1066	524	0.136	71	23	0.2	0.2	7.950	A

D - A194 Western Approach	840	210	122	2065	0.407	840	1015	0.7	0.7	3.023	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	891	223	573	1476	0.603	891	389	1.7	1.7	6.810	A
B - A194 Crossgate	483	121	606	1437	0.336	483	858	0.5	0.5	3.777	A
C - Maxwell Street	71	18	1066	524	0.136	71	23	0.2	0.2	7.950	A
D - A194 Western Approach	840	210	122	2065	0.407	840	1015	0.7	0.7	3.023	A

(Default Analysis Set) - 2020 Base + Com Dev + Dev, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Crossgate Roundabout	Standard Roundabout	A, B, C, D	3.98	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D4	2020 Base + Com Dev + Dev	AM	FLAT	07:45	09:15	90	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - B1303 Station Road		FLAT	✓	545	100.000
B - A194 Crossgate		FLAT	✓	437	100.000

C - Maxwell Street		FLAT	✓	61	100.000
D - A194 Western Approach		FLAT	✓	1095	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - B1303 Station Road	B - A194 Crossgate	C - Maxwell Street	D - A194 Western Approach
From	A - B1303 Station Road	0	231	8	306
	B - A194 Crossgate	133	0	24	280
	C - Maxwell Street	5	15	0	41
	D - A194 Western Approach	410	658	27	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - B1303 Station Road	B - A194 Crossgate	C - Maxwell Street	D - A194 Western Approach
From	A - B1303 Station Road	0	20	0	6
	B - A194 Crossgate	1	0	0	0
	C - Maxwell Street	0	0	0	0
	D - A194 Western Approach	1	4	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - B1303 Station Road	0.39	4.69	0.7	A	545	818
B - A194 Crossgate	0.27	3.10	0.4	A	437	656
C - Maxwell Street	0.09	5.59	0.1	A	61	92
D - A194 Western Approach	0.54	3.89	1.2	A	1095	1643

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	545	136	697	1399	0.390	542	546	0.0	0.7	4.650	A

B - A194 Crossgate	437	109	339	1603	0.273	436	900	0.0	0.4	3.086	A
C - Maxwell Street	61	15	716	707	0.086	61	59	0.0	0.1	5.568	A
D - A194 Western Approach	1095	274	152	2044	0.536	1090	624	0.0	1.2	3.854	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	545	136	700	1397	0.390	545	548	0.7	0.7	4.689	A
B - A194 Crossgate	437	109	341	1602	0.273	437	904	0.4	0.4	3.096	A
C - Maxwell Street	61	15	719	705	0.086	61	59	0.1	0.1	5.586	A
D - A194 Western Approach	1095	274	153	2043	0.536	1095	627	1.2	1.2	3.892	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	545	136	700	1397	0.390	545	548	0.7	0.7	4.689	A
B - A194 Crossgate	437	109	341	1602	0.273	437	904	0.4	0.4	3.096	A
C - Maxwell Street	61	15	719	705	0.086	61	59	0.1	0.1	5.586	A
D - A194 Western Approach	1095	274	153	2043	0.536	1095	627	1.2	1.2	3.892	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	545	136	700	1397	0.390	545	548	0.7	0.7	4.689	A
B - A194 Crossgate	437	109	341	1602	0.273	437	904	0.4	0.4	3.096	A
C - Maxwell Street	61	15	719	705	0.086	61	59	0.1	0.1	5.586	A
D - A194 Western Approach	1095	274	153	2043	0.536	1095	627	1.2	1.2	3.892	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	545	136	700	1397	0.390	545	548	0.7	0.7	4.689	A
B - A194 Crossgate	437	109	341	1602	0.273	437	904	0.4	0.4	3.096	A
C - Maxwell Street	61	15	719	705	0.086	61	59	0.1	0.1	5.586	A

D - A194 Western Approach	1095	274	153	2043	0.536	1095	627	1.2	1.2	3.892	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	545	136	700	1397	0.390	545	548	0.7	0.7	4.689	A
B - A194 Crossgate	437	109	341	1602	0.273	437	904	0.4	0.4	3.096	A
C - Maxwell Street	61	15	719	705	0.086	61	59	0.1	0.1	5.586	A
D - A194 Western Approach	1095	274	153	2043	0.536	1095	627	1.2	1.2	3.892	A

(Default Analysis Set) - 2020 Base + Com Dev + Dev, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	Crossgate Roundabout	Standard Roundabout	A, B, C, D	4.91	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D5	2020 Base + Com Dev + Dev	PM	FLAT	16:45	18:15	90	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - B1303 Station Road		FLAT	✓	909	100.000
B - A194 Crossgate		FLAT	✓	484	100.000

C - Maxwell Street		FLAT	✓	71	100.000
D - A194 Western Approach		FLAT	✓	844	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A - B1303 Station Road	B - A194 Crossgate	C - Maxwell Street	D - A194 Western Approach
From	A - B1303 Station Road	0	297	4	608
	B - A194 Crossgate	94	0	9	381
	C - Maxwell Street	9	20	0	42
	D - A194 Western Approach	288	546	10	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - B1303 Station Road	B - A194 Crossgate	C - Maxwell Street	D - A194 Western Approach
From	A - B1303 Station Road	0	20	0	6
	B - A194 Crossgate	1	0	0	0
	C - Maxwell Street	0	0	0	0
	D - A194 Western Approach	1	4	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A - B1303 Station Road	0.62	6.98	1.8	A	909	1364
B - A194 Crossgate	0.34	3.82	0.5	A	484	726
C - Maxwell Street	0.14	8.11	0.2	A	71	107
D - A194 Western Approach	0.41	3.03	0.7	A	844	1266

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	909	227	574	1476	0.616	902	390	0.0	1.7	6.808	A

B - A194 Crossgate	484	121	617	1430	0.338	482	859	0.0	0.5	3.794	A
C - Maxwell Street	71	18	1076	518	0.137	70	23	0.0	0.2	8.025	A
D - A194 Western Approach	844	211	122	2065	0.409	841	1024	0.0	0.7	3.015	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	909	227	576	1475	0.616	909	391	1.7	1.7	6.982	A
B - A194 Crossgate	484	121	622	1427	0.339	484	863	0.5	0.5	3.820	A
C - Maxwell Street	71	18	1083	515	0.138	71	23	0.2	0.2	8.109	A
D - A194 Western Approach	844	211	123	2065	0.409	844	1031	0.7	0.7	3.028	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	909	227	576	1475	0.616	909	391	1.7	1.8	6.985	A
B - A194 Crossgate	484	121	622	1427	0.339	484	863	0.5	0.5	3.821	A
C - Maxwell Street	71	18	1083	515	0.138	71	23	0.2	0.2	8.109	A
D - A194 Western Approach	844	211	123	2065	0.409	844	1031	0.7	0.7	3.028	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	909	227	576	1475	0.616	909	391	1.8	1.8	6.985	A
B - A194 Crossgate	484	121	622	1427	0.339	484	863	0.5	0.5	3.821	A
C - Maxwell Street	71	18	1083	515	0.138	71	23	0.2	0.2	8.109	A
D - A194 Western Approach	844	211	123	2065	0.409	844	1031	0.7	0.7	3.028	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	909	227	576	1475	0.616	909	391	1.8	1.8	6.985	A
B - A194 Crossgate	484	121	622	1427	0.339	484	863	0.5	0.5	3.821	A
C - Maxwell Street	71	18	1083	515	0.138	71	23	0.2	0.2	8.109	A

D - A194 Western Approach	844	211	123	2065	0.409	844	1031	0.7	0.7	3.028	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A - B1303 Station Road	909	227	576	1475	0.616	909	391	1.8	1.8	6.985	A
B - A194 Crossgate	484	121	622	1427	0.339	484	863	0.5	0.5	3.821	A
C - Maxwell Street	71	18	1083	515	0.138	71	23	0.2	0.2	8.109	A
D - A194 Western Approach	844	211	123	2065	0.409	844	1031	0.7	0.7	3.028	A

Basic Results Summary

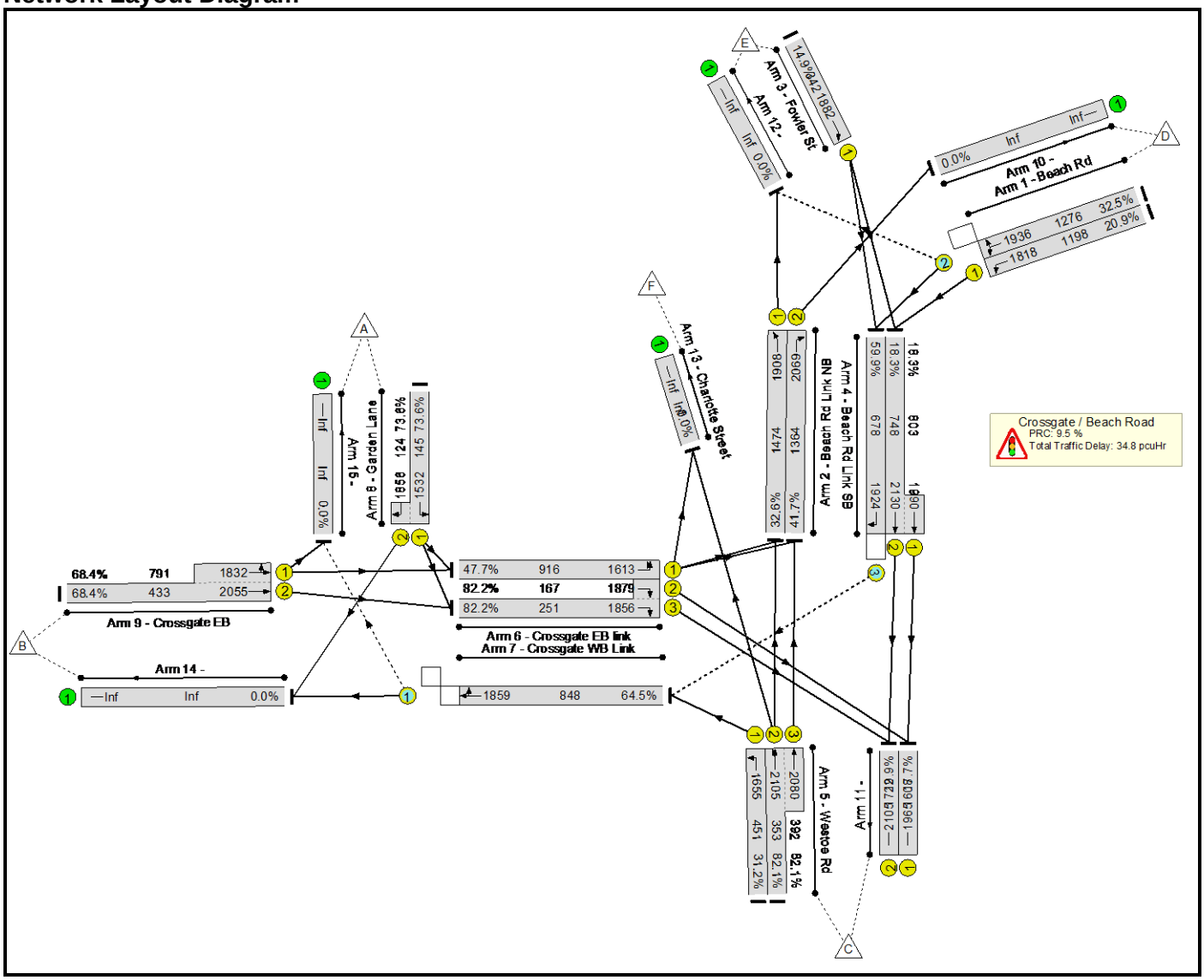
User and Project Details

Project:	**South Shields Town Centre Regeneration**
Title:	**Crossgate / Beach Road Proposed Layout**
Location:	South Shields, South Tyneside
Additional detail:	ign g to j entered as 6 ign j to g entered as 6 ign h to j entered as 6 ign j to h entered as 6 ign f to a changed from 7 to 5 ign f to b changed from 7 to 5 ign d to a changed from 12 to 10 ign d to b changed from 12 to 10 ign v to u changed from 9 to 6 ped mins on e,f,n,v changed from 7 to 6 ped min on d changed from 10 to 7 igns l to j l to k and n to i changed from 11 to 8 ped min on r,s,t changed from 9 to 6 in line with ltn 2/95 igns rst to opq changed to 9 secs from 11 and 12 seconds m to h and h to m ign removed as not necessary as not conflicting phase w left turn filter into fowler street added and an extra stage added to this junction - intergreens and phase minimum entered for new phase w
File name:	Garden Lane - Crossgate.lsg3x
Author:	Rachel Broadbent
Company:	JMP
Address:	

Basic Results Summary

Scenario 4: '2020 Base + Com Dev AM' (FG10: '2020 Base + Com Dev AM', Plan 2: 'single cyc')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Crossgate / Beach Road Proposed Layout	-	-	-		-	-	-	-	-	-	**82.2%**	**176**	**397**	**14**	**34.8**	-	-
Crossgate / Beach Road	-	-	-		-	-	-	-	-	-	**82.2%**	**176**	**397**	**14**	**34.8**	-	-
1/1	Beach Rd Left	U	A		1	57	-	251	1818	1198	20.9%	-	-	-	0.5	7.8	2.5
1/2	Beach Rd Left Right	O	A		1	57	-	415	1936	1276	32.5%	27	0	0	1.0	9.0	4.6
2/1	Beach Rd Link NB Ahead	U	B	W	1	67	10	481	1908	1474	32.6%	-	-	-	0.3	2.0	4.0
2/2	Beach Rd Link NB Right	U	B		1	57	-	568	2069	1364	41.7%	-	-	-	1.2	7.4	8.2
3/1	Fowler St Ahead	U	C		1	15	-	51	1882	342	14.9%	-	-	-	0.5	36.5	1.1
4/2+4/1	Beach Rd Link SB Ahead	U	H		1	60	-	284	2130:1990	748+803	18.3 : 18.3%	-	-	-	0.4	5.2	1.2
4/3	Beach Rd Link SB Right	O	G		1	30	-	406	1924	678	59.9%	0	397	9	2.7	24.4	8.9
5/1	Westoe Rd Left	U	I		1	23	-	141	1655	451	31.2%	-	-	-	1.2	31.2	2.9
5/2+5/3	Westoe Rd Ahead Ahead2	U	I		1	23	-	612	2105:2080	353+392	82.1 : 82.1%	-	-	-	7.0	40.9	11.3
6/1	Crossgate EB link Left Left2	U	J	K	1	49	33	437	1613	916	47.7%	-	-	-	2.2	18.3	8.8
6/3+6/2	Crossgate EB link Right	U	J		1	16	-	343	1856:1879	251+167	82.2 : 82.2%	-	-	-	6.0	62.9	8.8
7/1	Crossgate WB Link Ahead Right	O	P		1	50	-	547	1859	848	64.5%	149	0	6	4.4	28.8	10.7
8/1+8/2	Garden Lane Left Right	U	Q		1	9	-	198	1532:1856	145+124	73.6 : 73.6%	-	-	-	3.4	61.3	4.5

Basic Results Summary

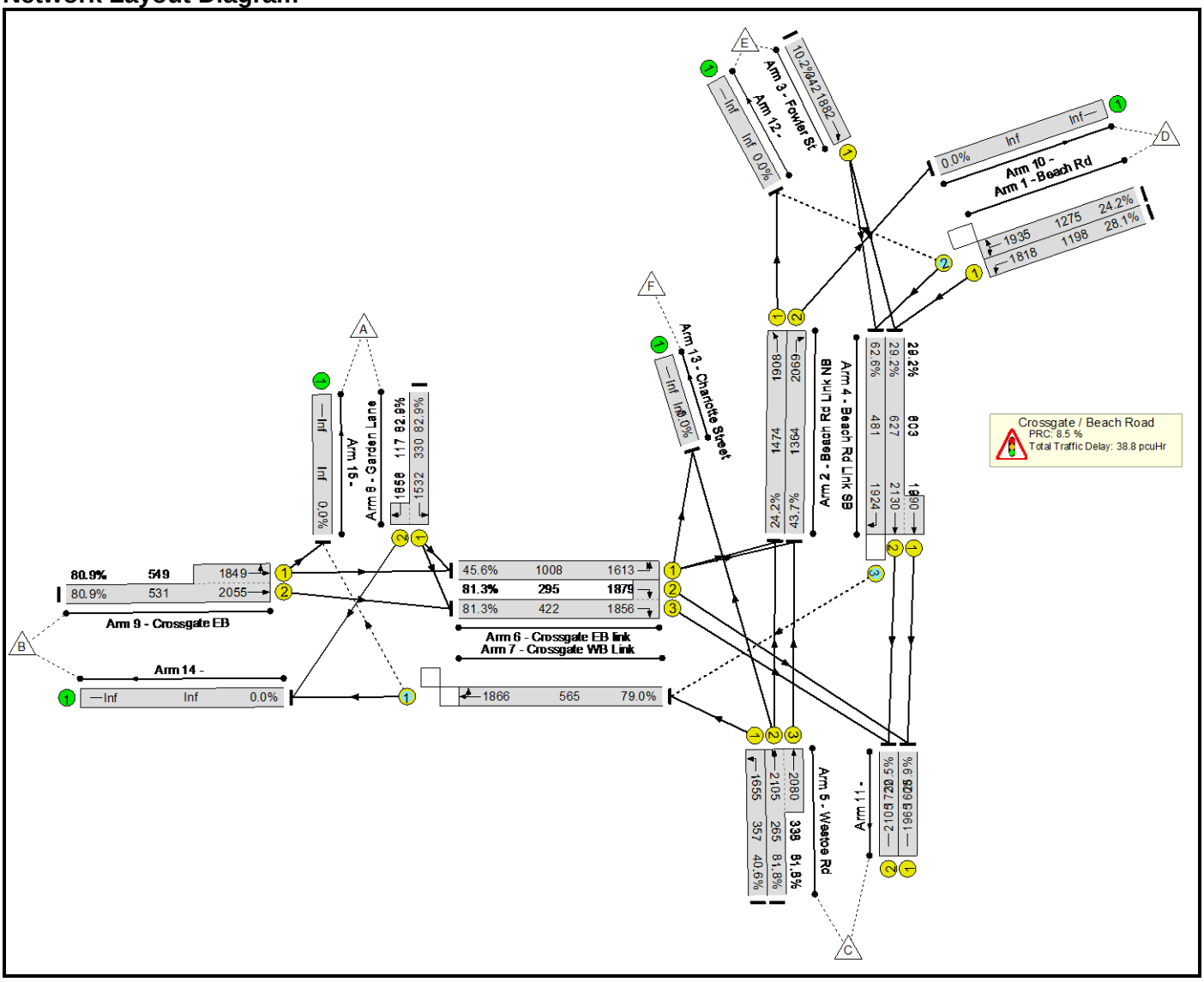
9/2+9/1	Crossgate EB Ahead Left	U	O		1	50	-	837	2055:1832	433+791	68.4 : 68.4%	-	-	-	3.6	15.4	10.8
11/1		U	U		1	71	-	284	1965	1608	17.7%	-	-	-	0.2	2.0	0.6
11/2		U	U		1	71	-	343	2105	1722	19.9%	-	-	-	0.2	1.8	0.6

C1	Stream: 1 PRC for Signalled Lanes (%):	116.1	Total Delay for Signalled Lanes (pcuHr):	3.54	Cycle Time (s):	88	
C1	Stream: 2 PRC for Signalled Lanes (%):	9.5	Total Delay for Signalled Lanes (pcuHr):	19.56	Cycle Time (s):	88	
C1	Stream: 3 PRC for Signalled Lanes (%):	22.3	Total Delay for Signalled Lanes (pcuHr):	11.32	Cycle Time (s):	88	
C1	Stream: 4 PRC for Signalled Lanes (%):	351.9	Total Delay for Signalled Lanes (pcuHr):	0.33	Cycle Time (s):	88	
	PRC Over All Lanes (%):	9.5	Total Delay Over All Lanes(pcuHr):	34.75			

Basic Results Summary

Scenario 5: '2020 Base + Com Dev PM' (FG11: '2020 Base + Com Dev PM', Plan 2: 'single cyc')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Crossgate / Beach Road Proposed Layout	-	-	-		-	-	-	-	-	-	**82.9%**	**114**	**294**	**23**	**38.8**	-	-
Crossgate / Beach Road	-	-	-		-	-	-	-	-	-	**82.9%**	**114**	**294**	**23**	**38.8**	-	-
1/1	Beach Rd Left	U	A		1	57	-	337	1818	1198	28.1%	-	-	-	0.8	8.4	3.6
1/2	Beach Rd Left Right	O	A		1	57	-	309	1935	1275	24.2%	21	0	0	0.7	8.2	3.2
2/1	Beach Rd Link NB Ahead	U	B	W	1	67	10	357	1908	1474	24.2%	-	-	-	0.2	1.8	0.7
2/2	Beach Rd Link NB Right	U	B		1	57	-	596	2069	1364	43.7%	-	-	-	0.7	4.1	4.1
3/1	Fowler St Ahead	U	C		1	15	-	35	1882	342	10.2%	-	-	-	0.3	35.9	0.8
4/2+4/1	Beach Rd Link SB Ahead	U	H		1	46	-	359	2130:1990	627+603	29.2 : 29.2%	-	-	-	0.8	8.0	2.6
4/3	Beach Rd Link SB Right	O	G		1	21	-	301	1924	481	62.6%	0	294	7	2.9	34.7	7.4
5/1	Westoe Rd Left	U	I		1	18	-	145	1655	357	40.6%	-	-	-	1.5	38.1	3.4
5/2+5/3	Westoe Rd Ahead Ahead2	U	I		1	18	-	493	2105:2080	265+338	81.8 : 81.8%	-	-	-	6.4	46.8	9.3
6/1	Crossgate EB link Left Left2	U	J	K	1	54	24	460	1613	1008	45.6%	-	-	-	1.3	10.2	5.0
6/3+6/2	Crossgate EB link Right	U	J		1	30	-	583	1856:1879	422+295	81.3 : 81.3%	-	-	-	4.8	29.5	7.8
7/1	Crossgate WB Link Ahead Right	O	P		1	38	-	446	1866	565	79.0%	93	0	17	5.9	47.5	12.7
8/1+8/2	Garden Lane Left Right	U	Q		1	21	-	371	1532:1856	330+117	82.9 : 82.9%	-	-	-	5.4	52.6	10.1

Basic Results Summary

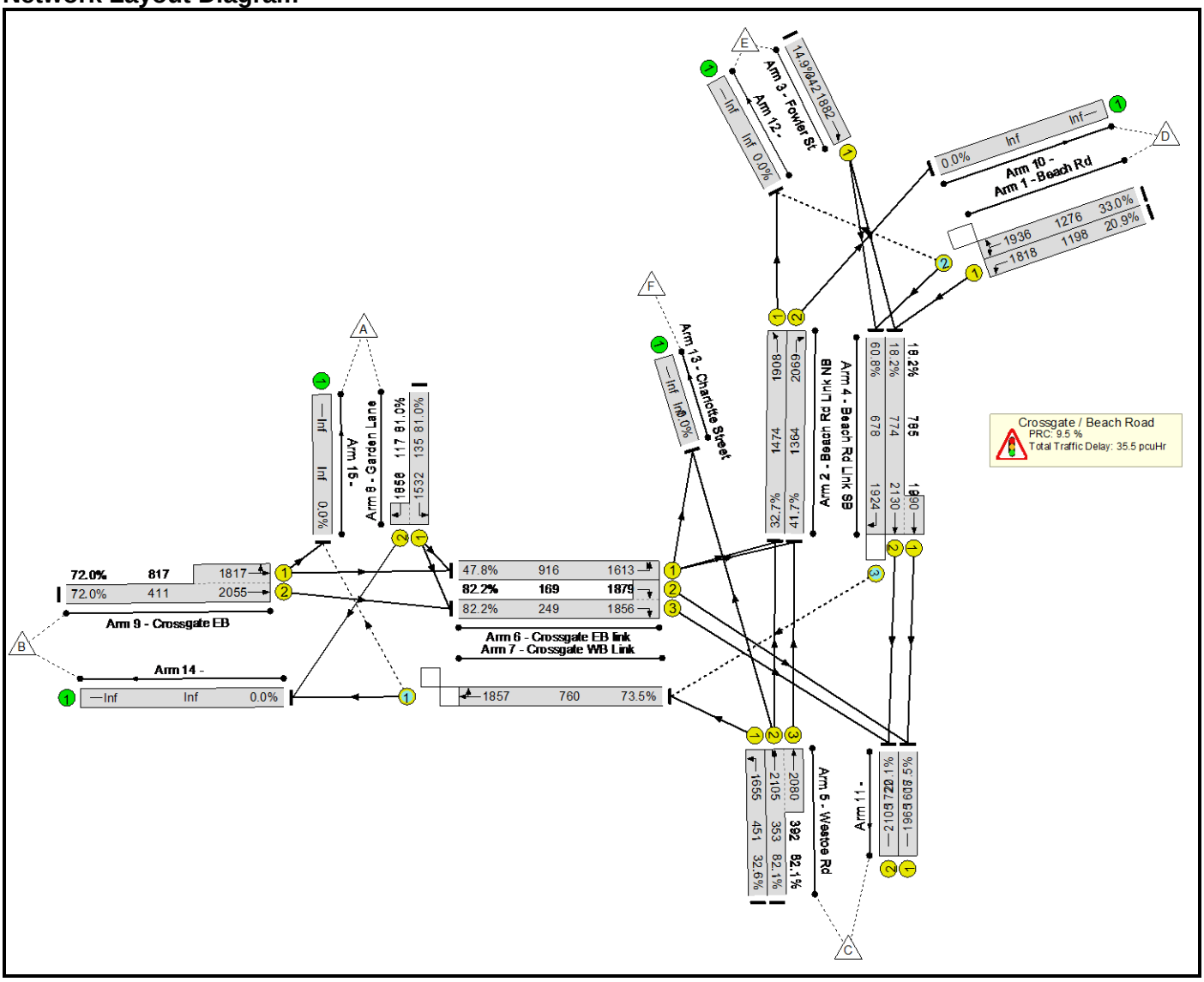
9/2+9/1	Crossgate EB Ahead Left	U	O		1	38	-	874	2055:1849	531+549	80.9 : 80.9%	-	-	-	6.5	26.8	13.5
11/1		U	U		1	71	-	416	1965	1608	25.9%	-	-	-	0.2	2.2	1.0
11/2		U	U		1	71	-	526	2105	1722	30.5%	-	-	-	0.3	2.0	1.0

C1	Stream: 1 PRC for Signalled Lanes (%):	105.9	Total Delay for Signalled Lanes (pcuHr):	2.69	Cycle Time (s):	88
C1	Stream: 2 PRC for Signalled Lanes (%):	10.1	Total Delay for Signalled Lanes (pcuHr):	17.73	Cycle Time (s):	88
C1	Stream: 3 PRC for Signalled Lanes (%):	8.5	Total Delay for Signalled Lanes (pcuHr):	17.80	Cycle Time (s):	88
C1	Stream: 4 PRC for Signalled Lanes (%):	194.7	Total Delay for Signalled Lanes (pcuHr):	0.54	Cycle Time (s):	88
	PRC Over All Lanes (%):	8.5	Total Delay Over All Lanes(pcuHr):	38.77		

Basic Results Summary

Scenario 6: '2020 Base + Com Dev + Dev AM' (FG12: '2020 Base + Com Dev + Dev AM', Plan 2: 'single cyc')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Crossgate / Beach Road Proposed Layout	-	-	-		-	-	-	-	-	-	**82.2%**	**182**	**403**	**17**	**35.5**	-	-
Crossgate / Beach Road	-	-	-		-	-	-	-	-	-	**82.2%**	**182**	**403**	**17**	**35.5**	-	-
1/1	Beach Rd Left	U	A		1	57	-	251	1818	1198	20.9%	-	-	-	0.5	7.8	2.5
1/2	Beach Rd Left Right	O	A		1	57	-	421	1936	1276	33.0%	27	0	0	1.1	9.0	4.7
2/1	Beach Rd Link NB Ahead	U	B	W	1	67	10	482	1908	1474	32.7%	-	-	-	0.4	2.9	5.2
2/2	Beach Rd Link NB Right	U	B		1	57	-	568	2069	1364	41.7%	-	-	-	1.4	8.6	8.4
3/1	Fowler St Ahead	U	C		1	15	-	51	1882	342	14.9%	-	-	-	0.5	36.5	1.1
4/2+4/1	Beach Rd Link SB Ahead	U	H		1	60	-	284	2130:1990	774+785	18.2 : 18.2%	-	-	-	0.4	5.2	1.0
4/3	Beach Rd Link SB Right	O	G		1	30	-	412	1924	678	60.8%	0	403	9	2.8	24.5	9.1
5/1	Westoe Rd Left	U	I		1	23	-	147	1655	451	32.6%	-	-	-	1.3	31.5	3.1
5/2+5/3	Westoe Rd Ahead Ahead2	U	I		1	23	-	612	2105:2080	353+392	82.1 : 82.1%	-	-	-	7.0	40.9	11.3
6/1	Crossgate EB link Left Left2	U	J	K	1	49	33	438	1613	916	47.8%	-	-	-	2.0	16.1	8.4
6/3+6/2	Crossgate EB link Right	U	J		1	16	-	344	1856:1879	249+169	82.2 : 82.2%	-	-	-	5.7	59.9	8.8
7/1	Crossgate WB Link Ahead Right	O	P		1	51	-	559	1857	760	73.5%	155	0	8	4.2	27.1	10.1
8/1+8/2	Garden Lane Left Right	U	Q		1	8	-	204	1532:1856	135+117	81.0 : 81.0%	-	-	-	4.1	72.7	5.3

Basic Results Summary

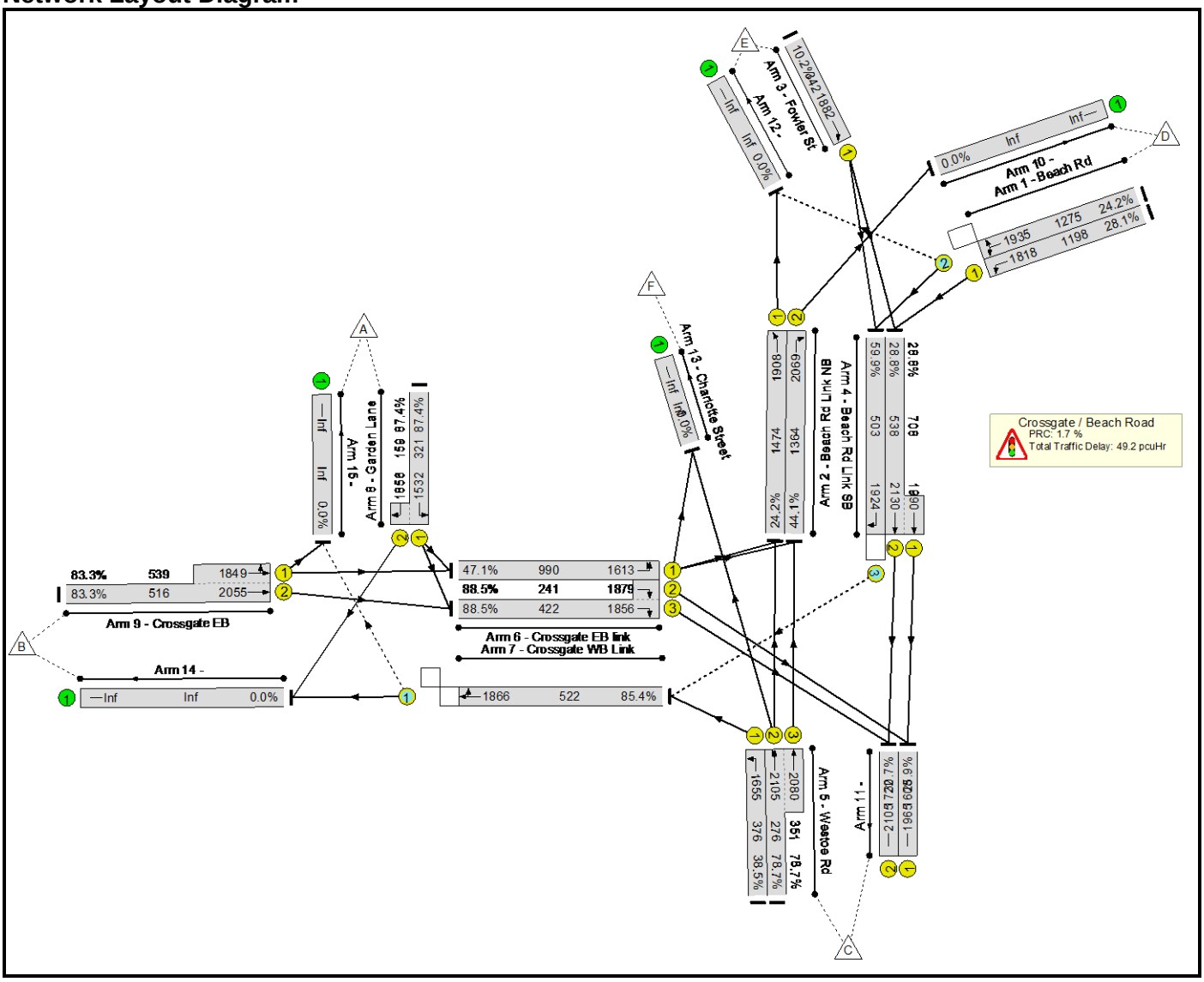
9/2+9/1	Crossgate EB Ahead Left	U	O		1	51	-	884	2055:1817	411+817	72.0 : 72.0%	-	-	-	3.9	15.9	12.3
11/1		U	U		1	71	-	282	1965	1608	17.5%	-	-	-	0.1	1.5	0.2
11/2		U	U		1	71	-	346	2105	1722	20.1%	-	-	-	0.1	1.4	0.2

C1	Stream: 1 PRC for Signalled Lanes (%):	116.1	Total Delay for Signalled Lanes (pcuHr):	3.87	Cycle Time (s):	88
C1	Stream: 2 PRC for Signalled Lanes (%):	9.5	Total Delay for Signalled Lanes (pcuHr):	19.13	Cycle Time (s):	88
C1	Stream: 3 PRC for Signalled Lanes (%):	11.1	Total Delay for Signalled Lanes (pcuHr):	12.23	Cycle Time (s):	88
C1	Stream: 4 PRC for Signalled Lanes (%):	348.0	Total Delay for Signalled Lanes (pcuHr):	0.25	Cycle Time (s):	88
	PRC Over All Lanes (%):	9.5	Total Delay Over All Lanes(pcuHr):	35.48		

Basic Results Summary

Scenario 7: '2020 Base + Com Dev + Dev PM' (FG13: '2020 Base + Com Dev + Dev PM', Plan 2: 'single cyc')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Crossgate / Beach Road Proposed Layout	-	-	-		-	-	-	-	-	-	**88.5%**	**99**	**274**	**60**	**49.2**	-	-
Crossgate / Beach Road	-	-	-		-	-	-	-	-	-	**88.5%**	**99**	**274**	**60**	**49.2**	-	-
1/1	Beach Rd Left	U	A		1	57	-	337	1818	1198	28.1%	-	-	-	0.8	8.4	3.6
1/2	Beach Rd Left Right	O	A		1	57	-	309	1935	1275	24.2%	20	0	1	0.7	8.4	3.2
2/1	Beach Rd Link NB Ahead	U	B	W	1	67	10	357	1908	1474	24.2%	-	-	-	1.0	9.6	4.4
2/2	Beach Rd Link NB Right	U	B		1	57	-	602	2069	1364	44.1%	-	-	-	2.6	15.8	9.6
3/1	Fowler St Ahead	U	C		1	15	-	35	1882	342	10.2%	-	-	-	0.3	35.9	0.8
4/2+4/1	Beach Rd Link SB Ahead	U	H		1	48	-	359	2130:1990	538+708	28.8 : 28.8%	-	-	-	2.0	20.0	4.2
4/3	Beach Rd Link SB Right	O	G		1	22	-	301	1924	503	59.9%	0	274	27	4.2	50.8	7.2
5/1	Westoe Rd Left	U	I		1	19	-	145	1655	376	38.5%	-	-	-	1.5	36.6	3.3
5/2+5/3	Westoe Rd Ahead Ahead2	U	I		1	19	-	493	2105:2080	276+351	78.7 : 78.7%	-	-	-	5.9	43.3	8.8
6/1	Crossgate EB link Left Left2	U	J	K	1	53	25	466	1613	990	47.1%	-	-	-	1.6	12.7	6.0
6/3+6/2	Crossgate EB link Right	U	J		1	28	-	587	1856:1879	422+241	88.5 : 88.5%	-	-	-	7.0	42.7	9.4
7/1	Crossgate WB Link Ahead Right	O	P		1	37	-	446	1866	522	85.4%	79	0	31	7.3	59.3	13.6
8/1+8/2	Garden Lane Left Right	U	Q		1	22	-	420	1532:1856	321+159	87.4 : 87.4%	-	-	-	6.6	57.0	12.0

Basic Results Summary

9/2+9/1	Crossgate EB Ahead Left	U	O		1	37	-	879	2055:1849	516+539	83.3 : 83.3%	-	-	-	7.1	29.1	14.5
11/1		U	U		1	71	-	417	1965	1608	25.9%	-	-	-	0.2	1.5	0.2
11/2		U	U		1	71	-	529	2105	1722	30.7%	-	-	-	0.2	1.6	0.3

C1	Stream: 1 PRC for Signalled Lanes (%):	103.9	Total Delay for Signalled Lanes (pcuHr):	5.45	Cycle Time (s):	88	
C1	Stream: 2 PRC for Signalled Lanes (%):	1.7	Total Delay for Signalled Lanes (pcuHr):	22.25	Cycle Time (s):	88	
C1	Stream: 3 PRC for Signalled Lanes (%):	2.9	Total Delay for Signalled Lanes (pcuHr):	21.08	Cycle Time (s):	88	
C1	Stream: 4 PRC for Signalled Lanes (%):	193.0	Total Delay for Signalled Lanes (pcuHr):	0.41	Cycle Time (s):	88	
	PRC Over All Lanes (%):	1.7	Total Delay Over All Lanes(pcuHr):	49.19			

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